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REPORTS

DATE:

12/97

1997 Natural Attenuation of Petroleum Hydrocarbons Monitoring Report

South For Lakes Unit
Lea County, NM

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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Phillips Petroleum Company
Permian Profit Center
New Mexico Asset Team
Odessa, Texas

December 1997

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SECTION 1

Introduction

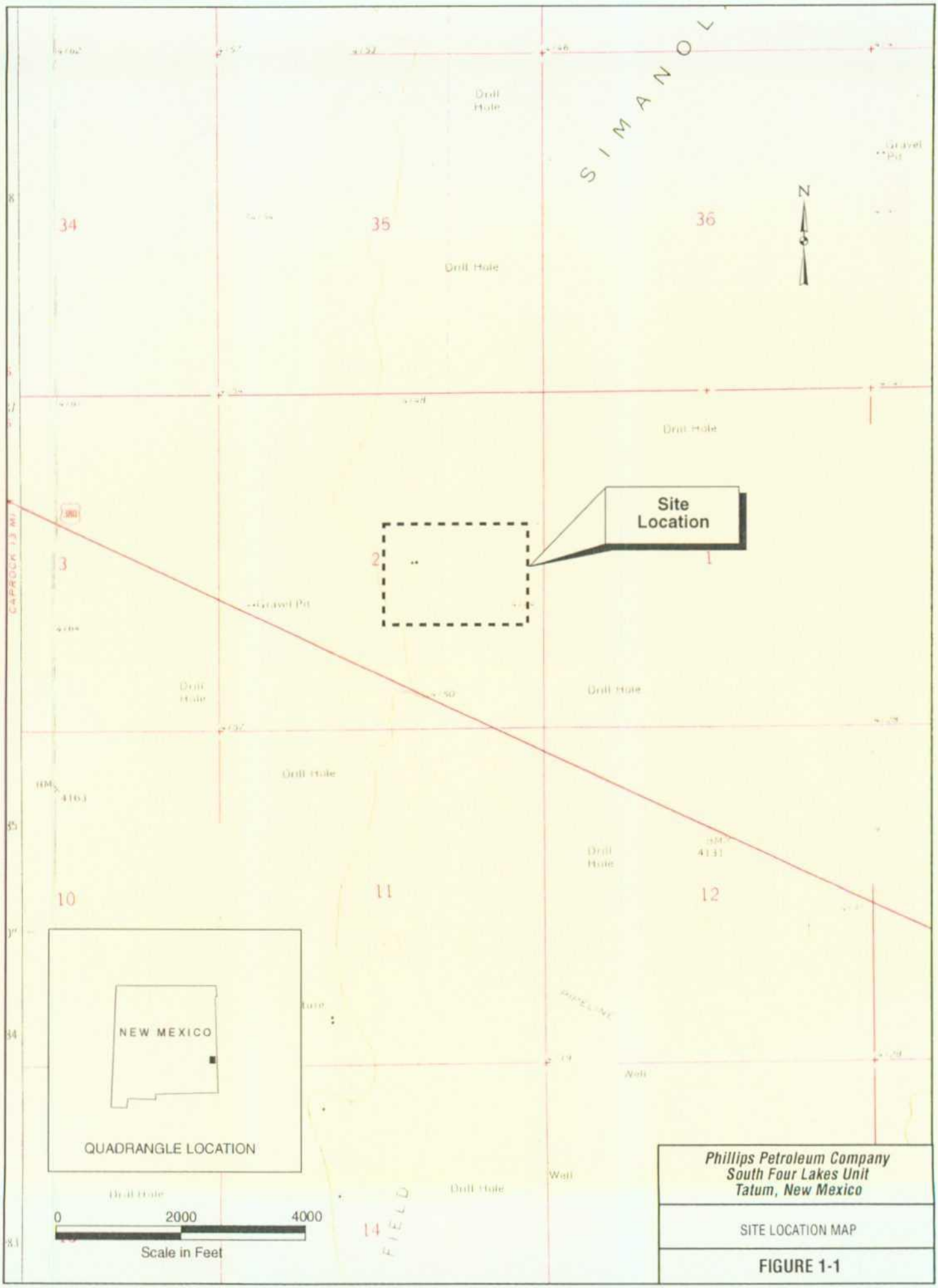
The following is the first annual natural attenuation monitoring report for Phillips Petroleum Company's (Phillips') South Four Lakes Unit. The South Four Lakes Unit (the Unit) is located in Lea County, New Mexico approximately 10 miles northwest of the town of Tatum (Figure 1-1). Submittal of this report is consistent with Phillips' long-term site management strategy outlined in a letter to State of New Mexico's Oil Conservation Commission dated, May 6, 1997.

Based on site investigations conducted at the Unit in 1994, nonaqueous phase liquid (NAPL) is present at the watertable beneath a closed production pit. In response to this condition, Phillips' has installed a wind driven free product recovery system (1996) and has evaluated the potential for natural attenuation processes to mitigate potential risks posed by dissolved petroleum hydrocarbons in groundwater (1996). In 1997, the system recovered 2,700 gallons of natural gas condensate and 190,000 to 200,000 gallons of water.

In regards to natural attenuation, work to date indicates that biological attenuation of petroleum hydrocarbon is actively occurring. The net result is that the dissolved hydrocarbon plume has only migrated a few hundred feet beyond the NAPL release and the extent of the plume appears to be stable. Future performance data will be used to evaluate the validity of this observation.

The objectives of this report are to document the results of the 1997 natural attenuation performance monitoring and to verify the overall protectiveness of the current site management approach. Content and organization of this report are as follows:

- Section 2 documents natural attenuation field work conducted in 1997,
- Section 3 provides an analysis of fluid level and water quality monitoring, and
- Section 4 lists conclusions and recommendations for future work.


SIMANOL
N
Site Location
Drill Hole
Gravel Pit
34
35
36
3
2
1
10
11
12
CAPROCK 13 MI
NEW MEXICO
QUADRANGLE LOCATION
0
2000
4000
Scale in Feet
Phillips Petroleum Company
South Four Lakes Unit
Tatum, New Mexico
SITE LOCATION MAP
FIGURE 1-1

SECTION 2

Documentation of December 1997 Field Activities

This section documents performance monitoring and natural attenuation data collection activities conducted in 1997.

Fluid Level Measurements

Figure 2-1 presents the location of all site monitoring wells. Water levels and NAPL thicknesses (where present) were measured at all wells targeted for annual monitoring using an oil-water interface probe. The probe was cleaned prior to use and between each well location using a methanol wipe followed by a clean water rinse. Fluid level measurements were recorded to the nearest 0.01 of a foot and recorded in the field logbook.

Water Quality Monitoring

Groundwater samples were collected in December 1997 from the 14 wells selected for annual sampling (Figure 2-1). With the exception of wells containing NAPL (MW-1, MW-6, MW-12, RW-1S and RW-2S), groundwater sample collection was performed using a down-hole, low-flow submersible pump. Decontamination of the submersible pump and tubing was performed prior to use and between each location using potable water and Liquinox wash followed by a potable water rinse.

At MW-1, MW-6, MW-12, and RW-1S analytical samples were collected using dedicated Teflon bailers. At RW-2S, analytical samples were collected by activating the windmill-driven pump.

Each well was purged of a minimum of three casing volumes of water prior to sample collection. Field measurements of pH, Eh, conductivity, and temperature were performed during purging. Due to unanticipated shipping delays and equipment failures, field measurements of pH, Eh, conductivity, temperature, and dissolved oxygen were not obtained at all wells.

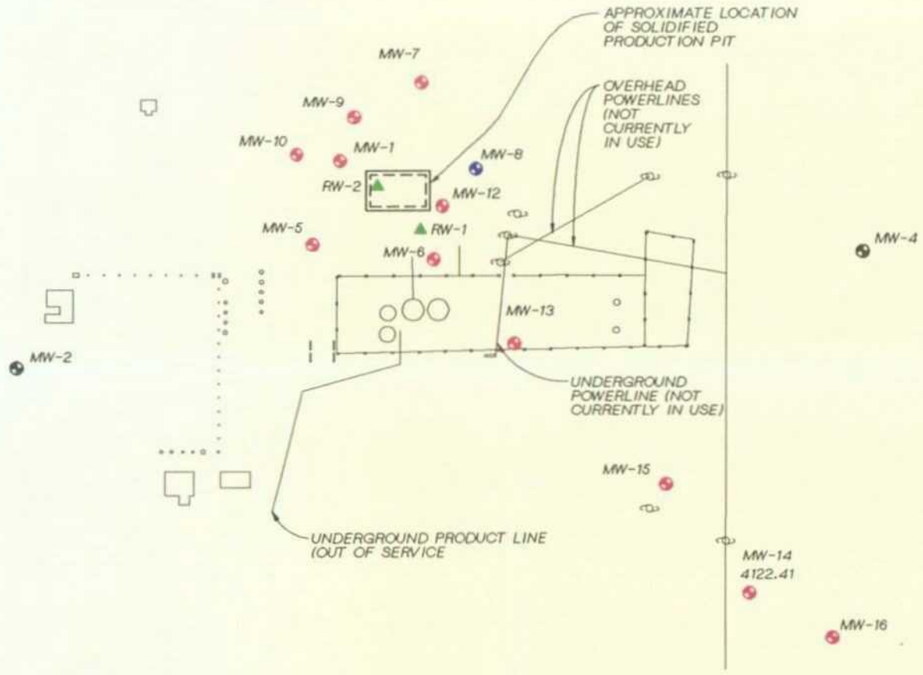
Stabilized field parameter measurements for the December 1997 event are presented in Appendix A along with historical field parameter values. The field parameter values for the December 1997 event are in good agreement with historical values. Consequently, the overall goals of the monitoring are not significantly compromised by the missing data.

The sequence in which wells were sampled was as follows:

- Upgradient monitor wells
- Historically clean downgradient monitor wells
- Monitor wells along the fringes of the BTEX plume
- Monitor wells within the area of separate-phase liquids

With the exception of dissolved oxygen, groundwater samples were analyzed for the parameters listed in Table 2-1 by Heritage Environmental Laboratories. Dissolved oxygen values were measured in the field using drop-count calorimetric titration (Modified Winkler Method).

All groundwater analytical results to date are presented in Appendix B of this report.



MW-3

LEGEND

- Power Pole
- Monitoring Well
- MW-8 Location has been plugged and abandoned
- Locations not included in long-term monitoring program
- RW-1 and RW-2 Recovery Well Clusters

0 150 300 450

SCALE 1"=150'

Phillips Petroleum Company
South Four Lakes Unit
Tatum, New Mexico

Production Lease Tank Battery
Layout and
Monitoring Well Locations

Figure 2-1

TABLE 2-1
Parameters and Analytical Methods

Parameter	Objective	Lab or Field	Method	Detection Limit
Organics				
BTEX/Naphthalene	Contaminants of concern	Lab	8020 Mod.	1.0 µg/L
TOC	Total organic loading in groundwater	Lab	415.2	1.0 mg/L
Methane	By-product of contaminant degradation	Lab	GC/FID/PID	8.0 µg/L
Electron Acceptors				
Dissolved Oxygen	Preferred electron acceptor	Field	Winkler Titration	0.10 mg/L
Nitrate	Electron acceptor	Lab	300.0	0.05 mg/L
Nitrite	Potential intermediate in reduction of NO_3 to N_2	Lab	354.1	0.50 mg/L
Sulfate	Electron acceptor	Lab	300.0	0.25 mg/L
General Water Chemistry				
Carbonate Species–CO_3, HCO_3, and Alkalinity	Insight into water chemistry (buffering capacity) and microbial activity (CO_2 generation)	Lab	310.1	1.0 mg/L
Major Cations–sodium, calcium, potassium, magnesium, manganese, and phosphorus	For ion balance	Lab	200.7	0.01 to 0.5 mg/L
Chloride	For ion balance	Lab	300.0	2.5 mg/L
Iron	Indicator of low redox conditions	Lab	200.7	0.025 mg/L
Sulfide	Indicator of low redox conditions	Lab	376.1	1.0 mg/L
TDS	General water quality parameter	Lab	160.1	10.0 mg/L
pH, conductivity, temperature, and Eh	General water quality parameters and redox conditions of groundwater system	Field	Field meters	

SECTION 3

Analysis of Collected Data

This section presents an analysis of the fluid level and water quality data collected in December 1997.

Water Level Measurements

Fluctuations in water levels beneath the Unit are shown in Figure 3-1 for the period of January 1996 through December 1997. With the exception of MW-14, groundwater levels in January 1996 were slightly higher than in the other three quarters of 1996 and December 1997. The low value reported for MW-14 in January 1996 is likely an invalid measurement. The remaining quarterly measurements at MW-14 agree favorably with the other wells (Figure 3-1).

During the April 1996 sampling event, the windmill-driven free-product recovery system (RW-2S) was pumping continuously causing a slight depression in water levels at MW-1 and MW-12 (Figure 3-1). Overall, groundwater levels beneath the Unit did not fluctuate significantly over the period of record (Figure 3-1).

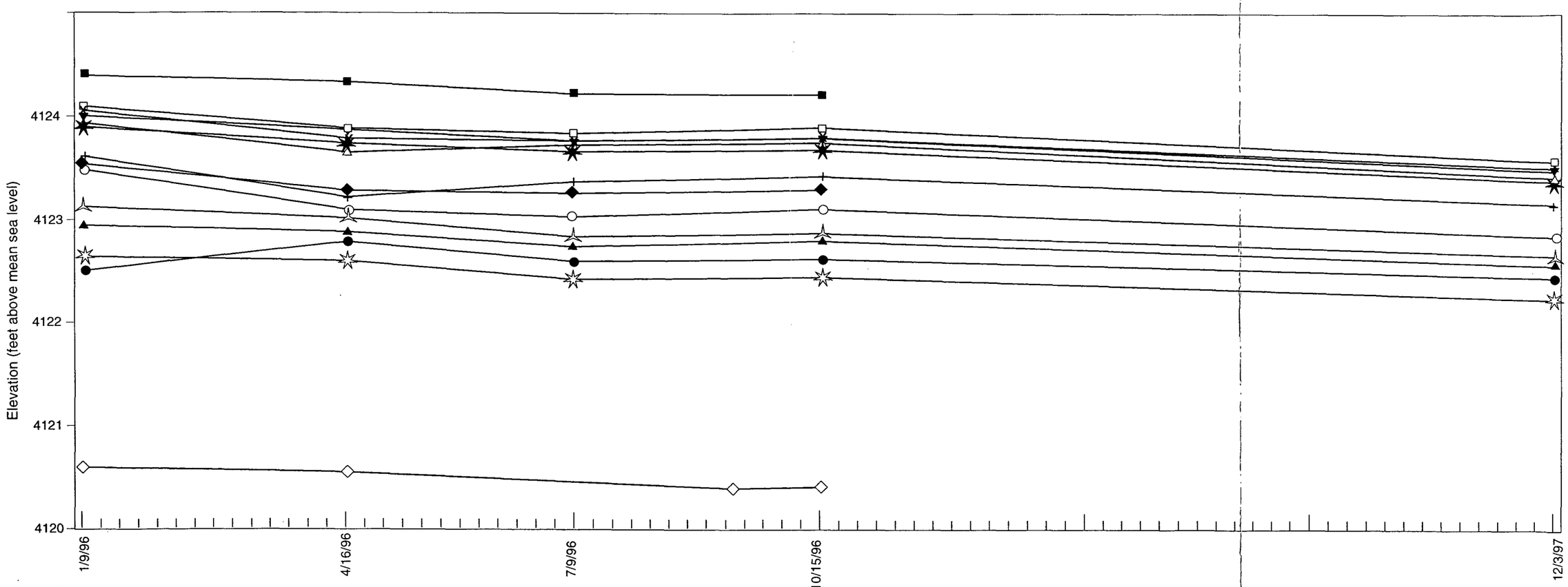
Figure 3-2 present the potentiometric surface beneath the Unit in December 1997. As shown in Figure 3-2, groundwater flow is to the east-southeast at an average gradient of 0.002 feet per foot (ft/ft). While water levels appear to have declined slightly, it is important to note that the magnitude and direction of the hydraulic gradient remained constant.[1]

NAPL Thickness Measurements

NAPL thickness measurements in site wells from January 1996 through December 1997 are summarized in Table 3-1. At MW-6, NAPL thicknesses remained fairly constant during 1996. At wells MW-1 and MW-12, NAPL thicknesses increased from January to April 1996 and then remained fairly constant. At RW-1S, NAPL thicknesses increased from January to July 1996 and then remained fairly constant. The increases in NAPL thicknesses may be due to pumping at RW-2S during the late spring and early summer of 1996 which drove NAPL towards these wells.

It should be recognized that NAPL thicknesses observed in wells greatly exaggerate NAPL thicknesses in formation. Furthermore, it is recognized that apparent thickness of NAPL in wells is also sensitive to water table fluctuations. The consequence of both of these factors is that NAPL thickness in wells provides only a general indication of the amount of NAPL present in formation.

[1] Quantification of Natural Attenuation of Petroleum Hydrocarbons in Groundwater, South Four Lakes Unit, Lea County New Mexico, May 1997.



a Well not included in annual sampling events

b Water level measured to characterize potentiometric surface
Well not included in annual sampling events

c December 1997 value not available due to probe malfunction

Phillips Petroleum Company
South Four Lakes Unit
Tatum, New Mexico

Groundwater Hydrographs
January 1996 through December 1997

Figure 3-1

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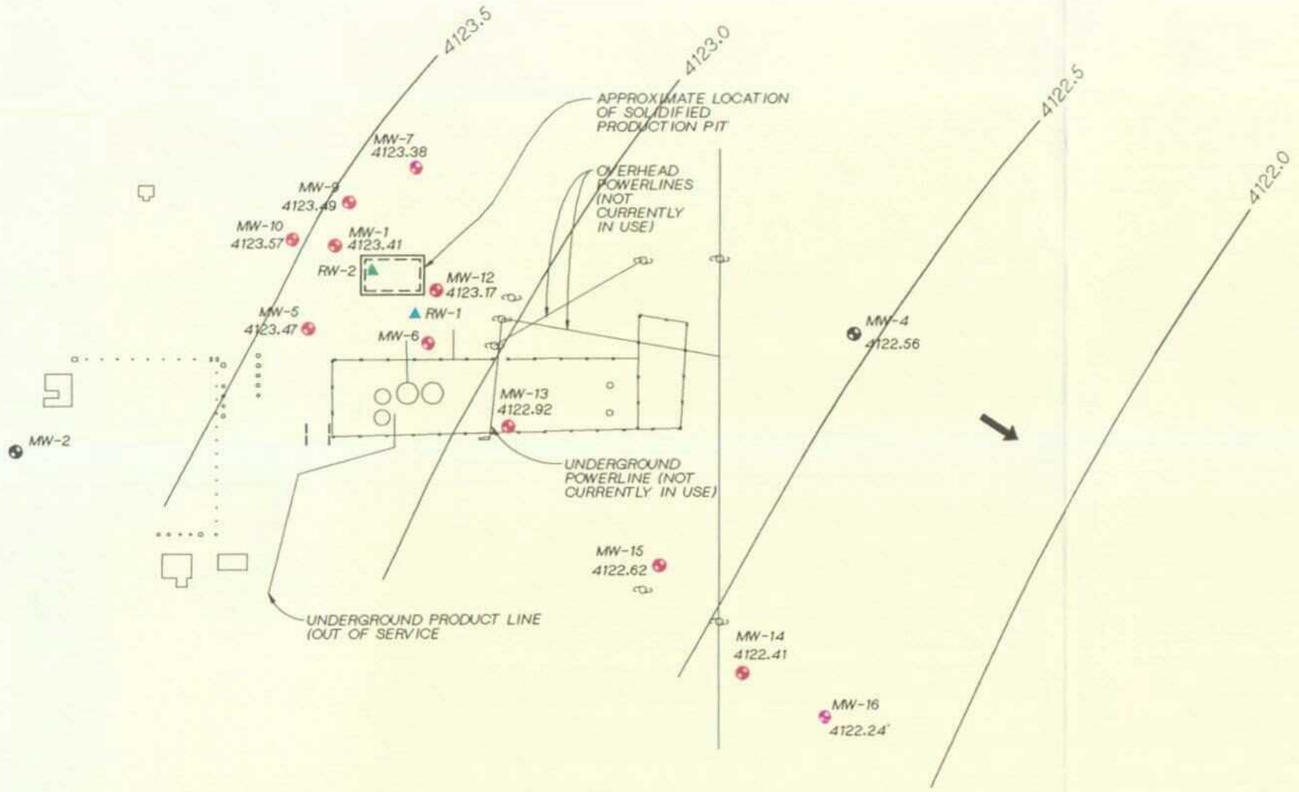

LEGEND

- Power Pole
- Monitoring Well
- Locations not included in long-term monitoring program
- RW-1 and RW-2 Recovery Well Clusters
- Groundwater Flow Direction
- Potentiometric Surface in Feet Above Mean Sea Level

0 150 300 450

SCALE 1"=150'

Phillips Petroleum Company
South Four Lakes Unit
Tatum, New Mexico

Potentiometric Surface
December 1997

Figure 3-2 3-3

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TABLE 3-1
Phillips Petroleum Company
South Four Lakes Unit
Nonaqueous Phase Petroleum Hydrocarbon Thickness (feet)

Well ID	1996 Values				1997 Values
	January	April	July	October	December
MW-1	2.67	3.17	3.17	3.21	2.80
MW-6	4.46	4.43	4.52	4.56	NA[a]
MW-12	4.00	5.04	4.12	3.99	3.82
RW-1S	0.15	3.58	4.72	4.67	4.26
RW-1D	Absent	Absent	Absent	Absent	Absent
RW-2S	3.50	NA[b]	NA[b]	NA[b]	NA[b]

Note:
[a]NAPL thickness at MW-6 not available due to probe malfunction, however; NAPL observed in bailer.
[b]NAPL measurements at RW-2S are not available due to the presence of the pump apparatus in the well.

Water Quality Monitoring

BTEX and Naphthalene Data

Table 3-2 presents a comparison of the December 1997 BTEX and naphthalene results to the results from the four quarterly sampling events in 1996.

As shown in Table 3-2, BTEX and naphthalene concentrations have remained below method detection limits in upgradient wells MW-5, MW-9, and MW-10 and in downgradient wells MW-14 and MW-16. At MW-7, both BTEX and naphthalene concentrations declined between October 1996 and December 1997. Historically, all BTEX constituents and naphthalene concentrations have remained below New Mexico Water Quality Control Commission (WQCC) standards at MW-7 (see Appendix B for complete results).

At downgradient well MW-13, BTEX concentrations declined between October 1996 and December 1997 (Table 3-2). Xylene concentrations decreased from an average of 1,705 µg/L to 570 µg/L, which is below the WQCC standard of 620 µg/L for xylene. Benzene concentrations also decreased at MW-13 from an average of 2,275 µg/L to 920 µg/L. Although benzene concentrations have decreased at MW-13, the December 1997 concentration of 920 µg/L remains above the WQCC standard of 10 µg/L for benzene. Naphthalene concentrations at MW-13 have remained fairly stable over the two-year period (see Appendix B for complete results).

At downgradient well MW-15, benzene concentrations were observed to decrease from a concentration of 96 µg/L in January 1996 to below detectable levels in October 1996. In December 1997, benzene concentrations rebounded to 91 µg/L. A similar trend is observed for the other BTEX constituents and naphthalene at MW-15 (see Appendix B for complete results).

TABLE 3-2
Site BTEX and Naphthalene Data (mg/L)

Well ID	1996 Values								1997 Values	
	January		April		July		October		December	
	BTEX	Naphthalene	BTEX	Naphthalene	BTEX	Naphthalene	BTEX	Naphthalene	BTEX	Naphthalene
MW-1*	4.16	NA	2.851	.140	NA	NA	NA	NA	NA	NA
MW-2	.001U	NA	.001U	.001U	.001U	.001U	.001U	.001U	--	--
MW-3	.001U	NA	.001U	.001U	.001U	.001U	.001U	.001U	--	--
MW-4	.001U	NA	.0012	.012	.001U	.019	.001U	.015	--	--
MW-5	.001U	NA	.001U	.001U	.001U	.001U	.001U	.001U	.001U	.001U
MW-6*	26.33	NA	61.50	1.90	NA	NA	NA	NA	NA	NA
MW-7	.019	NA	.015	.005	.013	.004	.020	.007	.002	.002
MW-9	.001U	NA	.001U	.001U	.001U	.001U	.001U	.001U	.001U	.001U
MW-10	.001U	NA	.001U	.001U	.001U	.001U	.001U	.001U	.001U	.001U
MW-12*	22.20	NA	29.60	.320	NA	NA	NA	NA	NA	NA
MW-13	4.34	NA	4.484	.067	4.484	.073	4.257	.075	1.79	.050U
MW-14	.001U	NA	.001U	.001U	.001U	.001U	.001U	.001U	.001U	.001U
MW-15	4.246	NA	3.212	.160	3.645	.150	2.660	.130	4.311	.160
MW-16	.001U	NA	.001U	.001U	.001U	.001U	.001U	.001U	.001U	.001U
RW-1D	NA	NA	8.470	.190	3.560	.050U	4.150	.050U	2.33	.061
RW-1S*	16.90	NA	NA	NA	NA	NA	NA	NA	18.10	.410
RW-2D	NA	NA	.624	.033	.116	.005	.045	.005	.061	.003
RW-2S	11.730	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

* = Indicates measurable NAPL at location.
-- = Indicates well not included in long-term sampling events.
NA = Parameter not analyzed.
U = Parameter analyzed for but not detected at levels above the adjacent numeric limit.

