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REPORTS

DATE: May 1995

SITE ASSESSMENT FOR THE BLOOMFIELD CRUDE STATION BLOOMFIELD, NEW MEXICO

MAY 1995

Prepared for:

GIANT INDUSTRIES ARIZONA, INC.

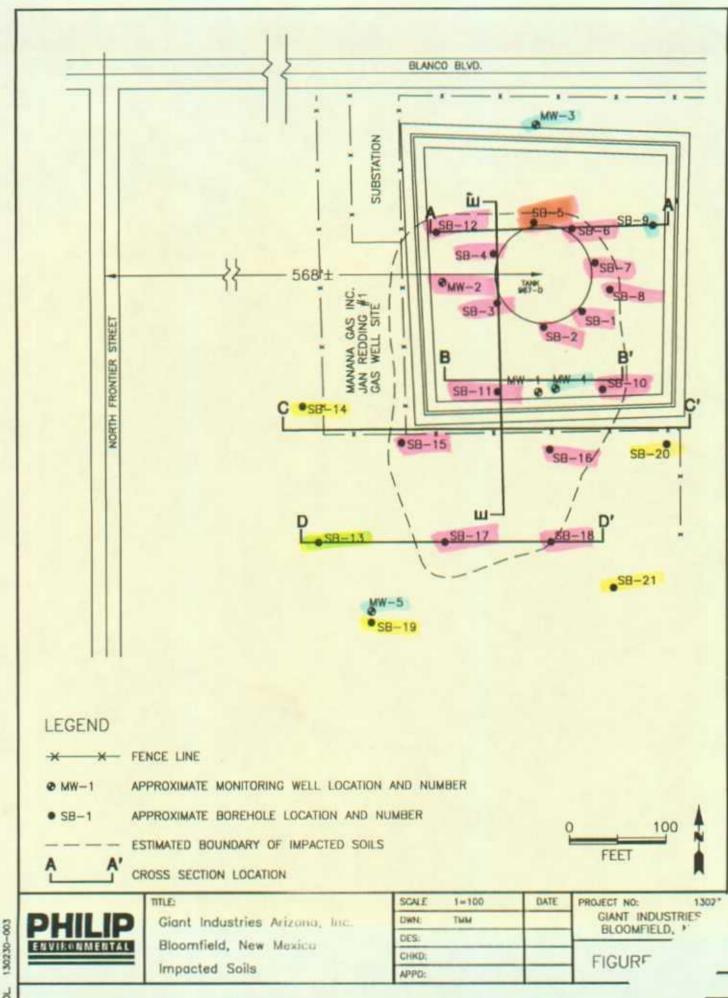
Project 13023



JUN 3 0 1995

Environmental Bureau Oil Conservation Division





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June, 1995

Giant Industries Arizona, Inc. Bloomfield, New Mexico

EXECUTIVE SUMMARY

This report summarizes the data collected in two phases of a site investigation at Giant Industries Arizona, Inc.'s Bloomfield Crude Station. This investigation is centered on Tank 967-D (the tank) on the western side of the station. In March of 1994, Giant discovered hydrocarbons in the vicinity of the tank. Giant contracted Philip Environmental Services Corporation to conduct a more extensive site investigation.

This investigation was completed in two phases: the first in September of 1994 and the second in April-of 1995. Data collected during these two phases indicate that soil and groundwater beneath the tank have been impacted by hydrocarbons. First phase soil sampling analytical results found hydrocarbons in the C6 through C34 range. An interval of contaminated soil, approximately 200 feet wide, extends southwest from the tank approximately 275 feet. The top of the impacted layer is approximately 8 to 12 feet below ground surface. This area of impacted soil appears to extend southwest off of Giant's property into an empty lot. Soil borings indicate that the impacted layer is approximately 12 feet thick below the edge of the tank, and gets progressively thinner until it tapers out to the southwest on the adjacent empty lot.

Monitoring wells were installed in both phases of the investigation. Samples collected from these wells indicate that groundwater has been impacted in one well (MW-2) located 110 feet west from the center of the tank. In the first sampling event completed in September 1994, groundwater samples collected were analyzed for general chemistry, purgeable halocarbons and aromatics, polynuclear-aromatic hydrocarbons, the 13 priority pollutant metals, and total petroleum hydrocarbons (TPH). Only TPH, benzene, toluene, ethylbenzene, and xylenes (BTEX), and small quantities of polynuclear aromatic hydrocarbons were detected. The TPH analyses found hydrocarbons in the C6 through C18 range. In the April 1995 sampling event, samples collected were analyzed for BTEX and TPH. In this sampling event, only MW-2 appeared to be impacted. Free-phase hydrocarbons were detected in MW-2 in both sampling events. This suggests that there is a free-phase hydrocarbon plume beneath the tank that may extend to the southwest, the apparent direction of groundwater flow. Off-site soil borings indicate that the free-phase plume does not extend off-site.

In general, the groundwater at the site is unsuitable for domestic supply, due to high concentrations of both sulfate and total dissolved solids (TDS). The general chemistry analytical results indicate TDS concentrations above New Mexico Water Quality Control Commission (NMWQCC) standards at all well locations, including upgradient well MW-3. Sulfate concentrations are also above the NMWQCC standard at all locations, with the exception of MW-2.

The groundwater data collected indicates that the shallowest saturated layers have been impacted by the hydrocarbons. These sandy, saturated layers appear to be relatively thin and discontinuous. Less permeable clay layers beneath the shallow saturated intervals may have slowed or prevented the downward movement of the hydrocarbons.

There are no known users, either domestic or industrial, of the shallow water at or downgradient of the site. Low anticipated well yield, poor chemical quality, and other existing sources are the probable reasons for the lack of production; possible future use of this water is unlikely.



1.0 INTRODUCTION

This report summarizes the information gathered in two phases of field investigation at the Bloomfield Crude Station in Bloomfield, New Mexico. The first phase was completed during the week beginning September 19, 1994. Eight soil borings were completed on the western side of the Bloomfield Crude Station (the site) around and directly adjacent to Tank 967-D (the tank). In the first phase, four monitoring wells were also installed in the vicinity of the tank.

The second phase took place during the week beginning April 24, 1995. Thirteen additional soil borings were completed to estimate the extent of the contaminated soil on the western side of the site and on the property adjacent to the site located to the south and the west. One monitoring well was installed outside the southwest boundary of the site, to monitor the estimated leading edge of the plume. This report compiles all of the information gathered to date.

1.1 SITE LOCATION

The site is located on the southwest corner of Blanco Boulevard and Fifth Street in the City of Bloomfield, San Juan County, New Mexico. The site is within the N1/2, NW1/4, NW1/4 of Section 22, Township 29 North, Range 11 West. A regional site location map is shown in Figure 1.

1.2 GEOGRAPHY

The site is located at the northern edge of the San Juan River flood plain, approximately 1.25 miles north of the San Juan River. The elevation at the site is approximately 5,480 feet above sea level. Average annual precipitation is 7 to 9 inches, with most of the precipitation falling in the winter months and during summer thunderstorms.

1.3 REGIONAL HYDROGEOLOGY AND GEOLOGY

The San Juan River Valley and its associated flood plain are relatively narrow, approximately 1.5 to 2 miles wide, in the vicinity of Bloomfield, New Mexico. The Tertiary Nacimiento Formation forms mesas on the north side of the river valley. These mesas rise up from the valley floor approximately one-half to three-quarters of a mile north of the site. A more complete description of the general geology and hydrogeology of the Bloomfield area is given in Giant's "Initial Site Assessment and Characterization Plan". The site-specific geologic and hydrogeologic conditions, as clarified in this investigation, will be described in this report.

1.4 SITE DESCRIPTION

The site covers an area of approximately 5.5 acres. Several tanks and buildings are present on the site, as shown on Figure 2. This investigation is centered on Tank 967-D, a 55,000-barrel storage tank that was constructed in 1956. This tank is not presently in



use. The tank is located in the western half of the site within a bermed area that is approximately 340 feet by 280 feet.

1.5 BACKGROUND

In March 1994 an excavation was made on the east side of the tank, to a depth of approximately 12 feet, using a backhoe. Soil samples were taken from the excavation and analyzed by Environmental Protection Agency (EPA) Method 8015 for total petroleum hydrocarbons (TPH) and by EPA Method 8020 for benzene, toluene, ethylbenzene, and total xylenes (BTEX). On March 15, 1994, the New Mexico Oil Conservation Division (NMOCD) was notified that hydrocarbons were found in the subsurface soil at the site. The results of this sampling are discussed in a report dated May 9, 1994, titled "Initial Site Assessment and Characterization Plan" for the Giant Bloomfield Station, that was prepared by Giant Industries Arizona, Inc. (Giant) and submitted to the NMOCD in May 1994. A letter dated June 23, 1994, from Giant to the NMOCD, clarified the site characterization work plan described in the May 9, 1995, report. In a letter dated August 19, 1994, NMOCD approved the work plan submitted by Giant. A more detailed account of the site's history is given in Giant's May 1994 "Initial Site Assessment and Characterization Plan".

On September 14, 1994, Giant contracted Philip Environmental Services Corporation (Philip) (formerly Burlington Environmental Inc.) to provide the first phase of a site investigation. During the week beginning September 19, 1994, Philip supervised the installation of four monitoring wells, MW-1 through MW-4, and eight exploratory soil borings, SB-1 through SB-8. Soil samples were collected from the soil borings, and groundwater samples were collected from the monitoring wells. A report titled "Site Assessment and Proposed Action Plan for the Bloomfield Crude Station, Bloomfield, New Mexico", dated January 1995, was generated from the information gathered in this phase of the site investigation. This report was submitted to the NMOCD. The January 1995 report included recommendations for a second phase of investigation. In a letter dated March 13, 1995, the NMOCD approved the recommendations for further investigation as described in the January 1995 report. During the week beginning April 24, 1995, Philip completed 13 soil borings, SB-9 through SB-21, and installed one Field headspace readings were taken with a monitoring well off-site, MW-5. photoionization detector (PID) on soil samples collected from all of the borings. Groundwater samples were collected from the newly installed well and from three of the four existing on-site wells.

The methods used to collect and analyze soil samples and groundwater are described in Section 2.1 of this report. Monitoring well installation procedures are described in Section 2.2 of this report. Monitoring well development and sampling methodology are described in Section 2.3 of this report.



2.0 METHODS OF INVESTIGATION

2.1 BOREHOLE DRILLING AND SAMPLING METHODOLOGIES

Soil borings SB-1 through SB-8, shown on Figures 2 and 3, were completed using a CME 75 drill rig equipped with 6.25-inch inside-diameter, hollow-stem augers. These borings were continuously cored using a 5-foot-long, 4-inch-diameter, split-barrel sampler. Soil borings SB-9 through SB-21 were completed using a CME 75 drill rig equipped with 4.25-inch inside-diameter, hollow-stem augers. These borings were continuously cored using 2-foot-long, 1.5-inch- diameter split spoons. Philip's field geologist described the lithology of the soil at each boring location on individual "Record of Subsurface Exploration" forms, included in Appendix A.

The soil cores from borings SB-1 through SB-8 were tested with a PID at 5-foot intervals, or at points where staining or hydrocarbon odor was noted. Soil cores from borings SB-9 through SB-21 were tested with a PID at 2-foot intervals, or at points as described above. Headspace readings were taken at these intervals by putting a portion of the core into a sealable plastic bag. The plastic bag was sealed and left in the sun for 10 to 20 minutes to volatilize any hydrocarbons present. After allowing the samples to sit in the sun, the PID was inserted into the bag and a headspace reading was taken. Drilling and sampling were discontinued when groundwater was encountered, when a clean soil interval was noted, or where a competent clay layer was encountered.

Drilling equipment and sampling tools were decontaminated prior to use at each boring location. Decontamination included cleaning the drilling equipment with an AlconoxTM soap solution followed by a potable water rinse. In the second phase of field investigation, the augers were steam cleaned between holes.

In the borings completed in the first phase, at each PID screening point, the core was split lengthwise; half of the core was placed into the plastic bag, and half was placed into a four-ounce glass sample jar with a Teflon[™]-lined lid. At each boring, the sample with the highest corresponding headspace reading was sent to the laboratory for analysis by EPA Method Modified 8015 for TPH, including quantification of both gasoline and diesel range hydrocarbons. Samples were preserved on ice for transport to the laboratory. Each sample collected was labeled with the boring number, sample interval depth, date, time of collection, and required laboratory analysis.

All soil samples collected were submitted to Analytical Technologies, Inc. (ATI) in Albuquerque, New Mexico, under strict chain-of-custody procedures.

2.2 MONITORING WELL INSTALLATION

The four monitoring wells completed in the first phase were installed within, or directly adjacent to, the bermed area around the tank. The monitoring well installed in the second



4

phase was completed outside the boundaries of the site, approximately two hundred feet southwest. The locations of these wells are shown on Figure 3.

Monitoring-well borings were advanced using the methods described in Section 2.1 of this report. Field screening was completed, but no soil samples from these borings were sent to a laboratory for analysis. The borings were advanced beyond the water table until a clean, competent clay unit was encountered. The wells were screened above the top of the clay. Details of well construction are given on the Well Installation Records included in Appendix B. Detailed lithologic information was recorded on "Record of Subsurface Exploration" forms also included in Appendix B.

The wells were screened in the following intervals:

- MW-1 from 5,470.73 feet to 5,480.73 feet
- MW-2 from 5,464.36 to 5,479.36 feet
- MW-3 from 5,467.49 to 5,482.49 feet
- MW-4 from 5,457.58 to 5,462.58 feet
- MW-5 from 5,453.96 to 5,468.96 feet

è

MW-1 was completed so as not to screen across a clay layer present at 15 feet that may confine hydrocarbons to the shallow soils. MW-4 was screened in a sand unit approximately 10 feet beneath the screened interval of MW-1. This screened interval was chosen to assess whether hydrocarbons had impacted water-bearing units beneath the clay between the completion depths of MW-1 and MW-4.

2.3 MONITORING WELL DEVELOPMENT AND SAMPLING METHODOLOGY

In the first phase, MW-1, MW-2, MW-3, and MW-4 were developed by raising and dropping a Teflon[™] bailer inside the well to surge water back and forth through the screen. At least three casing volumes were removed by bailing from MW-2, MW-3, and MW-4. ⁻Due to the lack of water in MW-1, following installation it was hoped that by vigorous development with distilled water, the well would produce water sufficient to sample. On September 22, 1994, 17 gallons of distilled water was introduced into the well. The distilled water was surged for approximately 30 minutes using a Teflon[™] bailer before being bailed out. Enough water was present in the well on September 23, 1994 to take a water-level reading with an electronic indicator. Groundwater samples were not collected from MW-1, due to the insufficient volume of water and the slow recovery of the well.

MW-5 was developed in the same manner described for MW-2, MW-3, and MW-4. Well development information for all wells was recorded on "Well Development and Purging Data" forms, included in Appendix C.

In both phases of the investigation groundwater samples were collected when the water being bailed from the wells was no longer silty and the temperature, pH, and conductivity readings stabilized. In the first phase, groundwater samples were collected at MW-2,



MW-3, and MW-4 in pre-preserved, 40-milliliter (ml) glass vials with Teflon[™]-lined caps (VOA vials) for analysis by EPA Methods 601 and 602 for purgeable halocarbons and aromatics. Two additional pre-preserved, VOA vials were filled for analysis for TPH by EPA Method Modified 8015. Two 1,000-ml glass bottles with Teflon[™]-lined lids were filled for analysis by EPA Method 610 for polynuclear aromatic hydrocarbons (PAHs). A pre-preserved, 1,000-ml plastic bottle was filled for analysis for the 13 priority pollutant metals by various EPA methods. These samples were stored on ice and transported for analysis to ATI.

Second phase groundwater sampling at MW-2, MW-3, MW-4, and MW-5 included collecting samples in pre-preserved, VOA vials for analysis by EPA Method 8020 for BTEX, and by EPA Method Modified 8015, for TPH. These samples were also stored on ice and transported for analysis to ATI.

In both phases, groundwater samples for general chemistry analysis were collected from all producing wells in 1,000-ml plastic bottles. These samples were stored on ice and transported for analysis to Inter-Mountain Laboratories, Inc. in Farmington, New Mexico.

All samples collected were submitted to the laboratories under strict chain-of-custody procedures. Water sampling data were recorded on "Water Sampling Data" forms included in Appendix D.



3.0 **RESULTS**

3.1 SITE LITHOLOGY

In the bermed area around the tank, a coarse to very coarse sand unit is present that extends from the surface to depths ranging from 4 feet beneath ground surface (bgs) to 11 feet bgs. This sand is well graded, angular to subangular, and is dry and loose. The surface sand unit grades into clayey sand or sandy clays. Information from the second phase of the investigation indicates that the surficial sand layer is also present in the empty lot to the south and the west of the site. Outside of the bermed area, the sand appears to thicken, extending to depths of 10 to 14 feet bgs.

Below the surface sand, it is more difficult to differentiate distinct layers. The clayey sand units grade into sandy clays over several inches. These fine-grained layers contain fine to medium sand and clay of low plasticity. They are medium-dense or stiff, and are usually moist.

Within the fine-grained layers are occasional coarse to very coarse, well-graded sand layers. These sand layers range from approximately 2 inches to 8 inches thick and are usually saturated. The thinner sand layers often occur in groups separated by 2-to 4-inch thick clayey layers. It appears that these sand layers transport the groundwater beneath the site. These sand layers cannot be definitively traced between holes and may be discontinuous.

A sandy clay or clay layer appears at depths ranging from 8 to 19 feet bgs. This layer is usually of low plasticity, stiff, and moist or damp. This layer appears to retard the downward movement of water and contaminants.

In the empty lot located to the south and the west, the lithology found in the soil borings is generally the same as that described above for the borings inside the berm. Most of the borings done outside the bermed area indicate a medium grained sand layer, approximately 0.5 to 2.5 feet thick, at depths ranging from 21 to 23 feet bgs. This layer is saturated and appears to carry water. A silty clay usually underlies this layer. The only boring with a notable difference in lithology is SB-20, which appears to contain more sand and have fewer and smaller clay-rich layers than the other borings.

3.2 SOIL SAMPLING RESULTS

Hydrocarbons were detected in all of the first phase borings. The PID headspace readings were recorded on the "Record of Subsurface Exploration" forms included in Appendix A. The laboratory analyses of the soil samples collected from borings SB-1 through SB-8 verify the presence of hydrocarbons in the subsurface. The laboratory analytical reports are included in Appendix E and are summarized in Table 1. The data from the soil borings indicate that the soil has been impacted on all sides of the tank. The locations of the first phase soil borings, SB-1 through SB-8, are shown in Figure 2; SB-9 through



Sample ID	C6 - C18 Range	C12 - C36 Range	Field Screenin
(Location-Depth)	mg/kg	mg/kg	NDU
SB-1-9.0	15	33	465
SB-2-12.5	1,300	1,300	432
SB-3-11.0	490	830	383
SB-4-16.5	4,900	3,200	305
SB-5-17.0	3,400	2,200	187
SB-6-5.0	180	78	236
SB-7-12.3	2,000	1,500	176
SB-8-12.0	550	410	202

SB12 are also shown on Figure 2. These soil borings were all located within 5 feet of the tank's wall, with the exception of SB-8, which was approximately 30 feet from the tank.

The locations of the soil borings completed in phase two, SB-9 through SB-21, are shown on Figure 4. In borings SB-9, SB-13, SB-14, SB-19, SB-20, and SB-21 no hydrocarbons were indicated in any of the samples' headspace readings. The information from the soil borings was used to delineate the approximate areal boundary of impacted soil shown in Figure 4. Although hydrocarbons were detected with the PID in SB-18, they were only visibly present in an interval approximately 1/3-foot thick at 17 feet bgs. For this reason, SB-18 is shown on the estimated boundary of impacted soil on Figure 4. Figure 5 includes cross sections showing the approximate vertical extent of the impacted soil.

equivalent to parts per million

In SB-1, SB-2, SB-6, and SB-7 the PID headspace readings suggest that soil not impacted by hydrocarbons is encountered at 14 to 15 feet bgs. SB-4 and SB-5 headspace readings indicate impacted soils extend to approximately 17 feet bgs. Headspace readings of samples taken from the MW-1 boring indicate impacted soils are present from 10 to 15 feet bgs (approximately 5,474 to 5,469 feet in elevation). MW-2 headspace readings indicate impacted soils are present from 9 to 15 feet bgs (approximately 5,474 to 5,468 feet in elevation). MW-3 headspace readings indicate that the soil in that boring was not impacted. At MW-4, no headspace readings were taken.

Information collected in the second phase of the field investigation further constrains the vertical extent of the impacted soil. The cross sections presented in Figure 5 use the information collected in the second phase to show the estimated extent of off-site impacted soil.



3.3 SITE HYDROGEOLOGY

On October 31, 1994, the depth to groundwater in MW-1 was measured with an ORS oil/water interface probe. The ORS probe indicated approximately 4 inches of water standing in the well. MW-2, MW-3, and MW-4 were also checked with the ORS probe on that date and only MW-2 had a measurable product layer. On April 27, 1995, depth to groundwater measurements were again taken with the ORS probe; as before, only MW-2 had a measurable product layer. It was noted that the water level in MW-1 had changed less than 1 inch since the measurement taken in October 1994. In MW-2, MW-3, and MW-4, water levels varied from 3 to 7 inches. This indicates that the water level measured in MW-1 does not reflect the elevation of the potentiometric surface, but is more likely standing water that has accumulated in the bottom of the well. For this reason MW-1 was not used to estimate the configuration of the potentiometric surface, shown on Figure 6 of this report. Water table elevations measured in both phases are shown in Table 2.

Well	10/31/94 Water Level	04/27/95 Water Level	10/31/94 Product Thickness	04/27/95 Product Thickness
MW-1	5470.49	5470.45	None	None
MW-2	2469.99	2469.50	0.11	0.47
MW-3	5473.57	5472.98	None	None
MW-4	5469.49	2469.77	None	None
MW-5	N/A	2464.58	None	None
Water leve	el elevation is given i	n feet above mean se	a level	

In light of the relatively similar lithologies noted in all of the borings, it is assumed that all of the wells are hydraulically connected. It is expected that the various clay and clayey sand layers will cause significant variations in the vertical and horizontal hydraulic conductivity. It is assumed that MW-1 is completed above the potentiometric surface. Figure 6 is a potentiometric surface map of the site, created using water level measurements taken with the ORS probe in MW-2, MW-3, MW-4, and MW-5. These four wells were used together, because they are screened in approximately the same interval — the shallow saturated zone. The water level in MW-2 for this figure was corrected for the influence of the product thickness.



The direction of groundwater flow in the shallow saturated zone is toward the southwest. The approximate hydraulic gradient is 0.020 ft/ft. Based on the gradient and flow direction of the saturated unit, as shown on Figure 6, MW-3 is upgradient of the site.

3.4 GROUNDWATER QUALITY

The results of the groundwater analytical testing are summarized in Tables 3, 4, 5, 6, 7, and 8. The laboratory analytical reports and quality assurance/quality control information are included in Appendix F.

• September 1994, Groundwater Sampling Results

The only compounds detected in the purgeable halocarbon and aromatic analyses (EPA Method 601/602) were BTEX. In the MW-2 sample all of the BTEX components were detected, but only benzene and total xylenes exceed the New Mexico Water Quality Control Commission (NMWQCC) standards. The MW-4 sample contained small quantities of benzene and total xylenes. The quantities detected in the MW-4 sample are well below the NMWQCC standards. None of the other purgeable halocarbons or aromatics were detected in any of the samples. These results, along with the NMWQCC standards, are summarized in Table 3.

The PAH analyses (EPA Method 610) detected PAHs only in the MW-2 sample. In this sample, the total of naphthalene plus monomethylnaphthalenes is 20.6 micrograms per liter (μ g/L). This is below the NMWQCC standard of 30 μ g/L for the sum of those parameters. Low levels of fluorene, phenanthrene, fluoranthene, and chrysene were also reported in the sample from MW-2; NMWQCC lists no standards for these parameters. These results are summarized in Table 4.

		RESULTS		
Well	Benzene μg/L	Toluene μg/L	Ethylbenzene μg/L	Total Xylenes μg/L
MW-3	<0.5	<0.5	<0.5	<0.5
MW-2	640	600	82	690
MW-4	2.1	<0.5	<0.5	1.2
NMWQCC Standards	10	750	750	620

None of the other purgeable halocarbons/aromatics were detected in any of the samples.



TABLE 4 - GROUNDWATER SAMPLING AROMATIC HYD	RESULTS, SEPTEN ROCARBONS (EPA		LYNUCLEAR
Units: µg/L	MW-3	MW-2	MW-4
Naphthalene	<0.50	8.9	<0.50
Acenaphthylene	<1.0	<1.0	<1.0
Acenaphthene	<0.50	<0.50	<0.50
Fluorene	<0.10	1.2	<0.10
Phenanthrene	<0.05	1.8	<0.05
Anthracene	<0.05	<0.05	<0.05
Fluoranthene	<0.10	1.2	<0.10
Pyrene	<0.10	<0.10	<0.10
Benzo(a)Anthracene	<0.10	<0.10	<0.10
Chrysene	<0.10	0.17	<0.10
Benzo(b)Fluoranthene	<0.10	<0.10	<0.10
Benzo(k)Fluoranthene	<0.10	<0.10	<0.10
Benzo(a)Pyrene	<0.10	<0.10	<0.10
Dibenzo(a,h)Anthracene	<0.20	<0.20	<0.20
Benzo(g,h,i)Perylene	<0.10	<0.10	<0.10
Indeno(1,2,3-CD)Pyrene	<0.10	<0.10	<0.10
1-Methylnaphthalene	< 0.30	5.9	<0.30
2-Methylnaphthalene	<0.30	5.8	<0.30
$\mu g/L = micrograms per liter$			

The TPH analysis of the MW-2 sample found 5 milligrams per liter (mg/L) of fuel hydrocarbons in the C6 through C18-hydrocarbon range. No hydrocarbons were detected in the MW-3 or MW-4 samples with this analysis. These results are summarized in Table 5.

The analyses of the 13 priority pollutant metals reported these constituents above detection limits only in the MW-2 sample. Chromium, copper, and zinc were detected in this sample. None of these parameters exceed the NMWQCC standards. These results are summarized in Table 6.



The general chemistry analysis results indicate high conductivity (4,250 microhms per centimeter [μ mhos/cm] to 5,420 μ mhos/cm) in all of the samples. Total dissolved solids (TDS) were also found to be high (3,020 mg/L to 4,710 mg/L) in samples from MW-2, MW-3 (upgradient), and MW-4. The NMWQCC standard for TDS in a domestic water supply is 1,000 mg/L. These results indicate a poor quality of groundwater for potable use. The samples from MW-3 and MW-4 exceed the NMWQCC domestic water supply standard for sulfate. The standard for sulfate is 600 mg/L, the MW-3 (upgradient) and MW-4 samples contained 1,920 mg/L and 2,470 mg/L, respectively. The sample taken from MW-2 contained 1,050 mg/L chloride, which exceeds the NMWQCC domestic water supply standard for chloride of 250 mg/L. These results are shown in Table 7 and on the laboratory analytical reports in Appendix F.

Well	September 1994 mg/L	April 1995 mg/L
MW-3	<1	<1
MW-2	5	3
MW-4	<1	<1
NMWQCC Standard	None	None



Well	Silver mg/L	Arsenic mg/L	Beryllium mg/L	Cadmium mg/L	Chromium mg/L
MW-3	<0.01	<0.005	< 0.004	<0.0005	< 0.01
MW-2	<0.01	< 0.005	<0.004	<0.0005	0.010
MW-4	<0.01	<0.005	<0.004	<0.0005	<0.01
NMWQCC Standard	0.05	0.1	No std.	0.01	0.05
	Copper mg/L	Mercury mg/L	Nickel mg/L	Lead mg/L	Antimony mg/L
MW-3	<0.01	<0.0002	<0.02	<0.002	<0.05
MW-2	0.012	<0.0002	<0.02	<0.002	<0.05
MW-4	<0.01	< 0.0002	<0.02	<0.002	<0.05
NMWQCC Standard	1	0.002	0.2	<0.05	No std.
	Seleni mg/		Thallium mg/L		Zinc mg/L
MW-3	<0.00)5	<0.005		0.023
MW-2	<0.00)5	<0.005		0.032
MW-4	<0.00)5	<0.005		0.026
NMWQCC Standard	0.03	5	No std.		10

No std. = No NMWQCC standard



	EMBER 1994, I					
Analyte	Units	MW-2	MW-3	MW-4	MW-5	WQCC
Lab pH	s.u.	6.6	7.1	7.0	6.9	6-9
Conductivity	µmhos/cm	4,920	4,250	5,420	6,000	No Std.
TDS	mg/L	3,049	3,413	4,389	4,410	1,000
Alkalinity as CaCO ₃	mg/L	957	521	576	775	No Std.
Sodium Absorption Ratio	ratio	11.785	8.147	10.886	8.84	No Std.
Bicarbonate as HCO ₃	mg/L	1,170	635	703	945	No Std.
Carbonate as CO ₃	mg/L	0	0	0	0	No Std.
Hydroxide	mg/L	0	0	0	0	No Std.
Chloride	mg/L	1,050	48	175	996	250
Sulfate	mg/L	245	1,920	2,470	1,390	600
Calcium	mg/L	325	439	439	634	No Std.
Magnesium	mg/L	30	37	53	51	No Std.
Potassium	mg/L	1.4	1.4	3.5	6.6	No Std.
Sodium	mg/L	828	661	907	861	No Std.
s.u. = standard units			•			
μ mhos/cm = micromhos pe	r centimeter					
mg/L = milligrams per liter						
WQCC = New Mexico Wat	er Quality Co	ntrol Comm	ission Stan	dard		
No Std. = No Standard						

• April 1995, Groundwater Sampling Results

Samples from MW-2, MW-3, MW-4, and MW-5 were analyzed by EPA Method 8020 for BTEX. A duplicate sample was collected for this analysis from MW-2 and designated MW-52. These results are summarized in Table 8. In the MW-2 sample and duplicate, all of the BTEX components were detected. No BTEX components were detected in any of the other samples.

*** 11			Ethylbenzene	Total Xylenes
Well	μg/L	μg/L	μg/L	μg/L
MW-3	< 0.5	<0.5	<0.5	<0.5
MW-2	220	280	53	430
MW-52 (MW-2 duplicate)	380	550	93	830
MW-4	< 0.5	<0.5	<0.5	<0.5
MW-5	< 0.5	<0.5	<0.5	< 0.5
NMWQCC Standards	10	750	750	620

The TPH analyses reported 3 mg/L in the MW-2 sample and 5 mg/L in the MW-52 (MW-2 duplicate) sample. No hydrocarbons were detected in the MW-3, MW-4, or MW-5 analyses. These results are summarized in Table 5.

The general chemistry analysis indicates that the water quality of samples collected from MW-2, MW-3, and MW-4 are essentially the same as the water quality of the samples collected in September 1994. The general chemistry of the sample collected from MW-5 indicates concentrations of TDS and chloride above NMWQCC standards.

The laboratory analytical reports for the April 1995 sampling event are included in Appendix F.



4.0 CONCLUSIONS

4.1 Soils Investigation Conclusions

The field screening data from the soil borings indicate that hydrocarbons are concentrated in the sandy clays or clayey sands beneath the dry, loose, surface-sand layer. Borings directly adjacent to the tank indicate that impacted soils extend to a depth of approximately 14 to 17 feet bgs. The average thickness of the impacted soils within the bermed area around the tank is approximately 9 feet. The top of this impacted layer is approximately 8 to 12 feet bgs. Headspace readings from all of the borings indicate that the hydrocarbons in the soil extend south and west from the tank. The direction of groundwater migration inferred from measured water levels in the monitoring wells (Figure 6), corroborates this direction of hydrocarbon migration. Figures 4 and 5 illustrate the estimated areal and vertical extent of the impacted soils, as indicated by the borings done to date.

4.2 **GROUNDWATER SAMPLING CONCLUSIONS**

The sampling events in September 1994 and April 1995 indicate that MW-2 has been impacted by hydrocarbons. The presence of a layer of product in MW-2 is further evidence that the groundwater at this site is impacted by hydrocarbons. All of the groundwater samples from MW-3, upgradient, indicate that the groundwater at that location has not been impacted. The results from the MW-4 sample collected in September 1994 indicated that the groundwater at that location may be slightly impacted, although the results were not reconfirmed in the April 1995 sample. It is possible that the BTEX detected at MW-4 in September 1994 was due to small amounts of hydrocarbons carried into the screened water-bearing zone during drilling or well installation, statistical variability, natural variations, or attenuation. The results obtained from MW-5 indicate that the effects of the hydrocarbon impact do not extend to MW-5's location.

If the tank is the source of the hydrocarbons, the direction of groundwater flow suggested by the potentiometric surface map (Figure 6) would indicate that the contaminant plume should migrate to the southwest. The results of the groundwater sampling suggest that MW-2 is in a free-phase hydrocarbon plume; MW-3, MW-4, and MW-5 appear to be outside this plume (Figure 6). In addition, dissolved-phase hydrocarbons were only confirmed in MW-2. This suggests that any dissolved-phase plume is also of limited areal extent.

