3R - 258

REPORTS

DATE:

March 2004

Annual Report
Bloomfield Crude Station
Bloomfield, New Mexico

March 2004

Prepared For

Giant Industries, Inc.
Bloomfield, New Mexico

Project 30003

Lodestar Services, Incorporated
PO Box 3861 Farmington, NM 87499-3861 Office (505) 334-2791

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Introduction

This annual report describes the work completed at Giant Industries, Inc.'s (Giant's) former Crude Station in Bloomfield, New Mexico since the previous annual report submitted during July, 2002. This report includes data collected through January 2004 including:

- Soil sampling and biovent system installation prior to the initiation of bioventing on February 17, 2003
- Biovent monitoring and soil sampling in October 2003
- Groundwater sampling on January 30, 2003 at all monitoring wells prior to bioventing
- Groundwater sampling at all wells on January 20, 2004
- Quarterly sampling at MW-6,
- Product removal from MW-2 during the second half of 2002 and 2003.

The former Bloomfield Crude Station is located on the southwest corner of Blanco Boulevard and Fifth Street in the city of Bloomfield, San Juan County, New Mexico. The site occupies approximately 5.5 acres within the N ½, NW ¼, NW ¼ of Section 22, Township 29 North, Range 11 West. A regional location map is shown in Figure 1.

A 55,000 barrel crude oil storage tank was previously located at the site within an earthen berm, which occupied approximately 100,000 square feet on the west side of the former crude station. Tank 967-D and berms were removed between late 1995 and early 1996. Approximately 12,924 cubic yards of hydrocarbon impacted soil was removed and landfarmed at Giant's Bisti landfarm. The excavation was backfilled and graded. Currently, the site is an unoccupied, open space. A site map presented as Figure 2 shows the boundary of the former excavation. West of the former tank site is a City of Bloomfield Electrical Substation and two well sites (Jan Redding #1 and Cook #1E) owned and operated by Manana Gas. To the west of the electric substation and Manana well sites, a vacant lot exists. What appears to be a monument may indicate a previous well site that has been plugged and abandoned. Historical research of this area indicate that several oil and possibly gas wells, may have once been operational on this lot, such as Bishop #1, Bishop #3, Hare #1 and Kittell #1 (Figure 2).

The former crude station has been the focus of a subsurface investigation where activities have included numerous soil borings and sampling, installation of seven ground water monitoring wells, excavation and offsite land farming of hydrocarbon impacted soil, and ground water sampling. The area of focused investigation is where the former crude oil storage tank numbered 967-D was located. A more detailed historical account can be found in a report previously submitted to the New Mexico Oil Conservation Division (NMOCD) titled *Comprehensive Report for the Bloomfield Crude Station*, dated January 2000. A chronology of site operations and investigations is found in the Golden Environmental Management report *Monitoring Well Installation, Ground Water Sampling and Bioventing Pilot Test Bloomfield Crude Station, Bloomfield, New Mexico*, dated July 2001.

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Methodology

Initiation of bioventing was completed according to *Bioventing Plan, July 2002* submitted to the New Mexico Oil Conservation Division during July 2002. Groundwater sampling at all monitoring wells followed accepted industry practices. Product (free phase crude oil) recovery was completed by measuring product thickness followed by hand bailing product and groundwater and storing it onsite in a 55 gallon drum.

Bioventing

Bioventing is the process of supplying air to indigenous microorganisms to enhance natural mineralization of hydrocarbons to carbon dioxide and water. Giant initiated a bioventing pilot test on June 20, 2001 to investigate the feasibility of in-situ remediation of hydrocarbon impacted soils not removed during excavation. The pilot test included the injection of air into three levels within the vadose zone. Oxygen, carbon dioxide, and volatile hydrocarbon concentrations from within the pore space of the soil in each zone was monitored. Air injection ceased on June 21, 2001 and respiration rates of the biologic activity were monitored for an additional five days, through June 26, 2001.

Oxygen, carbon dioxide, and ionizable hydrocarbon readings collected during the bioventing pilot test are presented in *Monitoring Well Installation, Groundwater Sampling, and Bioventing Pilot Test, Bloomfield Crude Station, July 2001.* A 14 percent decrease in oxygen along with a 50 percent increase in carbon dioxide concentrations measured in the soil gas during the five days following the air-injection, indicated significant biologic activity at the site. During the five days following the pilot test, approximately nine-pounds of hydrocarbons were mineralized to carbon dioxide and water within a 30-foot radius.

The following recommendation was made in the above report:

"Implement bioventing at the site to reduce the hydrocarbon concentrations in soil below NMOCD standards. Injection wells should be used on the perimeter of the impacted soil to prevent offsite migration of hydrocarbon containing soil gas. Space injection wells 60-feet on center with an injection rate of approximately 25 cubic feet per minute. Air should be injected at a depth of 10- to 15-feet beneath ground surface. Delineation of impacted soil will proceed with the installation of injection wells and monitoring points."

Giant initiated installation of the bioventing system on October 4, 2002 according to the *Bioventing Work Plan* approved by the NMOCD on December 9, 2002. System installation included hand boring three inch holes with a hand auger, collecting soil samples at three-foot intervals and screening the samples using headspace techniques. Eight soil samples with the highest headspace readings were submitted to Pinnacle Laboratories in Albuquerque, NM for benzene, toluene, ethylbenzene, xylenes (BTEX), and total petroleum hydrocarbon (THP)

analyses by United States Environmental Protection Agency (USEPA) methods 8021 and 8015, respectively. Samples were collected in one quart plastic bags and split for headspace and laboratory analysis. Samples for laboratory analyses were immediately placed in four ounce glass jars, sealed, labeled, stored on ice, and shipped to the laboratory under strict chain-of-custody procedures.

Following sampling, one foot of one-inch diameter polyvinyl chloride .01 inch slotted well screen was set in each hole at approximately twelve feet beneath ground surface at thirty nine locations. Eighteen points are used for monitoring subsurface gasses and twenty one points are used to inject air. Monitoring and Injection point locations are shown on Figure 3.

Injection air is supplied by a Gast™ oil-less rotary vane compressor that supplies approximately 90 standard cubic feet per minute air. The compressor is housed in an existing office building on-site and travels through 1-1/2 inch PVC pipe to each injection point. Valves are located on each injection and monitoring point. The air is injected where field screening and laboratory analyses indicate elevated concentrations of hydrocarbons in the subsurface. Operations and maintenance are performed routinely to ensure the system is operational.

The compressor operates from 0700 hours to 1800 hours Monday through Fridays. Subsurface oxygen and carbon dioxide concentrations were monitored prior to startup and daily for the first five days of operation, then weekly for four weeks, then monthly. Following the second month, readings were taken after six and nine months of operations. Oxygen and carbon dioxide were measured using a GEM ™ gas monitor. Each point was evacuated until the gas reading was stable.

Comparative soil samples were collected following approximately eight months of system operations. Soil samples were collected from a location approximately two feet from where initial eight soil samples were collected and at the same depth as the original. These samples were also screened in the field using headspace techniques and submitted for laboratory analysis for BTEX and TPH by USEPA methods 8021 and 8015, respectively.

Ground Water Sampling

On January 30, 2002 and January 20, 2004 ground water samples and depth-to-ground water measurements were collected from monitoring wells MW-2 through MW-7. Each well was checked for the presence of free phase crude oil. Samples were collected from six monitor wells. Giant abandoned monitoring well MW-1 during excavation of the tank pad in August 2000. Samples were not previously collected from MW-2 due to presence of free phase crude oil. MW-7 was sampled at the request of the NMOCD though Giant believes groundwater impact at this location is not related to their operations as discussed in previous reports. Ground water monitoring well MW-6 was sampled during July and September as well.

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Results

Bioventing

The results from headspace field screening using a PhotoVac photoionization detector (PID) during monitoring and injection point installation are as follows.

Table 1 Biovent Headspace Results

Location	DEPTH (feet)	PID (ppm)	Location	DEPTH (feet)	PID (ppm)	Location	DEPTH (feet)	PID (ppm)
IP-1	6	57.5	IP-21	6	3.5	MP-12	6	6.2
IP-1	9	57.5	IP-21	9	0.2	MP-12	9	8.9
IP-1	12	594	IP-21	12	4.8	MP-12	12	700
IP-10	6	756	IP-22		no PIDs	MP-13	6	6
IP-10	9	724	IP-23	6	0.3	MP-13	9	4.9
IP-10	12	212	ip-23	9.5	1.3	MP-13	13	650
IP-11	6	262	IP-3	9	240	MP-14	6	1.5
IP-11	9	543	IP-3	12	738	MP-14	9	6.9
IP-11	12.5	59.2	IP-4	6	102	MP-14	12	1.8
IP-12	6	2.9	IP-4	9	415	MP-15	6	0.4
IP-12	9	5.1	IP-4	12	618	MP-16	6	4.2
IP-12	13	616	IP-5	6	1.8	mp-16	9	no PIDs
IP-13	6	5.6	IP-5	9	768	mp-16	10.5	no PIDs
IP-13	9	2	IP-5	13	20.3	MP-2	6	69
IP-13	12	7.5	IP-6	6	187	MP-2	9	697
IP-14	6	0	IP-6	9	1005	MP-2	12	793
IP-14	9	0	IP-6	13	200	MP-3	6	777
IP-14	13.5	25.7	IP-7	3	2.2	MP-3	9	146
IP-15		no PIDs	IP-7	6	19	MP-3	12	23.8
IP-16	6	1.6	IP-7	9	655	MP-4	6	410
IP-16	9	728	IP-7	12	676	MP-4	9	122
IP-16	13	675	IP-8	3	29.2	MP-4	12	632
IP-17		no PIDs	IP-8	6	106	MP-5	6	37.6
IP-18	3	24.2	IP-8	9	439	MP-5	9	757
IP-18	6	106	IP-8	13	76	MP-5	12	865
IP-18	9	439	IP-9	3	102	MP-6	3	2.6
IP-18	12	10.3	IP-9	6	503	MP-6	6	2.1
IP-18	13	76	IP-9	9	74	MP-6	12	616
IP-19		no PIDs	IP-9	12	627	MP-7	3	224
IP-2	6	13.5	MP-1	6	2.3	MP-7	6	872
IP-2	9	786	MP-1	9	602	MP-7	9	708
IP-2	12.5	562	MP-1	13	203	MP-7	11	70.7
IP-20	3	1.5	MP-10	6	49.1	MP-8	6	30.3
IP-20	6	1.2	MP-10	9	733	MP-8	9	772
IP-20	9	1	MP-10	12	738	MP-8	12	602
IP-20	12	0.7	MP-11	6	0	MP-12	6	6.2
IP-21	3	0.4	MP-11	9	0	MP-12	9	8.9
MP-9		no PIDs	MP-11	12	732	MP-12	12	700

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Vial Number: 11

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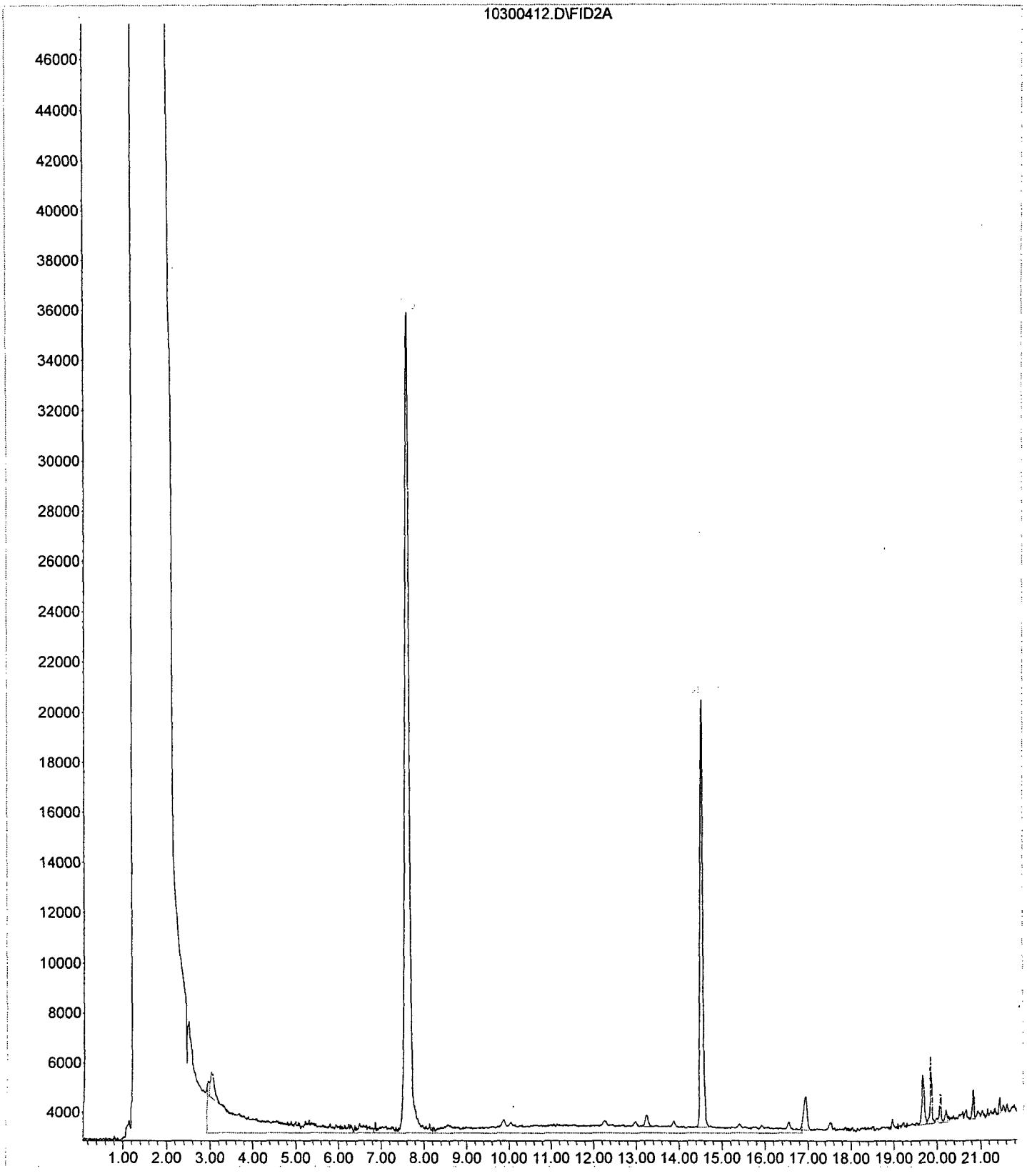

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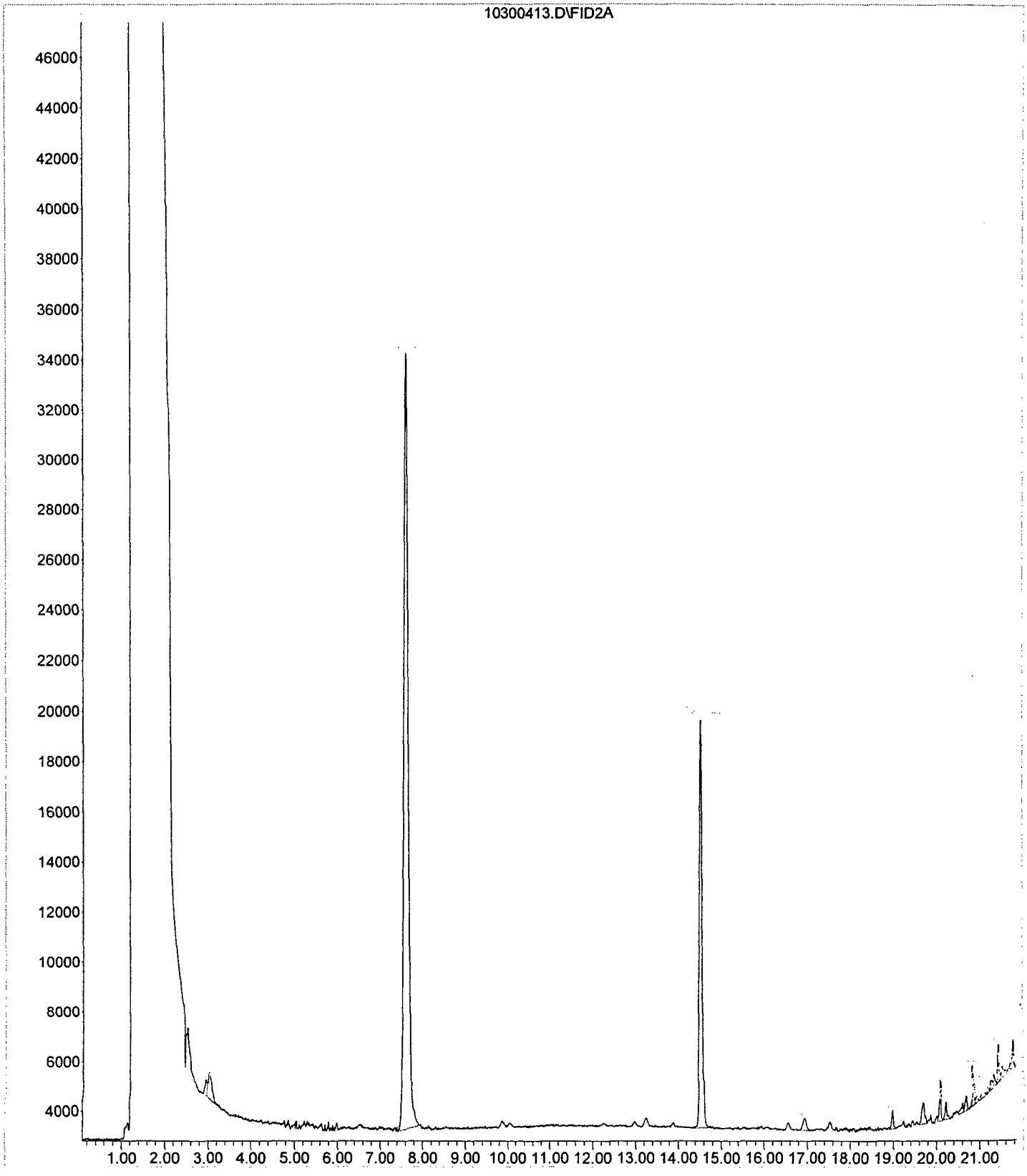

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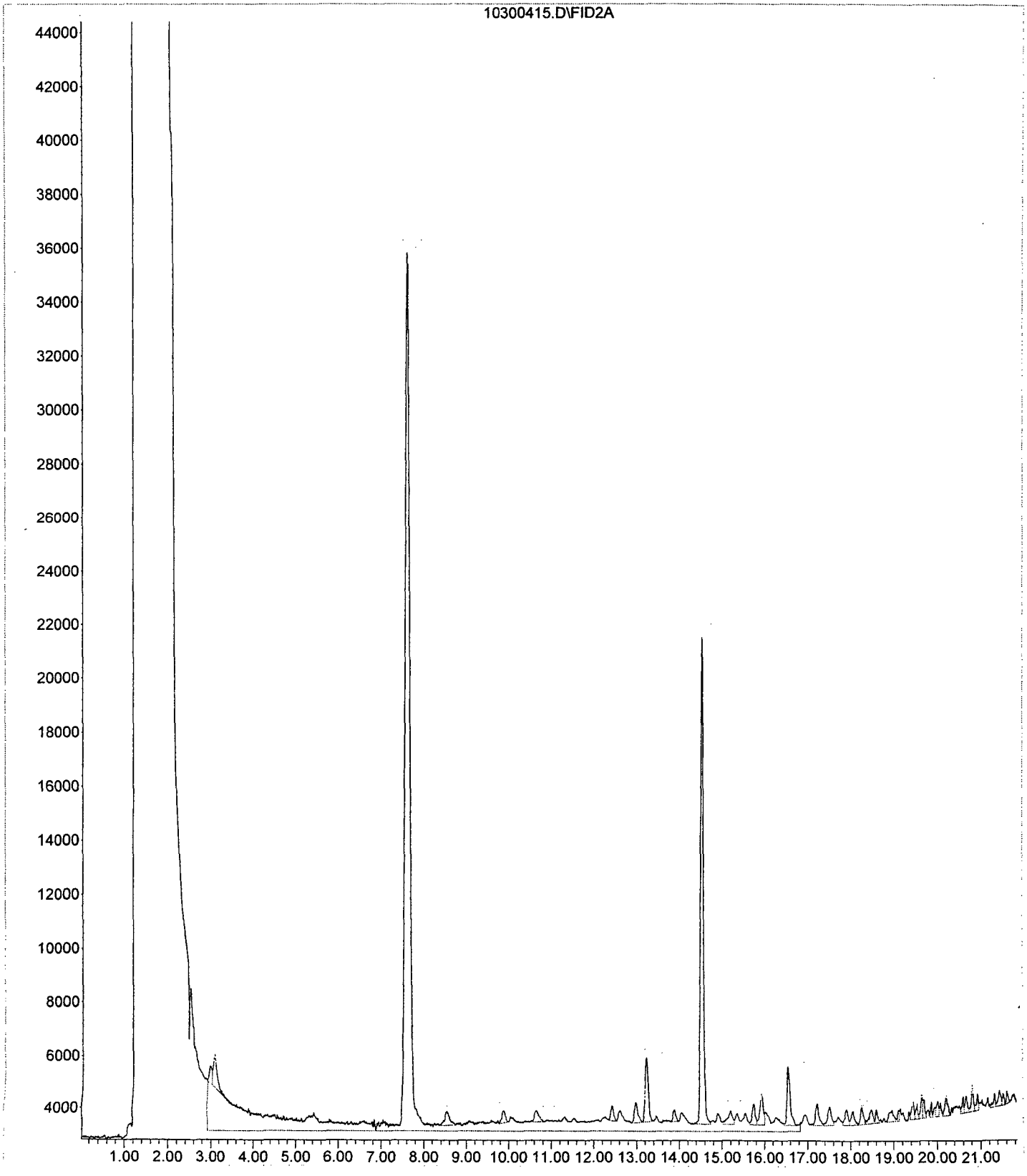

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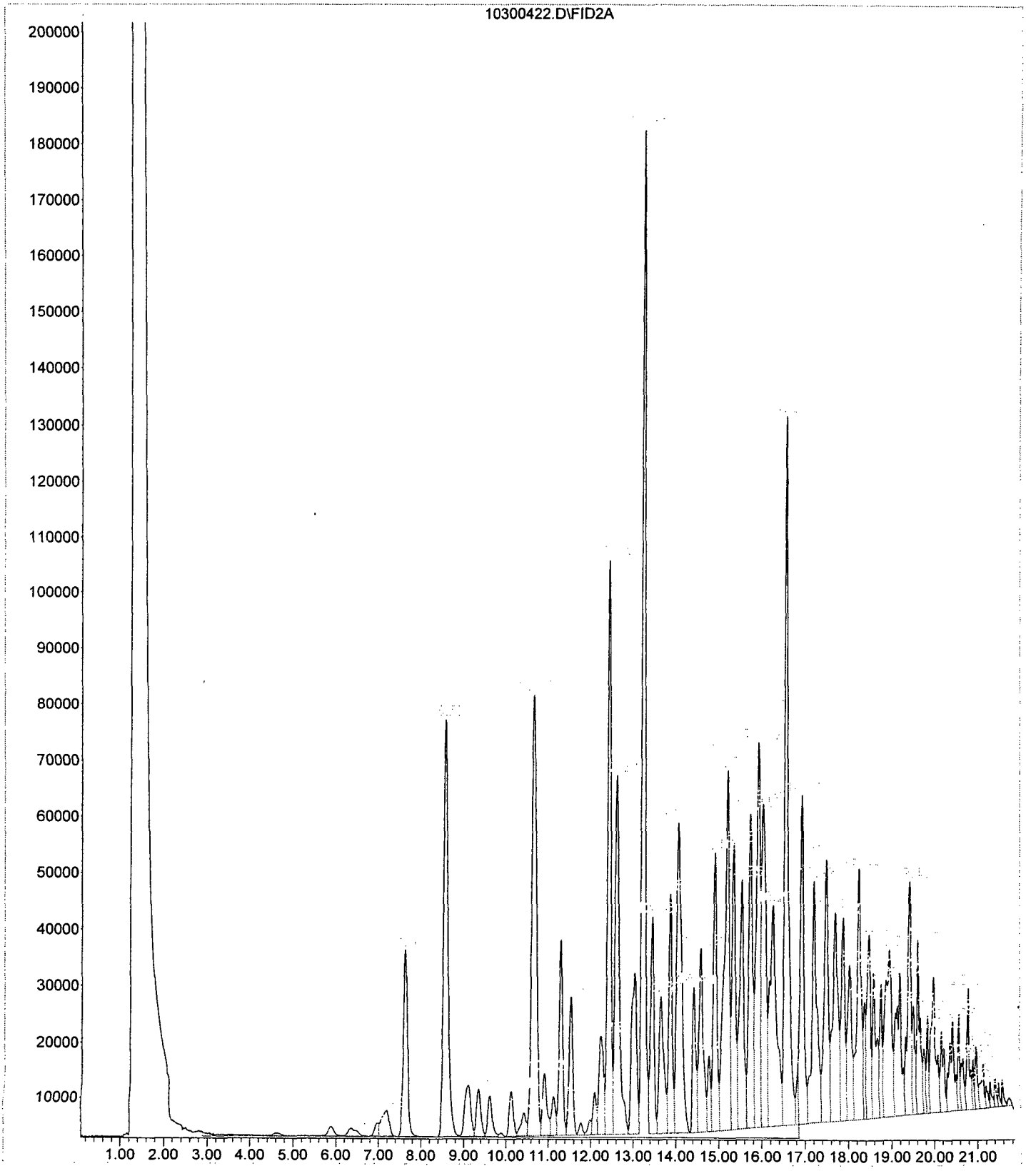

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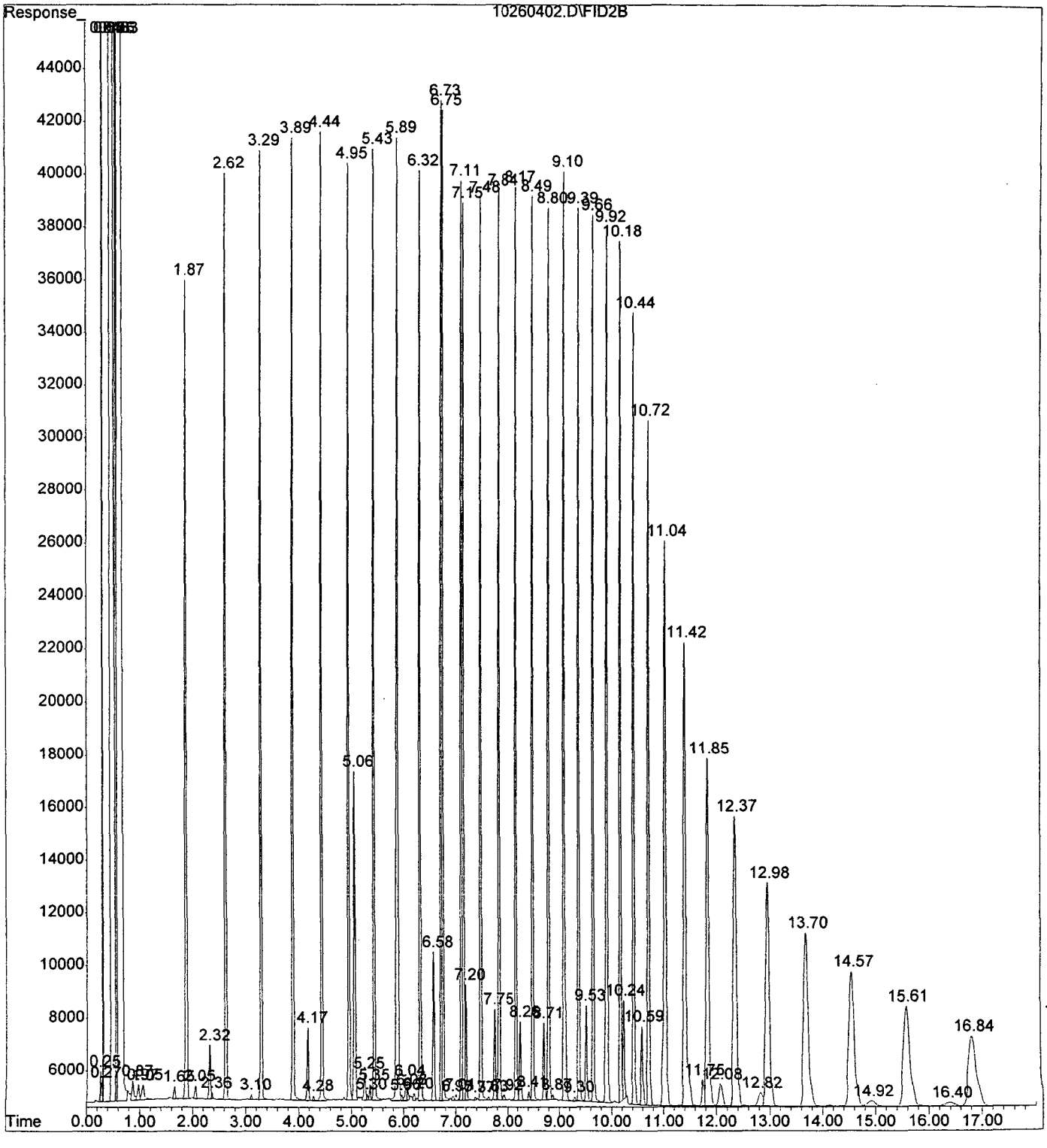