At deep wells RW-1D and RW-2D, BTEX and naphthalene concentrations decreased between April and July 1996 and then remained fairly constant through December 1997 (Table 3-2). Hydrocarbon Distribution in Groundwater

Figure 3-3 presents the estimated extent of dissolved BTEX in groundwater based on the December 1997 analytical results, the locations where measurable NAPL was observed, and the inferred extent of NAPL based on those observations.

As shown in Figure 3-3, detectable levels of BTEX are generally limited to the vicinity of the closed EXXON production pit to a distance of approximately 340 feet downgradient of the NAPL zone. The zone of NAPL is limited to the immediate vicinity of the closed EXXON production pit (Figure 3-3).

Further migration of NAPL is unlikely since the source was removed during disposal pit closure (December, 1995), recoverable NAPL is being removed at RW-2S and, the fact that NAPL migration is limited by the high residual saturation left at the trailing edge of a mobile free-phase liquid zone. Additionally, data from MW-7, MW-13, and MW-15 suggests that the extent of the dissolved BTEX plume may be sensitive to the effects of pumping at RW-2S.

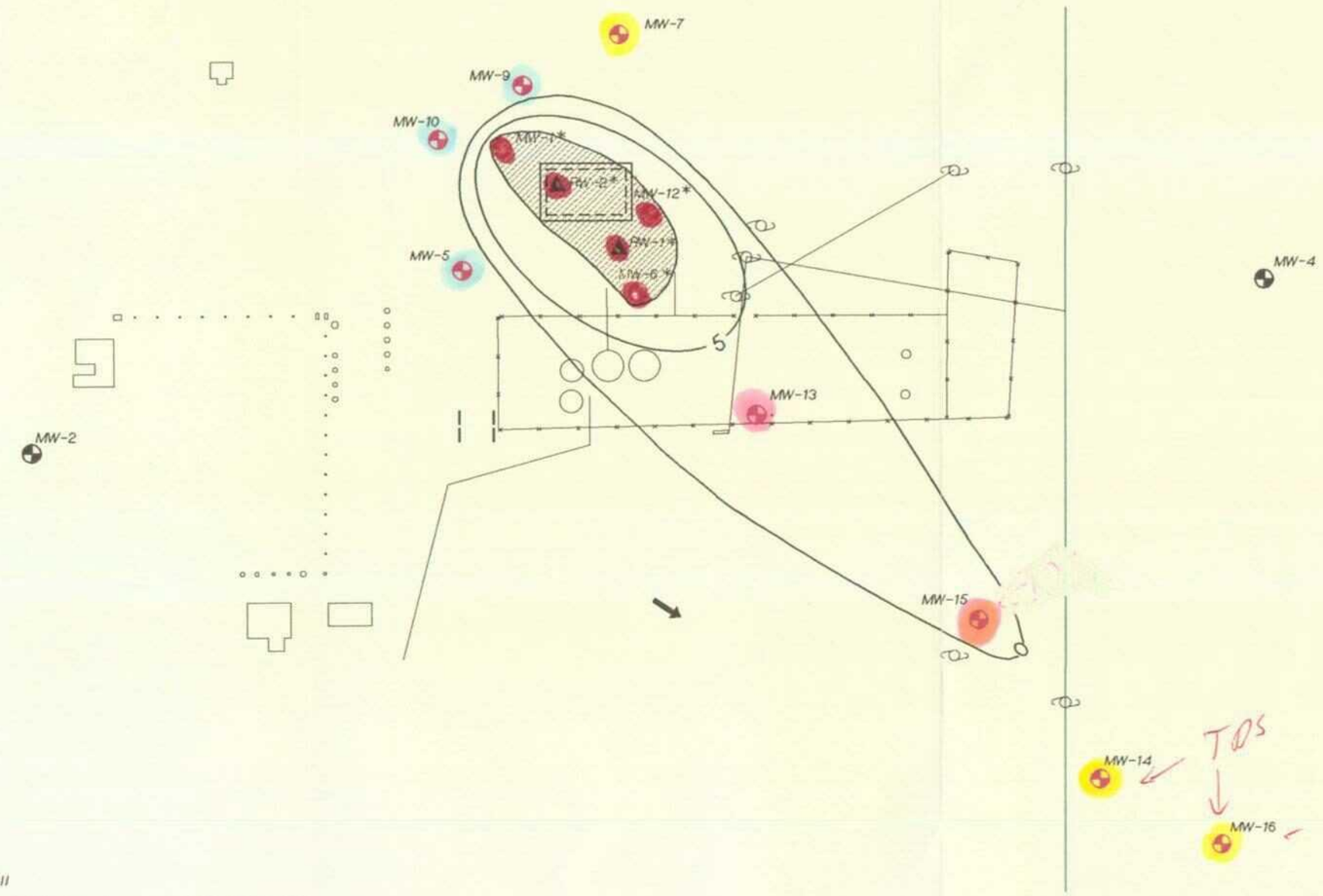
Natural Attenuation Parameters

The electron acceptor and biodegradation by-product data collected in December 1997 is presented graphically in Figure 3-4 and 3-5. The direction of groundwater flow is also depicted on the two figures. Posted values compared favorably to historical values.

As shown on Figure 3-4, upgradient oxygen, nitrate, and sulfate are depleted in wells within the NAPL zone and dissolved BTEX plume (MW-1, MW-6, MW-12, MW-13, and MW-15) indicating their use as electron acceptors. The concentrations of these three constituents rebound downgradient suggesting that there is capacity to degrade dissolved hydrocarbons downgradient of the site.

As shown on Figure 3-5, bicarbonate is elevated in wells within the NAPL zone (MW-1, MW-6, and MW-12) and downgradient (MW-13, MW-14, and MW-15) reflecting carbon dioxide generation through biological respiration. Dissolved iron concentrations increase within the BTEX plume and downgradient indicating the insoluble ferric iron (Fe^{3+}) is being used as an electron acceptor producing highly soluble ferrous iron (Fe^{2+}).

Based on the analysis of electron acceptors and biodegradation by-products, it is concluded that biological processes continue to actively reduce hydrocarbons in both the downgradient dissolved plume and in the areas where NAPL is present.



LEGEND

- Power Pole
- Monitoring Well
- Wells not included in long-term monitoring program
- RW-1 and RW-2 Recovery Well Clusters
- Inferred Extent of NAPL
- 5 — BTEX Concentrations in mg/L
- * Indicates Measurable Free-phase Product Observed
- Groundwater Flow Direction

Note: BTEX values posted in Table 3-2 of text

0 100 200 300

SCALE 1"=100

Phillips Petroleum Company
South Four Lakes Unit
Tatum, New Mexico

Extent of BTEX in Groundwater [mg/L]

Figure 3-3 3-7

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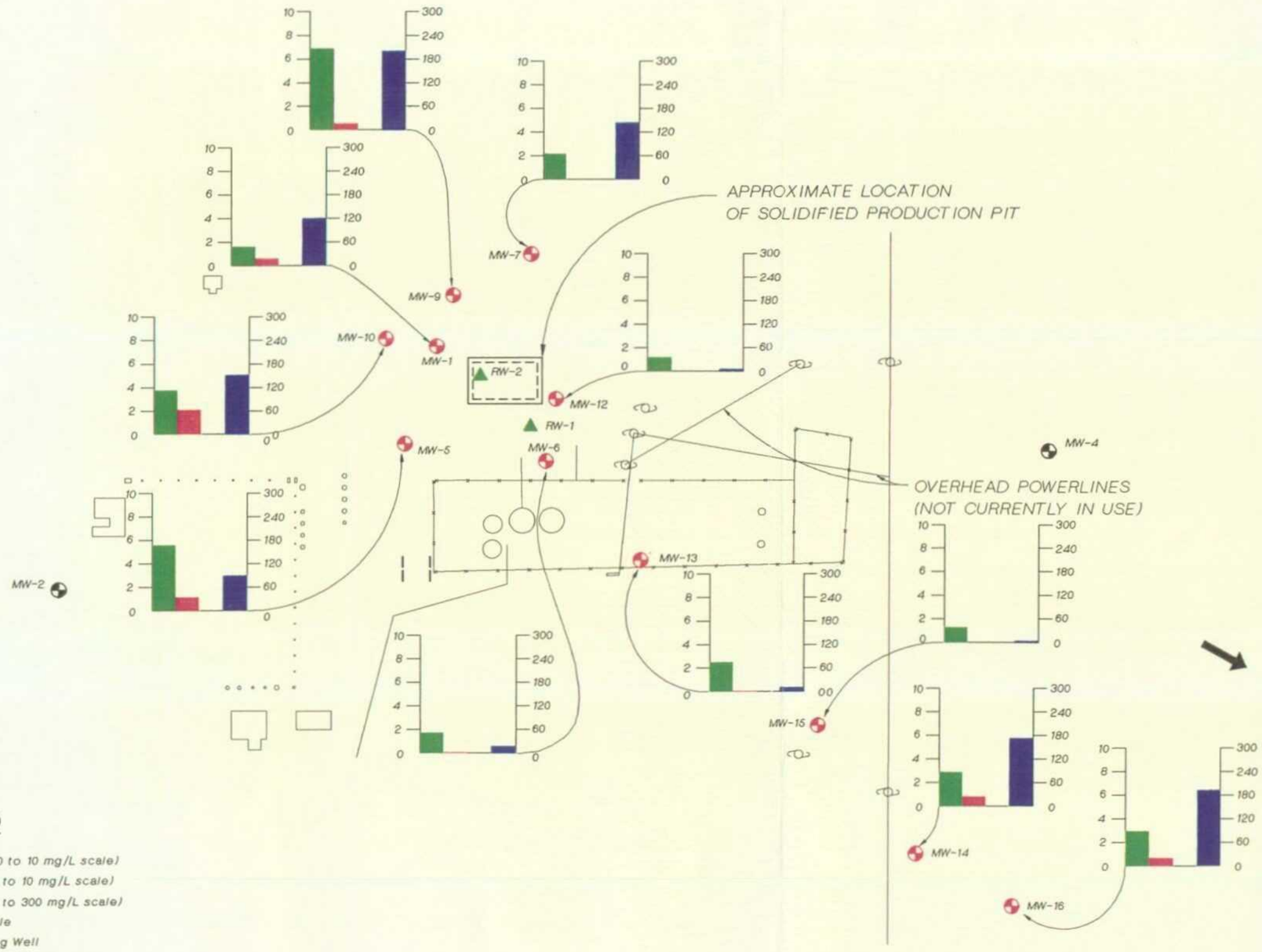

LEGEND

- Oxygen (0 to 10 mg/L scale)
- Nitrate (0 to 10 mg/L scale)
- Sulfate (0 to 300 mg/L scale)
- Power Pole
- Monitoring Well
- Locations not included in long-term monitoring program
- RW-1 and RW-2 Recovery Well Clusters
- Groundwater Flow Direction

Notes:
Underground product line and powerline locations infered based on best available information.

Phillips Petroleum Company
South Four Lakes Unit
Tatum, New Mexico

Electron Acceptors in Groundwater (mg/L))

Figure 3-4 3-8

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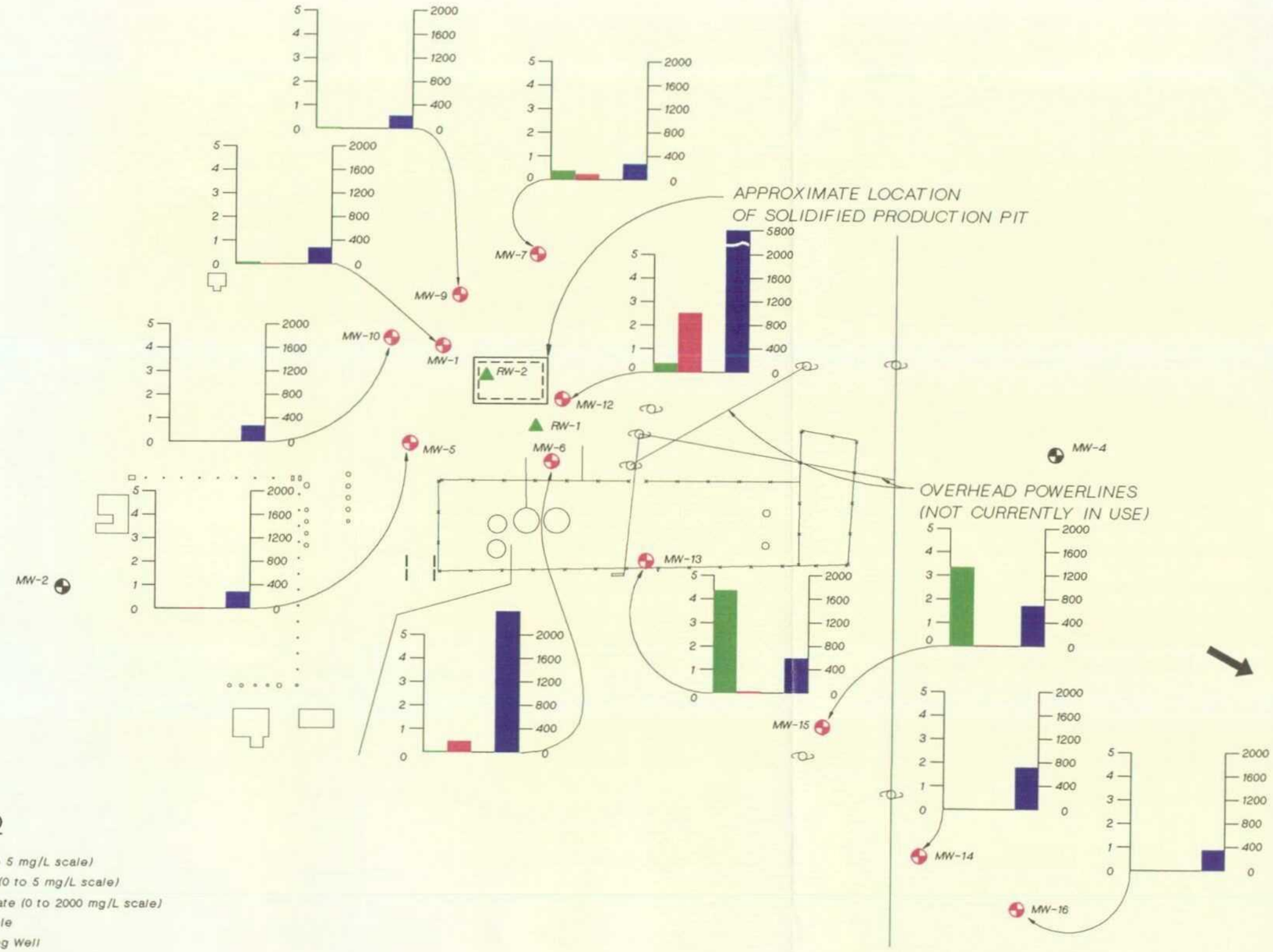

N

LEGEND

- Iron (0 to 5 mg/L scale)
- Methane (0 to 5 mg/L scale)
- Bicarbonate (0 to 2000 mg/L scale)
- Power Pole
- Monitoring Well
- Locations not included in long-term monitoring program
- RW-1 and RW-2 Recovery Well Clusters
- Groundwater Flow Direction

Notes:
Underground product line and powerline locations infered based on best available information.

0 100 200 300

SCALE 1"=100

Phillips Petroleum Company
South Four Lakes Unit
Tatum, New Mexico

Biodegradation Byproducts in Groundwater (mg/L))

Figure 3-5 3-9

2311f3-5.div 12-JAN-1996

SECTION 4

Conclusions and Recommendations

The results of the 1997 groundwater monitoring event indicate that biological attenuation of petroleum hydrocarbon is actively occurring. The net result is that the dissolved hydrocarbon plume has only migrated a few hundred feet beyond the NAPL release and the extent of the plume appears to be stable. Based on this result, it is recommended that the current site management and monitoring be continued.

At this point in the monitoring program, it is recommended that MW-4 not be abandoned. Water levels at MW-4 provide control for the potentiometric surface map. As a result, water levels at MW-4 should be measured during future monitoring events. Monitoring wells MW-2 and MW-3 do not add value to the monitoring program and should be plugged and abandoned.

APPENDIX A

Field Parameter Values

Phillips Petroleum Company, South Four Lakes Unit
Field Parameter Data

		1996 Values				1997 Values	
Well ID	**Parameter**	**January**	**April**	**July**	**October**	**December**	**Units**
MW-01	Conductance	1250	753	1330	1310	1020	µmohs
MW-01	Eh	-205	-160	-158	-180	NA	millivolts
MW-01	Oxygen	1.51	2.5	1.19	0.1	NA	MG/L
MW-01	Temperature	66.7	74.5	67.5	67.1	62.8	F°
MW-01	pH	7.54	8	7.89	8.01	7.82	UNITS
MW-02	Conductance	1332	9200	1145	1160	NS	µmohs
MW-02	Eh	153.5	4.99	210	234	NS	millivolts
MW-02	Oxygen	1.6	3.44	3.44	1.83	NS	MG/L
MW-02	Temperature	66.5	61.7	67.7	67.6	NS	F°
MW-02	pH	7.34	6.76	8.47	7.37	NS	UNITS
MW-03	Conductance	5190	4120	4210	4360	NS	µmohs
MW-03	Eh	117.5	5.46	28.4	108	NS	millivolts
MW-03	Oxygen	3.26	2.15	1.88	1.14	NS	MG/L
MW-03	Temperature	68.9	67.3	68.8	68.7	NS	F°
MW-03	pH	6.8	6.51	7.64	7.06	NS	UNITS
MW-04	Conductance	3050	2400	2220	2360	NS	µmohs
MW-04	Eh	14	NA	-170	-196	NS	millivolts
MW-04	Oxygen	2.65	2	1.9	NA	NS	MG/L
MW-04	Temperature	67.9	70.2	67.8	67.7	NS	F°
MW-04	pH	7.29	6.72	7.87	7.15	NS	UNITS
MW-05	Conductance	951	608	745	778	NA	µmohs
MW-05	Eh	266	247	195	161	145	millivolts
MW-05	Oxygen	5.27	5.38		6.51	NA	MG/L
MW-05	Temperature	63.7	60.7	67.3	66.3	NA	F°
MW-05	pH	7.51	7.1	7.45	7.42	NA	UNITS
MW-06	Conductance	5370	1850	4550	4090	NA	µmohs
MW-06	Eh	-205	-156	-130	-205	NA	millivolts
MW-06	Oxygen	1.98		1.67	0.1	NA	MG/L
MW-06	Temperature	64.2	78.9	67.7	65.8	NA	F°
MW-06	pH	7.16		7.28	7.83	NA	UNITS
MW-07	Conductance	1860	1280	1315	1200	965	µmohs
MW-07	Eh	-283	10.6	-220	-274	NA	millivolts
MW-07	Oxygen	2.06	2.82	3.37	0.76	2.08	MG/L

Phillips Petroleum Company, South Four Lakes Unit
Field Parameter Data

		1996 Values				1997 Values	
Well ID	**Parameter**	**January**	**April**	**July**	**October**	**December**	**Units**
MW-07	Temperature	67.3	66.4	67.8	66.9	62.2	F°
MW-07	pH	7.4	7.3	7.75	7.69	7.62	UNITS
MW-09	Conductance	1171	780	928	935	NA	µmohs
MW-09	Eh	241	3.45	235	283	NA	millivolts
MW-09	Oxygen	5.98	7.03	6.3	6.3	NA	MG/L
MW-09	Temperature	66.7	64.7	67.2	68.3	NA	F°
MW-09	pH	7.31	6.7	8.33	7.59	NA	UNITS
MW-10	Conductance	2000	1215	1538	1598	NA	µmohs
MW-10	Eh	241	182	235	241	120	millivolts
MW-10	Oxygen	4.8	4.57	4.58	4.1	3.83	MG/L
MW-10	Temperature	65.5	60.8	66.7	67	NA	F°
MW-10	pH	7.33	6.76	8.08	7.45	NA	UNITS
MW-12	Conductance	6580	2700	5890	6950	3160	µmohs
MW-12	Eh	-206	-165	-80	-24	NA	millivolts
MW-12	Oxygen	0.81	1.32	1.35	0.1	NA	MG/L
MW-12	Temperature	68	64.1	67.3	71	61.6	F°
MW-12	pH	7.58	7.12	7.11	7.09	7.60	UNITS
MW-13	Conductance	3300	1705	2810	2610	2740	µmohs
MW-13	Eh	-227	-175	-160	-205	NA	millivolts
MW-13	Oxygen	1.66	1.19	1.49	0.85	2.22	MG/L
MW-13	Temperature	66.8	70.8	67.3	66	65.1	F°
MW-13	pH	6.38	6.76	7.03	7.04	7.34	UNITS
MW-14	Conductance	1660	1097	1790	1450	NA	µmohs
MW-14	Eh	114.7	5.11	109	142	NA	millivolts
MW-14	Oxygen	5.7	NA	3.68	2.96	NA	MG/L
MW-14	Temperature	67.3	65.3	75.7	65.2	NA	F°
MW-14	pH	7.8	7.87	9.06	7.62	NA	UNITS
MW-15	Conductance	2480	1508	2340	2540	2610	µmohs
MW-15	Eh	-258	10.76	-118	-223	NA	millivolts
MW-15	Oxygen	1.3	2.17	2.08	1.05	1.19	MG/L
MW-15	Temperature	65.3	71.1	66.7	64.7	63.0	F°
MW-15	pH	7.21	7.04	7.35	7.24	7.40	UNITS
MW-16	Conductance	1684	1208	1355	1370	NA	µmohs
MW-16	Eh	258	4.51	99	146	NA	millivolts

Phillips Petroleum Company, South Four Lakes Unit
Field Parameter Data

Well ID	Parameter	1996 Values				1997 Values	Units
		January	April	July	October	December	
MW-16	Oxygen	4.9	4.75	3	3.56	2.83	MG/L
MW-16	Temperature	66.7	61.4	69.1	64.1	NA	F°
MW-16	pH	7.45	7.2	7.75	7.55	NA	UNITS
RW-1D	Conductance	6540	3550	5850	5370	4050	µmohs
RW-1D	Eh	-130	-238	-243	-310	NA	millivolts
RW-1D	Oxygen	1.15	NA	0.1	0.1	BDL	MG/L
RW-1D	Temperature	64.9	69.8	67.4	67.7	64.1	F°
RW-1D	pH	7.72	7.59	7.81	7.81	8.24	UNITS
RW-1S	Conductance	4350	NA	NA	NA	4980	µmohs
RW-1S	Eh	30	NA	NA	NA	NA	millivolts
RW-1S	Oxygen	2.25	NA	NA	NA	NA	MG/L
RW-1S	Temperature	64.7	NA	NA	NA	63.3	F°
RW-1S	pH	7.68	NA	NA	NA	7.42	UNITS
RW-2D	Conductance	1690	NA	NA	NA	NA	µmohs
RW-2D	Eh	-226	NA	NA	NA	NA	millivolts
RW-2D	Temperature	66	NA	NA	NA	NA	F°
RW-2D	pH	7.57	NA	NA	NA	NA	UNITS
RW-2S	Conductance	2430	NA	NA	NA	NS	µmohs
RW-2S	Eh	-205	NA	NA	NA	NS	millivolts
RW-2S	Oxygen	0.79	NA	NA	NA	NS	MG/L
RW-2S	Temperature	69.6	NA	NA	NA	NS	F°
RW-2S	pH	7.66	NA	NA	NA	NS	UNITS

Notes:
NA = Value not available.
NS = Well not included in long-term monitoring program.