The shallow water at the site appears to be perched, separated from underlying groundwater by clay units. Recharge to this perched zone is most likely from direct infiltration of rainfall from within the bermed area surrounding the tank, or from seasonal irrigation upgradient. The results of the groundwater sampling indicate that the groundwater quality in the saturated unit sampled by these four wells is not



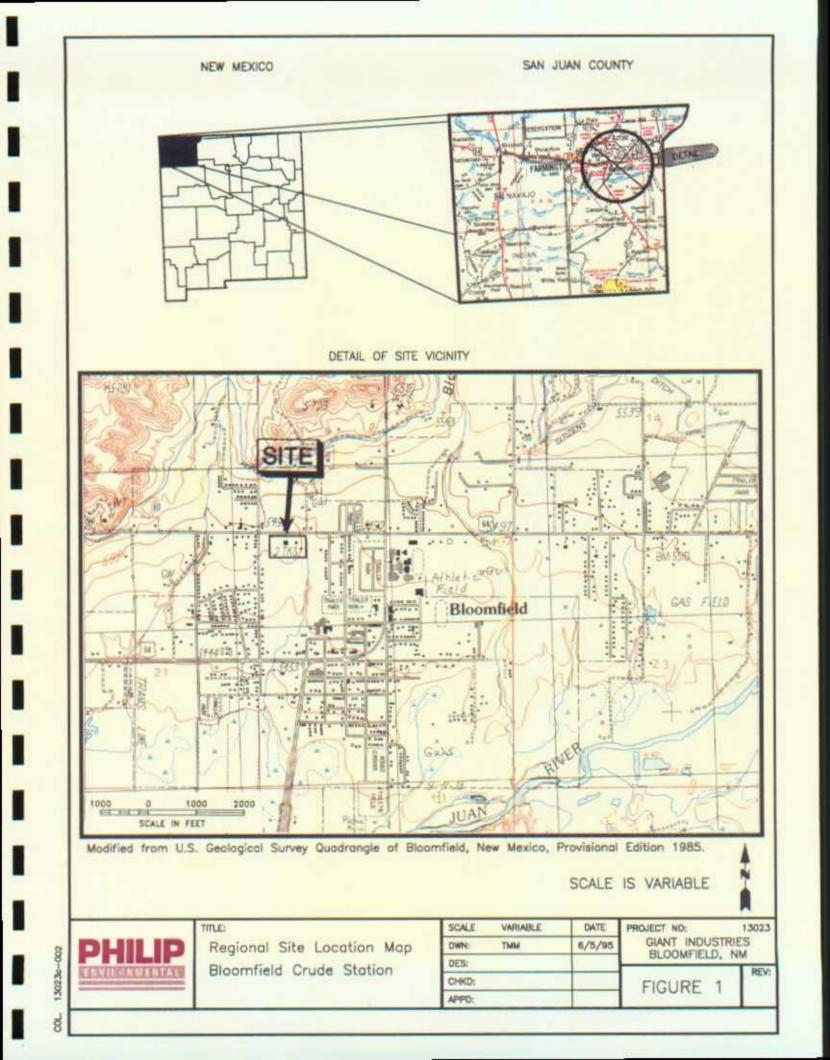
suitable for use as a domestic water supply, based upon high naturally occurring TDS and sulfate contents. There are no known users, either domestic or industrial, of the shallow water at or downgradient of the site. Low anticipated well yield, poor chemical quality, and other existing sources are the probable reasons for the lack of production; possible future use of this water is unlikely. Deeper groundwater resources, as seen in MW-4, do not appear impacted.

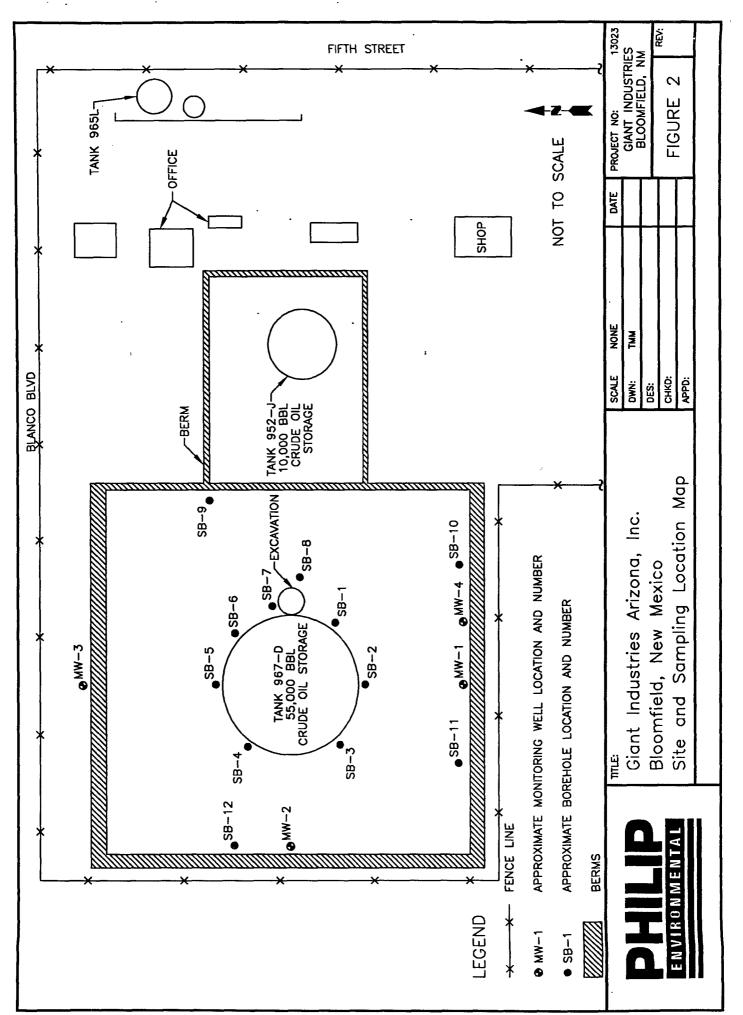


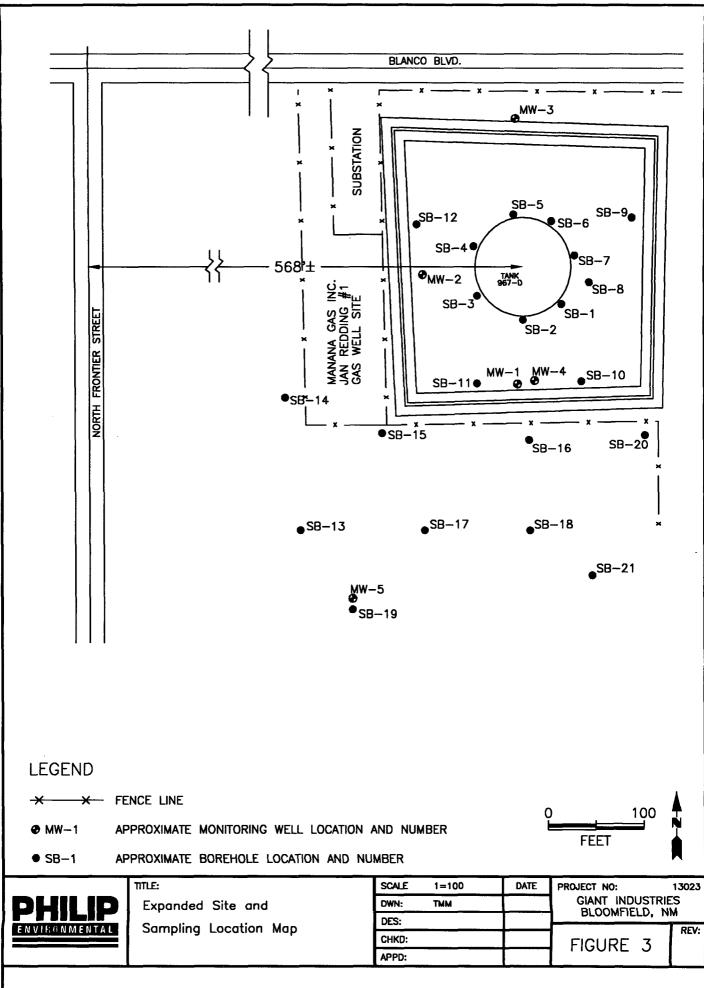
LIST OF FIGURES

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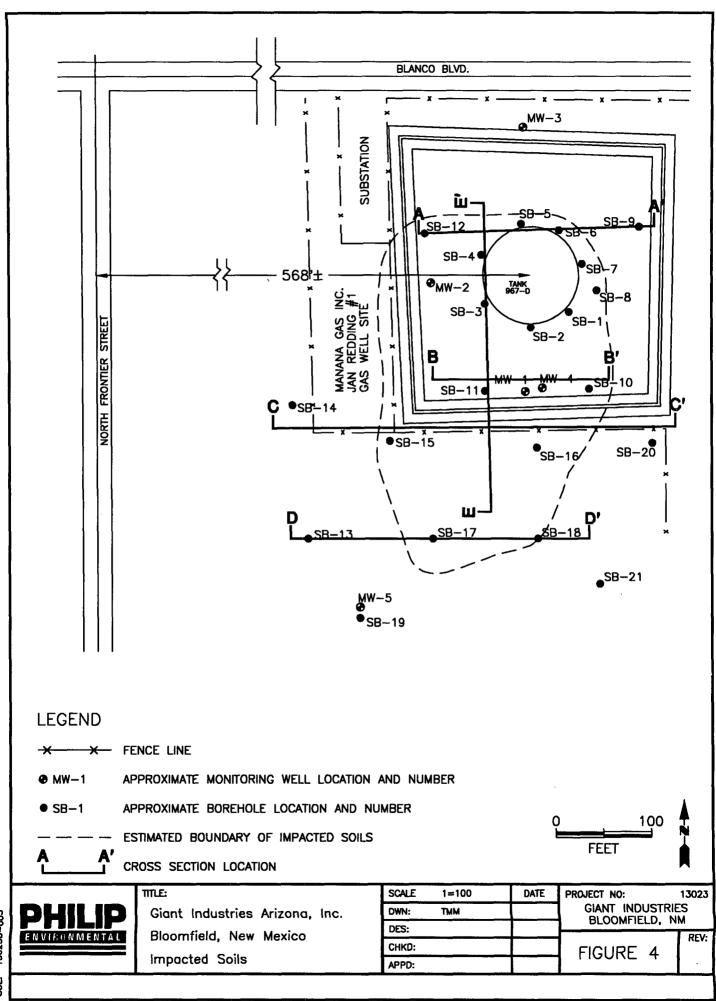
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				• • • • • •	REFERENCE PAGE
FIGURE 1 -	REGIONAL SITE LOCAT	fion Map			1
FIGURE 2 - S	SITE AND SAMPLING L	OCATION MAP			1, 3, 6, 7
FIGURE 3 - I	EXPANDED SITE AND S	SAMPLING LOCAT	ION MAP		3, 4
FIGURE 4 - I	IMPACTED SOILS				7, 15
FIGURE 5 -	IMPACTED SOIL CROS	S SECTIONS			7, 15
FIGURE 6 - /	Approximate Poten	TIOMETRIC SURF	ACE - APRIL 27,	, 1995	6, 8, 9, 15



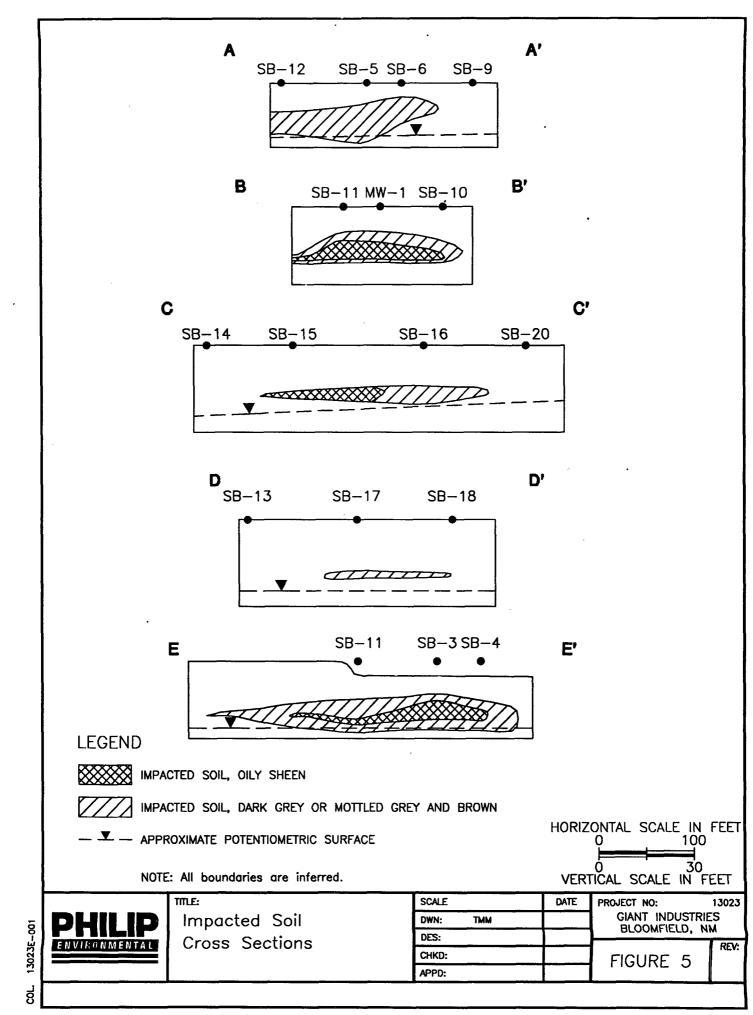


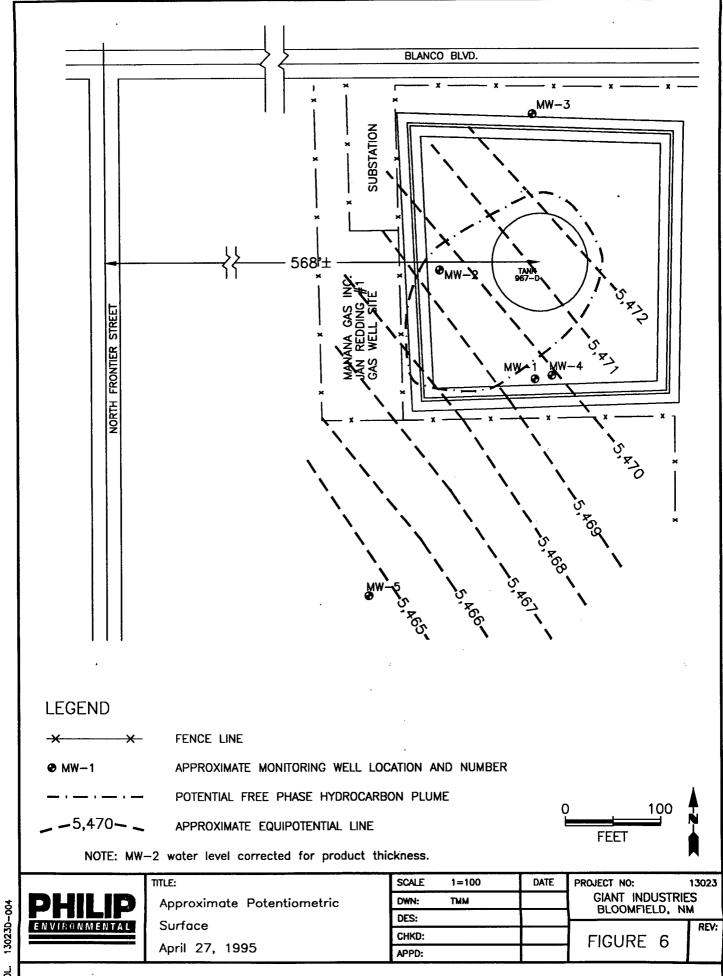


13023D-002 S



130230-003





APPENDIX A

"Record of Subsurface Exploration" Forms

BURLINGTON ENVIRONMENTAI
4000 Monroe Road Farmington, NM 87401

RECORD OF SUBSURFACE EXPLORATION

				Well No.
PROJ	ECT	NAME	:	Giant= Bloomfield PROJECT NO: 13023
ELEV			•	BOREHOLE LOCATION/COORDINATES: 581
LOGG	ED E	3Y:	<u>5. K</u>	GWL: depth date/timeGWL: depth
DRIL	LED	BY:	Rol	dgers 9 Co GWL: depth 9.60 date/time 9/19/94 1752
DRIL	LING	S/RIC	MET	THODS: <u>H54</u>
DATE	E/TIN	1E S1	TARTE	ED: <u>9/19/94, 1000</u> , DATE/TIME COMPLETION (S): <u>9/19/94, 1100</u>
				TYPE: PTD BZ = Breathing Zone: BH = Borehole: S = Sample
			1112	
문관	ៗត្រ	SAMPLE INTERVAL	ĒĒ	SAMPLE DESCRIPTION
DEPTH (feet)	SAMPLE		E € ≥	CLASSIFICATION SYSTEM (1565)
	0Z	ឹដ	ωŴ	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM (JSC.5) CLASSIFICATION (JSC.5) CLASSIFICA
-				SAND, SW, Fine 30%, coarse 700 SW Sand, locse, dry, light brown Well graded
-	}		.5	Sand, loose, dry, light brown
-			50	well graded
<u>.</u>	3.5		-	84 Jacobia ale
-			3Z	84 hydrocarbon odor
-5			3Z 50	
-				
h				8.0 446
8.0	8.0			CLAY CC. Displace in the second
	9.0			CLAY, SOFT, low plasticity CL 465 hydrocarbon odor
-10				Medium grey, moist 10.5
-		_	4.5	Olive-grey, well groded SW 11.4 ULLSRAID. (19258, 1058, 4127 SW 11.4
	11.5	1	50	11.45AND, COORSE, Vet, grey SW 125
 			<u> </u>	CLAY, Stiff, TOW PLOSTICITY TO MEDICI
	1		 	OK TOM, MOIST
_740	'			14.0 BOH.
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BURLINGTON ENVIRONMENTAL
4000 Monroe Road Farmington, NM 87401

RECORD OF SUBSURFACE EXPLORATION

	hell NU.
PROJECT NAME: Giant Bloomfield	PROJECT NO: 13023
ELEVATION: BOREHOLE LOCATION/COO	RDINATES: <u>5B-Z</u>
	y_ date/time _ 9/19/94 _ 1754
DRILLED BY: Kodgers GWL: depth	date/time
DRILLING/RIG METHODS: HSA	0/0/04/1700
DATE/TIME STARTED: <u>9/19/94</u> 1100 DATE/TIME	COMPLETION (S): <u>9/19/94, /200</u>
	hing Zone: BH = Borehole: S = Sample
	AIR AIR MONITORING HONITORING AND BLOK COUNTS) BZ BH S
HIGH HIGH	HONITORING AND
	(BLOK COUNTS)
54/17 (07550 69 - 100 (0750 6	
- 34 JAND, coarse 60% - very coarse 54 40%, locse, dry, lant. brown algant. well graded.	
30 St alglay W. Well graded.	
30 21	
-5	17 5.0
	110 8.0 228 Hydrog arbon odor skqli Hydrocarbon odor
	11.0 8.0 11 young 200 pz 4/1
-10 CLAY, soft low plasticity CL med-grey, moist.	Hydrocarbon odor
12.1 SAND-80% med. Sand, Frace Fines med. dense, moist, mottked black & grey 5W	121 125 432
dk. tan moist trace mod	- 140-0
-15 Sand.	140
14.0 - BOH	
COMMENTS:	

BURLINGTON ENVIRONMENTAL 4000 Monroe Road Farmington, NM 87401

RECORD OF SUBSURFACE EXPLORATION

										Well No.
PR0.	ECT	NAME	<u>: (</u>	riant- Bloomfield						PROJECT NO: 13023
	ATIC			BOREHOLE LOCATION	(COO	RDIN	ATES	:.5	<u>B-</u>	3
LOGGED BY: <u>5K</u> GWL: depth <u>13.5 T.D.</u> dry date/time <u>9/9/94</u> 1757										
				dgers GWL: depth		(date,	/tim	ie	· · · · · · · · · · · · · · · · · · ·
				THODS: <u>H3.4</u> ED: 9/19/94,1230 DATE/T						9/19/94 1315
	E/TIN									9/9/94 1315 Borehole: S = Sample
	MUN		LING	$TYPE: \underline{PID} = BZ = B$						DOLGUOIG' 2 - 2911016
Fa	មត្ត	SAMPLE INTERVAL	ЧРЕ П С	SAMPLE DESCRIPTION	SMBOL		AIR MONITORING UNITS <u>PARA</u> BZ - BH S			DRILLING CONDITIONS
DEPTH (feet)	NA N		₽ >.	-	S,	TH fee		ITORI S 00	ING	AND (BLOW COUNTS)
u-C	ωz		SA RCC	CLASSIFICATION SYSTEM	nscs	₿~	BZ BH S		<u> </u>	
-	1	1	<u> </u>	SAND, COBISE, LOOSE, dry Ight brown, well graded.	54	· · · · ·				·
	ł			Ight brown, well graded.						Au ZILEr ale
										At 3.4 ft, color changes to lightgre
						4.5		_	,	•
-5				4.5 Clayey SAND, loose, domp, light	5P-	4		4.5		Hydrocarbon odor in grey materia
-				grey,	5C					In grey - materia
,				77	ļ	<u>7.2</u>				
				Sandy CLAY, med sand-10%, stiff low plasticity, grex, moist	CL	_				
,		1				9.5	1]	500	Z77	
-10				Clayer SAND, med. firm, m damp	ISC				203	Clayey Sand has 1"-z" layers of coarse to very coar
•				grey wil black motifling-	<u> </u> ∧->	11.3	+	11.0		coarse to very coars
•				10~ 30 % 3 3 10	SC					At 127 fr. color
•					-	14.5		14.0	114	changes from grey
				14.5 BOH	+	1.0		19.0		changes from grey to lont. brown.
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4000 Monroe Road Farmington, NM 87401 RECORD OF SUBSURFACE EXPLORATION

												Well No.
PR0	ECT	NAME	<u> </u>	Giant Bloc	mfield							PROJECT NO: 13023
ELEV			•		BOREHOLE LOCA							4
LOGG	ed e	BY:	<u>5K</u>	, 	GWL: depth 15	5 T.O.	dry	<u> </u>	iate	/tin	ne <u>I</u>	/19/94 1759
DRIL	LED	BY: .	Ro	dgers	GWL: depth			(date	/tim	ne	9./19/94
		-		THODS: <u>HSH</u>								
1				ED: <u>9/19/94</u>		ATE/TI					-	
AIR	MON]	TOR:	ING	TYPE: <u>PIN</u>	B	Z = Br	eat	ning	Zor	ne: I	3H =	Borehole: $S = Sample$
DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE PECOV. (1n)		ESCRIPTION TEM <u>USC.S</u>		USCS SYMBOL	DEPTH CHNG (feet)	MON UNIT BZ	AIR ITORI S	ING 2711 S	DRILLING CONDITIONS AND (BLOW COUNTS)
-				5AND, COƏrse loose, dry, lqht graded.	brown, well	,	5W	4.1			5	Ar 2.0 ft color change from 1941 brown to Ight grex.
-5				clayey SAND, sand, loose, d to olive	fine and mi amp, lght g	ed. Trey	5W 5C			щ.0		Hydrocarbon odor- in grey material
\vdash				G- WHICH NY Y	Pa Lina to mad	den		8.Z		8.Z	229	Decasional
-				Sandy CLAY, IC stiff, low plaz grey	ticity. Ato	dam'	c				1-77	Layers of very coarse
-/0 - -				grey		P	5			10.0		Sand in this units 1"-4" thick. scarce gravel-fine to med. hear 15!
Ľ										רעו	116	
-15				SAND, coarse losse, wet, gro well graded	to very cool	rse 7,	5W	15.0			305	Strang budgesch
-												
- zo -				Sandy CLAY, 10 Sand, Soft, low light brown	% med to coa 1 plasticity, <	orse lamp	CL	<u>A</u> .Z		20 C	5	
				200 BOH		,						
-									c.			
- -												
<u> </u>												
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	O ^{ming}	ton, NN	A 87401								Borehole No 585 Well No.
E	LEV	ATIO	Nt	•	Giant Bloomfie BOREHOLE	LOCATION/COO	POIN	ATES:	. <u>5</u>	8-	PROJECT NO: 13023
D	RIL	LED		R	GWL: dep dg <u>er</u> GWL: dep HODS: <u>HS</u>	oth <u>14.5</u> oth					7/19/94 1802
D	ATE	/TIM	E ST	TARTI	ED: <u>9/19/94</u> 1430 TYPE: <u>PIED</u>	_ BZ = Breat	hing	Zone	e; B	H =	9 <i>119194 1530</i> Borehole: S = Sample
UEPTH 0	(feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (1n)	SAMPLE DESCRIPTIO	nscs swed	DEPTH CHNG (feet)	MONI UNITS BZ	AIR TORI -	NG K	DRILLING CONDITIONS AND (BLOW COUNTS)
					SAND, coarse to very loose, moist, lant bru groded.	v coarse in, well Sh					
	5.0						6.5		5.0	14	3.Z color changes From lahr brown to grey. Grey Material smells like hydroca
					sandy CLAY, Fine to me soft, med plasticity, o some plant material	ed sand by lamp, grey CL			8 .5	142	
	10.0								120	51	
	15.0				SAND, coarse to very loose, wet, dk grex, u	coarse 54	14.9	1	15-0	81	
-					loose, wet, dk grex, u	vell graded			17.0	187	
					Sandy CLAY, 10% med. + Sand, & Firm, low plasticity ZO.0 BOH	o coorse Mamp CL	18.3		aos	62	
										÷	
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4000 M Farmin	gton, NI		1	HEUUP		SUBSI	א זאך אנ		EAF			10	Bore	hole No.	
PROL	ÆCT	NAME	Ξ_(Fiant-Blo									PROJECT N	10: .130	23
ELEV			<u>.</u>			EHOLE LO								1803	{
LOGO	ED E	BY: 	<u>ZK</u> Pa	dgers		: depth. : depth.				date, date,			119199	1805	
				THODS: HS		. uepui.					/ נוו	<u>ہے۔</u> تا			
				ED: <u>9/19/</u>	<u>1540</u>)	DATE/T	IME	COMP	LETI	ON (S	5):	9/19/94	1615	
AIR	MONI	TOR	ING	TYPE:	2		8Z = B	reat	hing	Zon	e; E	3H =	Borehole;	S = Samp	ole
DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (1n)	SAMF CLASSIFICATION	LE DESC		5	uscs smea	DEPTH CHNG (feet)	MON UNIT	AIR ITORI S / /	NG 9111		G CONDITION AND W COUNTS)	IS
-				SAND, COD	rse to	very coo	arse,	5W						<u> </u>	
-				SAND, COD loose, don well grac	ied led	nt brou	n,	\mathcal{S}							
ŀ									<i>u.</i> 0						
+				clayey SAN Med. dense	D, fine	, and me	d. Jand	10			5.0	2 <i>3</i> 6	Hydroci in gre	arbond	odor
-5				med. dense	e, lght	greyto	grey	X			-		in gre	mate	erial.
									7.5						
	1			Sondy CLAY, Soft Med.				CL	9.4		10.0	53			
-10				Clayer SAN	D, San	12 75 26	tove.	50			10.0				
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[1			
-15				15.0	BOH	+		┼──			150	1	ţ		
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GEOLOGIST SIGNATURE

BURLINGTON ENVIRONMENTAL
4000 Monroe Road

Farmington, NM 87401

RECORD OF SUBSURFACE EXPLORATION

											Well No.
PROJECT NAME: Giant Bloomfield PROJECT NO: 13023											
ELEVATION: BOREHOLE LOCATION/COORDINATES: <u>5B-7</u>											
LOGG	ED E	3Y: 🚅	<u>5.</u> K	GWL: depth	_dry		(date	/tin	ne	7/19/94 1748
				dgers GWL: depth	/		(date	/tim	ne	
				THODS:		_			•		
DATE/TIME STARTED:											
				TYPE: PID							Borehole: S = Sample
					T						
ĘЭ	។ស	щ¥Г	ΨΞ	SAMPLE DESCRIPTION		SMB0.	Z D⊐		AIR		DRILLING CONDITIONS
DEPTH (feet)	25	SAMPLE INTERVAL	ר. קב			ŝ	Нee		ITOR:	ING Om	AND (BLOW COUNTS)
<u>u</u> _	SS	ω Π Ν	SAMP	CLASSIFICATION SYSTEM _USC	2	nscs	₿~		3 <u>4</u> 4	ING Ø <i>M</i> S	(BEON COONTS)
-	}		<u> </u>	SAND, COBISE to Very CO.	arse,			BZ [<u>. BH</u>	<u> S </u>	
-	}		} .	loose, damp, laht brou	UN	SW					lar to make and
F		1	ļ	well grodea.							color turns to grey
i.		1		•							at 3.6ft. grey Material has hydrocarbon odor.
-		1					4.5		4.5	43	hydrocarbon odor.
-5		1		clayer SAND, fine and m	1ed.				-1		occasional
-				sand 10%, soft, low pla med dense, light grey to	sticity,	5C			-		Layers of coarse sand 4"-8" thick
Ļ]]	med dense, ight grey 10	giey						sand 9-8. Thick
_											Hydracashing
-	ł									150	Hydrocarbon odor
-10	1								10.0	120	
	1	1	1		[· ·
	1		•				123		1-7 2	176	
-	1			same as above, but	-	5C			12		No Hydroczrbon
-				light brown in colo,	- 1	Ľ					odor-'
-15		1.		1					150	11	
-15				15.0 BOH							
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	4000 Monroe Road Farmington, NM 87401

												Well No.	
PB0.1	FCT	NAME	÷ (siant- Bl	oomfield	7		-				PROJECT NO: 1302	3
ELEV					BOREHOLE LO	CATION/	'C00f	DIN	ATES	<u>: 5</u>	R8		
LOGG			5K		GWL: depth.	11-	1 di	בא מ	late	/tim		7/19/94 1750	
DRILLED BY: Rodgers GWL: du								$\overline{}$	date	/tim	ne		
DRILLING/RIG METHODS: HSH													
DATE/TIME STARTED:								5					
AIR MONITORING TYPE: BZ = Breathing Zone: BH = Borehole: S = Samp								3					
ಕರ	ሣස	ᆈᆋ	1 L L	SAMPLE	DESCRIPTION		SMBOL	Ž Ď⊋	AIR			DRILLING CONDITIONS	
DEPTH (feet)	55	SAMPLE	ר. ב.≥				ŝ	Еe	AIR MONITORING UNITS <u>ppm1</u> BZ BH S			AND (BLOW COUNTS)	
	0Z	ωЯ Ц	SAMP	CLASSIFICATION SY	STEM USCS		nscs	₿~	0711	5 / /		(BCON COONTS)	
			<u> </u>	SANTZ CORTSE	to very coa	ISP.	<u> </u>		BZ	<u>. BH</u>	_5	· · · · · · · · · · · · · · · · · · ·	
-				SAND, CODISE loose, damp,	light Brown,	well	5W						
-	Į			graded.	,								
-			1										
-				JK9/9/				4.4		5.0	4	Crow material b:	a ≺
-5				clayer SAND,	Fine tomed. a	sand	SC			0.0		Grey material ha	ע ר
-				10%, Med. den. 5K 9/19/94	se, grey to	DIDCE	1						' •
-											100		
-								8.3		80	159	÷	
-				Sandy CLAY,	Fine to mec	. Sand	-1					This layer has occasional layer of coarse sand 4"-8" thick,	
- 16				Sandy CLAV, 10%, Stiff,	grey		$ \mathcal{O} $	1				occasional lavar	-<
L 'V					• •					170	202	of coarse sand	
								ł		12.0		4"-8" thick.	
								}	1		a		
-15								ł		15.0	96	4	
15				15.0 BO	H								
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COMM	ENTS	х <u> </u>					-						
												······································	

GEOLOGIST SIGNATURE _

Philip Environmental Services Corp.

