# GW-ZS

## MONITORING REPORTS





William C. Olson New Mexico Oil Conservation Division Environmental Bureau 2040 S. Pacheco Santa Fe, New Mexico 87505



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**ENVIRONMENTAL** 

#### Subject:

Annual Summary Report for 1997 Groundwater Monitoring Activities at Warren Monument Gas Plant, Lea County, New Mexico

Dear Mr. Olson:

On behalf of Warren Petroleum Company L.P. (Warren), please find the annual summary report for 1997 groundwater monitoring activities at the Warren Monument Gas Plant in Lea County, New Mexico. Groundwater monitoring activities for 1997 were conducted by Warren plant personnel. This annual summary report has been prepared jointly by Warren and ARCADIS Geraghty & Miller, Inc. to satisfy the reporting requirements outlined in the New Mexico Oil Conservation District (NMOCD) letter to Warren dated August 9, 1996.

Tulsa, 19 March 1998

Contact: John P. Shonfelt, P.G.

Extension: (918) 664-9900

#### **SUMMARY OF MONITORING ACTIVITIES**

The 1997 monitoring activities consisted of conducting quarterly groundwater gauging and sampling events. The following monitoring activities were conducted during each referenced quarterly event. Any deviations, problems, or deficiencies encountered during the monitoring period are also reported.

#### **FIRST QUARTER 1997**

- Gauged fluid levels in 13 monitoring wells on February 27, 1997.
- Sampled five monitoring wells (WP-1, WP-5, WP-6, WP-7, and WP-14) on February 27, 1997 which did not contain measurable free-phase hydrocarbons. All groundwater samples were analyzed by SPL Laboratory for benzene, toluene, ethylbenzene, and xylenes (BTEX) constituents using USEPA Method 8020A; the inorganic constituents chlorides, total dissolved solids (TDS), and sulfates; total metals; and polynuclear aromatic hydrocarbons (PAHs).
- Well WP-2 was still dry and thus, could not be sampled.

 Due to the delay in sampling the fourth quarter 1996 sampling event, the first quarter 1997 groundwater samples were not collected until February 27, 1997.

#### **SECOND QUARTER 1997**

- Gauged fluid levels in 13 monitoring wells on May 19, 1996.
- Sampled four monitoring wells (WP-1, WP-5, WP-7, and WP-14) on May 19, 1997 which did not contain measurable free-phase hydrocarbons. All groundwater samples were analyzed by SPL Laboratory for BTEX constituents using USEPA Method 8020A; the inorganic constituents chlorides, TDS, and sulfates; total metals; and PAHs.
- Well WP-2 was essentially dry and thus, could not be sampled.

#### **THIRD QUARTER 1996**

- Gauged fluid levels in 13 monitoring wells on August 19, 1996.
- Sampled four monitoring wells (WP-1, WP-5, WP-7, and WP-14) on August 19, 1996 which did not contain measurable free-phase hydrocarbons. All groundwater samples were analyzed by SPL Laboratory for BTEX constituents using USEPA Method 8020A; the inorganic constituents chlorides, TDS, and sulfates; total metals; and PAHs.
- Well WP-2 was essentially dry and thus, could not be sampled.

#### **FOURTH QUARTER 1997**

- Gauged fluid levels in 13 monitoring wells on January 5, 1998.
- Sampled four monitoring wells (WP-1, WP-5, WP-7, and WP-14) on January 5, 1998. All groundwater samples were analyzed by SPL Laboratory for BTEX constituents using USEPA Method 8020A; the inorganic constituents chlorides, TDS, and sulfates; total metals; and PAHs.
- Well WP-2 was essentially dry and thus, could not be sampled during the fourth quarter event.

#### SUMMARY OF MONITORING AND ANALYTICAL RESULTS

#### FLUID LEVEL MEASUREMENTS

Results of the 1997 fluid-level monitoring activities are summarized below. A site map with monitoring well locations is presented as Figure 1.

- Field measurements, water-level elevations, and liquid hydrocarbon thickness are presented in Tables 1A, 1B, and 1C, respectively. A summary table of groundwater elevations corrected for the presence of liquid hydrocarbons is presented in Table 1D. Based on previous results of liquid hydrocarbon characterization conducted at the site, a average specific gravity of 0.72 was used to calculate corrected groundwater elevations. Graphs of groundwater elevations versus time are presented as Appendix A.
- A slight increasing trend in water-level elevations was observed across the site during 1997 with the exception of water-level elevations from Wells WP-3 and WP-4. Well WP-2 was essentially dry during 1997.
- Groundwater was encountered at approximately 28 ft to 40 ft below the measuring point elevations (Table 1A). The saturated thickness of the alluvial sediments beneath the site ranged from being near dry in Well WP-2 to 8.5 ft in Well WP-10. The saturated thickness was less than 5 ft in seven of the 13 wells at the site.
- Groundwater elevation contour maps for each quarterly monitoring period are presented as Figures 2 though 5. Groundwater flow beneath the eastern half of the site is predominantly towards the southeast while groundwater flow beneath the western portion of the site is toward the south. An apparent area of groundwater mounding is present east of the processing area. The configuration of the water table appears to be consistent throughout each monitoring event in 1997.
- An anomalous high water-level elevation was recorded in Well WP-7 during the January 1998 gauging event. This value was not used in the construction of the groundwater elevation contour map for this period. The cause of the anomalous data is unknown.

#### ANALYTICAL RESULTS

Analytical results for the 1997 monitoring program are summarized below.

- A summary of groundwater quality data for the six wells (WP-1, WP-5, WP-6, WP-7, WP-13, and WP-14) sampled on a quarterly basis is presented in Tables 2A, 2B and 2C. A series of graphs showing BTEX concentrations versus time and inorganic parameter (chlorides, TDS, and sulfate) concentrations versus time are presented as Appendix B. The analytical data sheets for samples collected during the 1997 monitoring program are presented as Appendix C.
- BTEX levels were detected in four out of five monitoring wells sampled during the first quarter of 1997 except Well WP-7. Benzene is the predominant constituent detected in four of the five groundwater samples with detectable concentrations of BTEX. During the 1997 monitoring period, the highest concentrations of benzene were detected in Wells WP-1 and WP-5. Ethylbenzene was the predominant constituent detected in Well WP-6 during the first quarter of 1997. Well WP-6 was not sampled after the first quarter of 1997 due to the presence of a hydrocarbon film.
- Inorganic groundwater quality indicates elevated concentrations of chlorides, TDS, and sulfates are present in the groundwater beneath the site. The highest concentrations of chlorides, TDS, and sulfates were detected in Well WP-7 which is located in the northwest portion of the site. The elevated concentrations do not appear to be related to gas plant operations but are likely related to former operations at the Climax Chemical Company located approximately one-half mile northwest (upgradient) of the Warren site.
- A summary of total metals data for groundwater samples collected in 1997 is presented in Table 2B. Of the eight RCRA heavy metals, only three (barium, chromium, and lead) metals were detected in the groundwater samples. Barium was detected in all five monitoring wells at concentrations ranging from 0.06 mg/L to 2.6 mg/L. Chromium was detected in all five monitoring wells at concentrations ranging from 0.01 mg/L to 0.15 mg/L. Lead was detected in only one sample collected from Well WP-1 at a concentration of 0.09 mg/L.
- A summary of PAH data for groundwater samples collected in 1997 is presented in Table 2C. Only trace levels of PAHs were detected in four (WP-2, WP-5, WP-7, and WP-14) of the five wells. Detectable concentrations of naphthalene were present in Wells WP-1, WP-5, and WP-7 at concentrations ranging from 0.1 μg/L to 7.0 μg/L. Detectable concentrations of fluorene were present in Wells WP-1 and WP-5 with concentrations ranging from 0.8 μg/L to 8.0 μg/L. Detectable levels of phenanthrene ranging from 0.5 μg/L to 11.0 μg/L were

detected in Wells WP-1, WP-5, WP-7, and WP-14. Dibenzo (a,h) anthracene was detected in only Well WP-1 at a concentration of  $3.0 \mu g/L$ .

#### DISTRIBUTION OF LIQUID HYDROCARBONS

The approximate extent of liquid hydrocarbons is shown for each quarterly monitoring event on Figures 6 through 9. A brief summary of findings is presented below.

- During February 1997, liquid hydrocarbons were detected in eight (Wells WP-3, WP-4, WP-6, WP-10, WP-11, WP-12, WP-13, and WP-15) of the 13 wells (Figure 6). Liquid hydrocarbon thickness in wells ranged from 0.01 ft in Well WP-6 to 1.49 ft in Well WP-4.
- During May 1997, liquid hydrocarbons were detected in eight (Wells WP-3, WP-4, WP-6, WP-10, WP-11, WP-12, WP-13, and WP-15) of the 13 wells (Figure 7). Liquid hydrocarbon thickness in wells ranged from 0.01 ft in Wells WP-3, WP-6, and WP-10 to 0.78 ft in Well WP-11.
- During August 1997, liquid hydrocarbons were detected in seven (Wells WP-4, WP-6, WP-10, WP-11, WP-12, WP-13, and WP-15) of the 13 wells (Figure 8). Liquid hydrocarbon thickness in wells ranged from 0.01 ft in Wells WP-6, WP-10, and WP-15 to 1.16 ft in Well WP-4.
- During January 1998, liquid hydrocarbons were detected in seven (Wells WP-4, WP-6, WP-10, WP-11, WP-12, WP-13, and WP-15) of the 13 wells (Figure 9).
   Liquid hydrocarbon thickness in wells ranged from 0.03 ft in Well WP-6 to 1.0 ft in Well WP-4.

#### SUMMARY OF HYDROCARBON RECOVERY OPERATIONS

Hydrocarbon recovery operations in 1997 consisted of periodically pumping three wells using pneumatic skimming pumps. Produced fluids are pumped to the onsite oil/water separator and plant wastewater system. Recovered volumes of produced water and hydrocarbons for each recovery well are presented in Tables 3A, 3B, and 3C and can be summarized as follows.

- Hydrocarbons could not be recovered from Well WP-2 because it was essentially dry during 1997.
- Approximately 140 gallons of hydrocarbon product and 150 gallons of produced water were recovered from Well WP-3 during 1997. Hydrocarbon recovery

operations were ceased in April 1997 due to low water-table conditions and pump limitations.

- Approximately 220 gallons of hydrocarbon product and 270 gallons of produced water were recovered from Well WP-4 during 1997. Hydrocarbon recovery operations were ceased in April 1997 because of the low water-table conditions and pump limitations.
- Approximately 25 gallons of hydrocarbon product and 265 gallons of produced water were recovered from Well WP-10 during 1997. Hydrocarbon recovery operations were ceased in March 1997 because of the reduced hydrocarbon thickness in the well.

#### **CONCLUSIONS AND RECOMMENDATIONS**

Based on the results of the 1997 monitoring program, the following conclusions can be made.

- A slight increasing trend in water-level elevations was observed across the site during 1997 with the exception of water-level elevations from Wells WP-3, and WP-4. These wells are located along the extreme south or eastern portions of the site (Figure 1). Well WP-2 was essentially dry during 1997.
- Groundwater flow beneath the eastern half of the site is predominantly towards the southeast while groundwater flow beneath the western portion of the site is toward the south. An apparent area of groundwater mounding is present east of the processing area, and possibly in Well WP-7. The configuration of the water table appears to be consistent throughout each monitoring event in 1997.
- BTEX levels were detected in all samples from monitoring wells except Well WP-7. Benzene is the predominant constituent detected in four of the five groundwater samples with detectable concentrations of BTEX. During the 1997 monitoring period, the highest concentrations of benzene were detected in Wells WP-1 and WP-5. Ethylbenzene was the predominant constituent detected in Well WP-6 during the first quarter of 1997. Well WP-6 was not sampled after the first quarter of 1997.
- Inorganic groundwater quality indicates elevated concentrations of chlorides, TDS, and sulfates are present in the groundwater beneath the site. The highest concentrations of chlorides, TDS, and sulfates were detected in Well WP-7 which is located in the northwest portion of the site. The elevated concentrations do not appear to be related to gas plant operations but are likely related to former

operations at the Climax Chemical Company located approximately one-half mile northwest (upgradient) of the Warren site.

- Only low levels of the heavy metals barium, chromium, and lead were detected in groundwater samples.
- Trace levels of PAHs were detected in samples from four of the five monitoring wells. The levels of PAHs in groundwater beneath the site are considered insignificant.
- Two separate hydrocarbon plumes were detected at the site during 1997. The northern plume is larger and occurs southeast (downgradient) of the gas processing area and condensate storage area. The southern plume occurs southeast (downgradient) of the former produced water pond and burn pit.
- A total of 385 gallons of hydrocarbons were recovered in 1997 from Wells WP-3, WP-4, and WP-10. Low water-table conditions in conjunction with pump limitations minimized recovery well operation in the third and fourth quarters of 1997. In an effort to make the recovery system operate more efficiently during low water-level conditions, Warren is in the process of purchasing two bottom loading hydrocarbon skimming pumps for Wells WP-4 and WP-13. In addition, the hydrocarbon recovery system is currently being expanded. These modifications should improve hydrocarbon recovery operations in 1998.

Based on the results to the 1997 monitoring program the following recommendations can be made.

- 1. During the March 1998 sampling event, samples should be collected for analysis of BTEX, chlorides, TDS, and sulfates.
- 2. Complete the upgrade and modification of the hydrocarbon recovery system as discussed above.

Based on information discussed with the OCD during the March 5, 1998, meeting, Warren proposes the following groundwater monitoring program for the Monument site in 1998. The 1998 groundwater monitoring program will consist of semi-annual groundwater sampling. Prior to sampling, all monitoring wells will be gauged for the presence of liquid hydrocarbons and water-level elevations. The first groundwater sampling event will be conducted in June 1998 in an effort to coincide with late Spring precipitation events. The first event will be considered the comprehensive sampling event as all five monitoring wells (WP-1, WP-5, WP-6, WP-7, and WP-14) without liquid hydrocarbons will be sampled for analysis of BTEX, chlorides, TDS, sulfates, and total metals using the appropriate USEPA methods. The second event will be

conducted in October to coincide with the end of the Fall precipitation season. Three perimeter downgradient monitor wells (WP-1, WP-5, and WP-14) will be sampled during the second event for analysis of BTEX, chlorides, TDS, and sulfates. The above monitoring events are scheduled to coincide with seasonal periods of precipitation and thus, should be representative of higher groundwater flow conditions. The results of the groundwater monitoring program as well as hydrocarbon recovery activities will be summarized in an annual report submitted to the OCD. The annual report for 1998 will be submitted to the OCD by January 15, 1999.

The first sampling event of 1998 monitoring event is scheduled for June. The 1998 groundwater monitoring will be completed per the proposed plan unless additional input is received from the OCD. Please contact Russell Dykes of Warren at (713) 767-0072 if you have any questions regarding this annual summary report package.

Sincerely,

ARCADIS Geraghty & Miller Inc

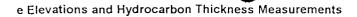
John P. Shonfelt, P.G.

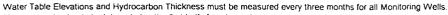
Senior, Project Manager/Hydrogeologist

Brian Guillette, P.G. Regional Manager

Conies:

Russell Dykes (Warren Petroleum) Jerry Sexton (NMOCD Hobbs District) Mike Hicks (Warren - Monument)





Measurements should be taken during the first half of each quarter.

All wells should be guaged at the same time with the date noted in the space provided in the table. Surveyed elevations are recorded on the Sheet labeled Well Information.

MSL water elevations and product thickness are automatically calculated in Tables 1-B and 1-C, respectively.

	1 1	-A, ACTL			199		1		19					10	98	
	}	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	4=4.04=	2nd Qtr	3rd Qtr	4th Qtr	MW	1st Qtr			144 54
Monitor \	Mallin	10/31/95	11/14/95	1/24/96	6/26/96	9/26/96	1/28/97	1st Qtr 2/27/97	2nd Qtr 5/19/97	8/19/97	1/5/98	mvv #	1St Qtr	2nd Qtr	3rd Qtr	4th Qtr
WP-1	Product	32.00	25.80	28.00	29.95	30.45	31.08	31.26	31.00	29.72	29.14	MW1				<del></del>
VVP-1	Water	32.00	25.80	28.00	29.95	30.45	31.08	31.26	31.00	29.72	29.14	(AIAA I				<del></del>
WP-2	Product	30.70	30.95	31.53	31,71	31.71	31.71	31.65	31.65	31.65	31.65	MW2				
VVF-72	Water	31.00	31.35	31,71	31.71	31.71	31,71	31.65	31.65	31.65	31.65	111472				<del> </del>
WP-3	Product	29.40	29.30	29,17	29.53	29.85	29.94	29.94	30.06	. 31.03 NA	31.03 NA	MW3		-		<del></del>
VVI -5	Water	29.60	29.55	29.45	29.77	29.95	30.26	30.15	30.07	NA.	NA.	11113				<del></del>
WP-4	Product	33.60	33.75	33.96	34.70	35.20	35.65	35.68	36.56	36.14	36.30	MW4		<del></del>		<del> </del>
**1 -4	Water	35.00	35.10	35.23	36.60	36.85	37.00	37,17	37.21	37.30	37.30	11177-4		-		
WP-5	Product	31.90	32.10	32.62	33.60	34.00	34.57	34.71	34.50	34.19	34.31	MW5		····	<del></del>	
***	Water	31.90	32.10	32.62	33,60	34.00	34.57	34.71	34.50	34.19	34.31	111113				
WP-6	Product	28.80	28.80	28.75	28.80	28.80	28.78	28.72	28.75	28,77	28.77	MW6				
	Water	28.80	28.80	28.78	28.80	28.80	28.78	28.73	28.76	28.78	28.80			1	···	<del>                                     </del>
WP-7	Product	31.25	34.30	31.77	32,10	32.20	32.45	32.47	32.34	31,29	28.65	MW7		-		
	Water	31.25	34.30	31.77	32.10	32.20	32.45	32.47	32.34	31,29	28.65					
WP-8	Product	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8WM			·	<del>                                     </del>
	Water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			İ		
WP-9	Product	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	MW9				<u> </u>
	Water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA					
WP-10	Product	28.35	28.15	28.10	28.60	28.75	28.88	28.89	29.79	28.89	28.58	MW10				<u> </u>
	Water	28.45	28.35	28.30	28.72	28.90	29.14	29.14	29.80	28.90	28.70			1		
WP-11	Product	NA	29.60	29.32	30,30	30.45	30.61	30.61	30.61	30.78	30.40	MW11		T		1
	Water	NA	29.68	29.49	30.43	31.00	31.39	31.53	31.39	31.25	30.51			1	T	1
WP-12	Product	AN	38.08	37.54	38.45	38.60	38.95	38.79	38.34	38.09	38.40	MW12		1		
	Water	NA	38.25	37.76	38.50	39.00	39.24	39.02	38.90	38.19	38.95					
WP-13	Product	NA	30.25	29.88	30.55	30.70	30.81	30.83	31.04	31.01	30.80	MW13		1		
	Water	NA	30.25	29.88	30.55	30.70	31.42	31.43	31,61	31.44	31.02		Î		1	
WP-14	Product	NA	40.75	40.85	40.90	41.00	41.14	41.13	40.90	40.62	41.31	MW14		1		
	Water	NA	• 40.75	40.85	40.90	41.00	41.14	41.13	40.90	40.62	41.31					
WP-15	Product	NA	33,60	32.96	33.95	33.20	33.10	33.09	33.15	33.11	33.21	MW15		Ţ		
1	Water	NA	33.60	33.16	34.30	33.40	33.49	33.47	33.58	33,12	33.58			T	1	

Measurements

Note: The bottom of well WP-2 is 31,71 feet from top of casing. Well #2 is dry.

NA indicates not measured or not able to measure.

Note: well #6 has trace of product but not enough to measure.

Note: #3 MW 3rd Quarter 97 unable to measure due to grounding cable in hole.

Page 1

Table 1-B, Wa	iter Table	Elevation	15, Feet at	ove MSL	<del></del>									,	
	19:	95	1996					19	97				19	98	
Monitor Well ID	3rd Otr 10/31/95	4th Otr 11/14/95	1st Qtr 1/24/96	2nd Qtr 4/2/96	3rd Qtr 9/26/96	4th Otr 1/28/97	1st Qtr 2/27/97	2nd Otr 5/19/97	3rd Qtr 8/19/97	4th Otr 1/5/98		1st Otr	2nd Otr	3rd Otr	4th Qtr
WP-1	3546.01	3552.21	3550.01	3548.06	3547.56	3546.93	3546.75	3547.01	3548.29	3548.87	MW1			<u> </u>	L
WP-2	3546,77	3546.42	3546.06	3546.06	3546.06	3546.06	3546.12	3546.12	3546.12	3546,12	MW2		L		L
WP-3	3551.61	3551.66	3551.76	3551.44	3551.26	3550.95	3551.06	3551.14	NA	NA	MW3			1	
WP-4	3542.15	3542.05	3541.92	3540.55	3540.30	3540.15	3539.98	3539.94	3539.85	3539.85	MW4				
WP-5	3547.60	3547.40	3546.88	3545.90	3545.50	3544.93	3544.79	3545.00	3545:31	3545-19	MW5				
WP-6	3556.56	3556 56	3556.58	3556.56	3556.56	3556.58	3556.63	3556.60	3548.80	3549.22	MW6				
WP-7	3551.79	3548.74	3551.27	3550.94	3550.84	3550.59	3550.57	3550.70	3551.75	3554.39	MW7				
WP-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	MW8				
WP-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	MW9				
WP-10	3551.63	3551.73	3551.78	3551.36	3551.18	3550.94	3550.94	3550.28	3551.18	3551.38	MW10				
WP-11	NA	3551.55	3551.74	3550.80	3550.23	3549.84	3549.70	3549.84	3549.98	3550.72	MW11				
WP-12	NA	3543.64	3544.13	3543.39	3542.89	3542.65	3542.87	3542.99	3543.70	3542-94	MW12				
WP-13	NA	3549.40	3549.77	3549.10	3548.95	3548.23	3548.22	3548.04	3548.21	3541,25	MW13				
WP-14	NA	3541 06	3540.96	3540.91	3540.81	3540.67	3540.68	3540,91	3541.19	C3542-86	MW14				
WP-15	NA	3548 67	3549 11	3547.97	3548.87	3548.78	3548.80	3548.69	3549.15	3551:47	MW15				

The water table in well WP-3 may be below bottom of well which has an elevation of 3551.91 fast NA indicates not measured or not able to measure

Table 1-C, Pr			761												
	199	95		199	6	1		199	97		i i		19	98	
	3rd Qtr	4th Qtr	1st Otr	2nd Qtr	3rd Otr	4th Otr	1st Qtr	2nd Otr	3rd Qtr	4th Qtr		1st Otr	2nd Qtr	3rd Otr	4th Otr
Monitor Well ID	10/31/95	11/14/95	1/24/96	4/2/96	9/26/96	1/28/97	2/27/97	5/19/97	8/19/97	1/5/98					
No	<del>   </del>										MW1				
WP-1	<del> </del>														
WP-2	0.30	0 40	0.18								MW2				
WP-3	0.20	0 25	0.28	0 24	0.10	0.32	0.21	0.01	NA	NA)	MW3				i
WP-4	1.40	1 35	1,27	1 90	1.65	1.35	1.49	0.65	1,16	1.00	MW4				
WP-5											MW5				
WP-6			0 03				0.01	0.01	0.01	0.03	MW6				
WP-7											MW7				
WP-8	NA	NA	NA				NA	NA	NA	NA	MW8				
WP-9	NA	NA	AN				NA	NA	NA	NA	MW9				
WP-10	0 10	0.20	0 20	0.12	0.15	0.26	0.25	0.01	0.01	0.12	MW10				
WP-11	NA	0 08	0 17	0 13	0.55	0.78	0.92	0.78	0.47	0.11	MW11				
WP-12	NA.	0.17	0.22	0.05	0,40	0.29	0.23	0.56	0.10	0.55	MW12				
WP-13	NA					0.61	0.60	0.57	0.43	0.22	MW13				
WP-14	NA										MW14				
WP-15	NA		0 20	0.35	0.20	0.39	0.38	0.43	0.01	0.37	MW15				

Blanks indicate no product measured. NA indicates not measured or not able to measure.

TABLE 1-D ME	ASUREME	VIS TO E	оттом	OF WELL	.S				
	1	19	97				19	98	
	1st Otr	2nd Qtr	3rd Qtr	4th Otr	ſ	1st Otr	2nd Otr	3rd Qtr	4th Qtr
Monitor Well ID	2/27/97	5/19/97	8/19/97	1/5/98					
MW-1	34.82	34.82	34.82	34.82	MW1				
MW-2	31.65	31.65	31.65	31.65	MW2				
MW-3	38.10	38.10	38.10	38.10	MW3				
MW-4	37.40	37.40	37.40	37.40	MW4				
MW-5	38.00	38.00	38.00	38.00	MW5			i	
MW-6	30.50	30.50	30.50	30.50	MW6				
MW-7	37.58	37.58	37.58	37.58	MW7				
8-WM	NA	NA	NA	NA	MW8				
MW-9	NA	NA	NA	NA	eWM				
MW-10	37.20	37.20	37.20	37.20	MW10				
MW-11	36.40	36.40	36.40	36.40	MW11				
MW-12	43.20	43.20	43.20	43.20	MW12		T		t
MW-13	36,40	36.40	36.40	36.40	MW13				
MW-14	48.30	48.30	48.30	48.30	MW14		<u> </u>	1	
MW-15	35.10	35,10	35.10	35.10	MW15				

TABLE 1-E THICKNESS OF PRODUCT AND WATER TO BOTTOM OF HOLE

Table 1D. Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

		Measured	Measured	Corrected
		Groundwater	Product	Groundwater
	Well	Elevation	Thickness	Elevation
Date	I.D.	(ft AMSL)	(ft)	(ft AMSL)
10/31/95	WP-1	2 546 01		3,546.01
11/14/95	VV L - I	3,546.01		3,552.21
1/14/93		3,552.21		3,550.01
4/2/96		3,550.01		3,548.06
9/26/96		3,548.06 3,547.56		3,547.56
1/28/97		3,546.93		3,546.93
2/27/97		3,546.75		3,546.75
5/19/97		3,547.01		3,547.01
8/19/97		3,548.29		3,548.29
1/5/98		3,548.87		3,548.87
1/3/90		3,348.67		3,340.07
10/31/95	WP-2	3,546.77	0.30	3,546.99
11/14/95		3,546.42	0.40	3,546.71
1/24/96		3,546.06	0.18	3,546.19
4/2/96		3,546.06		3,546.06
9/26/96	•	3,546.06		3,546.06
1/28/97		3,546.06		3,546.06
2/27/97		3,546.12		3,546.12
5/19/97		3,546.12		3,546.12
8/19/97		3,546.12		3,546.12
1/5/98		3,546.12		3,546.12
10/31/95	WP-3	3,551.61	0.20	3,551.76
11/14/95		3,551.66	0.25	3,551.84
1/24/96		3,551.76	0.28	3,551.96
4/2/96		3,551.44	0.24	3,551.61
9/26/96		3,551.26	0.10	3,551.33
1/28/97		3,550.95	0.32	3,551.18
2/27/97		3,551.06	0.21	3,551.21
5/19/97		3,551.14	0.01	3,551.15
8/19/97		NA	NA	NA
1/5/98		NA	NA	NA
10/31/95	WP-4	3,542.15	1.40	3,543.17
11/14/95	** 1 -4	3,542.15	1.35	3,543.03
1/24/96		3,541.92	1.27	3,542.84
4/2/96		3,540.55	1.90	3,541.93
マルムルノひ		3,540.30	1.65	3,541.50
9/26/96			1.35	3,541.13
9/26/96 1/28/97		3 3411 13		J.J.T.I.J
1/28/97		3,540.15 3,539.98		-
1/28/97 2/27/97		3,539.98	1.49	3,541.06
1/28/97		•		-

Table 1D. Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

		Measured	Measured	Corrected
		Groundwater	Product	Groundwater
	Well	Elevation	Thickness	Elevation
Date	I.D.	(ft AMSL)	(ft)	(ft AMSL)
10/31/95	WP-5	3,547.60		3,547.60
11/14/95		3,547.40		3,547.40
1/24/96		3,546.88		3,546.88
4/2/96		3,545.90		3,545.90
9/26/96		3,545.50		3,545.50
1/28/97		3,544.93		3,544.93
2/27/97		3,544.79		3,544.79
5/19/97		3,545.00		3,545.00
8/19/97		3,545.31		3,545.31
1/5/98		3545.19		3,545.19
10/31/95	WP-6	3,556.56		3,556.56
11/14/95	,,,	3,556.56		3,556.56
1/24/96		3,556.58	0.03	3,556.60
4/2/96		3,556.56	0.03	3,556.56
9/26/96		3,556.56		3,556.56
1/28/97		3,556.58		3,556.58
2/27/97		3,556.63	0.01	3,556.64
5/19/97		3,556.60	0.01	3,556.61
8/19/97		3,556.58	0.01	3,556.59
1/5/98		3,556.56	0.03	3,556.58
10/31/95	WD 7	2 551 70		2 551 70
	<b>WP-7</b>	3,551.79		3,551.79
11/14/95		3,548.74		3,548.74
1/24/96		3,551.27		3,551.27
4/2/96		3,550.94		3,550.94
9/26/96		3,550.84		3,550.84
1/28/97		3,550.59		3,550.59
2/27/97		3,550.57		3,550.57
5/19/97		3,550.70		3,550.70
8/19/97		3,551.75		3,551.75
1/5/98		3,554.39		3,554.39
10/31/95	WP-10	3,551.63	0.10	3,551.70
11/14/95		3,551.73	0.20	3,551.88
1/24/96		3,551.78	0.20	3,551.93
4/2/96		3,551.36	0.12	3,551.45
9/26/96		3,551.18	0.15	3,551.29
1/28/97		3,550.94	0.26	3,551.13
2/27/97		3,550.94	0.25	3,551.12
5/19/97		3,550.28	0.01	3,550.29
8/19/97		3,551.18	0.01	3,551.19
1/5/98		3,551.38	0.12	3,551.47

Table 1D. Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

	Well	Measured Groundwater Elevation	Measured Product Thickness	Corrected Groundwater Elevation
Date	I.D.	(ft AMSL)	(ft)	(ft AMSL)
	1.10	(10.1.11.0.2)		(11.11.11.12)
11/14/95	WP-11	3,551.55	0.08	3,551.61
1/24/96		3,551.74	0.17	3,551.86
4/2/96		3,550.80	0.13	3,550.89
9/26/96		3,550.23	0.55	3,550.63
1/28/97		3,549.84	0.78	3,550.41
2/27/97		3,549.70	0.92	3,550.37
5/19/97		3,549.84	0.78	3,550.41
8/19/97		3,549.98	0.47	3,550.32
1/5/98		3,550.72	0.11	3,550.80
11/14/95	WP-12	3,543.64		3,543.64
1/24/96		3,544.13		3,544.13
4/2/96		3,543.39		3,543,39
9/26/96		3,542.89	0.40	3,543.18
1/28/97		3,542.65	0.29	3,542.86
2/27/97		3,542.87	0.23	3,543.04
5/19/97		3,542.99	0.56	3,543.40
8/19/97		3,543.70	0.10	3,543.77
1/5/98		3,542.94	0.55	3,543.34
11/14/95	WP-13	3,549.40		3,549.40
1/24/96	VII 10	3,549.77		3,549.77
4/2/96		3,549.10		3,549.10
9/26/96		3,548.95		3,548.95
1/28/97		3,548.23	0.61	3,548.67
2/27/97		3,548.22	0.60	3,548.66
5/19/97		3,548.04	0.57	3,548.45
8/19/97		3,548.21	0.43	3,548.52
1/5/98		3,548.63	0.22	3,548.79
11/14/05	XX/D 14	2 5 4 1 0 6		2 541 07
11/14/95	WP-14	3,541.06		3,541.06
1/24/96		3,540.96		3,540.96
4/2/96		3,540.91		3,540.91
9/26/96		3,540.81		3,540.81 3,540.67
1/28/97		3,540.67		3,540.67
2/27/97		3,540.68		3,540.68
5/19/97		3,540.91		3,540.91 3,541.10
8/19/97 1/5/98		3,541.19 3,540.50		3,541.19 3,540.50

Footnotes on last page.

Table 1D.

Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

		Measured	Measured	Corrected
		Groundwater	Product	Groundwater
	Well	Elevation	Thickness	Elevation
Date	I.D.	(ft AMSL)	(ft)	(ft AMSL)
1/14/95	WP-15	3,548.67		3,548.67
1/24/96		3,549.11	0.20	3,549.26
4/2/96		3,547.97	0.35	3,548.22
9/26/96		3,548.87	0.20	3,549.02
1/28/97		3,548.78	0.39	3,549.06
2/27/97		3,548.80	0.38	3,549.08
5/19/97		3,548.69	0.43	3,549.00
8/19/97		3,549.15	0.01	3,549.16
1/5/98		3,548.69	0.37	3,548.96

ft

Feet

**AMSL** 

Above Mean Sea Level

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Table 2A. Summary of Groundwater Quality Data, Warren Monument, New Mexico, Warren Petroleum, Inc

2/27/97 5/19/97 8/19/97 1/5/98 10/31/95 12/20/95 2/19/96 7/11/96 10/11/96 1/17/97 2/27/97 5/19/97 8/19/97 10/31/95 12/20/95 2/19/96 7/11/96 10/11/96 1/17/97 10/31/95 12/20/95 2/19/96 7/11/96 10/11/96 11/17/97 2/27/97 5/19/97 8/19/97 Date WP-6 WP-5 WP-1 Well Ħ Benzene 5,100 5,000 6,300 2,500 1,100 NA 590 200 1,300 1,200  $(\mu g/L)$ 620 290 610 280 280 280 180 NS NS 140 110 140 180 200 200 260 290 290 230 430 Toluene  $(\mu g/L)$ 333333333333 2333:23333 33-3233 Ethylbenzene  $(\mu g/L)$ 880 320 630 450 910 910 580 690 NS 333-2133-2 24 ND 8 12 NA 8 6 8 ND 18 **Xylenes**  $(\mu g/L)$ 255555552 255555552 Total BTEX  $(\mu g/L)$ 144 111 140 180 2201.1 2264.1 2291.0 430 750 5,118 5,000 6,300 2,618 1,481 NA 607 210 1,430 1,680 680 1,240 797 1,690 760 950 NS NS Chlorides 6,700 7,500 9,000 6,250 6,150 6,350 6,300 6,300 6,820 14,200 5,760 (mg/L)2,100 1,900 1,500 1,520 1,520 1,670 1,500 1,420 NS NS 30 16 21 78 202 NA NA 277 277 226 92 16,229 17,087 20,202 15,321 15,024 15,833 15,190 15,288 32,222 14,579 907 798 1,146 1,369 1,446 NA 1,389 1,389 1,330 1,530 (mg/L)5,271 5,259 4,718 4,724 4,724 3,678 4,371 4,654 NS NS TDS (mg/L) Sulfate 2,960 2,670 3,090 2,880 2,800 2,800 2,800 2,440 2,900 28 28 21 34 34 17 17 NS NS

Table 2A. Summary of Groundwater Quality Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

(mg/L)	(mg/L)	(mg/L)	(μg/L)	$(\mu g/L)$	$(\mu g/L)$	$(\mu g/L)$	(μg/L)	ID	Date
Sulfate	TDS	Chlorides	Total BTEX	Xylenes	Ethylbenzene	Toluene	Benzene	Well	

12/20/95 2/19/96 7/11/96 10/11/96 1/17/97 2/27/97 2/27/97 5/19/97 8/19/97 1/5/98	12/20/95 2/19/96 7/11/96 10/11/97 1/17/97 2/27/97 5/19/97 8/19/97 1/5/98	10/31/95 12/20/95 2/19/96 7/11/96 10/11/97 2/27/97 5/19/97 8/19/97 1/5/98	Date
WP-14	WP-13	WP-7	Well ID
120 81 27 29 ND ND 27 32 65 65	5,100 5,700 3,600 2,700 2,700 NS NS	222222222	Benzene (μg/L)
GRAFIES 1.	ZZZZS63ZZZZZZ	3333333333	Toluene (μg/L)
2 ND 6.1 ND 1.6 1.3 55 2.9	150 500 700 NS NS NS	3333333-33	Ethylbenzene (μg/L)
55 55 55 55 55	NNNN 1432NNN	333333:333	Xylenes (μg/L)
143 82 27 49 ND ND 31.7 34.7 175 175 39.4	5,270 5,850 3,730 4,220 3,603 NS NS	333333:-33	Total BTEX (μg/L)
7,750 10,000 12,200 11,500 11,700 11,700 12,400 12,400 12,000	2,300 1,150 975 975 487 NS NS NS	16,000 15,000 16,500 15,200 15,200 15,200 15,200 16,200 6,870 9,300	Chlorides (mg/L)
15,888 21,366 25,570 19,754 24,483 25,463 25,463 25,009 23,619 25,345	5,387 3,495 3,229 3,027 2,207 NS NS NS	35,492 32,986 36,587 34,522 33,712 30,385 34,468 34,470 16,781 26,116	TDS (mg/L)
1,170 2,670 3,040 29 3,110 3,780 2,740 3,790 3,500	NS N	5,830 5,390 6,160 6,270 5,720 3,510 6,170 5,160 3,350 6,900	Sulfate (mg/L)

 μg/L
 grams per liter.

 mg/L
 grams per liter.

 G:\APROJECT\warren\ok532002\tables\\warren\wq.x\s\]WATER QUALITY DATA

Table 2B. 1997 Summary of Groundwater Quality Data, Total Metals, Warren Monument, New Mexico, Warren Petroleum, Inc.

1			•		
2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	Date
WP-14	WP-7	WP-6	WP-5	WP-1	Well ID
\$333 8333	2222	SSSA	3333	3333	Silver (mg/L)
8888	SSSS	SSS	SSSS	SSSS	Arsenic (mg/L)
0.46 0.68 0.45 0.36	0.06 0.52 0.17 0.20	0.66 NS NS	0.5 1.26 0.05 0.21	1.3 2.6 1.5 0.8	Barium (mg/L)
890 1160 859 923	909 1350 1110 634	NS NS NS NS 189	508 2330 278 393	120 676 346 122	Calcium (mg/L)
3333	SSSS	SN SN A BN A	SSSS	SSSS	Cadmium (mg/L)
8858 8558	Baga Baga	0.14 NS NS	ND 0.0 N	0.02 0.15 0.03 0.03	Chromium (mg/L)
5.2 6.7 4.8 4.6	1.4 14.6 4.7 6.5	22.5 NS NS NS	7.1 69.6 0.6 3.0	28 134 32 16	Iron (mg/L)
3333	SSSS	SS SN S	SSSS	SSSS	Mercury (mg/L)
78 79 69 70	123 119 114 70	NS NS NS	56 75 49 51	5 28 10 7	Potassium (mg/L)
314 325 304 310	358 377 381 157	134 NS NS	125 249 108 108	39 90.3 44.8 26.3	Potassium Magnesium (mg/L) (mg/L)
BESE	SSSS	SN SN GN GN	SSSS	ND N	Lead (mg/L)
BESE	<b>EEEE</b>	NS SN GN GN GN	2223	2223	Selenium (mg/L)

NS
Not Sampled
ND
Not Detected

µg/L
Micrograms per liter.

mg/L
Milligrams per liter.

G:\APROJECT\WARREN\OK532002\TABLES\(TMETALS.XLS\) METALS

Table 2C. 1997 Summary of Groundwater Quality Data, Polynuclear Aromatic Hydrocarbons, Warren Monument, New Mexico, Warren Petroleum, Inc.

2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	2/27/97 5/19/97 8/19/97 1/5/98	Date
WP-14	WP-7	WP-6	WP-5	WP-1	Well ID
RARR	0.1 D D D D	NS SN ON ON	ND ND ND ND ND	ND ND 7.0	Naphthalene (μg/L)
3888	RRRR	NS NN NN ND	NN NN N	NN NN NA D NA	Acenaphthylene (μg/L)
3333	8888	NS SN GN GN	2823	N N N N	Acenaphthene (µg/L)
3333	3333	NS SN ON NO	ND ND 0.8	8.0 NA NA NA NA	Fluorene (µg/L)
3.0 8.0 3.0	5 B B B B	NS SN GN GN GN GN	ND ND 0.9	NA NA	Phenanthrene (µg/L)
2222	RRRR	NS SN NS NS UN NS	RRRR	ND NA N	Anthracene (μg/L)
8888	BESE	NS SS N	SSSS	NDNAN	Fluoranthene (µg/L)
3333	2222	Z Z Z Z	3333	A S S S	Pyrene (µg/L)
2323	8888	NS S N	3838	NNAN	Chrysene (µg/L)
3333	8888	NS NS N	3333	ND NA N	Benzo (a) anthracene (μg/L)
2222	3333	NS SS N	2222	Z Z Z Z	Benzo (b) fluoranthene (µg/L)
8888	BBBB	NS SS N	BRRR	N N N N	Benzo (k) fluoranthene (µg/L)
8888	8888	S S S	8888	NNN	Benzo (a) pyrene (μg/L)
2222	3333	NS SN	8888 8	ND ND 3.0	Dibenzo (a,h) anthracene (μg/L)
RARA	RRRR	N N N N	SSSS	ND NA N	Benzo (g,h,i) perylene (µg/L)
NNNN	NNNN	NS NS ND	NNNN	3333	Indeno (1,2,3-cd) pyrene (µg/L)

O:\APROJECT\WARREN\OK532002\TABLES\\WARREN\WQ.XLS\\WATER QUALITY DATA

ND NS NS μg/L mg/L

Not Detected.
Not Available.
Not Sampled.
Micrograms per liter.
Milligrams per liter.



Both the Hydrocarbon and the Total Fluid (water + hydrocarbon) volumes recovered must be recorded for the following monitor wells: WP-2, WP-3, WP-10, and WP-13. (MW-13 replaces the Climax Well) Cumulative Volumes are totaled automatically.

Pumping Well WP-4 is not currently an OCD requirment, we are pumping it voluntarily at this time.

Table 3-A, Volume of Total Fluids and Hydrocarbon Recovered, gallons									
		Monitor Well WP-2			Monitor Well WP-3				
Period						Total Fluids Recovered			
Cove		This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative
From	То	Period	Total	Period	Total	Period	Total	Period	Total
7/5/95	7/12/95		0		0	1,245	1,245		0
2/5/96	2/22/96		0		0	1,058			720
2/22/96	3/9/96		0		0	750	3,053		
3/9/96	3/25/96		0		0	430	3,483		1,547
3/25/96	3/31/96		0		0	440	3,923		1,877
3/31/96	4/6/96		0		0	250	4,173		1
4/6/96	4/12/96		0		0	150	4,323		2,177
4/12/96	4/15/96		0		0	140	4,463	100	2,277
4/15/96	4/18/96		0		0	147	4,610	127	2,404
4/18/96	4/23/96		0		0	200		150	2,554
4/23/96	5/2/96		0		0	150	4,960	100	2,654
5/2/96	6/1/96		0		0	800		710	3,364
6/1/96	7/1/96		0		0	1,115		837	4,201
7/1/96 9/2/96	9/2/96 10/1/96		0		0	1,653		1,119	5,320
3/1/97	3/21/97		0	<u> </u>	0	660 130	9,188	240 120	5,560
3/1/9/	4/18/97		0		0	20	9,318 9,338	20	5,680 5,700
	4/10/97		0	<u> </u>	0		9,338	20	5,700
			0		0		9,338		5,700
			0		0		9,338		5,700
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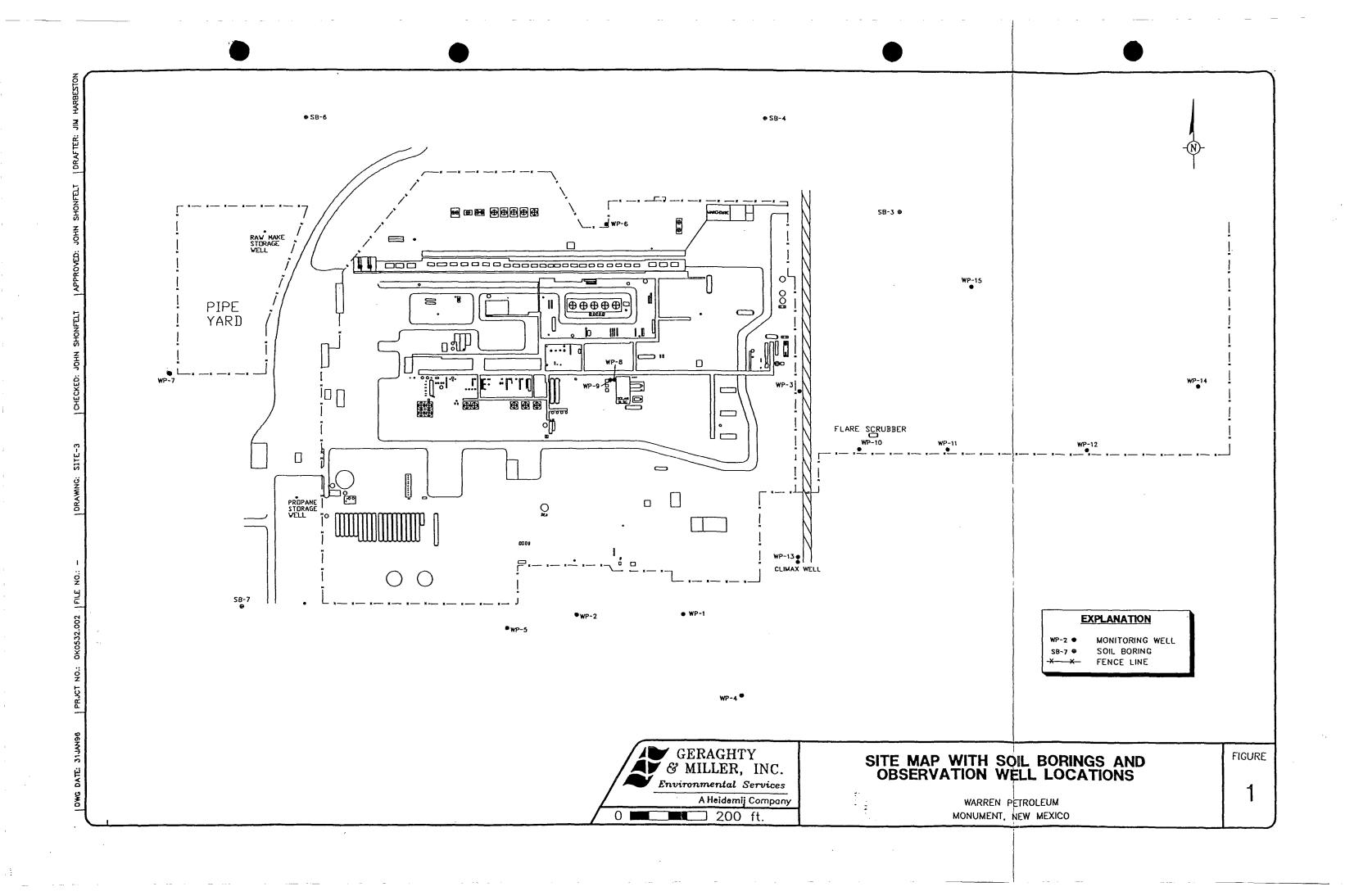
Table 3	-B, Vo				ydrocarbo				
			onitor Well	WP-4		Monitor Well WP-10			
Period		Total Fluids Recovered		Hydrocarbon Recovered		Total Fluids Recovered		Hydrocarbon Recovered	
Cove		This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative
From	То	Period	Total	Period	Total	Period	Total	Period	Total
8/2/95	8/14/95	1,386	1,386	0	0		0		0
8/14/95	9/7/95	1,027	2,413	0	0		0		0
10/18/95	10/24/95	1,005	3,418	0	0		0		0
	11/12/95	715	4,133	0	0		0		0
12/5/95	12/15/95	630	4,763	585	585		0		0
12/20/95	1/13/96	705	5,468	650	1,235		0		0
2/22/96	3/12/96		5,468		1,235		920	190	190
3/12/96	3/13/96		5,468		1,235	60	980	10	200
5/13/96	5/29/96	1,202	6,670	605	1,840		980		200
6/26/96	8/19/96	1,024	7,694	506	2,346		980		200
3/11/97	3/21/97		7,694		2,346		1,245	25	225
	4/18/97	270	7,964	220	2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
<b>.</b>			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
	· · · · · · · · · · · · · · · · · · ·		7,964		2,566	<u> </u>	1,245		225
			7,964		2,566	<u> </u>	1,245		225
			7,964		2,566		1,245		225
			7,964		2,566		1,245		225
	<del></del>							<u> </u>	

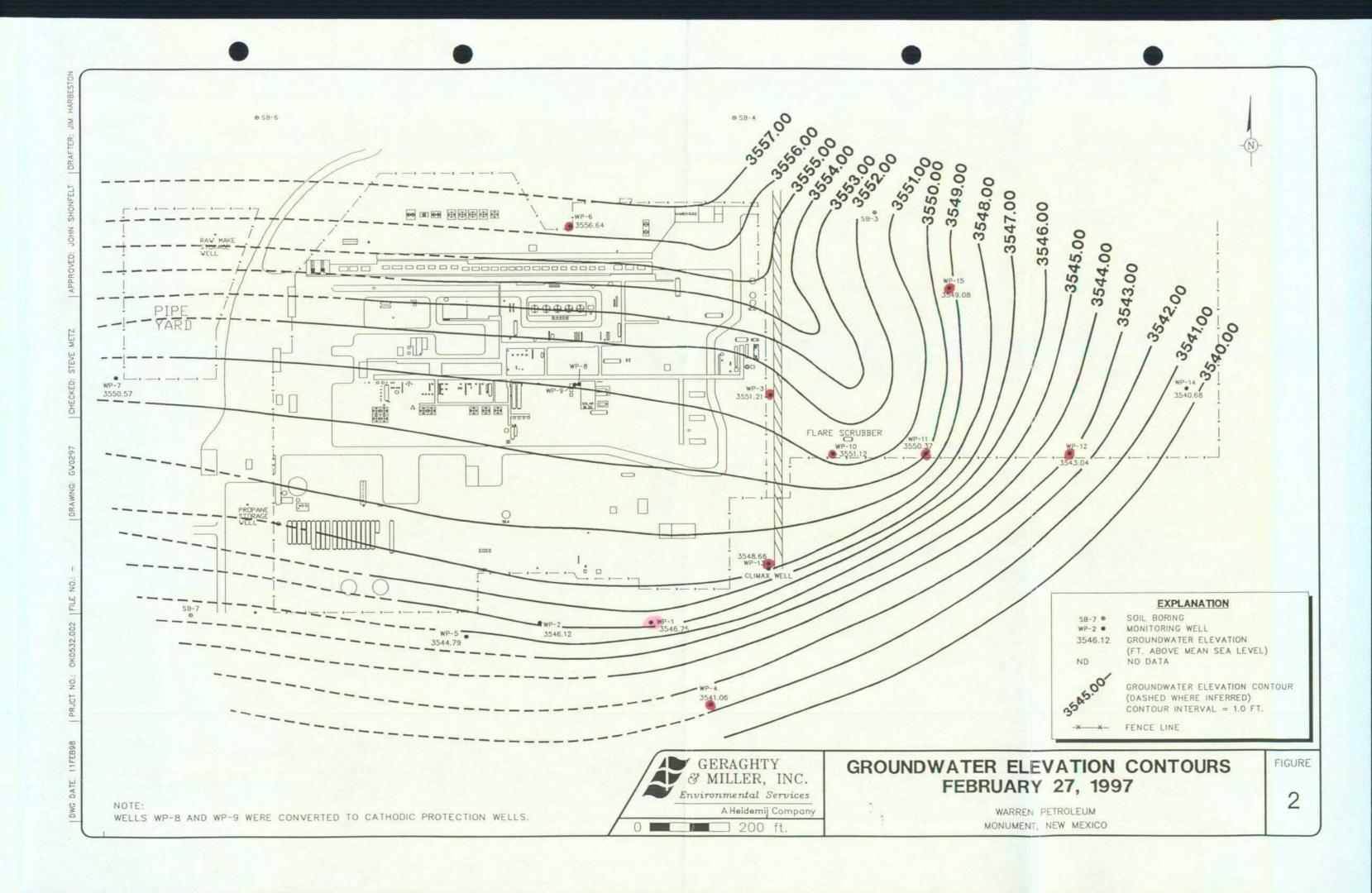
Table 3-C, Volume of Total Fluids and Hydrocarbon Recovered, gallons									
		Monitor Well WP-13				Monitor Well (extra)			
Period		Total Fluids Recovered H		Hydrocarbon Recovered		Total Fluids Recovered		Hydrocarbon Recovered	
Cove	ered	This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative
From	To	Period	Total	Period	Total	Period	Total	Period	Total
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0	<del></del>	0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
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			0		0		0		0
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			0		0		0		0
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			0		0		0		0
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			0		0		0	l	0
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			0		0		0		0
			0		0		0		0
			0		0		0		0
1									

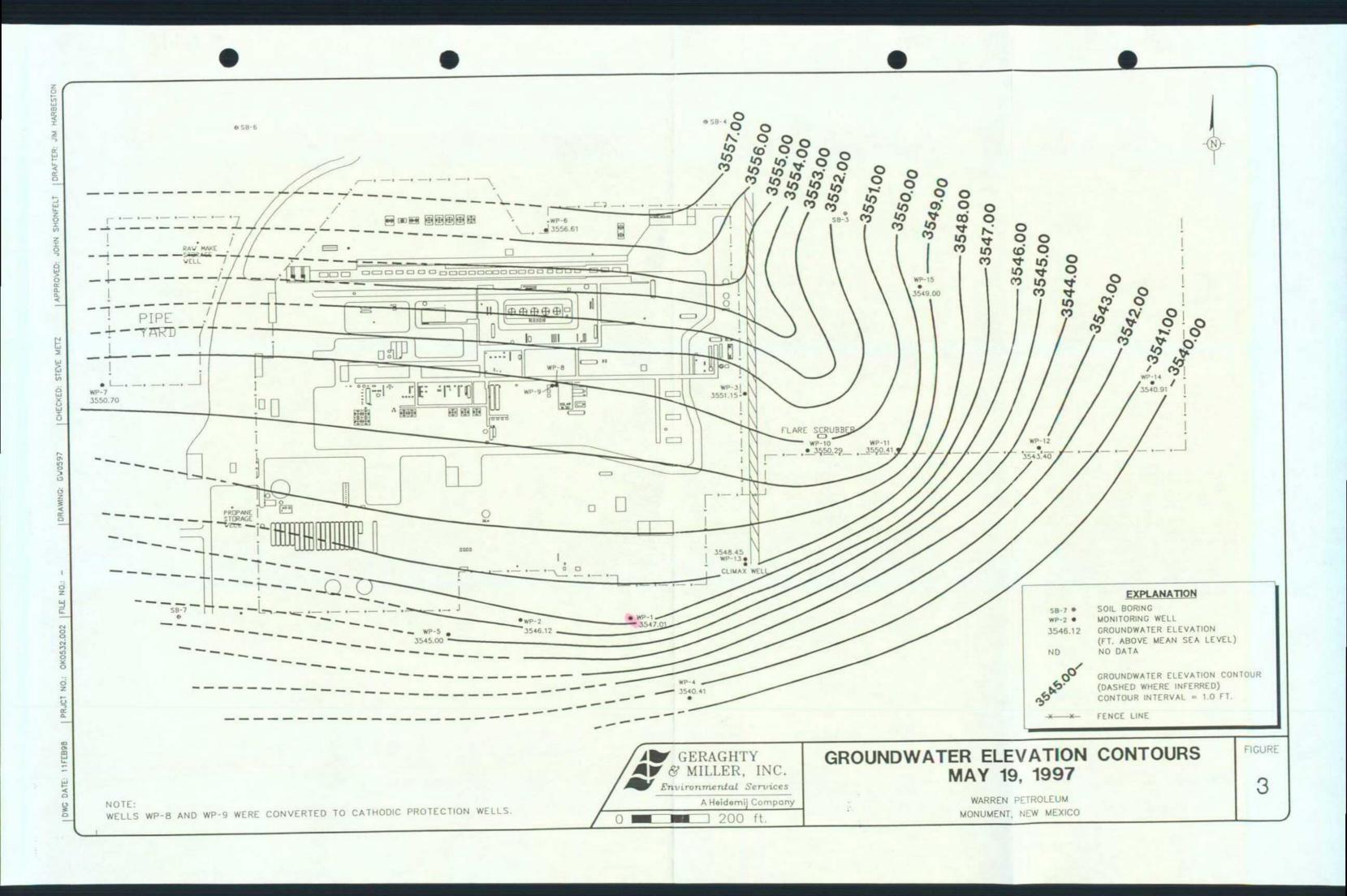
#### Well Information

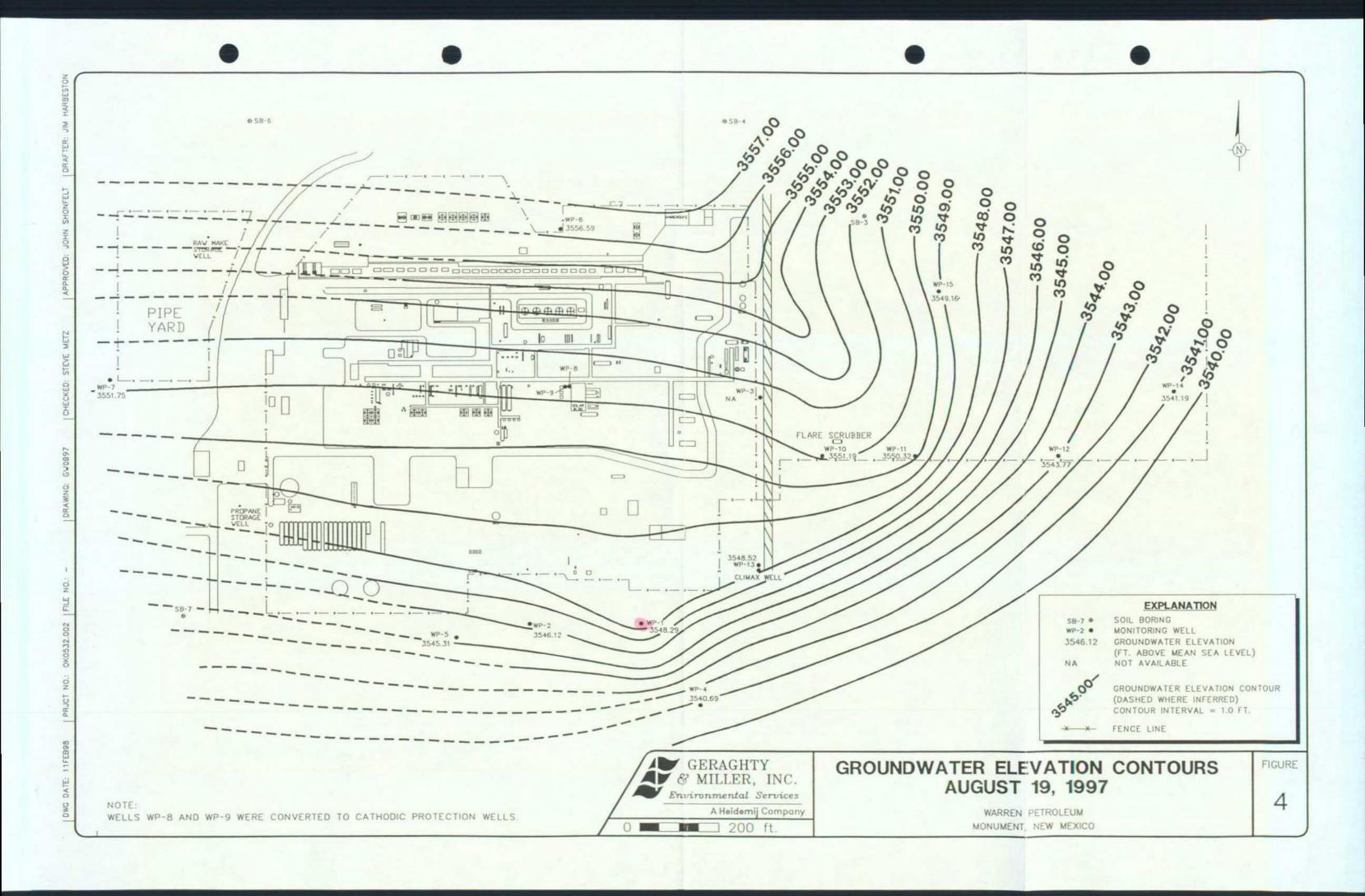
These are the last elevations, shot 3-15-96 by Basin Surveys.

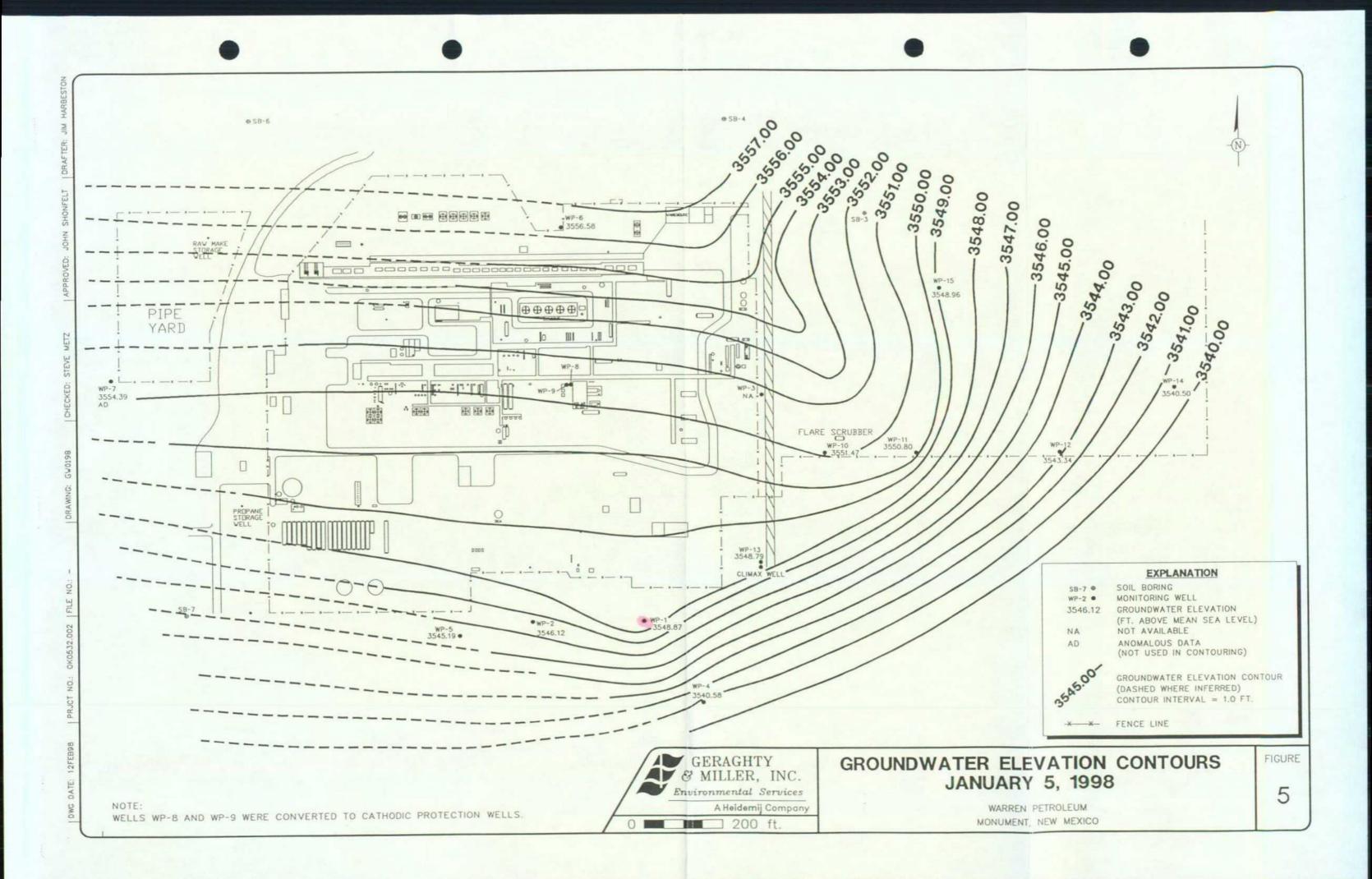
Monitoring Well Reference Point Elevations, feet					
Monitor Well ID	Reference Elevation				
	3/15/96				
WP-1	3578.01				
WP-2	3577.77				
WP-3	3581.21				
WP-4	3577.15				
WP-5	3579.50				
WP-6	3585.36				
WP-7	3583.04				
WP-8	3580.67				
WP-9	3579.75				
WP-10	3580.08				
WP-11	3581.23				
WP-12	3581.89				
WP-13	3579.65				
WP-14	3581.81				
WP-15	3582.27				