APPENDIX B

Groundwater Data

Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-01	IN	Alkalinity	260.00	210.00	230.00	250.00	237.50	260.00		1.000	MG/L
MW-01	IN	Arsenic	NA	BDL	BDL	BDL	BDL	NA	0.1	0.005	MG/L
MW-01	IN	Barium	NA	0.13	0.24	0.75	0.37	NA	1.0	0.010	MG/L
MW-01	IN	Benzene	260.00	51.00	NA	NA	155.50	NA	10.00	1.000	UG/L
MW-01	IN	Bicarbonate	260.00	210.00	230.00	250.00	237.50	260.00		1.000	MG/L
MW-01	IN	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-01	IN	Calcium	100.00	130.00	140.00	100.00	117.50	110.00		0.200	MG/L
MW-01	IN	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-01	IN	Chloride	120.00	150.00	160.00	170.00	150.00	100.00		1.300	MG/L
MW-01	IN	Chromium	NA	0.06	0.05	BDL	0.05	NA	0.05	0.010	MG/L
MW-01	IN	Ethyl Benzene	450.00	340.00	NA	NA	395.00	NA	750.0	1.000	UG/L
MW-01	IN	Iron	0.14	0.08	0.07	0.06	0.09	0.10		0.025	MG/L
MW-01	IN	Lead	NA	BDL	BDL	BDL	BDL	BDL	0.05	0.005	MG/L
MW-01	IN	Magnesium	13.00	16.00	18.00	12.00	14.75	14.00		0.200	MG/L
MW-01	IN	Manganese	0.40	0.32	0.36	0.35	0.36	0.49		0.010	MG/L
MW-01	IN	Mercury	NA	BDL	BDL	BDL	BDL	NA	0.002	0.0002	MG/L
MW-01	IN	Methane	20.00	BDL	8.60	NA	14.30	170.00		8.000	UG/L
MW-01	IN	Naphthalene	NA	140.00	NA	NA	140.00	NA	30.0	1.000	UG/L
MW-01	IN	Nitrogen, Nitrate	1.00	1.60	1.60	1.00	1.30	0.67		0.050	MG/L
MW-01	IN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-01	IN	Oxygen	1.50	2.50	1.19	BDL	1.73	NA		0.100	MG/L
MW-01	IN	Phosphorus	0.06	0.08	0.07	0.07	0.07	BDL		0.030	MG/L
MW-01	IN	Potassium	1.40	1.20	1.30	1.00	1.23	1.30		0.200	MG/L
MW-01	IN	Selenium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-01	IN	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-01	IN	Sodium	91.00	73.00	85.00	80.00	82.25	94.00		0.200	MG/L
MW-01	IN	Solids	680.00	750.00	800.00	1300.00	882.50	650.00		10.000	MG/L
MW-01	IN	Sulfate	120.00	160.00	160.00	130.00	142.50	120.00		0.250	MG/L
MW-01	IN	Sulfide	BDL	BDL	3.00	2.00	2.50	3.40		1.000	MG/L
MW-01	IN	Toluene	730.00	270.00	NA	NA	500.00	NA	750.0	1.000	UG/L
MW-01	IN	Total Organic Carbon	80.00	3.60	5.90	13.00	25.63	11.00		1.000	MG/L
MW-01	IN	Total Xylenes	2720.00	2190.00	NA	NA	2455.00	NA	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-02	UP	Alkalinity	290.00	270.00	340.00	300.00	300.00	NS		1.000	MG/L
MW-02	UP	Arsenic	NA	BDL	BDL	BDL	BDL	NS	0.10	0.005	MG/L
MW-02	UP	Barium	NA	0.06	0.06	0.05	0.06	NS	1.0	0.010	MG/L
MW-02	UP	Benzene	BDL	BDL	BDL	BDL	BDL	NS	10.0	1.000	UG/L
MW-02	UP	Bicarbonate	290.00	270.00	340.00	300.00	300.00	NS		1.000	MG/L
MW-02	UP	Cadmium	NA	BDL	BDL	BDL	BDL	NS	0.01	0.005	MG/L
MW-02	UP	Calcium	85.00	100.00	100.00	87.00	93.00	NS		0.200	MG/L
MW-02	UP	Carbonate	BDL	BDL	BDL	BDL	BDL	NS		1.000	MG/L
MW-02	UP	Chloride	80.00	80.00	84.00	79.00	80.75	NS		2.500	MG/L
MW-02	UP	Chromium	NA	BDL	BDL	BDL	BDL	NS	0.05	0.010	MG/L
MW-02	UP	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	NS	750.0	1.000	UG/L
MW-02	UP	Iron	BDL	0.04	0.03	BDL	0.03	NS		0.025	MG/L
MW-02	UP	Lead	NA	BDL	BDL	BDL	BDL	NS	0.05	0.005	MG/L
MW-02	UP	Magnesium	31.00	33.00	33.00	28.00	31.25	NS		0.200	MG/L
MW-02	UP	Manganese	0.29	0.32	0.32	0.28	0.30	NS		0.010	MG/L
MW-02	UP	Mercury	NA	BDL	0.001	BDL	0.001	NS	0.002	0.0002	MG/L
MW-02	UP	Methane	BDL	BDL	BDL	BDL	BDL	NS		8.000	UG/L
MW-02	UP	Naphthalene	NA	BDL	BDL	BDL	BDL	NS	30.0	1.000	UG/L
MW-02	UP	Nitrogen, Nitrate	16.00	17.00	17.00	16.00	16.50	NS		0.050	MG/L
MW-02	UP	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	NS		0.500	MG/L
MW-02	UP	Oxygen	1.60	3.44	3.44	1.83	2.58	NS		0.100	MG/L
MW-02	UP	Phosphorus	0.08	0.05	0.19	0.06	0.10	NS		0.030	MG/L
MW-02	UP	Potassium	2.40	2.60	2.40	2.10	2.38	NS		0.200	MG/L
MW-02	UP	Selenium	NA	BDL	BDL	BDL	BDL	NS	0.05	0.005	MG/L
MW-02	UP	Silver	NA	BDL	BDL	BDL	BDL	NS	0.05	0.010	MG/L
MW-02	UP	Sodium	82.00	82.00	79.00	65.00	77.00	NS		0.200	MG/L
MW-02	UP	Solids	680.00	700.00	680.00	680.00	685.00	NS		10.000	MG/L
MW-02	UP	Sulfate	120.00	120.00	120.00	130.00	122.50	NS		0.250	MG/L
MW-02	UP	Sulfide	BDL	BDL	BDL	BDL	BDL	NS		1.000	MG/L
MW-02	UP	Toluene	BDL	BDL	BDL	BDL	BDL	NS	750.0	1.000	UG/L
MW-02	UP	Total Organic Carbon	BDL	BDL	3.80	2.00	2.90	NS		1.000	MG/L
MW-02	UP	Total Xylenes	BDL	BDL	BDL	BDL	BDL	NS	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-03	DWN	Alkalinity	440.00	440.00	440.00	440.00	440.00	NS		1.000	MG/L
MW-03	DWN	Arsenic	NA	BDL	BDL	BDL	BDL	NS	0.10	0.005	MG/L
MW-03	DWN	Barium	NA	0.10	0.10	0.09	0.10	NS	1.0	0.010	MG/L
MW-03	DWN	Benzene	BDL	BDL	BDL	BDL	BDL	NS	10.0	1.000	UG/L
MW-03	DWN	Bicarbonate	440.00	440.00	440.00	440.00	440.00	NS		1.000	MG/L
MW-03	DWN	Cadmium	NA	BDL	BDL	BDL	BDL	NS	0.01	0.005	MG/L
MW-03	DWN	Calcium	200.00	220.00	210.00	190.00	BDL	NS		0.200	MG/L
MW-03	DWN	Carbonate	BDL	BDL	BDL	BDL	BDL	NS		1.000	MG/L
MW-03	DWN	Chloride	1000.00	990.00	1100.00	1200.00	1072.50	NS		2.500	MG/L
MW-03	DWN	Chromium	NA	BDL	BDL	BDL	BDL	NS	0.05	0.010	MG/L
MW-03	DWN	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	NS	750.0	1.000	UG/L
MW-03	DWN	Iron	BDL	0.03	0.03	BDL	0.03	NS		0.025	MG/L
MW-03	DWN	Lead	NA	BDL	BDL	BDL	BDL	NS	0.05	0.005	MG/L
MW-03	DWN	Magnesium	43.00	46.00	44.00	40.00	43.25	NS		0.200	MG/L
MW-03	DWN	Manganese	BDL	BDL	BDL	BDL	BDL	NS		0.010	MG/L
MW-03	DWN	Mercury	NA	BDL	0.0013	0.0003	0.001	NS	0.002	0.0002	MG/L
MW-03	DWN	Methane	240.00	1200.00	490.00	480.00	602.50	NS		8.000	UG/L
MW-03	DWN	Naphthalene	NA	BDL	BDL	BDL	BDL	NS	30.0	1.000	UG/L
MW-03	DWN	Nitrogen, Nitrate	0.46	0.48	0.40	0.44	0.45	NS		0.050	MG/L
MW-03	DWN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	0.00	NS		0.500	MG/L
MW-03	DWN	Oxygen	3.26	2.15	1.88	1.14	2.11	NS		0.100	MG/L
MW-03	DWN	Phosphorus	0.04	BDL	0.05	0.04	0.04	NS		0.030	MG/L
MW-03	DWN	Potassium	14.00	15.00	14.00	13.00	14.00	NS		0.200	MG/L
MW-03	DWN	Selenium	NA	BDL	BDL	BDL	BDL	NS	0.05	0.005	MG/L
MW-03	DWN	Silver	NA	BDL	BDL	BDL	BDL	NS	0.05	0.010	MG/L
MW-03	DWN	Sodium	490.00	570.00	560.00	490.00	527.50	NS		0.200	MG/L
MW-03	DWN	Solids	2300.00	2300.00	2400.00	2400.00	2350.00	NS		10.000	MG/L
MW-03	DWN	Sulfate	99.00	90.00	97.00	96.00	95.50	NS		0.250	MG/L
MW-03	DWN	Sulfide	BDL	BDL	BDL	BDL	BDL	NS		1.000	MG/L
MW-03	DWN	Toluene	BDL	BDL	BDL	BDL	BDL	NS	750.0	1.000	UG/L
MW-03	DWN	Total Organic Carbon	5.20	BDL	11.00	1.30	6.15	NS		1.000	MG/L
MW-03	DWN	Total Xylenes	BDL	BDL	BDL	BDL	BDL	NS	620.0	1.000	UG/L

[a] Method Limit Specific to 1997 Results
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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-04	DWN	Alkalinity	480.00	390.00	400.00	380.00	412.50	NS		1.000	MG/L
MW-04	DWN	Arsenic	NA	BDL	BDL	BDL	BDL	NS	0.10	0.005	MG/L
MW-04	DWN	Barium	NA	0.17	0.31	0.42	0.30	NS	1.0	0.010	MG/L
MW-04	DWN	Benzene	BDL	BDL	BDL	BDL	BDL	NS	10.0	1.000	UG/L
MW-04	DWN	Bicarbonate	480.00	390.00	400.00	380.00	412.50	NS		1.000	MG/L
MW-04	DWN	Cadmium	NA	BDL	BDL	BDL	BDL	NS	0.01	0.005	MG/L
MW-04	DWN	Calcium	45.00	76.00	100.00	110.00	82.75	NS		0.200	MG/L
MW-04	DWN	Carbonate	BDL	BDL	BDL	BDL	0.00	NS		1.000	MG/L
MW-04	DWN	Chloride	460.00	450.00	460.00	460.00	457.50	NS		2.500	MG/L
MW-04	DWN	Chromium	NA	BDL	BDL	BDL	BDL	NS	0.05	0.010	MG/L
MW-04	DWN	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	NS	750.0	1.000	UG/L
MW-04	DWN	Iron	0.52	1.00	1.60	0.97	1.02	NS		0.025	MG/L
MW-04	DWN	Lead	NA	BDL	BDL	BDL	BDL	NS		0.005	MG/L
MW-04	DWN	Magnesium	8.20	14.00	20.00	22.00	16.05	NS		0.200	MG/L
MW-04	DWN	Manganese	0.07	0.12	0.16	0.17	0.13	NS		0.010	MG/L
MW-04	DWN	Mercury	NA	BDL	0.0004	BDL	0.0004	NS	0.002	0.0002	MG/L
MW-04	DWN	Methane	720.00	6600.00	5000.00	3500.00	3955.00	NS		8.000	UG/L
MW-04	DWN	Naphthalene	NA	12.00	19.00	15.00	15.33	NS	30.0	1.000	UG/L
MW-04	DWN	Nitrogen, Nitrate	BDL	BDL	BDL	0.06	0.06	NS		0.050	MG/L
MW-04	DWN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	NS		0.500	MG/L
MW-04	DWN	Oxygen	2.65	2.00	1.90	NA	2.18	NS		0.100	MG/L
MW-04	DWN	Phosphorus	0.14	0.05	0.11	0.04	0.09	NS		0.030	MG/L
MW-04	DWN	Potassium	17.00	20.00	23.00	22.00	20.50	NS		0.200	MG/L
MW-04	DWN	Selenium	NA	BDL	BDL	BDL	BDL	NS	0.05	0.005	MG/L
MW-04	DWN	Silver	NA	BDL	BDL	BDL	BDL	NS	0.05	0.010	MG/L
MW-04	DWN	Sodium	410.00	400.00	280.00	210.00	325.00	NS		0.200	MG/L
MW-04	DWN	Solids	1300.00	1300.00	1200.00	1200.00	1250.00	NS		10.000	MG/L
MW-04	DWN	Sulfate	78.00	60.00	43.00	36.00	54.25	NS		0.250	MG/L
MW-04	DWN	Sulfide	BDL	BDL	BDL	BDL	BDL	NS		1.000	MG/L
MW-04	DWN	Toluene	BDL	BDL	BDL	BDL	BDL	NS	750.0	1.000	UG/L
MW-04	DWN	Total Organic Carbon	4.00	BDL	11.00	BDL	7.50	NS		1.000	MG/L
MW-04	DWN	Total Xylenes	BDL	1.20	BDL	BDL	1.20	NS	620.0	1.000	UG/L

[a] Method Limit Specific to 1997 Results
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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-05	UP	Alkalinity	220.00	230.00	220.00	220.00	222.50	260.00		1.000	MG/L
MW-05	UP	Arsenic	NA	BDL	BDL	0.01	0.01	NA	0.10	0.005	MG/L
MW-05	UP	Barium	NA	0.06	0.05	0.05	0.05	NA	1.0	0.010	MG/L
MW-05	UP	Benzene	BDL	BDL	BDL	BDL	BDL	BDL	10.0	1.000	UG/L
MW-05	UP	Bicarbonate	220.00	230.00	220.00	220.00	222.50	260.00		1.000	MG/L
MW-05	UP	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-05	UP	Calcium	85.00	92.00	84.00	78.00	84.75	87.00		0.200	MG/L
MW-05	UP	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-05	UP	Chloride	41.00	40.00	38.00	36.00	38.75	37.00		2.500	MG/L
MW-05	UP	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-05	UP	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-05	UP	Iron	BDL	BDL	BDL	BDL	BDL	0.028		0.025	MG/L
MW-05	UP	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-05	UP	Magnesium	13.00	14.00	13.00	12.00	13.00	13.00		0.200	MG/L
MW-05	UP	Manganese	BDL	BDL	BDL	BDL	BDL	BDL		0.010	MG/L
MW-05	UP	Mercury	NA	BDL	BDL	BDL	BDL	NA	0.002	0.0002	MG/L
MW-05	UP	Methane	BDL	21.00	BDL	BDL	21.00	BDL		8.000	UG/L
MW-05	UP	Naphthalene	NA	BDL	BDL	BDL	BDL	BDL	30.0	1.000	UG/L
MW-05	UP	Nitrogen, Nitrate	1.30	1.20	0.91	1.10	1.13	0.96		0.050	MG/L
MW-05	UP	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-05	UP	Oxygen	5.27	5.38	NA	6.51	5.72	NA		0.100	MG/L
MW-05	UP	Phosphorus	BDL	BDL	0.05	0.04	0.05	BDL		0.030	MG/L
MW-05	UP	Potassium	1.30	1.30	1.30	1.20	1.28	1.30		0.200	MG/L
MW-05	UP	Selenium	NA	BDL	BDL	0.01	0.01	NA	0.05	0.005	MG/L
MW-05	UP	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-05	UP	Sodium	54.00	56.00	50.00	46.00	51.50	45.00		0.200	MG/L
MW-05	UP	Solids	500.00	490.00	470.00	500.00	490.00	450.00		10.000	MG/L
MW-05	UP	Sulfate	110.00	110.00	100.00	110.00	107.50	88.00		0.250	MG/L
MW-05	UP	Sulfide	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-05	UP	Toluene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-05	UP	Total Organic Carbon	BDL	BDL	1.90	2.00	1.95	BDL		1.000	MG/L
MW-05	UP	Total Xylenes	BDL	BDL	BDL	BDL	BDL	BDL	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	1996 Results April	1996 Results July	1996 Results October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-06	IN	Alkalinity	550.00	340.00	530.00	970.00	597.50	2400.00		1.000	MG/L
MW-06	IN	Arsenic	NA	0.02	0.02	0.02	0.02	NA	0.10	0.005	MG/L
MW-06	IN	Barium	NA	4.40	3.00	2.20	3.20	NA	1.0	0.010	MG/L
MW-06	IN	Benzene	9100.00	13000.00	NA	NA	11050.00	NA	10.0	1.000	UG/L
MW-06	IN	Bicarbonate	550.00	340.00	530.00	970.00	597.50	2400.00		1.000	MG/L
MW-06	IN	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-06	IN	Calcium	260.00	230.00	210.00	180.00	220.00	150.00		0.200	MG/L
MW-06	IN	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-06	IN	Chloride	1400.00	1200.00	1100.00	890.00	1147.50	720.00		2.500	MG/L
MW-06	IN	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-06	IN	Ethyl Benzene	930.00	5000.00	NA	NA	2965.00	NA	750.0	1.000	UG/L
MW-06	IN	Iron	3.20	2.20	1.90	1.40	2.18	BDL		0.025	MG/L
MW-06	IN	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-06	IN	Magnesium	66.00	57.00	53.00	41.00	54.25	39.00		0.200	MG/L
MW-06	IN	Manganese	1.10	1.00	0.85	0.72	0.92	0.79		0.010	MG/L
MW-06	IN	Mercury	NA	BDL	0.0008	BDL	0.0008	NA	0.002	0.0002	MG/L
MW-06	IN	Methane	120.00	380.00	39.00	NA	179.67	400.00		8.000	UG/L
MW-06	IN	Naphthalene	NA	1900.00	NA	NA	1900.00	NA	30.0	1.000	UG/L
MW-06	IN	Nitrogen, Nitrate	BDL	0.73	0.48	0.29	0.50	BDL		0.050	MG/L
MW-06	IN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-06	IN	Oxygen	1.98	BDL	1.67	BDL	1.83	NA		0.100	MG/L
MW-06	IN	Phosphorus	0.23	0.28	0.11	0.14	0.19	0.31		0.030	MG/L
MW-06	IN	Potassium	2.10	1.80	1.50	1.40	1.70	2.00		0.200	MG/L
MW-06	IN	Selenium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-06	IN	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-06	IN	Sodium	620.00	500.00	570.00	540.00	557.50	400.00		0.200	MG/L
MW-06	IN	Solids	3700.00	2600.00	2500.00	2500.00	2825.00	1700.00		10.000	MG/L
MW-06	IN	Sulfate	46.00	56.00	40.00	43.00	46.25	21.00		0.250	MG/L
MW-06	IN	Sulfide	7.80	3.00	BDL	2.00	4.27	BDL		1.000	MG/L
MW-06	IN	Toluene	11000.00	19000.00	NA	NA	15000.00	NA	750.0	1.000	UG/L
MW-06	IN	Total Organic Carbon	750.00	11.00	13.00	13.00	196.75	17.00		1.000	MG/L
MW-06	IN	Total Xylenes	5300.00	24500.00	NA	NA	14900.00	NA	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