4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation							
Borehole Location							
GWL Depth							
Logged By	S.Kelly						
Drilled By	M. Donohue						
Date/Time Started	4/24/95, 0845						
Date/Time Complet	ted 4/24/95, 1000						

Borehole #	SB-9	
Well #		
Page	1	of

1

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Project Name	Giant Bloom	field Tank						
Project Number	13023	Phase	####					
Project Location	5th St. and E	Blanco Blvd	, Bloomfield, NM					
Well Logged By	S. Kel							
Personnel On-Site	M. Donohue, K. Padilla							

Well Logged By
Personnel On-Site
Contractors On-Site
Client Personnel On-Site

Drilling Method <u>H</u> Air Monitoring Method

HSA od PID, CGI

			Sample			Depth				
Depth	Sample	Sample	Type &	Sample Description	USCS	Lithology	Ai	r Monitor	ring	Drilling Conditions
(Feet)	Number	Interval	Recovery	Classification System: USCS	Symbol	Change	ιι	Inits: NE	υ	& Blow Counts
			(inches)			(feet)	BZ	BH	s	
0				SAND, med to coarse, loose, light brown,	sw				1	
				damp, well graded						
									í	
									ļ	
5									1	
									1	
		6.5 -	.5/2.0						1	
		8.5	.0,2.0			7.5				
		8.5 -	7/2 0	silty CLAY, soft, med. plasticity, light	CL	·····			0	at 8.5
10		10.5	.772.0			10			ľ	at 0.5
⊢ '°		10.5 -	1 1 /	brown, damp, some fine organics- roots	~~~~				0	at 10.5
\vdash				sandy CLAY, med to fine sand - 30%, soft	CL					at 10.5
		12.5		light brown, some fine organics, damp						. 10 5
		12.5 -	.5/2.0						0	at 12.5
		14.5				4-				
15		14.5 -	.5/2.0			15			0	at 14.5
		16.5		SAND, med to coarse, loose, light brown	SW					at 16.5
<u>⊢</u>				trace clay to some clay, wet, well graded					0	at 16.5
				BOH at 16.5						
										Water at 13.7' in augers
20										after drilling.
									i	
25										
									Į	
									[
30										
									,	
35										
40										

Comments:

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

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Elevation	
Borehole Location	
GWL Depth	
Logged By S	5.Kelly
Drilled By	A. Donohue
Date/Time Started	4/24/95, 1045
Date/Time Complete	d 4/24/95, 1130

		Page	1 0	F 1	
Project Name	Giant Bloom	nfield Tank			
Project Number	13023	Phase	##	# #	
Project Location	5th St. and	Blanco Bive	d, Bloom	field,	NM

S. Kelly

M. Donohue, K. Padilla

Borehole # Well #

SB-10

of 1

Contractors On-Site Client Personnel On-Site

Well Logged By

Personnel On-Site

HSA **Drilling Method** Air Monitoring Method

PID, CGI

			Sample			Depth				
Depth	Sample	Sample	Type &	Sample Description	USCS	Lithology		ir Monito	-	Drilling Conditions
(Feet)	Number	interval	Recovery	Classification System: USCS	Symbol	Change		Units: N		& Blow Counts
			(inches)		014	(feet)	BZ	вн	s	
° °				SAND, med to coarse, loose, light brown,	sw					
				damp, well graded						1
_										
										}
5										
		7.0 -	.4/2.0							1
		8								
10		9.0 -	1.3/			9.9			6	at 9.0
		11		Silty CLAY, 25% silt, soft, grey, damp,	CL	10 -			500	
			1.2/	hydrocarbon odor	0.14	10.5			508	at 11.0
		13		Clayey SAND, fine to med sand, grey,	SW-	11.0				
15		13.0 -	.8/2.0	damp, hydrocarbon odor	SC	11.9			23	at 13.0
¹		15 15.0 -		Silty CLAY, same as above, but firm,	CL				2788	at 15.0
\vdash				hydrocarbon odor, with some sandy		16.5			2788	at 15.0
		17_		intervals .1' to .2' thick	SW	10.5			3703	at 17.0
				SAND, fine to med, loose, olive grey, wet, hydrocarbon odor	377				3703	PID reads "overrange"
<u> </u>				BOH at 17.0						at 15.0 and 17.0.
<u> </u>				BOH at 17.0						
										Water encountered at
—										approx. 16.5
-										approx. 10.5
25										
23										
-										
30										
⊢										
35				•					l	
40										
· · · · · ·										1

Comments:

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation			· · · ·	
Borehole Location				
GWL Depth				
Logged By	S.K	lelly		
Drilled By	м.	Donohue		
Date/Time Started		4/24/95,	1245	
Date/Time Comple	ted	4/24/	95, 1330	

Well #
Page

Giant Bloomfield Tank

13023

Borehole #

Phase

5th St. and Blanco Blvd, Bloomfield, NM

SB-11 of

3001

1

1

Project Number

Project Name

Well Logged By

Project Location

S. Kelly M. Donohue, K. Padilla

Personnel On-Site **Contractors On-Site Client Personnel On-Site**

Drilling Method Air Monitoring Method

HSA PID, CGI

			Sample		USCS	Depth				
Depth	Sample	Sample	Type &	Sample Description		Lithology		ir Monito Units: N	-	Drilling Conditions
(Feet)	Number	Interval	Recovery (inches)	Classification System: USCS	Symbol	Change (feet)	BZ	BH	s s	& Blow Counts
0			(inches)	SAND, med to coarse, loose, light brown,	sw	(reet)	D2		<u> </u>	
Ŭ				damp, well graded	011					
			{	uamp, wen graueu	1			[({ ·
			1					}	1	
┝										
5										1
j – ľ										
					1					
-		6.5 -	.5/2.0	1		8			Į	
		8.5		clayey SAND, fine sand, med density	SP-SC			ĺ	1	
10		8.5 -	.75/	damp, grey-olive, less clay toward 11.0.	31-30				66	at 9.0
		11	2	Hydrocarbon odor	1				00	at 5.0
		10.5 -	0.35		1			1	1526	at 11.0
		12.5	0.35						7520	
		12.5 -							2071	at 13.0
15		14.5							30/1	at 15.0
F ~~		14.5 -	.2/2.0		í – – – – – – – – – – – – – – – – – – –	16			[[
		16.5	.2/2.0	SAND, med to fine, loose, wet, olive grey	sw					
		16.5 -	1.4/	strong hydrocarbon odor, oily sheen,	0,11				2000	at 16.5
- ·		18.5	2	has some clay rich layers	1				2000	at 10.0
20				BOH at 18.5	í,				21	at 18.5
				5011 42 10.0					- '	
<u>⊢</u>										
-										PID reads "overrange"
										at 11.0, 13.0 and 16.5.
25										
										At apprx. 17.0', color
F										turns to light brown.
			[
30										
35			ļ							
			1							
40					1					ĺ

Comments:

Philip Environmental Services Corp. 4000 Monroe Road

Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation	
Borehole Location	
GWL Depth	
Logged By	S.Kelly
Drilled By	M. Donohue
Date/Time Started	4/24/95, 1415
Date/Time Comple	ted 4/24/95, 1500

	Borehole #		SB-12				
	Well #						
	Page	1	of	1			
Giant Bloom	nfield Tai	nk					

CD 11

3000

Project Number
Project Location
Well Logged By

Personnel On-Site

Project Name

S. Kelly

13023

HSA

M. Donohue, K. Padilla

Phase

5th St. and Blanco Blvd, Bloomfield, NM

Contractors On-Site Client Personnel On-Site

Drilling Method Air Monitoring Method

PID, CGI

										1
[[Sample		ſ	Depth				1 1
Depth	Sample	Sample	Type &	Sample Description	USCS	Lithology		ir Monite		Drilling Conditions
(Feet)	Number	Interval	Recovery	Classification System: USCS	Symbol	Change		Units: N	DU	& Blow Counts
			(inches)			(feet)	ΒZ	BH	S	
0				SAND, med to coarse, loose, light brown,	SW					
				damp, well graded						
			ļ .]					-
5										
						•				
		7.0 -	.7/2.0			` 8.5				
			.772.0			0.5				
		9		same as above, with hydrocarbon odor,	ſ					
10		9.0 -	.7/2.0	more fines		9.5			909	at 9.0
		11		sandy CLAY, 25% fine sand, soft, low	CL					
1		11.0 -	.9/2.0	plasticity, olive grey, damp, hydrocarbon	1				2066	at 11.0
		13		odor		12.5				
				SAND, fine, 15% silt, loose, olive grey,	sw				2624	at 13.0
					500				2024	at 13.0
15		14.0 -		damp, hydrocarbon odor		15				
		16		same as above with more clay, olive						1
				brown						
				BOH at 16.0'					4	at 16.0
20										}
20 L										
										{
										PID reads "overrange"
										at 11.0, 13.0 and 16.5.
25										
25										
							-			
					l		-			
										1 1
30										
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										L

Comments:

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation	
Borehole Locatio	n
GWL Depth	
Logged By	S.Kelly
Drilled By	M. Donohue
Date/Time Start	ed 4/25/95, 0850
Date/Time Com	bleted 4/25/95, 1015

Borehole	ə #
Well #	

SB-13

of 1

Page 1

Giant Bloom			
13023	Phase	3001	
5th St. and	Blanco Blvd,	Bloomfield,	NM
	13023		

S. Kelly

M. Donohue, K. Padilla

·· ·
Personnel On-Site
Contractors On-Site
Client Personnel On-Site

Well Logged By

Drilling Method HSA Air Monitoring Method

PID, CGI

					<u> </u>	D				· · · · · · · · · · · · · · · · · · ·
			Sample			Depth				
Depth	Sample	Sample	Type &	Sample Description	USCS	Lithology		ir Monito	-	Drilling Conditions
(Feet)	Number	Interval	Recovery	Classification System: USCS	Symbol	Change		Units: N		& Blow Counts
			(inches)			(feet)	BZ	BH	<u>s</u>	
° °				silty SAND, med to fine sand, 5% silt	sw					
				loose, light brown, damp, well graded						
								1	1	
			1					ł		1
5										
									0	at 5.0
			ļ							j j
		6.5 -	.95/					ł		
		8.5	2]	0	at 8.5
10		8.5 -	.4/2.0	becomes richer in clay - approx. 10% at					Ŭ	
I		10.5		10.5'					0	at 10.5
			.65/	10.5					0	at 10.5
		10.5 -		line eres instants station in stations						
		12.5		Has some intervals richer in clay, some						
		12.5 -	No	richer in sand, difficult to see due to poor				i		
15		14.5	rec.	recovery.						
		14.5 -	.7/2.0							
		16.5							1	at 16.5
		16.5 -	.6/2.0							
		18.5				19		1	3	at 18.5
20		19.0 -	.8/2.0	CLAY, soft, med plasticity, light brown	CL					
		21		damp, grading to sandy clay at 21.0 with				1	3	at 21.0
		21.0 -		25% fine sand		22				
		23		silty SAND, fine to med sand, loose, light	SP-SM			1		Water at approx. 21.5.
				brown, wet, well graded						
25				BOH at 23.0	í			[
										1 1
30										
							ĺ			
										j j
35										
										1
			1		1					{
										1
40										1
								_		

Comments:

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401

(505) 326-2262 FAX (505) 326-2388

Elevation	
Borehole Location	
GWL Depth	
Logged By S	.Kelly
Drilled By	I. Donohue
Date/Time Started	4/25/95, 1110
Date/Time Complete	d 4/25/95, 1210

Borehole #	SB-14
Well #	
Page 1	of 1
Discusticated Tamb	

Project Name	Giant Bloom	field Tank	
Project Number	13023	Phase	3000
Project Location	5th St. and	Blanco Blvd	
Well Logged By	S. Ke	lly	

Personnel On-Site	M. Donohue, K. Padilla
Contractors On-Site	

Client Personnel On-Site

Drilling Method Air Monitoring Method

HSA PID, CGI

			Sample		1	Depth					
Depth	Sample	Sample	Type &	Sample Description	USCS	Lithology		onitori	-		g Conditions
(Feet)	Number	Interval	Recovery	Classification System: USCS	Symbol	Change		s: ND		& BI	ow Counts
			(inches)	SAND, med to fine sand, loose	sw	(feet)	BZ	BH	S	<u> </u>	·
° ۱					300]					
				light brown, dry, well graded						1	
				occasionally includes some clay							
								1			
5)				ļ	
										1	
10		9.5 -	.4/2.0]	
		12									
		11.5 -	.65/						3	at 11.5	
		13.5	2			13					
		13.5 -	.35/	silty CLAY, 15% silt, firm, low plasticity,	CL				3	at 13.5	
15		15.5	2	light brown, moist							
		15.5 -	.8/2.0						4	at 15.5	
		17.5				17					
		17.5 -	.65/	clayey SAND, 10% clay, loose, light	SC				4	at 17.5	
		19.5	2	brown, moist, well graded]	18.5					
20		19.5 -		silty CLAY, same as above	CL				3	at 19.5	
		21.5									
		21.5 -	1.3/			22.5			3	at 21.5	Med. sand
		23.5		silty CLAY, 15% silt, 5% fine sand, firm,	CL						layer at
		23.5 -		non-plastic, light olive grey, moist		23.5			4	at 23.5	apprx. 21.5
25		25.5		SAND, fine to med sand, 15% silt, loose,	SW-SM						2.5, wet
				light brown, wet, poorly graded							
				BOH at 25.5	រ					Water at a	рргох. 21.5
				Don de Loio							pproxi 2110
30					ł					1	
⊢ "								1			
								1			
35				· ·				1			
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					J						
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I	-				L					L	

Comments:

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation		
Borehole Location	n	
GWL Depth		
Logged By	S.K	elly
Drilled By	M. (	Donohue
Date/Time Starte	ed	4/25/95, 1330
Date/Time Com	leted	4/25/95, 1430

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Borehole	• #	SB-1	5	
Well #				
Page	1	of	1	

3000

Giant Bloomfield Tank Project Name 13023 Project Number 5th St. and Blanco Blvd, Bloomfield, NM **Project Location** 

S. Kelly

M. Donohue, K. Padilla

Phase

**Contractors On-Site** Client Personnel On-Site

Well Logged By

Personnel On-Site

**Drilling Method** Air Monitoring Method

PID, CGI

HSA

										····
			Sample			Depth				
Depth	Sample	Sample	Type &	Sample Description	USCS	Lithology		Monitor		Drilling Conditions
(Feet)	Number	Interval	Recovery	Classification System: USCS	Symbol	Change		nits: ND		& Blow Counts
			(inches)		- CW	(feet)	BZ	8H	<u>s</u>	<u> </u>
P 0				SAND, med to fine sand, loose	sw					
				light brown, dry, well graded						
			1		1				1	
									ĺ	
					[					
5					1	1				
					I.					]
10		9.5 -	.4/2.0	increasing clay content toward 11.5' to	1					
		12		approx. 5%	1					
	- 1	11.5 -	.65/		1	i i			6	at 11.5
		13.5	.00, 2			13			Ŭ	
		13.5 -		silty CLAY, 15% silt, 5% fine sand, soft	CL				3	at 13.5
15		15.5	2	non plastic, light brown, moist		15.5			Ŭ	
⊢— '°		15.5 -		silty SAND, med to fine sand, 5% silt,	SW-SM				3	at 15.5
		17.5		loose, dark olive grey, wet with oily sheen		1			Ŭ	10.0
I		17.5 -		hydrocarbon odor		17.3			382	at 17.5
<u> </u>		19.5			ML				302	
⊢ ₂₀		19.5	_2	sandy SILT, 10% fine sand, 5% clay,soft, light brown, moist	IVIL				3	at 19.5
⊢					{	2			3	a( 15.5
			[	BOH at 19.5	1					
					1					
25										
		:								
30	J									ļ
	(		í í		í – – –					
35										
										1
- 40										
└ <u></u> ~~										
		_			I					I

Comments:

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

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Elevation	
Borehole Location	
GWL Depth	
Logged By	S.Kelly
Drilled By	M. Donohue
Date/Time Started	4/25/95, 1515
Date/Time Complet	ed 4/25/95, 1600

		Page	1	of 1	·······
Project Name	Giant Bloon	nfield Tank			
Project Number	13023	Phase		3001	
Project Location	5th St. and	Blanco Bly	/d, 8	loomfield,	NM
Well Logged By	<u>S. Ke</u>	elly			
Personnel On-Site	M. D	onohue, K	. Pac	lilla	
Contractors On-Site					

Borehole #

**Client Personnel On-Site** 

HSA Drilling Method Air Monitoring Method

PID, CGI

Depth (#et)     Sample Number     Sample Inserve Number     Sample Recovery Recovery Bight brown, dry, well graded     USCS Symbol Symbol Symbol (Eet)     Lagent USCS USC (Eet)     Lagent USCS (Eet)     At Maritering USCS (Eet)     At Maritering USCS (Eet)     Diffield (Eet)     Diffield USCS (Eet)     At Maritering USCS (Eet)     Diffield (Eet)	<b></b>										<u> </u>
(Fest)         Number         Instant         Instant         Classification System: USCS         Symbol         Chance (red)         Unter: NUL (red)         A Blow Courts           0         0         1         0         30         5         ALD, med to fine sand, loose light brown, dry, well graded         SW         1         1         4         1         4         1         4         1         4         1         4         1         4         1         5         4         1         4         1         4         1         4         1         5         4         1         4         1         5         4         1         4         1         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         5         6         6         1         1         4         1         1         1         1         1         1         1         1         1	<b>í</b> 1			Sample		1	Depth				
Image: Content of Content of Content of the sand, loose         Image: Content of Content										-	
0     SAND, med to fine aand, loese light brown, dry, well graded     SW     11       10     9.5 - 4/2.0 12     11     11       11.5     .65/ 13.5     silty CLAY, 15% silt, soft, light brown, 13.5     11       13     2     moist       13.5     .35/ 15.5     same as above but dark gry color, in 15.5     13.4       15.5     15.5     17.5       17.5     .8/2.0       17.5     .8/2.0       17.5     .8/2.0       17.5     .8/2.0       19.5     2       20     20       21     SAND, med to fine sand, 5% silt, loose, light brown, wet, well graded       20     21.5       21.5     SAND, med to fine sand, 5% silt, loose, light brown, wet, well graded       30     30       31     at 23.5	(Feet)	Number	Interval		Classification System: USCS	Symbol					& Blow Counts
5     ight brown, dry, weil graded     11       10     9.5 - 4/2.0     11       11.5     .65/     sity CLAY, 15% sit, soft, light brown, 13.5     2       13.5     2     moist     13.4       13.6     .35/     15.5 to 17.5 smples, color appears to be     CL       15     15.5 to 17.5 smple, color appears to be     CL       17.5     .66/     15.5 to 17.5 smple, color appears to be       17.5     .65/       19.5     2       20     2       21     SW       21     SW				(inches)			(feet)	BZ	вн	<del>, s</del>	l
5       9.5 - 4/2.0         10       9.5 - 4/2.0         11.5 - 6.67       silty CLAY, 15% silt, soft, light brown, CL         13.5       2         13.5 - 3.57       2moist         13.5 - 3.57       2 moist         15.5 - 2.15.5 to 17.5 sample, color appears to be       11.42         17.5 - 15.7       mottled brown/grey.         17.5 - 17.5 - 17.5 - 2       21         20       21         21       21         22.5 - 23.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5 - 11.5	° °					sw					1
10       9.5 - 4/2.0 12       11         11.5 - 65/ 13.5 - 3/2.0 15       silty CLAY, 15% silt, soft, light brown, 13.5 - 2 15.5 2       CL       11         15       15.5 - 3/2.0 17.5 - 65/ 19.5 - 2       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       1142 at 13.5         20       19.5 - 65/ 19.5 - 3/2.0       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       134 at 19.5         20       21       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       30         20       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       4       at 23.5         30       30       30       30       30       30       30       30					light brown, dry, well graded				-		
10       9.5 - 4/2.0 12       11         11.5 - 65/ 13.5 - 3/2.0 15       silty CLAY, 15% silt, soft, light brown, 13.5 - 2 15.5 2       CL       11         15       15.5 - 3/2.0 17.5 - 65/ 19.5 - 2       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       1142 at 13.5         20       19.5 - 65/ 19.5 - 3/2.0       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       134 at 19.5         20       21       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       30         20       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       4       at 23.5         30       30       30       30       30       30       30       30											
10       9.5 - 4/2.0 12       11         11.5 - 65/ 13.5 - 3/2.0 15       silty CLAY, 15% silt, soft, light brown, 13.5 - 2 15.5 2       CL       11         15       15.5 - 3/2.0 17.5 - 65/ 19.5 - 2       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       1142 at 13.5         20       19.5 - 65/ 19.5 - 3/2.0       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       134 at 19.5         20       21       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       30         20       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       4       at 23.5         30       30       30       30       30       30       30       30											
10       9.5 - 4/2.0 12       11         11.5 - 65/ 13.5 - 3/2.0 15       silty CLAY, 15% silt, soft, light brown, 13.5 - 2 15.5 2       CL       11         15       15.5 - 3/2.0 17.5 - 65/ 19.5 - 2       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       1142 at 13.5         20       19.5 - 65/ 19.5 - 3/2.0       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       134 at 19.5         20       21       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       30         20       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       4       at 23.5         30       30       30       30       30       30       30       30						J					j
10       9.5 - 4/2.0 12       11         11.5 - 65/ 13.5 - 3/2.0 15       silty CLAY, 15% silt, soft, light brown, 13.5 - 2 15.5 2       CL       11         15       15.5 - 3/2.0 17.5 - 65/ 19.5 - 2       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       1142 at 13.5         20       19.5 - 65/ 19.5 - 3/2.0       15.5 to 17.5 sample, color appears to be motiled brown/grey.       CL       134 at 19.5         20       21       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       30         20       21.5 - 10.5 sample, color appears to be motiled brown, wet, well graded       SW       4       at 23.5         30       30       30       30       30       30       30       30											
12       11.5       .65/       silty CLAY, 15% silt, soft, light brown,       11         13.5       2       moist       13.4       11.5         13.5       2       moist       13.4       13.4         15.5       2       15.5 to 17.5 sample, color appears to be mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       21         17.5       .85/1       19.5 2       21         20       21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW         21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW       4         30       30       35       35       35       4						1					
12       11.5       .65/       silty CLAY, 15% silt, soft, light brown,       11         13.5       2       moist       13.4       11.5         13.5       2       moist       13.4       13.4         15.5       2       15.5 to 17.5 sample, color appears to be mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       21         17.5       .85/1       19.5 2       21         20       21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW         21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW       4         30       30       35       35       35       4	┨┝────│								ļ		
12       11.5       .65/       silty CLAY, 15% silt, soft, light brown,       11         13.5       2       moist       13.4       11.5         13.5       2       moist       13.4       13.4         15.5       2       15.5 to 17.5 sample, color appears to be mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       21         17.5       .85/1       19.5 2       21         20       21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW         21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW       4         30       30       35       35       35       4	<b>i</b>										
12       11.5       .65/       silty CLAY, 15% silt, soft, light brown,       11         13.5       2       moist       13.4       11.5         13.5       2       moist       13.4       13.4         15.5       2       15.5 to 17.5 sample, color appears to be mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       21         17.5       .85/1       19.5 2       21         20       21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW         21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW       4         30       30       35       35       35       4						l			1	1	
12       11.5       .65/       silty CLAY, 15% silt, soft, light brown,       11         13.5       2       moist       13.4       11.5         13.5       2       moist       13.4       13.4         15.5       2       15.5 to 17.5 sample, color appears to be mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       CL       13.4         17.5       .82.0       mottled brown/grey.       21         17.5       .85/1       19.5 2       21         20       21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW         21.5       SAND, med to fine sand, 5% silt, loose, ight brown, wet, well graded       SW       4         30       30       35       35       35       4											
11.5       .65/ 2       silty CLAY, 15% silt, soft, light brown, moist       CL       13.4         13.5       .2       moist       13.4         13.5       .35/       same as above but dark grey color, in 15.5       13.4       11.42       at 13.5         15       15.5       .8/2.0       mottled brown/grey.       CL       13.4       142       at 13.5         17.5       .8/2.0       mottled brown/grey.       CL       13.4       142       at 13.5         17.5       .8/2.0       mottled brown/grey.       CL       13.4       142       at 15.5         17.5       .65/       19.5       2       21       21       21       13.4       at 19.5         21.5       SAND, med to fine sand, 5% silt, loose, 23.5       SW       SW       4       at 23.5         30       30       30       30       30       4       at 23.5	10			.4/2.0					[		
13.5       2       moist       13.4         13.5       35/       same as above but dark grey color, in       13.4         15.5       15.5       15.5       15.5       15.5         15.5       .8/2.0       mottled brown/grey.       CL       586       at 15.5         17.5       .8/2.0       mottled brown/grey.       CL       586       at 15.5         19.5       2						<b>.</b>	11				
13.5       2       moist       13.4         13.5       35/       same as above but dark grey color, in       13.4         15.5       15.5       15.5       15.5       15.5         15.5       .8/2.0       mottled brown/grey.       CL       586       at 15.5         17.5       .8/2.0       mottled brown/grey.       CL       586       at 15.5         19.5       2			11.5 -	.65/	silty CLAY, 15% silt, soft, light brown,	CL				1	at 11.5
15       13.535/ 15.5 2       same as above but dark grey color, in 15.5 10       11.42       at 13.5         15       15.58/2.0 17.5       institued brown/grey.       CL       586       at 15.5         17.5       19.5 2       at 13.5       institued brown/grey.       21       586       at 15.5         20       21.5 - 23.5       SAND, med to fine sand, 5% silt, loose, 23.5       SW       30       4       at 23.5         30       30       30       30       30       31       31       31       31					moist	[	13.4		1	1	
15       2       15.5 to 17.5 sample, color appears to be mottled brown/grey.       CL       586       at 15.5         17.5       .8/2.0       mottled brown/grey.       231       at 17.5         17.5       2						1			1	1142	at 13.5
15.5       .8/2.0       mottled brown/grey.         17.5       .65/         19.5       2         20       21.5         21.5       SAND, med to fine sand, 5% silt, loose, light brown, wet, well graded         25       80H at 23.5         30       30         35       35	1 - 1								1		
17.5       17.5 · .65/         19.5       2         20       21         21.5 · 23.5       SAND, med to fine sand, 5% silt, loose, light brown, wet, well graded         23.5       BOH at 23.5         30       30         33       35	<b>                                     </b>									500	
17.565/ 19.5 2       2         20       21         21.5 - 23.5       SAND, med to fine sand, 5% silt, loose, light brown, wet, well graded         25       35         30       30         35       35				.8/2.0	mottied brown/grey.	[			ſ	580	at 15.5
19.5       2         20       21.5-         23.5       light brown, wet, well graded         25       30         30       35         35       35											
20     21.5     SAND, med to fine sand, 5% silt, loose, light brown, wet, well graded     SW     134     at 19.5       25     23.5     BOH at 23.5     SW     4     at 23.5       30     30     35     35     134     at 19.5										231	at 17.5
21.5- 23.5     SAND, med to fine sand, 5% silt, loose, light brown, wet, well graded     SW     4     at 23.5       25     30     30     31     4     at 23.5			19.5	2							
21.5 SAND, med to fine sand, 5% silt, loose, 23.5 light brown, wet, well graded BOH at 23.5 4 at 23.5 4 at 23.5 4 at 23.5 4 at 23.5	20									134	at 19.5
21.5 SAND, med to fine sand, 5% silt, loose, 23.5 light brown, wet, well graded BOH at 23.5 4 at 23.5 4 at 23.5 4 at 23.5 4 at 23.5							21				
23.5       light brown, wet, well graded         BOH at 23.5       4         at 23.5       30         30       31         35       35			21.5 -		SAND, med to fine sand, 5% silt, loose,	SW					
BOH at 23.5											
						5					ot 22 5
					BOH at 23.5					-	at 23.5
	23										
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	30										
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<u>40</u>											
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	40										

Comments:

**Geologist Signature** 

SB-16

Well # 1

RECOR	D OF S	SUBSU	RFACE	EXPLORATION					Borehole Well #	# <u>SB-17</u>	
Philip Envi		tal Servic	es Corp.						Page	1 of 1	
4000 Monro							C:		6. I.J. T.	u le	
Farmington,					Project N Project N		130	_	field Ta Phas		
(606) 326-22	262 FAA	(606) 326	-2388		Project N Project L		5th St. and Blanco Blvd, Bloomfield, NM				
Elevation					Well Log	ged By		S. Ke			
Borehole Location Personnel On-S						l On-Site		<u>M. D</u>	onohue,	K. Padilla	
GWL Dep				, +, •		ors On-Site					
Logged B		S.Kelly		<u> </u>	Client Pe	rsonnel Or	-Site				
Drilled By		M. Dono			D-111 14		ЦСА				
Date/Time Date/Time			6/95, 09 4/26/95		Drilling N	toring Met	HSA had	PID, C	<u>`GI</u>		
	a comp		4/20/95	, 1030		round man	nou	110, 0		·····	
			Sample		T	Depth				I	
Depth	Sample	Sample	Type &	Sample Description	USCS	Lithology	A	ir Monito	oring	Drilling Conditions	
(Feet)	Number	Interval	Recovery	Classification System: USCS	Symbol	Change		Units: N	•	& Blow Counts	
			(inches)	· · · · · · · · · · · · · · · · · · ·	<u> </u>	(feet)	ВZ	ВН	s		
0				SAND, med to fine sand, loose	sw	[					
				light brown, dry, well graded	1	1			Í		
								1			
			-								
						[			[		
5											
					1						
		<u> </u>									
10		9	.35/		1						
		11	2								1
		11.0 -	.25/						1	at 11.0	
		13	2			13					
<b>–</b>		13.0 -	.3/2.0	silty CLAY, 25% silt, stiff, low plasticity,	CL				1	at 13.0	
15		15	7/0 0	light brown, moist, some small pockets of	1	10 5					
┣-		15.0 -	.7/2.0	med sand		16.5			4	at 15.0	
┣-		17	0/2.0	silty SAND, fine to med sand, loose, dark	SM-SM	1			1 1		
-		17.0 - 19	.8/2.0	olive grey, moist, well graded,		18.5			1601	at 17.0	
20		19.0 -	.5/2.0	hydrocarbon odor silty CLAY, same as above, but with 20%	CL	10.5			19	at 19.0	
⊢″	1	21		fine sand		I					
		21.0 -	.5/2.0		I	22			5	at 21.0	
		23		silty SAND, fine sand, 15% silt, 5% clay,	SW-SM						
		23.0 -	2.0/	dense, light greyish brown, moist		24.4			4	at 23.0 Water at	
25		25	2	silty CLAY, same as above	CL		1		2	at 24.0 apprx 22.	5'
				BOH at 25.0	1				2	at 25.0	
					1					grades to	
										med sand	
L					1					toward 25.0'	
30					1					1	
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L					1	1					
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			]		1						
35					Í						
					1						
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					ł						
40					I						
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Comments:

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Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation	
Borehole Location	
GWL Depth	
Logged By	S.Kelly
Drilled By	M. Donohue
Date/Time Started	4/26/95, 1040
Date/Time Complet	ted 4/26/95, 1130

	Well #		
	Page	1	of
Giant Bloon	nfield Ta	ank	
13023	Pha	se	3000

Borehole #

SB-18

1

Project Number	13023	Phase	3000
Project Location	5th St. and	Blanco Blvd,	Bloomfield, NM
Well Logged By	<u>S. K</u>	elly	
Personnel On-Site	M. D	onohue, K. P	adilla