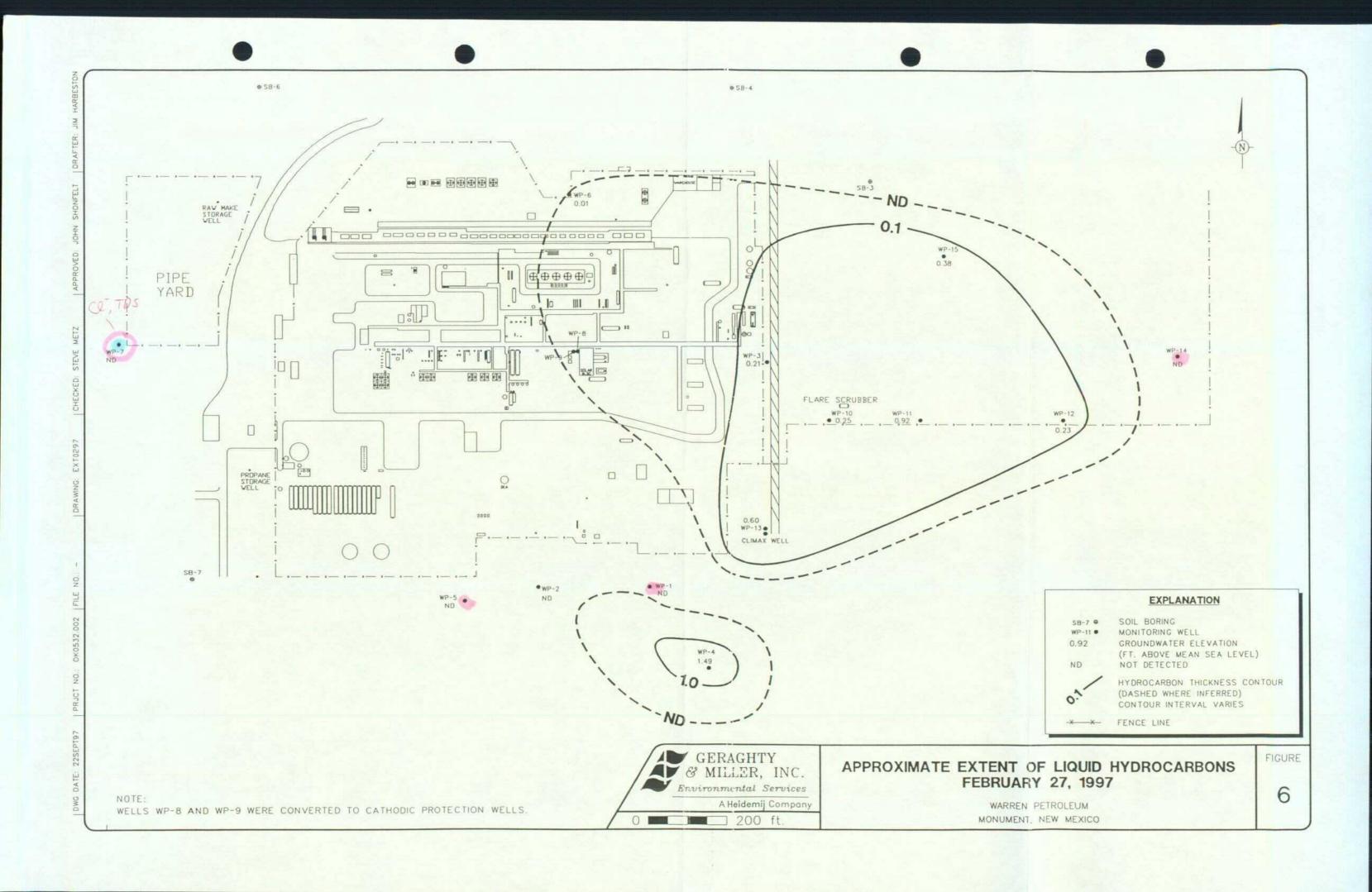


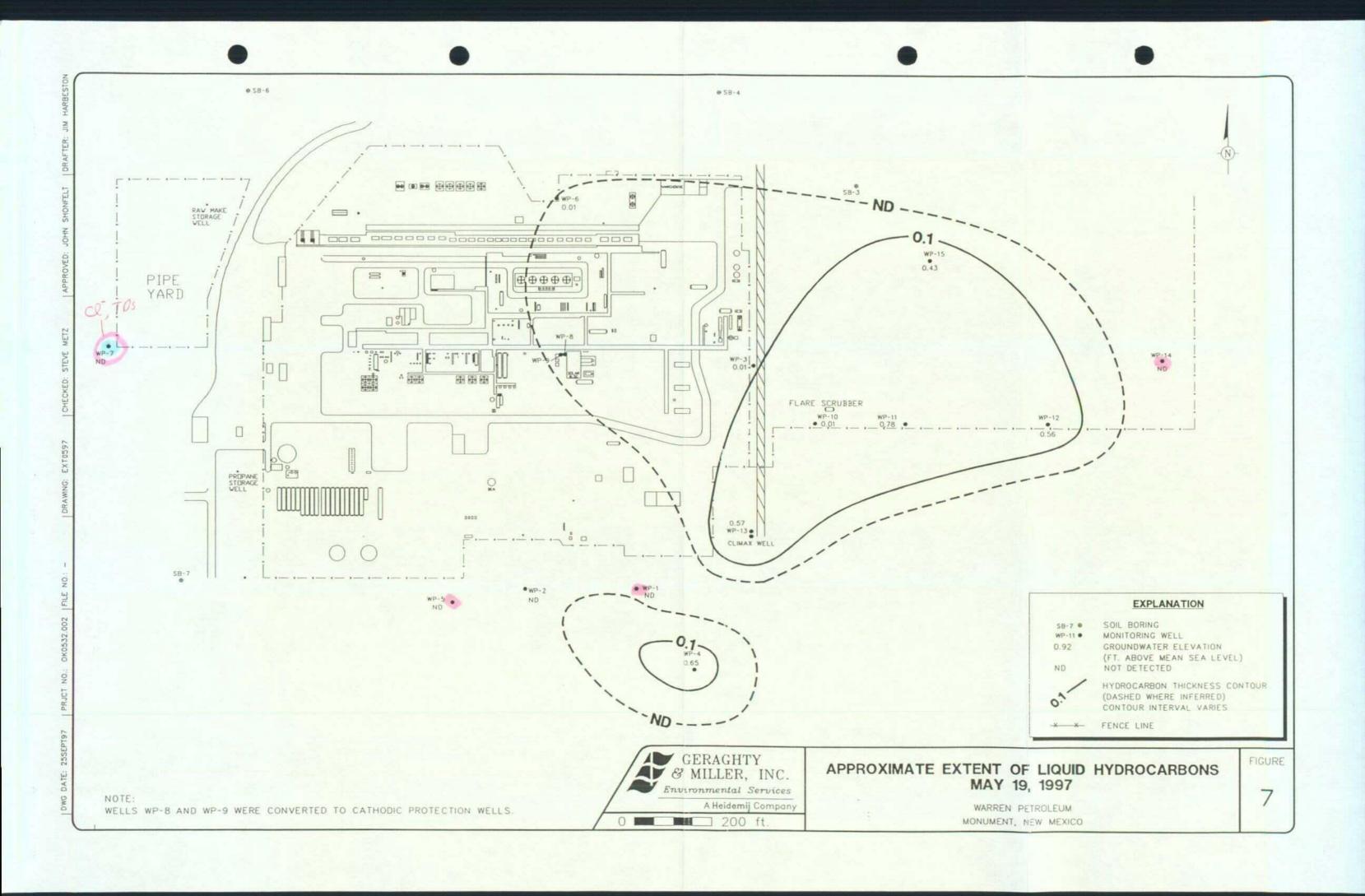


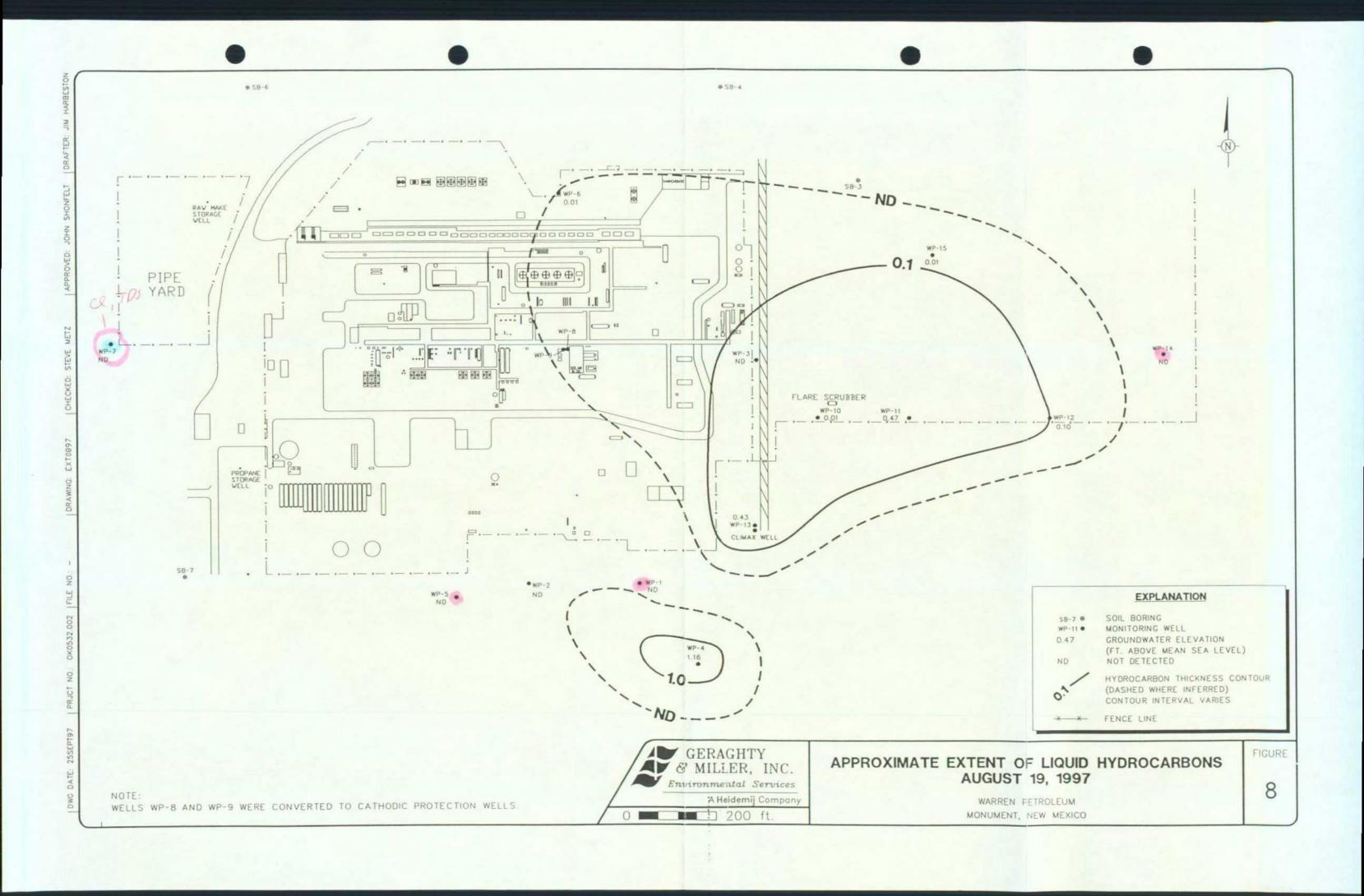


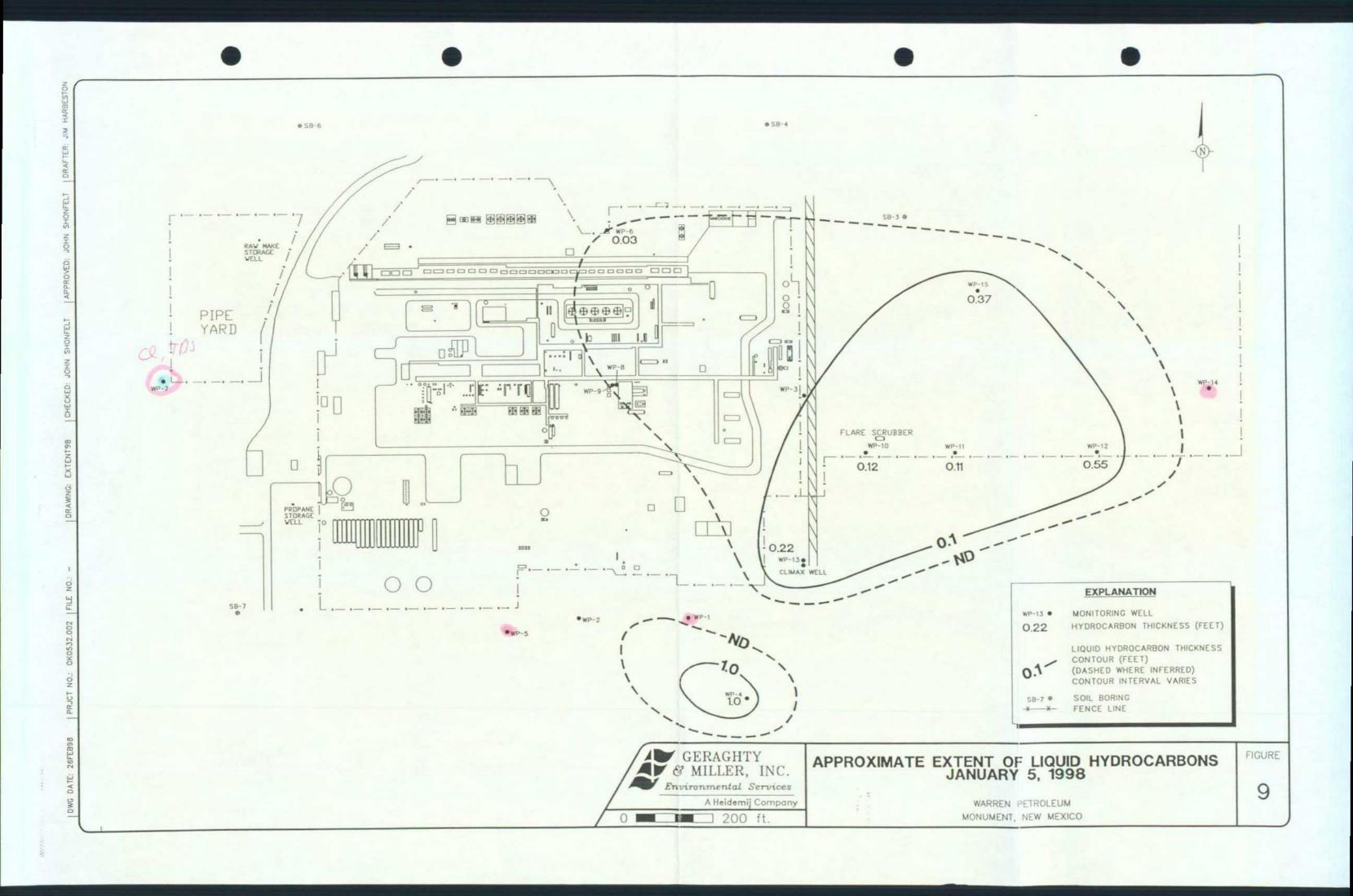


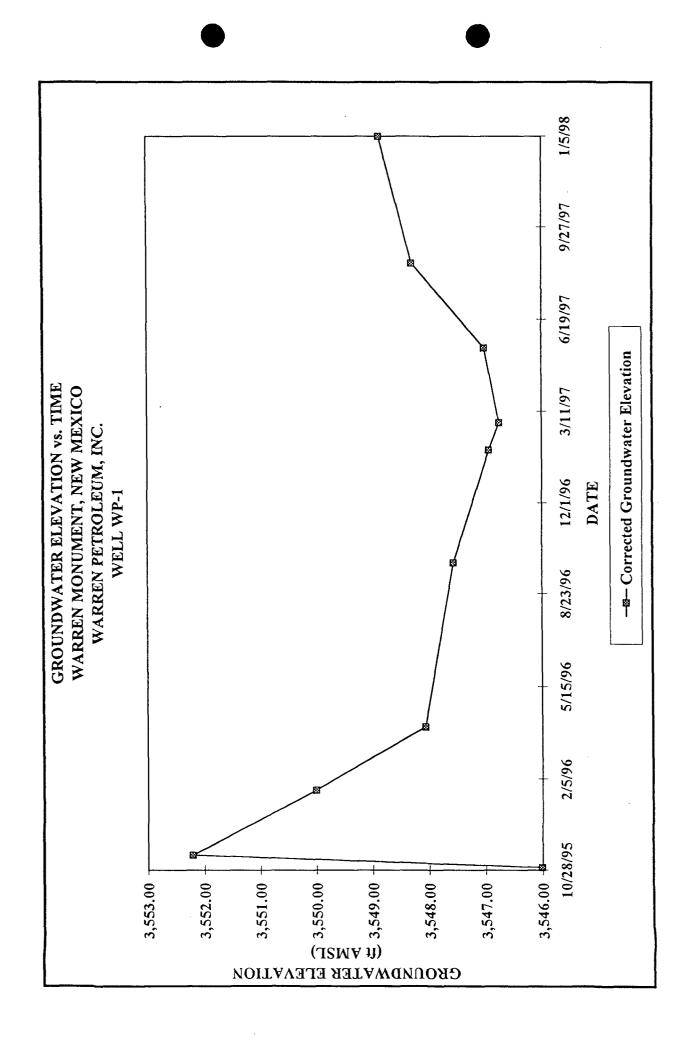


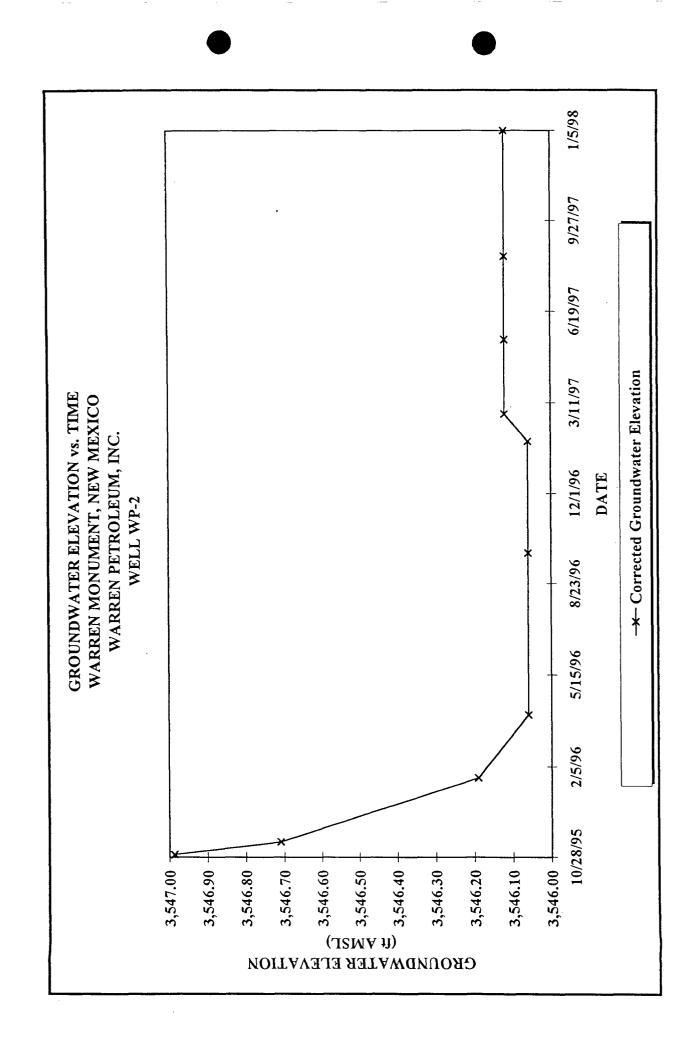


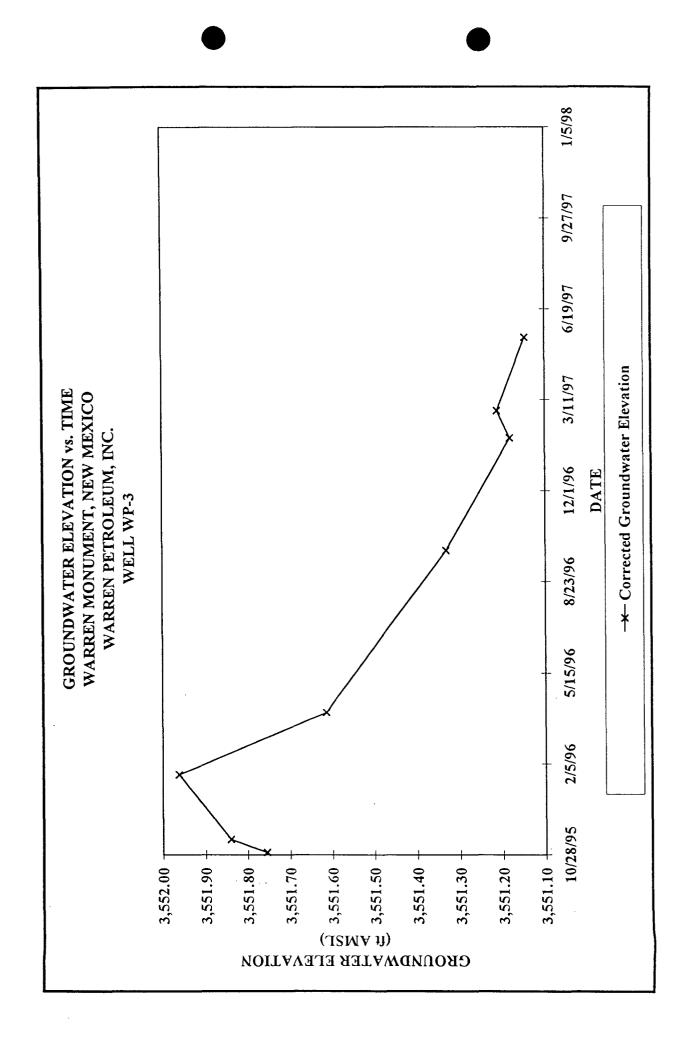


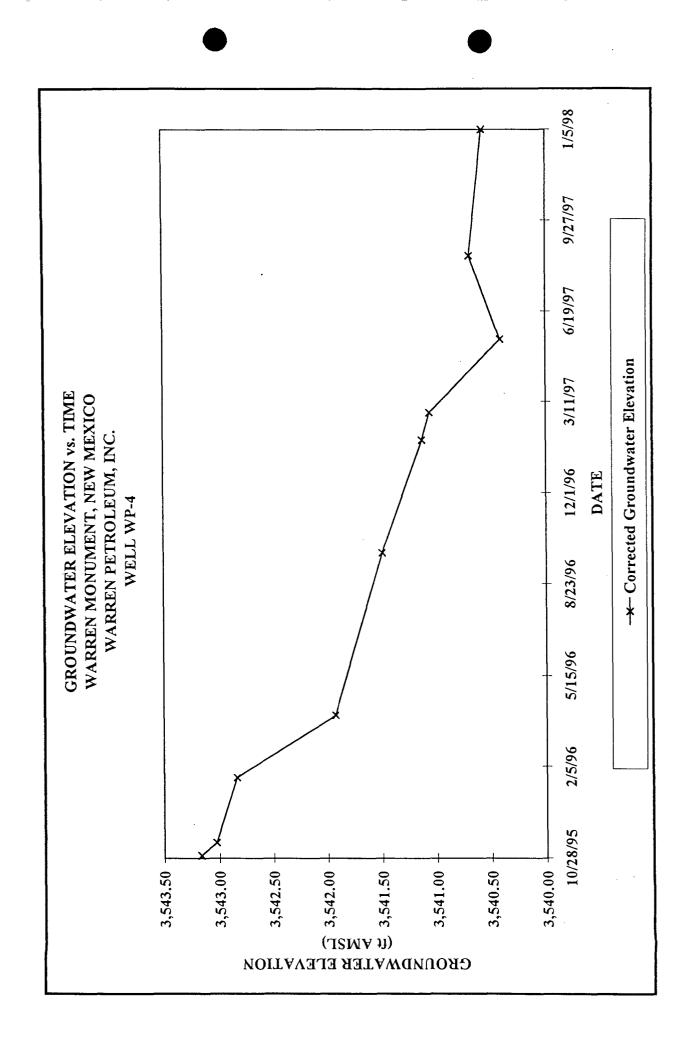


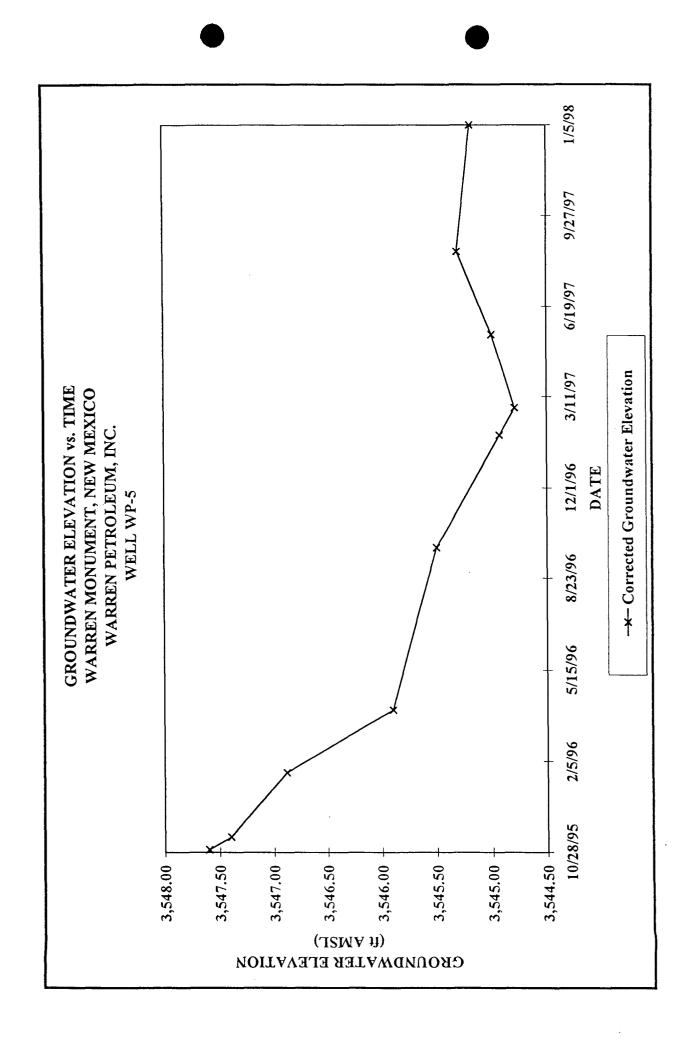


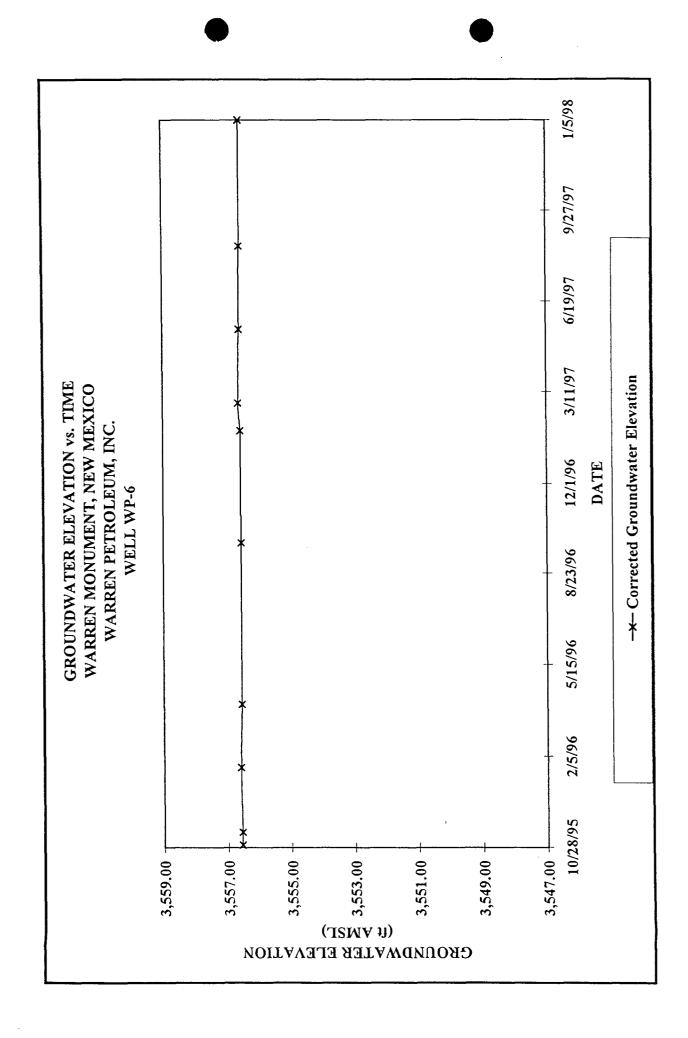


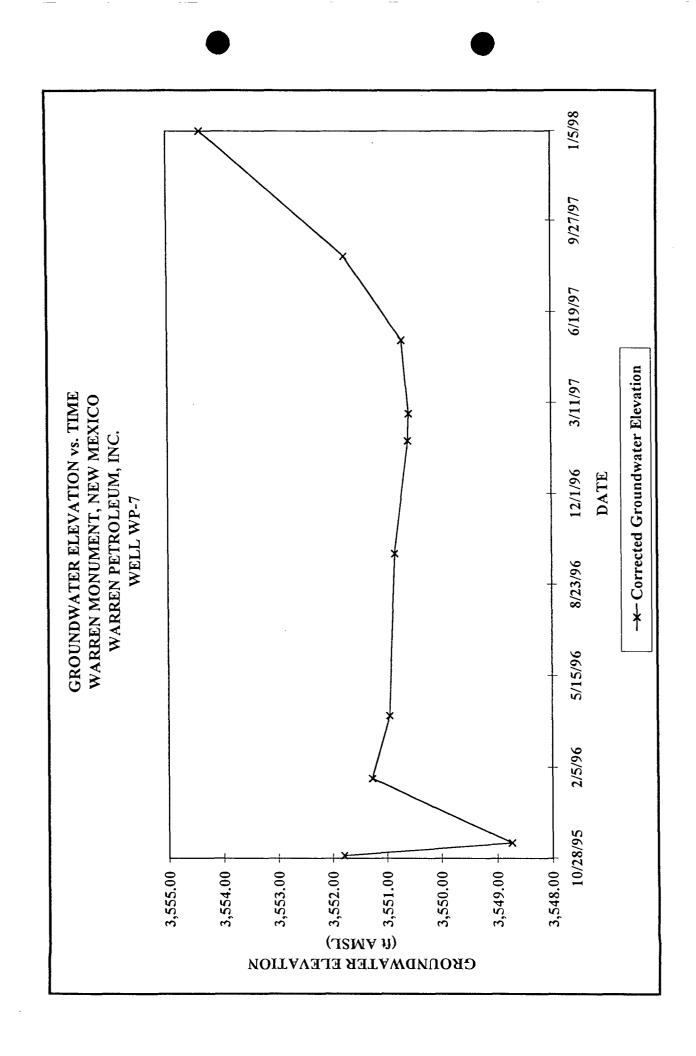


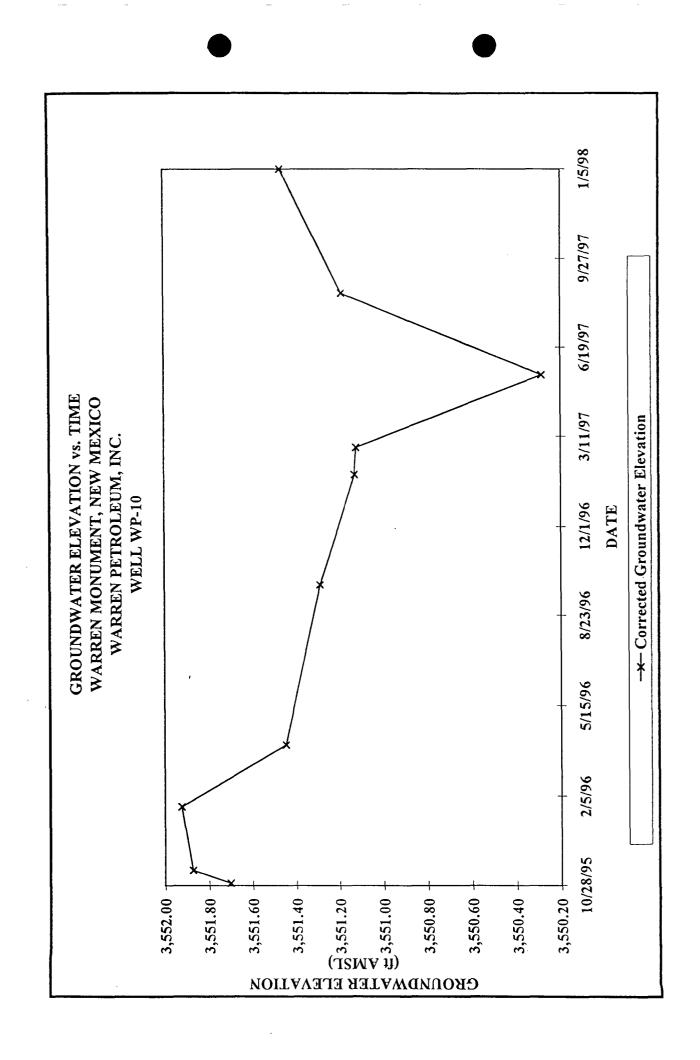


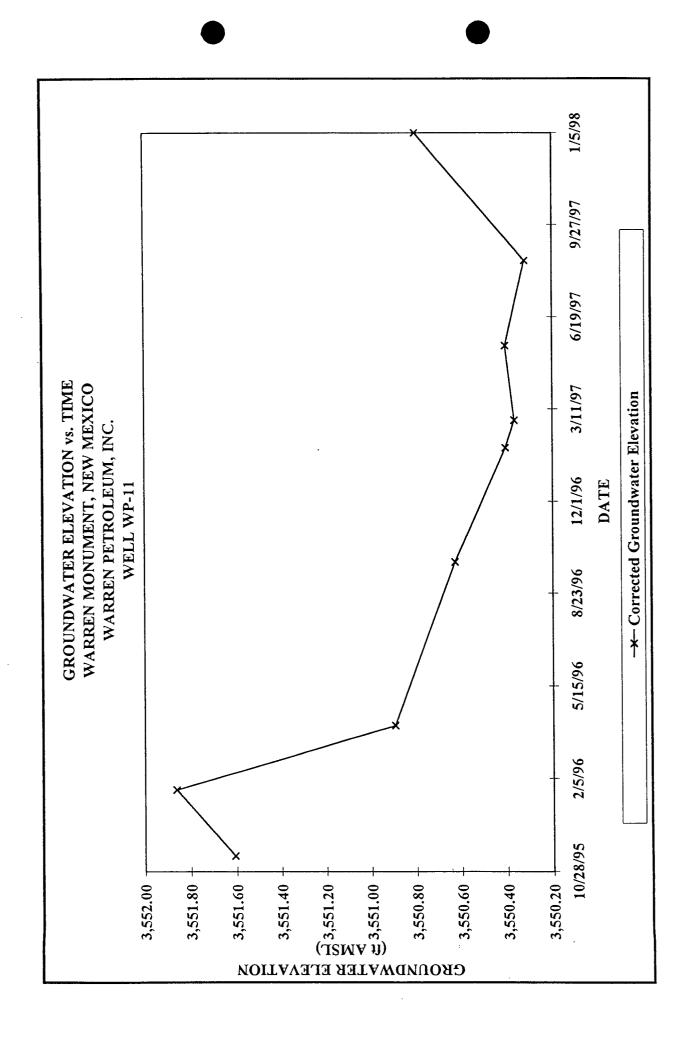


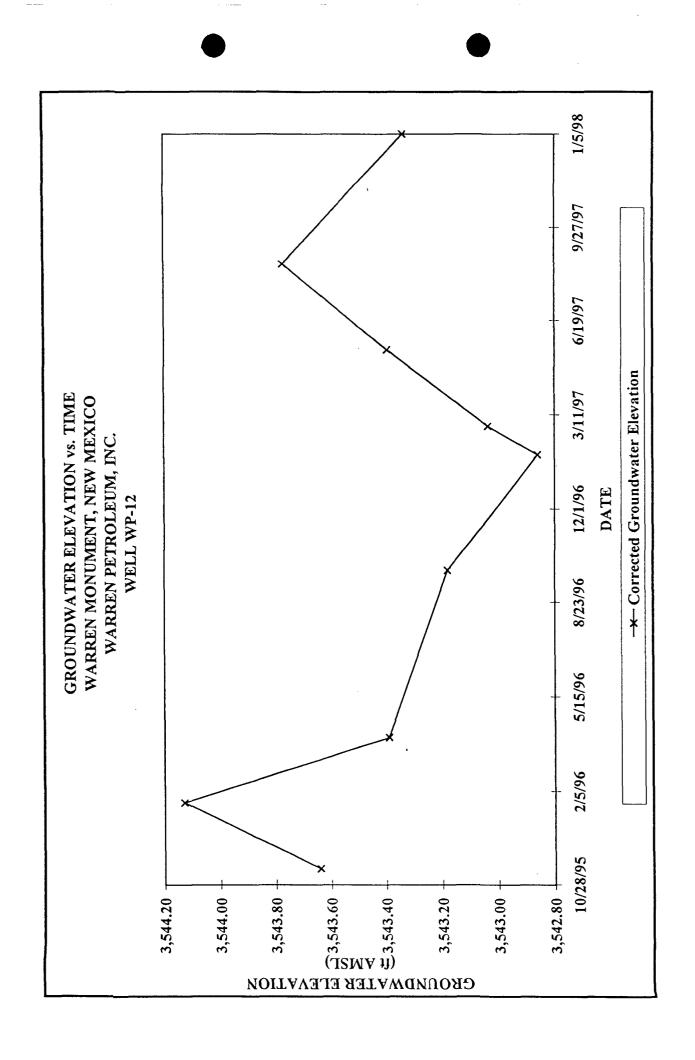


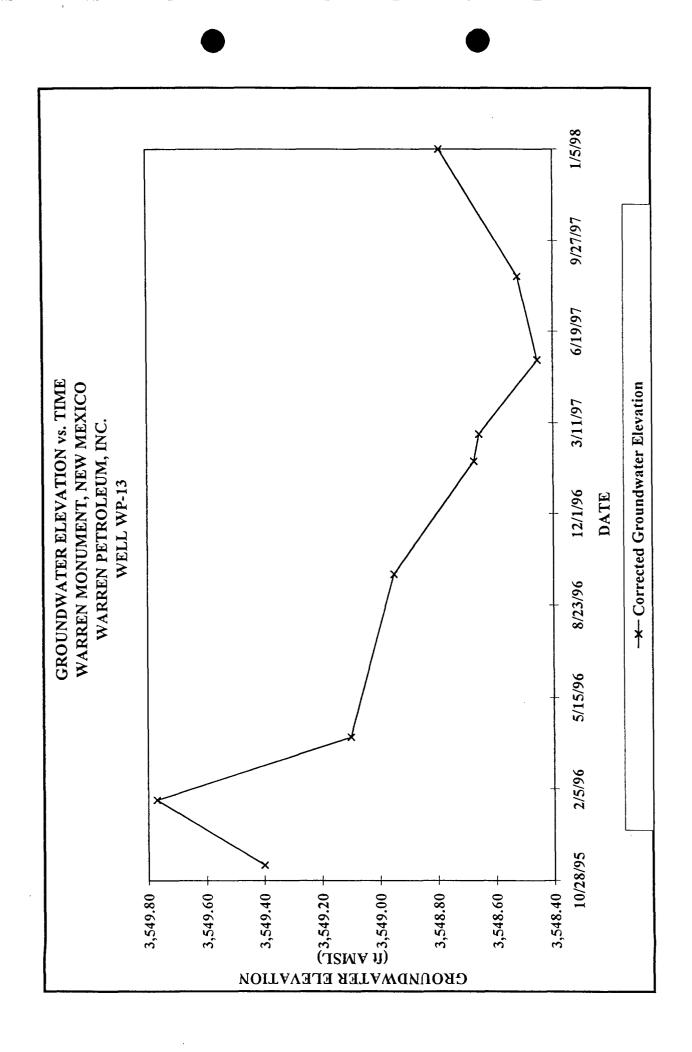


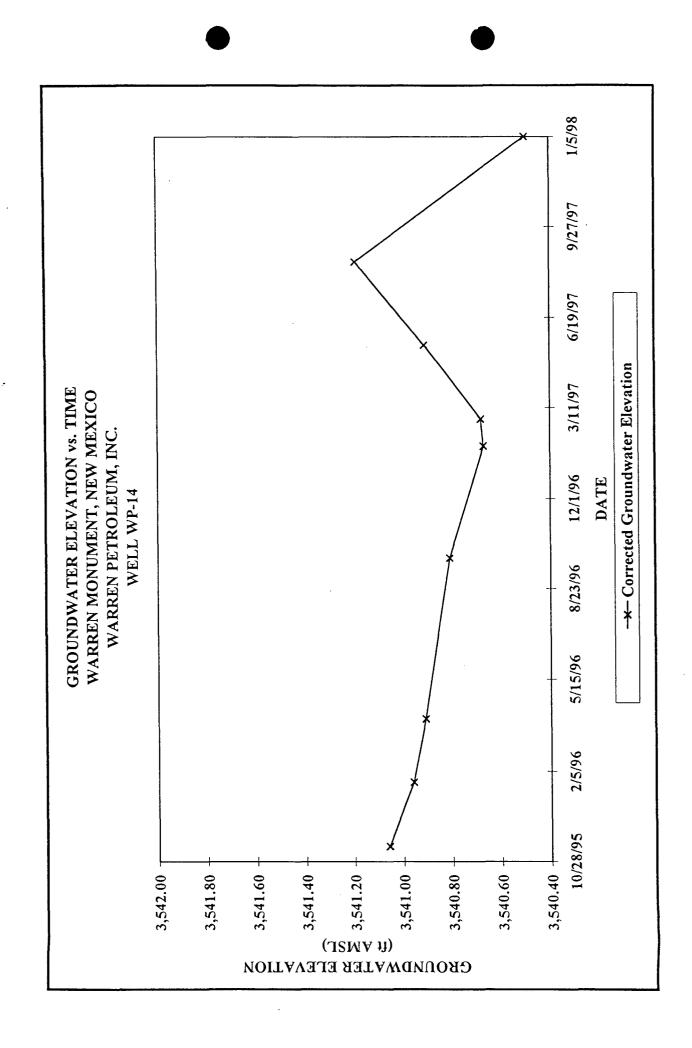


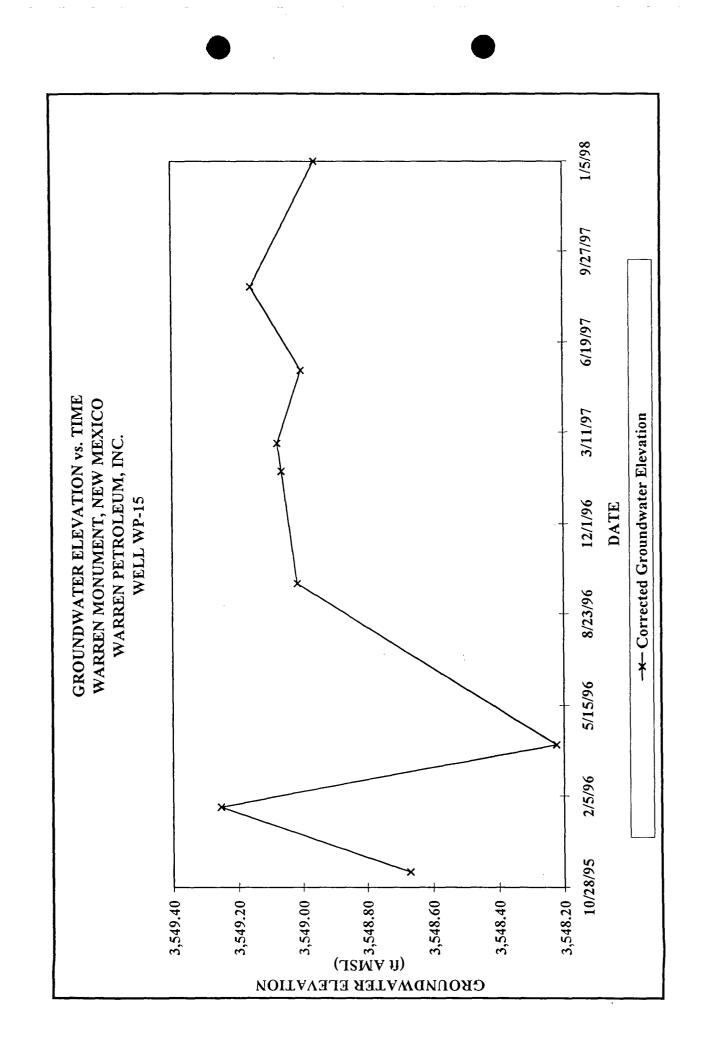


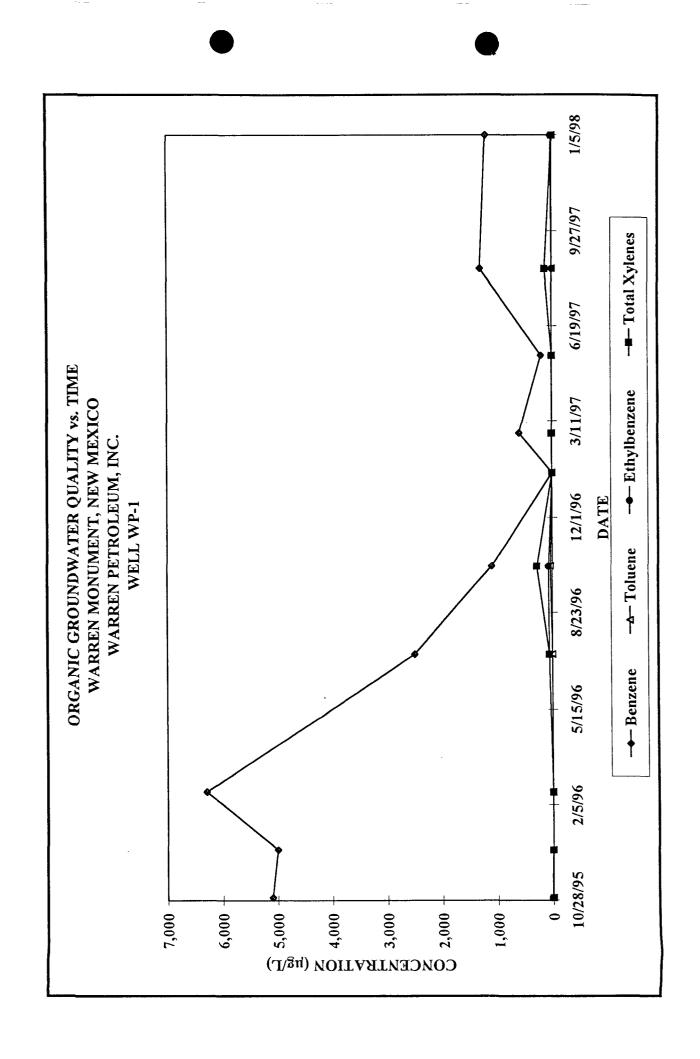


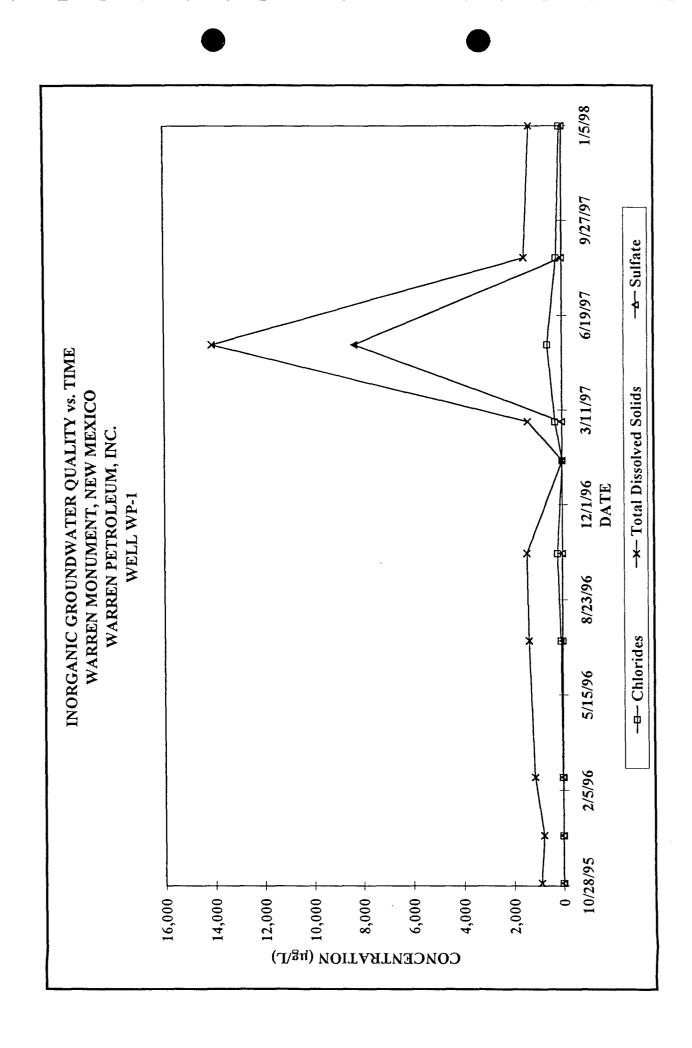


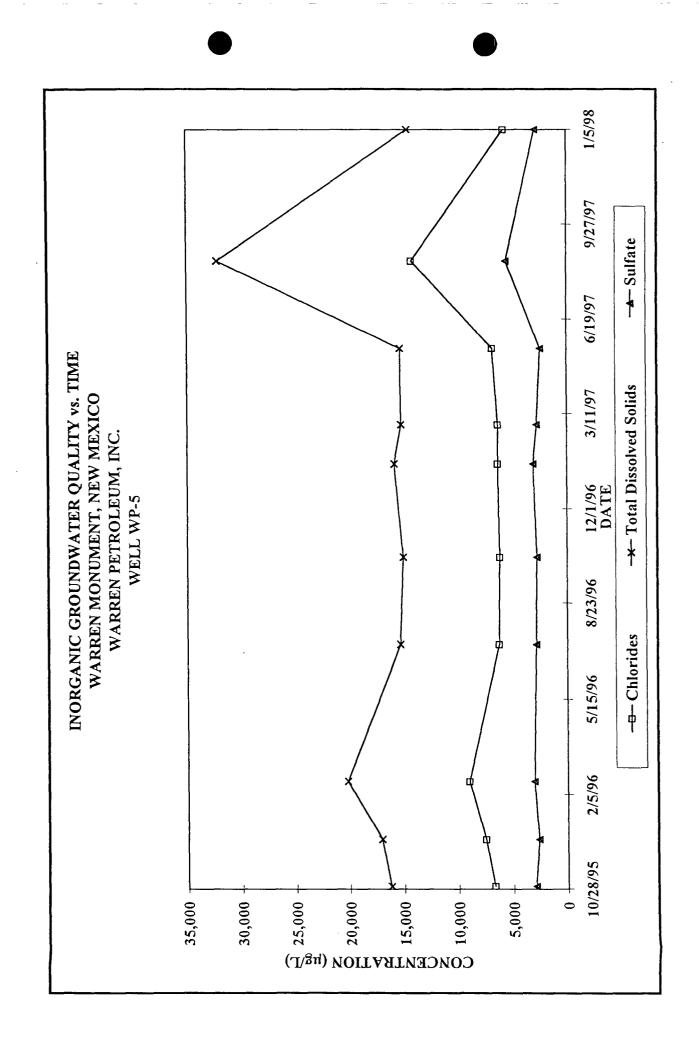


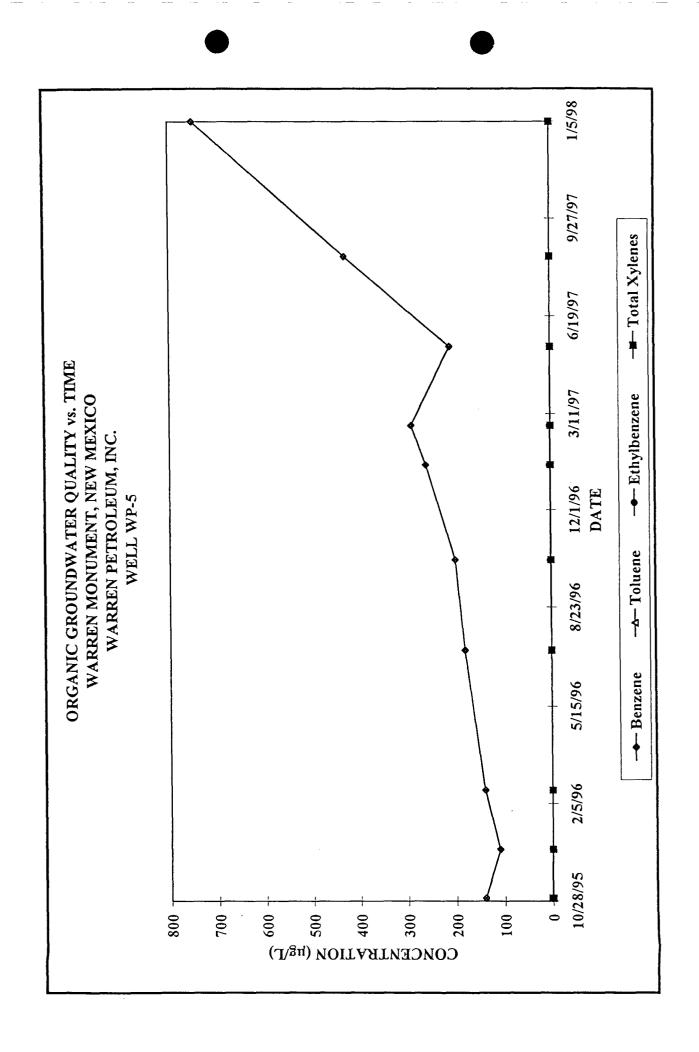


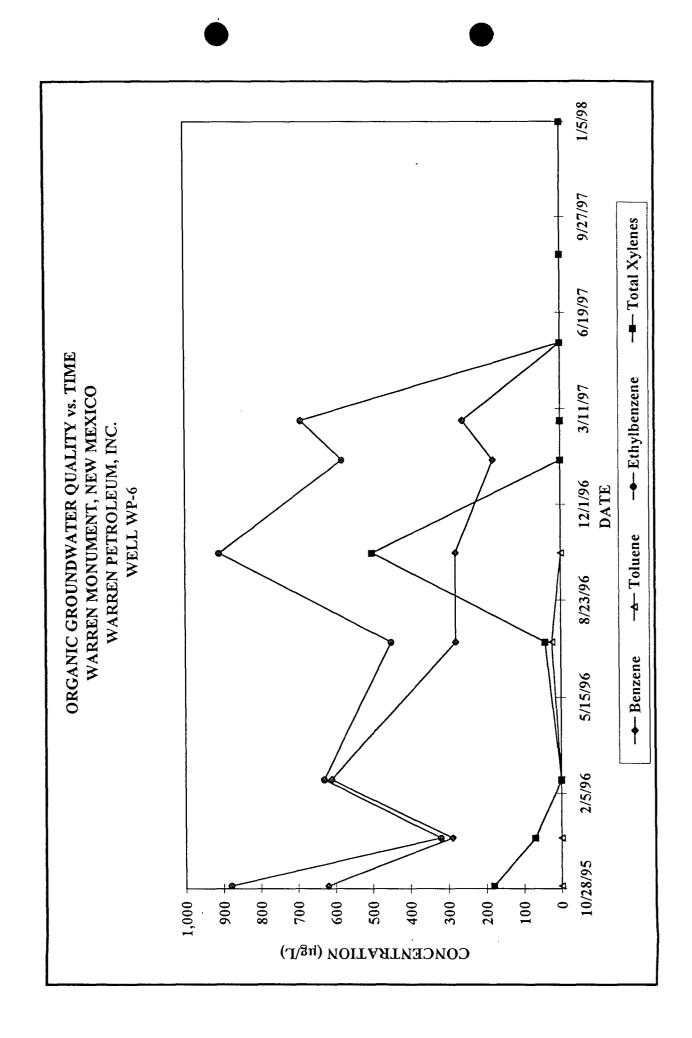


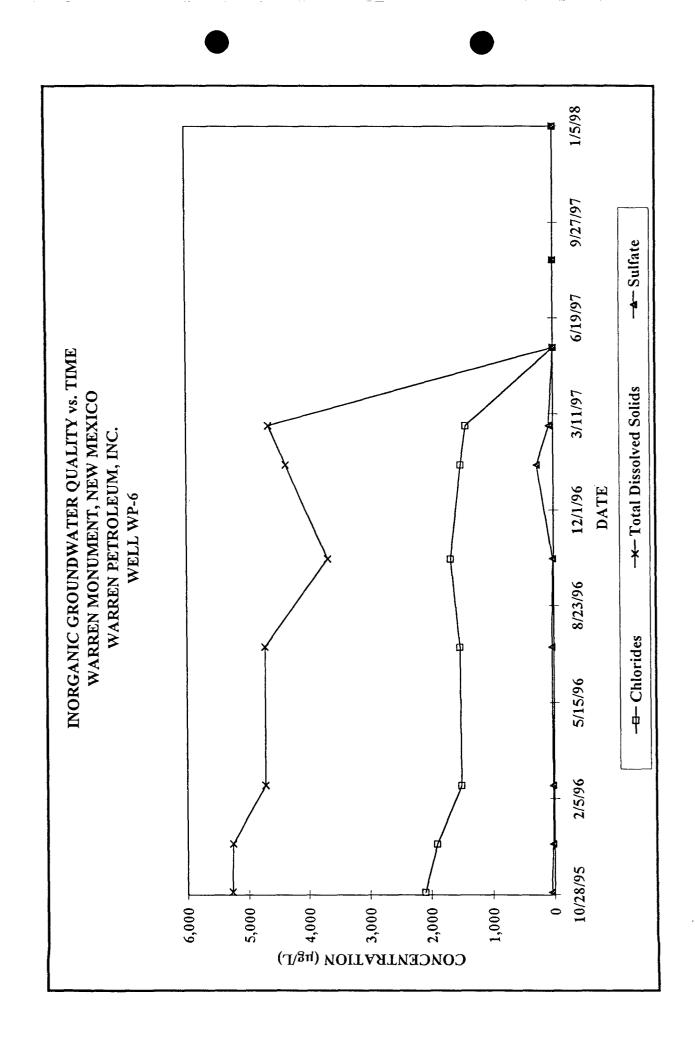


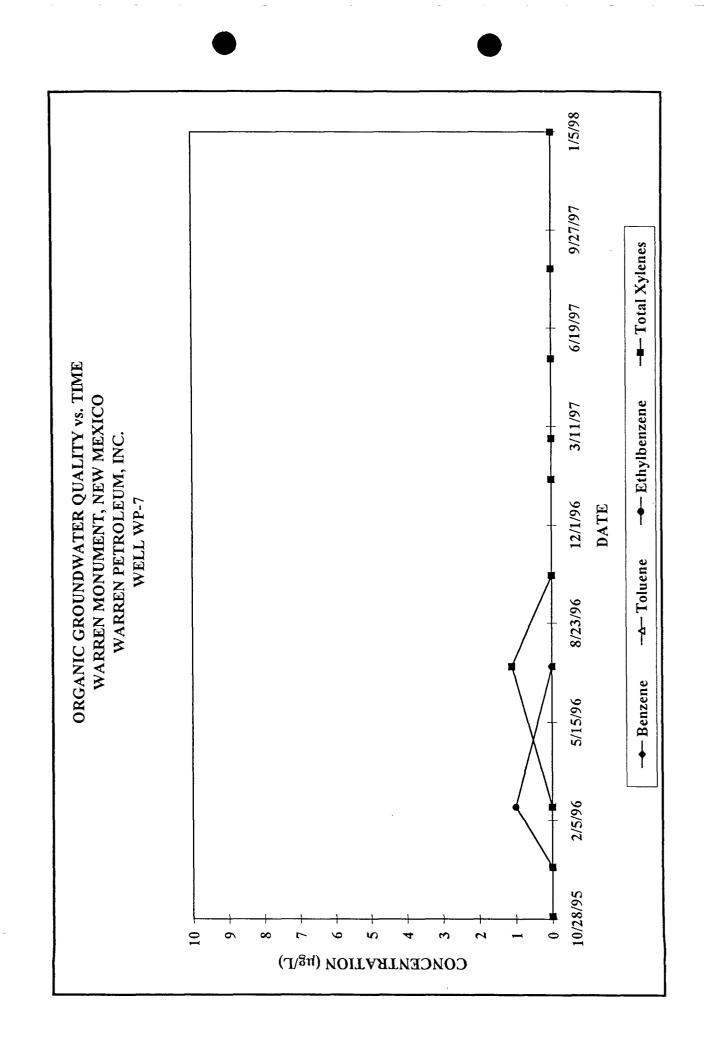


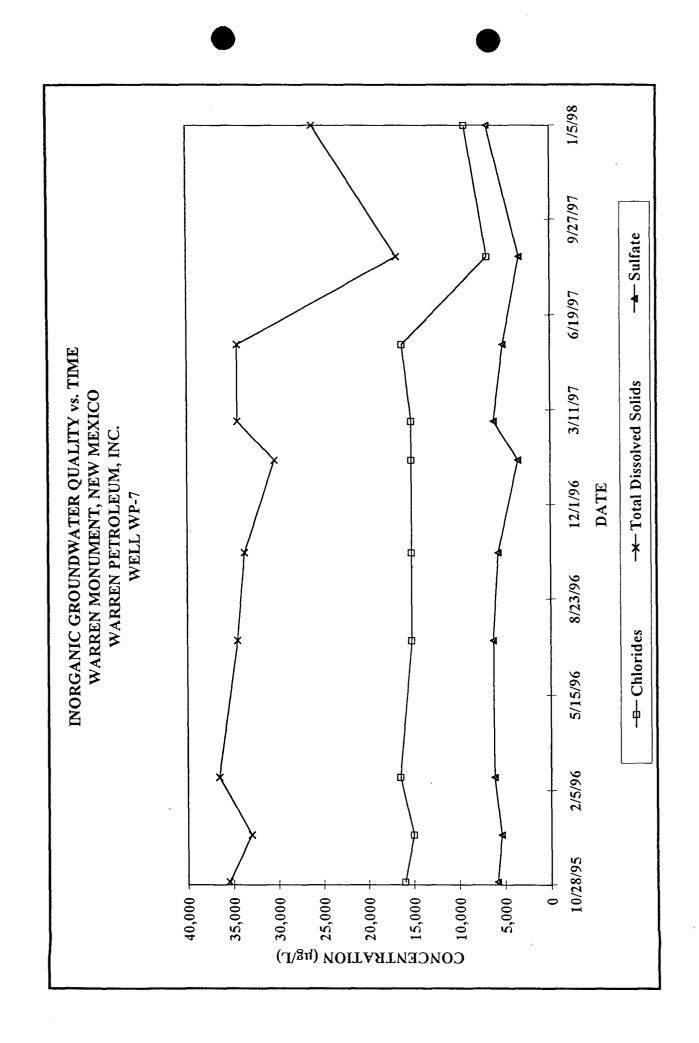


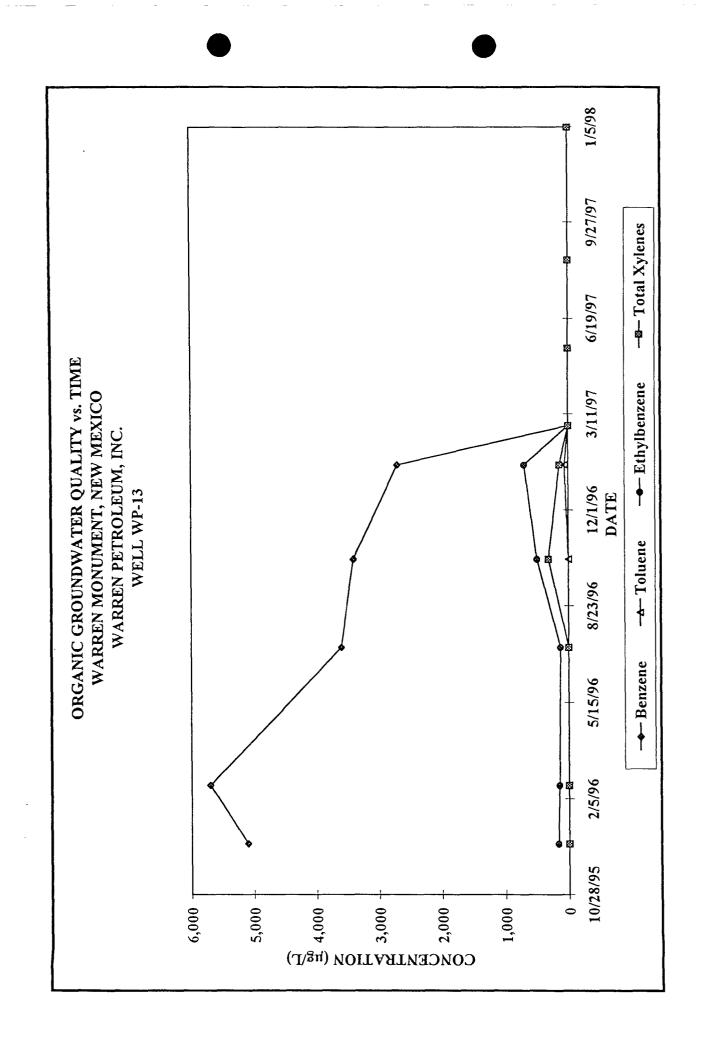


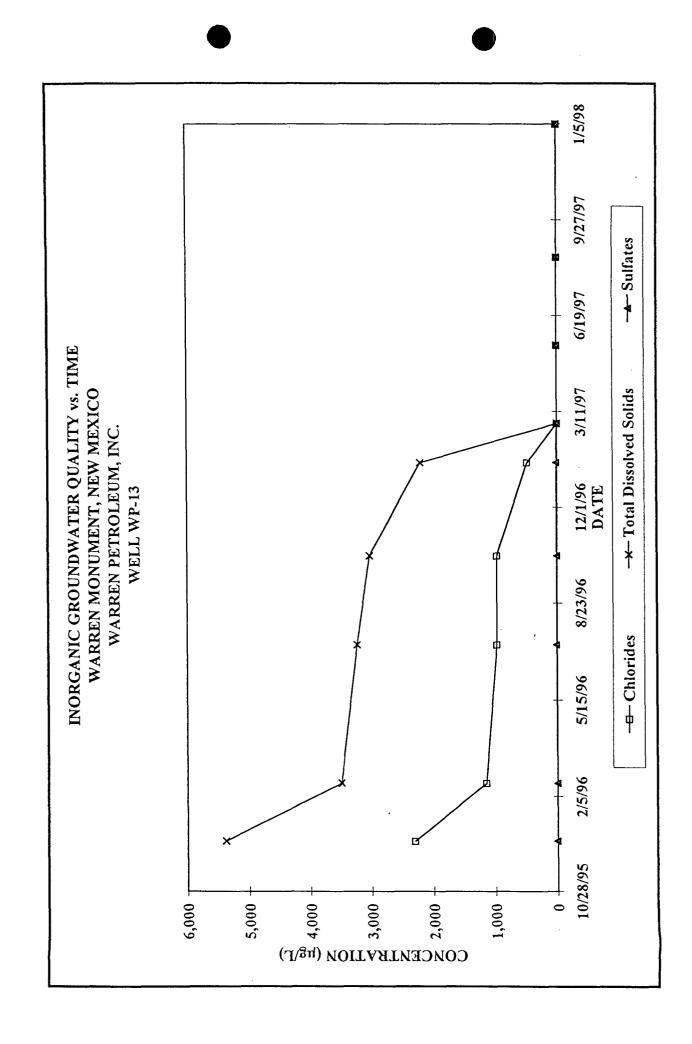


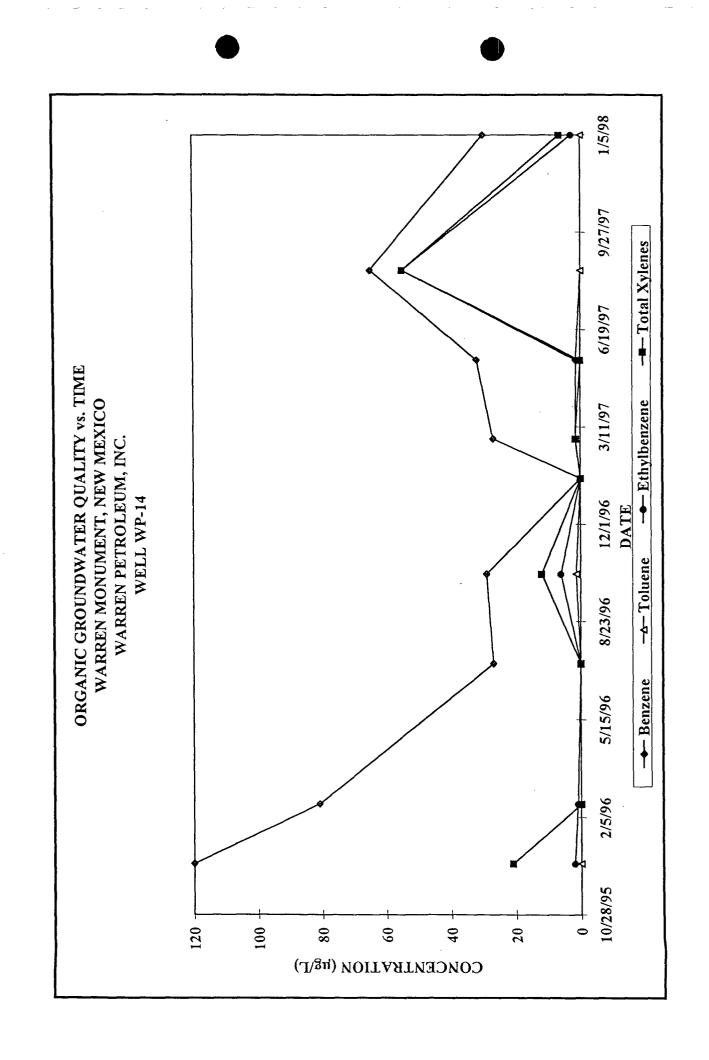


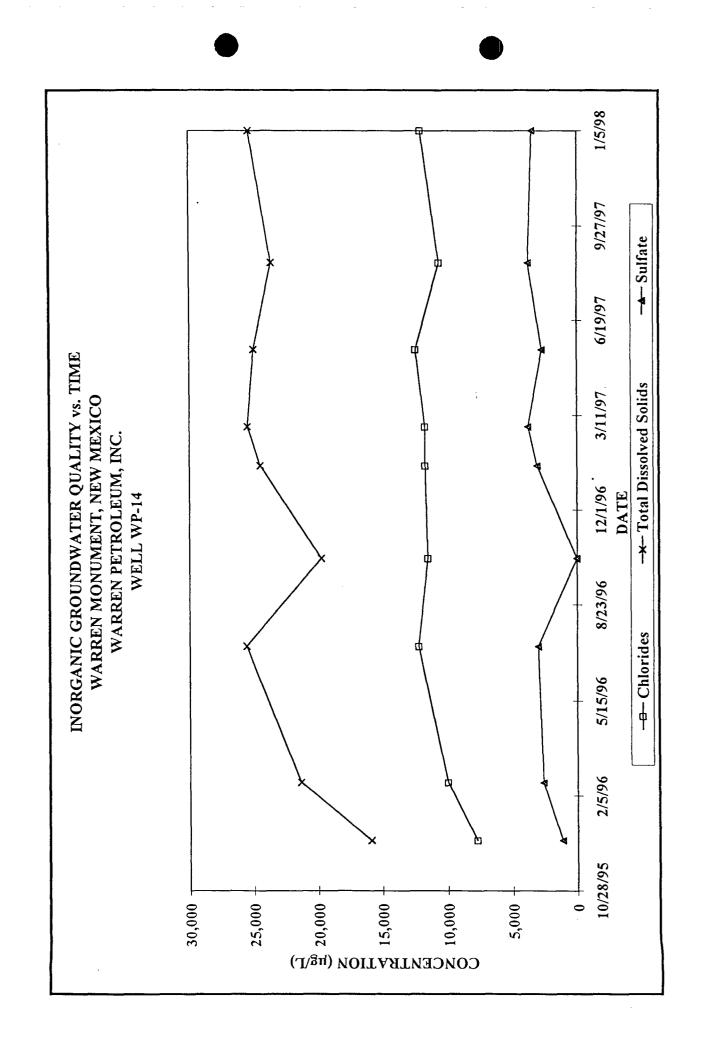














HOUSTON LABORATORY
8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

March 14, 1997

Mr. Buddy Marley WARREN PETROLEUM P.O. Box 67 Monument, NM 88265

The following report contains analytical results for samples received at Southern Petroleum Laboratories (SPL) on February 28, 1997. The samples were assigned to Certificate of Analysis No. 9702C74 and analyzed for all parameters as listed on the chain of custody.

Based on the conditions of the sample, procedures performed and quality controls implemented for this project, the following exceptions were noted for this data package.

The Matrix Spike Duplicate recovery was out of QC limits for Total Iron and Total Sodium analysis, due to matrix interference. The Matrix Spike recovery was out of QC limits for Total Sodium analysis, due to matrix interference. The sample spike was not from your sampling batch. The laboratory control sample and standard recoveries are in, verifying that the calibration is still valid.

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



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

## SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis Number: 97-02-C74

Approved for Release by:

Bernadette A. Fini, Project Manager

Date:

Greg Grandits Laboratory Director

Idelis Williams 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

# Certificate of Analysis No. H9-9702C74-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPHED BI: Walter rectofedin company

SAMPLE ID: MW #1 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 11:20:00

DATE RECEIVED: 02/28/97

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE TOLUENE ETHYLBENZENE	590 ND 12	5.0 P 5.0 P 5.0 P	μg/L μg/L μg/L
TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	5.0 607		μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: fab Date: 03/07/97	% Recovery 107 80		
Silver, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:37:15	ND	0.01	mg/L
Arsenic, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:37:15	ND	0.1	mg/L
Barium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:37:15	1.32	0.005	mg/L
Calcium, Total Method 6010A *** Analyzed by: JR Date: 03/06/97	120	0.1	mg/L

<sup>(</sup>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.



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

Certificate of Analysis No. H9-9702C74-01

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DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1 A-G

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 02/27/97 11:20:00

DATE RECEIVED: 02/28/97

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:37:15	ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:37:15	0.02	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:37:15	27.9	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 03/03/97		ND	0.0008	mg/L
Potassium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:37:15	5	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:37:15	38.9	0.1	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. H9-9702C74-01

Warren Petroleum

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DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1 A-G

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 02/27/97 11:20:00

DATE RECEIVED: 02/28/97

ANALYTICA PARAMETER	L DATA RESULTS	DETECTION	UNITS
FARMETER	KEDOLID	LIMIT	OMITI
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: MM Date: 03/03/97	03/03/97		
Lead, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:37:15	ND .	0.05	mg/L
Selenium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:37:15	ND	0.1	mg/L
Chloride Method 325.3 * Analyzed by: PT Date: 03/01/97	277	5	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	700	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. H9-9702C74-01

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 11:20:00

DATE RECEIVED: 02/28/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/11/97	210	1	mg/L
pH Method 150.1 * Analyzed by: LAR Date: 02/28/97	7.18		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 02/28/97	0.444		Mohms-cm
Sulfate Method 375.4 * Analyzed by: DSE Date: 03/07/97	9	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 02/28/97	1.000		
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 03/11/97	1389	1	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.



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

Certificate of Analysis No. H9-9702C74-01

Warren Petroleum

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03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 11:20:00

DATE RECEIVED: 02/28/97

				·	
ANA	LYTICAL DATA				
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		ND	18.00		ug/L
Acenaphthylene		ND	10.00		ug/L
Acenaphthene		ND	20.0		ug/L
Fluorene		ND	40.0		ug/L
Phenanthrene		ND	40.0		ug/L
Anthracene		ND	20.0		ug/L
Fluoranthene		ND	20.0		ug/L
Pyrene		ND	20.0		$\mathtt{ug}/\mathtt{L}$
Chrysene		ND	16.00		ug/L
Benzo (a) anthracene	•	ND	16.00		ug/L
Benzo (b) fluoranthene		ND	12.00		ug/L
Benzo (k) fluoranthene		ND	14.00		ug/L
Benzo (a) pyrene		ND	6.00		ug/L
Dibenzo (a,h) anthracene		ND	14.00		ug/L
Benzo (g,h,i) perylene		ND	20.0		ug/L
Indeno (1,2,3-cd) pyrene		ND	16.00		ug/L
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	REC	OVERY	LIMIT	LIMIT
Biphenyl	200 ug/L		D	、50	150
Coronene	200 ug/L		D	50	150

ANALYZED BY: KA DATE/TIME: 03/07/97 04:47:09 EXTRACTED BY: SW DATE/TIME: 03/03/97 13:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

D - Diluted, control limits not applicable.

#### COMMENTS:



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

Certificate of Analysis No. H9-9702C74-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

8265 **MATRIX:** WATER

SAMPLED BY: Warren Petroleum Company SAMPLE ID: MW #5 A-G

DATE RECEIVED: 02/28/97

DATE SAMPLED: 02/27/97 10:40:00

PROJECT NO:

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS LIMIT BENZENE 290 1.0 P μg/L TOLUENE ND 1.0 P μg/L **ETHYLBENZENE** 1.0 P 1.1 μg/L TOTAL XYLENE 1.0 P ND μg/L TOTAL VOLATILE AROMATIC HYDROCARBONS 291.1  $\mu g/L$ Surrogate % Recovery 1,4-Difluorobenzene 167MI 4-Bromofluorobenzene 83 Method 8020A \*\*\* Analyzed by: fab Date: 03/08/97 Silver, Total ND 0.01 mg/L Method 6010A \*\*\* Analyzed by: JM Date: 03/05/97 14:40:40 Arsenic, Total ND 0.1 mg/L Method 6010A \*\*\* Analyzed by: JM Date: 03/05/97 14:40:40 Barium, Total 0.534 0.005 mg/L Method 6010A \*\*\* Analyzed by: JM

(P) - Practical Quantitation Limit ND - Not detected.
MI - Matrix Interference.

Date: 03/05/97 14:40:40

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. H9-9702C74-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:40:00

DATE RECEIVED: 02/28/97

	ANALYTICAL	DATA	•	
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Calcium, Total Method 6010A *** Analyzed by: JR Date: 03/06/97		508	1	mg/L
Cadmium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:40:40	ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:40:40	ND	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:40:40	7.10	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 03/03/97		ND	0.0008	mg/L
Potassium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:40:40	56	2	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

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Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:40:00

DATE RECEIVED: 02/28/97

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Magnesium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:40:40	125	0.1	mg/L
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: MM Date: 03/03/97	03/03/97		
Lead, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:40:40	ND	0.05	mg/L
Selenium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:40:40	ND	0.1	mg/L
Chloride Method 325.3 * Analyzed by: PT Date: 03/01/97	6300	100	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	ND	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.



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Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:40:00

DATE RECEIVED: 02/28/97

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION LIMIT	UNITS
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	600	1	mg/L
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/11/97	4794	1	mg/L
pH Method 150.1 * Analyzed by: LAR Date: 02/28/97	7.24		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 02/28/97	0.046		Mohms-cm
Sulfate Method 375.4 * Analyzed by: DSE Date: 03/07/97	2800	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 02/28/97	1.010		

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. H9-9702C74-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:40:00

DATE RECEIVED: 02/28/97

ANALYTICAL DATA

PARAMETER RESULTS DETECTION UNITS

LIMIT

Total Dissolved Solids 15190 1 mg/L

Method CALCULATION Analyzed by: DAM

Date: 03/11/97

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. H9-9702C74-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:40:00

DATE RECEIVED: 02/28/97

AN	ALYTICAL DATA				
PARAMETER	RESI	ULTS	PQL*		UNITS
Naphthalene		0.1	0.09		ug/L
Acenaphthylene		ND	0.05		ug/L
Acenaphthene		ND	0.1		ug/L
Fluorene		0.8	0.2		ug/L
Phenanthrene		ND	0.2		ug/L
Anthracene		ND	0.1		ug/L
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		ug/L
Chrysene		ND	0.08		ug/L
Benzo (a) anthracene		ND	0.08		ug/I
Benzo (b) fluoranthene		ND	0.06		ug/I
Benzo (k) fluoranthene		ND	0.07		ug/L
Benzo (a) pyrene		ND	0.03		ug/L
Dibenzo (a,h) anthracene		ND	0.07		ug/L
Benzo (g,h,i) perylene		ND	0.1		ug/I
Indeno (1,2,3-cd) pyrene		ND	0.08		ug/I
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	REC	OVERY	LIMIT	LIMII
Biphenyl	200 ug/L		112	50	150
Coronene	200 ug/L	358	MI	50	150

ANALYZED BY: KA

EXTRACTED BY: SW

DATE/TIME: 03/05/97 00:12:49 DATE/TIME: 03/03/97 13:00:00

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

Certificate of Analysis No. H9-9702C74-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

971 PROJECT: 1st Quarter Analysis

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/27/97 10:00:00 SAMPLE ID: MW #7 A-G

DATE RECEIVED: 02/28/97

MATRIX: WATER

PROJECT NO:

PARAMETER ANALYTICAL	DATA RESULTS	DETECTION LIMIT	UNITS
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE	ND ND ND ND	5.0 P 5.0 P 5.0 P 5.0 P	μg/L μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: fab Date: 03/05/97	ND % Recovery 73 93		μg/L
Silver, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:44:05	ND	0.01	mg/L
Arsenic, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:44:05	ND	0.1	mg/L
Barium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:44:05	0.055	0.005	mg/L
Calcium, Total Method 6010A *** Analyzed by: JR Date: 03/06/97	909	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.

<sup>(</sup>P) - Practical Quantitation Limit



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

Certificate of Analysis No. H9-9702C74-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:00:00

DATE RECEIVED: 02/28/97

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:44:05	. ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:44:05	ND	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:44:05	1.35	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 03/03/97		ND	0.0004	mg/L
Potassium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:44:05	123	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:44:05	358	0.1	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. H9-9702C74-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:00:00

DATE RECEIVED: 02/28/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: MM Date: 03/03/97	03/03/97	24112			
Lead, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:44:05	ND	0.05	mg/L		
Selenium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:44:05	ND	0.1	mg/L		
Chloride Method 325.3 * Analyzed by: PT Date: 03/01/97	15200	500	mg/L		
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	ND	1 .	mg/L		
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	500	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. H9-9702C74-03

PROJECT NO:

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

MATRIX: WATER SAMPLED BY: Warren Petroleum Company **DATE SAMPLED:** 02/27/97 10:00:00

SAMPLE ID: MW #7 A-G DATE RECEIVED: 02/28/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/11/97	11206	1	mg/L
pH Method 150.1 * Analyzed by: LAR Date: 02/28/97	7.26		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 02/28/97	0.022		Mohms-cm
Sulfate Method 375.4 * Analyzed by: DSE Date: 03/07/97	6170	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 02/28/97	1.023		
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 03/11/97	34468	1	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.



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

Certificate of Analysis No. H9-9702C74-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 10:00:00

DATE RECEIVED: 02/28/97

	ANALYTICAL DATA			
PARAMETER	RESULTS	PQL*	•	UNITS
Naphthalene	ND	0.09		ug/L
Acenaphthylene	ND	0.05		ug/L
Acenaphthene	ND	0.1		ug/L
Fluorene	ND	0.2		ug/L
Phenanthrene	ND	0.2		ug/L
Anthracene	ND	0.1		ug/L
Fluoranthene	ND	0.1		ug/L
Pyrene	NE	0.1		ug/L
Chrysene	ND	0.08		ug/L
Benzo (a) anthracene	ND	0.08		${\tt ug/L}$
Benzo (b) fluoranthene	NE	0.06		ug/L
Benzo (k) fluoranthene	NE	0.07		ug/L
Benzo (a) pyrene	ND	0.03		ug/L
Dibenzo (a,h) anthracen	e ND	0.07		ug/L
Benzo (g,h,i) perylene	NE	0.1		ug/L
Indeno (1,2,3-cd) pyren	e ND	0.08		ug/L
SURROGATES	AMOUNT	%	LOWER	UPPER
	SPIKED F	RECOVERY	LIMIT	LIMIT
Biphenyl	200 ug/L	84	50	150
Coronene	200 ug/L	81	50	150

ANALYZED BY: KA DATE/TIME: 03/05/97 00:54:08 EXTRACTED BY: SW DATE/TIME: 03/03/97 13:00:00

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

Certificate of Analysis No. H9-9702C74-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 14:10:00

DATE RECEIVED: 02/28/97

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	260	5.0 P	μg/L
TOLUENE	ND	5.0 P	μg/L
ETHYLBENZENE	690	5.0 P	μg/L
TOTAL XYLENE	ND	5.0 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	950		$\mu { m g/L}$
Surrogate	% Recovery		
1,4-Difluorobenzene	73		
4-Bromofluorobenzene Method 8020A ***	73		
Analyzed by: HS Date: 03/08/97			
<i>,</i> ,	<b>)</b> TD	0.01	/-
Silver, Total Method 6010A ***	ND	0.01	mg/L
Analyzed by: JM			
Date: 03/05/97 14:56:36			
Arsenic, Total	ND	0.1	mg/L
Method 6010A ***			
Analyzed by: JM			
Date: 03/05/97 14:56:36			
Barium, Total	0.658	0.005	mg/L
Method 6010A ***			
Analyzed by: JM			
Date: 03/05/97 14:56:36			
Calcium, Total	189	0.1	mg/L
Method 6010A ***			
Analyzed by: JR			
Date: 03/06/97		,	

<sup>(</sup>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.

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. H9-9702C74-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A-G

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 02/27/97 14:10:00

DATE RECEIVED: 02/28/97

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	14:56:36	ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	' 14:56:36	0.14	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	' 14:56:36	22.5	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 03/03/97	,	ND	0.0008	mg/L
Potassium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97	7 14:56:36	26	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: JM Date: 03/05/9	7 14:56:36	134	0.1	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. H9-9702C74-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 14:10:00

DATE RECEIVED: 02/28/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION	UNITS		
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: MM Date: 03/03/97	03/03/97	LIMIT			
Lead, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:56:36	ND	0.05	mġ/L		
Selenium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:56:36	ND	0.1	mg/L		
Chloride Method 325.3 * Analyzed by: PT Date: 03/01/97	1420	50	mg/L		
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	ND	1	mg/L		
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	1700	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. H9-9702C74-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A-G

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 02/27/97 14:10:00

DATE RECEIVED: 02/28/97

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION	UNITS
PARAMETER	RESULIS	LIMIT	UNIIS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/11/97	1091	1	mg/L
pH Method 150.1 * Analyzed by: LAR Date: 02/28/97	7.70		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 02/28/97	0.151		Mohms-cm
Sulfate Method 375.4 * Analyzed by: DSE Date: 03/07/97	, 71	5	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 02/28/97	1.001		
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 03/11/97	4654	1	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.



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

Certificate of Analysis No. H9-9702C74-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 14:10:00

DATE RECEIVED: 02/28/97

AN	ALYTICAL DATA				
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		ND	4.50		ug/L
Acenaphthylene		ND	2.50		ug/L
Acenaphthene		ND	5.0		ug/L
Fluorene		ND	10.0		ug/L
Phenanthrene		ND	10.0		ug/L
Anthracene		ND	5.0		ug/L
Fluoranthene		ND	5.0		ug/L
Pyrene		ND	5.0		ug/L
Chrysene		ND	4.00		ug/L
Benzo (a) anthracene		ND	4.00		ug/L
Benzo (b) fluoranthene		ND	3.00		ug/L
Benzo (k) fluoranthene		ND	3.50		ug/L
Benzo (a) pyrene		ND	1.50		ug/L
Dibenzo (a,h) anthracene		ND	3.50		ug/L
Benzo (g,h,i) perylene		ND	5.0		ug/L
Indeno (1,2,3-cd) pyrene		ND	4.00		ug/L
SURROGATES	AMOUNT SPIKED	% REC	COVERY	LOWER LIMIT	UPPER LIMIT
Biphenyl	200 ug/L		D	50	150
Coronene	200 ug/L		D	50	150

ANALYZED BY: KA DATE/TIME: 03/07/97 12:46:23 EXTRACTED BY: SW DATE/TIME: 03/03/97 13:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: \* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

D - Diluted, control limits not applicable.

### COMMENTS:

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

# Certificate of Analysis No. H9-9702C74-05

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

MATRIX: WATER

PROJECT NO:

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/27/97 13:00:00

SAMPLE ID: MW #14 A-G

DATE RECEIVED: 02/28/97

			······································				
	ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS						
PARAMETER	RESULTS	DETECTION LIMIT	UNITS				
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	27 1.5 1.6 1.6 31.7	1.0 P 1.0 P 1.0 P	μα/Γ μα/Γ μα/Γ μα/Γ				
Surrogate	% Recovery						
1,4-Difluorobenzene	77						
4-Bromofluorobenzene Method 8020A *** Analyzed by: HS Date: 03/08/97	90						
Silver, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	ND	0.01	mg/L				
Arsenic, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	ND	0.1	mg/L				
Barium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	0.456	0.005	mg/L				
Calcium, Total Method 6010A *** Analyzed by: JR Date: 03/06/97	890	1	mg/L				

<sup>(</sup>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. 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. H9-9702C74-05

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 13:00:00

DATE RECEIVED: 02/28/97

ANALYTICAI	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	ND	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	5.23	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 03/03/97	ND	0.0008	mg/L
Potassium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	78	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	314	0.1	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. H9-9702C74-05

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 13:00:00

DATE RECEIVED: 02/28/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: MM Date: 03/03/97	03/03/97				
Lead, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	ND	0.05	mg/L		
Selenium, Total Method 6010A *** Analyzed by: JM Date: 03/05/97 14:59:59	ND	0.1	mg/L		
Chloride Method 325.3 * Analyzed by: PT Date: 03/01/97	11700	500	mg/L		
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	ND	1	mg/L		
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 02/28/97	700	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. H9-9702C74-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 13:00:00

DATE RECEIVED: 02/28/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/11/97	7996	1	mg/L
pH Method 150.1 * Analyzed by: LAR Date: 02/28/97	7.27		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 02/28/97	0.029		Mohms-cm
Sulfate Method 375.4 * Analyzed by: DSE Date: 03/07/97	3780	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 02/28/97	1.016		
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 03/11/97	25463	1	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.



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

# Certificate of Analysis No. H9-9702C74-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

03/14/97

PROJECT: 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A-G

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 02/27/97 13:00:00

DATE RECEIVED: 02/28/97

ANZ	ALYTICAL DATA				
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		ND	0.90		ug/L
Acenaphthylene		ND	0.50		ug/L
Acenaphthene		ND	1.0		ug/L
Fluorene		ND	2.0		ug/L
Phenanthrene		ND	2.0		ug/L
Anthracene		ND	1.0		ug/L
Fluoranthene		ND	1.0		ug/L
Pyrene		ND	1.0		ug/L
Chrysene		ND	0.80		ug/L
Benzo (a) anthracene		ND	0.80		ug/L
Benzo (b) fluoranthene		ND	0.60		ug/L
Benzo (k) fluoranthene		ND	0.70		ug/L
Benzo (a) pyrene		ND	0.30		ug/L
Dibenzo (a,h) anthracene		ND	0.70		ug/L
Benzo (g,h,i) perylene		ND	1.0		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.80		ug/L
SURROGATES	AMOUNT	ૠ		LOWER	UPPER
	SPIKED	REC	COVERY	LIMIT	LIMIT
Biphenyl	200 ug/L		72	50	150
Coronene	200 ug/L		57	50	150

ANALYZED BY: KA DATE/TIME: 03/07/97 04:17:21 EXTRACTED BY: SW DATE/TIME: 03/03/97 13:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: \* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

### COMMENTS:

# Certif

### HOUSTON LABORATORY

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

Certificate of Analysis No. H9-9702C74-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 03/14/97

**PROJECT:** 1st Quarter Analysis 97'

SITE: Monument, NM 88265

SAMPLED BY: Provided By SPL

SAMPLE ID: Trip Blank

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 02/27/97

DATE RECEIVED: 02/28/97

ANALYTICAL 1	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
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	<b>N</b> D		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	77		
4-Bromofluorobenzene	90		
Method 8020A ***			
Analyzed by: fab			
Date: 03/05/97			

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



 $\mu g/L$ 

Units:

SPL BATCH QUALITY CONTROL REPORT \*\* METHOD 8020/602

HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Batch Id:

VARE970307100400

### 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		
MTBE	ND	50	35	70.0	63 - 120		
Benzene	ND	50	39	78.0	62 - 121		
Toluene	ND	50	47	94.0	66 - 136		
EthylBenzene	ND	50	47	94.0	70 - 136		
O Xylene	ND	50	50	100	74 - 134		
4 & P Xylene	ND	100	100	100	77 - 140		

### 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 %	-	imits(***) (Advisory)	
	<2>	<3>	Result	Recovery <4>	Result	Recovery <5>	Difference	RPD Max.	Recovery R	ange
мтве	1.1	20	19	89.5	20	94.5	5.43	20	39 -	150
BENZENE	ND	20	19	95.0	19	95.0	0	25	39 -	150
TOLUENE	ND	20	19	95.0	19	95.0	0	26	56 -	134
ETHYLBENZENE	ND	20	20	100	20	100	0	38	61 -	128
O XYLENE	ND	20	19	95.0	18	90.0	5.41	29	40 -	130
M & P XYLENE	ИD	40	38	95.0	39	97.5	2.60	20	43 -	152

Analyst: fab

Sequence Date: 03/07/97

SPL ID of sample spiked: 9702D20-01A

Sample File ID: E\_C7197.TX0

Method Blank File ID:

Blank Spike File ID: E C7193.TX0

Matrix Spike File ID: E\_C7194.TX0

Matrix Spike Duplicate File ID: E\_C7195.TX0

\* = 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

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

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

(\*\*) = Source: SPL-Houston Historical Data (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

9702C92-06A 9702D20-02A 9702D20-03A 9702C74-01A 9702C36-02A 9703185-01A 9703195-01A 9703187-02A

9702C44-02A 9702D33-01B 9702C44-01A 9702D33-02B

9703187-01A 9703187-03A 9702D20-04A 9702D20-01A

9702C40-08A 9703086-05A



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

HOUSTON LABORATORY

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

Batch Id:

VARE970308120900

### 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		
МТВЕ	ND	50	39	78.0	63 - 120		
Benzene	ND ·	50	37	74.0	62 - 121		
Toluene	ND	50	46	92.0	66 - 136		
EthylBenzene	ND	50	46	92.0	70 - 136		
O Xylene	ND	50	49	98.0	74 - 134		
M & P Xylene	ND	100	98	98.0	77 - 140		

### 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 cate	MS/MSD Relative %	_	Limits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery Range
MTBE	ND	20	20	100	20	100	0	20	39 - 150
BENZENE	ND	20	20	100	20	100	0	25	39 - 150
TOLUENE	ND	20	20	100	20	100	0	26	56 - 134
ETHYLBENZENE	ND	20	20	100	20	100	0	38	61 - 128
O XYLENE	ND	20	19	95.0	19	95.0	0	29	40 - 130
M & P XYLENE	ND	40	39	97.5	39	97.5	0	20	43 - 152
_				1	<b>}</b>		į.		1

Analyst: fab

Sequence Date: 03/08/97

SPL ID of sample spiked: 9702C44-08A

Sample File ID: E\_C7225.TX0

Method Blank File ID:

Blank Spike File ID: E\_C7220.TX0
Matrix Spike File ID: E\_C7221.TX0

Matrix Spike Duplicate File ID: E\_C7222.TX0

\* = 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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

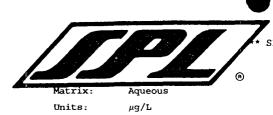
9702C44-01A 9702C44-03A 9702C44-04A 9702C44-06A

9702C44-09A 9702C44-05A 9702C74-02A 9702C51-04A

9702C51-05A 9702C44-02A 9702C44-07A 9702C51-02A

9702C51-01A 9702C51-03A 9702C44-01A 9702C44-04A

9702C44-10A 9702C44-08A 9702C44-07A



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

HOUSTON LABORATORY

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

Batch Id:

VARE970305082500

### 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		
мтве	ND	50	42	84.0	63 - 120		
Benzene	ND	50	42	84.0	62 - 121		
Toluene	ND	50	49	98.0	66 - 136		
EthylBenzene	ND	50	48	96.0	70 - 136		
O Xylene	ND	50	49	98.0	74 - 134		
M & P Xylene	ND	100	96	96.0	77 - 140		

### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix Result	Spike Recovery	Matrix Duplio		MS/MSD Relative &	_	Limits(***) (Advisory)
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range
MTBE	ND	20	18	90.0	18	90.0	0	20	39 - 150
BENZENE	ND	20	20	100	20	100	0	25	39 - 150
TOLUENE	ND	20	20	100	20	100	0	26	56 - 134
ETHYLBENZENE	ND	20	20	100	20	100	0	38	61 - 128
O XYLENE	ND	20	20	100	20	100	0	29	40 - 130
M & P XYLENE	ND	40	41	102	41	102	0	20	43 ~ 152

Analyst: fab

Sequence Date: 03/05/97

SPL ID of sample spiked: 9702B66-06A

Sample File ID: E\_C7114.TX0

Method Blank File ID:

Blank Spike File ID: E\_C7109.TX0
Matrix Spike File ID: E\_C7112.TX0

Matrix Spike Duplicate File ID: E\_C7113.TX0

\* = 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

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

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

(\*\*) = Source: SPL-Houston Historical Data (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

9702D19-06A 9702C74-03A 9702D19-03A 9702D19-05A

9702C74-06A 9702B66-07A 9702B66-08A 9702B66-04A

9702B66-01A 9702B66-02A 9702B66-09A 9702B66-10A 9702B66-03A 9702B66-05A 9703071-02A 9703071-03A

9702B66-06A



SPL BATCH QUALITY CONTROL REPORT \*\* METHOD 8020/602

HOUSTON LABORATORY

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

Units:

μg/L

VARE970308165700 Batch Id:

### 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		
TBE	ND	50	34	68.0	63 - 120		
Benzene	ND	50	32	64.0	62 - 121		
Toluene	ND	50	42	84.0	66 - 136		
EthylBenzene	ND	50	44	88.0	70 - 136		
) Xylene	ND	50	44	88.0	74 - 134		
1 & P Xylene	ND	100	90	90.0	77 - 140		

### 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 %	_	Limits(***) (Advisory)	
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery	Range
мтве	<b>N</b> D	20	20	100	22	110	9.52	20	39 ~	150
BENZENE	27	20	53	130	55	140	7.41	25	39 -	150
TOLUENE	1.5	20	28	132	26	122	7.87	26	56 -	134
ETHYLBENZENE	1.6	20	23	107	23	107	0	38	61 -	128
O XYLENE	ND	20	21	93.0	23	103	10.2	29	40 -	130
M & P XYLENE	1.6	40	40	96.0	43	104	8.00	20	43 -	152

Analyst: HS

Sequence Date: 03/08/97

SPL ID of sample spiked: 9702C74-05A

Sample File ID: E\_C7252.TX0

Method Blank File ID:

Blank Spike File ID: E\_C7248.TX0 Matrix Spike File ID: E\_C7249.TX0

Matrix Spike Duplicate File ID: E\_C7250.TX0

\* = 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

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

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

(\*\*) = Source: SPL-Houston Historical Data (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

### SAMPLES IN BATCH (SPL ID):

9703018-05A 9703018-06A 9703018-07A 9703018-08A 9703018-09A 9703170-01A 9703170-02A 9703170-07A 9703170-03A 9703170-05A 9703170-06A 9703171-01A 9703171-03A 9703170-04A 9703171-02A 9703171-04A 9703171-05A 9702C74-05A 9702C74-04A 9703018-03A

\*\* SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD EPA 6310

PAGE

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

Units: ug/L

Batch Id:

1970307091600

# BLANK SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Duplic	Spike	MS/MSD Relative %		Limits(**) (Advisory)
			Result	Recovery	Result	Recovery	Difference	RPD	
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range
NAPHTHALENE	ND	0.5	0.35	70.0	0.35	70.0	0	30	1 - 122
ACENAPHTHYLENE	ND	0.5	0.33	66.0	0.32	64.0	3.08	30	1 - 124
ACENAPHTHENE	ND	0.5	0.36	72.0	0.37	74.0	2.74	30	1 - 124
FLUORENE	ND	0.5	0.39	78.0	0.39	78.0	0	30	1 - 142
PHENANTHRENE	ND	0.5	0.36	72.0	0.37	74.0	2.74	30	1 - 155
ANTHRACENE	ND-	0.5	0.26	52.0	0.26	52.0	0	30	1 - 126
FLUORANTHENE	ND	0.5	0.38	76.0	0.38	76.0	0	30	14 - 123
PYRENE	ND	0.5	0.37	74.0	0.37	74.0	0	30	1 - 140
CHRYSENE	ND	0.5	0.40	80.0	0.40	80.0	0	30	1 - 199
BENZO (A) ANTHRACENE	ND	0.5	0.36	72.0	0.36	72.0	0	30	12 - 135
BENZO (B) FLUORANTHENE	ND	0.5	0.38	76.0	0.38	76.0	0	30	6 - 150
BENZO (K) FLUORANTHENE	ND	0.5	0.38	76.0	0.38	76.0	0	30	1 - 159
BENZO (A) PYRENE	ND	0.5	0.38	76.0	0.38	76.0	0	30	1 - 128
DIBENZO (A,H) ANTHRACENE	, ND	0.5	0.37	74.0	0.37	74.0	0	30	1 - 110
BENZO (G,H,I) PERYLENE	ND	0.5	0.37	74.0	0.37	74.0	0	30	1 - 116
INDENO (1,2,3-CD) PYRENE	ND	0.5	0.39	78.0	0.38	76.0	2.60	30	1 - 116

Analyst: KA

Sequence Date: 03/04/97

Method Blank File ID:

Sample File ID:

Blank Spike File ID: 970304A\005-0101

Matrix Spike File ID:

Matrix Spike Duplicate File ID:

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

# ICP Spectro opy Method 6010 Quality Contro



Matrix: Water

Units: mg/L

Date:030597 Time:0753 File Name: 030597M3

Analyst: JM
HOUSTON LABORATORY

8880 INTERCHANGE DRIVE CHECKSTON, TEXAS 77054
PHONE (719) 000-0901
Om 3 6 7

**Laboratory Control Sample** 

Element		True Value		<u></u>	Lower Limit	Upper Limit
Silver	ND	2.00	1.94	97	1.60	2.40
Aluminum						
Arsenic	ND	4.00	3.98	99	3.20	4.80
Barium	ND	2.00	1.90	95	1.60	2.40
Beryllium						
Calcium						
Cadmium	ND	2.00	1.91	96	1.60	2.40
Cobalt						
Chromium	ND	2.00	1.91	95	1.60	2.40
Copper	ND	2.00	1.92	96	1.60	2.40
Iron	ND	2.00	1.96	98	1.60	2.40
Potassium	ND	20.00	18.91	95	16.00	24.00
Magnesium	ND	20.00	19.46	97	16.00	24.00
Manganese						
Sodium						1
Nickel	ND	2.00	1.97	99	1.60	2.40
Lead	ND	2.00	2.00	100	1.60	2.40
Antimony						
Selenium	ND	4.00	3.89	97	3.20	4.80
Thallium						
Vanadium						
Zinc	ND	2.00	1.99	99	1.60	2.40

	•
Work Orde	ers in Batch
Work Order	Fractions
97-02-D24	01B
97-02-C64	01B,03B 04B,06B 08B,10B
97-02-C65	04D-09D
97-02-C74	01B-05B

Matrix Snike - Snike Dunlicate Results Work Order Sniked: 97-02-D24 01B

матіх Бріке	atrix Spike - Spike Duplicate Results					Work Order Spiked: 97-02-D24 01B					
	Sample	Spike	Matr	ix Spike	Matrix Spi	ke Duplicate	$\neg$	QC L	imits	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	$\bot$	% Rec	overy	RPD %	Limits %
Silver	ND	1.0	0.8594	85.9	0.8379	83.8	$\prod$	80	120	2.5	20.0
Aluminum						ll					
Arsenic	ND	2.0	1.768	88.4	1.743	87.2		80	120	1.4	20.0
Barium	0.0626	1.0	0.8961	83.4	0.8816	81.9		80	120	1.8	20.0
Beryllium											
Calcium											
Cadmium	ND	1.0	0.8406	84.1	0.8225	82.3		80	120	2.2	20.0
Cobalt											
Chromium	ND	1.0	0.8442	84.4	0.8252	82.5		80	120	2.3	20.0
Copper	ND	1.0	0.8464	84.6	0.8299	83.0		80	120	2.0	20.0
Iron	0.4266	1.0	1.254	82.7	1.219	79.2		80	120	4.3	20.0
Potassium	ND	10.0	8.985	89.9	8.637	86.4	$\Box$	80	120	3.9	20.0
Magnesium	101.3	10.0	112.3	110.0	112.5	112.0		80	120	1.8	20.0
Manganese											
Sodium											
Nickel	ND	1.0	0.8532	85.3	0.8473	84.7		80	120	0.7	20.0
Lead	ND	1.0	0.8715	87.2	0.843	84.3		80	120	3.3	20.0
Antimony											
Selenium	ND	2.0	1.705	85.3	1.711	85.6		80	120	0.4	20.0
Thallium											
Vanadium											
Zinc	0.0394	1.0	0.907	86.8	0.8953	85.6	П	80	120	1.4	20.0

<sup>\*</sup> Spike Results Outside Method Limits

# ICP Spectr Copy Method 6010 Quality Control Leport



Matrix: Water

Units: mg/L

Date: 030697 Time: 0735 File Name: 030697R4

Analyst: JR HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

Checked TEXAS 77054

Work Orders in Batch Work Order Fractions

97-02-C65 04D-09D

97-02-C74

01B-05B

Laboratory Control Sample  Element   Mth. Blank   True Value   Result   % Recovery   Lower Limit   Upper Limit												
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit						
Silver												
Aluminum												
Arsenic												
Barium												
Beryllium												
Calcium	ND	20.00	19.94	100	16.00	24.00						
Cadmium												
Cobalt												
Chromium												
Copper												
Iron												
Potassium												
Magnesium												
Manganese												
Sodium	. ND	20.00	18.77	94	16.00	24.00						
Nickel												
Lead												
Antimony												
Selenium												
Thallium												
Vanadium												
Zinc												

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 97-02-D24 01B

Maurx Spike	Sample	Spike		ix Spike	7	Matrix Spi	ke Duplicate		QC L		Spike	QC
Element	Result	_	Result	_	.	Result	Recovery				RPD %	
	Result	Added	Result	Recovery	4	Result	Recovery	_	% Rec	overy	RPD %	Limits %
Silver					Щ			L				
Aluminum					Ц			L				
Arsenic								L				<u> </u>
Barium			<u> </u>					L				
Beryllium												
Calcium	60.42	10.0	69.23	88.1		69.63	92.1		80	120	4.4	20.0
Cadmium												
Cobalt												
Chromium												
Copper												
Iron												
Potassium												
Magnesium												
Manganese								Г				
Sodium	75.94	10.0	83.81	78.7	*	82.65	67.1	+	80	120	15.9	20.0
Nickel	:							Γ				
Lead								Γ				
Antimony								Γ				
Selenium								Γ				
Thallium												
Vanadium								Γ				
Zinc								Γ				

<sup>\*</sup> Spike Results Outside Method Limits



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

03/03/97 Reported on:

Analyzed on: 03/03/97 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:

Mercury, Total Method 7470 A\*\*\*

SPL Sample ID Number	Blank Value ug/L	LCS Concentration ug/L	Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	2.00	1.95	97.5	80 - 120

-9703040

# Samples in batch:

9702947-01A	9702A70-08E	9702A70-09E	9702A86-05E
9702A91-01A	9702C60-01C	9702C74-01B	9702C74-02B
9702C74-03B	9702C74~04B	9702C74-05B	

### COMMENTS:

LCS= SPL ID# 94-452-30-8



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

### \* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 03/03/97 Analyzed on: 03/03/97

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:

Mercury, Total Method 7470 A\*\*\*

SPL Sample	Method	Sample	Spike	Matrix Spike		Matrix Spike Duplicate		•		QC LIMITS Advisory)	
ID Number	: .			Result ug/L	_	Result ug/L	Recovery	(%)	RPD Max	% REC	
9702C74-02B	ND	ND	2.00	1.93	96.5	1.89	94.5	2.1	20	75 -125	

-9703040

### Samples in batch:

 9702947-01A
 9702A70-08E
 9702A70-09E
 9702A86-05E

 9702A91-01A
 9702C60-01C
 9702C74-01B
 9702C74-02B

 9702C74-03B
 9702C74-04B
 9702C74-05B

### COMMENTS:

LCS= SPL ID# 94-452-30-8



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 03/03/97

Analyzed on: 03/01/97

Analyst:

PT

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	Į l	Measured Concentration mg/L	% Recovery		Limits overy
LCS	ND	27.23	27.49	101	90 - 110	

-9703024

# Samples in batch:

9702B62-01C	9702B62-02C	9702B62-04C	9702B62-05C
9702C65~04E	9702C65-05E	9702C65-06E	9702C65-07E
9702C65~08E	9702C65-09E	9702C65-10A	9702C74-01D
9702C74~02D	9702C74-03D	9702C74-04D	9702C74-05D
9703003~03A			

COMMENTS:

LCS= SPL ID#94463290-18



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

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous Reported on: 03/03/97

Analyzed on: 03/01/97

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	Matrix Spike   Matrix Spike   Duplicate		RPD	•	C LIMITS Advisory)		
ID Number	•		  Added  mg/L	Result	: -	Result mg/L	Recovery	(%)	RPD Max	% REC
9702C74-05D	ND	23.49	50.00	72.48	98.0	72.48	98.0	0	2.7	93.2 -109.3

-9703026

### Samples in batch:

9702B62-01C 9702B62-02C 9702C74-01D

9702B62-04C

9702B62-05C

9702C74-05D

9702C74-02D

9702C74-03D 9702C74-04D



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

# \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/28/97

Analyzed on:

02/28/97

Analyst:

LAR

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.
9702C74-01D	ND	ND	0	2.2

-9702918

# Samples in batch:

9702C74-01D 9702C74-05D 9702C74-02D

9702C74-03D

9702C74-04D



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

02/28/97

Reported on: Analyzed on:

02/28/97

Analyst:

LAR

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.
9702C74-01D	700	700	0	3

-9702920

# Samples in batch:

9702C74-01D 9702C74-05D

9702C74-02D

9702C74-03D

9702C74-04D



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: Analyzed on:

02/28/97

02/28/97

Analyst:

LAR

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

рН Method 150.1 \*

### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9702C74-01D	7.18	7.18	0	1.0

-9702913

# Samples in batch:

9702C74-01D 9702C74-05D

9702C74-02D

9702C74-03D

9702C74-04D



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

03/06/97

Analyzed on: 02/28/97

Analyst:

LAR

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

Resistivity Method 120.1 \*

### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mohms-cm	Duplicate Sample mohms-cm	RPD	RPD Max.
9702C74-01D	0.444	0.444	0	1.0

-9703167

# Samples in batch:

9702C74-01D

9702C74-02D

9702C74-03D

9702C74-04D

9702C74-05D



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: Analyzed on:

03/07/97

03/07/97

Analyst:

DSE

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	10.15	9.38	92.4	90 - 110

-9703201

# Samples in batch:

9702A95-02C	9702A95-03C	9702B62-01C	9702B62-02C
9702B62-04C	9702B62-05C	9702B76-01A	9702C65-04E
9702C65-05E	9702C65-06E	9702C65-07E	9702C65-08E
9702C65-09E	9702C65-10A	9702C66-35A	9702C74-01D
9702C74-03D	9702C74-04D	9702C74-05D	9703270-01B
COMMENTED			

COMMENTS:

LCS = SPL I.D. #9553592-21



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 03/07/97

Analyzed on: 03/07/97

Analyst:

DSE

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	QC Limits Recovery
LCS	ND	10.15	10.03	98.8	90 - 110

-9703200

Samples in batch:

9702C74-02D

COMMENTS:

LCS = SPL I.D. #9553592-21



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

### \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous Repor

Reported on: 03/07/97 Analyzed on: 03/07/97

Analyst:

DSE

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	•	ix Spike   licate	RPD		C LIMITS Advisory)
ID Number	: .		  Added  mg/L	Result		Result  mg/L	Recovery	( <b>%</b> )	RPD Max	% REC
9702C65-08E	ND	10.16	10.00	22.24	121	21.73	116	4.2	11.8	79.6 -122

-9703198

### Samples in batch:

 9702C65-06E
 9702C65-07E
 9702C65-08E
 9702C65-09E

 9702C65-10A
 9702C66-35A
 9702C74-01D
 9702C74-03D

 9702C74-04D
 9702C74-05D



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 03/07/97

Analyzed on: 03/07/97 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	Matri	ix Spike	•	ix Spike licate	RPD	,	QC LIMITS Advisory)
ID Number	Blank  mg/L	: .		Result mg/L	•	Result mg/L	Recovery	(%)	RPD Max	% REC
9702C74-02D	ND	12.94	10.00	24.85	119	24.02	111	7.0	11.8	79.6 -122

-9703199

Samples in batch:

9702C74-02D



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 02/28/97 Analyzed on: 02/28/97

Analyst:

LAR

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

Specific Gravity ASTM D1429

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9702C74-01D	1.000	1.000	0	1.0

-9702915

# Samples in batch:

9702C74-01D 9702C74-05D

9702C74-02D

9702C74-03D

9702C74-04D



HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713)660-0901

June 11, 1997

Mr. Buddy Marley WARREN PETROLEUM P. O. Box 67 Monument, NM 88265

	RECEIVED	
	AUG 1 4 1991	
Ţ	3Y:	

The following report contains analytical results for samples received at Southern Petroleum Laboratories (SPL) on May 20, 1997. The samples were assigned to Certificate of Analysis No(s).9705958 and analyzed for the parameters specified on the chain of custody.

Based on the conditions of the sample, procedures performed and quality controls implemented for this project, the following exceptions were noted for this data package.

Your sample MW #7 A-E (SPL ID# 9705958-01) was randomly selected for the use in SPL's quality control program for Total Metals by 6010. The Matrix Spike, Matrix Spike Duplicate and Relative Percent Difference (%RPD) recoveries were out of QC limits for various spiked compounds in the Total Metals (6010) analysis, due to matrix interference. The laboratory control sample and standard recoveries are in, verifying that the calibration is still valid.

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 Number(s) 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



#### HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

# SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis Number: 97-05-958

Approved for Release by:

Bernadette A. Fini, Project Manager

Date:

Greg Grandits Laboratory Director

Idelis Williams 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

#### Certificate of Analysis No. H9-9705958-01

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 10:50:00

DATE RECEIVED: 05/20/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
BENZENE	ND	5.0 P	μg/L		
TOLUENE	ND	5.0 P	μg/L		
ETHYLBENZENE	ND	5.0 P	μg/L		
TOTAL XYLENE	ND	5.0 P	μg/L		
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		$\mu$ g/L		
Surrogate	% Recovery				
1,4-Difluorobenzene	100				
4-Bromofluorobenzene Method 8020A *** Analyzed by: VHZ	100				
Date: 05/28/97					
Silver, Total	ND	0.01	mg/L		
Method 6010A ***					
Analyzed by: DQ					
Date: 05/29/97					
Arsenic, Total	ND	0.1	mg/L		
Method 6010A ***					
Analyzed by: DQ					
Date: 05/29/97					
Barium, Total	0.522	0.005	mg/L		
Method 6010A ***					
Analyzed by: DQ					
Date: 05/29/97					
Calcium, Total	1350	1	mg/L		
Method 6010A ***					
Analyzed by: DQ					
Date: 06/05/97					

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.

<sup>(</sup>P) - Practical Quantitation Limit



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

Certificate of Analysis No. H9-9705958-01

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 10:50:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	0.04	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	14.6	0.1	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 05/27/97	ND <sub>.</sub>	0.0002	mg/L
Potassium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	119	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	377	0.1	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.

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\*\*\*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. H9-9705958-01

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 10:50:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA				
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 05/21/97	ICP 05/21/97	<b></b>			
Lead, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.05	mg/L		
Selenium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.1	mg/L		
Chloride Method 325.3 * Analyzed by: PT Date: 05/22/97	16200	100	mg/L		
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97	ND	1	mg/L		
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97	448	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. H9-9705958-01

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 10:50:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 06/09/97	1080		mg/L
pH Method 150.1 * Analyzed by: LAR Date: 05/20/97	7.00		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 05/20/97	0.02	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 05/29/97	516	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 05/23/97	1.02	В	
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 06/09/97	3447	0 1	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.



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

Certificate of Analysis No. H9-9705958-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 10:50:00

DATE RECEIVED: 05/20/97

	NALYTICAL DATA			
PARAMETER	RESULTS	-	*	UNITS
Naphthalene	NI	•		ug/L
Acenaphthylene	NI	0.1		ug/L
Acenaphthene	NI	0.3		ug/L
Fluorene	NI	0.3		ug/L
Phenanthrene	NI	0.1		ug/L
Anthracene	NI	0.1		ug/L
Fluoranthene	NI	0.1		ug/L
Pyrene	NI	0.1		ug/L
Chrysene	NI	0.1		ug/L
Benzo (a) anthracene	NI	0.1		ug/L
Benzo (b) fluoranthene	NI	0.1		ug/L
Benzo (k) fluoranthene	NI	0.1		ug/L
Benzo (a) pyrene	NI	0.1		ug/L
Dibenzo (a,h) anthracene	NI	0.1		ug/L
Benzo (g,h,i) perylene	NI	0.1		ug/L
Indeno (1,2,3-cd) pyrene	NI	0.1		ug/L
SURROGATES	AMOUNT	%	LOWER	UPPER
	SPIKED I	RECOVERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L	80	50	150
Phenanthrene d-10	0.20 ug/L	95	50	150

ANALYZED BY: KA DATE/TIME: 05/29/97 05:29:36 EXTRACTED BY: SW DATE/TIME: 05/24/97 11:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: \* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

#### COMMENTS:

Certifi

#### HOUSTON LABORATORY

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

Certificate of Analysis No. H9-9705958-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 11:50:00

DATE RECEIVED: 05/20/97

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	32	1.0 P	$\mu { t g}/{ t L}$
TOLUENE	1.4		μg/L
ETHYLBENZENE	1.3		μg/L
TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	ND 34.7	1.0 P	μg/L μg/L
TOTAL VOLATILE AROMATIC HIDROCARBONS	J4.7		μ9/п
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene Method 8020A ***	103		
Analyzed by: VHZ			
Date: 05/29/97			
Silver, Total	ND	0.01	mg/L
Method 6010A ***	110	0.01	9/ 2
Analyzed by: DQ			
Date: 05/29/97			
Arsenic, Total	ND	0.1	mg/L
Method 6010A ***			<b>3</b> ,
Analyzed by: DQ			
Date: 05/29/97			
Barium, Total	0.682	0.005	mg/L
Method 6010A ***			<u>.</u>
Analyzed by: DQ			
Date: 05/29/97			
Calcium, Total	1160	1	mg/L
Method 6010A ***			
Analyzed by: DQ			
Date: 06/05/97			

<sup>(</sup>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.



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

Certificate of Analysis No. H9-9705958-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 11:50:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	. ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	0.01	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	6.7	0.1	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 05/27/97	ND	0.0002	mg/L
Potassium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	79	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	325	0.1	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. H9-9705958-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 11:50:00

DATE RECEIVED: 05/20/97

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION	UNITS
FARMIEIEK	61110637	LIMIT	ONTIS
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 05/21/97	ICP 05/21/97		
Lead, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.05	mg/L
Selenium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.1	mg/L
Chloride Method 325.3 * Analyzed by: PT Date: 05/22/97	12400	200	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97	ND	2	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97	684	2	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. H9-9705958-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 11:50:00

DATE RECEIVED: 05/20/97

		ANALYTICAI	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCUL Analyzed by: Date:			7613	1	mg/L
pH Method 150.1 Analyzed by: Date:			7.08		pH units
Resistivity Method 120.1 Analyzed by: Date:			0.028	0.001	Mohms-cm
Sulfate Method 375.4 Analyzed by: Date:			2740	250	mg/L
Specific Gravi ASTM D1429 Analyzed by: Date:	-		1.022		
Total Dissolve Method CALCUI Analyzed by: Date:	LATION		25009	1	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.



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

Certificate of Analysis No. H9-9705958-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 11:50:00

DATE RECEIVED: 05/20/97

AN	ALYTICAL DATA				
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		ND	2.5		ug/L
Acenaphthylene		ND	2.5		ug/L
Acenaphthene		ND	7.5		ug/L
Fluorene		ND	7.5		ug/L
Phenanthrene		ND	2.5		ug/L
Anthracene		ND	2.5		ug/L
Fluoranthene		ND	2.5		ug/L
Pyrene		ND	2.5		ug/L
Chrysene		ND	2.5		ug/L
Benzo (a) anthracene		ND	2.5		ug/L
Benzo (b) fluoranthene		ND	2.5		ug/L
Benzo (k) fluoranthene		ND	2.5		ug/L
Benzo (a) pyrene		ND	2.5		ug/L
Dibenzo (a,h) anthracene		ND	2.5		ug/L
Benzo (g,h,i) perylene		ND	2.5		ug/L
Indeno (1,2,3-cd) pyrene		ND	2.5		ug/L
SURROGATES	AMOUNT SPIKED	% RECO	OVERY	LOWER LIMIT	UPPER LIMIT
1-Fluoronaphthalene Phenanthrene d-10	0.20 ug/L 0.20 ug/L	I	)	50 50	150 150

ANALYZED BY: KA DATE/TIME: 06/01/97 08:15:26 EXTRACTED BY: SW DATE/TIME: 05/24/97 11:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: \* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

D - Diluted, control limits not applicable.

#### COMMENTS:



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

# Certificate of Analysis No. H9-9705958-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 13:15:00

DATE RECEIVED: 05/20/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	200 1.1 8.3 1.0 210.4	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: 05/29/97	<b>% Recovery</b> 83 93				
Silver, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.01	mg/L		
Arsenic, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.1	mg/L		
Barium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	2.57	0.005	mg/L		
Calcium, Total Method 6010A *** Analyzed by: DQ Date: 06/05/97	676	1	mg/L		

<sup>(</sup>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.



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

Certificate of Analysis No. H9-9705958-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 13:15:00

DATE RECEIVED: 05/20/97

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	0.15	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	134	0.1	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 05/27/97	ND	0.0002	mg/L
Potassium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	28	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	90.3	0.1	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.

Certificate of Analysis No. H9-9705958-03

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

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 13:15:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 05/21/97	ICP 05/21/97	HIMI	
Lead, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	0.09	0.05	mg/L
Selenium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.1	mg/L
Chloride Method 325.3 * Analyzed by: PT Date: 05/22/97	594	10	mg/I
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97		2	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97	708	2	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. H9-9705958-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 13:15:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 06/09/97	3556	1	mg/L
pH Method 150.1 * Analyzed by: LAR Date: 05/20/97	7.72		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 05/20/97	0.353	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 05/29/97	8310	2500	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 05/23/97	1.006		
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 06/09/97		1	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.