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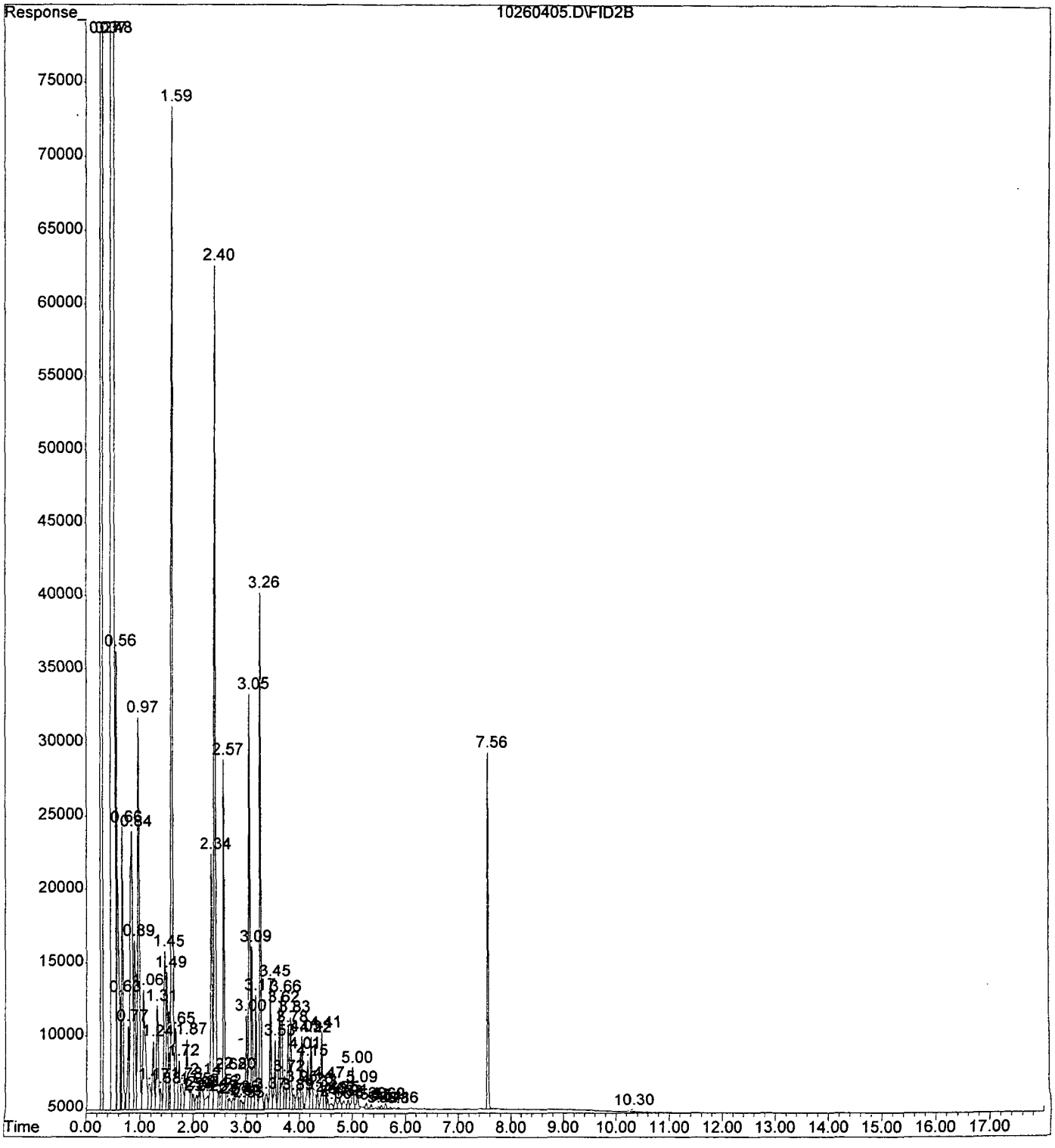

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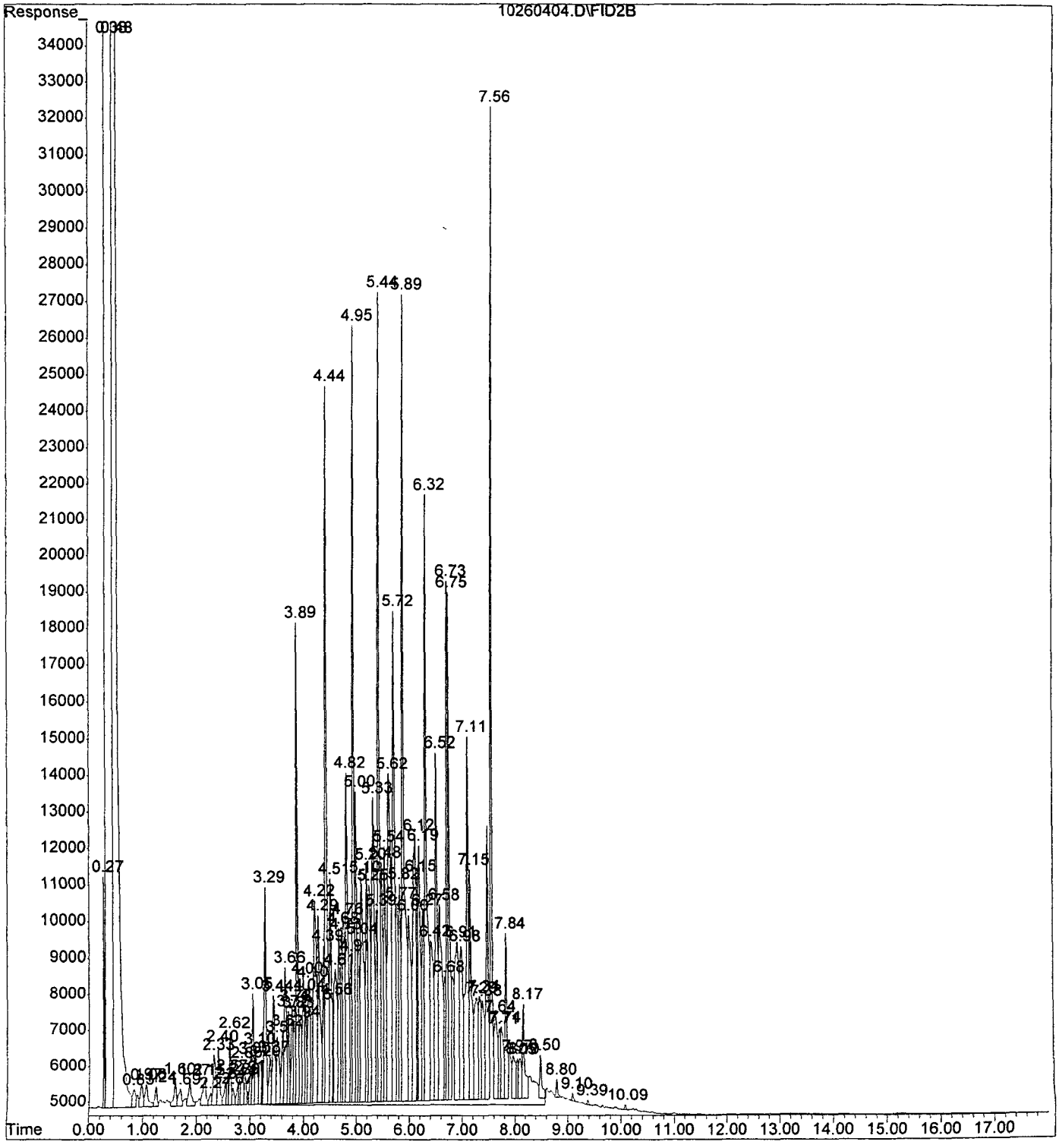
Sample Name: DRO CCV 200PPB
Misc Info : GC5-08-15
Vial Number: 4



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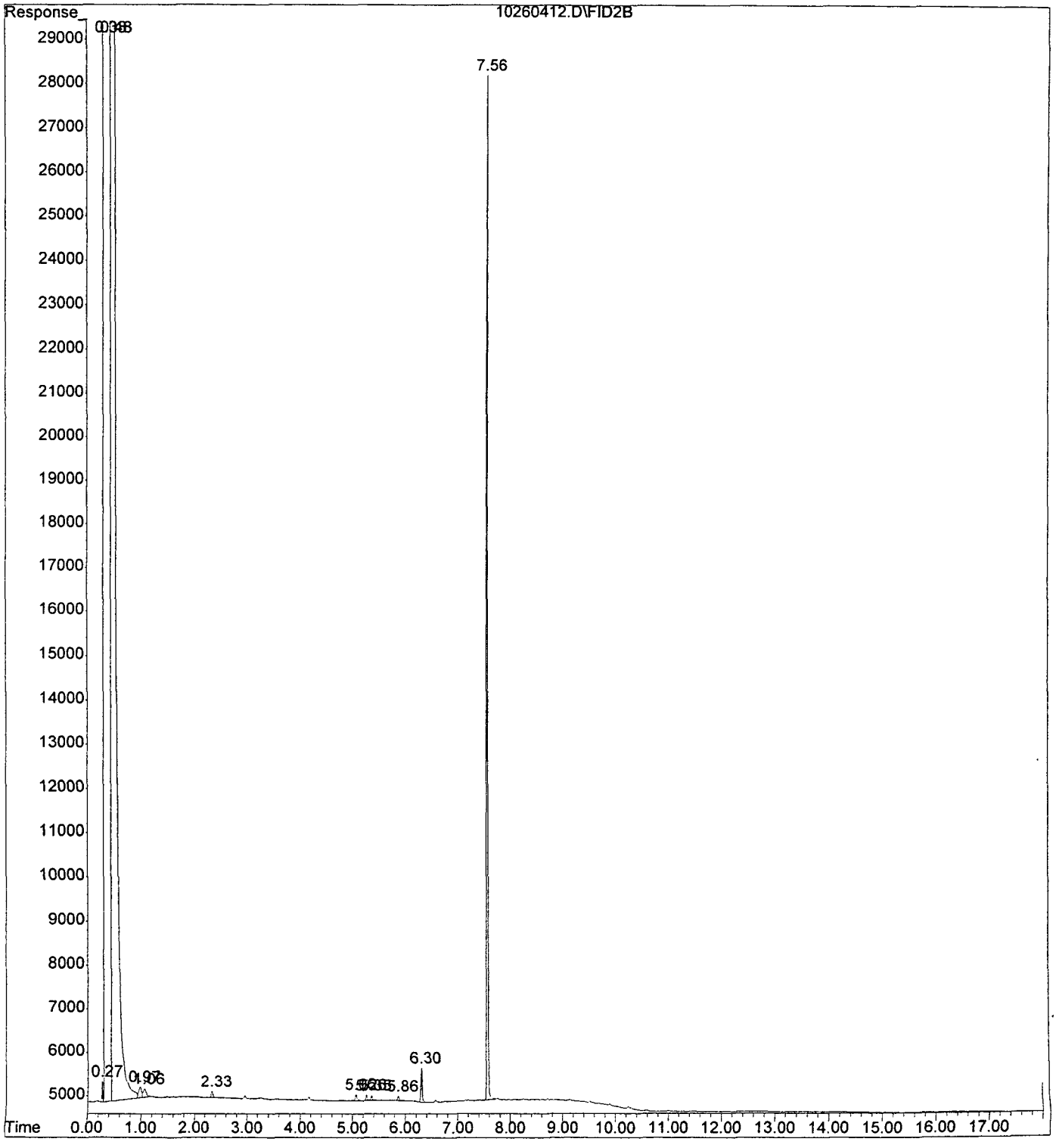

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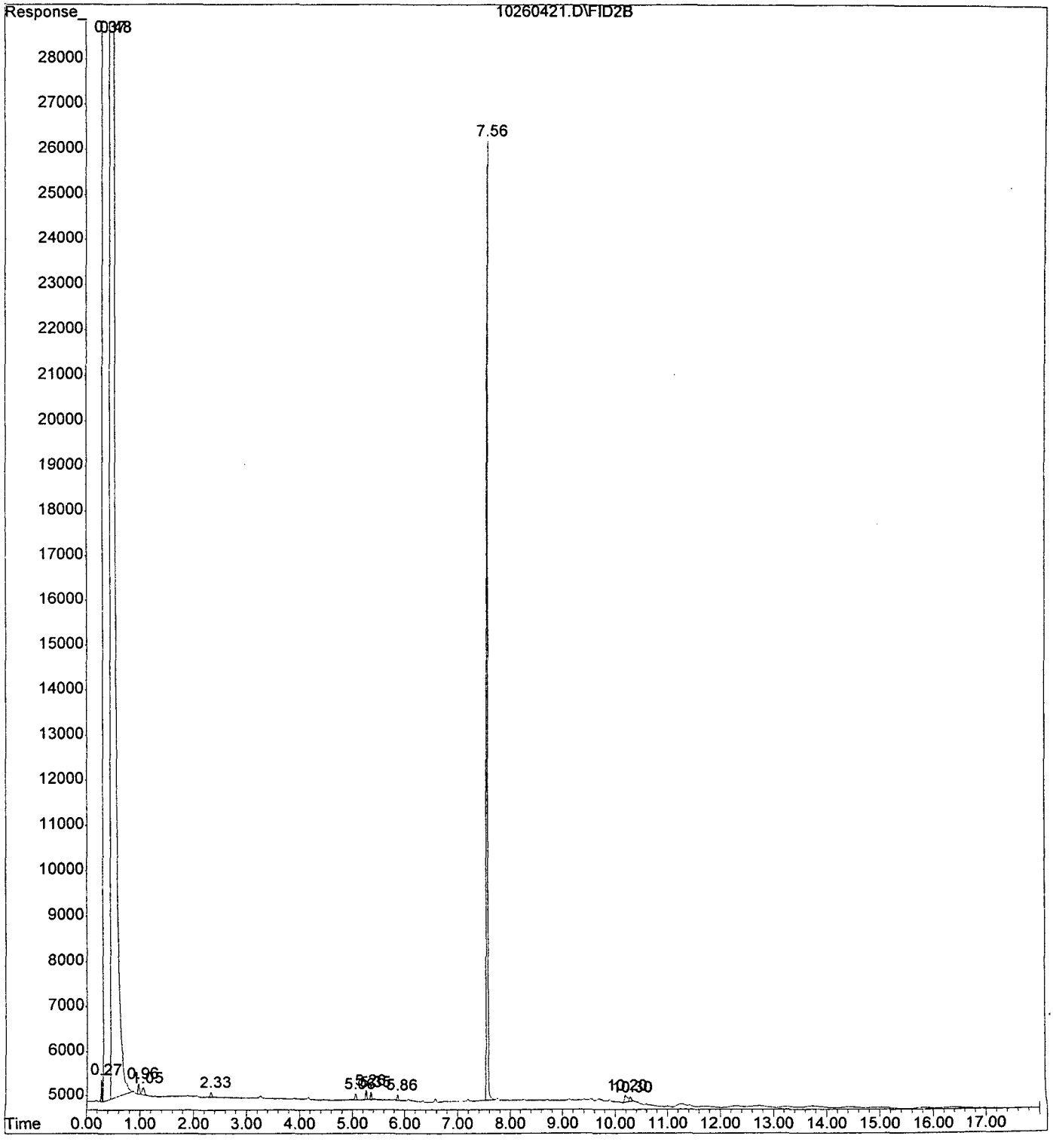

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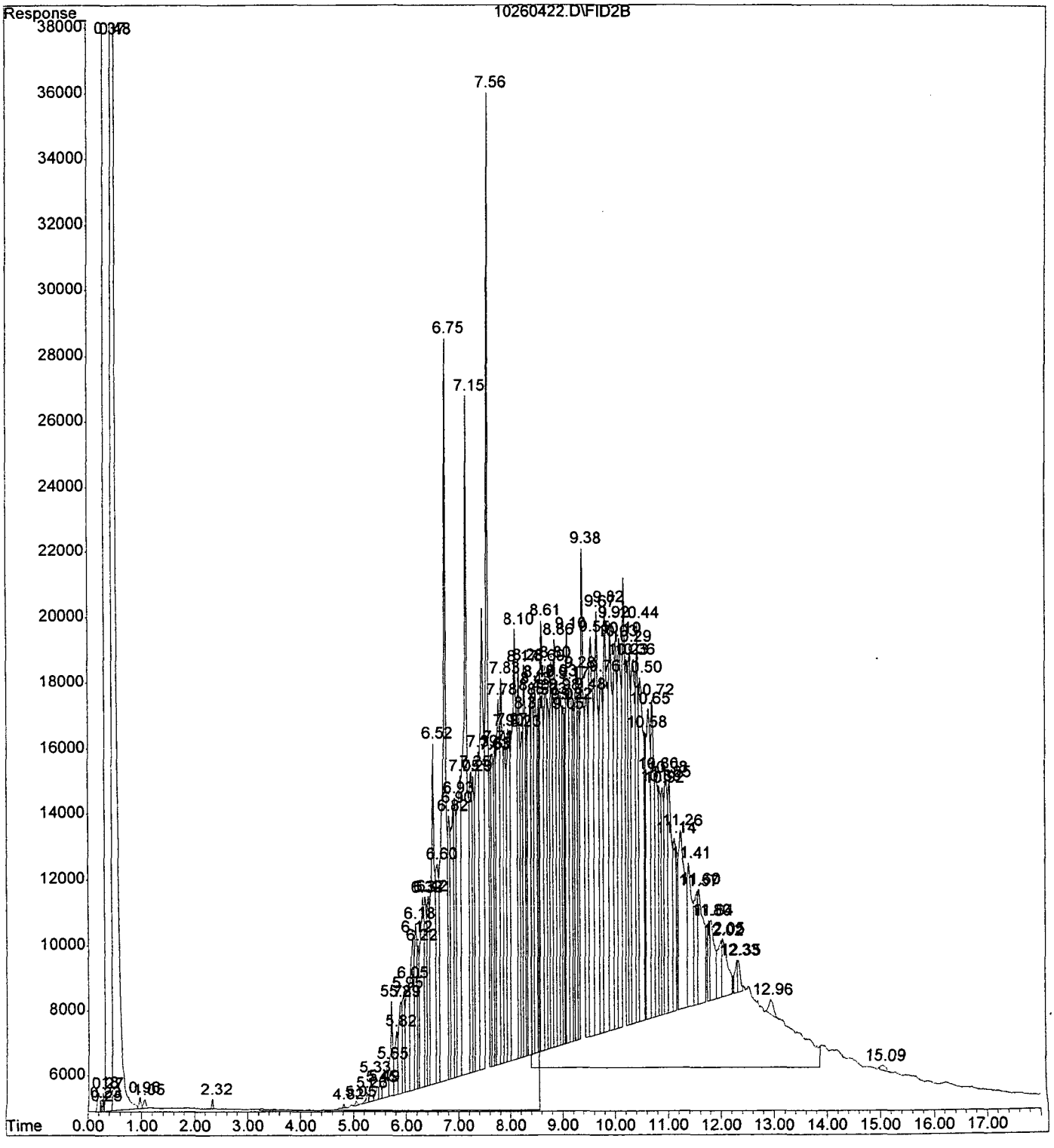

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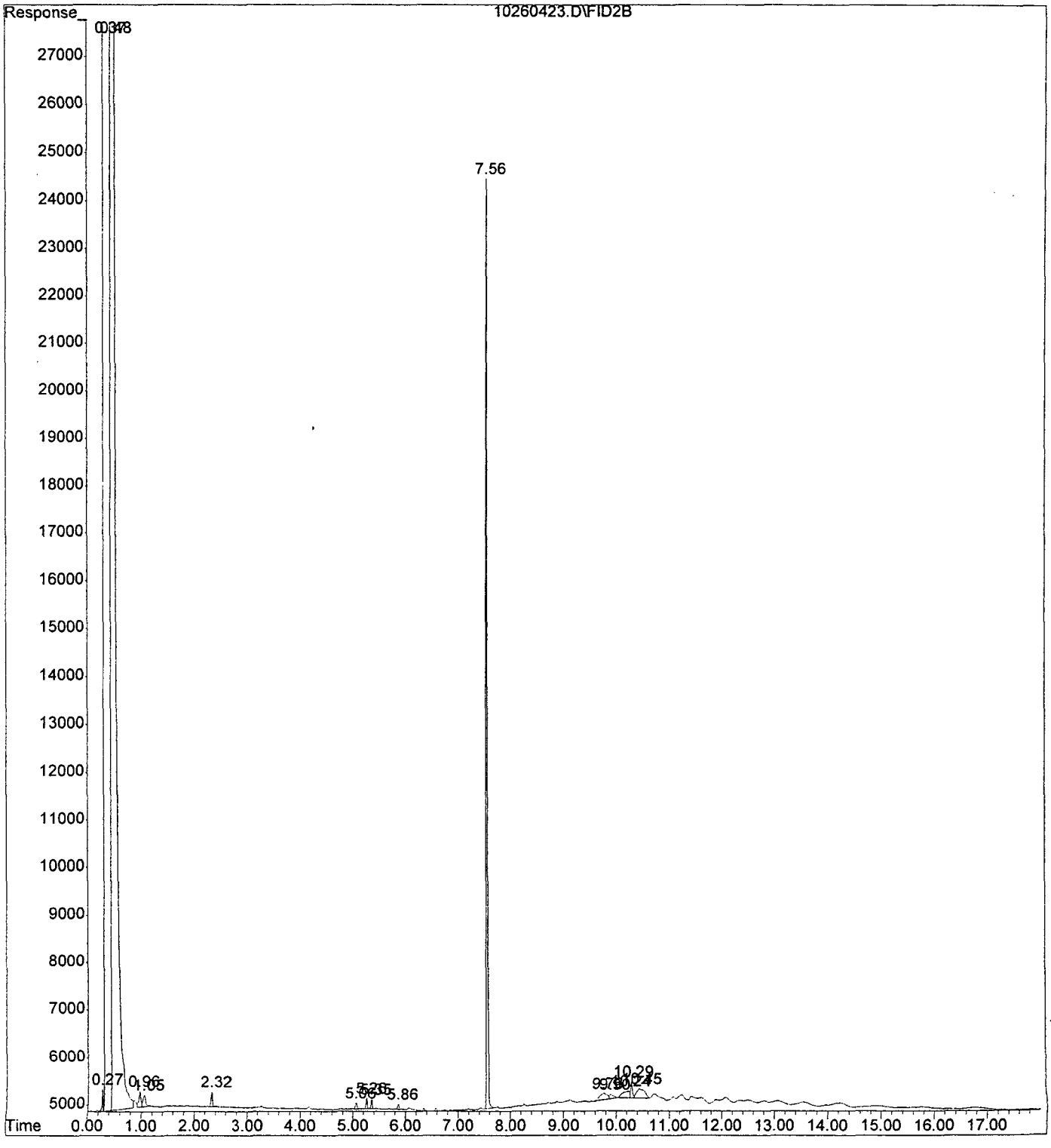

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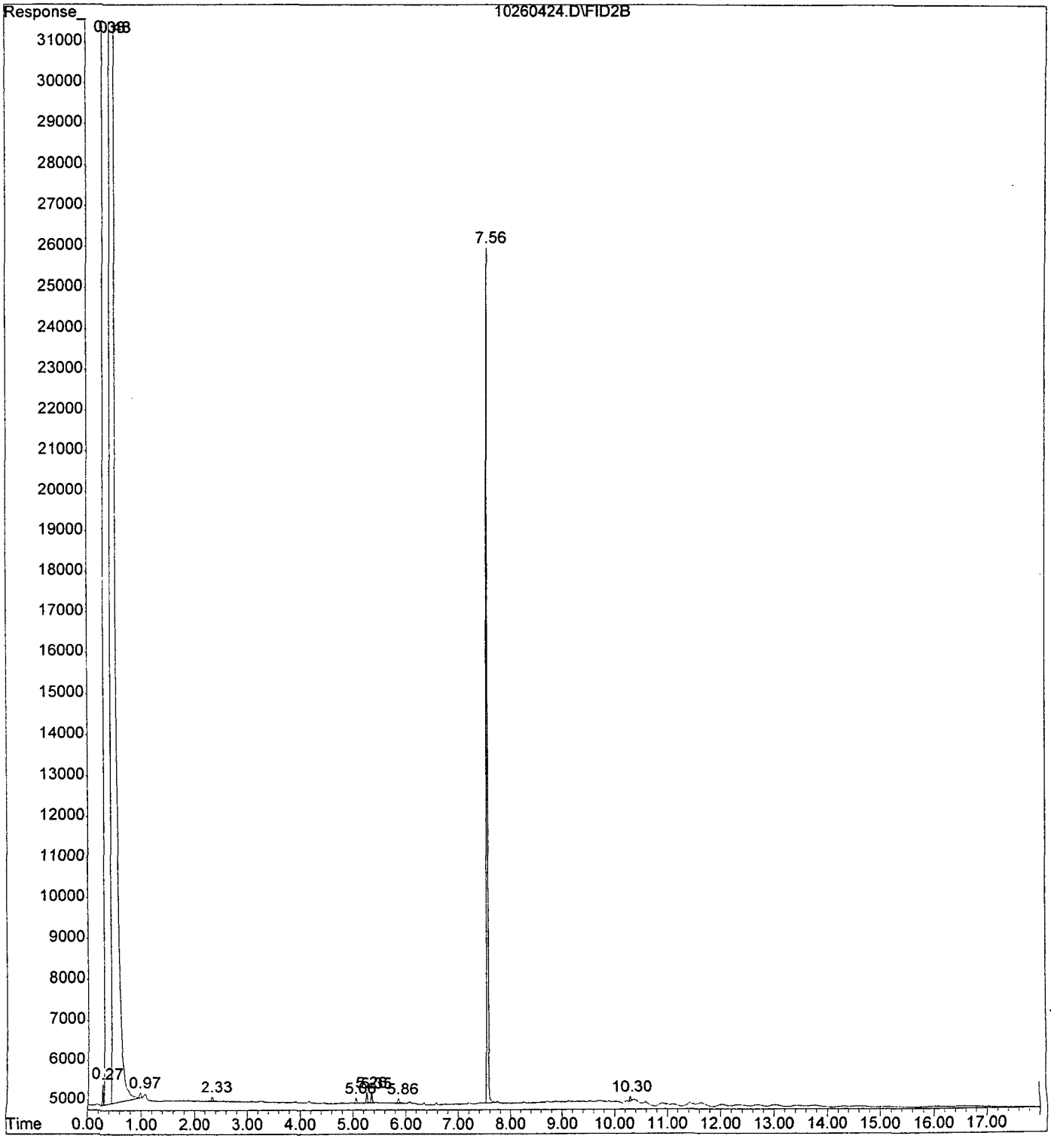