Contractors On-Site Client Personnel On-Site

Project Name

Drilling Method HSA Air Monitoring Method

od PID, CGI

Depth (Feet)     Sample Number     Sample Interval     Sample Recorpt (inches)     Sample Sample (inches)     Sample Sample (inches)     Sample Sample (inches)     Depth (inches)     Air Monitoring (inches)     Diffing Conditions & Biow Counts       0     0     1     5     5     0     10     8     2     BI     5       5     0     1     1     1     1     1     1     1     4       10     9     .2/2.0     1     1     11     1     1     1       11     1     .2/2.0     1     1     1     1     1       11     .2/2.0     1     .4/2.0     1     1     1     1       13     .2/2.0     1     .4/2.0     1     1     1     1       11     .2/2.0     1     .4/2.0     1     1     1     1       15     15     light brown, moist     1     1     1     1     1       17     2     .4/2.0     .4/2.0     1     1     1     1       19     but with med sand     1     1     1     1     1     1       20     19.0     .8/2     .4/2.0     .4/2.0     1     1     1 <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>·····</th></t<>											·····
Prest     Number     Interval     Recovery lincheal     Classification System: USCS     Symbol     Charge Heat     Units: NDU B2     & Blow Counts       0     0     5     SAND, med to fine send, loose light brown, dry, well graded     SW     1     5     5       10     9     .2/2.0     11     11.0     11.0     11.0     11.0       11.0     .4/2.0     same as above, but with 10% clay     11.1     1     at 11.0       15.0     .55/     15.0     .55/     iight brown, moist     17     1     at 15.0       19.0     .85/     .80H at 21.0     BOH at 21.0     1     at 19.0     at 19.0       20     .30     .85/     .80H at 21.0		<b>.</b> .	<b>.</b> .					••			
Image: Sand product of the sand, loose         Image: Sand product of the sand, loose         SW         Image: Sand product of the sand, loose         Image:											
0       9       .2/2.0         10       9       .2/2.0         11       11         11.0       .4/2.0         13.0       .4/2.0         silty CLAY, 20% silt, stiff, low plasticity,       14.5         15       .15         17.0       .9/2.0         18.0       .55/         19.0       .88/         20       .15         19.0       .81/         20       .15         19.0       .85/         19.0       .85/         20       .15         19.0       .85/         20       .10         19.0       .85/         21       2         BOH at 21.0       .17.0         30       .11         21       .21.0         30       .31         30       .31	(Feet)	Number	Interval		Classification System: USCS	Symbol		1			& Blow Counts
5       9       .2/2.0         10       9       .2/2.0         11       11.0         11.0       .4/2.0         13       .0         15       .15         15       .15         17.0       .9/2.0         but with mod sand         19       .2/2.0         11       .11.0         11.0       .4/2.0         15       .15.0         15.0       .55/         light brown, moist       .17         17.0       .9/2.0         but with med sand       .17         19				(inches)	SAND mad to fine cond loops	SW	(Teet)	BZ	ВН	<u> </u>	· · · · · · · · · · · · · · · · · · ·
5       9       2/2.0         10       11       11         11.0       .4/2.0       same as above, but with 10% clay         13       13.0       .4/2.0         15       15.0       .4/2.0         15       15.0       .11         17.0       .9/2.0       clayey SAND, same as silty CLAY above, but with med sand         19.0       .9/2.0       clayey SAND, same as silty CLAY above, but with med sand         20       19.0       .85/         21       2       BOH at 21.0         25       30       BOH at 21.0	~					31					
10       9       .2/2.0         11       11         11.0       .4/2.0         13.0       .4/2.0         15       .55/         15.0       .55/         17.0       .9/2.0         19       but with med sand         20       19.0         19.0       .85/         21       2         BOH at 21.0       1         at 21.0       organic matter present at 17.0°, also .25° to .5         bid with med sand       .25         30       .30					light brown, dry, well graded						
10       9       .2/2.0         11       11         11.0       .4/2.0         13.0       .4/2.0         15       .55/         15.0       .55/         17.0       .9/2.0         19       but with med sand         20       19.0         19.0       .85/         21       2         BOH at 21.0       1         at 21.0       organic matter present at 17.0°, also .25° to .5         bid with med sand       .25         30       .30										Į	
10       9       .2/2.0         11       11         11.0       .4/2.0         13.0       .4/2.0         15       .55/         15.0       .55/         17.0       .9/2.0         19       but with med sand         20       19.0         19.0       .85/         21       2         BOH at 21.0       1         at 21.0       organic matter present at 17.0°, also .25° to .5         bid with med sand       .25         30       .30											
10       9       .2/2.0         11       11         11.0       .4/2.0         13.0       .4/2.0         15       .55/         15.0       .55/         17.0       .9/2.0         19       but with med sand         20       19.0         19.0       .85/         21       2         BOH at 21.0       1         at 21.0       organic matter present at 17.0°, also .25° to .5         bid with med sand       .25         30       .30	╞─╴_│										
11       11         11.04/2.0       same as above, but with 10% clay         13       13.04/2.0         13.04/2.0       silty CLAY, 20% silt, stiff, low plasticity,         15       15.055/         15,055/       light brown, moist         17.09/2.0       clayey SAND, same as silty CLAY above,         but with med sand       17.0         20       19.085/         21       2         BOH at 21.0       1 at 21.0         30       30	└── °										
11       11         11.04/2.0       same as above, but with 10% clay         13       11.04/2.0         13.04/2.0       silty CLAY, 20% silt, stiff, low plasticity,         15       15.04/2.0         15       15.055/         17.09/2.0       clayey SAND, same as silty CLAY above,         19       but with med sand         19.085/       21         20       .85/         21       2         BOH at 21.0       1         30				[			[ . [			[	
11       11         11.04/2.0       same as above, but with 10% clay         13       11.04/2.0         13.04/2.0       silty CLAY, 20% silt, stiff, low plasticity,         15       15.04/2.0         15       15.055/         17.09/2.0       clayey SAND, same as silty CLAY above,         19       but with med sand         19.085/       21         20       .85/         21       2         BOH at 21.0       1         30						i				ł	
11       11         11.04/2.0       same as above, but with 10% clay         13       11.04/2.0         13.04/2.0       silty CLAY, 20% silt, stiff, low plasticity,         15       15.055/         15.055/       light brown, moist         17.09/2.0       clayey SAND, same as silty CLAY above,         19       but with med sand         20       19.085/         21       2         BOH at 21.0         30       30											
11       11         11.04/2.0       same as above, but with 10% clay         13       11.04/2.0         13.04/2.0       silty CLAY, 20% silt, stiff, low plasticity,         15       15.055/         15.055/       light brown, moist         17.09/2.0       clayey SAND, same as silty CLAY above,         19       but with med sand         20       19.085/         21       2         BOH at 21.0         30       30											1
11.04/2.0       same as above, but with 10% clay       1       at 11.0         13.04/2.0       silty CLAY, 20% silt, stiff, low plasticity,       14.5       1       at 13.0         15       15.055/       light brown, moist       17       2       11       at 13.0         17.09/2.0       clayey SAND, same as silty CLAY above,       17       435       at 17.0         19.095/       21       2       BOH at 21.0       4       at 19.0         25       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30       30<	10		9	.2/2.0							
11.04/2.0       same as above, but with 10% clay       1       at 11.0         13       13.04/2.0       silty CLAY, 20% silt, stiff, low plasticity,       14.5         15       15       silty CLAY, 20% silt, stiff, low plasticity,       1       at 13.0         17       2       17       14.5       1       at 13.0         19       clavey SAND, same as silty CLAY above,       1       at 15.0       435       at 17.0         20       19.085/       .85/       .21       2       BOH at 21.0       4       at 21.0         30       .30       .30       .30       .31       .31       .31       .31       .31			11				11				1
15       13.0 - 4/2.0       14.5         15       silty CLAY, 20% silt, stiff, low plasticity,       14.5         17.055/       light brown, moist       17         17.09/2.0       clayey SAND, same as silty CLAY above,       17         19.085/       21       2         BOH at 21.0       1       at 13.0         30       30       30		i l	11.0 -	.4/2.0						1	at 11.0
15       silty CLAY, 20% silt, stiff, low plasticity, light brown, moist       17         17       2       17.0         17.0       .9/2.0       clayey SAND, same as silty CLAY above, but with med sand       17         20       19.0       .85/       17         21       2       BOH at 21.0       1       at 19.0         25       30       30       30       30       30			13								1
15       silty CLAY, 20% silt, stiff, low plasticity, light brown, moist       17         17       2       17.0         17.0       .9/2.0       clayey SAND, same as silty CLAY above, but with med sand       17         20       .85/       .85/       .17         21       2       BOH at 21.0       1       at 15.0         30       .85/			13.0 -	.4/2.0			14.5			1	at 13.0
15.055/       light brown, moist       17         17.09/2.0       clayey SAND, same as silty CLAY above, but with med sand       17         20       19       but with med sand         19.085/       21       2         BOH at 21.0       1       at 15.0         30       30       30	15		15		silty CLAY, 20% silt, stiff, low plasticity,						
17       2       17       17         17.09/2.0       clayey SAND, same as silty CLAY above, but with med sand       435       at 17.0         19       but with med sand       4       at 19.0       1         20       21       2       BOH at 21.0       1       at 21.0         25       30       30       30       30       30       30       30			15.0 -	.55/			[ [			1	at 15.0
17.0 -       .9/2.0       clayey SAND, same as silty CLAY above, but with med sand       435       at 17.0         19.0 -       .85/       21       2       4       at 19.0         25			17				17				
19       but with med sand         19.085/ 21 2       .85/ 21 2         BOH at 21.0       1 at 21.0         25			17.0 -	.9/2.0	clavev SAND, same as silty CLAY above,	**********	**********			435	at 17.0
20       19.085/ 21       .85/ 2         21       2         BOH at 21.0       1         at 21.0       organic matter present at 17.0', also .25" to .5 black beds have hydrocarbon odor, black beds have hydrocarbon odor, black beds are present over a .3' interval down from .3' interval down from .25	—									_	
21     2       BOH at 21.0       1       at 21.0       organic matter present at 17.0°, also .25" to.5 black beds have hydrocarbon odor, blacl beds are present over a .3' interval down from	20			85/						4	at 19.0
BOH at 21.0 25 30 30 BOH at 21.0 1 at 21.0 organic matter present at 17.0', also .25" to.5 black beds have hydrocarbon odor, black beds are present over a .3' interval down from											
25 25 30 30 30 30 30 30 30 30 30 30					ROH at 21 0	<b>i</b>					at 21 0
25 at 17.0', also .25" to.5 black beds have hydrocarbon odor, black beds are present over a .3' interval down from	I				Bon at 21.0					•	
25 at 17.0', also .25" to.5 black beds have hydrocarbon odor, black beds are present over a .3' interval down from	- 1										
black beds have hydrocarbon odor, black beds are present over a .3' interval down from											
A state of the sta	2°					1					1
30 30 30 30 30 30 30 30 30 30 30 30 30 50 50 50 50 50 50 50 50 50 50 50 50 50											
30 30 30 30 30 30 30 31 interval down from											
											í ·
											.3' interval down from 17'
	30										
35											
	35										1
			I								
			i								1
<u> </u>	40										

Comments:

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (605) 326-2262 FAX (506) 326-2388

Elevation	
Borehole Location	
GWL Depth	
Logged By S	.Kelly
Drilled By N	1. Donohue
Date/Time Started	4/26/95, 1230
Date/Time Complete	d 4/26/95, 1330

		Page	1	of	1	
Project Name	Giant Bloon	nfield Tanl	k.			
Project Number	13023	Phase		3000		
Project Location	5th St. and	Blanco Bl	vd,	Bloomf	ield,	NM
Well Logged By	<u>S. Ke</u>	elly				
Personnel On-Site	<u>M</u> . D	onohue, K	(. Pa	adilla		

Personnel On-Site Contractors On-Site Client Personnel On-Site

HSA Drilling Method Air Monitoring Method

PID, CGI

			Sample			Depth		-			
Depth	Sample	Sample	Туре &	Sample Description	USCS	Lithology	Air	Monitor	ing	Drilling Conditions	
(Feet)	Number	Interval	Recovery	Classification System: USCS	Symbol	Change		its: ND	-	& Blow Counts	
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(inches)		-,	(feet)	BZ	вн	s		
0		-	111011031	SAND, med to fine sand, loose	sw	(1001)	<u> </u>		<u> </u>		
ٽ ٽا					0	1					
				light brown, dry, well graded			1				
5										]	
							1				
10		9	.4/2.0								
│		11	, 2.0			10.5					
		11.0 -	5/2 0						~		
			.5/2.0	silty CLAY, 10% silt, firm, non-plastic,	CL		1		2	at 11.0	
		13		light brown, moist		13			-		
		13.0 -	.2/2.0	silty SAND, fine to med sand, 5% silt,	SW-SM				2	at 13.0	
15		15		loose, light brown, moist, well graded			1			1	
		15.0 -	.7/2.0						4	at 15.0 med sand	
		17				17				layer at ap	orx
		17.0 -	.85/	silty CLAY, same as above	CL				2	at 17.0 16.0, aprx	<u>د</u>
		19	2							1.0' thick	
20		19.0 -	.9/2.0						2	at 19.0	
		21				20.8			_	some grey	,
		21.0 -	2.0/	cilty SAND, come as above	SW-S	22.3			2	at 21.0 mottling a	
I		21.0 -	2.01	silty SAND, same as above silty CLAY, same as above	CL		1		2	ar 21.0 motung a aprx 17.0	
I			<u> </u>						_		
				BOH at 23.0					2	at 23.0	
25			[							med to coarse	
										sand layer from 2	21'
										to 22.4'. 5% silt	,
										well graded,	
										photo 12	
30											
											-
	- 1						1				
							1				
				•							
35											
							1				
	1				1		) í				
40											

Comments:

**Geologist Signature** 

SB-19

Well # Page 1

Borehole #

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Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation				
Borehole Location				
GWL Depth				
Logged By	S.Kelly			
Drilled By	M. Donohue			
Date/Time Started	4/27/95, 0900			
Date/Time Comple	eted 4/27/95, 1000			

Project Name	Giant Bloom	ield Tank
Project Number	13023	Phase
Project Location	5th St. and E	Blanco Blv

13023 Phase h St. and Blanco Blvd, Bloomfield, NM

M. Donohue, K. Padilla

S. Kelly

PID, CGI

Well Logged By Personnel On-Site Contractors On-Site **Client Personnel On-Site** 

**Drilling Method** HSA Air Monitoring Method

		, 1000			<u>110,</u>	····	
mple Sample mber Interval		Sample Description Classification System: USCS SAND, med to fine sand, loose	USCS Symbol SW	Depth Lithology Change (feet)	Air Monit Units: M BZ BH		Drilling Conditions & Blow Counts
9 ### 11.0 - 13 13.0 - 15 15.0 - 17 17.0 - 19 19.0 - 21	2 .9/2.0 .7/2.0	silty CLAY, 20% silt, firm, non-plastic, light brown, moist. SAND, same as above, moist, turning to wet BOH at 21.0	5W			0 1 1 1 1	at 11.0 at 13.0 at 15.0 at 17.0 at 19.0 coarse to med sand layer, wet, from approx. 17.0' to 18.5

Comments:

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Geologist Signature

SB-20

Well # Page

Borehole #

of

3000

1

	_
1	

Philip Environmental Services Corp. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation	
Borehole Location	
GWL Depth	
Logged By	S.Kelly
Drilled By	M. Donohue
Date/Time Started	4/27/95, 1015
Date/Time Complet	ed 4/27/95, 1115

Project Name	Giant Bloomfield Tan					
Project Number	13023	Phase				
Project Location	5th St. and	Blanco Blv				

3023 Phase 3000 St. and Blanco Blvd, Bloomfield, NM

M. Donohue, K. Padilla

Borehole #

Well #

Page

Well Logged By Personnel On-Site Contractors On-Site **Client Personnel On-Site** 

**Drilling Method** Air Monitoring Method

HSA

S. Kelly

PID, CGI

	Comple		4/27/95		Air Monit		-			
Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)		Monitor nits: ND BH	-	Drilling Conditions & Blow Counts
0 				SAND, med to fine sand, loose light brown, dry, well graded	SW					
10 		9 11 11.0 - 13 13.0 - 15 15.0 - 17 17.0 - 19	.5/2.0 .8/2.0 .9/2.0 .4/2.0 .6/2.0	silty CLAY, 20% silt, soft, low plasticity, light brown, moist 14.4 to 14.8 is a layer with 10% med sand with some organic matter	CL	10.7			3 3 1 3	at 11.0 at 13.0 at 15.0 at 17.0
20  25 		19.0 - 21		SAND, med to fine sand, 10% silt, loose, light brown, wet, well graded BOH at 21	SW	19			3	at 19.0 at 21.0
30 										

Comments:

**Geologist Signature** 

SB-21

1 of

1

## **APPENDIX B**

### "MONITORING WELL INSTALLATION RECORD" AND "RECORD OF SUBSURFACE EXPLORATION" FORMS

Burlington Environmental Inc. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Well Locatio	n		
GWL Depth			
installed By	RODGERS	DRILLING	

 Date/Time Started
 9/20/94
 0730

 Date/Time Completed
 9/20/94
 1130

Time Completed <u>9/20/9</u>	94 1130	
Depths in Reference	to Ground Surface	
ltem	Material	Depth (feet)
op of Protective Casing		0.0
ttom of Protective Casing p of Permanent Borehole sing ttom of Permanent Borehole sing		
p of Concrete	NEAT CEMENT WITH 5% BENTONITE	0.0
ottom of Concrete		-1.2
p of Grout		
ttom of Grout		
p of Well Riser	PVC	-0.0
ttom of Well Riser	PVC	-3.5
p of Well Screen	PVC	-3.5
ttom of Well Screen	PVC	-13.5
p of Peltonite Seal	BENTONITE PELLETS	-1.2
ottom of Peltonite Seal	BENTONITE PELLETS	-2.5
p of Gravel Pack	CSSI, 10-20 SAND	-2.5
ottom of Gravel Pack	CSSI, 10-20 SAND	-14.0
p of Natural Cave-In		
ottom of Natural Cave-In		
op of Groundwater		DRY

Comments:

Total Depth of Borehole

**Geologist Signature** 

-14.0

Bottom of Borehole

-14.0

 Well #
 MW-1

 Page 1
 of 1

 Project Name
 GIANT - BLOOMFIELD

 Project Number
 13023
 Phase
 0077

 Project Location
 5TH AND BLANCO STREETS

 On-Site Geologist
 SARAH KELLY

 Personnel On-Site

Borehole #

Un-Site Geologist	SARAH KEL	цц I	
Personnel On-Site			
Contractors On-Site	RODGERS		
Client Personnel On-S	lite		

JAL_MW2.WK1

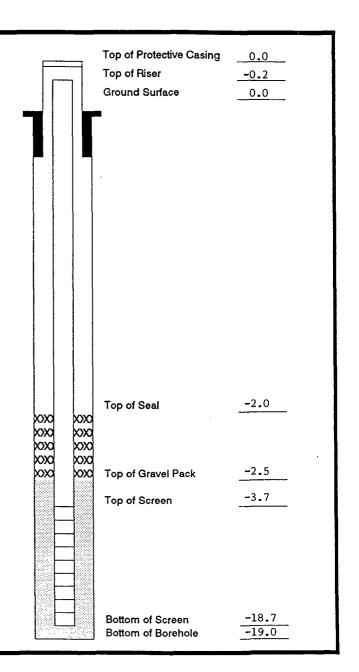
Burlington Environmental Inc. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation			
Well Location			
GWL Depth			
Installed By	RODGERS	DRILLING	

Date/Time Started 9/20/94 1250 Date/Time Completed 9/20/94 1530

Depths in Reference to Ground Surface					
ltem	Material	Depth (feet)			
Top of Protective Casing		-0.0			
Bottom of Protective Casing					
Top of Permanent Borehole Casing					
Bottom of Permanent Borehole Casing					
Top of Concrete	NEAT CEMENT WITH 5% BENTONITE	-0.0			
Bottom of Concrete	NEAT CEMENT WITH 5% BENTONITE	-2.0			
Top of Grout					
Bottom of Grout					
Top of Well Riser	PVC	-0.2			
Bottom of Well Riser	PVC	-3.7			
Top of Well Screen	PVC	-3.7			
Bottom of Well Screen	PVC	-18.7			
Top of Peltonite Seal	BENTONITE PELLETS	-2.0			
Bottom of Peltonite Seal	BENTONITE PELLETS	-2.5			
Top of Gravel Pack	CSSI 10-20 SAND	-2.5			
Bottom of Gravel Pack	CSSI 10-20 SAND	-19.0			
Top of Natural Cave-In					
Bottom of Natural Cave-In					
Top of Groundwater		-13.35			
Total Depth of Borehole		-19.0			

	Borehole # Well # <u>MW-2</u> Page _1 of	
Project Name	GIANT - BLOOMRIELE	)
Project Number	13023 Phase	0077
Project Location	5TH AND BLANCO STRE	ZETS
On-Site Geologia Personnel On-Si Contractors On- Client Personnel	te	



Comments:

Burlington Environmental Inc. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation			
Well Location			
GWL Depth			
Installed By	RODGERS	DRILLING	

Date/Time Started 9/20/94 1600 Date/Time Completed 9/20/94 1820

Depths in Reference	to Ground Surface			<b></b>	$\exists$	Top of Protective Casing Top of Riser	<u> </u>
ltem	Material	Depth (feet)				Ground Surface	0.0
Top of Protective Casing		-0.0					
Bottom of Protective Casing Top of Permanent Borehole Casing Bottom of Permanent Borehole							
Casing Top of Concrete	NEAT CEMENT WITH 5% BENTONITE	-0.0					
Bottom of Concrete	NEAT CEMENT WITH 5% BENTONITE	-2.0					
Top of Grout	· · · · · · · · · · · · · · · · · · ·						
Bottom of Grout	· · · · · · · · · · · · · · · · · · ·						
Top of Well Riser	PVC	-0.2					
Bottom of Well Riser	PVC	-3.7					
Top of Well Screen	PVC	-3.7				Top of Seal	-2.0
Bottom of Well Screen	PVC	-18.7		) XXX	xxx xxx		
Top of Peltonite Seal	BENTONITE PELLETS	5 -2.0	j k	))) ))))	xxx XXX		-2.5
Bottom of Peltonite Seal	BENTONITE PELLETS	-2.5		)))	xxx	·	
Top of Gravel Pack	CSSI 10-20 SAND	-2.5				Top of Screen	-21.3
Bottom of Gravel Pack	CSSI 10-20 SAND	-19.0			-		
Top of Natural Cave-In							
Bottom of Natural Cave-In		ļ					
Top of Groundwater		-14.39		<u>E</u>	11	Bottom of Screen	-26.3
Total Depth of Borehole		-19.0			<u>. 7979</u>	Bottom of Borehole	-26.5

Comments:

	Borehole Well # Page <u>1</u>	#
Project Name	GIANT - BLO	OMFIELD
Project Number	13023	Phase 0077
Project Location	5TH AND BL	ANCO STREETS
On-Site Geologist Personnel On-Site		KELLY
Contractors On-S	ite RODGI	ERS
Client Personnel	On-Site	······································

Burlington Environmental Inc. 4000 Monroe Road Farmington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Date/Time Completed

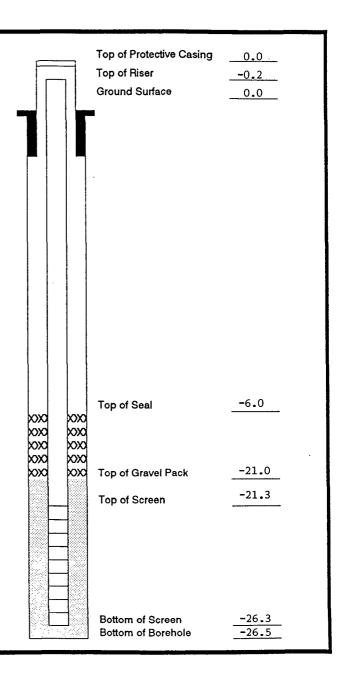
Elevation				
Well Location				
GWL Depth				
Installed By	RODGERS	DRILLING		
Date/Time Sta	rted	9/21/94	0730	

9/21/94

1600

Depths in Reference to Ground Surface Item Material Depth (feet) Top of Protective Casing 0.0 **Bottom of Protective Casing** Top of Permanent Borehole Casing Bottom of Permanent Borehole Casing NEAT CEMENT WITH Top of Concrete 5% BENTONITE 0.0 NEAT CEMENT WITH 5% BENTONITE -6.0 Bottom of Concrete Top of Grout Bottom of Grout PVC Top of Well Riser -0.2 PVC -21.3 **Bottom of Well Riser** PVC -21.3 Top of Well Screen Bottom of Well Screen PBC -26.3 BENTONITE PELLETS Top of Peltonite Seal -6.0 AND POWDER BENTONITE PELLETS -21.0 AND POWDER Bottom of Pettonite Seal CSSI, 10-20 SAND -21.0 Top of Gravel Pack CSSI, 10-20 SAND -26.5 Bottom of Gravel Pack Top of Natural Cave-In Bottom of Natural Cave-In Top of Groundwater 13.28 -26.5 Total Depth of Borehole

	Boreh	iole #					
	Well ≉	¥ MI	∛-4				
	Page	1 of	1				
Project Name	GIANT -	BLOOMFI	ELD				
Project Number	13023	Ph	ase	0077			
Project Location	5TH AND	BLANCO S	STRE	ETS			
On-Site Geologis		RAH KELLY	<u> </u>	•			
Personnel On-Sit							
Contractors On-S	Site <u>ROI</u>	RODGERS					
<b>Client Personnel</b>	On-Site						



Comments:

Philip Environmental Services Corporation 4000 Monroe Road Farmington, New Mexico 67401 (505) 326-2262 FAX (505) 326-2368

Elevation	
Well Location	
GWL Depth	
Installed By	

 Date/Time Started
 5/2/95, 1000

 Date/Time Completed
 5/2/95, 1120

Depths in Reference	to Ground Surface				Top of Protective Casing Top of Riser	
ltem	Material	Depth (feet)			Ground Surface	
Top of Protective Casing		0.0				
Bottom of Protective Casing Top of Permanent Borehole Casing Bottom of Permanent Borehole Casing		-1.0				
Top of Concrete						
Bottom of Concrete	3.94# sacks Zia					
Top of Grout	type-II cement	0.0				
Bottom of Grout	11 . 11	6.0				
Top of Well Riser						
Bottom of Well Riser		10.0				
Top of Well Screen	PVC sch. 40 .010 slot	10.0			Top of Seal	-6.0
Bottom of Well Screen	n	25.0		x0X0 XXX		
Bentonite Top of <del>Peltonite</del> Seal	2 50# bucket 1/4	6.0		XXX XXX		
Bentonite Bottom of <del>Pettonito</del> Seal	bent. pellets	7.8	xxx	$\tilde{x}$	Top of Gravel Pack	-7.8
Top of Gravel Pack	19 50# sacks 10-20 CSSI Sand	7.8.			Top of Screen	-100
Bottom of Gravel Pack	11	23.5				
Top of Natural Cave-In		23.5				
Bottom of Natural Cave-In	· · ·	25.0				
Top of Groundwater	•	ļ			Bottom of Screen	-25.0
Total Depth of Borehole		25.0	L		Bottom of Borehole	-25-0

Comments: Well end cap - PVC is .53' from bottom of end cap to beginning of slotting.

**Geologist Signature** 

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Borehole #	
Well # MW-5	
Page <u>1</u> of <u>1</u>	
Project Name Giant Bloomfield	

M. Donohue, K. Padilla

S. Kelly

Phase 3000

Project Number 13023

Project Location

**On-Site Geologist** 

Personnel On-Site

Contractors On-Site

Farmin	onroe Ro gton, NN	M 87401		RECORD OF SUBSURF						Borehole No. Well No. <i>MW</i> -
PROJ	ECT	NAME	<u>: _6</u>	iant- Bloom tield						PROJECT NO: 13023
	ATIO		- - - - - - - - - - - - - -	BOREHOLE LOCATI						
LUGG	ED B	ڪ : ٥٢ ٥٧٠	Z V	GWL: depth GWL: depth						
							uaci	e/ c11	iic	••································
DATE	5TIM	97 E S	ZOT IARTI	1400s: <u> </u>	E/TIME	COMF	LET	ION (	s):_	9/20/94 0930
										Borehole: S = Sample
		_	μĴ	· · · · · · · · · · · · · · · · · · ·	ğ	ę				
DEPTH (feet)	SAMPLE	SAMPLE INTERVAL	<u>ت ع</u>	SAMPLE DESCRIPTION	SMBOL	et)	мо	AIR NITOR: TS <u>4</u> 4	ING	DRILLING CONDITIONS AND
Щ. Щ.	\$2	SAN	S A B	CLASSIFICATION SYSTEM <u>USCS</u>			UNI	TS P	om	(BLOW COUNTS)
			<u>υщ</u>		<u> </u>	ă	BZ	F BH	S	······
				SAND, Med 30% to very cos To &, loose, damp, light brown, well groded, angular to sub- angular.	₹ <b>5</b> 00					
-5								50	Z	
			3.Z 15.0							
-10				9.7 Sandy CLAY, 20% fine to med. 58 soft, med plasticity, light brows	nd CL	9.7		10.0	<u>239</u>	T
- -			3.2	Namp.		120		13.0	180	5 Hydrocarbon odor 13.7+014.6 - med. to
-			5.0	Same as abeve but light brow		14.5 15-0	T	15.0	78	CORTSP Sand, 546 an
-15			3.1	Clayey SHND, Fine to med 60%,				18.0	4	
-				Sandy CLAY, 10% Fine Sand, Sti low plasticity, light brown, dan	IC 1	18.0			4Z	
-20			-			21.0		20.9		
-				SAND, 40% coarse, 60% fine to med. lo moist, 19ht Brown, poorly graded, Suba ROH	ng. SP	221	>	220	14	
-				B.O.H. at 20.00 (drove sampler to ZZ.0						· · ·
-				Fr.)						
-										
- - ·										,
·										

GEOLOGIST SIGNATURE _ March Holly

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BURLINGTON ENVIRONMENTAL				
4000 Monroe Road	RECORD	OF	SUBSURFACE	EXPLORATION

4000 Monroe Road Farmington, NM 87401

Page / of ( Borehole No. Well No

		<i></i>		NeII NO. MW-Z
PROJ	ECT	NAME	:	Giant-Bloomfield PROJECT NO: 13023
ELEV			•	BOREHOLE LOCATION/COORDINATES:
LOGG	ED B	Y:	<u>5, K</u>	GWL: depth 13.35 date/time 9/20/94 1800.
DRIL	LED	BY: _	Kợ	dgers GWL: depth date/time
DRIL	LING	RI(	è de la	THODS: HSPA ED: 44949120194 125 DATE/TIME COMPLETION (S): 9/20/94 14.30
DATE	E/TIM	ES	TART	ED: 4/19/94 9/20/94 125 DATE/TIME COMPLETION (S): 9/20/94 14.30
AIR		TOR:	ING	TYPE: $\underline{PTD}$ BZ = Breathing Zone: BH = Borehole: S = Sample
DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (1n)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM <u>USCS</u> <u>B</u> <u>CLASSIFICATION SYSTEM</u> <u>USCS</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u>
		3.9 5.0		SAND, very coarse 30%, med 50 and fine 70%, trace fine gravel, loose, damp, light brown w/some rust staining, poorly groded, sub angular 00 5.0
- - - - - - - - -		z 5 5.0		Signolau 1.8 Glayey SAND, 25% Fines, fine to med. sand, soft, damp, light grey, Same as above, still grey. Sc. 0.0 Sc. 0.0
- 20		3.Z 5.C		Sondy CLAY, ZO& Fine Sand, Soft, CL 190 190 190 190 190 190 190 190 190 190
- - - - - COMM	ENTS			
·		•		
				GEOLOGIST SIGNATURE
				OLOLOUIST STONATORE STONATORE STONATORE

BURL ENVI 4000 Mc Farming	RON	MEN Dad	VTAL	RECORD	OF SUBS	SURFAC	E	EXF	۲LO	RAT	ΓIÓ	N Page/ Borehole No. Well No./	. '
ELEV LOGG DRIL	ATIC ED E	)nt 3Y: _1 BY: .	5.K Roc		BOREHOLE L GWL: depth GWL: depth	OCATION 	<u>35 i</u>	Toc (	iate iate	/tim		PROJECT NO: <u>1302</u> 1/20/94 /800	
DATE	I/TIN	Æ S	TARTE	D: <u>9/20/94</u>	1600	DATE/T	IME	COMP	LETI			9 <i> 20 94  730</i> Borehole: S = Samp	 ole
DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (1n)	SAMPLE CLASSIFICATION SY	DESCRIPTION STEM <u>USC</u>	5	USCS SYMBOL	DEPTH CHNG (feet)	UNIT	AIR ITORI S PP		DRILLING CONDITION AND (BLOK COUNTS)	S
			3.8	SAND, ZOB UL Fine to Med, I dry, poorty c	loose, light graded, BH	brown gular	5P	4.Z		0.0 5.0	.5		<u></u>
-5			3:10	clayoy SAND, -25% fines, so poorty graded	tine to med. t, light brow , dtmp.	5 8nd 1911,	SC			5.0		- ·	
-10			29					11.5	0,0	0.0	۰۲+ 7-		
- -			5.0	Sandy CLAY, 20 Soft to Stiff, lig med. plasticity clayey SHND,			a	135		1010			
- 15 -			3.8	Moist. Same as ab			5C	16.6		<b> 5</b> .0	10		
-			5.0	40% coarse sand, angui	to very co. ar. wet	arse	SC	19.7					
-20				5andy CLAY, 3 BO.H. 3+ Z			CL			200	1.0		
F													

GEOLOGIST SIGNATURE Sauch Helly

COMMENTS: __

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ENVI	RON	ION MEN	ITAL							54
4000 Mo Farming	zton, NM	4 87401		RECORD OF SUBSURFA	CE	EXF	PLC	RA.	TIC	N Page of Borehole No. Well No. MW-
PROJ	ECT	NAME	:_ <i>6</i>	Fiant-Bloomfield						PROJECT NO: 13023
ELEV			<u>&lt; V</u>	BOREHOLE LOCATION	1/000	RDIN	ATES	S		01-2011
				GWL: depth GWL: depth GWL: depth						7/23/74
				HODS: GNL. UEDUN			uale	:/ L II	IC	· · · · · · · · · · · · · · · · · · ·
				ED: 9/21/94 0730 DATE/	TIME	COMP	LET	ION (	s):_	9/21/94 1330
AIR	MONI	TOR	[NG ]	PYPE: PID BZ = E	Breat	hing	Zo	ne; I	3H =	Borehole: S = Sample
DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE ECOV. (1n)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM: <u>USCS</u>	USCS SYMBOL	(feet) (feet)	MONUNIT	AIR NITORI IS	ING 2001	DRILLING CONDITIONS AND (BLOK COUNTS)
-			<u> </u>	SAND- med-302, very coarse 702	101		BZ	BH	<u> </u>	Augering to 20.01
				loose dry to damp, light brown, well graded, angular to sub-angula						
				(description from MW-1 log)	4					
				(description tion must log)						
-5										-
		Į					ļ			
•							0	0		
-10				Approx.	$\downarrow$	10				
				Sandy CLAY, 20% fine to med. Sandy Soft, med. plasticity, light brown turning to grey, damp	\$					
•				brown turning to a rey, domp	CL	·				
				(description taken from MW-1 log)						
						14,5				
-15				claver SAND, 60% Fine to med. 40. coarse, trace Fines, loose, domp, light brown, poorly graded, angul	8	ł				
				light brown, poorly graded, angula to sub-angular	7					
			lar	to sub-angular (description takenfrom mw-1log. Approx.		18.0		60		
			19.5	The data without the tarm	CL			-	t	Sample recovery poor.
-20			2.4	as described above.	SC	z1.0				Drillers says he feels a
0			50	SAND, coarse to very coarse, 5%			1			change at 21.0
				Fines, loose to medium dense, wet,	Sh	1				
				light brown, well graded, angular.						
			235		ľ			1.1		-
-z5			3.2			26.5	JOK	9/z1/0	14	At 25.5, 26 driller fel
- - -			50	Sondy CLAY, 30% fine Sand, stift, med plasticity, brown, damp, some plant material.	, CL					a change.
30			28 B							

COMMENTS: Had to stop drilling at 0930 so driller could make on appointment. Resumed drilling at 1330.