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

# Certificate of Analysis No. H9-9705958-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 12:45:00

DATE RECEIVED: 05/20/97

ANALYTICAL	DATA	<u> </u>	
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	210	1.0 P	$\mu { m g/L}$
TOLUENE	ND	1.0 P	μg/L
ETHYLBENZENE	ND	1.0 P	μg/L
TOTAL XYLENE	ND	1.0 P	$\mu g/L$
TOTAL VOLATILE AROMATIC HYDROCARBONS	210		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene Method 8020A *** Analyzed by: VHZ	97		
Date: 05/28/97			
Silver, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.01	mg/L
Argonia Total	ND	0.1	m~ /T
Arsenic, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.1	mg/L
Barium, Total	1.26	0.005	mg/L
Method 6010A ***			٥,
Analyzed by: DQ			
Date: 05/29/97			
Calcium, Total	2330	1	mg/L
Method 6010A ***			
Analyzed by: DQ			
Date: 06/05/97			

<sup>(</sup>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.



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

Certificate of Analysis No. H9-9705958-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

**SAMPLE ID:** MW #5 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 12:45:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Cadmium, Total Method 6010A *** Analyzed by: DQ	ND	0.01	mg/L
Date: 05/29/97			
Chromium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	0.08	0.01	mg/L
Iron, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	69.6	0.1	mg/L
Mercury, Total Method 7470 A*** Analyzed by: PB Date: 05/27/97	ND	0.0002	mg/L
Potassium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	75	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	.249	0.1	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. H9-9705958-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 05/19/97 12:45:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 05/21/97	ICP 05/21/97	HILLI	
Lead, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.05	mg/L
Selenium, Total Method 6010A *** Analyzed by: DQ Date: 05/29/97	ND	0.1	mg/L
Chloride Method 325.3 * Analyzed by: PT Date: 05/22/97	6820	100	mg/L ·
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97	ND	2	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: LAR Date: 05/20/97	696	2	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.

# ·

HOUSTON LABORATORY

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

Certificate of Analysis No. H9-9705958-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 12:45:00

DATE RECEIVED: 05/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 06/09/97	2607	1	mg/L
pH Method 150.1 * Analyzed by: LAR Date: 05/20/97	7.53		pH units
Resistivity Method 120.1 * Analyzed by: LAR Date: 05/20/97	0.045	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 05/29/97	2440	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: LAR Date: 05/23/97	1.014		
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 06/09/97	15288	1	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.



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

Certificate of Analysis No. H9-9705958-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

06/10/97

PROJECT: 2nd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/19/97 12:45:00

DATE RECEIVED: 05/20/97

				,	
IA .	NALYTICAL DATA			•	
PARAMETER	RESU	JLTS	PQL*		UNITS
Naphthalene		ND	2.5		ug/L
Acenaphthylene		ND	2.5		ug/L
Acenaphthene		ND	7.5		ug/L
Fluorene		ND	7.5		ug/L
Phenanthrene		ND	2.5		ug/L
Anthracene		ND	2.5		ug/L
Fluoranthene		ND	2.5		ug/L
Pyrene		ND	2.5		ug/L
Chrysene		ND	2.5		ug/L
Benzo (a) anthracene		ND	2.5		ug/L
Benzo (b) fluoranthene		ND	2.5		ug/L
Benzo (k) fluoranthene		ND	2.5		ug/L
Benzo (a) pyrene		ND	2.5		ug/L
Dibenzo (a,h) anthracene		ND	2.5		ug/L
Benzo (g,h,i) perylene		ND	2.5		ug/L
Indeno (1,2,3-cd) pyrene		ND	2.5		ug/L
SURROGATES	TUUOMA	8		LOWER	UPPER
	SPIKED	RECO	OVERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L	Ι	)	50	150
Phenanthrene d-10	0.20 ug/L	I	)	50	150

ANALYZED BY: KA DATE/TIME: 05/29/97 17:09:24 EXTRACTED BY: SW DATE/TIME: 05/24/97 11:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: \* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

D - Diluted, control limits not applicable.

#### COMMENTS:

# QUALITY CONTROL DOCUMENTATION



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

HOUSTON LABORATORY

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

Matrix: Units: Aqueous

μg/L

Batch Id: HP\_J970528144200

#### LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Added Result Recovery		QC Limits(**) (Mandatory) % Recovery Range	
«TBE	ND	100	81.3	81.3	63 - 120	
Benzene	ND	100	89.0	89.0	62 - 121	
Toluene	ND	100	89.2	89.2	66 - 136	
EthylBenzene	ND	100	87.7	87.7	70 - 136	
) Xylene	ND	100	88.2	88.2	74 - 134	
4 & P Xylene	ND	200	175.5	87.8	77 - 140	

#### MATRIX SPIKES

Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %	_	Limits(***) (Advisory)
<2>	<3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery Range
1.0	20	21	100	22	105	4.88	20	39 - 150
ND	20	19	95.0	19	95.0	0	25	39 - 150
ND	20	19	95.0	18	90.0	5.41	26	56 - 134
ND	20	18	90.0	18	90.0	0	38	61 - 128
ND	20	19	95.0	18	90.0	5.41	29	40 - 130
ND	40	37	92.5	36	90.0	2.74	20	43 - 152
	Results <2> 1.0 ND ND ND ND	Results Added  <2> <3>  1.0 20  ND 20	Results     Added     Result       <2>     <3>     <1>       1.0     20     21       ND     20     19       ND     20     19       ND     20     18       ND     20     18       ND     20     19	Results         Added         Result         Recovery           <2>         <3>         <1>         <4>           1.0         20         21         100           ND         20         19         95.0           ND         20         19         95.0           ND         20         18         90.0           ND         20         19         95.0	Results         Added         Result         Recovery         Result           <2>         <3>         <1>         <4>         <1>           1.0         20         21         100         22           ND         20         19         95.0         19           ND         20         19         95.0         18           ND         20         18         90.0         18           ND         20         19         95.0         18           ND         20         19         95.0         18	Results         Added         Result         Recovery         Result         Recovery           <2>         <3>         <1>         <4>         <1>         <5>           1.0         20         21         100         22         105           ND         20         19         95.0         19         95.0           ND         20         19         95.0         18         90.0           ND         20         18         90.0         18         90.0           ND         20         19         95.0         18         90.0           ND         20         19         95.0         18         90.0	Results         Added         Duplicate         Relative %           Result         Recovery         Result         Recovery         Difference           4.2>         4.3>         4.5         4.88         4.88           ND         20         19         95.0         19         95.0         0           ND         20         19         95.0         18         90.0         5.41           ND         20         18         90.0         18         90.0         0           ND         20         19         95.0         18         90.0         5.41           ND         20         19         95.0         18         90.0         5.41	Results         Added         Duplicate         Relative %           Result         Recovery         Result         Recovery         Difference         RPD           4.2>         4.3>         4.5         4.88         20           1.0         20         19         95.0         19         95.0         0         25           ND         20         19         95.0         18         90.0         5.41         26           ND         20         18         90.0         18         90.0         38           ND         20         19         95.0         18         90.0         5.41         29

Analyst: VHZ

Sequence Date: 05/28/97

SPL ID of sample spiked: 9705A38-01A

Sample File ID: J\_E7911.TX0

Method Blank File ID:

Blank Spike File ID: J\_E7903.TX0
Matrix Spike File ID: J\_E7905.TX0

Matrix Spike Duplicate File ID: J\_E7906.TX0

\* = 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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

9705A38-01A 9705A38-02A 9705B42-02A 9705B72-03A

9705B72-04A 9705A60-01A 9705958-02A 9705958-03A

9705A60-03A 9705A60-02A 9705B26-03A 9705B26-02A

9705B26-06A 9705B71-02A 9705B42-02A 9705B69-02A

9705B26-04A 9705A38-03A



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

#### HOUSTON LABORATORY

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

Matrix: Units: Aqueous μg/L Batch Id:

HP\_J970527212200

#### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)
COMPOUNDS	Blank Result	Added <3>	Result	Recovery	(Mandatory) * Recovery Range
MTBE	ND	100.0	87	87.0	63 - 120
Benzene	ND	100.0	89	89.0	62 - 121
Toluene	ND	100.0	90	90.0	66 - 136
EthylBenzene	ND	100.0	89	89.0	70 - 136
O Xylene	ND	100.0	89	89.0	74 - 134
M & P Xylene	ND	200.0	178	89.0	77 - 140

#### MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix	Spike	MS/MSD Relative %	_	imits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery Range
MTBE	254	20	270	NC	270	NC	NC	20	39 - 150
BENZENE	ND	20	22	110	22	110	0	25	39 - 150
TOLUENE	ND	20	22	110	21	105	4.65	26	56 - 134
ETHYLBENZENE	ND	20	22	110	20	100	9.52	38	61 - 128
O XYLENE	ND	20	22	110	20	100	9.52	29	40 - 130
M & P XYLENE	ND	40	44	110	40	100	9.52	20	43 - 152

Analyst: VHZ

Sequence Date: 05/28/97

SPL ID of sample spiked: 9705C60-01A'

Sample File ID: J E7874.TX0

Method Blank File ID:

Blank Spike File ID: J\_E7899.TX0
Matrix Spike File ID: J E7871.TX0

Matrix Spike Duplicate File ID: J\_E7872.TX0

\* = 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

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

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

(\*\*) = Source: SPL-Houston Historical Data (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

9705B69-03A 9705B69-04A 9705B72-01A 9705B72-04A 9705B72-08A 9705958-04A 9705B72-05A 9705958-01A

9705B72-06A 9705B42-05A 9705B69-05A 9705C60-01A

9705B42-04A 9705B69-05A



\* SPL BATCH QUALITY CONTROL REPORT \*\*

Method 8310 \*\*\*

HOUSTON LABORATORY

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

Matrix:

Aqueous

Units: ug/L

Batch Id: 1970527184910

#### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank Spike		QC Limits(**)
COMPOUNDS	Blank Result	Added	Result	Recovery	(Mandatory)
	<2>	<3>	<1>	ŧ	ł Recovery Range
Naphthalene	ND	0.50	0.39	78.0	. 33 - 122
Acenaphthylene	ND	0.50	0.53	106	42 - 138
Acenaphthene	ND	0.50	0.41	82.0	25 - 123
Fluorene	ND	0.50	0.43	86.0	19 - 142
Phenanthrene	ND	0.50	0.40	80.0	40 - 121
Anthracene	ND	0.50	0.35	70.0	32 - 121
Fluoranthene	ND	0.50	0.41	82.0	51 - 115
Pyrene	ND	0.50	0.42	84.0	45 - 117
Chrysene	ND	0.50	0.55	110	44 - 122
Benzo (a) anthracene	ND	0.50	0.40	80.0	57 - 118
Benzo (b) fluoranthene	ND	0.50	0.43	86.0	62 - 121
Benzo (k) fluoranthene	ND	0.50	0.42	84.0	63 - 117
Benzo (a) pyrene	ND	0.50	0.41	82.0	42 - 120
Dibenzo (a,h) anthracene	ND	0.50	0.43	86.0	53 - 118
Benzo (g,h,i) perylene	ND	0.50	0.44	88.0	51 - 116
Indeno (1,2,3-cd) pyrene	ND	0.50	0.45	90.0	60 - 116

#### MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix Duplio	Spike MS/MSD		_	imits(***) (Advisory)
			Result	Recovery	Result	Recovery	Difference	RPD	
	<2>	<3>	<1>	<4>	·<1>	<5>		Max.	Recovery Range
NAPHTHALENE	ND	0.5	0.38	76.0	0.39	78.0	2.60	30	1 - 12
ACENAPHTHYLENE	ND	0.5	0.33	66.0	0.34	68.0	2.99	30	1 - 12
ACENAPHTHENE	ND	0.5	0.48	96.0	0.49	98.0	2.06	30	1 - 12
FLUORENE	ND	0.5	0.38	76.0	0.39	78.0	2.60	30	1 - 14
PHENANTHRENE	ND	0.5	0.40	80.0	0.40	80.0	0	30	1 - 15
ANTHRACENE	ND	0.5	0.32	64.0	0.33	66.0	3.08	30	1 - 12
FLUORANTHENE	ND	0.5	0.41	82.0	0.47	94.0	13.6	30	14 - 12
PYRENE	ND	0.5	0.40	80.0	0.43	86.0	7.23	30	1 - 14
CHRYSENE	ND	0.5	0.53	106	0.60	120	12.4	30	1 - 19
BENZO (A) ANTHRACENE	ND	0.5	0.40	80.0	0.43	86.0	7.23	30	12 - 13
BENZO (B) FLUORANTHENE	ND	0.5	0.43	86.0	0.49	98.0	13.0	30	6 - 15
BENZO (K) FLUORANTHENE	ND	0.5	0.43	86.0	0.52	104	18.9	30	1 ~ 15
BENZO (A) PYRENE	ND	0.5	0.23	46.0	0.26	52.0	12.2	30	1 - 12
DIBENZO (A,H) ANTHRACENE	ND	0.5	0.46	92.0	0.52	104	12.2	30	1 - 11
BENZO (G,H,I) PERYLENE	ND	0.5	0.43	86.0	0.48	96.0	11.0	30	111
INDENO (1,2,3-CD) PYRENE	ND	0.5	0.52	104	0.48	96.0	8.00	30	1 - 11



SPL BATCH QUALITY CONTROL REPORT \*\* Method 8310 \*\*\*

HOUSTON LABORATORY

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

Matrix:

Aqueous

Units:

ug/L

Batch Id:

1970527184910

Analyst: KA

Sequence Date: 05/28/97

SPL 1D of sample spiked: 970522SFB1

Sample File ID: 970523A\015-1101

Method Blank File ID:

Blank Spike File ID: 970528A\LC\_A0006

Matrix Spike File ID: 970523A\016-1101

Matrix Spike Duplicate File ID: 970523A\017-1101 (\*\*\*) = Source: Temporary Limits

\* = 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

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

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

(\*\*) = Source: SPL-Houston Historical Data (3rd Q '96)

SAMPLES IN BATCH (SPL ID):

9705B74-05C 9705B74-07C 9705B74-06C 9705958-01D

9705958-04D 9705958-02D 9705A73-02C 9705A73-05C

9705A78-02B 9705A78-03B 9705B74-03C 9705B74-04C

# CP Spectropy Method 6010 Quality Control kepol

ICP Spectr

Matrix: Water

Units: mg/L

HOUSTON LABORATORY 8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

PHONE (713)660-0901 Anlayst: DQ

Date: 060597 Time: 17:01 File Name: 060597W4

Laboratory Control Sample

		boratory Col				
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum						
Arsenic						
Barium						
Beryllium						
Calcium	ND	20.00	20.29	101	16.00_	24.00
Cadmium						
Cobalt						
Chromium						
Copper						
Iron						
Potassium						
Magnesium						
Manganese						
Sodium						
Nickel						
Lead						
Antimony						
Selenium						
Thallium						
Vanadium						
Zinc	ND	2.00	ND	0	1.60	2.40

Work Orders in Batch
Work Order Fractions

97-05-958 01B-04B

Matrix Spike - Spike Duplicate Results Work Order Spiked: 9705958-01

Matrix Spike	atrix Spike - Spike Duplicate Results						Work Order Spiked: 9705958-01B						
	Sample	Spike	Matr	ix Spike			ke Duplicate		QC L	imits	Spike		QC
Element	Result	Added	Result	Recovery		Result	Recovery		% Recovery		RPD %		Limits %
Silver					П								
Aluminum			1		Ш			L					
Arsenic	i		<u> </u>		Ц			L			·	$\perp$	
Barium					Ш								
Beryllium													
Calcium	134.8	10.0	154.4	196.0	Ŀ	159.7	249.0	ŀ	80	120	23.8	••	20.0
Cadmium												L	
Cobalt			<u> </u>										
Chromium													
Copper													
Iron													
Potassium			<u> </u>		Ш								
Magnesium													
Manganese													
Sodium													
Nickel								L					
Lead_					$\perp$			L					
Antimony													
Selenium													
Thallium								L					
Vanadium												$\perp$	
Zinc					1								

<sup>\*</sup> Spike Results Outside Method Limits

<sup>\*\*</sup> Spike RPD Outside Method Limits



Matrix: Water

Date:052997 Time:0753 File Name:

Units: mg/L

Analyst: DQ

052997S3

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

Checkes ON, TEXAS 77054 PHONE 73 5

Laboratory Control Sample

Work Orders in Batch Work Order Fractions 97-05-958 01B-04B 97-05-A22 01C-06C 97-05-A35 03A

		bolatory col			<del> </del>	
Element		True Value				Upper Limit
Silver	ND	2.00	1.99	100	1.60	2.40
Aluminum						
Arsenic	ND	4.00	3.95	99	3.20	4.80
Barium	ND	2.00	1.99	99	1.60	2.40
Beryllium						
Calcium						
Cadmium	ND	2.00	1.86	93	1.60	2.40
Cobalt						
Chromium	ND	2.00	1.92	96	1.60	2.40
Copper						
Iron	ND	2.00	1.96	98	1.60	2.40
Potassium	ND	20.00	19.52	98	16.00	24.00
Magnesium	ND	20.00	19.88	99	16.00	24.00
Manganese						
Sodium					<u> </u>	
Nickel						
Lead	ND	2.00	1.93	96	1.60	2.40
Antimony						
Selenium	ND	4.00	3.94	99	3.20	4.80
Thallium						
Vanadium						
Zinc	I	1		1		

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 9705958-01B QC Sample Spike Matrix Spike Matrix Spike Duplicate QC Limits Spike Element Result Added Result Recovery Result Recovery % Recovery RPD % Limits % Silver ND 1.0 1.03 103.0 1.026 102.6 80 120 0.4 20.0 Aluminum Arsenic 2.0 2.017 100.9 2.032 80 120 ND 101.6 0.7 20.0 80 Barium 0.5222 1.0 1.414 89.2 1.394 87.2 120 2.3 20.0 Beryllium Calcium Cadmium ND 1.0 1.014 101.4 1.028 102.8 80 120 1.4 20.0 Cobalt Chromium 0.0422 1.0 0.8812 83.9 0.8902 84.8 80 120 1.1 20.0 Copper Iron 14.58 1.0 16.99 241.0 17.3 272.0 80 120 12.1 20.0 Potassium 119 10.0 136.2 172.0 133.1 141.0 80 19.8 20.0 120 376.7 Magnesium 10.0 397 203.0 402.6 259.0 80 120 24.2 20.0 Manganese Sodium Nickel 1.0 Lead ND 0.9459 94.6 0.9456 94.6 80 120 0.0 20.0 Antimony ND Selenium 2.0 2.09 104.5 2.111 105.6 80 120 1.0 20.0 Thallium Vanadium

Zinc

<sup>\*</sup> Spike Results Outside Method Limits

<sup>\*\*</sup> Spike RPD Outside Method Limits



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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 05/27/97 Analyzed on: 05/27/97

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:

Mercury, Total Method 7470 A\*\*\*

SPL Sample	Method	Sample	Spike	Matrix Spike		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)	
ID Number				Result		Result ug/L	Recovery	(%)	RPD Max	% REC
9705854-10A	ND	ND	2.00	1.95	97.5	1.93	96.5	1.0	20	75 -125

-9705A16

#### Samples in batch:

9705854-10A

9705958-01B

9705958-02B

9705958-03B

9705958-04B 9705A37-01E

#### COMMENTS:

LCS= SPL ID# 94-452-29-6



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

05/27/97

Analyzed on:

05/27/97

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:

Mercury, Total Method 7470 A\*\*\*

SPL Sample ID Number	Blank Value ug/L		Measured % Concentration Recovery ug/L		QC Limits Recovery
LCS	ND	2.00	2.08	104	80 - 120

-9705A16

# Samples in batch:

9705854-10A

9705958-01B

9705958-02B 9705958-03B

9705958-04B

9705A37-01E

COMMENTS:

LCS= SPL ID# 94-452-29-6



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

05/22/97

Analyzed on:

05/20/97

Analyst:

LAR

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.
9705972-01A	336	336	0	5

-9705878

# Samples in batch:

9705958-01C

9705958-02C

9705958-03C 9705958-04C

9705972-01A

9705975-01B



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

05/22/97

Analyzed on:

05/20/97

Analyst:

LAR

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.
9705972-01A	ND	ND	0	5

-9705880

# Samples in batch:

9705958-01C

9705958-02C

9705958-03C

9705958-04C

9705972-01A

9705975-01B



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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous Reported on: 05/23/97 Analyzed on: 05/22/97

Analyst:

PT

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	Matrix Spike		Matrix Spike   Duplicate		RPD	QC LIMITS (Advisory)		
ID Number	  Blank  mg/L		  Added  mg/L	Result mg/L		Result	Recovery	(%)	RPD Max	% REC	
9705B20-01B	ND	266	500	771	101	771	101	0	5	92 -109	

-9705918

Samples in batch:

9705958-01C

9705958-02C 9705958-03C 9705958-04C

9705B20-01B



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

05/23/97

Analyzed on:

05/22/97

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 ID Number	Blank Value mg/L		Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	27.23	27.47	101	94 - 106

-9705917

# Samples in batch:

9705958-01C 9705B20-01B

9705958-02C 9705958-03C 9705958-04C

COMMENTS:

LCS= SPL ID# 95535108-7



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: 1

Aqueous

Reported on:

05/20/97

Analyzed on:

05/20/97

Analyst:

LAR

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

pH Method 150.1 \*

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9705946-01B	5.39	5.39	0	1.0

-9705793

# Samples in batch:

9705876-01A 9705946-01B 9705958-01C 9705958-02C 9705958-03C 9705958-04C 9705972-01A 9705975-01B



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

05/22/97

Analyzed on:

05/20/97

Analyst:

LAR

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

Resistivity
Method 120.1 \*

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mohms-cm	Duplicate Sample mohms-cm	RPD	RPD Max.
9705972-01A	0.012	0.012	0	1.0

-9705885

# Samples in batch:

9705958-01C

9705958-02C

9705958-03C

9705958-04C

9705972-01A

9705975-01B



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 05/23/97

Analyzed on: 05/23/97

Analyst:

LAR

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

Specific Gravity ASTM D1429

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9705972-01A	1.049	1.047	0.2	1.0

-9705968

# Samples in batch:

9705958-01C

9705958-02C

9705958-03C

9705958-04C

9705972-01A

9705975-01B



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

#### \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 06/02/97 Analyzed on: 05/29/97

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	•	ix Spike   licate	RPD	•	-	IMITS sory)
ID Number			•	Result	•	Result	Recovery	(%)	RPD Max		₹ REC
9705958-02C	ND	10.98	10.00	20.99	100	21.42	104	3.9	9.5	84	-120

-9706042

Samples in batch:

9705958-01C 970SD56-01A 9705958-02C

9705958-03C

9705958-04C

COMMENTS:



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

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

06/02/97

Analyzed on: 05/29/97

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	10.15	9.97	98.2	82 - 111

-9706043

#### Samples in batch:

9705958-01C

9705958-02C

9705958-03C

9705958-04C

9705D56-01A

COMMENTS:

SPL LCS#: 95535108-7

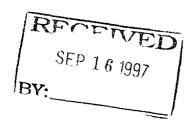


8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713)660-0901

September 4, 1997

Buddy Marley WARREN PETROLEUM P.O. Box 67 Monument, NM 88265





The following report contains analytical results for samples received at Southern Petroleum Laboratories (SPL) on August 20, 1997. The samples were assigned to Certificate of Analysis No.(s) 9708811 and analyzed for all parameters as listed on the chain of custody.

Based on the conditions of the sample, procedures performed and quality controls implemented for this project, the following exceptions were noted for this data package.

The Matrix Spike and Matrix Spike Duplicate recoveries were out of QC limits for Total Calcium and Magnesium (6010) analysis, due to matrix interference. Sample spiked was not from your batch of samples. The laboratory control sample and standard recoveries are in, verifying that the calibration is still valid.

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: 97-08-811

Approved for Release by:

Bernadette A. Fini, Project Manager

Date:

Greg Grandits Laboratory Director

Idelis Williams Quality Assurance Officer

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



HOUSTON LABORATORY

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

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 9/4/97

Attn: Buddy Marley

PROJECT: 3rd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-F

PROJECT NO:

MATRIX: Water

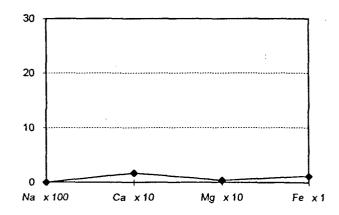
DATE SAMPLED: 8/19/97 0:00

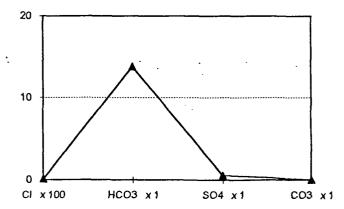
DATE RECEIVED: 8/20/97

# ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	<b>WET CHEMISTRY</b>	<u>RESULT</u>
Sodium, Na (Calc.)	0	0.00	Total Dissolved Solids	
Calcium, Ca	346	17.27	(calc.) mg/L	1529.65
Magnesium, Mg	44.8	3.69		
Chloride, Cl	226	6.38	Specific Gravity	
Bicarbonate, CaCO	840	13.77	60/60 deg. F.	1.0047
Sulfate SO4	29	0.60	-	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	32.4	1.16	(Mohm-cm) 75 deg. F.	0.4800
Barium, Ba	1.45	0.02	-	
			pН	
			pH units	7.69
			-	

# MINERAL ANALYSIS PATTERN







#### HOUSTON LABORATORY

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

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 9/4/97

Attn: Buddy Marley

PROJECT: 3rd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

**SAMPLE ID: MW #5 A-F** 

PROJECT NO:

MATRIX: Water

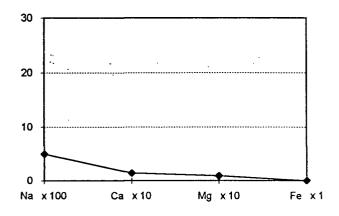
**DATE SAMPLED: 8/19/97 0:00** 

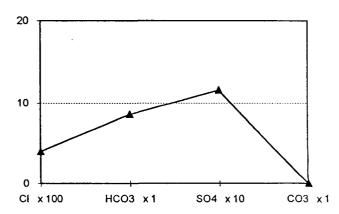
DATE RECEIVED: 8/20/97

# ANALYTICAL DATA

ION	mg/L	meg/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	11510.8626	500.69	Total Dissolved Solids	<del></del>
Calcium, Ca	278	13.87	(calc.) mg/L	32221.5546
Magnesium, Mg	108	8.88	_	
Chloride, Cl	14200	400.56	Specific Gravity	
Bicarbonate, CaCO	525	8.60	60/60 deg. F.	1.0503
Sulfate SO4	5550	115.55		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.64	0.02	(Mohm-cm) 75 deg. F.	0.0230
Barium, Ba	0.052	0.00		
			pН	
			pH units	7.41

# MINERAL ANALYSIS PATTERN







#### **HOUSTON LABORATORY**

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

0

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 9/4/97

Attn: Buddy Marley

PROJECT: 3rd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-F

PROJECT NO:

MATRIX: Water

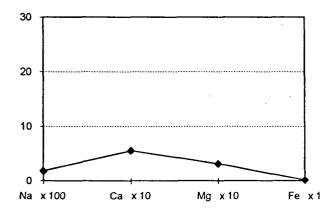
DATE SAMPLED: 8/19/97 0:00

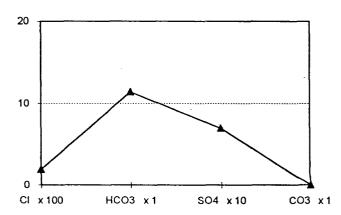
DATE RECEIVED: 8/20/97

# ANALYTICAL DATA

Y0.Y	~	~	YAYDE CYYDY (YODDY)	
<u>ION</u>	mg/L	meq/L		RESULT
Sodium, Na (Calc.)	4256.01589	185.12	Total Dissolved Solids	
Calcium, Ca	1110	55.39	(calc.) mg/L	16780.8689
Magnesium, Mg	381	31.34		
Chloride, Cl	6870	193.79	Specific Gravity	
Bicarbonate, CaCO	695	11.39	60/60 deg. F.	1.0401
Sulfate SO4	3350	69.75		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	4.68	0.17	(Mohm-cm) 75 deg. F.	0.0420
Barium, Ba	0.173	0.00		
			pН	
			pH units	7.47
			_	1

# MINERAL ANALYSIS PATTERN







## **HOUSTON LABORATORY**

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

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 9/4/97

Attn: Buddy Marley

PROJECT: 3rd Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-F

MATRIX: Water

DATE SAMPLED: 8/19/97 0:00

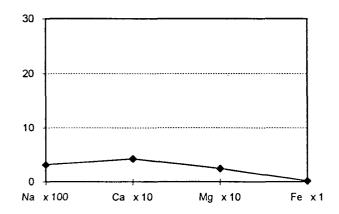
DATE RECEIVED: 8/20/97

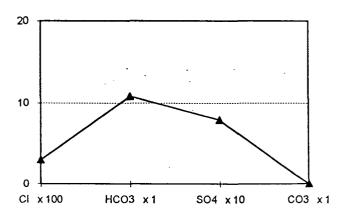
PROJECT NO:

# ANALYTICAL DATA

<u>ION</u>	mg/L	meg/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	7332.17694	318.93	Total Dissolved Solids	
Calcium, Ca	859	42.86	(calc.) mg/L	23619.4659
Magnesium, Mg	304	25.01	-	
Chloride, Cl	10600	299.01	Specific Gravity	
Bicarbonate, CaCO	660	10.82	60/60 deg. F.	1.0211
Sulfate SO4	3790	78.91		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	4.84	0.17	(Mohm-cm) 75 deg. F.	0.0290
Barium, Ba	0.449	0.01		
			pН	
			pH units	7.15
			-	Y

# MINERAL ANALYSIS PATTERN







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

#### Certificate of Analysis No. H9-9708811-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

MATRIX: WATER

PROJECT NO:

SAMPLED BY: Warren Petroleum

DATE SAMPLED: 08/19/97 10:00:00

SAMPLE ID: MW #1 A-F

DATE RECEIVED: 08/20/97

ANALYTICAL DATA							
PARAMETER	RESULTS	DETECTION	UNITS				
		LIMIT					
BENZENE	1300	25 P	$\mu$ g/L				
TOLUENE	ND	25 P	$\mu$ g/L				
ETHYLBENZENE	ND	25 P	$\mu$ g/L				
TOTAL XYLENE	130	25 P	μg/L				
TOTAL VOLATILE AROMATIC HYDROCARBONS	1430		$\mu$ g/L				
Surrogate	% Recovery						
1,4-Difluorobenzene	92						
4-Bromofluorobenzene	97						
Method 8020A ***							
Analyzed by: RL							
Date: 08/26/97							
Chloride	226	5	mg/L				
Method 325.3 *		J	1119 / D				
Analyzed by: PT							
Date: 08/20/97							
Carbonate, as CaCO3	ND	1	mg/L				
Method SM 4500-CO2D **							
Analyzed by: DAM							
Date: 08/20/97							
Bicarbonate, as CaCO3	840	1	mg/L				
Method SM 4500-CO2D **		_	5/ 25				
Analyzed by: DAM							
Date: 08/20/97							

<sup>(</sup>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.



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

DATE: 09/04/97

#### Certificate of Analysis No. H9-9708811-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

PROJECT NO:

MATRIX: WATER

SITE: Monument, NM 88265
SAMPLED BY: Warren Petroleum

**PROJECT:** 3rd Quarter Sampling (97)

DATE SAMPLED: 08/19/97 10:00:00

SAMPLE ID: MW #1 A-F

DATE RECEIVED: 08/20/97

		ANALYTICAL DATA			
PARAMETER		RESU	JLTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCUI Analyzed by: Date:			ND	. 1	mg/L
pH Method 150.1 Analyzed by: Date:		7	7.69		pH units
Resistivity Method 120.1 Analyzed by: Date:		0.	.480	0.001	Mohms-cm
Sulfate Method 375.4 Analyzed by: Date:			29	2	mg/L
Specific Grave ASTM D1429 Analyzed by: Date:	-	1.0	0047		g/cm3
Total Dissolve Method CALCUI Analyzed by: Date:	LATION	1	1530	<b>1</b>	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. H9-9708811-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 10:00:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Silver, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND	0.01	mg/L
Arsenic, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND	0.1	mg/L
Barium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	1.45	0.005	mg/L
Calcium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	346	0.1	mg/L
Cadmium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND	0.01	mg/L
Chromium, Total Method 6010A *** Analyzed by: PS	0.03	0.01	mg/L
Date: 08/29/97		· · · · · · · · · · · · · · · · · · ·	

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. H9-9708811-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 10:00:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Iron, Total	32.4	0.02	mg/L
Method 6010A ***			3.
Analyzed by: PS			
Date: 08/29/97		•	
Mercury, Total	ND	0.0002	mg/L
Method 7470 A***			3.
Analyzed by: AG			
Date: 08/26/97			
Potassium, Total	10	2	mg/L
Method 6010A ***			-
Analyzed by: PS			
Date: 08/29/97			
Magnesium, Total	44.8	0.1	mg/L
Method 6010A ***			37
Analyzed by: PS			
Date: 08/29/97			
Acid Digestion-Aqueous,	ICP 08/27/97		
Method 3010A ***	•		
Analyzed by: MM			
Date: 08/27/97			
Lead, Total	ND	0.05	mg/L
Method 6010A ***			
Analyzed by: PS	÷		
Date: 08/29/97	<u> </u>		

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. H9-9708811-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

mg/L

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 10:00:00

DATE RECEIVED: 08/20/97

ANALYTICAL DATA

PARAMETER RESULTS DETECTION UNITS

LIMIT

Selenium, Total ND 0.1

Method 6010A \*\*\*
Analyzed by: PS

Date: 08/29/97

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. H9-9708811-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 10:00:00

DATE RECEIVED: 08/20/97

AN	ALYTICAL DATA				
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		ND	10.0		ug/L
Acenaphthylene		ND	10.0		ug/L
Acenaphthene		ND	30.0		ug/L
Fluorene		ND	30.0		$\mathtt{ug/L}$
Phenanthrene		ND	10.0		ug/L
Anthracene		ИD	10.0		ug/L
Fluoranthene		ND	10.0		ug/L
Pyrene		ND	10.0		ug/I
Chrysene		ND	10.0		ug/I
Benzo (a) anthracene		ND	10.0		ug/I
Benzo (b) fluoranthene		ND	10.0		ug/I
Benzo (k) fluoranthene		ND	10.0		ug/I
Benzo (a) pyrene		ND	10.0		ug/I
Dibenzo (a,h) anthracene		ND	10.0		ug/I
Benzo (g,h,i) perylene		ND	10.0		ug/I
Indeno (1,2,3-cd) pyrene		ND	10.0		ug/I
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	REC	OVERY	LIMIT	LIMI
1-Fluoronaphthalene	0.20 ug/L	]	0	50	150
Phenanthrene d-10	0.20 ug/L	1	D	50	150

ANALYZED BY: KA DATE/TIME: 08/26/97 01:04:31 EXTRACTED BY: DR DATE/TIME: 08/21/97 15:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: \* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

D - Diluted, control limits not applicable.

#### COMMENTS:



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

#### Certificate of Analysis No. H9-9708811-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 09:30:00

DATE RECEIVED: 08/20/97

ANALYTICAL DATA							
PARAMETER	RESULTS	DETECTION	UNITS				
DEVICENT	400	LIMIT					
BENZENE	430	1.0 P	$\mu$ g/L				
TOLUENE	ND	1.0 P	$\mu$ g/L				
ETHYLBENZENE	ND	1.0 P	$\mu$ g/L				
TOTAL XYLENE	ND	1.0 P	$\mu$ g/L				
TOTAL VOLATILE AROMATIC HYDROCARBON	IS 430		$\mu$ g/L				
Surrogate	% Recovery						
1,4-Difluorobenzene	133MĪ						
4-Bromofluorobenzene	130						
Method 8020A ***							
Analyzed by: RL							
Date: 08/26/97							
Chloride	14200	500	mg/L				
Method 325.3 *			9/ 2				
Analyzed by: PT							
Date: 08/20/97							
2000 00/20/21							
Carbonate, as CaCO3	ND	1	mg/L				
Method SM 4500-CO2D **			<del>-</del> .				
Analyzed by: DAM							
Date: 08/20/97							
Bicarbonate, as CaCO3	525	1	mg/L				
Method SM 4500-CO2D **	323	<b>-</b>	111/ D				
Analyzed by: DAM							
Date: 08/20/97							

<sup>(</sup>P) - Practical Quantitation Limit ND - Not detected. MI - Matrix interference.

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. H9-9708811-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 09:30:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		<del></del>
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: IP Date: 09/03/97	11511	1	mg/L
pH Method 150.1 * Analyzed by: DAM Date: 08/20/97	7.41		pH units
Resistivity Method 120.1 * Analyzed by: EM Date: 08/21/97	0.023	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 09/02/97	5550	500	mg/L
Specific Gravity ASTM D1429 Analyzed by: DSE Date: 09/02/97	1.0503		g/cm3.
Total Dissolved Solids Method CALCULATION Analyzed by: IP Date: 09/03/97	32222	1	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.



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

#### Certificate of Analysis No. H9-9708811-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 09:30:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		<del></del>
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Silver, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ИД	0.01	mg/L
Arsenic, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND	0.1	mg/L
Barium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	0.052	0.005	mg/L
Calcium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	278	0.1	mg/L
Cadmium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND	0.01	, mg/L
Chromium, Total Method 6010A ***	ND	0.01	mg/L
Analyzed by: PS Date: 08/29/97			

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. H9-9708811-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 09:30:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Iron, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	0.64	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 08/26/97	ND	0.0002	mg/L
Potassium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	. 49	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	108	0.1	mg/L
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: MM Date: 08/27/97	ICP 08/27/97		
Lead, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND .	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

#### Certificate of Analysis No. H9-9708811-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 09:30:00

DATE RECEIVED: 08/20/97

ANALYTICAL DATA

PARAMETER RESULTS DETECTION UNITS

LIMIT

Selenium, Total ND 0.1 mg/L

Method 6010A \*\*\*
Analyzed by: PS

Date: 08/29/97

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. H9-9708811-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 09:30:00

DATE RECEIVED: 08/20/97

AN	ALYTICAL DATA				
PARAMETER	REST	ULTS	PQL*		UNITS
Naphthalene		ND	1.0		ug/L
Acenaphthylene		ND	1.0		ug/L
Acenaphthene		ND	3.0		ug/L
Fluorene		ND	3.0		ug/L
Phenanthrene		1	1.0		ug/L
Anthracene		ND	1.0		ug/L
Fluoranthene		ND	1.0		ug/L
Pyrene		ND	1.0		ug/I
Chrysene		ND	1.0		ug/I
Benzo (a) anthracene		ND	1.0		ug/I
Benzo (b) fluoranthene		ND	1.0		ug/I
Benzo (k) fluoranthene		ND	1.0		ug/I
Benzo (a) pyrene		ND	1.0		ug/I
Dibenzo (a,h) anthracene		ND	1.0		ug/I
Benzo (g,h,i) perylene		ND	1.0		ug/I
Indeno (1,2,3-cd) pyrene		ND	1.0		ug/I
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	RECO	VERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L		70	50	150
Phenanthrene d-10	0.20 ug/L	900	MI	50	150

ANALYZED BY: KA
EXTRACTED BY: DR

DATE/TIME: 08/28/97 02:14:44 DATE/TIME: 08/21/97 15:00:00

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

#### Certificate of Analysis No. H9-9708811-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 08:30:00

DATE RECEIVED: 08/20/97

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	$\mu$ g/L
TOLUENE	ND	1.0 P	$\mu$ g/L
ETHYLBENZENE	ND	1.0 P	$\mu$ g/L
TOTAL XYLENE	ND	1.0 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene	77		
Method 8020A ***			
Analyzed by: RL Date: 08/26/97			
Date: 00/20/9/			
Chloride	6870	250	mg/L
Method 325.3 *			
Analyzed by: PT			
Date: 08/20/97			
Carbonate, as CaCO3	ND	1	mg/L
Method SM 4500-CO2D **			٥,
Analyzed by: DAM			•
Date: 08/20/97			
Bicarbonate, as CaCO3	695	1	mg/L
Method SM 4500-CO2D **			57
Analyzed by: DAM			
Date: 08/20/97			
Sodium, Total	4256	1	mg/L
Method CALCULATION		<del></del>	57
Analyzed by: IP			
Date: 09/03/97			

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.

QUALITY ASSURANCE: These analyses are performed in accordance

with EPA guidelines for quality assurance.

<sup>(</sup>P) - Practical Quantitation Limit



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

#### Certificate of Analysis No. H9-9708811-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 08:30:00

DATE RECEIVED: 08/20/97

PARAMETER		ANALYTICAL	RESULTS	DETECTION LIMIT	UNITS
pH Method 150.1 Analyzed by: Date:			7.47		pH units
Resistivity Method 120.1 Analyzed by: Date:			0.042	0.001	Mohms-cm
Sulfate Method 375.4 Analyzed by: Date:			3350	250	mg/L
Specific Grav. ASTM D1429 Analyzed by: Date:	_		1.0401		g/cm3
Total Dissolve Method CALCU Analyzed by: Date:	LATION		16781	1	mg/L
Silver, Total Method 6010A Analyzed by: Date:	***		ND	0.01	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. H9-9708811-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 08:30:00

DATE RECEIVED: 08/20/97

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Arsenic, Total Method 6010A Analyzed by: Date:	***		ND	0.1	mg/L
Barium, Total Method 6010A Analyzed by: Date:			0.173	0.005	mg/L
Calcium, Total Method 6010A Analyzed by: Date:	***		1110	1	mg/L
Cadmium, Total Method 6010A Analyzed by: Date:	***		ND	0.01	mg/L
Chromium, Tota Method 6010A Analyzed by: Date:	***		ND	0.01	mg/L
Iron, Total Method 6010A Analyzed by: Date:				0.02	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. H9-9708811-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-F

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 08/19/97 08:30:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 08/26/97	ND	0.0002	mg/L
Potassium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	114	2	mg/L
Magnesium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	381	0.1	mg/L
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: MM Date: 08/27/97	ICP 08/27/97		
Lead, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND	0.05	mg/L
Selenium, Total Method 6010A *** Analyzed by: PS Date: 08/29/97	ND	0.1	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. H9-9708811-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 08:30:00

DATE RECEIVED: 08/20/97

AN.	ALYTICAL DATA				
PARAMETER	RESU	JLTS	PQL*		UNITS
Naphthalene		ND	0.1		ug/I
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/I
Fluorene		ND	0.3		ug/I
Phenanthrene		ND	0.1		ug/I
Anthracene		ND	0.1		ug/I
Fluoranthene		ND	0.1		ug/I
Pyrene		ND	0.1		ug/I
Chrysene		ND	0.1		ug/I
Benzo (a) anthracene		ND	0.1		ug/I
Benzo (b) fluoranthene		ND	0.1		ug/I
Benzo (k) fluoranthene		ND	0.1		ug/I
Benzo (a) pyrene		ND	0.1		ug/I
Dibenzo (a,h) anthracene		ND	0.1		ug/I
Benzo (g,h,i) perylene		ND	0.1		ug/I
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/I
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	RECO	VERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L		60	50	150
Phenanthrene d-10	0.20 ug/L		95	50	150

ANALYZED BY: KA DATE/TIME: 08/25/97 11:43:54 EXTRACTED BY: DR DATE/TIME: 08/21/97 15:00:00

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

## Certificate of Analysis No. H9-9708811-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 11:00:00

DATE RECEIVED: 08/20/97

7.13.Y YOMT 03.T	DAMA		
PARAMETER ANALYTICAL	RESULTS	DETECTION LIMIT	UNITS
BENZENE	65	1.0 P	$\mu$ g/L
TOLUENE	ND	1.0 P	μg/L
ETHYLBENZENE	55	1.0 P	μg/L
TOTAL XYLENE	55	1.0 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	175		$\mu$ g/L
Surrogate	% Recovery		
1,4-Difluorobenzene	83		
4-Bromofluorobenzene	150MI		
Method 8020A *** Analyzed by: RL			
Date: 08/26/97			
Bacc. 00/20/37			
Chloride	10600	250	mg/L
Method 325.3 *			3,
Analyzed by: PT			
Date: 08/20/97			
Carbonate, as CaCO3	ND	1	mg/L
Method SM 4500-CO2D **	110	-	11.97 1
Analyzed by: DAM			
Date: 08/20/97			
Bicarbonate, as CaCO3	660	1	mg/L
Method SM 4500-CO2D **		_	5/-2
Analyzed by: DAM			
Date: 08/20/97			

<sup>(</sup>P) - Practical Quantitation Limit ND - Not detected.
MI - Matrix interference.

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. H9-9708811-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 11:00:00

DATE RECEIVED: 08/20/97

		ANALYTICAL DATA		
PARAMETER		RESULT	S DETECT LIMIT	ON UNITS
Sodium, Total Method CALCUI Analyzed by: Date:		733	2 1	mg/L
pH Method 150.1 Analyzed by: Date:		7.1	5	pH units
Resistivity Method 120.1 Analyzed by: Date:		0.02	9 0.001	Mohms-cm
Sulfate Method 375.4 Analyzed by: Date:		379	0 250	mg/L
Specific Grave ASTM D1429 Analyzed by: Date:		1.021	1	g/cm3
Total Dissolve Method CALCUI Analyzed by: Date:	LATION	2361	9 1	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.



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

#### Certificate of Analysis No. H9-9708811-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265

ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 11:00:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Silver, Total	ND	0.01	mg/L
Method 6010A ***			
Analyzed by: PS			
Date: 08/29/97			
Arsenic, Total	ND	0.1	mg/L
Method 6010A ***			
Analyzed by: PS			
Date: 08/29/97	·		
Barium, Total	0.449	0.005	mg/L
Method 6010A ***			
Analyzed by: PS			
Date: 08/29/97			
Calcium, Total	859	-1	mg/L
Method 6010A ***			
Analyzed by: PS			
Date: 08/29/97	•		
Cadmium, Total	ND	0.01	mg/L
Method 6010A ***			3.
Analyzed by: PS			
Date: 08/29/97			
Chromium, Total	ИD	0.01	mg/L
Method 6010A ***			
Analyzed by: PS		• .	•
Date: 08/29/97			

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. H9-9708811-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 11:00:00

DATE RECEIVED: 08/20/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Iron, Total	4.84	0.02	mg/L
Method 6010A ***			
Analyzed by: PS			
Date: 08/29/97			
Mercury, Total	ND	0.0002	mg/L
Method 7470 A***			
Analyzed by: AG			
Date: 08/26/97			
Potassium, Total	69	2	mg/L
Method 6010A ***			
Analyzed by: PS			
Date: 08/29/97			
Magnesium, Total	304	0.1	mg/L
Method 6010A ***			<i>3.</i>
Analyzed by: PS			
Date: 08/29/97			
Acid Digestion-Aqueous,	ICP 08/27/97		
Method 3010A ***	·		
Analyzed by: MM			
Date: 08/27/97			
Lead, Total	ND	0.05	mg/L
Method 6010A ***			
Analyzed by: PS			
Date: 08/29/97		•	

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. H9-9708811-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265

ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 11:00:00

DATE RECEIVED: 08/20/97

ANALYTICAL DATA

PARAMETER RESULTS DETECTION UNITS

LIMIT

Selenium, Total ND 0.1 mg/L

Method 6010A \*\*\*
Analyzed by: PS

Date: 08/29/97

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. H9-9708811-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

09/04/97

**PROJECT:** 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 08/19/97 11:00:00

DATE RECEIVED: 08/20/97

AN	ALYTICAL DATA				
PARAMETER	RESULT	'S	PQL*		UNITS
Naphthalene	1	1D	2.5		ug/I
Acenaphthylene	I.	1D	2.5		ug/I
Acenaphthene	ľ	1D	7.5		ug/I
Fluorene	Ŋ	1D	7.5		ug/I
Phenanthrene		6	2.5		ug/I
Anthracene	1	1D	2.5		ug/I
Fluoranthene	Ŋ	1D .	2.5		ug/I
Pyrene	T.	1D	2.5		ug/l
Chrysene	1	1D	2.5	•	ug/
Benzo (a) anthracene	1	1D	2.5		ug/1
Benzo (b) fluoranthene	1	1D	2.5		ug/I
Benzo (k) fluoranthene	1	1D	2.5		ug/
Benzo (a) pyrene	1	1D	2.5		ug/
Dibenzo (a,h) anthracene	1	1D	2.5		ug/I
Benzo (g,h,i) perylene	1	1D	2.5		ug/
Indeno (1,2,3-cd) pyrene	1	1D	2.5		ug/
SURROGATES	AMOUNT	%		LOWER	UPPE
	SPIKED	PIKED RECOVERY		LIMIT	LIMI
1-Fluoronaphthalene	0.20 ug/L	1	05	50	15
Phenanthrene d-10	0.20 ug/L			50	15

ANALYZED BY: KA DATE/TIME: 08/28/97 01:34:48 EXTRACTED BY: DR DATE/TIME: 08/21/97 15:00:00

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

#### Certificate of Analysis No. H9-9708811-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 09/04/97

PROJECT: 3rd Quarter Sampling (97)

SITE: Monument, NM 88265

SAMPLED BY: Provided By SPL

SAMPLE ID: Trip Blank

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 08/19/97

DATE RECEIVED: 08/20/97

ANALYTICAL I	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	$\mu$ g/L
TOLUENE	ND	1.0 P	μg/L
ETHYLBENZENE	ND	1.0 P	μg/L
TOTAL XYLENE	ND	1.0 P	$\mu$ g/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		$\mu$ g/L
Surrogate	% Recovery		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	73		
Method 8020A ***			
Analyzed by: RL			
Date: 08/26/97			

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.

<sup>(</sup>P) - Practical Quantitation Limit

# QUALITY CONTROL DOCUMENTATION



\* SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

#### HOUSTON LABORATORY

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

Matrix: Units: Aqueous

μg/L

Batch Id: HP\_P970826114000

#### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	C Spike	QC Limits(**) (Mandatory) % Recovery Range					
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %						
Benzene	ND	50	56	112	62 - 121					
Toluene	ND	50	56	112	66 - 136					
EthylBenzene	ND	50	57	114	70 - 136					
O Xylene	ND	50	57	114	74 - 134					
M & P Xylene	ND	100	110	110	77 - 140					

#### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	ke Matrix Spike Duplicate				QC Limits(***) % (Advisory)		
			Result	Recovery	Result	Recovery	Difference	RPD			
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range		
BENZENE	ND	20	20	100	23	115	14.0	25	39 - 150		
TOLUENE	ND	20	19	95.0	22	110	14.6	26	56 - 134		
ETHYLBENZENE	ND	20	19	95.0	21	105	10.0	38	61 - 128		
O XYLENE	ND	20	18	90.0	21	105	15.4	29	40 - 130		
M & P XYLENE	ND	40	37	92.5	42	105	12.7	20	43 - 152		

Analyst: RL

Sequence Date: 08/27/97

SPL ID of sample spiked: 9708A37-09A

Sample File ID: P\_H7091.TX0

Method Blank File ID:

Blank Spike File ID: P\_H7115.TX0 Matrix Spike File ID: P\_H7089.TX0

Matrix Spike Duplicate File ID: P\_H7090.TX0

\* = 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

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

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

(\*\*) = Source: SPL-Houston Historical Data (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (4th Q '94)

SAMPLES IN BATCH(SPL ID):

9708A37-10A 9708A37-11A 9708A37-07A 9708A37-08A

9708811-02A 9708811-03A 9708811-04A 9708811-01A

9708A37-09A 9708811-05A



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*
Method 8310 \*\*\*

PAGE

**HOUSTON LABORATORY** 

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

Matrix: Units: Aqueous ug/L Batch Id:

1970825035900

#### 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)					
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery R	ange			
NAPHTHALENE	ND	0.5	0.33	66.0	0.33	66.0	0	30	33 -	122			
ACENAPHTHYLENE	ND	0.5	0.30	60.0	0.33	66.0	9.52	30	42 -	138			
ACENAPHTHENE	ND	0.5	0.36	72.0	0.37	74.0	2.74	30	25 -	123			
FLUORENE	ND	0.5	0.34	68.0	0.32	64.0	6.06	30	19 -	142			
PHENANTHRENE	ND	0.5	0.35	70.0	.0.34	68.0	2.90	30	40 -	121			
ANTHRACENE	ND	0.5	0.30	60.0	0.30	60.0	0	30	32 -	121			
FLUORANTHENE	ND	0.5	0.36	72.0	0.35	70.0	2.82	30	51 -	115			
PYRENE	ND	0.5	0.35	70.0	0.35	70.0	0	30	45 -	117			
CHRYSENE	ND	0.5	0.38	76.0	0.38	76.0	0	30	44 -	122			
BENZO (A) ANTHRACENE	ND	0.5	0.36	72.0	0.35	70.0	2.82	30	57 -	118			
BENZO (B) FLUORANTHENE	ND	0.5	0.41	82.0	0.41	82.0	0	30	62 -	121			
BENZO (K) FLUORANTHENE	ND	0.5	0.42	84.0	0.38	76.0	10.0	30	63 -	117			
BENZO (A) PYRENE	ND	0.5	0.42	84.0	0.39	78.0	7.41	30	42 -	120			
DIBENZO (A,H) ANTHRACENE	ND	0.5	0.47	94.0	0.53	106	12.0	30	53 -	118			
BENZO (G,H,I) PERYLENE	ND	0.5	0.36	72.0	0.38	76.0	5.41	30	51 -	116			
INDENO (1,2,3-CD) PYRENE	ND	0.5	0.43	86.0	0.43	86.0	0	30	60 -	116			

Analyst: KA

Sequence Date: 08/25/97 Method Blank File ID:

Sample File ID:

Blank Spike File ID: 970825A\008-0801

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

# ICP Spectros py Method 6010 Quality Control Report

J J J J J Spectro

Matrix: Water

Units: mg/L

Date:082997 Time:1030 File Name: 082997C5

Analysto PSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

Checked(713)660-0901

m 8/2/97

# Laboratory Control Sample

Element		True Value		% Recovery	Lower Limit	Upper Limit
Silver	ND	2.00	2.06	103	1.60	2.40
Aluminum						
Arsenic	ND	4.00	3.93	98	3.20	4.80
Barium	ND	2.00	2.03	101	1.60	2.40
Beryllium						
Calcium	ND	20.00	20.83	104	16.00	24.00
Cadmium	ND	2.00_	1.93	97	1.60	2.40
Cobalt						
Chromium	ND	2.00	2.04	102	1.60	2.40
Copper	ND	2.00	2.02	101	1.60	2.40
Iron	ND	2.00	2.05	103	1.60	2.40
Potassium	ND	20.00	19.89	99	16.00	24.00
Magnesium	ND	20.00	20.73	104	16.00	24.00
Manganese		·				
Sodium	·					
Nickel						
Lead	ND	2.00	1.98	99	1.60	2.40
Antimony						
Selenium	ND	4.00	4.16	104	3.20	4.80_
Thallium						
Vanadium	-					
Zinc	ND	2.00	2.08	104	1.60	2.40

Work Orde	ers in Batch
Work Order	Fractions
97-08-858	01A-02A
97-08-861	01A-02A
97-08-811	01C-04C
97-08-A81	01B
97-08-B10	01A

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 9708858-01A

Matrix Spike	- Spike Di		Work Order Spiked: 9708858-01A										
	Sample	Spike	Mati	ix Spike		Matrix Spi	ke Duplicate		QCL	imits.	Spike		QC
Element	Result	Added	Result	Recover	у	Result	Recovery		% Red	covery	RPD %		Limits %
Silver	ND	1.0	0.899	89.9		0.8992	89.9		80	120	0.0	T	20.0
Aluminum													
Arsenic	ND	2.0	1.8	90.0		1.812	90.6		80	120	0.7	T	20.0
Barium	0.0814	1.0	0.9483	86.7		0.9494	86.8		80	120	0.1		20.0
Beryllium	-											Τ	
Calcium	233.1	10.0	276.8	437.0	*	260.9	278.0	*	80	120	44.5	**	20.0
Cadmium	ND	1.0	0.8457	84.6	П	0.8451	84.5	П	80	120	0.1	Τ	20.0
Cobalt					П							T	
Chromium	0.0131	1.0	0.8693	85.6	П	0.8711	85.8		80	120	0.2	Τ	20.0
Copper	ND	1.0	0.8789	87.9		0.8797	88.0		80	120	0.1	Τ	20.0
Iron	0.3013	1.0	1.229	92.8		1.19	88.9		80	120	4.3	T	20.0
Potassium	3.7	10.0	13.34	96.4		13.77	100.7		80	120	4.4		20.0
Magnesium	53.65	10.0	69.65	160.0	*	66.88	132.3	*	80	120	19.0	Τ	20.0
Manganese												Τ	
Sodium			-									Τ	
Nickel		·										T	
Lead	ND	1.0	0.871	87.1		0.8516	85.2		80	120	2.3	T	20.0
Antimony					$\prod$							T	
Selenium	ND	2.0	1.867	93.4		1.85	92.5		80	120	0.9		20.0
Thallium													
Vanadium												Ι	
Zinc	0.0213	1.0	0.9673	94.6		0.935	91.4		80	120	3.5	Τ	20.0

<sup>\*</sup> Spike Results Outside Method Limits

<sup>\*\*</sup> Spike RPD Outside Method Limits



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

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

08/27/97

Analyzed on:

08/26/97

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 ug/L	% Recovery	QC Limits Recovery
LCS	ND	2.00	2.01	100	80 - 120

-9708947

# Samples in batch:

9708811-01C

9708811-02C

9708811-03C

9708811-04C

9708826-04D

9708858-01A

9708858-02A

COMMENTS:

LCS = SPL ID# 94-452-29-6



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

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous Reported on: 08/27/97 Analyzed on: 08/26/97

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			rix Spike Matrix Spike Duplicate		RPD	I.	ac LI Advis	
ID Number	Blank ug/L	Result ug/L	Added ug/L	Result ug/L	Recovery %	Result ug/L	Recovery %	(%)	RPD Max	*	REC
9708826-04D	ND	ND	2.00	1.84	92.0	1.78	89.0	3.3	20	75	-125

-9708947

# Samples in batch:

9708811-01C

9708811-02C

9708811-03C

9708811-04C

9708826-04D

9708858-01A

9708858-02A

COMMENTS:

LCS = SPL ID# 94-452-29-6



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

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 08/21/97

Analyzed on: 08

08/20/97

Analyst:

PT

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	27.23	27.47	101	94 - 106

<del>-</del>9708757

# Samples in batch:

9707E37-03A 9708677-02G 9708750-01C 9708753-01A 9708787-08A 9708811-01B 9708811-02B 9708811-03B

9708811-04B

#### COMMENTS:

LCS= SPL ID# 95535126-07.



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous Reported on: 08/21/97 Analyzed on: 08/20/97

Analyst:

PT

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	Matrix Spike		Matrix Spike Duplicate		RPD	1	QC LIMITS (Advisory)	
ID Number	Blank mg/L	Result mg/L	Added mg/L	Result mg/L	Recovery %	Result mg/L	Recovery %	(%)	RPD Max	% REC	
9708753-01A	ND	31.91	50.00	82.42	101	82.42	101	0	5	92 -109	

-9708756

#### Samples in batch:

9708677-02G 9708750-01C 9707E37-03A 9708753-01A 9708787-08A 9708811-04B 9708811-01B 9708811-028 9708811-03B



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 08/21/97

Analyzed on: 08/20/97

Analyst:

DAM

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.
9708811-04B	ND	ND	0	5

-9708765

Samples in batch:

9708811-01B

9708811-02B

9708811-03B

9708811-04B



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

08/21/97

Analyzed on:

08/20/97

Analyst:

DAM

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.
9708811-04B	660	650	1.5	5

-9708764

Samples in batch:

9708811-01B 9708811-02B 9708811-03B 9708811-04B



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

08/22/97

Analyzed on:

08/20/97

Analyst:

dam

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

рΗ Method 150.1 \*

### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9708811-01B	7.69	7.71	0.3	1.0

~9708831

Samples in batch:

9708811-01B

9708811-02B 9708811-03B

9708811-04B



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

08/21/97

Analyzed on:

08/21/97

Analyst:

EM

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

> Resistivity Method 120.1 \*

### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration Mohms-cm	Duplicate Sample Mohms-cm	RPD	RPD Max.
9708811-03B	0.042	0.042	0	1.0

-9708780

Samples in batch:

9708811-01B

9708811-02B 9708811-03B

9708811-04B



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

### SPL QUALITY CONTROL REPORT \*\*

Aqueous Matrix:

Reported on:

09/02/97

Analyzed on:

09/02/97

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	10.15	11.01	108	82 - 111

-9709012

# Samples in batch:

9708811-01B 9708C19-03C

9708811-02B 9708811-03B

9708811-04B

COMMENTS:

SPL LCS#: 95535126-7



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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 09/02/97 Analyzed on: 09/02/97

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	e Spike	Matrix Spike		Matrix Spike Duplicate		RPD		QC LIMITS Advisory)
ID Number	Blank mg/L	Result mg/L	Added mg/L	Result mg/L	Recovery %	Result mg/L	Recovery %	(%)	RPD Max	% REC
9708c19-03c	ND	8.73	10.00	20.49	118	20.32	116	1.7	9.5	84 -120

-9709011

Samples in batch:

9708811-01B 9708C19-03C 9708811-02B

9708811-03B

9708811-04B



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 09/02/97

Analyzed on: 09/02/97

Analyst:

DSE

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

Specific Gravity **ASTM D1429** 

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration g/cm3	Duplicate Sample g/cm3	RPD	RPD Max.
9708811-01B	1.0047	1.0052	0	1.0

-9709005

Samples in batch:

9708811-01B

9708811-02B 9708811-03B 9708811-04B



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

January 21, 1998

Mr. Buddy Marley WARREN PETROLEUM P.O. Box 67 Monument, NM 88265

The following report contains analytical results for the sample(s) received at Southern Petroleum Laboratories (SPL) on January 7, 1998. The sample(s) was assigned to Certificate of Analysis No.(s) 9801174 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

Sonia West

Client Services Representative



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

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 98-01-174

Approved for Release by:

Sonia West, Client Services Representative

1-21-98

Date

Greg Grandits
Laboratory Director

Idelis Williams 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

ertificate of Analysis No. H9-9801174-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:00:00

DATE RECEIVED: 01/07/98

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION	UNITS
BENZENE		1200	<b>LIMIT</b> 5.0 P	μg/L
TOLUENE		ND	5.0 P	μg/L
ETHYLBENZENE		24	5.0 P	μg/L
TOTAL XYLENE		ND	5.0 P	μg/L
TOTAL VOLATILE AROMATIC	HYDROCARBONS	1224		μg/L
Surrogate		% Recovery		
1,4-Difluorobenzene		120		
4-Bromofluorobenzene Method 8020A ***	2	100		
Analyzed by: DN				
Date: 01/09/98				
Chloride		92	2	mg/L
Method 325.3 *				٥.
Analyzed by: TV				
Date: 01/09/98				
Carbonate, as CaCO3		ND	5	mg/L
Method SM 4500-CO2D **				5,
Analyzed by: JS				
Date: 01/08/98				
Bicarbonate, as CaCO3		864	5	mg/L
Method SM 4500-CO2D **				•
Analyzed by: JS				
Date: 01/08/98				

<sup>(</sup>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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on

01/07/98, analyze samples outside of holding time.

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

ertificate of Analysis No. H9-9801174-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#1 A-F

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 01/05/98 13:00:00

DATE RECEIVED: 01/07/98

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULA Analyzed by: I Date: 0			182	1	mg/L
pH Method 150.1 * Analyzed by: 5 Date: 0			8.23		pH units
Resistivity Method 120.1 * Analyzed by: 3 Date: 0			0.546	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: F			9	2	mg/L
Specific Gravit ASTM D1429 Analyzed by: F Date: 0	•		1.006		g/cm3
Total Dissolved Method CALCULA Analyzed by: I Date: 0	ATION		1319	1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

QUALITY ASSURANCE: These analyses are performed in accordance

with EPA guidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

ertificate of Analysis No. H9-9801174-01 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:00:00

DATE RECEIVED: 01/07/98

	ANAT VIII CAT DAIDA		
PARAMETER	ANALYTICAL DATA RESULTS	DETECTION LIMIT	UNITS
Silver, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.01	mg/L
Arsenic, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND .	0.1	mg/L
Barium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		0.005	mg/L
Calcium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	122	0.1	mġ/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	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.

COMMENTS: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

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

ertificate of Analysis No. H9-9801174-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:00:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Chromium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	0.03	0.01	mg/L
Iron, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	16.2	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 01/09/98	ND	0.0002	mg/L
Potassium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	7	2	mg/L
Magnesium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	26.3	0.1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

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

ertificate of Analysis No. H9-9801174-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:00:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 01/07/98	ICP 01/07/98		
Lead, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.05	mg/L
Selenium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on

01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

ertificate of Analysis No. H9-9801174-01 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#1 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:00:00

DATE RECEIVED: 01/07/98

AN	ALYTICAL DATA				
PARAMETER	RES'	ULTS	PQL*		UNITS
Naphthalene		7	2.00		ug/L
Acenaphthylene		ND	2.00		ug/L
Acenaphthene		ND	6.00		ug/L
Fluorene		8	6.00		ug/L
Phenanthrene		11	2.00		ug/L
Anthracene		ND	2.00		ug/L
Fluoranthene		ND	2.00		ug/L
Pyrene		ND	2.00		ug/L
Chrysene		ND	2.00		ug/L
Benzo (a) anthracene		ND	2.00		ug/L
Benzo (b) fluoranthene		ND	2.00		ug/L
Benzo (k) fluoranthene		ND	2.00		ug/L
Benzo (a) pyrene		ND	2.00		ug/L
Dibenzo (a,h) anthracene		3	2.00		ug/L
Benzo (g,h,i) perylene		ND	2.00		ug/L
Indeno (1,2,3-cd) pyrene		ND	2.00		ug/L
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	RECO	OVERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L	I	)	50	150
Phenanthrene d-10	0.20 ug/L	I	)	50	150

ANALYZED BY: KA

DATE/TIME: 01/15/98 15:19:26

EXTRACTED BY: PC

DATE/TIME: 01/08/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

\* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

D - Diluted, control limits not applicable.

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9801174-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:30:00

DATE RECEIVED: 01/07/98

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
BENZENE	750	5.0 P	$\mu g/L$		
TOLUENE	ND	5.0 P	μg/L		
ETHYLBENZENE TOTAL XYLENE	ND ND	5.0 P 5.0 P	μg/L μg/L		
TOTAL VOLATILE AROMATIC HYDROCARBONS	750	3.0 F	μg/L		
Surrogate	% Recovery				
1,4-Difluorobenzene	107				
4-Bromofluorobenzene Method 8020A *** Analyzed by: DN/ Date: 01/07/98	93				
Chloride Method 325.3 * Analyzed by: TV Date: 01/09/98	5760	250	mg/L		
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 01/08/98	ND	5	mg/L		
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 01/08/98	674	5	mg/L		

<sup>(</sup>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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

er@ificate of Analysis No. H9-9801174-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:30:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA			
PARAMETER	RES	ULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 01/20/98	•	4690	1	mg/L
pH Method 150.1 * Analyzed by: JS Date: 01/08/98		7.74		pH units
Resistivity Method 120.1 * Analyzed by: JS Date: 01/08/98	0	.050	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 01/14/98		2900	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: KS Date: 01/16/98	1	.025		g/cm3
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 01/20/98	1	4579	1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time. QUALITY ASSURANCE: These analyses are performed in accordance

with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE

er@ificate of Analysis No. H9-9801174-02 PHONE (713) 660-0901

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

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:30:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Silver, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.01	mg/L
Arsenic, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.1	mg/L
Barium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		0.005	mg/L
Calcium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	393	0.1	mg/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND B	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

er&ificate of Analysis No. H9-9801174-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:30:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Chromium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.01	mg/L
Iron, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	3.01	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 01/09/98	ND	0.0002	mg/L
Potassium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	51	2	mg/L
Magnesium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	108	0.1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

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

er@ificate of Analysis No. H9-9801174-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#5 A-F

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 01/05/98 13:30:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA						
PARAMETER	RESULTS	DETECTION LIMIT	UNITS				
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 01/07/98	ICP 01/07/98		•				
Lead, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.05	mg/L				
Selenium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

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

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#5 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 13:30:00

DATE RECEIVED: 01/07/98

AN	ALYTICAL DATA	1			
PARAMETER	RES	SULTS	PQL*		UNITS
Naphthalene		ND	0.50		ug/L
Acenaphthylene		ND	0.50		ug/L
Acenaphthene		ND	1.50		ug/L
Fluorene		ND	1.50		ug/L
Phenanthrene		0.9	0.50		ug/L
Anthracene		ND	0.50		ug/L
Fluoranthene		ND	0.50		ug/L
Pyrene		ND	0.50		ug/L
Chrysene		ND	0.50		ug/L
Benzo (a) anthracene		ND	0.50		ug/L
Benzo (b) fluoranthene		ND	0.50		ug/L
Benzo (k) fluoranthene		ND	0.50		ug/L
Benzo (a) pyrene		ND	0.50		ug/L
Dibenzo (a,h) anthracene		ND	0.50		ug/L
Benzo (g,h,i) perylene		ND	0.50		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.50		ug/L
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	REC	OVERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L		95	50	150
Phenanthrene d-10	0.20 ug/L	0	MI	50	150

ANALYZED BY: KA DATE/TIME: 01/15/98 15:55:32 EXTRACTED BY: PC DATE/TIME: 01/08/98 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

ertificate of Analysis No. H9-9801174-03 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 11:00:00

DATE RECEIVED: 01/07/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	μg/L
TOLUENE	ND	1.0 P	μg/L
ETHYLBENZENE	ND	1.0 P	μg/L
TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	ND ND	1.0 P	μg/L μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene Method 8020A *** Analyzed by: DN/ Date: 01/07/98	93		·
Chloride	9300	250	mg/L
Method 325.3 * Analyzed by: TV Date: 01/09/98			
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 01/08/98	ND	5	mg/L
2466. 01,00,50			
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 01/08/98	570	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

<sup>(</sup>P) - Practical Quantitation Limit

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

er@ificate of Analysis No. H9-9801174-03 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 11:00:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA	10.000	
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 01/20/98	8478	1	mg/L
pH Method 150.1 * Analyzed by: JS Date: 01/08/98	7.52		pH units
Resistivity Method 120.1 * Analyzed by: JS Date: 01/08/98	0.030	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 01/14/98	6900	500	mg/L
Specific Gravity ASTM D1429 Analyzed by: KS Date: 01/16/98	1.018		g/cm3
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 01/20/98	26116	1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

QUALITY ASSURANCE: These analyses are performed in accordance

with EPA guidelines for quality assurance.

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

r@ificate of Analysis No. H9-9801174-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 11:00:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA		
PARAMETER	RESULT:	S DETECTION LIMIT	UNITS
Silver, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	N	0.1	mg/L
Arsenic, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	N	D 1	mg/L
Barium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	0.2	0 0.05	mg/L
Calcium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	63	4 1	mg/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	N	D 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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

reificate of Analysis No. H9-9801174-03 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#7 A-F

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 01/05/98 11:00:00

DATE RECEIVED: 01/07/98

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Chromium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		ИD	0.1	mg/L
Iron, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		6.5	0.2	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 01/09/98		ND	0.0002	mg/L
Potassium, Total Method 6010B *** Analyzed by: PS Date: 01/09/9੪		70	20	mg/L
Magnesium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	· · · · · · · · · · · · · · · · · · ·	157	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9801174-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 11:00:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS			
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 01/07/98	ICP 01/07/98					
Lead, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.5	mg/L			
Selenium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

er lificate of Analysis No. H9-9801174-03 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265

ATTN: Buddy Marley

01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#7 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 11:00:00

DATE RECEIVED: 01/07/98

A	ALYTICAL DATA				
PARAMETER	RES	ULTS	PQL*		UNITS
Naphthalene		0.1	0.10		ug/L
Acenaphthylene		ND	0.10		ug/L
Acenaphthene		ND	0.30		ug/L
Fluorene		ND	0.30		ug/L
Phenanthrene		0.5	0.10		ug/L
Anthracene		ND	0.10		ug/L
Fluoranthene		ND	0.10		ug/L
Pyrene		ND	0.10		ug/L
Chrysene		ND	0.10		ug/L
Benzo (a) anthracene		ND	0.10		ug/L
Benzo (b) fluoranthene		ND	0.10		ug/L
Benzo (k) fluoranthene		ND	0.10		ug/L
Benzo (a) pyrene		ND	0.10		ug/L
Dibenzo (a,h) anthracene		ND	0.10		ug/L
Benzo (g,h,i) perylene		ND	0.10		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.10		ug/L
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	REC	OVERY	LIMIT	LIMIT
1-Fluoronaphthalene	$0.20~\mathrm{ug/L}$		65	50	150
Phenanthrene d-10	$0.20~{ m ug/L}$		150	50	150

ANALYZED BY: KA DATE/TIME: 01/14/98 18:19:10 EXTRACTED BY: PC DATE/TIME: 01/08/98 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

ertificate of Analysis No. H9-9801174-04 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#14 A-F

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 01/05/98 14:15:00

DATE RECEIVED: 01/07/98

ANALYTICAL DATA				
PARAMETER	RESULTS	DETECTION LIMIT	UNITS	
BENZENE	30	1.0 P	$\mu$ g/L	
TOLUENE	ND	1.0 P	μg/L	
ETHYLBENZENE	2.9	1.0 P	μg/L	
TOTAL XYLENE	6.5	1.0 P	μg/L	
TOTAL VOLATILE AROMATIC HYDROCARBON:	S 39.4		μg/L	
Surrogate	% Recovery			
1,4-Difluorobenzene	93			
4-Bromofluorobenzene Method 8020A ***	107			
Analyzed by: TB				
Date: 01/12/98				
Chloride	12000	250	mg/L	
Method 325.3 *				
Analyzed by: TV	•			
Date: 01/09/98				
Carbonate, as CaCO3	ND	5	mg/L	
Method SM 4500-CO2D **				
Analyzed by: JS				
Date: 01/08/98				
Bicarbonate, as CaCO3	559	5	mg/L	
Method SM 4500-CO2D **			<u>.</u>	
Analyzed by: JS				
Date: 01/08/98				

<sup>(</sup>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: All samples for Carbonate, Bicarbonate, and pH were

received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

ertificate of Analysis No. H9-9801174-04 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 14:15:00

DATE RECEIVED: 01/07/98

		ANALYTICAL	DATA		
PARAMETER	•		RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATIO Analyzed by: DAM Date: 01/2			7978	1	mg/L
pH Method 150.1 * Analyzed by: JS Date: 01/0	08/98		7.04		pH units
Resistivity Method 120.1 * Analyzed by: JS Date: 01/0	08/98		0.029	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 01/1	14/98		3500	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: KS Date: 01/1	16/98		1.023		g/cm3
Total Dissolved So Method CALCULATIO Analyzed by: DAM Date: 01/2	ON		25345	1	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time. QUALITY ASSURANCE: These analyses are performed in accordance

with EPA guidelines for quality assurance.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

ertificate of Analysis No. H9-9801174-04 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 14:15:00

DATE RECEIVED: 01/07/98

PARAMETER	ANALYTICAL	DATA RESULTS	DETECTION LIMIT	UNITS
Silver, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		ND	0.1	mg/L
Arsenic, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		ND	1	mg/L
Barium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		0.36	0.05	mg/L
Calcium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		923	1 `	mg/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		ND	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

ereificate of Analysis No. H9-9801174-04 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 14:15:00

DATE RECEIVED: 01/07/98

	ANALYTICAL			
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Chromium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		ND	0.1	mg/L
Iron, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		4.6	0.2	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 01/09/98		ND	0.0002	mg/L
Potassium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		70	20	mg/L
Magnesium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98		310	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: All samples for Carbonate, Bicarbonate, and pH were received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

er&ificate of Analysis No. H9-9801174-04 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 14:15:00

DATE RECEIVED: 01/07/98

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 01/07/98	ICP 01/07/98		
Lead, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	0.5	mg/L
Selenium, Total Method 6010B *** Analyzed by: PS Date: 01/09/98	ND	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: All samples for Carbonate, Bicarbonate, and pH were

received expired at SPL, Inc.. Per Buddy Marley on 01/07/98, analyze samples outside of holding time.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

ertificate of Analysis No. H9-9801174-04 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#14 A-F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/05/98 14:15:00

DATE RECEIVED: 01/07/98

			····		
AN	ALYTICAL DATA				
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		ND	1.00		ug/L
Acenaphthylene		ND	1.00		ug/L
Acenaphthene		ND	3.00		ug/L
Fluorene		ND	3.00		ug/L
Phenanthrene		3	1.00		ug/L
Anthracene		ND	1.00		ug/L
Fluoranthene		ND	1.00		ug/L
Pyrene		ND	1.00		ug/L
Chrysene		ND	1.00		ug/L
Benzo (a) anthracene		ND	1.00		ug/L
Benzo (b) fluoranthene		ND	1.00		ug/L
Benzo (k) fluoranthene		ND	1.00		ug/L
Benzo (a) pyrene		ND	1.00		ug/L
Dibenzo (a,h) anthracene		ND	1.00		ug/L
Benzo (g,h,i) perylene		ND	1.00		ug/L
Indeno (1,2,3-cd) pyrene		ND	1.00		ug/L
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	REC	OVERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20  ug/L	•	100	50	150
Phenanthrene d-10	0.20 ug/L	0	MI	50	150

ANALYZED BY: KA

DATE/TIME: 01/15/98 16:31:42

EXTRACTED BY: PC

DATE/TIME: 01/08/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES:

\* - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

MI - Matrix Interference.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE

er@ificate of Analysis No. H9-9801174-05 HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/21/98

PROJECT: 4th Quarter Sampling

SITE: Monument, NM 88265 SAMPLED BY: Provided By SPL SAMPLE ID: Trip Blank PROJECT NO:
MATRIX: WATER

DATE SAMPLED: 01/05/98
DATE RECEIVED: 01/07/98

, ANALYTICAL I	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
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	90		
Method 8020A ***			
Analyzed by: DN			

ND - Not detected.

Date: 01/08/98

(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.

# QUALITY CONTROL DOCUMENTATION



SPL BATCH QUALITY CONTROL REPORT \*\* METHOD 8020

HOUSTON LABORATORY

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

Batch Id: HP\_U980109010200

#### LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result	Spike Added	Blank Result	Spike Recovery	QC Limits(**) (Mandatory)		
	<2>	<3>	<1>	¥.	% Recovery Range		
MTBE	ND	50	49	98.0	72 - 128		
Benzene	ND	50	46	92.0	61 - 119		
Toluene	ND	50	47	94.0	65 - 125		
EthylBenzene	ND	. 50	47	94.0	70 - 118		
O Xylene	ND	50	48	96.0	72 - 117		
M & P Xylene	ND	100	96	96.0	72 - 116		

#### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix	Spike	MS/MSD Relative %	_	Limits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
мтве	1.6	20	20	92.0	24	112	19.6	20	39 - 150
BENZENE	ND	20	17	85.0	17	85.0	0	21	32 - 164
TOLUENE	ND	20	17	85.0	17	85.0	0	20	38 - 159
ETHYLBENZENE	ND	20	17	85.0	17	85.0	0	19	52 - 142
O XYLENE	ND	20	17	85.0	17	85.0	0	18	53 - 143
M & P XYLENE	ND	40	36	90.0	36	90.0	0	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

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

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: 01/09/98

Method Blank File ID:

Sample File ID: U\_A2129.TX0

SPL ID of sample spiked: 9801216-03A

Blank Spike File ID: U\_A2126.TX0

Matrix Spike File ID: U A2127.TX0

Matrix Spike Duplicate File ID: U\_A2128.TX0

Analyst: DN

9801217-05A 9801217-06A 9801219-01A 9801217-02A

9801219-02A 9801219-03A 9801219-04A 9801174-01A

9801217-03A 9801216-03A 9801216-02A 9801216-05A

9801217-01A



SPL BATCH QUALITY CONTROL REPORT \*\* METHOD 8020/602

**HOUSTON LABORATORY** 

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

Batch Id: HP\_U980107152800

#### 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
мтве	ND	50	47	94.0	72 - 128
Benzene	ND	50	47	94.0	61 - 119
Toluene	ND	· 50	47	94.0	65 - 125
EthylBenzene	ND	50	47	94.0	70 - 118
O Xylene	ND	50	4.8	96.0	72 - 117
M & P Xylene	ND	100	98	98.0	72 - 116

#### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Duplie	Spike	MS/MSD Relative %	_	imits(***) [Advisory]
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
мтве	2.4	20	21	93.0	18	78.0	17.5	20	39 - 150
BENZENE	ND	20	14	70.0	14	70.0	0	21	32 - 164
TOLUENE	ND	20	14	70.0	13	65.0	7.41	20	38 - 159
ETHYLBENZENE	ND	20	13	65.0	13	65.0	0	19	52 - 142
O XYLENE	ND	20	14	70.0	14	70.0	0	18	53 - 143
M & P XYLENE	ND	40	28	70.0	25	62.5	11.3	17	53 - 144

Analyst: DN/

Sequence Date: 01/07/98

SPL ID of sample spiked: 9712E08-06A

Sample File ID: U\_A2071.TX0

Method Blank File ID:

Blank Spike File ID: U\_A2066.TX0 Matrix Spike File ID: U\_A2068.TX0

Matrix Spike Duplicate File ID: U\_A2069.TX0

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

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):

9712E08-04A 9712E08-05A 9712E08-07A 9801187-02B

9801179-01A 9801184-01A 9801174-03A 9801174-02A

9801187-01B 9712E08-06A 9712E08-08A 9712E08-09A



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054

Batch Id:

HP\_U980112043000

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

#### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)		
COMPOUNDS	Blank Result	Added <3>	Result <1>	Recovery	(Mandatory)  Recovery Range		
MTBE	ND	50	49	98.0	72 - 128		
Benzene	ND	50	47	94.0	61 - 119		
Toluene	ND	50	47	94.0	65 - 125		
EthylBenzene	ND	50	47	94.0	70 - 118		
O Xylene	ND	50	47	94.0	72 - 117		
M & P Xylene	ND	100	94	94.0	72 - 116		
	i	1	1	1			

#### 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	MS/MSD Relative %		vimits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
мтве	6.4	20	17	53.0	20	68.0	24.8 *	20	39 - 150
BENZENE	ND	20	17	85.0	18	90.0	5.71	21	32 - 164
TOLUENE	ND	20	17	85.0	18	90.0	5.71	20	38 - 159
ETHYLBENZENE	ND	20	17	85.0	18	90.0	5.71	19	52 - 142
O XYLENE	ИD	20	17	85.0	18	90.0	5.71	18	53 - 143
M & P XYLENE	ND	40	34	85.0	36	90.0	5.71	17	53 - 144

Analyst: TB

Sequence Date: 01/12/98

SPL ID of sample spiked: 9801342-08A

Sample File ID: U\_A2200.TX0

Method Blank File ID:

Blank Spike File ID: U\_A2188.TX0
Matrix Spike File ID: U\_A2197.TX0

Matrix Spike Duplicate File ID: U\_A2198.TX0

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

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):

 9801116-03A
 9801116-06A
 9801116-01A
 9801342-07A

 9801325-04A
 9801325-01A
 9801325-03A
 9801325-02A

 9801324-01A
 9801324-13A
 9801324-02A
 9801324-03A

 9801324-04A
 9801324-05A
 9801324-06A
 9801324-07A

 9801342-08A
 9801174-04A
 9801218-04A
 9801114-03A



SPL BATCH QUALITY CONTROL REPORT \*\* METHOD 8020/602

**HOUSTON LABORATORY** 

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

Batch Id: HP\_U980108134200

#### LABORATORY CONTROL SAMPLE

Method Blank Result <2>	Spike Added <3>	Blank Result <1>	Recovery	QC Limits(**) (Mandatory) % Recovery Range		
ND	50	55	110	72 - 128		
ND	50	46	92.0	61 - 119		
ND	50	47	94.0	65 - 125		
ND	50	46	92.0	70 - 118		
ND	50	47	94.0	72 - 117		
ND	100	96	96.0	72 - 116		
	Blank Result <2> ND ND ND ND ND ND ND ND ND	Blank Result	Blank Result	Blank Result         Added         Result         Recovery           <2>         <3>         <1>         \$           ND         50         55         110           ND         50         46         92.0           ND         50         47         94.0           ND         50         46         92.0           ND         50         47         94.0           ND         50         47         94.0		

#### 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	MS/MSD Relative %	_	imits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
мтве	6.6	20	24	87.0	29	112	25.1 *	20	39 - 150
BENZENE	ND	20	19	95.0	19	95.0	0	21	32 - 164
TOLUENE	מא	20	18	90.0	19	95.0	5.41	20	38 - 159
ETHYLBENZENE	ND	20	18	90.0	19	95.0	5.41	19	52 - 142
O XYLENE	ND	20	19	95.0	19	95.0	0	18	53 - 143
M & P XYLENE	ND	40	38	95.0	39	97.5	2.60	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

% 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: 01/08/98

Method Blank File ID:

Sample File ID: U\_A2098A.TX0

SPL ID of sample spiked: 9801216-04A

Blank Spike File ID: U A2091A.TX0

Matrix Spike File ID: U\_A2093A.TX0

Matrix Spike Duplicate File ID: U\_A2094A.TX0

Analyst: DN

9801194-01A 9801194-02A 9801199-01A 9801216-01A

9801202-01A 9801202-02A 9801174-05A 9801202-03A

9801216-04A 9801188-01A



SPL BATCH QUALITY CONTROL REPORT \*\*
Method 8310 \*\*\*

PAGE

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

Batch Id:

2980113220120

#### BLANK 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 %	_	Limits(**) (Advisory)
			Result	Recovery	Result	Recovery	Difference	RPD	
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range
NAPHTHALENE	ND	0.50,	0.44	88.0	0.48	96.0	8.70	30	33 - 122
ACENAPHTHYLENE	ND	0.50	0.51	102	0.39	78.0	26.7	30	42 - 138
ACENAPHTHENE	ND	0.50	0.43	86.0	0.44	88.0	2.30	30	25 - 123
FLUORENE	ND	0.50	0.42	84.0	0.45	90.0	6.90	30	19 - 142
PHENANTHRENE	ND	0.50	0.45	90.0	0.50	100	10.5	30	40 - 121
ANTHRACENE	ND	0.50	0.42	84.0	0.43	86.0	2.35	30	32 - 121
FLUORANTHENE	DИ	0.50	0.46	92.0	0.48	96.0	4.26	30	51 - 115
PYRENE	ND	0.50	0.48	96.0	0.48	96.0	0	30	45 - 117
CHRYSENE	ND	0.50	0.48	96.0	0.47	94.0	2.11	30	44 - 122
BENZO (A) ANTHRACENE	ND	0.50	0.46	92.0	0.47	94.0	2.15	30	57 - 118
BENZO (B) FLUORANTHENE	ND	0.50	0.49	98.0	0.48	96.0	2.06	30	62 - 121
BENZO (K) FLUORANTHENE	ND	0.50	0.49	98.0	0.47	94.0	4.17	30	63 - 117
BENZO (A) PYRENE	ND	0.50	0.52	104	0.50	100	3.92	30	42 - 120
DIBENZO (A,H) ANTHRACENE	ND	0.50	0.47	94.0	0.46	92.0	2.15	30	53 - 118
BENZO (G,H,I) PERYLENE	ИD	0.50	0.48	96.0	0.44	88.0	8.70	30	51 - 116
INDENO (1,2,3-CD) PYRENE	ND	0.50	0.51	102	0.49	98.0	4.00	30	60 - 116
	1		I	1		1		1	

Analyst: KA

Sequence Date: 01/13/98 Method Blank File ID:

Sample File ID:

Blank Spike File ID: 980113A\003-0301

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

# ICP Spectros by Method 6010 Quality Control I



Matrix: Water

Units: mg/L

Analy#OPSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, YEXAS \$2054 Cheered (713,660-090)

Date:010998 Time:1035 File Name: 010998C7

**Laboratory Control Sample** 

1/12/198

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	<b>Upper Limit</b>
Silver	ND	2.00	2.16	108	1.60	2.40
Aluminum						
Arsenic	ND	4.00	4.37	109	3.20	4.80
Barium	ND	2.00	2.05	103	1.60	2.40
Beryllium						
Calcium	ND	20.00	23.52	118	16.00	24.00
Cadmium	ND	2.00	2.06	103	1.60	2.40
Cobalt						
Chromium	ND	2.00	2.14	107	1.60	2.40
Copper	ND	2.00	2.09	104	1.60	2.40
Iron	ND	2.00	2.19	109	1.60	2.40
Potassium	ND	20.00	20.52	103	16.00	24.00
Magnesium	ND	20.00	21.57	108	16.00	24.00
Manganese						
Sodium						
Nickel						
Lead	ND	2.00	2.16	108	1.60	2.40
Antimony						
Selenium	ND	4.00	4.26	107	3.20	4.80
Thallium						
Vanadium						
Zinc	ND	2.00	2.22	111	1.60	2.40

Work Ord	lers in Batch
Work Order	Fractions
98-01-092	01B
98-01-174	01C-04C
98-01-187	01C

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 9801092-01B

Matrix Opine	Sample	Spike		ix Spike		ke Duplicate		QC L		Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	!		overy	RPD %	Limits %
Silver	ND	10.0	10.49	104.9	10.69	106.9		80	120	1.9	20.0
Aluminum											
Arsenic	ND	20.0	22.13	110.7	22.19	111.0		80	120	0.3	20.0
Barium	0.032	10.0	9.96	99.3	10.09	100.6		80	120	1.3	20.0
Beryllium											
Calcium	9.575	100.0	128.7	119.1	130.5	120.9	*	80	120	1.5	20.0
Cadmium	0.0126	10.0	10.61	106.0	10.86	108.5		80	120	2.3	20.0
Cobalt											
Chromium	ND	10.0	10.75	107.5	10.89	108.9		80	120	1.3	20.0
Copper	0.0157	10.0	10.44	104.2	10.57	105.5		80	120	1.2	20.0
Iron	0.4443	10.0	11.34	109.0	11.56	111.2		80	120	2.0	20.0
Potassium	7.547	100.0	114.9	107.4	110.5	103.0		80	120	4.2	20.0
Magnesium	2.622	100.0	107.2	104.6	108.4	105.8		80	120	1.1	20.0
Manganese											
Sodium											
Nickel	_										
Lead	ND	10.0	11.12	111.2	11.23	112.3		80	120	1.0	20.0
Antimony											
Selenium	ND	20.0	21.95	109.8	22.17	110.9		80	120	1.0	20.0
Thallium											
Vanadium								<u> </u>			
Zinc	0.2914	10.0	11.51	112.2	11.64	113.5		80	120	1.2	20.0

<sup>\*</sup> Values Outside QC Range Due To Matrix Interference. Elements Bench Spiked:ALL



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/16/98

Analyzed on:

01/16/98

Analyst:

KS

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

Specific Gravity ASTM D1429

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration g/cm3	Duplicate Sample g/cm3	RPD	RPD Max.
9801174-01B	1.006	1.009	0.3	1.0

-9801530

# Samples in batch:

9801174-01B

9801174-02B

9801174-03B 9801174-04B

9801557-02A

9801558-02A



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

SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 01/09/98

Analyzed on: 01/09/98

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 ug/L	% Recovery	QC Limits Recovery
LCS	ND	2.00	2.08	104	80 - 120

-9801257

#### Samples in batch:

9801159-01C 9801174-04C

9801174-01C 9801174-02C 9801174-03C

#### COMMENTS:

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

\* VALUE 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: 01/09/98 Analyzed on: 01/09/98

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		QC LII Advis	
ID Number		•	1	Result	•	Result ug/L	Recovery	(%)	RPD Max	<b>%</b>	REC
9801174-02C	ND	ND	2.00	0.51	25.5.*	0.53	26.5	3 . 8	20	75	-125

-9801257

Samples in batch:

9801159-01C 9801174-04C

9801174-01C 9801174-02C

9801174-03C

COMMENTS:

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

\* VALUE 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:

01/10/98

Analyzed on:

01/09/98

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	1	Measured Concentration MG/L	% Recovery	QC Limits Recovery	
LCS	ND	27.25	26.59	97.6	94 - 106	

-9801281

# Samples in batch:

9801117-03A

9801174-01B

9801174-02B

9801174-03B

9801174-04B

9801205-01M

9801205-02M

9801245-01K

9801290-01A

COMMENTS:

LCS =SPL ID#95535160-11



\* SPL QUALITY CONTROL REPORT \*\*

**HOUSTON LABORATORY** 

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

Matrix:

Aqueous

Reported on: 01/10/98 Analyzed on: 01/09/98

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	Matrix Spike   Matrix Spike   Duplicate		RPD		QC LIMITS   Advisory)		
ID Number	:	•	•	Result	•	Result MG/L	Recovery	(%)	RPD Max	% REC
9801290-01A	ND	53.18	50	101.03	95.7	102.80	99.2	3.6	————   5 	92 -109

-9801280

#### Samples in batch:

 9801117-03A
 9801174-01B
 9801174-02B
 9801174-03B

 9801174-04B
 9801205-01M
 9801205-02M
 9801245-01K

9801290-01A



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

SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 01/09/98

Analyzed on: 01/08/98 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.
9801174-04B	ND	ND	0	5

-9801262

Samples in batch:

9801174-01B

9801174-02B 9801174-03B

9801174-04B



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/09/98

Analyzed on:

01/08/98

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.
9801174-04B	559	554	0.9	5

-9801261

Samples in batch:

9801174-01B

9801174-02B 9801174-03B

9801174-04B



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

SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/12/98

Analyzed on:

01/08/98

Analyst:

JS

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

рН Method 150.1 \*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	ŖPD	RPD Max.
9801247-01D	7.87	7.88	0.1	1.0

-9801293

Samples in batch:

9801174-01B

9801174-02B 9801174-03B

9801174-04B

9801247-01D



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/09/98

Analyzed on:

01/08/98

Analyst:

JS

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:

> Resistivity Method 120.1 \*

SPL Sample ID Number	Blank Value umhos-cm	Concentration	Measured Concentration umhos-cm	% Recovery	QC Limits Recovery	
LCS	ND	1408.8	1384.5	98.3	90 - 110	

-9801264

# Samples in batch:

9801174-01B

9801174-02B 9801174-03B

9801174-04B

#### COMMENTS:

LCS ID#: 94453175-8



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

SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 01/09/98 Analyzed on: 01/08/98

Analyst:

JS

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

Resistivity
Method 120.1 \*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mohms-cm	Duplicate Sample mohms-cm	RPD	RPD Max.
9801174-02B	0.050	0.050	0	1.0

-9801263

Samples in batch:

9801174-01B

9801174-02B 9801174-03B 9801174-04B



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

SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/14/98

Analyzed on:

01/14/98

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	10.15	9.09	89.6	82 - 111

-9801439

# Samples in batch:

9801117-03A	9801174-01B	9801174-02B	9801174-03B
9801174-04B	9801283-01C	9801283-02C	9801283-05C
9801283-06C	9801287-01C	9801287-02C	9801287-04C
9801287-05C			

# COMMENTS:

SPL LCS#: 95535160-5



\*\* SPL QUALITY CONTROL REPORT \*\*

HOUSTON LABORATORY

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

Matrix:

Aqueous

Reported on: 01/14/98 Analyzed on: 01/14/98

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	Matri	ix Spike	•	ix Spike licate	RPD	•	QC LIMITS Advisory)
ID Number		:	:	Result	-	Result	Recovery	(%)	RPD Max	% REC
9801117-03A	ND	6.80	10.00	17.12	103	17.43	106	2.9	9.5	84 -120

-9801438

#### Samples in batch:

 9801117-03A
 9801174-01B
 9801174-02B
 9801174-03B

 9801174-04B
 9801283-06C
 9801287-01C
 9801287-02C

9801287-04C 9801287-05C



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/16/98

Analyzed on:

01/16/98

Analyst:

KS

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

Specific Gravity ASTM D1429

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration g/cm3	Duplicate Sample g/cm3	RPD	RPD Max.
9801174-01B	1.006	1.009	0.3	1.0

-9801530

# Samples in batch:

9801174-01B

9801174-02B

9801174-03B

9801174-04B

9801557-02A

9801558-02A

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February 14, 1997

William C. Olson New Mexico Oil Conservation Division Environmental Bureau 2040 S. Pacheco Santa Fe, New Mexico 87505 DECENVED

FEB 1 7 1998

Environmental Bureau

Gil Conservation Division

Re: Annual Summary Report for 1996 Groundwater Monitoring Activities at Warren Monument Gas Plant, Lea County, New Mexico

Dear Mr. Olson:

On behalf of Warren Petroleum Company L.P. (Warren), please find the annual summary report for 1996 groundwater monitoring activities at the Warren Monument Gas Plant in Lea County, New Mexico. Groundwater monitoring activities for 1996 were conducted by Warren plant personnel. This annual summary report has been prepared jointly by Warren and Geraghty & Miller, Inc. to satisfy the reporting requirements outlined in the New Mexico Oil Conservation District (NMOCD) letter to Warren dated August 9, 1996.