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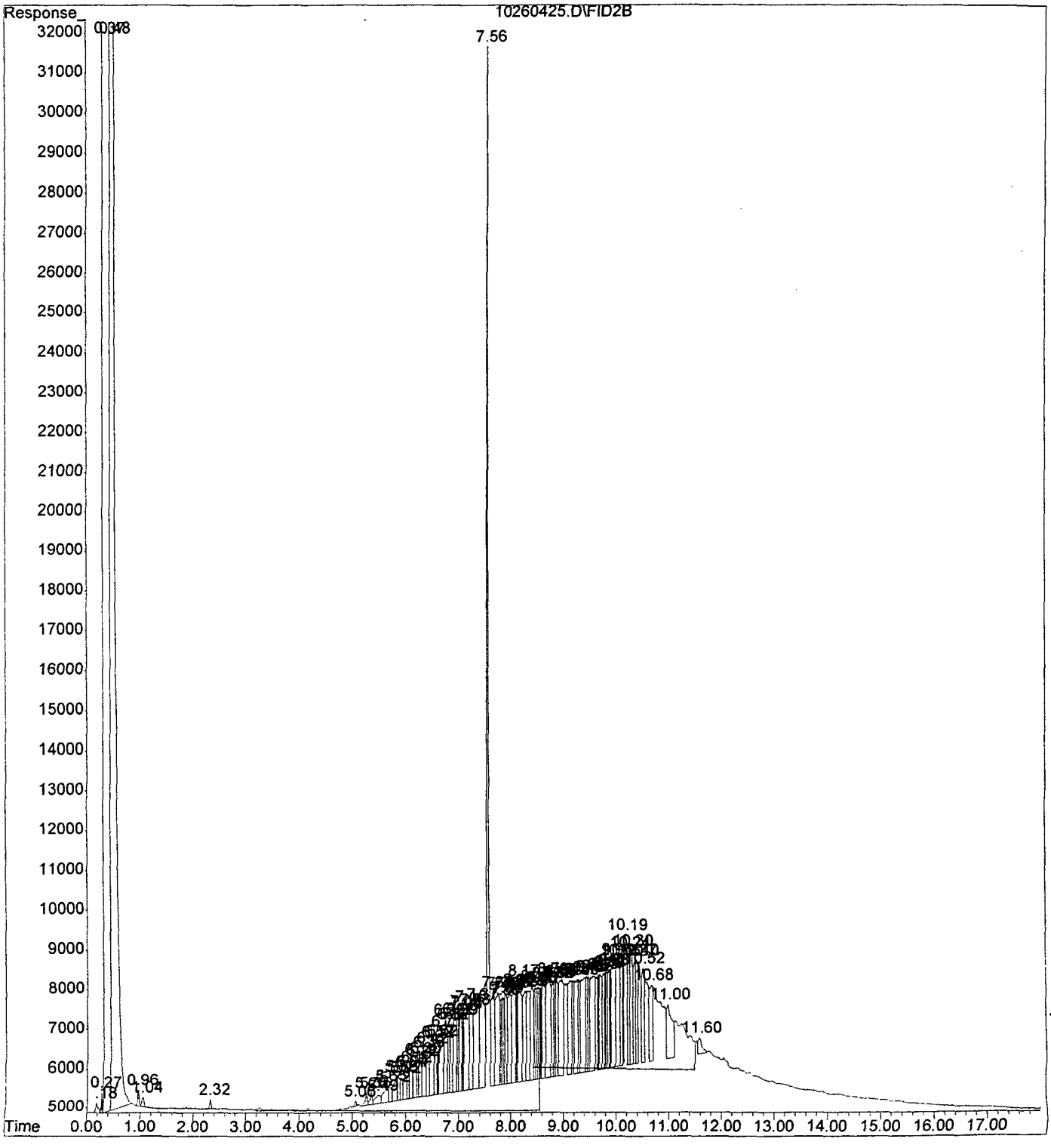

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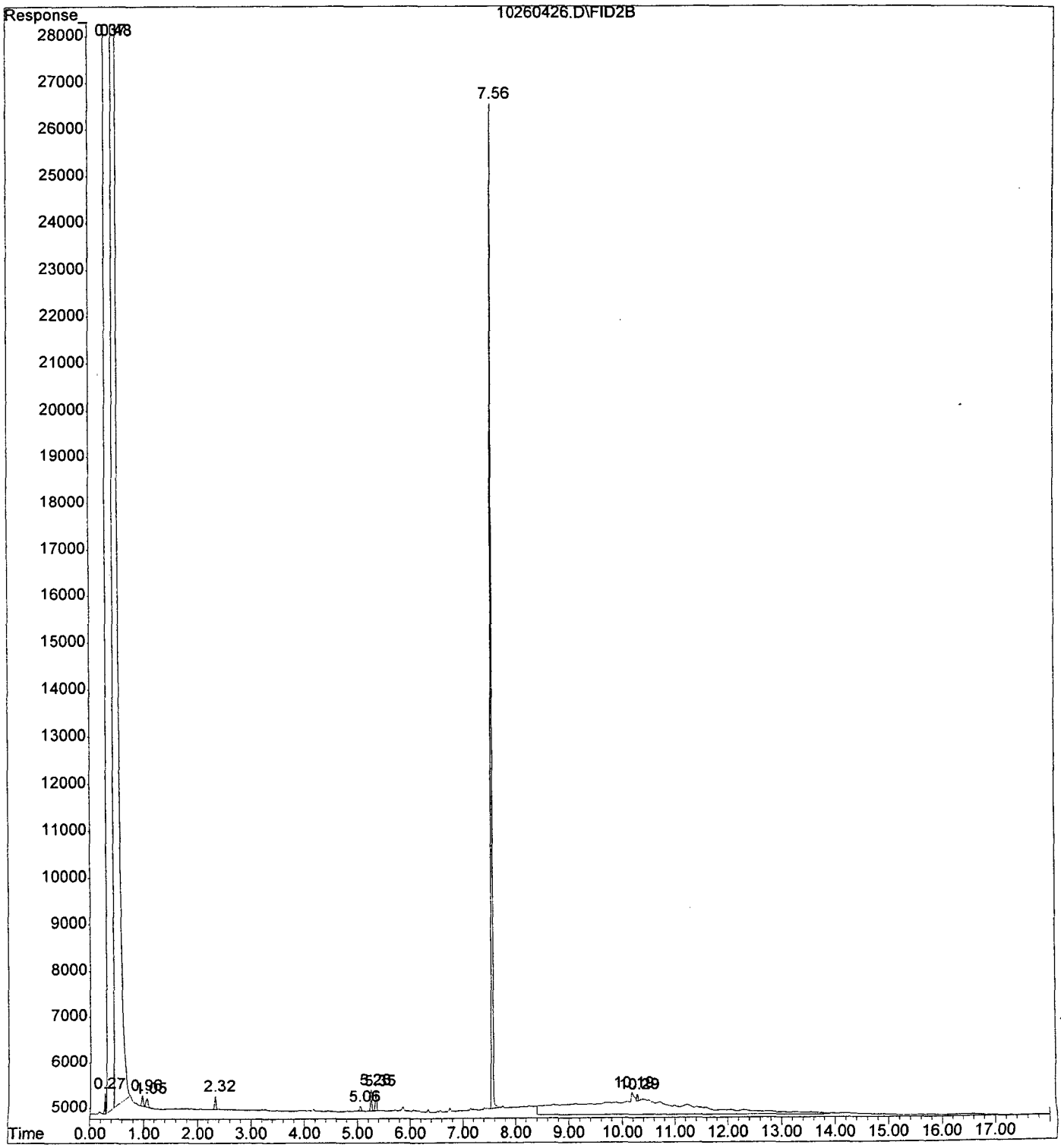

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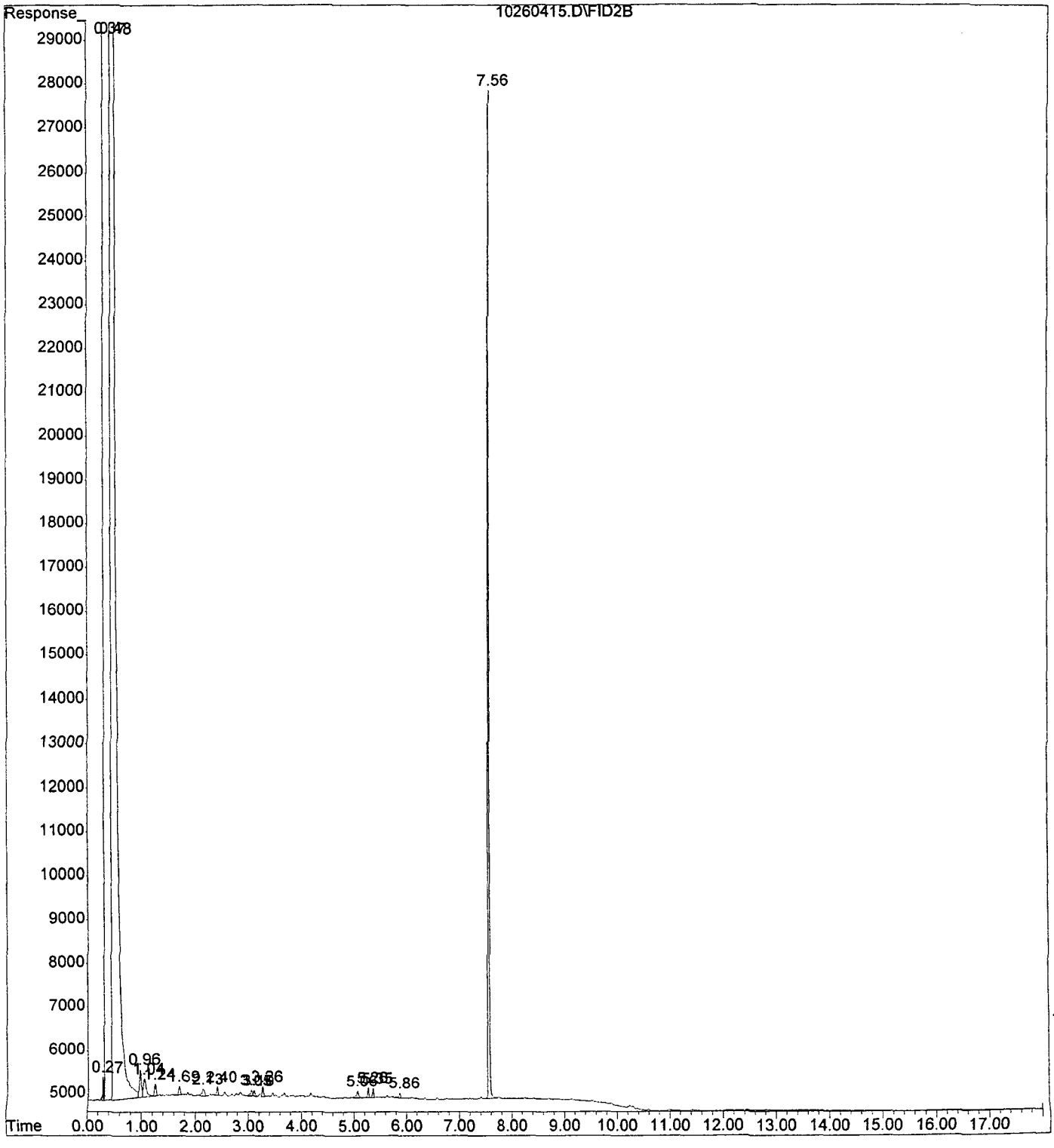

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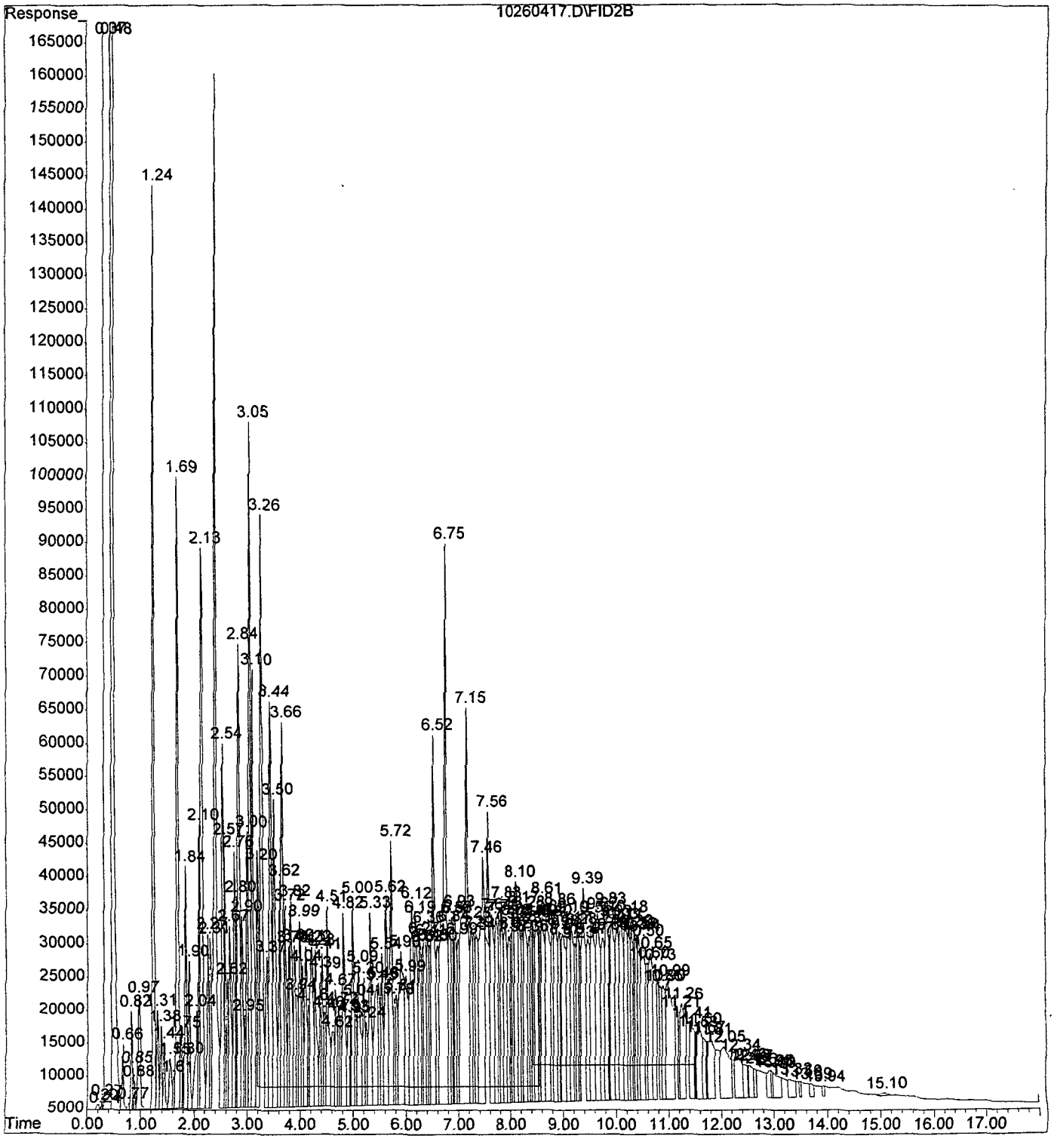

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

PINNACLE
LABORATORIES

Pinnacle Lab ID number **501099**
February 04, 2005

LODESTAR
26 CR 3500
FLORA VISTA, NM 87415

GIANT INDUSTRIES
111 COUNTY ROAD 4990
BLOOMFIELD, NM 87413

Project Name GIANT CRUDE
Project Number 30002-1

Attention: MARTIN NEE/TIM KINNEY

On 01/15/2005 Pinnacle Laboratories Inc., (ADHS License No. AZ0643), 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.

EPA Method 8021 was performed by Pinnacle Laboratories, Inc., Albuquerque, NM.

All other analyses were performed by Severn Trent Services, Pensacola, FL.

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

H. Mitchell Rubenstein, Ph.D.
General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
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Fax (505) 344-4413

CLIENT	: LODESTAR	PINNACLE ID	: 501099
PROJECT #	: 30002-1	DATE RECEIVED	: 01/15/2005
PROJECT NAME	: GIANT CRUDE	REPORT DATE	: 02/04/2005

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
501099 - 01	MW-5	AQUEOUS	01/13/2005
501099 - 02	MW-6	AQUEOUS	01/13/2005
501099 - 03	MW-7	AQUEOUS	01/13/2005
501099 - 04	MW-3	AQUEOUS	01/13/2005
501099 - 05	MW-2	AQUEOUS	01/13/2005
501099 - 06	MW-4	AQUEOUS	01/13/2005
501099 - 07	TRIP	AQUEOUS	01/07/2005

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B
CLIENT : LODESTAR
PROJECT # : 30002-1
PROJECT NAME : GIANT CRUDE

PINNACLE I.D. : 501099
ANALYST : BP

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MW-5	AQUEOUS	01/13/2005	NA	01/17/2005	1
02	MW-6	AQUEOUS	01/13/2005	NA	01/17/2005	1
03	MW-7	AQUEOUS	01/13/2005	NA	01/17/2005	25

PARAMETER	DET. LIMIT	UNITS	MW-5	MW-6	MW-7
BENZENE	**0.5**	**UG/L**	< 0.5	< 0.5	**1600**
TOLUENE	0.5	UG/L	< 0.5	< 0.5	< 13
ETHYLBENZENE	**0.5**	**UG/L**	< 0.5	< 0.5	**220**
TOTAL XYLENES	**1.0**	**UG/L**	< 1.0	< 1.0	**1500**
SURROGATE:					
BROMOFLUOROBENZENE (%)			101	100	97
SURROGATE LIMITS	(80 - 120)				

CHEMIST NOTES:
N/A

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PINNACLE LABORATORIES

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B
CLIENT : LODESTAR
PROJECT # : 30002-1
PROJECT NAME : GIANT CRUDE

PINNACLE I.D. : 501099
ANALYST : BP

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MW-3	AQUEOUS	01/13/2005	NA	01/17/2005	1
05	MW-2	AQUEOUS	01/13/2005	NA	01/17/2005	10
06	MW-4	AQUEOUS	01/13/2005	NA	01/17/2005	1

PARAMETER	DET. LIMIT	UNITS	MW-3	MW-2	MW-4
BENZENE	**0.5**	**UG/L**	< 0.5	**430**	< 0.5
TOLUENE	0.5	UG/L	< 0.5	< 5.0	< 0.5
ETHYLBENZENE	**0.5**	**UG/L**	< 0.5	**360**	< 0.5
TOTAL XYLENES	**1.0**	**UG/L**	< 1.0	**1000**	< 1.0
SURROGATE:					
BROMOFLUOROBENZENE (%)			98	115	98
SURROGATE LIMITS	(80 - 120)				

CHEMIST NOTES:
N/A

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PINNACLE LABORATORIES

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B
CLIENT : LODESTAR
PROJECT # : 30002-1
PROJECT NAME : GIANT CRUDE

PINNACLE I.D. : 501099
ANALYST : BP

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
7	TRIP	AQUEOUS	01/07/2005	NA	01/17/2005	1

PARAMETER	DET. LIMIT	UNITS	TRIP
BENZENE	0.5	UG/L	< 0.5
TOLUENE	0.5	UG/L	< 0.5
ETHYLBENZENE	0.5	UG/L	< 0.5
TOTAL XYLENES	1.0	UG/L	< 1.0

SURROGATE:
BROMOFLUOROBENZENE (%) 100
SURROGATE LIMITS (80 - 120)

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021B	PINNACLE I.D.	: 501099
BLANK I. D.	: 011705	DATE EXTRACTED	: N/A
CLIENT	: LODESTAR	DATE ANALYZED	: 01/17/2005
PROJECT #	: 30002-1	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT CRUDE	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
SURROGATE:		
BROMOFLUOROBENZENE (%)		99
SURROGATE LIMITS:	(80 - 120)	

CHEMIST NOTES:
N/A

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PINNACLE LABORATORIES

GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021B	PINNACLE I.D.	: 501099
BATCH #	: 011705	DATE EXTRACTED	: N/A
CLIENT	: LODESTAR	DATE ANALYZED	: 01/17/2005
PROJECT #	: 30002-1	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT CRUDE	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	20.6	103	20.6	103	0	(80 - 120)	20
TOLUENE	<0.5	20.0	20.7	104	20.7	104	0	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	20.6	103	20.7	104	0	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	61.8	103	62.2	104	1	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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PINNACLE LABORATORIES

GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

TEST	: EPA 8021B	PINNACLE I.D.	: 501099
MSMSD #	: 501099-04	DATE EXTRACTED	: N/A
CLIENT	: LODESTAR	DATE ANALYZED	: 01/18/2005
PROJECT #	: 30002-1	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT CRUDE	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	20.2	101	20.4	102	1	(80 - 120)	20
TOLUENE	<0.5	20.0	20.5	103	20.4	102	0	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	20.3	102	20.2	101	0	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	61.3	102	60.9	102	1	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

SEVERN TRENT STL

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Analytical Report

For: Ms. Jacinta Tenorio
Pinnacle Laboratories
2709-D Pan American Freeway Northeast
Albuquerque, NM 87107
CC:

Order Number: C501406
SDG Number:
Client Project ID:
Project: 501099:GI/GIANT CRUDE
Report Date: 01/28/2005
Sampled By: Client
Sample Received Date: 01/18/2005
Requisition Number:
Purchase Order:

Marty Edwards, Project Manager
medwards@stl-inc.com

SEVERN TRENT STL

STL Pensacola 3355 McLemore Drive - Pensacola FL 32514 Telephone:(850) 474-1001 Fax:(850) 478-2671

Sample Summary

Order: C501406
Date Received: 01/18/2005

Client: Pinnacle Laboratories
Project: 501099:GI/GIANT CRUDE

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
MW-5/501099-01	C501406*1	Liquid	01/13/2005 08:51
MW-6/501099-02	C501406*2	Liquid	01/13/2005 09:25
MW-7/501099-03	C501406*3	Liquid	01/13/2005 10:25
MW-3/501099-04	C501406*4	Liquid	01/13/2005 11:02
MW-2/501099-05	C501406*5	Liquid	01/13/2005 11:47
MW-4/501099-06	C501406*6	Liquid	01/13/2005 12:52

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-1	MW-5/501099-01	Liquid	01/18/05	01/13/05 08:51	
01406-2	MW-6/501099-02	Liquid	01/18/05	01/13/05 09:25	
01406-3	MW-7/501099-03	Liquid	01/18/05	01/13/05 10:25	
01406-4	MW-3/501099-04	Liquid	01/18/05	01/13/05 11:02	
01406-5	MW-2/501099-05	Liquid	01/18/05	01/13/05 11:47	

Parameter	Units	Sample ID 01406-1 MW-5/501099-01	01406-2 MW-6/501099-02	01406-3 MW-7/501099-03	01406-4 MW-3/501099-04	01406-5 MW-2/501099-05
Total Dissolved Solids (160.1)						
Total Dissolved Solids	mg/l	4800	3000	930	3900	2000
Dilution Factor		1	1	1	1	1
Analysis Date		01/18/05	01/18/05	01/18/05	01/18/05	01/18/05
Batch ID		TDW006	TDW006	TDW006	TDW006	TDW006
Analyst		ST	ST	ST	ST	ST
CO2 and Forms of Alkalinity (4500D)						
Bicarbonate (2320/4500)	mg/l as CaCO3	870	1100	740	560	1300
Carbon Dioxide, Free	mg/l as CaCO3	320	120	110	51	47
Carbonate (2320/4500)	mg/l as CaCO3	<1.0	2.0	1.0	1.0	7.0
Hydroxide	mg/l as CaCO3	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Dioxide, Total	mg/l as CaCO3	1100	1100	760	540	1200
Dilution Factor		1	1	1	1	1
Analysis Date		01/20/05	01/20/05	01/20/05	01/20/05	01/20/05
Batch ID		AEW005	AEW005	AEW005	AEW005	AEW005
Analyst		ST	ST	ST	ST	ST
Alkalinity (to pH 4.5) as CaCO3 (2320B)						
Alkalinity (to pH 4.5) as CaCO3	mg/l	870	1100	740	560	1300
Dilution Factor		1	1	1	1	1
Analysis Date		01/20/05	01/20/05	01/20/05	01/20/05	01/20/05
Batch ID		AEW005	AEW005	AEW005	AEW005	AEW005
Analyst		ST	ST	ST	ST	ST

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-1	MW-5/501099-01	Liquid	01/18/05	01/13/05 08:51	
01406-2	MW-6/501099-02	Liquid	01/18/05	01/13/05 09:25	
01406-3	MW-7/501099-03	Liquid	01/18/05	01/13/05 10:25	
01406-4	MW-3/501099-04	Liquid	01/18/05	01/13/05 11:02	
01406-5	MW-2/501099-05	Liquid	01/18/05	01/13/05 11:47	

Parameter	Units	Sample ID 01406-1 MW-5/501099-01	01406-2 MW-6/501099-02	01406-3 MW-7/501099-03	01406-4 MW-3/501099-04	01406-5 MW-2/501099-05
pH (150.1)						
pH	units	7.0	7.2	7.0	7.4	7.6
Dilution Factor		1	1	1	1	1
Analysis Date		01/18/05	01/18/05	01/18/05	01/18/05	01/18/05
Batch ID		PHX008	PHX008	PHX008	PHX008	PHX008
Analyst		GK	GK	GK	GK	GK
Sulfate as SO4 (375.4)						
Sulfate as SO4	mg/l	1200	940	190	2100	58
Dilution Factor		40	40	6	75	5
Analysis Date		01/18/05	01/18/05	01/18/05	01/18/05	01/18/05
Batch ID		SEW006	SEW006	SEW006	SEW006	SEW006
Analyst		GK	GK	GK	GK	GK
Chloride (4500E)						
Chloride	mg/l	1100	93	15	37	110
Dilution Factor		20	3	1	1	3
Analysis Date		01/18/05	01/18/05	01/18/05	01/18/05	01/18/05
Batch ID		CKW007	CKW007	CKW007	CKW007	CKW007
Analyst		GK	GK	GK	GK	GK

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-1	MW-5/501099-01	Liquid	01/18/05	01/13/05 08:51	
01406-2	MW-6/501099-02	Liquid	01/18/05	01/13/05 09:25	
01406-3	MW-7/501099-03	Liquid	01/18/05	01/13/05 10:25	
01406-4	MW-3/501099-04	Liquid	01/18/05	01/13/05 11:02	
01406-5	MW-2/501099-05	Liquid	01/18/05	01/13/05 11:47	

Parameter	Units	Sample ID 01406-1 MW-5/501099-01	01406-2 MW-6/501099-02	01406-3 MW-7/501099-03	01406-4 MW-3/501099-04	01406-5 MW-2/501099-05
Specific Conductance (120.1)						
Specific Conductance	umhos/cm	6800	4100	1500	4700	3000
Dilution Factor		1	1	1	1	1
Analysis Date		01/19/05	01/19/05	01/19/05	01/19/05	01/19/05
Batch ID		CDW003	CDW003	CDW003	CDW003	CDW003
Analyst		ST	ST	ST	ST	ST
Nitrate-Nitrite, Nitrogen (353.2)						
Nitrate + Nitrite-N	mg/l	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate-N	mg/l	<0.10	<0.10	<0.10	<0.10	<0.10
Dilution Factor		1	1	1	1	1
Analysis Date		01/21/05	01/21/05	01/21/05	01/21/05	01/21/05
Batch ID		N3W008	N3W008	N3W008	N3W008	N3W008
Analyst		GK	GK	GK	GK	GK
Nitrite-N (354.1)						
Nitrite-N	mg/l	<0.10	<0.10	<0.10	<0.10	<0.10
Dilution Factor		1	1	1	1	1
Analysis Date		01/18/05	01/18/05	01/18/05	01/18/05	01/18/05
Batch ID		N2W010	N2W010	N2W010	N2W010	N2W010
Analyst		GK	GK	GK	GK	GK

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-1	MW-5/501099-01	Liquid	01/18/05	01/13/05 08:51	
01406-2	MW-6/501099-02	Liquid	01/18/05	01/13/05 09:25	
01406-3	MW-7/501099-03	Liquid	01/18/05	01/13/05 10:25	
01406-4	MW-3/501099-04	Liquid	01/18/05	01/13/05 11:02	
01406-5	MW-2/501099-05	Liquid	01/18/05	01/13/05 11:47	

Parameter	Units	Sample ID 01406-1 MW-5/501099-01	01406-2 MW-6/501099-02	01406-3 MW-7/501099-03	01406-4 MW-3/501099-04	01406-5 MW-2/501099-05
Metals (6010B)						
Calcium	mg/l	670	220	180	450	140
Iron	mg/l	4.3	23	27	3.9	11
Magnesium	mg/l	60	28	20	47	19
Manganese	mg/l	11	4.0	3.0	0.79	1.3
Potassium	mg/l	10	6.7	3.3	3.9	3.8
Sodium	mg/l	910	670	150	690	620
Dilution Factor		1	1	1	1	1
Prep Date		01/21/05	01/21/05	01/21/05	01/21/05	01/21/05
Analysis Date		01/21/05	01/21/05	01/21/05	01/21/05	01/21/05
Batch ID		PW027	PW027	PW027	PW027	PW027
Prep Method		3010A	3010A	3010A	3010A	3010A
Analyst		GSP	GSP	GSP	GSP	GSP
Quantitation Factor		1.000	1.000	5.000	1.000	1.000
Hardness by calculation (6010B)						
Hardness as CaCO3	mg/l	1900	670	540	1400	430
Dilution Factor		5	1	1	5.0	1
Prep Date		01/21/05	01/21/05	01/21/05	01/21/05	01/21/05
Analysis Date		01/21/05	01/21/05	01/21/05	01/21/05	01/21/05
Batch ID		PW027	PW027	PW027	PW027	PW027
Prep Method		3010A	3010A	3010A	3010A	3010A
Analyst		GSP	GSP	GSP	GSP	GSP
Quantitation Factor		5.000	1.000	1.000	5.000	1.000

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-6	MW-4/501099-06	Liquid	01/18/05	01/13/05 12:52	