GEOLOGIST SIGNATURE

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1/21/9

Philip Environmental Services Corp. 4000 Monroe Road Fermington, New Mexico 87401 (505) 326-2262 FAX (505) 326-2388

Elevation	
Borehole Location	
GWL Depth	
Logged By	
Drilled By	
Date/Time Started	5/2/95,0915
Date/Time Complete	5/2195 0941.

Project Name Project Number Project Location

Well # Paga of Phase

Borehole #

Well Logged By Personnel On-Site Contractors On-Site

Κ.

Client Personnel On-Site

**Drilling Method** Air Monitoring Method

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)		Monitori nits: ND BH	-	Drilling Conditions & Blow Counts
	Number	15.3 15.3 12 12 12 21 0	Recovery (inches)	Classification System: USCS SHND, MIEd. to CODESE, loose, light brown, damp Well graded. Silty CLAY, non-plastic IS90 Silt, light brown, damp.	Symbol	Change	Ur	nits: ND BH	U [,] .	
35							5	-		-

**Geologist Signature** 

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# **APPENDIX C**

## **"Well Development and Purging Data" Forms**

-1 Page_1_of_1 13023 1307777 Field	Serial No. (If applicable) Hydac Comments odof: hydrocarboy	
Well Number MUJ-1 Page 1 o Project No. 13023 Phase.Task No. 007 St., Bloom field	Instruments       Instruments       PX pH Meter       Do Monitor       PX Conductivity Meter       PX Temperature Meter       Intro druction       Intro druction       Intro druction       Intro druction       Intro druction       PH       Intro druction       Intred       Intro dructio	
A Development D Purging Mee 2d Blanco	$\frac{H}{2} = \frac{1}{2} \times \frac{1}$	
a Br Partin Mand	ation ation ation 2.6 ation 13.66 ation	
Project Manager Martin Kee Project Manager Martin Kee Project Manager Martin Kee Project Manager Sth and Blanco St.)	ne Calculation     Well (feet)     13.6       Water (feet)     13.1       Water (feet)     13.1       Sis: Well     4" Grave       Water Volume in Well     6 and 0       Cubic Feet     Gallons       Cubic Feet     Gallons       Number on     7       Number on     7	
Well Development and Purging Data         Serial No. WDPD-         Serial No. WDPD-         Serial No. WDPD-         Project Manager M/2         Ciant Tuc.         Site Address Sth	Water Volume Calculation         Initial Depth of Well (feet)         Initial Depth to Water (feet)         Height of Water Column in Well (feet)         Diameter (inches): Well         Vell Casing         Vell Casing         Item         Oubic Feet         Otal         Vell Casing         Vell Casing         Item         Oubic Feet         Oubic Feet         Otal         Neel Pack         Item         Oubic Feet         Gravel Pack         Item         Vert         Cotal         Increment         Cumulative         Increment         Cumulative         Increment         Cumulative         Increment         Cumulative         Increment         Cumulative         Sufficie         Increment         Cumulative         Increment         Cumulative         Increment         Cumulative         Increment         Cumulative         Increment         Cumulative <td< td=""><td>1</td></td<>	1
ent and	LC C	
Well Developme AL Serial No. WOPD. Triant- Bloomfield Giant Tuc.	ia lumes of Water Removal dicator Parameters pment ler Bottom Valve Bottom Valve Stainless-steel Kemmerer Stainless-steel Kemmerer a beeton the bouble Check Valve Stainless-steel Kemmerer (teet) (teet) (teet) the development criteria are met.	~ ~
Vell De serial No. WOPD- Liant-Bl	iteria volumes of Water Rem volumes of Water Rem elopment Bailer C Double Check Valve C Double Check Valve aliner Pump Bailer Pump Bailer Pump Bailer aliner Pump Bailer C alininin Pump Bailer C alininin C alinin C ali	
BURLINGTON BURLINGTON ENVIRONMENTAL S Project Name Client Company Site Name	Development Criteria       Z 3 to 5 Casing Volumes of Water Removal       Z 3 to 5 Casing Volumes of Water Removal       Z Stabilization of Indicator Parameters       Other       Centrifugal       Submersible       Centrifugal       Submersible       Centrifugal       Submersible       Other       Other       Other         Date       Image       Image       Image       Other         Date         Image             Image	

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BUKLINGTON ENVIRONMENTAL Project Name	TTAL	Serial No. WDPD-	RIDON	Serial No. WDPD- Siant- Ringun Field	·۲		Project Manager	ler V	l'ac'	artin Moo	100	ā	Project No.	Page tot	
Client Company	1	Flant	t In	Thc.									Phase.Task No	No. 0077.	NN
Site Name							Site Address	sss							
Development Criteria	nt Criteria	~			-	Nater Vo	Water Volume Calculation	ulation			<u> </u>	Instruments	v	Serial No. (If applicable)	licable
X 3 to 5 Casing Volumes of Water Removal Stabilization of Indicator Parameters	Casing Volu	umes o icator	if Water R Paramete	Removal rs		nitial Dept nitial Dept	Initial Depth of Well (feet) _ Initial Depth to Water (feet)	eet)	2.10	<u>jo</u> a	ł	X pH Meter	er	Hydze	
					1	leight of \	Height of Water Column in Well (feet)	i in Well	(feet)	5.22		DO Monitor	nitor		
Methods of Development	Develop	ment				Diameter (	Diameter (inches): Well	1/1/	Gravel Pack	ack <i>S</i> ,	>	X Conductivity Meter	tivity Mete		
		r ottom	Vahvo		•		Water V	Water Volume in Well		Gallons to be		X Temperature Meter	ature Meté		
Centrirugal     Submersible		ouble	Double Check Valve	alve		ltem	Cubic Feet	_	Galions	Removed		□ other			
D Peristaltic		tainles	□ Stainless-steel Kemmerer	smmerer		Well Casing		З,	4	3.4	<b></b> ]				
□ Other					<b>I</b>	Gravel Pack		Q.	Ν	10. Z	5	Water Disposal	osal	/ / _	
					<b>t</b>	Drilling Fluids Total				13.6	, ,, ,,	2. 0111	20 cc	MININ .	
		velopment			Ending		Water Volume Removed	Product Volume	Volume	X			Ľ		
Date	Time	Method Pump Bailer	нетоvан насе (gal/min)	(feet)	Water Depth (feet)	Increment	(gallons) Cumulative	Removed Igallons Increment Cumulat	d (gailons) Cumulative	(C)	Н	Conductivity (umhos/cm)	(mg/L) (mg/L)	V & Comments	
9/22/94	1250	$\overline{\times}$				Ь	5			1				cloudy, brow	40
	1335	X				0	15					]		VERY CION	ray.
	1350	X				5	0 N			67.0	6.08	<i><b>al</b>hh</i>		clearing ap	e, O WM
Sraher 400	Ð	Х				S	л Л		· · · · · · · · · · · · · · · · · · ·	•	⇒	\$		7	
	1437	X				Ŋ	30 M0			65.1	6.33	<u> </u>		Slight - mOST	13
	1457	X				5	35			65.2	6.52	44.30		slight br	row?
	1515	X				б	40			64.9	6.61	4370		5/ichtve	row
														1 20 .	
							,								
							1								
Circle the date and time that the development criteria are met.	d time that ti	ie develc	opment crite	eria are met.											
Comments															

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MW-3 Page 1 of 1 do. 13023 ask No. 007777	Serial No. (If applicable) Hydac ter Thydac ter Thydac ter Thydac ter Thydac ter Thydac ter Thydac
Well Number MW. Project No. 1 Phase.Task No.	Instruments X pH Meter Do Monitor X conductivity Meter X conductivity Meter X Temperature Meter Dissoval Ude// volume Ude// volume Dissoval umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbos/cm/ umbo
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A B Development R Purging	7 7 7 7 7 7 8 8 8 8 8 8 8 8 8 8 9 10 7 10 7 10 7 10 7 10 7 10 7 10 7 10 10 10 10 10 10 10 10 10 10
Data Data	e Calculation Vell (feet) <u>18,50</u> Nater (feet) <u>3.02</u> Column in Well (feet) <u>5.02</u> Column in Well (feet) <u>5.05</u> Neth <u>4</u> Gravel Pack Water Volume in Well Gallon Ubic Feet Gallons Rer Moved Renoved (gallons) Temp Moved Renoved (gallons) Temp Mulative Increment Cumulative (gallons) C C C C C C C C C C C C C C C C C C C
Project Manager 22	
and Pr	Vater Volt Initial Depth Height of Wi Diameter (inn Item Item Item Item Item Item Item Item
pment wFiea	moval in S we we merer we be the water beet the set of the s
Well Development and Purging Data ^{L Serial No. WDPD.} ^{L Serial No. WDPD.} ^{Serial No. WDPD.}	Parameters Parameters Check Val Check Val (gal/min) (gal/min)
BURLINGTON BURLINGTON ENVIRONMENTAL Project Name Client Company Site Name	Development Criteria         X 3 to 5 Casing Volumes of Stabilization of Indicator         X Stabilization of Indicator         D Other         Other         D Date         Time         Pump Bailer         Pater Removal Data         Date         Time         Pump Bailer         Date         Time         Pump Bailer         Date         Time         Pump Bailer         Date         Time         Pump Bailer         Cobe         V/J/S         V/J/S         V/Ve//         Comments         U/Ve//         D         Comments         U/Ve//         D          D Date

	Well Development an	pmer	nt ar	Id Pu	d Purging Data	Dat		Development	Well Number		mw-4	I
Project Name	Serial No. WDPD-	-field		Pr	Proiect Manager	er V	lartim	1 Ma	C T	oiect No.	Project No. / 30 Z 3	ļ
] ≥	Giant I	2.		-						Phase.Task No.	10. 007777	
Site Name					Site Address 5th 9	ss <i>54</i>		Blanco	5t. BI	Bleonaf	Pierd	
Development Criteria	teria		Ň	ater Voli	Water Volume Calculation	ılation			Instruments	v	Serial No. (If applicable)	-
X 3 to 5 Casing X Stabilization o	X 3 to 5 Casing Volumes of Water Removal X Stabilization of Indicator Parameters	moval	Init Init	ial Depth	Initial Depth of Well (feet) _ Initial Depth to Water (feet)		14.381		凶 pH Meter	er	Hydac	· 1
			Hei	ght of Wa	Height of Water Column in Well (feet)	in Well (f	et) /// (	,29	DO Monitor	nitor		
s of Deve	elopment		Dia	meter (ind	Diameter (inches): Well		4/// Gravel Pack	8"	Ka Conduct	Conductivity Meter		
Pump	Bailer X Bottom Valve				Water Vo	Iume		Gallons to be	X Temperature Meter	ature Meter		
□ Submersible	Double Check Valve	/e	;	ltem	Cubic Feet	t Gallons	+	Removed	Other			
Peristaltic	Stainless-steel Kemmerer	nmerer	s la	Well Casing				٥	Water Dissocal	1000		
Other				Drilling Fluids		14.(	/ /4.	2	Water Uisp	lsai	on site	i
Water Removal Data	Data			Total			12	1= 9:	well volamo	Seri	)	
	Development Method Removel Rate	÷	Ending Water Depth	Water Volu (gal	Water Volume Removed . (gelions)	Product Volume Removed (gellons	Volume (gallons): Temperature	rature	Conductivity	Dissolved Oxygen		ſ
Date Time	Pump Bailer	(feet)	(feet)	Increment	Cumulative		2	Hđ	(//mhos/cm)	(mg/L)	Comments	
9/23/94 091	5 X 1			10	16			1	1	•	brown, silty	1
1, 093				<i>Q1</i>	02			 	}		brown silty	
0440	o   X			S	25		59	1.1 6.3	1 4210			
1000	X			01	35		5	.96.	0 4250		11	<b></b>
020	X			0	45		61	96.8	54 4030		Slight's brown	N
1 1045	X			N	50		64	.56.9	020/1 /10		slightly brow	1
00//	X			<i>Γ</i> ι	55		10	120	07 // LO			<u>م</u>
	×		1	0	09		2		4 71 20			
V 1230		\	<u> </u>									
Circle the date and time t	Circle the date and time that the development criteria are met.	are met.	e met.	, , , ,	1 02/	Louis	Fig. 000 to	4   4				-1
	an a salat			]								1
Developer's Signature(s)	re(s) Jank	Y	16.	Ì			Date	Date 9/23	194 Re	Reviewer	Date	1
	•			P				, <b>x</b>	-			

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	Well Number <u>MW-S</u> Page <u>1</u> of <u>1</u> Project No. <u>13023</u>	Phase.Task No. 2000.77	Serial No. (If applicable)		:y Meter 1/ //	e Meter 1/ //			· (120 1)	Manufacture 4	Oxygen (mg/L) Comments	Clear	v //		く / /				s slightly	ver Date	
		Phase	Instruments	PH Meter	Conductivity Meter	Temperature Meter		Water Disposal	014-		Conductivity (umhos/cm)	6.71 4720	0921 689	6.96 4230	7,00 4270	4250			set it appears	14/05	
	ata Development R Purging		12° ES	12.68'	ll (feet) <u>いしつ</u> Gravel Pack	in Well Gallons to be Gallons Removed					ed (gaijoris) Temperature (°C) (°C)	69.5	61.71	59.4	60.1	59.7		-	I. buck	Date 5	
	Purging Da		Water Volume Calculation	Initial Depth of Well (feet) Initial Depth to Water (feet)	Height of Water Column in Well (feet) Diameter (inches): Well <u></u> Grave			×	Fluids Total		(galions) Cumulative hich	S	4	0	Ŋ	14			white 5 ga		
	ment and ]			1	Height of Diameter	Item	Well	Gravel Pack	Drilling Fluids Total	Endina Water	Water Depth (feet) Incr	5	M	N	N	N		met.	lects in	V, Mla	Link
	Il Developi	2	G	X 3 to 5 Casing Volumes of Water Removal X Stabilization of Indicator Parameters	ment	er Bottom Valve	U Double Check Valve Stainless-steel Kemmerer				Method Removel Rate Intake Depth (gal/min) (feet) (feet)	×	X	۲	×	×		he development criteria are	Winter co	and cloudy	MULT
() ()	PHILIP We serial serial Project Name	) yng	Development Criteria	X 3 to 5 Casing Vol X Stabilization of In Other	Methods of Development		Peristaltic	Other		Water Hemoval Data	Date Time	E/2/02 12EH	t	1309	267 1327	1327		Circle the date and time that the development criteria are met	Comments When	prown 21	Developer's Signature(s) _

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# **APPENDIX D**

"WATER SAMPLING DATA" FORMS

	mple Typ	1-	Groundwa	<u> </u>	<u> </u>	<b>`</b>		:her				•		<u>9/22/9</u>
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	oject Man te Name _							$\mathcal{P}_{1}$						077.7
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Γ				W	ater Qua	lity Read	lings		W	ater Co	llection	Data		
							Cond	i. Volun	_	Removal	Pump Intake		Final Water	Notes
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	Water Qu	uality/Wa	ater Colle					<u></u>					xygen; Co	ond. = Conductivity
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Sampler Temp. DO (umhos/ Removed Rate Depth Depth (Explain	Projec	e Typ t Nan		⊠ Groundu Ì <i>ant−</i>		<u>_</u>			er				•	Date	9/23/9 23
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Water Quality ReadingsWater Collection DataDateTimeSamplerTemp. InitialsCond. (mg/L)Volume Removed (mg/L)Removal Removed (gallons)Pump Removal (gallons)Final Water Depth (feet)Notes (Explain Depth (feet)DateTimeInitials(°C) (°C)pHCond. (mg/L)Volume (gallons)Removal Removal (gallons)Pump (gallons)Final Untake 	Sam Re I	pling equest Depth equest	<b>J Spec</b> ted Sar Interva ted Wa	<b>ification</b> npling al (feet) it Followin	s <u>////</u> a		Init 1	<b>ial Me</b> Fime Ela nitial W	<b>asurem</b> apsed Fr ater Dep	<b>nent:</b> om F oth (f	<b>s</b> Final De Feet)	velopm <i>14,</i> 3	ent/P 81	urging (h	nours)
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$\frac{17.15'}{17.15'}$ Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (S Sample Containers Container Type: G = Clear Glass; A = Amber Glass; P = Plastic; V = VOA Vial (Glass); O = Other (S Preservatives: H = HCl; N = HNO ₃ ; S = H ₂ SO ₄ ; A = NaOH; O = Other (Specify); - = None $\frac{Analytical}{Parameter List}$ Container Field Container Field Filtered Collection Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comments Comme		1	1				$\times$		1-1	5		X	レ		
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ample	Contai	ners	Preservativ	ves: H = HCl;	N = H	NO₃; \$	S = H₂S	50₄; A			= Other	(Spec	ify); — =	None
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Name _					<u></u>									
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Form A0202 Rev. 02/24/94

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ater Qu	ality/	Water (	Colle	ction							I	DO = Diss	olved (	Dxygen; C	Cond. = Conductivity
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mple C	ontai	ners	Pres	servatives	s: H = HCI;	: N = HI	NO ₃ ; S	s = H	,SO₄; /	A = M	NaOH;	0 = 0 then	(Spec	;ify); — =	= None
		ners			s: H = HCl;	Fie Filte	eld	S = H	₂SO₄; /	Co Du	oled ring	0 = Other	(Spec	ify); — =	- None
Analytic Parameter	al	Number	C	ontainer	Volume (ml	Fie Filte	eld		₂SO₄;	Co Du Colle	oled	0 = Other	(Spec	ify); — = Commen	
Analytic Parameter	al List	<u>یں میں میں میں میں میں میں میں میں میں م</u>	C	ontainer		Fie Filte	eld ered	Pres		Co Du Colle	oled ring ection	0 = Other			
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	177	Commen	ts
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	ts
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	ts
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	ts
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	ts
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	ts
Analytic Parameter	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	ts
	al List	Number	C	ontainer	Volume (ml	Fie Filte	eld ered	Pres	erved	Co Du Colle	oled ring ection	to #	TI M	Commen 	ts
Analytic Parameter	al List 070 015 hen	Number	C	ontainer	Volume (ml	Fie Filte	No X X X	Pres 4 4	erved		oled rring ection No	to # to J to J	11 	Commen L/D 12	ts TTAK
Analytic Parameter 37EX, \$ PH, \$C Sen. Co Sen. Co Iter Type	al List 070 015 hen	Number Z I		ontainer Type V P	Volume (ml 40 40	Fie Filte	No X X X Chair	Pres 4 4 4			orm N	to # to J to J		Commen L/D 12	ts
Analytic Parameter TEX, \$ PH, \$C Den. Co Den.	al List 070 015 hen	Number Z I Samf			Volume (ml 40 40 		No X X X Chair	Pres 4 4 4		Colling Colling Yes X X X	orm N	to <u>#</u> to <u>]</u> to <u>]</u> umber <u>(</u>		Commen 2-197 12-	ts TTAK

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## **APPENDIX E**

## LABORATORY ANALYTICAL REPORTS FOR SOIL ANALYSES



2709-D Pan American Freeway, NE Albuquerque, NM 87107 Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 409397

September 29, 1994

Burlington Environmental 4000 Monroe Road Farmington, NM 87401

Project Name/Number: GIANT BLOOMFIELD 13023

Attention: S. Kelly

On **09/22/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **non-aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D. Project Manager

H. Mitchell Rubenstein, Ph.D. Laboratory Manager

MR:jt

Enclosure



CLIENT	: BURLINGTON ENVIRONMENTAL	DATE RECEIVED	:09/22/94
PROJECT #	:13023		
PROJECT NAME	: GIANT BLOOMFIELD	REPORT DATE	:09/29/94

ATI ID: 409397

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SB1-9.0	NON-AQ	09/19/94
02	SB2-12.5	NON-AQ	09/19/94
03	SB3-11.0	NON-AQ	09/19/94
04	SB4-16.5	NON-AQ	09/19/94
05	SB5-17.0	NON-AQ	09/19/94
06	SB6-5.0	NON-AQ	09/19/94
07	SB7-12.3	NON-AQ	09/19/94
08	SB8-12.0	NON-AQ	09/19/94

---TOTALS---

MATRIX #SAMPLES NON-AQ 8

## ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



#### GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED ATI I.D.: CLIENT : BURLINGTON ENVIRONMENTAL 409397 PROJECT # : 13023 : GIANT BLOOMFIELD PROJECT NAME SAMPLE DATE DATE DATE DIL. CLIENT I.D. MATRIX SAMPLED FACTOR ID. # EXTRACTED ANALYZED NON-AQ SB1-9.0 01 09/19/94 09/22/94 09/23/94 1 02 SB2-12.5 NON-AQ 09/19/94 09/22/94 09/26/94 5 03 SB3-11.0 NON-AQ 09/19/94 09/22/94 09/26/94 5 PARAMETER UNITS 01 02 03 FUEL HYDROCARBONS MG/KG 15 1300 490 HYDROCARBON RANGE C6-C12 C6-C12 C6-C12 HYDROCARBONS QUANTITATED USING GASOLINE GASOLINE GASOLINE FUEL HYDROCARBONS MG/KG 33 1300 830 HYDROCARBON RANGE C12-C34 C12-C30 C12-C32 HYDROCARBONS QUANTITATED USING DIESEL DIESEL DIESEL SURROGATE: O-TERPHENYL (%) 99 100 85

Analytical **Technologies,** Inc.

#### GAS CHROMATOGRAPHY RESULTS

: EPA 8015 MODIFIED TEST CLIENT : BURLINGTON ENVIRONMENTAL ATI I.D.: 409397 PROJECT # : 13023 : GIANT BLOOMFIELD PROJECT NAME SAMPLE DATE DATE DATE DIL. ID. # CLIENT I.D. MATRIX SAMPLED EXTRACTED ANALYZED FACTOR 04 SB4-16.5 NON-AQ 09/19/94 09/22/94 09/26/94 10 05 SB5-17.0 09/22/94 09/26/94 NON-AQ 09/19/94 10 SB6-5.0 06 NON-AQ 09/19/94 09/22/94 09/23/94 1 PARAMETER UNITS 05 06 04 FUEL HYDROCARBONS MG/KG 4900 3400 180 HYDROCARBON RANGE C6-C12 C6-C12 C6-C12 · HYDROCARBONS QUANTITATED USING GASOLINE GASOLINE GASOLINE FUEL HYDROCARBONS MG/KG 78 3200 2200 HYDROCARBON RANGE C12-C32 C12-C32 C12-C30 HYDROCARBONS QUANTITATED USING DIESEL DIESEL DIESEL SURROGATE: O-TERPHENYL (%) NA NA 97

NA=SURROGATE RECOVERY NOT OBTAINABLE DUE TO SAMPLE DILUTION



#### GAS CHROMATOGRAPHY RESULTS

: EPA 8015 MODIFIED TEST CLIENT : BURLINGTON ENVIRONMENTAL ATI I.D.: 409397 PROJECT # : 13023 PROJECT NAME : GIANT BLOOMFIELD SAMPLE DATE DATE DATE DIL. ID. # CLIENT I.D. MATRIX SAMPLED EXTRACTED FACTOR ANALYZED 07 SB7-12.3 NON-AQ 09/19/94 09/27/94 09/28/94 10 80 SB8-12.0 NON-AQ 09/19/94 09/22/94 09/23/94 1 UNITS 07 PARAMETER 08 FUEL HYDROCARBONS MG/KG 550 2000 HYDROCARBON RANGE C6-C14 C6-C12 HYDROCARBONS QUANTITATED USING GASOLINE GASOLINE FUEL HYDROCARBONS MG/KG 1500 410 HYDROCARBON RANGE C12-C32 C12-C34 HYDROCARBONS QUANTITATED USING DIESEL DIESEL SURROGATE: 94 97 O-TERPHENYL (%)

Analytical **Technologies**, Inc.

## GAS CHROMATOGRAPHY RESULTS

## REAGENT BLANK

TEST	: EPA 8015 MODIFIED	ATI I.D.	: 409397
BLANK I.D.	: 092294B	MATRIX	: NON-AQ
CLIENT	: BURLINGTON ENVIRONMENTA	L DATE EXTRACTED	: 09/22/94
PROJECT #	: 13023	DATE ANALYZED	: 09/23/94
PROJECT NAME	: GIANT BLOOMFIELD	DILUTION FACTOR	: 1
PARAMETER	UNIT:	5	<u></u>
FUEL HYDROCARE	BONS MG/KG	G <5 ·	
HYDROCARBON RA	INGE	-	
HYDROCARBONS Q	UANTITATED USING	-	

SURROGATE:

O-TERPHENYL (%)



## GAS CHROMATOGRAPHY RESULTS

## REAGENT BLANK

TEST	: EPA 8015 MODIFIED	ATI I.D.	: 409397
BLANK I.D.	: 092794	MATRIX	: NON-AQ
CLIENT	: BURLINGTON ENVIRONMENT	AL DATE EXTRACTED	: 09/27/94
PROJECT #	: 13023	DATE ANALYZED	: 09/28/94
PROJECT NAME	: GIANT BLOOMFIELD	DILUTION FACTOR	R : 1
PARAMETER	UNIT	S	
FUEL HYDROCARI	BONS MG/K	G <5	<u>, , , , , , , , , , , , , , , , , , , </u>
HYDROCARBON RA	ANGE	-	
HYDROCARBONS (	QUANTITATED USING	-	

SURROGATE:

O-TERPHENYL (%)

Analytical **Technologies,** Inc.

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## GAS CHROMATOGRAPHY - QUALITY CONTROL

### MSMSD

TEST	: EPA 8015 MO	DIFIED						
MSMSD #	: 092294B			ATI I.D.		:	409397	
CLIENT	: BURLINGTON	ENVIRONME	ENTAL	DATE EXT	RACTED	:	09/22/	94
PROJECT #	: 13023			DATE ANA	LYZED	:	09/23/9	94
PROJECT NAME	C: GIANT BLOOM	FIELD		SAMPLE M	ATRIX	:	NON-AQ	
REF. I.D.	: 092294B			UNITS		:	MG/KG	
<u></u>		SAMPLE	CONC	SPIKED	- %	DUP	DUP	
PARAMETER		RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD
FUEL HYDROCA	ARBONS	<5	100	100	100	100	100	0

(Spike Sample Result - Sample Result)
% Recovery = ------ X 100
Spike Concentration

(Sample Result - Duplicate Result) RPD (Relative Percent Difference) = ------ X 100 Average Result Analytical **Technologies,** Inc.

## GAS CHROMATOGRAPHY - QUALITY CONTROL

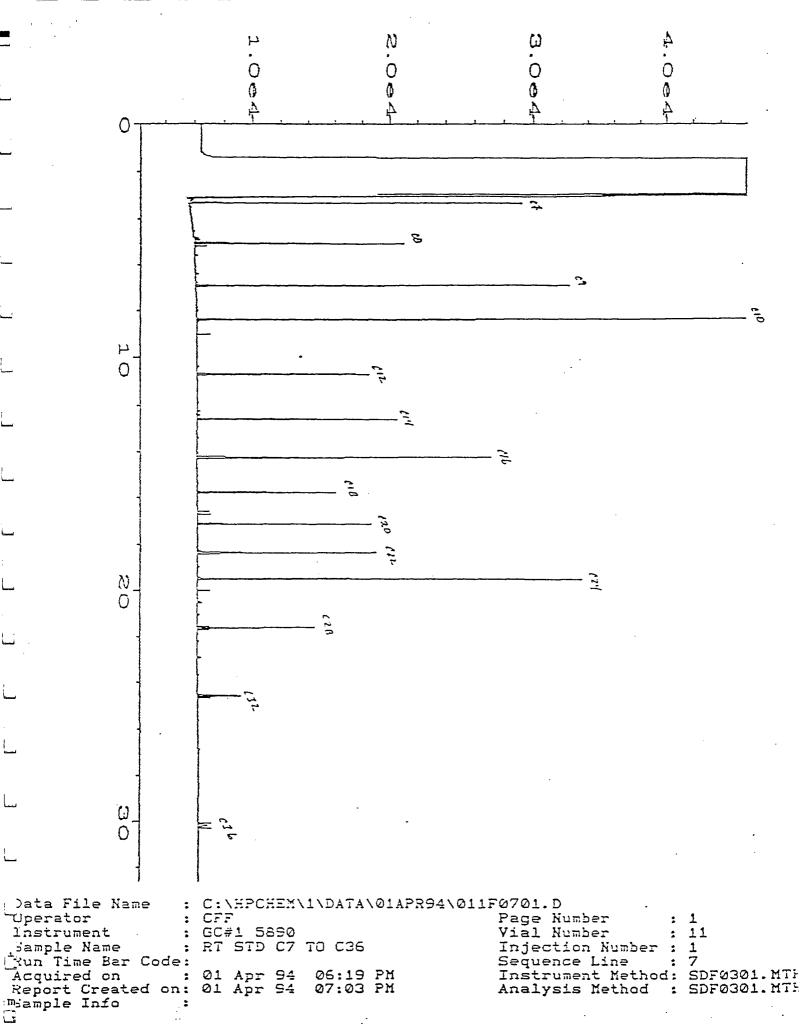
### MSMSD

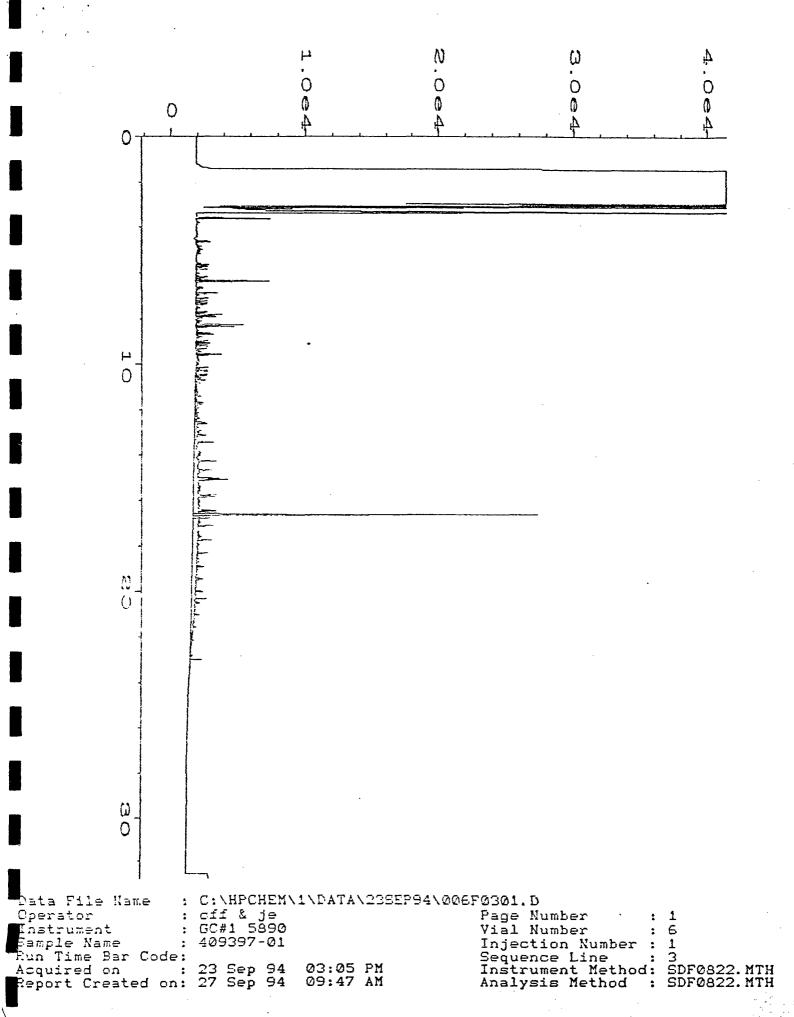
TEST	: EPA 8015 MO	DIFIED						
MSMSD #	: 40941102			ATI I.D.		:	409397	
CLIENT	: BURLINGTON	ENVIRONME	ENTAL	DATE EXT	RACTED	:	09/27/9	94
PROJECT #	: 13023			DATE ANA	LYZED	:	09/28/9	94
PROJECT NAME	: GIANT BLOOM	FIELD		SAMPLE M	ATRIX	:	NON-AQ	
REF. I.D.	: 40941102			UNITS		:	MG/KG	
		SAMPLE	CONC	SPIKED	0/0	DUP	DUP	<u></u>
PARAMETER		RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD
FUEL HYDROCA	RBONS	<5	100	120	120	120	120	0

(Spike Sample Result - Sample Result)
% Recovery = ----- X 100
Spike Concentration