#### **SUMMARY OF MONITORING ACTIVITIES**

The 1996 monitoring activities consisted of conducting quarterly groundwater gauging and sampling events. The following monitoring activities were conducted during each referenced quarterly event. Any deviations, problems, or deficiencies encountered during the monitoring period are also reported.

#### **FIRST QUARTER 1996**

- Gauged fluid levels in 13 monitoring wells on January 24, 1996.
- Sampled all six monitoring wells (WP-1, WP-5, WP-6, WP-7, WP-13, WP-14) on February 19, 1996 which did not contain measurable free-phase hydrocarbons. All groundwater samples were analyzed by SPL Laboratory for benzene, toluene, ethylbenzene, and xylenes (BTEX) constituents using USEPA Method 8020A and the inorganic constituents chlorides, total dissolved solids (TDS), and sulfates.
- No problems were encountered during the monitoring period.

#### **SECOND QUARTER 1996**

- Gauged fluid levels in 13 monitoring wells on April 2, 1996.
- Sampled six monitoring wells (WP-1, WP-5, WP-6, WP-7, WP-13, WP-14) on July 11, 1996 which did not contain measurable free-phase hydrocarbons. All groundwater samples were analyzed by SPL Laboratory for BTEX constituents using USEPA Method 8020A and the inorganic constituents chlorides, TDS, and sulfates.
- Second quarter groundwater sampling was delayed until July 1996 due to changes in plant personnel. Well WP-2 was essentially dry and thus, could not be sampled.

#### **THIRD QUARTER 1996**

- Gauged fluid levels in 13 monitoring wells on September 26, 1996.
- Sampled six monitoring wells (WP-1, WP-5, WP-6, WP-7, WP-13, WP-14) on October 11, 1996 which did not contain measurable free-phase hydrocarbons. All groundwater samples were analyzed by SPL Laboratory for BTEX constituents using USEPA Method 8020A and the inorganic constituents chlorides, TDS, and sulfates.
- Third quarter groundwater sampling was delayed until October 1996. Well WP-2 was essentially dry and thus, could not be sampled.

#### **FOURTH QUARTER 1996**

- Gauged fluid levels in 13 monitoring wells on January 28, 1996.
- Sampled five monitoring wells (WP-5, WP-6, WP-7, WP-13, and WP-14) on January 17, 1997. All groundwater samples were analyzed by SPL Laboratory for BTEX constituents using USEPA Method 8020A and the inorganic constituents chlorides, TDS, and sulfates.
- Fourth quarter groundwater gauging and sampling was delayed until January 1997. Well WP-1 did not recover after purging and Well WP-2 was essentially dry; therefore, both wells were not be sampled during the fourth quarter event.
- A groundwater quality sample was inadvertently collected from Well WP-13 during the fourth quarter even though liquid hydrocarbons were detected in the well for the first time.
- A review of the 1996 data indicates the sampling program was not changed during the third and fourth quarters to include polynuclear aromatic hydrocarbons and heavy metals

3

as discussed in the OCD letter dated August 9, 1996. This deficiency will be addressed during the February 1997 sampling event.

## **SUMMARY OF MONITORING AND ANALYTICAL RESULTS**

#### FLUID LEVEL MEASUREMENTS

Results of the 1996 fluid-level monitoring activities are summarized below. A site map with monitoring well locations is presented as Figure 1.

- Field measurements, water-level elevations, and liquid hydrocarbon thickness are presented in Tables 1A, 1B, and 1C, respectively. A summary table of groundwater elevations corrected for the presence of liquid hydrocarbons is presented in Table 1D. Based on previous results of liquid hydrocarbon characterization conducted at the site, a average specific gravity of 0.72 was used to calculate corrected groundwater elevations. Graphs of groundwater elevations versus time are presented as Attachment A.
- A significant decreasing trend (i.e. greater than 0.5 ft) in water-level elevations was observed across the site during 1996 with the exception of water-level elevations from Wells WP-6, WP-14, and WP-15. All three of these wells are located along the extreme north or eastern portions of the site (Figure 1). Well WP-2 was essentially dry during 1996.
- Groundwater was encountered at approximately 28 ft to 40 ft below the measuring point elevations (Table 1A). The saturated thickness of the alluvial sediments beneath the site ranged from being near dry in Well WP-2 to 10.52 ft in Well WP-10. The saturated thickness was less than 5 ft in eight of the 13 wells at the site.
- Groundwater elevation contour maps for each quarterly monitoring period are presented as Figures 2 though 5. Groundwater flow beneath the eastern half of the site is predominantly towards the southeast while groundwater flow beneath the western portion of the site is toward the south. An apparent area of groundwater mounding is present east of the processing area. The configuration of the water table appears to be consistent throughout each monitoring event in 1996.
- Anomalous high water-level elevations were recorded in Well WP-1 during the January, April, and September 1996 gauging events. These values were not used in the construction of the groundwater elevation contour maps. The cause of the anomalous data is unknown; however, the likely explanation is groundwater mounding due to localized recharge or erroneous water-level measurements.

#### **ANALYTICAL RESULTS**

Analytical results for the 1996 monitoring program are summarized below.

- A summary of groundwater quality data for the six wells (WP-1, WP-5, WP-6, WP-7, WP-13, and WP-14) sampled on a quarterly basis is presented in Table 2. A series of graphs showing BTEX concentrations versus time and inorganic parameter (chlorides, TDS, and sulfate) concentrations versus time are presented as Attachment B. The analytical data sheets for samples collected during the 1996 monitoring program are presented as Attachment C.
- BTEX levels were detected in all samples from monitoring wells except Well WP-7. Benzene is the predominant constituent detected in four of the five groundwater samples with detectable concentrations of BTEX. During the 1996 monitoring period, the highest concentrations of benzene were detected in Wells WP-1 and WP-13. Ethylbenzene was the predominant constituent detected in Well WP-6.
- Inorganic groundwater quality indicates elevated concentrations of chlorides, TDS, and sulfates are present in the groundwater beneath the site. The highest concentrations of chlorides, TDS, and sulfates were detected in Well WP-7 which is located in the northwest portion of the site. The elevated concentrations do not appear to be related to gas plant operations but are likely related to former operations at the Climax Chemical Company located approximately one-half mile northwest (upgradient) of the Warren site.

# DISTRIBUTION OF LIQUID HYDROCARBONS

The approximate extent of liquid hydrocarbons is shown for each quarterly monitoring event on Figures 6 through 9. A brief summary of findings is presented below.

- During January 1996, liquid hydrocarbons were detected in eight (Wells WP-2, WP-3, WP-4, WP-6, WP-10, WP-11, and WP-12) of the 13 wells (Figure 6). Liquid hydrocarbon thickness in wells ranged from 0.03 ft in Well WP-3 to 1.27 ft in Well WP-4.
- During April 1996, liquid hydrocarbons were detected in only six (Wells WP-3, WP-4, WP-6, WP-10, WP-11, and WP-12) of the 13 wells (Figure 7). Liquid hydrocarbon thickness in wells ranged from 0.05 ft in Well WP-12 to 1.90 ft in Well WP-4.
- During September 1996, liquid hydrocarbons were detected in only six (Wells WP-3, WP-4, WP-6, WP-10, WP-11, and WP-12) of the 13 wells (Figure 8). Liquid hydrocarbon thickness in wells ranged from 0.10 ft in Well WP-3 to 1.65 ft in Well WP-4.

During January 1997, liquid hydrocarbons were detected in seven (Wells WP-3, WP-4, WP-6, WP-10, WP-11, WP-12, and WP-13) of the 13 wells (Figure 9). Liquid hydrocarbons were detected in Well WP-13 for the first time since installation. Liquid hydrocarbon thickness in wells ranged from 0.26 ft in Well WP-10 to 1.35 ft in Well WP-4.

# SUMMARY OF HYDROCARBON RECOVERY OPERATIONS

Hydrocarbon recovery operations in 1996 consisted of periodically pumping three wells using pneumatic skimming pumps. Produced fluids are pumped to the onsite oil/water separator and plant wastewater system. Recovered volumes of produced water and hydrocarbons for each recovery well are presented in Tables 3A, 3B, and 3C and can be summarized as follows.

- Hydrocarbons could not be recovered from Well WP-2 because it was essentially dry during 1996 due to decreased water-table conditions.
- Approximately 4,840 gallons of hydrocarbon product and 2,045 gallons of produced water were recovered from Well WP-3 during 1996. Hydrocarbon recovery operations were ceased in October 1996 due to low water-table conditions.
- Approximately 1,111 gallons of hydrocarbon product and 1,115 gallons of produced water were recovered from Well WP-4 during 1996. Hydrocarbon recovery operations were ceased in August 1996 because of the low water-table conditions.
- Approximately 200 gallons of hydrocarbon product and 780 gallons of produced water were recovered from Well WP-10 during 1996. Hydrocarbon recovery operations were ceased in February 1996 because of the reduced hydrocarbon thickness in the well.
- No product was present in Well WP-13 until January 1997 and thus, no product was recovered in 1996.

# **CONCLUSIONS AND RECOMMENDATIONS**

Based on the results of the 1996 monitoring program, the following conclusions can be made.

• The 1996 monitoring program was conducted generally according to plan with the exception of inadvertently not changing the sampling program during the third and fourth quarter to include PAHs and heavy metals. The OCD was informed of the oversight and the additional samples will be collected during the February 1997 sampling event.

- A significant decreasing trend (i.e. greater than 0.5 ft) in water-level elevations was observed across the site during 1996 with the exception of water-level elevations from Wells WP-6, WP-14, and WP-15. All three of these wells are located along the extreme north or eastern portions of the site (Figure 1). Well WP-2 was essentially dry during 1996.
- Groundwater flow beneath the eastern half of the site is predominantly towards the southeast while groundwater flow beneath the western portion of the site is toward the south. An apparent area of groundwater mounding is present east of the processing area. The configuration of the water table appears to be consistent throughout each monitoring event in 1996.
- BTEX levels were detected in all samples from monitoring wells except Well WP-7. Benzene is the predominant constituent detected in four of the five groundwater samples with detectable concentrations of BTEX. During the 1996 monitoring period, the highest concentrations of benzene were detected in Wells WP-1 and WP-13. Ethylbenzene was the predominant constituent detected in Well WP-6.
- Inorganic groundwater quality indicates elevated concentrations of chlorides, TDS, and sulfates are present in the groundwater beneath the site. The highest concentrations of chlorides, TDS, and sulfates were detected in Well WP-7 which is located in the northwest portion of the site. The elevated concentrations do not appear to be related to gas plant operations but are likely related to former operations at the Climax Chemical Company located approximately one-half mile northwest (upgradient) of the Warren site.
- Two separate hydrocarbon plumes were detected at the site during 1996. The northern plume is larger and occurs southeast (downgradient) of the gas processing area and condensate storage area. The southern plume occurs southeast (downgradient) of the former produced water pond and burn pit.
- A total of 6,151 gallons of hydrocarbons were recovered in 1996 from Wells WP-3, WP-4, and WP-10. Low water-table conditions prevented recovery well operation in the third and fourth quarters of 1996.

Based on the results to the 1996 monitoring program the following recommendations can be made.

- 1. Fluid level gauging and well sampling should be performed together as a single field activity.
- 2. During the February 1997 sampling event, samples should be collected for analysis of PAHs and heavy metals in addition to BTEX, chlorides, TDS, and sulfates. The results of

the PAH and heavy metal analysis should be discussed with the OCD to determine the necessity of collecting this data on a quarterly basis.

3. The existing hydrocarbon recovery system should be expanded to include Wells WP-11 and WP-13.

The first quarter 1997 monitoring event is scheduled for the week of February 24, 1997. The remaining quarterly events are tentatively scheduled for the third or fourth weeks of May, August, and November 1997. Please contact J. Dee Morris of Warren at (713) 507-6752 if you have any questions regarding this annual summary report package.

Sincerely,

GERAGHTY & MILLER, INC.

John P. Shonfelt, P.G.

Project Scientist/Project Manager

Brian Guillette, P.G.

Associate/Office Manager

JPS:ndf

**Enclosures** 

cc: J. Dee Morris (Warren Petroleum)
Jerry Sexton (NMOCD Hobbs District)

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# e Elevations and Hydrocarbon Thickness Measurements



Water Table Elevations and Hydrocarbon Thickness must be measured every three months for all Monitoring Wells. Measurements should be taken during the first half of each quarter.

All wells should be guaged at the same time with the date noted in the space provided in the table.

Surveyed elevations are recorded on the Sheet labeled Well Information.

MSL water elevations and product thickness are automatically calculated in Tables 1-B and 1-C, respectively

		199	95	1996					( 19	97	
		3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Monitor	Well ID	10/31/95	11/14/95	1/24/96	6/26/96	9/26/96	1/28/97				
WP-1	Product	32.00	25.80	28.00	29.95	30.45	31.08				
	Water	32.00	25.80	28.00	29.95	30.45	31.08			-	
WP-2	Product	30.70	30.95	31.53	31.71	31.71	31.71				
	Water	31.00	31.35	31.71	31.71	31.71	31.71				
WP-3	Product	29.40	29.30	29.17	29.53	29.85	29.94				
	Water	29.60	29.55	29.45	29.77	29.95	30.26				
WP-4	Product	33.60	33.75	33.96	34.70	35.20	35.65				
	Water	35.00	35.10	35.23	36.60	36.85	37.00				
WP-5	Product	31.90	32.10	32.62	33.60	34.00	34.57				
	Water	31.90	32.10	32.62	33.60	34.00	34.57				
WP-6	Product	28.80	28.80	28.75	28.80	28.80	28.78				
	Water	28.80	28.80	28.78	28.80	28.80	28.78				
WP-7	Product	31.25	34.30	31.77	32.10	32.20	32.45				-
	Water	31.25	34.30	31.77	32.10	32.20	32.45				
WP-8	Product	NA	NA	NA	NA	NA	NA				
	Water	NA	NA	NA	NA	NA	NA				
WP-9	Product	NA	NA	NA	NA	NA	NA				
	Water	NA	NA	NA	NA	NA	NA				
WP-10	Product	28.35	28.15	28.10	28.60	28.75	28.88				
	Water	28.45	28.35	28.30	28.72	28.90	29.14				
WP-11	Product	NA	29.60	29.32	30.30	30.45	30.61				
	Water	NA	29.68	29.49	30.43	31.00	31.39				
WP-12	Product	NA	38.08	37.54	38.45	38.60	38.95				
	Water	NA	38.25	37.76	38.50	39.00	39.24				
WP-13	Product	NA	30.25	29.88	30.55	30.70	30.81				
	Water	NA	30.25	29.88	30.55	30.70	31.42				
WP-14	Product	NA	40.75	40.85	40.90	41.00	41.14				
	Water	NA	40.75	40.85	40.90	41.00	41.14				
WP-15	Product	NA	33.60	32.96	33.95	33.20	33.10				
	Water	NA	33.60	33.16	34.30	33.40	33.49				

Note: The bottom of well WP-2 is 31.71 feet from top of casing. Well #2 is dry.

NA indicates not measured or not able to measure.

Note: well #6 has trace of product but not enough to measure.



	199	1995		1996				1996			
	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	
Monitor Well ID	10/31/95	11/14/95	1/24/96	4/2/96	9/26/96	1/28/97					
WP-1	3546.01	3552.21	3550.01	3548.06	3547.56	3546.93					
WP-2	3546.77	3546.42	3546.06	3546.06	3546.06	3546.06					
WP-3	3551.61	3551.66	3551.76	3551.44	3551.26	3550.95					
WP-4	3542.15	3542.05	3541.92	3540.55	3540.30	3540.15					
WP-5	3547.60	3547.40	3546.88	3545.90	3545.50	3544.93		·			
WP-6	3556.56	3556.56	3556.58	3556.56	3556.56	3556.58					
WP-7	3551.79	3548.74	3551.27	3550.94	3550.84	3550.59	_				
WP-8	NA	NA	NA	NA	NA	NA	-				
WP-9	NA	NA	NA	NA	NA	NA					
WP-10	3551.63	3551.73	3551.78	3551.36	3551.18	3550.94					
WP-11	NA	3551.55	3551.74	3550.80	3550.23	3549.84					
WP-12	NA NA	3543.64	3544.13	3543.39	3542.89	3542.65					
WP-13	NA	3549.40	3549.77	3549.10	3548.95	3548.23					
WP-14	NA	3541.06	3540.96	3540.91	3540.81	3540.67					
WP-15	NA	3548.67	3549.11	3547.97	3548.87	3548.78					

The water table in well WP-3 may be below bottom of well which has an elevation of 3551.91 fast. NA indicates not measured or not able to measure.

Table 1-C,	Product Thic	kness, fe	et							
1995		1996				1996				
Monitor Well II	3rd Qtr 10/31/95	4th Qtr 11/14/95	1st Qtr 1/24/96	2nd Qtr 4/2/96	3rd Qtr 9/26/96	4th Qtr 1/28/97	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
WP-1										
WP-2	0.30	0.40	0.18							
WP-3	0.20	0.25	0.28	0.24	0.10	0.32				
WP-4	1.40	1.35	1.27	1.90	1.65	1.35				
WP-5										
WP-6			0.03							
WP-7										
WP-8	NA	NA	NA							
WP-9	NA	NA	NA							
WP-10	0.10	0.20	0.20	0.12	0.15	0.26				
WP-11	NA	0.08	0.17	0.13	0.55	0.78				
WP-12	NA	0.17	0.22	0.05	0.40	0.29				
WP-13	NA					0.61				1
WP-14	NA									
WP-15	NA		0.20	0.35	0.20	0.39	<del></del>			

Blanks indicate no product measured. NA indicates not measured or not able to measure.

Table 1D. Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

DATE	WELL I.D.	MEASURED GROUNDWATER ELEVATION (ft AMSL)	MEASURED PRODUCT THICKNESS (ft)	CORRECTED GROUNDWATER ELEVATION (ft AMSL)
10/21/05	******	2.546.01		2.546.01
10/31/95	WP-1	3,546.01		3,546.01
11/14/95		3,552.21		3,552.21
1/24/96		3,550.01		3,550.01 3,548.06
4/2/96		3,548.06		•
9/26/96 1/28/97		3,547.56		3,547.56 3,546.93
1/20/97		3,546.93		3,340.23
10/31/95	WP-2	3,546.77	0.30	3,546.99
11/14/95		3,546.42	0.40	3,546.71
1/24/96		3,546.06	0.18	3,546.19
4/2/96		3,546.06	•	3,546.06
9/26/96		3,546.06	•	3,546.06
1/28/97		3,546.06		3,546.06
10/31/95	WP-3	3,551.61	0.20	3,551.76
11/14/95		3,551.66	0.25	3,551.84
1/24/96		3,551.76	0.28	3,551.96
4/2/96		3,551.44	0.24	3,551.61
9/26/96		3,551.26	0.10	3,551.33
1/28/97		3,550.95	0.32	3,551.18
10/31/95	WP-4	3,542.15	1.40	3,543.17
11/14/95		3,542.05	1.35	3,543.03
1/24/96		3,541.92	1.27	3,542.84
4/2/96		3,540.55	1.90	3,541.93
9/26/96		3,540.30	1.65	3,541.50
1/28/97		3,540.15	1.35	3,541.13

Footnotes on last page.

Table 1D. Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

DATE	WELL I.D.	MEASURED GROUNDWATER ELEVATION (ft AMSL)	MEASURED PRODUCT THICKNESS (ft)	CORRECTED GROUNDWATER ELEVATION (ft AMSL)
10/31/95	WP-5	3,547.60		3,547.60
11/14/95		3,547.40		3,547.40
1/24/96		3,546.88		3,546.88
4/2/96		3,545.90		3,545.90
9/26/96		3,545.50		3,545.50
1/28/97		3,544.93		3,544.93
10/31/95	WP-6	3,556.56		3,556.56
11/14/95		3,556.56		3,556.56
1/24/96		3,556.58	0.03	3,556.60
4/2/96		3,556.56		3,556,56
9/26/96		3,556.56		3,556.56
1/28/97		3,556.58		3,556.58
10/31/95	WP-7	3,551.79		3,551.79
11/14/95		3,548.74		3,548.74
1/24/96		3,551.27		3,551.27
4/2/96		3,550.94		3,550.94
9/26/96		3,550.84		3,550.84
1/28/97		3,550.59		3,550.59
10/31/95	WP-10	3,551.63	0.10	3,551.70
11/14/95		3,551.73	0.20	3,551.88
1/24/96		3,551.78	0.20	3,551.93
4/2/96	•	3,551.36	0.12	3,551.45
9/26/96		3,551.18	0.15	3,551.29
1/28/97		3,550.94	0.26	3,551.13

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Table 1D. Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

DATE	WELL I.D.	MEASURED GROUNDWATER ELEVATION (ft AMSL)	MEASURED PRODUCT THICKNESS (ft)	CORRECTED GROUNDWATER ELEVATION (ft AMSL)
<del></del> -		`		
11/14/95	WP-11	3,551.55	0.08	3,551.61
1/24/96		3,551.74	0.17	3,551.86
4/2/96		3,550.80	0.13	3,550.89
9/26/96	,	3,550.23	0.55	3,550.63
1/28/97		3,549.84	0.78	3,550.41
11/14/95	WP-12	3,543.64		3,543.64
1/24/96		3,544.13		3,544.13
4/2/96		3,543.39		3,543.39
9/26/96		3,542.89	0.40	3,543.18
1/28/97		3,542.65	0.29	3,542.86
11/14/95	WP-13	3,549.40		3,549.40
1/24/96		3,549.77		3,549.77
4/2/96		3,549.10		3,549.10
9/26/96		3,548.95		3,548.95
1/28/97		3,548.23	0.61	3,548.67
11/14/95	WP-14	3,541.06		3,541.06
1/24/96		3,540.96		3,540.96
4/2/96		3,540.91		3,540.91
9/26/96		3,540.81		3,540.81
1/28/97		3,540.67		3,540.67

Footnotes on last page.

Table 1D. Historical Summary of Groundwater Elevation Data, Warren Monument, New Mexico, Warren Petroleum, Inc.

DATE	WELL I.D.	MEASURED GROUNDWATER ELEVATION (ft AMSL)	MEASURED PRODUCT THICKNESS (ft)	CORRECTED GROUNDWATER ELEVATION (ft AMSL)
11/14/95	WP-15	3,548.67		3,548.67
1/24/96		3,549.11	0.20	3,549.26
4/2/96		3,547.97	0.35	3,548.22
9/26/96		3,548.87	0.20	3,549.02
1/28/97		3,548.78	0.39	3,549.06

ft

Feet

**AMSL** 

Above Mean Sea Level

G:\STAFF\RGP\WARRENWL.XLS

Summary of Groundwater Quality Data, Warren Monument, New Mexico, Warren Petroleum, Inc. Table 2.

Well Date ID	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (μg/L)	Xylenes (μg/L)	Total BTEX (µg/L)	Chlorides (mg/L)	TDS (mg/L)	Sulfate (mg/L)
,			١					
10/31/95 WP-1	5,100	R	18	R	5,118	30	206	R
12/20/95	5,000	Q Q	QN QN	S	5,000	16	262	Q.
2/19/96	6,300	QZ	QN ON	R	6,300	21	1,146	QN QN
7/11/96	2,500	QN ON	09	58	2,618	78	1,369	6
10/11/96	1,100	33	89	280	1,481	202	1,446	<b>∞</b>
1/17/97	NA A	NA	Y Z	NA	NA	NA	NA	NA
10/31/95 WP-5	140	Q	7	7	144	6,700	16,229	2,960
12/20/95	110	S		Q.	111	7,500	17,087	2,670
2/19/96	140	QZ	QN ON	Q Q	140	9,000	20,202	3,090
7/11/96	180	QZ QZ	Q.	Q.	180	6,250	15,321	2,880
10/11/96	200	S	1.1	R	201.1	6,150	15,024	2,800
1/17/97	260	1.9	2.2	QN	264.1	6,350	15,833	3,110
10/31/95 WP-6	620	<del>N</del>	880	180	1,680	2,100	5,271	53
12/20/95	290	Q.	320	70	089	1,900	5,259	28
2/19/96	610	ON ON	630	QN Q	1,240	1,500	4,718	21
7/11/96	280	25	450	42	797	1,520	4,724	34
10/11/96	280	2	910	200	1,690	1,670	3,678	17
1/17/97	180	S	280	R	160	1,500	4,371	268

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Summary of Groundwater Quality Data, Warren Monument, New Mexico, Warren Petroleum, Inc. Table 2.

Date	Well ID	Benzene (µg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)	Xylenes (μg/L)	Total BTEX (µg/L)	Chlorides (mg/L)	TDS (mg/L)	Sulfate (mg/L)
10/31/95 WP-7	7-	R	QZ	Ð	QN N	QN ON	16,000	35,492	5,830
12/20/95		R	QZ	QN QN	QN	Q	15,000	32,986	5,390
2/19/96		R	QX	<u>.</u>	Q.	1	16,500	36,587	6,160
7/11/96		R	QZ	<del>S</del>	1.1	1.1	15,200	34,522	6,270
10/11/96		S	QN QN	Q.	2	2	15,200	33,712	5,720
1/17/97		N Q	N Q	QN QN	QX	Q.	15,200	30,385	3,510
÷									
12/20/95 WP-13	-13	5,100	QN	170	QN	5,270	2,300	5,387	11
2/19/96		5,700	QN QN	150	QN N	5,850	1,150	3,495	\$
7/11/96		3,600	QN ON	130	R	3,730	975	3,229	13
10/11/96		3,400	NO	200	320	4,220	975	3,027	6
1/17/97		2,700	63	700	140	3,603	487	2,207	15
12/20/95 WP-14	-14	120	ND	7	21	143	7,750	15,888	1,170
2/19/96		81	QN QN		QN	82	10,000	21,366	2,670
7/11/96		27	QN QN	S	QN Q	27	12,200	25,570	3,040
10/11/96		59	1.4	6.1	12	49	11,500	19,754	29
1/17/97		g	QN ON	<del>Q</del>	ΩN	Q.	11,700	24,483	3,110

μg/L Milrograms per liter.
mg/L Milligrams per liter.
G:STAFFRGPWARRENWQ.DAT

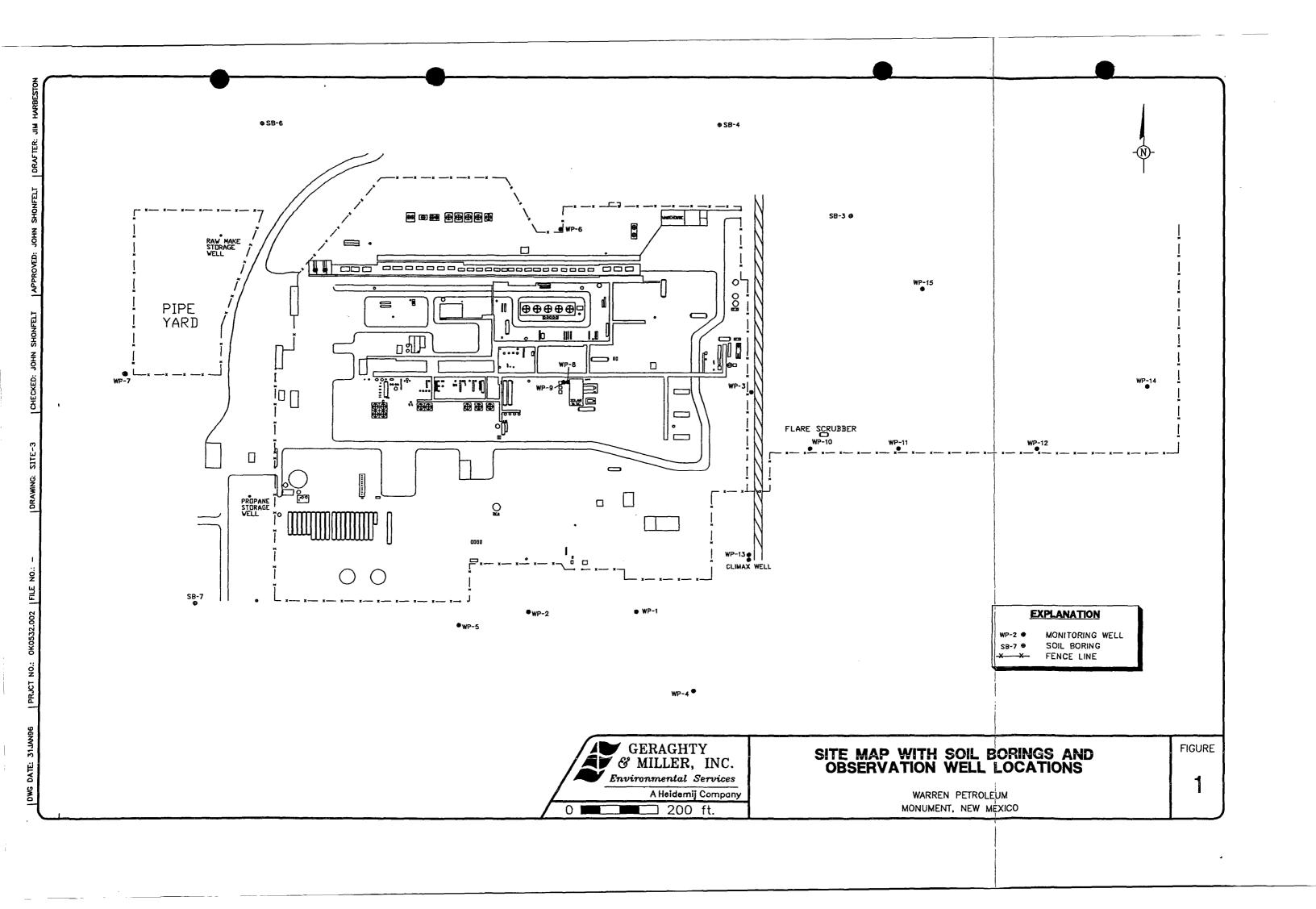
## Table 3 - Recovered Volumes

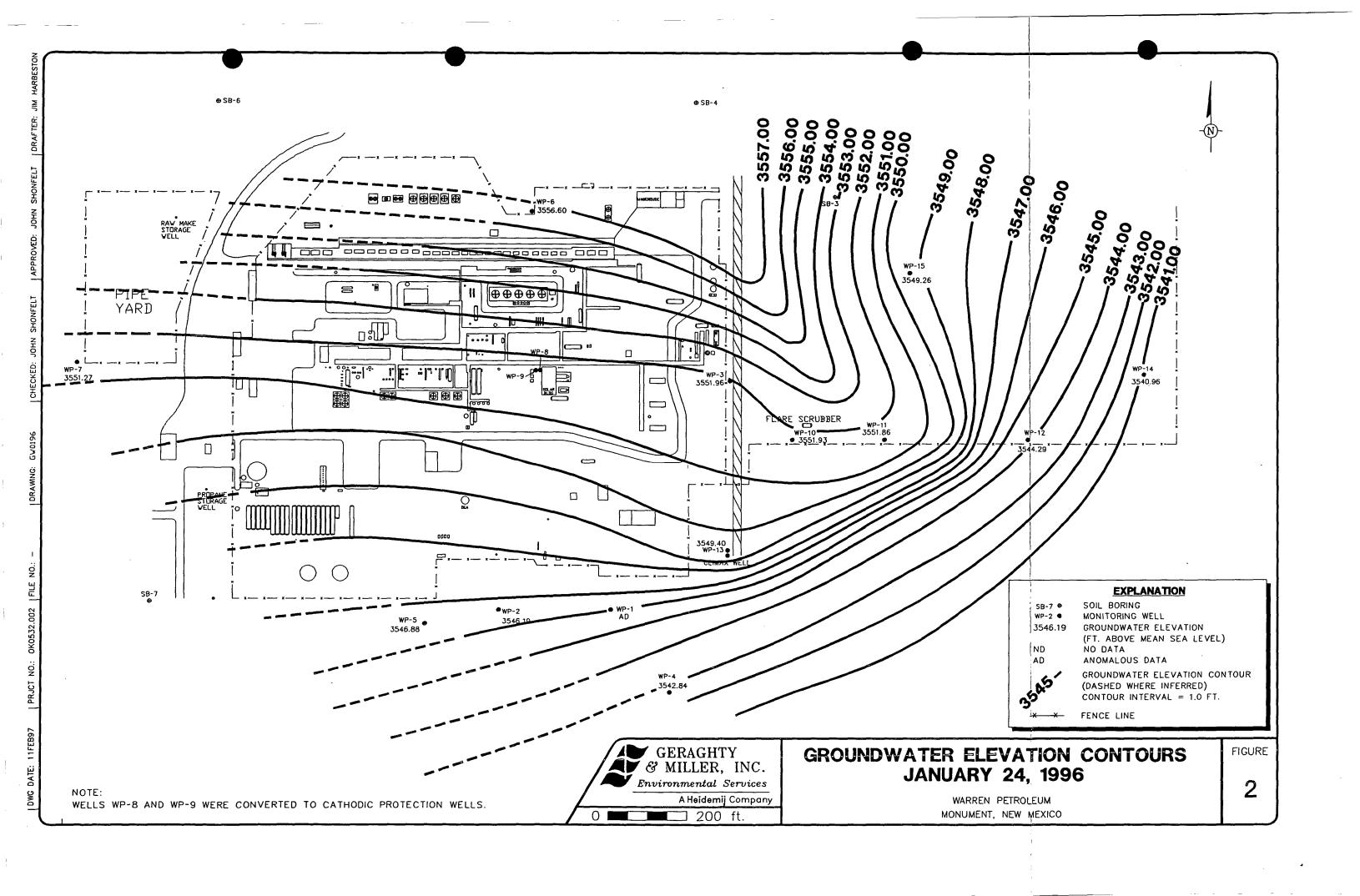
Both the Hydrocarbon and the Total Fluid (water + hydrocarbon) volumes recovered must be recorded for the following monitor wells: WP-2, WP-3, WP-10, and WP-13. (MW-13 replaces the Climax Well) Cumulative Volumes are totaled automatically.

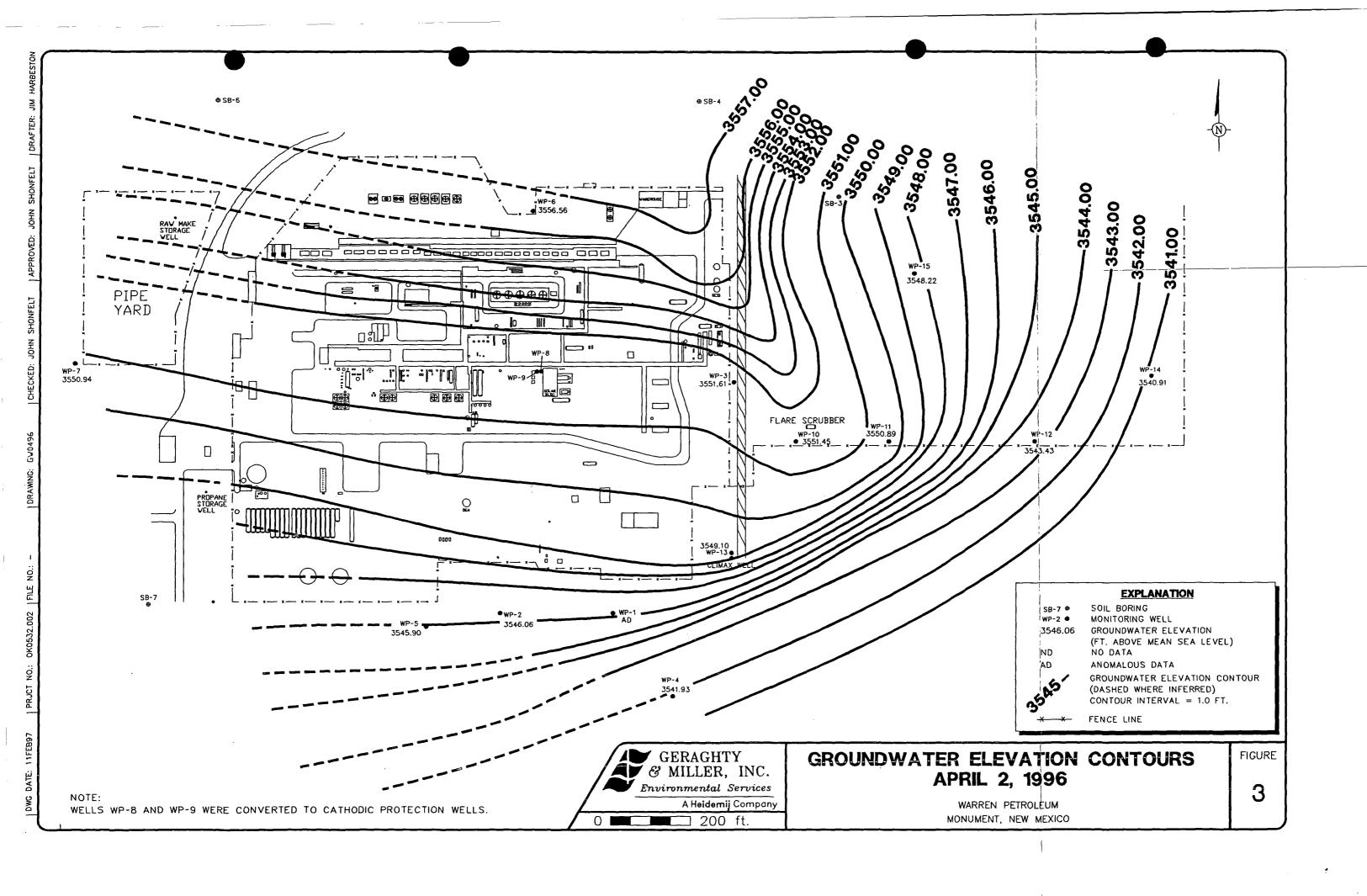
Pumping Well WP-4 is not currently an OCD requirment, we are pumping it voluntarily at this time.

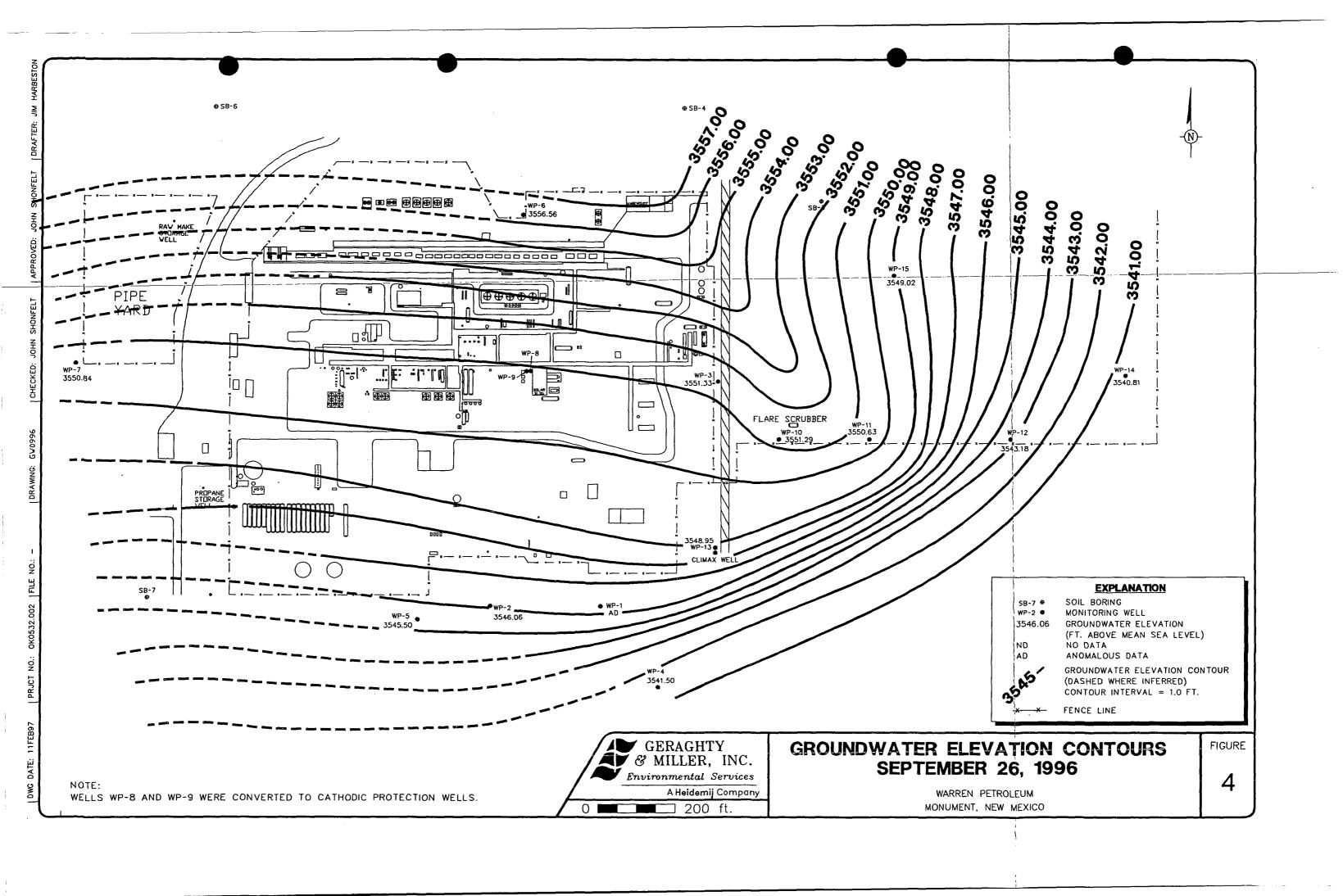
Table 3	-A, Vo	lume of	Total Fluid	ds and H	ydrocarbo	n Recov	ered, gal	lons	
		Monitor Well WP-2				Monitor Well WP-3			
Period		Total Fluids Recovered				Total Fluids Recovered		Hydrocarbo	n Recovered
Cove	red	This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative
From	To	Period	Total	Period	Total	Period	Total	Period	Total
7/5/95	7/12/95		0	_	0	1,245	1,245		0
2/5/96	2/22/96		0		0	1,058	2,303	720	720
2/22/96	3/9/96		0		0	750	3,053	397	1,117
3/9/96	3/25/96		0		0	430	3,483		1,547
3/25/96	3/31/96		0		0	440	3,923		1,877
3/31/96	4/6/96		0		0	250	4,173		2,027
4/6/96	4/12/96		0		0	150			2,177
4/12/96	4/15/96		0		0	140	4,463	100	2,277
4/15/96	4/18/96		0		0	147	4,610		2,404
4/18/96	4/23/96		0		0	200	4,810	150	2,554
4/23/96	5/2/96		0		0	150	4,960	100	2,654
5/2/96	6/1/96		0		0	800	5,760		3,364
6/1/96	7/1/96		0		0	1,115			4,201
7/1/96	9/2/96		0		0	1,653			5,320
9/2/96	10/1/96		0	<u> </u>	0	660	9,188		5,560
			0		0		9,188		5,560
			0		0		9,188		5,560
			0		0		9,188		5,560
			0		0		9,188		5,560
		<u> </u>	0		0		9,188		5,560
			0	<u> </u>	0		9,188		5,560
			0		0		9,188		5,560
			0	<u> </u>	0		9,188		5,560
			0		0		9,188		5,560
			0		0		9,188	1	5,560
			0		0		9,188		5,560
			0		0		9,188		5,560
			0	1	0		9,188		5,560
			0		0		9,188		5,560
			0		0		9,188		5,560

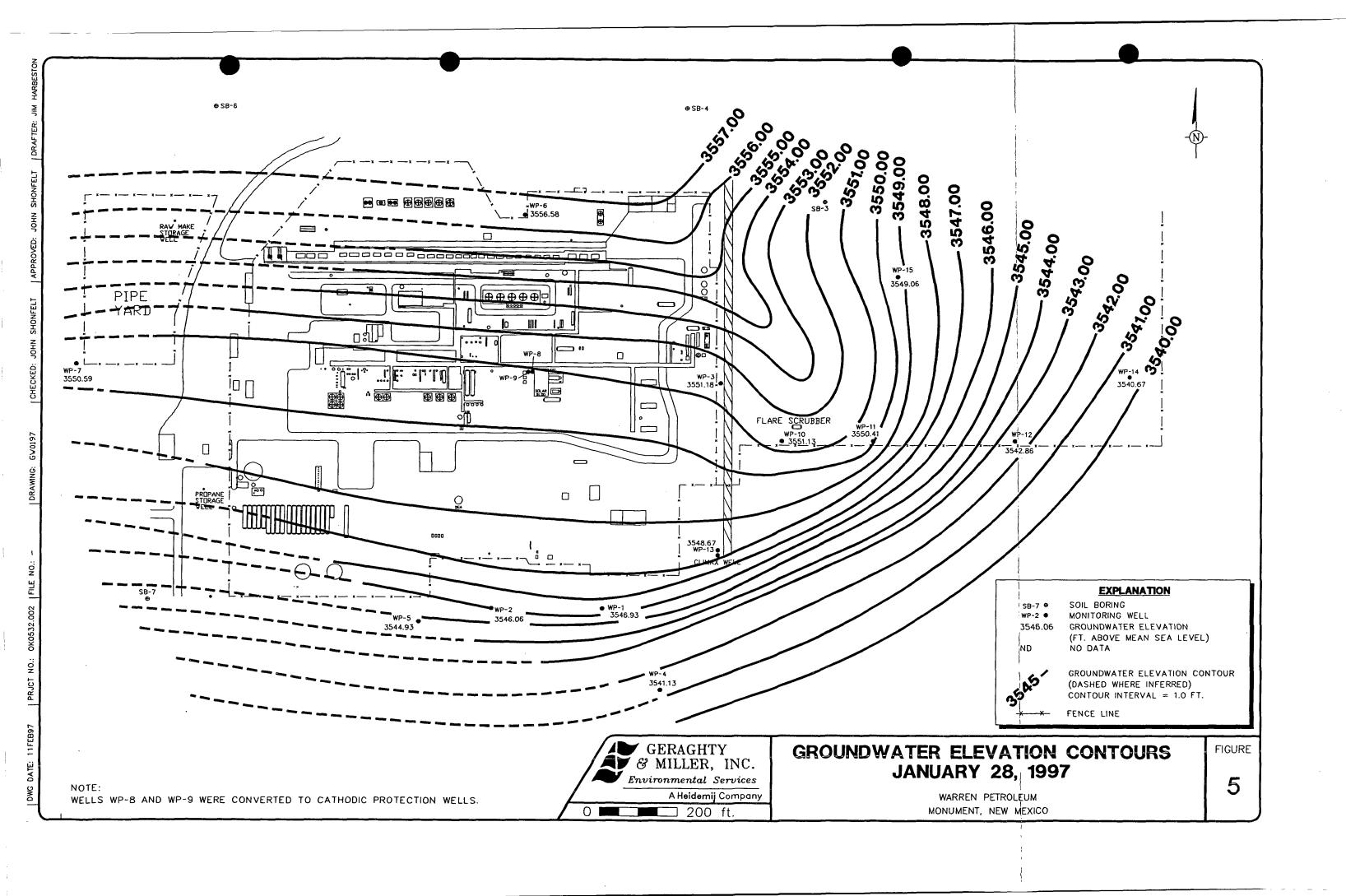
Table 3	-B, Vo		Total Fluid		ydrocarbo				
		Monitor Well WP-4			Monitor Well WP-10				
Period		Total Fluids Recovered		Hydrocarbon Recovered		Total Fluids Recovered		Hydrocarbo	n Recovered
Cove	ered	This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative
From	To	Period	Total	Period	Total	Period	Total	Period	Total
8/2/95	8/14/95		1,386	0	0		0		0
8/14/95	9/7/95	1,027	2,413	0	0		0		0
	10/24/95	1,005	3,418	0	0		0		0
	11/12/95	715	4,133	0	0	•	0		0
	12/15/95	630	4,763	585	585		0		0
12/20/95	1/13/96	705	5,468	650	1,235		0		0
2/22/96	3/12/96		5,468		1,235		920	190	190
3/12/96	3/13/96		5,468		1,235	60	980	10	200
5/13/96	5/29/96	1,202	6,670	605	1,840		980		200
6/26/96	8/19/96	1,024	7,694	506	2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346	1	980		200
			7,694		2,346	1	980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			7,694		2,346		980		200
			l	<u> </u>	<u> </u>				

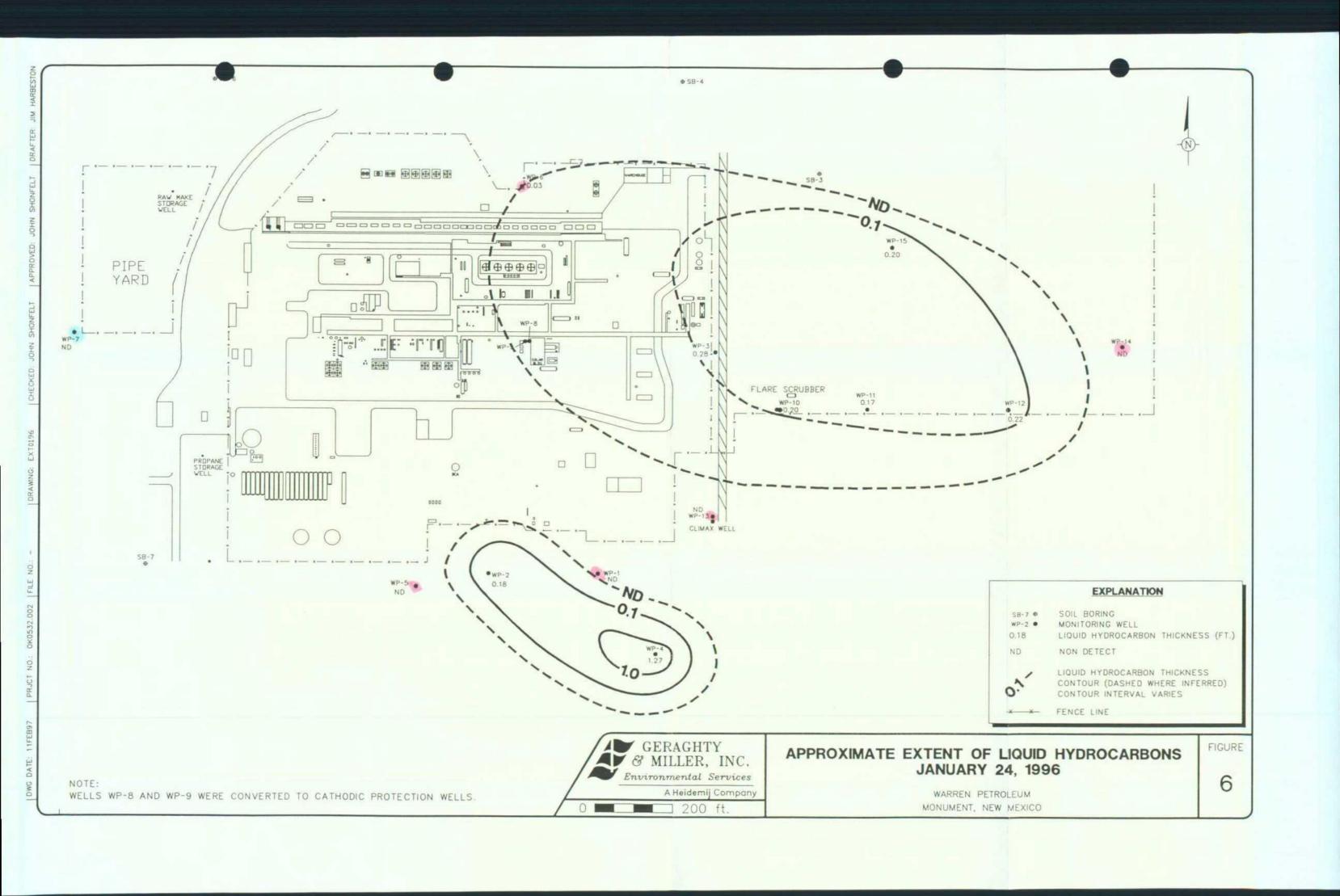


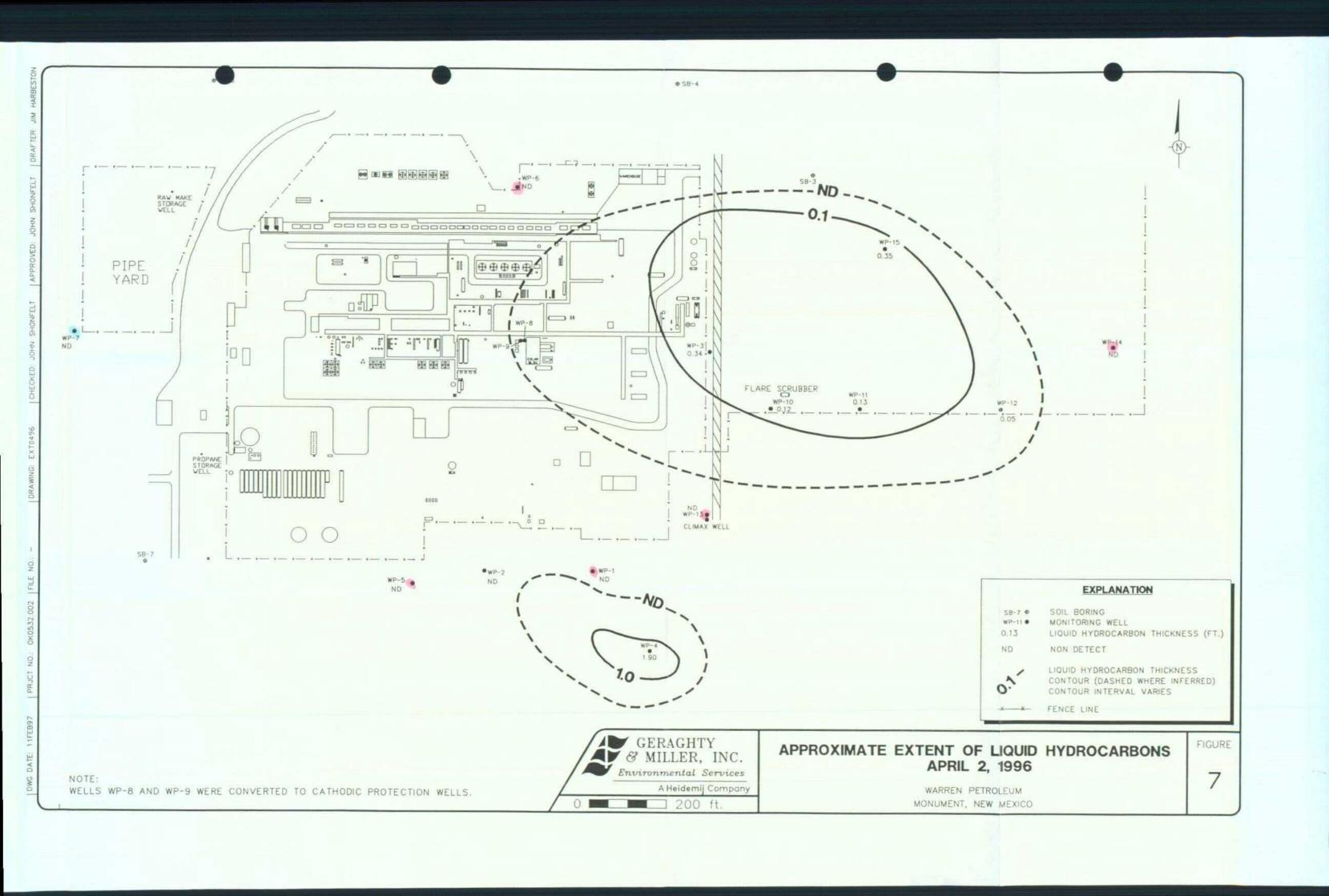


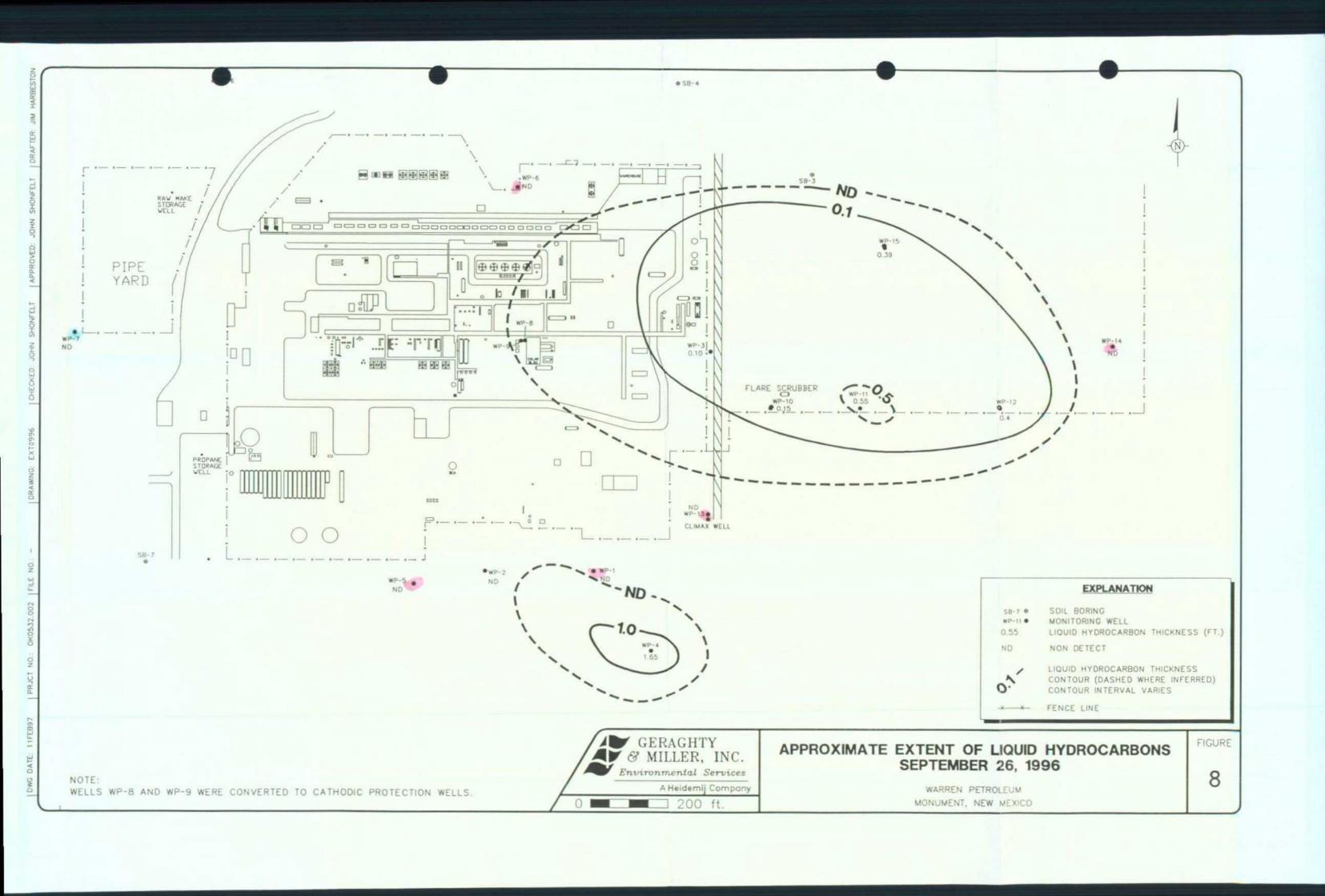


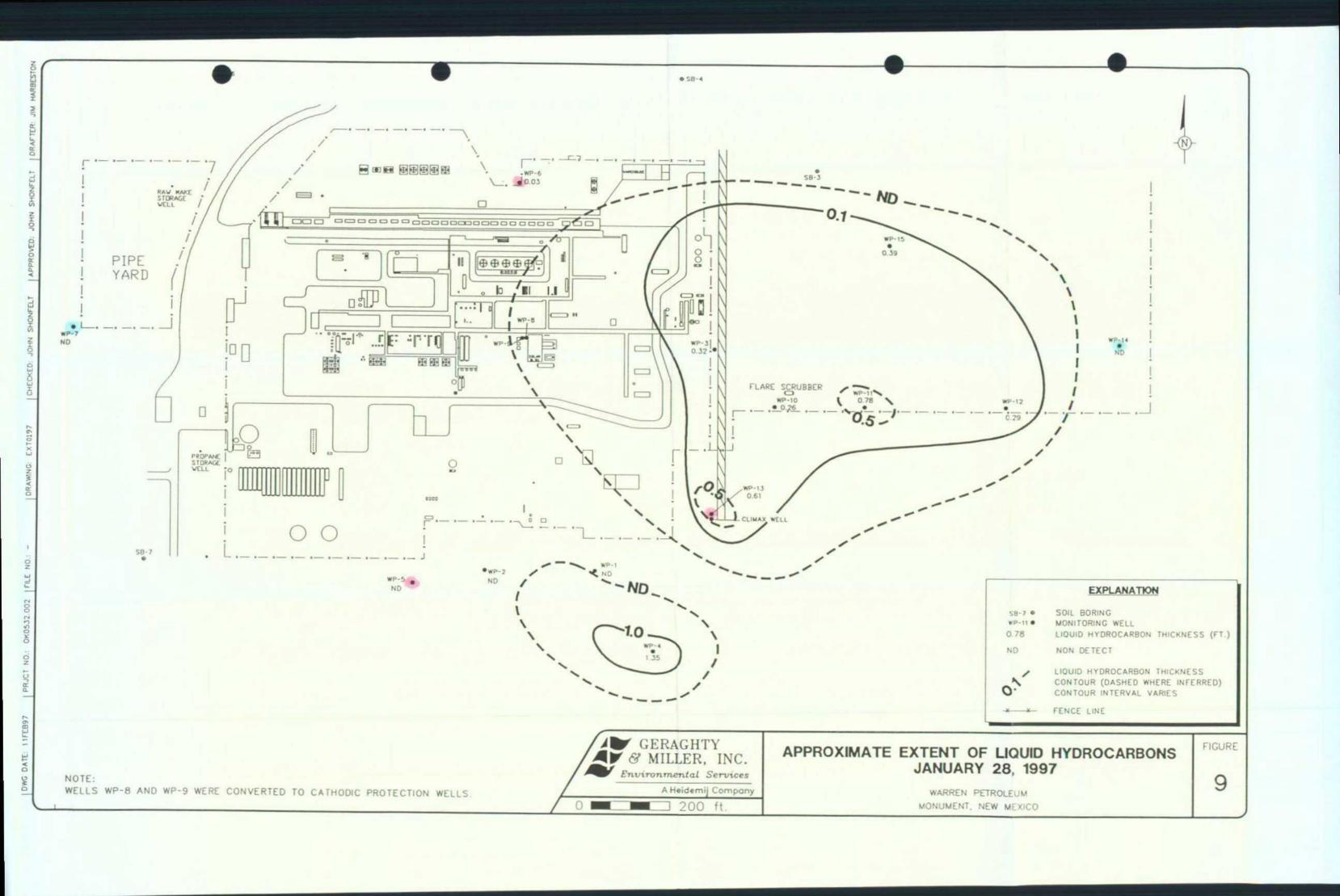






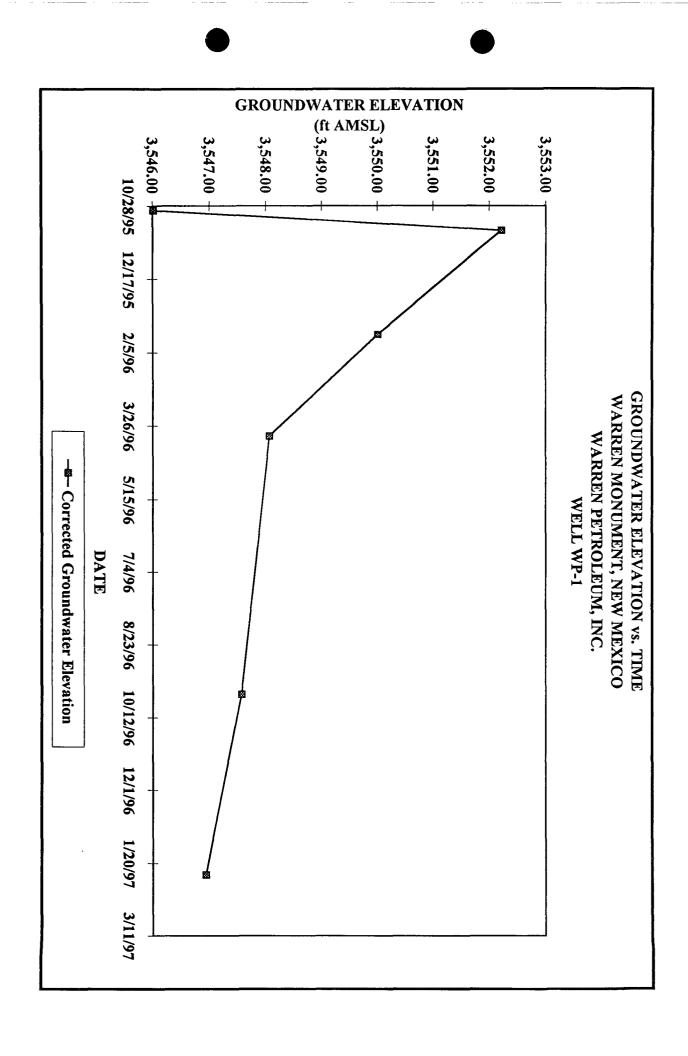


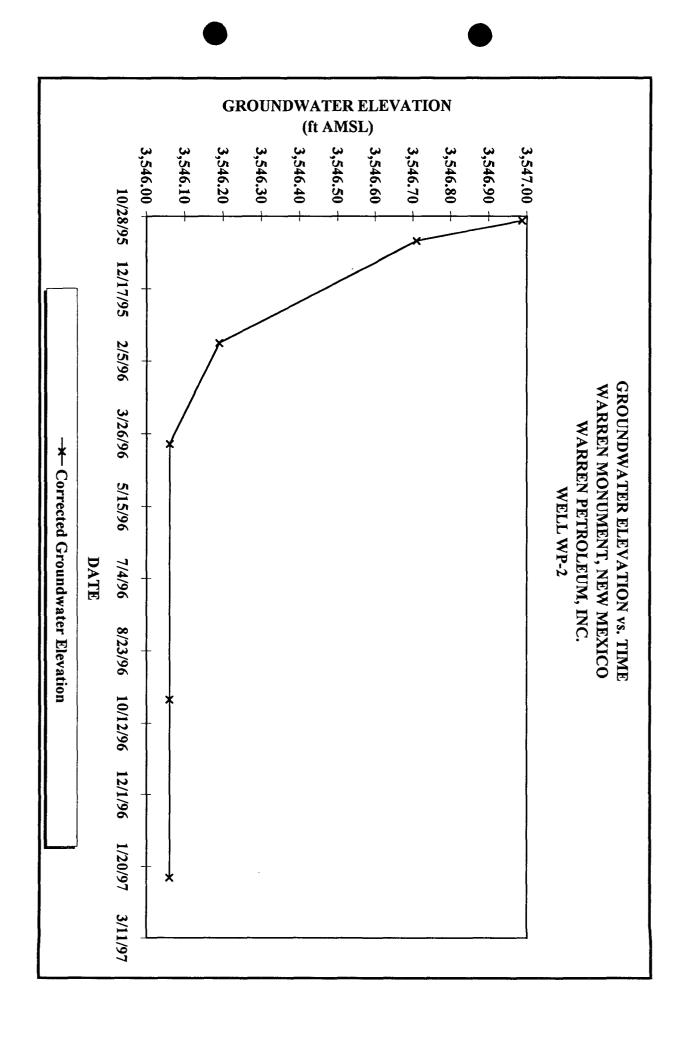


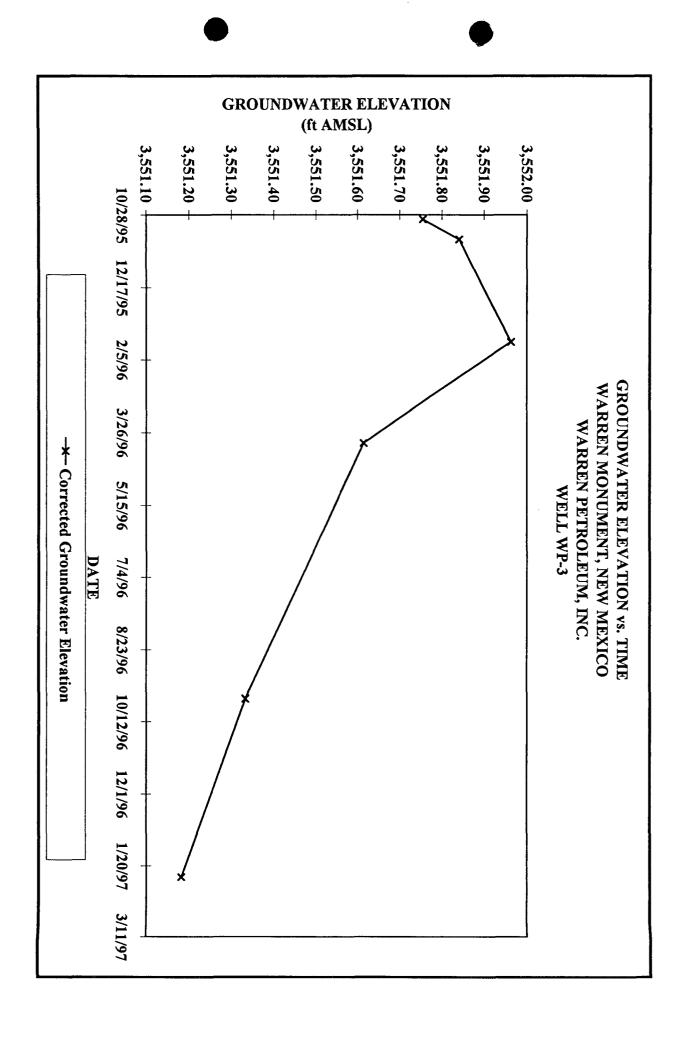


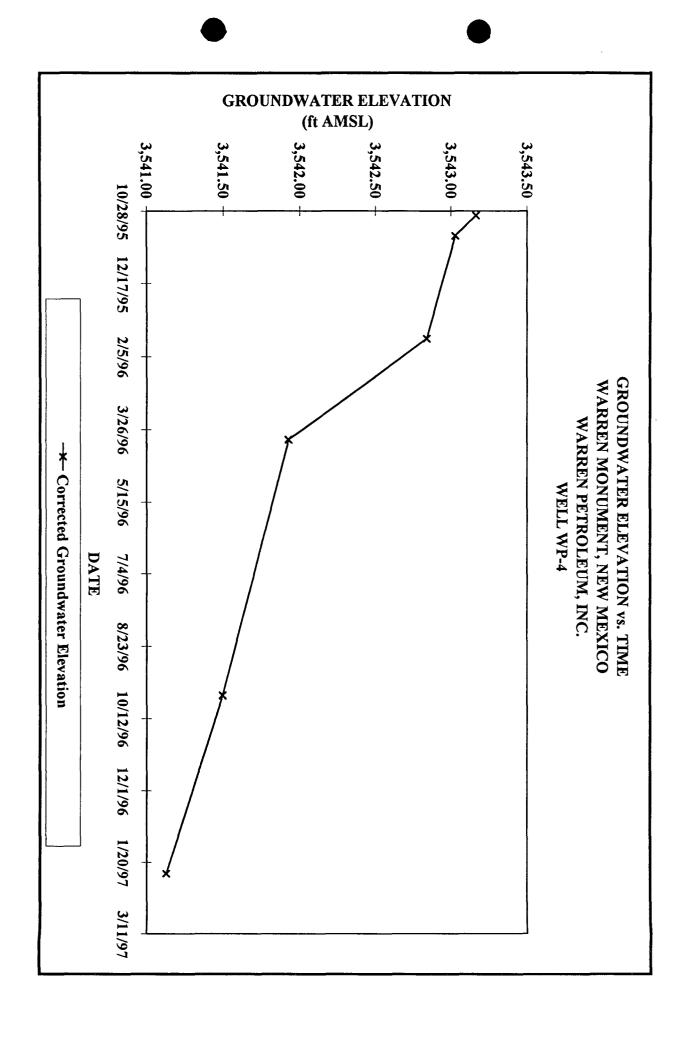
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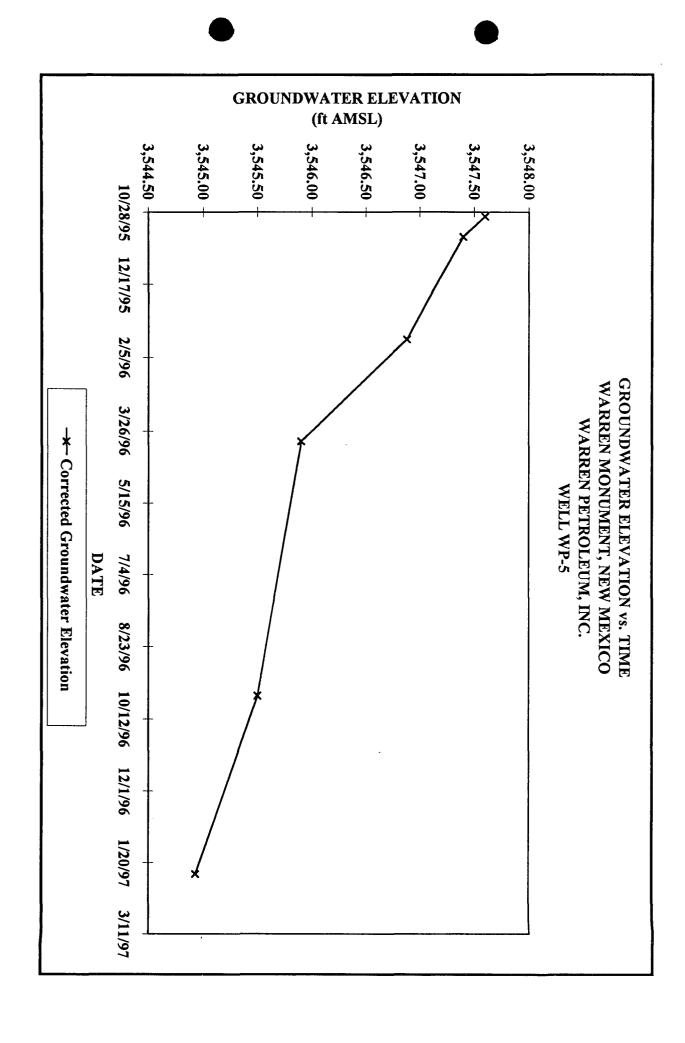
## ATTACHMENT A