			1996 Results				1996	1997 Results	WQCC	Method	
Well ID	Group	Parameter	January	April	July	October	Average	December	Standard	Limit[a]	Units
MW-07	UP	Alkalinity	300.00	430.00	430.00	730.00	472.50	280.00		1.000	MG/L
MW-07	UP	Arsenic	NA	BDL	BDL	BDL	BDL	NA	0.10	0.005	MG/L
MW-07	UP	Barium	NA	0.08	0.05	0.07	0.07	NA	1.0	0.010	MG/L
MW-07	UP	Benzene	5.90	4.20	3.20	4.70	4.50	2.30	10.0	1.000	UG/L
MW-07	UP	Bicarbonate	300.00	430.00	430.00	730.00	472.50	280.00		1.000	MG/L
MW-07	UP	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-07	UP	Calcium	91.00	94.00	62.00	69.00	79.00	68.00		0.200	MG/L
MW-07	UP	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-07	UP	Chloride	210.00	180.00	110.00	120.00	155.00	69.00		2.500	MG/L
MW-07	UP	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-07	UP	Ethyl Benzene	13.00	11.00	10.00	15.00	12.25	BDL	750.0	1.000	UG/L
MW-07	UP	Iron	0.67	0.77	0.46	0.40	0.58	0.34		0.025	MG/L
MW-07	UP	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-07	UP	Magnesium	17.00	17.00	11.00	12.00	14.25	11.00		0.200	MG/L
MW-07	UP	Manganese	0.10	0.11	0.08	0.07	0.09	0.078		0.010	MG/L
MW-07	UP	Mercury	NA	BDL	0.0012	BDL	0.0012	NA	0.002	0.0002	MG/L
MW-07	UP	Methane	170.00	490.00	190.00	440.00	322.50	290.00		8.000	UG/L
MW-07	UP	Naphthalene	NA	5.40	3.50	7.30	4.05	1.80	30.0	1.000	UG/L
MW-07	UP	Nitrogen, Nitrate	BDL	BDL	BDL	BDL	BDL	BDL		0.050	MG/L
MW-07	UP	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-07	UP	Oxygen	2.06	2.82	3.37	0.76	2.25	2.08		0.100	MG/L
MW-07	UP	Phosphorus	0.11	0.15	0.14	0.17	0.14	BDL		0.030	MG/L
MW-07	UP	Potassium	38.00	36.00	30.00	32.00	34.00	28.00		0.200	MG/L
MW-07	UP	Selenium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-07	UP	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-07	UP	Sodium	180.00	160.00	120.00	130.00	147.50	98.00		0.200	MG/L
MW-07	UP	Solids	900.00	920.00	730.00	720.00	817.50	620.00		10.000	MG/L
MW-07	UP	Sulfate	170.00	170.00	170.00	180.00	172.50	140.00		0.250	MG/L
MW-07	UP	Sulfide	BDL	2.00	BDL	3.00	2.50	BDL		1.000	MG/L
MW-07	UP	Toluene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-07	UP	Total Organic Carbon	BDL	BDL	1.40	BDL	1.40	BDL		1.000	MG/L
MW-07	UP	Total Xylenes	BDL	BDL	BDL	BDL	BDL	BDL	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-09	UP	Alkalinity	230.00	200.00	200.00	210.00	210.00	200.00		1.000	MG/L
MW-09	UP	Arsenic	NA	BDL	BDL	BDL	BDL	NA	0.10	0.005	MG/L
MW-09	UP	Barium	NA	0.06	0.07	0.05	0.06	NA	1.0	0.010	MG/L
MW-09	UP	Benzene	BDL	BDL	BDL	BDL	BDL	BDL	10.0	1.000	UG/L
MW-09	UP	Bicarbonate	230.00	200.00	200.00	210.00	210.00	200.00		1.000	MG/L
MW-09	UP	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-09	UP	Calcium	100.00	100.00	100.00	86.00	96.50	100.00		0.200	MG/L
MW-09	UP	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-09	UP	Chloride	54.00	58.00	57.00	58.00	56.75	54.00		2.500	MG/L
MW-09	UP	Chromium	NA	0.01	BDL	BDL	0.01	NA	0.05	0.010	MG/L
MW-09	UP	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-09	UP	Iron	BDL	0.04	BDL	BDL	0.04	BDL		0.025	MG/L
MW-09	UP	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-09	UP	Magnesium	11.00	11.00	11.00	9.30	10.58	11.00		0.200	MG/L
MW-09	UP	Manganese	BDL	BDL	BDL	BDL	BDL	BDL		0.010	MG/L
MW-09	UP	Mercury	NA	BDL	0.0004	BDL	0.0004	NA	0.002	0.0002	MG/L
MW-09	UP	Methane	BDL	BDL	BDL	BDL	BDL	BDL		8.000	UG/L
MW-09	UP	Naphthalene	NA	BDL	BDL	BDL	BDL	BDL	30.0	1.000	UG/L
MW-09	UP	Nitrogen, Nitrate	0.59	0.56	0.65	0.70	0.63	0.61		0.050	MG/L
MW-09	UP	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-09	UP	Oxygen	5.98	7.03	6.30	6.30	6.40	NA		0.100	MG/L
MW-09	UP	Phosphorus	0.10	0.06	0.10	0.08	0.09	BDL		0.030	MG/L
MW-09	UP	Potassium	2.00	2.40	1.80	1.60	1.95	1.70		0.200	MG/L
MW-09	UP	Selenium	NA	0.01	BDL	BDL	0.01	NA	0.05	0.005	MG/L
MW-09	UP	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-09	UP	Sodium	74.00	71.00	78.00	65.00	72.00	73.00		0.200	MG/L
MW-09	UP	Solids	620.00	630.00	640.00	620.00	627.50	630.00		10.000	MG/L
MW-09	UP	Sulfate	180.00	190.00	180.00	190.00	185.00	200.00		0.250	MG/L
MW-09	UP	Sulfide	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-09	UP	Toluene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-09	UP	Total Organic Carbon	BDL	BDL	6.90	BDL	6.90	BDL		1.000	MG/L
MW-09	UP	Total Xylenes	BDL	BDL	BDL	BDL	BDL	BDL	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-10	UP	Alkalinity	300.00	200.00	220.00	240.00	240.00	240.00		1.000	MG/L
MW-10	UP	Arsenic	NA	BDL	BDL	BDL	BDL	NA	0.10	0.005	MG/L
MW-10	UP	Barium	NA	0.06	0.07	0.05	0.06	NA	1.0	0.010	MG/L
MW-10	UP	Benzene	BDL	BDL	BDL	BDL	BDL	BDL	10.0	1.000	UG/L
MW-10	UP	Bicarbonate	300.00	200.00	220.00	240.00	240.00	240.00		1.000	MG/L
MW-10	UP	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-10	UP	Calcium	170.00	160.00	160.00	140.00	157.50	84.00		0.200	MG/L
MW-10	UP	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-10	UP	Chloride	290.00	260.00	260.00	260.00	267.50	140.00		2.500	MG/L
MW-10	UP	Chromium	NA	0.62	0.56	0.46	0.55	NA	0.05	0.010	MG/L
MW-10	UP	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-10	UP	Iron	BDL	BDL	BDL	BDL	BDL	BDL		0.025	MG/L
MW-10	UP	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-10	UP	Magnesium	20.00	19.00	19.00	16.00	18.50	11.00		0.200	MG/L
MW-10	UP	Manganese	BDL	BDL	BDL	0.02	0.02	BDL		0.010	MG/L
MW-10	UP	Mercury	NA	BDL	0.0008	BDL	0.0008	NA	0.002	0.0002	MG/L
MW-10	UP	Methane	BDL	BDL	BDL	BDL	BDL	BDL		8.000	UG/L
MW-10	UP	Naphthalene	NA	BDL	BDL	BDL	BDL	BDL	30.0	1.000	UG/L
MW-10	UP	Nitrogen, Nitrate	4.80	4.10	3.70	3.90	4.13	2.00		0.050	MG/L
MW-10	UP	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-10	UP	Oxygen	4.80	4.57	4.58	4.10	4.51	3.83		0.100	MG/L
MW-10	UP	Phosphorus	0.06	0.05	0.11	0.08	0.08	BDL		0.030	MG/L
MW-10	UP	Potassium	3.40	4.00	3.40	3.00	3.45	2.30		0.200	MG/L
MW-10	UP	Selenium	NA	0.01	BDL	BDL	0.01	NA	0.05	0.005	MG/L
MW-10	UP	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-10	UP	Sodium	130.00	110.00	120.00	120.00	120.00	130.00		0.200	MG/L
MW-10	UP	Solids	1100.00	970.00	1000.00	1000.00	1017.50	720.00		10.000	MG/L
MW-10	UP	Sulfate	160.00	160.00	170.00	180.00	167.50	150.00		0.250	MG/L
MW-10	UP	Sulfide	1.40	5.00	BDL	BDL	3.20	BDL		1.000	MG/L
MW-10	UP	Toluene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-10	UP	Total Organic Carbon	BDL	BDL	2.00	2.60	2.30	BDL		1.000	MG/L
MW-10	UP	Total Xylenes	BDL	BDL	BDL	BDL	BDL	BDL	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-12	IN	Alkalinity	630.00	550.00	540.00	670.00	597.50	5800.00		1.000	MG/L
MW-12	IN	Arsenic	NA	0.02	0.02	0.01	0.02	NA	0.10	0.005	MG/L
MW-12	IN	Barium	NA	20.00	15.00	15.00	16.67	NA	1.0	0.010	MG/L
MW-12	IN	Benzene	7200.00	11000.00	NA	NA	9100.00	NA	10.0	1.000	UG/L
MW-12	IN	Bicarbonate	630.00	550.00	540.00	670.00	597.50	5800.00		1.000	MG/L
MW-12	IN	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-12	IN	Calcium	200.00	370.00	320.00	290.00	295.00	110.00		0.200	MG/L
MW-12	IN	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-12	IN	Chloride	1700.00	2100.00	1900.00	2000.00	1925.00	810.00		2.500	MG/L
MW-12	IN	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-12	IN	Ethyl Benzene	1500.00	1100.00	NA	NA	1300.00	NA	750.0	1.000	UG/L
MW-12	IN	Iron	2.80	5.60	5.20	0.04	3.41	0.27		0.025	MG/L
MW-12	IN	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-12	IN	Magnesium	45.00	90.00	66.00	76.00	69.25	24.00		0.200	MG/L
MW-12	IN	Manganese	0.85	1.60	1.30	1.30	1.26	0.62		0.010	MG/L
MW-12	IN	Mercury	NA	BDL	BDL	0.0015	0.0015	NA	0.002	0.0002	MG/L
MW-12	IN	Methane	310.00	430.00	920.00	NA	553.33	2500.00		8.000	UG/L
MW-12	IN	Naphthalene	NA	320.00	NA	NA	320.00	NA	30.0	1.000	UG/L
MW-12	IN	Nitrogen, Nitrate	BDL	BDL	BDL	BDL	BDL	BDL		0.050	MG/L
MW-12	IN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-12	IN	Oxygen	0.81	1.32	1.35	BDL	1.16	NA		0.100	MG/L
MW-12	IN	Phosphorus	0.13	0.26	0.15	0.19	0.18	0.92		0.030	MG/L
MW-12	IN	Potassium	18.00	29.00	23.00	21.00	22.75	14.00		0.200	MG/L
MW-12	IN	Selenium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-12	IN	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-12	IN	Sodium	800.00	900.00	890.00	590.00	795.00	500.00		0.200	MG/L
MW-12	IN	Solids	3600.00	4300.00	4200.00	4300.00	4100.00	1400.00		10.000	MG/L
MW-12	IN	Sulfate	0.86	BDL	BDL	0.37	0.62	4.30		0.250	MG/L
MW-12	IN	Sulfide	BDL	9.00	BDL	3.00	6.00	BDL		1.000	MG/L
MW-12	IN	Toluene	6100.00	11000.00	NA	NA	8550.00	NA	750.0	1.000	UG/L
MW-12	IN	Total Organic Carbon	46.00	19.00	14.00	22.00	25.25	9.30		1.000	MG/L
MW-12	IN	Total Xylenes	7400.00	6500.00	NA	NA	6950.00	NA	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
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MW-13	DWN	Alkalinity	1000.00	680.00	630.00	690.00	750.00	580.00		1.000	MG/L
MW-13	DWN	Arsenic	NA	0.02	0.02	0.02	0.02	NA	0.10	0.005	MG/L
MW-13	DWN	Barium	NA	1.70	1.60	1.80	1.70	NA	1.0	0.010	MG/L
MW-13	DWN	Benzene	2400.00	2400.00	2200.00	2100.00	2275.00	920.00	10.0	50.000	UG/L
MW-13	DWN	Bicarbonate	1000.00	680.00	630.00	690.00	750.00	580.00		1.000	MG/L
MW-13	DWN	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-13	DWN	Calcium	190.00	180.00	170.00	190.00	182.50	190.00		0.200	MG/L
MW-13	DWN	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-13	DWN	Chloride	560.00	540.00	560.00	530.00	547.50	560.00		2.500	MG/L
MW-13	DWN	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-13	DWN	Ethyl Benzene	330.00	370.00	430.00	350.00	370.00	160.00	750.0	50.000	UG/L
MW-13	DWN	Iron	4.30	4.00	4.00	4.40	4.18	4.30		0.025	MG/L
MW-13	DWN	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-13	DWN	Magnesium	69.00	62.00	62.00	63.00	64.00	66.00		0.200	MG/L
MW-13	DWN	Manganese	1.90	1.90	1.90	2.10	1.95	2.20		0.010	MG/L
MW-13	DWN	Mercury	NA	BDL	0.0004	BDL	0.0004	NA	0.002	0.0002	MG/L
MW-13	DWN	Methane	60.00	130.00	70.00	120.00	95.00	74.00		8.000	UG/L
MW-13	DWN	Naphthalene	NA	67.00	73.00	75.00	53.75	BDL	30.0	50.000	UG/L
MW-13	DWN	Nitrogen, Nitrate	0.07	BDL	BDL	BDL	0.07	BDL		0.050	MG/L
MW-13	DWN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-13	DWN	Oxygen	1.66	1.19	1.49	0.85	1.30	2.22		0.100	MG/L
MW-13	DWN	Phosphorus	0.12	0.08	0.11	0.09	0.10	BDL		0.030	MG/L
MW-13	DWN	Potassium	1.20	1.20	1.00	1.10	1.13	1.20		0.200	MG/L
MW-13	DWN	Selenium	NA	BDL	BDL	0.01	0.01	NA	0.05	0.005	MG/L
MW-13	DWN	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-13	DWN	Sodium	260.00	210.00	220.00	220.00	227.50	240.00		0.200	MG/L
MW-13	DWN	Solids	1500.00	1500.00	1500.00	1400.00	1475.00	1500.00		10.000	MG/L
MW-13	DWN	Sulfate	4.50	2.30	2.70	2.80	3.08	11.00		0.250	MG/L
MW-13	DWN	Sulfide	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-13	DWN	Toluene	22.00	14.00	34.00	97.00	41.75	140.00	750.0	50.000	UG/L
MW-13	DWN	Total Organic Carbon	21.00	11.00	8.80	13.00	13.45	14.00		1.000	MG/L
MW-13	DWN	Total Xylenes	1590.00	1700.00	1820.00	1710.00	1705.00	570.00	620.0	50.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-14	DWN	Alkalinity	450.00	650.00	1200.00	2000.00	1075.00	740.00		1.000	MG/L
MW-14	DWN	Arsenic	NA	BDL	BDL	0.01	BDL	NA	0.10	0.005	MG/L
MW-14	DWN	Barium	NA	0.03	0.03	0.03	0.03	NA	1.0	0.010	MG/L
MW-14	DWN	Benzene	BDL	BDL	BDL	BDL	BDL	BDL	10.0	1.000	UG/L
MW-14	DWN	Bicarbonate	450.00	650.00	1200.00	2000.00	1075.00	740.00		1.000	MG/L
MW-14	DWN	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-14	DWN	Calcium	62.00	75.00	79.00	82.00	74.50	91.00		0.200	MG/L
MW-14	DWN	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-14	DWN	Chloride	87.00	100.00	110.00	120.00	104.25	130.00		2.500	MG/L
MW-14	DWN	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-14	DWN	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-14	DWN	Iron	0.03	0.05	0.03	BDL	0.03	BDL		0.025	MG/L
MW-14	DWN	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-14	DWN	Magnesium	18.00	19.00	20.00	18.00	18.75	18.00		0.200	MG/L
MW-14	DWN	Manganese	0.01	0.01	0.01	BDL	0.01	BDL		0.010	MG/L
MW-14	DWN	Mercury	NA	BDL	0.0003	BDL	0.0003	NA	0.002	0.0002	MG/L
MW-14	DWN	Methane	BDL	BDL	BDL	BDL	BDL	BDL		8.000	UG/L
MW-14	DWN	Naphthalene	NA	BDL	BDL	BDL	BDL	BDL	30.0	1.000	UG/L
MW-14	DWN	Nitrogen, Nitrate	0.38	0.47	0.37	0.60	0.46	0.79		0.050	MG/L
MW-14	DWN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-14	DWN	Oxygen	5.70	NA	3.68	2.96	2.89	NA		0.100	MG/L
MW-14	DWN	Phosphorus	0.07	0.08	0.11	0.08	0.09	BDL		0.030	MG/L
MW-14	DWN	Potassium	2.60	1.90	1.70	1.20	1.85	0.88		0.200	MG/L
MW-14	DWN	Selenium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-14	DWN	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-14	DWN	Sodium	210.00	200.00	180.00	180.00	192.50	160.00		0.200	MG/L
MW-14	DWN	Solids	900.00	920.00	1000.00	930.00	937.50	900.00		10.000	MG/L
MW-14	DWN	Sulfate	230.00	230.00	220.00	250.00	232.50	170.00		0.250	MG/L
MW-14	DWN	Sulfide	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-14	DWN	Toluene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-14	DWN	Total Organic Carbon	4.70	BDL	1.90	BDL	3.30	BDL		1.000	MG/L
MW-14	DWN	Total Xylenes	BDL	BDL	BDL	BDL	BDL	BDL	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-15	DWN	Alkalinity	400.00	300.00	260.00	430.00	347.50	680.00		1.000	MG/L
MW-15	DWN	Arsenic	NA	BDL	BDL	BDL	BDL	NA	0.10	0.005	MG/L
MW-15	DWN	Barium	NA	1.70	1.80	2.40	1.97	NA	1.0	0.010	MG/L
MW-15	DWN	Benzene	96.00	52.00	35.00	BDL	45.75	91.00	10.0	1.000	UG/L
MW-15	DWN	Bicarbonate	400.00	300.00	260.00	430.00	347.50	680.00		1.000	MG/L
MW-15	DWN	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-15	DWN	Calcium	130.00	130.00	140.00	180.00	145.00	170.00		0.200	MG/L
MW-15	DWN	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-15	DWN	Chloride	430.00	410.00	510.00	580.00	482.50	490.00		2.500	MG/L
MW-15	DWN	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-15	DWN	Ethyl Benzene	880.00	690.00	850.00	610.00	757.50	860.00	750.0	1.000	UG/L
MW-15	DWN	Iron	1.70	1.60	1.80	2.40	1.88	3.30		0.025	MG/L
MW-15	DWN	Lead	NA	BDL	0.04	BDL	0.04	NA	0.05	0.005	MG/L
MW-15	DWN	Magnesium	52.00	51.00	57.00	70.00	57.50	66.00		0.200	MG/L
MW-15	DWN	Manganese	0.66	0.66	0.75	0.98	0.76	0.87		0.010	MG/L
MW-15	DWN	Mercury	NA	BDL	0.0002	BDL	0.0002	NA	0.002	0.0002	MG/L
MW-15	DWN	Methane	BDL	8.50	BDL	BDL	8.50	8.70		8.000	UG/L
MW-15	DWN	Naphthalene	NA	160.00	150.00	130.00	146.67	160.00	30.0	1.000	UG/L
MW-15	DWN	Nitrogen, Nitrate	BDL	BDL	BDL	BDL	BDL	BDL		0.050	MG/L
MW-15	DWN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-15	DWN	Oxygen	1.30	2.17	2.08	1.05	1.65	1.19		0.100	MG/L
MW-15	DWN	Phosphorus	0.05	0.06	0.06	0.05	0.06	BDL		0.030	MG/L
MW-15	DWN	Potassium	1.90	2.20	2.20	2.50	2.20	3.50		0.200	MG/L
MW-15	DWN	Selenium	NA	0.01	0.01	BDL	0.01	NA	0.05	0.005	MG/L
MW-15	DWN	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-15	DWN	Sodium	190.00	170.00	160.00	180.00	175.00	240.00		0.200	MG/L
MW-15	DWN	Solids	1200.00	1200.00	1400.00	1400.00	1300.00	1400.00		10.000	MG/L
MW-15	DWN	Sulfate	27.00	42.00	55.00	46.00	42.50	4.80		0.250	MG/L
MW-15	DWN	Sulfide	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-15	DWN	Toluene	870.00	550.00	610.00	420.00	612.50	1100.00	750.0	1.000	UG/L
MW-15	DWN	Total Organic Carbon	9.70	BDL	3.90	4.80	6.13	BDL		1.000	MG/L
MW-15	DWN	Total Xylenes	2400.00	1920.00	2150.00	1630.00	2025.00	2260.00	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
MW-16	DWN	Alkalinity	330.00	330.00	340.00	390.00	347.50	380.00		1.000	MG/L
MW-16	DWN	Arsenic	NA	BDL	BDL	BDL	BDL	NA	0.10	0.005	MG/L
MW-16	DWN	Barium	NA	0.03	0.03	0.03	0.03	NA	1.0	0.010	MG/L
MW-16	DWN	Benzene	BDL	BDL	BDL	BDL	BDL	BDL	10.0	1.000	UG/L
MW-16	DWN	Bicarbonate	330.00	330.00	340.00	390.00	347.50	380.00		1.000	MG/L
MW-16	DWN	Cadmium	NA	BDL	BDL	BDL	BDL	NA	0.01	0.005	MG/L
MW-16	DWN	Calcium	91.00	92.00	88.00	79.00	87.50	90.00		0.200	MG/L
MW-16	DWN	Carbonate	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-16	DWN	Chloride	66.00	68.00	93.00	73.00	75.00	66.00		2.500	MG/L
MW-16	DWN	Chromium	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-16	DWN	Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-16	DWN	Iron	BDL	0.03	0.04	BDL	0.04	BDL		0.025	MG/L
MW-16	DWN	Lead	NA	BDL	BDL	BDL	BDL	NA	0.05	0.005	MG/L
MW-16	DWN	Magnesium	15.00	15.00	14.00	13.00	14.25	14.00		0.200	MG/L
MW-16	DWN	Manganese	BDL	BDL	BDL	BDL	BDL	BDL		0.010	MG/L
MW-16	DWN	Mercury	NA	BDL	0.0004	BDL	0.0004	NA	0.002	0.0002	MG/L
MW-16	DWN	Methane	BDL	BDL	BDL	BDL	BDL	BDL		8.000	UG/L
MW-16	DWN	Naphthalene	NA	BDL	BDL	BDL	BDL	BDL	30.0	1.000	UG/L
MW-16	DWN	Nitrogen, Nitrate	1.00	0.92	0.86	0.81	0.90	0.66		0.050	MG/L
MW-16	DWN	Nitrogen, Nitrite	BDL	BDL	BDL	BDL	BDL	BDL		0.500	MG/L
MW-16	DWN	Oxygen	4.90	4.75	3.03	3.56	4.06	2.83		0.100	MG/L
MW-16	DWN	Phosphorus	0.05	0.05	0.06	0.04	0.05	BDL		0.030	MG/L
MW-16	DWN	Potassium	1.50	0.96	1.20	0.89	1.14	0.88		0.200	MG/L
MW-16	DWN	Selenium	NA	0.01	BDL	BDL	0.01	NA	0.05	0.005	MG/L
MW-16	DWN	Silver	NA	BDL	BDL	BDL	BDL	NA	0.05	0.010	MG/L
MW-16	DWN	Sodium	190.00	170.00	180.00	160.00	175.00	170.00		0.200	MG/L
MW-16	DWN	Solids	900.00	910.00	910.00	870.00	897.50	850.00		10.000	MG/L
MW-16	DWN	Sulfate	280.00	260.00	230.00	260.00	257.50	190.00		0.250	MG/L
MW-16	DWN	Sulfide	BDL	BDL	BDL	BDL	BDL	BDL		1.000	MG/L
MW-16	DWN	Toluene	BDL	BDL	BDL	BDL	BDL	BDL	750.0	1.000	UG/L
MW-16	DWN	Total Organic Carbon	BDL	BDL	2.90	BDL	2.90	BDL		1.000	MG/L
MW-16	DWN	Total Xylenes	BDL	BDL	BDL	BDL	BDL	BDL	620.0	1.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	April	July	October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
RW-1D	IN	Alkalinity	500.00	NA	NA	NA	500.00	NA		1.000	MG/L
RW-1D	IN	Benzene	NA	6000.00	3000.00	3700.00	4233.33	2000.00	10.0	50.000	UG/L
RW-1D	IN	Bicarbonate	500.00	NA	NA	NA	500.00	NA		1.000	MG/L
RW-1D	IN	Calcium	50.00	NA	NA	NA	50.00	NA		0.200	MG/L
RW-1D	IN	Carbonate	BDL	NA	NA	NA	BDL	NA		1.000	MG/L
RW-1D	IN	Cholride	1600.00	NA	NA	NA	1600.00	NA		2.500	MG/L
RW-1D	IN	Ethyl Benzene	NA	510.00	210.00	220.00	313.33	220.00	750.0	50.000	UG/L
RW-1D	IN	Iron	0.11	NA	NA	NA	0.11	NA		0.025	MG/L
RW-1D	IN	Magnesium	16.00	NA	NA	NA	16.00	NA		0.200	MG/L
RW-1D	IN	Manganese	0.11	NA	NA	NA	0.11	NA		0.010	MG/L
RW-1D	IN	Methane	73.00	NA	NA	NA	73.00	NA		8.000	UG/L
RW-1D	IN	Naphthalene	NA	190.00	BDL	BDL	190.00	61.00	30.0	50.000	UG/L
RW-1D	IN	Nitrogen, Nitrite	BDL	NA	NA	NA	BDL	NA		0.500	MG/L
RW-1D	IN	Nitrogren, Nitrate	BDL	NA	NA	NA	BDL	NA		0.050	MG/L
RW-1D	IN	Oxygen	1.15	BDL	BDL	BDL	1.15	NA		0.100	MG/L
RW-1D	IN	Phosphorous	0.08	NA	NA	NA	0.08	NA		0.030	MG/L
RW-1D	IN	Potassium	7.00	NA	NA	NA	7.00	NA		0.200	MG/L
RW-1D	IN	Sodium	1100.00	NA	NA	NA	1100.00	NA		0.200	MG/L
RW-1D	IN	Solids	3300.00	NA	NA	NA	3300.00	NA		10.000	MG/L
RW-1D	IN	Sufide	BDL	NA	NA	NA	BDL	NA		1.000	MG/L
RW-1D	IN	Sulfate	7.90	NA	NA	NA	7.90	NA		0.250	MG/L
RW-1D	IN	Toluene	NA	BDL	BDL	BDL	BDL	BDL	750.0	50.000	UG/L
RW-1D	IN	Total Organic Carbon	35.00	NA	NA	NA	35.00	NA		1.000	MG/L
RW-1D	IN	Total Xylenes	NA	1960.00	350.00	230.00	846.67	110.00	620.0	50.000	UG/L

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Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

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			January	April	July	October	Average	December	Standard	Limit[a]	
RW-1S	IN	Alkalinity	790.00	NA	NA	NA		NA		1.000	MG/L
RW-1S	IN	Benzene	5800.00	NA	NA	NA		8300.00	10.0	250.000	UG/L
RW-1S	IN	Bicarbonate	790.00	NA	NA	NA		NA		1.000	MG/L
RW-1S	IN	Calcium	39.00	NA	NA	NA		NA		0.200	MG/L
RW-1S	IN	Carbonate	BDL	NA	NA	NA		NA		1.000	MG/L
RW-1S	IN	Chloride	1100.00	NA	NA	NA		NA		2.500	MG/L
RW-1S	IN	Ethyl Benzene	900.00	NA	NA	NA		1100.00	750.0	250.000	UG/L
RW-1S	IN	Iron	0.06	NA	NA	NA		NA		0.025	MG/L
RW-1S	IN	Magnesium	11.00	NA	NA	NA		NA		0.200	MG/L
RW-1S	IN	Manganese	0.10	NA	NA	NA		NA		0.010	MG/L
RW-1S	IN	Methane	130.00	NA	NA	NA		NA		8.000	UG/L
RW-1S	IN	Naphthalene	NA	NA	NA	NA		410.00	30.0	250.000	UG/L
RW-1S	IN	Nitrogen, Nitrate	BDL	NA	NA	NA		NA		0.050	MG/L
RW-1S	IN	Nitrogen, Nitrite	BDL	NA	NA	NA		NA		0.500	MG/L
RW-1S	IN	Oxygen	2.25	NA	NA	NA		NA		0.100	MG/L
RW-1S	IN	Phosphorus	0.32	NA	NA	NA		NA		0.030	MG/L
RW-1S	IN	Potassium	5.70	NA	NA	NA		NA		0.200	MG/L
RW-1S	IN	Sodium	920.00	NA	NA	NA		NA		0.200	MG/L
RW-1S	IN	Solids	2600.00	NA	NA	NA		NA		10.000	MG/L
RW-1S	IN	Sulfate	82.00	NA	NA	NA		NA		0.250	MG/L
RW-1S	IN	Sulfide	BDL	NA	NA	NA		NA		1.000	MG/L
RW-1S	IN	Toluene	5100.00	NA	NA	NA		3000.00	750.0	250.000	UG/L
RW-1S	IN	Total Organic Carbon	47.00	NA	NA	NA		NA		1.000	MG/L
RW-1S	IN	Total Xylenes	5100.00	NA	NA	NA		5700.00	620.0	250.000	UG/L