Parameter	Units	Sample ID 01406-6 MW-4/501099-06
Total Dissolved Solids (160.1)		
Total Dissolved Solids	mg/l	4000
Dilution Factor		1
Analysis Date		01/18/05
Batch ID		TDW006
Analyst		ST
CO2 and Forms of Alkalinity (4500D)		
Bicarbonate (2320/4500)	mg/l as CaCO3	420
Carbon Dioxide, Free	mg/l as CaCO3	31
Carbonate (2320/4500)	mg/l as CaCO3	1.0
Hydroxide	mg/l as CaCO3	<1.0
Carbon Dioxide, Total	mg/l as CaCO3	400
Dilution Factor		1
Analysis Date		01/20/05
Batch ID		AEW005
Analyst		ST
Alkalinity (to pH 4.5) as CaCO3 (2320B)		
Alkalinity (to pH 4.5) as CaCO3	mg/l	420
Dilution Factor		1
Analysis Date		01/20/05
Batch ID		AEW005
Analyst		ST

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-6	MW-4/501099-06	Liquid	01/18/05	01/13/05 12:52	

Parameter	Units	Sample ID 01406-6 MW-4/501099-06
pH (150.1)		
pH	units	7.3
Dilution Factor		1
Analysis Date		01/18/05
Batch ID		PHX008
Analyst		GK
Sulfate as SO4 (375.4)		
Sulfate as SO4	mg/l	2200
Dilution Factor		75
Analysis Date		01/18/05
Batch ID		SEW006
Analyst		GK
Chloride (4500E)		
Chloride	mg/l	30
Dilution Factor		1
Analysis Date		01/18/05
Batch ID		CKW007
Analyst		GK
Specific Conductance (120.1)		
Specific Conductance	umhos/cm	4900
Dilution Factor		1
Analysis Date		01/19/05
Batch ID		CDW003
Analyst		ST

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-6	MW-4/501099-06	Liquid	01/18/05	01/13/05 12:52	

Parameter	Units	Sample ID: 01406-6 MW-4/501099-06
Nitrate-Nitrite, Nitrogen (353.2)		
Nitrate + Nitrite-N	mg/l	<0.10
Nitrate-N	mg/l	<0.10
Dilution Factor		1
Analysis Date		01/21/05
Batch ID		N3W008
Analyst		GK
Nitrite-N (354.1)		
Nitrite-N	mg/l	<0.10
Dilution Factor		1
Analysis Date		01/18/05
Batch ID		N2W010
Analyst		GK
Metals (6010B)		
Calcium	mg/l	450
Iron	mg/l	18
Magnesium	mg/l	49
Manganese	mg/l	5.2
Potassium	mg/l	10
Sodium	mg/l	740
Dilution Factor		1
Prep Date		01/21/05
Analysis Date		01/21/05
Batch ID		PW027
Prep Method		3010A
Analyst		GSP
Quantitation Factor		1.000

SEVERN TRENT STL

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Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-6	MW-4/501099-06	Liquid	01/18/05	01/13/05 12:52	

Parameter	Units	Sample ID: 01406-6 MW-4/501099-06
Hardness by calculation (6010B)		
Hardness as CaCO3	mg/l	1300
Dilution Factor		5
Prep Date		01/21/05
Analysis Date		01/21/05
Batch ID		PW027
Prep Method		3010A
Analyst		GSP
Quantitation Factor		5.000

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01406-7	Method Blank	Liquid	01/18/05		
01406-8	Lab Control Standard % Recovery	Liquid	01/18/05		
01406-9	LCS Accuracy Control Limit (%R)	Liquid	01/18/05		
01406-10	Precision (%RPD) MS/MSD	Liquid	01/18/05		
01406-11	MS Precision Advisory Limit (%RPD)	Liquid	01/18/05		

Parameter	Units	Sample ID 01406-7 Method Blank	01406-8 Lab Control	01406-9 StanLCS Accuracy Con	01406-10 Precision (%RPD)	01406-11 MS Precision Ad
Total Dissolved Solids (160.1)						
Total Dissolved Solids	mg/l	<5.0	93 %	68-120	N/A	N/A
Dilution Factor		1				
Analysis Date		01/18/05				
Batch ID		TDW006	TDW006			
Analyst		ST				
CO2 and Forms of Alkalinity (4500D)						
Bicarbonate (2320/4500)	mg/l as CaCO3	N/A	N/A	N/A	N/A	N/A
Alkalinity (to pH 4.5) as CaCO3 (2320B)						
Alkalinity (to pH 4.5) as CaCO3	mg/l	<1.0	100 %	90-110	5	20
Dilution Factor		1				
Analysis Date		01/20/05				
Batch ID		AEW005	AEW005		AEW005	
Analyst		ST				
Sulfate as SO4 (375.4)						
Sulfate as SO4	mg/l	<5.0	101 %	90-110	7	19
Dilution Factor		1				
Analysis Date		01/18/05				
Batch ID		SEW006	SEW006		SEW006	
Analyst		GK				

Headspace readings were not recorded where there was no physical evidence of impacted soil. The results of laboratory analyses from eight of the highest headspace reading locations are shown in Table 2. Also included in Table 2 are the results of samples from the same locations collected one year later at the same depth approximately two feet from the original sample.

Table 2 Biovent Laboratory Results

Location (Oct 02)	Depth (feet)	PID (ppm)	Lab TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl benzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)
MP-11	12	732	1290	2.9	nd	5.8	36	44.7
IP-16	9	728	5690	0.85	0.78	7.7	58	67.33
MP-8	9	772	nd	nd	nd	nd	nd	0
IP-12	12	616	2470	nd	nd	2.1	16	18.1
IP-7	12	676	4720	2.9	nd	7.6	51	61.5
MP-3	6	777	750	2	0.3	3.2	23	28.5
MP-7	6	872	2830	2	3.3	8.6	56	69.9
IP-10	6	756	1470	0.42	0.14	0.11	1.1	1.77

Location (Oct 03)	Depth (feet)	PID (ppm)	Lab TPH (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl benzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)
MP-11	12	191	157	nd	nd	nd	nd	0
IP-16	9	110	2600	nd	nd	nd	nd	0
MP-8	9	149	nd	nd	nd	nd	nd	0
IP-12	12	190	720	nd	nd	nd	nd	0
IP-7	12	287	1299	nd	nd	nd	0.29	0.29
MP-3	6	314	400	nd	nd	nd	nd	0
MP-7	6	3964	4700	3.5	nd	10	89	102.5
IP-10	6	311	21	nd	nd	nd	nd	0

Comparison of Laboratory Results Between Oct-02 and Oct-03 Results

Hole	Depth (feet)	% Change Lab TPH mg/kg	% Change Total BTEX mg/kg
MP-11	12	-88%	-100%
IP-16	9	-54%	-100%
MP-8	9	nc	nc
IP-12	12	-71%	-100%
IP-7	12	-72%	-99.5%
MP-3	6	-47%	-100%
MP-7	6	66%	47%
IP-10	6	-99%	-100%
Ave.		-52%	-79%

Nc: no change Nd: not detected

As shown on the above Table 2, Laboratory reports indicate a decrease of BTEX constituents by 100% in five of the eight locations sampled. Of the other three locations, MP-8, MP-7, and MP-3; MP-8 showed no change, neither THP or BTEX were detected in either the pre-biovent or eight-month-later sample; MP-3 showed a 99% decrease of BTEX; MP-7 showed a forty seven percent increase in BTEX. THP was decreased by an average of fifty two percent for all eight samples. Laboratory analytical reports and chain-of-custody documentation are included in Appendix A.

The results of carbon dioxide and oxygen measurements during bioventing are as follows:

Table 3 Results of Air Monitoring

Monitoring Point Location	Average Conentration During Operations	Percentage of Pretest Reading	Average Conentration During Operations	Percentage of Pretest Reading
	Oxygen		Carbon Dioxide	
IP10	3.15	18%	6.52	362%
IP11	19.51	93%	1.03	†
IP13	18.62	89%	1.74	868%
IP14	5.77	29%	6.84	684%
IP15	20.07	96%	1.21	151%
IP17	20.44	98%	1.10	110%
IP19	19.27	92%	1.24	309%
IP20	5.88	29%	6.36	1061%
IP21	18.33	88%	1.20	86%
IP22	20.14	96%	0.94	234%
IP23	20.69	99%	0.66	111%
IP8	3.25	16%	13.43	1678%
MP14	14.20	74%	3.34	334%
MP15	18.40	88%	1.82	303%
MP16	20.11	96%	0.97	1621%
MP4	1.94	10%	12.05	1004%
MP7	6.56	35%	5.60	400%
MP9	13.13	64%	1.89	189%
Ave.	13.86	69%	3.77	476%

† There was no carbon dioxide in IP 11 during pretest readings.

Measurements at individual monitoring points are shown on the Bioventing Data tables in Appendix B. Air monitoring points were, for the most part, installed away from the injection

points that were installed in the areas of highest hydrocarbon concentrations. Because these points were away from hydrocarbons and hence biologic activity, initial oxygen concentrations were typically higher and carbon dioxide concentrations typically lower than readings in areas of higher hydrocarbon concentrations. The average of all oxygen concentrations at all monitoring points was sixty nine percent of pretest concentrations. The average of all carbon dioxide concentrations at all monitoring points was four hundred and seventy six percent of pretest concentrations

Ground Water Sampling

Depth-to-water measurements taken during January 2003 and January 2004 are shown in Table 4. During January 2004, water depth ranged from 22.46 feet beneath the top of the well casing (BTOC) in MW-7 to 12.53 feet BTOC in MW-2. Product was intermittently found in MW-2. Free phase crude oil has never been found in any of the other wells. Ground water elevations were calculated, and inferred ground water elevation contour maps are presented as Figures 4 and 5. The ground water elevation for MW-2 was corrected using a product density of 0.7 that of water to properly reflect the estimated elevation. Based on the contours, ground water movement appears to be to the southwest and the hydraulic gradient is 0.015 feet per feet.

Table 4: Ground Water Elevation Data

Well Number	Casing Elevation (ft)	Date	Depth to Water (ft)	Depth to Product (ft)	Product Thickness (ft)	Groundwater Elevation (ft)
MW-1*	na	na	na	na	na	na
MW-2**	5485.33	1/30/2003	12.53	np	np	5472.80
		1/20/2004	14.24	14.2	0.04	5471.12
MW-3	5488.61	1/30/2003	12.89	np	np	5475.72
		1/20/2004	14.62	np	np	5473.99
MW-4	5486.18	1/30/2003	13.89	np	np	5472.29
		1/20/2004	15.08	np	np	5471.10
MW-5	5481.61	1/30/2003	13.97	np	np	5467.64
		1/20/2004	15.17	np	np	5466.44
MW-6	5486.18	1/30/2003	15.58	np	np	5470.60
		1/20/2004	16.98	np	np	5469.20
MW-7†	5491.86	1/30/2003	20.18	np	np	5471.68
		1/20/2004	22.46	np	np	5469.40

Notes:
Measuring points are marked by a notch in top of well casing
na: not applicable
np: indicates there was no free phase product present
Groundwater Elevation = (Surveyed Well Casing Elevation) - (Depth to Water)
Water level elevation is given in feet above mean sea level
* MW-1 was abandoned by Giant in 2000
** MW-2 water level is corrected for product thickness using a specific gravity of 0.7 that of water
† MW-7 was not sampled on May 10, 2002 because it was recommended for abandonement. Upon request of the NMOCD, it was sampled on June 26, 2002

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Laboratory analytical results for BTEX are presented in Table 5. Complete reports from Pinnacle Laboratories are included in Appendix A. During January 2004, BTEX was not detected in the groundwater from MW-3 and MW-4. At MW-5 the only constituent detected was xylene at 1.1 micrograms per liter (µg/L). Benzene was detected in MW-6 at 0.9 µg/L, toluene at 1.6 µg/L, ethylbenzene at 2.9 µg/L, and xylenes at 16 µg/L, all below New Mexico Water Quality Control Commission (NMWQCC) standards. The concentrations of Benzene in MW-2 and MW-7 were over NMWQCC standards at 1100 µg/L and 3300 µg/L, respectively. Toluene was not detected in these wells. Ethylbenzene concentrations were 650 µg/L in MW-2 and 460 µg/L in MW-7, beneath NMWQCC standards. Xylenes in MW-2 and MW-7 were over NMWQCC standards at 3200 µg/L and 3300 µg/L, respectively.

Table 5: Ground Water Analytical Results 2003/2004

NMWQCC Standards		Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
		10	**750**	**750**	**620**
MW-1*	Sep-94	NS	NS	NS	NS
	Apr-95	NS	NS	NS	NS
	Sep-99	NS	NS	NS	NS
	Dec-99	NS	NS	NS	NS
	May-01	NS	NS	NS	NS
	May-02	NS	NS	NS	NS
MW-2	Sep-94	**640**	600	82	**690**
	Apr-95	**220**	280	53	430
	Sep-99	NSP	NSP	NSP	NSP
	Dec-99	NSP	NSP	NSP	NSP
	May-01	NSP	NSP	NSP	NSP
	May-02	NSP	NSP	NSP	NSP
	Jan-03	**1700**	ND	650	**3200**
	Jan-04	**1100**	ND	340	**1800**
MW-3	Sep-94	ND	ND	ND	ND
	Apr-95	ND	ND	ND	ND
	Sep-99	ND	ND	ND	ND
	Dec-99	ND	ND	ND	ND
	May-01	ND	ND	ND	ND
	May-02	ND	ND	ND	ND
	Jan-03	ND	ND	ND	ND
	Jan-04	ND	ND	ND	ND
MW-4	Sep-94	2.1	ND	ND	1.2
	Apr-95	ND	ND	ND	ND
	Sep-99	ND	ND	ND	ND
	Dec-99	ND	ND	ND	ND
	May-01	ND	ND	ND	ND

NMWQCC Standards		Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
		10	**750**	**750**	**620**
	May-02	ND	ND	ND	ND
	Jan-03	ND	ND	ND	ND
	Jan-04	ND	ND	ND	ND
MW-5	Sep-94	NS	NS	NS	NS
	Apr-95	ND	ND	ND	ND
	Sep-99	ND	ND	ND	ND
	Dec-99	ND	ND	ND	ND
	May-01	ND	ND	ND	ND
	May-02	ND	ND	ND	ND
	Jan-03	ND	ND	ND	ND
	Jan-04	ND	ND	ND	1.1
MW-6**	May-01	**12**	15	13	83
	May-02	ND	ND	0.53	1.4
	Oct -02	ND	ND	ND	3.2
	Jan-03	6.0	20	87	350
	Jul-03	ND	2.7	3.2	16
	Sept-03	0.8	3.7	4.0	24
	Jan-04	0.9	1.6	2.9	16
MW-7**	May-01	**2,400**	ND	380	**2,800**
	June-02	**2,000**	ND	140	**1,100**
	Oct-02	**1100**	ND	79	490
	Jan-03	**3200**	ND	400	**3100**
	Jan-04	**3300**	ND	460	**3300**

The results of general chemistry analyses for January 2004 are shown in Table 6. Results indicate high conductivity in all of the samples, ranging from 11400 microhms per centimeter (µmhos/cm) to 6700 µmhos/cm. Total dissolved salts (TDS) are also high, with levels between 920 milligram per liter (mg/L) in MW-7 and 4810 mg/L in MW-5. All of the samples have concentrations greater than the New Mexico Water Quality Control Commission (NMWQCC) domestic water supply standard for TDS of 1000 mg/L. These results indicate a poor quality for potable use. The samples from wells MW-3, MW-4, MW-5, and MW-6 exceed the NMWQCC water supply standard for sulfate at 2300 mg/L, 2500 mg/L, 1400 mg/L, and 1400 mg/L, respectively. The standard for sulfate is 600 mg/L. The sample taken from MW-5 contained 1300 mg/L of chloride. The elevated levels of these parameters are indicators of the typically poor quality of shallow ground water at the site. The complete laboratory analytical reports are included in Appendix A. Historical general chemistry of ground water sampled at the Bloomfield Crude Station is included in Appendix B.

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Table 6: Ground Water General Chemistry Results

Analyte	Units	Date	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	NMWQCC
Lab pH	s.u.	1/30/03	7	7	7	6.6	7	6.7	6-9
		1/20/04	7	7.3	7.3	6.8	7.2	6.9	
Conductivity	µmho s/cm	1/30/03	3230	4320	4460	6910	3070	1310	No Std.
		1/20/04	3100	4500	4500	6700	4100	1400	
TDS	mg/L	1/30/03	3220	3660	3850	5080	2180	810	1000
		1/20/04	2000	4000	3900	4600	3000	920	
Alkalinity as CaCO3	mg/L	1/30/03	1520	560	400	830	1140	696	No Std.
		1/20/04	1500	560	400	840	1000	720	
Bicarbonate as CaCO3	mg/L	1/30/03	1850	683	488	1010	1390	849	No Std.
		1/20/04	1500	560	400	840	1000	720	
Carbonate as CO3	mg/L	1/30/03	<1	<1	<1	<1	<1	<1	No Std.
		1/20/04	<1	1	3	1	1	3	
Hydroxide	mg/L	1/30/03	<1	<1	<1	<1	<1	<1	No Std.
		1/20/04	<1	<1	<1	<1	<1	<1	
Chloride	mg/L	1/30/03	51	56	40		79	35	250
		1/20/04	85	44	27	**1300**	96	13	
Sulfate	mg/L	1/30/03	369	**2330**	**2570**	**1330**	540	57	600
		1/20/04	130	**2300**	**2500**	**1400**	**1400**	**120**	
Calcium	mg/L	1/30/03	133	428	361	616	203	152	No Std.
		1/20/04	140	320	390	690	390	170	
Magnesium	mg/L	1/30/03	20	39.4	40.8	58.1	23.1	36.8	No Std.
		1/20/04	18	44	44	57	63	23	
Potassium	mg/L	1/30/03	1	1.6	2.8	4.8	2.1	1	No Std.
		1/20/04	3	3.6	6.7	11	29	7.0	
Sodium	mg/L	1/30/03	660	671	667	829	514	126	No Std.
		1/20/04	680	780	810	1000	870	170	
Iron	mg/L	1/30/03	5	10.6	4.11	9.41	14.2	112	No Std.
		1/20/04	21	3.3	6.5	8.2	140	55	
Manganese	mg/L	1/30/03	1	1.32	3.12	10.2	4	4.79	No Std.
		1/20/04	1	.66	4.8	11	7.9	3.3	
Nitrate/Nitrite	mg/L	1/30/03	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	10
		1/20/04	ns	ns	ns	ns	ns	ns	
Dissolved Oxygen (field)	mg/L	1/30/03	0.64	4.23	0.95	0.63	1.06	<0.05	No Std.
		1/20/04	2.09	2.09	0.9	0.27	1.11	0.49	

Notes:
s.u. = standard units
µmhos/cm - microhms per centimeter
mg/L = milligrams per liter
NMWQCC = New Mexico Water Quality Control Commission Standard
No Std. = No Standard

Product Recovery

Since June 2003, free phase crude oil was identified and removed from MW-2 during July, August, and September. The product thickness ranged from 0.05 feet in July 2002 to 0.16 feet in September 2002. Product was not found again until July 2003 at 0.02 feet thick. Following July 2003 it was not found again until January 2004 when it was measured at 0.04 feet thick. A comprehensive summary of product monitoring and recovery is presented in Table 7. The product and water is stored on-site in a 55 gallon drum.

Table 7: Product Recovery Data

Date	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed (gal) (includes purge water)
May 4, 1995	NA	NA	NA	9
Sept 30, 1999	15.00	17.48	2.47	2.75
Nov 16, 1999	14.65	17.00	2.35	2.0
Dec 14, 1999	14.66	16.76	2.10	5.0
May 11, 2001	14.69	16.77	1.96	2.5
May 21, 2001	15.10	15.65	0.55	0
May 23, 2001	15.13	15.69	0.56	0
July 3, 2001	15.48	16.32	0.84	0
July 9, 2001	15.54	16.43	0.89	1.1
May 13, 2002	14.70	15.51	0.81	1.4
May 22, 2002	14.64	15.29	0.65	1.2
May 30, 2002	14.70	15.14	0.44	1.1
June 5, 2002	14.76	15.00	0.24	1.1
June 13, 2002	14.75	14.91	0.15	0.6
June 19, 2002	14.70	14.78	0.08	0.6
June 26, 2002	14.68	14.73	0.05	0.3
July 5, 2002	14.63	14.69	0.05	0.2
July 12, 2002	14.56	14.61	0.05	0.2
July 18, 2002	14.53	14.59	0.06	0.2
July 25, 2002	14.51	14.56	0.05	0.2
July 31, 2002	14.43	14.47	0.04	0.1
August 16, 2002	14.25	14.32	0.06	0.2
September 6, 2002	14.18	14.30	0.12	0.1
September 19, 2002	14.22	14.38	0.16	0.2
October 21, 2002		13.87	0.00	0

Date	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed (gal) (includes purge water)
January 30, 2003		12.53	0.00	0
March 26, 2003		13.75	0.00	0
May 16, 2003		14.30	0.00	0
July 27, 2003	14.06	14.08	0.02	2.0
August 18, 2003		14.07	0.00	0
September 15, 2003		14.08	0.00	0
January 20, 2004	14.2	14.24	0.04	2.5
				0
Total Gallons of Product and Purge Water Removed Since 1995				34.55

Conclusions

Bioventing

Based on the decreased in concentrations of TPH and BTEX following approximately eight months of operations, bioventing is effectively reducing the concentrations of hydrocarbons in the subsurface. The concentrations of oxygen and carbon dioxide recorded through January 2004 indicate sustained biologic activity at the site.

Ground Water Sampling

The ground water sampling and analyses for 2002 indicate the contaminant plume in the ground water at Giant's former Crude Station has not changed substantially since this investigation began in 1994. Laboratory analyses of ground water samples from MW-3 and MW-4 remain below the detectable levels for BTEX. The concentrations of BTEX in MW-5 remains below detection levels except for xylenes which were detected at slightly above detection limits. Additional sampling is required to verify this result. Ground water in the vicinity of MW-2, MW-6, and MW-7 has been impacted by BTEX. Although all BTEX constituents were detected in MW-6, all concentrations were below standards. Ground water from MW-2 and MW-7 contain concentrations of benzene, ethylbenzene and xylenes that are above NMWQCC standards. Free phase hydrocarbons are still present in MW-2. Efforts to remove the product have resulted in reduction of product thickness from 2.47 feet to 0.04 feet since September, 1999. .

The NMWQCC standards for sulfate are exceeded at all monitoring wells except MW-2 and MW-7 where high concentrations of hydrocarbons are present. Total dissolved solids standards are exceeded at all wells except MW-2. The NMWQCC standard for chloride in water is exceeded in MW-5. The elevated levels of these parameters are indicators of the typically poor quality of the shallow ground water at the site.

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The potentiometric surface has decreased since last year, but general direction and flow gradient remain static. Ground water flow is to the southwest at 0.015 ft/ft.

Product Recovery

Product recovery at MW-2 has resulted in the reduction of free phase product in the well. During 2003 there were several months that product was not evident in the well indicating that product removal is nearly complete

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Recommendations

After compiling the most recent analytical results and comparing these with historical results, the following remedial action and monitoring plan is recommended:

- Continue bioventing at the site to reduce the hydrocarbon concentrations in soil to below NMWQCC standards.
- Collect soil samples during October 2004 to monitor progress of remediation.
- Also during October 2004, turn off the bioventing system for one week and measure the concentrations of hydrocarbons in the soil gas at all monitoring and injection points.
- Monitor MW-2 monthly for product and complete product recovery as necessary.
- Conduct annual ground water sampling for BTEX and general chemistry constituents at all monitoring wells during January 2005.
- Prepare and annual report for the work completed through January 2005.

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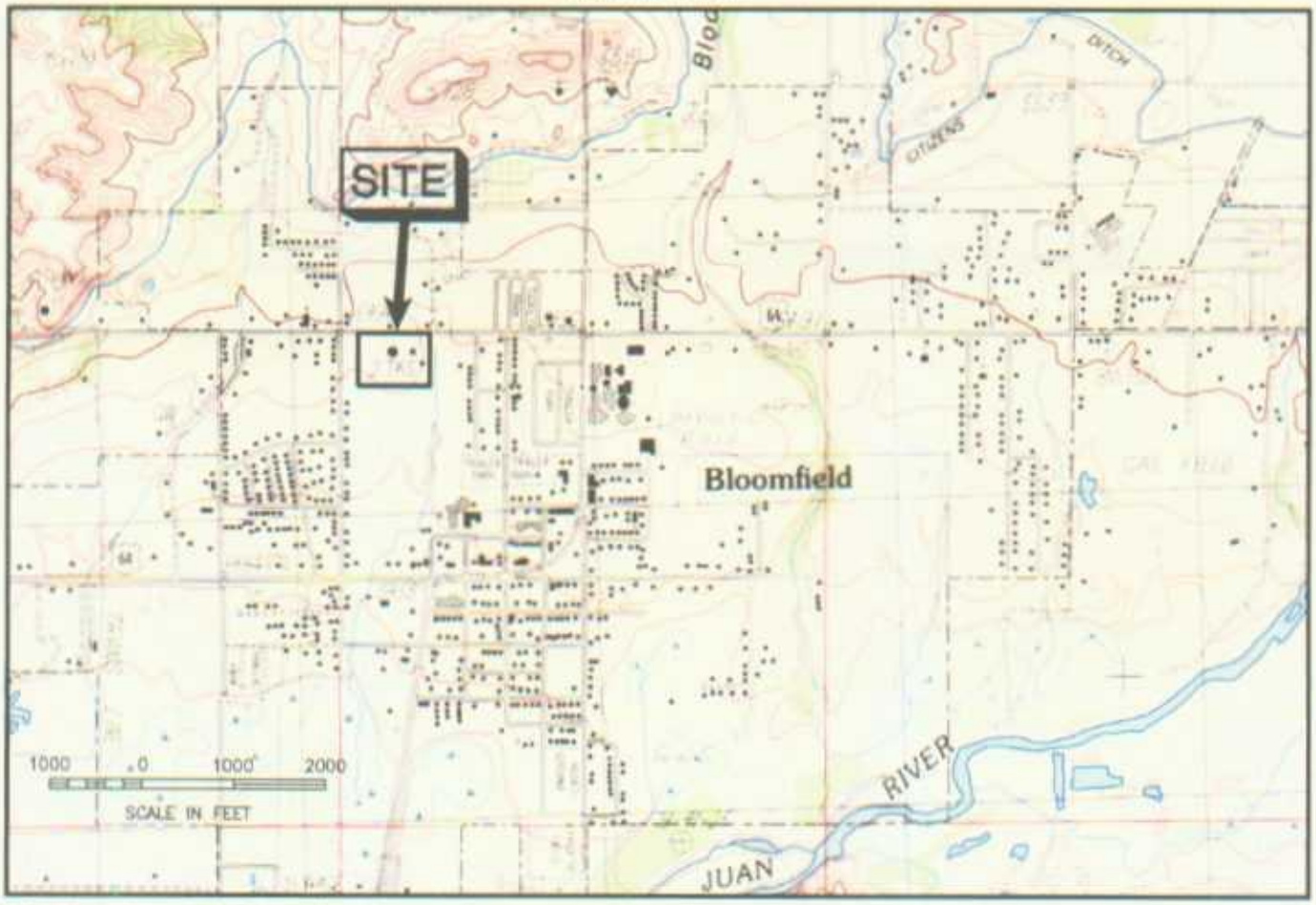
Figure 1: Site Location Map

NEW MEXICO

SAN JUAN COUNTY

AREA IN DETAIL



Modified from U.S. Geological Survey Quadrangle of Bloomfield, New Mexico, Provisional Edition 1985