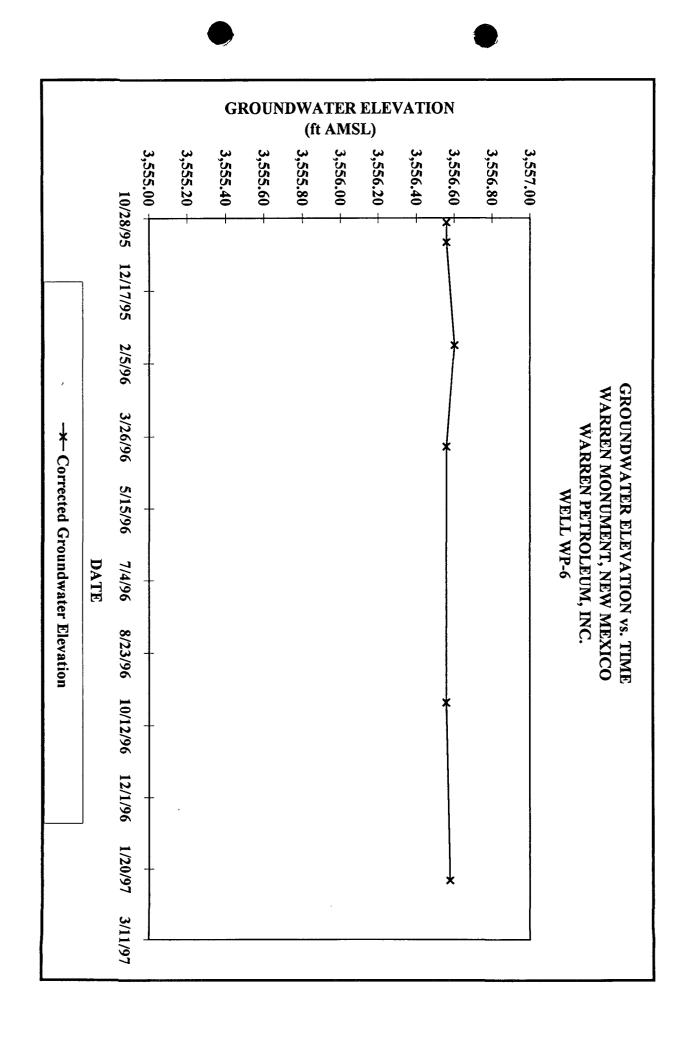


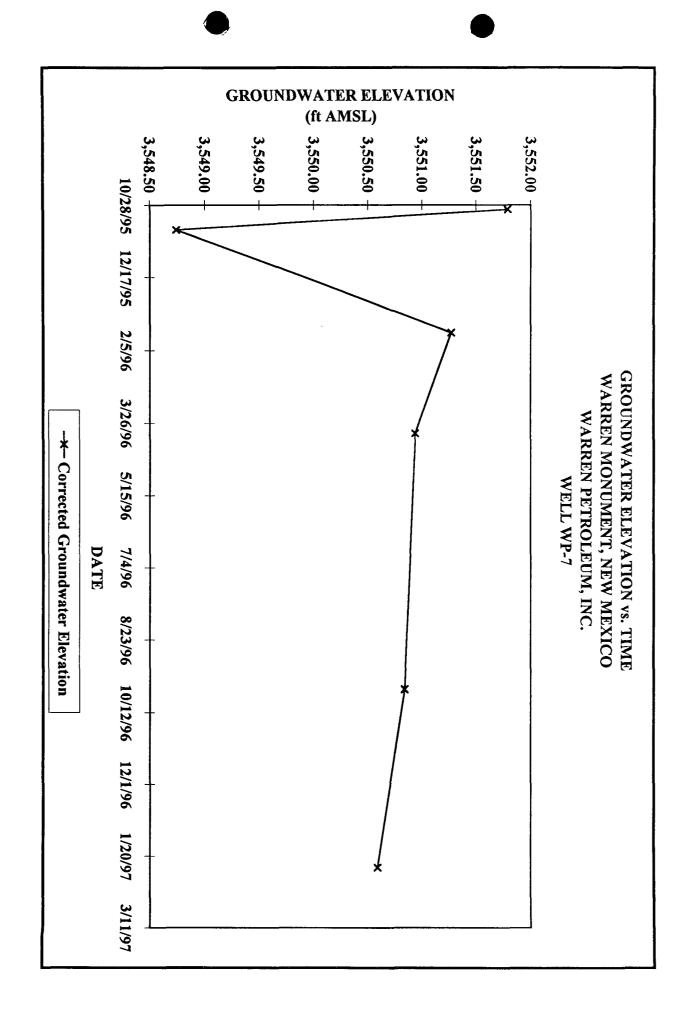


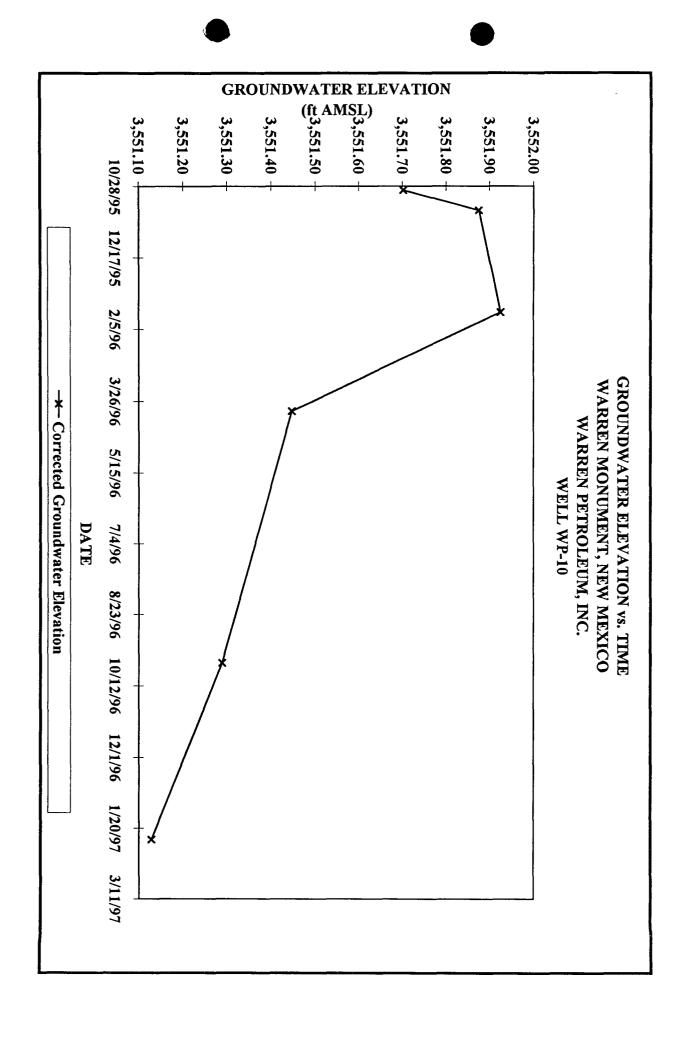


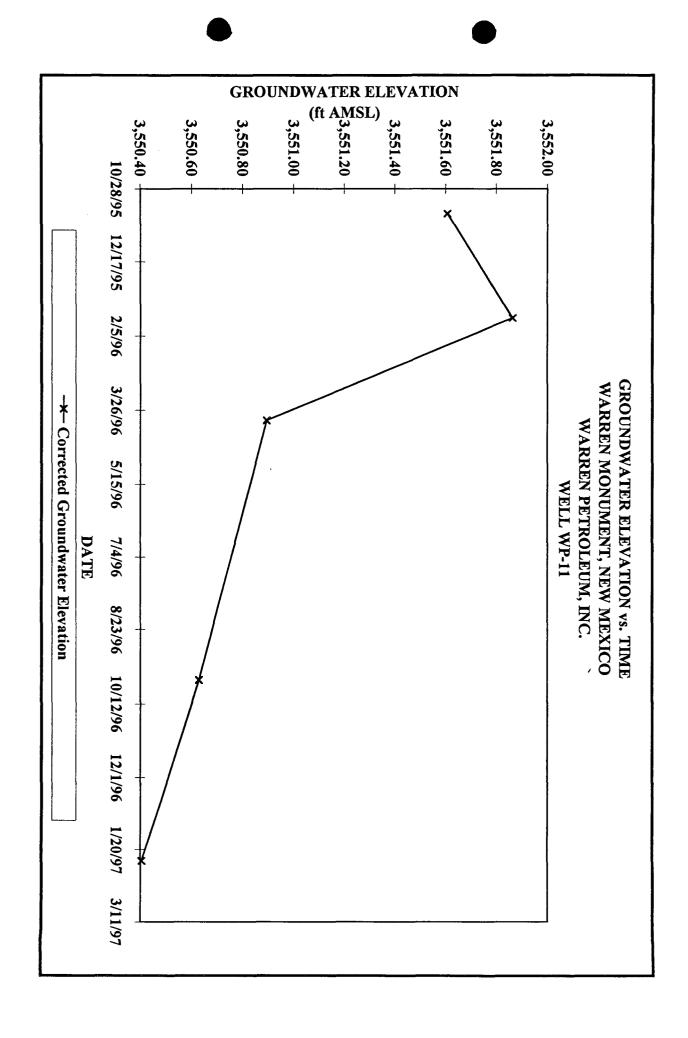


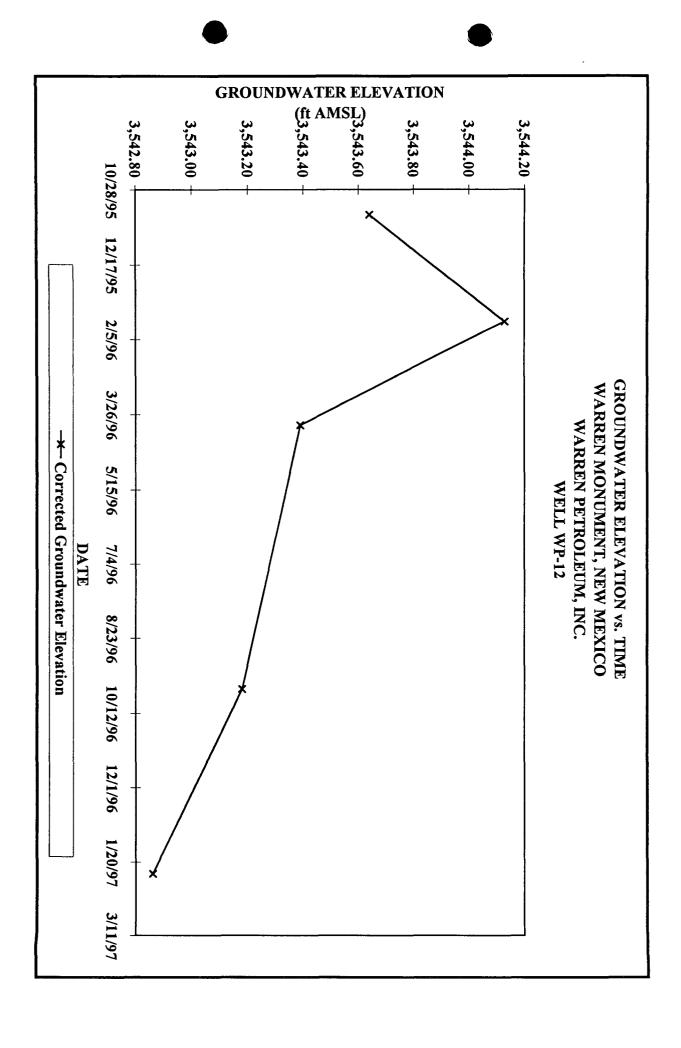


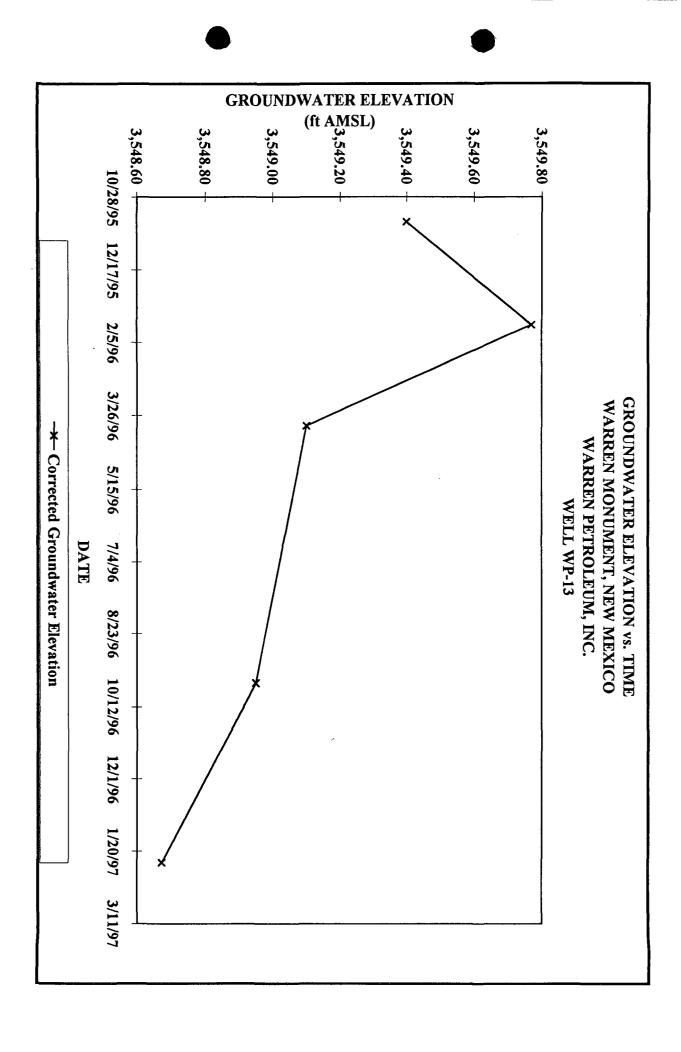


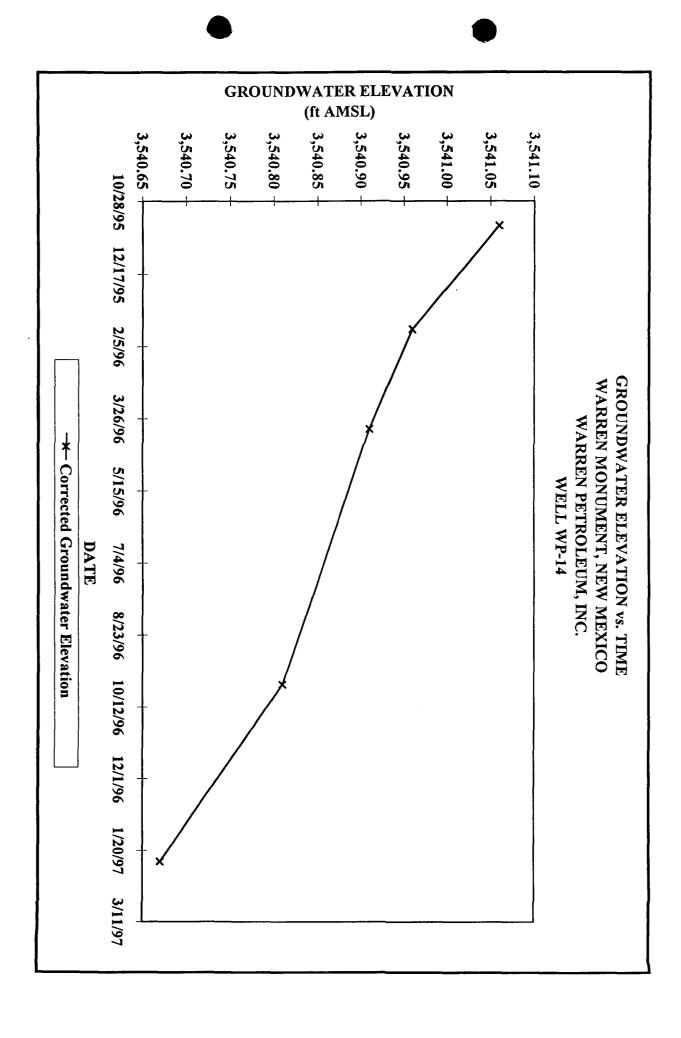


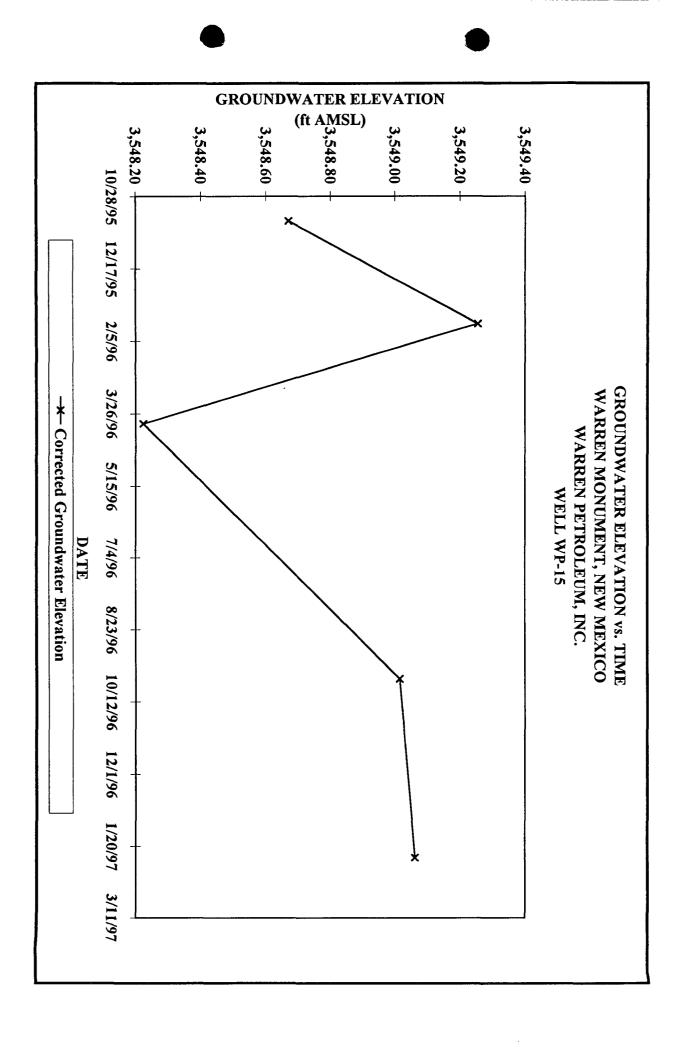




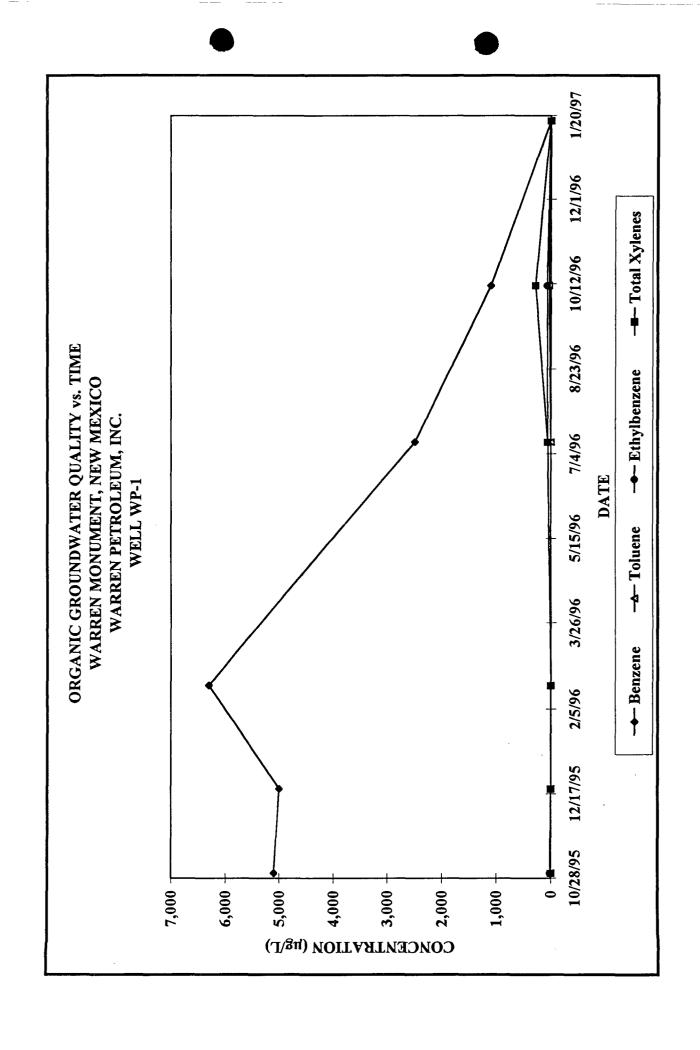


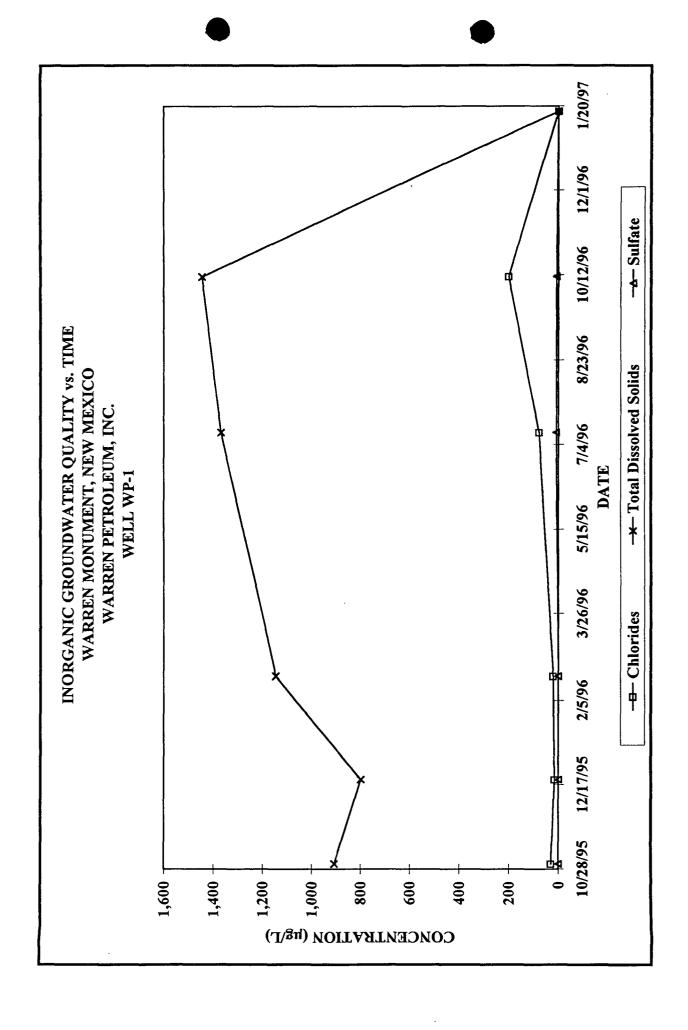


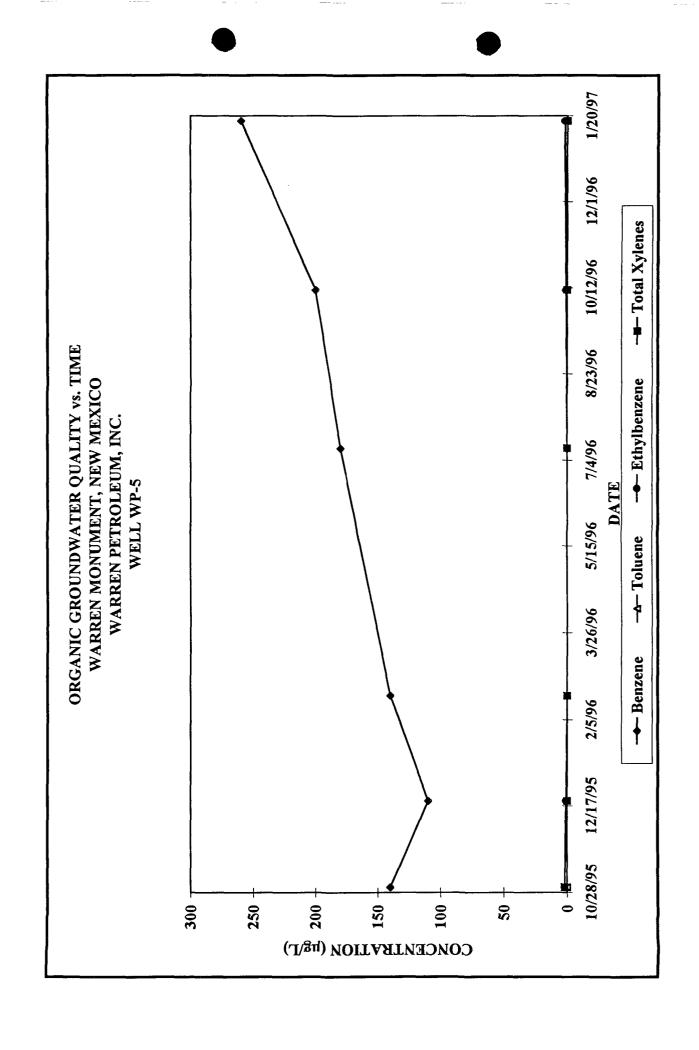


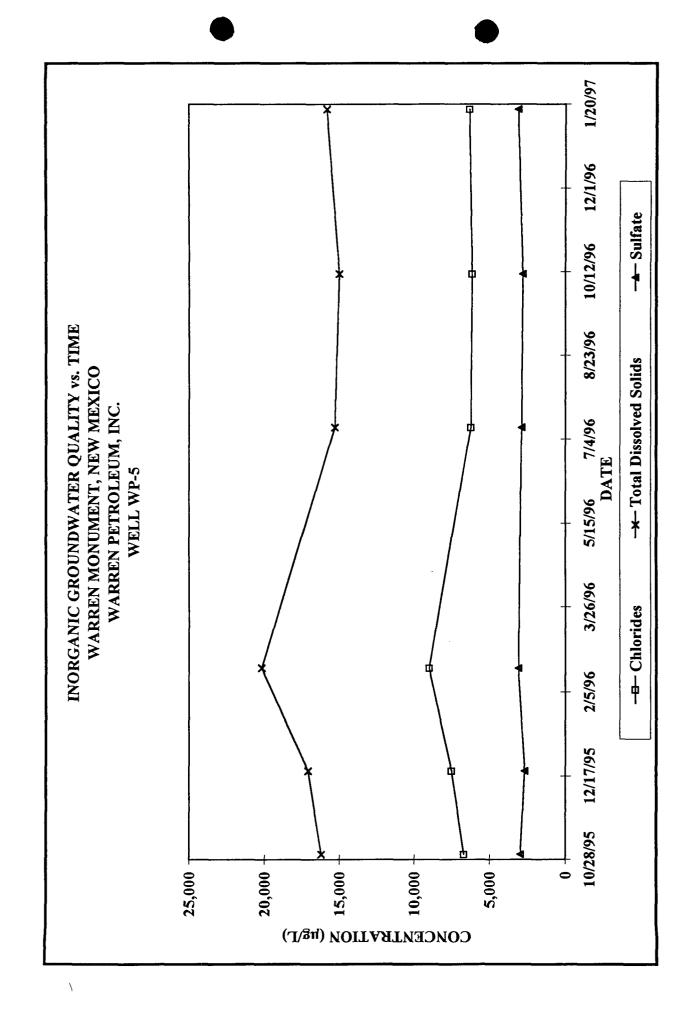


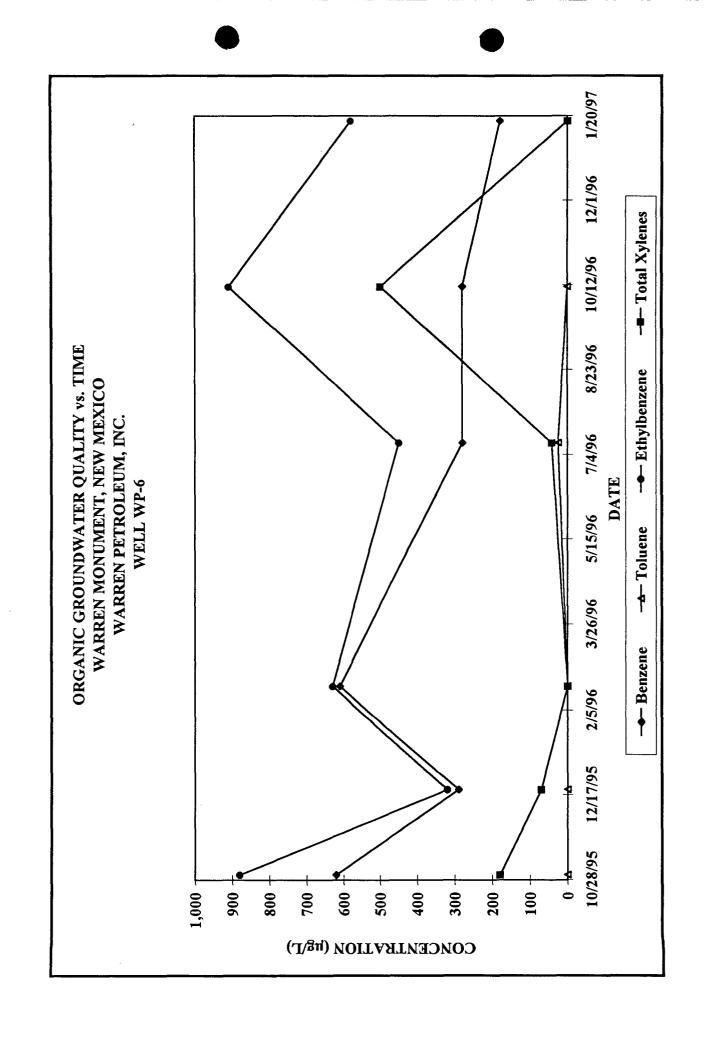
## **ATTACHMENT B**

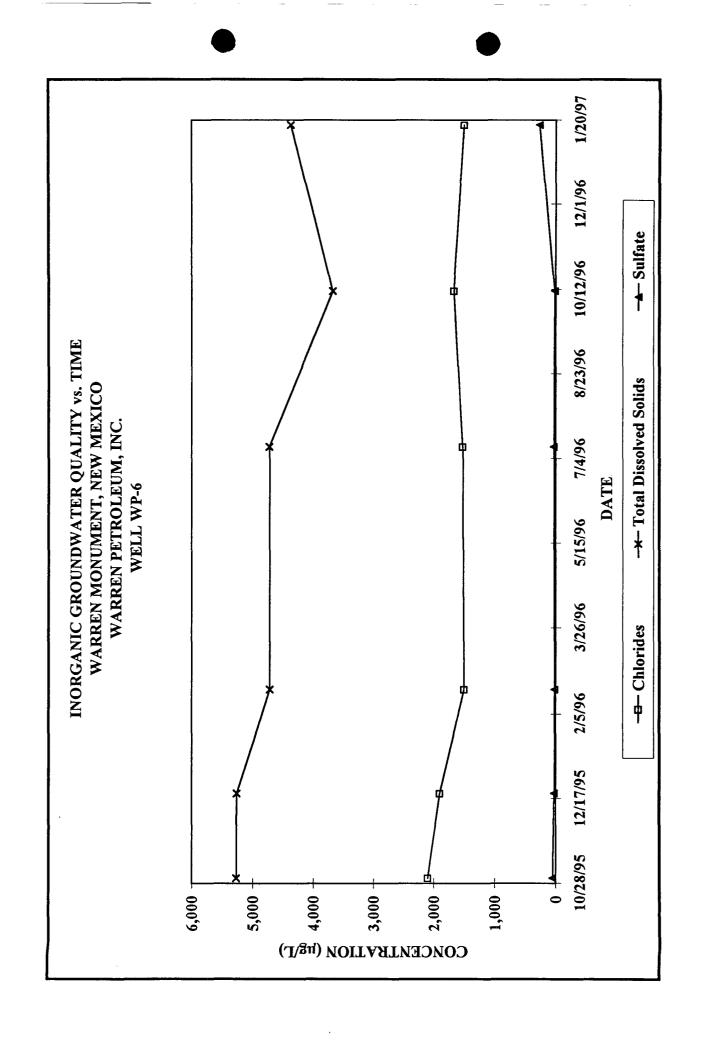


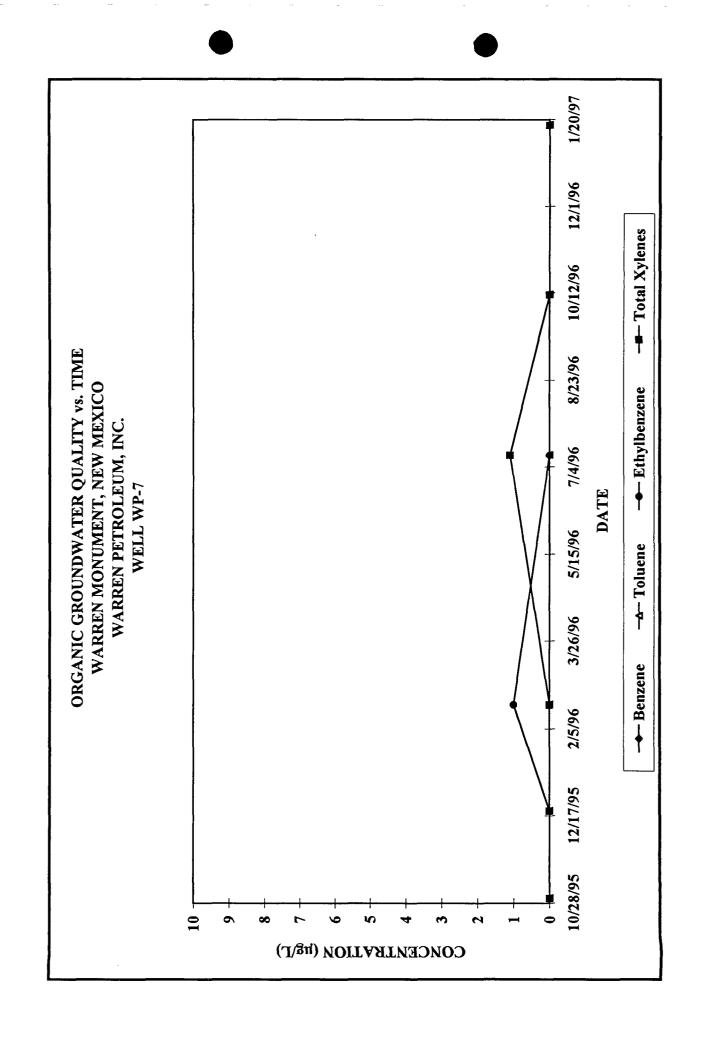


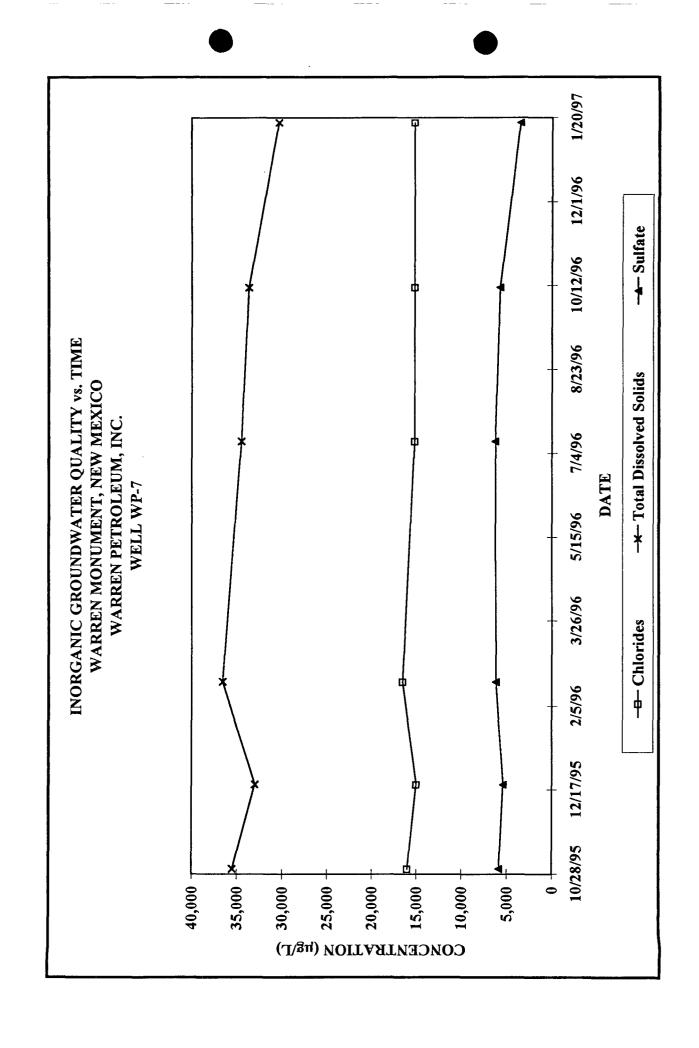


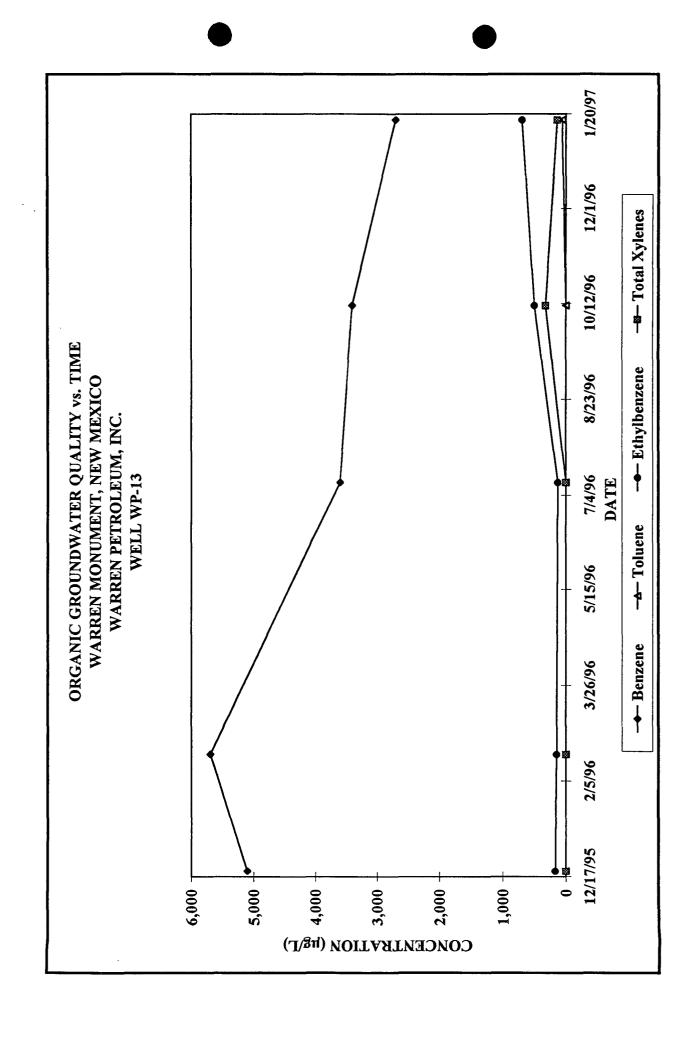


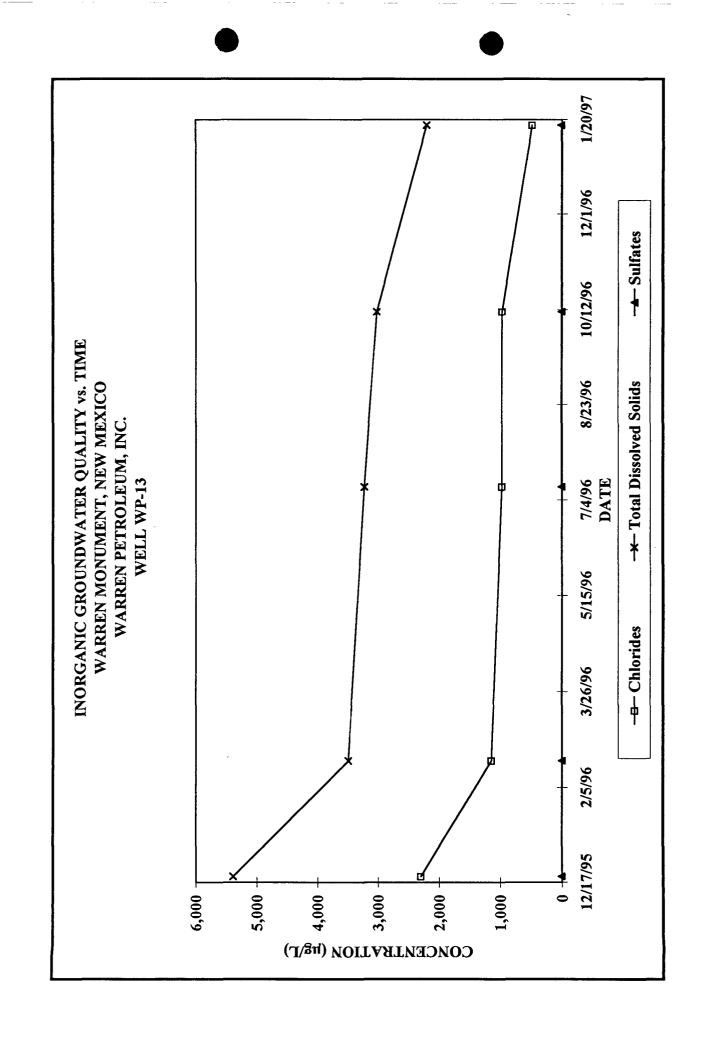


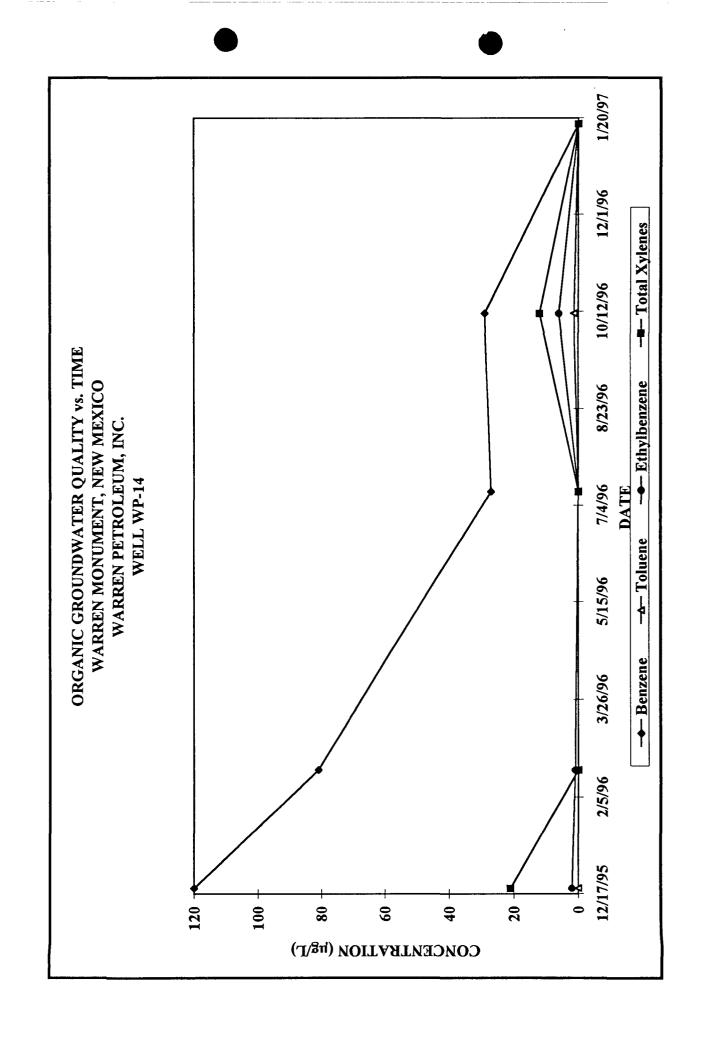


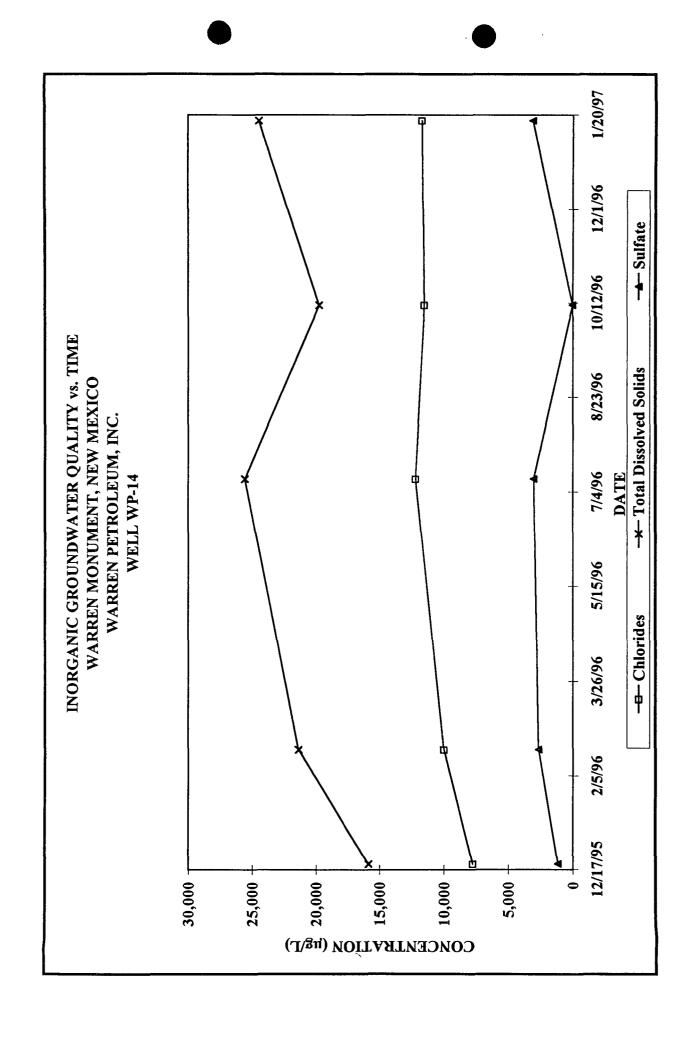












# ATTACHMENT C



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

SPL, INC.

### REPORT APPROVAL SHEET

WORK ORDER NUMBER: 96 - 02 - 880

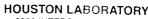
Approved for release by:

Date: 3/6/96

Date: 3/6/00

M. Scott Sample, Laboratory Director

Debbie Proctor, Project Manager





8880 INTERCHAN 3E DRIVE HOUSTON, TEXAS 77054 PHONE (713) 650-0901

### CASE NARRATIVE

WORKORDER NO.: 9602880

Southern Petroleum Laboratories (SPL) is pleased to present the results of laboratory analysis to Warren Petroleum Company. Six water samples and one trip blank were received intact at our laboratory on 02/20/96 at a temperature of 4 degrees Celsius. The following is a brief narrative of the laboratory analysis.

The samples were analyzed for BTEX by SW 846 8020 and a variety of cations and anions. There were no deviations from the methods.

All of the quality control data was within acceptable limits for the samples associated with this work order, with the exception of the matrix spike/matrix spike duplicate (MS/MSD) analysis for Total Calcium, Potassium, and Magnesium on sample 9602880-02B, MW#5. The MS/MSD recoveries were higher than the advisory QC limits. However, the recovery of the laboratory control standard was within acceptable limits and the entire analysis is considered to be in control.

Please refer to this project by 9602880 to expedite any further discussions. I will be happy to address any questions or concerns you may have.

SOUTHERN PETROLEUM LABORATORIES

Debbie Proctor

Project Manager



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

# Certificate of Analysis NO. 9602880-01

For: Warren Petroleum

P.O. Box 67 Monument, NM 88265

Attn: Oscar DeLeon

PROJECT: Liquid Analysis SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #1** 

P.O. #:

DATE: 03/04/96

PROJECT NO: 118

**MATRIX**: Water

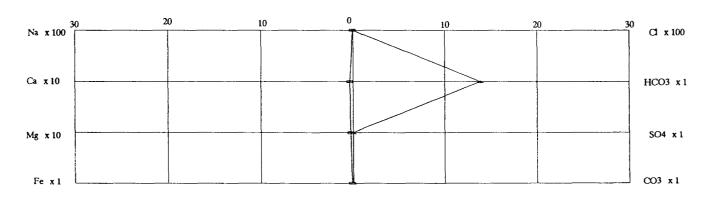
DATE SAMPLED: 02/19/96 13:00:00

DATE RECEIVED: 02/20/96

# ANALYTICAL DATA

ION	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	176.49	7.68	Total Dissolved Solids	
Calcium, Ca	74.7	3.73	(calc.) mg/L	1164.12
Magnesium, Mg	34.2	2.81	, , ,	
Chloride, Cl	21	0.59	Specific Gravity	
Bicarbonate, CaCO3	848	13.90	60/60 deg. F.	1.0000
Sulfate SO4	0	0.00		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	4.06	0.15	(Mohm-cm) 75 deg. F.	0.6640
Barium, Ba	1.67	0.02		
			pН	
			pH units	7.25

# MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9602880-02

For: Warren Petroleum

P.O. Box 67

Monument, NM 88265

Attn: Oscar DeLeon

PROJECT: Liquid Analysis SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #5** 

P.O. #:

DATE: 03/04/96

PROJECT NO: 118

MATRIX: Water

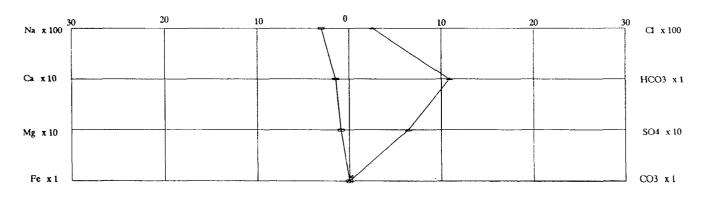
**DATE SAMPLED:** 02/19/96 13:30:00

DATE RECEIVED: 02/20/96

# **ANALYTICAL DATA**

ION	mg/L	meg/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	6978.54	303.55	Total Dissolved Solids	
Calcium, Ca	295	14.72	(calc.) mg/L	20201.66
Magnesium, Mg	112	9.21	, , ,	
Chloride, Cl	9000	253.88	Specific Gravity	
Bicarbonate, CaCO3	664	10.88	60/60 deg. F.	1.0100
Sulfate SO4	3090	64.33	-	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.09	0.00	(Mohm-cm) 75 deg. F.	0.0490
Barium, Ba	0.03	0.00	, , ,	
			pН	
			pH units	7.11
			•	

## MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9602880-03

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 03/04/96

Attn: Oscar DeLeon PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #6** 

PROJECT NO: 118

MATRIX: Water

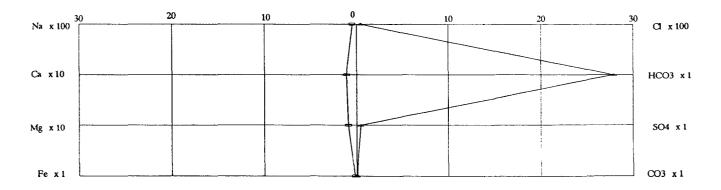
**DATE SAMPLED:** 02/19/96 11:00:00

DATE RECEIVED: 02/20/96

# ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	1133.2	49.29	Total Dissolved Solids	
Calcium, Ca	228	11.38	(calc.) mg/L	4718.46
Magnesium, Mg	113	9.30		
Chloride, Cl	1500	42.31	Specific Gravity	
Bicarbonate, CaCO3	1700	27.86	60/60 deg. F.	1.0020
Sulfate SO4	21	0.44	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	5.53	0.20	(Mohm-cm) 75 deg. F.	0.1540
Barium, Ba	0.73	0.01	, , ,	
			рH	
•			pH units	7.37
			•	

# MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9602880-04

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 03/04/96

Attn: Oscar DeLeon

PROJECT: Liquid Analysis SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #7** 

PROJECT NO: 118 MATRIX: Water

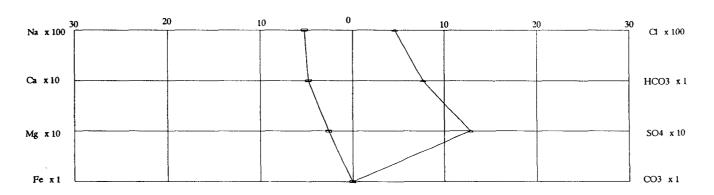
**DATE SAMPLED: 02/19/96 10:00:00** 

DATE RECEIVED: 02/20/96

# **ANALYTICAL DATA**

ION	mg/L	meg/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	12029.18	523.24		
Calcium, Ca	964	48.10	(calc.) mg/L	36586.83
Magnesium, Mg	320	26.32	, , -	
Chloride, Cl	16500	465.44	Specific Gravity	
Bicarbonate, CaCO3	470	7.70	60/60 deg. F.	1.0250
Sulfate SO4	6160	128.25	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	1.58	0.06	(Mohm-cm) 75 deg. F.	0.0230
Barium, Ba	0.07	0.00	, ,	
			рH	
			pH units	6.92
			_	

# MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9602880-05

For: Warren Petroleum

P.O. Box 67

Monument, NM 88265

Attn: Oscar DeLeon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #13** 

P.O. #:

DATE: 03/04/96

PROJECT NO: 118

MATRIX: Water

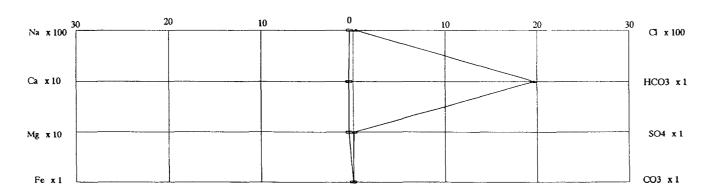
**DATE SAMPLED:** 02/19/96 14:00:00

DATE RECEIVED: 02/20/96

# **ANALYTICAL DATA**

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	973.14	42.33	Total Dissolved Solids	
Calcium, Ca	97.2	4.85	(calc.) mg/L	3494.65
Magnesium, Mg	57.6	4.74		
Chloride, Cl	1150	32.44	Specific Gravity	
Bicarbonate, CaCO3	1200	19.67	60/60 deg. F.	0.9990
Sulfate SO4	5	0.10	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	1.49	0.05	(Mohm-cm) 75 deg. F.	0.1980
Barium, Ba	2.22	0.03	, ,	
			pН	
			pH units	7.19

### MINERAL ANALYSIS PATTERN





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

### Certificate of Analysis NO. 9602880-06

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

Attn: Oscar DeLeon

Oscar DeLeon L

PROJECT: Liquid Analysis SITE: Monument, NM

SAMPLE BY: Warren Petroleum

SAMPLE ID: MW #14

DATE: 03/04/96

PROJECT NO: 118

P.O. #:

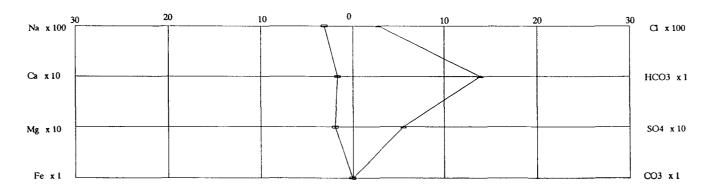
**MATRIX:** Water **DATE SAMPLED:** 02/19/96 14:30:00

DATE RECEIVED: 02/20/96

# ANALYTICAL DATA

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	<b>RESULT</b>
Sodium, Na (Calc.)	7217.5	313.94	<b>Total Dissolved Solids</b>	
Calcium, Ca	334	16.67	(calc.) mg/L	21366.21
Magnesium, Mg	236	19.41	, ,	
Chloride, Cl	10000	282.09	Specific Gravity	
Bicarbonate, CaCO3	849	13.91	60/60 deg. F.	1.0140
Sulfate SO4	2670	55.59	-	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	1.62	0.06	(Mohm-cm) 75 deg. F.	0.0320
Barium, Ba	0.09	0.00	• • •	
			pН	
			pH units	6.91

# MINERAL ANALYSIS PATTERN





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

### Certificate of Analysis No. H9-9602880-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 13:00:00

SAMPLE ID: MW #1

DATE RECEIVED: 02/20/96

ANALYTICAL DATA				
PARAMETER	RESULTS	DETECTION LIMIT	UNITS	
BENZENE	6300	1000 P	μg/L	
TOLUENE	ND	1000 P	μg/L	
ETHYLBENZENE	ND	1000 P	μg/L	
TOTAL XYLENE	ND	1000 P	μg/L	
TOTAL VOLATILE AROMATIC HYDROCARBONS	6300		μg/L	
Surrogate	% Recovery			
1,4-Difluorobenzene	82			
4-Bromofluorobenzene METHOD 8020A *** Analyzed by: YN Date: 03/01/96	68			
Barium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	1.67	0.005	mg/L	
Calcium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	74.7	0.1	mg/L	
Iron, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	4.06	0.02	mg/L	

<sup>(</sup>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: Tost Methods for Evaluating Solid Waste, EPA SW846, 3rd 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. H9-9602880-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1

PROJECT NO: 118

MATRIX: WATER

DATE SAMPLED: 02/19/96 13:00:00

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	4	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	34.2	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	21	1	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	848	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 TIS) 660-0901

## Certificate of Analysis No. H9-9602880-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

MATRIX: WATER

PROJECT NO: 118

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 13:00:00

SAMPLE ID: MW #1

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	176	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/20/96	7.25		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/20/96	0.664		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/20/96	ND	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/20/96	1.000		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	1164	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. H9-9602880-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE ID: MW #5

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 13:30:00

DATE RECEIVED: 02/20/96

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	140	10 P	μg/L
TOLUENE	ND	10 P	μg/L
ETHYLBENZENE	ND	10 P	μg/L
TOTAL XYLENE	ND	10 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	140		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	83		
4-Bromofluorobenzene METHOD 8020A *** Analyzed by: YN Date: 03/01/96	76		
Barium, Total  METHOD 6010A ***  Analyzed by: DQ  Date: 02/22/96	0.028	0.005	mg/L
Calcium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	295	0.1	mg/L
Iron, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	0.09	0.02	mg/L

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9602880-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118

MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

**DATE SAMPLED:** 02/19/96 13:30:00

SAMPLE ID: MW #5

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	62	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	112	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	9000	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	664	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: 03/04/96

### Certificate of Analysis No. H9-9602880-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT: Liquid Analysis PROJ

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5

PROJECT NO: 118

MATRIX: WATER

DATE SAMPLED: 02/19/96 13:30:00

DATE RECEIVED: 02/20/96

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	6978	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/20/96	7.11		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/20/96	0.049		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/20/96	3090	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/20/96	1.010		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	20202	1	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.



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

### Certificate of Analysis No. H9-9602880-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE ID: MW #6

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 11:00:00

DATE RECEIVED: 02/20/96

ANALYTICAI	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	610	500 P	μg/L
TOLUENE	ND	500 P	μg/L
ETHYLBENZENE	630	500 P	μg/L
TOTAL XYLENE	ND	500 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	1240		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	82		
4-Bromofluorobenzene	80		
METHOD 8020A ***			
Analyzed by: YN			
Date: 03/01/96			
Barium, Total	0.734	0.005	mg/L
METHOD 6010A ***			
Analyzed by: DQ			
Date: 02/22/96			
Calcium, Total	228	0.1	mg/L
METHOD 6010A ***			
Analyzed by: DQ			
Date: 02/22/96			
Iron, Total	5.53	0.02	mg/L
METHOD 6010A ***			-
Analyzed by: DQ			
Date: 02/22/96			

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9602880-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118

MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 11:00:00

SAMPLE ID: MW #6

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	17	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	113	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	1500	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	1700	. 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. H9-9602880-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 11:00:00

SAMPLE ID: MW #6

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	1133	. 1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/20/96	7.37		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/20/96	0.154		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/20/96	21	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/20/96	1.002		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	4718	1	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.



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

### Certificate of Analysis No. H9-9602880-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118

SAMPLED BY: Warren Petroleum Company

MATRIX: WATER
DATE SAMPLED: 02/19/96 10:00:00

SAMPLE ID: MW #7

DATE RECEIVED: 02/20/96

		ANALYTICAL	DATA			
PARAMETER				RESULTS	DETECT:	ION UNITS
BENZENE				ND	1 P	μg/L
TOLUENE				ND	1 P	μg/L
ETHYLBENZENE				l	1 P	μg/L
TOTAL XYLENE				ND	1 P	μg/L
TOTAL VOLATII	LE AROMATIC	HYDROCARBONS		1		μg/L
Surrogate	<b>.</b>		% R	ecovery		
	orobenzene			76		
METHOD 8020A Analyzed by:				80		
Barium, Total METHOD 6010A Analyzed by: Date:				0.074	0.005	mg/L
Calcium, Total METHOD 6010A Analyzed by: Date:	* * *	·		964	0.5	mg/L
Iron, Total METHOD 6010A Analyzed by: Date:				1.58	0.02	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.

<sup>(</sup>P) - Practical Quantitation Limit



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

DATE: 03/04/96

### Certificate of Analysis No. H9-9602880-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT NO: 118

PROJECT: Liquid Analysis PROJECT N
SITE: Monument, NM MATRI

MATRIX: WATER
DATE SAMPLED: 02/19/96 10:00:00

SAMPLED BY: Warren Petroleum Company SAMPLE ID: MW #7

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	142	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	320	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	16500	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	470	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. H9-9602880-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118

MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 10:00:00

SAMPLE ID: MW #7 DATE RECEIVED: 02/20/96

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULAT Analyzed by: DA Date: 02	MΔ		12029	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02			6.92		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02			0.023		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02			6160	500	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02			1.025		
Total Dissolved METHOD CALCULAT Analyzed by: DA Date: 02	MY.		36587	1	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.



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

### Certificate of Analysis No. H9-9602880-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

DATE RECEIVED: 02/20/96

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 14:00:00

SAMPLE ID: MW #13

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	5700	50 P	μg/L
TOLUENE	ND	50 P	μg/L
ETHYLBENZENE	150	50 P	μg/L
TOTAL XYLENE	CIN	50 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	5850		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	86		
METHOD 8020A ***			
Analyzed by: YN			
Date: 03/01/96			
Barium, Total	2.22	0.005	mg/L
METHOD 6010A ***			
Analyzed by: DQ			
Date: 02/22/96			
Calcium, Total	97.2	0.1	mg/L
METHOD 6010A ***			
Analyzed by: DQ			
Date: 02/22/96			
Iron, Total	1.49	0.02	mg/L
METHOD 6010A ***			
Analyzed by: DQ			
Date: 02/22/96			

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9602880-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

DATE RECEIVED: 02/20/96

SAMPLED BY: Warren Petroleum Company

**DATE SAMPLED:** 02/19/96 14:00:00

SAMPLE ID: MW #13

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	8	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	57.6	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	1150	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	1200	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: 03/04/96

### Certificate of Analysis No. H9-9602880-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT: Liquid Analysis PROJECT NO: 118

SITE: Monument, NM MATRIX: WATER
SAMPLED BY: Warren Petroleum Company DATE SAMPLED: 02/19/96 14:00:00

SAMPLE ID: MW #13 DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	973	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/20/96	7.19		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/20/96	0.198		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/20/96	5	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/20/96	0.999		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	3495	1	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.



8880 INTERCHANGE DP /E HOUSTON, TEXAS 77034 PHONE (713) 660-090:

### Certificate of Analysis No. H9-9602880-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 14:30:00

SAMPLE ID: MW #14

DATE RECEIVED: 02/20/96

	. <del></del>			
	ANALYTICAL			
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
BENZENE		81	1 P	μg/L
TOLUENE		ND	1 P	μg/L
ETHYLBENZENE		1	1 P	$\mu g/L$
TOTAL XYLENE		ND	1 P	μg/L
TOTAL VOLATILE AROMATIC	HYDROCARBONS	82		$\mu g/L$
Surrogate		% Recovery		
1,4-Difluorobenzene		90		
4-Bromofluorobenzene METHOD 8020A ***		101		
Analyzed by: YN				
Date: 03/01/96				
Barium, Total		0.088	0.005	mg/L
METHOD 6010A ***			•	
Analyzed by: DQ				
Date: 02/22/96				
Calcium, Total		334	0.1	mg/L
METHOD 6010A ***				
Analyzed by: DQ				
Date: 02/22/96				
Iron, Total		1.62	0.02	mg/L
METHOD 6010A ***				
Analyzed by: DQ				
Date: 02/22/96				

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9602880-06

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 14:30:00

SAMPLE ID: MW #14

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	58	1	mg/L ·
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	236	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	10000	500 .	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	' 1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	849	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. H9-9602880-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14

PROJECT NO: 118

MATRIX: WATER

**DATE SAMPLED:** 02/19/96 14:30:00

DATE RECEIVED: 02/20/96

		ANTAT VTTCAT	ከአሞአ		
PARAMETER		ANALYTICAI	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULAT Analyzed by: DA Date: 02	M		7218	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02			6.91		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02			0.032		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02			2670	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02	i		1.014		
Total Dissolved METHOD CALCULAT Analyzed by: DA Date: 02	ION M		21366	1	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.



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

### Certificate of Analysis No. H9-9602880-07

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Provided by SPL

SAMPLE ID: Trip Blank

PROJECT NO: 118

MATRIX: WATER

**DATE SAMPLED:** 02/05/96

DATE RECEIVED: 02/20/96

ANALYTICAL DATA			
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	μg/L
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	ND	1 P	$\mu$ g/L
TOTAL XYLENE	ND	1 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	99		
4-Bromofluorobenzene	60		
METHOD 8020A ***			
Analyzed by: YN			
Date: 03/01/96			

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.

<sup>(</sup>P) - Practical Quantitation Limit

# QUALITY CONTROL DOCUMENTATION

PL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

PAGE HOUSTON LABORATORY

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

Matrix:

Aqueous

Units:

μg/L

Batch Id: HP\_R960301012700

#### 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	
Benzene	ND	50	55	110	62 - 121	
Toluene	ND	50	52	104	66 - 136	
EthylBenzene	ND	50	46	92.0	70 - 136	
O Xylene	ND	50	53	106	74 - 134	
M & P Xylene	ND	100	110	110	77 - 140	

#### MATRIX 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 Q Relative %		Limits(***) (Advisory)	
			Result	Recovery	Result	Recovery	Difference	RPD		
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range	
BENZENE	ND	20	21	105	21	105	0	25	39 - 150	
TOLUENE	ND	20	21	105	20	100	4.88	26	56 - 134	
ETHYLBENZENE	ND	20	17	85.0	17	85.0	0	38	61 - 128	
O XYLENE	ND	20	19	95.0	19	95.0	0	29	40 - 130	
M & P XYLENE	ND	40	39	97.5	38	95.0	2.60	20	43 - 152	
	1	ľ	1	•	1	1	1 1	1		

Analyst: YN

Sequence Date: 03/01/96

SPL ID of sample spiked: 9602B39-04A

Sample File ID: R\_\_\_160.TX0

Method Blank File ID:

Blank Spike File ID:  $R_{\underline{\hspace{1cm}}}153.TX0$ 

Matrix Spike File ID: R\_\_\_156.TX0

Matrix Spike Duplicate File ID: R\_\_\_157.TX0

\* = Values Outside QC Range

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 (3rd Q '95:

(\*\*\*) = Source: SPL-Houston Historical Data (4th Q 194)

SAMPLES IN BATCH (SPL ID) :

9602A23-03A 9602A23-01A 9602B37-02A 9602A09-05A

9602B39-02A 9602B39-03A 9602B39-01A 9602880-06A

9602977-02A 9602880-02A 9602880-05A 9602880-03A

9602880-01A 9602B38-02A 9602A52-02A 9602A52-01A

9602B38-01A 9602880-07A 9602B39-04A

QC Officer

L BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

PAGE HOUSTON LABORATORY

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

Matrix:

Aqueous

Units:

 $\mu g/L$ 

Batch Id: HP\_R960301044600

#### 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	
Benzene	ND	50	33	66.0	62 - 121	
Toluene	ND	150	· 120	80.0	66 - 136	
EthylBenzene	ND	50	41	82.0	70 - 136	
O Xylene	ND	100	98	98.0	74 - 134	
M & P Xylene	ND	200	190	95.0	77 - 140	

#### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	MatrixDuplie	Spike	MS/MSD Relative %	'   -		
			Result	Recovery	Result	Recovery	Difference	RPD		
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery	Range
BENZENE	ND	50	60	120	60	120	0	25	39 -	150
TOLUENE	6.2	150	180	116	170	109	6.22	26	56 -	134
ETHYLBENZENE	2.1	50	53	102	53	102	0	38	61 -	128
O XYLENE	10	100	130	120	120	110	8.70	29	40 -	130
M & P XYLENE	11	100	140	129	130	119	8.06	20	43 -	152

Analyst: YN

Sequence Date: 03/01/96

SPL ID of sample spiked: 9602940-01A

Sample File ID: R\_\_\_188.TX0

Method Blank File ID:

Blank Spike File ID: R\_\_\_182.TX0

Matrix Spike File ID: R\_\_\_185.TX0

Matrix Spike Duplicate File ID: R\_\_\_186.TX0

\* = Values Outside QC Range

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 (3rd Q '95)
(\*\*\*) = Source: SPL-Houston Historical Data (4th Q '94)

SAMPLES IN BATCH (SPL ID) :

9602880-04A 9602940-03A 9602940-04A 9602940-05A 9602940-02A 9602940-08A 9602940-07A 9602940-06A

9602976\_01A 9602976-06A 9602976-05A 9602976-02A

9602976-07A 9602976-08A 9602940-01A

QC Officer )

ICP Spectroscopy Method 6010 Quality Control Report



Matrix: Water

Units: mg/L

8880 INTERCHANGE DRIVE

Laboratory Control Sample

Date:022296 Time:0851 File Name: 022296Q1

Work Orders in Batch Work Order Fractions

96-02-880

01B-06B

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum						
Arsenic						
Barium	ND	2.00	1.918	96	1.60	2.40
Beryllium						
Calcium	ND	20.00	19.620	98	16.00	24.00
Cadmium						
Cobalt						
Chromium						
Copper						
Iron	ND	2.00	1.902	95	1.60	2.40
Potassium	ND	20.00	18.580	93	16.00	24.00
Magnesium	ND	20.00	19.720	99	16.00	24.00
Manganese						
Sodium						
Nickel						
Lead						
Antimony						
Selenium						
Thallium						
Vanadium	<u> </u>			<u> </u>		
Zinc	L					

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 96-02-880 02B

Maurix Spike	e - Spike D	uplicate Re		Work Order Spiked: 96-02-880 02B									
	Sample	Spike	Mati	ix Spike		Matrix Spi	ke Duplicate	:	QC L	imits	Spike		QC
Element	Result	Added	Result	Recover	у	Result	Recovery		% Red	covery	RPD %	0	Limits %
Silver					$\prod$			Π				$\mathbb{I}$	
Aluminum													
Arsenic													
Barium	0.0283	1.0	0.9976	97		0.9921	96	Π	08	120	0.6		20.0
Beryllium													
Calcium	295.3	10.0	318.7	234	·	313.3	180	•	80	120	26.1	**	20.0
Cadmium													
Cobalt					П							$\top$	
Chromium					П			T				$\top$	
Copper								T				$\top$	
Iron	0.0899	1.0	1.174	108		1.017	93		80	120	15.6		20.0
Potassium	62.5	10.0	79.96	175	1	76.02	135	•	80	120	25.4	**	20.0
Magnesium	112.1	10.0	127.7	156	1.	124.7	126	•	80	120	21.3	**	20.0
Manganese					П			Π					
Sodium								Т					
Nickel					$\prod$								
Lead					$\prod$								
Antimony													
Selenium					$\coprod$							$oxed{\bot}$	
Thallium													
Vanadium													
Zinc					$\prod$			1					

<sup>\*</sup> Spike Results Outside Method Limits

<sup>\*\*</sup> Spike RPD Outside Method Limits



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 02/22/96

Analyzed on: 02/21/96 Analyst:

CA

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	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPO Max.
9602780-03A	ND	50.00	102	102	0	93 109	2.7

-9602780

#### Samples in batch:

9602780-03A

9602782-03A 9602880-03C 9602853-04A

9602880-01C

9602880-02C 9602880-06C

9602880-04C 9602880-05C

COMMENTS:



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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/22/96

Analyzed on:

02/21/96

Analyst:

CA

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	۶ Recovery	QC Limits Recovery
LCS	ND	51.60	51.98	101	90 - 110

-9602781

# Samples in batch:

9602780-03A

9602782-03A

9602853-04A

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL ID# 9553514-21

SPL Incorporated

QC Officer



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 02/21/96

Analyzed on: 02/21/96

Analyst:

LC

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.
9602880-06C	ND	ND	0	2.2

-9602776

# Samples in batch:

9602853-04A

9602880-02C

9602880-03C

9602880-04C

9602880-01C 9602880-05C

9602880-06C

COMMENTS:

Incorporated SPL,

OC Øfficer



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 02/21/96

Analyzed on: 02/21/96

Analyst:

LC

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.
9602880-06C	850	848	0.2	3

-9602775

#### Samples in batch:

9602853-04A

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL Incorporated

OC officer



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 02/21/96

Analyzed on: 02/20/96

Analyst:

CA

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

> рН METHOD 150.1 \*

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH UNITS	Duplicate Sample pH UNITS	RPD	RPD Max.
9602887-02C	8.39	8.42	0.4	1.0

-9602726

# Samples in batch:

9602403-01A

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

9602887-02C

COMMENTS:

Incorporated

QC Officer



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

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/20/96

Analyzed on: 02/20/96

Analyst:

LC

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

> рН METHOD 150.1 \*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9602880-04C	6.91	6.92	0.1	1.0

-9602717

Samples in batch:

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

Incorporated

OC Officer



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/20/96

Analyzed on:

02/20/96

Analyst:

LC

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

Resistivity EPA 120.1 \*

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ohms-cm	Duplicate Sample ohms-cm	RPD	RPD Max.
9602880-02C	0.049	0.049	0	1.0

-9602716

Samples in batch:

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL Incorporated

OC officer



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/21/96

Analyzed on: 02/20/96

Analyst:

CA

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

Resistivity EPA 120.1 \*

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ohms-cm	Duplicate Sample ohms-cm	RPD	RPD Max.
9602880-02C	0.049	0.049	0	1.0

-9602728

Samples in batch:

9602880-01C 9602880-05C

9602880-02C 9602880-06C

9602880-03C 9602880-04C

COMMENTS:

SPL Incorporated

OC officer



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 02/20/96 Analyzed on: 02/20/96

Analyst:

ST

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	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9602880-05C	ND	10.00	99.4	93.8	5.8	79 122	11.

-9602720

Samples in batch:

9602880-01C 9602880-05C 9602880-02C 9602880-06C 9602880-03C

9602880-04C

COMMENTS:

SPL Tricorporated were



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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/20/96

Analyzed on:

02/20/96

Analyst:

ST

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
LCS	ND	20.00	19.93	99.6	90	- 110

-9602721

### Samples in batch:

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL LCS ID#9553514-21

SPL Incorporated

QC Øfficer



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/20/96

Analyzed on:

02/20/96

Analyst:

ST

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

Specific Gravity ASTM D1429

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9602880-04C	1.025	1.025	0	1.0

-9602719

### Samples in batch:

9602880-01C 9602880-05C 9602880-02C 9602880-06C 9602880-03C

9602880-04C

COMMENTS:

SPL, Incomporated

OC Officer

# CHAIN OF CUSTODY AND SAMPLE RECEIPT CHECKLIST

8880 Interchange Drive, Houston, TX 77054 (713) 660-0901	Other S. Relinquished by:	Standard 3. Kelinquished by:	12hr 1. Keinquished by Sampler:	Standard QC Level 3 QC []	Requested TAT   Special Reporting Requirements   Fax Results   C   Raw Data	FAX -505-393-4780	Client/Consultant Remarks:	MUHOC " //Sky U D /	mw # 65 " 110 mm Uw P 1 2	MUHGG " //sm V W V YO 1	MU #SC " 1 WOW V W P	Sh " Jee N W	1 02 C C C C C C C C C C C C C C C C C C		E 100 00 10 10 10 10 10 10 10 10 10 10 10	1 04 1 M 1 16/61/8 6/4 N N N N N N N N N N N N N N N N N N N	SL: P=: G=: 1=: 1=:	=wat =slu plast glass: 1 lite 8oz	ter dge	O = 0 $A = V = 0$ $= 40$ $6 = 1$ $2 = 0$	vial oz 4 6oz HN	OSCAR DECRON  Decre  103	: P.S. Box 67 - 505-393-2823	matrix bottl	Analysis Request & Chain of Custody Record	SPL, Inc.
Ambassador 1 E. Oranget	time	10:38	J		Special Det				_	ئ		-	3 >		_	ω ×	Nu	mbe	r of						cord	
Caffery Pa horpe Aver	6. Meceived	1. Keegy	2. Received by		Special Detection Limits (specify):			×	×	×	×	×	×	×	×			410 410		C1	۲۲					SPL Wor
Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775 E. Orangethorpe Avenue, Fullerton, CA 92631 (714) 447-6868	ed by Laboratory:	12/2	Les Experss	Q EX		Temp:	Intact? $(\underline{D}_{X})$	×	~		×	X		×	×		m	A10	TRA	NIO	w S			d Analys		
37-4775 447-6868				20/2/2	review (initial):		マ           																		/ of 2	04184

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8880 Interchange Drive, Houston, TX 77054 (713) 660-0901		48hr Standard 3. Relinquished by:	72hr 1. Relinguished by Sampler. OSCARC DECED	Standard QC   Level 3 QC	ing Requirements Fax Results 🔲 Raw Data 🔲	FAX 508-393-4780	Client/Consultant Remarks:	mw# 140 " Z30m V w P /	TO # 196 1 2 2 7 2 9 1 2	1 04 1 2 2	130	136 = 793	m w # 139 11 2 m / w / 40 1	RU#70 "10% VWP 1	3	mw #79 2/19/96/10:00 mm V W V 40 1	SL P= G= 1= 8=	8oz HCI	tic s er 4	O: V= V= 6= : 2=	Project Name: Mond new Nm 88 des soil am vial or 160z	ner: 0=1	-393, 2823	Client Name: MARKEN Repobleum Company matrix bottle size pres.	Analysis Request & Chain of Custody Record	SPL, Inc.
Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775 1 E. Orangethorpe Avenue, Fullerton, CA 92631 (714) 447-6868	time 6. Received by Laboratory:	1. 30 4. Received by	ing Ch. 2. Received by: FO EXPLESS		Special Detection Limits (specify):  PM review (initial):	4	Intact? OF N	/ × ×	\ \ \ \ \	×	×	× ×	X	\ \ \	× ×	3   X		В	TE	X	A 7.			Requested Analysis	rd page 2 of 2	SPL Workorder No:

# SPL Houston Environmental Laboratory

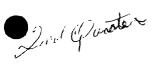
# Sample Login Checklist

Dat	Time: 2/20/96	10:30		
SPI	L Sample ID:			
	9606	7880		
			Yes	<u>No</u>
l	Chain-of-Custody (COC) form is pre	esent.		
2	COC is properly completed.			
3	If no, Non-Conformance Worksheet	has been completed.		
4	Custody seals are present on the shi	pping container.		
5	If yes, custody seals are intact.	V		
6	All samples are tagged or labeled.	U		
7	If no, Non-Conformance Worksheet	has been completed.		
8	Sample containers arrived intact		V	
9	Temperature of samples upon arriva	1:		4 c
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	2309	7/13/4
		Other:		
11	Method of sample disposal:	SPL Disposal		
		HOLD		
		Return to Client		

Name:		Date:
		0/00/0
	MARA MADON	H 20196
	yww quiteri	







HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054

PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 96-06-D01

Approved for Release by:

Debbie Proctor, Project Manager

Date:

Greg Grandits
Laboratory Director

COPY

Idelis Williams Quality Assurance Officer



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

# Certificate of Analysis NO. 9606D01-01

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

Attn: Oscar Deleon

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D & E

DATE: 07/11/96

PROJECT NO:

MATRIX: WATER

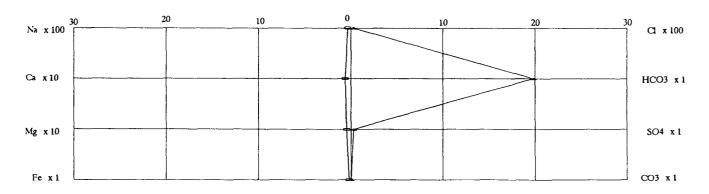
**DATE SAMPLED:** 06/26/96 12:00:00

DATE RECEIVED: 06/27/96

# **ANALYTICAL DATA**

ION	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	830.87	36.14	Total Dissolved Solids	
Calcium, Ca	127.00	6.34	(calc.) mg/L	3228.92
Magnesium, Mg	56.80	4.67	, , ,	
Chloride, Cl	975.00	27.50	Specific Gravity	
Bicarbonate, CaCO3	1210.00	19.83	60/60 deg. F.	1.00
Sulfate SO4	13.00	0.27	-	
Carbonate, CaCO3	0.00	0.00	Resistivity	
Iron, Fe(Total)	5.97	0.21	(Mohm-cm) 75 deg. F.	0.2030
Barium, Ba	2.28	0.03		
			pН	
			pH units	7.47
		l	_	

### MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9606D01-02

For: Warren Petroleum P.O. Box 67 Monument, NM 88265

Attn: Oscar Deleon

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D & E

DATE: 07/11/96

PROJECT NO:

MATRIX: WATER

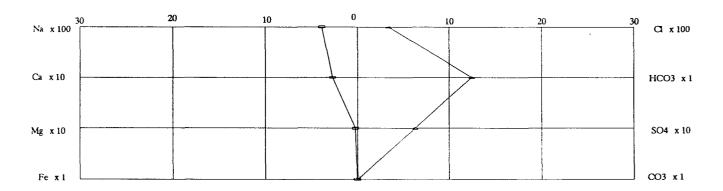
**DATE SAMPLED:** 06/26/96 13:30:00

DATE RECEIVED: 06/27/96

# ANALYTICAL DATA

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	<b>RESULT</b>
Sodium, Na (Calc.)	8923.48	388.15	Total Dissolved Solids	
Calcium, Ca	554.00	27.64	(calc.) mg/L	25570.14
Magnesium, Mg	29.70	2.44	, , ,	
Chloride, Cl	12200.00	344.15	Specific Gravity	
Bicarbonate, CaCO3	760.00	12.46	60/60 deg. F.	1.01
Sulfate SO4	3040.00	63.29		
Carbonate, CaCO3	0.00	0.00	Resistivity	
Iron, Fe(Total)	1.88	0.07	(Mohm-cm) 75 deg. F.	0.0280
Barium, Ba	0.08	0.00	,	
			pН	
			pH units	7.32
			•	·

### MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9606D01-03

For: Warren Petroleum P.O. Box 67 Monument, NM 88265

Attn: Oscar Deleon

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum Company

**SAMPLE ID: MW #6 ABCD & E** 

DATE: 07/11/96

PROJECT NO:

**MATRIX:** WATER

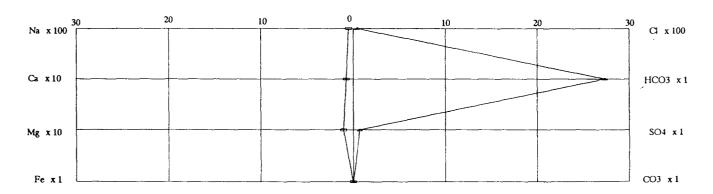
**DATE SAMPLED:** 06/26/96 11:00:00

DATE RECEIVED: 06/27/96

# ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	1203.02	52.33		
Calcium, Ca	150.00	7.49	(calc.) mg/L	4724.24
Magnesium, Mg	130.00	10.69		
Chloride, Cl	1520.00	42.88	Specific Gravity	
Bicarbonate, CaCO3	1670.00	27.37	60/60 deg. F.	1.01
Sulfate SO4	34.00	0.71		
Carbonate, CaCO3	0.00	0.00	Resistivity	
Iron, Fe(Total)	0.77	0.03	(Mohm-cm) 75 deg. F.	0.1370
Barium, Ba	0.45	0.01	•	
			pН	
			pH units	7.74

# MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9606D01-04

For: Warren Petroleum P.O. Box 67 Monument, NM 88265

Attn: Oscar Deleon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

PROJECT NO:

SITE: Monument, NM

MATRIX: WATER

**SAMPLE BY:** Warren Petroleum Company

**DATE SAMPLED:** 06/26/96 10:45:00

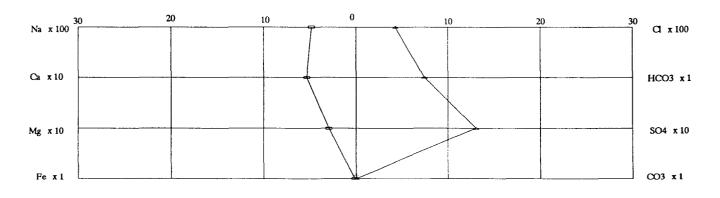
SAMPLE ID: MW #7 A B C D & E

DATE RECEIVED: 06/27/96

# **ANALYTICAL DATA**

<u>ION</u>	mg/L	meq/L	<b>WET CHEMISTRY</b>	<b>RESULT</b>
Sodium, Na (Calc.)	11052.15	480.74	Total Dissolved Solids	
Calcium, Ca	1070.00	53.39	(calc.) mg/L	34521.92
Magnesium, Mg	358.00	29.45	,	
Chloride, Cl	15200.00	428.77	Specific Gravity	
Bicarbonate, CaCO3	452.00	7.41	60/60 deg. F.	1.03
Sulfate SO4	6270.00	130.54	<del>-</del>	
Carbonate, CaCO3	0.00	0.00	Resistivity	
Iron, Fe(Total)	3.62	0.13	(Mohm-cm) 75 deg. F.	0.0200
Barium, Ba	0.15	0.00	, , , , , , , , , , , , , , , , , , ,	
			pН	
			pH units	6.90
			•	

## MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9606D01-05

For: Warren Petroleum P.O. Box 67 Monument, NM 88265

Attn: Oscar Deleon

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum Company

SAMPLE ID: MW #1 A B C D & E

DATE: 07/11/96

PROJECT NO:

MATRIX: WATER

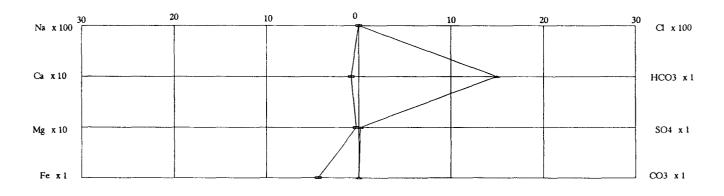
**DATE SAMPLED:** 06/26/96 12:30:00

DATE RECEIVED: 06/27/96

# ANALYTICAL DATA

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	34.24	1.49	Total Dissolved Solids	
Calcium, Ca	167.00	8.33	(calc.) mg/L	1368.73
Magnesium, Mg	35.10	2.89	, , ,	
Chloride, Cl	78.00	2.20	Specific Gravity	
Bicarbonate, CaCO3	913.00	14.96	60/60 deg. F.	1.00
Sulfate SO4	9.00	0.19	_	
Carbonate, CaCO3	0.00	0.00	Resistivity	
Iron, Fe(Total)	124.00	4.44	(Mohm-cm) 75 deg. F.	0.5330
Barium, Ba	1.39	0.02	_	
			pН	
			pH units	7.30
			*	

# MINERAL ANALYSIS PATTERN





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

# Certificate of Analysis NO. 9606D01-06

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

Attn: Oscar Deleon

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D & E

DATE: 07/11/96

PROJECT NO:

**MATRIX: WATER** 

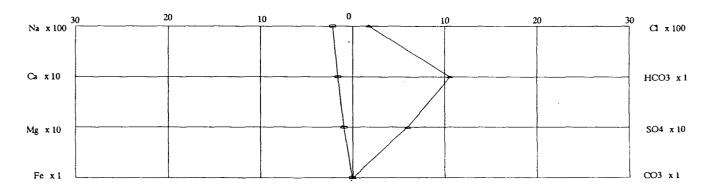
**DATE SAMPLED:** 06/26/96 13:00:00

DATE RECEIVED: 06/27/96

# **ANALYTICAL DATA**

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	5049.55	219.64		
Calcium, Ca	324.00	16.17	(calc.) mg/L	15320.64
Magnesium, Mg	117.00	9.62		
Chloride, Cl	6250.00	176.30	Specific Gravity	
Bicarbonate, CaCO3	646.00	10.59	60/60 deg. F.	1.01
Sulfate SO4	2880.00	59.96	_	
Carbonate, CaCO3	0.00	0.00	Resistivity	
Iron, Fe(Total)	1.96	0.07	(Mohm-cm) 75 deg. F.	0.0430
Barium, Ba	0.14	0.00		
			рH	
			pH units	7.13

# MINERAL ANALYSIS PATTERN





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

Certificate of Analysis No. H9-9606D01-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 12:00:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	3600	10 P	μg/L
TOLUENE	ND	10 P	μg/L
ETHYLBENZENE	130	10 P	μg/L
TOTAL XYLENE	ND	10 P	μg/L
TOTAL BTEX	3730		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	107		
4-Bromofluorobenzene METHOD 5030/8020 *** Analyzed by: fab Date: 07/04/96	87		
Barium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	2.28	0.005	mg/L
Calcium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	127	0.1	mg/L
Iron, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	5.97	0.02	mg/L

<sup>(</sup>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.



9180 INTERCHANGE DRIVE -OUSTON, TEXAS 77054 PHONE (713) 660-0901

#### Certificate of Analysis No. H9-9606D01-01

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

MATRIX: WATER

SAMPLED BY: Warren Petroleum Company SAMPLE ID: MW #13 A B C D & E

DATE SAMPLED: 06/26/96 12:00:00

DATE RECEIVED: 06/27/96

PROJECT NO:

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	8	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	56.8	0.1	mg/L
Acid Digestion-Aqueous METHOD 3010A *** Analyzed by: AM Date: 07/03/96	, ICP 07/03/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 07/03/96	975	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	1210	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. H9-9606D01-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D & E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 06/26/96 12:00:00

DATE RECEIVED: 06/27/96

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATIO Analyzed by: DAM Date: 07/1			831	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 06/2	27/96		7.47		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 06/2	27/96		0.203		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 07/0	09/96		13	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: LC Date: 07/0	02/96		1.00	,	
Total Dissolved So METHOD CALCULATIO Analyzed by: DAM Date: 07/1	NC		3229	1	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.



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

### Certificate of Analysis No. H9-9606D01-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 13:30:00

DATE RECEIVED: 06/27/96

PARAMETER		ANALYTICAL	DATA	RESULTS	חפיים כו	CTION	ITNITTO
PARAMETER				KESULIS	LIMI		UNITS
BENZENE				27	1		μg/L
TOLUENE				ND	1	P	μg/L
ETHYLBENZENE				ND	1		$\mu g/L$
TOTAL XYLENE				ND	1	P	$\mu$ g/L
TOTAL BTEX				27			μg/L
Surrogate			% 1	Recovery			
1,4-Difluorob	enzene			87			
4-Bromofluoro				90			
METHOD 5030/8020	***						
Analyzed by: fab	,						
Date: 07/0	3/96						
Barium, Total				0.083	0.00	15	mg/L
METHOD 6010A ***							97 –
Analyzed by: JM							
Date: 07/1	1/96						
Calcium, Total				<b>5 6 7 8</b>	0.	2	/T
METHOD 6010A ***				554	υ.	2	mg/L
Analyzed by: JM							
Date: 07/1	1/96						
23.22. 2 , 2.	_,						
Iron, Total				1.88	0.0	2	mg/L
METHOD 6010A ***							
Analyzed by: JM	1 /06						
Date: 07/1	1/96						

<sup>(</sup>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.



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

#### Certificate of Analysis No. H9-9606D01-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D & E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 06/26/96 13:30:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	61	1	'mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	297	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AM Date: 07/03/96	ICP 07/03/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 07/03/96	12200	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	760	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 (7:3) 660-0901

Certificate of Analysis No. H9-9606D01-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

MATRIX: WATER

PROJECT NO:

SAMPLED BY: Warren Petroleum Company SAMPLE ID: MW #14 A B C D & E

**DATE SAMPLED:** 06/26/96 13:30:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 07/11/96	8923	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 06/27/96	7.32		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 06/27/96	0.028		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 07/09/96	3040	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: LC Date: 07/02/96	1.01		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 07/11/96	25570	1	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.



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

#### Certificate of Analysis No. H9-9606D01-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

ent, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D & E

MATRIX: WATER

**DATE SAMPLED:** 06/26/96 11:00:00

DATE RECEIVED: 06/27/96

PROJECT NO:

	3373 T. WOT CO. 1. D. S.		
PARAMETER	ANALYTICAL DATA RESULTS	DETECTION LIMIT	UNITS
BENZENE	280	5 P	μg/L
TOLUENE	25	5 P	μg/L
ETHYLBENZENE	450	5 P	μg/L
TOTAL XYLENE	42	5 P	μg/L
TOTAL BTEX	797		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	93		
METHOD 5030/8020 ***			
Analyzed by: YN Date: 07/06/96			
Date: 07/06/96			
Barium, Total	0.451	0.005	mg/L
METHOD 6010A ***			3.
Analyzed by: JM			
Date: 07/11/96			
Calcium, Total	150	0.1	mg/L
METHOD 6010A ***	130	0.1	1119712
Analyzed by: JM			
Date: 07/11/96			
Iron, Total	A 77	0.02	m~ /1
METHOD 6010A ***	0.77	0.02	mg/L
Analyzed by: JM			
Date: 07/11/96			
<u> </u>		<u>.</u>	

#### (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. H9-9606D01-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 11:00:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	16	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	130	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AM Date: 07/03/96	ICP 07/03/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 07/03/96	1520	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96		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. H9-9606D01-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 11:00:00

DATE RECEIVED: 06/27/96

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 07/11/96	1203	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 06/27/96	7.74		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 06/27/96	0.137		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 07/09/96	34	2	mg/L
Specific Gravity ASTM D1429 Analyzed by: LC Date: 07/02/96	1.00		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 07/11/96	4724	1	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.



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

# Certificate of Analysis No. H9-9606D01-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 10:45:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	μg/I
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	ND	1 P	μg/L
TOTAL XYLENE	1.1	1 P	μg/I
TOTAL BTEX	1.1		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	90		
4-Bromofluorobenzene METHOD 5030/8020 *** Analyzed by: fab Date: 07/03/96	87		
Barium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	0.148	0.005	mg/L
Calcium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	1070	1	mg/L
Iron, Total  METHOD 6010A ***  Analyzed by: JM  Date: 07/11/96	3.62	0.02	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.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

<sup>(</sup>P) - Practical Quantitation Limit



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

# Certificate of Analysis No. H9-9606D01-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

MATRIX: WATER

SAMPLED BY: Warren Petroleum Company SAMPLE ID: MW #7 A B C D & E

DATE SAMPLED: 06/26/96 10:45:00

DATE RECEIVED: 06/27/96

PROJECT NO:

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	116	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	358	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AM Date: 07/03/96	ICP 07/03/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 07/03/96	15200	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	452	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.

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. H9-9606D01-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

PROJECT NO:

MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 06/26/96 10:45:00

SAMPLE ID: MW #7 A B C D & E

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 07/11/96	11052	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 06/27/96	6.90		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 06/27/96	0.020		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 07/09/96	6270	500	mg/L
Specific Gravity ASTM D1429 Analyzed by: LC Date: 07/02/96	1.03		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 07/11/96	34522	1	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.

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. H9-9606D01-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 12:30:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	2500	10 P	μg/L
TOLUENE	ND	10 P	μg/L
ETHYLBENZENE	60	10 P	μg/L
TOTAL XYLENE	58	10 P	μg/L
TOTAL BTEX	2618		μg/L
Surrogate	% Recovery	*	
1,4-Difluorobenzene	100		
4-Bromofluorobenzene METHOD 5030/8020 *** Analyzed by: YN Date: 07/05/96	90		
Barium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	1.39	0.005	mg/L
Calcium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	167	0.1	mg/L
Iron, Total  METHOD 6010A ***  Analyzed by: JM  Date: 07/11/96	124	0.02	mg/L

<sup>(</sup>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.

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. H9-9606D01-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 12:30:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	7	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	35.1	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AM Date: 07/03/96	ICP 07/03/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 07/03/96	78	1	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	913	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.

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. H9-9606D01-05

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #1 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 12:30:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 07/11/96	34	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 06/27/96	7.30		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 06/27/96	0.533		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 07/09/96	9	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: LC Date: 07/02/96	0.999		
Total Dissolved Solids  METHOD CALCULATION  Analyzed by: DAM  Date: 07/11/96	1369	1	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.

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. H9-9606D01-06

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company SAMPLE ID: MW #5 A B C D & E

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 06/26/96 13:00:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	180	1 P	μg/L
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	ND	1 P	μg/L
TOTAL XYLENE	ND	1 P	μg/L
TOTAL BTEX	180		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene	93		
METHOD 5030/8020 ***			
Analyzed by: fab			
Date: 07/03/96			
Barium, Total	0.136	0.005	mg/L
METHOD 6010A ***			_
Analyzed by: JM			
Date: 07/11/96			
Calcium, Total	324	0.1	mg/L
METHOD 6010A ***			
Analyzed by: JM			
Date: 07/11/96		•	
Iron, Total	1.96	0.02	mg/L
METHOD 6010A ***			
Analyzed by: JM			
Date: 07/11/96			

<sup>(</sup>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.

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. H9-9606D01-06

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 13:00:00

DATE RECEIVED: 06/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	52	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 07/11/96	117	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AM Date: 07/03/96	ICP 07/03/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 07/03/96	6250	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 06/27/96	646	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.

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. H9-9606D01-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D & E

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 06/26/96 13:00:00

DATE RECEIVED: 06/27/96

			<del></del>	
PARAMETER		ANALYTICAL DATA RESULTS		UNITS
Sodium, Total METHOD CALCUL Analyzed by: Date:		5050	LIMIT 1	mg/L
pH METHOD 150.1 Analyzed by: Date:		7.13		pH units
Resistivity EPA 120.1 * Analyzed by: Date:	LC 06/27/96	0.043		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:		2880	250	mg/L
Specific Gravi ASTM D1429 Analyzed by: Date:	-	1.01		
Total Dissolve METHOD CALCUL Analyzed by: Date:	ATION	15321	1	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.

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. H9-9606D01-07

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 07/11/96

PROJECT: 2nd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Provided by SPL

SAMPLE ID: Trip Blank

PROJECT NO:

MATRIX: WATER

**DATE SAMPLED:** 05/10/96

DATE RECEIVED: 06/27/96

	<del></del>				
	ANALYTICAL	DATA			
PARAMETER		RI	ESULTS	DETECTION	UNITS
				LIMIT	
BENZENE			ND	1 P	μg/L
TOLUENE			ND	1 P	μg/L
ETHYLBENZENE			ND	1 P	μg/L
TOTAL XYLENE			ND	1 P	μg/L
TOTAL BTEX			ND		μg/L
Surrogate		% Red	covery		
1,4-Difluorobenzene			97		
4-Bromofluorobenzene			103		
METHOD 5030/8020 ***					
Analyzed by: fab					
Date: 07/03/96					

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



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

PAGEHOUSTON LABORATORY

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

Matrix: Units: Aqueous

Batch Id:

VARD960705074100

#### LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Added Result Recovery (Ma		QC Limits(**) (Mandatory) % Recovery Range	
Benzene	ND	50	52	104	62 - 12 <b>1</b>
Toluene	ND	50	53	106	66 - 136
EthylBenzene	ND	50	52	104	70 - 136
O Xylene	ND	50	53	106	74 - 134
M & P Xylene	ND	100	110	110	77 - 140

#### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix Spike		Matrix Spike MS/MSD Duplicate Relative %		QC Limits(***)  (Advisory)		
			Result	Recovery	Result	Recovery	Difference	RPD	
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range
BENZENE	260	20	290	NC	300	NC	NC	25:	39 - 150
TOLUENE	8	20	28	100	29	105	4.88	26	56 - 134
ETHYLBENZENE	7	20	27	100	28	105	4.88	38	61 - 128
O XYLENE	7	20	28	105	28	105	0	29	40 - 130
M & P XYLENE	24	40	64	100	66	105	4.88	20	43 - 152

Analyst: YN

Sequence Date: 07/05/96

SPL ID of sample spiked: 9607039-01A

Sample File ID: D\_\_\_819.TX0

Method Blank File ID:

Blank Spike File ID: D\_\_813.TX0
Matrix Spike File ID: D\_\_816.TX0

Matrix Spike Duplicate File ID: D\_\_\_817.TX0

\* = Values Outside QC Range

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (4th Q '94)

SAMPLES IN BATCH (SPL ID):

9606E54-07A 9606E54-08A 9606E54-09A 9606E54-10A

9606D01-03A 9606E54-04A 9606E54-02A 9606E54-03A

9607039-03A 9606E54-11A 9607045-01A 9607045-02A

9606E54-01A 9607044-01A 9607044-02A 9607044-05A

9607039-01A 9607039-02A

oc officer



SPL BATCH QUALITY CONTROL REPORT \*\*

METHOL 8020\*\*\*

PAGEHOUSTON LABORATORY

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

Matrix: Units: Aqueous

μg/L

Batch Id: VARD960702202000

#### 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
Benzene	ND	50	47	94.0	62 - 121
Toluene	ND	50	53	106	66 - 136
EthylBenzene	ND	50	53	106	70 - 136
O Xylene	ND	50	55	110	74 - 134
M & P Xylene	ND	100	110	110	77 ~ 140

#### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	· • • • • • • • • • • • • • • • • • • •		MS/MSD QC Limits(*** Relative % (Advisory)			
			Result	Recovery	Result	Recovery	Difference	RPD	
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range
BENZENE	ND	20	29	143	29	143	0	25	39 - 150
TOLUENE	ND	20	28	139 *	28	139 •	0	26	56 - 134
ETHYLBENZENE	ИД	20	27	135 *	27	135 *	0	38	61 - 128
O XYLENE	ND	20	27	134 *	27	134 *	0	29	40 - 130
M & P XYLENE	ND	40	55	137	54	134	2.21	20	43 - 152
		ì	ì	Ì	ľ	Y	<b>i</b> 1	ĺ	1

Analyst: fab

Sequence Date: 07/02/96

SPL ID of sample spiked: 9606E42-03A

Sample File ID: D\_\_\_755.TX0

Method Blank File ID:

Blank Spike File ID: D\_\_\_747.TX0

Matrix Spike File ID: D\_\_\_750.TX0

Matrix Spike Duplicate File ID: D\_\_\_751.TX0

\* = Values Outside QC Range

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (4th Q '94)

SAMPLES IN BATCH (SPL ID):

9606E42-03A 9606E45-05A 9606E45-09A 9606E42-04A

9606E45-01A 9606E45-08A 9606E44-02A 9606D01-04A

9606D01-02A 9606E40-01A 9606E40-02A 9606E40-04A

9606E40-03A 9607105-02A 9607010-01A

N/ Nd



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

PAGEHOUSTON LABORATORY

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

Matrix:

Aqueous

Units:

 $\mu g/L$ 

Batch Id: VARD960703050800

#### LABORATORY CONTROL SAMPLE

SPIKE	Method Blank Result <2>	Spike Added <3>	Blank Result <1>	Spike Recovery	QC Limits(**) (Mandatory) % Recovery Range	
Benzene	ND	50	46	92.0	62 - 121	
Toluene	ND	50	53	106	66 - 136	
EthylBenzene	ND	50	55	110	70 - 136	
O Xylene	ND	50	56	112	74 ~ 134	
M & P Xylene	ИД	100	110	110	77 - 140	

#### 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 %		Limits(***) (Advisory)
			Result	Recovery	Result	Recovery	Difference	RPD	
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery Range
BENZENE	ND	20	23	115	22	110	4.44	25	39 - 150
TOLUENE	ND	20	23	115	23	115	0	26	56 - 134
ETHYLBENZENE	ND	20	21	105	22	110	4.65	38	61 - 128
O XYLENE	ND	20	22	110	22	110	0	29	40 - 130
M & P XYLENE	ИО	40	44	110	44	110	ວ	20	43 - 152

Analyst: fab

Sequence Date: 07/03/96

SPL ID of sample spiked: 9606E40-05A

Sample File ID: D 783.TX0

Method Blank File ID:

Blank Spike File ID: D\_\_\_777.TX0

Matrix Spike File ID: D\_\_\_780.TX0

Matrix Spike Duplicate File ID: D\_\_\_781.TX0

\* = Values Outside QC Range

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (4th Q '94)

SAMPLES IN BATCH (SPL ID):

9606D01-06A 9607040-01A 9607040-03A 9607051-02A 9607051-03A 9607059-01A 9607051-01A 9607040-05A 9607051-05A 9607081-02A 9607081-01A 9606E45-02A 9606D01-01A 9606D01-05A 9606E54-05A 9606E54-06A 9606E54-01A 9606E40-05A 9606E40-06A 9606E40-07A

>) And



 $\mu g/L$ 

Units:

SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

PAGHOUSTON LABORATORY

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

Batch Id:

HP\_N960702063600

#### LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Result	Spike Recovery	QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	44	88.0	20 - 110
Benzene	ND	50	41	82.0	62 - 121
Toluene	ND	50	43	86.0	66 - 136
EthylBenzene	ND	50	46	92.0	70 - 136
O Xylene	ND	50	48	96.0	74 - 134
M & P Xylene	ND	100	100	100	77 - 140
	i	i	Į.	I	

#### MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %	-	imits(***) (Advisory)
	<2>	<3>	Result	Recovery <4>	Result	Recovery <5>	Difference	RPD Max.	Recovery Range
мтве	ND	20	25	125	24	120	4.08	20	39 - 150
BENZENE	ND	20	24	120	24	120	0	25	39 - 150
TOLUENE	ND	20	23	115	24	120	4.26	26	56 - 134
ETHYLBENZENE	ΝTD	20	23	115	25	125	8.33	38	61 - 128
O XYLENE	ND	20	24	120	24	120	0	29	40 - 130
M & P XYLENE	ND	40	50	125	50	125	0	20	43 - 152

Analyst: fab

Sequence Date: 07/02/96

SPL ID of sample spiked: 9606E08-01A

Sample File ID: N\_\_\_123.TX0

Method Blank File ID:

Blank Spike File ID: N\_\_\_115.TX0

Matrix Spike File ID: N\_\_118.TX0

Matrix Spike Duplicate File ID: N\_\_119.TX0

\* = Values Outside QC Range

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

9606E08-01A 9606E01-08A 9606E01-10A 9606E01-11A

9606E01-12A 9606E01-14A 9606E08-02A 9606E08-03A

9606E15-03A 9606E15-01A 9606D01-07A 9606E15-02A

9606E52-01A 9606E52-03A 9606E52-02A 9606E01-09A

9606D50-04A 9606E01-13A

QC Officer

# ICP Spect copy Method 6010 Quality Contra Report



Matrix: Water

Units: mg/L

Analyst: IM LABORATORY 8880 INTERCHANGE DRIVE

Date:071196 Time:0811 File Name: 071196M1

Checked (713) 660-0901

7/11/96

**Laboratory Control Sample** 

Work Orders in Batch Work Order Fractions

96-06-D01 01B-06B

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum						
Arsenic						
Barium	ND	2.00	2.04	102	1.60	2.40
Beryllium						
Calcium	ND	20.00	19.50	98	16.00	24.00
Cadmium						
Cobalt						
Chromium						
Copper	,					
Iron	ND	2.00	1.99	100	1.60	2.40
Potassium	ND	20.00	21.23	106	16.00	24.00
Magnesium	ND	20.00	19.75	99	16.00	24.00
Manganese						
Sodium						
Nickel						
Lead						
Antimony						
Selenium				-		
Thallium						
Vanadium						
Zinc						

Matrix Snike - Snike Dunlicate Regults Work Order Sniked: 96-06-056 01A

Matrix Spike	e - Spike Di	uplicate Re		Work Orde						
	Sample	Spike	Mati	rix Spike	Matrix Sp	ike Duplicate	QC I	imits	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	% Re	covery	RPD %	Limits %
Silver										
Aluminum										
Arsenic										
Barium	0.646	1.0	1.549	90.3	1.46	81.4	80	120	10.4	20.0
Beryllium										
Calcium	38.99	10.0	48.41	94.2	48.32	93.3	80	120	1.0	20.0
Cadmium					Ţ					
Cobalt			T							
Chromium					Ţ	1				
Copper					T		T			
Iron	2.982	1.0	3.917	93.5	3.914	93.2	80	120	0.3	20.0
Potassium	1.3	10.0	11.64	103.4	10.62	93.2	80	120	10.4	20.0
Magnesium	35.61	10.0	45.43	98.2	45.43	98.2	80	120	0.0	20.0
Manganese					T					
Sodium										
Nickel										
Lead										
Antimony					1					
Selenium					T					
Thallium			1							
Vanadium										
Zinc			1	<del> </del>	1		T			

Elements Bench Spiked: Ca,Mg,Fe

Ca,Mg,Fe X10 DIL



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

#### \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 07/03/96 Analyzed on: 07/03/96

Analyst: (

CA

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	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max
9606D01-01C	ND	50.00	100	100	0	93 109	2.7

-9607102

#### Samples in batch:

 9606D01-01C
 9606D01-02C
 9606D01-03C
 9606D01-04C

 9606D01-05C
 9606D01-06C
 9606D54-01C
 9606D54-02C

9606D54-03C 9606D54-04C

COMMENTS:

SPL Dicorporated June

oc officer



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

#### \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

07/03/96

Analyzed on:

07/03/96

Analyst:

CA

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	51.60	50.48	97.8	90 - 110

-9607103

# Samples in batch:

9606 <u>D</u> 01-01C	9606D01-02C	9606D01-03C	9606D01-04C
9606D01-05C	9606D01-06C	9606D54-01C	9606D54-02C
9606D54-03C	9606D54-04C	9606D54-05C	9606D85-01I

#### COMMENTS:

SPL LCS ID# 9553536-18

SPL Incorporated

QC Officer



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

# \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

06/28/96

Analyzed on:

06/27/96

Analyst:

LC

This sample was randomly selected for use in the  $\mbox{SPL}$  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.
9606D01-04C	ND	ND	0	2.2

-9606A73

Samples in batch:

9606D01-01C 9606D01-05C 9606D01-02C 9606D01-06C 9606D01-03C

9606D01-04C

COMMENTS:

SPL Incorporated

OC Officer



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

06/28/96

Analyzed on:

06/27/96

Analyst:

LC

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.
9606D01-04C	450	454	0.9	3

-9606A73

#### Samples in batch:

9606D01-01C 9606D01-05C 9606D01-02C 9606D01-06C 9606D01-03C

9606D01-04C

COMMENTS:

SPL, Incorporated

QC Officer



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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

06/28/96

Analyzed on:

06/27/96

Analyst:

LC

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

pH METHOD 150.1 \*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9606D11-01D	6.89	6.90	0.1	1.0

-9606A74

# Samples in batch:

9606C38-01C

960<u>6D</u>01-01C

9606D01-02C

9606D01-03C

9606D01-04C

9606D01-05C

9606D01-06C

9606D11-01D

COMMENTS:

SPL, Incorporated

QC Officer



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

#### \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

06/28/96

Analyzed on:

06/27/96

Analyst:

LC

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

Resistivity EPA 120.1 \*

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration Mohms-cm	Duplicate Sample Mohms-cm	RPD	RPD Max.
9606D01-04C	0.020	0.020	0	1.0

-9606A67

Samples in batch:

9606D01-01C

9606D01-02C

9606D01-03C

9606D01-04C

9606D01-05C

9606D01-06C

COMMENTS:

SPL Incorporates

QC/Officer



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 07/10/96 Analyzed on: 07/09/96 Analyst: Sf

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	Aint: Added   mkj/L	Matrix   Spike  Recovery   %	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9606074-01C	ОИ	10.00	94.9	98.7	3.9	79 122	11.