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Analytical Data

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RW-2D	IN	Alkalinity	1000.00	NA	NA	NA	1000.00	NA		1.000	MG/L
RW-2D	IN	Benzene	NA	190.00	32.00	10.00	77.33	6.10	10.0	1.000	UG/L
RW-2D	IN	Bicarbonate	1000.00	NA	NA	NA	1000.00	NA		1.000	MG/L
RW-2D	IN	Calcium	76.00	NA	NA	NA	76.00	NA		0.200	MG/L
RW-2D	IN	Carbonate	BDL	NA	NA	NA	BDL	NA		1.000	MG/L
RW-2D	IN	Chloride	250.00	NA	NA	NA	250.00	NA		2.500	MG/L
RW-2D	IN	Ethyl Benzene	NA	64.00	BDL	4.10	34.05	BDL	750.0	1.000	UG/L
RW-2D	IN	Iron	0.08	NA	NA	NA	0.08	NA		0.025	MG/L
RW-2D	IN	Magnesium	15.00	NA	NA	NA	15.00	NA		0.200	MG/L
RW-2D	IN	Manganese	0.06	NA	NA	NA	0.06	NA		0.010	MG/L
RW-2D	IN	Methane	BDL	NA	NA	NA	BDL	NA		8.000	UG/L
RW-2D	IN	Naphthalene	NA	33.00	4.60	4.60	14.07	2.70	30.0	1.000	UG/L
RW-2D	IN	Nitrogen, Nitrate	0.07	NA	NA	NA	0.07	NA		0.050	MG/L
RW-2D	IN	Nitrogen, Nitrite	BDL	NA	NA	NA	BDL	NA		0.500	MG/L
RW-2D	IN	Oxygen	NA	NA	NA	NA	NA	NA		0.100	MG/L
RW-2D	IN	Phosphorus	0.34	NA	NA	NA	0.34	NA		0.030	MG/L
RW-2D	IN	Potassium	4.30	NA	NA	NA	4.30	NA		0.200	MG/L
RW-2D	IN	Sodium	180.00	NA	NA	NA	180.00	NA		0.200	MG/L
RW-2D	IN	Solids	900.00	NA	NA	NA	900.00	NA		10.000	MG/L
RW-2D	IN	Sulfate	130.00	NA	NA	NA	130.00	NA		0.250	MG/L
RW-2D	IN	Sulfide	BDL	NA	NA	NA	BDL	NA		1.000	MG/L
RW-2D	IN	Toluene	NA	110.00	3.60	7.10	40.23	BDL	750.0	1.000	UG/L
RW-2D	IN	Total Organic Carbon	23.00	NA	NA	NA	23.00	NA		1.000	MG/L
RW-2D	IN	Total Xylenes	NA	260.00	80.00	24.00	121.33	55.00	620.0	1.000	UG/L

[a] Method Limit Specific to 1997 Results
BDL = Below Method Detection Limit
DWN = Down Gradient Well
IN = Well Within NAPL Zone
NA = Not Analyzed
NS = Well Not Included in Long-Term Sampling Events
UP = Upgradient Well
WQCC = Water Quality Control Commission

Phillips Petroleum Company, South Four Lakes Unit
Analytical Data

Well ID	Group	Parameter	1996 Results January	1996 Results April	1996 Results July	1996 Results October	1996 Average	1997 Results December	WQCC Standard	Method Limit[a]	Units
RW-2S	IN	Alkalinity	500.00	NA	NA	NA		NS	1.000	MG/L	
RW-2S	IN	Benzene	2800.00	NA	NA	NA		NS	1.000	UG/L	
RW-2S	IN	Bicarbonate	500.00	NA	NA	NA		NS	1.000	MG/L	
RW-2S	IN	Calcium	65.00	NA	NA	NA		NS	0.200	MG/L	
RW-2S	IN	Carbonate	BDL	NA	NA	NA		NS	1.000	MG/L	
RW-2S	IN	Chloride	410.00	NA	NA	NA		NS	2.500	MG/L	
RW-2S	IN	Ethyl Benzene	630.00	NA	NA	NA		NS	1.000	UG/L	
RW-2S	IN	Iron	0.08	NA	NA	NA		NS	0.025	MG/L	
RW-2S	IN	Magnesium	17.00	NA	NA	NA		NS	0.200	MG/L	
RW-2S	IN	Manganese	0.03	NA	NA	NA		NS	0.010	MG/L	
RW-2S	IN	Methane	22.00	NA	NA	NA		NS	8.000	UG/L	
RW-2S	IN	Naphthalene	NA	NA	NA	NA		NS	1.000	UG/L	
RW-2S	IN	Nitrogen, Nitrate	BDL	NA	NA	NA		NS	0.050	MG/L	
RW-2S	IN	Nitrogen, Nitrite	BDL	NA	NA	NA		NS	0.500	MG/L	
RW-2S	IN	Oxygen	0.79	NA	NA	NA		NS	0.100	MG/L	
RW-2S	IN	Phosphorus	0.14	NA	NA	NA		NS	0.030	MG/L	
RW-2S	IN	Potassium	5.10	NA	NA	NA		NS	0.200	MG/L	
RW-2S	IN	Sodium	250.00	NA	NA	NA		NS	0.200	MG/L	
RW-2S	IN	Solids	990.00	NA	NA	NA		NS	10.000	MG/L	
RW-2S	IN	Sulfate	92.00	NA	NA	NA		NS	0.250	MG/L	
RW-2S	IN	Sulfide	BDL	NA	NA	NA		NS	1.000	MG/L	
RW-2S	IN	Toluene	4300.00	NA	NA	NA		NS	1.000	UG/L	
RW-2S	IN	Total Organic Carbon	32.00	NA	NA	NA		NS	1.000	MG/L	
RW-2S	IN	Total Xylenes	4000.00	NA	NA	NA		NS	1.000	UG/L	

[a] Method Limit Specific to 1997 Results
BDL = Below Method Detection Limit
DWN = Down Gradient Well
IN = Well Within NAPL Zone
NA = Not Analyzed
UP = Upgradient Well
WQCC = Water Quality Control Commission

APPENDIX C

Original Laboratory Data Sheets

CASE NARRATIVE
SHIPPING & RECEIVING

The following samples were intact at the time of receipt. The samples were logged in and distributed to the appropriate groups for the requested testing.

ID	CLIENT ID	DATE RECE
A427474	MW-5	3-Dec-97
A427475	MW-10	3-Dec-97
A427476	MW-9	3-Dec-97
A427477	MW-16	3-Dec-97
A427478	MW-14	3-Dec-97
A427560	MW-7	4-Dec-97
A427561	RW-1D	4-Dec-97
A427562	MW-15	4-Dec-97
A427565	MW-13	4-Dec-97
A427566	MW-6	4-Dec-97
A427815	RW-2D	5-Dec-97
A427817	RW-1S	5-Dec-97
A427818	TB-1	5-Dec-97
A427819	MW-12	5-Dec-97
A427821	MW-1	5-Dec-97
A427822	ILMW-1	5-Dec-97

Teresa A. Miller
Document Control Officer

TO ENSURE PROPER HANDLING OF S. .LES PLEASE COMPLETE THIS ENTIRE FORM

HERITAGE ENVIRONMENTAL SERVICES

COMMERCIAL LABORATORY OPERATIONS

I-66005

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

Co. Name: CH2M HILL

Project Name: South 4 LAKES

Quote No.: de Albuquerque PO No.:

ENVIRONMENTAL PROGRAM:

CWA NPDES _____ IWP _____ SLUDGE _____

RCRA MW _____ SW _____ DISPOSAL _____

SDWA _____ CERCLA/SUPERFUND _____ OTHER X

Sampled by:

Report To:

Co:

Add:

Attn:

Phone:

Accelerated Turnaround Requested _____
(Subject to Additional Charge)

Result Request by: ___/___/___ Mo Day Yr
(Date must be Accepted and Approved by Lab)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BTEX, Naphthalene, Monomethylnaphthalene	Methane	Fe, Ca, Mg, Mn, K, Na	Total Phosphorus	Sulfide	TOC	NO_3, NO_2, DS, Cl, SO_4, Alkalinity	Remarks:	LAB Sample No.
MW-5	12-2-97	0930 AM/PM		X	MW-5	GW	11	3	3	1	1	1	1	1	Please DISCARD HG (Mercury) SAMPES	A42747
MW-10	"	1015 AM/PM		X	MW-10	"	11	3	3	1	1	1	1	1	"	475
MW-9	"	1040 AM/PM		X	MW-9	"	11	3	3	1	1	1	1	1	"	476
MW-16	"	1300 AM/PM		X	MW-16	"	11	3	3	1	1	1	1	1	"	477
MW-14	12-2-97	1400 AM/PM		X	MW-14	GW	11	3	3	1	1	1	1	1	"	478
		AM/PM														
		AM/PM														
		AM/PM														
		AM/PM														
		AM/PM													Shipment Includes 5 Boxes	
		AM/PM														
		AM/PM														
		AM/PM														

Analyses Requested
(Note special detection limits or methods)

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
John Gallup	12-2-97 / 1700			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/	Angie Clemons	12/3/97 10:45		

Properly Preserved _____

Broken Bottles _____

Distribution: White original and Yellow copy to accompany sample to laboratory.
Pink copy to be retained by client.

Rev. 6/95

[redacted] ENSURE PROPER HANDLING OF S[redacted]ES PLEASE COMPLETE THIS ENTIRE FORM

HERITAGE ENVIRONMENTAL SERVICES
COMMERCIAL LABORATORY OPERATIONS

I-66006

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

Co. Name: CH2M Hill
Project Name: South 4 Lakes
Quote No.: deAlbuquerque | PO No.:
ENVIRONMENTAL PROGRAM:
CWA NPDES ____ IWP ____ SLUDGE ____
RCRA MW ____ SW ____ DISPOSAL ____
SDWA ____ CERCLA/SUPERFUND ____ OTHER X
Sampled by:

Report To:
Co:
Add:
Attn:
Phone:
Accelerated Turnaround Requested ____ (Subject to Additional Charge)
Result Request by: ____/____/____ Mo Day Yr
(Date must be Accepted and Approved by Lab)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BTEX, Naphthalene, Methyl Naph, Methane	Fe, Ca, Mg, Mn, K, Na	Total Phosphorous	Sulfide	TOC	NO3, NO2, DS, Cl, SO4, Alkalinity	Remarks:	LAB Sample No.
MW-7	12-3-97	0745 AM/PM		X	MW-7	GW	11	3	3	1	1	1	1		A42756
RW-1D	12-3-97	0840 AM/PM		X	RW-1D	GW	3	3							561
MW-15	12-3-97	0930 AM/PM		X	MW-15	GW	11	3	3	1	1	1	1		562
MW-13	12-3-97	1015 AM/PM		X	MW-13	GW	11	3	3	1	1	1	1		563
MW-6	12-3-97	1350 AM/PM		X	MW-6	GW	8		3	1	1	1	1	Please Filter metals in Lab; Analytes aqueous phase	564
		AM/PM													
		AM/PM													
		AM/PM													
		AM/PM												4 boxes	
		AM/PM													
		AM/PM													
		AM/PM													

Analyses Requested (Note special detection limits or methods)

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
John Sallen	12-3-97/1700			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/	DC Edwards	12/4/97/11:30	MW-6 broken TOC MW-7 broken TOC	Properly Preserved ____ Broken Bottles ____

Distribution: White original and Yellow copy to accompany sample to laboratory.
Pink copy to be retained by client.

Rev. 6/95

[redacted] ENSURE PROPER HANDLING OF SAMPLES PLEASE COMPLETE THIS ENTIRE FORM

HERITAGE ENVIRONMENTAL SERVICES
COMMERCIAL LABORATORY OPERATIONS

I-66007

7901 West Morris Street
Indianapolis, Indiana 46231 (317) 243-0811 Fax (317) 486-5095

Co. Name: CH2M Hill

Project Name: South 4 Lakes

Quote No.: PO No.:

ENVIRONMENTAL PROGRAM:

CWA NPDES _____ IWP _____ SLUDGE _____

RCRA MW _____ SW _____ DISPOSAL _____

SDWA _____ CERCLA/SUPERFUND _____ OTHER X

Sampled by:

Report To:
Co:
Add:
Attn:
Phone:

Accelerated Turnaround Requested _____
(Subject to Additional Charge)

Result Request by: ___/___/___ (Mo / Day / Yr)
(Date must be Accepted and Approved by Lab)

Analyses Requested (Note special detection limits or methods)

Client ID:	Date:	Time:	Comp	Grab	Sample Description	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Other	No. of Containers	BTEX, Naphthalene, Nitrobenzene, Naphthalene	Methane	Fe, Ca, Mg, Mn, K, Na	Total Phosphorus	Sulfide	TOC	NO3, NO2, PO4, Cl, SO4, Alkalinity				Remarks:	LAB Sample No.
RW-2D	12-4-97	0730 AM/PM		X	RW-2D	GW	3	3											A427815
MW-12	"	0800 AM/PM		X	MW-12	GW	8		3	1	1	1	1	1	A427819			Please filter metals in Lab. Analyze aqueous phase	
RW-1S	"	0900 AM/PM		X	RW-1S	GW	3	3											A427817
MW-1	"	1000 AM/PM		X	MW-1	GW	8		3	1	1	1	1	1	A427821			Please filter metals in lab. Analyze aqueous phase	
ILMW-1	12-4-97	1145 AM/PM		X	ILMW-1	GW	11	3	3	1	1	1	1	1					A427822
TB-1	12-4-97	1200 AM/PM		X	Trip Blank	GW	3	3											A427818
		AM/PM																	
		AM/PM																	
		AM/PM																	
		AM/PM																3 Boxes	
		AM/PM																	
		AM/PM																	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Jake Dalley	12-4-97/1400			/	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/			/	
Relinquished by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time	Remarks	
	/	Thomas Broderick	12-5-97 11:40		

Properly Preserved _____

Broken Bottles _____

Distribution: White original and Yellow copy to accompany sample to laboratory.
Pink copy to be retained by client.

Rev. 6/95

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	03-DEC-97	3892	A427474
	Complete 11-DEC-97	PO Number VERBAL*	
	Printed 11-DEC-97	Sampled 02-DEC-97 09:30	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-5
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 04-DEC-97 16:59 Instrument: GC/PID ELCD Test: G460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	BDL	1	ug/L
O-XYLENE	BDL	1	ug/L
NAPHTHALENE	BDL	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	104.0		% Rec
CHLOROFLUOROBENZENE	101.5		% Rec

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	260	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	260	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 03-DEC-97 15:47 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	88	0.5	mg/L

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 18:04 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	37	0.5	mg/L

1:2 dilution

DISSOLVED SOLIDS EPA 160.1
Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	450	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL | Analysis Date: 04-DEC-97 12:56 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	BDL	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ | Analysis Date: 04-DEC-97 09:41 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	BDL	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 17:47 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	0.96	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 18:04 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	0.1	mg/L

Unable to analyze sample at lower dilution due to high concentration of non-target compounds.
1:2 dilution

FIELD FILTRATION SAS
Analyst: . | Analysis Date: | Instrument: FIELD | Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: P. MASTERS | Analysis Date: 04-DEC-97 14:00 | Instrument: PREP | Test: P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 03:59 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	87.	0.20	mg/L

IRON ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 03:59 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	0.028	0.025	mg/L

MAGNESIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 03:59 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	13.	0.20	mg/L

MANGANESE ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 03:59 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	BDL	0.010	mg/L

POTASSIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 03:59 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	1.3	0.20	mg/L

SODIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 03:59 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	45.	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66005.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

Sample Comments

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : G A Bruch

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	03-DEC-97	3892	A427475
	Complete 11-DEC-97	PO Number VERBAL*	
	Printed 11-DEC-97	Sampled 02-DEC-97 10:15	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-10
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 04-DEC-97 17:56 Instrument: GC/PID ELCD Test: 0460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	BDL	1	ug/L
O-XYLENE	BDL	1	ug/L
NAPHTHALENE	BDL	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	101.5		% Rec
CHLOROFLUOROBENZENE	99.0		% Rec

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	240	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	240	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 03-DEC-97 19:15 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	150	2.5	mg/L

1:10 dilution

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 19:15 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	140	2.5	mg/L

1:10 dilution

DISSOLVED SOLIDS EPA 160.1
Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	720	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL | Analysis Date: 04-DEC-97 13:17 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	BDL	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ | Analysis Date: 04-DEC-97 09:41 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	BDL	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 15:47 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	0.5	mg/L

1:10 dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

FIELD FILTRATION SAS
Analyst: , | Analysis Date: | Instrument: FIELD | Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: P. MASTERS | Analysis Date: 04-DEC-97 14:00 | Instrument: PREP | Test: P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:02 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	84.	0.20	mg/L

IRON ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:02 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	BDL	0.025	mg/L

MAGNESIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:02 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	11.	0.20	mg/L

MANGANESE ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:02 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	BDL	0.010	mg/L

POTASSIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:02 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	2.3	0.20	mg/L

SODIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:02 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	130	0.20	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS Analysis Date: 03-DEC-97 18:57 Instrument: IC Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	2	0.05	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66005.

Sample Comments

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : _____

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	03-DEC-97	3892	A427476
	Complete	PO Number	
	11-DEC-97	VERBAL*	
	Printed	Sampled	
	11-DEC-97	02-DEC-97 10:40	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-9
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 04-DEC-97 18:52 Instrument: GC/PID ELCD Test: D460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	BDL	1	ug/L
O-XYLENE	BDL	1	ug/L
NAPHTHALENE	BDL	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	104.5		% Rec
CHLOROFLUOROBENZENE	102.5		% Rec

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	200	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	200	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 03-DEC-97 19:50 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	200	1.3	mg/L

1:5 dilution

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 03-DEC-97 19:50 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	54	1.3	mg/L

1:5 dilution

DISSOLVED SOLIDS EPA 160.1

Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	630	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS

Analyst: B. BELL | Analysis Date: 04-DEC-97 13:46 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	BDL	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1

Analyst: K. STALOWICZ | Analysis Date: 04-DEC-97 09:41 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	BDL	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1

Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1

Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 03-DEC-97 19:32 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	0.61	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 03-DEC-97 19:50 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	0.25	mg/L

1:5 dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

FIELD FILTRATION SAS

Analyst: . | Analysis Date: | Instrument: FIELD | Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Analyst: P. MASTERS | Analysis Date: 04-DEC-97 14:00 | Instrument: PREP | Test: P132.2.0

Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:05 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	100	0.20	mg/L

IRON ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:05 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	BDL	0.025	mg/L

MAGNESIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:05 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	11.	0.20	mg/L

MANGANESE ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:05 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	BDL	0.010	mg/L

POTASSIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:05 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	1.7	0.20	mg/L

SODIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:05 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	73.	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66005.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

Sample Comments

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : G A Busch

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	03-DEC-97	3892	A427477
	Complete 11-DEC-97	PO Number VERBAL*	
	Printed 11-DEC-97	Sampled 02-DEC-97 13:00	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-16
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 04-DEC-97 09:49 Instrument: GC/PID ELCD Test: 0460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	BDL	1	ug/L
O-XYLENE	BDL	1	ug/L
NAPHTHALENE	BDL	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	103.5		% Rec
CHLOROFLUOROBENZENE	101.5		% Rec

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	380	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	380	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 03-DEC-97 21:18 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	190	2.5	mg/L

1:10 dilution

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 21:18 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	66	2.5	mg/L

1:10 dilution

DISSOLVED SOLIDS EPA 160.1
Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	850	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL | Analysis Date: 04-DEC-97 14:14 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	BDL	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ | Analysis Date: 04-DEC-97 09:41 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	BDL	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 20:08 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	0.66	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 21:18 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	0.5	mg/L

Unable to analyze sample at lower dilution due to high concentration of non-target compounds.
1:10 dilution

FIELD FILTRATION SAS
Analyst: . | Analysis Date: | Instrument: FIELD | Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: P. MASTERS | Analysis Date: 04-DEC-97 14:00 | Instrument: PREP | Test: P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:09 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	90.	0.20	mg/L

IRON ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:09 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	BDL	0.025	mg/L

MAGNESIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:09 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	14.	0.20	mg/L

MANGANESE ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:09 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	BDL	0.010	mg/L

POTASSIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:09 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	0.88	0.20	mg/L

SODIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:09 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	170	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66005.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

Sample Comments

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : JA Busch

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	03-DEC-97	3892	A427478
	Complete 12-DEC-97	PO Number VERBAL*	
	Printed 12-DEC-97	Sampled 02-DEC-97 14:00	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-14
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING | Analysis Date: 04-DEC-97 20:46 | Instrument: GC/PID ELCD | Test: D460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	BDL	1	ug/L
O-XYLENE	BDL	1	ug/L
NAPHTHALENE	BDL	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	105.0		% Rec
CHLOROFLUOROBENZENE	101.0		% Rec

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE | Analysis Date: 09-DEC-97 22:00 | Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	740	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE | Analysis Date: 09-DEC-97 22:00 | Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE | Analysis Date: 09-DEC-97 22:00 | Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	740	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 03-DEC-97 22:29 | Instrument: IC | Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	170	2.5	mg/L

1:10 dilution

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 22:29 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	130	2.5	mg/L

1:10 dilution

DISSOLVED SOLIDS EPA 160.1
Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	900	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL | Analysis Date: 04-DEC-97 14:29 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	BDL	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ | Analysis Date: 04-DEC-97 09:41 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	BDL	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 22:11 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	0.79	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 03-DEC-97 22:29 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	0.50	mg/L

1:10 dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

FIELD FILTRATION SAS
Analyst: . | Analysis Date: | Instrument: FIELD | Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: P. MASTERS | Analysis Date: 04-DEC-97 14:00 | Instrument: PREP | Test: P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:12 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	91.	0.20	mg/L

IRON ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:12 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	BDL	0.025	mg/L

MAGNESIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:12 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	18.	0.20	mg/L

MANGANESE ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:12 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	BDL	0.010	mg/L

POTASSIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:12 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	0.88	0.20	mg/L

SODIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 05-DEC-97 04:12 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	160	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66005.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

Sample Comments

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	04-DEC-97	3892	A427560
	Complete 15-DEC-97	PO Number VERBAL*	
	Printed 15-DEC-97	Sampled 03-DEC-97 07:45	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-7
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 08-DEC-97 14:27 Instrument: GC/PID ELCD Test: O460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	2.3	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	BDL	1	ug/L
O-XYLENE	BDL	1	ug/L
NAPHTHALENE	1.8	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	103.0		% Rec
CHLOROFLUOROBENZENE	99.0		% Rec

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	280	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	280	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 04-DEC-97 18:46 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	140	1.3	mg/L

1:5 dilution

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 04-DEC-97 18:46 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	69	1.3	mg/L

1:5 dilution

DISSOLVED SOLIDS EPA 160.1
Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	620	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL | Analysis Date: 04-DEC-97 16:02 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	290	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ | Analysis Date: 08-DEC-97 08:10 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	BDL	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 04-DEC-97 18:28 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	BDL	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 04-DEC-97 18:46 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	0.25	mg/L

1:5 dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

FIELD FILTRATION SAS
Analyst: . | Analysis Date: | Instrument: FIELD | Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: R. DALAL | Analysis Date: 11-DEC-97 12:00 | Instrument: PREP | Test: P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 04:56 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	68.	0.20	mg/L

IRON ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 04:56 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	0.34	0.025	mg/L

MAGNESIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 04:56 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	11.	0.20	mg/L

MANGANESE ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 04:56 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	0.078	0.010	mg/L

POTASSIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 04:56 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	28.	0.20	mg/L

SODIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 04:56 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	98.	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66006.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

Sample Comments

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : P.Y Spencer

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	04-DEC-97	3892	A427561
	Complete 10-DEC-97	PO Number VERBAL*	
	Printed 10-DEC-97	Sampled 03-DEC-97 08:40	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: RW-1D
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 08-DEC-97 20:09 Instrument: GC/PID ELCD Test: O460 2.0

Parameter	Result	Det. Limit	Units
BENZENE	2000	50	ug/L
TOLUENE	BDL	50	ug/L
ETHYL BENZENE	220	50	ug/L
M/P-XYLENE	BDL	50	ug/L
O-XYLENE	110	50	ug/L
NAPHTHALENE	61	50	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	98.4		% Rec
CHLOROFLUOROBENZENE	95.0		% Rec

1:50 Dilution necessary due to high concentration of target compounds.

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66006.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : JA Busch

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	04-DEC-97	3892	A427562
	Complete	PO Number	
	15-DEC-97	VERBAL*	
	Printed	Sampled	
	15-DEC-97	03-DEC-97 09:30	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-15
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 08-DEC-97 21:06 Instrument: GC/PID ELCD Test: 0460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	91	25	ug/L
TOLUENE	1100	25	ug/L
ETHYL BENZENE	860	25	ug/L
M/P-XYLENE	1400	25	ug/L
O-XYLENE	860	25	ug/L
NAPHTHALENE	160	25	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	101.6		% Rec
CHLOROFLUOROBENZENE	100.4		% Rec

1:25 Dilution necessary due to high concentration of target compounds.

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	680	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	680	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 19:38 | Instrument: IC | Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	4.8	0.25	mg/L

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 19:56 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	490	6.3	mg/L

1:25 dilution

DISSOLVED SOLIDS EPA 160.1

Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	1400	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS

Analyst: B. BELL | Analysis Date: 04-DEC-97 16:17 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	8.7	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1

Analyst: K. STALOWICZ | Analysis Date: 08-DEC-97 08:10 | Instrument: TOC | Test: G401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	BDL	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1

Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1

Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 19:38 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	BDL	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 19:56 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	1.3	mg/L

1:25 dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

FIELD FILTRATION SAS

Analyst: . Analysis Date: Instrument: FIELD Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Analyst: R. DALAL Analysis Date: 11-DEC-97 12:00 Instrument: PREP Test: P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:18 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	170	0.20	mg/L

IRON ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:18 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	3.3	0.025	mg/L

MAGNESIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:18 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	66.	0.20	mg/L

MANGANESE ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:18 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	0.87	0.010	mg/L

POTASSIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:18 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	3.5	0.20	mg/L

SODIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:18 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	240	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample Comments

Sample chain of custody number 66006.