SCALE IS VARIABLE

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(505) 334-2791

TITLE:
GIANT INDUSTRIES ARIZONA, INC.
BLOOMFIELD, NEW MEXICO
SITE LOCATION MAP

DWN: CJG	DES.:
CHKD:	APPD:
DATE: 03/11/04	REV.: 0

PROJECT NO.: 30002
GIANT INDUSTRIES
BLOOMFIELD, NM

FIGURE 1

D:\DRAW\MARTIN\61714

Figure 2: Site Map

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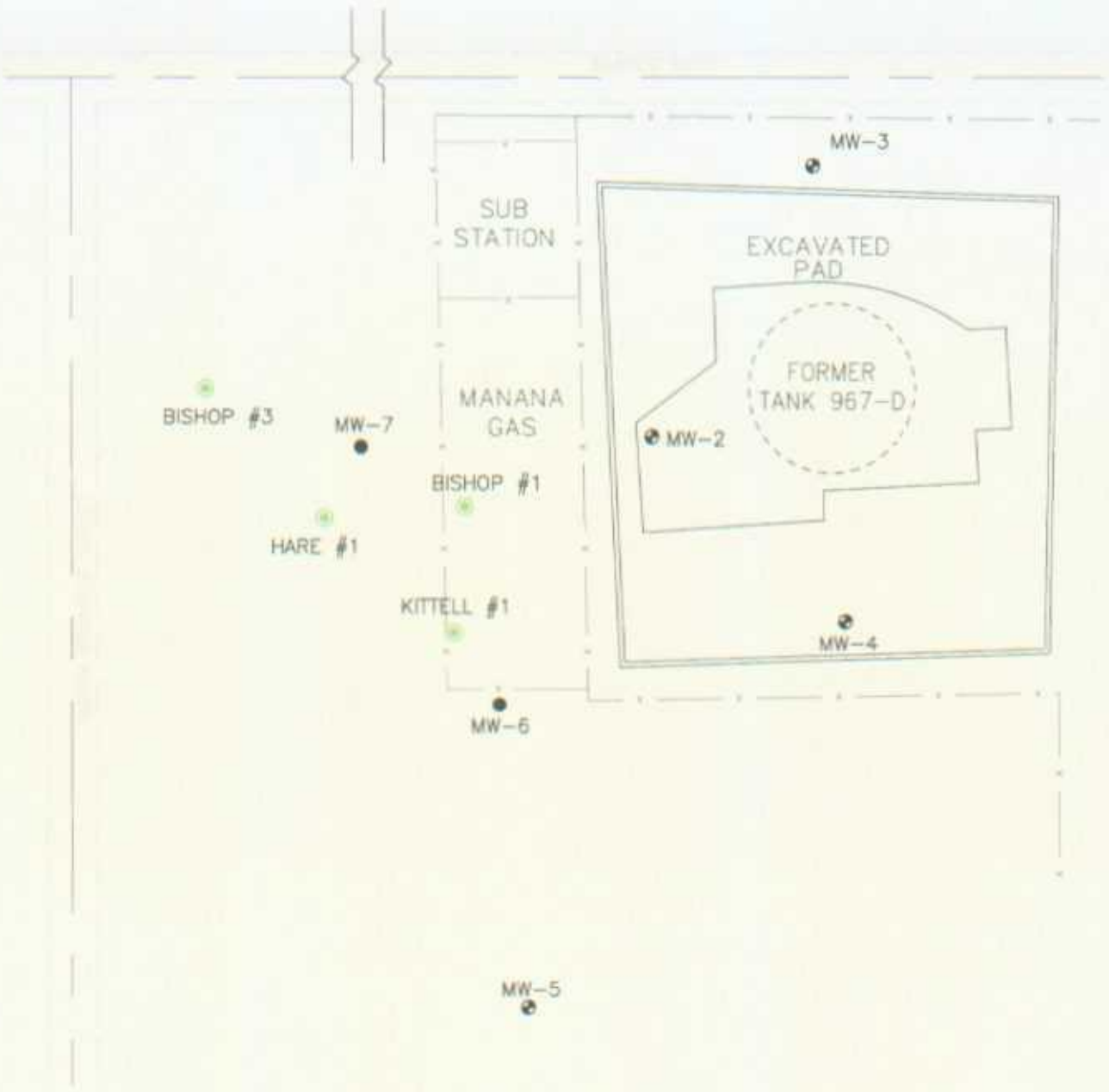

LEGEND

- FENCE LINE
- MW-1 APPROXIMATE LOCATION OF MONITOR WELL & NUMBER
- NEW GROUND WATER MONITOR WELLS INSTALLED
- APPROXIMATE LOCATION OF HISTORICAL OIL & GAS WELLS
- EARTHEN BERM

0 100
FEET

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TITLE:
GIANT INDUSTRIES ARIZONA, INC.
BLOOMFIELD, NEW MEXICO
SITE MAP

DWN: CJG	DES.:
CHKD:	APPD:
DATE: 03/11/04	REV.: 1

PROJECT NO.: 30002
GIANT INDUSTRIES
BLOOMFIELD, NM

FIGURE 2

D:\DRAW\MAPS\61718

Figure 3 Bioventing Layout Map

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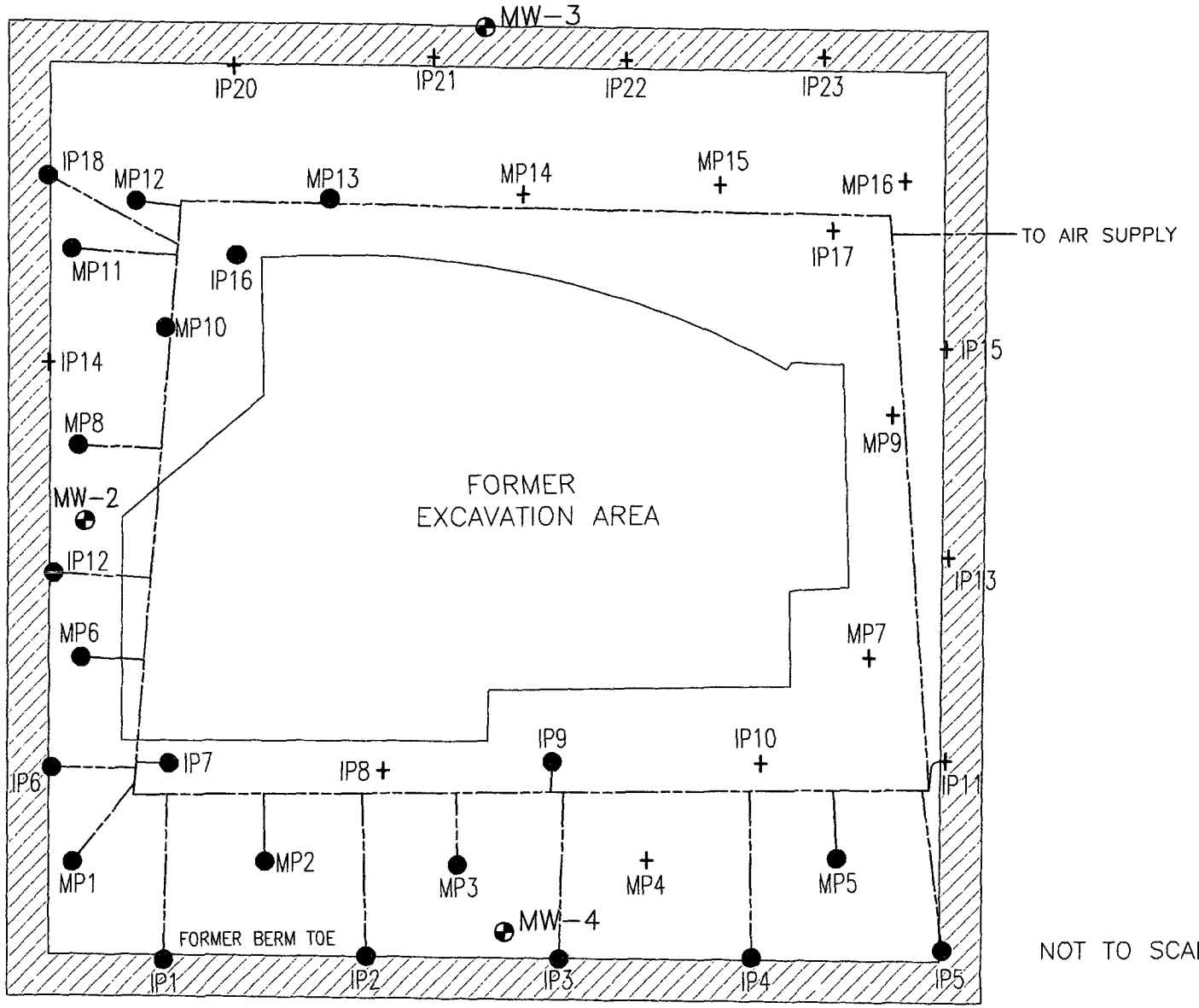

D:\DRAW\MARTIN\6171-FIG3

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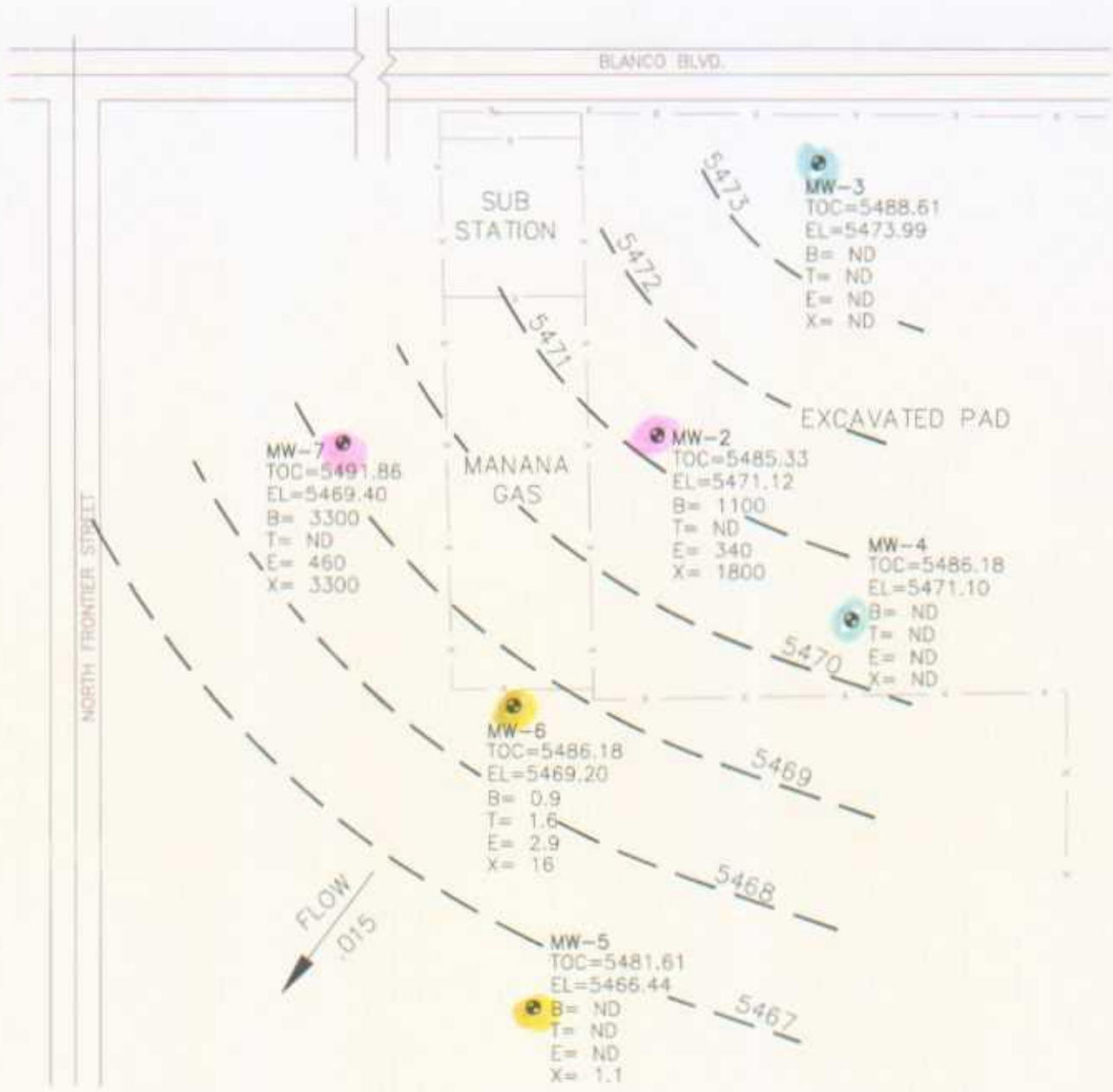
TITLE:
GIANT INDUSTRIES ARIZONA, INC.
BLOOMFIELD, NEW MEXICO
BIOVENT PILOT TEST

DWN:	DES.:
CJG	
CHKD:	APPD:
DATE:	REV.:
03/11/04	1

PROJECT NO.: 30002
GIANT INDUSTRIES
BLOOMFIELD, NM

FIGURE 3

Figure 4: Ground Water Elevation Contour Map January 2003



LEGEND

	FENCE LINE
MW-2 5467.99	APPROXIMATE LOCATION OF MONITOR WELL AND NUMBER
	APPROXIMATE GROUND WATER GRADIENT
	POTENTIOMETRIC SURFACE OF GROUND WATER
TOC	TOP OF CASING ELEVATION
EL	GROUND WATER ELEVATION
B	BENZENE IN ug/L
T	TOLUENE IN ug/L
E	ETHYLBENZENE IN ug/L
X	TOTAL XYLENES IN ug/L

0 100 FEET

N

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TITLE: GROUND WATER GRADIENT MAP

JANUARY 20, 2004

DWN: CJG | DES:
CHKD: | APPD:
DATE: 03/11/04 | REV.: 1

PROJECT NO. 30002
GIANT INDUSTRIES
BLOOMFIELD, NM

FIGURE 4

D:\DRAWINGS\MAPPING\8171-FIG4

Figure 5: Ground Water Elevation Contour Map January 2004

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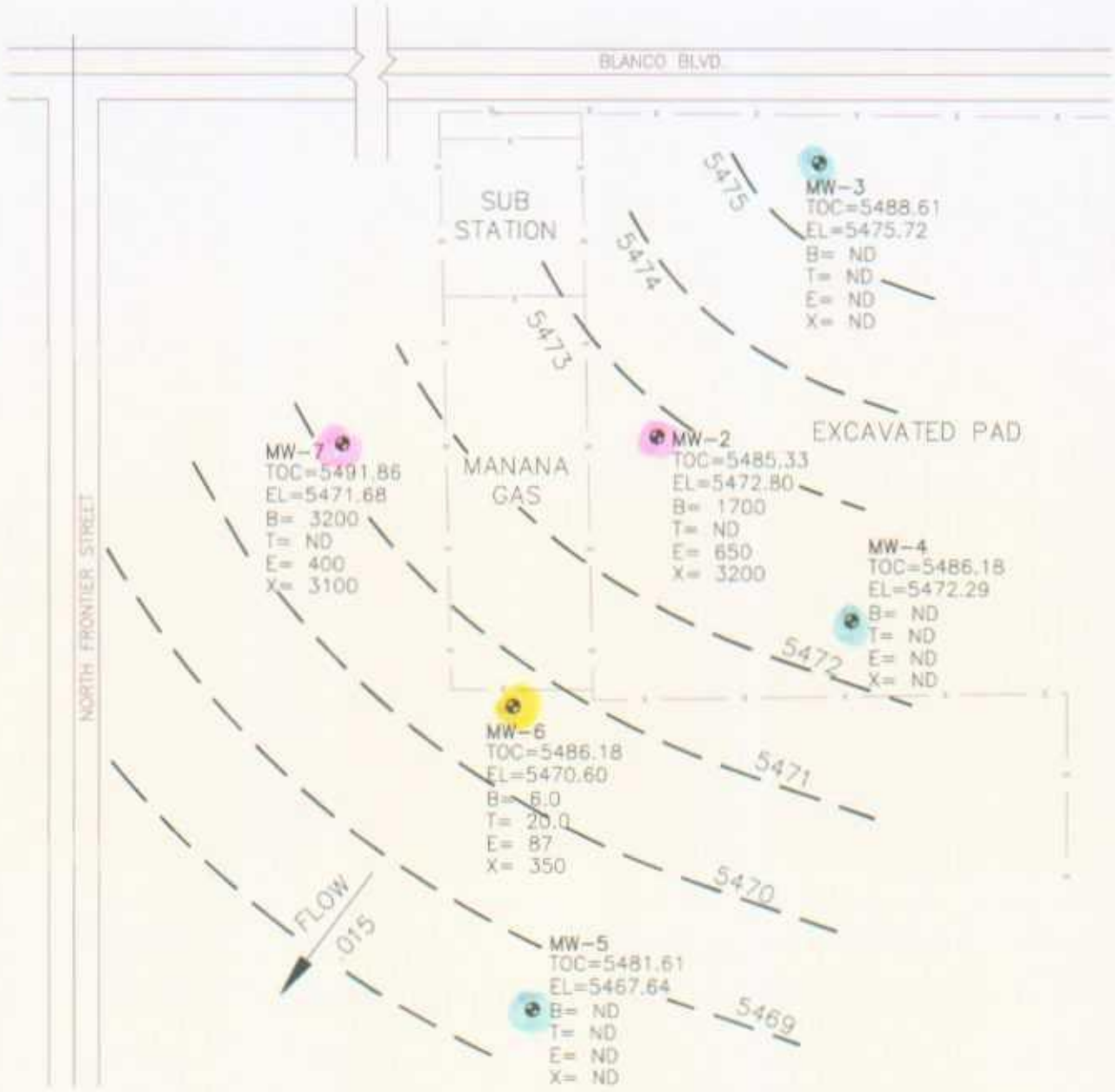

LEGEND

×——×	FENCE LINE
MW-2 5467.99	APPROXIMATE LOCATION OF MONITOR WELL AND NUMBER
	APPROXIMATE GROUND WATER GRADIENT
	POTENTIOMETRIC SURFACE OF GROUND WATER
TOC	TOP OF CASING ELEVATION
EL	GROUND WATER ELEVATION
B	BENZENE IN ug/L
T	TOLUENE IN ug/L
E	ETHYLBENZENE IN ug/L
X	TOTAL XYLENES IN ug/L
ND	NOT DETECTED

0 100 FEET

N

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(505) 334-2791

TITLE: GROUND WATER GRADIENT MAP

JANUARY 30, 2003

DWN: CJG | DES.: | CHKD: | APPD: | DATE: 03/11/04 | REV.: 1

PROJECT NO.: 30002
GIANT INDUSTRIES
BLOOMFIELD, NM

FIGURE 5

D:\DRAW\MAPPING\6171-F04

Appendix A

Analytical Laboratory Reports

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Appendix A

Analytical Laboratory Reports

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PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **301069**
February 07, 2003

GIANT INDUSTRIES
111 COUNTY RD. 4990
BLOOMFIELD, NM 87413

Project Name CRUDE STATION
Project Number 226107

Attention: MARTIN NEE/TIM KINNEY

On 01/31/03 Pinnacle Laboratories, Inc., (ADHS License No. AZ0592 pending), 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.

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: jt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	: GIANT INDUSTRIES	PINNACLE ID	: 301069
PROJECT #	: 226107	DATE RECEIVED	: 01/31/03
PROJECT NAME	: CRUDE STATION	REPORT DATE	: 02/07/03

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
301069 - 01	MW-5 0301301211	AQUEOUS	01/30/03
301069 - 02	MW-6 0301301256	AQUEOUS	01/30/03
301069 - 03	MW-2 0301301604	AQUEOUS	01/30/03
301069 - 04	MW-7 0301301340	AQUEOUS	01/30/03
301069 - 05	MW-3 0301301418	AQUEOUS	01/30/03
301069 - 06	MW-4 0301301515	AQUEOUS	01/30/03

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED
CLIENT : GIANT INDUSTRIES
PROJECT # : 226107
PROJECT NAME : CRUDE STATION

PINNACLE I.D.: 301069

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
[illegible]	MW-5 0301301211	AQUEOUS	01/30/03	NA	01/31/03	1
[illegible]	MW-6 0301301256	AQUEOUS	01/30/03	NA	02/04/03	5
03	MW-2 0301301604	AQUEOUS	01/30/03	NA	01/31/03	100

PARAMETER	DET. LIMIT	UNITS	MW-5 0301301211	MW-6 0301301256	MW-2 0301301604
BENZENE	0.5	**UG/L**	< 0.5	**6.0**	**1700**
TOLUENE	0.5	**UG/L**	< 0.5	**20**	< 50
ETHYLBENZENE	0.5	**UG/L**	< 0.5	**87**	**650**
TOTAL XYLENES	1.0	**UG/L**	< 1.0	**350**	**3200**
SURROGATE:					
BROMOFLUOROBENZENE (%)			102	104	110
SURROGATE LIMITS	(80 - 120)				

CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED
CLIENT : GIANT INDUSTRIES PINNACLE I.D.: 301069
PROJECT # : 226107
PROJECT NAME : CRUDE STATION

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
	MW-7 0301301340	AQUEOUS	01/30/03	NA	02/04/03	25
	MW-3 0301301418	AQUEOUS	01/30/03	NA	01/31/03	1
06	MW-4 0301301515	AQUEOUS	01/30/03	NA	01/31/03	1

PARAMETER	DET. LIMIT	UNITS	MW-7 0301301340	MW-3 0301301418	MW-4 0301301515
BENZENE	0.5	**UG/L**	**3200**	< 0.5	< 0.5
TOLUENE	0.5	UG/L	< 13	< 0.5	< 0.5
ETHYLBENZENE	0.5	**UG/L**	**400**	< 0.5	< 0.5
TOTAL XYLENES	1.0	**UG/L**	**3100**	< 1.0	< 1.0
SURROGATE:					
BROMOFLUOROBENZENE (%)			114	101	99
SURROGATE LIMITS	(80 - 120)				

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 301069
BLANK I. D.	: 013103	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/31/03
PROJECT #	: 226107	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: CRUDE STATION		

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
SURROGATE:		
BROMOFLUOROBENZENE (%)		101
SURROGATE LIMITS:	(80 - 120)	
CHEMIST NOTES:		
NA		

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 301069
LANK I. D.	: 020403	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 02/04/03
ROJECT #	: 226107	SAMPLE MATRIX	: AQUEOUS
ROJECT NAME	: CRUDE STATION		

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
THYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
URROGATE:		
ROMOFLUOROBENZENE (%)		99
SURROGATE LIMITS:	(80 - 120)	

CHEMIST NOTES:
NA

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 301069
ATCH I.D. #	: 013103	DATE EXTRACTED	: N/A
LIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/31/03
ROJECT #	: 226107	SAMPLE MATRIX	: AQUEOUS
ROJECT NAME	: CRUDE STATION	UNITS	: UG/L

ARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
ENZENE	<0.5	20.0	20.1	101	19.9	100	1	(80 - 120)	20
OLUENE	<0.5	20.0	21.5	108	21.1	106	2	(80 - 120)	20
THYLBENZENE	<0.5	20.0	22.5	113	21.8	109	3	(80 - 120)	20
OTAL XYLENES	<1.0	60.0	69.2	115	67.0	112	3	(80 - 120)	20

HEMIST NOTES:
A

$$\%\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 301069
ATCH I.D. #	: 020403	DATE EXTRACTED	: N/A
LIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 02/04/03
ROJECT #	: 226107	SAMPLE MATRIX	: AQUEOUS
ROJECT NAME	: CRUDE STATION	UNITS	: UG/L

ARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
ENZENE	<0.5	20.0	18.8	94	19.1	96	2	(80 - 120)	20
OLUENE	<0.5	20.0	19.9	100	20.0	100	1	(80 - 120)	20
THYLBENZENE	<0.5	20.0	20.3	102	20.4	102	0	(80 - 120)	20
OTAL XYLENES	<1.0	60.0	62.6	104	63.2	105	1	(80 - 120)	20

HEMIST NOTES:
A

$$\%\text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
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Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

ST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 301069
MSMSD #	: 301069-01	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/31/03
ROJECT #	: 226107	SAMPLE MATRIX	: AQUEOUS
ROJECT NAME	: CRUDE STATION	UNITS	: UG/L

RAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
NZENE	<0.5	20.0	19.4	97	19.4	97	0	(80 - 120)	20
OLUENE	<0.5	20.0	20.6	103	20.7	104	0	(80 - 120)	20
THYLBENZENE	<0.5	20.0	21.3	107	21.3	107	0	(80 - 120)	20
TAL XYLENES	<1.0	60.0	65.3	109	65.2	109	0	(80 - 120)	20

HEMIST NOTES:
A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington , NM 87401

Date: 2/19/03

Client: Giant Refining Co.

Lab ID: 0303W00344-0349

Project: Bal/Metals

Dear Client:

The samples were received for analysis at Inter-Mountain Laboratories (IML), Farmington, New Mexico. Enclosed is the result of the analyses.

Comment:

The enclosed report has been independently reviewed for compliance with IML-Farmington's Quality Assurance Plan and Data Quality Objectives. IML has examined all of the data in the report and has made every effort possible to make sure it is complete, accurate, and compliant. Quality Assurance data, if not included, is on file and available upon request.

Unless otherwise noted, all results were obtained by approved methods. Practical Quantification Limits (PQLs) are based on statistically derived determinations, and upon any dilutions necessary to obtain proper method response without matrix interference.

William Lipps
Laboratory Director/IML-Farmington, NM

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington, NM 87401

Client: Giant Refining Co.
Project: BAL/METALS
Sample ID: BLOOMFIELD MW-5
Lab ID: 0303W00344
Matrix: Water
Condition: Cool/Intact

Date Received: 01/31/03
Date Reported: 02/19/03
Date Sampled: 01/30/03
Time Sampled: 1211

Parameter	Analytical Result	Units		Units	PQL	Method	Analysis Date	Time	Init.
PH	6.6	s.u.			0.1	EPA 150.1	01/31/03	1205	AB
Electrical Conductivity	6,910	µmhos/cm			10	SM 2510B	01/31/03	1205	AB
Solids - Total Dissolved	5,080	mg/L			10	2540 C	02/05/03	1130	AB
Dissolved oxygen	5	mg/L			0.05	SM 4500-O	02/06/03	0900	AB
Alkalinity (CaCO3)	830	mg/L			1	SM 2320B	02/06/03	1530	AB
Hardness (CaCO3)	1,780	mg/L			1	EPA 200.7			
Major Cations									
Calcium	616	mg/L	30.7	meq/L	0.2	EPA 200.7	02/14/03	1221	WL
Magnesium	58.1	mg/L	4.78	meq/L	0.2	EPA 200.7	02/14/03	1221	WL
Potassium	4.8	mg/L	0.12	meq/L	0.2	EPA 200.7	02/14/03	1221	WL
Sodium	829	mg/L	36.05	meq/L	0.2	EPA 200.7	02/14/03	1221	WL
Major Anions									
Bicarbonate (HCO3)	1,010	mg/L	16.60	meq/L	1	SM 2320B	02/06/03	1530	AB
Carbonate (CO3)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1530	AB
Chloride	1,090	mg/L	30.74	meq/L	1	EPA 300.0	02/06/03	1055	AB
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1530	AB
Nitrogen - Nitrate/Nitrite	<0.05	mg/L	<0.01	meq/L	0.05	EPA 353.2	02/12/03	1200	RB
Sulfate	1,330	mg/L	27.69	meq/L	5	EPA 300.0	02/06/03	1055	AB
Anion/Cation Balance QC Information									
Anion Sum			75.02	meq/L	0.01	SM 1030			
Cation Sum			71.69	meq/L	0.01	SM 1030			
Cation/Anion Balance			2.27	%	0.01	SM 1030			
Total Metals									
Iron	9.41	mg/L			0.02	EPA 200.7	02/04/03	1223	WL
Manganese	10.2	mg/L			0.01	EPA 200.7	02/04/03	1223	WL

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995.
EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

Reviewed By: _____

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington, NM 87401

Client: Giant Refining Co.
Project: BAL/METALS
Sample ID: BLOOMFIELD MW-6
Lab ID: 0303W00345
Matrix: Water
Condition: Cool/Intact

Date Received: 01/31/03
Date Reported: 02/19/03
Date Sampled: 01/30/03
Time Sampled: 1256

Parameter	Analytical Result	Units		Units	PQL	Method	Analysis Date	Time	Init.
PH	7.0	s.u.			0.1	EPA 150.1	01/31/03	1205	AB
Electrical Conductivity	3,070	µmhos/cm			10	SM 2510B	01/31/03	1205	AB
Solids - Total Dissolved	2,180	mg/L			10	2540 C	02/05/03	1130	AB
Dissolved oxygen	4	mg/L			0.05	SM 4500-O	02/06/03	0900	AB
Alkalinity (CaCO3)	1,140	mg/L			1	SM 2320B	02/06/03	1530	AB
Hardness (CaCO3)	602	mg/L			1	EPA 200.7			
Major Cations									
Calcium	203	mg/L	10.1	meq/L	0.2	EPA 200.7	02/14/03	1223	WL
Magnesium	23.1	mg/L	1.90	meq/L	0.2	EPA 200.7	02/14/03	1223	WL
Potassium	2.1	mg/L	0.05	meq/L	0.2	EPA 200.7	02/14/03	1223	WL
Sodium	514	mg/L	22.34	meq/L	0.2	EPA 200.7	02/14/03	1223	WL
Major Anions									
Bicarbonate (HCO3)	1,390	mg/L	22.80	meq/L	1	SM 2320B	02/06/03	1530	AB
Carbonate (CO3)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1530	AB
Chloride	79	mg/L	2.22	meq/L	1	EPA 300.0	02/06/03	1111	AB
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1530	AB
Nitrogen - Nitrate/Nitrite	<0.05	mg/L	<0.01	meq/L	0.05	EPA 353.2	02/12/03	1200	RB
Sulfate	540	mg/L	11.24	meq/L	5	EPA 300.0	02/06/03	1111	AB
Anion/Cation Balance QC Information									
Anion Sum			36.26	meq/L	0.01	SM 1030			
Cation Sum			34.42	meq/L	0.01	SM 1030			
Cation/Anion Balance			2.60	%	0.01	SM 1030			
Total Metals									
Iron	14.2	mg/L			0.02	EPA 200.7	02/04/03	1226	WL
Manganese	4.00	mg/L			0.01	EPA 200.7	02/04/03	1226	WL

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995.
EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