-9607261

#### Samples in batch:

9606001-01C 9606D01-02C 9606D01-03C 9606D01-04C 9606D01-05C 9606D06-03C 9606D01-06C 9606D74-01C 9606D06-01C 9606006-020

COMMENTS:



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

07/10/96

Analyzed on:

07/09/96

Analyst:

ST

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	9	Measured Concentration mg/L	% Recovery		Limits
LCS	ND	20.00	19.24	96.2	90	- 110

-9607268

# Samples in batch:

*****			
9606D01-01C	9606D01-02C	9606D01-03C	9606D01-04C
9606D01-05C	9606D01-06C	9606D06-01C	9606D06-02C
3000DOT-03C	2000D01-00C	3000D00-01C	3000000-020
9606D06-03C	9606D07-01C	9606D07-02C	9606D07-03C
9606D07-04C	9606D07-05C	9606D54-01C	9606D54-02C
9606D54-03C	9606D54-04C	9606D54-05C	9606D74-01C
COMMENTS ·			
00			

SPL LCS ID#9553536-18

SPK, Incorporated

OC'Officer



8680 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

# \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

07/03/96

Analyzed on:

07/02/96

Analyst:

LC

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

Specific Gravity ASTM D1429

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9606D01-06C	1.010	1.010	0	1.0

-9607116

Samples in batch:

9606<u>D01</u>-01C 9606D01-05C 9606D01-02C 9606D01-06C 9606D01-03C

9606D01-04C

COMMENTS:

SPL Incorporated

QC Officer

# CHAIN OF CUSTODY AND SAMPLE RECEIPT CHECKLIST

<ul><li>8880 Interchange Drive, I</li><li>459 Hughes Drive, Trave</li></ul>	Odver 🔲	48hr Standard	72hr		Requested TAT		Client/Consultant Remarks:	3 11	11 0	# C	= 10	MW#SA	11 6	// D	11 6	=	MW#/A	SAMPLE ID	Invoice To: Spon E	Project Location: MONAMENT,	Project Number:	Project Name: 2nd Stre Str		Address/Phone: Po. Box 67	Client Name: MAKEGN Let		1000
8880 Interchange Drive, Houston, TX 77054 (713) 660-0901 459 Hughes Drive, Traverse City, MI 49684 (616) 947-5777	5. Relinquished by:	3. Relinquished by:		Standard QC	Special Reporting Requirements F			"	"	//	"	6-26-96 1 cm	11	11	1)	11 1	6-26-96 1235	DATE TIME comp		Nm 88265		Signpling - ANALYSIS	ELEON	'	refrum Company	Analysis Request &	7
0-0901	date	date	date		Fax Results 💋 Ra		Laboratory remarks:	11 4 11	11 P 11	" V 4	V ".	2 V 7	" 1	11 4 1	" 1	" 1	W V 4	SL= P= G=	plas	idge tic s	O: A= V=	=via	ner: ber	glass	ttle	Chain of	SPL, Inc.
300 Amb			36-26	Level 4 🛠 🔲	Raw Data 🔲 Sp				7	0 /	40 /	40 /		2	40 /	1 of	40   1	8=8 1=1 3=1	8oz HCI H2S	l SO4	6=1 2= O=	60z  - HN  - oth	IO3 ner:		size pres.	Custody Record	
0 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775 11 E. Orangethorpe Avenue, Fullerton, CA 92631 (714) 447-6868	6. Received by Laboratory:	time 4. Received by:	2.		Special Detection Limits (specify):	Temp:	Intact?	× '	×	×	×	X	×	X .	×	>	X X	B	7	Elon An	- - - - -	,			Requested Analysis	d chocapol	SPL Workorder No:
(318) 237-4775 I (714) 447-6868		•	1/96/1000		PM review (initial):	3, M	N DA N																		rsis	page / of 3	H- 01867

DATE TIME comp grab W=water S=soil SL=sludge O=oth Sanple:    1	DATE TIME Comp grab Wewater Sesoil SLesludge Oeother:    I	Analysis Request & Chain of Custody Record  Where N Petulian Commy & Chain of Custody Record  Matrix Details Size press.  Matrix Details Size	time  4. Received by:  6. Received by Laboratory:  500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775  1511 E. Orangethorpe Avenue, Fullerton, CA 92631 (714) 447-6868
DATE TIME Comp grab W=water S=soil SL=sludge O=oth SL=sludge O=oth V=vial 3 QC    Level 3 QC    Level 4 QC    Special Reporting Requirements Fax Results    Level 4 QC    Level 5 QC    Level 5 QC    Level 6 QC    Level 7 QC    Level 8 QC    Level 8 QC    Level 9 QC	Sundard QC   Level 3 QC   Level 4 QC   Level	AT Special Reporting Requirements  Fax Results  SPL, Inc.  SPL, Inc.  SPL, Inc.  SPL, Inc.  Chain of Custody Recomption of Custody R	2. Req
DATE TIME Comp grab    W = water S = soil   SL = sludge O = oth	DATE TIME Comp grab    Secial Reporting Requirements   Far Regults	Analysis Request & Chain of Custody Recomposition of Custody Recomposition Requirements  Special Reporting Requirements  Fax Results  Analysis Request & Chain of Custody Recomposition Requirements  Fax Results  Analysis Request & Chain of Custody Recomposition Requirements  Fax Results  Analysis Request & Chain of Custody Recomposition Requirements  Fax Results  Analysis Request & Chain of Custody Recomposition Recomposition Requirements  Fax Results  Analysis Request & Chain of Custody Recomposition	
DATE  DATE  DATE  TIME  SSESSI  Substitute of the state o	DATE  DATE  DATE  TIME  SESSI  SUBSTITUTE  TIME  SUBSTITUTE  SUBST	Analysis Request & Chain of Custody Record    DATE   TIME   Comp gab   We water   Sesoil   SLesludge   Oeother:   Oeother:   Slesludge   Oeother:	ction L
	MPLE IID  DATE  DATE  TIME  CHAPTE  TIME  CONTRIBUTE  TOTAL  TOTA	MARLEN PERCECUL  SOS-353-7823  COMMUNICATION SESSON  MIPLE III)  DATE  TIME  COMP GRAD  V=plastic  G=glass  V=vial  THE  H  H  H  H  H  H  H  H  H  H  H  H	
MPLE II)  DATE  TIME  OPEN  OP	C	MARLE III SPL Sos -383-2823  MARLE III DATE TIME comp gab We water Sesoil SLesludge Oeother:  We water	
MPLE ID  DATE  TIME  OA  W=water S=soil SL=sludge O=oth  C=glass V=vial  C=glass V=vial  C=HCl 2=HN  C	MPLE III  A We water Sesoil  SLesludge Oeother:	SPL, Inc.	
MPLE II)  MPLE III  MPLE I	MPLE II)  DATE  TIME  SOCIATION  MPLE III)  DATE  TIME  Comp  STACK  MPLE III)  DATE  TIME  SOCIATION  SOCIATI	Analysis Request & Chain of Custody Record  Whaten Delegod  Analysis Request & Chain of Custody Record  MPLE III  DATE  TIME  TIME  One part of Custody Record  One part o	×
MPLE ID  DATE  TIME  Comp  grab  W=water S=soil  SL=sludge O=oth  C=glass  V=via  W=W2SO4  C=HCl  3=H2SO4  O=oth	MPLE ID  DATE  TIME  Comp  grab  W=water S=soil SL=sludge O=other:  W=plastic A=amber g G=glass  V=vial  S=H2SO4  O=other:  CSAR  W=water S=soil SL=sludge O=other:  V = plastic A=amber g S=80z 16=160z  1=HCl 2=HNO3 3=H2SO4  O=other:	MARREN Vekulur Containers  SPL, Inc.  SOBANG VEKULUR Contain of Custody Record  Warren Vekulur Containers  SOBANG VEKULUR Containers  Analysis Request & Chain of Custody Record  Matrix bottle size press.  Matri	$\times$
MPLE ID  DATE  TIME  Comp  grab  Sesoil  SL=sludge  O=oth  C=glass  V=via  T=HCl  3=H2SO4  O=oth  C=Residence   MPLE II)  DATE  TIME  Comp  grab  W=water S=soil SL=sludge O=other:  P=plastic A=amber S G=glass V=vial  1=1 liter 4=4oz 40=7 8=8oz 16=16oz  1=HCl 2=HNO3 3=H2SO4 O=other:	SPI, Inc.	~ -	
MPLE ID  DATE  TIME  COMP  STATE  SENTING  MPLE ID  DATE  TIME  Comp  STATE  STATE  Comp  STATE  STATE  Comp  STATE  STATE  STATE  Comp  STATE	MPLE ID  DATE  TIME  COMP  STATE  TIME  STATE  TIME  COMP  STATE  TIME  STATE  TIME  STATE  TIME  STATE  TIME  STATE  TIME  TIME  STATE  TIME  STATE  TIME  TIME  TIME  STATE  TIME  TIME  TIME  TIME  STATE  TIME	MPREN Pekulua Company Matrix Bottle Size Pres.  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Sequest & Chain of Custody Record  NOSAR DECECT MASSIS Sequest & Chain of Custody Record  NOSAR DECECT MASSIS Sequest & Chain of Custody Record  NOSAR DECECT MASSIS Sequest & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS Request & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSIS REQUEST & Chain of Custody Record  NOSAR DECECT MASSI	×
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MPLE ID  DATE  TIME  comp grate  W=water S=soil  SL=sludge O=oth  P=plastic A=am  G=glass V=via  1=1 liter 4=4oz 4  8=8oz 16=16oz  1=HCl 2=HN  3=H2SO4 O=oth	MPLE ID  DATE  TIME  comp grate  W=water S=soil  SL=sludge O=other:  P=plastic A=amber grate  G=glass V=vial  1=1 liter 4=4oz 40=7  8=8oz 16=16oz  1=HCl 2=HNO3  3=H2SO4 O=other:	MAPLE ID  DATE  TIME comp grab  SPL, Inc.  SPL, Inc.  Wheren Person Contany  matrix bottle size  matrix bottle size  matrix bottle size  matrix bottle size  person  SL=sludge O=other:  P=plastic A=amber glass  V=vial  1=1 liter 4=40z 40=vial  8=80z 16=160z  1=HCl 2=HNO3  3=H2SO4 O=other:	X i
Type Property of the Property	Type December Sesoil  Swater Sesoil  Slastic A=amber S	MARREN PORDER Con Analysis Request & Chain of Custody Recorners  Ware Sesoil  Evaluation Analysis Request & Chain of Custody Recorners  Evaluation Associated Size Press  Servater Sesoil  Evaluation Associated Size Press  Selass V=vial  Sociated Associated Size Press  Holding Ass	B
er S=soil dge O=oth ic A=am V=vial er 4=40z 4 16=160z 2=HN O4 O=oth	er S=soil dge O=other: ic A=amber g V=vial er 4=40z 40=16=160z 2=HNO3 O4 O=other:	MARGEN PERCENT OF Analysis Request & Chain of Custody Recording Oscar December:  Serial Seria	T Jind
S=soil O=oth A=am V=via =4oz 4 6=16oz 2=HN O=oth	S=soil O=other:  A=amber q V=vial =40z 40=06=160z 2=HNO3 O=other:	SPL, Inc.  Wheren Person  Social Sequest & Chain of Custody Record Process  Social Sequest Process  Social Sequest & Chain of Custody Record Process  Social Sequest Pro	E (
EM Ota Anhlyss  = soil = am = via 1602 = HN	ENDER DECEON  Soil = other:  = amber (= vial oz 40 = vial	SPL, Inc.  (WARREN) Pekulum Company matrix bottle size pres.  (POBOX 67 Sus-393-2823 soil sother: amber glass vial oz 40 matrix bottle size pres.  (DSIAR DECEON O3 sother: amber glass soil soil size pres.  (POSIAR DECEON O3 sother: amber glass soil soil size pres.  (POSIAR DECEON O3 sother: amber glass soil soil soil size pres.	X A-
	OSAR DECEON DECE	SPL, Inc.  Waren Peholus Corpany   matrix bottle size pres.  POBOX 67 505-353-2823   ii   be   matrix    TS NS	
67 505-353-2823		SPL, In & Chain	
12 Sos -353-2823 matrix b	Metrologic Contany matrix b	SPL, Inc.	
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8880 Interchange Drive, Houston, TX 77054 (713) 660-0901	Other	48hr Standard			Requested TAT		Client/Consultant Remarks:	8	D	C	B	MW#14 A	6	0	C	N	MW# 13 A	SAMPLE ID	Invoice To: SAME	Project Location: MONUMENT	Project Number:	Project Name: ZM QHZ K	Client Contact: OSIAN DE	_	Client Name: WARREN Hohe,	®	
Houston, TX 7	5. Relinquished by:	3. Kelinquished by:	·	Standare	Special Reporting Requirements							6-2-961					196-96-9	DATE		NM		Bus ysis	Lean		Christeum Company	Ana	7
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# SPL Houston Environmental Laboratory

# Sample Login Checklist

Time:

Date:

Name:

Sulest

	427/96	· · · · · · · · · · · · · · · · · · ·	1000		
SPI	L Sample ID:				
	96061	001			
L				Yes	<u>No</u>
l	Chain-of-Custody (COC) form	is pre	esent.		
2	COC is properly completed.				
3	If no, Non-Conformance Work	csheet	has been completed.		
4	Custody seals are present on th	ne ship	oping container.	V	
5	If yes, custody seals are intact.				
6	All samples are tagged or labele	ed.			
7	If no, Non-Conformance Work	csheet	has been completed.		
8	Sample containers arrived inta			V	
9	Temperature of samples upon	arriva)	l:		3° C
10	Method of sample delivery to	SPL:	SPL Delivery		
			Client Delivery		
<u> </u>			FedEx Delivery (airbill #)	82779	33445
		- <u>-</u>	Other:		
11	Method of sample disposal:		SPL Disposal		/
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		·· <u>·</u>	Return to Client		

Date:

6/27/96

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**HOUSTON LABORATORY** 

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

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 96-09-F72

COPY

Approved for Release by:

Brent Barron, Client Services Supervisor

Greg Grandits
Laboratory Director

Idelis Williams Quality Assurance Officer



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

#### Certificate of Analysis No. H9-9609F72-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

DATE SAMPLED: 09/26/96 10:15:00 SAMPLED BY: Warren Petroleum Company DATE RECEIVED: 09/27/96

PROJECT NO:

MATRIX: WATER

SAMPLE ID: MW #1 A B C D E & F

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS LIMIT 10 P BENZENE 1100 μg/L TOLUENE 33 10 P μg/L 10 P **ETHYLBENZENE** 68 μg/L TOTAL XYLENE 280 10 P μq/L TOTAL BTEX 1481 μg/L Surrogate % Recovery 1,4-Difluorobenzene 87 4-Bromofluorobenzene 97 METHOD 5030/8020 \*\*\* Analyzed by: RL Date: 10/10/96 Barium, Total 1.11 0.005 mg/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96 Calcium, Total 128 0.1 mq/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96 Iron, Total 33.8 0.02 mg/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96

(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 ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.



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

DATE: 10/12/96

# Certificate of Analysis No. H9-9609F72-01

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT NO:

PROJECT: 3rd Quarter Analysis SITE: Monument, NM

MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 09/26/96 10:15:00

SAMPLE ID: MW #1 A B C D E & F

DATE RECEIVED: 09/27/96

ANALYTICAL DATA						
PARAMETER	RESULTS	DETECTION LIMIT	UNITS			
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	4	1	mg/L			
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	34.7	0.1	mg/L			
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AMG Date: 10/02/96	ICP 10/02/96					
Chloride METHOD 325.3 * Analyzed by: CA Date: 10/10/96	202	5	mg/L			
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	ND	1	mg/L			
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	830	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.

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: 10/12/96

# Certificate of Analysis No. H9-9609F72-01

Warren Petroleum

P.O. Box 67 Monument, NM 8

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT NO:

MATRIX: WATER

SITE: Monument, NM
SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 09/26/96 10:15:00

SAMPLE ID: MW #1 A B C D E & F

PROJECT: 3rd Quarter Analysis

DATE RECEIVED: 09/27/96

		ANALYTICAL DAT	<u> </u>		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCUL Analyzed by: Date:			205	1	mg/L
pH METHOD 150.1 Analyzed by: Date:			7.43		pH units
Resistivity EPA 120.1 * Analyzed by: Date:	LAR 10/01/96		0.555		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:			8	1	mg/L
Specific Gravi ASTM D1429 Analyzed by: Date:	•		1.012		
Total Dissolve METHOD CALCUL Analyzed by: Date:	NOITA		1446	1	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.

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. H9-9609F72-02

PROJECT NO:

MATRIX: WATER

DATE RECEIVED: 09/27/96

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

DATE SAMPLED: 09/26/96 10:45:00 SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D E & F

ANALYTICAL DATA RESULTS DETECTION UNITS PARAMETER LIMIT 200 1 P BENZENE μg/L TOLUENE ND 1 P μg/L 1 P **ETHYLBENZENE** 1.1 μg/L TOTAL XYLENE ND 1 P μg/L TOTAL BTEX 201.1 μq/L Surrogate % Recovery 1,4-Difluorobenzene 97 87 4-Bromofluorobenzene METHOD 5030/8020 \*\*\* Analyzed by: RL Date: 10/10/96 Barium, Total 0.31 0.005 mg/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96 408 Calcium, Total 0.1 mg/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96 Iron, Total 3.82 0.02 mg/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96

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 ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

<sup>(</sup>P) - Practical Quantitation Limit ND - Not detected.



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

# Certificate of Analysis No. H9-9609F72-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 10:45:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	54	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	117	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AMG Date: 10/02/96	ICP 10/02/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 10/10/96	6150	100	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	644	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. H9-9609F72-02

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

**PROJECT:** 3rd Quarter Analysis

SITE: Monument, NM

MATRIX: WATER

PROJECT NO:

DATE RECEIVED: 09/27/96

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 09/26/96 10:45:00

SAMPLE ID: MW #5 A B C D E & F

		ANALYTICA	AL DATA		
PARAMETER		12412222	RESULT	S DETECT LIMIT	ION UNITS
Sodium, Total METHOD CALCULA Analyzed by: I Date: 1			484	7 1	mg/L
pH METHOD 150.1 Analyzed by: I Date: 1			7.4	0	pH units
Resistivity EPA 120.1 * Analyzed by: I Date: I	LAR 10/01/96		0.04	6	Mohms-cm
Sulfate METHOD 375.4 Analyzed by: S			280	0 250	mg/L
Specific Gravit ASTM D1429 Analyzed by: S	-		1.01	5	
Total Dissolved METHOD CALCULA Analyzed by: I Date: 1	ATION		1502	4 1	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.



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

Certificate of Analysis No. H9-9609F72-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 09:00:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	280	5 P	μg/L
TOLUENE	ND	5 P	μg/L
ETHYLBENZENE	910	5 P	μg/L
TOTAL XYLENE	500	5 P	μg/L
TOTAL BTEX	1690		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	80		
4-Bromofluorobenzene	100		
METHOD 5030/8020 ***			
Analyzed by: RL Date: 10/10/96			
Date: 10/10/96			
Barium, Total	0.61	0.005	mg/L
METHOD 6010A ***			3.
Analyzed by: JM			
Date: 10/08/96			
Calcium, Total	215	0.1	mg/L
METHOD 6010A ***	213	0.1	mg/ H
Analyzed by: JM			
Date: 10/08/96			
Iron, Total	18.7	0.02	mq/L
METHOD 6010A ***	10.7	0.02	mg/ L
Analyzed by: JM			
Date: 10/08/96			

<sup>(</sup>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.



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

DATE: 10/12/96

#### Certificate of Analysis No. H9-9609F72-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT NO:

752

1

mg/L

PROJECT: 3rd Quarter Analysis
SITE: Monument, NM

CAMPLED DV. Warren Detroleum Company

SAMPLED BY: Warren Petroleum Company SAMPLE ID: MW #6 A B C D E & F

DATE SAMPLED: 09/26/96 09:00:00 DATE RECEIVED: 09/27/96

MATRIX: WATER

ANALYTICAL DATA RESULTS DETECTION UNITS PARAMETER LIMIT Potassium, Total 20 1 mg/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96 Magnesium, Total 129 0.1 mg/L METHOD 6010A \*\*\* Analyzed by: JM Date: 10/08/96 Acid Digestion-Aqueous, ICP 10/02/96 METHOD 3010A \*\*\* Analyzed by: AMG Date: 10/02/96 Chloride 1670 50 mg/L METHOD 325.3 \* Analyzed by: CA Date: 10/10/96 Carbonate, as CaCO3 ND 1 mg/L

ND - Not detected.

METHOD SM 4500-CO2D \*\*

Date: 10/02/96

Date: 10/02/96

Analyzed by: LAR

Analyzed by: LAR

Bicarbonate, as CaCO3

METHOD SM 4500-CO2D \*\*

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. H9-9609F72-03

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 09:00:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 10/11/96	857	1	mg/L
pH METHOD 150.1 * Analyzed by: LAR Date: 10/01/96	7.96		pH units
Resistivity EPA 120.1 * Analyzed by: LAR Date: 10/01/96	0.144		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 10/08/96	17	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 10/10/96	1.013		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 10/11/96	3678	1	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.



8880 INTEL CHANGE DRIVE HOUSTON, TEXAS 77054

PHONE 713) 660-0901

Certificate of Analysis No. H9-9609F72-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

**PROJECT:** 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 08:15:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	μg/L
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	ND	1 P	μg/L
TOTAL XYLENE	ND	1 P	μg/L
TOTAL BTEX	ND	± ±	μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	83		
4-Bromofluorobenzene METHOD 5030/8020 *** Analyzed by: RL Date: 10/10/96	. 87		
Barium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	0.13	0.005	mg/L
Calcium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	1080	1	mg/L
<pre>Iron, Total   METHOD 6010A *** Analyzed by: JM</pre>	3.31	0.02	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.

<sup>(</sup>P) - Practical Quantitation Limit



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

Certificate of Analysis No. H9-9609F72-04

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A B C D E & F

PROJECT NO: MATRIX: WATER

DATE SAMPLED: 09/26/96 08:15:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	121	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	349	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AMG Date: 10/02/96	ICP 10/02/96	,	
Chloride METHOD 325.3 * Analyzed by: CA Date: 10/10/96	15200	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	448	2	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. H9-9609F72-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SAMPLE ID: MW #7 A B C D E & F

SITE: Monument, NM

PROJECT NO: MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

**DATE SAMPLED:** 09/26/96 08:15:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 10/11/96	10790	, 1	mg/L
pH METHOD 150.1 * Analyzed by: LAR Date: 10/01/96	7.02		pH units
Resistivity EPA 120.1 * Analyzed by: LAR Date: 10/01/96	0.022		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 10/08/96	5720	500	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 10/10/96	1.033		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 10/11/96	33712	1	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.



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

## Certificate of Analysis No. H9-9609F72-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 12:15:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	3400	50 P	$\mu$ g/L
TOLUENE	ND	50 P	μg/L
ETHYLBENZENE	500	50 P	$\mu$ g/L
TOTAL XYLENE	320	50 P	μg/L
TOTAL BTEX	4220		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	87		
4-Bromofluorobenzene METHOD 5030/8020 *** Analyzed by: RL Date: 10/10/96	87		
Barium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	2.18	0.005	mg/L
Calcium, Total METHOD 6010A *** Analyzed by: JM	481	0.1	mg/L
Date: 10/08/96			
<pre>Iron, Total METHOD 6010A *** Analyzed by: JM</pre>	32.6	0.02	mg/L

<sup>(</sup>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.



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

# Certificate of Analysis No. H9-9609F72-05

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

**PROJECT:** 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 12:15:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	13	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	74.8	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AMG Date: 10/02/96	ICP 10/02/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 10/10/96	975	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	1112	2	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. H9-9609F72-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 12:15:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 10/11/96	327	1	mg/L
pH METHOD 150.1 * Analyzed by: LAR Date: 10/01/96	7.53		pH units
Resistivity EPA 120.1 * Analyzed by: LAR Date: 10/01/96	0.225		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 10/08/96	9	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 10/10/96	1.015		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 10/11/96	3027	1	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.



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

DATE: 10/12/96

## Certificate of Analysis No. H9-9609F72-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 13:00:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	29	1 P	μg/L
TOLUENE	1.4	1 P	μg/L
ETHYLBENZENE	6.1	1 P	μg/L
TOTAL XYLENE	12	1 P	μg/L
TOTAL BTEX	48.5		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	- 83		
4-Bromofluorobenzene METHOD 5030/8020 *** Analyzed by: RL Date: 10/10/96	87		
Barium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	0.11	0.005	mg/L
Calcium, Total METHOD 6010A *** Analyzed by: JM Date: 10/10/96	621	1	mg/L
Iron, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	2.21	0.02	mg/L

<sup>(</sup>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. H9-9609F72-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 10/12/96

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 13:00:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	68	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 10/08/96	295	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: AMG Date: 10/02/96	ICP 10/02/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 10/10/96	11500	200	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 10/02/96	784	2	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: 10/12/96

# Certificate of Analysis No. H9-9609F72-06

Warren Petroleum P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

PROJECT: 3rd Quarter Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 09/26/96 13:00:00

DATE RECEIVED: 09/27/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 10/11	6454 <sup>7</sup> 96	1	mg/L
pH METHOD 150.1 * Analyzed by: LAR Date: 10/01	7.54		pH units
Resistivity EPA 120.1 * Analyzed by: LAR Date: 10/01	0.031		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 10/08	<sup>7</sup> 96	2	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 10/10	1.041		
Total Dissolved Sol METHOD CALCULATION Analyzed by: DAM Date: 10/11		1	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.

# QUALITY CONTROL DOCUMENTATION



SPL BATCH QUALITY CONTROL PEPORT \*\*
METHOD 8020/602

#### HOUSTON LABORATORY

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

Matrix:

Aqueous

Units:

μg/L

VARE961009105000

#### LABORATORY CONTROL SAMPLE

Barch Id:

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)
COMPOUNDS	Blank Result	Added <3>	Result	Recovery %	(Mandatory) % Recovery Range
мтве	ND	50	49	98.0	63 - 120
Benzene	ND	50	48	96.0	62 - 121
Toluene	ND	50	49	98.0	66 - 136
EthylBenzene	ND	50	52	104	70 - 136
O Xylene	ND	50	49	98.0	74 - 134
M & P Xylene	ND	100	110	110	77 - 140

#### 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 Relative %	-	imits(***) (Advisory)	
	<2>	<3>	Result <1>	Recovery <4>	Result	Recovery <5>	Difference	RPD Max.	Recovery	Range
MTBE	7.7	20	29	106	28	102	3.85	20	39 -	150
BENZENE	ND	20	20	95.4	19	90.4	5.38	25	39 -	150
TOLUENE	· ND	20	20	98.2	19	93.2	5.22	26	56 -	134
ETHYLBENZENE	ND	20	21	101	20	96.4	4.66	38	61 -	128
O XYLENE	ND	20	20	98.6	18	88.6	10.7	29	40 -	130
M & P XYLENE	<b>N</b> D	40	42	103	39	96.0	7.04	20	43 -	152

Analyst: RL

Sequence Date: 10/09/96

SPL ID of sample spiked: 9609G50-05A

Sample File ID: J6 107.TX0

Method Blank File ID:

Blank Spike File ID: J6\_\_105.TX0

Matrix Spike File ID: J6\_\_109.TX0

Matrix Spike Duplicate File ID: J6\_110.TX0

\* = Values Outside QC Range

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID) :

9609G50-04A 9610294-05A 9609F76-03A 9609F76-04A

9609F78-01A 9610294-06A 9610294-7A 9609G50-02A

9609G50-03A 9610053-01A 9609F72-06A 9609F72-02A 9609F72-01A 9609F72-05A 9609G50-05A

9610294-04A 9609G50-02A 9609G50-03A



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

#### HOUSTON LABORATORY

5880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Units: Aqueous µg/L

Batch Id: VARE961010121600

#### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**)	
COMPOUNDS	Blank Result	Added <3>	Result <1>	Recovery	(Mandatory) % Recovery Range	
MTBE	ND	50	52	104	63 - 120	
Benzene	ND	50	48	96.0	62 - 121	
Toluene	ND	50	49	98.0	66 - 136	
EthylBenzene	ND	50	52	104	70 - 136	
O Xylene	ND	50	50	100	74 - 134	
M & P Xylene	ND	100	106	106	77 - 140	

#### MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative %	_	Limits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
мтве	12	20	32	100	31	95.0	5.13	20	39 - 150
BENZENE	ND	20	20	97.5	19	92.5	5.26	25	39 - 150
TOLUENE	DИ	20	19	94.0	19	94.0	0	26	56 - 134
ETHYLBENZENE	ND	20	20	98.8	20	98.8	0	38	61 - 128
O XYLENE	ND	20	19	94.2	19	94.2	0	29	40 - 130
M & P XYLENE	ND	40	42	104	41	101	2.93	20	43 - 152

Analyst: RL

Sequence Date: 10/10/96

SPL ID of sample spiked: 9610073-04A

Sample File ID: J6\_\_139.TX0

Method Blank File ID:

Blank Spike File ID: J6\_136.TX0

Matrix Spike File ID: J6\_\_140.TX0

Matrix Spike Duplicate File ID: J6\_\_141.TX0

\* = Values Outside QC Range

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

9610015-04A 9610161-07A 9610139-01A 9610073-03A

9610073-02A 9610161-06A 9610161-01A 9610161-02A

9610161-03A 9610161-04A 9610161-05A 9610324-11A

9610324-12A 9610324-10A 9610324-09A 9610640-01A

9609F72-03A 9610073-01A 9610073-04A 9610015-02A

Water Analysis Mineral Pattern

Workorder: 9609F72-1C

CATIONS	mg/l	mg/me	me/l	
Sodium, Na (calc.)	204.52	22.99	8.90	
Calcium, Ca	128.00	20.04	6.39	
Magnesium, Mg	34.70	12.16	2.85	
Barium, Ba	1.11	68.67	0.02	
Potassium, K	4.00	39.10	0.10	
Iron, Fe	33.80	27.92	1.21	
TOTAL CATIONS (w	o Na)			10.57
ANIONS				
Chloride, Cl	202.00	35.45	5.70	
Sulfate, SO4	8.00	48.03	0.17	
Carbonate, CaCO3	0.00	30.01	0.00	
Bicarbonate, CaCO3	830.00	61.02	13.60	
Bromide, Br	0.00	79.90	0.00	
TOTAL ANIONS				19.47
TDS (calc.)	1446.13			

Water Analysis
Mineral Pattern
Workorder: 9609F72-2C

TDS (calc.)

CATIONS Sodium, Na (calc.) Calcium, Ca	mg/l 4846.53 408.00	mg/me 22.99 20.04	me/l 210.81 20.36	
Magnesium, Mg	117.00	12.16	9.62	
Barium, Ba	0.31	68.67	0.00	
Potassium, K	54.00	39.10	1.38	
Iron, Fe	3.82	27.92	0.14	
TOTAL CATIONS (w/	o Na)			31.51
Chloride, Cl	6150.00	35.45	173.47	
Sulfate, SO4	2800.00	48.03	58.29	
Carbonate, CaCO3	0.00	30.01	0.00	
Bicarbonate, CaCO3	644.00	61.02	10.55	
Bromide, Br	0.00	79.90	0.00	
TOTAL ANIONS				242.32

15023.66

Water Analysis Mineral Pattern Workorder: 9609F72-3C

CATIONS	mg/l	mg/me	me/l	
Sodium, Na (calc.)	856.43	22.99	37.25	
Calcium, Ca	215.00	20.04	10.73	
Magnesium, Mg	129.00	12.16	10.61	
Barium, Ba	0.61	68.67	0.01	
Potassium, K	20.00	39.10	0.51	
Iron, Fe	18.70	27.92	0.67	
TOTAL CATIONS (w	o Na)			22.53
ANIONS				
Chloride, Cl	1670.00	35.45	47.10	
Sulfate, SO4	17.00	48.03	0.35	
Carbonate, CaCO3	0.00	30.01	0.00	
Bicarbonate, CaCO3	752.00	61.02	12.32	
Bromide, Br	0.00	79.90	0.00	
TOTAL ANIONS				59.78
TDS (calc.)	3678.74			

Water Analysis
Mineral Pattern
Workorder: 9609F72-4C

CATIONS	mg/l	mg/me	me/l	
Sodium, Na (calc.)	10790.27	22.99	469.35	
Calcium, Ca	1080.00	20.04	53.89	
Magnesium, Mg	349.00	12.16	28.71	
Barium, Ba	0.13	68.67	0.00	
Potassium, K	121.00	39.10	3.09	
Iron, Fe	3.31	27.92	0.12	
TOTAL CATIONS (v	v/o Na)			85.82
Chloride, Cl	15200.00	35.45	428,74	
Sulfate, SO4	5720.00	48.03	119.08	
Carbonate, CaCO3	0.00	30.01	0.00	
Bicarbonate, CaCO3	448.00	61.02	7.34	
Bromide, Br	0.00	79.90	0.00	
TOTAL ANIONS				555.16
TDS (calc.)	33711.71			

Water Analysis Mineral Pattern

Workorder: 9609F72-5C

CATIONS	mg/l	mg/me	me/l	
Sodium, Na (calc.)	327.05	22.99	14.23	
Calcium, Ca	481.00	20.04	24.00	
Magnesium, Mg	74.80	12.16	6.15	
Barium, Ba	2.18	68.67	0.03	
Potassium, K	13.00	39.10	0.33	
Iron, Fe	32.60	27.92	1.17	
TOTAL CATIONS (w	/o Na)			31.69
ANIONS				
Chloride, Cl	975.00	35.45	27.50	
Sulfate, SO4	9.00	48.03	0.19	
Carbonate, CaCO3	0.00	30.01	0.00	
Bicarbonate, CaCO3	1112.00	61.02	18.22	
Bromide, Br	0.00	79.90	0.00	
TOTAL ANIONS				45.91
TDS (calc.)	3026.63			

Water Analysis Mineral Pattern

Workorder: 9609F72-6C

TDS (calc.)

CATIONS Sodium, Na (calc.) Calcium, Ca Magnesium, Mg Barium, Ba Potassium, K	mg/l 6454.44 621.00 295.00 0.11 68.00 2.21	mg/me 22.99 20.04 12.16 68.67 39.10 27.92	me/l 280.75 30.99 24.27 0.00 1.74 0.08	
Iron, Fe	-	21.72	0.00	<i>57</i> ,00
TOTAL CATIONS (w	/o Na)			57.08
ANIONS				
Chloride, Cl	11500.00	35.45	324.37	
Sulfate, SO4	29.00	48.03	0.60	
Carbonate, CaCO3	0.00	30.01	0.00	
Bicarbonate, CaCO3	784.00	61.02	12.85	
Bromide, Br	0.00	79.90	0.00	
TOTAL ANIONS				337.83

19753.76



HOUSTON LABORATORY 5880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 10/10/96 Analyzed on: 10/10/96

Analyst. CA

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	Amt Added mg/L	Matrix   Spike  Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9609F72-01C	ND	50.00	102	102	0	93.2 - 109.3	2.7

-9610480

Samples in batch:

9609F72-01C 9609F72-05C

9609F72-02C 9609F72-06C 9609F72-03C

9609F72-04C



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/10/96

Analyzed on: 10/10/96

Analyst:

CA

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	51.60	51.48	99.8	90 - 110

-9610481

# Samples in batch:

9609F72-01C

9609F72-02C

9609F72-03C 9609F72-04C

9609F72-05C

9609F72-06C

COMMENTS:

SPL LCS ID# 9553564-3

# copy Method 6010 Quanty Contro



Manganese Sodium Nickel \_ead Antimony Selenium Thallium Vanadium Zinc

Matrix: Water

Units: mg/L

Analyst IM HOUSTON LABORATORY

8880 INTERCHANGE DRIVE Checked 1713) 560 002-

Date:101096 Time:0829 File Name: 101096M1

Laboratory Control Sample										
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit				
Silver										
Aluminum										
Arsenic										
Barium					<u> </u>					
Beryllium										
Calcium	ND	20.00	19.96	100	16.00	24.00				
Cadmium										
Cobalt										
Chromium										
Copper										
Iron										
Potassium										
Magnesium										

Work Orders in Batch

Work Order Fractions

96-09-F72 06B

Matrix Spik	Sample	Spike				Work Order Spiked: 96-09  Matrix Spike Duplicate			imits	Spike		QC
Element	Result	Added	Result	Recovery	Result	Recovery		i	covery	RPD %		Limits %
Silver	Result	Added	ricount	1 (CCOVERY	1 Result	i Recovery	T	70 1100	1	100 70	_	Littles 70
Aluminum			<del> </del>		<del>                                     </del>	<del></del>	╁	<del></del>	<del> </del>	<del></del>	+	<u> </u>
Arsenic			1		<del> </del>		$\vdash$				+	
Barium				<del> </del>	<del> </del>	<del> </del>	$\vdash$		}	<del>-</del>	+	
Beryllium	-		<del> </del>		+		╁╌				╁	
Calcium	113	10.0	123.5	105.0	126.2	132.0	1.	80	120	22.8	••	20.0
Cadmium			1		1 20.2	102.0	T		120		1	
Cobalt			1		†						1	
Chromium												
Copper												
lron												
Potassium							Γ					
Magnesium												
Manganese												
Sodium												
Nickel												
Lead							L					
Antimony					<u> </u>						1_	
Selenium											$\perp$	
Thallium			ļ				L					
Vanadium			ļ		1		1				_	
Zinc						1	l	(	l l		l	l

<sup>\*</sup> Spike Results Outside Method Limits

<sup>\*\*</sup> Spike RPD Outside Method Limits

# ICP Spectrescopy Method 6010 Quality Control Report



Matrix: Water

Units: mg/L

Date:100896 Time:0830 File Name: 100896M1

Analyst: JM HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver	ND	2.00	1.92	96	1.60	2.40
Aluminum						
Arsenic						
Barium	ND	2.00	2.00	100	1.60	2.40
Beryllium						
Calcium	ND	20.00	19.28	96	16.00	24.00
Cadmium	ND	2.00	1.83	91	1.60	2.40
Cobalt						
Chromium	ND	2.00	1.94	97	1.60	2.40
Copper						
Iron	ND	2.00	2.01	100	1.60	2.40
Potassium	_ND	20.00	20.63	103	16.00	24.00
Magnesium	ND	20.00	19.53	98	16.00	24.00
Manganese						
Sodium						
Nickel	ND	2.00	1.92	96	1.60	2.40
Lead	ND	2.00	1.90	95	1.60	2.40
Antimony						
Selenium						
Thallium						
Vanadium						
Zinc						

Work Orders in Bate										
Work Order	Fractions									
96-09-F51	09B-16B									
96-09-F72	01B-06B									
96-09-F38	03C,05C 06C									
96-09-F42	01J,02J									

Work Order Spiked: 96-09-F51 09B Matrix Spike - Spike Duplicate Results

Matrix Spike - Spike Duplicate Results				Work Order Spiked: 96-09-F51 09B						
	Sample Spike			trix Spike Matrix Spike Duplicate			QCL	imits	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	% Red	covery	RPD %	Limits %
Silver	ND	1.0	0.9867	98.7	0.9826	98.3	80	120	0.4	20.0
Aluminum										
Arsenic										
Barium	0.2628	1.0	1.238	97.5	1.247	98.4	80	120	0.9	20.0
Beryllium										
Calcium	112.9	10.0	123.2	103.0	122.3	94.0	80	120	9.1	20.0
Cadmium	ND	1.0	0.9512	95.1	0.9423	94.2	80	120	0.9	20.0
Cobalt										
Chromium	ND	1.0	0.9749	97.5	0.9692	96.9	80	120	0.6	20.0
Copper										
iron	ND	1.0	1.009	100.9	0.9923	99.2	80	120	1.7	20.0
Potassium	5.594	10.0	16.23	106.4	16.12	105.3	80	120	1.0	20.0
Magnesium	60.23	10.0	69.82	95.9	69.88	96.5	80	120	0.6	20.0
Manganese										
Sodium										
Nickel	ND	1.0	0.9469	94.7	0.9389	93.9	80	120	0.8	20.0
Lead	ND	1.0	0.9565	95.7	0.9651	96.5	80	120	0.9	20.0
Antimony										
Selenium										
Thallium										
Vanadium										
Zinc										



HOUSTON, TEXAS 77054 PHONE (713) 660-0901

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/10/96

Analyzed on:

10/10/96

Analyst:

ST

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

Specific Gravity ASTM D1429

## -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9609F72-01C	1.0123	1.0125	0	1.0

-9610482

# Samples in batch:

9609F72-01C

9609F72-02C

9609F72-03C

9609F72-04C

9609F72-05C

9609F72-06C

9610453-02B

9610453-03B



BB80 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Ac

Aqueous

Reported on:

10/02/96

Analyzed on:

10/02/96

Analyst:

LAR

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.
9609E18-01C	ND	ND	0	2.2

-9610083

## Samples in batch:

9609E18-01C 9609E18-02C 9609E18-03C 9609E18-04C 9609E18-05C 9609E18-06C 9609F72-01C 9609F72-02C 9609F72-04C



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 10/02/96

Analyzed on: 10/02/96

Analyst:

LAR

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.
9609F72-06C	ND	ND	0	2.2

-9610082

Samples in batch:

9609F72-05C

9609F72-06C



8880 INTERCHANGE DHIVE HOUSTON, TEXAS 77054 PHONE (713) 660-090:

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/02/96

Analyzed on: 10/02/96

Analyst:

LAR

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.
9609E18-01C	160	160	0	3

-9610080

# Samples in batch:

9609E18-01C	9609E18-02C	9609E18-03C	9609E18-04C
9609E18-05C	9609E18-06C	9609F72-01C	9609F72-02C
9609F72-03C	9609F72-04C		`



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

# \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/02/96

Analyzed on:

10/02/96

Analyst:

LAR

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.
9609F72-06C	788	780	1.0	3

-9610081

Samples in batch:

9609F72-05C

9609F72-06C



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/02/96

Analyzed on: 10/01/96

Analyst:

LAR

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

> рН METHOD 150.1 \*

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9609F72-01C	7.42	7.44	0.3	1.0

-9610096

# Samples in batch:

9609F51-01A	9609F51-02A	9609F51-03A	9609F51-04A
9609F72-01C	9609F72-02C	9609F72-03C	9609F72~04C
9609872-050	9609F72_06C	STAN-	•



8880 INTERCHANGE DRIVE HOUSTON, TEXAS TT054 PHONE (713) 660-090:

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/02/96

Analyzed on: 10/01/96

Analyst:

LAR

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

> Resistivity EPA 120.1 \*

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mohms-cm	Duplicate Sample mohms-cm	RPD	RPD Max.
9609E18-01C	0.008	0.008	0	1.0

-9610093

# Samples in batch:

9609E18-02C 9609E18-01C 9609E18-03C 9609E18-04C 9609E18-05C 9609E18-06C 9609F72-01C 9609F72-02C 9609F72-03C



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-090:

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/02/96

Analyzed on:

10/01/96

Analyst:

LAR

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

Resistivity EPA 120.1 \*

## -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mohms-cm	Duplicate Sample mohms-cm	RPD	RPD Max.
9609F72-04C	0.022	0.022	0	1.0

-9610094

Samples in batch:

9609F72-04C

9609F72-05C

9609F72-06C



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

## \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

10/09/96

Analyzed on:

10/08/96

Analyst:

ST

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	<b>(</b>	Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	20.00	19.00	95.0	90 - 110

-9610423

# Samples in batch:

9609F51-09C

9609F59-01E

9609F72-01C

9609F72-02C

9609F72-03C

9609F72-04C

9609F72-05C

9609F72-06C

9609F73-01D

COMMENTS:

SPL LCS ID#9553564-1



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 10/09/96 Analyzed on: 10/08/96

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 ID Number	Blank Value mg/L	Amt Added mg/L	Matrix   Spike  Recovery   %	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max
9609F51-09C	NO	10.00	97.5	98.3	0.8	79.6 - 122	11.8

-9610422

#### Samples in batch:

9609F51-09C 9609F72-03C 9609F73-01D

9609F59-01E 9609F72-04C

9609F72-01C

9609F72-02C 9609F72-06C

9609F72-05C

COMMENTS:

# CHAIN OF CUSTODY AND SAMPLE RECEIPT CHECKLIST

0583 (318) 237-4775 92631 (714) 447-6868	Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775 E. Orangethorpe Avenue, Fullerton, CA 92631 (714) 447-6868	ъbassador Ca . Orangethor	500 Arr 1511 E.	٥٥		0-0901 5777	713) 66 16) 947	( 77054 ( 49684 (6	Houston, TX rse City, MI	8880 Interchange Drive, Houston, TX 77054 (713) 660-0901 459 Hughes Drive, Traverse City, MI 49684 (616) 947-5777	₩ 8880 Ir 459 Hu
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page / of 3	1609F72	rd	Chain of Custody Record	Custo	ain of		Request &	Analysis )	Ą	(A)	
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8880 Interchange Drive, Houston, TX 77054 (713) 660-0901 459 Hughes Drive, Traverse City, MI 49684 (616) 947-5777	5. Relinquished by:	3. Relinquished by:	1. Hinguished by sampley	Standard CC	Special Reporting Requirements						7	8/5					9-2696 9 8gm	DATE TIME comp		59688 WN L		- Analysis	DECEON	13	lemm	Analysis Request &	7
60-0901 7-5777				Level 3 QC	Fax Results		Laboratory remarks:	, p	11 1	0 1	" /	1 W	" P	11 1	4 V	4 V	V   W	W= SL= P=p G=g	=wat	ter dge	O=	soil=oth=ami=vial	ner: ber (	glass	natrix	est & Chain of Custody	SPL, Inc.
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H- 08496	SPL Workorder No:				Inc.	SPL, Inc.			*			

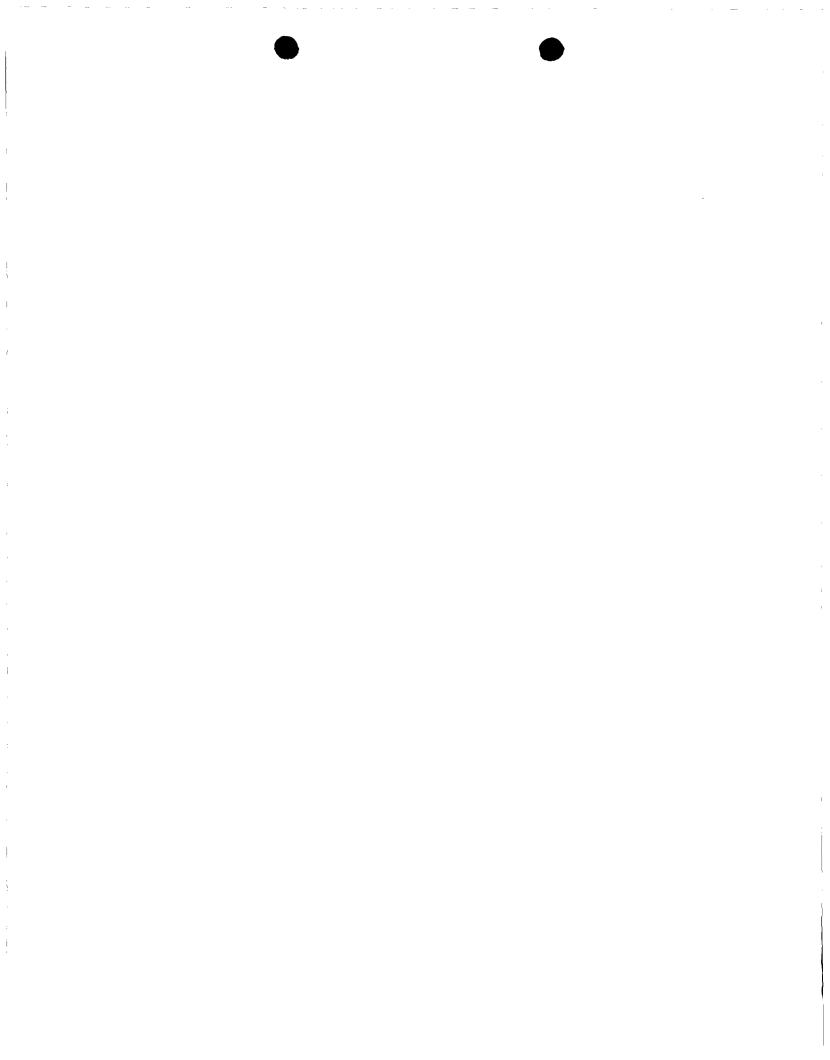
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## SPL Houston Environmental Laboratory

## Sample Login Checklist

Dat	re: 9/27/96 Tim	ne: /000		
SPI	L Sample ID:			
	9609F72			
			Yes	No
l	Chain-of-Custody (COC) form is	present.		
2	COC is properly completed.			/
3	If no, Non-Conformance Workshe	eet has been completed.		
4	Custody seals are present on the s	hipping container.		
5	If yes, custody seals are intact.			
6	All samples are tagged or labeled.			
7	If no, Non-Conformance Worksho	eet has been completed.		
8	Sample containers arrived intact		U	
9	Temperature of samples upon arri	val:		§° C
10	Method of sample delivery to SPL	.: SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	308410	8145 10512
		Other:		
11	Method of sample disposal:	SPL Disposal	V	/
		HOLD		
		Paturn to Client		

Name:	Date:
Sillest.	9/21/96





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

January 17, 1997

Mr. Buddy Marley Warren Petroleum P.O. Box 67 Monument, NM 88265



The following report contains analytical results for samples received at Southern Petroleum Laboratories (SPL) on January 15, 1997. The samples were assigned to Certificate of Analysis No.9701529 and analyzed for all parameters as listed on the chain of custody.

Based on the conditions of the samples, procedures performed and quality controls implemented for this project, the following exceptions were noted for this data project.

The Matrix Spike and Matrix Spike Duplicate were out of QC limits for Total Iron analysis, due to matrix interference. Sample spiked was not from your sampling batch. The laboratory control samples and standard recoveries are in, verifying that the calibration is still valid.

If you have any questions or comments pertaining to this data report, please do not hesitate to contact me. Please reference the above Work Order Number 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

RECEIVED

FEB - 3 1997

BA





SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis Number: 97-01-529

Approved for Release by:

Bernadette A. Fini, Project Manager

Data

Greg Grandits Laboratory Director

Idelis Williams Quality Assurance Officer

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



## Certificate of Analysis No. 9701529-01

HOUSTON LABORATORY 8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054

PHONE (713) 660-0901

0

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/17/97

Attn: Buddy Marley

PROJECT: 4th Quarter '96

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#5,ABCDEF

PROJECT NO:

MATRIX: Water

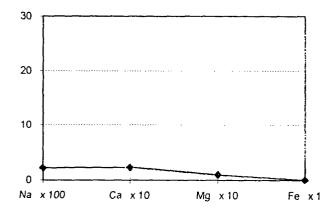
**DATE SAMPLED:** 01/14/97

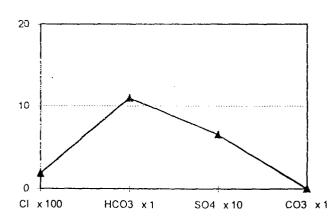
DATE RECEIVED: 01/15/97

#### ANALYTICAL DATA

ION Sodium No (Colo)	<u>mg/L</u> 5065.62	meg/L 220.34	<u>WET CHEMISTRY</u> Total Dissolved Solids	RESULT
Sodium, Na (Calc.) Calcium, Ca	460	22.95	(calc.) mg/L	15833
Magnesium, Mg	122	10.04		
Chloride, Cl	6350	179.13	Specific Gravity	
Bicarbonate, CaCO	668	10.95	60/60 deg. F.	1.0100
Sulfate SO4	3110	64.75		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	1.26	0.05	(Mohm-cm) 75 deg. F.	0.0420
Barium, Ba	0.12	0.00		
			pН	
			pH units	7.22

#### MINERAL ANALYSIS PATTERN







## Certificate of Analysis No. 9701529-02

HOUSTON LABORATORY

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

0

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/17/97

Attn: Buddy Marley

PROJECT: 4th Quarter '96

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#6,ABCDEF

PROJECT NO:

MATRIX: Water

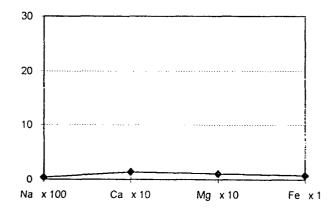
**DATE SAMPLED:** 01/14/97

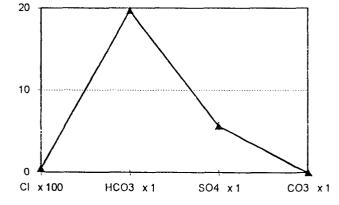
DATE RECEIVED: 01/15/97

#### ANALYTICAL DATA

			· · ·	
ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	<u>RESULT</u>
Sodium, Na (Calc.)	930.87	40.49	Total Dissolved Solids	
Calcium, Ca	287	14.32	(calc.) mg/L	4371.33
Magnesium, Mg	137	11.27		
Chloride, Cl	1500	42.31	Specific Gravity	
Bicarbonate, CaCO	1200	19.67	60/60 deg. F.	1.0020
Sulfate SO4	268	5.58		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	23.7	0.85	(Mohm-cm) 75 deg. F.	0.1730
Barium, Ba	0.77	0.01	_	
			pН	
			pH units	7.44
			-	

#### MINERAL ANALYSIS PATTERN







#### Certificate of Analysis No. 9701529-03

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

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

MATRIX: Water

DATE: 01/17/97

Attn: Buddy Marley

PROJECT: 4th Quarter '96

PROJECT NO:

0

SITE: Monument, NM

SAMPLED BY: Warren Petroleum SAMPLE ID: MW#7,ABCDEF

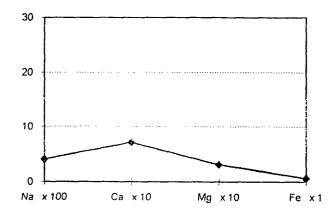
**DATE SAMPLED:** 01/14/97

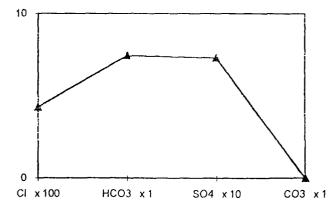
DATE RECEIVED: 01/15/97

#### ANALYTICAL DATA

<u>ION</u>	mg/L	meg/L	WET CHEMISTRY	<u>RESUL</u>
Sodium, Na (Calc.)	9287.73	403.99	Total Dissolved Solids	
Calcium, Ca	1420	70.86	(calc.) mg/L	30385.1
Magnesium, Mg	372	30.60		
Chloride, Cl	15200	428.77	Specific Gravity	
Bicarbonate, CaCO	454	7.44	60/60 deg. F.	1.0250
Sulfate SO4	3510	73.08		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	18.8	0.67	(Mohm-cm) 75 deg. F.	0.0210
Barium, Ba	0.57	0.01	Ç	
			рH	
			pH units	6.98
			*	

#### MINERAL ANALYSIS PATTERN







## Certificate of Analysis No. 9701529-04

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

0

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/17/97

Attn: Buddy Marley

PROJECT: 4th Quarter '96

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#13,ABCDEF

PROJECT NO:

MATRIX: Water

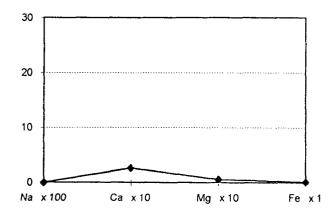
DATE SAMPLED: 01/14/97

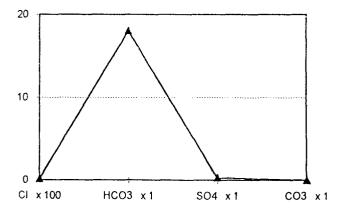
DATE RECEIVED: 01/15/97

#### ANALYTICAL DATA

<u>ION</u>	mg/L	meg/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	4.59	0.20	Total Dissolved Solids	
Calcium, Ca	514	25.65	(calc.) mg/L	2206.62
Magnesium, Mg	71	5.84		
Chloride, Cl	487	13.74	Specific Gravity	
Bicarbonate, CaCO	1100	18.03	60/60 deg. F.	1.0020
Sulfate SO4	15	0.31		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	3.56	0.13	(Mohm-cm) 75 deg. F.	0.2150
Barium, Ba	3.47	0.05		
			рH	
			pH units	7.24

#### MINERAL ANALYSIS PATTERN







## Certificate of Analysis No. 9701529-05

HOUSTON LABORATORY

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

0

Client: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/17/97

Attn: Buddy Marley

PROJECT: 4th Quarter '96

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW#14,ABCDEF

PROJECT NO:

MATRIX: Water

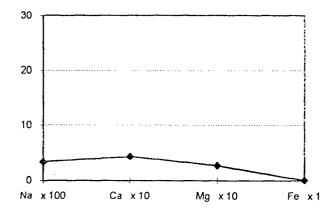
**DATE SAMPLED:** 01/14/97

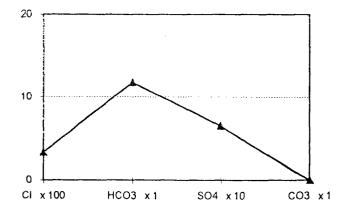
DATE RECEIVED: 01/15/97

#### ANALYTICAL DATA

ION	mg/L	meg/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	7683.95	334.23	Total Dissolved Solids	
Calcium, Ca	866	43.21	(calc.) mg/L	24482.6
Magnesium, Mg	327	26.90		
Chloride, Cl	11700	330.04	Specific Gravity	
Bicarbonate, CaCO	714	11.70	60/60 deg. F.	1.0170
Sulfate SO4	3110	64.75		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	3.42	0.12	(Mohm-cm) 75 deg. F.	0.0270
Barium, Ba	0.23	0.00		
			рН	
		,	pH units	6.98
			•	

#### MINERAL ANALYSIS PATTERN







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

#### Certificate of Analysis No. H9-9701529-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

96' PROJECT: 4th Quarter Analysis

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D E & F

MATRIX: WATER

DATE SAMPLED: 01/14/97 13:00:00

DATE RECEIVED: 01/15/97

PROJECT NO:

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION	UNITS
BENZENE	260	LIMIT 1.0 P	μg/L
TOLUENE	1.9	1.0 P	μg/L
ETHYLBENZENE	2.2	1.0 P	μg/L
TOTAL XYLENE	ND	1.0 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	264.1		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	127		
4-Bromofluorobenzene METHOD 8020A ***	90		
Analyzed by: LJ			
Date: 01/16/97			
Barium, Total	0.119	0.005	mg/L
METHOD 6010A ***			3.
Analyzed by: JM			
Date: 01/16/97			
Calcium, Total	460	0.1	mg/L
METHOD 6010A ***			
Analyzed by: JM			
Date: 01/16/97			
Iron, Total	1.26	0.02	mg/L
METHOD 6010A ***			
Analyzed by: JM			
Date: 01/16/97			
Potassium, Total	56	1	mg/L
METHOD 6010A ***			
Analyzed by: JM Date: 01/16/97			
Ducc. 01/10/5/			

<sup>(</sup>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.

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. H9-9701529-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 13:00:00

DATE RECEIVED: 01/15/97

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION	UNITS
PARAMEIER	RESULIS	LIMIT	ONIIS
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	122	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: GJ Date: 01/15/97	ICP 01/15/97		
Chloride METHOD 325.3 * Analyzed by: EG Date: 01/15/97	6350	100	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	668	1	mg/L
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 01/16/97	5066	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. H9-9701529-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 13:00:00

DATE RECEIVED: 01/15/97

			<del></del>	
PARAMETER		ANALYTICAL DATA RESULTS	DETECTION	UNITS
pH METHOD 150.1 Analyzed by: Date:		7.22	TIMIT	pH units
Resistivity EPA 120.1 * Analyzed by: Date:	LAR 01/15/97	0.042		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:		3110	250	mg/L
Specific Grave ASTM D1429 Analyzed by: Date:		1.010		
Total Dissolve METHOD CALCUI Analyzed by: Date:	LATION	15833	1	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.



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

#### Certificate of Analysis No. H9-9701529-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 10:30:00

DATE RECEIVED: 01/15/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
BENZENE	180	25 P	μg/L		
TOLUENE	ND	25 P	μg/L		
ETHYLBENZENE	580	25 P	μg/L		
TOTAL XYLENE	ND	25 P	μg/L		
TOTAL VOLATILE AROMATIC HYDROCARBONS	760		μg/L		
Surrogate	% Recovery				
1,4-Difluorobenzene	85				
4-Bromofluorobenzene	89				
METHOD 8020A ***					
Analyzed by: LJ Date: 01/16/97					
Date: 01/16/97					
Barium, Total	0.765	0.005	mg/L		
METHOD 6010A ***					
Analyzed by: JM					
Date: 01/16/97					
Calcium, Total	287	0.1	mg/L		
METHOD 6010A ***			_		
Analyzed by: JM					
Date: 01/16/97					
Iron, Total	23.7	0.02	mg/L		
METHOD 6010A ***			J.		
Analyzed by: JM					
Date: 01/16/97					
Potassium, Total	24	1	mg/L		
METHOD 6010A ***	<del></del>	-	٥, –		
Analyzed by: JM					
Date: 01/16/97					

<sup>(</sup>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.



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

#### Certificate of Analysis No. H9-9701529-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 10:30:00

DATE RECEIVED: 01/15/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	137	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: GJ Date: 01/15/97	ICP 01/15/97		
Chloride METHOD 325.3 * Analyzed by: EG Date: 01/15/97	1500	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	1200	1	mg/L
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 01/16/97	931	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. H9-9701529-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 10:30:00

DATE RECEIVED: 01/15/97

		ANALYTICAL DATA		
PARAMETER		RESULTS	DETECTION Limit	UNITS
pH METHOD 150.1 Analyzed by: Date:		. 7.44		pH units
Resistivity EPA 120.1 * Analyzed by: Date:	LAR 01/15/97	0.173		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:		268	25	mg/L
Specific Grav: ASTM D1429 Analyzed by: Date:	-	1.002		
Total Dissolve METHOD CALCUI Analyzed by: Date:	LATION	4371	1	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.



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

Certificate of Analysis No. H9-9701529-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 10:00:00

DATE RECEIVED: 01/15/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
BENZENE	ND	5.0 P	μg/L		
TOLUENE	ND	5.0 P	μg/L		
ETHYLBENZENE	ND	5.0 P	μg/L		
TOTAL XYLENE	ND	5.0 P	μg/L		
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L		
Surrogate	% Recovery				
1,4-Difluorobenzene	80				
4-Bromofluorobenzene	87				
METHOD 8020A ***					
Analyzed by: LJ					
Date: 01/16/97					
Barium, Total	0.567	0.005	mg/L		
METHOD 6010A ***			-		
Analyzed by: JM					
Date: 01/16/97		·			
Calcium, Total	1420	1	mg/L		
METHOD 6010A ***					
Analyzed by: JM					
Date: 01/16/97					
Iron, Total	18.8	0.02	mg/L		
METHOD 6010A ***					
Analyzed by: JM					
Date: 01/16/97					
Potassium, Total	122	1	mg/L		
METHOD 6010A ***		•			
Analyzed by: JM					
Date: 01/16/97		•			

#### 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.

<sup>(</sup>P) - Practical Quantitation Limit



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

#### Certificate of Analysis No. H9-9701529-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 10:00:00

DATE RECEIVED: 01/15/97

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	372	0.1	·mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: GJ Date: 01/15/97	ICP 01/15/97		
Chloride METHOD 325.3 * Analyzed by: EG Date: 01/15/97	15200	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97		1	mg/L
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 01/16/97	9288	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. H9-9701529-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #7 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 10:00:00

DATE RECEIVED: 01/15/97

		ANALYTICAL DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
pH METHOD 150.1 Analyzed by: I Date:		6.98		pH units
Resistivity EPA 120.1 * Analyzed by: Date:	LAR 01/15/97	0.021		Mohms-cm
Sulfate  METHOD 375.4  Analyzed by: 0  Date: 0		3510	250	mg/L
Specific Gravit ASTM D1429 Analyzed by: Date:	_	1.025		
Total Dissolved METHOD CALCUL Analyzed by: Date:	ATION	30385	1	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.



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

DATE: 01/17/97

#### Certificate of Analysis No. H9-9701529-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265

ATTN: Buddy Marley

PROJECT NO:

PROJECT: 4th Quarter Analysis 96'

MATRIX: WATER

SITE: Monument, NM 88265 SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 01/14/97 11:00:00

SAMPLE ID: MW #13 A B C D E & F

DATE RECEIVED: 01/15/97

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
BENZENE	2700	10 P	μg/L		
TOLUENE	63	10 P	μg/L		
ETHYLBENZENE	700	10 P	μg/L		
TOTAL XYLENE	140	10 P	μg/L		
TOTAL VOLATILE AROMATIC HYDROCARBONS	3603		μg/L		
Surrogate	% Recovery				
1,4-Difluorobenzene	93				
4-Bromofluorobenzene METHOD 8020A *** Analyzed by: LJ Date: 01/16/97	67				
Barium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	3.47	0.005	mg/L		
Calcium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	514	1	mg/L		
<pre>Iron, Total METHOD 6010A *** Analyzed by: JM</pre>	3.56	0.02	mg/L		
Potassium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	8	1	mg/L		

<sup>(</sup>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. H9-9701529-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265

ATTN: Buddy Marley

PROJECT NO:

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D E & F

MATRIX: WATER

DATE SAMPLED: 01/14/97 11:00:00

DATE RECEIVED: 01/15/97

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION	UNITS	
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	71.0	0.1	mg/L	
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: GJ Date: 01/15/97	ICP 01/15/97			
Chloride METHOD 325.3 * Analyzed by: EG Date: 01/15/97	487	5	mg/L	
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	ND	1 .	mg/L	
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	1100	1	mg/L	
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 01/16/97	5	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. H9-9701529-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 11:00:00

DATE RECEIVED: 01/15/97

PARAMETER		ANALYTICAL DATA RESULTS	DETECTION	UNITS
pH METHOD 150.1 Analyzed by: Date: 0		7.24	= -	pH units
Resistivity EPA 120.1 * Analyzed by: Date: 0	LAR 01/15/97	0.215		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: 0 Date: 0		15	5 1	mg/L
Specific Gravit ASTM D1429 Analyzed by: Date:	-	1.002	2	
Total Dissolved METHOD CALCULA Analyzed by: I Date:	NOITA	2207	7 1	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.



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

#### Certificate of Analysis No. H9-9701529-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 961

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 12:30:00

DATE RECEIVED: 01/15/97

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	25 P	μg/L
TOLUENE	ND	25 P	μg/L
ETHYLBENZENE	ND	25 P	μg/L
TOTAL XYLENE	ND	25 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	81		
4-Bromofluorobenzene	85		
METHOD 8020A ***			
Analyzed by: LJ			
Date: 01/16/97			
Barium, Total	0.232	0.005	mg/L
METHOD 6010A ***			3.
Analyzed by: JM			
Date: 01/16/97			
Calcium, Total	866	1	mq/L
METHOD 6010A ***			3.
Analyzed by: JM			
Date: 01/16/97			
Iron, Total	3.42	0.02	mg/L
METHOD 6010A ***			5.
Analyzed by: JM			
Date: 01/16/97			
Potassium, Total	78	1	mg/L
METHOD 6010A ***			5.
Analyzed by: JM			
Date: 01/16/97			

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.

<sup>(</sup>P) - Practical Quantitation Limit



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

#### Certificate of Analysis No. H9-9701529-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 12:30:00

DATE RECEIVED: 01/15/97

PARAMETER	ANALYTICAL DATA RESULTS	DETECTION	UNITS
		LIMIT	
Magnesium, Total METHOD 6010A *** Analyzed by: JM Date: 01/16/97	327	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: GJ Date: 01/15/97	ICP 01/15/97		
Chloride METHOD 325.3 * Analyzed by: EG Date: 01/15/97	11700	200	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LAR Date: 01/15/97	714	1	mg/L
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 01/16/97	7681	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. H9-9701529-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Buddy Marley

DATE: 01/17/97

PROJECT: 4th Quarter Analysis 96'

SITE: Monument, NM 88265

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #14 A B C D E & F

PROJECT NO:

MATRIX: WATER

DATE SAMPLED: 01/14/97 12:30:00

DATE RECEIVED: 01/15/97

PARAMETER		ANALYTICAL DATA RESULTS	DETECTION LIMIT	UNITS
pH METHOD 150.1 Analyzed by: Date:		6.98	DIMII	pH units
Resistivity EPA 120.1 * Analyzed by: Date:	LAR 01/15/97	0.027		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:		3110	250	mg/L
Specific Gravi ASTM D1429 Analyzed by: Date:	-	1.017		
Total Dissolve METHOD CALCUL Analyzed by: Date:	NOITA	24483	1	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.

## QUALITY CONTROL DOCUMENTATION



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

HOUSTON LABORATORY

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

Matrix:

Aqueous

Units: µg/L

Batch Id: VARE970116085600

#### 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	47	94.0	63 - 120
Benzene	ND	50	44	88.0	62 - 121
Toluene	ND	50	46	92.0	66 - 136
EthylBenzene	ND	50	48	96.0	70 - 136
O Xylene	ND	50	50	100	74 - 134
M & P Xylene	ND	100	99	99.0	77 - 140

#### 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 cate	MS/MSD Relative %	_	imits(***) (Advisory)	
	<2>	<3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery R	Range
MTBE	ND	20	19	95.0	21	105	10.0	20	39 -	150
BENZENE	מא	20	22	110	22	110	0	25	39 -	150
POLUENE	ND	20	22	110	22	110	0	26	56 -	134
ETHYLBENZENE	ND	20	23	115	23	115	0	38	61 -	128
XYLENE	ND	20	24	120	23	115	4.26	29	40 -	130
4 & P XYLENE	ND	40	49	122	47	118	3.33	20	43 -	152

Analyst: LJ

Sequence Date: 01/16/97

SPL ID of sample spiked: 9701532-01A

Sample File ID: E\_A7419.TX0

Method Blank File ID:

Blank Spike File ID: E\_A7414.TX0

Matrix Spike File ID: E\_A7415.TX0

Matrix Spike Duplicate File ID: E\_A7416.TX0

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (2nd Q '95)

SAMPLES IN BATCH (SPL ID):

9701529-03A 9701529-05A 9701472-01A 9701529-01A

9701529-02A 9701529-04A 9701505-01A 9701505-02A

9701532-03A 9701505-03A 9701507-03A 9701532-02A

9701534-01A 9701560-02A 9701560-03A 9701531-01A

9701531-02A 9701532-01A 9701228-01A

#### ICP Spectrescopy Method 6010 Quality Control Report

Matrix: Water

Units: mg/L

Date:011697 Time:0810 File Name: 011697M3

Analyst HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 Checkedie (713) 660-0901

17197

#### Laboratory Control Sample

	Element   Mth. Blank   True Value   Result   % Recovery   Lower Limit   Upper Limit											
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit						
Silver	ND	2.00	2.06	103	1.60	2.40						
Aluminum												
Arsenic												
Barium	ND	2.00	2.05	102	1.60	2.40						
Beryllium												
Calcium	ND	20.00	20.40	102	16.00	24.00						
Cadmium	ND	2.00	1.95	97	1.60	2.40						
Cobalt												
Chromium	ND	2.00	2.10	105	1.60	2.40						
Copper	ND	2.00	2.05	103	1.60	2.40						
Iron	ND	2.00	2.07	103	1.60	2.40						
Potassium	ND	20.00	19.55	98	16.00	24.00						
Magnesium	ND	20.00	20.32	102	16.00	24.00						
Manganese												
Sodium												
Nickel												
Lead	ND	2.00	2.04	102	1.60	2.40						
Antimony				·								
Selenium												
Thallium												
Vanadium												
Zinc	ND	2.00	2.05	103	1.60	2.40						

	ers in Batch
Work Order	Fractions
97-01-455	03C-09C
97-01-456	10C
97-01-529	01B-05B
97-01-567	01B

Matrix Spike - Spike Duplicate Results Work Order Spiked: 97-01-455 03C

Matrix Spike - Spike Duplicate Results						Work Order Spiked: 97-01-455 03C						
·	Sample Spike Matrix Spike					Matrix Sp	QC L	imits	Spike	QC		
Element	Result	Added	Result	Recover	у_	Result	Recovery	,	% Red	covery	RPD %	Limits %
Silver	ND	1.0	0.9269	92.7	I	0.9278	92.8	I	80	120	0.1	20.0
Aluminum					$\mathbf{I}_{-}$							
Arsenic					Ι		1					
Barium	0.2135	1.0	1.124	91.1		1.144	93.1		80	120	2.2	20.0
Beryllium								П				
Calcium	3.92	10.0	12.68	87.6	1_	12.73	88.1		80	120	0.6	20.0
Cadmium	ND	1.0	0.8852	88.5	T	0.8761	87.6		80	120	1.0	20.0
Cobalt					T							
Chromium	ND	1.0	0.9699	97.0	T	0.9674	96.7	Т	80	120	0.3	20.0
Copper	ND	1.0	0.9151	91.5	Τ	0.9221	92.2		80	120	0.8	20.0
Iron	7.867	1.0	10.17	230.3	1	10.51	264.3	1.	80	120	13.7	20.0
Potassium	4.748	10.0	13.77	90.2	Τ	14.08	93.3		80	120	3.4	20.0
Magnesium	2.684	10.0	11.89	92.1	Ţ	12 05	93 7		80	120	17	20.0
iManganese			i		1	Ĺ	i	1	·	1	1	
Sodium												
Nickel					L							
Lead	ND	1.0	0.9485	94.9	$\Gamma$	0.9432	94.3		80	120	0.6	20.0
Antimony					Π							
Selenium					П							
Thallium												
Vanadium												
Zinc	0.0466	1.0	0.9763	93.0	T	0.9728	92.6		80	120	0.4	20.0

<sup>\*</sup> Spike Results Outside Method Limits



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 01/16/97 Analyzed on: 01/15/97

Analyst:

LAR

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.
9701529-01C	668	672	0.6	3

-9701457

#### Samples in batch:

9701529-01C

9701529-02C 9701529-03C 9701529-04C

9701529-05C

COMMENTS:



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/16/97

Analyzed on: 01/15/97

Analyst:

LAR

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.
9701529-01C	ND	ND	0	2.2

-9701456

#### Samples in batch:

9701529-01C

9701529-02C 9701529-03C 9701529-04C

9701529-05C

COMMENTS:



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/16/97

Analyzed on:

01/15/97

Analyst:

EG

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	27.23	26.49	97.3	90 - 110	

-9701468

#### Samples in batch:

9701529-01C 9701529-05C

9701529-02C 9701529-03C

9701529-04C

COMMENTS:

LCS= SPL ID# 9553580-08



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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 01/16/97 Analyzed on: 01/15/97

Analyst:

FG

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	•	ix Spike Licate	RPD	•	QC LIMITS   Advisory)
ID Number	:	:		Result		Result mg/L	Recovery	(%)	RPD.	LREC
9701529-03C	ND	30.5	50.0	78.48	96.0	79.48	98.0	2.1	2.7	93.2 -109.3

-0701469

Samples in batch:

9701529-01C 9701529-05C 9701529-02C

9701529-03C

9701529-04C

COMMENTS:



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

01/16/97

Analyzed on: 01/15/97

Analyst:

LAR

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

> рН METHOD 150.1 \*

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9701548-01A	6.36	6.38	0.3	1.0

-9701458

#### Samples in batch:

9701529-01C

9701529-02C

9701529-03C 9701529-04C

9701529-05C

9701548-01A



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 01/16/97

Analyzed on: 01/15/97

Analyst:

LAR

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

Resistivity EPA 120.1 \*

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mohms-cm	Duplicate Sample mohms-cm	RPD	RPD Max.
9701529-01C	0.042	0.042	0	1.0

-9701453

Samples in batch:

9701529-01C

9701529-02C 9701529-03C 9701529-04C

9701529-05C



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

01/16/97 Reported on:

Analyzed on: 01/15/97

Analyst:

LAR

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

Specific Gravity ASTM D1429

#### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9701529-01C	1.010	1.010	0	1.0

-9701461

#### Samples in batch:

9701529-01C 9701529-05C

9701529-02C 9701529-03C 9701529-04C



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 01/16/97

Analyzed on: 01/16/97

Analyst:

CA

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	10.15	9.21	90.7	90 - 110

-9701466

#### Samples in batch:

9701529-01C

9701529-02C

9701529-03C 9701529-04C

9701529-05C

9701565-01B

COMMENTS:

SPL LCS ID# 9553580-08





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

#### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 01/16/97 Analyzed on: 01/16/97

Analyst: CA

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	Matrix Spike Duplicate		RPD	!	QC LIMITS Advisory)
ID Number	•	•	  Added  mg/L	Result		Result	Recovery	(%)	RPD   Max	% REC
9701529-03C	ND	2.54	10.00	13.55	110	12.97	104	5.6	11.8	79.6 -122

-9701465

Samples in batch:

9701529-01C 9701529-02C 9701529-03C 9701529-04C

9701529-05C 9701565-01B



March 13, 1996

Mr. William C. Olson Hydrogeologist, Environmental Bureau Oil Conservation Division 2040 S. Pacheco Santa Fe, New Mexico 87505 MAR 13 1996

Environmental Bureau
Oil Conservation Division

Warren Petroleum Company P. O. Box 1589 Tulsa, OK 74102 1350 South Boulder Tulsa, OK 74119

Health, Environment and Loss Prevention Phone 918 560 4000 Fax 918 560 4111

RE:

Ground Water Contamination
Warren Petroleum Monument Gas Plant

Lea County, New Mexico

Dear Mr. Olson,

This letter is in response to OCD correspondence dated June 20, 1995, and September 26, 1995.

The September 26, 1995 letter authorized Warren's work plan for additional groundwater investigation.

Refer to Attachment 1. As requested in item #5 of the approval letter, a copy of Geraghty and Miller's report describing the field activities, geologic logs, and well completion diagrams is attached. Groundwater analytical results are summarized and included in Attachment 2 below. In regards to item #5 c, a water table elevation map cannot be completed at this. We have had trouble getting an accurate survey of the monitor well elevations. We hope to have this resolved soon and will include a water table elevation in our next semi-annual report.

The June 20, 1995 letter authorized Warren's plan for product recovery, groundwater monitoring, and reporting. Refer to Attachment 2. This attachment provides a summary of the activities for the last half of 1995 plus tables containing the requested information on water table elevations, product thickness, recovery volumes, and analytical results. Groundwater elevation and product thickness maps could not be developed at this time for the same reason as noted above. However, maps for this period as well as the next period will be provided in the next semi-annual report.

Please advise if any additional information is needed or if any changes in the recovery or monitoring program are required at this time. My phone number is 918-560-4114, or you may contact Donnie Wallis at 505-393-2823, if you have any questions. Thank you for your assistance in this matter.

Sincerely.

cc:

Jerry Sexton NMOCD District Office 1000 W. Broadway Hobbs, NM 88240

K. A. Peterson - Tulsa F. C. Noah - Monument D. E. Wallis - Monument L. T. Reed - Tulsa File: (NM) VII B. I.

# **ATTACHMENT 1**



A Heidemij company

RECEIVED

February 29, 1996

MAR - 1 1996

Environmental Protection

J.D. Morris Warren Petroleum Company P.O. Box 1589 Tulsa, Oklahoma 74102

RE:

Summary of Supplemental Field Activities at Warren Monument Gas Plant, Lea County, New Mexico.

#### Referenced Documents:

- 1. Liquid Hydrocarbon Assessment, Warren Petroleum Company Monument Gas Plant, Monument, New Mexico (April 6, 1995).
- 2. Expanded Work Plan for Groundwater Contamination, Warren Petroleum Monument Gas Plant, Lea County, New Mexico (August 31, 1995).

Geraghty & Miller, Inc. has prepared this correspondence to summarize supplemental field activities associated with the liquid hydrocarbon assessment at the Warren Monument Gas Plant (Plant) in Lea County, New Mexico. Supplemental field activities were approved by the New Mexico Oil Conservation Division (OCD) in a correspondence to Warren dated September 6, 1995, and consisted of drilling and installing five observation wells to assess subsurface conditions related to the occurrence and nature of liquid hydrocarbons detected at the site. Subsequent to installation, the newly installed observation wells were sampled by Warren Plant personnel during the next scheduled quarterly groundwater sampling event.

This correspondence describes the field activities and methods used by Geraghty & Miller during the supplemental hydrocarbon assessment and presents the groundwater quality data collected by Warren. Relevant documentation including geologic logs and well construction diagrams are provided as attachments.



#### FIELD ACTIVITIES AND METHODS

#### **OBSERVATION WELL INSTALLATION**

Five groundwater observation wells (WP-11, WP-12, WP-13, WP-14, and WP-15) were installed from November 7 through November 10, 1995. Observation well locations are shown on Figure 1. Geologic Logs and Well Construction Logs are presented in Attachments A and B, respectively.

All observation wells were installed by Eades Water Well of Hobbs, New Mexico using standard air rotary drilling methods. The formation was logged from cuttings which were circulated to the surface during the installation of a 6.75-inch borehole. In addition, one to two standard split spoon samples were collected from each borehole to confirm the lithology of the water bearing unit and/or bedrock unit. Cuttings and/or split spoon samples were containerized in Ziploc<sup>TM</sup> baggies, allowed to equilibrate to ambient temperature, and analyzed for the presence of volatile organic compounds (VOCs) using a photoionization device (PID). Field headspace results are included on the Geologic Logs presented in Attachment A.

Four of the five observation wells (WP-11, WP-12, WP-13, and WP-14) were completed "open hole" with 15 ft of 4-inch schedule 40 PVC flush-threaded, 0.020-inch mill-slotted screen. The remaining portion of the wells were constructed of 4-inch flush threaded schedule 40 PVC casing. The remaining observation well was constructed according to the above specifications but with 2-inch well materials. The screened portion of all observation wells was positioned to bracket to water table. Filter pack material (No. 10-20 sand) was added to the borehole annulus to a height of approximately 2-3 ft above the top of the screened interval. Approximately 3 ft of hydrated bentonite was installed above the filter pack. A Type I Portland cement grout with five percent bentonite was placed on top of the bentonite seal to an elevation of 3 ft below ground surface (bgs). Final completion included placing Type I Portland cement in the remaining annular space, constructing a 2 ft surface pad around the well and installing a lockable metal protective casing over the PVC well head. Schematic well construction details are provided in Attachment B.

#### WELL DEVELOPMENT

The wells were developed by bailing and surging with a bailer until the majority of the fine grained sediment was removed from the well. Each well was developed until either 10 well volumes of fluid were removed or until the well was bailed dry on two occasions. All fluids were containerized and disposed onsite at the Plant wastewater system.

Please call if you have any questions regarding the supplemental observation well installation activities at the Warren Monument Gas Plant.

Sincerely,

GERAGHTY & MILLER, INC.

John P. Shonfelt, P.G.

Project Scientist/Project Manager

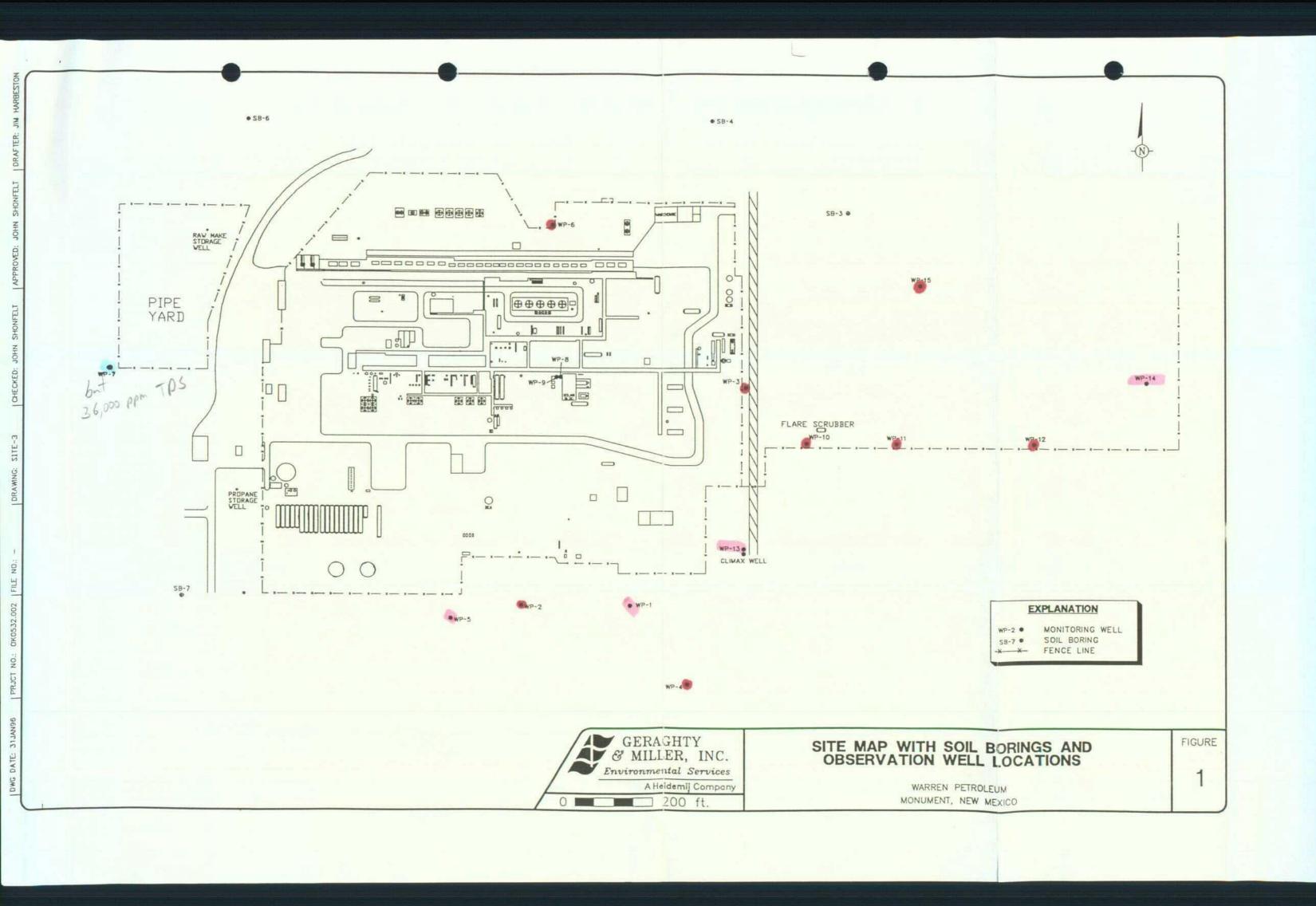
Brian Guillette

Associate/Office Manager

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**Enclosure** 

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## ATTACHMENT A

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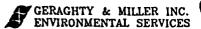


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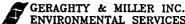
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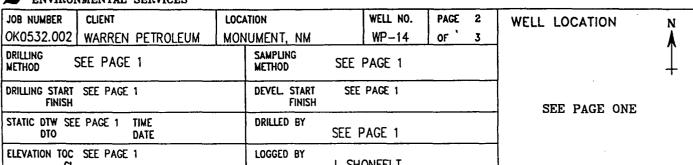
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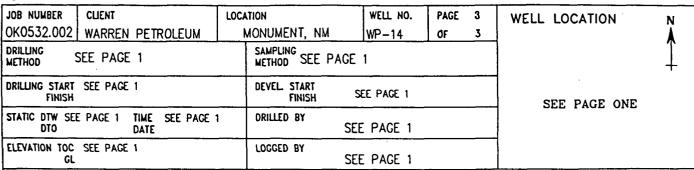
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STATIC DTW DTO	TIME DATE				DRIL	LED BY	EADE	S DRILLING	;	·····	WP-12	•					
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WELL CONSTRUCTION	DEPTH	CLASS	N/	AME		COLOR	DESCRIP GRADATI ODOR,RE	ON, SECONDAR	Y CHAR	ACTERIST	ICS,	Y.C.	HNU (PPM)	SAMPLE NO.	SAMPLE DEPTH	BLOWS	RECOV.X TYPE
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	7 -						FAST	DRILLING									
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	16		-				CALIC	HE CLAST									
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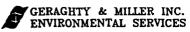
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WELL CONSTRUCTION	DEPTH FEET	CLASS	NAME		COLOR	DESCRIPTION: GRADATION, SECONDARY CHARACTERISTICS, ODOR, REMARKS.	M.C.	HNU (PPM)	SAMPLE NO.	SAMPLE DEPTH	BLOWS	RECOV.X	TYPE		
		SP	SAND		LT PK	SAME AS ABOVE, TRACE CALICHE	D	BKG	5				Cυ		
	21 -					CLASTS, NO ODOR									
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	-	SP	SAND	,	LT PK	SAME AS ABOVE, TRACE CALICHE	٥	BKG	6		$\sqcup$		CL		
	26 -					CLASTS, NO ODOR	<u> </u>		<u> </u>			Ш	<u> </u>		
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	-		<u> </u>		<u> </u>	CALICHE CLASTS, NO ODOR			_			_	L		
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	".	<u></u>			ļ	DENSE CALICHE LAYER, VERY HARD	D	<u> </u>	<u> </u>	<u> </u>	<u> </u>	Ļ	CI		
	33 -	<u> </u>				DRILLING WHITE TO GRAY CLASTS		<u> </u>			L	<u> </u>			
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		ļ	CALICHE		WH	DENSE, SOME GRAY AND PINK CLASTS	D	3.0	8	_	$\perp$	L	CI		
	36 -	ļ	LIMESTO	NE_	<u> </u>	SL HC ODOR	<u> </u>	<u> </u>	_	_	↓_	<u> </u>	L		
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WELL CONSTRUCTION	DEPTH FEET	CLASS	NAME	COLOR	DESCRIPTION: GRADATION, SECONDARY CHARACODOR, REMARKS.	CTERISTICS,	DNH.	M.C.	(PPM)	SAMPLE NO.	SAMPLE	BLOWS	RECOV.X	TYPE
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JOB NUMBER CLIENT OKO532.002 WARRE	N DET	ם חובו	l l	ATION	IT, NM		WELL NO. WP-15	PAGE, OF	1 2	WELL	LOC	ATI	ИС			N A	
DRILLING AIR ROT		KOLEC	M   MOI	SAMP	LING	CUTT	INGS/SPLIT				WP-1 ●	15					
DRILLING START 11/9/95 FINISH 11/9/95	 5 5			DEVE	L START FINISH		<del></del>					•				•	
STATIC DTW DTO	TIME DATE			DRILL	ED BY	EADE	S DRILLING			⊗ FLARE		v					
ELEVATION TOC GL				LOGO	SED BY	J. SH	ONFELT	·		T DANCE	3170		,				
WELL CONSTRUCTION	DEPTH	CLASS	NAME		COLOR	DESCRIP GRADATIO ODOR, RE	ON, SECONDARY	CHARAC	TERISTIC	es,	¥.C.	(PPW)	SAMPLE NO.	SAMPLE DEPTH	BLOWS	RECOV.X	ITPE
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JOB NUMBER CLIENT	LOCATION	WELL NO.	PAGE 2	WELL LOCATION N
OK0532.002 WARREN PETROLE	JM MONUMENT, NM	WP-15 (	OF 2	
DRILLING SEE PAGE 1	SAMPLING METHOD	SEE PAGE 1		
DRILLING START SEE PAGE 1 FINISH	DEVEL. START FINISH	SEE PAGE 1		SEE PAGE ONE
STATIC DTW SEE PAGE 1 TIME DATE	DRILLED BY	EE PAGE 1		
ELEVATION TOC SEE PAGE 1	LOGGED BY	SHONFELT		

D10	DATE				SEE PAGE I							
ELEVATION TOC SEE PA	GE 1			LOGGED BY	J. SHONFELT							
WELL CONSTRUCTION	DEPTH FEET	CLASS	NAME	COLOR	DESCRIPTION: GRADATION,SECONDARY CHARACTERISTICS, ODOR,REMARKS.	M.C.	HNU (PPM)	SAMPLE NO.	SAMPLE DEPTH	BLOWS	RECOV.X	TYPE
		SP	SAND	LT GY	SAME AS ABOVE	D		5				Cl
	21 -				ABUNDANT CALICH CLASTS, NO ODOR							
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	23 -	ļ	<u> </u>		DENSE CALICHE		<u> </u>	<u> </u>	<u> </u>		_	L
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	25 -	SP	SAND	GY	SAME AS ABOVE	D	9.0	6		П		C
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	.	ļ	SAND	GY	VF-FG SILTY, SOME CLAY W/ ABUND	<u>  w</u>	60	17	<u> </u>	<u> </u>	90	<u> s</u>
	31 -	ļ	ļ		CALICHE CLASTS, MOD HC ODOR	<u> </u>	$\perp$	↓_		↓_		L
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## **ATTACHMENT B**



(UNCONSOLIDATED)

	Project _ <b>OK0532.002</b>	Well WP-11
	Town/City MONUMENT	
	County <u>LEA</u>	
	Permit No.	<del></del>
6 3/4" DIAMETER DRILLED HOLE	Land-Surface Elevation and Datum	— Feet
6 3/4" DIAMETER DRILLED HOLE  WELL CASING 4" SCH 40 PVC	Installation Date(s) 11/8/95 Drilling Method AIR ROTARY	
GROUT		
—— 12.5 FT.	Development Technique(s) a  BAIL/PUMP & SURGE	and Date(s) 11/09/95
BENTONITE PELLETS 15.3 FT.		
18.0 FT.	Water Removed During Dev	NONE Gallons relopment 30 Gallons 29.69 Feet below M.P.
WELL SCREEN 4" SCH40 PVC 20 SLOT	Pumping Depth to Water NA Pumping Duration NA Yield NA Gpm Specific Capacity NA	Feet below M.P.  Hours  Date NA
SAND PACK		
33.0 FT. 36.0 FT.	Remarks OLGALBY NORTON 10-20 SAN	D
NOT TO SCALE	BAGS	
Measuring Point is Top of Well Casing Unless Otherwise Noted.	3/4 BAG PURE GOLD CHIPS	
*Depth Below Land Surface	Prepared By J. SHONFELT	



	Project <u>OK0532.002</u> Well <u>WP-12</u>	
	Town/City MONUMENT	
	County LEA State NEW MEXICO	
	Permit No.	
— 6 3/4" DIAMETER	Land-Surface Elevation	
DRILLED HOLE	and DatumFeet	
WELL CASING 4" SCH 40 PVC	Installation Date(s) <u>11/8/95;11/9/95</u>	
4 SCH 40 PVC	Drilling Method AIR ROTARY	-
a pour	Drilling Contractor EADES	_
— 6 3/4" DIAMETER DRILLED HOLE  WELL CASING 4" SCH 40 PVC	Drilling Fluid AIR	
	Development Technique(s) and Date(s)	
19.2 FT.	BAIL/PUMP & SURGE 11/09/95	
BENTONITE PELLETS		
21.4 FT.		
25.0 FT.	Fluid Loss During Drilling NA G	allon
	Water Removed During Development 15.0 G	
	Static Depth to Water Feet below	
	Pumping Depth to Water NA Feet below	М. F
	Pumping Duration NA Hours	
WELL SCREEN 4" SCH40 PVC	Yield NA Gpm Date NA	
20 SLOT	Specific Capacity NA Gpm/Ft.	
	Well Purpose MONITORING WELL	
SAND PACK		
	Fracture Zones	<del> </del>
□□ 40.0 FT.	Remarks	
42.0 FT.	BAILED DRY TWICE DURING DEVELOPMENT	
NOT TO SCALE		
Measuring Point is Top of		
Well Casing Unless Otherwise Noted.		
*Depth Below Land Surface	Prepared By J. SHONFELT	



	Project <u>OK0532.002</u>	Well WP-13
	Town/City MONUMENT	
	County <u>LEA</u>	
	Permit No.	
6 3/4" DIAMETER	Land-Surface Elevation	
DRILLED HOLE	and Datum	Feet
WELL CASING	Installation Date(s) 11/8/95	
4" SCH 40 PVC	Drilling Method AIR ROTARY	
GROUT	Drilling Contractor <u>EADES</u>	
6 3/4" DIAMETER DRILLED HOLE  WELL CASING 4" SCH 40 PVC  GROUT	Drilling Fluid AIR	
	Development Technique(s) ar	nd Date(s)
—11.8 FT.	BAIL/PUMP & SURGE	
BENTONITE PELLETS		
14.0 FT.		
—— 18.0 FT.	Fluid Loss During Drilling N	A Gallons
	Fluid Loss During Drilling <u>N</u> Water Removed During Devel	opment 14.0 Gallons
	Static Depth to Water29	2.96 Feet below M.P.
	Pumping Depth to Water NA	
	Pumping Duration NA	
WELL SCREEN	Yield NA Gpm	Date <b>NA</b>
4° SCH40 PVC 20 SLOT	Specific Capacity NA	
	Well Purpose MONITORING WE	
	Well Purpose   MONITORING WE	LL
SAND PACK		
	Fracture Zones	
33.0 FT.	Remarks	
34.0 FT.	BAILED DRY TWICE DURING DEV	/ELOPMENT
NOT TO SCALE		
Measuring Point is Top of		
Well Casing Unless Otherwise Noted.		
*Depth Below Land Surface	Prepared By J. SHONFELT	



	Project <u>OK0532.002</u> Well <u>WP-14</u>
-	Town/City MONUMENT
6 3/4" DIAMETER DRILLED HOLE	County <u>LEA</u> State <u>NEW MEXICO</u>
	Permit No.
6 3/4" DIAMETER	Land-Surface Elevation
DRILLED HOLE	and DatumFeet
WELL CASING	Installation Date(s) 11/9/95
4" SCH 40 PVC	Drilling Method AIR ROTARY
ana.um	Drilling Contractor <u>EADES</u>
GROUT	Drilling Fluid AIR
- 6 3/4" DIAMETER DRILLED HOLE  - WELL CASING 4" SCH 40 PVC  - GROUT  - 27.0 FT.	Development Technique(s) and Date(s)
27.0 FT.	BAIL/PUMP & SURGE 11/9/95
- BENTONITE PELLETS	
— 30.0 FT.	
	Fluid Loss During Drilling NA Gallons
	Water Removed During Development 47.0 Gallons
	Static Depth to Water Feet below M.P
	Pumping Depth to Water NA Feet below M.P
7.00	Pumping Duration NA Hours
WELL SCREEN 4" SCH40 PVC	Yield NA Gpm Date NA
SO SLOT	Specific Capacity NA Gpm/Ft.
	Well Purpose MONITORING WELL
SAND PACK	
	Fracture Zones
□48.0 FT.	Remarks
48.0 FT.	PRODUCTIVE WATER ZONE
NOT TO SCALE	
easuring Point is Top of ell Casing Unless Otherwise	
oted.	
epth Below Land Surface	Prepared By J. SHONFELT



	Project <u>OK0572.002</u> well <u>WP-15</u>
VIIIII VIIIII	Town/City MONUMENT
	County LEA State NEW MEXICO
	Permit No
6.0" DIAMETER	Land-Surface Elevation
	and Datum Feet
WELL CASING	Installation Date(s) 11/9/95
2° SCH 40 PVC	Drilling Method AIR ROTARY
GROUT	Drilling Contractor <u>EADES</u>
GROUT	Drilling Fluid AIR
	Development Technique(s) and Date(s)
13.0 FT.	BAIL/PUMP & SURGE
BENTONITE PELLETS	
— 15.0 FT.	
17.5 FT.	Fluid Loss During Drilling NA Gallons
	Water Removed During Development Callons
	Static Depth to Water Feet below M.F
	Pumping Depth to Water NA Feet below M.F
WELL SCREEN	Pumping Duration NA Hours
2" SCH40 PVC	Yield NA Gpm Date NA
20 SLOT	Specific Capacity NA Gpm/Ft.
	Well Purpose OBSERVATION
SAND PACK	
	Fracture Zones
32.5 FT.	Remarks
32.5 FT.	BAILED DRY TWICE DURING DEVELOPMENT
NOT TO SCALE	
Measuring Point is Top of	
Well Casing Unless Otherwise Noted.	
*Depth Below Land Surface	Prepared By <u>J. SHONFELT</u>

# **ATTACHMENT 2**

## **Activity Summary**

#### July 1995 through Dec., 1995

Five new wells were installed during this time. Four of these wells were installed to further delineate the eastern border of the groundwater contamination. These wells are WP-11, WP-12, WP-14, and WP-15. One well was installed to take the place of the Climax well. This well was WP-13. A report from Geraghty and Miller, Feb. 29, 1996, further describes the installation of these wells.