This Certificate shall not be reproduced, except in full, without the written approval of the lab.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	04-DEC-97	3892	A427565
	Complete 15-DEC-97	PO Number VERBAL*	
	Printed 15-DEC-97	Sampled 03-DEC-97 10:15	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-13
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 08-DEC-97 22:03 Instrument: GC/PID ELCD Test: 0460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	920	50	ug/L
TOLUENE	140	50	ug/L
ETHYL BENZENE	160	50	ug/L
M/P-XYLENE	360	50	ug/L
O-XYLENE	210	50	ug/L
NAPHTHALENE	BDL	50	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	102.6		% Rec
CHLOROFLUOROBENZENE	97.5		% Rec

1:50 Dilution necessary due to high concentration of target compounds.

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	580	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	580	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 20:14 | Instrument: IC | Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	11	0.25	mg/L

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 20:46 | Instrument: IC | Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	560	13	mg/L

1:50 dilution

DISSOLVED SOLIDS EPA 160.1

Analyst: J. ZAVELA | Analysis Date: 05-DEC-97 12:15 | Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	1500	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS

Analyst: B. BELL | Analysis Date: 04-DEC-97 16:58 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	74	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1

Analyst: K. STALOWICZ | Analysis Date: 08-DEC-97 08:10 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	14	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1

Analyst: M. BOROS | Analysis Date: 04-DEC-97 23:45 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1

Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 20:14 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	BDL	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS | Analysis Date: 04-DEC-97 20:46 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	2.5	mg/L

1:50 dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

FIELD FILTRATION SAS

Analyst: . Analysis Date: Instrument: FIELD Test: P110.0.0

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Analyst: R. DALAL Analysis Date: 11-DEC-97 12:00 Instrument: PREP Test: P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:23 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
CALCIUM	190	0.20	mg/L

IRON ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:23 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
IRON	4.3	0.025	mg/L

MAGNESIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:23 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	66.	0.20	mg/L

MANGANESE ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:23 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
MANGANESE	2.2	0.010	mg/L

POTASSIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:23 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
POTASSIUM	1.2	0.20	mg/L

SODIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:23 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: FIELD FILTRATION SAS P110.0.0

Parameter	Result	Det. Limit	Units
SODIUM	240	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample Comments

Sample chain of custody number 66006.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : P.K Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	04-DEC-97	3892	A427566
	Complete 15-DEC-97	PO Number VERBAL*	
	Printed 15-DEC-97	Sampled 03-DEC-97 13:50	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-6
LOCATION: SOUTH 4 LAKES

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	2400	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	2400	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 04-DEC-97 21:04 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	21	0.25	mg/L

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 04-DEC-97 22:29 Instrument: IC Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	720	13	mg/L
1:50 dilution			

DISSOLVED SOLIDS EPA 160.1

Analyst: J. ZAVELA Analysis Date: 05-DEC-97 12:15 Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	1700	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL Analysis Date: 04-DEC-97 17:12 Instrument: GC/FID Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	400	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ Analysis Date: 08-DEC-97 08:10 Instrument: TOC Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	17	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS Analysis Date: 04-DEC-97 23:45 Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE Analysis Date: 09-DEC-97 10:14 Instrument: AUTO-ANALYZER Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	0.31	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS Analysis Date: 04-DEC-97 21:04 Instrument: IC Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	BDL	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS Analysis Date: 04-DEC-97 22:29 Instrument: IC Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	2.5	mg/L

1:50 dilution
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A
Analyst: P. MASTERS Analysis Date: 04-DEC-97 20:00 Instrument: PREP Test: P110.5.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	200		mL
FINAL VOLUME	200		mL

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: R. DALAL Analysis Date: 11-DEC-97 12:00 Instrument: PREP Test: P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:27 Instrument: ICP Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
CALCIUM	150	0.20	mg/L

IRON ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:27 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
IRON	BDL	0.025	mg/L

MAGNESIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:27 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	39.	0.20	mg/L

MANGANESE ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:27 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
MANGANESE	0.79	0.010	mg/L

POTASSIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:27 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
POTASSIUM	2.0	0.20	mg/L

SODIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:27 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
SODIUM	400	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66006.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : PF Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	05-DEC-97	3892	A427815
	Complete	PO Number	
	10-DEC-97	VERBAL*	
	Printed	Sampled	
	10-DEC-97	04-DEC-97 07:30	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: RW-2D
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 08-DEC-97 15:24 Instrument: GC/PID ELCD Test: O460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	6.1	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	16	1	ug/L
O-XYLENE	39	1	ug/L
NAPHTHALENE	2.7	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	102.0		% Rec
CHLOROFLUOROBENZENE	104.0		% Rec

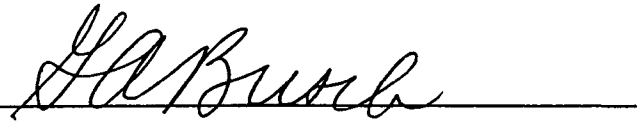
Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66007.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : 

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	05-DEC-97	3892	A427817
	Complete 10-DEC-97	PO Number VERBAL*	
	Printed 10-DEC-97	Sampled 04-DEC-97 09:00	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: RW-1S
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 08-DEC-97 17:18 Instrument: GC/PID ELCD Test: 0460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	8300	250	ug/L
TOLUENE	3000	250	ug/L
ETHYL BENZENE	1100	250	ug/L
M/P-XYLENE	3800	250	ug/L
O-XYLENE	1900	250	ug/L
NAPHTHALENE	410	250	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	101.6		% Rec
CHLOROFLUOROBENZENE	98.4		% Rec

1:250 Dilution necessary due to high concentration of target compounds.

Sample Comments

Sample chain of custody number 66007.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : _____

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	05-DEC-97	3892	A427818
	Complete	PO Number	
	10-DEC-97	VERBAL*	
	Printed	Sampled	
	10-DEC-97	04-DEC-97 12:00	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: TB-1
LOCATION: SOUTH 4 LAKES

PURGEABLE AROMATICS BY GC/PID SW846-8020A

Analyst: S. STRUEWING Analysis Date: 08-DEC-97 13:31 Instrument: GC/PID ELCD Test: D460.2.0

Parameter	Result	Det. Limit	Units
BENZENE	BDL	1	ug/L
TOLUENE	BDL	1	ug/L
ETHYL BENZENE	BDL	1	ug/L
M/P-XYLENE	BDL	1	ug/L
O-XYLENE	BDL	1	ug/L
NAPHTHALENE	BDL	1	ug/L
...			
SURROGATE RECOVERY			

FLUOROBENZENE	98.5		% Rec
CHLOROFLUOROBENZENE	94.5		% Rec

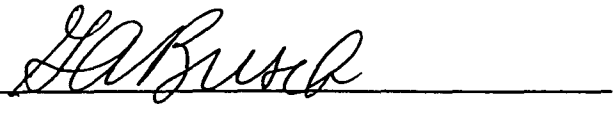
Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66007.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : 

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	05-DEC-97	3892	A427819
	Complete 15-DEC-97	PO Number VERBAL*	
	Printed 16-DEC-97	Sampled 04-DEC-97 08:00	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-12
LOCATION: SOUTH 4 LAKES

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	5800	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	5800	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 05-DEC-97 18:39 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	4.3	0.25	mg/L

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 05-DEC-97 19:11 Instrument: IC Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	810	13	mg/L

1:50 DILUTION

DISSOLVED SOLIDS EPA 160.1

Analyst: J. ZAVELA Analysis Date: 10-DEC-97 14:55 Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	1400	10	mg/L

Filtered less sample due to sample matrix.

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL | Analysis Date: 05-DEC-97 16:47 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	2500	40	ug/L

1:5 DILUTION

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ | Analysis Date: 08-DEC-97 08:10 | Instrument: TOC | Test: O4D1.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	9.3	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS | Analysis Date: 09-DEC-97 23:00 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	BDL	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	0.92	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 05-DEC-97 18:39 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	BDL	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 05-DEC-97 19:11 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	2.5	mg/L

1:50 DILUTION
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A
Analyst: P. MASTERS | Analysis Date: 05-DEC-97 16:00 | Instrument: PREP | Test: P110.5.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	500		mL
FINAL VOLUME	500		mL

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: R. DALAL | Analysis Date: 11-DEC-97 12:00 | Instrument: PREP | Test: P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER | Analysis Date: 12-DEC-97 05:32 | Instrument: ICP | Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
CALCIUM	110	0.20	mg/L

IRON ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:32 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
IRON	0.27	0.025	mg/L

MAGNESIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:32 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	24.	0.20	mg/L

MANGANESE ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:32 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
MANGANESE	0.62	0.010	mg/L

POTASSIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:32 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
POTASSIUM	14.	0.20	mg/L

SODIUM ICP EPA 200.7
Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 23:51 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
SODIUM	500	20.	mg/L

DILUTION 1:100

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66007.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : P.K. Spence

CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, INC. COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	05-DEC-97	3892	A427821
	Complete 15-DEC-97	PO Number VERBAL*	
	Printed 16-DEC-97	Sampled 04-DEC-97 10:00	

Report To	Bill To
JAKE GALLEGOS CH2M HILL 100 INVERNESS TERRACE EAST ENGLEWOOD, CO 80112-5304	STEVE DE ALBUQUERQUE PHILLIPS PETROLEUM; HOUSTON 6330 WEST LOOP SOUTH BELLAIRE, TX 77401

Sample Description

CLIENT ID: MW-1
LOCATION: SOUTH 4 LAKES

ALKALINITY TOTAL EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G605.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	260	1.0	mg/L

ALKALINITY (CARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G611.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	BDL	1.0	mg/L

ALKALINITY (BICARBONATE) EPA 310.1

Analyst: R. PIERCE Analysis Date: 09-DEC-97 22:00 Test: G610.2.0

Parameter	Result	Det. Limit	Units
ALKALINITY	260	1.0	mg/L

SULFATE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 05-DEC-97 20:37 Instrument: IC Test: G300.7.0

Parameter	Result	Det. Limit	Units
SULFATE	120	1.3	mg/L
1:5 DILUTION			

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0

Analyst: M. ADKINS Analysis Date: 05-DEC-97 20:37 Instrument: IC Test: G300.2.0

Parameter	Result	Det. Limit	Units
CHLORIDE	100	1.3	mg/L
1:5 DILUTION			

DISSOLVED SOLIDS EPA 160.1

Analyst: J. ZAVELA Analysis Date: 10-DEC-97 14:55 Test: G402.7.0

Parameter	Result	Det. Limit	Units
DISSOLVED SOLIDS	650	10	mg/L

SPECIAL SERVICES FOR GC/FID/PID/ELCD SAS
Analyst: B. BELL | Analysis Date: 05-DEC-97 15:44 | Instrument: GC/FID | Test: X106.0.0

Parameter	Result	Det. Limit	Units
METHANE	170	8.0	ug/L

TOTAL ORGANIC CARBON EPA 415.1
Analyst: K. STALOWICZ | Analysis Date: 08-DEC-97 08:10 | Instrument: TOC | Test: O401.1.0

Parameter	Result	Det. Limit	Units
TOTAL ORGANIC CARBON (TOC)	11	1.0	mg/L

SULFIDE (TITRIMETRIC IODINE) EPA 376.1
Analyst: M. BOROS | Analysis Date: 09-DEC-97 23:00 | Test: G110.3.0

Parameter	Result	Det. Limit	Units
SULFIDE	3.4	1.0	mg/L

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1
Analyst: C. PEREGRINE | Analysis Date: 09-DEC-97 10:14 | Instrument: AUTO-ANALYZER | Test: G207.2.0

Parameter	Result	Det. Limit	Units
PHOSPHORUS	BDL	0.03	mg/L

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 05-DEC-97 20:04 | Instrument: IC | Test: G300.5.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRATE	0.67	0.05	mg/L

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0
Analyst: M. ADKINS | Analysis Date: 05-DEC-97 20:37 | Instrument: IC | Test: G300.3.0

Parameter	Result	Det. Limit	Units
NITROGEN, NITRITE	BDL	0.25	mg/L

1:5 DILUTION
Unable to analyze sample at lower dilution due to high concentration of non-target compounds.

0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A
Analyst: P. MASTERS | Analysis Date: 05-DEC-97 16:00 | Instrument: PREP | Test: P110.5.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	500		mL
FINAL VOLUME	500		mL

FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0
Analyst: R. DALAL | Analysis Date: 11-DEC-97 12:00 | Instrument: PREP | Test: P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

CALCIUM ICP EPA 200.7
Analyst: A. STOCKBURGER | Analysis Date: 12-DEC-97 05:36 | Instrument: ICP | Test: M409.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
CALCIUM	110	0.20	mg/L

IRON ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:36 Instrument: ICP Test: M415.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
IRON	0.097	0.025	mg/L

prep blank was 0.027 mg/l

LEAD TRACE ICP EPA 200.7

Analyst: A. ROBERTSON Analysis Date: 12-DEC-97 13:07 Instrument: TRACE ICP Test: M416.0.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
LEAD	BDL	0.0050	mg/L

MAGNESIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:36 Instrument: ICP Test: M418.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
MAGNESIUM	14.	0.20	mg/L

MANGANESE ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:36 Instrument: ICP Test: M419.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
MANGANESE	0.49	0.010	mg/L

POTASSIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:36 Instrument: ICP Test: M426.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
POTASSIUM	1.3	0.20	mg/L

SODIUM ICP EPA 200.7

Analyst: A. STOCKBURGER Analysis Date: 12-DEC-97 05:36 Instrument: ICP Test: M431.3.0
Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0 P132.2.0
Prep: 0.45 MICRON PORE DIAMETER MEMBRANE FILTRATION SM 302A P110.5.0

Parameter	Result	Det. Limit	Units
SODIUM	94.	0.20	mg/L

Sample Comments

BDL Below Detection Limit

Sample chain of custody number 66007.

Additional copies of this report sent to:
STEVE DE ALBUQUERQUE, PHILLIPS PETROLEUM COMPANY
6330 WEST LOOP SOUTH, BELLAIRE, TX 77401

Sample Comments

JAKE GALLEGOS, THE BEST WESTERN - EL RANCHO
2205 N MAIN STREET (SHIPPING ADDRESS), ROSWELL, NM 88201

Approved : P.K Spence

QUALITY ASSURANCE REPORT

Service Location
HERITAGE ENVIRONMENTAL SERVICES, INC.
COMMERCIAL LABORATORY OPERATIONS
7901 W. MORRIS ST.
INDIANAPOLIS, IN 46231
(317)243-8304

Report Date
17-DEC-97

Submitter
PHILLIPS PETROLEUM; HOUSTON
STEVE DE ALBUQUERQUE
6330 WEST LOOP SOUTH
BELLAIRE, TX 77401

Client ID	Lab ID	Date-Time Sampled	Date Received	Date Complete	Description
MW-5	A427474	02-DEC-97 09:30	03-DEC-97	11-DEC-97	LOCATION: SOUTH 4 LAKES
MW-10	A427475	02-DEC-97 10:15	03-DEC-97	11-DEC-97	LOCATION: SOUTH 4 LAKES
MW-9	A427476	02-DEC-97 10:40	03-DEC-97	11-DEC-97	LOCATION: SOUTH 4 LAKES
MW-16	A427477	02-DEC-97 13:00	03-DEC-97	11-DEC-97	LOCATION: SOUTH 4 LAKES
MW-14	A427478	02-DEC-97 14:00	03-DEC-97	12-DEC-97	LOCATION: SOUTH 4 LAKES
MW-7	A427560	03-DEC-97 07:45	04-DEC-97	15-DEC-97	LOCATION: SOUTH 4 LAKES
RW-1D	A427561	03-DEC-97 08:40	04-DEC-97	10-DEC-97	LOCATION: SOUTH 4 LAKES
MW-15	A427562	03-DEC-97 09:30	04-DEC-97	15-DEC-97	LOCATION: SOUTH 4 LAKES
MW-13	A427565	03-DEC-97 10:15	04-DEC-97	15-DEC-97	LOCATION: SOUTH 4 LAKES
MW-6	A427566	03-DEC-97 13:50	04-DEC-97	15-DEC-97	LOCATION: SOUTH 4 LAKES
RW-2D	A427815	04-DEC-97 07:30	05-DEC-97	10-DEC-97	LOCATION: SOUTH 4 LAKES
RW-1S	A427817	04-DEC-97 09:00	05-DEC-97	10-DEC-97	LOCATION: SOUTH 4 LAKES
TB-1	A427818	04-DEC-97 12:00	05-DEC-97	10-DEC-97	LOCATION: SOUTH 4 LAKES
MW-12	A427819	04-DEC-97 08:00	05-DEC-97	15-DEC-97	LOCATION: SOUTH 4 LAKES
MW-1	A427821	04-DEC-97 10:00	05-DEC-97	15-DEC-97	LOCATION: SOUTH 4 LAKES
ILMW-1	A427822	04-DEC-97 11:45	05-DEC-97	15-DEC-97	LOCATION: SOUTH 4 LAKES

SULFIDE (TITRIMETRIC IODINE) EPA 376.1 — G110.3

Run: R339517 Analyst.: M BOROS Run Date...: 04-DEC-97
ANALYTICAL Reviewer: K FULLMER Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q776775		SULFIDE			-.152	mg/L		
LFB01	Q776778		SULFIDE	100		87.9	mg/L	87.9	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPI01	Q776783	A427478	SULFIDE	0	50	42.6	mg/L	85.2	
DPS01	Q776784	A427478	SULFIDE	0	50	43.1	mg/L	86.2	1.2
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						

Run: R339744 Analyst.: M BOROS Run Date...: 09-DEC-97
ANALYTICAL Reviewer: B SHRAKE Review Date: 10-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q778078		SULFIDE			-.077	mg/L		
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
SPI01	Q778080	A427822	SULFIDE	0	50	41.7	mg/L	83.4	
DPS01	Q778081	A427822	SULFIDE	0	50	42.4	mg/L	84.8	1.7

PHOSPHORUS, TOTAL (AUTOMATED) EPA 365.1 — G207.2

Run: R339756 Analyst.: C PEREGRINE Run Date...: 09-DEC-97 Instrument: AUTO-ANALYZER
ANALYTICAL Reviewer: K FULLMER Review Date: 09-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q778205		PHOSPHORUS			0.003	mg/L		
CDL01	Q778206		PHOSPHORUS	0.025		0.027	mg/L	108	
ICV01	Q778207		PHOSPHORUS	1		1.05	mg/L	105	
LFB01	Q778209		PHOSPHORUS	15.9		15.1	mg/L	95	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SPI01	Q778212	A427474	PHOSPHORUS	0	1.91	1.73	mg/L	90.6	
DPS01	Q778213	A427474	PHOSPHORUS	0	1.91	1.64	mg/L	85.9	5.3
CCV	Q778214		PHOSPHORUS	0.25		0.267	mg/L	106.8	
BLA01	Q778215		PHOSPHORUS			0.002	mg/L		
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
CCV	Q778217		PHOSPHORUS	0.25		0.265	mg/L	106	
BLA01	Q778218		PHOSPHORUS			0.003	mg/L		
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
DUP01	Q778220	A427821	PHOSPHORUS	0		BDL	mg/L		
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
LFB01	Q778221		PHOSPHORUS	15.9		15.1	mg/L	95	
BLA01	Q778222		PHOSPHORUS			-.014	mg/L		

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
ICV01	Q778223		PHOSPHORUS	1		1.05	mg/L	105	
CCV	Q778224		PHOSPHORUS	0.25		0.269	mg/L	107.6	
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
CCV	Q778229		PHOSPHORUS	0.25		0.272	mg/L	108.8	
BLA01	Q778230		PHOSPHORUS			0.003	mg/L		

CHLORIDE BY ION CHROMATOGRAPHY EPA 300.0 G300.2

Run: R339492 Analyst.: M ADKINS Run Date...: 03-DEC-97 Instrument: IC
ANALYTICAL Reviewer: E WERNZ Review Date: 04-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q776639		CHLORIDE			< 0.1	mg/L		
CCVL	Q776640		CHLORIDE	1.25		1.22	mg/L	97.6	
CCVH	Q776641		CHLORIDE	12.5		11.5	mg/L	92	
LFB01	Q776642		CHLORIDE	2.5		2.44	mg/L	97.6	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SPI01	Q776643	A427474	CHLORIDE	33.7	5	38.7	mg/L	100	
DPS01	Q776644	A427474	CHLORIDE	33.7	5	39	mg/L	106	5.8
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
CCVL	Q776645		CHLORIDE	1.25		1.25	mg/L	100	
CCVH	Q776646		CHLORIDE	12.5		11.5	mg/L	92	
BLA01	Q776647		CHLORIDE			< 0.1	mg/L		
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SPI01	Q776648	A427477	CHLORIDE	59.6	25	84.8	mg/L	100.8	
DPS01	Q776649	A427477	CHLORIDE	59.6	25	85	mg/L	101.6	.8
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
CCVL	Q776655		CHLORIDE	1.25		1.23	mg/L	98.4	
CCVH	Q776656		CHLORIDE	12.5		11.6	mg/L	92.8	
BLA01	Q776657		CHLORIDE			< 0.1	mg/L		

Run: R339524 Analyst.: M ADKINS Run Date...: 04-DEC-97 Instrument: IC
ANALYTICAL Reviewer: E WERNZ Review Date: 05-DEC-97

BLA01	Q776858		CHLORIDE			< 0.1	mg/L		
CCVL	Q776859		CHLORIDE	1.25		1.26	mg/L	100.8	
CCVH	Q776860		CHLORIDE	12.5		11.6	mg/L	92.8	
LFB01	Q776861		CHLORIDE	2.5		2.43	mg/L	97.2	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI01	Q776862	A427560	CHLORIDE	61.8	12.5	74.8	mg/L	104	
DPS01	Q776863	A427560	CHLORIDE	61.8	12.5	75.3	mg/L	108	3.8
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
CCVL	Q776864		CHLORIDE	1.25		1.23	mg/L	98.4	
CCVH	Q776865		CHLORIDE	12.5		11.6	mg/L	92.8	
BLA01	Q776866		CHLORIDE			< 0.1	mg/L		
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
CCVL	Q776869		CHLORIDE	1.25		1.29	mg/L	103.2	
CCVH	Q776870		CHLORIDE	12.5		11.5	mg/L	92	
BLA01	Q776871		CHLORIDE			BDL 0.014	mg/L		

Run: R339645 Analyst.: M ADKINS Run Date...: 05-DEC-97 Instrument: IC
ANALYTICAL Reviewer: E WERNZ Review Date: 09-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q777565		CHLORIDE			< 0.1	mg/L		
CCVL	Q777566		CHLORIDE	1.25		1.24	mg/L	99.2	
CCVH	Q777567		CHLORIDE	12.5		11.8	mg/L	94.4	
LFB01	Q777568		CHLORIDE	2.5		2.47	mg/L	98.8	
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SPI01	Q777569	A427819	CHLORIDE	732	125	855	mg/L	98.4	
DPS01	Q777570	A427819	CHLORIDE	732	125	857	mg/L	100	1.6
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCVL	Q777571		CHLORIDE	1.25		1.28	mg/L	102.4	
CCVH	Q777572		CHLORIDE	12.5		11.8	mg/L	94.4	
BLA01	Q777573		CHLORIDE			< 0.1	mg/L		

NITRITE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0 G300.3

Run: R339492 Analyst.: M ADKINS Run Date...: 03-DEC-97 Instrument: IC
ANALYTICAL Reviewer: E WERNZ Review Date: 04-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q776639		NITROGEN, NITRITE			< 0.02	mg/L		
CCVL	Q776640		NITROGEN, NITRITE	0.5		0.496	mg/L	99.2	
CCVH	Q776641		NITROGEN, NITRITE	5		4.82	mg/L	96.4	
LFB01	Q776642		NITROGEN, NITRITE	1		0.999	mg/L	99.9	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SPI01	Q776643	A427474	NITROGEN, NITRITE	0	2	2.03	mg/L	101.5	
DPS01	Q776644	A427474	NITROGEN, NITRITE	0	2	2.04	mg/L	102	.5
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
CCVL	Q776645		NITROGEN, NITRITE	0.5		0.5	mg/L	100	
CCVH	Q776646		NITROGEN, NITRITE	5		4.83	mg/L	96.6	
BLA01	Q776647		NITROGEN, NITRITE			< 0.02	mg/L		
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SPI01	Q776648	A427477	NITROGEN, NITRITE	0	10	9.9	mg/L	99	
DPS01	Q776649	A427477	NITROGEN, NITRITE	0	10	9.86	mg/L	98.6	.4
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
CCVL	Q776655		NITROGEN, NITRITE	0.5		0.492	mg/L	98.4	
CCVH	Q776656		NITROGEN, NITRITE	5		4.85	mg/L	97	
BLA01	Q776657		NITROGEN, NITRITE			< 0.02	mg/L		

Run: R339524 Analyst.: M ADKINS Run Date...: 04-DEC-97 Instrument: IC
ANALYTICAL Reviewer: E WERNZ Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q776858		NITROGEN, NITRITE			< 0.02	mg/L		
CCVL	Q776859		NITROGEN, NITRITE	0.5		0.495	mg/L	99	
CCVH	Q776860		NITROGEN, NITRITE	5		4.84	mg/L	96.8	
LFB01	Q776861		NITROGEN, NITRITE	1		0.999	mg/L	99.9	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI01	Q776862	A427560	NITROGEN, NITRITE	0	5	5	mg/L	100	
DPS01	Q776863	A427560	NITROGEN, NITRITE	0	5	4.99	mg/L	99.8	.2
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
CCVL	Q776864		NITROGEN, NITRITE	0.5		0.497	mg/L	99.4	
CCVH	Q776865		NITROGEN, NITRITE	5		4.87	mg/L	97.4	
BLA01	Q776866		NITROGEN, NITRITE			< 0.02	mg/L		