Reviewed By: _____

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington, NM 87401

Client: Giant Refining Co.
Project: BAL/METALS
Sample ID: BLOOMFIELD MW-2
Lab ID: 0303W00346
Matrix: Water
Condition: Cool/Intact

Date Received: 01/31/03
Date Reported: 02/19/03
Date Sampled: 01/30/03
Time Sampled: 1604

Parameter	Analytical Result	Units		Units	PQL	Method	Analysis Date	Time	Init.
PH	7.2	s.u.			0.1	EPA 150.1	01/31/03	1205	AB
Electrical Conductivity	3,230	µmhos/cm			10	SM 2510B	01/31/03	1205	AB
Solids - Total Dissolved	2,320	mg/L			10	2540 C	02/05/03	1130	AB
Dissolved oxygen	<0.05	mg/L			0.05	SM 4500-O	02/06/03	0900	AB
Alkalinity (CaCO3)	1,520	mg/L			1	SM 2320B	02/06/03	1530	AB
Hardness (CaCO3)	416	mg/L			1	EPA 200.7			
Major Cations									
Calcium	133	mg/L	6.66	meq/L	0.2	EPA 200.7	02/14/03	1225	WL
Magnesium	20.1	mg/L	1.66	meq/L	0.2	EPA 200.7	02/14/03	1225	WL
Potassium	0.7	mg/L	0.02	meq/L	0.2	EPA 200.7	02/14/03	1225	WL
Sodium	660	mg/L	28.71	meq/L	0.2	EPA 200.7	02/14/03	1225	WL
Major Anions									
Bicarbonate (HCO3)	1,850	mg/L	30.39	meq/L	1	SM 2320B	02/06/03	1530	AB
Carbonate (CO3)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1530	AB
Chloride	51	mg/L	1.44	meq/L	1	EPA 300.0	02/06/03	1126	AB
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1530	AB
Nitrogen - Nitrate/Nitrite	0.07	mg/L	0.01	meq/L	0.05	EPA 353.2	02/12/03	1200	RB
Sulfate	369	mg/L	7.69	meq/L	5	EPA 300.0	02/06/03	1126	AB
Anion/Cation Balance QC Information									
Anion Sum			39.52	meq/L	0.01	SM 1030			
Cation Sum			37.05	meq/L	0.01	SM 1030			
Cation/Anion Balance			3.23	%	0.01	SM 1030			
Total Metals									
Iron	5.36	mg/L			0.02	EPA 200.7	02/04/03	1230	WL
Manganese	1.19	mg/L			0.01	EPA 200.7	02/04/03	1230	WL

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995.
EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

Reviewed By: _____

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington, NM 87401

Client: Giant Refining Co.
Project: BAL/METALS
Sample ID: BLOOMFIELD MW-7
Lab ID: 0303W00347
Matrix: Water
Condition: Cool/Intact

Date Received: 01/31/03
Date Reported: 02/19/03
Date Sampled: 01/30/03
Time Sampled: 1340

Parameter	Analytical Result	Units		Units	PQL	Method	Analysis Date	Time	Init.
PH	6.7	s.u.			0.1	EPA 150.1	01/31/03	1205	AB
Electrical Conductivity	1,310	µmhos/cm			10	SM 2510B	01/31/03	1205	AB
Solids - Total Dissolved	810	mg/L			10	2540 C	02/05/03	1130	AB
Dissolved oxygen	<0.05	mg/L			0.05	SM 4500-O	02/06/03	0900	AB
Alkalinity (CaCO3)	696	mg/L			1	SM 2320B	02/06/03	1640	AB
Hardness (CaCO3)	531	mg/L			1	EPA 200.7			
Major Cations									
Calcium	152	mg/L	7.58	meq/L	0.2	EPA 200.7	02/14/03	1228	WL
Magnesium	36.8	mg/L	3.03	meq/L	0.2	EPA 200.7	02/14/03	1228	WL
Potassium	1.0	mg/L	0.02	meq/L	0.2	EPA 200.7	02/14/03	1228	WL
Sodium	126	mg/L	5.49	meq/L	0.2	EPA 200.7	02/14/03	1228	WL
Major Anions									
Bicarbonate (HCO3)	849	mg/L	13.92	meq/L	1	SM 2320B	02/06/03	1640	AB
Carbonate (CO3)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1640	AB
Chloride	35	mg/L	0.99	meq/L	1	EPA 300.0	02/06/03	1142	AB
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1640	AB
Nitrogen - Nitrate/Nitrite	<0.05	mg/L	<0.01	meq/L	0.05	EPA 353.2	02/12/03	1200	RB
Sulfate	57	mg/L	1.19	meq/L	5	EPA 300.0	02/06/03	1142	AB
Anion/Cation Balance QC Information									
Anion Sum			*16.10*	*meq/L*	0.01	SM 1030			
Cation Sum			16.12	meq/L	0.01	SM 1030			
Cation/Anion Balance			*0.06*	%	0.01	SM 1030			
Total Metals									
Iron	112	mg/L			0.02	EPA 200.7	02/04/03	1233	WL
Manganese	4.79	mg/L			0.01	EPA 200.7	02/04/03	1233	WL

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995.
EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

Reviewed By: _____

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington, NM 87401

Client: Giant Refining Co.
Project: BAL/METALS
Sample ID: BLOOMFIELD MW-3
Lab ID: 0303W00348
Matrix: Water
Condition: Cool/Intact

Date Received: 01/31/03
Date Reported: 02/19/03
Date Sampled: 01/30/03
Time Sampled: 1418

Parameter	Analytical Result	Units		Units	PQL	Method	Analysis Date	Time	Init.
PH	7.0	s.u.			0.1	EPA 150.1	01/31/03	1205	AB
Electrical Conductivity	4,320	µmhos/cm			10	SM 2510B	01/31/03	1205	AB
Solids - Total Dissolved	3,660	mg/L			10	2540 C	02/05/03	1130	AB
Dissolved oxygen	7	mg/L			0.05	SM 4500-O	02/06/03	0900	AB
Alkalinity (CaCO3)	560	mg/L			1	SM 2320B	02/06/03	1640	AB
Hardness (CaCO3)	1,230	mg/L			1	EPA 200.7			
Major Cations									
Calcium	428	mg/L	21.4	meq/L	0.2	EPA 200.7	02/14/03	1230	WL
Magnesium	39.4	mg/L	3.24	meq/L	0.2	EPA 200.7	02/14/03	1230	WL
Potassium	1.6	mg/L	0.04	meq/L	0.2	EPA 200.7	02/14/03	1230	WL
Sodium	671	mg/L	29.19	meq/L	0.2	EPA 200.7	02/14/03	1230	WL
Major Anions									
Bicarbonate (HCO3)	683	mg/L	11.20	meq/L	1	SM 2320B	02/06/03	1640	AB
Carbonate (CO3)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1640	AB
Chloride	56	mg/L	1.57	meq/L	1	EPA 300.0	02/06/03	1157	AB
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1640	AB
Nitrogen - Nitrate/Nitrite	2.76	mg/L	0.20	meq/L	0.05	EPA 353.2	02/12/03	1200	RB
Sulfate	2,330	mg/L	48.46	meq/L	5	EPA 300.0	02/06/03	1157	AB
Anion/Cation Balance QC Information									
Anion Sum			61.20	meq/L	0.01	SM 1030			
Cation Sum			53.83	meq/L	0.01	SM 1030			
Cation/Anion Balance			6.41	%	0.01	SM 1030			
Total Metals									
Iron	10.6	mg/L			0.02	EPA 200.7	02/04/03	1237	WL
Manganese	1.32	mg/L			0.01	EPA 200.7	02/04/03	1237	WL

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995.
EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

Reviewed By: _____

Inter·Mountain Laboratories, Inc.

2506 West Main Street
Farmington, NM 87401

Client: Giant Refining Co.
Project: BAL/METALS
Sample ID: BLOOMFIELD MW-4
Lab ID: 0303W00349
Matrix: Water
Condition: Cool/Intact

Date Received: 01/31/03
Date Reported: 02/19/03
Date Sampled: 01/30/03
Time Sampled: 1515

Parameter	Analytical Result	Units		Units	PQL	Method	Analysis Date	Time	Init.
PH	7.0	s.u.			0.1	EPA 150.1	01/31/03	1205	AB
Electrical Conductivity	4,460	µmhos/cm			10	SM 2510B	01/31/03	1205	AB
Solids - Total Dissolved	3,850	mg/L			10	2540 C	02/05/03	1130	AB
Dissolved oxygen	7	mg/L			0.05	SM 4500-O	02/06/03	0900	AB
Alkalinity (CaCO3)	400	mg/L			1	SM 2320B	02/06/03	1640	AB
Hardness (CaCO3)	1,070	mg/L			1	EPA 200.7			
Major Cations									
Calcium	361	mg/L	18.0	meq/L	0.2	EPA 200.7	02/14/03	1233	WL
Magnesium	40.8	mg/L	3.36	meq/L	0.2	EPA 200.7	02/14/03	1233	WL
Potassium	2.8	mg/L	0.07	meq/L	0.2	EPA 200.7	02/14/03	1233	WL
Sodium	667	mg/L	29.00	meq/L	0.2	EPA 200.7	02/14/03	1233	WL
Major Anions									
Bicarbonate (HCO3)	488	mg/L	8.00	meq/L	1	SM 2320B	02/06/03	1640	AB
Carbonate (CO3)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1640	AB
Chloride	40	mg/L	1.14	meq/L	1	EPA 300.0	02/06/03	1213	AB
Hydroxide (OH)	<1	mg/L	<0.01	meq/L	1	SM 2320B	02/06/03	1640	AB
Nitrogen - Nitrate/Nitrite	<0.05	mg/L	<0.01	meq/L	0.05	EPA 353.2	02/12/03	1200	RB
Sulfate	2,570	mg/L	53.48	meq/L	5	EPA 300.0	02/06/03	1213	AB
Anion/Cation Balance QC Information									
Anion Sum			62.59	meq/L	0.01	SM 1030			
Cation Sum			50.43	meq/L	0.01	SM 1030			
Cation/Anion Balance			10.76	%	0.01	SM 1030			
Total Metals									
Iron	4.11	mg/L			0.02	EPA 200.7	02/04/03	1240	WL
Manganese	3.12	mg/L			0.01	EPA 200.7	02/04/03	1240	WL

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995.
EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

Reviewed By: _____

Inter-Mountain Laboratories, Inc.

2506 West Main Street
Farmington, NM 87401

Quality Control Report
Duplicate Analysis

Client: Giant Refining Co.
Project: BAL/METALS
Sample ID: BLOOMFIELD MW-4
Lab ID: 0303W00349
Matrix: Water
Condition: Cool/Intact

Report Date: 02/19/03
Receipt Date: 01/31/03
Sample Date: 01/30/03
Time Sampled: 1515

Parameter	Original Conc.	Duplicate Conc.	Relative % Diff.	PQL	Units
PH	7.0	7.0	0	0.1	s.u.
Electrical Conductivity	4,460	4,460	0	10	µmhos/cm
Solids - Total Dissolved	3,850	3,870	1	10	mg/L
Dissolved oxygen	7	7	0	0.05	mg/L
Alkalinity (CaCO3)	400	410	2	1	mg/L
Hardness (CaCO3)	1,070	1,070	0	1	mg/L
Major Cations					
Calcium	361	362	0	0.2	mg/L
Magnesium	40.8	40.9	0	0.2	mg/L
Potassium	2.8	3.2	13	0.2	mg/L
Sodium	667	668	0	0.2	mg/L
Major Anions					
Bicarbonate (HCO3)	488	500	2	1	mg/L
Carbonate (CO3)	<1	<1	NC*	1	mg/L
Chloride	40	40	0	1	mg/L
Hydroxide (OH)	<1	<1	NC*	1	mg/L
Nitrogen - Nitrate/Nitrite	<0.05	<0.05	NC*	0.05	mg/L
Sulfate	2,570	2,590	1	5	mg/L
Anion/Cation Balance QC Information					
Anion Sum	63	63	0	0.01	meq/L
Cation Sum	50.43	50.58	0	0.01	meq/L
Cation/Anion Balance	10.76	11.22		0.01	%
Total Metals					
Iron	4.11	4.21	2	0.02	mg/L
Manganese	3.12	3.21	3	0.01	mg/L

*NC - Non-Calculable RPD due to value(s) less than DL

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995.
EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

Reviewed By: _____

imi
Inter- Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Giant Crude Station	Bloomfield

Sampler: (Signature)	Chain of Custody Tape No.
(AESE)	

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TDS	Major Ions	DO/NO2/NO3	Iron Manganese	Remarks
mw-5	1-30-03	1211	344	water	2	x	x	x	x	
mw-6	1-30-03	1256	345	water	2	x	x	x	x	
mw-2	1-30-03	1604	346	water	2	x	x	x	x	
mw-7	1-30-03	1340	347	water	2	x	x	x	x	
mw-3	1-30-03	1418	348	water	2	x	x	x	x	
mw-4	1-30-03	1515	349 D	water	2	x	x	x	x	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	1/31/03	1025			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time
				1-31-03	1025

Inter-Mountain Laboratories, Inc.

☐ 555 Absaraka, Sheridan, Wyoming 82801, Telephone (307) 674-7506
☐ 1633 Terra Avenue, Sheridan, Wyoming 82801, Telephone (307) 672-8945
☐ 1701 Phillips Circle, Gillette, Wyoming 82718, Telephone (307) 682-8945
☒ 2506 West Main Street, Farmington, NM 87401, Telephone (505) 326-4737
☐ 11183 State Hwy. 30, College Station, TX 77845, Telephone (979) 776-8945

79229

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **401058**
February 13, 2004

GIANT INDUSTRIES
111 COUNTY RD. 4990
BLOOMFIELD, NM 87413

LODESTAR
26 CR 3500
AZTEC NM 87415

Project Name GIANT BLOOMFIELD CRUDE STATION
Project Number (NONE)

Attention: TIM KINNEY/MARTIN NEE

On 01/26/04 Pinnacle Laboratories Inc., (ADHS License No. AZ0643), 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.

EPA method 8021and pH analyses were performed by Pinnacle Laboratories, Inc. Albuquerque, NM.

All remaining analyses were performed by Severn Trent Laboratories, Inc. Pensacola, FL.

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

H. Mitchell Rubenstein, Ph.D.
General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	: GIANT INDUSTRIES	PINNACLE ID	: 401058
PROJECT #	: (NONE)	DATE RECEIVED	: 01/26/04
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	REPORT DATE	: 02/13/04

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
401058 - 01	MW-7	AQUEOUS	01/20/04
401058 - 02	MW-6	AQUEOUS	01/20/04
401058 - 03	MW-5	AQUEOUS	01/20/04
401058 - 04	MW-3	AQUEOUS	01/20/04
401058 - 05	MW-4	AQUEOUS	01/20/04
401058 - 06	MW-2	AQUEOUS	01/20/04
401058 - 07	TRIP BLANK	AQUEOUS	01/15/04

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
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GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT INDUSTRIES	PINNACLE I.D.	: 401058
PROJECT #	: (NONE)	DATE RECEIVED	: 01/26/04
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	ANALYST	: BP

SAMPLE ID #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE ANALYZED
01	MW-7	AQUEOUS	01/20/04	01/26/04
[illegible]	MW-6	AQUEOUS	01/20/04	01/26/04
[illegible]	MW-5	AQUEOUS	01/20/04	01/26/04

PARAMETER	UNITS	MW-7	MW-6	MW-5
pH (150.1)	UNITS	6.9	7.2	6.8

CHEMIST NOTES:
N/A

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GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT INDUSTRIES	PINNACLE I.D.	: 401058
PROJECT #	: (NONE)	DATE RECEIVED	: 01/26/04
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	ANALYST	: BP

SAMPLE ID #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE ANALYZED
0	MW-3	AQUEOUS	01/20/04	01/26/04
0	MW-4	AQUEOUS	01/20/04	01/26/04
06	MW-2	AQUEOUS	01/20/04	01/26/04

PARAMETER	UNITS	MW-3	MW-4	MW-2
(150.1)	UNITS	7.3	7.3	7.3

CHEMIST NOTES:
A

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GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT	: GIANT INDUSTRIES	PINNACLE I.D.	: 401058
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	DATE ANALYZED	: 01/26/04

PARAMETER	UNITS	PINNACLE I.D.	SAMPLE RESULT	DUP. RESULT	% RPD
PH	UNITS	401058-06	7.31	7.39	1

CHEMIST NOTES:

N/A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED
CLIENT : GIANT INDUSTRIES — PINNACLE I.D. : 401058
PROJECT # : (NONE) — ANALYST : BP
PROJECT NAME : GIANT BLOOMFIELD CRUDE STATION

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MW-7	AQUEOUS	01/20/04	NA	01/28/04	25
02	MW-6	AQUEOUS	01/20/04	NA	01/29/04	1
03	MW-5	AQUEOUS	01/20/04	NA	01/28/04	1

PARAMETER	DET. LIMIT	UNITS	MW-7	MW-6	MW-5
BENZENE	**0.5**	**UG/L**	**3300**	**0.9**	< 0.5
TOLUENE	**0.5**	**UG/L**	< 13	**1.6**	< 0.5
ETHYLBENZENE	**0.5**	**UG/L**	**460**	**2.9**	< 0.5
TOTAL XYLENES	**1.0**	**UG/L**	**3300**	**16**	**1.1**
SURROGATE:					
BROMOFLUOROBENZENE (%)			97	97	98
SURROGATE LIMITS	(80 - 120)				

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED
CLIENT : GIANT INDUSTRIES
PROJECT # : (NONE)
PROJECT NAME : GIANT BLOOMFIELD CRUDE STATION

PINNACLE I.D. : 401058
ANALYST : BP

SAMPLE ID #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	MW-3	AQUEOUS	01/20/04	NA	01/28/04	1
05	MW-4	AQUEOUS	01/20/04	NA	01/28/04	1
0	MW-2	AQUEOUS	01/20/04	NA	01/29/04	100

PARAMETER	DET. LIMIT	UNITS	MW-3	MW-4	MW-2
BENZENE	**0.5**	**UG/L**	< 0.5	< 0.5	**1100**
TOLUENE	0.5	UG/L	< 0.5	< 0.5	< 50
ETHYLBENZENE	**0.5**	**UG/L**	< 0.5	< 0.5	**340**
TOTAL XYLENES	**1.0**	**UG/L**	< 1.0	< 1.0	**1800**
SURROGATE:					
BROMOFLUOROBENZENE (%)			96	97	99
SURROGATE LIMITS	(80 - 120)				

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED
CLIENT : GIANT INDUSTRIES
PROJECT # : (NONE)
PROJECT NAME : GIANT BLOOMFIELD CRUDE STATION

PINNACLE I.D. : 401058
ANALYST : BP

SAMPLE ID #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	TRIP BLANK	AQUEOUS	01/15/04	NA	01/28/04	1

PARAMETER	DET. LIMIT	UNITS	TRIP BLANK
BENZENE	0.5	UG/L	< 0.5
TOLUENE	0.5	UG/L	< 0.5
ETHYLBENZENE	0.5	UG/L	< 0.5
TOTAL XYLENES	1.0	UG/L	< 1.0

SURROGATE:
BROMOFLUOROBENZENE (%) 96
SURROGATE LIMITS (80 - 120)

CHEMIST NOTES:
NA

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Albuquerque, New Mexico 87107
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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 401058
BLANK I. D.	: 012704B	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/28/04
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
SURROGATE:		
BROMOFLUOROBENZENE (%)		94
SURROGATE LIMITS:	(80 - 120)	
CHEMIST NOTES:		
N/A		

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 401058
BLANK I. D.	: 012904B	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/29/04
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
SURROGATE:		
BROMOFLUOROBENZENE (%)		98
SURROGATE LIMITS:	(80 - 120)	
CHEMIST NOTES:		

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 401058
BATCH #	: 012704B	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/28/04
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	20.8	104	20.6	103	1	(80 - 120)	20
TOLUENE	<0.5	20.0	20.0	100	19.8	99	1	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	20.2	101	20.0	100	1	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	59.3	99	58.6	98	1	(80 - 120)	20

CHEMIST NOTES:

N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 401058
BATCH #	: 012904B	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/29/04
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	20.5	103	20.3	102	1	(80 - 120)	20
TOLUENE	<0.5	20.0	19.7	99	19.6	98	1	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	20.0	100	19.8	99	1	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	58.7	98	58.3	97	1	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 401058
MS/MSD #	: 401058-03	DATE EXTRACTED	: N/A
CLIENT	: GIANT INDUSTRIES	DATE ANALYZED	: 01/28/04
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: GIANT BLOOMFIELD CRUDE STATION	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	20.9	105	20.2	101	3	(80 - 120)	20
TOLUENE	<0.5	20.0	20.0	100	19.4	97	3	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	20.2	101	19.6	98	3	(80 - 120)	20
TOTAL XYLENES	1.1	60.0	59.3	97	57.6	94	3	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

SEVERN TRENT STL

STL Pensacola 3355 McLemore Drive - Pensacola FL 32514 Telephone:(850) 474-1001 Fax:(850) 478-2671

Analytical Report

For: Ms. Jacinta Tenorio
Pinnacle Laboratories
2709-D Pan American Freeway Northeast
Albuquerque, NM 87107
CC:

Order Number: C401596
SDG Number:
Client Project ID:
Project: 401058 GI-GIANT BLOOMFIELD CRUDE STATION
Report Date: 02/05/2004
Sampled By: Client
Sample Received Date: 01/27/2004
Requisition Number:
Purchase Order:

Lance Larson, Project Manager
llarson@stl-inc.com
02/13/2004

Sample Summary

Order: C401596
Date Received: 01/27/2004

Client: Pinnacle Laboratories
Project: 401058 GI-GIANT BLOOMFIELD CRUDE STATION

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
MW-7/401058-01	C401596*1	Liquid	01/20/2004 10:35
MW-6/401058-02	C401596*2	Liquid	01/20/2004 11:33
MW-5/401058-03	C401596*3	Liquid	01/20/2004 12:35
MW-3/401058-04	C401596*4	Liquid	01/20/2004 14:27
M4-4/401058-05	C401596*5	Liquid	01/20/2004 15:40
MW-2/401058-06	C401596*6	Liquid	01/20/2004 16:25

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-1	MW-7/401058-01	Liquid	01/27/04	01/20/04 10:35	
01596-2	MW-6/401058-02	Liquid	01/27/04	01/20/04 11:33	
01596-3	MW-5/401058-03	Liquid	01/27/04	01/20/04 12:35	
01596-4	MW-3/401058-04	Liquid	01/27/04	01/20/04 14:27	
01596-5	M4-4/401058-05	Liquid	01/27/04	01/20/04 15:40	

Parameter	Units	Lab Sample IDs 01596-1	01596-2	01596-3	01596-4	01596-5
Total Dissolved Solids (160.1)						
Total Dissolved Solids	mg/l	920	3000	4600	4000	3900
Dilution Factor		1	1	1	1	1
Analysis Date		01/27/04	01/27/04	01/27/04	01/27/04	01/27/04
Batch ID		TDW009	TDW009	TDW009	TDW009	TDW009
Analyst		ST	ST	ST	ST	ST
CO2 and Forms of Alkalinity (4500D)						
Bicarbonate (2320/4500)	mg/l as CaCO3	720	1000	840	560	400
Carbon Dioxide, Free	mg/l as CaCO3	74	65	140	52	11
Carbonate (2320/4500)	mg/l as CaCO3	1.0	3.0	1.0	1.0	3.0
Hydroxide	mg/l as CaCO3	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Dioxide, Total	mg/l as CaCO3	710	940	880	550	360
Analysis Date		01/29/04	01/29/04	01/29/04	01/29/04	01/29/04
Batch ID		AEW003	AEW003	AEW003	AEW003	AEW003
Analyst		ST	ST	ST	ST	ST
Alkalinity (to pH 4.5) as CaCO3 (2320B)						
Alkalinity (to pH 4.5) as CaCO3	mg/l	720	1000	840	560	400
Dilution Factor		1	1	1	1	1
Analysis Date		01/29/04	01/29/04	01/29/04	01/29/04	01/29/04
Batch ID		AEW003	AEW003	AEW003	AEW003	AEW003
Analyst		ST	ST	ST	ST	ST

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-1	MW-7/401058-01	Liquid	01/27/04	01/20/04 10:35	
01596-2	MW-6/401058-02	Liquid	01/27/04	01/20/04 11:33	
01596-3	MW-5/401058-03	Liquid	01/27/04	01/20/04 12:35	
01596-4	MW-3/401058-04	Liquid	01/27/04	01/20/04 14:27	
01596-5	M4-4/401058-05	Liquid	01/27/04	01/20/04 15:40	

Parameter	Units	Lab Sample IDs 01596-1	01596-2	01596-3	01596-4	01596-5
Chloride (4500E)		7	6	5	3	4
Chloride	mg/l	13	96	1300	44	27
Dilution Factor		1	1	20	1	1
Analysis Date		01/28/04	01/28/04	01/28/04	01/28/04	01/28/04
Batch ID		CKW010	CKW010	CKW010	CKW010	CKW010
Analyst		CR	CR	CR	CR	CR
Sulfate as SO4 (.)						
Sulfate as SO4	mg/l	120	1400	1400	2300	2500
Dilution Factor		10	50	50	75	75
Analysis Date		01/28/04	01/28/04	01/28/04	01/28/04	01/28/04
Batch ID		SEW007	SEW007	SEW007	SEW007	SEW007
Analyst		CR	CR	CR	CR	CR
Specific Conductance (120.1)						
Specific Conductance	umhos/cm	1400	4100	6700	4500	4500
Dilution Factor		1	1	1	1	1
Analysis Date		01/28/04	01/28/04	01/28/04	01/28/04	01/28/04
Batch ID		CDW006	CDW006	CDW006	CDW006	CDW006
Analyst		ST	ST	ST	ST	ST

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-1	MW-7/401058-01	Liquid	01/27/04	01/20/04 10:35	
01596-2	MW-6/401058-02	Liquid	01/27/04	01/20/04 11:33	
01596-3	MW-5/401058-03	Liquid	01/27/04	01/20/04 12:35	
01596-4	MW-3/401058-04	Liquid	01/27/04	01/20/04 14:27	
01596-5	M4-4/401058-05	Liquid	01/27/04	01/20/04 15:40	

		Lab Sample IDs				
Parameter	**Units**	**01596-1**	**01596-2**	**01596-3**	**01596-4**	**01596-5**
Metals (6010B)		7	6	5	3	4
Calcium	mg/l	170	320	690	490	390
Iron	mg/l	55	140	8.2	3.3	6.5
Magnesium	mg/l	23	63	57	44	44
Manganese	mg/l	3.3	7.9	11	0.66	4.8
Potassium	mg/l	7.0	29	11	3.6	6.7
Sodium	mg/l	170	870	1000	780	810
Hardness	mg/l	520	1100	2000	1400	1200
Dilution Factor		1	1	1	1	1
Prep Date		01/28/04	01/28/04	01/28/04	01/28/04	01/28/04
Analysis Date		01/30/04	01/30/04	01/30/04	01/30/04	01/30/04
Batch ID		PW051	PW051	PW051	PW051	PW051
Prep Method		3010A	3010A	3010A	3010A	3010A
Analyst		GSP	GSP	GSP	GSP	GSP
Quantitation Factor		1.000	1.000	1.000	1.000	1.000

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-6	MW-2/401058-06	Liquid	01/27/04	01/20/04 16:25	

Parameter	Units	Lab Sample IDs 01596-6
Total Dissolved Solids (160.1)		
Total Dissolved Solids	mg/l	2000
Dilution Factor		1
Analysis Date		01/27/04
Batch ID		TDW009
Analyst		ST
CO2 and Forms of Alkalinity (4500D)		
Bicarbonate (2320/4500)	mg/l as CaCO3	1500
Carbon Dioxide, Free	mg/l as CaCO3	120
Carbonate (2320/4500)	mg/l as CaCO3	4.0
Hydroxide	mg/l as CaCO3	<1.0
Carbon Dioxide, Total	mg/l as CaCO3	1400
Analysis Date		01/29/04
Batch ID		AEW003
Analyst		ST
Alkalinity (to pH 4.5) as CaCO3 (2320B)		
Alkalinity (to pH 4.5) as CaCO3	mg/l	1500
Dilution Factor		1
Analysis Date		01/29/04
Batch ID		AEW003
Analyst		ST

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-6	MW-2/401058-06	Liquid	01/27/04	01/20/04 16:25	

Parameter	Units	Lab Sample IDs 01596-6
Chloride (4500E)		
Chloride	mg/l	85
Dilution Factor		2
Analysis Date		01/28/04
Batch ID		CKW010
Analyst		CR
Sulfate as SO4 (.)		
Sulfate as SO4	mg/l	130
Dilution Factor		10
Analysis Date		01/28/04
Batch ID		SEW007
Analyst		CR
Specific Conductance (120.1)		
Specific Conductance	umhos/cm	3100
Dilution Factor		1
Analysis Date		01/28/04
Batch ID		CDW006
Analyst		ST
Metals (6010B)		
Calcium	mg/l	140
Iron	mg/l	21
Magnesium	mg/l	18
Manganese	mg/l	1.3
Potassium	mg/l	2.9
Sodium	mg/l	680