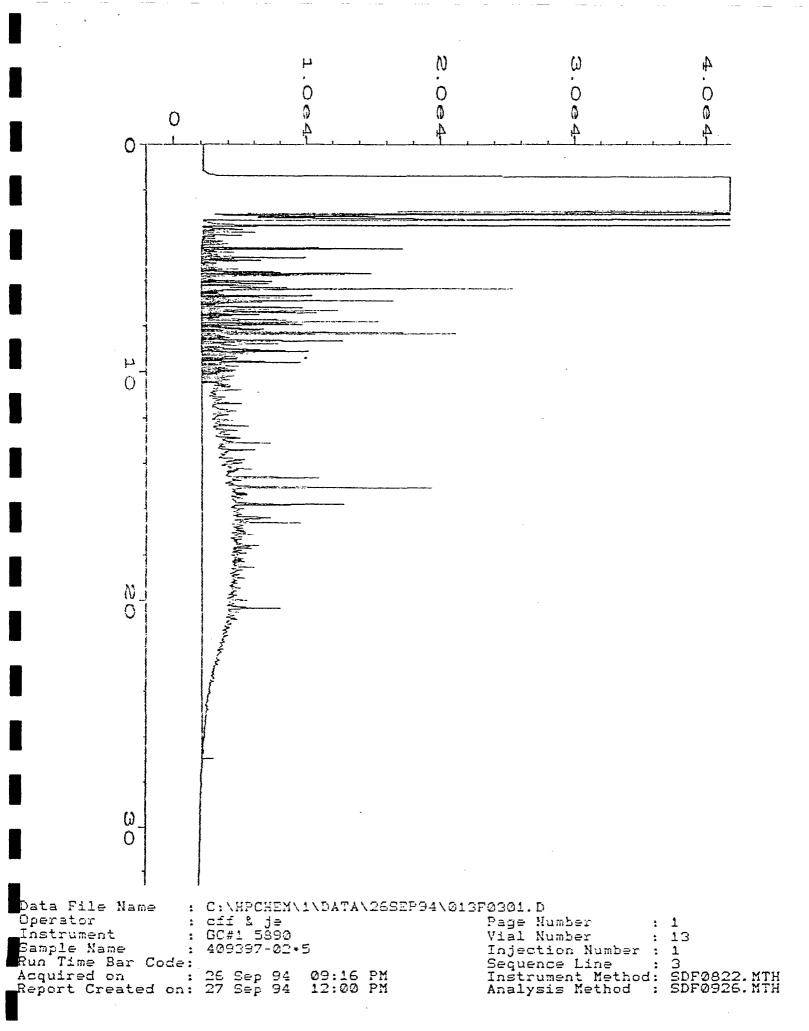
ALLEST UD 9397 COC Serial No. C 1864			Comments										Date Time	d/23/4/ CO12	Airbill No. 1389025691	
one X	10121 10121	CT-CT-CT-CT-CT-CT-CT-CT-CT-CT-CT-CT-CT-C							29			Received By:		Dutte		
ustod	er of Bottle	at Hay			A A	X Sa	1 × 06	X	80 × 1		1		Time	0620	т Х.	and Lab Notes:
Chain-of Custody Record 4000 Monroe Road Farmington, NM 87401 (505) 326-2262 PF (505) 326-2388 FA	<u>Γ</u> ζ. τ	1 N	ne Matrix 30 Soil J			30	2	HC	7 07				Date	9/21/94	Carrier: Feo	Shipping
• –	Giant Bloomfield 13023 Phase Task 0077 Kelly	uera	Date Time <i>GIAPH</i> 1100		9/19/94 1430	9/19/94 1530	9/19/94 1615	9/19/94 1704	9/19/9/1740					ly .	S No	r Samples) Sodium hyroxide (NaOH) 
BURLINGTON ENVIRONMENTAL A Philip Environmental Company	Project Name 6-jant Project Number 13023 Samplers 5, Ke/1	2	Sample Number (and depth) $SB1 - q, o$	582-12.5		585-17.0	586-5.0	587-12,3	588-12.0			Relinquished by:	Signature	Parch Nol	Samples Iced: X Yes	Y for Wate

BE-179 4/94

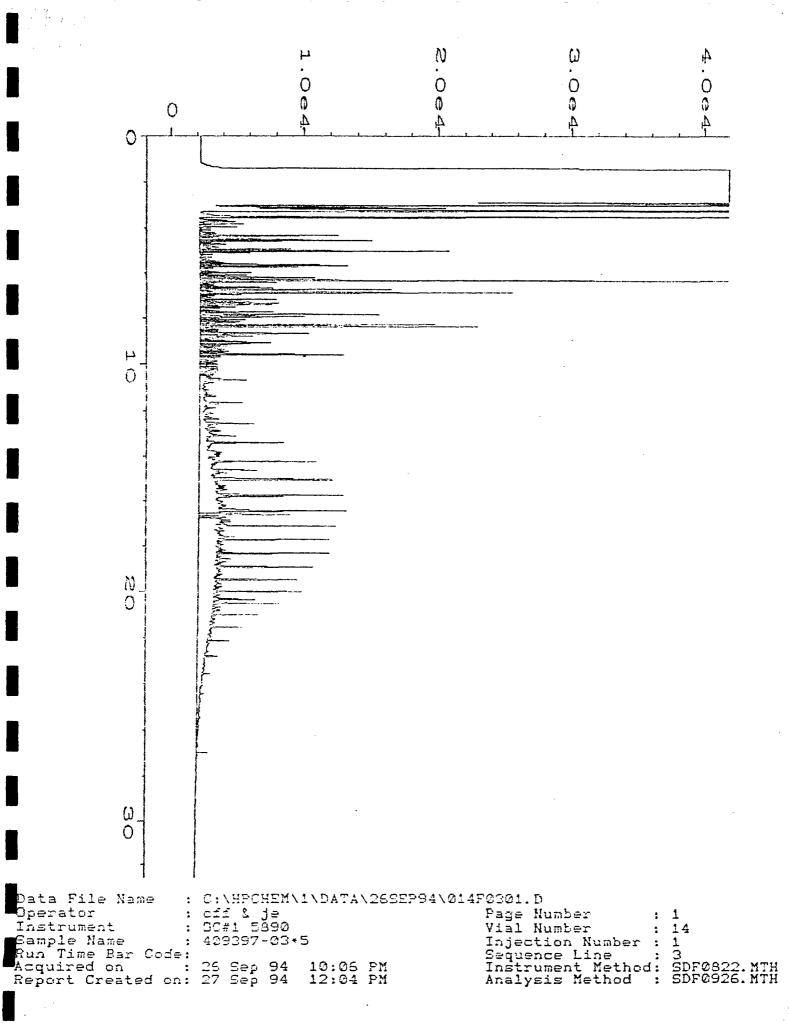


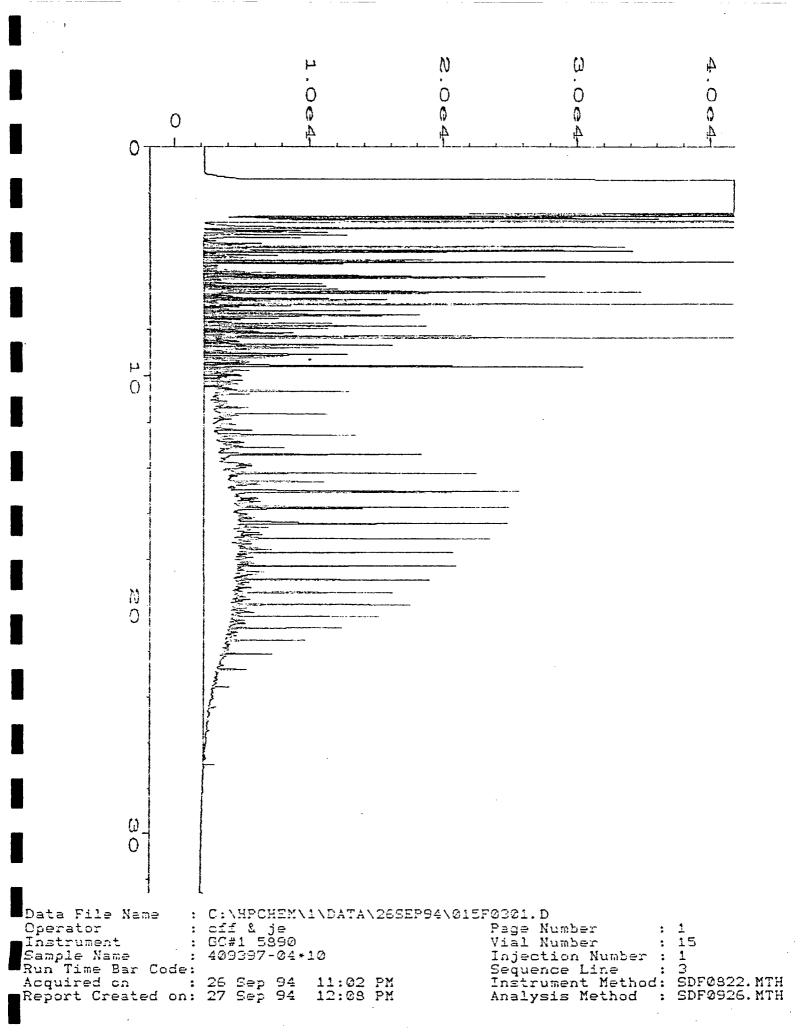


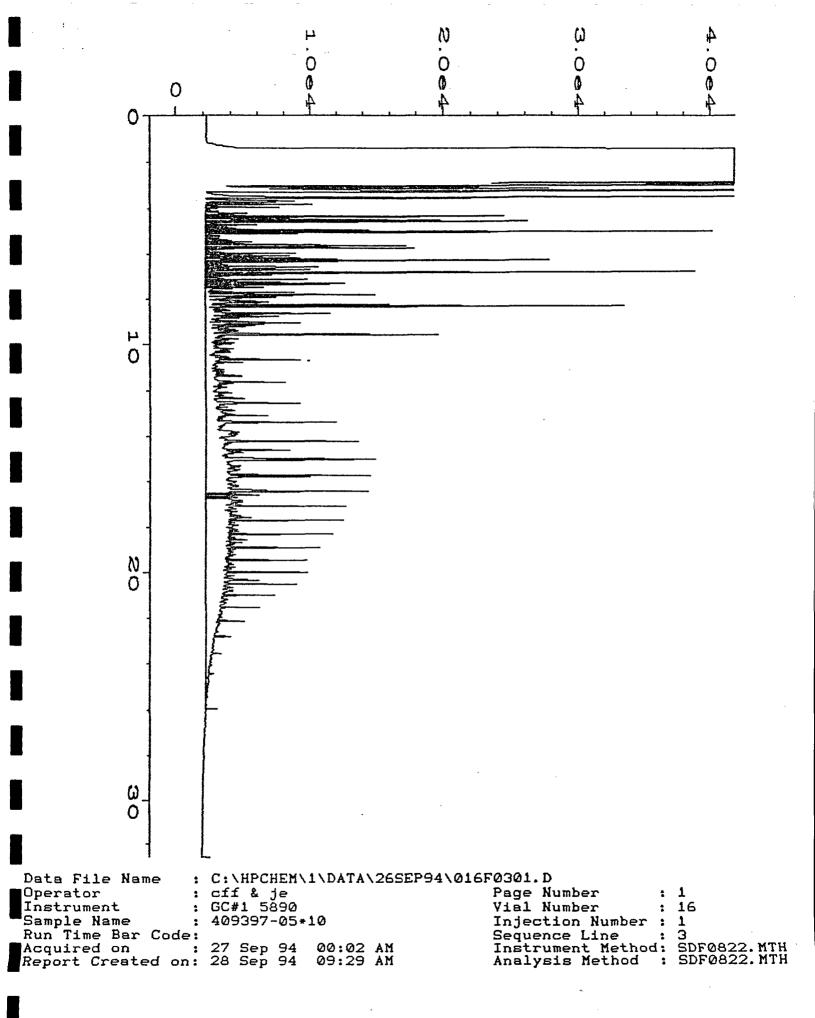
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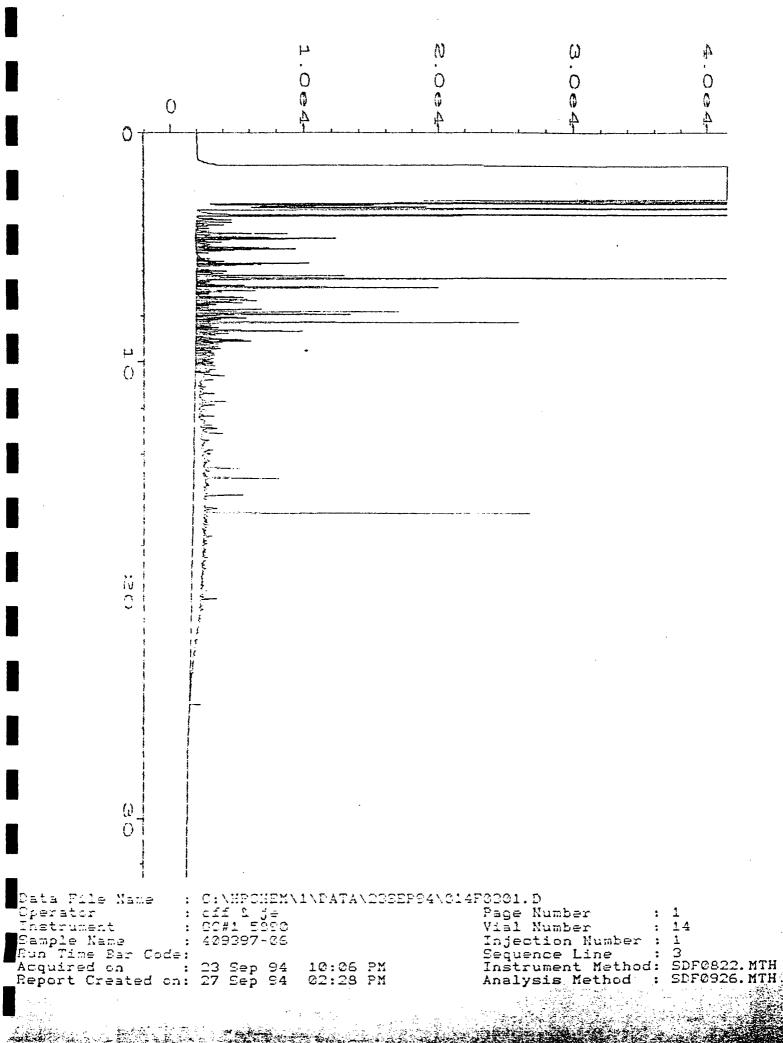
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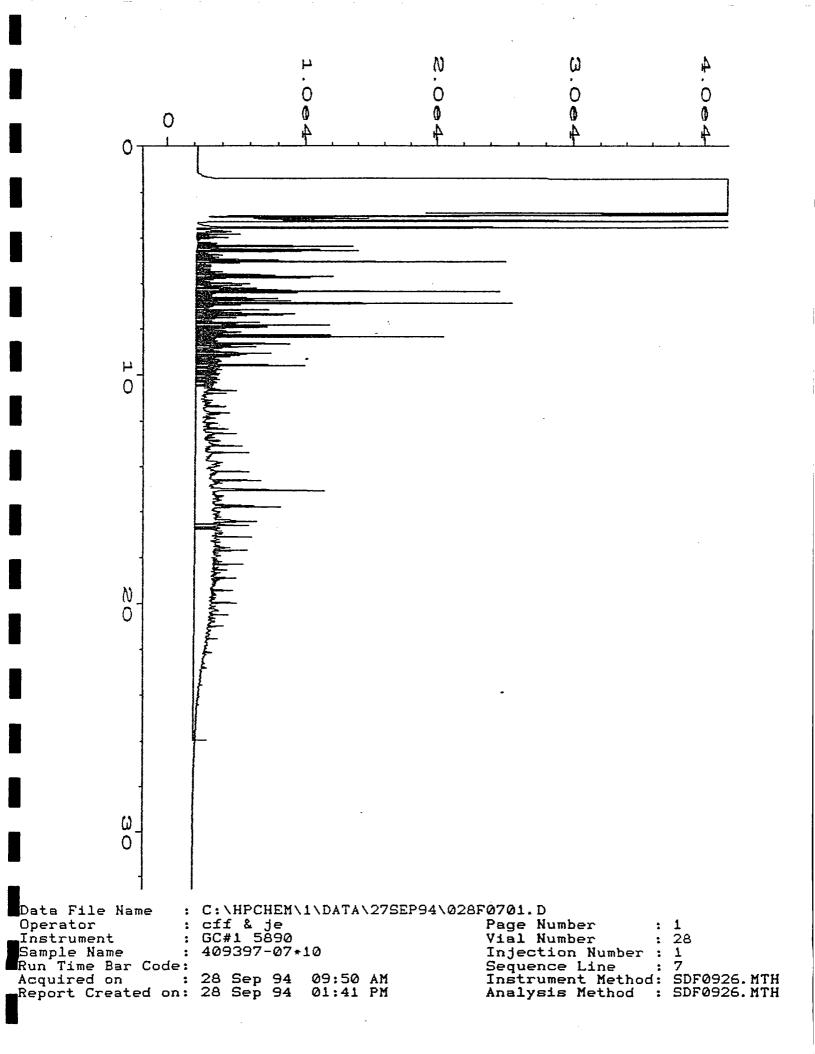


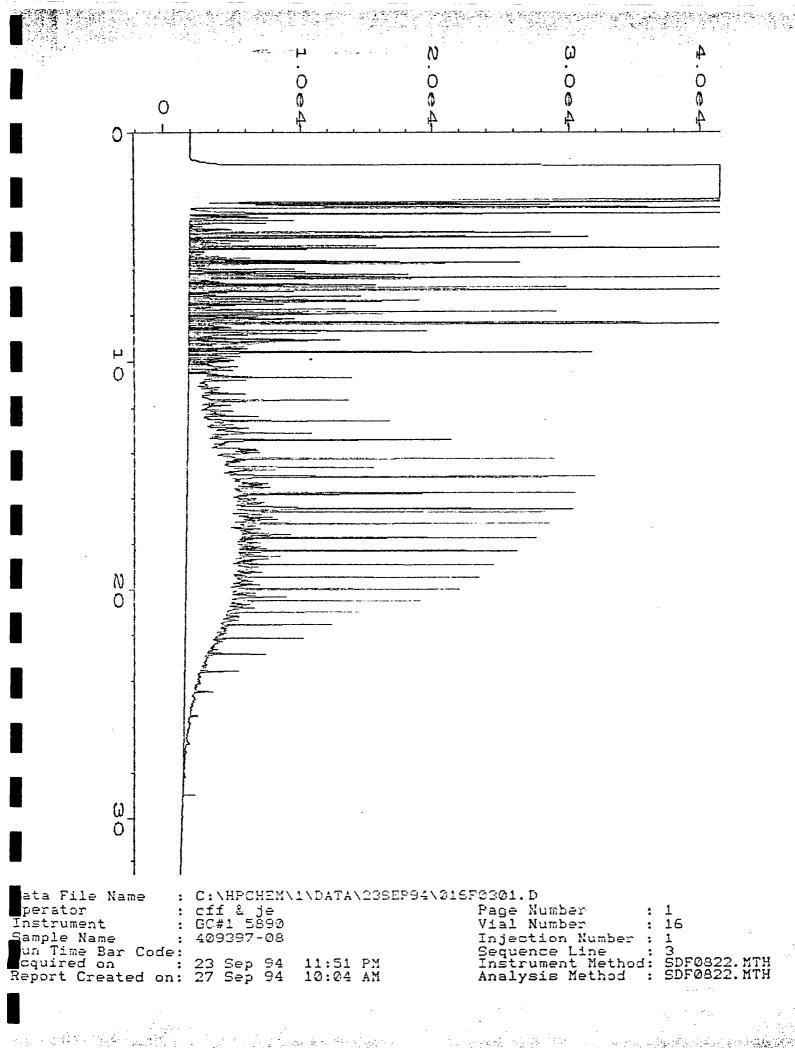


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# **APPENDIX F**

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## LABORATORY ANALYTICAL REPORTS FOR GROUNDWATER ANALYSES



2506 West Main Street Farmington, New Mexico 87401 Tel. (505) 326-4737



Sarah Kelly Giant - Bloomfield P. O. Box 256 Farmington, NM 87499

Dear Sarah:

Enclosed please find the results for water samples received at Inter-Mountain Laboratories, Farmington on September 23, 1994. The Project was identified as "Bloomfield." Analyses for General Chemistry parameters were performed as specified on the accompanying Chain of Custody document.

Tests were performed in accordance with 40 CFR 136, "Guidelines Establishing Test Procedures for Analysis," as amended.

If you have any questions or comments about the analysis, please call me at your convenience.

Sincerely,

Main Hoppe

Marlon E. Hopper Lab Manager Inter-Mountain Laboratories

Enclosures: Analytical Report

Inter-Mountain Laboratories, Inc.

Client:	Giant Bloomfield	Farmingt	2506 W. Main Street on, New Mexico 87401
Project:	Bloomfield	Date Reported:	10/11/94
Sample ID:	MW2-1	Date Sampled:	09/22/94
Laboratory ID:	W01627	Time Sampled:	1630
Sample Matrix:	Water	Date Received:	09/23/94
Condition:	Cool/Intact		

Parameter	Analytical Result	Units		Units
Lab pH	6.6	s.u.		
Lab Conductivity @ 25° C	4,920	umhos/cm		
Total Dissolved Solids @ 180°C	3,020	mg/L		
Total Dissolved Solids (Calc)	3049	mg/L		
Total Alkalinity as CaCO3	957	mg/L		
SAR	11.785	ratio		
Bicarbonate as HCO3	1,170	mg/L	19.14	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide	0	mg/L	0.00	meq/L
Chloride	1,050	mg/L	29.50	meq/L
Sulfate	245	mg/L	5.10	meq/L
Calcium	325	mg/L	16.20	meq/L
Magnesium	30	mg/L	2.48	meq/L
Potassium	1.4	mg/L	0.04	meq/L
Sodium	828	mg/L	36.02	meq/L
Cations			54.73	meq/L
Anions			53.74	meq/L
Cation/Anion Difference			0.91	%

Reference:

U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. "Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Reported by ML

Reviewed by

nter Mountain Laboratories, Inc.

Client:	Giant Bloomfield	Farming	2506 W. Main Street on, New Mexico 87401
Project:	Bloomfield	Date Reported:	10/11/94
ample ID:	MW4-1	Date Sampled:	09/23/94
Laboratory ID:	W01628	Time Sampled:	1200
Sample Matrix:	Water	Date Received:	09/23/94
condition:	Cool/Intact		

	Analytical			
arameter	Result	Units		Units
ab pH	7.0	s.u.		
ab Conductivity @ 25° C	5,420	umhos/cm		
otal Dissolved Solids @ 180°C	4,710	mg/L		
otal Dissolved Solids (Calc)	4,389	mg/L		
otal Alkalinity as CaCO3	576	mg/L		
AR	10.886	ratio		
Bicarbonate as HCO3	703	mg/L	11.53	meq/l
Carbonate as CO3	0	mg/L	0.00	meq/l
Hydroxide	0	mg/L	0.00	meq/l
Chloride	175	mg/L	4.93	meq/l
Sulfate	2,470	mg/L	51.38	meq/l
Calcium	439	mg/L	21.90	meq/l
Magnesium	53	mg/L	4.37	meq/l
Potassium	3.5	mg/L	0.09	meq/l
Sodium	907	mg/L	39.45	meq/l
ations		••••	65.81	meq/
nions	••••••		67.83	meq/
ation/Anion Difference			1.51	%

Reference:

U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. "Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Reported by M

Reviewed by

mter Mountain Laboratories, Inc.

client:	Giant Bloomfield	2506 W. Main Street Farmington, New Maxico 87401			
Project:	Bloomfield	Date Reported:	10/11/94		
Sample ID:	MW3-1	Date Sampled:	09/23/94		
Laboratory ID:	W01629	Time Sampled:	1530		
_Sample Matrix:	Water	Date Received:	09/23/94		
Condition:	Cool/Intact				

	Analytical			
Parameter	Result	Units		Units
Lab pH	7.1	s.u.		
Lab Conductivity @ 25° C	4,250	umhos/cm		
Total Dissolved Solids @ 180°C	3,660	mg/L		
Total Dissolved Solids (Calc)	3,413	mg/L		
Fotal Alkalinity as CaCO3	521	mg/L		
SAR	8.147	ratio		
Bicarbonate as HCO3	635	mg/L	10.41	meq/L
Carbonate as CO3	0	mg/L	0.00	meg/L
Hydroxide	0	mg/L	0.00	meq/L
Chloride	48	mg/L	1.36	meq/L
Sulfate	1,920	mg/L	39.90	meq/L
Calcium	439	mg/L	21.90	meq/L
Magnesium	37	mg/L	3.01	meq/L
Potassium	1.4	mg/L	0.04	meq/L
Sodium	661	mg/L	28.75	meq/L
Cations		••••	53.70	meq/L
Anions		••••	51.66	meq/L
Cation/Anion Difference		· · · · ·	1.93	%

Reference:

U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. "Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Reviewed by



2709-D Pan American Freeway, NE Albuquerque, NM 87107 Phone (505) 344-3777 FAX (505) 344-4413

#### ATI I.D. 409415

October 26, 1994

Burlington Environmental 4000 Monroe Road Farmington, NM 87401

Project Name/Number: GIANT-BLOOMFIELD 13023

Attention: S. Kelly

On **09/26/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

D indicates the compound was analyzed at a greater dilution.

Due to matrix interferences, cadmium and lead spike analyses were performed using the Method of Standard Additions (MSA). The spike results given are the correlation coefficients (CC), which are  $\geq 0.995$ .

For EPA Method 601/602 Toluene was found in the water reagent blank associated with the MS/MSD (09/27/94). Toluene was also found in the water reagent blank, at 0.7 ug/l, associated with all of the client's samples. Toluene was found only in client sample "MW2-1" at 600 ug/l.

EPA Method 8015 and 601/602 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

All other analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letítia Krakowski, Ph.D. Project Manager

H. Mitchell Rubenstein, Ph.D. Laboratory Manager

MR:jt

Enclosure

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

Analytical **Technologies,** Inc.

1

CLIENT	: BURLINGTON ENVIRONMENTAL	DATE RECEIVED	:09/26/94
PROJECT #	:13023		
PROJECT NAME	: GIANT-BLOOMFIELD	REPORT DATE	:10/26/94

ATI ID: 409415

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW3-1	AQUEOUS	09/23/94
02	MW2-1	AQUEOUS	09/22/94
)3	MW4-1	AQUEOUS	09/23/94
04	TRIP BLANK	AQUEOUS	09/14/94

---TOTALS---

<u>MATRIX</u> AQUEOUS #SAMPLES 4

### ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date. METALS RESULTS



- -

# ATI I.D. : 409415

CLIENT : BURLINGTON PROJECT # : 13023 PROJECT NAME : BLOOMFIELD	ENVIRONMENTAL	DATE RECEIVED : 09/26/94 REPORT DATE : 10/26/94
PARAMETER	UNITS 01	02 03
SILVER (EPA 200.7/6010) ARSENIC (EPA 206.2/7060) BERYLLIUM (EPA 200.7/6010) CADMIUM (EPA 213.2/7131) CHROMIUM (EPA 200.7/6010) COPPER (EPA 200.7/6010) MERCURY (EPA 245.1/7470) NICKEL (EPA 200.7/6010) LEAD (EPA 239.2/7421) ANTIMONY (EPA 200.7/6010) SELENIUM (EPA 270.2/7740)	MG/L<0.0005MG/L<0.010	<0.005 < 0.005 <0.004 < 0.004 <0.0005 < 0.0005 0.010 < 0.010 <0.012 < 0.010 <0.0002 < 0.0002 <0.020 < 0.020 <0.002 < 0.002 <0.05 < 0.05 <0.005 < 0.005
THALLIUM (EPA 279.2/7841) ZINC (EPA 200.7/6010)	MG/L <0.005 MG/L 0.023	<0.005 <0.005 0.032 0.026

METALS - QUALITY CONTROL

Analytical **Technologies,** Inc.

LIENT	-	:	BURLINGTON	ENVIRONMENTAL
PROJECT	#	:	13023	
PROJECT	NAME	:	BLOOMFIELD	

ATI I.D. : 409415

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT RPD	SPIKED SAMPLE		۶ REC
SILVER ARSENIC BERYLLIUM CADMIUM CHROMIUM COPPER MERCURY NICKEL LEAD	MG/L MG/L MG/L MG/L MG/L MG/L MG/L MG/L	40941503 40941501 40941503 40941503 40941503 40941503 40941502 40941503 40941503 40941503	<0.005 <0.004 <0.0005 <0.010 <0.010 <0.0002 <0.020	<0.010 NA <0.005 NA <0.004 NA <0.0005 NA <0.010 NA <0.010 NA <0.010 NA <0.0002 NA <0.020 NA <0.002 NA	0.426 0.041 0.451 MSA 0.886 0.454 0.0047 0.889 MSA	0.500 0.050 CC= 1.00 0.500 0.0050 1.00 CC=	85 82 90 .9976 89 91 94 89 .9998
ANTIMONY SELENIUM THALLIUM ZINC	MG/L MG/L MG/L MG/L	40941503 40941501 40941501 40941503	<0.05 <0.005 <0.005	<0.05 NA <0.005 NA <0.005 NA 0.027 4	0.88 0.031 0.048 0.502	1.00 0.050 0.050 0.500	88 62 96 95

Recovery = (Spike Sample Result - Sample Result) ----- X 100 Spike Concentration

RPD (Relative Percent Difference) = (Sample Result - Duplicate Result) Average Result

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#### GAS CHROMATOGRAPHY RESULTS

TEST			-	CICS (EPA 60	• •	
CLIENT	: BURLINGT	ON ENVIRON	IMENTAL	ATI I.D.:	409415	
PROJEC						
PROJEC		DOMFIELD				
SAMPLE			DATE	DATE	DATE	DIL.
ID. #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
01	MW3-1	AQUEOUS	09/23/94	NA	09/28/94	1
02	MW2-1	AQUEOUS	09/22/94	NA	09/28/94	1
03	MW4-1	AQUEOUS	09/23/94	NA	09/28/94	1
PARAME	TER		UNITS	01	02	03
BENZEN	E		UG/L	<0.5	640 D(10)	2.1
BROMOD	ICHLOROMETHANE		UG/L	<0.2	<0.2	<0.2
BROMOF	ORM		UG/L	<0.5	<0.5	<0.5
BROMOM	ETHANE		UG/L	<1.0	<1.0	<1.0
CARBON	TETRACHLORIDE		UG/L	<0.2	<0.2	<0.2
CHLORO	BENZENE		UG/L	<0.5	<0.5	<0.5
CHLORO	ETHANE		UG/L	<0.5	<0.5	<0.5
CHLORO	FORM		UG/L	<0.5	<0.5	<0.5
CHLORO	METHANE		UG/L	<1.0	<1.0	<1.0
DIBROM	OCHLOROMETHANE		UG/L	<0.2	<0.2	<0.2
1,2-DII	BROMOETHANE (EDB)		UG/L	<0.2	<0.2	<0.2
1,2-DI(	CHLOROBENZENE		UG/L	<0.5	<0.5	<0.5
1,3-DI	CHLOROBENZENE		UG/L	<0.5	<0.5	<0.5
1,4-DI	CHLOROBENZENE		UG/L	<0.5	<0.5	<0.5
1,1-DI(	CHLOROETHANE	••	UG/L	<0.2	<0.2	<0.2
1,2-DIC	CHLOROETHANE (EDC)		UG/L	<0.5	<0.5	<0.5
1,1-DIC	CHLOROETHENE		UG/L	<0.2	<0.2	<0.2
CIS-1,2	2-DICHLOROETHENE		UG/L	<0.2	<0.2	<0.2
TRANS-	1,2-DICHLOROETHENE		UG/L	<1.0	<1.0	<1.0
1,2-DI(	CHLOROPROPANE	•	UG/L	<0.2	<0,2	<0.2
cis-1,3	3-DICHLOROPROPENE		UG/L	<0.2	<0.2	<0.2
TRANS-	1,3-DICHLOROPROPENE	2	UG/L	<0.2	<0.2	<0.2
ETHYLBI	ENZENE		UG/L	<0.5	82 D(10).	<0.5
METHYLI	ENE CHLORIDE		UG/L	<2.0	<2.0	<2.0
1,1,2,2	2-TETRACHLOROETHANE	2	UG/L	<0.2	<0.2	<0.2
TETRACI	HLOROETHENE		UG/L	<0.5	<0.5	<0.5
TOLUENI	E		UG/L	<0.5	600 D(10)B	<0.5
1,1,1-7	<b>FRICHLOROETHANE</b>		UG/L	<1.0	<1.0	<1.0
1,1,2-3	<b>IRICHLOROETHANE</b>		UG/L	<0.2	<0.2	<0.2
TRICHLO	OROETHENE		UG/L	<0.2	<0.2	<0.2
	OROFLUOROMETHANE		UG/L	<0.2	<0.2	<0.2
VINYL C	CHLORIDE		UG/L	<0.5	<0.5	<0.5
TOTAL 3	XYLENES		UG/L	<0.5	690 D(10)	1.2
SURROGI	ATES:					
	HLOROMETHANE (%)			106	98	. 99
	DROTOLUENE (%)			103	94 D(10)	101