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
CCVL	Q776869		NITROGEN, NITRITE	0.5		0.491	mg/L	98.2	
CCVH	Q776870		NITROGEN, NITRITE	5		4.83	mg/L	96.6	
BLA01	Q776871		NITROGEN, NITRITE			BDL 0.002	mg/L		
Run: R339645 ANALYTICAL		Analyst.: M ADKINS Reviewer: E WERNZ		Run Date...: 05-DEC-97 Review Date: 09-DEC-97		Instrument: IC			
BLA01	Q777565		NITROGEN, NITRITE			< 0.02	mg/L		
CCVL	Q777566		NITROGEN, NITRITE	0.5		0.499	mg/L	99.8	
CCVH	Q777567		NITROGEN, NITRITE	5		4.92	mg/L	98.4	
LFB01	Q777568		NITROGEN, NITRITE	1		0.949	mg/L	94.9	
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SPI01	Q777569	A427819	NITROGEN, NITRITE	0	50	49	mg/L	98	
DPS01	Q777570	A427819	NITROGEN, NITRITE	0	50	48.9	mg/L	97.8	.2
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCVL	Q777571		NITROGEN, NITRITE	0.5		0.503	mg/L	100.6	
CCVH	Q777572		NITROGEN, NITRITE	5		4.91	mg/L	98.2	
BLA01	Q777573		NITROGEN, NITRITE			< 0.02	mg/L		

NITRATE-NITROGEN BY ION CHROMATOGRAPHY EPA 300.0 G300.5

Run: R339492 ANALYTICAL		Analyst.: M ADKINS Reviewer: E WERNZ		Run Date...: 03-DEC-97 Review Date: 04-DEC-97		Instrument: IC			
QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q776639		NITROGEN, NITRATE			< 0.02	mg/L		
CCVL	Q776640		NITROGEN, NITRATE	0.5		0.496	mg/L	99.2	
CCVH	Q776641		NITROGEN, NITRATE	5		4.57	mg/L	91.4	
LFB01	Q776642		NITROGEN, NITRATE	1		0.998	mg/L	99.8	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SPI01	Q776643	A427474	NITROGEN, NITRATE	0.844	2	2.61	mg/L	88.3	
DPS01	Q776644	A427474	NITROGEN, NITRATE	0.844	2	2.59	mg/L	87.3	1.1
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
CCVL	Q776645		NITROGEN, NITRATE	0.5		0.492	mg/L	98.4	
CCVH	Q776646		NITROGEN, NITRATE	5		4.57	mg/L	91.4	
BLA01	Q776647		NITROGEN, NITRATE			< 0.02	mg/L		
SPI01	Q776648	A427477	NITROGEN, NITRATE	0.563	10	10	mg/L	94.4	
DPS01	Q776649	A427477	NITROGEN, NITRATE	0.563	10	9.99	mg/L	94.3	.1
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
CCVL	Q776655		NITROGEN, NITRATE	0.5		0.486	mg/L	97.2	
CCVH	Q776656		NITROGEN, NITRATE	5		4.59	mg/L	91.8	
BLA01	Q776657		NITROGEN, NITRATE			< 0.02	mg/L		
Run: R339524 ANALYTICAL		Analyst.: M ADKINS Reviewer: E WERNZ		Run Date...: 04-DEC-97 Review Date: 05-DEC-97		Instrument: IC			
BLA01	Q776858		NITROGEN, NITRATE			< 0.02	mg/L		
CCVL	Q776859		NITROGEN, NITRATE	0.5		0.491	mg/L	98.2	
CCVH	Q776860		NITROGEN, NITRATE	5		4.57	mg/L	91.4	
LFB01	Q776861		NITROGEN, NITRATE	1		0.994	mg/L	99.4	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI01	Q776862	A427560	NITROGEN, NITRATE	0	5	4.81	mg/L	96.2	
DPS01	Q776863	A427560	NITROGEN, NITRATE	0	5	4.77	mg/L	95.4	.8
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
CCVL	Q776864		NITROGEN, NITRATE	0.5		0.495	mg/L	99	
CCVH	Q776865		NITROGEN, NITRATE	5		4.62	mg/L	92.4	
BLA01	Q776866		NITROGEN, NITRATE			< 0.02	mg/L		
Run: R339645 ANALYTICAL		Analyst.: M ADKINS Reviewer: E WERNZ		Run Date...: 05-DEC-97 Review Date: 09-DEC-97		Instrument: IC			
BLA01	Q777565		NITROGEN, NITRATE			< 0.02	mg/L		
CCVL	Q777566		NITROGEN, NITRATE	0.5		0.49	mg/L	98	
CCVH	Q777567		NITROGEN, NITRATE	5		4.72	mg/L	94.4	
LFB01	Q777568		NITROGEN, NITRATE	1		0.927	mg/L	92.7	
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SPI01	Q777569	A427819	NITROGEN, NITRATE	0	50	46.4	mg/L	92.8	
DPS01	Q777570	A427819	NITROGEN, NITRATE	0	50	46.6	mg/L	93.2	.4
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCVL	Q777571		NITROGEN, NITRATE	0.5		0.486	mg/L	97.2	
CCVH	Q777572		NITROGEN, NITRATE	5		4.73	mg/L	94.6	
BLA01	Q777573		NITROGEN, NITRATE			< 0.02	mg/L		

SULFATE BY ION CHROMATOGRAPHY EPA 300.0 G300.7

Run: R339492 ANALYTICAL — Analyst.: M ADKINS, Reviewer: E WERNZ — Run Date...: 03-DEC-97, Review Date: 04-DEC-97 — Instrument: IC

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q776639		SULFATE			< 0.1	mg/L		
CCVL	Q776640		SULFATE	2.5		2.41	mg/L	96.4	
CCVH	Q776641		SULFATE	25		23	mg/L	92	
LFB01	Q776642		SULFATE	5		4.88	mg/L	97.6	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SPI01	Q776643	A427474	SULFATE	79.1	10	90.3	mg/L	112	
DPS01	Q776644	A427474	SULFATE	79.1	10	89.9	mg/L	108	3.6
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
CCVL	Q776645		SULFATE	2.5		2.49	mg/L	99.6	
CCVH	Q776646		SULFATE	25		23.1	mg/L	92.4	
BLA01	Q776647		SULFATE			< 0.1	mg/L		
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SPI01	Q776648	A427477	SULFATE	171	50	220	mg/L	98	
DPS01	Q776649	A427477	SULFATE	171	50	220	mg/L	98	0
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
CCVL	Q776655		SULFATE	2.5		2.38	mg/L	95.2	
CCVH	Q776656		SULFATE	25		23.4	mg/L	93.6	
BLA01	Q776657		SULFATE			< 0.1	mg/L		
Run: R339524 ANALYTICAL		Analyst.: M ADKINS Reviewer: E WERNZ		Run Date...: 04-DEC-97 Review Date: 05-DEC-97		Instrument: IC			
BLA01	Q776858		SULFATE			< 0.1	mg/L		
CCVL	Q776859		SULFATE	2.5		2.45	mg/L	98	
CCVH	Q776860		SULFATE	25		23.2	mg/L	92.8	
LFB01	Q776861		SULFATE	5		4.91	mg/L	98.2	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI01	Q776862	A427560	SULFATE	130	25	157	mg/L	108	
DPS01	Q776863	A427560	SULFATE	130	25	156	mg/L	104	3.8

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
CCVL	Q776864		SULFATE	2.5		2.39	mg/L	95.6	
CCVH	Q776865		SULFATE	25		23.4	mg/L	93.6	
BLA01	Q776866		SULFATE			< 0.1	mg/L		
Run: R339645 ANALYTICAL		Analyst.: M ADKINS Reviewer: E WERNZ		Run Date...: 05-DEC-97 Review Date: 09-DEC-97		Instrument: IC			
BLA01	Q777565		SULFATE			< 0.1	mg/L		
CCVL	Q777566		SULFATE	2.5		2.48	mg/L	99.2	
CCVH	Q777567		SULFATE	25		23.7	mg/L	94.8	
LFB01	Q777568		SULFATE	5		4.94 -	mg/L	98.8	
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SPI01	Q777569	A427819	SULFATE	1.72	250	237	mg/L	94.1	
DPS01	Q777570	A427819	SULFATE	1.72	250	237	mg/L	94.1	0
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCVL	Q777571		SULFATE	2.5		2.39	mg/L	95.6	
CCVH	Q777572		SULFATE	25		23.7	mg/L	94.8	
BLA01	Q777573		SULFATE			< 0.1	mg/L		

DISSOLVED SOLIDS EPA 160.1 — G402.7

Run: R339785 ANALYTICAL		Analyst.: J ZAVELA Reviewer: B SHRAKE		Run Date...: 05-DEC-97 Review Date: 10-DEC-97					
QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
LCS01	Q778373		DISSOLVED SOLIDS	543		559	mg/L	102.9	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
DUP01	Q778374	A427476	DISSOLVED SOLIDS	630		640	mg/L		1.6
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPI01	Q778375	A427478	DISSOLVED SOLIDS	450	250	676	mg/L	90.4	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
LCS01	Q778376		DISSOLVED SOLIDS	995		995	mg/L	100	
BLA01	Q778377		DISSOLVED SOLIDS			-2	mg/L		
Run: R339974 ANALYTICAL		Analyst.: J ZAVELA Reviewer: B SHRAKE		Run Date...: 10-DEC-97 Review Date: 12-DEC-97					
BLA01	Q779610		DISSOLVED SOLIDS			-23	mg/L		
LCS01	Q779611		DISSOLVED SOLIDS	1190		1180	mg/L	99.2	
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
DUP01	Q779612	A427822	DISSOLVED SOLIDS	9400		9700	mg/L		3.1
SPI01	Q779613	A428069	DISSOLVED SOLIDS	180	250	411	mg/L	92.4	
LCS01	Q779614		DISSOLVED SOLIDS	1190		1170	mg/L	98.3	
BLA01	Q779615		DISSOLVED SOLIDS			-38	mg/L		

ALKALINITY TOTAL EPA 310.1 — G605.2

Run: R339749 Analyst.: R PIERCE Run Date...: 09-DEC-97
ANALYTICAL Reviewer: K FULLMER Review Date: 10-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
LFB01	Q778115		ALKALINITY	20.9		22	mg/L	105.3	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
DUP01	Q778116	A427478	ALKALINITY	740		750	mg/L		1.3
CCV	Q778117		ALKALINITY	125		118	mg/L	94.4	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
DUP01	Q778120	A427822	ALKALINITY	430		420	mg/L		2.4
CCV	Q778121		ALKALINITY	125		113	mg/L	90.4	
DUP01	Q778161	A427822	ALKALINITY	430		420	mg/L		2.4
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
CCV	Q778168		ALKALINITY	125		118	mg/L	94.4	

ALKALINITY (BICARBONATE) EPA 310.1 — G610.2

Run: R339749 Analyst.: R PIERCE Run Date...: 09-DEC-97
ANALYTICAL Reviewer: K FULLMER Review Date: 10-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
LFB01	Q778115		ALKALINITY	20.9		22	mg/L	105.3	
CCV	Q778117		ALKALINITY	125		118	mg/L	94.4	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
DUP01	Q778136	A427478	ALKALINITY	740		750	mg/L		1.3
CCV	Q778137		ALKALINITY	125		118	mg/L	94.4	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
DUP01	Q778161	A427822	ALKALINITY	430		420	mg/L		2.4
CCV	Q778162		ALKALINITY	125		113	mg/L	90.4	

ALKALINITY (CARBONATE) EPA 310.1 — G611.2

Run: R339749 Analyst.: R PIERCE Run Date...: 09-DEC-97
ANALYTICAL Reviewer: K FULLMER Review Date: 10-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
LFB01	Q778115		ALKALINITY	20.9		22	mg/L	105.3	
CCV	Q778117		ALKALINITY	125		118	mg/L	94.4	
DUP01	Q778161	A427822	ALKALINITY	430		420	mg/L		2.4
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
DUP01	Q778165	A427478	ALKALINITY	0		BDL	mg/L		
CCV	Q778168		ALKALINITY	125		118	mg/L	94.4	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
DUP01	Q778171	A427822	ALKALINITY	0		BDL	mg/L		
CCV	Q778172		ALKALINITY	125		113	mg/L	90.4	

CALCIUM ICP EPA 200.7 — M409.3

Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Run: R339405 Analyst.: P MASTERS Run Date...: 04-DEC-97
PREP Reviewer: W WATNESS Review Date: 05-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q776054	SPEX	R339465
BLA02	Q776055	NA	R339465
SPI02	Q776056	A427474	R339465
DPS02	Q776057	A427474	R339465
SAMPLE	A427474	Rep: 0	R339465
SAMPLE	A427475	Rep: 0	R339465
SAMPLE	A427476	Rep: 0	R339465
SAMPLE	A427477	Rep: 0	R339465
SAMPLE	A427478	Rep: 0	R339465

Run: R339824 Analyst.: R DALAL Run Date...: 11-DEC-97
PREP Reviewer: W WATNESS Review Date: 11-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q778671	SPEX	R339945
BLA02	Q778672	NA	R339945
SPI02	Q778673	A427560	R339945
DPS02	Q778674	A427560	R339945
SAMPLE	A427560	Rep: 0	R339945
SAMPLE	A427562	Rep: 0	R339945
SAMPLE	A427565	Rep: 0	R339945
SAMPLE	A427566	Rep: 0	R339945
SAMPLE	A427819	Rep: 0	R339945
SAMPLE	A427821	Rep: 0	R339945
SAMPLE	A427822	Rep: 0	R339945

Run: R339465 Analyst.: A STOCKBURGER Run Date...: 04-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q776437	INORGAN	CALCIUM	50.0		49.7	mg/L	99	
BLA01	Q776438	NA	CALCIUM			< 0.0800	mg/L		
ICV01	Q776441	SPEX	CALCIUM	20		20.6	mg/L	103	
ICS-A	Q776445	PERKIN-	CALCIUM	500		465.	mg/L	93	
BLA02	Q776055	NA	CALCIUM			< 0.0800	mg/L		
LCS	Q776054	SPEX	CALCIUM	100		93.2	mg/L	93	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPI02	Q776056	A427474	CALCIUM	86.8	100	176.	mg/L	89	
DPS02	Q776057	A427474	CALCIUM	86.8	100	172.	mg/L	85	4
CCV	Q776469	INORGAN	CALCIUM	50.0		47.9	mg/L	96	
BLA01	Q776470	NA	CALCIUM			< 0.0800	mg/L		
ICS-A	Q776480	PERKIN-	CALCIUM	500		452.	mg/L	90	

Run: R339945 Analyst.: A STOCKBURGER Run Date...: 11-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 15-DEC-97

CCV	Q779360	INORGAN	CALCIUM	50.0		47.9	mg/L	96	
BLA01	Q779361	NA	CALCIUM			< 0.0800	mg/L		
ICV01	Q779364	SPEX	CALCIUM	20		20.6	mg/L	103	
ICS-A	Q779368	PERKIN-	CALCIUM	500		464.	mg/L	93	
BLA02	Q778672	NA	CALCIUM			< 0.0800	mg/L		
LCS	Q778671	SPEX	CALCIUM	100		93.8	mg/L	94	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI02	Q778673	A427560	CALCIUM	68.4	100	167.	mg/L	99	
DPS02	Q778674	A427560	CALCIUM	68.4	100	165.	mg/L	97	3
CCV	Q779386	INORGAN	CALCIUM	50.0		49.4	mg/L	99	
BLA01	Q779387	NA	CALCIUM			< 0.0800	mg/L		
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCV	Q779388	INORGAN	CALCIUM	50.0		50.0	mg/L	100	
BLA01	Q779389	NA	CALCIUM			< 0.0800	mg/L		
ICS-A	Q779399	PERKIN-	CALCIUM	500		485.	mg/L	97	

IRON ICP EPA 200.7 M415.3

Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Run: R339405 Analyst.: P MASTERS Run Date...: 04-DEC-97
PREP Reviewer: W WATNESS Review Date: 05-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q776054	SPEX	R339465
BLA02	Q776055	NA	R339465
SPI02	Q776056	A427474	R339465
DPS02	Q776057	A427474	R339465
SAMPLE	A427474	Rep: 0	R339465
SAMPLE	A427475	Rep: 0	R339465

HERITAGE ENVIRONMENTAL SERVICES, INC.

QC Type	Lab ID	Source	Anal Run
SAMPLE	A427476	Rep: 0	R339465
SAMPLE	A427477	Rep: 0	R339465
SAMPLE	A427478	Rep: 0	R339465

Run: R339824 Analyst.: R DALAL Run Date...: 11-DEC-97
PREP Reviewer: W WATNESS Review Date: 11-DEC-97

LCS	Q778671	SPEX	R339945
BLA02	Q778672	NA	R339945
SPI02	Q778673	A427560	R339945
DPS02	Q778674	A427560	R339945
SAMPLE	A427560	Rep: 0	R339945
SAMPLE	A427562	Rep: 0	R339945
SAMPLE	A427565	Rep: 0	R339945
SAMPLE	A427566	Rep: 0	R339945
SAMPLE	A427819	Rep: 0	R339945
SAMPLE	A427821	Rep: 0	R339945
SAMPLE	A427822	Rep: 0	R339945

Run: R339465 Analyst.: A STOCKBURGER Run Date...: 04-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q776437	INORGAN	IRON	5.00		5.05	mg/L	101	
BLA01	Q776438	NA	IRON			< 0.0100	mg/L		
ICV01	Q776439	PERKIN	IRON	1		1.01	mg/L	101	
CDL01	Q776444	INORGAN	IRON	10		9.93	mg/L	99	
ICS-A	Q776445	PERKIN-	IRON	200		177.	mg/L	89	
BLA02	Q776055	NA	IRON			< 0.0100	mg/L		
LCS	Q776054	SPEX	IRON	10.0		9.48	mg/L	95	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPI02	Q776056	A427474	IRON	0.0276	1.00	0.968	mg/L	94	
DPS02	Q776057	A427474	IRON	0.0276	1.00	0.967	mg/L	94	0
CCV	Q776469	INORGAN	IRON	5.00		4.78	mg/L	96	
BLA01	Q776470	NA	IRON			< 0.0100	mg/L		
ICS-A	Q776480	PERKIN-	IRON	200		183.	mg/L	92	

Run: R339945 Analyst.: A STOCKBURGER Run Date...: 11-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 15-DEC-97

CCV	Q779360	INORGAN	IRON	5.00		4.88	mg/L	98	
BLA01	Q779361	NA	IRON			< 0.0100	mg/L		
ICV01	Q779362	PERKIN	IRON	1		1.01	mg/L	101	
CDL01	Q779367	INORGAN	IRON	10		9.92	mg/L	99	
ICS-A	Q779368	PERKIN-	IRON	200		177.	mg/L	89	
BLA02	Q778672	NA	IRON			0.0271	mg/L		
LCS	Q778671	SPEX	IRON	10.0		9.65	mg/L	97	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI02	Q778673	A427560	IRON	0.339	1.00	1.34	mg/L	100	
DPS02	Q778674	A427560	IRON	0.339	1.00	1.34	mg/L	100	0
CCV	Q779386	INORGAN	IRON	5.00		4.98	mg/L	100	
BLA01	Q779387	NA	IRON			< 0.0100	mg/L		
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCV	Q779388	INORGAN	IRON	5.00		5.03	mg/L	101	
BLA01	Q779389	NA	IRON			< 0.0100	mg/L		
ICS-A	Q779399	PERKIN-	IRON	200		186.	mg/L	93	

LEAD TRACE ICP EPA 200.7 — M416.0

Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Run: R339824 Analyst.: R DALAL Run Date...: 11-DEC-97
PREP Reviewer: W WATNESS Review Date: 11-DEC-97

QC Type	Lab ID	Source	Anal Run
SAMPLE	A427821	Rep: 0	R339961
LCS	Q778697	INORGAN	R339961
BLA02	Q778698	NA	R339961
SPI02	Q778699	A427560	R339961
DPS02	Q778700	A427560	R339961

Run: R339961 Analyst.: A ROBERTSON Run Date...: 12-DEC-97 Instrument: TRACE ICP
ANALYTICAL Reviewer: S O'NEAL Review Date: 15-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q779477	INORGAN	LEAD	0.1		0.101	mg/L	101	
BLA01	Q779478	NA	LEAD			< 0.00200	mg/L		
ICV01	Q779479	PERKIN-	LEAD	0.05		0.0487	mg/L	97	
CDL01	Q779482	PERKIN-	LEAD	0.006		0.00617	mg/L	103	
ICS-A	Q779485	PERKIN	LEAD	0.05		0.0457	mg/L	91	
LCS	Q778697	INORGAN	LEAD	0.5		0.471	mg/L	94	
BLA02	Q778698	NA	LEAD			< 0.00200	mg/L		
SPI02	Q778699	A427560	LEAD	0	0.5	0.479	mg/L	96	
DPS02	Q778700	A427560	LEAD	0	0.5	0.490	mg/L	98	2
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
CCV	Q779490	INORGAN	LEAD	0.1		0.0988	mg/L	99	
BLA01	Q779491	NA	LEAD			< 0.00200	mg/L		
CDL01	Q779494	PERKIN-	LEAD	0.006		0.00546	mg/L	91	
ICS-A	Q779496	PERKIN	LEAD	0.05		0.0456	mg/L	91	

MAGNESIUM ICP EPA 200.7 — M418.3

Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Run: R339405 Analyst.: P MASTERS Run Date...: 04-DEC-97
PREP Reviewer: W WATNESS Review Date: 05-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q776054	SPEX	R339465
BLA02	Q776055	NA	R339465
SPI02	Q776056	A427474	R339465
DPS02	Q776057	A427474	R339465
SAMPLE	A427474	Rep: 0	R339465
SAMPLE	A427475	Rep: 0	R339465
SAMPLE	A427476	Rep: 0	R339465
SAMPLE	A427477	Rep: 0	R339465
SAMPLE	A427478	Rep: 0	R339465

Run: R339824 Analyst.: R DALAL Run Date...: 11-DEC-97
PREP Reviewer: W WATNESS Review Date: 11-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q778671	SPEX	R339945
BLA02	Q778672	NA	R339945
SPI02	Q778673	A427560	R339945
DPS02	Q778674	A427560	R339945
SAMPLE	A427560	Rep: 0	R339945
SAMPLE	A427562	Rep: 0	R339945
SAMPLE	A427565	Rep: 0	R339945
SAMPLE	A427566	Rep: 0	R339945
SAMPLE	A427819	Rep: 0	R339945
SAMPLE	A427821	Rep: 0	R339945
SAMPLE	A427822	Rep: 0	R339945

Run: R339465 Analyst.: A STOCKBURGER Run Date...: 04-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q776437	INORGAN	MAGNESIUM	50.0		50.1	mg/L	100	
BLA01	Q776438	NA	MAGNESIUM			< 0.0800	mg/L		
ICV01	Q776441	SPEX	MAGNESIUM	20		20.7	mg/L	104	
ICS-A	Q776445	PERKIN-	MAGNESIUM	500		488.	mg/L	98	
BLA02	Q776055	NA	MAGNESIUM			< 0.0800	mg/L		
LCS	Q776054	SPEX	MAGNESIUM	100		94.3	mg/L	94	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPI02	Q776056	A427474	MAGNESIUM	13.2	100	107.	mg/L	94	
DPS02	Q776057	A427474	MAGNESIUM	13.2	100	106.	mg/L	93	1
CCV	Q776469	INORGAN	MAGNESIUM	50.0		48.5	mg/L	97	
BLA01	Q776470	NA	MAGNESIUM			< 0.0800	mg/L		
ICS-A	Q776480	PERKIN-	MAGNESIUM	500		482.	mg/L	96	

Run: R339945 Analyst.: A STOCKBURGER Run Date...: 11-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 15-DEC-97

CCV	Q779360	INORGAN	MAGNESIUM	50.0		48.4	mg/L	97	
BLA01	Q779361	NA	MAGNESIUM			< 0.0800	mg/L		
ICV01	Q779364	SPEX	MAGNESIUM	20		20.6	mg/L	103	
ICS-A	Q779368	PERKIN-	MAGNESIUM	500		485.	mg/L	97	
BLA02	Q778672	NA	MAGNESIUM			< 0.0800	mg/L		
LCS	Q778671	SPEX	MAGNESIUM	100		93.4	mg/L	93	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI02	Q778673	A427560	MAGNESIUM	11.5	100	110.	mg/L	99	
DPS02	Q778674	A427560	MAGNESIUM	11.5	100	110.	mg/L	99	1
CCV	Q779386	INORGAN	MAGNESIUM	50.0		49.3	mg/L	99	
BLA01	Q779387	NA	MAGNESIUM			< 0.0800	mg/L		
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCV	Q779388	INORGAN	MAGNESIUM	50.0		49.7	mg/L	99	
BLA01	Q779389	NA	MAGNESIUM			< 0.0800	mg/L		
ICS-A	Q779399	PERKIN-	MAGNESIUM	500		509.	mg/L	102	