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-6	MW-2/401058-06	Liquid	01/27/04	01/20/04 16:25	

Parameter	Units	Lab Sample IDs 01596-6
Metals (6010B)		
Hardness	mg/l	420
Dilution Factor		1
Prep Date		01/28/04
Analysis Date		01/30/04
Batch ID		PW051
Prep Method		3010A
Analyst		GSP
Quantitation Factor		1.000

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-7	Method Blank	Liquid	01/27/04		
01596-8	Lab Control Standard % Recovery	Liquid	01/27/04		
01596-9	Matrix Spike % Recovery	Liquid	01/27/04		
01596-10	Matrix Spike Duplicate % Recovery	Liquid	01/27/04		

Parameter	Units	Lab Sample IDs 01596-7	01596-8	01596-9	01596-10
Total Dissolved Solids (160.1)					
Total Dissolved Solids	mg/l	<5.0	102 %	N/A	N/A
Dilution Factor		1			
Analysis Date		01/27/04			
Batch ID		TDW009	TDW009		
Analyst		ST			
CO2 and Forms of Alkalinity (4500D)					
Bicarbonate (2320/4500)	mg/l as CaCO3	N/A	N/A	N/A	N/A
Alkalinity (to pH 4.5) as CaCO3 (2320B)					
Alkalinity (to pH 4.5) as CaCO3	mg/l	<1.0	97 %	99 %	97 %
Dilution Factor		1			
Analysis Date		01/29/04			
Batch ID		AEW003	AEW003	AEW003	AEW003
Analyst		ST			
Chloride (4500E)					
Chloride	mg/l	<2.0	99 %	105 %	105 %
Dilution Factor		1			
Analysis Date		01/28/04			
Batch ID		CKW010	CKW010	CKW010	CKW010
Analyst		CR			

Analytical Data Report

Lab Sample ID	Description	Matrix	Date Received	Date Sampled	SDG#
01596-7	Method Blank	Liquid	01/27/04		
01596-8	Lab Control Standard % Recovery	Liquid	01/27/04		
01596-9	Matrix Spike % Recovery	Liquid	01/27/04		
01596-10	Matrix Spike Duplicate % Recovery	Liquid	01/27/04		

Parameter	Units	Lab Sample IDs 01596-7	01596-8	01596-9	01596-10
Sulfate as SO4 (.)					
Sulfate as SO4	mg/l	<5.0	102 %	97 %	98 %
Dilution Factor		1			
Analysis Date		01/28/04			
Batch ID		SEW007	SEW007	SEW007	SEW007
Analyst		CR			
Specific Conductance (120.1)					
Specific Conductance	umhos/cm	<1.0	100 %	N/A	N/A
Dilution Factor		1			
Analysis Date		01/28/04			
Batch ID		CDW006	CDW006		
Analyst		ST			
Metals (6010B)					
Calcium	mg/l	<0.50	101 %	94 %	120 %
Iron	mg/l	<0.10	102 %	101 %	106 %
Magnesium	mg/l	<0.50	100 %	99 %	105 %
Manganese	mg/l	<0.010	101 %	101 %	105 %
Potassium	mg/l	<1.0	98 %	111 %	115 %
Sodium	mg/l	<1.0	99 %	109 %	121 %
Dilution Factor		1			
Prep Date		01/28/04			
Analysis Date		01/30/04			
Batch ID		PW051	PW051	PW051	PW051
Prep Method		3010A			
Analyst		GSP			
Quantitation Factor		1.000			

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

Cation-Anion Balance Worksheet

Accession Number: PLI 401058-4

Anions	Result (mg/l)	Factor	Total (me/l)
Chloride	44	0.02821	1.24124
Sulfate	2300	0.02082	47.88600
Carbonate	1	0.03333	0.03333
Bi-Carbonate	560	0.01639	9.17840
	Total Anions =		**58.33897**

Cations	Result (mg/l)	Factor	Total (me/l)
Calcium	490	0.04990	24.45100
Potassium	3.6	0.02558	0.09209
Magnesium	44	0.08229	3.62076
Sodium	780	0.04350	33.93000
	Total Cations =		**62.09385**

Anion/Cation Balance (% difference) =	3.1%		
Total Anions+Cations =	120	mg/l	(calculated)
Total Dissolved Solids =	4000	mg/l	(measured)
TDS/ion sum ratio =	33.21		
Electrical Cond =	4500	umh/cm	(measured)
TDS/EC ratio =	0.889		

Cation-Anion Balance Worksheet

Accession Number: PLI 401058-5

Anions	Result (mg/l)	Factor	Total (me/l)
Chloride	27	0.02821	0.76167
Sulfate	2500	0.02082	52.05000
Carbonate	3	0.03333	0.09999
Bi-Carbonate	400	0.01639	6.55600
	Total Anions =		**59.46766**

Cations	Result (mg/l)	Factor	Total (me/l)
Calcium	390	0.04990	19.46100
Potassium	6.7	0.02558	0.17139
Magnesium	44	0.08229	3.62076
Sodium	810	0.04350	35.23500
	Total Cations =		**58.48815**

Anion/Cation Balance (% difference) =	0.8%		
Total Anions+Cations =	118	mg/l	(calculated)
Total Dissolved Solids =	3900	mg/l	(measured)
TDS/ion sum ratio =	33.06		
Electrical Cond =	4500	umh/cm	(measured)
TDS/EC ratio =	0.867		

Cation-Anion Balance Worksheet

Accession Number: PLI 401058-6

Anions	Result (mg/l)	Factor	Total (me/l)
Chloride	85	0.02821	2.39785
Sulfate	130	0.02082	2.70660
Carbonate	4	0.03333	0.13332
Bi-Carbonate	1500	0.01639	24.58500
	Total Anions =		**29.82277**

Cations	Result (mg/l)	Factor	Total (me/l)
Calcium	140	0.04990	6.98600
Potassium	2.9	0.02558	0.07418
Magnesium	18	0.08229	1.48122
Sodium	680	0.04350	29.58000
	Total Cations =		**38.1214**

Anion/Cation Balance (% difference) =	12.2%		
Total Anions+Cations =	68	mg/l	(calculated)
Total Dissolved Solids =	2000	mg/l	(measured)
TDS/ion sum ratio =	29.44		
Electrical Cond =	3100	umh/cm	(measured)
TDS/EC ratio =	0.645		

Cation-Anion Balance Worksheet

Accession Number: PLI 401058-2

Anions	Result (mg/l)	Factor	Total (me/l)
Chloride	96	0.02821	2.70816
Sulfate	1400	0.02082	29.14800
Carbonate	30	0.03333	0.99990
Bi-Carbonate	1000	0.01639	16.39000
	Total Anions =		**49.24606**

Cations	Result (mg/l)	Factor	Total (me/l)
Calcium	320	0.04990	15.96800
Potassium	29	0.02558	0.74182
Magnesium	63	0.08229	5.18427
Sodium	870	0.04350	37.84500
	Total Cations =		**59.73909**

Anion/Cation Balance (% difference) =	9.6%		
Total Anions+Cations =	109	mg/l	(calculated)
Total Dissolved Solids =	3000	mg/l	(measured)
TDS/ion sum ratio =	27.53		
Electrical Cond =	4100	umh/cm	(measured)
TDS/EC ratio =	0.732		

Cation-Anion Balance Worksheet

Accession Number: PLI 401058-3

Anions	Result (mg/l)	Factor	Total (me/l)
Chloride	1300	0.02821	36.67300
Sulfate	1400	0.02082	29.14800
Carbonate	1	0.03333	0.03333
Bi-Carbonate	840	0.01639	13.76760
	Total Anions =		**79.62193**

Cations	Result (mg/l)	Factor	Total (me/l)
Calcium	690	0.04990	34.43100
Potassium	11	0.02558	0.28138
Magnesium	57	0.08229	4.69053
Sodium	1000	0.04350	43.50000
	Total Cations =		**82.90291**

Anion/Cation Balance (% difference) =	2.0%		
Total Anions+Cations =	163	mg/l	(calculated)
Total Dissolved Solids =	4600	mg/l	(measured)
TDS/ion sum ratio =	28.30		
Electrical Cond =	6700	umh/cm	(measured)
TDS/EC ratio =	0.687		

STL Pensacola
PROJECT SAMPLE INSPECTION FORM

SEVERN TRENT STL

Lab Order #: C401596 Date Received: 1/27/04

1.	Was there a Chain of Custody?	(Yes)	No*		8.	Were samples checked for preservative? *(Check pH of all H_2O requiring preservative (STL-PN SOP 917) except VOA vials that require zero headspace)*+	(Yes) No* N/A
2.	Was Chain of Custody properly filled out and relinquished?	(Yes)	No*		9.	Is there sufficient volume for analysis requested?	(Yes) No* N/A *(Can)*
3.	Were all samples properly labeled and identified?	(Yes)	No*		10.	Were samples received within Holding Time? (REFER TO STL-SOP 1040)	(Yes) No*
4.	Were samples received cold? (Criteria: 2° - 6°C; STL-SOP 1055)	(Yes)	No*	N/A	11.	Is Headspace visible > ¼" in diameter in VOA vials?*	Yes* No (N/A)
5.	Did samples require splitting or compositing♦?	Yes*	(No)		12.	**Were Trip Blanks Received?**	Yes No (N/A)
6.	Were samples received in proper containers for analysis requested?	(Yes)	No*		13.	If sent, were matrix spike bottles returned?	Yes No* (N/A)
7.	Were all sample containers received intact?	(Yes)	No*		14.	If sent, were T-Handles returned?	Yes No* (N/A)
					15.	If any issues, how was PM notified?	PSIF ☐ Verbal ☐

Airbill Number(s): 1Z8781680143577080 **Shipped By:** (UPS) FedX HD BUS ABX

(HD – Hand Delivery)

Cooler Numbers & Temp(s) (°C): Client 4.2°c IR1

(IE. 340L-4°C-CCK8 – LIST THERMOMETER NUMBER FOR VERIFICATION)

Out of Control Events and Inspection Comments (list sample IDs/Tests where appropriate):

1-3. COC/Sample ID/COC discrepancy: _____

4. Insufficient Ice ☐ Delay in delivery ☐ Other ☐ _____

5. Samples were Split ☐ Composited ☐ Requested by: Client ☐ PM ☐ Other: _____

6. Improper Containers (ID/Size/desc): _____

7. Broken bottles/Test: _____

8. Incorrect pH: _____

9. Test/Matrix/Volume: _____

10. Out of Holding Time/Test: _____

11. VOA headspace >1/4"

(list~size) _____

List additional comments by above number: Watch Hold Times!

(USE BACK OF PSIF FOR ADDITIONAL NOTES AND COMMENTS) ☞

Inspected By: MK **Date:** 1/27/04 **Logged By:** LK **Date:** 27-JAN-04

♦ *Note all Out-of-Control and/or questionable events on Comment Section of this form. For holding times, the analytical department will flag immediate hold time samples(pH, Dissolved O2, Residual Cl) as out of hold time, therefore, these samples will not be documented on this PSIF.*

♦ *All volatile samples requested to be split or composited must be done in the Volatile Lab. Document: "Volatile sample values may be compromised due to sample splitting (compositing)"*

\+ *All pH results for North Carolina, New York, and other requested samples are to be recorded on the pH log provided (STL-SOP 938).*

* *According to EPA, ¼" of headspace is acceptable in 40 ml vials requiring volatile analysis.*

SEVERN TRENT STL

Organic Data Qualifiers for Final Report

B	The analyte was detected in the method blank and in the client's sample.
D	The result was obtained from a dilution.
E	The result exceeds the calibration range.
J	Estimated value because the analyte concentration is less than the reporting limit.
M	A matrix effect was present.
N	Presumptive evidence of a compound. The compound was identified qualitatively or as a Tentatively Identified Compound.
N/C	Not Calculable. Either the sample spiked was > 4X spike concentration, or the compound was diluted out, or the results of sample duplicate analysis were <RL.
P	Second-column or detector confirmation exceeded method criteria. Appropriate value is reported and data is flagged/qualified as instructed by method/regulation.
U or < or ND	The analyte was not detected.
*	The result is not within control limit(s).

Inorganic Data Qualifiers for Final Report

B	The analyte was detected in the method blank and in the client's sample.
E	The reported value is estimated because of the presence of interference.
J	Estimated value because the analyte concentration is less than the reporting limit.
N	The spiked sample recovery is not within control limits.
N/C	Not Calculable. Either the sample spiked was > 4X spike concentration, or the compound was diluted out, or the results of sample duplicate analysis were <RL.
U or < or ND	The analyte was not detected.
*	Duplicate analysis not within control limits
M	The duplicate injection precision was not met.
S	The reported value was determined by the Method of Standard Addition (MSA).
W	Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance and post spike recovery is greater than or equal to 40%, the sample is flagged with a "W" and no further action is required.
+	The Standard Additions Correlation Coefficient is <0.995.
L	The result is not within control limit(s).

It is permissible to submit an Out-of-Control Events/Corrective Action form and/or Case Narrative in lieu of using above qualifiers.

When the laboratory receives a sample that does not meet EPA requirements for sample collection, preservation or holding time, the laboratory is required to reject the samples. The client must be notified and asked whether the lab should proceed with analysis. Data from any samples that do not meet sample acceptance criteria (collection, preservation and holding time), must be flagged, or noted on a corrective action form or case narrative, or addressed on the Project Sample Inspection Form (PSIF) in an unambiguous manner clearly defining the nature and substance of the variation. NPDES samples from North Carolina that do not meet EPA requirements for sample collection, preservation or holding time are non-reportable for NPDES compliance monitoring.

Abbreviations

ND	Not Detected at or above the STL Pensacola reporting limit (RL)
NS	Not Submitted
NA	Not Applicable
MDL	STL Pensacola Method Detection Limit
RL	STL Pensacola Reporting Limit
NoMS	Not enough sample provided to prepare and/or analyze a method-required matrix spike (MS) and/or duplicate (MSD)

Florida Projects Inorganic/Organic

Refer to FL DEP 62-160; Table 4 Data Qualifier Codes. FL DEP Rule 62-160, Table 1 lists the Florida sites which require data qualifiers.

Arizona DEQ Projects

Any qualified data submitted to Arizona DEQ (ADEQ) after January 1, 2001 must be designated using the Arizona Data Qualifiers as developed by the Arizona ELAC technical subcommittee. Refer to the ADEQ qualifier list.

Severn Trent Laboratories Inc.
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Revised/Effective: 1-23-04.

SEVERN TRENT STL

STL PENSACOLA
Certifications, Memberships & Affiliations

Alabama Department of Environmental Management, Laboratory ID No. 40150 (Drinking Water by Reciprocity with FL)

Arizona Department of Health Services, Lab ID No. AZ0589 (Hazardous Waste & Wastewater)

Arkansas Department of Pollution Control and Ecology, (88-0689) (Environmental)

California Department of Health Services, **ELAP** Laboratory ID No. I-2510 (Hazardous Waste and Wastewater)

Connecticut Department of Health Services, Connecticut Lab Approval No. PH-0697 (D W, H W and Wastewater)

Florida DOH, **NELAP** Laboratory ID No. E81010 (Drinking Water, Hazardous Waste and Wastewater)

Florida DEP/DOH CompQAP # 980156

Illinois Environmental Laboratory Accreditation Program (ELAP), **NELAP** Laboratory ID No. 200041 (Wastewater and Hazardous Waste)

Iowa Department of Natural Resources, Laboratory ID No. 367 (WW & UST)

Kansas Department of Health & Environment, **NELAP** Laboratory ID No. E10253 (Wastewater and Hazardous Waste)

Kentucky NR&EPC, Laboratory ID No. 90043 (Drinking Water)

Kentucky Petroleum Storage Tank Env Assurance Fund, Laboratory ID No. 0053 (UST)

Louisiana DEQ, LELAP, **NELAP** Laboratory ID No. 02075, Agency Interest ID 30748 (Environmental)

Maryland DH&MH Laboratory ID No. 233 (Drinking Water by Reciprocity with Florida)

Massachusetts DEP, Laboratory ID No. M-FL094 (Wastewater)

Michigan Bureau of E&OccH, Laboratory ID No.9912 (Drinking Water by Reciprocity with Florida)

New Hampshire DES ELAP, **NELAP** Laboratory ID No. 250502 (Drinking Water & Wastewater)

New Jersey DEP&E, **NELAP** Laboratory ID No. FL006 (Wastewater and Hazardous Waster)

North Carolina DENR, Laboratory ID No. 314 (Hazardous Waste and Wastewater)

North Dakota DH&Consol Labs, Laboratory ID No. R-108 Wastewater and Hazardous Waste by Reciprocity with Florida)

Oklahoma Department of Environmental Quality, Laboratory ID No. 9810 (Hazardous Waste and Wastewater)

Pennsylvania Department of Environmental Resources, **NELAP** Laboratory ID No. 68-467 (Drinking Water & Wastewater)

South Carolina DH&EC, Laboratory ID No. 96026 (Wastewater & Solids/Hazardous Waste by Reciprocity with FL)

Tennessee Department of Health & Environment, Laboratory ID No. 02907 (Drinking Water)

Virginia Department of General Services, Laboratory ID No. 00008 (Drinking Water by Reciprocity with FL)

West Virginia DOE, Office of Water Resources, Laboratory ID No. 136 (Haz Waste and Wastewater)

EPA ICR (Information Collection Rule) Approved Laboratory, Laboratory ID No. ICRFL031

NFESC (Naval Facilities Engineering Services Center)

USACE (United States Army Corps. of Engineers), MRD

STL Pensacola also has a foreign soil permit to accept soils from locations other than the continental United States. Permit No. S-37599

Pinnacle Laboratories, Inc. **Interlab Chain of Custody** Date: 1/26/04 Page: 1 of 1

Network Project Manager: Jacinta Tenorio

Pinnacle Laboratories, Inc.
2709-D Pan American Freeway, NE
Albuquerque, NM 87107
(505) 344-3777 Fax (505) 344-4413

WATCH HOLD TIME FOR TDS!

C401596

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
MW-7/401058-01	1/20/04	1035	AQ	
MW-6/401058-02		1133		
MW-5/401058-03		1235		
MW-3/401058-04		1427		
MW-4/401058-05		1540		
MW-2/401058-06	↓	1625	↓	

ANALYSIS REQUEST

Metals (8) RCRA	TCLP RCRA (8) Metals	Metals-13 PP List	Metals-TAL (23 Metals)	Dissolved Fe, Mn, Pb (6010)	Ca, Mg, K, Na, Fe, Mn	Gen Chemistry: EC, TDS, Cl, SO4 Cation/Anion Balance	Alk+Bicarb, Carb, Hardness	Volatile Organics GC/MS (8260)	BOD	COD	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	PNA (8310)/8270 SIMS	8260 (TCLP 1311) ZHE		Base/Neutral Acid Compounds GC/MS (625/8270)	Uranium (ICP-MS)	Radium 226+228	Gross Alpha/Beta	TO-14	NUMBER OF CONTAINERS
					X	X	X	X													1
					X	X	X	X													1
					X	X	X	X													1
					X	X	X	X													1
					X	X	X	X													1
					X	X	X	X													1

PROJECT INFORMATION			SAMPLE RECEIPT		SAMPLES SENT TO:		RELINQUISED BY: 1.	RELINQUISED BY: 2.
PROJECT #:	401058		Total Number of Containers		PENSACOLA - STL-FL	X	Signature: Francine Irvine Time: 1700	Signature: Time:
PROJ. NAME:	GI		Chain of Custody Seals		ESL - OR		Printed Name: Francine Irvine Date: 1/26/04	Printed Name: Date:
QC LEVEL:	STD	IV	Received Intact?		ATEL - AZ		Pinnacle Laboratories, Inc.	Company
QC REQUIRED:	MS MSD BLANK		Received Good Cond./Cold		ATEL - MARION		RECEIVED BY: 1.	RECEIVED BY: 2.
TAT:	STANDARD	RUSH!!	LAB NUMBER:		ATEL - MELMORE		Signature: Mark Swafford Time: 1005	Signature: Time:
DUE DATE:	2/9		COMMENTS:		EHL		Printed Name: Date: 1/27/04	Printed Name: Date:
RUSH SURCHARGE:	—				GEL		Company STL PNS	Company
CLIENT DISCOUNT:	—				U OF MIAMI			
SPECIAL CERTIFICATION REQUIRED:	YES NO				WCAS			
					WOHL			

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 1/20/04 PAGE: 1 OF 1

PLI Accession #: 401058

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: CODESTAR
ADDRESS: 2C Road 3500
Aztec NM 87415
PHONE: 505 334 2791
FAX: 505 320 9675
BILL TO: Tim Kinney
COMPANY: GIANT
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.
MW-7	1/20/04	1035	H2O	01
MW-6	1/20/04	1133	H2O	02
MW-5	1/20/04	1235	H2O	03
MW-3	1/20/04	1427	H2O	04
MW-4	1/20/04	1540	H2O	05
MW-2	1/20/04	1625	H2O	06
Trip Blank	1/15/04	1500	H2O	07

ANALYSIS REQUEST

SAMPLE ID	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject		(M8015) Gas/Purge & Trap	8021 (BTEX)/~~8015 (Gasoline) MTBE~~	8021 (BTEX) □MTBE □TMB □PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB □/DBCP □		8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics □PBMS	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry: EC, TDS, Cl, SO4	HARDNESS, Total Alk/Bicarb/Carb	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method1311)	Metals: Ca, Mg, K, Na, Fe, Mn	PH, Cation/Anion Balance	NUMBER OF CONTAINERS
MW-7					2																1	1					X	1	5
MW-6					2																1	1					X	1	5
MW-5					2																1	1					X	1	5
MW-3					2																1	1					X	1	5
MW-4					2																1	1					X	1	5
MW-2					2																1	1					X	1	5
Trip Blank					1																								1

WEEKEND ANALYSES MAY RESULT IN AN ADDITIONAL SURCHARGE - PLEASE INQUIRE.

PROJECT INFORMATION

PROJ. NO.: BLOOMFIELD
PROJ. NAME: GIANT ~~CRUDE~~ STATION
P.O. NO.:
SHIPPED VIA: HAND DELIVERED

SAMPLE RECEIPT

NO CONTAINERS	31
CUSTODY SEALS	(Y) N / NA
RECEIVED INTACT	yes
BLUE ICE/ICE	3.1 °C

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) □24hr* □48hr* □72hr* □ 1 WEEK (NORMAL) □
*NOT AVAILABLE ON ALL ANALYSES

CERTIFICATION REQUIRED □ NM □ SDWA □ AZ □ OTHER

METHANOL PRESERVATION □ METALS □ TOTAL □ DISSOLVED

COMMENTS: NO MTBE ON BTEX ANALYSIS

1/27 per Martin Nee report only 8021 BTEX. NO 8015 Gasoline.

RELINQUISHED BY: 1.
Signature: [signature] Time: 0800
Printed Name: Date: 1/21/04
Company:
See Reverse side (Force Majeure)

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: (LAB) 2.
Signature: Francine Trujillo Time: 1330
Printed Name: Francine Trujillo Date: 1/26/04
Pinnacle Laboratories Inc.

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **307122**
August 13, 2003

MARTIN NEE
26 CR 3500
FLORA VISTA, NM 87415

GIANT INDUSTRIES
111 COUNTY ROAD 4990
BLOOMFIELD, NM 87413

Project Name CRUDE STATION
Project Number 30001.0

Attention: MARTIN NEE/TIM KINNEY

On 07/29/03 Pinnacle Laboratories Inc., (ADHS Lincense No. AZ0643), 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.

H. Mitchell Rubenstein, ~~Ph.D.~~
General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	: MARTIN NEE	PINNACLE ID	: 307122
PROJECT #	: 30001.0	DATE RECEIVED	: 07/29/03
PROJECT NAME	: CRUDE STATION	REPORT DATE	: 08/13/03

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
307122 - 01	MW-6 CS	AQUEOUS	07/27/03

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED
CLIENT : MARTIN NEE
PROJECT # : 30001.0
PROJECT NAME : CRUDE STATION

PINNACLE I.D. : 307122
ANALYST : BP

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
307122-1	MW-6 CS	AQUEOUS	07/27/03	NA	08/04/03	1

PARAMETER	DET. LIMIT	UNITS	MW-6 CS
BENZENE	0.5	UG/L	< 0.5
TOLUENE	**0.5**	**UG/L**	**2.7**
ETHYLBENZENE	**0.5**	**UG/L**	**3.2**
TOTAL XYLENES	**1.0**	**UG/L**	**16**

SURROGATE:
BROMOFLUOROBENZENE (%) 102
SURROGATE LIMITS (80 - 120)

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 307122
BLANK I. D.	: 080403B	DATE EXTRACTED	: N/A
LIENT	: MARTIN NEE	DATE ANALYZED	: 08/04/03
PROJECT #	: 30001.0	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: CRUDE STATION	ANALYST	: BP

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
SURROGATE:		
BROMOFLUOROBENZENE (%)		96
SURROGATE LIMITS:	(80 - 120)	

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 307122
BATCH I.D. #	: 080403B	DATE EXTRACTED	: N/A
CLIENT	: MARTIN NEE	DATE ANALYZED	: 08/04/03
PROJECT #	: 30001.0	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: CRUDE STATION	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	18.6	93	18.5	93	1	(80 - 120)	20
TOLUENE	<0.5	20.0	20.2	101	20.1	101	0	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	21.3	107	21.4	107	0	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	62.6	104	62.7	105	0	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 307122
MS/MSD #	: 307126-07	DATE EXTRACTED	: N/A
CLIENT	: MARTIN NEE	DATE ANALYZED	: 08/04/03
PROJECT #	: 30001.0	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: CRUDE STATION	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	18.5	93	18.4	92	1	(80 - 120)	20
TOLUENE	<0.5	20.0	19.5	98	19.2	96	2	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	21.9	110	21.5	108	2	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	65.0	108	63.8	106	2	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

LABORATORY Annache
Contract ~~El Paso Corp., San Juan River Basin~~ Giant

Chain of Custody ID 220703mw04
Page 1 of 1
Air Bill No.

307122

~~MWH~~ 505 334 2791
Phone ~~(801) 617-3200 FAX (801) 617-4200~~
~~MWH~~ Contact ~~Brian Buttars~~ Martin Nee
Project Crude Station
Project Number 30001.0
Date Due
Sampler's Name MTN
(print clearly)

Location ID	Sample ID	Depth Interval (ft)	Date Collected	Time Collected	Matrix [a]	Sampling Technique [b]	BTEX SW-846 8021B	Alkalinity SM 2320B	TDS USEPA 160.1	NM WQCC Metals SW-846 6010B & 7470A	Cations SW-846 6010B	Anions USEPA 300.0	Nitrate USEPA 300.0	Nitrite USEPA 300.0				
MW-6CS	01		7-27-03	1450	WG	B	X											

ANALYSES REQUESTED

[a] **Matrix:**
SO – Soil
WS – Surface Water
WG – Ground Water
AA – Air
WQ – Trip Blank/ Equipment Blanks
WW – Wastewater

[b] **Sampling Technique:**
Composite=C
Grab=G
Hand Auger=HA
Submersible Pump=SP
Bladder Pump=BP
Bailer=B
Wellhead Faucet=WF
Hydropunch=HP

Location IDs:
Groundwater Sites=GW
Bisti=BI
Jaquez=JA
North Flare Pit=NF
South Flare Pit=SF
San Juan River Plant=SJ

Relinquished by/Affiliation	Received by/Affiliation	Date	Time
	Francine Jaramillo / PLI 7/29/03 1515	7-29-03	0800

LABORATORY USE ONLY

SAMPLES WERE:

1 (Shipped) or hand delivered
Notes:

2 Ambient or Chilled
Notes:

3 Temperature 11.3°C

4 Received Broken/Leaking (Improperly Sealed)
Y (N)
Notes:

5 Properly Preserved
(Y) N
Notes:

6 Received Within Holding Times
(Y) N
Notes:

COC Tape Was:

1 Present on Outer Package
(Y) N NA

2 Unbroken on Outer Package
Y (N) NA

3 Present on Sample
(Y) N NA

4 Unbroken on Sample
Y (N) NA
Notes:

Discrepancies Between Sample Labels and COC Record?
Y (N)
Notes:

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **309128**
October 20, 2003

MARTIN NEE
26 CR 3500
FLORA VISTA, NM 87415

GIANT INDUSTRIES
111 COUNTY RD 4990
BLOOMFIELD, NM 87413

Project Name BCS
Project Number (NONE)

Attention: MARTIN NEE/TIM KINNEY

On 09/24/03 Pinnacle Laboratories Inc., (ADHS Lincense No. AZ0643), 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.