Monitoring and recovery efforts continued with results being recorded in the following tables:

Table 1 - Water Table Elevations and Hydrocarbon Thickness Measurements

Table 2 - Analytical Results

Table 3 - Recovered Volumes

Recovered volumes consisted mainly of water due to poor pump performance. To improve hydrocarbon recovery rates three new pumps have been purchased which increased the hydrocarbon recovery significantly. Two of these pumps are currently operating and we are planning installation of the third.

In regards to water table elevations, we have had trouble obtaining an accurate survey of the wellhead elevations. Three separate survey attempts have produced questionable results. At this time we are locating a new surveyor to resolve this problem. Consequently, the elevations reported may be in err and may be subject to correction in future reports.

## Table 1 - Water Table Elevations and Hydrocarbon Thickness Measurements

Water Table Elevations and Hydrocarbon Thickness must be measured every three months for all Monitoring Wells.

Measurements should be taken during the first half of each quarter.

All wells should be guaged at the same time and the date noted in the space provided in the table.

Surveyed elevations are recorded on the Sheet labeled Well Information.

MSL water elevations and product thickness are automatically calculated in Tables 1-B and 1-C, respectively.

Table	1-A, AC	TUAL FIE	LD MEA	SUREME	NTS, from	reference	point on n	orth side o	of casing, fe	et	
		199				96				97	
Monitor	Well ID	3rd Qtr 10/31/95	4th Qtr 11/14/95	1st Qtr 1/24/96	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
WP-1	Product	32.00		28.00							
	Water	32.00	25.80	28.00					<del> </del>		
WP-2	Product	30.70	30.95	31.53							
-	Water	31.00	31.35	31.71							
WP-3	Product	29.40	29.30	29.17							
	Water	29.60	29.55	29.45						·	
WP-4	Product	33.60	33.75	33.96							
	Water	35.00	35.10	35.23							
WP-5	Product	31.90	32.10	32.62							
	Water	31.90	32.10	32.62							
WP-6	Product	28.80	28.80	28.75							<u> </u>
	Water	28.80	28.80	28.78							
WP-7	Product	31.25	34.30	31.77							
	Water	31.25	34.30	31.77							
WP-8	Product	NA	NA	NA							
	Water	NA	NA	NA						•	
WP-9	Product	NA	NA	NA							
	Water	NA	NA	NA							
WP-10	Product	28.35	28.15	28.10							
	Water	28.45	28.35	28.30							
WP-11	Product	NA	29.60	29.32							
	Water	NA	29.68	29.49							
WP-12	Product	NA	38.08	37.54							
	Water	NA	38.25	37.76							
WP-13	Product	NA	30.25	29.88							
	Water	NA	30.25	29.88							
WP-14	Product	NA	40.75	40.85							
	Water	NA	40.75	40.85							
WP-15	Product	NA	33.60	32.96							
	Water	NA	33.60	33.16							

Note: The bottom of well WP-2 is 31.71 feet from top of casing.

NA indicates not measured or not able to measure.

	199	95		19	96			19	96	
	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Monitor Well ID	10/31/95	11/14/95	1/24/96							
WP-1	3546.01	3552.21	3550.01							
WP-2	3546.73	3546.38	3546.02							
WP-3	3551.76	3551.81	3551.91			· · · · · · · · · · · · · · · · · · ·				
WP-4	3542.17	3542.07	3541.94				,			
WP-5	3547.54	3547.34	3546.82							
WP-6	3556.54	3556.54	3556.56							
WP-7	3551.80	3548.75	3551.28							
WP-8	NA	NA	NA							
WP-9	NA	NA	NA							
WP-10	3551.73	3551.83	3551.88							
WP-11	NA	3553.52	3553.71							
WP-12	NA	3543.69	3544.18							
WP-13	NA	3549.41	3549.78							
WP-14	NA	3541.09	3540.99		-					
WP-15	NA	3548.74	3549.18				<del></del>			

The water table in well WP-3 may be below bottom of well which has an elevation of 3551.91 fasl. NA indicates not measured or not able to measure.

	199	95		19	96			19	96	
Monitor Well ID	3rd Qtr 10/31/95	4th Qtr 11/14/95	1st Qtr 1/24/96	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
WP-1									1	
WP-2	0.30	0.40	0.18							
WP-3	0.20	0.25	0.28	***						-
WP-4	1.40	1.35	1.27							
WP-5										
WP-6			0.03							
WP-7										
WP-8	NA	NA	NA							
WP-9	NA	NA	NA.							
WP-10	0.10	0.20	0.20							
WP-11	NA	0.08	0.17							
WP-12	NA	0.17	0.22							
WP-13	NA									
WP-14	NA									
WP-15	NA		0.20							

Blanks indicate no product measured. NA indicates not measured or not able to measure.

# Table 2 -- Monitor Well Analytical Results Monument Groundwater Analytical Results

Each of the following monitor wells, WP-1, WP-5, WP-6, and WP-7, WP-13, and WP-14 must be sampled and analyzed on a quarterly basis coinciding with the measurements taken for Table 1.

	1005	Ž		10	1998			1997	7	
	3rd Otr	4th Otr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Parameter	10/31/95	12/20/95								
:										
Benzene, ug/i	5100.00	5000.00 6300.00	6300.00							
Toluene, ug/l	ND	ND	ND							
Ethylbenzene, ug/l	18.00	ND	ND							
Xylenes, ug/l	IDN	ND	ND							
Total BTEX, ug/l	5118.00	5000.00	6300.00							
Chlorides, mg/l	30.00	16.00	21.00							
Total Dissolved Solids, mg/l	907.00	798.00	1164.00							
Sulfate, mg/l	ND	ND	ND							

Table 2-B, Analytical Results for Monitor well	ts for Monit	or well -	WP-5					9		
	1995	95		19	1996			1997	97	
Parameter	3rd Qtr 10/31/95	4th Qtr 12/20/95	1st Qtr 2/19/96	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr 3rd Qtr	3rd Qtr	4th Qtr
Benzene, ug/l	140.00	110.00	140.00							
Toluene, ug/l	ND	ND	ND							
Ethylbenzene, ug/l	2.00	1.00	ND							
Xylenes, ug/l	2.00	ND	ND							
Total BTEX, ug/l	144.00	111.00	140.00							
Chlorides, mg/l	6700.00	7500.00	7500.00 9000.00							
Total Dissolved Solids, mg/l	16229.00	17087.00 20202.00	20202.00							
Sulfate, mg/l	2960.00	2670.00	3090.00							

Analytical

Table 2-C, Analytical Results for Monitor well -	ts for Monit	or well -	WP-6							
	19	1995		19	1996			1997	97	
Parameter	3rd Qtr 10/31/95	4th Qtr 12/20/95	1st Qtr 2/19/96	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Benzene, ug/l	620.00	290.00	610.00							
Toluene, ug/l	ND	ND	ND							
Ethylbenzene, ug/l	880.00	320.00	630.00							
Xylenes, ug/l	180.00	70.00	ND							
Total BTEX, ug/l	1680.00	680.00	1240.00							
Chlorides, mg/l	2100.00	1900.00	1500.00							
Total Dissolved Solids, mg/l	5271.00	5259.00	4718.00							
Sulfate, mg/l	53.00	28.00	21.00							
Note: The 10/31/95 CI, TDS, and Sulfate results were reversed for wells WP-6 and WP-7. These tab	and Sulfate r	esults were	reversed to	r wells WP.	-6 and WP-	<ol><li>These tal</li></ol>	oles reflect t	les reflect this correction.	on.	

Table 2-D, Analytical Results for Monitor well	s for Monit	or well -	WP-7						a and	
	1995	95		19	1996			1997	97	
	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Parameter	10/31/95	12/20/95	2/19/96							
Benzene, ug/l	ND	ND	ND							
Toluene, ug/l	ND	ND	ND							
Ethylbenzene, ug/l	ND	ND	1.00							
Xylenes, ug/l	ND	ND	ND							
Total BTEX, ug/l	ND	ND	1.00							
Chlorides, mg/l	16000.00	15000.00	16500.00							
Total Dissolved Solids, mg/l	35492.00	32986.00	36587.00							
Sulfate, mg/l	5830.00	5390.00	6160.00							
Note: The 10/31/95 CI, TDS, and Sulfate results were reversed for wells WP-6 and WP-7. These ta	ınd Sulfate r	esults were	reversed fo	or wells WP	-6 and WP-	7. These tal	bles reflect this correction	his correction	on.	

Table 2-E, Analytical Results for Monitor well -	s for Monit	or well -	WP- 13							
	.1995	95		19	1996			1997	97	
Parameter	3rd Qtr	4th Qtr 12/20/95	1st Qtr 2/19/96	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr 3rd Qtr		4th Qtr
Benzene, ug/l		5100.00	5700.00							
Toluene, ug/l		ND	ND							
Ethylbenzene, ug/l		170.00	150.00							
Xylenes, ug/l		ND	ND							
Total BTEX, ug/l		5270.00	5850.00							
Chlorides, mg/l		2300.00	1150.00							
Total Dissolved Solids, mg/l		5387.00	3495.00							
Sulfate, mg/l		11.00	5.00							

Table 2-F, Analytical Results for Monitor well -	for Monit	or well -	WP- 14							
	19	1995		191	1996			1997	97	
Parameter	3rd Qtr NA	4th Qtr 12/20/95	4th Qtr 1st Qtr 12/20/95 2/19/96	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Benzene, ug/l		120.00	81.00							
Toluene, ug/l		ND	ND						!	
Ethylbenzene, ug/l		2.00	1.00							
Xylenes, ug/l		21.00	ND							
Total BTEX, ug/l		143.00	82.00							
Chlorides, mg/l		7750.00	7750.00 10000.00							
Total Dissolved Solids, mg/l		15888.00 21366.00	21366.00							
Sulfate, mg/l		1170.00	1170.00 2670.00							



Both the Hydrocarbon and the Total Fluid (water + hydrocarbon) volumes recovered must be recorded for each of the following monitor wells: WP-2, WP-3, WP-10, and WP-13. (MW-13 replaces the Climax Well)

Cumulative Volumes are totaled automatically.

Pumping Well WP-4 is not currently an OCD requirment, we are pumping it voluntarily at this time.

Table 3-A, Volume of Total Fluids and Hydrocarbon Recovered, gallons									
				WP-2					
Peri	od	Total Fluids	Recovered		n Recovered			Hydrocarbon Recovered	
Cove		This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative
From	То	Period	Total	Period	Total	Period	Total	Period	Total
7/5/95	7/12/95		0		0		1,245		0
2/5/96	2/22/96		0		0	1,058			720
2/22/96	3/9/96		0		0	750	3,053	397	1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0	L	0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1, <u>11</u> 7
			0		0		3,053		1,117
			0	L	0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0	<u> </u>	0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117
			0		0		3,053		1,117

Peri	od	M		WP-4					Table 3-B, Volume of Total Fluids and Hydrocarbon Recovered, gallons									
Peri	0d [						WP-10											
i	ou l				n Recovered			Hydrocarbon Recovered										
Cove		This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative									
From	То	Period	Total	Period	Total	Period	Total	Period	Total									
8/2/95	8/14/95	1,386	1,386	0	0		0		0									
8/14/95	9/7/95	1,027	2,413	0	0		0		0									
	10/24/95	1,005		0	0		0		0									
	11/12/95	715			0		0		0									
	12/15/95	630			585		0		0									
12/20/95	1/13/96	705	5,468	650	1,235		0		0									
2/22/96	3/12/96		5,468		1,235	920	920	190	190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									
			5,468		1,235		920		190									

Table 3-C, Volume of Total Fluids and Hydrocarbon Recovered, gallons									
		onitor Well				Monitor Well (extra)			
Peri	od	Total Fluids	Recovered	Hydrocarbo	n Recovered	Total Fluids	Recovered	Hydrocarbo	n Recovered
Cove		This	Cumulative	This	Cumulative	This	Cumulative	This	Cumulative
From	То	Period	Total	Period	Total	Period	Total	Period	Total
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0	,	0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0	-	0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0
			0		0		0		0

### Well Information

Monitoring Well Reference I	Point Elevations, feet		
Monitor Well ID	Reference Elevation		
		2/1/96 Dit	fference
WP-1	3578.01	3578.01	
WP-2	3577.73	3577.73	
WP-3	3581.36	3581.36	
WP-4	3577.17	3581.55	4.38 higher
WP-5	3579.44	3582.84	3.40 higher
WP-6	3585.34	3578.71	6.63 lower
WP-7	3583.05	3583.20	0.15 higher
WP-8	3581.51	3581.94	0.43 higher
WP-9	3581.64	3581.84	0.20 higher
WP-10	3580.18	3580.18	
WP-11	3583.20	3583.20	
WP-12	3581.94	3581.94	
WP-13	3579.66	3579.66	
WP-14	3581.84	3581.84	
WP-15	3582.34	3582.34	



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

SPL, INC.

### REPORT APPROVAL SHEET

WORK ORDER NUMBER: 95 - 11 - 042

Approved for release by:

M. Scott Sample Laboratory Director

Date: 11 17 95

Debbie Proctor, Project Manager

Date: 11/17/195

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

tificate of Analysis NO. 9511042-01

For: Warren Petroleum P.O. Box 218 Canadian, TX 79014

Attn: Donnie Wallis

P.O. #:

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

SAMPLE ID: Mon Well 1

PROJECT NO:

**MATRIX: LIQUID** 

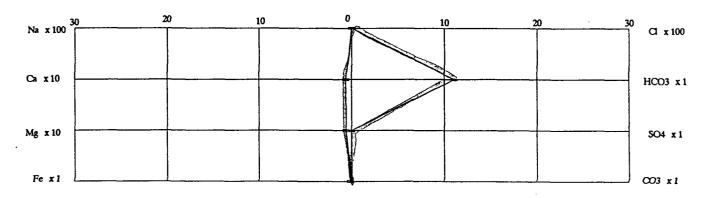
**DATE SAMPLED:** 10/31/95 09:00:00

DATE RECEIVED: 11/01/95

### **ANALYTICAL DATA**

<u>ION</u>	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	-9.28	-0.40	Total Dissolved Solids	
Calcium, Ca	123	6.14	(calc.) mg/L	907.57
Magnesium, Mg	71	5.84		
Chloride, Cl	30	0.85	Specific Gravity	
Bicarbonate, CaCO3	677	11.10	60/60 deg. F.	0.0970
Sulfate SO4	0	0.00		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	3.27	0.12	(Mohm-cm) 75 deg. F.	0.8990
Barium, Ba	6.58	0.10		
			pН	
			pH units	7.16

### MINERAL ANALYSIS PATTERN



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

ertificate of Analysis NO. 9511042-02

For: Warren Petroleum P.O. Box 218 Canadian, TX 79014

P.O. #:

DATE: 11/16/95

Attn: Donnie Wallis

PROJECT NO:

PROJECT: Liquid Analysis

MATRIX: LIQUID

SITE: Monument, NM SAMPLE BY: Warren Petroleum

DATE SAMPLED: 10/31/95 09:30:00

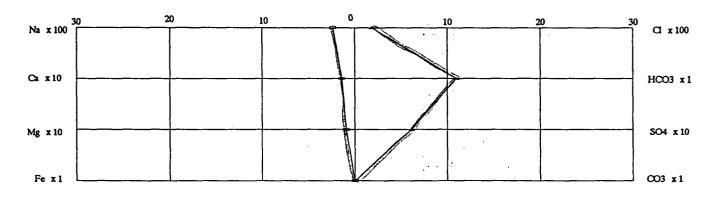
SAMPLE ID: Mon Well 5

DATE RECEIVED: 11/01/95

### ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	5434.95	236.40		
Calcium, Ca	284	14.17	(calc.) mg/L	16229.01
Magnesium, Mg	113	9.30		
Chloride, Cl	6700	189.00	Specific Gravity	
Bicarbonate, CaCO3	670	10.98	60/60 deg. F.	. 1.0100
Sulfate SO4	2960	61.63	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.03	0.00	(Mohm-cm) 75 deg. F.	0.0520
Barium, Ba	0.03	0.00	, , ,	
			рH	
			pH units	7.20
			-	

### MINERAL ANALYSIS PATTERN



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

Certificate of Analysis NO. 9511042-03

For: Warren Petroleum P.O. Box 218 Canadian, TX 79014

Attn: Donnie Wallis

P.O. #:

DATE: 11/16/95

PROJECT: Liquid Analysis

PROJECT NO:

SITE: Monument, NM

MATRIX: LIQUID

SAMPLE BY: Warren Petroleum

**DATE SAMPLED:** 10/31/95 08:00:00

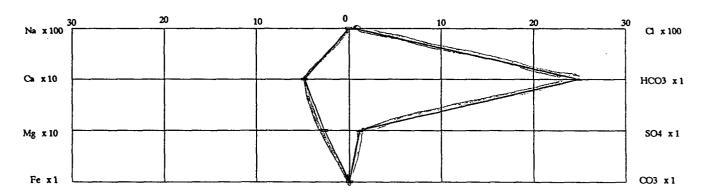
SAMPLE ID: Mon Well 7

DATE RECEIVED: 11/01/95

### ANALYTICAL DATA

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	123.18	5.36	Total Dissolved Solids	
Calcium, Ca	969	48.35	(calc.) mg/L	5271.23
Magnesium, Mg	328	26.98		
Chloride, Cl	2100	59.24	Specific Gravity	
Bicarbonate, CaCO3	1520	24.91	60/60 deg. F.	1.0100
Sulfate SO4	53	1.10	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.03	0.00	(Mohm-cm) 75 deg. F.	0.1420
Barium, Ba	0.03	0.00		
			pН	
			pH units	7.40

### MINERAL ANALYSIS PATTERN



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

Certificate of Analysis NO. 9511042-04

For: Warren Petroleum P.O. Box 218 Canadian, TX 79014

P.O. #:

DATE: 11/16/95

Attn: Donnie Wallis

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

SAMPLE ID: Mon Well 6

PROJECT NO:

MATRIX: LIQUID

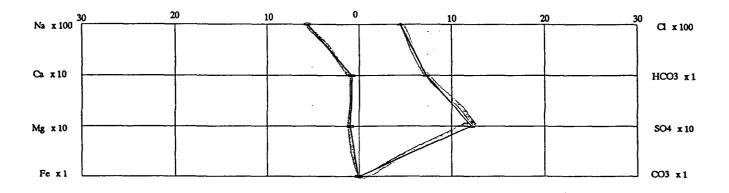
DATE SAMPLED: 10/31/95 08:30:00

DATE RECEIVED: 11/01/95

### **ANALYTICAL DATA**

<u>ION</u>	mg/L	meg/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	12919.15	561.95	Total Dissolved Solids	
Calcium, Ca	160	7.98	(calc.) mg/L	35492.24
Magnesium, Mg	115	9.46		
Chloride, Cl	16000	451.34	Specific Gravity	
Bicarbonate, CaCO3	446	7.31	60/60 deg. F.	. 1.0200
Sulfate SO4	5830	121.38		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	3.54	0.13	(Mohm-cm) 75 deg. F.	0.0250
Barium, Ba	0.55	0.01		
			pH <sub></sub>	
			pH units	6.92
			•	

### MINERAL ANALYSIS PATTERN





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

### Certificate of Analysis No. H9-9511042-01

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

**PROJECT:** Liquid Analysis

**SITE:** Monument, NM

MATRIX: LIQUID

PROJECT NO:

SAMPLED BY: Warren Petroleum

DATE SAMPLED: 10/31/95 09:00:00

SAMPLE ID: Mon Well 1

DATE RECEIVED: 11/01/95

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	5100	10 P	μg/L
TOLUENE	ND	10 P	μg/L
ETHYLBENZENE	18	10 P	μg/I
TOTAL XYLENE	ND	10 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	5118		μg/I
Surrogate	% Recovery		
1,4-Difluorobenzene	134		
4-Bromofluorobenzene	105		
METHOD 8020***			
Analyzed by: YN			
Date: 11/05/95			
Barium, Total	6.58	0.005	mg/L
METHOD 6010 ***			
Analyzed by: DQ			
Date: 11/09/95			
Calcium, Total	123	0.1	mg/L
METHOD 6010 ***			
Analyzed by: DQ			
Date: 11/09/95			
Iron, Total	3.27	0.02	mg/L
METHOD 6010 ***			
Analyzed by: DQ			
Date: 11/09/95			

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9511042-01

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: Mon Well 1

PROJECT NO:

MATRIX: LIQUID

**DATE SAMPLED:** 10/31/95 09:00:00

DATE RECEIVED: 11/01/95

ANALYTICAL DATA								
PARAMETER	RESULTS	DETECTION LIMIT	UNITS					
Potassium, Total	6	1	mg/L					
METHOD 6010 ***								
Analyzed by: DQ								
Date: 11/09/95								
Magnesium, Total	71	0.1	mg/L					
METHOD 6010 ***								
Analyzed by: DQ								
Date: 11/09/95								
Acid Digestion-Aqueous,	ICP 11/02/95							
METHOD 3010 ***								
Analyzed by: AM								
Date: 11/02/95								
Chloride	30	2	mg/L					
METHOD 325.3 *								
Analyzed by: ET								
Date: 11/03/95								
Carbonate, as CaCO3	ND	1	mg/L					
METHOD SM 4500-CO2D **			<i>J.</i>					
Analyzed by: JS								
Date: 11/01/95	,							
Bicarbonate, as CaCO3	677	1	mg/L					
METHOD SM 4500-CO2D **			2,					
Analyzed by: JS								
Date: 11/01/95								

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. H9-9511042-01

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: Mon Well 1

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 10/31/95 09:00:00

DATE RECEIVED: 11/01/95

	•	ANALYTICAL DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCU Analyzed by: Date:		64	1	mg/L
pH METHOD 150.1 Analyzed by: Date:		7.16		pH units
Resistivity EPA 120.1 * Analyzed by: Date:	JS 11/06/95	0.899		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:		ND	1	mg/L
Specific Grav ASTM D1429 Analyzed by: Date:	_	0.097		
Total Dissolve METHOD CALCU Analyzed by: Date:	LATION	907		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. H9-9511042-02

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

MATRIX: LIQUID **DATE SAMPLED:** 10/31/95 09:30:00

SAMPLE ID: Mon Well 5

DATE RECEIVED: 11/01/95

PROJECT NO:

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	140	1 P	μg/L
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	2	1 P	μg/L
TOTAL XYLENE	2	1 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	144		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	111		
4-Bromofluorobenzene METHOD 8020*** Analyzed by: YN Date: 11/05/95	107		
Barium, Total METHOD 6010 *** Analyzed by: DQ Date: 11/09/95	0.028	0.005	mg/L
Calcium, Total METHOD 6010 *** Analyzed by: DQ Date: 11/09/95	284	0.1	mg/L
Iron, Total METHOD 6010 *** Analyzed by: DQ Date: 11/09/95	0.03	0.02	mg/L

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9511042-02

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

MATRIX: LIQUID

SAMPLED BY: Warren Petroleum

DATE SAMPLED: 10/31/95 09:30:00

SAMPLE ID: Mon Well 5

DATE RECEIVED: 11/01/95

PROJECT NO:

·	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total	67	1	mg/L
METHOD 6010 ***			
Analyzed by: DQ			
Date: 11/09/95			
Magnesium, Total	113	0.1	mg/L
METHOD 6010 ***			
Analyzed by: DQ			
Date: 11/09/95		•	
Acid Digestion-Aqueous,	ICP 11/02/95		
METHOD 3010 ***			
Analyzed by: AM Date: 11/02/95			
Date: 11/02/33			
Chloride	6700	200	mg/L
METHOD 325.3 *			
Analyzed by: ET			
Date: 11/03/95			
Carbonate, as CaCO3	ND	1	mg/L
METHOD SM 4500-CO2D **			
Analyzed by: JS			
Date: 11/01/95			
Bicarbonate, as CaCO3	670	1	mg/L
METHOD SM 4500-CO2D **			
Analyzed by: JS			
Date: 11/01/95			

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. H9-9511042-02

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: Mon Well 5

PROJECT NO:

MATRIX: LIQUID

**DATE SAMPLED:** 10/31/95 09:30:00

DATE RECEIVED: 11/01/95

	<del></del>	ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCUI Analyzed by: Date:			5435	1	mg/L
pH METHOD 150.1 Analyzed by: Date:			7.20		pH units
Resistivity EPA 120.1 * Analyzed by: Date:	JS 11/06/95		0.052		Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:			2960	250	mg/L
Specific Grav ASTM D1429 Analyzed by: Date:	-		1.010		
Total Dissolve METHOD CALCU Analyzed by: Date:	LATION		16229	1	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.



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

### Certificate of Analysis No. H9-9511042-03

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: Mon Well 7

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 10/31/95 08:00:00

DATE RECEIVED: 11/01/95

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS									
RESULTS	DETECTION LIMIT	UNITS							
ND	1 P	μg/L							
ND	1 P	μg/L							
ND	1 P	μg/L							
ND	1 P	μg/L							
s nd		μg/L							
% Recovery									
97									
93									
0.025	0.005	mg/L							
969	1	mg/I							
0.03	0.02	mg/L							
	RESULTS  ND ND ND ND S Recovery 97 93  0.025	RESULTS DETECTION LIMIT  ND 1 P  ND 1 P  ND 1 P  ND 1 P  ND 1 P  ND 97  93  0.025 0.005							

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.

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<sup>(</sup>P) - Practical Quantitation Limit



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

### Certificate of Analysis No. H9-9511042-03

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: Mon Well 7

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 10/31/95 08:00:00

DATE RECEIVED: 11/01/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010 *** Analyzed by: DQ Date: 11/09/95	178	1	mg/L
Magnesium, Total METHOD 6010 *** Analyzed by: DQ Date: 11/09/95	328	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010 *** Analyzed by: AM Date: 11/02/95	ICP 11/02/95		
Chloride METHOD 325.3 * Analyzed by: ET Date: 11/03/95	2100	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: JS Date: 11/01/95	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: JS Date: 11/01/95	1520	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. H9-9511042-03

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

**SITE:** Monument, NM

SAMPLED BY: Warren Petroleum

**SAMPLE ID:** Mon Well 7

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 10/31/95 08:00:00

DATE RECEIVED: 11/01/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION	123 I	1	mg/L
Analyzed by: DAM Date: 11/14	/95		
pH METHOD 150.1 * Analyzed by: JS Date: 11/03	. 7.40 ./95		pH units
Resistivity EPA 120.1 * Analyzed by: JS Date: 11/06	0.142		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 11/09	53	5	mg/L
Specific Gravity ASTM D1429 Analyzed by: JS Date: 11/0	1.010		
Total Dissolved SomeTHOD CALCULATION Analyzed by: DAM Date: 11/14	ī	1	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.



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

### Certificate of Analysis No. H9-9511042-04

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO:
MATRIX: LIQUID

SAMPLED BY: Warren Petroleum

DATE SAMPLED: 10/31/95 08:30:00

SAMPLE ID: Mon Well 6

DATE RECEIVED: 11/01/95

ANALYTICAL 1	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	620	5 P	μg/I
TOLUENE	ND	5 P	μg/I
ETHYLBENZENE	880	5 P	μg/I
TOTAL XYLENE	180	5 P	μg/I
TOTAL VOLATILE AROMATIC HYDROCARBONS	1680		μg/I
Surrogate	% Recovery		
1,4-Difluorobenzene	112		
4-Bromofluorobenzene	136		
METHOD 8020***			
Analyzed by: YN			
Date: 11/05/95			
Barium, Total	0.554	0.005	mg/I
METHOD 6010 ***			
Analyzed by: DQ			
Date: 11/09/95			
Calcium, Total	160	0.1	mg/I
METHOD 6010 ***			
Analyzed by: DQ		,	
Date: 11/09/95			
Iron, Total	3.54	0.02	mg/L
METHOD 6010 ***		*	
Analyzed by: DQ			
Date: 11/09/95			

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9511042-04

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

MATRIX: LIQUID **DATE SAMPLED:** 10/31/95 08:30:00 SAMPLED BY: Warren Petroleum

SAMPLE ID: Mon Well 6

DATE RECEIVED: 11/01/95

PROJECT NO:

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010 *** Analyzed by: DQ Date: 11/09/95	18	1	mg/L
Magnesium, Total METHOD 6010 *** Analyzed by: DQ Date: 11/09/95	115	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010 *** Analyzed by: AM Date: 11/02/95	ICP 11/02/95		
Chloride METHOD 325.3 * Analyzed by: ET Date: 11/03/95	16000	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: JS Date: 11/01/95	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: JS Date: 11/01/95	446	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. H9-9511042-04

Warren Petroleum

P.O. Box 218

Canadian, TX 79014 ATTN: Donnie Wallis

DATE: 11/16/95

PROJECT: Liquid Analysis

SITE: Monument, NM

onument, NM

**SAMPLED BY:** Warren Petroleum

SAMPLE ID: Mon Well 6

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 10/31/95 08:30:00

DATE RECEIVED: 11/01/95

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 11/14/95	12919	1	mg/L
pH METHOD 150.1 * Analyzed by: JS Date: 11/01/95	6.92		pH units
Resistivity EPA 120.1 * Analyzed by: JS Date: 11/06/95	0.025		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 11/09/95	5830	625	mg/L
Specific Gravity ASTM D1429 Analyzed by: JS Date: 11/06/95	1.020		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 11/14/95	35492	1	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.

### QUALITY CONTROL DOCUMENTATION



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020

PAGE HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

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

Matrix: Units: Aqueous µg/L Batch Id:

HP\_J951105153810

### LABORATORY CONTROL SAMPLE

SPIKE	Method Spike		Blani	c Spike	QC Limits(**)		
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %	(Mandatory) % Recovery Range		
Benzene	ND	50	45	90.0	61 - 123		
Toluene	ND	150	140	93.3	62 - 122		
EthylBenzene	ND	50	50	100	56 - 119		
0 Xylene	ND .	100	97	97.0	32 - 160		
M & P Xylene	ND	200	200	100	32 - 160		

### MATRIX SPIKES

S P I K E C O M P Q U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix <u>Dupli</u>	Spike cate	MS/MSD Relative %		imits(***) Advisory)
	<2>	⋖\$>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
BENZENE	6	50	63	114	63	114	0	25	39 - 150
TOLUENE	6	150	180	116	180	116	0	26	56 - 134
ETHYLBENZENE	ND	50	60	120	60	120	0	38	61 - 128
O XYLENE	4	100	110	106	110	106	0	20	40 - 130
M & P XYLENE	8	100	130	122	130	122	0	20	43 - 152

Analyst: YN

Sequence Date: 11/05/95

SPL ID of sample spiked: 9511204-01A

Sample File ID: J\_\_\_389.TX0

Method Blank File ID:

Blank Spike File ID: J 382.TX0
Matrix Spike File ID: J 385.TX0

wathix shike life in: 1 \_\_ 202.1x0

Matrix Spike Duplicate File ID: J\_\_\_386.TX0

\* = Values Outside QC Range

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 =  $|(4 - 4)| / [(4 + 5)] \times 0.5] \times 100$ 

(\*\*) = Source: SPL Historical Data

(\*\*\*) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9511042-01C 9511126-01A 9511126-07A 9511126-09A

9511203-05A 9511203-09A 9511203-03A 9511203-08A

9511203-07A 9511203-06A 9511203-01A 9511203-02A

9511203-04A 9511203-11A 9511203-10A 9511203-12A

9511204-01A 9511042-02C 9511042-04C

C Officer



SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020

PAGE HOUSTON LABORATORY

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

Matrix: Units: Aqueous µg/L Batch Id:

HP\_J951102060710

### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blanl	Spike	QC Limits(**)		
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %	(Mandatory) % Recovery Range		
Benzene	ND	50	47	94.0	61 - 123		
Toluene	ND	150	150	100	62 - 122		
EthylBenzene	ND	50	52	104	56 - 119		
O Xylene	ND .	100	100	100	32 - 160		
M & P Xylene	ND	200	210	105	32 - 160		

### 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 cate	MS/MSD Relative %		imits(***) (Advisory)
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
BENZENE	150	50	200	100	200	100	0	25	39 - 150
TOLUENE	9	150	200	127	190	121	4.84	26	56 - 134
ETHYLBENZENE	51	50	110	118	110	118	0	38	61 - 128
O XYLENE	8	100	130	122	120	112	8.55	20	40 - 130
M & P XYLENE	38	100	170	132	170	132	0	20	43 - 152

Analyst: DAO

Sequence Date: 11/02/95

SPL ID of sample spiked: 9510D28-03A

Sample File ID: J\_\_271.TXO

Method Blank File ID:

Blank Spike File ID: J\_\_\_265.TX0

Matrix Spike File ID: J\_\_\_268.TX0

Matrix Spike Duplicate File ID: J\_\_\_269.TX0

\* = Values Outside QC Range

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 =  $((4 - (5) / ((4 + (5) ) \times 0.5) \times 100)$ 

(\*\*) = Source: SPL Historical Data

(\*\*\*) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9510028-02A 9511007-13A 9511009-04A 9511033-03A

9511030-01A 9511010-01A 9511005-01A 9511023-01A 9511023-02A 9511030-03A 9511033-01A 9511031-03A

9511042-03C 9510C08-01A 9510B80-05A 9511031-01A

9510D28-03A 9510D28-04A 9510D28-05A

ac Officer

### ICP Spectros py Method 6010 Quality Control port

Matrix: Water

Units: mg/L

Date:110995 Time:0915 File Name: 110995Q2

Analyst: DO
HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON TAYAS 77054
Checked on A 18 July

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum				`		
Arsenic						
Barium	ND	2.00	1.889	94	1.60	2.40
Beryllium						
Calcium	ND	20.00	19.340	- 97	16.00	24.00
Cadmium						
Cobalt						
Chromium						
Copper						
Iron	ND	2.00	2.047	102	1.60	2.40
Potassium	ND	20.00	18.790	94	16.00	24.00
Magnesium	ND	20.00	19.480	97	16.00	24.00
Manganese						
Sodium						
Nickel						-
Lead						
Antimony						
Selenium				,		
Thallium						
Vanadium						

Work Order Fractions

95-11-042 01A-04A

Matrix Spike	e - Spike Di	uplicate Re	esults		Work Orde	r Spiked: 95-	11-042	04A		
	Sample	Spike	Mati	ix Spike	Matrix Sp	ke Duplicate	QCL	imits	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	% Rec	covery	RPD %	Limits %
Silver										
Aluminum										
Arsenic										
Barium	0.554	1.0	1.42	87	1.392	84	80	120	3.3	20.0
Beryllium										
Calcium	159.3	10.0	167.7	84	170	107	80	120	24.1	** 20.0
Cadmium										
Cobalt										
Chromium										
Copper										
Iron	3.54	1.0	4.688	115	4.63	109	80	120	5.2	20.0
Potassium	17.55	10.0	28.3	108	28.12	106	80	120	1.7	20.0
Magnesium	115	10.0	123.6	86	124.8	98	80	120	13.0	20.0
Manganese										
Sodium										
Nickel										
Lead										
Antimony										
Selenium										
Thallium										
Vanadium										
Zinc									_	

<sup>\*\*</sup> Spike RPD Outside Method Limits



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 11/07/95 Analyzed on: 11/03/95 Analyst: ET

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	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9511103-01C	ND	50	102	102	0	93 109	2.7

-9511209

Samples in batch:

9510089-010 9510C90-01E

9511042-028

9510035-03A 9510038-03A

9510056-03A 9511042-04B 9511042-01B 9511103-01C

9511042-03B

COMMENTS:



6880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

11/07/95

Analyzed on:

11/03/95

Analyst:

ET

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	51.6	51.98	101	90 - 110

-9511209

### Samples in batch:

9510C89-Q1D	9510C90-01E	9510D35-03A	9510D38-03A
9510D56-03A	9511042-01B	9511042-02B	9511042-03B
9511042-04B	9511103-01C	•	

### COMMENTS:

LCS = SPL I.D #94463120-3

SPL Incorporated

QC/Officer



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous Reported on: 11/01/95 11/01/95

Analyzed on: 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.
9511042-01B	ND	ND	0	2.2

-9511041

Samples in batch:

9511042-01B

9511042-02B

9511042-03B

9511042-04B

COMMENTS:

QC Officer



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

### \* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 11/01/95

Analyzed on: 11/01/95

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.
9511042-01B	676	678	0.3	3

-9511040

Samples in batch:

9511042-01B

9511042-02B

9511042-03B

9511042-04B

COMMENTS:

SPL Incorporated

QC Officer



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

### \* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 11/01/95

Analyzed on: Analyst:

11/01/95 JS

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

pH METHOD 150.1 \*

### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ph units	Duplicate Sample ph units	RPD	RPD Max.
9511004-01A	7.90	7.90	0	1.0

-9511039

### Samples in batch:

9511003-01F	9511003-02F	9511003-03F	9511003-04F
9511004-01A	9511005-01C	9511042-01B	9511042-02B
9511042-03B	9511042-04B	•	

**COMMENTS:** 

SPL Incorporated

OC/Officer



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous Reported on: 11/07/95 11/06/95

Analyzed on:

Analyst: JS

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

> Resistivity EPA 120.1 \*

### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ohms-cm	Duplicate Sample ohms-cm	RPD	RPD Max.
9511103-01B	0.310	0.310	0	1.0

-9511187

Samples in batch:

9511042-01B 9511103-01B

9511042-02B 9511042-03B

9511042-04B

COMMENTS:

SPL

QC Officer



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 11/09/95

Analyzed on: 11/09/95 Analyst: ST

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	Amt Added mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9511056-01F	ND	10.00	94.7	96.6	2.0	79 122	11.

-9511306

Samples in batch:

9511042-01B

9511042-02B

9511042-03B

9511042-04B

9511056-01F

9511103-01B

9511342-01F

COMMENTS:



HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

11/09/95

Analyzed on:

11/09/95

Analyst:

ST

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	QC Limits Recovery
LCS	ND	20.00	19.89	99.4	90 - 110

-9511307

### Samples in batch:

9511042-Q1B

9511042-02B

9511042-03B

9511042-04B

9511056-01F

9511103-01B

9511342-01F

COMMENTS:

SPL LCS ID#955356-6

SPL, Incorporated

QC Øfficer



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

11/06/95

Analyzed on: 11/06/95

Analyst:

JS

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

Specific Gravity ASTM D1429

### -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.		
9511042-01B	0.097	0.097	0	1.0		

-9511156

Samples in batch:

9511042-01B 9511103-01B

9511042-02B

9511042-03B

9511042-04B

COMMENTS:

QC Officer

## CHAIN OF CUSTODY AND SAMPLE RECEIPT CHECKLIST

95/1042 Page \_



### Environmental Laboratory 8880 Interchange Drive Houston, Texas 77054 713/660-0901

# **Analysis Request and Chain of Custody Record**

		<del></del>	1 12	<del>, , , ,</del>	r	_	<b>)</b>					<del></del>				<del></del>
Seal #	SAMPLER REMARKS:		Chan A	Sampler	4	"	н	u u	Man-Well 6	3	*	*	2	Mon well of 7	Field Sample No./ Identification	Project No.
	aks: Inquimes		Affiliation	Samplers: (Signature)	2	u	*	11	10-31-95	2	2	"	"	58-76-07	Date and Time	
	Ž						-		<del> </del>		ļ	<del>                                     </del>			Grab	
as.	40	(Signature)	Relinquished by: (Signature)	Relinquished by: (Signature)	-\$	ų	6655	4	Malgene	z	u	6/288	z	Nalgene	Sample E Container O (Size/Mat'l)	Client/Project Name
528-363-2823	08681	:			A	ŋ	"	" "	"	4	11	1)	"	L19414	Sample Type (Liquid, Sludge, Etc.)	em Compray
828	Deceon			ļ . <u></u>	u	"	the		Nitre District	2	u	HU		2010	Preser- vative	n
Po Box 67 MONUMENT NUM	(Signature)	Time: (Signature)  A A A A A A A A A A A A A A A A A A A	(Signature)	Received by: (Signature)	*	.11	& 7EX	4	Mejor let à Louis	u	4	を7ピ <sup>×</sup>	u	Cat & Anion	ANALYSIS REQUESTED	Project Location  Monument, N.M.
Ž	Laboratory No.	36 ( )	Intact	Intact											LABORATORY REMARKS	

297.53

95/10/12 86%

Page 2 of



## Environmental Laboratory 8880 Interchange Drive Houston, Texas 77054 713/660-0901

# Analysis Request and Chain of Custody Record

	ext proper	Data Residits to: WPC - Monument	123	22-53	505-593-2823				Seal #	
Laboratory No.	Date   14'5	The state of the s	Lean	Offer Delega	athi Ossa	`	Saminbul		SAMPLER REMARKS:	
U C	Time:	(Signature)	Time:			Reinquished by: (Signature)				
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Intact	Date:	Received by: (Signature)	Date:			Relinquished by:		Samplers: (Signature)	/ Sample	
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		3			4	"		*	4	
		Cot & Anion	Ma for	Nitre 2010/	"	Nolgene		10-3/-95 9302m	Man Wells	
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		lor Col & Anion	Ma	Niture	Liguid	Nolgene		10-31-75 9 2m	Man Well 1	
LABORATORY REMARKS		ANALYSIS REQUESTED	,	Preser- vative	Sample Type (Liquid, Sludge, Etc.)	Sample Container (Size/Mat'l)	Grab Comp	Date and Time	Field Sample No./ Identification	
	Nur	Monunced U	lany	0	Permoleum	Client/Project Name	<b>~</b>		Project No.	
										_

29282



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

SPL, INC.

### REPORT APPROVAL SHEET

WORK ORDER NUMBER: 96 - 02 - 880

Approved for release by:

M. Scott Sample, Laboratory Director

Debbie Proctor, Project Manager

Date: 3/6/ase

Date: 3/6/96





### CASE NARRATIVE

WORKORDER NO.: 9602880

Southern Petroleum Laboratories (SPL) is pleased to present the results of laboratory analysis to Warren Petroleum Company. Six water samples and one trip blank were received intact at our laboratory on 02/20/96 at a temperature of 4 degrees Celsius. The following is a brief narrative of the laboratory analysis.

The samples were analyzed for BTEX by SW 846 8020 and a variety of cations and anions. There were no deviations from the methods.

All of the quality control data was within acceptable limits for the samples associated with this work order, with the exception of the matrix spike/matrix spike duplicate (MS/MSD) analysis for Total Calcium, Potassium, and Magnesium on sample 9602880-02B, MW#5. The MS/MSD recoveries were higher than the advisory QC limits. However, the recovery of the laboratory control standard was within acceptable limits and the entire analysis is considered to be in control.

Please refer to this project by 9602880 to expedite any further discussions. I will be happy to address any questions or concerns you may have.

SOUTHERN PETROLEUM LABORATORIES

Debbie Proctor

Project Manager



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

### Certificate of Analysis NO. 9602880-01

For: Warren Petroleum P.O. Box 67 Monument, NM 88265

Attn: Oscar DeLeon

P.O. #:

DATE: 03/04/96

PROJECT: Liquid Analysis

**PROJECT NO: 118** 

SITE: Monument, NM

MATRIX: Water **DATE SAMPLED: 02/19/96 13:00:00** 

SAMPLE BY: Warren Petroleum

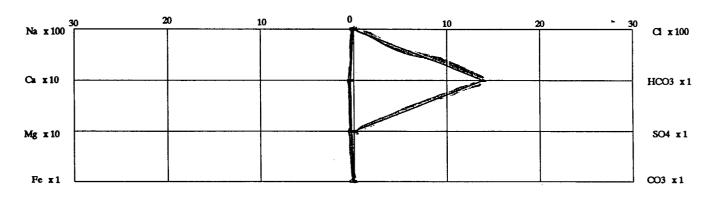
DATE RECEIVED: 02/20/96

**SAMPLE ID: MW #1** 

### ANALYTICAL DATA

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	176.49	7.68	Total Dissolved Solids	
Calcium, Ca	74.7	3.73	(calc.) mg/L	1164.12
Magnesium, Mg	34.2	2.81	, , ,	
Chloride, Cl	21	0.59	Specific Gravity	
Bicarbonate, CaCO3	848	13.90	60/60 deg. F.	1.0000
Sulfate SO4	0	0.00	•	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	4.06	0.15	(Mohm-cm) 75 deg. F.	0.6640
Barium, Ba	1.67	0.02		
			рH	
			pH units	7.25

### MINERAL ANALYSIS PATTERN







PHONE (713) 660-0901

### Certificate of Analysis NO. 9602880-02

For: Warren Petroleum

P.O. Box 67

Monument, NM 88265

Attn: Oscar DeLeon

DATE: 03/04/96 **PROJECT NO: 118** 

PROJECT: Liquid Analysis

SITE: Monument, NM

**MATRIX:** Water

SAMPLE BY: Warren Petroleum

**DATE SAMPLED: 02/19/96 13:30:00** 

P.O. #:

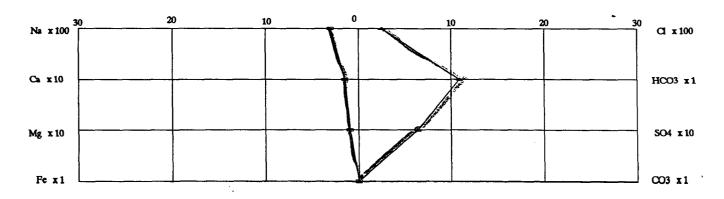
**SAMPLE ID: MW #5** 

DATE RECEIVED: 02/20/96

### **ANALYTICAL DATA**

<u>ION</u>	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	6978.54	303.55	<b>Total Dissolved Solids</b>	
Calcium, Ca	295	14.72	(calc.) mg/L	20201.66
Magnesium, Mg	112	9.21	, ,	
Chloride, Cl	9000	253.88	Specific Gravity	
Bicarbonate, CaCO3	664	10.88	60/60 deg. F.	1.0100
Sulfate SO4	3090	64.33	-	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.09	0.00	(Mohm-cm) 75 deg. F.	0.0490
Barium, Ba	0.03	0.00	· · · · · · ·	
			pН	
			pH units	7.11
			•	

### **MINERAL ANALYSIS PATTERN**





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

### Certificate of Analysis NO. 9602880-03

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

Attn: Oscar DeLeon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #6** 

P.O. #:

DATE: 03/04/96

**PROJECT NO: 118** 

MATRIX: Water

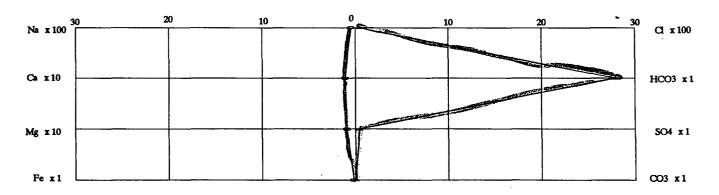
**DATE SAMPLED:** 02/19/96 11:00:00

DATE RECEIVED: 02/20/96

### ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	1133.2	49.29	Total Dissolved Solids	
Calcium, Ca	228	11.38	(calc.) mg/L	4718.46
Magnesium, Mg	113	9.30	, , -	
Chloride, Cl	1500	42.31	Specific Gravity	
Bicarbonate, CaCO3	1700	27.86	60/60 deg. F.	1.0020
Sulfate SO4	21	0.44	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	5.53	0.20	(Mohm-cm) 75 deg. F.	0.1540
Barium, Ba	0.73	0.01		
			pН	
			pH units	7.37

### **MINERAL ANALYSIS PATTERN**







Certificate of Analysis NO. 9602880-04

For: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 03/04/96

Attn: Oscar DeLeon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #7** 

PROJECT NO: 118

MATRIX: Water

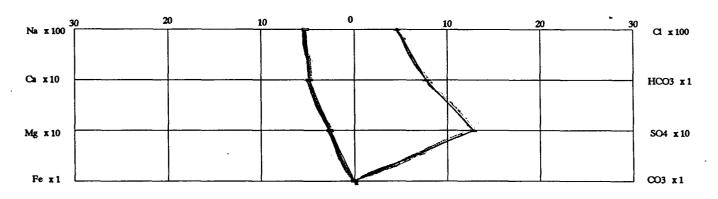
**DATE SAMPLED:** 02/19/96 10:00:00

DATE RECEIVED: 02/20/96

### ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	<b>WET CHEMISTRY</b>	<b>RESULT</b>
Sodium, Na (Calc.)	12029.18	523.24	<b>Total Dissolved Solids</b>	
Calcium, Ca	964	48.10	(calc.) mg/L	36586.83
Magnesium, Mg	320	26.32	, , ,	
Chloride, Cl	16500	465.44	Specific Gravity	
Bicarbonate, CaCO3	470	7.70	60/60 deg. F.	1.0250
Sulfate SO4	6160	128.25	•	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	1.58	0.06	(Mohm-cm) 75 deg. F.	0.0230
Barium, Ba	0.07	0.00		
			pН	
			pH units	6.92
			•	

### **MINERAL ANALYSIS PATTERN**







Certificate of Analysis NO. 9602880-05

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

Attn: Oscar DeLeon

P.O. #: DATE: 03/04/96

PROJECT: Liquid Analysis

PROJECT NO: 118

MATRIX: Water

SITE: Monument, NM

DATE SAMPLED: 02/19/96 14:00:00

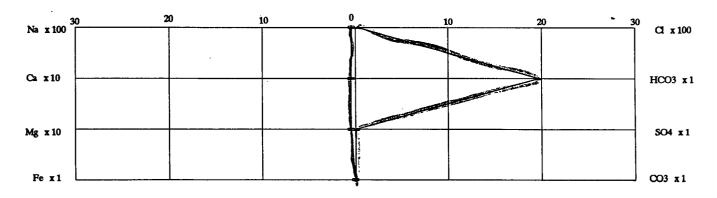
SAMPLE BY: Warren Petroleum SAMPLE ID: MW #13

DATE RECEIVED: 02/20/96

### ANALYTICAL DATA

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	973.14	42.33	Total Dissolved Solids	
Calcium, Ca	97.2	4.85	(calc.) mg/L	3494.65
Magnesium, Mg	57.6	4.74		
Chloride, Cl	1150	32.44	Specific Gravity	
Bicarbonate, CaCO3	1200	19.67	60/60 deg. F.	0.9990
Sulfate SO4	5	0.10		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	1.49	0.05	(Mohm-cm) 75 deg. F.	0.1980
Barium, Ba	2.22	0.03	, , , ,	
			рH	
			pH units	7.19
		,	=	

### **MINERAL ANALYSIS PATTERN**





PHONE (713) 660-0901



Certificate of Analysis NO. 9602880-06

For: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 03/04/96

Attn: Oscar DeLeon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #14** 

PROJECT NO: 118

MATRIX: Water

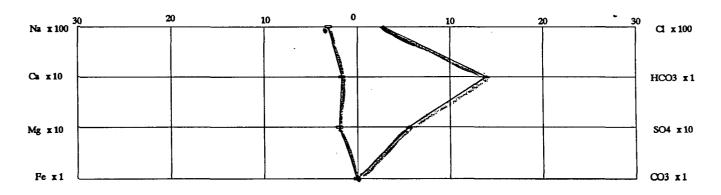
**DATE SAMPLED:** 02/19/96 14:30:00

DATE RECEIVED: 02/20/96

### **ANALYTICAL DATA**

ION	mg/L	meq/L	<b>WET CHEMISTRY</b>	<b>RESULT</b>
Sodium, Na (Calc.)	7217.5	313.94	<b>Total Dissolved Solids</b>	
Calcium, Ca	334	16.67	(calc.) mg/L	21366.21
Magnesium, Mg	236	19.41	, , ,	
Chloride, Cl	10000	282.09	Specific Gravity	•
Bicarbonate, CaCO3	849	13.91	60/60 deg. F.	1.0140
Sulfate SO4	2670	55.59	-	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	1.62	0.06	(Mohm-cm) 75 deg. F.	0.0320
Barium, Ba	0.09	0.00		
		Į.	pН	
			pH units	6.91
			<del>-</del>	

### **MINERAL ANALYSIS PATTERN**





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

### Certificate of Analysis No. H9-9602880-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

**DATE SAMPLED:** 02/19/96 13:00:00

SAMPLE ID: MW #1 DATE RECEIVED: 02/20/96

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	6300	1000 P	μg/L
TOLUENE	ND	1000 P	μg/L
ETHYLBENZENE	ND	1000 P	μg/L
TOTAL XYLENE	ND	1000 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	6300		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	82		
4-Bromofluorobenzene	68		
METHOD 8020A ***			
Analyzed by: YN			
Date: 03/01/96			
Barium, Total	1.67	0.005	mg/L
METHOD 6010A ***			
Analyzed by: DQ			
Date: 02/22/96			
Calcium, Total	74.7	0.1	mg/L
METHOD 6010A ***			_
Analyzed by: DQ			
Date: 02/22/96			
Iron, Total	4.06	0.02	mg/L
METHOD 6010A ***		•	_
Analyzed by: DQ			
Date: 02/22/96			•

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9602880-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

MATRIX: WATER

DATE RECEIVED: 02/20/96

PROJECT NO: 118

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 13:00:00

SAMPLE ID: MW #1

ANALYTICAL DATA **PARAMETER** RESULTS DETECTION UNITS LIMIT Potassium, Total 4 mg/L METHOD 6010A \*\*\* Analyzed by: DQ Date: 02/22/96 Magnesium, Total 34.2 0.1 mg/L METHOD 6010A \*\*\* Analyzed by: DQ Date: 02/22/96 Acid Digestion-Aqueous, ICP 02/21/96 METHOD 3010A \*\*\* Analyzed by: MM Date: 02/21/96 Chloride 21 1 mg/L METHOD 325.3 \* Analyzed by: CA Date: 02/21/96 Carbonate, as CaCO3 ND 1 mg/L METHOD SM 4500-CO2D \*\* Analyzed by: LC Date: 02/21/96 Bicarbonate, as CaCO3 848 1 mg/L METHOD SM 4500-CO2D \*\* Analyzed by: LC Date: 02/21/96

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. H9-9602880-01

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118 MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 13:00:00

SAMPLE ID: MW #1 DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	176	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/20/96	7.25		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/20/96	0.664		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/20/96	ND	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/20/96	1.000		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	1164		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.



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### Certificate of Analysis No. H9-9602880-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE ID: MW #5

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 13:30:00

DATE RECEIVED: 02/20/96

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	140	10 P	μg/L
TOLUENE	ND	10 P	μg/L
ETHYLBENZENE	ND	10 P	μg/L
TOTAL XYLENE	ND	10 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	140		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	83		
4-Bromofluorobenzene	76		
METHOD 8020A ***			
Analyzed by: YN			
Date: 03/01/96			
Barium, Total	0.028	0.005	mg/L
METHOD 6010A ***			
Analyzed by: DQ			
Date: 02/22/96			
Calcium, Total	295	0.1	mg/L
METHOD 6010A ***			<b>J</b> .
Analyzed by: DQ			
Date: 02/22/96			
Iron, Total	0.09	0.02	mg/L
METHOD 6010A ***		•	
Analyzed by: DQ		,	
Date: 02/22/96			

<sup>(</sup>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.



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### Certificate of Analysis No. H9-9602880-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE ID: MW #5

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 13:30:00

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	62	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	112	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		·
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	9000	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1 .	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	664	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.



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### Certificate of Analysis No. H9-9602880-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #5

PROJECT NO: 118

MATRIX: WATER

DATE SAMPLED: 02/19/96 13:30:00

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	6978	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/20/96	7.11		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/20/96	0.049		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/20/96	3090	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/20/96	1.010		
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	20202	1	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.



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### Certificate of Analysis No. H9-9602880-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 11:00:00

SAMPLE ID: MW #6

DATE RECEIVED: 02/20/96

ANALYTICAL DATA				
PARAMETER	RESULTS	DETECTION LIMIT	UNITS	
BENZENE	610	500 P	μg/L	
TOLUENE	ND	500 P	μg/L	
ETHYLBENZENE	630	500 P	μg/L	
TOTAL XYLENE	ND	500 P.	μg/L	
TOTAL VOLATILE AROMATIC HYDROCARBONS	1240		μg/L	
Surrogate	% Recovery			
1,4-Difluorobenzene	82			
4-Bromofluorobenzene	80			
METHOD 8020A ***				
Analyzed by: YN				
Date: 03/01/96				
Barium, Total	0.734	0.005	mg/L	
METHOD 6010A ***				
Analyzed by: DQ				
Date: 02/22/96				
Calcium, Total	228	0.1	mg/L	
METHOD 6010A ***			_	
Analyzed by: DQ	•			
Date: 02/22/96				
Iron, Total	5.53	0.02	mg/L	
METHOD 6010A ***		•		
Analyzed by: DQ				
Date: 02/22/96				

(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.



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### Certificate of Analysis No. H9-9602880-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 11:00:00

SAMPLE ID: MW #6

DATE RECEIVED: 02/20/96

-	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	17	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	113	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	1500	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	1700	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.



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### Certificate of Analysis No. H9-9602880-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

MATRIX: WATER SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #6

DATE SAMPLED: 02/19/96 11:00:00

DATE RECEIVED: 02/20/96

PROJECT NO: 118

		ANALYTICAL DAT	A		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATI Analyzed by: DAM Date: 02/	<b>1</b>		1133	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/	/20/96		7.37		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/	/20/96		0.154		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/	/20/96		21	1	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/	/20/96		1.002		
Total Dissolved S METHOD CALCULATI Analyzed by: DAM Date: 02/	ION A	<i>:</i>	4718	1	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.



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### Certificate of Analysis No. H9-9602880-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 10:00:00

SAMPLE ID: MW #7 DATE RECEIVED: 02/20/96

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
BENZENE		ND	1 P	μg/L
TOLUENE		ND	1 P	μg/L
ETHYLBENZENE	•	1	1 P	μg/L
TOTAL XYLENE		ND	1 P	μg/L
TOTAL VOLATILE AROMATIC	HYDROCARBONS	1		μg/L
Surrogate		% Recovery		
1,4-Difluorobenzene		76	•	
4-Bromofluorobenzene METHOD 8020A ***		80		
Analyzed by: YN				
Date: 03/01/96				
Barium, Total		0.074	0.005	mg/L
METHOD 6010A ***				
Analyzed by: DQ				
Date: 02/22/96				
Calcium, Total		964	0.5	mg/L
METHOD 6010A ***				
Analyzed by: DQ				
Date: 02/22/96				
Iron, Total		1.58	0.02	mg/L
METHOD 6010A ***		•	•	-
Analyzed by: DQ .				
Date: 02/22/96				

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.

<sup>(</sup>P) - Practical Quantitation Limit



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

### Certificate of Analysis No. H9-9602880-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 10:00:00

SAMPLE ID: MW #7

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	142	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	320	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	16500	500	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	470	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. H9-9602880-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 10:00:00

SAMPLE ID: MW #7 DATE RECEIVED: 02/20/96

		ANALYTICAL DATA		
PARAMETER		RESUI	TTS DETECT LIMIT	'ION UNITS
Sodium, Total METHOD CALCUI Analyzed by: Date:		120	)29 1	mg/L
Н		6.	.92	pH units
METHOD 150.1 Analyzed by:		••	. 52	pii diixeb
Resistivity EPA 120.1 * Analyzed by: Date:	LC 02/20/96	0.0	)23	Mohms-cm
Sulfate METHOD 375.4 Analyzed by: Date:		61	L60 500	mg/L
Specific Grave ASTM D1429 Analyzed by: Date:	-	1.0	)25	
Total Dissolve METHOD CALCU Analyzed by: Date:	LATION	365	587 1	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.



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

### Certificate of Analysis No. H9-9602880-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 14:00:00

SAMPLE ID: MW #13 DATE RECEIVED: 02/20/96

ANALYTICAL DATA				
PARAMETER	RESULTS	DETECTION LIMIT	UNITS	
BENZENE	5700	50 P	μg/L	
TOLUENE	ND	50 P	μg/L	
ETHYLBENZENE	150	50 P	μg/L	
TOTAL XYLENE	ND	50 P	μg/L	
TOTAL VOLATILE AROMATIC HYDROCARBONS	5850		μg/L	
Surrogate	% Recovery			
1,4-Difluorobenzene	97			
4-Bromofluorobenzene	8,6			
METHOD 8020A ***				
Analyzed by: YN				
Date: 03/01/96				
Barium, Total	2.22	0.005	mg/L	
METHOD 6010A ***			_	
Analyzed by: DQ				
Date: 02/22/96				
Calcium, Total	97.2	0.1	mg/L	
METHOD 6010A ***			<b>J</b> .	
Analyzed by: DQ				
Date: 02/22/96				
Iron, Total	1.49	0.02	mg/L	
METHOD 6010A ***			_	
Analyzed by: DQ				
Date: 02/22/96				

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9602880-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum Company

SAMPLE ID: MW #13

PROJECT NO: 118

MATRIX: WATER

DATE SAMPLED: 02/19/96 14:00:00

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96			mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	57.6	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	1150	50	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	1200	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.



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### Certificate of Analysis No. H9-9602880-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

DATE RECEIVED: 02/20/96

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 14:00:00

SAMPLE ID: MW #13

ANALYTICAL DATA

PARAMETER RESULTS DETECTION UNITS
LIMIT

Sodium, Total 973 1 mg/L

METHOD CALCULATION Analyzed by: DAM

Date: 02/29/96

pH 7.19 pH units

METHOD 150.1 \*
Analyzed by: LC

Date: 02/20/96

Resistivity 0.198 Mohms-cm

EPA 120.1 \*

Analyzed by: LC

Date: 02/20/96

Sulfate 5 1 mg/L

METHOD 375.4 \*
Analyzed by: ST

Date: 02/20/96

Specific Gravity 0.999

**ASTM D1429** 

Analyzed by: ST

Date: 02/20/96

Total Dissolved Solids 3495 1 mg/L

METHOD CALCULATION

Analyzed by: DAM

Date: 02/29/96

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. H9-9602880-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE ID: MW #14

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 14:30:00

DATE RECEIVED: 02/20/96

PARAMETER ANALYTICAL	DATA RESULTS	DETECTION LIMIT	UNITS	
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	81 ND 1 ND 82	1 P 1 P 1 P 1 P	μg/L μg/L μg/L μg/L	
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene METHOD 8020A *** Analyzed by: YN Date: 03/01/96	% Recovery 90 101		μg/L	
Barium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	0.088	0.005	mg/L	
Calcium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	334	0.1	mg/L	
Iron, Total  METHOD 6010A ***  Analyzed by: DQ  Date: 02/22/96	1.62	0.02	mg/L	

<sup>(</sup>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.



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

### Certificate of Analysis No. H9-9602880-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

DATE SAMPLED: 02/19/96 14:30:00

SAMPLE ID: MW #14 DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	58	1	mg/L
Magnesium, Total METHOD 6010A *** Analyzed by: DQ Date: 02/22/96	236	0.1	mg/L
Acid Digestion-Aqueous, METHOD 3010A *** Analyzed by: MM Date: 02/21/96	ICP 02/21/96		
Chloride METHOD 325.3 * Analyzed by: CA Date: 02/21/96	10000	500 •	mg/L
Carbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	ND	1	mg/L
Bicarbonate, as CaCO3 METHOD SM 4500-CO2D ** Analyzed by: LC Date: 02/21/96	849	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. H9-9602880-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO: 118
MATRIX: WATER

SAMPLED BY: Warren Petroleum Company

**DATE SAMPLED:** 02/19/96 14:30:00

SAMPLE ID: MW #14

DATE RECEIVED: 02/20/96

	ANALYTICAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	7218	1	mg/L
pH METHOD 150.1 * Analyzed by: LC Date: 02/20/96	6.91		pH units
Resistivity EPA 120.1 * Analyzed by: LC Date: 02/20/96	0.032		Mohms-cm
Sulfate METHOD 375.4 * Analyzed by: ST Date: 02/20/96	2670	250	mg/L
Specific Gravity ASTM D1429 Analyzed by: ST Date: 02/20/96	1.014		·
Total Dissolved Solids METHOD CALCULATION Analyzed by: DAM Date: 02/29/96	21366		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.



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

### Certificate of Analysis No. H9-9602880-07

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 03/04/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Provided by SPL

SAMPLE ID: Trip Blank

PROJECT NO: 118

MATRIX: WATER

DATE SAMPLED: 02/05/96

DATE RECEIVED: 02/20/96

ANALYTICAL 1	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	μg/L
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	ND	1 P	μg/L
TOTAL XYLENE	ND	. 1 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	99		
4-Bromofluorobenzene	60		
METHOD 8020A ***			
Analyzed by: YN			
Date: 03/01/96			

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



BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

PAGE HOUSTON LABORATORY

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

Matrix:

Aqueous

Units: µg/L

Batch Id: HP\_R960301012700

### LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike  Result Recovery  <1> %		QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	55	110	62 - 121
Toluene	ND	50	52	104	66 - 136
EthylBenzene	ND	50	46	92.0	70 - 136
O Xylene	ND	50	53	106	74 - 134
M & P Xylene	· ND	100	110	110	77 - 140

### MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix			Matrix Spike MS/MSD  Duplicate Relative %		QC Limits(***)(Advisory)		
	<2>	<3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery Range	
BENZENE TOLUENE ETHYLBENZENE	ND ND	20 20 20	21 21 17	105	21 20 17		0 4.88 0	25 26 38	39 - 150 56 - 134 61 - 128	
O XYLENE M & P XYLENE	ND ND	20 40	19 39	95.0	19 38		0 2.60	29 20	40 - 130 43 - 152	

Analyst: YN

Sequence Date: 03/01/96

SPL ID of sample spiked: 9602B39-04A

Sample File ID: R\_\_\_160.TX0

Method Blank File ID:

Blank Spike File ID: R\_\_\_153.TX0

Matrix Spike File ID: R\_\_\_156.TX0

Matrix Spike Duplicate File ID: R\_\_\_157.TX0

\* = Values Outside QC Range

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 (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (4th Q '94)

SAMPLES IN BATCH (SPL ID):

9602A23-03A 9602A23-01A 9602B37-02A 9602A09-05A

9602B39-02A 9602B39-03A 9602B39-01A 9602880-06A

9602977-02A 9602880-02A 9602880-05A 9602880-03A

9602880-01A 9602B38-02A 9602A52-02A 9602A52-01A

9602B38-01A 9602880-07A 9602B39-04A

OC Officer

PAGE HOUSTON LABORATORY

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

Matrix: Units:

Aqueous μg/L

Batch Id:

HP\_R960301044600

### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**) (Mandatory) % Recovery Range		
COMPOUNDS	Blank Result	Added <3>	Result <1>	Recovery			
Benzene	ND	50	33	66.0	62 - 121		
Toluene	ND	150	120	80.0	66 - 136		
EthylBenzene	ND	50	41	82.0	70 - 136		
O Xylene	ND	100	98	98.0	74 - 134		
M & P Xylene	· ND	200	190	95.0	77 - 140		
			<u> </u>	1			

### MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %		QC Limits(***)(Advisory)	
	<2>	<3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery Range	
BENZENE	ND	50	60	120	60	120	0	25	39 - 150	
TOLUENE	6.2	150	180	116	170	109	6.22	26	56 - 134	
ETHYLBENZENE	2.1	50	53	102	53	102	0	38	61 - 128	
O XYLENE	10	100	130	120	120	110	8.70	29	40 - 130	
M & P XYLENE	11	100	140	129	130	119	8.06	20	43 - 152	

Analyst: YN

Sequence Date: 03/01/96

SPL ID of sample spiked: 9602940-01A

Sample File ID: R\_\_\_188.TX0

Method Blank File ID:

Blank Spike File ID: R\_\_\_182.TX0

Matrix Spike File ID: R\_\_\_185.TX0

Matrix Spike Duplicate File ID: R\_\_\_186.TX0

\* = Values Outside QC Range

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 =  $(<1> / <3>) \times 100$ 

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

(\*\*) = Source: SPL-Houston Historical Data (3rd Q '95)

(\*\*\*) = Source: SPL-Houston Historical Data (4th Q '94)

SAMPLES IN BATCH (SPL ID):

9602880-04A 9602940-03A 9602940-04A 9602940-05A

9602940-02A 9602940-08A 9602940-07A 9602940-06A

9602976\_01A 9602976-06A 9602976-05A 9602976-02A

9602976-07A 9602976-08A 9602940-01A

### ICP Spectroscopy Method 6010 Quality Control Report

Matrix: Water

, Units: mg/L

Date:022296 Time:0851 File Name: 022296Q1

Work Orders in Batch Work Order Fractions

96-02-880 01B-06B

1	abo	rator	, Con	trol	Sam	nle
L	_av	ласы		1401	Jailli	Dic

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	<b>Upper Limit</b>
Silver	Ī					
Aluminum						
Arsenic						
Barium	ND	2.00	1.918	96	1.60	2.40
Beryllium						
Calcium	ND	20.00	19.620	98	16.00	24.00
Cadmium						
Cobalt						
Chromium						
Соррег						
Iron	ND	2.00	1.902	95	1.60	2.40
Potassium	ND	20.00	18.580	93	16.00	24.00
Magnesium	ND	20.00	19.720	99	16.00	24.00
Manganese						
Sodium						
Nickel						
Lead						
Antimony						
Selenium						
Thallium						
Vanadium						
Zinc						

triy Snika - Snika Dunlicata Results

Matrix Spike		_	Work Order Spiked: 96-02-880 02B										
	Sample	Spike		ix Spike		•	ike Duplicate			imits	Spike		QC
Element	Result	Added	Result	Recover	لــــــــــــــــــــــــــــــــــــــ	Result	Recovery	$\sqcup$	% Rec	overy	RPD %		Limits %
Silver					$\prod$		<u> </u>	$\Box$				$\Box$	
Aluminum								Ш					
Arsenic							İ						
Barium	0.0283	1.0	0.9976	97		0.9921	96	Ш	_80	120	0.6		20.0
Beryllium													
Calcium	295.3	10.0	318.7	234	•	313.3	180	Ŀ	80	120	26.1	**	20.0
Cadmium													
Cobalt					$\prod$								
Chromium					П							Т	
Copper					П								
iron	0.0899	1.0	1.174	108	П	1.017	93		80	120	15.6		20.0
Potassium	62.5	10.0	79.96	175	1.	76.02	135	٠	80	120	25.4	**	20.0
Magnesium	112.1	10.0	127.7	156	1	124.7	126	*	80	120	21.3		20.0
Manganese					П								
Sodium					$\Box$							Т	
Nickel			7		П	<u> </u>						Τ	
Lead		<u> </u>			П			П				T	
Antimony					П	_						7	
Selenium					П							Т	
Thallium					$\prod$							$\top$	
Vanadium												$\top$	
Zinc					П			П				Т	

<sup>\*</sup> Spike Results Outside Method Limits
\*\* Spike RPD Outside Method Limits



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

### SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous Reported on: 02/22/96 Analyzed on: 02/21/96

Analyst:

CA

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	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9602780-03A	ND	50.00	102	102	0	93 109	2.7

-9602780

### Samples in batch:

9602780-03A

9602782-03A 9602880-03C 9602853-04A 9602880-04C 9602880-01C 9602880-05C

9602880-02C 9602880-06C

COMMENTS:





### \* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/22/96

Analyzed on:

02/21/96

Analyst:

CA

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	51.60	51.98	101	90 - 110

-9602781

### Samples in batch:

9602780-03A

9602782-03A

9602853-04A

9602880-01C-

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL ID# 9553514-21

SPL Incorporated

QC Officer



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

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: A

Aqueous

Reported on:

02/21/96

Analyzed on:

02/21/96

Analyst:

LC

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.
9602880-06C	ND	ND	0	2.2

-9602776

### Samples in batch:

9602853-04A

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL, Incorporated

OC Officer



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

### \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 02/21/96 Analyzed on: 02/21/96

Analyst:

LC

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.
9602880-06C	850	848	0.2	3

-9602775

### Samples in batch:

9602853-04A 9

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL, Incomporated

QC officer



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# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 02/21/96 Analyzed on: 02/20/96

Analyzed on: Analyst:

CA

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

pH METHOD 150.1 \*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH UNITS	Duplicate Sample pH UNITS	RPD	RPD Max.
9602887-02C	8.39	8.42	0.4	1.0

-9602726

# Samples in batch:

9602403-01A 9602880-01C 9602880-02C 9602880-03C 9602880-04C 9602880-05C 9602880-06C 9602887-02C

COMMENTS:

Inthus Menl

QC Officer



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# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on:

02/20/96

Analyzed on:

02/20/96

Analyst:

LC

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

pH METHOD 150.1 \*

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9602880-04C	6.91	6.92	0.1	1.0

-9602717

# Samples in batch:

9602880-01C 9602880-05C 9602880-02C 9602880-06C 9602880-03C

9602880-04C

COMMENTS:

SPL Incorporated

QC'Officer



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# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/20/96

Analyzed on: 02/20/96

Analyst:

LC

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

Resistivity EPA 120.1 \*

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ohms-cm	Duplicate Sample ohms-cm	RPD	RPD Max.
9602880-02C	0.049	0.049	0	1.0

-9602716

# Samples in batch:

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:



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# \* SPL QUALITY CONTROL REPORT \*\*

Matrix: Aqueous

Reported on: 02/21/96

Analyzed on: 02/20/96

Analyst: CA

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

Resistivity EPA 120.1 \*

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ohms-cm	Duplicate Sample ohms-cm	RPD	RPD Max.
9602880-02C	0.049	0.049	0	1.0

-9602728

# Samples in batch:

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

Cythus munel



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#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 02/20/96 Analyzed on: 02/20/96 Analyst: ST

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	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9602880-05C	ND	10.00	99.4	93.8	5.8	79 122	11.

-9602720

Samples in batch:

9602880-01C 9602880-05C 9602880-02C 9602880-06C 9602880-03C

9602880-04C

COMMENTS:



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/20/96

Analyzed on:

02/20/96

Analyst:

ST

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	QC Limits Recovery
LCS	ND	20.00	19.93	99.6	90 - 110

-9602721

# Samples in batch:

9602880-01C 9602880-05C 9602880-02C

9602880-03C

9602880-04C

9602880-06C

COMMENTS:

SPL LCS ID#9553514-21

SPL, Incorporated

OC Øfficer



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

02/20/96

Analyzed on:

02/20/96

Analyst:

 $\mathtt{ST}$ 

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

Specific Gravity ASTM D1429

# -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9602880-04C	1.025	1.025	0	1.0

-9602719

# Samples in batch:

9602880-01C

9602880-02C

9602880-03C

9602880-04C

9602880-05C

9602880-06C

COMMENTS:

SPL, Incorporated

OC Officer

# CHAIN OF CUSTODY AND SAMPLE RECEIPT CHECKLIST

	<b>Y</b> An	SF Analysis Request &	SPL,	L, Inc. Chain of Custody Record	c. of Cı	ıstody	Reco	ord		SPL Wo	SPL Workorder No:	1887	9		H-O	H-04184
Client Name: MARIEN PG	Ellum	Compi	TANY 1	matrix bottle	ottle	size	pres.				Rec	quest	ed Ar	Requested Analysis	is	
Address/Phone: PS.BOX 6	7-505	-395-	25.23	glass		vial										
Client Contact: OSCAR DE	ELKON			ner:	l 			ners								
Project Name: MONUMEN 7	NM			soil oth	-vial	oz 4 60z	HN oth	ıtair		<u></u> ሊፋ	~S					
Project Number: # 1/8				0=	V=			Cor		O1	NIO					
N	N			dge		er 4	504	r of	çχ	R	or Ora			-		
Tavoice To:				=wa =slu plas	glas	l lite 8oz	HCI H2S	mbe	378	Ava	410					
SAMPLE ID	DATE	TIME	comp grab	SL				Nu	L	M	m					
MW#/9	2/19/96	No.	7	ر ا	<	40	\	W	×							
16	ι,	1/52m	7	ري ا	ρ	10	رو	ı		×	×		ļ			
アンサーの	))	1,000	ς_	ع	ØP		<b>6</b>	_		×	×					
mw# 59	u	130	7		<	40	1	W	×							
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1	ί,	1 300	\ V	$\omega$	P			1		×	X					
MW#69	ν ,	110th	V	$\omega$	<	94	,	الم	×							
mw#65	lt	11 0 mm	V	W	ρ	1	<u>ب</u>	1		×	×	!				
mu#6c	ų	11 cm	7		ρ	/		/		×	X					
Client/Consultant Remarks:	-			Laboratory remarks:	emarks	•								Intact?	Ž.	N
FR 58-393-4	780													Temp:	2	M
Requested TAT	Special Reporting Requirements	ng Requiremen	its Fax Results	sults		Raw Data		Special	Detection	n Limits	Special Detection Limits (specify):			-	PM review	w (initial):
<u> </u>	Star	Standard QC	Level 3 QC	8		Level 4 QC	r D								S S	OK PINCES
24hr 🗍 72hr 🔲	1. Relimpuished by	muished by Sampler:	tean	,		Z-15.	96	time d	2/K	2. Received by	My PA	W.	X	2523		7
48hr 🔲 Standard 🔲	3. Relinquished by:	l by:				date /		time 16:38	8	L Reg	N. C.	111	,			¢
Other 🔲	5. Relinquished by:	l by:				daye /		time		6. Received	৬	Laboratory	=			
8880 Interchange Drive, Houston, TX 77054 (713) 660-0901 459 Hughes Drive, Traverse City, MI 49684 (616) 947-5777	fouston, TX se City, MI	(77054 (71 49684 (616	3) 660-090 5) 947-577	7		٥٥	500 Ar 1511 E	nbassa . Oran	dor Ca gethor	ffery Pa	arkway nue, Fu	Scott	LA 70	)583 (3 2631 (	318) 2 (714) .	Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775 E. Orangethorpe Avenue, Fullerton, CA 92631 (714) 447-6868

Client Name: MARLEAN Companion   Marix bottle   Size   Press.    Client Contact: USCAM   December   Sample   Sa	96 4. Received by:
Laboratory remarks:    A   Color   Containers   Color   Containers   Color   Containers   Color   Containers   Color	Special Detection Limits (specify):
## 19 DATE TIME one grab Wewater Sesoil SLesludge Oeother:  ## 19 Wewater SLesludge Oeother:  ## 19 Wewater SLesludge Oeother:  ## 19 Wewater SLesludge Oeother:  ## 19 Wewater SLesludge Oeother:  ## 19 Wewater Slass of Slass of Sla	
WARREST REPROGRAM CONDAM MARKET STATE TIME COMPRESS STATE ST	
WARREN Report Containers  WARREN Report Containers  WARREN Report Containers  WARREN Report Containers  WARREN Report Containers  WARREN Report Containers  WARREN Report Containers  WARREN Report Containers  WARREN Report Containers  MARREN Report Cont	
MARKEN Replemen Company  MARKEN Replemen Company  MPLE ID  MONTE TIME comp grab  W=water S=soil SL=sludge O=other:  W=plastic A=amber glass of C=glass V=vial  I=1 liter 4=4oz 40=vial 8=8oz 16=16oz  I=HCl 2=HNO3 3=H2SO4 O=other:  Number of Containers	
MARKEN REPORTION  MARKEN REPORT OF STATE OF STAT	^ ×
MARKEN Kapadeum Composition Co	2 /
MPLE ID  MPL	
MARKEN Repoleum Company  MARKEN Repoleum Company  ME Company  ME Company  ME Company  ME Company  Menument Nm 88365  Menument N	1
MPLE ID  MPL	2 /
MPLE ID  DATE  TIME  Comp grab  W=water S=soil SL=sludge O=other:  P=plastic A=amber glass bottle C=glass V=vial  1=1 liter 4=4oz 40=vial 8=8oz 16=16oz  1=HCl 2=HNO3 3=H2SO4 O=other:  Number of Containers	
Marken Repoleum Company  The Name of Containers  ""CSCAR DECED Matrix Bottle  The Name of Containers  ""CSCAR DECED Matrix Bottle  "	3=H2
Marken Repoleum Company  "CSCAN DECEN MONUMENT NM 88365"  S=soil O=other:  A=amber glass bottle 4=40z 40=vial 6=160z  2=HNO3 O=other:  Containers	of er of
MARKEN Kehrsleum Company matrix bottle size pres.  "CSCAR DECEON matrix bottle size pres.  amber glass soil enther: entainers  "HONUMENT Non 88865 pres.  soil enther: entainers	O: Co
MARKEN Kelpholeum Company matrix bottle size pres.  FOLLOX 67 - Sos-393-2823  CSCAR OFLEON  Water Company matrix bottle size pres.  Solution of the size pres.  Solution of the size pres.  Solution of the size pres.  Solution of the size pres.  Solution of the size pres.	eoth
MARKEN Kehroleum Company matrix bottle size	ner: ners
MARKEN Kespoleum Company matrix bottle size	
	res.

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# SPL Houston Environmental Laboratory

# Sample Login Checklist

Time:

Date:

Dat	2/20/96 Time:	16:30		
SPI	L Sample ID:			
	9602	1880		
			<u>Yes</u>	No
1	Chain-of-Custody (COC) form is pre	sent.	V	
2	COC is properly completed.			<u>.</u>
3	If no, Non-Conformance Worksheet	has been completed.		
4	Custody seals are present on the ship	pping container.	V	
5	If yes, custody seals are intact.		V	
6	All samples are tagged or labeled.		V	
7	If no, Non-Conformance Worksheet	has been completed.		\
8	Sample containers arrived intact		V	
9	Temperature of samples upon arrival	:		<b>⊬</b> c
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	8369	7/3/4
		Other:		
11	Method of sample disposal:	SPL Disposal		
		HOLD		
		Return to Client		

Name:		Date:
	ghat a start of	2/20/96
	Mila paron	1 12



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

SPL, INC.

# REPORT APPROVAL SHEET

WORK ORDER NUMBER: 95 - 12 - 991

Approved for release by:

Debbie Proctor, Project Manager

Date: 1/15/9 6



#### CASE NARRATIVE

**WORKORDER NO.: 9512991** 

Southern Petroleum Laboratories (SPL) is pleased to present the results of laboratory analysis to Warren Petroleum Company. Six water samples and a trip blank were received at our laboratory on 12/20/95 at a temperature of 4 degrees Celsius. Additional unpreserved sample for MW 1, 7, and 14 was received on 12/26/95 at a temperature of 3 degrees Celsius. The following is a brief narrative of the laboratory analysis.

The samples were analyzed for BTEX by SW 8020 and a variety of major cations and anions. There were no deviations from the methods.

All of the quality control data was within acceptable limits for the samples associated with this work order, with the exception of the matrix spike/matrix spike duplicate (MS/MSD) analysis for Total Potassium and Total Magnesium on sample 9512991-06B, MW-14. The MS/MSD recoveries were higher than the advisory QC limits. However, the recovery of the laboratory control standard was within acceptable limits and the entire analysis is considered to be in control.

Please refer to this project by 9512991 to expedite any further discussions. I will be happy to address any questions or concerns you may have.

SOUTHERN PETROLEUM LABORATORIES

Debbie Proctor Project Manager



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

# Certificate of Analysis No. H9-9512991-01

Warren Petroleum P.O. Box 67

Monument, NM 88265

ATTN: Oscar DeLeon DATE: 01/15/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: Mon Well #1

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 12/20/95 09:30:00

DATE RECEIVED: 12/20/95

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	5000	50 P	μg/I
TOLUENE	ND	50 P	μg/I
ETHYLBENZENE	ND	50 P	μg/I
TOTAL XYLENE	ND	50 P	μg/I
TOTAL VOLATILE AROMATIC HYDROCARBONS	5000		μg/I
Surrogate	% Recovery		
1,4-Difluorobenzene	99		
4-Bromofluorobenzene	. 99		
METHOD 8020***			
Analyzed by: SB			
Date: 12/28/95			

(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.

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. 9512991-01

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

Attn: Oscar Deleon

PROJECT: Liquid Analysis SITE: Monument, NM

SAMPLE BY: Warren Petroleum

SAMPLE ID: Mon Well #1

P.O. #:

DATE: 01/03/96

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 12/20/95 09:30:00

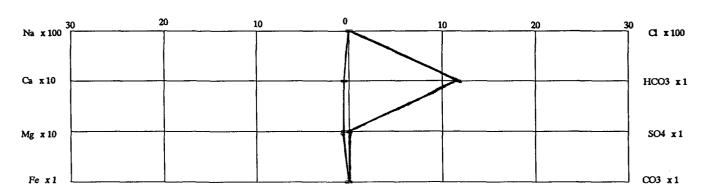
DATE RECEIVED: 12/20/95

# ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	15.62	0.68	<b>Total Dissolved Solids</b>	
Calcium, Ca	111	5.54	(calc.) mg/L	931.22
Magnesium, Mg	67	5.51	, , ,	
Chloride, Cl	16	0.45	Specific Gravity	
Bicarbonate, CaCO3	708	11.60	60/60 deg. F.	0.9980
Sulfate SO4	0	0.00	-	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	3.35	0.12	(Mohm-cm) 75 deg. F.	0.9260
Barium, Ba	5.25	0.08		
			pН	
		l	pH units	7.40

# MINERAL ANALYSIS PATTERN

(Number Below Ion Name meq/liter/Scale Unit)





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

# Certificate of Analysis No. H9-9512991-02

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 01/15/96

PROJECT: Liquid Analysis

SITE: Monument, NM

PROJECT NO:

MATRIX: LIQUID

SAMPLED BY: Warren Petroleum

DATE SAMPLED: 12/20/95 09:45:00

SAMPLE ID: MW #5 DATE RECEIVED: 12/20/95

ANALYTICAL I	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	110	1 P	μg/L
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	1	1 P	μg/L
TOTAL XYLENE	ND	1 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	111		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	102		
4-Bromofluorobenzene	106		
METHOD 8020***			
Analyzed by: VHZ			
Date: 01/03/96			

<sup>(</sup>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.