MANGANESE ICP EPA 200.7 M419.3

Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Run: R339405 Analyst.: P MASTERS Run Date...: 04-DEC-97
PREP Reviewer: W WATNESS Review Date: 05-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q776054	SPEX	R339465
BLA02	Q776055	NA	R339465
SPI02	Q776056	A427474	R339465
DPS02	Q776057	A427474	R339465
SAMPLE	A427474	Rep: 0	R339465
SAMPLE	A427475	Rep: 0	R339465
SAMPLE	A427476	Rep: 0	R339465
SAMPLE	A427477	Rep: 0	R339465
SAMPLE	A427478	Rep: 0	R339465

Run: R339824 Analyst.: R DALAL Run Date...: 11-DEC-97
PREP Reviewer: W WATNESS Review Date: 11-DEC-97

LCS	Q778671	SPEX	R339945
BLA02	Q778672	NA	R339945
SPI02	Q778673	A427560	R339945
DPS02	Q778674	A427560	R339945
SAMPLE	A427560	Rep: 0	R339945
SAMPLE	A427562	Rep: 0	R339945
SAMPLE	A427565	Rep: 0	R339945
SAMPLE	A427566	Rep: 0	R339945
SAMPLE	A427819	Rep: 0	R339945
SAMPLE	A427821	Rep: 0	R339945
SAMPLE	A427822	Rep: 0	R339945

Run: R339465 Analyst.: A STOCKBURGER Run Date...: 04-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q776437	INORGAN	MANGANESE	5.00		4.96	mg/L	99	
BLA01	Q776438	NA	MANGANESE			< 0.00400	mg/L		
ICV01	Q776439	PERKIN	MANGANESE	1		1.00	mg/L	100	
CDL01	Q776443	PERKIN	MANGANESE	0.030		0.0291	mg/L	97	
ICS-A	Q776446	PERKIN	MANGANESE	0.500		0.462	mg/L	92	
BLA02	Q776055	NA	MANGANESE			< 0.00400	mg/L		
LCS	Q776054	SPEX	MANGANESE	5.00		4.63	mg/L	93	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPI02	Q776056	A427474	MANGANESE	0	0.500	0.462	mg/L	92	
DPS02	Q776057	A427474	MANGANESE	0	0.500	0.462	mg/L	92	0
CCV	Q776469	INORGAN	MANGANESE	5.00		4.78	mg/L	96	
BLA01	Q776470	NA	MANGANESE			< 0.00400	mg/L		
CDL01	Q776479	PERKIN	MANGANESE	0.030		0.0285	mg/L	95	
ICS-A	Q776481	PERKIN	MANGANESE	0.500		0.435	mg/L	87	

Run: R339945 Analyst.: A STOCKBURGER Run Date...: 11-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 15-DEC-97

CCV	Q779360	INORGAN	MANGANESE	5.00		4.85	mg/L	97	
BLA01	Q779361	NA	MANGANESE			< 0.00400	mg/L		
ICV01	Q779362	PERKIN	MANGANESE	1		1.01	mg/L	101	
CDL01	Q779366	PERKIN	MANGANESE	0.030		0.0288	mg/L	96	

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
ICS-A	Q779369	PERKIN	MANGANESE	0.500		0.455	mg/L	91	
BLA02	Q778672	NA	MANGANESE			< 0.00400	mg/L		
LCS	Q778671	SPEX	MANGANESE	5.00		4.73	mg/L	95	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI02	Q778673	A427560	MANGANESE	0.0782	0.500	0.576	mg/L	100	
DPS02	Q778674	A427560	MANGANESE	0.0782	0.500	0.578	mg/L	100	0
CCV	Q779386	INORGAN	MANGANESE	5.00		4.99	mg/L	100	
BLA01	Q779387	NA	MANGANESE			< 0.00400	mg/L		
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCV	Q779388	INORGAN	MANGANESE	5.00		5.04	mg/L	101	
BLA01	Q779389	NA	MANGANESE			< 0.00400	mg/L		
CDL01	Q779398	PERKIN	MANGANESE	0.030		0.0313	mg/L	104	
ICS-A	Q779400	PERKIN	MANGANESE	0.500		0.467	mg/L	93	

POTASSIUM ICP EPA 200.7 — M426.3

Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Run: R339405 — Analyst.: P MASTERS — Run Date...: 04-DEC-97
PREP — Reviewer: W WATNESS — Review Date: 05-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q776054	SPEX	R339465
BLA02	Q776055	NA	R339465
SPI02	Q776056	A427474	R339465
DPS02	Q776057	A427474	R339465
SAMPLE	A427474	Rep: 0	R339465
SAMPLE	A427475	Rep: 0	R339465
SAMPLE	A427476	Rep: 0	R339465
SAMPLE	A427477	Rep: 0	R339465
SAMPLE	A427478	Rep: 0	R339465

Run: R339824 — Analyst.: R DALAL — Run Date...: 11-DEC-97
PREP — Reviewer: W WATNESS — Review Date: 11-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q778671	SPEX	R339945
BLA02	Q778672	NA	R339945
SPI02	Q778673	A427560	R339945
DPS02	Q778674	A427560	R339945
SAMPLE	A427560	Rep: 0	R339945
SAMPLE	A427562	Rep: 0	R339945
SAMPLE	A427565	Rep: 0	R339945
SAMPLE	A427566	Rep: 0	R339945
SAMPLE	A427819	Rep: 0	R339945
SAMPLE	A427821	Rep: 0	R339945
SAMPLE	A427822	Rep: 0	R339945

Run: R339465 — Analyst.: A STOCKBURGER — Run Date...: 04-DEC-97 — Instrument: ICP
ANALYTICAL — Reviewer: S ENDERSON — Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q776437	INORGAN	POTASSIUM	50		50.4	mg/L	101	
BLA01	Q776438	NA	POTASSIUM			< 0.0800	mg/L		
ICV01	Q776440	PERKIN	POTASSIUM	10		9.91	mg/L	99	

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
ICV01	Q776441	SPEX	POTASSIUM	20		20.4	mg/L	102	
BLA02	Q776055	NA	POTASSIUM			< 0.0800	mg/L		
LCS	Q776054	SPEX	POTASSIUM	100		96.3	mg/L	96	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPI02	Q776056	A427474	POTASSIUM	1.28	100	97.9	mg/L	97	
DPS02	Q776057	A427474	POTASSIUM	1.28	100	97.4	mg/L	96	1
CCV	Q776469	INORGAN	POTASSIUM	50		49.1	mg/L	98	
BLA01	Q776470	NA	POTASSIUM			< 0.0800	mg/L		

Run: R339945 Analyst.: A STOCKBURGER Run Date...: 11-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 15-DEC-97

CCV	Q779360	INORGAN	POTASSIUM	50		48.4	mg/L	97	
BLA01	Q779361	NA	POTASSIUM			< 0.0800	mg/L		
ICV01	Q779363	PERKIN	POTASSIUM	10		9.90	mg/L	99	
ICV01	Q779364	SPEX	POTASSIUM	20		20.3	mg/L	102	
BLA02	Q778672	NA	POTASSIUM			< 0.0800	mg/L		
LCS	Q778671	SPEX	POTASSIUM	100		94.0	mg/L	94	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPI02	Q778673	A427560	POTASSIUM	28.2	100	129.	mg/L	101	
DPS02	Q778674	A427560	POTASSIUM	28.2	100	128.	mg/L	100	1
CCV	Q779386	INORGAN	POTASSIUM	50		49.2	mg/L	98	
BLA01	Q779387	NA	POTASSIUM			< 0.0800	mg/L		
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
CCV	Q779388	INORGAN	POTASSIUM	50		49.7	mg/L	99	
BLA01	Q779389	NA	POTASSIUM			< 0.0800	mg/L		

SODIUM ICP EPA 200.7 M431.3

Prep: FAA OR ICP ACID DIGESTION (DISSOLVED METALS) EPA 200.0

Run: R339405 Analyst.: P MASTERS Run Date...: 04-DEC-97
PREP Reviewer: W WATNESS Review Date: 05-DEC-97

QC Type	Lab ID	Source	Anal Run
LCS	Q776054	SPEX	R339465
BLA02	Q776055	NA	R339465
SPI02	Q776056	A427474	R339465
DPS02	Q776057	A427474	R339465
SAMPLE	A427474	Rep: 0	R339465
SAMPLE	A427475	Rep: 0	R339465
SAMPLE	A427476	Rep: 0	R339465
SAMPLE	A427477	Rep: 0	R339465
SAMPLE	A427478	Rep: 0	R339465

Run: R339824 Analyst.: R DALAL Run Date...: 11-DEC-97
PREP Reviewer: W WATNESS Review Date: 11-DEC-97

LCS	Q778671	SPEX	R339945
BLA02	Q778672	NA	R339945

QC Type	Lab ID	Source	Anal Run
SPIO2	Q778673	A427560	R339945
DPSO2	Q778674	A427560	R339945
SAMPLE	A427560	Rep: 0	R339945
SAMPLE	A427562	Rep: 0	R339945
SAMPLE	A427565	Rep: 0	R339945
SAMPLE	A427566	Rep: 0	R339945
SAMPLE	A427819	Rep: 0	R339954
SAMPLE	A427821	Rep: 0	R339945
SAMPLE	A427822	Rep: 0	R339954

Run: R339465 Analyst.: A STOCKBURGER Run Date...: 04-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q776437	INORGAN	SODIUM	50		50.8	mg/L	102	
BLA01	Q776438	NA	SODIUM			< 0.0800	mg/L		
ICV01	Q776440	PERKIN	SODIUM	1		1.01	mg/L	101	
ICV01	Q776441	SPEX	SODIUM	20		20.6	mg/L	103	
BLA02	Q776055	NA	SODIUM			0.124	mg/L		
LCS	Q776054	SPEX	SODIUM	100		104.	mg/L	104	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
SPIO2	Q776056	A427474	SODIUM	44.7	100	146.	mg/L	101	
DPSO2	Q776057	A427474	SODIUM	44.7	100	144.	mg/L	99	2
CCV	Q776469	INORGAN	SODIUM	50		47.8	mg/L	96	
BLA01	Q776470	NA	SODIUM			< 0.0800	mg/L		

Run: R339945 Analyst.: A STOCKBURGER Run Date...: 11-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 15-DEC-97

CCV	Q779360	INORGAN	SODIUM	50		49.1	mg/L	98	
BLA01	Q779361	NA	SODIUM			< 0.0800	mg/L		
ICV01	Q779363	PERKIN	SODIUM	1		0.986	mg/L	99	
ICV01	Q779364	SPEX	SODIUM	20		20.6	mg/L	103	
BLA02	Q778672	NA	SODIUM			< 0.0800	mg/L		
LCS	Q778671	SPEX	SODIUM	100		106.	mg/L	106	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SPIO2	Q778673	A427560	SODIUM	97.8	100	212.	mg/L	114	
DPSO2	Q778674	A427560	SODIUM	97.8	100	210.	mg/L	112	2
CCV	Q779386	INORGAN	SODIUM	50		50.3	mg/L	101	
BLA01	Q779387	NA	SODIUM			< 0.0800	mg/L		
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
CCV	Q779388	INORGAN	SODIUM	50		50.8	mg/L	102	
BLA01	Q779389	NA	SODIUM			< 0.0800	mg/L		

Run: R339954 Analyst.: A STOCKBURGER Run Date...: 12-DEC-97 Instrument: ICP
ANALYTICAL Reviewer: S ENDERSON Review Date: 15-DEC-97

CCV	Q779431	INORGAN	SODIUM	50		48.7	mg/L	97	
BLA01	Q779432	NA	SODIUM			< 0.0800	mg/L		
ICV01	Q779434	PERKIN	SODIUM	1		1.01	mg/L	101	
ICV01	Q779435	SPEX	SODIUM	20		20.1	mg/L	101	
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
CCV	Q779447	INORGAN	SODIUM	50		49.2	mg/L	98	
BLA01	Q779448	NA	SODIUM			< 0.0800	mg/L		

TOTAL ORGANIC CARBON EPA 415.1 — 0401.1

Run: R339520 Analyst.: K STALOWICZ Run Date...: 04-DEC-97 Instrument: TOC
ANALYTICAL Reviewer: K FULLMER Review Date: 05-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q776805		TOTAL ORGANIC CARBON (TOC)			-.61	mg/L		
CDL01	Q776806		TOTAL ORGANIC CARBON (TOC)	5		4.46	mg/L	89.2	
ICV01	Q776807		TOTAL ORGANIC CARBON (TOC)	32.6		31	mg/L	95.1	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
CCV	Q776810		TOTAL ORGANIC CARBON (TOC)	50		48	mg/L	96	
BLA01	Q776811		TOTAL ORGANIC CARBON (TOC)			-.56	mg/L		
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SPI01	Q776812	A427477	TOTAL ORGANIC CARBON (TOC)	0	20	22.9	mg/L	114.5	
DPS01	Q776813	A427477	TOTAL ORGANIC CARBON (TOC)	0	20	22.2	mg/L	111	3.1
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
CCV	Q776814		TOTAL ORGANIC CARBON (TOC)	50		48.4	mg/L	96.8	
BLA01	Q776815		TOTAL ORGANIC CARBON (TOC)			-.58	mg/L		

Run: R339660 Analyst.: K STALOWICZ Run Date...: 08-DEC-97 Instrument: TOC
ANALYTICAL Reviewer: K FULLMER Review Date: 09-DEC-97

BLA01	Q777654		TOTAL ORGANIC CARBON (TOC)			-.39	mg/L		
CDL01	Q777655		TOTAL ORGANIC CARBON (TOC)	5		4.94	mg/L	98.8	
ICV01	Q777656		TOTAL ORGANIC CARBON (TOC)	32.6		31.4	mg/L	96.3	
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427566		See Cert. of Analysis, Rep: 0						
CCV	Q777659		TOTAL ORGANIC CARBON (TOC)	50		49.9	mg/L	99.8	
BLA01	Q777660		TOTAL ORGANIC CARBON (TOC)			-.09	mg/L		
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
SPI01	Q777661	A427822	TOTAL ORGANIC CARBON (TOC)	12	20	34.3	mg/L	111.5	
DPS01	Q777662	A427822	TOTAL ORGANIC CARBON (TOC)	12	20	35.1	mg/L	115.5	3.5
SAMPLE	A427821		See Cert. of Analysis, Rep: 0						
SAMPLE	A427819		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
CCV	Q777663		TOTAL ORGANIC CARBON (TOC)	50		50.4	mg/L	100.8	
BLA01	Q777664		TOTAL ORGANIC CARBON (TOC)			-.02	mg/L		

PURGEABLE AROMATICS BY GC/PID SW846-8020A — 0460.2

Run: R339062 Analyst.: S STRUEWING Run Date...: 24-NOV-97 Instrument: GC/PID ELCD
ANALYTICAL Reviewer: A BRADBURN Review Date: 12-DEC-97

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
LCS01	Q773476	.	BENZENE	20		20.2	ug/L	101	
LCS01	Q773476	.	TOLUENE	20		20.8	ug/L	104	
LCS01	Q773476	.	ETHYL BENZENE	20		21.2	ug/L	106	
LCS01	Q773476	.	M/P-XYLENE	40		40.1	ug/L	100.3	
LCS01	Q773476	.	O-XYLENE	20		20.8	ug/L	104	
LCS01	Q773476	.	NAPHTHALENE	20		21.8	ug/L	109	

HERITAGE ENVIRONMENTAL SERVICES, INC.

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
BLA01	Q773477	.	BENZENE			BDL 1	ug/L		
BLA01	Q773477	.	TOLUENE			BDL 1	ug/L		
BLA01	Q773477	.	ETHYL BENZENE			BDL 1	ug/L		
BLA01	Q773477	.	M/P-XYLENE			BDL 1	ug/L		
BLA01	Q773477	.	O-XYLENE			BDL 1	ug/L		
BLA01	Q773477	.	NAPHTHALENE			BDL 1	ug/L		
CCVD	Q773484	.	BENZENE	22		20	ug/L		9.1
CCVD	Q773484	.	TOLUENE	22		20.7	ug/L		5.9
CCVD	Q773484	.	ETHYL BENZENE	22		21.4	ug/L		2.7
CCVD	Q773484	.	M/P-XYLENE	44		41	ug/L		6.8
CCVD	Q773484	.	O-XYLENE	22		21.9	ug/L		.5
CCVD	Q773484	.	NAPHTHALENE	22		20.1	ug/L		8.6
SPI02	Q767108	A426689	BENZENE	0	992	1010	ug/kg	101.8	
SPI02	Q767108	A426689	TOLUENE	0	992	1080	ug/kg	108.9	
SPI02	Q767108	A426689	ETHYL BENZENE	0	992	1100	ug/kg	110.9	
SPI02	Q767108	A426689	M/P-XYLENE	0	1984	2150	ug/kg	108.4	
SPI02	Q767108	A426689	O-XYLENE	0	992	1140	ug/kg	114.9	
DPS02	Q767109	A426689	BENZENE	0	992	1010	ug/kg	101.8	0
DPS02	Q767109	A426689	TOLUENE	0	992	1090	ug/kg	109.9	.9
DPS02	Q767109	A426689	ETHYL BENZENE	0	992	1110	ug/kg	111.9	.9
DPS02	Q767109	A426689	M/P-XYLENE	0	1988	2210	ug/kg	111.2	2.6
DPS02	Q767109	A426689	O-XYLENE	0	992	1160	ug/kg	116.9	1.7
SPI01	Q775302	A427193	BENZENE	0	20	19.9	ug/L	99.5	
SPI01	Q775302	A427193	TOLUENE	0	20	21.7	ug/L	108.5	
SPI01	Q775302	A427193	ETHYL BENZENE	0	20	21.1	ug/L	105.5	
SPI01	Q775302	A427193	M/P-XYLENE	0	40	42	ug/L	105	
SPI01	Q775302	A427193	O-XYLENE	0	20	21.3	ug/L	106.5	
DPS01	Q775303	A427193	BENZENE	0	20	19.9	ug/L	99.5	0
DPS01	Q775303	A427193	TOLUENE	0	20	21.1	ug/L	105.5	2.8
DPS01	Q775303	A427193	ETHYL BENZENE	0	20	21.1	ug/L	105.5	0
DPS01	Q775303	A427193	M/P-XYLENE	0	40	42	ug/L	105	0
DPS01	Q775303	A427193	O-XYLENE	0	20	21.6	ug/L	108	1.4
CCV	Q775304		BENZENE	20		18	ug/L	90	
CCV	Q775304		TOLUENE	20		18.8	ug/L	94	
CCV	Q775304		ETHYL BENZENE	20		18.9	ug/L	94.5	
CCV	Q775304		M/P-XYLENE	40		37.9	ug/L	94.8	
CCV	Q775304		O-XYLENE	20		19.6	ug/L	98	
SAMPLE	A427474		See Cert. of Analysis, Rep: 0						
SAMPLE	A427475		See Cert. of Analysis, Rep: 0						
SAMPLE	A427476		See Cert. of Analysis, Rep: 0						
SAMPLE	A427477		See Cert. of Analysis, Rep: 0						
SAMPLE	A427478		See Cert. of Analysis, Rep: 0						
CCV	Q777781	.	BENZENE	20		18.8	ug/L	94	
CCV	Q777781	.	TOLUENE	20		19	ug/L	95	
CCV	Q777781	.	ETHYL BENZENE	20		20.3	ug/L	101.5	
CCV	Q777781	.	M/P-XYLENE	40		39.6	ug/L	99	
CCV	Q777781	.	O-XYLENE	20		19.3	ug/L	96.5	
CCV	Q777781	.	NAPHTHALENE	20		17.4	ug/L	87	
BLA01	Q777782	.	BENZENE			BDL 1	ug/L		
BLA01	Q777782	.	TOLUENE			BDL 1	ug/L		
BLA01	Q777782	.	ETHYL BENZENE			BDL 1	ug/L		
BLA01	Q777782	.	M/P-XYLENE			BDL 1	ug/L		
BLA01	Q777782	.	O-XYLENE			BDL 1	ug/L		
BLA01	Q777782	.	NAPHTHALENE			BDL 1	ug/L		

HERITAGE ENVIRONMENTAL SERVICES, INC.

QC Type	Lab ID	Source	Parameter	True/Sampl	Spike Val	Observed	Units	% Rec	RPD
SAMPLE	A427818		See Cert. of Analysis, Rep: 0						
SAMPLE	A427560		See Cert. of Analysis, Rep: 0						
SAMPLE	A427815		See Cert. of Analysis, Rep: 0						
SAMPLE	A427822		See Cert. of Analysis, Rep: 0						
SAMPLE	A427817		See Cert. of Analysis, Rep: 0						
CCV	Q777783	.	BENZENE	20		19.9	ug/L	99.5	
CCV	Q777783	.	TOLUENE	20		20.7	ug/L	103.5	
CCV	Q777783	.	ETHYL BENZENE	20		21.7	ug/L	108.5	
CCV	Q777783	.	M/P-XYLENE	40		42.5	ug/L	106.3	
CCV	Q777783	.	O-XYLENE	20		19	ug/L	95	
CCV	Q777783	.	NAPHTHALENE	20		20.3	ug/L	101.5	
BLA01	Q777784	.	BENZENE			BDL 1	ug/L		
BLA01	Q777784	.	TOLUENE			BDL 1	ug/L		
BLA01	Q777784	.	ETHYL BENZENE			BDL 1	ug/L		
BLA01	Q777784	.	M/P-XYLENE			BDL 1	ug/L		
BLA01	Q777784	.	O-XYLENE			BDL 1	ug/L		
BLA01	Q777784	.	NAPHTHALENE			BDL 1	ug/L		
SAMPLE	A427561		See Cert. of Analysis, Rep: 0						
SAMPLE	A427562		See Cert. of Analysis, Rep: 0						
SAMPLE	A427565		See Cert. of Analysis, Rep: 0						
CCV	Q779148	.	BENZENE	20		21	ug/L	105	
CCV	Q779148	.	TOLUENE	20		21.6	ug/L	108	
CCV	Q779148	.	ETHYL BENZENE	20		22.7	ug/L	113.5	
CCV	Q779148	.	M/P-XYLENE	40		44.6	ug/L	111.5	
CCV	Q779148	.	O-XYLENE	20		19.5	ug/L	97.5	
CCV	Q779148	.	NAPHTHALENE	20		20.2	ug/L	101	
BLA01	Q779149	.	BENZENE			BDL 1	ug/L		
BLA01	Q779149	.	TOLUENE			BDL 1	ug/L		
BLA01	Q779149	.	ETHYL BENZENE			BDL 1	ug/L		
BLA01	Q779149	.	M/P-XYLENE			BDL 1	ug/L		
BLA01	Q779149	.	O-XYLENE			BDL 1	ug/L		
BLA01	Q779149	.	NAPHTHALENE			BDL 1	ug/L		
DUP01	Q779150	A428001	BENZENE	0		BDL	ug/L		
DUP01	Q779150	A428001	TOLUENE	0		BDL	ug/L		
DUP01	Q779150	A428001	ETHYL BENZENE	0		BDL	ug/L		
DUP01	Q779150	A428001	M/P-XYLENE	0		BDL	ug/L		
DUP01	Q779150	A428001	O-XYLENE	0		BDL	ug/L		
DUP01	Q779150	A428001	NAPHTHALENE	0		BDL	ug/L		
SPI01	Q779151	A428001	BENZENE	0	22	19.8	ug/L	90	
SPI01	Q779151	A428001	TOLUENE	0	22	20.4	ug/L	92.7	
SPI01	Q779151	A428001	ETHYL BENZENE	0	22	21.7	ug/L	98.6	
SPI01	Q779151	A428001	M/P-XYLENE	0	44	42.4	ug/L	96.4	
SPI01	Q779151	A428001	O-XYLENE	0	22	19	ug/L	86.4	
SPI01	Q779151	A428001	NAPHTHALENE	0	22	19.4	ug/L	88.2	
DPS01	Q779152	A428001	BENZENE	0	22	20.5	ug/L	93.2	3.5
DPS01	Q779152	A428001	TOLUENE	0	22	21.2	ug/L	96.4	3.9
DPS01	Q779152	A428001	ETHYL BENZENE	0	22	22.3	ug/L	101.4	2.8
DPS01	Q779152	A428001	M/P-XYLENE	0	44	43.7	ug/L	99.3	3
DPS01	Q779152	A428001	O-XYLENE	0	22	19.6	ug/L	89.1	3.1
DPS01	Q779152	A428001	NAPHTHALENE	0	22	20.2	ug/L	91.8	4

Comments

*Q773484 NOTE: * Outside method limits.*
*Q779148 * The analysis meets EPA 601 criteria, but does not meet N. Carolina*

Comments
% difference requirements of +/- 10%.
Q779149 * The result is BDL and the analysis meets EPA 601 criteria, but does not meet N. carolina % difference requirement of +/- 10%.

Approved by: _____