D(10)=DILUTED 10X, ANALYZED 09/28/94 B=FOUND IN ASSOCIATED WATER REAGENT BLANK

TEST : PURGEABLE	HALOCARI	BONS/AROMAT	ICS (EPA 60	1/602)	
CLIENT : BURLINGTO	N ENVIRON	NMENTAL	ATI I.D.:	409415	
PROJECT # : 13023					
PROJECT NAME : GIANT-BLO	OMFIELD				
SAMPLE		DATE	DATE	DATE	DIL.
ID. # CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
04 TRIP BLANK	AQUEOUS	09/14/94	NA	09/28/94	1
PARAMETER		UNITS	04		
BENZENE		UG/L	<0.5		
BROMODICHLOROMETHANE		UG/L	<0.2		
BROMOFORM		UG/L	<0.5		
BROMOMETHANE		UG/L	<1.0		
CARBON TETRACHLORIDE		UG/L	<0.2		
CHLOROBENZENE		UG/L	<0.5		
CHLOROETHANE		UG/L	<0.5		
CHLOROFORM		UG/L	<0.5		
CHLOROMETHANE		UG/L	<1.0		
DIBROMOCHLOROMETHANE		UG/L	<0.2		
1,2-DIBROMOETHANE (EDB)		UG/L	<0.2		
1,2-DICHLOROBENZENE		UG/L	<0.5		
1,3-DICHLOROBENZENE		UG/L	<0.5		
1,4-DICHLOROBENZENE		UG/L	<0.5		
1,1-DICHLOROETHANE		UG/L	<0.2		
1,2-DICHLOROETHANE (EDC)		UG/L	<0.5		
1,1-DICHLOROETHENE	•	UG/L	<0.2		
CIS-1,2-DICHLOROETHENE		UG/L	<0.2		
TRANS-1,2-DICHLOROETHENE		UG/L	<1.0		
1,2-DICHLOROPROPANE		UG/L	<0.2		
CIS-1,3-DICHLOROPROPENE		UG/L	<0.2		
TRANS-1, 3-DICHLOROPROPENE		UG/L	<0.2		
ETHYLBENZENE		UG/L	<0.5		
METHYLENE CHLORIDE		UG/L	<2.0		
1,1,2,2-TETRACHLOROETHANE		UG/L	<0.2		
TETRACHLOROETHENE		UG/L	<0.5		
TOLUENE		UG/L	<0.5		
1,1,1-TRICHLOROETHANE		UG/L	<1.0		
1,1,2-TRICHLOROETHANE		UG/L	<0.2		
TRICHLOROETHENE		UG/L	<0.2		
TRICHLOROFLUOROMETHANE		UG/L	<0.2		
VINYL CHLORIDE		UG/L	<0.2		
TOTAL XYLENES		UG/L	<0.5		
		-			
SURROGATES:					
BROMOCHLOROMETHANE (%)			98		

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BROMOCHLOROMETHANE (%) TRIFLUOROTOLUENE (%)

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# GAS CHROMATOGRAPHY RESULTS - QUALITY CONTROL

# REAGENT BLANK

TEST: EPA 601/602BLANK I.D.: 092794CLIENT: BURLINGTON ENVIPROJECT #: 13023PROJECT NAME: GIANT-BLOOMFIEI	D	ATI I.D. MATRIX DATE EXTRACTED DATE ANALYZED DIL. FACTOR	: 409415 : AQUEOUS : NA : 09/27/94 : 1
PARAMETER	UNITS		
BENZENE	UG/L	<0.5	
BROMODICHLOROMETHANE	UG/L	<0.2	
BROMOFORM	UG/L	<0.5	
BROMOMETHANE	UG/L	<1.0	
CARBON TETRACHLORIDE	UG/L	<0.2	
CHLOROBENZENE	UG/L	<0.5	
CHLOROETHANE	UG/L	<0.5	
CHLOROFORM	UG/L	<0.5	
CHLOROMETHANE	UG/L	<1.0	
DIBROMOCHLOROMETHANE	UG/L	<0.2	
1,2-DIBROMOETHANE (EDB)	UG/L	<0.2	
1,2-DICHLOROBENZENE	UG/L	<0.5	
1,3-DICHLOROBENZENE	UG/L	<0.5	
1,4-DICHLOROBENZENE	UG/L	<0.5	
1,1-DICHLOROETHANE	UG/L	<0.2	
1,2-DICHLORQETHANE (EDC)	UG/L	<0.5	
1, 1-DICHLOROETHENE	UG/L	<0.2	
CIS-1, 2-DICHLOROETHENE	UG/L	<0.2	
TRANS-1, 2-DICHLOROETHENE	UG/L	<1.0	
1,2-DICHLOROPROPANE	UG/L	<0.2	
CIS-1, 3-DICHLOROPROPENE	UG/L	<0.2	
TRANS-1, 3-DICHLOROPROPENE	UG/L	<0.2	
ETHYLBENZENE	UG/L	<0.5	
METHYLENE CHLORIDE	UG/L	<2.0	
1,1,2,2-TETRACHLOROETHANE	UG/L	<0.2	
TETRACHLOROETHENE	UG/L	<0.5	
TOLUENE	UG/L	0.7	
1,1,1-TRICHLOROETHANE	UG/L	<1.0	
1,1,2-TRICHLOROETHANE	UG/L	<0.2	
TRICHLOROETHENE	UG/L	<0.2	
TRICHLOROFLUOROMETHANE	UG/L	<0.2	
VINYL CHLORIDE	UG/L	<0.5	
TOTAL XYLENES	UG/L	<0.5	
SURROGATES:			
BROMOCHLOROMETHANE (%)		101	
TRIFLUOROTOLUENE (%)		101	
INTI DOMOTODOENE (%)		TOI	

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GAS CHROMATOGRAPHY RESULTS - QUALITY CONTROL

# REAGENT BLANK

TEST BLANK I.D. CLIENT PROJECT #			ATI I.D. MATRIX DATE EXTRACTED DATE ANALYZED	: 09/28/94
PROJECT NAME	: GIANT-BLOOMFIELD		DIL. FACTOR	:1
PARAMETER		UNITS		· · · · · · · · · · · · · · · · · · ·
BENZENE		UG/L	<0.5	
BROMODICHLORON	IETHANE	UG/L	<0.2	
BROMOFORM		UG/L	<0.5	
BROMOMETHANE		UG/L	<1.0	
CARBON TETRACH	ILORIDE	UG/L	<0.2	
CHLOROBENZENE		UG/L	<0.5	
CHLOROETHANE		UG/L	<0.5	
CHLOROFORM		UG/L	<0.5	
CHLOROMETHANE		UG/L	<1.0	
DIBROMOCHLORON		UG/L	<0.2	
1,2-DIBROMOETH		UG/L	<0.2	
1,2-DICHLOROBE		UG/L	<0.5	
1,3-DICHLOROBI		UG/L	<0.5	
1,4-DICHLOROBI		UG/L	<0.5	
1,1-DICHLOROET		UG/L	<0.2	
1,2-DICHLOROET	• •	UG/L	<0.5	
1,1-DICHLOROET		UG/L	<0.2	
CIS-1,2-DICHLC	•	UG/L	<0.2	
TRANS-1,2-DICH		UG/L	<1.0	
1,2-DICHLOROPH		UG/L	<0.2	
CIS-1,3-DICHLO	-	UG/L	<0.2	
TRANS-1,3-DICH	ILOROPROPENE	UG/L	<0.2	
ETHYLBENZENE		UG/L	<0.5	
METHYLENE CHLC		U <u>G</u> /L	<2.0	
1,1,2,2-TETRAC		UG/L	<0.2	
TETRACHLOROETH	IENE	UG/L	<0.5	
TOLUENE		UG/L	0.6	
1,1,1-TRICHLOF		UG/L	<1.0	
1,1,2-TRICHLOF		UG/L	<0.2	
TRICHLOROETHEN	IE	UG/L	<0.2	
TRICHLOROFLUOF	OMETHANE	UG/L	<0.2	
VINYL CHLORIDE	6	UG/L	<0.5	
TOTAL XYLENES		UG/L	<0.5	
SURROGATES:				
BROMOCHLOROMET			106	
TRIFLUOROTOLUE	NE (%)		110	

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# GAS CHROMATOGRAPHY RESULTS - QUALITY CONTROL

# REAGENT BLANK

TEST : EPA 601/6	02	ATI I.D. : 409415
BLANK I.D. : 092894		MATRIX : AQUEOUS
	N ENVIRONMENTAL	DATE EXTRACTED : NA
PROJECT # : 13023		DATE ANALYZED : 09/28/9
PROJECT NAME : GIANT-BLO		DIL. FACTOR : 1
PARAMETER	UNITS	
BENZENE	UG/L	<0.5
BROMODICHLOROMETHANE	UG/L	<0.2
BROMOFORM	UG/L	<0.5
BROMOMETHANE	UG/L	<1.0
CARBON TETRACHLORIDE	UG/L	<0.2
CHLOROBENZENE	UG/L	<0.5
CHLOROETHANE	UG/L	<0.5
CHLOROFORM	UG/L	<0.5
CHLOROMETHANE	•	<1.0
DIBROMOCHLOROMETHANE	UG/L	
1,2-DIBROMOETHANE (EDB)	UG/L	<0.2
1,2-DICHLOROBENZENE	UG/L	<0.5
1,3-DICHLOROBENZENE	UG/L	<0.5
1,4-DICHLOROBENZENE	UG/L	<0.5
1,1-DICHLOROETHANE	UG/L	<0.2
1,2-DICHLOROETHANE (EDC)	UG/L	<0.5
1,1-DICHLOROETHENE	UG/L	<0.2
CIS-1,2-DICHLOROETHENE	UG/L	<0.2
TRANS-1,2-DICHLOROETHENE	UG/L	<1.0
1,2-DICHLOROPROPANE	UG/L	<0.2
CIS-1,3-DICHLOROPROPENE	UG/L	<0.2
TRANS-1, 3-DICHLOROPROPENE	UG/L	<0.2
ETHYLBENZENE	UG/L	<0.5
METHYLENE CHLORIDE	UG/L	<2.0
1,1,2,2-TETRACHLOROETHANE	UG/L	<0.2
TETRACHLOROETHENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
1,1,1-TRICHLOROETHANE	UG/L	<1.0
1,1,2-TRICHLOROETHANE	UG/L	<0.2
TRICHLOROETHENE	UG/L	<0.2
TRICHLOROFLUOROMETHANE	UG/L	<0.2
VINYL CHLORIDE	UG/L	<0.5
TOTAL XYLENES	UG/L	<0.5
		-
SURROGATES:		
BROMOCHLOROMETHANE (%)		95
TRIFLUOROTOLUENE (%)		102

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Analytical Technologies, GAS CHROMATOGRAPHY - RESULTS

# TEST : POLYNUCLEAR AROMATICS (EPA 610)

CLIENT : BURLINGTON ENVIRONMENTAL PROJECT # : 13023 PROJECT NAME : BLOOMFIELD CLIENT I.D. : MW3-1 SAMPLE MATRIX : AQUEOUS	DATE SAMPLED : 09/23/94 DATE RECEIVED : 09/26/94 DATE EXTRACTED : 09/27/94 DATE ANALYZED : 10/03/94 UNITS : UG/L DILUTION FACTOR : 1
COMPOUNDS	RESULTS
NAPHTHALENE ACENAPHTHYLENE ACENAPHTHENE FLUORENE PHENANTHRENE ANTHRACENE FLUORANTHENE PYRENE BENZO(A)ANTHRACENE CHRYSENE BENZO(B)FLUORANTHENE BENZO(A)FLUORANTHENE BENZO(A)PYRENE DIBENZO(a,h)ANTHRACENE BENZO(a,h)ANTHRACENE BENZO(g,h,i)PERYLENE INDENO(1,2,3-CD)PYRENE 1-METHYLNAPHTHALENE 2-METHYLNAPHTHALENE	<0.50 <1.0 <0.50 <0.10 <0.05 <0.05 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.30 <0.30

# SURROGATE PERCENT RECOVERIES

2-CHLOROANTHRACENE (%)

Analytical **Technologies,** Inc. GAS CHROMATOGRAPHY – RESULTS

ATI I.D. : 40941502

# TEST : POLYNUCLEAR AROMATICS (EPA 610)

CLIENT : BURLINGTON EN PROJECT # : 13023 PROJECT NAME : BLOOMFIELD CLIENT I.D. : MW2-1 SAMPLE MATRIX : AQUEOUS	NVIRONMENTAL DATE SAMPLED : 09/23/94 DATE RECEIVED : 09/26/94 DATE EXTRACTED : 09/27/94 DATE ANALYZED : 10/11/94 UNITS : UG/L DILUTION FACTOR : 1
COMPOUNDS	RESULTS
NAPHTHALENE ACENAPHTHYLENE ACENAPHTHENE FLUORENE PHENANTHRENE ANTHRACENE FLUORANTHENE PYRENE BENZO(A)ANTHRACENE CHRYSENE BENZO(B)FLUORANTHENE BENZO(A)PYRENE DIBENZO(a,h)ANTHRACENE BENZO(a,h)ANTHRACENE BENZO(g,h,i)PERYLENE INDENO(1,2,3-CD)PYRENE 1-METHYLNAPHTHALENE	$     \begin{array}{r}             8.9 \\             <1.0 \\             <0.50 \\             1.2 \\             1.8 D \\             <0.05 \\             1.2 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             <0.10 \\             \\0.00 \\             <0.10 \\             \\0.00 \\             <0.10 \\             \\0.00 \\             \\0.00 \\           $

#### SURROGATE PERCENT RECOVERIES

-CHLOROANTHRACENE (%)

# Analytical **Technologies,** Inc. GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 40941503

TEST : POLYNUCLEAR AROMATICS (EPA 610)	
CLIENT : BURLINGTON ENVIRONMENTAL PROJECT # : 13023 PROJECT NAME : BLOOMFIELD CLIENT I.D. : MW4-1 SAMPLE MATRIX : AQUEOUS	DATE SAMPLED : 09/23/94 DATE RECEIVED : 09/26/94 DATE EXTRACTED : 09/27/94 DATE ANALYZED : 10/03/94 UNITS : UG/L DILUTION FACTOR : 1
COMPOUNDS	RESULTS
NAPHTHALENE ACENAPHTHYLENE ACENAPHTHENE FLUORENE PHENANTHRENE ANTHRACENE FLUORANTHENE PYRENE BENZO(A)ANTHRACENE CHRYSENE BENZO(B)FLUORANTHENE BENZO(A)PYRENE DIBENZO(a,h)ANTHRACENE BENZO(a,h)ANTHRACENE BENZO(g,h,i)PERYLENE INDENO(1,2,3-CD)PYRENE 1-METHYLNAPHTHALENE 2-METHYLNAPHTHALENE	<0.50 <1.0 <0.50 <0.10 <0.05 <0.05 <0.05 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.30 <0.30

### SURROGATE PERCENT RECOVERIES

2-CHLOROANTHRACENE (%)

Analytical Technologies, GAS CHROMATOGRAPHY - RESULTS

# REAGENT BLANK

TEST : POLYNUCLEAR AROMATICS (EPA 610) CLIENT : BURLINGTON ENVIRONMENTAL PROJECT # : 13023 PROJECT NAME : BLOOMFIELD CLIENT I.D. : REAGENT BLANK	ATI I.D. : 409415 DATE EXTRACTED : 09/27/94 DATE ANALYZED : 10/14/94 UNITS : UG/L DILUTION FACTOR : N/A
COMPOUNDS	RESULTS
NAPHTHALENE ACENAPHTHYLENE ACENAPHTHENE FLUORENE PHENANTHRENE ANTHRACENE FLUORANTHENE PYRENE BENZO(A)ANTHRACENE CHRYSENE BENZO(B)FLUORANTHENE BENZO(A)PYRENE DIBENZO(A, PYRENE DIBENZO(a, h)ANTHRACENE BENZO(G, h, i)PERYLENE INDENO(1,2,3-CD)PYRENE 1-METHYLNAPHTHALENE 2-METHYLNAPHTHALENE	<0.50 <1.0 <0.50 <0.10 <0.05 <0.05 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.10 <0.30 <0.30

# SURROGATE PERCENT RECOVERIES

2-CHLOROANTHRACENE (%)

Analytical **Technologies,** Inc. QUALITY CONTROL DATA ATI I.D. : 409415 TEST : POLYNUCLEAR AROMATICS (EPA 610) CLIENT : BURLINGTON ENVIRONMENTAL PROJECT # : 13023 DATE ANALYZED : 10/03/94 PROJECT NAME : BLOOMFIELD SAMPLE MATRIX : AQUEOUS REF I.D. : 40941501 UNITS : UG/L DUP. DUP. SAMPLE CONC. SPIKED % SPIKED શ્વ OMPOUNDS RESULT SPIKED SAMPLE REC. SAMPLE REC. RPD 20 16 80 18 90 12 ENAPHTHYLENE <1.0 <0.05 2.5 <0.10 2.5 2.1 84 2.3 PHENANTHRENE 92 9 2.1 84 2.3 9 PYRENE 92 <0.20 5.0 76 4.1 3.8 DIBENZO(a,h)ANTHRACENE 82 8 BENZO(k)FLUORANTHENE <0.10 2.5 2.1 84 2.2 5 88

Recovery = (Spike Sample Result - Sample Result) Spike Concentration RPD (Relative % Difference) = (Spiked Sample - Duplicate Spike) Result Sample Result Average of Spiked Sample



# GAS CHROMATOGRAPHY RESULTS

TEST	: EPA 8015	MODIFIED				
CLIENT	: BURLINGTO	ON ENVIRON	IMENTAL ·	ATI I.D.:	409415	
PROJECT #	: 13023					
PROJECT NAME	: GIANT-BLC	OOMFIELD				
SAMPLE ID. # CLIENT	I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01 MW3-1	·····	AQUEOUS	09/23/94	09/27/94	09/28/94	1
02 MW2-1		AQUEOUS	09/22/94	09/27/94	09/28/94	1
03 MW4-1		AQUEOUS	09/23/94	09/27/94	09/28/94	1
PARAMETER			UNITS	01	02	03
FUEL HYDROCARE	BONS		MG/L	<1	5	<1
HYDROCARBON RA	ANGE			-	C6-C12	-
HYDROCARBONS Ç	<b>UANTITATED</b>	USING		-	GASOLINE	-

97

95

98

SURROGATE:

O-TERPHENYL (%)

,

#### GAS CHROMATOGRAPHY RESULTS

### REAGENT BLANK

TEST	: EPA 8015 MODIFIED		ATI I.D.	: 409415
BLANK I.D.	: 092794		MATRIX	: AQUEOUS
CLIENT	: BURLINGTON ENVIRO	NMENTAL	DATE EXTRACTED	: 09/27/94
PROJECT #	: 13023		DATE ANALYZED	: 09/27/94
PROJECT NAME	: GIANT-BLOOMFIELD		DILUTION FACTOR	: 1
PARAMETER		UNITS	, <b>, , , , , , , , , , , , , , , , , , </b>	
FUEL HYDROCARI	BONS	MG/L	<1	······
HYDROCARBON RA	ANGE		-	
HYDROCARBONS (	QUANTITATED USING		-	

SURROGATE:

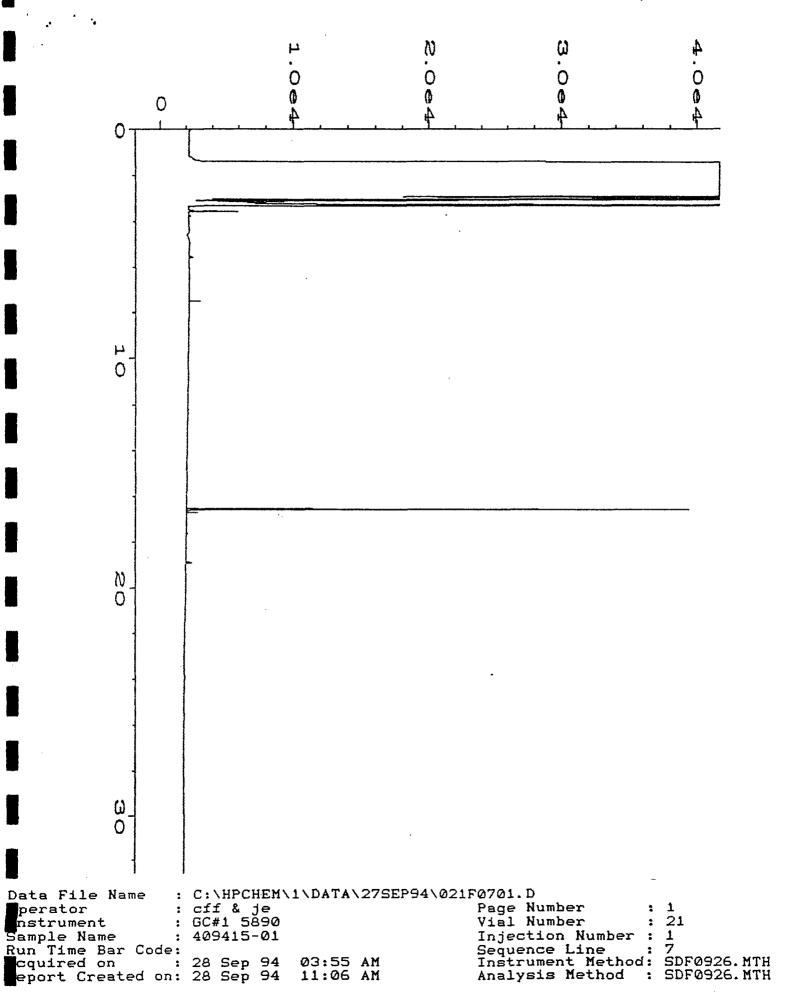
O-TERPHENYL (%)

#### GAS CHROMATOGRAPHY - QUALITY CONTROL

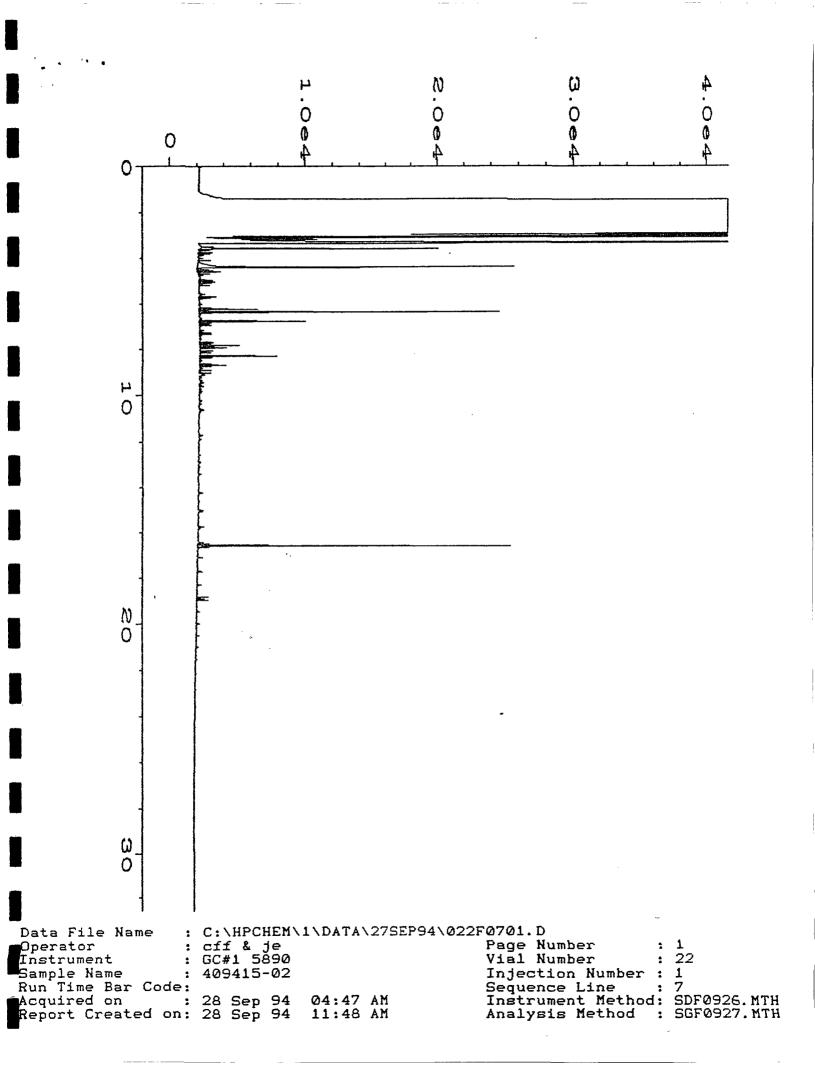
#### MSMSD

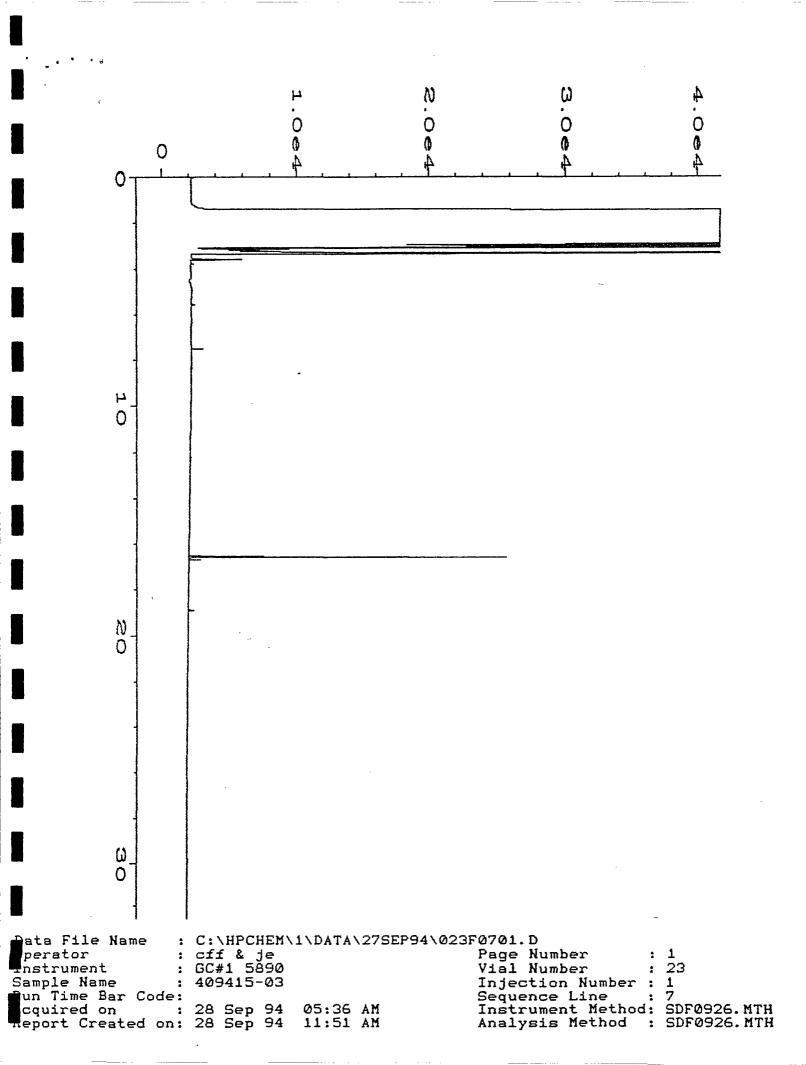
TEST	: EPA 8015 MO	DIFIED						
MSMSD #	: 092794			ATI I.D.		:	409415	
CLIENT	: BURLINGTON	ENVIRONME	ENTAL	DATE EXT	RACTED	:	09/27/	94
PROJECT #	: 13023			DATE ANA	LYZED	:	09/27/9	94
PROJECT NAME	E : GIANT-BLOOM	FIELD		SAMPLE M	ATRIX	:	AQUEOU	S
REF. I.D.	: 092794			UNITS		:	MG/L	
PARAMETER		SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
FUEL HYDROCA	RBONS	<1	35	35	100	36	103	3

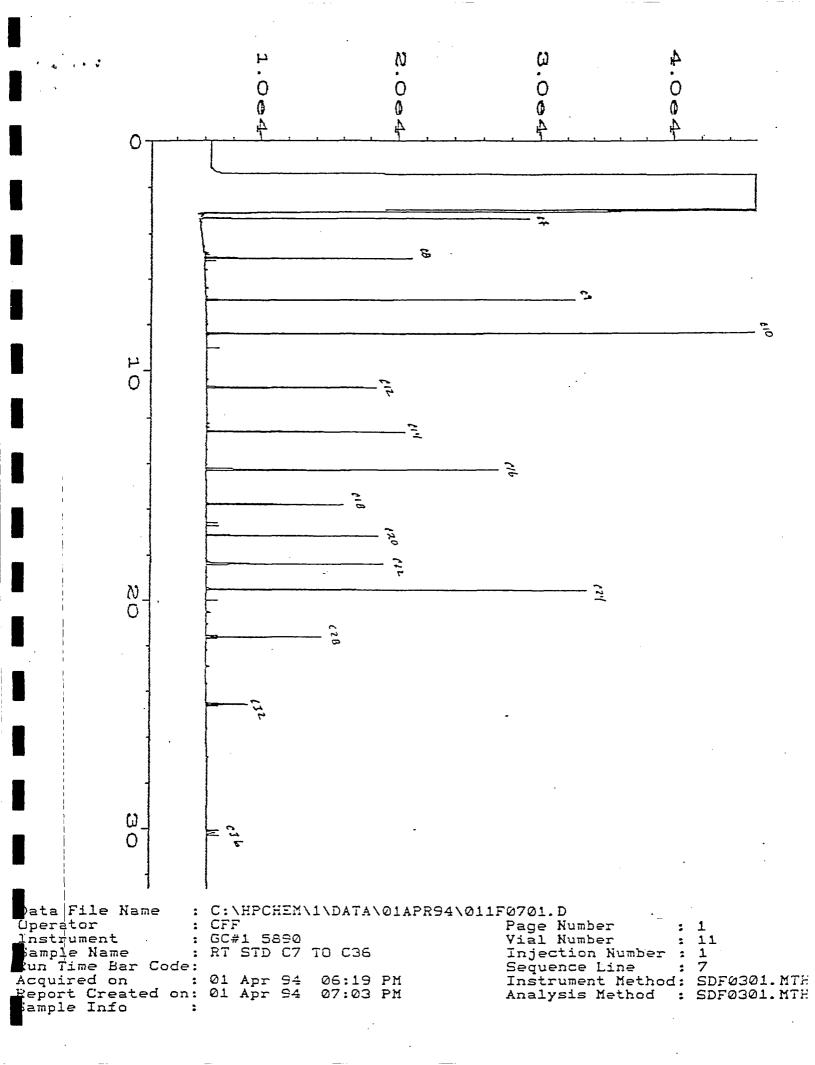
(Spike Sample Result - Sample Result) % Recovery = ----- X 100 Spike Concentration