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. 9512991-02

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/03/96

Attn: Oscar Deleon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #5** 

PROJECT NO:

**MATRIX: LIQUID** 

**DATE SAMPLED: 12/20/95 09:45:00** 

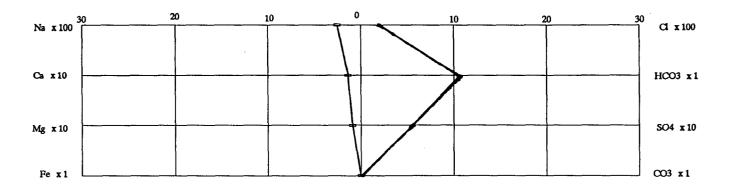
DATE RECEIVED: 12/20/95

# ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	<b>WET CHEMISTRY</b>	RESULT
Sodium, Na (Calc.)	5814.11	252.90	Total Dissolved Solids	
Calcium, Ca	280	13.97	(calc.) mg/L	17087.22
Magnesium, Mg	113	9.30	, ,	
Chloride, Cl	7500	211.57	Specific Gravity	
Bicarbonate, CaCO3	648	10.62	60/60 deg. F.	1.0080
Sulfate SO4	2670	55.59	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.08	0.00	(Mohm-cm) 75 deg. F.	0.5200
Barium, Ba	0.03	0.00		
			pH	
			pH units	6.97

# MINERAL ANALYSIS PATTERN

(Number Below Ion Name meq/liter/Scale Unit)





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

# Certificate of Analysis No. H9-9512991-03

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 01/15/96

PROJECT: Liquid Analysis

SITE: Monument, NM

**SAMPLED BY:** Warren Petroleum

SAMPLE ID: MW #7

PROJECT NO:

MATRIX: LIQUID

**DATE SAMPLED:** 12/20/95 08:45:00

DATE RECEIVED: 12/20/95

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ŃD	1 P	μg/I
TOLUENE	ND	1 P	μg/I
ETHYLBENZENE	ND	1 P	μg/I
TOTAL XYLENE	ND	1 P	μg/I
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/I
Surrogate	% Recovery		
1,4-Difluorobenzene	98		
4-Bromofluorobenzene	101		
METHOD 8020***			
Analyzed by: SB		•	
Date: 12/29/95			

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 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. 9512991-03

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/03/96

Attn: Oscar Deleon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #7** 

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 12/20/95 08:45:00

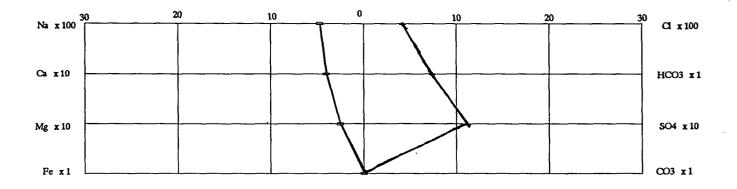
DATE RECEIVED: 12/20/95

# ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	10880.63	473.28		
Calcium, Ca	812	40.52	(calc.) mg/L	32985.97
Magnesium, Mg	308	25.34	` , ,	
Chloride, Cl	15000	423.13	Specific Gravity	
Bicarbonate, CaCO3	454	7.44	60/60 deg. F.	1.0250
Sulfate SO4	5390	112.22	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.31	0.01	(Mohm-cm) 75 deg. F.	0.0250
Barium, Ba	0.03	0.00	, , , , , , , , , , , , , , , , , , ,	
	F		рH	
			pH units	7.05

# MINERAL ANALYSIS PATTERN

(Number Below Ion Name meq/liter/Scale Unit)





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

# Certificate of Analysis No. H9-9512991-04

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 01/15/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #6

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 12/20/95 09:00:00

DATE RECEIVED: 12/20/95

ANALYTICAL 1	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	290	1 P	μg/L
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	320	1 P	μg/L
TOTAL XYLENE	70	1 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	680		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	105		
4-Bromofluorobenzene	177 «		
METHOD 8020***			
Analyzed by: VHZ			
Date: 01/03/96			

<sup>(</sup>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.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

<sup>« -</sup> Recovery beyond control limits.



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

# Certificate of Analysis NO. 9512991-04

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/03/96

Attn: Oscar Deleon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #6** 

PROJECT NO:

**MATRIX: LIQUID** 

DATE SAMPLED: 12/20/95 09:00:00

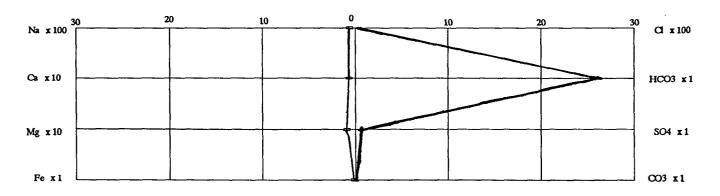
DATE RECEIVED: 12/20/95

# ANALYTICAL DATA

<u>ION</u>	mg/L	meg/L	WET CHEMISTRY	<b>RESULT</b>
Sodium, Na (Calc.)	1465.86	63.76	Total Dissolved Solids	
Calcium, Ca	136	6.79	(calc.) mg/L	5258.94
Magnesium, Mg	112	9.21		
Chloride, Cl	1900	53.60	Specific Gravity	
Bicarbonate, CaCO3	1596	26.16	60/60 deg. F.	1.0000
Sulfate SO4	28	0.58		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	3.6	0.13	(Mohm-cm) 75 deg. F.	0.1540
Barium, Ba	0.48	0.01		
			´ pH	
			pH units	7.06

# **MINERAL ANALYSIS PATTERN**

(Number Below Ion Name meq/liter/Scale Unit)





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

# Certificate of Analysis No. H9-9512991-05

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 01/15/96

PROJECT: Liquid Analysis

SITE: Monument, NM

MATRIX: LIQUID

SAMPLED BY: Warren Petroleum

DATE SAMPLED: 12/20/95 10:00:00

SAMPLE ID: MW #13

DATE RECEIVED: 12/20/95

PROJECT NO:

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	5100	25 P	$\mu$ g/L
TOLUENE	ND	25 P	μg/L
ETHYLBENZENE	170	25 P	$\mu$ g/L
TOTAL XYLENE	ND	25 P	$\mu$ g/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	5270		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	102		
4-Bromofluorobenzene	102		
METHOD 8020***			
Analyzed by: SB			
Date: 12/28/95			

<sup>(</sup>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.

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. 9512991-05

For: Warren Petroleum P.O. Box 67

Monument, NM 88265

Attn: Oscar Deleon

PROJECT: Liquid Analysis SITE: Monument, NM

**SAMPLE BY:** Warren Petroleum

**SAMPLE ID: MW #13** 

P.O. #:

DATE: 01/03/96

**PROJECT NO:** 

**MATRIX: LIQUID** 

**DATE SAMPLED: 12/20/95 10:00:00** 

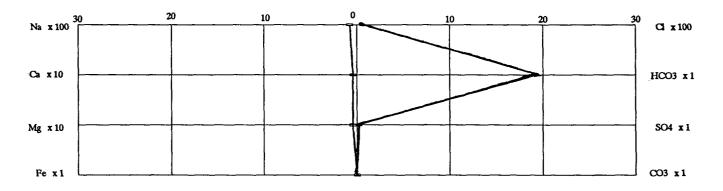
DATE RECEIVED: 12/20/95

# **ANALYTICAL DATA**

ION	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	1743.91	75.86		
Calcium, Ca	80.8	4.03	(calc.) mg/L	5387.43
Magnesium, Mg	54.1	4.45	, , -	
Chloride, Cl	2300	64.88	Specific Gravity	
Bicarbonate, CaCO3	1188	19.47	60/60 deg. F.	0.9990
Sulfate SO4	11	0.23	_	
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.87	0.03	(Mohm-cm) 75 deg. F.	0.2220
Barium, Ba	1.75	0.03		
			pН	
		1	pH units	7.07
			_	

# MINERAL ANALYSIS PATTERN

(Number Below Ion Name meg/liter/Scale Unit)





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

# Certificate of Analysis No. H9-9512991-06

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 01/15/96

PROJECT: Liquid Analysis

SITE: Monument, NM

, NM

SAMPLED BY: Warren Petroleum

SAMPLE ID: MW #14

PROJECT NO:

MATRIX: LIQUID

DATE SAMPLED: 12/20/95 10:30:00

DATE RECEIVED: 12/20/95

ANALYTICAL I	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	120	1 P	μg/Ĺ
TOLUENE	ND	1 P	μg/L
ETHYLBENZENE	2	1 P	μg/L
TOTAL XYLENE	21	1 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	143		$\mu$ g/L
Surrogate	% Recovery		
1,4-Difluorobenzene	101		
4-Bromofluorobenzene	108		
METHOD 8020***			
Analyzed by: SB			
Date: 12/29/95			

<sup>(</sup>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.

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. 9512991-06

For: Warren Petroleum

P.O. Box 67

Monument, NM 88265

P.O. #:

DATE: 01/03/96

Attn: Oscar Deleon

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLE BY: Warren Petroleum

**SAMPLE ID: MW #14** 

PROJECT NO:

**MATRIX: LIQUID** 

**DATE SAMPLED: 12/20/95 10:30:00** 

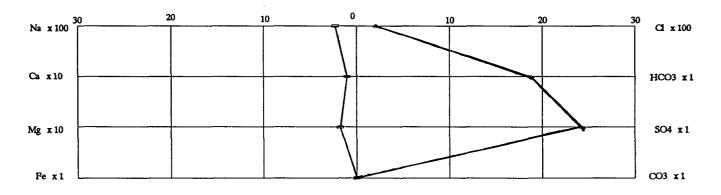
DATE RECEIVED: 12/20/95

# ANALYTICAL DATA

<u>ION</u>	mg/L	meq/L	WET CHEMISTRY	RESULT
Sodium, Na (Calc.)	5342.85	232.40	Total Dissolved Solids	
Calcium, Ca	207	10.33	(calc.) mg/L	15887.8
Magnesium, Mg	214	17.60	, , -	
Chloride, Cl	7750	218.62	Specific Gravity	
Bicarbonate, CaCO3	1148	18.81	60/60 deg. F.	1.0100
Sulfate SO4	1170	24.36		
Carbonate, CaCO3	0	0.00	Resistivity	
Iron, Fe(Total)	0.87	0.03	(Mohm-cm) 75 deg. F.	0.0470
Barium, Ba	0.08	0.00		
			pН	
			pH units	7.45

# MINERAL ANALYSIS PATTERN

(Number Below Ion Name meq/liter/Scale Unit)





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

# Certificate of Analysis No. H9-9512991-07

Warren Petroleum

P.O. Box 67

Monument, NM 88265 ATTN: Oscar DeLeon

DATE: 01/15/96

PROJECT: Liquid Analysis

SITE: Monument, NM

SAMPLED BY: Provided by SPL

**SAMPLE ID:** Trip Blank

PROJECT NO:

MATRIX: LIQUID

**DATE SAMPLED:** 12/05/95

DATE RECEIVED: 12/20/95

ANALYTICAL I	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	μg/I
TOLUENE	ND	1 P	μg/I
ETHYLBENZENE	ND	1 P	μg/I
TOTAL XYLENE	ND	1 P	μg/I
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/I
Surrogate	% Recovery		
1,4-Difluorobenzene	98		
4-Bromofluorobenzene	98		
METHOD 8020***			
Analyzed by: SB			
Date: 12/29/95			

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 ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

# QUALITY CONTROL DOCUMENTATION



PL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

PAGE HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Units: Aqueous µg/L

Batch Id: HP\_S951228124600

# LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blani	C Spike	QC Limits(**)		
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %	(Mandatory) % Recovery Range		
Benzene	ND	50	35	70.0	61 - 123		
Toluene	ND	50	44	88.0	62 - 122		
EthylBenzene	ND	50	57	114	56 - 119		
0 Xylene	ND	50	60	120	32 - 160		
M & P Xylene	ND	100	120	120	32 - 160		

#### 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 cate	MS/MSD Relative %	1	imits(***) (Advisory)
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
BENZENE	ND	50	39	78.0	38	76.0	2.60	25	39 - 150
TOLUENE	ND	150	110	73.3	110	73.3	0	26	56 - 134
ETHYLBENZENE	ND	50	36	72.0	34	68.0	5.71	38	61 - 128
O XYLENE	ND	100	76	76.0	73	73.0	4.03	20	40 - 130
M & P XYLENE	ND	100	76	76.0	73	73.0	4.03	20	43 - 152

Analyst: SB

Sequence Date: 12/28/95

SPL ID of sample spiked: 9512991-03A

Sample File ID: SS\_\_464.TXO

Method Blank File ID:

Blank Spike File ID: SS\_426.TX0

Matrix Spike File ID: SS\_462.TX0

Matrix Spike Duplicate File ID: SS\_463.TXO

\* = Values Outside QC Range

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 Historical Data

(\*\*\*) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9512A29-03A 9512A29-14A 9512A29-10A 9512A29-11A

9512A29-08A 9512A29-12A 9512A29-17A 9512991-01A

9512937-02B 9512991-05A 9512B02-02A 9512A29-07A

9512991-03A 9512A29-04A 9512A29-13A 9512A29-01A 9512833-02A 9512A29-09A 9512A29-18A

QQ Mh



BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020\*\*\*

PAGE HOUSTON LABORATORY

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

Matrix: Units: Aqueous µg/L Batch Id: HP\_S951229120500

#### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blani	Spike	QC Limits(**) (Mandatory) % Recovery Range		
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %			
Benzene	ND	50	42	84.0	61 - 123		
Toluene	ND	50	41	82.0	62 - 122		
EthylBenzene	ND	50	43	86.0	56 - 119		
O Xylene	ND	- 50	44	88.0	32 - 160		
M & P Xylene	ND	100	89	89.0	32 - 160		

#### 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 cate	MS/MSD Relative %		imits(***) (Advisory)
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
BENZENE	3	50	58	110	58	110	0	25	39 - 150
TOLUENE	7	150	170	109	170	109	0	26	56 - 134
ETHYLBENZENE	5	50	59	108	62	114	5.41	38	61 - 128
O XYLENE	14	100	120	106	120	106	0	20	40 - 130
M & P XYLENE	13	100	130	117	130	117	0	20	43 - 152

Analyst: SB

Sequence Date: 12/28/95

SPL ID of sample spiked: 9512997-02A

Sample File ID: SS\_469.TX0

Method Blank File ID:

Blank Spike File ID: SS\_456.TX0

Matrix Spike File ID: SS\_475.TX0

Matrix Spike Duplicate File ID: SS\_476.TXO

\* = Values Outside QC Range

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 Historical Data

(\*\*\*) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9512A76-03A 9512A76-04A 9512B02-01A 9512B02-03A

9512B02-04A 9512B02-06A 9512B02-07A 9512B02-08A

9512B02-09A 9512B02-05A 9512B02-11A 9512B02-10A

9512991-06A 9512991-07A 9512996-01A 9512997-01A

9512997-02A 9512A76-01A 9512A76-02A

QC Officer

SPL BATCH QUALITY CONTROL REPORT \*\*
METHOD 8020/602

PAGE HOUSTON LABORATORY

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

Matrix: Units: Aqueous µg/L Batch Id: HP

HP\_S960102181500

#### LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	<u>Blani</u>	k Spike	QC Limits(**) (Mandatory) % Recovery Range		
COMPOUNDS	Blank Result <2>	Added <3>	Result <1>	Recovery %			
MTBE	ND	50	45	90.0	56 - 135		
Benzene	ND	50	46	92.0	61 - 123		
Toluene	ND	50	44	88.0	62 - 122		
EthylBenzene	ND	50	44	88.0	56 - 119		
O Xylene	ND	50	46	92.0	32 - 160		
M & P Xylene	ND	100	95	95.0	32 - 160		

#### MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	•		Matrix Spike  Duplicate		ke MS/MSD Relative %		QC Limits(***)(Advisory)			
•	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery F	Range		
MTBE	. 120	20	130	NC	130	NC	NC	20	39 -	150		
BENZENE	3	20	18	75.0	18	75.0	0	25	39 -	150		
TOLUENE	2	20	15	65.0	15	65.0	0	26	56 -	134		
ETHYLBENZENE	ND	20	12	60.0 *	12	60.0 *	0	38	61 -	128		
O XYLENE	1	20	12	55.0	11	50.0	9.52	29	40 -	130		
M & P XYLENE	1	40	21	50.0	22	52.5	4.88	20	43 -	152		

Analyst: VHZ

Sequence Date: 01/03/96

SPL ID of sample spiked: 9512B11-01A

Sample File ID: SS\_\_602.TX0

Method Blank File ID:

Blank Spike File ID: SS\_\_613.TX0

Matrix Spike File ID: SS\_611.TX0

Matrix Spike Duplicate File ID: SS 612.TX0

\* = Values Outside QC Range

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

(\*\*\*) = Source:

SAMPLES IN BATCH(SPL ID):

9512A83-01A 9512A83-02A 9512A83-03A 9512A83-04A

9512A90-01A 9512991-02A 9512991-04A 9512A79-07A

9512A79-02A 9512A79-03A 9512A79-04A 9512A52-01A

9512B03-01A 9512D00-01A 9512D00-02A 9512D00-03A

9512B25-07A 9512A79-07A 9512B11-01A

ac officer

# ICP Spectrosepy Method 6010 Quality Control Report



Matrix: Water

Units: mg/L

Analyst DOSTON LABORATORY

8880 INTERCHANGE DRIVE

Date:122695 Time:0953 File Name: 122695Q2

Checkene (713) 660 0901

**Laboratory Control Sample** 

	Element   Mth. Blank   True Value   Result   % Recovery   Lower Limit   Upper Limit												
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit							
Silver													
Aluminum													
Arsenic													
Barium	ND	2.00	1.903	95	1.60	2.40							
Beryllium													
Calcium	ND	20.00	19.780	99	16.00	24.00							
Cadmium	ND	2.00	1.990	100	1.60	2.40							
Cobalt													
Chromium													
Copper	ND	2.00	1.955	98	1.60	2.40							
Iron	ND	2.00	1.927	96	1.60	2.40							
Potassium	ND	20.00	19.300	97	16.00	24.00							
Magnesium	ND	20.00	20.290	101	16.00	24.00							
Manganese													
Sodium													
Nickel		-											
Lead	ND	2.00	1.961	98	1.60	2.40							
Antimony													
Selenium													
Thallium													
Vanadium													
Zinc	0.020	2.00	2.026	101	1.60	2.40							

Work Orders in Batch Work Order Fractions 95-12-991 01B-06B 95-12-A50 01C 95-12-A46 01A

Matrix Spike - Spike Duplicate Results Work Order Spiked: 95-12-991 06B

Wau IX Spike						AAOLK OLGE			12-331	UUD			
	Sample	Spike	Mati	ix Spike		Matrix Spi	ke Duplicate		QCL	imits	Spike		QC
Element	Result	Added	Result	Recovery	,	Result	Recovery		% Rec	overy	RPD %		Limits %
Silver								Ī				$\Gamma$	
Aluminum								I				$\prod$	
Arsenic													
Barium	0.0817	1.0	1.025	94		1.025	94		80	120	0.0	Π	20.0
Beryllium								T				Τ	
Calcium	207.4	10.0	217.1	97		219.2	118		80	120	19.5	Π	20.0
Cadmium	ND	1.0	0.9744	97		0.9874	99	T	80	120	2.0		20.0
Cobalt								Γ				Τ	
Chromium					Γ			Τ				L	
Copper	ND	1.0	0.999	100		1.004	100	Π	80	120	0.5	$oxed{\Box}$	20.0
Iron	0.869	1.0	1.81	94	Γ	1.819	95	Π	80	120	1.0	Π	20.0
Potassium	54.93	10.0	68.45	135	•	70.87	159	•	80	120	16.4	Ţ	20.0
Magnesium	214.5	10.0	225.2	107		228.3	138	ŀ	80	120	25.3	**	20.0
Manganese													
Sodium								$I_{-}$				Ε	
Nickel													
Lead	ND	1.0	0.9268	93		0.9309	93		80	120	0.4		20.0
Antimony													
Selenium												L	
Thallium					L								
Vanadium												L	
Zinc	ND	1.0	1.023	102		1.027	103		80	120	0.4		20.0

<sup>\*</sup> Spike Results Outside Method Limits

<sup>\*\*</sup> Spike RPD Outside Method Limits



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 12/27/95 Analyzed on: 12/27/95 Analyst: DSE

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	Amt Added mg/l	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9512B14-03I	ND	50.00	100	100	0	93 109	2.7

-9512925

Samples in batch:

9512874-01A 9512A85-03A 9512991-01C 9512A89-03A

9512991-03C 9512B14-01I 9512991-06C

9512814-031

9512B14-04I

9512B14-02I

COMMENTS:



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/27/95

Analyzed on:

12/27/95

Analyst:

DSE

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 Rec		ery
LCS	ND	51.60	49.98	96.9	90	-	110

-9512927

# Samples in batch:

9512874-01A	9512991-01C	9512991-03C	9512991-06C
9512A85-03A	9512A89-03A	9512B14-01I	9512B14-02I
9512B14-03T	9512B14-04T		

#### COMMENTS:

LCS = SPL I.D. #9553510-3

SPL Incorporated

QC Officer



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

#### SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 12/22/95 Analyzed on: 12/22/95 Analyst: DSE

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	Amt Added mg/l	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPD Max.
9512581-03A	ND	50.0	104	104	0	93 109	2.7

-9512849

#### Samples in batch:

9512477-02B	9512477-03R	9512478-01R	9512479-01B
9512579-03A	9512581-03A	9512782-010	9512782-020
9512806-01K	9512806-02K	9512806-03K	9512806-04K
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3022000 0010	9312000-04K
9512991-02C	9512991-04C	9512991-05C	

# COMMENTS:



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

# \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: A

Aqueous

Reported on:

12/22/95

Analyzed on:

12/22/95

Analyst:

DSE

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		Limits
LCS	ND	51.60	51.98	101	90	- 110

-9512851

# Samples in batch:

9512477-02B	9512477-03B	9512478-01B	9512479-01B
9512579-03A	9512581-03A	9512782-01D	9512782-02D
9512806-01K	9512806-02K	9512806-03K	9512806-04K
9512991-02C	9512991-04C	9512991-05C	

#### COMMENTS:

LCS = SPL I.D. # 9553510-3

OC Officer



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

# SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 12/29/95 Analyzed on: 12/29/95 Analyst: ST

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	Amt Added mg/L	Matrix Spike Recovery	Matrix Spike Duplicate Recovery %	Relative Percent Difference	QC Limits Recovery	RPO Max.
9512991-06C	ND	10.00	113	108	4.5	79 122	11.

-9512A60

# Samples in batch:

9512782-01D 9512991-02C 9512991-06C 9512782-02D 9512874-01A 9512991-01C 9512991-03C 9512991-04C 9512991-05C

COMMENTS:



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

## \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/29/95

Analyzed on:

12/29/95

Analyst:

ST

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	20.00	18.69	93.4	90 - 110

-9512A61

## Samples in batch:

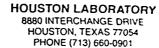
9512782-01D 9512782-02D 9512874-01A 9512991-01C 9512991-02C 9512991-03C 9512991-04C 9512991-05C 9512991-06C

COMMENTS:

SPL LCS ID#9553510-5

SPIN Incorporated Julies

Øfficer





SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/27/95

Analyzed on: 12/27/95

Analyst:

LC

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.
9512991-03C	452	456	0.9	3

-9512961

Samples in batch:

9512874-01A

9512991-01C

9512991-02C

9512991-03C

9512991-04C

9512991-05C

9512991-06C

COMMENTS:

OC Officer



## HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/27/95

Analyzed on: 12/27/95

Analyst:

LC

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.
9512991-03C	ND	ND	0	2.2

-9512962

## Samples in batch:

9512874-01A

9512991-01C

9512991-02C

9512991-03C

9512991-04C

9512991-05C

9512991-06C

**COMMENTS:** 



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

## \*\* SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/28/95

Analyzed on:

12/27/95

Analyst:

JS

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

Total Dissolved Solids METHOD 160.1 \*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9512991-01C	796	800	0.5	20

-9512A04

## Samples in batch:

9512738-01B 9512991-01C 9512739-01B

9512740-01B

9512741-01B

COMMENTS:

SPL, Incorporated



## **HOUSTON LABORATORY** 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/28/95

Analyzed on:

12/27/95

Analyst:

JS

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:

## Total Dissolved Solids METHOD 160.1 \*

SPL Sample ID Number	Blank Value mg/L		Measured Concentration mg/L	g Recovery	QC Limi Recover	
LCS	ND	252.0	255.0	101	90 -	110

-9512A03

## Samples in batch:

9512738-01B 9512991-01C

9512739-01B 9512740-01B

9512741-01B

COMMENTS:

LCS = SPL ID#: 9553510-18

SPL, Incorporated



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

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/26/95

Analyzed on: 12/26/95

Analyst:

ST

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

Specific Gravity ASTM D1429

## -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration	Duplicate Sample	RPD	RPD Max.
9512991-06C	1.010	1.010	0	1.0

-9512876

## Samples in batch:

9512782-01D	9512782-02D	9512975-03A	9512975-04A
9512991-01C	9512991-02C	9512991-03C	9512991-04C
9512991-05C	9512991-06C		

COMMENTS:



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

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 12/27/95 Analyzed on: 12/27/95

Analyst:

LC

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

Resistivity EPA 120.1 \*

## -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ohms-cm	Duplicate Sample ohms-cm	RPD	RPD Max.
9512991-03C	0.025	0.025	0	1.0

-9512960

Samples in batch:

9512991-01C 9512991-03C 9512991-06C

COMMENTS:

Incorporated

officer



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

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on: 12/22/95

Analyzed on: 12/21/95 Analyst: LC

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

Resistivity EPA 120.1 \*

## -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration ohms-cm	Duplicate Sample ohms-cm	RPD	RPD Max.
9512991-05C	0.222	0.222	0	1.0

-9512832

Samples in batch:

9512991-02C

9512991-04C

9512991-05C

COMMENTS:



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

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/27/95

Analyzed on: Analyst:

12/27/95 LC

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

pН METHOD 150.1 \*

## -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9512991-06C	7.44	7.46	0.3	1.0

-9512965

Samples in batch:

9512991-01C 9512991-03C 9512991-06C

**COMMENTS:** 



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

## SPL QUALITY CONTROL REPORT \*\*

Matrix:

Aqueous

Reported on:

12/22/95

Analyzed on: 12/21/95

Analyst:

LC

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

pН

METHOD 150.1 \*

## -- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9512991-05C	7.07	7.07	0	1.0

-9512820

## Samples in batch:

9512737-01B

9512991-02C

9512991-04C

9512991-05C

9512A20-01F

9512A20-02F

9512A20-03F

9512A20-04F

**COMMENTS:** 

OC Officer

# CHAIN OF CUSTODY AND SAMPLE RECEIPT CHECKLIST

Environmental Laboratory 8880 Interchange Drive Houston, Texas 77054 713/660-0901	
Analysis Request and Chain of Cu	95/279/ Part 12/05
in of Custody Record	Page of S

	SAMPLER REMARKS: Seai #			Rick S	Chark	Samplers					S#MW	e e	ě			Mon Well #	Field Sample No./ Identification	Got Ota Analysis
	KS: FLYUNICS A.			Attiliation	-	(Signatupa)				•	27.20					9390	Date and Time	Budysis
	Mes					:											Grab Comp	
	4/1/2 (	(Signature)	Relinquished by:	Relinquished by: (Signature)	(Signature)	Relinquished by:	NALBONE	6/045		•	6/Ass	NALGENE	GlASS	11	11.	9/455	Sample Container (Size/Mat'i)	Client/Project Name
	75CBN DI 7393-28 7393-47			<b>₹</b> ₹			11	ll	11	//	11	11	//	//	11	L1Quip	Sample Type (Liquid, Sludge, Etc.)	Chasleum (
	180 VE						<i>(</i> (	NITER	((	15	Hac	11	MALIA	ľ	K	ARC	Preservative	praduo
	\ [] \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Time:	Date: F	Date: F		Date:	11	MAJOR	11	11	BTE	//	MASORC	//	//	87		
saers	Receiptor laberatory: (Signature) (Signatu	0	Received by:	Received by: (Signature)	Signature)	Received by:		CAT + Anlina			X		AT + Anins			ZEX	ANALYSIS REQUESTED	Project Location  Monument Nm
	Time: 10:28 Labora	<u> </u>	Date: (ntac)	Date: Intact	Time:	Date: Intact											_5	888
	Laboratory No.	R	7	)													LABORATORY REMARKS	59

Page

# Environmental Laboratory 8880 Interchange Drive Houston, Texas 77054 713/660-0901

Anal
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Request and Chain
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Chain
<u>Q</u>
of Custody
Record

<i>A</i> / .	Client/Project Name	0, ,		Project Location	ion	
+ THE AMERIYSIS IN	WARREN 4	Gradeun Co	prost/w	Manumer	ent NM	88865
Field Date Sample No./ and ab Endentification Time G Co	Sample Container (Size/Mat'l)	Sample Type (Liquid, Sludge, Etc.)	Preser- vative	ANALYSIS REQUESTED	QUESTED	LABORATORY REMARKS
12522 F#MW	GlASS	Liou'e		BTEX		
	11	"		()		
	"	"		11		
	NACGONE	ď		MASOR CAT	Ts + Andres	
, d	9/185	lı		(		
MN#6 9#M	6/Ass	lι		BTEX		
	Î	11		<i>(</i> 1		
	×	11		U		
	MAGENE	G		MAJOR CHAS	t Anlians	
	G/ASS	2		11		
Sample s: (Signature)	Relinquished by: (Signature)			Date: Received by: (Signature)	Date:	Intact
Man Nexten				Time:	Time:	
lack Solvant	Relinquished by: (Signature)			Date: Received by: (Signature)	Date: Time:	Intact
	Relinquished by: (Signature)		·	Date: Received by: (Signature)	Date:	Muscl VY
						7707
SAMPLER REMARKS: A .	05cAPP 1	-393-2823 MB UECON			Date 14	D'O' Laboratory No.
Seal #	505-39	505-353-4780	Krax	MONUMEN	NM	

# Environmental Laboratory 8880 Interchange Drive Houston, Texas 77054 713/660-0901

# **Analysis Request and Chain of Custody Record**

Project No.		an	) / (	,	Project Location	
4th Othe Analysis	1515	WARREN FE	Emoleum (&	Smpan,	4 Morument NM	23688
Field Date Sample No./ and Identification Time	Grab	Sample E Container C (Size/Mat'l)	Sample Type (Liquid. Sludge, Etc.)	Preser- vative	ANALYSIS REQUESTED	LABORATORY REMARKS
MW#13 12-209	44	G/Ass	Liauin	Hec	BTEX	
		1	ll .	17	J)	
		11	(1	75	الر	
£		NALGENE	()	MI+Eic ACID	MASOR CATS & ANIONS	
•		9/855	11	Ir	tl	
WAY05:01 71 #MW	10 may (2)	Gloss	11	Hac	BTEX	
		l)	11	q .	ll	
		))	1)	11	K	
		NALBERE	11	Nitic	MAJOR CATS + AMONS	
		GMS	l <sub>(</sub>	70	7	
Samplers: (Signature)	ture)	Relinquished by: (Signature)	,	٠	Date: Received by: Date: (Signature) Time: Time:	Intact
Rich Spoker	whit	Relinquished by: (Signature)		<b>,</b>	Date: Received by: Date: (Signature)	Intact
		Relinquished by: (Signature)			Date: Received by: Date: (Signature)	(Miacl) 4-C
SAMPLER REMARKS:	OSCAR	`	28		Received for Jakonston Date JE	Date: 12 10 10 Laboratory No.
4	5	-866 - 50	5787-866	f	Data Results to: WPC - KO: Box 6	7.00
Seal #		505-393-4780	8-4780	XXV.	MOMMENT N'M	

# SPL Houston Environmental Laboratory

## Sample Login Checklist

Dat	Time:	1315		
SPI	L Sample ID:			
	9511042			
			<u>Yes</u>	No
1	Chain-of-Custody (COC) form is pro	esent.		
2	COC is properly completed.		/	
3	If no, Non-Conformance Worksheet	has been completed.		
4	Custody seals are present on the shi	pping container.		
5	If yes, custody seals are intact.			
6	All samples are tagged or labeled.			
7	If no, Non-Conformance Worksheet	has been completed.		
8	Sample containers arrived intact			
9	Temperature of samples upon arriva	1:	3	3° C
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	53975	591006
		Other:		
11	Method of sample disposal:	SPL Disposal	~	
		HOLD		
]		Return to Client		·

Name:	Date:
S. West	11/1/95

## CLIMAX CHEMICAL COMPANY

Monument, New Mexico

Wednesday, February 26, 1992

Dr. Bruce Swanton Hazardous and Radioactive Materials Bureau New Mexico Environment Department 525 Camino De Los Marquez Santa Fe, NM 87502

REF: 4th Qrt and Annual Assessment Groundwater Reports



## Bruce:

Enclosed please find the lab results for our 4th Quarter sampling event. Chain of Custody for this sampling event, and the Enclosure 5 Report (including Annual Summary) for the 4th Quarter.

There are a few things that I need to call your attention to:

- 1. Notice that Well 5-3, previously contaminated with TCE, has tested negative for any volatiles for four consecutive sampling events.
- 2. Notice Well 4-3. A new volatile constituent (Tetrachloroethene) has appeared and then dropped below detection limit twice in 1991.
- 3. Notice Well 1-3 (background). The 4th Quarter results show the presence of Lead at 33 ppb. We'll see if this repeats.
- 4. Notice that Well 12-9 was not sampled during the 4th Quarter sampling event. When I retrieved the bailer for the first sample, it came up full of crude oil. I have turned this over to OCD. They do not know if it came from Warren Petroleum's condensate plume, or from a pipeline or well casing leak. They are currently investigating. Irregardless, the well is useless as a RCRA monitoring well and will not be included in future sampling events. This problem will also affect the placement of downgradient boundary wells for completion of our Closure Plan and/or Post-Closure Plan.

If you have any questions or comments regarding these results or reports please call me.

John Good. Environmental Manager

# INTERIM STATUS MONITORING WELL SAMPLING AND DATA SHEETS

## ASSESSMENT QUARTERLY REPORT

This set of data sheets is for use by all facilities with RCRA monitoring wells and should be completed by facilities in assessment. HWMR-5, Part VI, Section 265.93(d)(d)(i).

NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME		CLIM	AX CHEMICAL	COMPANY	_
EPA I.D. NUMBER	NMD 99075	3931	_		
WELL NUMBER	1-3		SAMPLE COLL	ECTION BY	J. GOOD
WELL DEPTH	38.00	<u>0</u> ft.	LABORATORY	NAME	SWL, INC.
DATE SAMPLED	12/26/91	<del></del>	LABORATORY	SAMPLE ID#	75860
TIME SAMPLED	9:00	<del></del>	DATE RECEIVE	ED BY LAB	12/27/91
<u>PARAMETI</u>	<u>ERS</u>	STOR!		<u>VALUE</u>	DATE <u>ANALYZED</u>
Elevation of	G. Water	71993	ft.	3619.10	12/26/91
Well Casing	Volume		gal.	8.15	12/26/91
Pump Rate			gal/min	10.00	12/26/91
Pump Period	l	72004	min.	3.00	12/26/91
Volume Eva	cuated	73675	gal.	30.00	12/26/91
Well Sampli	ng Method	84077		BAILER	12/26/91
Sampler Mat	terial			TEFLON	NA
	Well Samplin	ng Metho	od:	BAILER	_

TAIR			MERCEDO
HND	IC.A IOI	( PAKA	METERS

WELL #: QRT:

1-3 4TH

<u>PARAMETERS</u>	STORET CODE	<u>UNITS</u>	<u>VALUE</u>	DETECTION <u>LIMIT</u>	DATE <u>ANALYZED</u>	METHOD USED
<u>pH</u>	00400	S.U.	7.19	NA	12/31-1/12	
	00400	S.U.	7.18	NA	12/31-1/12	4500 11*
	00400	S.U.	7.20	NA	12/31-1/12	4500-H*
	00400	S.U.	7.21	NA	12/31-1/12	
Specific	00095	umohs/cm	1681.00	0	12/31-1/12	
Conductivity	00095	umohs/cm	1671.00	0	12/31-1/12	2510 D*
`	00095	umohs/cm	1681.00	0	12/31-1/12	2510-B*
	00095	umohs/cm	1671.00	0	12/31-1/12	
	70354	ug/l (ppb)	NT	NT	12/31-1/12	
	70354	ug/l (ppb)	NT	NT	12/31-1/12	NET
	70354	ug/l (ppb)	NT	NT	12/31-1/12	NT
	70354	ug/l (ppb)	NT	NT	12/31-1/12	
T.O.C.	00680	mg/l (ppm)	NT	NT	12/31-1/12	
	00680	mg/l (ppm)	NT	NT .	12/31-1/12	NT
	00680	mg/l (ppm)	NT	NT	12/31-1/12	NI
	00680	mg/l (ppm)	NT	NT	12/31-1/12	
		DETECTED TESTED FOR		N/A = NOT APPI N/R = NOT REPO		

<sup>\*</sup> Standard Methods, 17th Ed.

## **GROUND WATER QUALITY PARAMETERS**

WELL #: QRT: 1-3 4TH

<u>PARAMETERS</u>	STORE <u>CODE</u>	T <u>UNITS</u>	VALUE	DETECTI <u>LIMIT</u>	ON	DATE <u>ANALYZED</u>	METHOD <u>USED</u>
Chloride	00940	mg/l (ppm)	269	14	ppm	12/31-1/12	4500-C1*
Iron	01045	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Manganese	71883	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Phenols	32730	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Sodium	00929	mg/l (ppm)	NT	NT	ppm	12/31-1/12	NT
Sulfate	00945	mg/l (ppm)	213_	1	ppm	12/31-1/12	4500-SO4*

DATE OF THIS REPORT:

26-Feb-92

SIGNATURE:

NAME (PRINTED):

JOHN GOOD

ND = NOT DETECTED NT = NOT TESTED FOR N/A = NOT APPLICABLE

N/R = NOT REPORTED

\* Standard Methods, 17th Ed.

## MONITORING WELL APPENDIX IX DATA FOR FACILITIES IN ASSESSEMENT

Under assessment monitoring as per HWMR-5 Part VI Section 263.93(d)(4)(i) and 42 Federal Register, 259.42 (July 9, 1987), please list values for the Appendix IX parameters which were found in your Appendix IX scan.

WELL #:	1-3	STORET	4TH_0	QRT	DETECTION	DATE	DATE	METHOD
PARAMETER		CODE	<u>UNITS</u>	VALUE	LIMIT	EXTRACTED	ANALYZED	<u>USED</u>
LEAD		?	ug/l	33.0	20.000	1/12/92	1/12/92	SW846
VOLATILES		?	ug/l	ND	VARIABLE	0.000	0.000	EPA624

WELL# 1-3

ND = NOT DETECTED	N/A = NOT APPLICABLE
NT = NOT TESTED FOR	N/R = NOT REPORTED

## ANNUAL SUMMARY OF MONITOR WELL DATA

This form is for annual presentation of data by all facilities operating under interim status.

NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME:

CLIMAX CHEMICAL COMPANY

EPA I.D. NUMBER

NMD 990753931

WELL NUMBER

1-3

		SAMPLE DATES							
		<u>3-27-91</u>	<u>6-26-91</u>	<u>10/10/91</u>	12/26/91				
<u>PARAMETERS</u>	<u>UNITS</u>		VALUE						
G.Water Elev.	ft.	3619.142	VALU 3618.892	<u>3619.100</u>	3619.100				
pH (Avg.)	S.U.	6.9	7.2	6.9	7.2				
Spec Cond(Avg.)	umohs/cm	1658	1651	1555	1676				
T.O.X (Avg.)	ug/l	0.0	0.0	0.0	0.0				
T.O.C. (Avg.)	mg/l	0.0	0.0	0.0	0.0				
Chloride	mg/l	284.0	284.0	269.0	269.0				
Iron	ug/l	NT	NT	NT	NT				
Manganese	ug/l	NT	NT	NT	NT				
Phenols.	ug/l	NT	NT	NT,	NT NT				
Sodium	mg/l	NT ;	NT ,	NT	NT				
Sulfate we too	mg/l	217.0	220.0	199.0	213.0				
	ND = NOT DETI NT = NOT TEST		NOT APPLICABLE NOT REPORTED	E					

CLIMAX CHEMICAL COMPANY
123 3.1\ENVIR\H2O-1991.WK3

## APPENDIX IX PARAMETERS

WELL #:

1-3

**ANNUAL SUMMARY** 

SAMPLE DATES

		SAMPLE DATES						
		<u>3-27-91</u>	<u>6-26-91</u>	<u>10/10/91</u>	<u>12/26/91</u>			
<u>PARAMETERS</u>	<u>UNITS</u>		<u>V</u> A	LUES				
HEAVY METALS (LEAD)	ug/l	ND	ND	ND	33.0			
VOLATILES	ug/l	ND	ND	ND	ND			

DATE OF REPORT: 26-Feb-92

SIGNATURE:

NAME (TYPED):

JOHN GOOD

ND = NOT DETECTED

N/A = NOT APPLICABLE

NT = NOT TESTED FOR

N/R = NOT REPORTED

# INTERIM STATUS MONITORING WELL SAMPLING AND DATA SHEETS

## ASSESSMENT QUARTERLY REPORT

This set of data sheets is for use by all facilities with RCRA monitoring wells and should be completed by facilities in assessment. HWMR-5, Part VI, Section 265.93(d)(d)(i).

NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME	CLIMAX CHEMICAL COMPANY						
EPA I.D. NUMBER	NMD 9907539	931	_				
WELL NUMBER	4-3	-	SAMPLE COLLE	ECTION BY	J. GOOD	-	
WELL DEPTH	39.000	ft.	LABORATORY	NAME	SWL, INC	<u>.</u> .	
DATE SAMPLED	12/26/91	-	LABORATORY	SAMPLE ID#	75862	-	
TIME SAMPLED	12:00N		DATE RECEIVE	D BY LAB	12/27/91	-	
PARAMETE	<u>rs</u>	STORI CODE		<u>VALUE</u>		DATE <u>ANALYZED</u>	
Elevation of	G. Water	71993	ft.	3563.74	-	12/26/91	
Well Casing	Volume		gal.	8.85	_	12/26/91	
Pump Rate			gal/min	10.00	_	12/26/91	
Pump Period		72004	min.	1.00	_	12/26/91	
Volume Evac	cuated	73675	gal.	10.00	_	12/26/91	
Well Samplir	ng Method	84077		BAILER	_	12/26/91	
Sampler Mate	erial			TEFLON	-	NA	
	Well Sampling	Metho	od:	BAILER	_		

INDICATOR PARA	AMETERS				WELL #: QRT:	4-3 4TH
PARAMETERS	STORET CODE	<u>UNITS</u>	VALUE	DETECTION LIMIT	DATE <u>ANALYZED</u>	METHOD USED
рН	00400	S.U.	6.82	NA	12/31-1/12	
	00400	S.U.	6.81	NA	12/31-1/12	4500 11*
	00400	S.U.	6.79	NA	12/31-1/12	4500-H*
	00400	S.U.	6.80	NA	12/31-1/12	
Specific	00095	umohs/cm	76363.00	0	12/31-1/12	
Conductivity	00095	umohs/cm	76670.00	0	12/31-1/12	2510 D#
	00095	umohs/cm	77183.00	0	12/31-1/12	2510-B*
	00095	umohs/cm	76465.00	0	12/31-1/12	
	70354	ug/l (ppb)	NT	NT	12/31-1/12	
	70354	ug/l (ppb)	NT	NT	12/31-1/12	3 TOTAL
	70354	ug/l (ppb)	NT	NT	12/31-1/12	NT
	70354	ug/l (ppb)	NT	NT	12/31-1/12	
T.O.C.	00680	mg/l (ppm)	NT	NT	12/31-1/12	
	00680	mg/l (ppm)	NT	NT .	12/31-1/12	
•	00680	mg/l (ppm)	NT	NT	12/31-1/12	NT
	00680	mg/l (ppm)	NT	NT	12/31-1/12	
		DETECTED TESTED FOR		N/A = NOT APPI N/R = NOT REPO		

<sup>\*</sup> Standard Methods, 17th Ed.

## **GROUND WATER QUALITY PARAMETERS**

WELL #: QRT: 4-3 4TH

<u>PARAMETERS</u>	STORE CODE	T <u>UNITS</u>	VALUE	DETECTI <u>LIMIT</u>	ON	DATE ANALYZED	METHOD <u>USED</u>
Chloride	00940	mg/l (ppm)	30493	14	ppm	12/31-1/12	4500-C1*
Iron	01045	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Manganese	71883	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Phenols	32730	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Sodium	00929	mg/l (ppm)	NT	NT	ppm	12/31-1/12	NT
Sulfate	00945	mg/l (ppm)	6506	1	ppm	12/31-1/12	4500-SO4*

DATE OF THIS REPORT:

26-Feb-92

SIGNATURE:

NAME (PRINTED):

JOHN GOOD

ND = NOT DETECTED N/A = NOT APPLICABLE NT = NOT TESTED FOR N/R = NOT REPORTED

\* Standard Methods, 17th Ed.

## MONITORING WELL APPENDIX IX DATA FOR FACILITIES IN ASSESSEMENT

Under assessment monitoring as per HWMR-5 Part VI Section 263.93(d)(4)(i) and 42 Federal Register, 259.42 (July 9, 1987), please list values for the Appendix IX parameters which were found in your Appendix IX scan.

WELL #: 4-3 PARAMETER	STORET CODE	4TH (	QRT <u>VALUE</u>	DETECTION LIMIT	DATE EXTRACTED	DATE <u>ANALYZED</u>	METHOD <u>USED</u>
CADMIUM	?	ug/l	88.0	10	1/7/92	1/7/92	7130
LEAD	?	ug/l	26.0	20	1/12/92	1/12/92	7420
1,2-DICHLOROETHANE	?	ug/l	16.3	5	1/9/92	1/9/92	EPA624

WELL# 4-3

ND = NOT DETECTED	N/A = NOT APPLICABLE
NT = NOT TESTED FOR	N/R = NOT REPORTED

## ANNUAL SUMMARY OF MONITOR WELL DATA

This form is for annual presentation of data by all facilities operating under interim status.

## NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME:

CLIMAX CHEMICAL COMPANY

EPA I.D. NUMBER

NMD 990753931

WELL NUMBER

4-3

		SAMPLE DATES						
		<u>3-27-91</u>	<u>6/26/91</u>	<u>10/10/91</u>	<u>12/26/91</u>			
<u>PARAMETERS</u>	<u>UNITS</u>		VALU	TC				
G.Water Elev.	ft.	3564.195	3563.778	3563.650	3563.737			
pH (Avg.)	S.U.	6.3	6.6	6.3	6.8			
Spec Cond(Avg.)	umohs/cm	71425	70957	63625	76670			
T.O.X (Avg.)	ug/l	0.0	0.0	0.0	0.0			
T.O.C. (Avg.)	mg/l	0.0	0.0	0.0	0.0			
Chloride	mg/l	29926.0	30493.0	30848.0	30493.0			
Iron	ug/l	NT	NT	NT	NT			
Manganese	ug/l	NT	NT	NT	NT			
Phenois	ug/l	NT	NT	<u>NT</u>	NT			
Sodium	mg/l	NT	NT	<u>NT</u>	NT			
Sulfate	mg/l	7782.0	7448.0	6889.0	6506.0			
	ND = NOT DET NT = NOT TEST		NOT APPLICABLE NOT REPORTED	E				

CLIMAX CHEMICAL COMPANY
123 3.1/ENVIR/H2O-1991.WK3

## APPENDIX IX PARAMETERS

WELL #:

4-3

**ANNUAL SUMMARY** 

SAMPLE DATES

		<u>3-27-91</u>	<u>6/26/91</u>	<u>10/10/91</u>	12/26/91
<u>PARAMETERS</u>	<u>UNITS</u>		VAL	<u>UES</u>	<del></del>
CADMIUM	ug/l	100.0	70.0	94.0	88.0
SILVER	ug/l	91.0	20.0	54.0	26.0
1,2-DICHLOROETHANE	ug/l	18.0	21.0	27.0	16.3
TETRACHLOROETHENE	ug/l	7.0		16.0	

DATE OF REPORT: 26-Feb-92

SIGNATURE:

NAME (TYPED):

JOHN GOOD

ND = NOT DETECTED

N/A = NOT APPLICABLE

NT = NOT TESTED FOR

N/R = NOT REPORTED

# INTERIM STATUS MONITORING WELL SAMPLING AND DATA SHEETS

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NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME		CLIM	AX CHEMICAL	COMPANY	_	
EPA I.D. NUMBER	NMD 990753	931	_			
WELL NUMBER	5-3	_	SAMPLE COLL	ECTION BY	J. GOOD	
WELL DEPTH	39.000	<u>f</u> t.	LABORATORY	NAME	SWL, INC.	
DATE SAMPLED	12/26/91		LABORATORY	SAMPLE ID#	75863	
TIME SAMPLED	10:00	_	DATE RECEIVE	D BY LAB	12/27/91	
<u>PARAMETI</u>	<u>ERS</u>	STOR!		<u>VALUE</u>	A	DATE NALYZED
Elevation of	G. Water	71993	ft.	3562.19		12/26/91
Well Casing	Volume		gal.	9.56		12/26/91
Pump Rate			gal/min	10.00		12/26/91
Pump Period	l	72004	min.	4.00	<u> </u>	12/26/91
Volume Eva	cuated	73675	gal.	40.00	<u> </u>	12/26/91
Well Sampli	ng Method	84077		BAILER		12/26/91
Sampler Mat	erial			TEFLON		NA
	Well Samplin	g Metho	od:	BAILER	_	

## INDICATOR PARAMETERS

WELL #: QRT: 5-3 4TH

<u>PARAMETERS</u>	STORET CODE	<u>UNITS</u>	VALUE	DETECTION LIMIT	DATE ANALYZED	METHOD <u>USED</u>
_ <u>pH</u>	00400	S.U.	7.46	NA	12/31-1/12	
	00400	S.U.	7.47	NA	12/31-1/12	
	00400	S.U.	7.44	NA	12/31-1/12	4500-H*
	00400	S.U.	7.46	NA	12/31-1/12	
Specific	00095	umohs/cm	26753.00	0	12/31-1/12	
Conductivity	00095	umohs/cm	26958.00	0	12/31-1/12	2510 D*
	00095	umohs/cm	26958.00	0	12/31-1/12	2510-B*
	00095	umohs/cm	27060.00	0	12/31-1/12	
_T.O.X.	70354	ug/l (ppb)	NT	NT	12/31-1/12	
	70354	ug/l (ppb)	NT	NT	12/31-1/12	
	70354	ug/l (ppb)	NT	NT	12/31-1/12	NT
	70354	ug/l (ppb)	NT	NT	12/31-1/12	
_T.O.C.	00680	mg/l (ppm)	NT	NT	12/31-1/12	
	00680	mg/l (ppm)	NT	NT .	12/31-1/12	\
	00680	mg/l (ppm)	NT	NT	12/31-1/12	NT
	00680	mg/l (ppm)	NT	NT	12/31-1/12	
		DETECTED		N/A = NOT APPI		

<sup>\*</sup> Standard Methods, 17th Ed.

N/R = NOT REPORTED

NT = NOT TESTED FOR

## **GROUND WATER QUALITY PARAMETERS**

WELL #: QRT:

5-3 4TH

PARAMETERS	STORET CODE UNITS A RES	DETEC VALUE //CI LIMIT		DATE ANALYZED	METHOD USED
Chloride	00940 mg/l (ppm)	6382 14	ppm	12/31-1/12	4500-CI*
Iron	01045 ug/l (ppb)	NT NT	ррь	12/31-1/12	NT
Manganese	71883 ug/I (ppb)	NT NT	, bbp	12/31-1/12	NT
Phenols	32730 ug/l (ppb)	NT NT	ppb	12/31-1/12	NT
Sodium	00929 mg/l (ppm)	NTNT	ppm	12/31-1/12	NT
Sulfate	00945 mg/l (ppm)	6329 1	ppm	12/31-1/12	4500-SO4*

7

DATE OF THIS REPORT:

26-Feb-92

SIGNATURE:

NAME (PRINTED):

JOHN GOOD

1.41.6E;

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5 M.

11636

ND = NOT DETECTED NT = NOT TESTED FOR N/A = NOT APPLICABLE

N/R = NOT REPORTED

\* Standard Methods, 17th Ed.

## MONITORING WELL APPENDIX IX DATA FOR FACILITIES IN ASSESSEMENT

Under assessment monitoring as per HWMR-5 Part VI Section 263.93(d)(4)(i) and 42 Federal Register, 259.42 (July 9, 1987), please list values for the Appendix IX parameters which were found in your Appendix IX scan.

WELL #: <u>5-3</u>	STORET	4TH_0	)RT	DETECTION	DATE	DATE	METHOD
PARAMETER	CODE	<u>UNITS</u>	<u>VALUE</u>	LIMIT	EXTRACTED	ANALYZED	USED
CADMIUM	?	ug/l	31.0	10	1/7/92	1/7/92	7130
SILVER	?	ug/l	ND	10	1/7/92	1/7/92	7760
ARSENIC	?	ug/l	ND	5	1/9/92	1/9/92	7060
VOLATILES	?	ug/l	ND	5	1/9/92	1/9/92	EPA 624

WELL # 5-3

ND = NOT DETECTED	N/A = NOT APPLICABLE
NT = NOT TESTED FOR	N/R = NOT REPORTED

## ANNUAL SUMMARY OF MONITOR WELL DATA

This form is for annual presentation of data by all facilities operating under interim status.

NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME:

CLIMAX CHEMICAL COMPANY

EPA I.D. NUMBER

NMD 990753931

WELL NUMBER

5-3

		SAMPLE DATES				
		<u>3-27-91</u>	<u>6/26/91</u>	<u>10/10/91</u>	12/26/91	
<u>PARAMETERS</u>	<u>UNITS</u>		VALU	TES		
G.Water Elev.	ft.	3562.610	3562.048	3562.360	3562.193	
pH (Avg.)	S.U.	6.9	7.1	6.7	7.5	
Spec Cond(Avg.)	umohs/cm	25125	27481	27500	26932	
T.O.X (Avg.)	ug/l	0.0	0.0	0.0	0.0	
T.O.C. (Avg.)	mg/l	0.0	0.0	0.0	0.0	
Chloride	mg/l	7801.0	7446.0	7801.0	6382.0	
Iron	ug/I	NT	NT	NT	NT	
Manganese	ug/l	NT	NT	NT	NT	
Phenois	ug/I	NT	NT	NT	NT	
Sodium	mg/l	NT	NT	NT	NT	
Sulfate	mg/l	6385.0	6296.0	6666.0	6329.0	
	ND = NOT DETECTED N/A = NOT APPLICABLE NT = NOT TESTED FOR N/R = NOT REPORTED					

## APPENDIX IX PARAMETERS

WELL #:

5-3

**ANNUAL SUMMARY** 

**SAMPLE DATES** 

		<u>3-27-91</u>	<u>6/26/91</u>	<u>10/10/91</u>	<u>12/26/91</u>
<u>PARAMETERS</u>	<u>UNITS</u>		<u>VAI</u>	LUES	
CADMIUM	ug/l	40.0	30.0	42.0	31.0
SILVER	ug/l	36.0	ND	ND	ND
ARSENIC	ug/l	12.0	ND	ND	ND
VOLATILES	ug/l	ND	ND	ND	ND

DATE OF REPORT: 26-Feb-92 SIGNATURE:

JOHN GOOD

NAME (TYPED):

ND = NOT DETECTED

N/A = NOT APPLICABLE

NT = NOT TESTED FOR

N/R = NOT REPORTED

# INTERIM STATUS MONITORING WELL SAMPLING AND DATA SHEETS

## ASSESSMENT QUARTERLY REPORT

This set of data sheets is for use by all facilities with RCRA monitoring wells and should be completed by facilities in assessment. HWMR-5, Part VI, Section 265.93(d)(d)(i).

NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME		CLIM	AX CHEMICAL	COMPANY	_
EPA I.D. NUMBER	NMD 99075	3931	_		
WELL NUMBER	10-10		SAMPLE COLL	ECTION BY	J. GOOD
WELL DEPTH	74.00	<u>0</u> ft.	LABORATORY	NAME	SWL, INC.
DATE SAMPLED	12/26/91		LABORATORY	SAMPLE ID#	75864
TIME SAMPLED	12:30	_	DATE RECEIVE	ED BY LAB	12/27/91
<u>PARAM</u>	ETERS	STOR!		<u>VALUE</u>	DATE <u>ANALYZED</u>
Elevation	n of G. Water	71993	ft.	3550.54	12/26/91
Well Cas	sing Volume		gal.	45.42	12/26/91
Pump R	ate		gal/min	10.00	12/26/91
Pump Pe	riod	72004	min.	6.00	12/26/91
Volume	Evacuated	73675	gal.	60.00	12/26/91
Well Sar	npling Method	84077	***	BAILER	12/26/91
Sampler	Material			TEFLON	<u>NA</u>
	Well Samplin	ig Metho	od:	BAILER	<del>-</del>

INDI	IC A TOE	DADA	METERS
1:3:5	I A III	LANA	

WELL #: QRT: 10-10 4TH

<u>PARAMETERS</u>	STORET CODE	<u>UNITS</u>	VALUE	DETECTION LIMIT	DATE <u>ANALYZED</u>	METHOD USED
рН	00400	S.U.	7.25	NA	12/31-1/12	
	00400	S.U.	7.38	NA	12/31-1/12	4500-H*
	00400	S.U.	7.36	NA	12/31-1/12	4500-n
	00400	S.U.	7.28	NA	12/31-1/12	
Specific Conductivity	00095	umohs/cm	43870.00	0	12/31-1/12	
<u> </u>	00095	umohs/cm	43870.00	0	12/31-1/12	2510-B*
	00095	umohs/cm	43768.00	0	12/31-1/12	2310-B
	00095	umohs/cm	43973.00	0	12/31-1/12	
<u>T.O.X.</u>	70354	ug/l (ppb)	NT	NT	12/31-1/12	
	70354	ug/l (ppb)	NT	NT	12/31-1/12	NT
	70354	ug/l (ppb)	NT	NT	12/31-1/12	***
	70354	ug/l (ppb)	NT	NT	12/31-1/12	
	00680	mg/l (ppm)	NT	NT	12/31-1/12	
	00680	mg/l (ppm)	NT	NT .	12/31-1/12	NT
	00680	mg/l (ppm)	NT	NT	12/31-1/12	141
	00680	mg/l (ppm)	NT	NT	12/31-1/12	

ND = NOT DETECTED	N/A = NOT APPLICABLE
NT = NOT TESTED FOR	N/R = NOT REPORTED

<sup>\*</sup> Standard Methods, 17th Ed.

#### **GROUND WATER QUALITY PARAMETERS**

WELL #: QRT: 10-10 4TH

<u>PARAMETERS</u>	STORE CODE	T <u>UNITS</u>	VALUE	DETECTI LIMIT	ON	DATE ANALYZED	METHOD <u>USED</u>
Chloride	00940	mg/l (ppm)	15247	14.	ppm	12/31-1/12	4500-C1*
Iron	01045	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Manganese	71883	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Phenols	32730	ug/l (ppb)	NT	NT	ppb	12/31-1/12	NT
Sodium	00929	mg/l (ppm)	NT	NT	ppm	12/31-1/12	NT
Sulfate	00945	mg/l (ppm)	3802	1	ppm	12/31-1/12	4500-SO4*

DATE OF THIS REPORT:

26-Feb-92

SIGNATURE:

NAME (PRINTED):

JOHN GOOD

ND = NOT DETECTED NT = NOT TESTED FOR N/A = NOT APPLICABLE N/R = NOT REPORTED

\* Standard Methods, 17th Ed.

#### MONITORING WELL APPENDIX IX DATA FOR FACILITIES IN ASSESSEMENT

Under assessment monitoring as per HWMR-5 Part VI Section 263.93(d)(4)(i) and 42 Federal Register, 259.42 (July 9, 1987), please list values for the Appendix IX parameters which were found in your Appendix IX scan.

WELL #: 10-10 PARAMETER	STORET CODE	4TH (	QRT <u>VALUE</u>	DETECTION LIMIT	DATE EXTRACTED	DATE ANALYZED	METHOD <u>USED</u>
CADMIUM	?	ug/l	46.0	10	1/8/92	1/8/92	7130
SILVER	?	ug/l	ND	10	1/7/92	1/7/92	7760
VOLATILES	?	ug/l	ND	5	1/9/92	1/9/92	EPA 624

WELL# 10-10

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#### ANNUAL SUMMARY OF MONITOR WELL DATA

This form is for annual presentation of data by all facilities operating under interim status.

#### NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME:

CLIMAX CHEMICAL COMPANY

EPA I.D. NUMBER

NMD 990753931

WELL NUMBER

10-10

		SAMPLE DATES							
		<u>3-27-91</u>	<u>6/26/91</u>	10/10/91	12/26/91				
<u>PARAMETERS</u>	<u>UNITS</u>		17AT:	UES					
G.Water Elev.	ft.	3540.082	VAL <sup>*</sup> 3550.748	3550.710	3550.540				
pH (Avg.)	S.U.	6.8	7.0	6.7	7.3				
Spec Cond(Avg.)	umohs/cm	42400	40962	37450	43870				
T.O.X (Avg.)	ug/l	0.0	0.0	0.0	0.0				
T.O.C. (Avg.)	mg/l	0.0	0.0	0.0	0.0				
Chloride	mg/l	17020.0	15956.0	14538.0	15247.0				
Iron	ug/l	NT	NT	NT	NT				
Manganese	ug/l	NT	NT	NT	NT				
Phenols	ug/l	NT	NT	NT	NT				
Sodium	mg/l	NT	NT	NT	NT				
Sulfate	mg/l	3834.0	3745.0	3662.0	3802.0				

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#### APPENDIX IX PARAMETERS

WELL #:

10-10

**ANNUAL SUMMARY** 

SAMPLE DATES

		<u>3-27-91</u>	<u>6/26/91</u>	10/10/91	12/26/91
<u>PARAMETERS</u>	<u>UNITS</u>		VAL	<u>UES</u>	
CADMIUM	ug/l	40.0	40.0	55.0	46.0
SILVER	ug/l	46.0	ND	ND	ND
VOLATILES	ug/l	ND	ND	ND	ND
	ug/l	0.0			

DATE OF REPORT: 26-Feb-92

SIGNATURE:

NAME (TYPED):

JOHN GOOD

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## INTERIM STATUS MONITORING WELL SAMPLING AND DATA SHEETS

#### ASSESSMENT QUARTERLY REPORT

This set of data sheets is for use by all facilities with RCRA monitoring wells and should be completed by facilities in assessment. HWMR-5, Part VI, Section 265.93(d)(d)(i).

NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME		CLIM	AX CHEMICAL	COMPANY	_	
EPA I.D. NUMBER	NMD 990753	931	-			
WELL NUMBER	12-9	_	SAMPLE COLLE	ECTION BY	J. GOOD	
WELL DEPTH	40.000	_ ft.	LABORATORY	NAME	SWL, INC	1 7•
DATE SAMPLED	12/26/91	_	LABORATORY	SAMPLE ID#	NT	
TIME SAMPLED	1:00	<b></b>	DATE RECEIVE	D BY LAB	NT	
<u>PARAMETE</u>	ERS	STORI CODE		<u>VALUE</u>		DATE <u>ANALYZED</u>
Elevation of	G. Water	71993	ft.	3558.51	_	12/26/91
Well Casing	Volume	*****	gal.	7.10	_	12/26/91
Pump Rate		**	gal/min	10.00	<del>-</del>	12/26/91
Pump Period		72004	min.	3.00	_	12/26/91
Volume Evac	cuated	73675	gal.	30.00		12/26/91
Well Samplin	ng Method	84077		NT	_	12/26/91
Sampler Mat	erial			TEFLON	-	NA
	Well Sampling	g Metho	d:	NT	_	

INDI	CATOR	PARA	METERS

WELL #:
QRT:

12-9 4TH

<u>PARAMETERS</u>	STORET CODE	<u>UNITS</u>	VALUE	DETECTION <u>LIMIT</u>	DATE <u>ANALYZED</u>	METHOD USED
<u>pH</u>	00400	S.U.	NT	NA	NT	
	00400	S.U.	NT	NA	NT	4500 774
	00400	S.U.	NT	NA	NT	4500-H*
	00400	S.U.	NT	NA	NT	
Specific	00095	umohs/cm	NT	. 0	NT	
Conductivity	00095	umohs/cm	NT	0	NT	2510 D4
	00095	umohs/cm	NT	. 0	NT	2510-B*
	00095	umohs/cm	NT	. 0	NT	
<u>T.O.X.</u>	70354	ug/l (ppb)	NT	NT	NT	
	70354	ug/l (ppb)	NT	NT	NT	
	70354	ug/l (ppb)	NT	NT	NT	NT
	70354	ug/l (ppb)	NT	NT	NT	
<u>T.O.C.</u>	00680	mg/l (ppm)	NT	NT	NT	
	00680	mg/l (ppm)	NT	NT	NT	\
	00680	mg/l (ppm)	NT	NT	NT	NT
	00680	mg/l (ppm)	NT	NT	NT	
		DETECTED FOR		N/A = NOT APPI		_

\* Standard Methods, 17th Ed.

N/R = NOT REPORTED

NT = NOT TESTED FOR

#### **GROUND WATER QUALITY PARAMETERS**

WELL #: QRT:

12-9 4TH

<u>PARAMETERS</u>	STORE CODE	T <u>UNITS</u>	<u>VALUE</u>	DETECTI <u>LIMIT</u>	ON	DATE <u>ANALYZED</u>	METHOD <u>USED</u>
Chloride	00940	mg/l (ppm)	NT	14	ppm	NT	4500-Cl*
Iron	01045	ug/l (ppb)	NT	NT	ppb	NT	NT
Manganese	71883	ug/l (ppb)	NT	NT	ppb	NT	NT
Phenols	32730	ug/l (ppb)	NT	NT	ppb	NT	NT
Sodium	00929	mg/l (ppm)	NT	NT	ppm	NT	NT
Sulfate	00945	mg/l (ppm)	NT	1	ppm	NT	4500-SO4*

DATE OF THIS REPORT:

26-Feb-92

SIGNATURE:

NAME (PRINTED):

JOHN GOOD

ND = NOT DETECTED NT = NOT TESTED FOR N/A = NOT APPLICABLE

N/R = NOT REPORTED

\* Standard Methods, 17th Ed.

#### MONITORING WELL APPENDIX IX DATA FOR FACILITIES IN ASSESSEMENT

Under assessment monitoring as per HWMR-5 Part VI Section 263.93(d)(4)(i) and 42 Federal Register, 259.42 (July 9, 1987), please list values for the Appendix IX parameters which were found in your Appendix IX scan.

WELL #: 12	-9 STORET	4TH_0	QRT	DETECTION	DATE	DATE	METHOD
<u>PARAMETER</u>	CODE		VALUE	LIMIT	EXTRACTED	ANALYZED	USED
CADMIUM	?	ug/l	NT	10	NT	NT	NT
SILVER	?	ug/l	NT	10	NT	NT	NT
ARSENIC	?	ug/l	NT	10	NT	NT	NT
VOLATILES	?	ug/l	NT	5	NT	NT	NT

WELL# 12-9

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#### ANNUAL SUMMARY OF MONITOR WELL DATA

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NEW MEXICO ENVIRONMENTAL DEPARTMENT RADIOACTIVE and HAZARDOUS WASTE BUREAU 525 CAMINO DE LOS MARQUEZ SANTA FE, NEW MEXICO 87502

FACILITY NAME:

CLIMAX CHEMICAL COMPANY

EPA I.D. NUMBER

NMD 990753931

WELL NUMBER

12-9

		SAMPLE DATES									
		<u>3/27/91</u>	<u>6/26/91</u>	<u>10/10/91</u>	<u>12/26/91</u>						
PARAMETERS	<u>UNITS</u>		VALU	TEC							
G.Water Elev.	ft.	3560.177	<u>3559.739</u>	3557.630	3558.510						
pH (Avg.)	S.U.	6.9	7.1	6.9	0.0						
Spec Cond(Avg.)	umohs/cm	56475	51721	48800	0						
T.O.X (Avg.)	ug/l	0.0	0.0	0.0	0.0						
T.O.C. (Avg.)	mg/l	0.0	0.0	0.0	0.0						
Chloride	mg/l	19856.0	19147.0	19147.0	NT						
Iron	ug/l	NT	NT	NT	NT						
Manganese	ug/l	<u>NT</u>	<u>NT</u>	NT	NT						
Phenois	ug/l	NT	NT	NT	NT						
Sodium	mg/l	NT	NT	NT	NT						
Sulfate	mg/l	10339.0	10123.0	9703.0	NT						
	ND = NOT DE	TECTED N/A =	NOT APPLICABI	E							

ND = NOT DETECTED	N/A = NOT APPLICABLE	
NT = NOT TESTED FOR	N/R = NOT REPORTED	

#### APPENDIX IX PARAMETERS

WELL #:

12-9

**ANNUAL SUMMARY** 

SAMPLE DATES

		<u>3/27/91</u>	<u>6/26/91</u>	<u>10/10/91</u>	<u>12/26/91</u>
<u>PARAMETERS</u>	<u>UNITS</u>	3300000000000	VAL	<u>UES</u>	
CADMIUM	ug/l	70.0	60.0	50.0	NT
SILVER	ug/l	50.0	ND	ND	NT
ARSENIC	ug/l	17.0	ND	ND	NT
VOLATILES	ug/l	ND	ND	ND	NT

DATE OF REPORT: 26-Feb-92

SIGNATURE:

JOHN GOOD

NAME (TYPED):

JOIN GOOD

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N/A = NOT APPLICABLE

NT = NOT TESTED FOR

N/R = NOT REPORTED

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Environmental Protects							TODY R	EC	OR	D					
Proj. NO.	PROJECT				CHEMICAL (	COMP	ANY								
		ASSE	SSME	OM TI	NITORING				<b>4</b> T	H	QUA	<b>IRT</b>	ER		YEAR: 1991
SAMPLERS:	(Sig	neture)				John (	Good	Ì				S	OUT	THV	VESTERN LABORATORIES INC
						400		l	LA	BO	RAT	OR	Y:		MIDLAND, TEXAS
STATION					STATION	# OF	WATER								
NUMBER	DATE	TIME	COMP	GRAB	LOCATION	CONT	DEPTH	<u> </u>	AN	AL <u>Y</u>	SIS F	EQ	UIRE	D _	REMARKS
					Well #	[					T				Ch, SO4=, pH*, Spec Cond*
W-1	12/26/91	0900	X		1-3	8	25.75 '	Α	В						VOA, THM
					Well #									Γ	Cl-, SO4=, pH*, Spec Cond*
W-2	12/26/91	0930	X		2-3	8	44.17	Α	В	C				_	VOA, THM, TDS @180^ C.
			a grand of the	Sandilar by	Well # 3-3	a Chidall Augustum		1	-			4		13	
W-3	A CONTRACTOR OF THE	<b>阿尔德</b> 丁子巴	X			200	DRY	300	7.5			L.	E BAR		Dry Well
				\ 	Well#	1_		١.	_						CI-, SO4=, pH", Spec Cond"
W-4	12/26/91	1200	X		4-3	8	26.58	A	В	C	-	<del> </del>	4	<u> </u>	VOA, THM, TDS @180^ C.
					Well#	_			i		1	1	1		CI-, SO4=, pH*, Spec Cond*
W-5	12/26/91	1000	<u> </u>		5-3	8	25.42 '	Α	В		-	-	<del></del> -	<u> </u>	VOA, THM
104.40	400001	1.000			Weil#				_			}			Cl-, SO4=, pH*, Spec Cond*
W-10	12/26/91	1230	X		10-10	8	35.25 '		В			4	1	<del> </del>	VOA, THM
111.40	4000004	1.000			Well#	_					les -				
W-12	12/26/91	1300			12-9	0	29.50	œ	nta	mi	atec	W	oil	<u> </u>	
TRIP						_		١.	_				1		CI-, 804=, pH*, Spec Cond*
BLANKS	12/26/91		X		LAB	8		A	В			4		<u> </u>	VOA, THM
FIELD		ł 1									ŀ	-			CI-, SO4=, pH*, Spec Cond*
BLANKS	12/26/91	and miground man	X		FIELD	8		A	В			_ _		<u> </u>	VOA, THM
BLIND				Ì		_	認業		_						CI-, SO4=, pH*, Spec Cond*
SAMPLES	12/26/91	<b>等原产,</b> 例	X	1		8	接換	A	В			4	$\perp$	<u> </u>	VOA, THM
					Irrigation	١.	有多	_							
SOIL-N	12/26/91	1030	X	<u> </u>	System	1 1	170-190	D				1	ᆜ	<u> </u>	Soil pH
					Imigation	١.		_		1 1	l	- [	-	-	
SOIL-E	12/26/91	1030	X		System	1	222	٥	1			4		L	Soil pH
					Imigation	١.		_	i		- {	ı	İ	İ	
SOIL-S	12/26/91	1030	X		System	1		D		Ш		4		<u> </u>	Soil pH
					Imigation	١.		_		1 1		-	1	1	
SOIL-W	12/26/91	1030	X		System	1		D		!		+		_	Soil pH
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### **ANALYSIS DESCRIPTION:**

- A = Chloride (Cl-), Sulfate (SO4=), pH\*, Specific Conductivity\* (\*=4 replicates)
- B = Volatile Organics (VOA), Total Heavy Metals (THM)
- C = Total Dissolved Solids (TDS) @180^C.

D = pH (Soil Analysis)

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1	Relinquished by	Date / Time	Redeiyed by:	Relinquished by:	Date / Time	Received by:
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1	Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
9						
	Relinquished by:	Date / Time	Received by:	Date/Time Remarks:		
ı	PACIFIC TO LIVE WAY			·		



Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services 1703 West Industrial Avenue P.O. Box 2150 Midland, Texas 79702

Report of tests on

Water

Client

Climax Chemical Co.

Delivered by

John Good

File No.

6147600

Report No. Report Date 75860

1-31-92

Date Received

12-27-91

Identification Monitor Wells for the 4th Quarter of 1991, W-1

Sampled 12-26-91 by John Good

#### REPORT OF CHEMICAL ANALYSIS

<u>Parameters</u>	Results _mg/L	Date <u>Performed</u>	Analyst	<u>Method</u>
Sulfate	213	12-31-91	W. Jaycox	S.M. 4500-SO <sub>4</sub> , C
Chloride	269	12-31-91	W. Jaycox	S.M. 4500-Cl, B

<u>Parameters</u>	Test 1	Test 2	Test 3	<u>Test 4</u>
Conductivity, micromhos/cm @ 25°C  Date of Analysis 12-30-91  Analyst W. Jaycox  Method Std. Meth., 17th Ed., 2510-B	1681	1671	1681	1671
pH Date of Analysis 12-30-91	7.19	7.18	7.20	7.21

Analyst W. Jaycox

Method Std. Meth., 17th Ed., 4500-H

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Identification Monitor Wells for the 4th Quarter of 1991, W-1

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#### REPORT OF **VOLATILE ORGANICS ANALYSIS**

Date of Analysis 1-9-92	Method	EPA 624
Analyst R.K.W.		
Compound	<u>uq</u>	<u>/L</u>
Chloromethane	* 10	
Bromomethane	* 10	
Vinyl Chloride	* 10	
Chloroethane	* 10	
Methylene Chloride	* 5	
1,1-Dichloroethene-	<b>*</b> 5	
1,1-Dichloroethane	* 5	
trans-1,2-Dichloroethene-	* 5	
Chloroform	<b>*</b> 5	
1,2-Dichloroethane-	* 5	
1,1,1-Trichloroethane	* 5	
Carbon Tetrachloride-	* 5	
Bromodichloromethane	<b>*</b> 5	
1,2-Dichloropropane	* 5	
trans-1,3-Dichloropropene-	* 5	
Trichloroethene	* 5	
Dibromochloromethane	* 5	
1,1,2-Trichloroethane	* 5	
Benzene	* 5	
cis-1,3-Dichloropropene-	<b>*</b> 5	
2-Chloroethylvinylether-	* 10	
Bromoform	* 5	
Tetrachloroethene-	* 5	
1,1,2,2-Tetrachloroethane	* 5	
Toluene	<b>*</b> 5	
Chlorobenzene	* 5	
Ethylbenzene	* 5	
Total Xylenes———————————————————————————————————	* 5	
Acrolein		
Acrylonitrile	<b>*</b> 50	

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#### REPORT OF **TOTAL METALS**

<u>Parameters</u>	Results _mg/L_	Date <u>Performed</u>	Analyst	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	* 0.010	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead	0.033	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

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Identification Monitor Wells for the 4th Quarter of 1991, W-2

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REPORT OF CHEMICAL ANALYSIS

<u>Parameters</u>	Results _mg/L	Date <u>Performed</u>	Analyst	<u>Method</u>
Sulfate	100	12-31-91	W. Jaycox	S.M. 4500-SO <sub>4</sub> , C
Chloride	227	12-31-91	W. Jaycox	S.M. 4500-Cl, B
Total Disolved	950	12-31-91	W. Jaycox	S.M. 2540-C

<u>Parameters</u>	Test 1	Test 2	Test 3	Test 4
Conductivity, micromhos/cm @ 25°C  Date of Analysis 12-30-91  Analyst W. Jaycox  Method Std. Meth., 17th Ed., 2510-B	1415	1404	1415	1404
pH Pate of Analysis 12=30=91	7.60	7.58	7.60	7.59

Date of Analysis 12-30-91

Analyst W. Jaycox

Method Std. Meth., 17th Ed., 4500-H

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REPORT OF VOLATILE ORGANICS ANALYSIS

Date of Analysis 1-9-92	Method	EPA 624
Analyst R.K.W.		
Compound	ug	<u>/L</u>
Chloromethane	* 10	
Bromomethane	* 10	
Vinyl Chloride	* 10	
Chloroethane	* 10	
Methylene Chloride	* 5	
1,1-Dichloroethene-	* 5	
1,1-Dichloroethane	* 5	
trans-1,2-Dichloroethene-	* 5	
Chloroform	* 5	
1,2-Dichloroethane	* 5	
1,1,1-Trichloroethane	* 5	
Carbon Tetrachloride	* 5	
Bromodichloromethane	* 5	
1,2-Dichloropropane	* 5	
trans-1,3-Dichloropropene-	* 5	
Trichloroethene	* 5	
Dibromochloromethane	* 5	
1,1,2-Trichloroethane	* 5	
Benzene	* 5	
cis-1,3-Dichloropropene-	* 5	
2-Chloroethylvinylether-	* 10	
Bromoform	* 5	
Tetrachloroethene	* 5	
1,1,2,2-Tetrachloroethane-	* 5	
Toluene	* 5	
Chlorobenzene	* 5	
Ethylbenzene	* 5	
Total Xylenes———————————————————————————————————	* 5	
Acrolein	<b>*</b> 50	
Acrylonitrile-	<b>*</b> 50	

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## REPORT OF TOTAL METALS

<u>Parameters</u>	Results _mg/L	Date Performed	Analyst	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	* 0.010	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead	* 0.020	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

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Identification Monitor Wells for the 4th Quarter of 1991, W-4

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#### REPORT OF CHEMICAL ANALYSIS

<u>Parameters</u>	Results <u>mg/L</u>	Date <u>Performed</u>	Analyst	Method
Sulfate	6506	12-31-91	W. Jaycox	s.m. 4500-so <sub>4</sub> , c
Chloride	30493	12-31-91	W. Jaycox	S.M. 4500-Cl, B
Total Disolved Solids @ 180° C	60760	12-31-91	W. Jaycox	S.M. 2540-C

<u>Parameters</u>	Test 1	Test 2	Test 3	Test 4
Conductivity, micromhos/cm @ 25°C  Date of Analysis 12-30-91  Analyst W. Jaycox  Method Std. Meth., 17th Ed., 2510-B	76363	76670	77183	76465
pH	6.82	6.81	6.79	6.80

Date of Analysis 12-30-91

Analyst W. Jaycox

Method Std. Meth., 17th Ed., 4500-H

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## REPORT OF VOLATILE ORGANICS ANALYSIS

TOLATILE OTIGATION ATALISTS		
Date of Analysis 1-9-92	Method	EPA 624
Analyst R.K.W.		
Compound	<u>ug</u>	<u>/L</u>
Chloromethane	* 10	
Bromomethane	* 10	
Vinyl Chloride————————————————————————————————————	* 10	
Chloroethane	* 10	
Methylene Chloride	* 5	
1,1-Dichloroethene	* 5	
1,1-Dichloroethane	* 5	
trans-1,2-Dichloroethene	* 5	
Chloroform	* 5	
1,2-Dichloroethane	16.3	
1,1,1-Trichloroethane	* 5	
Carbon Tetrachloride————————————————————————————————————	* 5	
Bromodichloromethane————————————————————————————————————	* 5	
1,2-Dichloropropane	* 5	
trans-1,3-Dichloropropene-	* 5	
Trichloroethene	* 5	
Trichioroethene	* 5	
Dibromochloromethane	* 5	
1,1,2-Trichloroethane	* 5	
Benzene	* 5	
cis-1,3-Dichloropropene-	* 5	
2-Chloroethylyinylether-	* 10	
Bromoform	* 5	
Tetrachloroethene-	* 5	
1,1,2,2-Tetrachloroethane-	* 5	
Toluene	* 5	
Chlorobenzene	* 5	
Ethylbenzene	* 5	
Total Xylenes-	* 5	
Acrolein	* 50	
Acrylonitrile	* 50	

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## REPORT OF TOTAL METALS

<u>Parameters</u>	Results _mg/L	Date <u>Performed</u>	<u>Analyst</u>	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	0.088	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead	0.026	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

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#### REPORT OF CHEMICAL ANALYSIS

<u>Parameters</u>	Results mg/L	Date <u>Performed</u>	<u>Analyst</u>	<u>Method</u>
Sulfate	6329	12-31-91	W. Jaycox	s.M. 4500-SO <sub>4</sub> , C
Chloride	6382	12-31-91	W. Jaycox	S.M. 4500-Cl, B

<u>Parameters</u>	<u>Test 1</u>	Test 2	Test 3	Test 4
Conductivity, micromhos/cm @ 25°C  Date of Analysis 12-30-91  Analyst W. Jaycox  Method Std. Meth., 17th Ed., 2510-B	26753	26958	26958	27060
pH Date of Analysis 12-30-91 Analyst W. Jaycox	7.46	7.47	7.44	7.46

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Method Std. Meth., 17th Ed., 4500-H

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## REPORT OF VOLATILE ORGANICS ANALYSIS

Date of Analysis 1-9-92 Analyst R.K.W.	Method EPA 624
Compound	ug/L
Chloromethane	* 10
Bromomethane-	* 10
Vinyl Chloride	* 10
Chloroethane	* 10
Methylene Chloride	* 5
1,1-Dichloroethene	* 5
1.1-Dichloroethane	* 5
trans-1,2-Dichloroethene-	* 5
Chloroform	* 5
1,2-Dichloroethane-	* 5
1.1.1-Trichloroethane	* 5
Carbon Tetrachloride————————————————————————————————————	* 5
Bromodichloromethane	* 5
1,2-Dichloropropane	* 5
trans-1,3-Dichloropropene-	* 5
Trichloroethene	* 5
Dibromochloromethane	* 5
1,1,2-Trichloroethane	* 5
Benzene	* 5
cis-1,3-Dichloropropene-	* 5
2-Chloroethylvinylether———————————————————————————————————	* 10
Bromoform	* 5
Tetrachloroethene	
1,1,2,2-Tetrachloroethane-	* 5
Toluene	* 5
Chlorobenzene	
Ethylbenzene Ethylbenzene	* 5
Total Xylenes—	* 5
Acrolein	J
Acrylonitrile	* 50 * 50
ACT Y TOTAL CLASS TO THE STATE OF THE STATE	- 50

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## REPORT OF TOTAL METALS

<u>Parameters</u>	Results mg/L	Date <u>Performed</u>	<u>Analyst</u>	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	0.031	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead	* 0.020	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

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> REPORT OF CHEMICAL ANALYSIS

<u>Parameters</u>	Results mg/L	Date <u>Performed</u>	Analyst	<u>Method</u>
Sulfate	3802	12-31-91	W. Jaycox	s.M. 4500-SO <sub>4</sub> , C
Chloride	15247	12-31-91	W. Javcox	S.M. 4500-Cl, B

<u>Parameters</u>	Test 1	Test 2	Test 3	<u>Test</u>
Conductivity, micromhos/cm @ 25°C  Date of Analysis 12-30-91  Analyst W. Jaycox  Method Std. Meth., 17th Ed., 2510-B	43870	43870	43768	43973
pH Date of Analysis 12-30-91	7.25	7.38	7.36	7.28

Analyst W. Jaycox

Method Std. Meth., 17th Ed., 4500-H

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Method EPA 624

12-27-91

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REPORT OF VOLATILE ORGANICS ANALYSIS

Date of Analysis 1-9-92	Metuod	EPA 624
Analyst R.K.W.		
Compound	na na	<u>/ 1</u> _
Chloromethane	* 10	
Bromomethane	* 10	
Vinyl Chloride-	* 10	
	T 1U	
Methylene Chloride	* 5	
	<b>*</b> ~	
a a sight anathran	7 D	
the self-ship or on the se	× 5	
	T -	
1,2-Dichloroethane 1,1,1-Trichloroethane	* 5	
1,1,1-Trichloroethane	* 5	
	<b>7</b> 7	
D	78 5	
1,2-Dichloropropane	* 5	
the state of the s	* 5	
My Lab Lawaathana	~ )	
Dibanachland	<b>*</b> 5	
1 1 2 myighloroothane	* 5	
	<b>T</b> 5	
cis-1,3-Dichloropropene	* 5	
cis-1,3-Dichloropropene 2-Chloroethylvinylether	* 10	
	<b>P</b> D	
Mathematical Amount hone	* 5	
t t a a Motrachloroethano	* 5	
T) = 1	<b>7</b> 2	
Ot 7 and a second	* 5	
The best beautiful and the second sec	* 5	
Matal Vilanas	<b>*</b> 5	
9 9 - 4 m	* 50	•
Acrylonitrile	* 50	ı
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Identification Monitor Wells for the 4th Quarter of 1991, W-10

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#### REPORT OF **TOTAL METALS**

<u>Parameters</u>	Results _mg/L	Date <u>Performed</u>	Analyst	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	0.046	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead	* 0.020	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

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#### REPORT OF CHEMICAL ANALYSIS

<u>Parameters</u>	Results _mg/L	Date <u>Performed</u>	<u>Analyst</u>	Method
Sulfate	6349	12-31-91	W. Jaycox	S.M. 4500-SO <sub>4</sub> , C
Chloride	6382	12-31-91	W. Javcox	S.M. 4500-Cl. B

<u>Parameters</u>	<u>Test 1</u>	Test 2	Test 3	<u>Test</u>
Conductivity, micromhos/cm @ 25°C  Date of Analysis 12-30-91  Analyst W. Jaycox  Method Std. Meth., 17th Ed., 2510-B	27778	27368	27060	26958
pH Date of Analysis 12-30-91	7.40	7.48	7.46	7.50

Analyst W. Jaycox

Method Std. Meth., 17th Ed., 4500-H

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#### REPORT OF **VOLATILE ORGANICS ANALYSIS**

Date of Analysis 1-9-92	Metho	od	EPA 6	24
Analyst R.K.W.				
Compound		uq/	<u>L</u>	
Chloromethane	* 10	)		
Bromomethane	* 10	)		
Vinyl Chloride	* 10	)		
Chloroethane				
Methylene Chloride————————————————————————————————————	* 5	;		
1,1-Dichloroethene	<b>*</b> 5			
1,1-Dichloroethane	* 5	,		
trans-1,2-Dichloroethene	* 5			
Chloroform	* 5			
1,2-Dichloroethane	* 5			
1,1,1-Trichloroethane	* 5			
Carbon Tetrachloride	* 5			
Bromodichloromethane————————————————————————————————————	* 5	i		
1,2-Dichloropropane	* 5			
trans-1,3-Dichloropropene	* 5			
Trichloroethene	* 5			
Dibromochloromethane——————————	* 5	i		
1,1,2-Trichloroethane	* 5	i		
Benzene	* 5	i		
cis-1,3-Dichloropropene-	* 5			
2-Chloroethylyinylether-	* 10	)		
Bromoform————————————————————————————————	* 5			
Tetrachloroethene	* 5	j		
1,1,2,2-Tetrachloroethane	* 5	;		
Toluene	* 5	,		
Chlorobenzene	* 5	j		
Ethyl benzene	* 5	j		
Total Xylenes-	* 5			
Acrolein	<b>*</b> 50	)		
Acrylonitrile	<b>*</b> 50	)		

\*Denotes "less than"

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12-27-91

Identification Monitor Wells for the 4th Quarter of 1991, Blind

Sampled 12-26-91 by John Good

#### REPORT OF TOTAL METALS

<u>Parameters</u>	Results mg/L	Date <u>Performed</u>	Analyst	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	0.031	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead (a)	0.16	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

(a) Laboratory suspects contamination from an outside source.

\*Denotes "less than"

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Report of tests on Water

Client

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File No.

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Report No.

75866

Report Date

1-31-92

Date Received

12-27-91

Identification Monitor Wells for the 4th Quarter of 1991, Trip Blank

Sampled 12-26-91 by John Good

#### REPORT OF CHEMICAL ANALYSIS

<u>Parameters</u>	Results $mg/L$	Date <u>Performed</u>	Analyst	<u>Method</u>
Sulfate	* 10	12-31-91	W. Jaycox	S.M. 4500-SO <sub>4</sub> , C
Chloride	* 7	12-31-91	W. Javcox	S.M. 4500-Cl, B

<u>Parameters</u>	<u>Test 1</u>	Test 2	Test 3	Test /
Conductivity, micromhos/cm @ 25°C  Date of Analysis 12-30-91  Analyst W. Jaycox  Method Std. Meth., 17th Ed., 2510-B	* 10	* 10	* 10	* 10
pH Date of Analysis 12-30-91 Analyst W. Jaycox	5.46	5.36	5.40	5.38

\*Denotes "less than"

Method Std. Meth., 17th Ed., 4500-H

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Sampled 12-26-91 by John Good

REPORT OF VOLATILE ORGANICS ANALYSIS

Date of Analysis 1-9-92	Method	EPA 624
Analyst R.K.W.		
Compound	<u>ug</u>	<u>/L</u>
Chloromethane	* 10	
Bromomethane	* 10	
Vinyl Chloride	* 10	
Chloroethane	* 10	
Methylene Chloride	* 5	
1,1-Dichloroethene-	* 5	
1,1-Dichloroethane-	* 5	
trans-1,2-Dichloroethene-	* 5	
Chloroform—————————————————————————————————	* 5	
1,2-Dichloroethane	* 5	
1,1,1-Trichloroethane	* 5	
Carbon Tetrachloride-	* 5	
Bromodichloromethane	* 5	
1,2-Dichloropropane	* 5	
trans-1.3-Dichloropropene-	* 5	
Trichloroethene	* 5	
Dibromochloromethane	<b>*</b> 5	
1,1,2-Trichloroethane	<b>*</b> 5	
Benzene	* 5	
cis-1,3-Dichloropropene-	* 5	
2-Chloroethylvinylether-	* 10	
Bromoform	* 5	
Tetrachloroethene	* 5	
1,1,2,2-Tetrachloroethane	<b>*</b> 5	
Toluene	* 5	
Chlorobenzene	* 5	
Ethylbenzene — — — — — — — — — — — — — — — — — —	<b>*</b> 5	
Total Xylenes-	* 5	
Acrolein	<b>*</b> 50	
Acrylonitrile	<b>*</b> 50	

\*Denotes "less than"

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Identification Monitor Wells for the 4th Quarter of 1991, Trip Blank

Sampled 12-26-91 by John Good

## REPORT OF TOTAL METALS

<u>Parameters</u>	Results <u>mg/L</u>	Date <u>Performed</u>	<u>Analyst</u>	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	* 0.010	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead	* 0.020	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

\*Denotes "less than"

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Identification Monitor Wells for the 4th Quarter of 1991, Field Blank

Sampled 12-26-91 by John Good

#### REPORT OF **CHEMICAL ANALYSIS**

<u>Parameters</u>	Results mg/L	Date <u>Performed</u>	Analyst	<u>Method</u>
Sulfate	* 10	12-31-91	W. Jaycox	S.M. 4500-SO <sub>4</sub> , C
Chloride	* 7	12-31-91	W. Jaycox	S.M. 4500-Cl, B

Parameters	Test 1	Test 2	Test 3	Test 4
Conductivity, micromhos/cm @ 25°C Date of Analysis 12-30-91 Analyst W. Jaycox Method Std. Meth., 17th Ed., 2510-B	* 10	* 10	* 10	* 10
pH Date of Analysis 12-30-91	5.24	5.20	5.19	5.10

Analyst W. Jaycox

Method Std. Meth., 17th Ed., 4500-H

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1-31-92 12-27-91

Identification Monitor Wells for the 4th Quarter of 1991, Field Blank

Sampled 12-26-91 by John Good

## REPORT OF VOLATILE ORGANICS ANALYSIS

Date of Analysis 1-10-92	Method	<b>EPA 624</b>
Analyst R.K.W.		
Compound	<u>uq</u>	<u>/L</u>
Chloromethane	* 10	
Bromomethane————————————————————————————————————	* 10	
Vinyl Chloride————————————————————————————————————	* 10	
Chloroethane	* 10	
Methylene Chloride-	* 5	
1,1-Dichloroethene	* 5	
1,1-Dichloroethane	* 5	
trans-1,2-Dichloroethene-	<b>*</b> 5	
Chloroform	* 5	
1,2-Dichloroethane	* 5	
1,1,1-Trichloroethane	* 5	
Carbon Tetrachloride-		
Bromodichloromethane-	* 5	
1,2-Dichloropropane	* 5	
trans-1.3-Dichloropropene-	* 5	
Trichloroethene	* 5	
Dibromochloromethane	<b>*</b> 5	
1,1,2-Trichloroethane	<b>*</b> 5	
Benzene	<b>*</b> 5	
cis-1,3-Dichloropropene-	* 5	
2-Chloroethylyinylether	* 10	
Bromoform	* 5	
Tetrachloroethene	· * 5	
1,1,2,2-Tetrachloroethane-	<b>*</b> 5	
Toluene-	* 5	
Chlorobenzene	* 5	
Ethylbenzene	* 5	
Total Xylenes—	<b>*</b> 5	
Acrolein	<b>*</b> 50	
Acrylonitrile-	* 50	

\*Denotes "less than"

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Identification Monitor Wells for the 4th Quarter of 1991, Field Blank

Sampled 12-26-91 by John Good

## REPORT OF TOTAL METALS

<u>Parameters</u>	Results mg/L	Date <u>Performed</u>	Analyst	Test Method
Arsenic	* 0.050	1-8-92	G. Bunch	SW846, 7061
Barium	* 0.50	1-8-92	G. Bunch	SW846, 7080
Cadmium	* 0.010	1-7-92	G. Bunch	SW846, 7130
Chromium	* 0.050	1-7-92	G. Bunch	SW846, 7190
Lead	* 0.020	1-12-92	G. Bunch	SW846, 7420
Mercury	* 0.0020	1-7-92	G. Bunch	SW846, 7470
Selenium	* 0.010	1-8-92	G. Bunch	SW846, 7741
Silver	* 0.050	1-7-92	G. Bunch	SW846, 7760

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