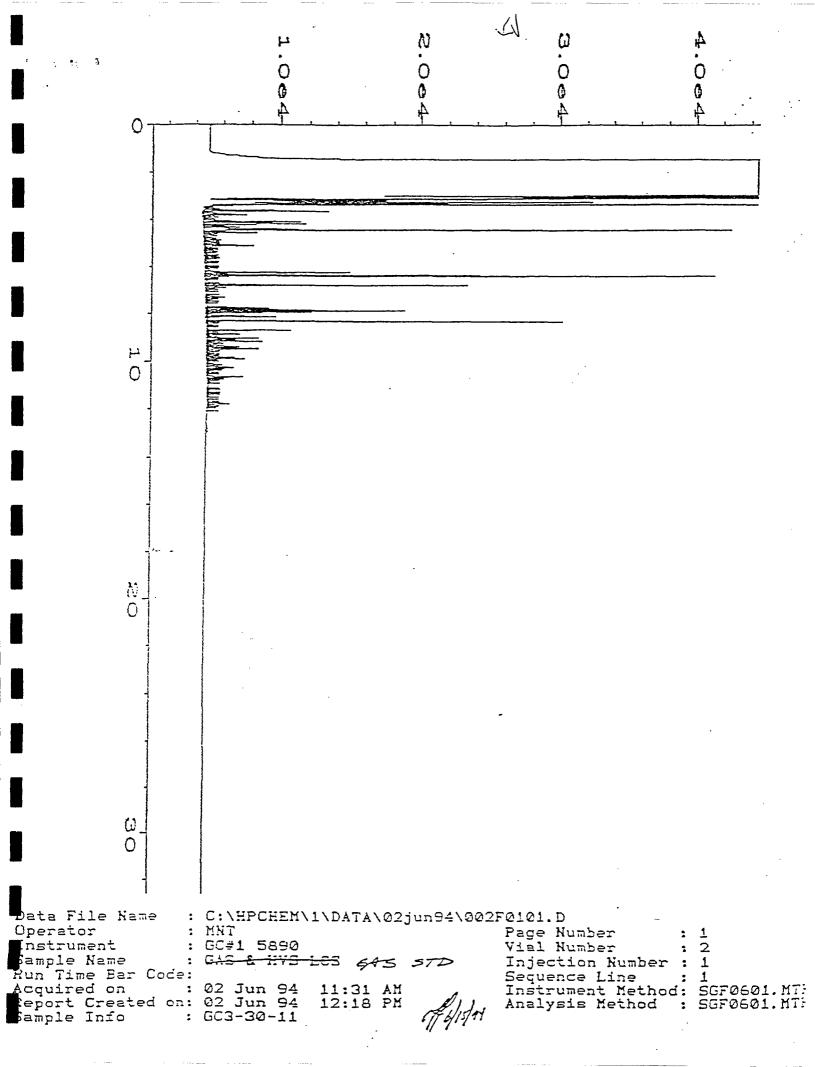


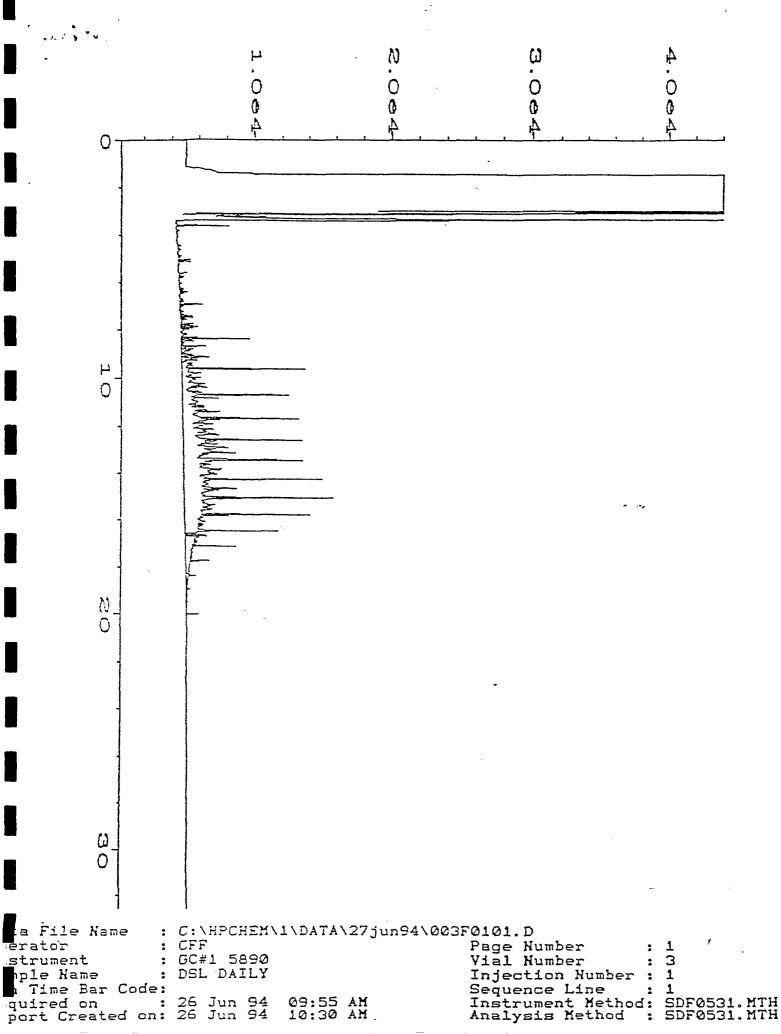
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	BURLINGTON ENVIRONMENTAL A Philip Environmental Company	N ENTAL ntal Company	Chain-of C 4000 Monroe Road Farmington, NM 87401	f <b>Cu</b>	f Custody Record	and	COC Serial	A-THU-	ATH+ 40945
	Project Name (-) ant- /	Blonfield	p1		Type of Analysis	A V			
Pr	Project Number 13023	Phase . Task OO 77.	0077.77		and Bottle	≫∖			
Sa	samplers 5. Kelly			to 19		Q			
ت 	Laboratory Name Analytica		Technologies, Tre	qunn	to here to	~			
	Location H/6	Albuguergine	1.W.W.	1 leto					
S	Sample Number (and depth)	Date	Time Matrix	л		9/			Comments
10	MW3-1	9123/94 15	530 HzO	N	X				
0	MW3-1		1530 Hz0	Ņ	$\boldsymbol{\lambda}$				
754	nw2-1	. \	630 HZO	N	X				
777	1-2mh	1 hd	630 H=0	N	$\boldsymbol{\lambda}$				
SIA	1-4M	_	$200 H_{z}O$	N	X				
31 1	1-1-1-1	/	ZUC HZO	N	X				
	nw4-1	-	200 H20	N	X				
016		HE2HU 1	530 HzO	N					
W box21.	1WZ-1(az)	9/23/94/ 16	30 HzO	N					
10	W3-1	9/23/94 15	530 HzO	÷ A	5K 9/23/94	X			
2	MW4-1	912344 120	00 H20	-		X			
	Relinquished by:					Received By:	,		
1	Signature	11	Date		Time	p   stgnature		ate	Time ,
	salah 196	16	9/23/9 9/26/9	40	7857	- AMA	7	Hor land	1.9,00
		L			2				
Ű	Samples Iced: X Yes	NO No	Carrier:				Airb	Airbill No.	
Pre	INLY for Water	Samples) Sodium hyroxide (NaOH) Hydrochioric acid (HCl)	Shipping ar	Id Lab Note H <i>司ハ</i> d	les: 1 Carrié	Carried to Lab.			
	Metals	Nitric acid (HNO3) Suffuric acid (H2SO4)							
	Other (Specify)								

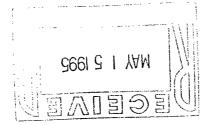
-179 4/94

BURLINGTON BURLINGTON ENVIRONMENTAL A Philip Environmental Company		<b>Chain-of</b> C 4000 Monroe Road Farmington, NM 87401	Cus	tody (50)	f Custody Record X (505) 326-2262 Phone X (505) 326-2388 FAX	C I	A-TT-H AOTAUS OCSERIAL No. C 1867	
Project Name (r) 207 - Blo Project Number 3023 P Samulors < 1011.	bomfield Phase.Task CO	LLLL		Type of Analysis and Bottle	A HARANA			
ry Name Hyra	Tec	sqies, tuc	rədmuN istoT					
02 MWZ-1 RUM Can defuil 91	91/122/14/1630	HZC H						COMMENTS
	-	20						
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did 1000		1/2/01		2837		<b>A</b>		1 1
Samples Iced: X Yes [	N N	Carrier:				Airbill No.	No.	
Y for Wat	er Samples) Sodium hyroxide (NaOH) 	Shipping and Lab Notes: Hand Ca	Hand Ca	rrìed	to Lab.			
Metals	Nitric acid (HNO3) Sulfuric acid (H2SO4)							
Other (Specify) Other (Specify)								

:-179 4/94

ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT       SAMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     AMPLE RECEIPT     SAMPLE RECEIPT       ALC/OO     ALC/OO     AMPLE RECEIPT       ALC/OO     ALC/OO     AMPLE RECEIPT	NETWORK PROJECT MANAGER: I FITTIA KRAKOWSKI	UMSKI			ANALYSIS REQUEST	DATE_LIPUC_P	PAGE L. OF
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ADD     A     A     A     A     A       1020     3     1     0     0     0     0       1030     3     0     0     0     0     0     0       1030     3     0     0     0     0     0     0       1020     3     0     0     0     0     0     0       1020     3     0     0     0     0     0     0       1020     3     0     0     0     0     0     0       1020     3     0     0     0     0     0     0       1020     3     0     0     0     0     0     0     0       1020     0     0     0     0     0     0     0     0     0       1020     0     0     0     0     0     0     0     0     0       1021     0     0     0     0     0     0     0     0     0       1021     0     0     0     0     0     0     0     0     0       1021     0     0     0     0     0     0     0     0     0			DECANIC LE OC DX	URFACTAN 32/632 MOC 19/619 MOC	itesel/Gasoli volstile Organi ACE	01AL COLI ECAL COLI 19053 ALPI	AIR - 02, CC
(b3C)     2     1     1     1       (b2C)     3     1     1     1       (b2C)     3     1     1     1       (b2C)     3     1     1     1       (b1C)     3     1     1     1       (b1C)     1     1     1     1       (c1C)     1     1     1     1       (c1C)     1     1     1     1       (c1C)     1     1     1		XIBIAM .		9 29 15	N A Q	E E	<b>∀</b>
700     3     700     3       700     4     4     4       700     4     4     4       700     5     7     4       700     5     7     7       700     5     7     7       700     7     7     7       700     7     7     7       700     7     7     7       700     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       701     7     7     7       7     7							
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SAMPLE RECEIPT     SAMPLES SENT TO     RELINOUISHED BY:     I.     RELINOUISHED BY:       TOTAL NUMBER OF CONTAINERS     Samples     Signature:     Time:     Signature:     Time:       TOTAL NUMBER OF CONTAINERS     Samples     Signature:     Time:     Signature:     Time:       TOTAL NUMBER OF CONTAINERS     Samples     Signature:     Time:     Signature:     Time:       TOTAL NUMBER OF CONTAINERS     Printed Name;     Date     Date     Date     Date       TOTAL NUMBER OF CONTAINERS     Printed Name;     Date     Date     Date       Thinker     Printed Name;     Date     Date     Date       INTACT?     PRINTLANUD     Analytical Fectinológies, Inc.     Company:     Date       LAB NUMBER     L/ALOO     PHOENIX     Analytical FectiveD BY: (LAB)     I.     RECEIVED BY: (LAB)       Od-H     L/C/OO     PHOENIX     FILEROUMIT     Signature:     Date:     PHOENIX       Od-H     L/C/OO     PHOENIX     PHOENIX     PHOENIX     PHOENIX     PHOENIX       ADA     PALOO     PHOENIX     PHOENIX     PHOENIX     PHOENIX     PHOENIX       ADA     L/C/OO     PHOENIX     PHOENIX     PHOENIX     PHOENIX     PHOENIX	1						
SAMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT     SAMPLE RECEIPT     RELINOUISHED BY:     I.     RELINOUISHED BY:       TOTAL NUMBER OF CONTAINERS     FIT. COLLINS     SIGnature:     Time:     Signature:     Time:       CHAIN OF CUSTODY SEALS     FIT. COLLINS     Printed Name:     Date     Printed Name:     Date       CHAIN OF CUSTODY SEALS     PENSACOLA     PRINted Name:     Date     Printed Name:     Date       INTACT?     RENTON     PRINted Name:     Date     Printed Name:     Date       INTACT?     RECEIVED GOOD COND.COLD     PRINted Name:     Date     Printed Name:     Date       IAB NUMBER     L/OOT     PRINCOLD     Printed Name:     Time:     Signature:     Time:       Ord     DAte     L/CLOOT     PRINCOLD     Printed Name:     Date     Printed Name:     Date       Ord     LADO     PRECEIVED BY: (LAB)     Internouxint     Time:     Signature:     Time:     Printed       Ord     LALOOT     PRECEIVED BY: (LAB)     Internouxint     Time:     Signature:     Time:       Ord     LALOOT     PRECEIVED BY: (LAB)     Internouxint     Time:     Printed     Printed							
TOTAL NUMBER OF CONTAINERS     San Diego     Signature:     Time:     Signature:     Time:       TOTAL NUMBER OF CONTAINERS     FT. COLINS     FT. COLINS     Printed Name;     Date     Printed Name;     Date       CHAIN OF CUSTODY SEALS     RENTON     PRINTON     Printed Name;     Date     Printed Name;     Date       INTACT?     RECEIVED GOOD COND.COLD     PENSACOIA     PRINTED Name;     Date     Date       INTACT?     PECEIVED GOOD COND.COLD     PORTLANU     PRINTED Name;     Date       IAB NUMBER     L/OPL     PORTLANU     PRINTECEIVED BY: (LAB)     I.     PECEIVED BY: (LAB)       OPL     L/OOP     PHOENIX     PHOENIX     FIBEROUMIT     Signature:     Time:     Signature:       OPL     L/OOP     PHOENIX     PHOENIX     PHOENIX     PHOENIX     PRINTO     PECEIVED BY: (LAB)     PECEIVED BY: (LAB)       OPL     L/OOP     PHOENIX     PHOENIX     PHOENIX     PROCEIVED BY: (LAB)     PECEIVED BY: (LAB)       OPL     L/OOP     PHOENIX     PHOENIX     PROCEIVED BY: (LAB)     PECEIVED BY: (LAB)       OPL     L/OOP     PHOENIX     PHOENIX     PROCEIVED BY: (LAB)     PROCEIVED BY: (LAB)       OPL     L/OOP     PHOENIX     PHOENIX     PROCEIVED BY: (LAB)     PROCEIVED BY: (LA		SAMPLEF	RECEIPT	SAMPLES SENT TO:	RELINOUISHED BY: 1.	RELINQUISHED	
CHAIN OF CUSTODY SEALS     Printed Name     Date       INTACT?     RENTON     RENTON       INTACT?     RENTON       INTACT?     RENTON       INTACT?     RENTON       INTACT?     RENTON       INTACT?     RENTON       INTACT?     RENTON       RECEIVED GOOD COND.KCOLD     PORTLANU       ADA WUBER     LOCOLD       LAB WUMBER     LOCOLD       PHOENIX     Nanaylical Technológies, Inc.       Company:     Signature       DAB ULALOO T     RECEIVED BY: (LAB)       DAB ULALOO T     PHOENIX       DAB ULALOO T     PRINTON       RIBEROUNIT     Signature:       Printod Name:     Date:       DAB ULALOO T     Printod Name:		TOTAL NUMBER OF CON	AINERS	SAN DIEGO		Signature:	Time:
INTACT?     NITACT?     PENSACOLA     U.D. COLOS (M. S. V. D. COLD)       RECEIVED GOOD COND.COLD     PORTLAND     Analytical Technológies, Inc.     Company:       LAB NUMBER     L/OUT (Signature)     PHOENIX     Millinguerque       DAP     U/CLOO)     PROENIX     Millinguerque       DAP     U/CLOO)     Printed Name:     Date:       DAP     U/CLOO)     Printed Name:     Date:       DAP     Company:     Company:     Printed Name)	TT	CHAIN OF CUSTODY SE			Name; Date	10	Date
HECENED GOOD CONDACOUD     Non-marked recented recented of the marked of the mar		INTACT?		PENSACOLA	8	34	
Dur Number     TUTUD       ADD     FILE       ADD     ECEIVED BY: (LAB)       ADD     FILE       ADD     EFILE       ADD     FILE       ADD     Printed Name:       Date:     Printed Name:       ADD     Printed Name:       Date:     Printed Name:       ADD     Company:       ADD     Company:			-  -	PORTLAND	Albuquerque	company.	
04 UC1007. FIBEROUMI Date: VOCIL-VIOUV DATE: Date: Printod Name: Date: Printod Name: Date: Printod Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Date: Anno Name: Anno Name: Date: Anno Name: Anno Name: Anno Name: Anno Name: Date: Anno Name:				FIJULINA	VED BY: (LAB	RECEIVED BY: (	AB) Tirae:
Mr. Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company: Company:	1	VU171	     	FIBEROUANT		Kaselle-V	101 Val
Company:						Printed Names	Vida Pate: 9/ 1/
	<u>v</u>				Company:	Company:	Ę
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2506 West Main Street Farmington, New Mexico 87401 Tel. (505) 326-4737

May 11, 1995

Ms. Sarah Kelly Philip Environmental 4000 Monroe Road Farmington, NM 87401

Dear Ms. Kelly:

Enclosed are the analytical results for water samples submitted for analyses to Inter-Mountain Labs - Farmington, New Mexico, on May 4, 1995. The samples were analyzed for General Chemistry Parameters, as specified on the accompanying Chain of Custody document.

Tests were performed in accordance with 40 CFR 136, "Guidelines Establishing Test Procedures for Analysis," as amended.

Please call me if you have any questions or comments concerning the analyses.

Sincerely,

Uliosa Klute

Melissa Klute Water Lab Supervisor IML - Farmington

Client:	Philip Environmental	Farmin	2506 W. Main Street gton, New Mexico 87401
Project:	Giant-Bloomfield Tank	Date Reported:	05/10/95
Sample ID:	MW-2	Date Sampled:	05/02/95
Laboratory ID:	W00370	Time Sampled:	1745
Sample Matrix:	Water	Date Received:	05/04/95
Condition:	Cool/Intact		

	Analytical			
Parameter	Result	Units		Units
ab pH	6.7	s.u.		
ab Conductivity @ 25° C	5,010	umhos/cm		
otal Dissolved Solids @ 180°C	3,180	mg/L		
otal Dissolved Solids (Calc)	3,200	mg/L		
Sodium Absorption Ratio	12.4	ratio		
otal Alkalinity as CaCO3	910	mg/L		
otal Hardness as CaCO3	885	mg/L		
Bicarbonate as HCO3	1,110	mg/L	18.20	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	884	mg/L	24.93	meq/L
Sulfate	591	mg/L	12.31	meq/L
Calcium	305	mg/L	15.20	meq/L
Magnesium	30	mg/L	2.50	meq/L
Potassium	2.0	mg/L	0.05	meq/L
Sodium	846	mg/L	36.79	meq/L
Cations			54.54	meq/L
nions	••••••		55.45	meq/L
ation/Anion Difference			0.83	%

**Reference:** 

U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. "Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported By M. Klute

Reviewed By_____

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			2506 W. Main Street
Client:	Philip Environmental	Farmin	gton, New Mexico 87401
Project:	Giant-Bloomfield Tank	Date Reported:	05/10/95
Sample ID:	MW-3	Date Sampled:	05/02/95
Laboratory ID: -	W00368	Time Sampled:	1345
Sample Matrix:	Water	Date Received:	05/04/95
Condition:	Cool/Intact		

	Analytical			
Parameter	Result	Units		Units
Lab pH	7.2	S.U.		
Lab Conductivity @ 25° C	4,420	umhos/cm		
Total Dissolved Solids @ 180°C	3,860	mg/L		
Total Dissolved Solids (Calc)	3,680	mg/L		
Sodium Absorption Ratio	7.36	ratio		
Total Alkalinity as CaCO3	523	mg/L		
Total Hardness as CaCO3	1,480	mg/L		
Bicarbonate as HCO3	638	mg/L	10.46	meq/L
Carbonate as CO3	0	mg/L	0.00	, meg/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	56	mg/L	1.58	, meq/L
Sulfate	2,060	mg/L	42.96	meq/L
Calcium	523	mg/L	26.10	meq/L
Magnesium	43	mg/L	3.57	meq/L
Potassium	3.1	mg/L	0.08	meq/L
Sodium	652	mg/L	28.36	meq/L
Cations			58.11	meq/L
Anions			56.55	meq/L
Cation/Anion Difference			1.36	%

**Reference:** 

U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. "Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported By M. Klute

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			2506 W. Main Street
Client:	Philip Environmental	. Farming	gton, New Mexico 87401
Project:	Giant-Bloomfield Tank	Date Reported:	05/10/95
Sample ID:	MW-4	Date Sampled:	05/02/95
Laboratory ID:	W00369	Time Sampled:	1555
Sample Matrix:	Water	Date Received:	05/04/95
Condition:	Cool/Intact		

	Analytical			
Parameter	Result	Units		Units
Lab pH	7.2	s.u.		
Lab Conductivity @ 25° C	5,360	umhos/cm		
Total Dissolved Solids @ 180°C	4,530	mg/L		
Total Dissolved Solids (Calc)	4,420	mg/L		
Sodium Absorption Ratio	10.1	ratio		
Total Alkalinity as CaCO3	577	mg/L		
Total Hardness as CaCO3	1,520	mg/L		
Bicarbonate as HCO3	704	mg/L	11.54	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meg/L
Chloride	163	mg/L	4.61	meq/L
Sulfate	2,420	mg/L	50.49	meq/L
Calcium	523	mg/L	26.10	meq/L
Magnesium	53	mg/L	4.33	meg/L
Potassium	4.3	mg/L	0.11	meq/L
Sodium	907	mg/L	39.47	meq/L
Cations			70.01	meq/L
Anions			66.66	meq/L
Cation/Anion Difference			2.45	%

**Reference:** 

U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. "Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported By M. Kluth

Client:	Philip Environmental			Far	2506 W. Main Stre mington, New Mexico 874(
Project:	Giant-Bloomfield Tank			Date Reported:	05/11/95
Sample ID:	MW-5			Date Sampled:	05/03/95
Laboratory ID:	W00367			Time Sampled:	1600
Sample Matrix:	Water			Date Received:	05/04/95
Condition:	Cool/Intact				
		Analytical			
Parameter		Result	Units		Units
Lab pH		6.9	s.u.		
Lab Conductivity @	) 25° C	6,000	umhos/cm		
Total Dissolved So	lids @ 180°C	4,440	mg/L		
Total Dissolved So	lids (Calc)	4,410	mg/L		
Sodium Absorption	n Ratio	8.84	ratio		
Total Alkalinity as (	CaCO3	775	mg/L		
Total Hardness as	CaCO3	1,790	mg/L		
Bicarbonate as	HCO3	945	mg/L	15.50	meq/L
Carbonate as C	03	0	mg/L	0.00	meq/L
Hydroxide as O	Η	0	mg/L	0.00	meq/L
Chloride		996	mg/L	28.10	meq/L
Sulfate		1,390	mg/L	29.02	meq/L
Calcium		634	mg/L	31.62	meq/L
Magnesium		51	mg/L	4.23	meq/L
Potassium		6.6	mg/L	0.17	meq/L
Sodium		861	mg/L	37.44	meq/L
Cations				73.46	meq/L
Anions				72.62	meq/L
Cation/Anion Differ	ence			0.57	%

Reference:U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983."Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Reported By M. Klute

Reviewed By_____

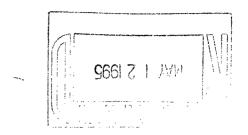
	<b>Chain of Custody Record</b>	Justody	Record		
Early Far	4000 Monroe Road Farmington, NM 87401		(505) 326-2262 Phone (505) 326-2388 FAX 1	coc serial No. C	3075
Gjant-Blocntheld 13023 Phase. Task 3	XM TT:	Type of Analysis and Bottle	HIS MONT		
Samplers S Ke/LY Laboratory Name T/ML	Mumber o	A.			
Samie Number (and denth) Date Time	Matrix Total				Comments
5/3/95/	<u>H</u> 2	2			
MW-3 5/245 1345	1 NZO 1	7			
MW-4 5/295 1555	HZO I	7			
MW-Z 5/245 1745	FHZO 1	7			
Relinquished by:			Received By:		
, Signature	Date	Time	Signature	, Date	Time
ly the	5/2/05	1734	Sea line	-19/8/5	P:02
Samples Iced: 🛛 Yes 🗆 No	Carrier:			Airbill No.	
Y for Water Samp	Shippin	b Notes: Giant	Bill Giant INUSTICS Arizona	ri <i>zon</i> a	_
Metals	Repu	ort resu	Report results to Philip Environmental	Environment	. 12
Cother (Specify)					

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PE-176 4/95



2709-D Pan American Freeway, NE Albuquerque, NM 87107 Phone (505) 344-3777 FAX (505) 344-4413



ATI I.D. 505318

May 11, 1995

Philip Environmental 4000 Monroe Road Farmington, NM 87401

Project Name/Number: GIANT BLOOMFIELD TANK 13023

Attention: Sarah Kelly

On **05/05/95**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Kräkøwski, Ph.D. Project Manager

MR:jt

Enclosure

H. Mitchell Rubenstein, Ph.D. Laboratory Manager



CLIENT	: PHILIP ENVIRONMENTAL	DATE RECEIVED	:05/05/95
PROJECT #	:13023		
PROJECT NAME	: GIANT BLOOMFIELD TANK	REPORT DATE	:05/11/95

ATI ID: 505318

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-4	AQUEOUS	05/02/95
02	MW-3	AQUEOUS	05/02/95
03	MW-52	AQUEOUS	05/02/95
04	MW-2	AQUEOUS	05/02/95
05	MW-5	AQUEOUS	05/03/95
06	TRIP BLANK	AQUEOUS	04/20/95

#### ---TOTALS---

# MATRIX#SAMPLESAQUEOUS6

#### ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



#### GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED

CLIENT : PHILIP EN

: PHILIP ENVIRONMENTAL ATI I.D.: 505318

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PROJECT # : 13023

PROJECT NAME : GIANT BLOOMFIELD TANK

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MW-4	AQUEOUS	05/02/95	05/05/95	05/05/95	1
02	MW-3	AQUEOUS	05/02/95	05/05/95	05/05/95	1
03	MW-52	AQUEOUS	05/02/95	05/05/95	05/05/95	1
PARAME	TER		UNITS	01	02	03
FUEL H	YDROCARBONS		MG/L	<1	<1	5
HYDROC	ARBON RANGE			-	-	C6-C12
HYDROC	ARBONS QUANTITATE	D USING		-	-	GASOLINE
SURROG	ATE:					
O-TERP	HENYL (%)			91	91	95



## GAS CHROMATOGRAPHY RESULTS

rest	:	EPA	8015	MODIFIED
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CLIENT : PHILIP ENVIRONMENTAL

ATI I.D.: 505318

**~·.** 

PROJECT # : 13023

PROJECT NAME : GIANT BLOOMFIELD TANK

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MW-2	AQUEOUS	05/02/95	05/05/95	05/05/95	1
05	MW-5	AQUEOUS	05/03/95	05/05/95	05/05/95	1
PARAME	TER		UNITS	04	05	
FUEL H	YDROCARBONS		MG/L	3	<1	
HYDROC	ARBON RANGE			C6-C10	_	
HYDROC.	ARBONS QUANTITATE	D USING		GASOLINE	_	
	-					

SURROGATE:

O-TERPHENYL (%)



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#### GAS CHROMATOGRAPHY RESULTS

REAGENT BLANK

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TEST	: EPA 8015 MODIFIED	ATI I.D.	: 505318
BLANK I.D.	: 050595	MATRIX	: AQUEOUS
CLIENT	: PHILIP ENVIRONMENTAL	DATE EXTRACTED	: 05/05/95
PROJECT #	: 13023	DATE ANALYZED	: 05/05/95
PROJECT NAME	: GIANT BLOOMFIELD TANK	DILUTION FACTOR	2:1
PARAMETER	UNIT	S	
FUEL HYDROCARE	BONS MG/L	<1	
HYDROCARBON RA	ANGE	-	
HYDROCARBONS (	QUANTITATED USING	-	

SURROGATE:

O-TERPHENYL (%)



#### GAS CHROMATOGRAPHY - QUALITY CONTROL

### MSMSD

-.,

TEST	: EPA 8015 M	ODIFIED						
MSMSD #	: 050595			ATI I.D.		:	505318	
CLIENT	: PHILIP ENV	IRONMENTAJ	L L	DATE EXT	RACTED	:	05/05/	95
PROJECT #	: 13023			DATE ANA	LYZED	:	05/05/	95
PROJECT NAM	E : GIANT BLOO	MFIELD TAN	١K	SAMPLE M	ATRIX	:	AQUEOU	S
REF. I.D.	: 050595			UNITS		:	MG/L	
PARAMETER		SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
FUEL HYDROCA	ARBONS	<1	34	30	88	29	85	3

% Recovery = (Spike Sample Result - Sample Result) % Recovery = X 100 Spike Concentration



#### GAS CHROMATOGRAPHY RESULTS

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TEST : BTEX, MTBE (EPA 8020)

CLIENT : PHILIP ENVIRONMENTAL ATI I.D.: 505318

PROJECT # : 13023

PROJECT NAME : GIANT BLOOMFIELD TANK

SAMPI			DATE	DATE	DATE	DIL.
ID. #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
01	MW-4	AQUEOUS	05/02/95	NA	05/05/95	1
02	MW-3	AQUEOUS	05/02/95	NA	05/05/95	1
03	MW-52	AQUEOUS	05/02/95	NA	05/05/95	5
PARAM	IETER		UNITS	01	02	03
BENZE	CNE		UG/L	<0.5	<0.5	380
TOLUE	INE		UG/L	<0.5	<0.5	550
ETHYL	BENZENE		UG/L	<0.5	<0.5	93
TOTAL	XYLENES		UG/L	<0.5	<0.5	830
METHY	L-t-BUTYL ETHER		UG/L	<2.5	<2.5	<13

#### SURROGATE:

BROMOFLUOROBENZENE (%)

95 93 104



#### GAS CHROMATOGRAPHY RESULTS

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TEST : BTEX, MTBE (EPA 8020)

CLIENT : PHILIP ENVIRONMENTAL ATI I.D.: 505318

PROJECT # : 13023

PROJECT NAME : GIANT BLOOMFIELD TANK

SAMPLE		MARDIN	DATE	DATE	DATE	DIL.
	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
	MW-2	AQUEOUS	05/02/95	NA	05/05/95	1
05	MW-5	AQUEOUS	05/03/95	NA	05/05/95	1
06	TRIP BLANK	AQUEOUS	04/20/95	NA	05/05/95	1
PARAMET	ER		UNITS	04	05	06
BENZENE	1 1 1		UG/L	220	<0.5	<0.5
TOLUENE	1		UG/L	280	<0.5	<0.5
ETHYLBE	NZENE		UG/L	53	<0.5	<0.5
TOTAL X	YLENES		UG/L	430	<0.5	<0.5
METHYL-	t-BUTYL ETHER		UG/L	<2.5	<2.5	<2.5

#### SURROGATE:

BROMOFLUOROBENZENE (%)

82 83 96

# GAS CHROMATOGRAPHY RESULTS

REAGENT BLANK

TEST	: BTEX, MTBE (EPA 8020)	ATI I.D.	: 505318
BLANK I.D.	: 050595	MATRIX	: AQUEOUS
CLIENT	: PHILIP ENVIRONMENTAL	DATE EXTRACTED	: NA
PROJECT #	: 13023	DATE ANALYZED	: 05/05/95
PROJECT NAME	: GIANT BLOOMFIELD TANK	DILUTION FACTOR	:1
PARAMETER	UNITS		······································
BENZENE	UG/L	<0.5	<u></u>
TOLUENE	UG/L	<0.5	
ETHYLBENZENE	UG/L	<0.5	
TOTAL XYLENES	UG/L	<0.5	
METHYL-t-BUTYL	ETHER UG/L	<2.5	

SURROGATE:

BROMOFLUOROBENZENE (%)

95

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# GAS CHROMATOGRAPHY - QUALITY CONTROL

#### MSMSD

TEST	: BTEX, MTBE	(EPA 8020	))					
MSMSD #	: 50531805			ATI I.D.		:	505318	
CLIENT	: PHILIP ENVI	RONMENTAL		DATE EXT	RACTED	:	NA	
PROJECT #	: 13023			DATE ANA	LYZED	:	05/05/	95
PROJECT NAME	: GIANT BLOOM	FIELD TAN	IK	SAMPLE M	ATRIX	:	AQUEOU	S
REF. I.D.	: 50531805			UNITS		:	UG/L	
PARAMETER		SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
BENZENE		<0.5	10	9.7	97	10	100	3
TOLUENE		<0.5	10	9.8	98	9.7	97	1
ETHYLBENZENE		<0.5	10	9.7	97	10	100	3
TOTAL XYLENE	S	<0.5	30	30	100	30	100	0
METHYL-t-BUT	YL ETHER	<2.5	20	22	110	22	110	0

(Spike Sample Result - Sample Result) % Recovery = ----- X 100 Spike Concentration

ſ			Chain		Cu	stody ]	of Custody Record	Ê	# 505318	$\left  \bigotimes_{i \in \mathbb{N}} \right $	
			4000 M Farminę	4000 Monroe Road Farmington, NM 87401	1 7401	(505	(505) 326-2262 Phone (505) 326-2388 FAX	$\mathcal{N}_{0}$	COC Serial No.	C 3076	76
	Project Name (「iのガー B Project Number   ろひえ ろ	לכ <i>רוון אברי א</i> ר אר אר אר אר אר אר אר אר אר אר אר אר אר	1 Ta	$\frac{LL}{2\pi}$	Bottles	Type of Analysis and Bottle					
	Samplers $\lesssim$ $K_{e}//\gamma$				to 19						
	Laboratory Name Aualy	Ytical Ter	Ter histogie	1/T	quun		A A A A A A A A A A A A A A A A A A A				
${\mathbf d}$	Location		101-2	1112	1 leto	A. A.Y					
$\mathcal{A}$	Sample Number (and depth)	Date	Time	Matrix	л		Y / / /	////		0	Comments
5	MIN-4	5/2/5/	500	$\mathcal{P}_{7}$	Ņ	>					
4	DIW-4	51245	555	$H_{\mathcal{F}}\dot{C}$	ŗJ	7					
R	MW-3	5/2/95 1	345	HZC.	H1	2 2					-
à	M.V.52	5/2/95 /	1/2/1	HaC	1-1	2 2					
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	MU-5	513 195 1	$  CC\rangle$	H=C	[]	22					
	MUDBIAN	- oe-h		Ats		Х					
5											
	Relinquished by:					-	Received By:			_	
	Signature			Date		Time		Signature	Date Date	6	Time
	Math Kil			3/07		2241	1 V-MART	1	12/0		0955
	Samples Iced: X Yes	°N □		Carrier:					Airbill No.		
	Y for W	amples) Sodium hyroxide (NaOH)		5	and Lab Notes:	tes: <i>B</i> ,//	- theid	Tradustries		Prizenz	r r
	Ø Volatile Organic Analysis ☐ Metais	Hydrochlorlc acid (HCl) Nitric acid (HNO3)	acid (HCI) d (HNO3)			Report	1+ Results	15 70	Ci	- nuiren	1 montal
	TPH (418.1)	Sulfuric acid (H2SO4)	l (H2SO4)								
	L_ Other (Specify)										

°E-176 4/95

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