H. Mitchell Rubenstein, Ph.D.
General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

IENT	: MARTIN NEE	PINNACLE ID	: 309128
ROJECT #	: (NONE)	DATE RECEIVED	: 09/24/03
OJECT NAME	: BCS	REPORT DATE	: 10/20/03

NNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
9128 - 01	BCS MW-6	AQUEOUS	09/23/03

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED
CLIENT : MARTIN NEE
PROJECT # : (NONE)
PROJECT NAME : BCS

PINNACLE I.D. : 309128
ANALYST : DSR

SAMPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
309128	BCS MW-6	AQUEOUS	09/23/03	NA	10/02/03	1

PARAMETER	DET. LIMIT	UNITS	BCS MW-6
BENZENE	**0.5**	**UG/L**	**0.8**
TOLUENE	**0.5**	**UG/L**	**3.7**
ETHYLBENZENE	**0.5**	**UG/L**	**4.0**
TOTAL XYLENES	**1.0**	**UG/L**	**24**

SURROGATE:
BROMOFLUOROBENZENE (%) 104
SURROGATE LIMITS (80 - 120)

CHEMIST NOTES:
NA

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 309128
BLANK I. D.	: 100203	DATE EXTRACTED	: NA
CLIENT	: MARTIN NEE	DATE ANALYZED	: 10/02/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: BCS	ANALYST	: DSR

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
SURROGATE:		
BROMOFLUOROBENZENE (%)		97
SURROGATE LIMITS:	(80 - 120)	

CHEMIST NOTES:
NA

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
LCSLCSD

TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 309128
LCSLCSD#	: 100203	DATE EXTRACTED	: NA
CLIENT	: MARTIN NEE	DATE ANALYZED	: 10/02/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: BCS	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	21.8	109	21.4	107	2	(80 - 120)	20
TOLUENE	<0.5	20.0	21.3	107	20.9	105	2	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	21.5	108	21.1	106	2	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	64.1	107	62.6	104	2	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\%\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
MSMSD

TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 309128
MSMSD #	: 309136-24	DATE EXTRACTED	: NA
CLIENT	: MARTIN NEE	DATE ANALYZED	: 10/03/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: BCS	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	21.7	109	21.1	106	3	(80 - 120)	20
TOLUENE	<0.5	20.0	21.3	107	20.6	103	3	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	21.3	107	20.7	104	3	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	63.6	106	61.7	103	3	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 9/24/03 PAGE: 1 OF 1

PLI Accession #: 309128

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Marten Nee

ADDRESS: 20 CR 3500
Flora Vista NM 87415

PHONE: 505 334 2791

FAX:

BILL TO: Tim Kenny

COMPANY: Grand Industries

ADDRESS: PO Box
Bloomfield NM 87413

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.
BCS MW-6	9/23/03	1110	water	01

Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject		(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline) MTBE	8021 (BTEX) ☐MTBE ☐TMB ☐PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐/DBCP ☐		8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics ☐PBMS	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:		Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method1311)	Metals:		NUMBER OF CONTAINERS
					X																							2

WEEKEND ANALYSES MAY RESULT IN AN ADDITIONAL SURCHARGE - PLEASE INQUIRE.

PROJECT INFORMATION

PROJ. NO.:

PROJ. NAME: BCS

P.O. NO.:

SHIPPED VIA: Truck

SAMPLE RECEIPT

NO CONTAINERS	2
CUSTODY SEALS	Y / N (NA)
RECEIVED INTACT	Yes
BLUE ICE/ICE	4.6 -

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐24hr* ☐48hr* ☐72hr* ☐ 1 WEEK (NORMAL) ☐
*NOT AVAILABLE ON ALL ANALYSES

CERTIFICATION REQUIRED ☐ NM ☐ SDWA ☐ AZ ☐ OTHER

METHANOL PRESERVATION ☐ | METALS ☐ TOTAL ☐ DISSOLVED

COMMENTS: No MTBE
Bloomfield Crude Station
(BCS)

RELINQUISHED BY: 1.

Signature: Time: 0600

Printed Name: MJ Nee Date: 9/24/03

Company: Marten Nee
See Reverse side (Force Majeure)

RECEIVED BY: 1.

Signature: Time:

Printed Name: Date:

Company:

RELINQUISHED BY: 2.

Signature: Time:

Printed Name: Date:

Company:

RECEIVED BY: (LAB) 2.

Signature: Time: 1525

Printed Name: Francine Tonvio Date: 9/24/03

Pinnacle Laboratories Inc.

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **210067**
October 31, 2002

AESE
906 SAN JUAN BLVD. SUITE D
FARMINGTON, NM 87401

GIANT INDUSTRIES
111 COUNTY ROAD 4990
BLOOMFIELD, NM 87413

Project Name BLOOMFIELD CRUDE ST.
Project Number 6171

Attention: MARTIN NEE/TIM KINNEY

On 10/14/02 Pinnacle Laboratories, Inc., (ADHS License No. AZ0592 pending), received a request to analyze **non-aq** 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.

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: jt

Enclosure

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
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Fax (505) 344-4413

CLIENT	: AESE	PINNACLE ID	: 210067
PROJECT #	: 6171	DATE RECEIVED	: 10/14/02
PROJECT NAME	: BLOOMFIELD CRUDE ST.	REPORT DATE	: 10/31/02

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
210067 - 01	IP10 6'	NON-AQ	10/10/02
210067 - 02	MP3 6'	NON-AQ	10/10/02
210067 - 03	MP7 6'	NON-AQ	10/10/02

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED
CLIENT : AESE
PROJECT # : 6171
PROJECT NAME : BLOOMFIELD CRUDE ST.

PINNACLE I.D.: 210067

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	IP10 6'	NON-AQ	10/10/02	10/14/02	10/17/02	5
02	MP3 6'	NON-AQ	10/10/02	10/14/02	10/17/02	5
	MP7 6'	NON-AQ	10/10/02	10/14/02	10/17/02	5

PARAMETER	DET. LIMIT	UNITS	IP10 6'	MP3 6'	MP7 6'
BENZENE	0.025	**MG/KG**	**0.42**	**2.0**	**2.0**
TOLUENE	0.025	**MG/KG**	**0.14**	**0.30**	**3.3**
ETHYLBENZENE	0.025	**MG/KG**	**0.11**	**3.2**	**8.6**
TOTAL XYLENES	0.050	**MG/KG**	**1.1**	**23**	**56**
SURROGATE:					
BROMOFLUOROBENZENE (%)			**S3**	**S3**	**S3**
SURROGATE LIMITS	(65 - 120)				

CHEMIST NOTES:
S3 = Surrogate was diluted out.

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 210067
BLANK I. D.	: 101402	DATE EXTRACTED	: 10/14/02
CLIENT	: AESE	DATE ANALYZED	: 10/14/02
PROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE ST.		

PARAMETER	UNITS	
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
ETHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050

SURROGATE:
BROMOFLUOROBENZENE (%) 96
SURROGATE LIMITS: (80 - 120)
CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 210067
BLANK I. D.	: 101702	DATE EXTRACTED	: N/A
CLIENT	: AESE	DATE ANALYZED	: 10/17/02
PROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE ST.		

PARAMETER	UNITS	
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
ETHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050

SURROGATE:
BROMOFLUOROBENZENE (%) 99
SURROGATE LIMITS: (80 - 120)
CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021 MODIFIED		
BATCH #	: 101402	PINNACLE I.D.	: 210067
CLIENT	: AESE	DATE EXTRACTED	: 10/14/02
PROJECT #	: 6171	DATE ANALYZED	: 10/14/02
PROJECT NAME	: BLOOMFIELD CRUDE ST.	SAMPLE MATRIX	: NON-AQ
		UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	0.93	93	0.92	92	1	(68 - 120)	20
TOLUENE	<0.025	1.00	0.93	93	0.93	93	0	(64 - 120)	20
ETHYLBENZENE	<0.025	1.00	0.93	93	0.93	93	0	(49 - 127)	20
TOTAL XYLENES	<0.050	3.00	2.80	93	2.82	94	1	(58 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021 MODIFIED		
BATCH #	: 101702	PINNACLE I.D.	: 210067
CLIENT	: AESE	DATE EXTRACTED	: N/A
PROJECT #	: 6171	DATE ANALYZED	: 10/17/02
PROJECT NAME	: BLOOMFIELD CRUDE ST.	SAMPLE MATRIX	: NON-AQ
		UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	0.93	93	0.91	91	2	(68 - 120)	20
TOLUENE	<0.025	1.00	0.92	92	0.90	90	2	(64 - 120)	20
ETHYLBENZENE	<0.025	1.00	0.94	94	0.92	92	2	(49 - 127)	20
TOTAL XYLENES	<0.050	3.00	2.78	93	2.72	91	2	(58 - 120)	20

CHEMIST NOTES:
N/A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : AESE PINNACLE I.D.: 210067
PROJECT # : 6171
PROJECT NAME : BLOOMFIELD CRUDE ST.

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	IP10 6'	NON-AQ	10/10/02	10/21/02	10/27/02	1
02	MP3 6'	NON-AQ	10/10/02	10/21/02	10/27/02	1
03	MP7 6'	NON-AQ	10/10/02	10/21/02	10/27/02	1

PARAMETER	DET. LIMIT	UNITS	IP10 6'	MP3 6'	MP7 6'
FUEL HYDROCARBONS, C7-C10	10	**MG/KG**	**330**	**400**	**1700**
FUEL HYDROCARBONS, C10-C22	10	**MG/KG**	**770**	**180**	**840**
FUEL HYDROCARBONS, C22-C36	50	**MG/KG**	**370**	**170**	**290**
CALCULATED SUM:			**1470**	**750**	**2830**
SURROGATE:					
O-TERPHENYL (%)			93	101	96
SURROGATE LIMITS	(66 - 151)				

CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)		
BLANK I.D.	: 102102B	PINNACLE I.D.	: 210067
CLIENT	: AESE	DATE EXTRACTED	: 10/21/02
PROJECT #	: 6171	DATE ANALYZED	: 10/27/02
PROJECT NAME	: BLOOMFIELD CRUDE ST.	SAMPLE MATRIX	: NON-AQ

PARAMETER	UNITS		
FUEL HYDROCARBONS, C7-C10	MG/KG	< 10	
FUEL HYDROCARBONS, C10-C22	MG/KG	< 10	
FUEL HYDROCARBONS, C22-C36	MG/KG	< 50	**R3**
SURROGATE:			
TERPHENYL (%)		95	
SURROGATE LIMITS	(80 - 151)		

CHEMIST NOTES:
R3 = Surrogate raised due to initial calibration limits.

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	:	210067
BATCH #	: 102102B	DATE EXTRACTED	:	10/21/02
CLIENT	: AESE	DATE ANALYZED	:	10/27/02
PROJECT #	: 6171	SAMPLE MATRIX	:	NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE ST.	UNITS	:	MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
DIESEL HYDROCARBONS	<10	200	227	114	228	114	0	(56 - 148)	20

CHEMIST NOTES:
N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
MSMSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 210067
MSMSD #	: 210064-30	DATE EXTRACTED	: 10/21/02
CLIENT	: AESE	DATE ANALYZED	: 10/28/02
PROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE ST.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
DIESEL HYDROCARBONS	<10	200	216	108	222	111	3	(56 - 148)	20

CHEMIST NOTES:

$$\%\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINACLE LABORATORIES

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 10/14/02 PAGE: 1 OF 1

PLI Accession #: 210067

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: Martin Nee

COMPANY: ~~Mark~~ AESE

ADDRESS: 906 San Juan Blvd, Ste D
Farmington, NM 87401

PHONE: 505 566 9116

FAX: 505 566 9120

BILL TO: Tim Kinney

COMPANY: Giant Industries Inc

ADDRESS: PO Box 159
Bloomfield, NM 87401

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject		(M8015) Gas/Purge & Trap	8021 (BTEX) 8015 (Gasoline) MTBE	8021 (BTEX) ☐MTBE ☐TMB ☐PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:		NUMBER OF CONTAINERS
IP10 6'	10/10/02	9:35	soil	01	X	X			X																						1
MP3 6'	10/10/02	13:10	soil	02	X	X			X																						1
MP7 6'	10/10/02	10:48	soil	03	X	X			X																						1

PROJECT INFORMATION	
PROJ. NO.:	6171
PROJ. NAME:	Bloomfield Crude St
P.O. NO.:	
SHIPPED VIA:	Grey Hound Bus

SAMPLE RECEIPT	
NO CONTAINERS	3
CUSTODY SEALS	(Y) N / NA
RECEIVED INTACT	YES
BLUE ICE/ICE	2.5°

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐24hr ☐48hr ☐72hr ☐1 WEEK (NORMAL) ☑

CERTIFICATION REQUIRED ☐NM ☐SDWA ☐OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

10/14 per Ashley @ AESE analyzed samples for 8021 BTEX / 8015 DRO.

RELINQUISHED BY: 1.

Signature: Ashley Lowe Time: 9:00

Printed Name: Ashley Lowe Date: 10/14/02

Company: AESE

See reverse side (Force Majeure)

RECEIVED BY: 1.

Signature: Time:

Printed Name: Date:

Company:

RELINQUISHED BY: 2.

Signature: Time:

Printed Name: Date:

Company:

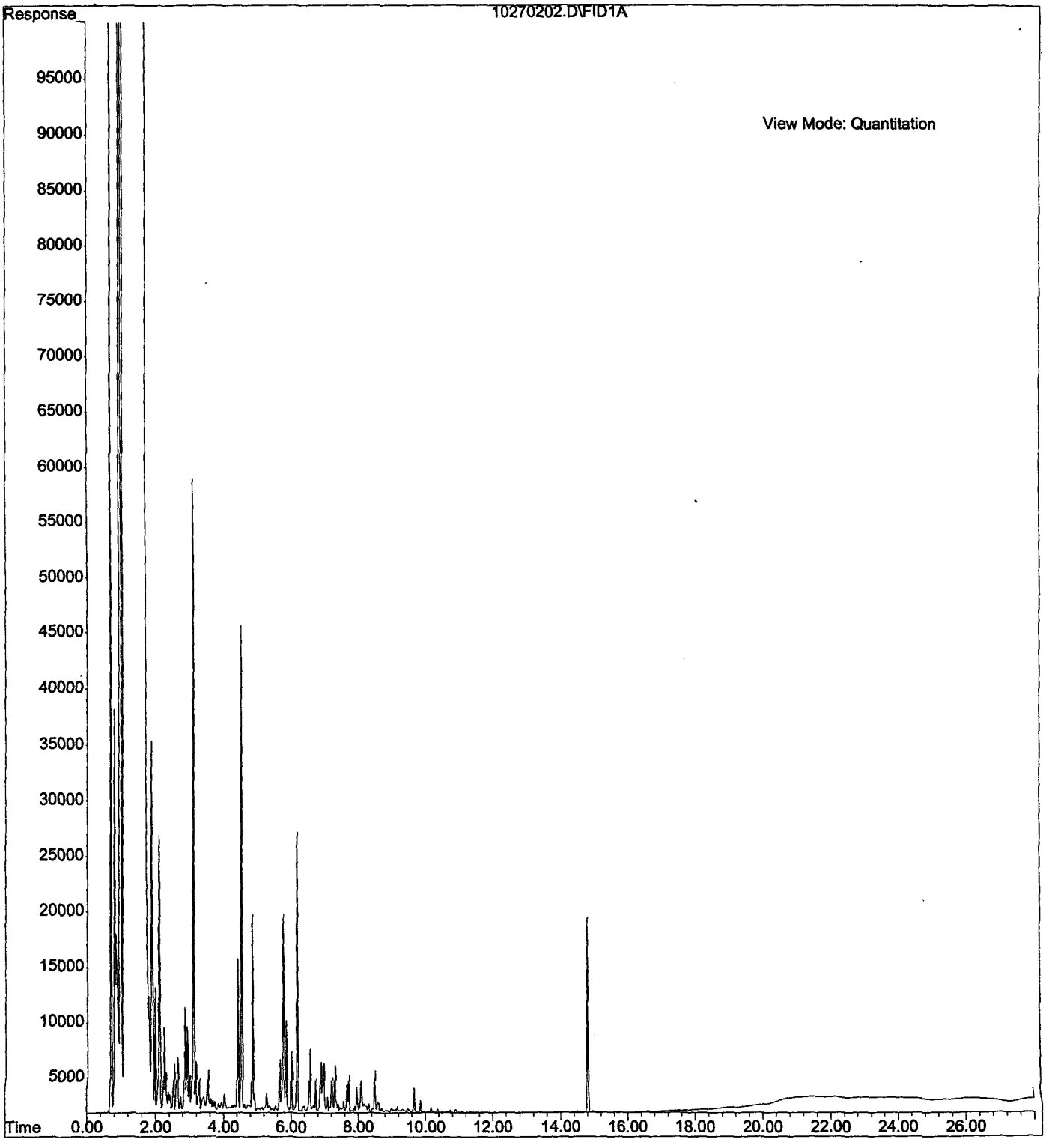
RECEIVED BY: (LAB) 2.

Signature: Francine Tarvo Time: 1550

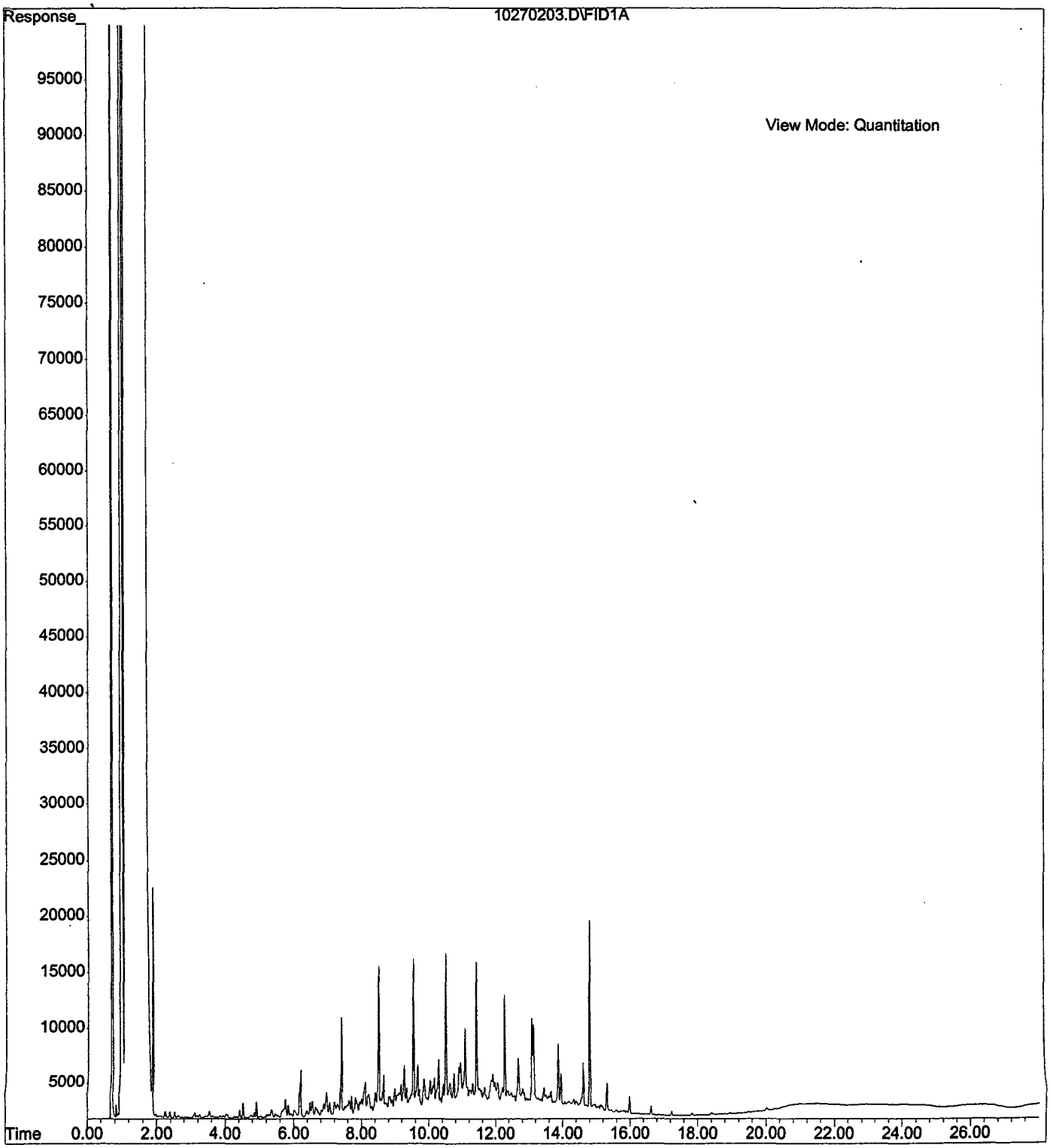
Printed Name: Francine Tarvo Date: 10/14/02

Pinnacle Laboratories Inc.

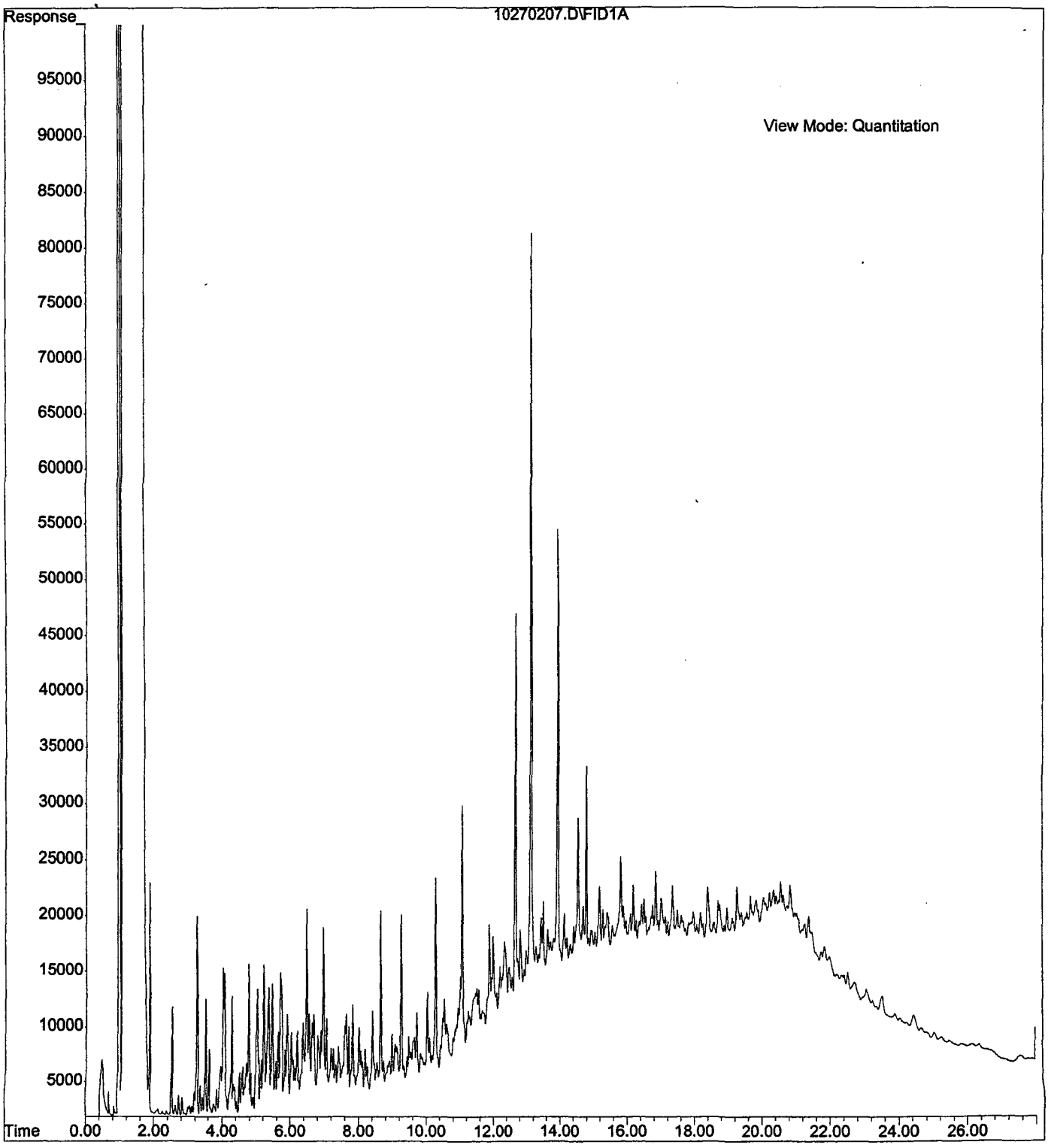
File : C:\HPCHEM\2\DATA\102702A\10270202.D
Operator : ccm
Acquired : 27 Oct 2002 19:27 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: gas ccv
Misc Info : GC4-65-15 (200 ug/ml)
Vial Number: 2



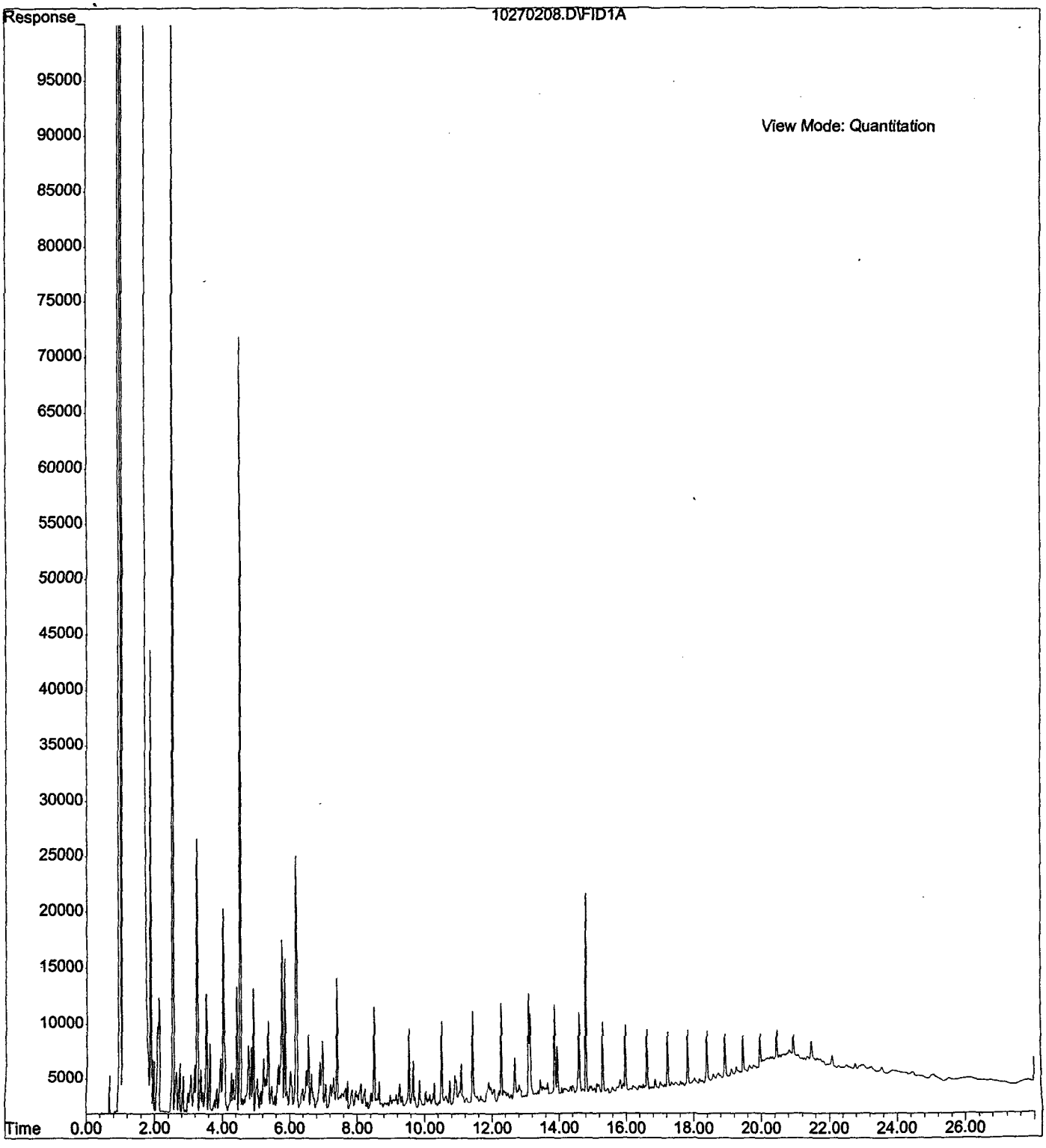
File : C:\HPCHEM\2\DATA\102702A\10270203.D
Operator : ccm
Acquired : 27 Oct 2002 19:08 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: dsl ccv
Misc Info : GC4-65-13 (200 ug/ml)
Vial Number: 3



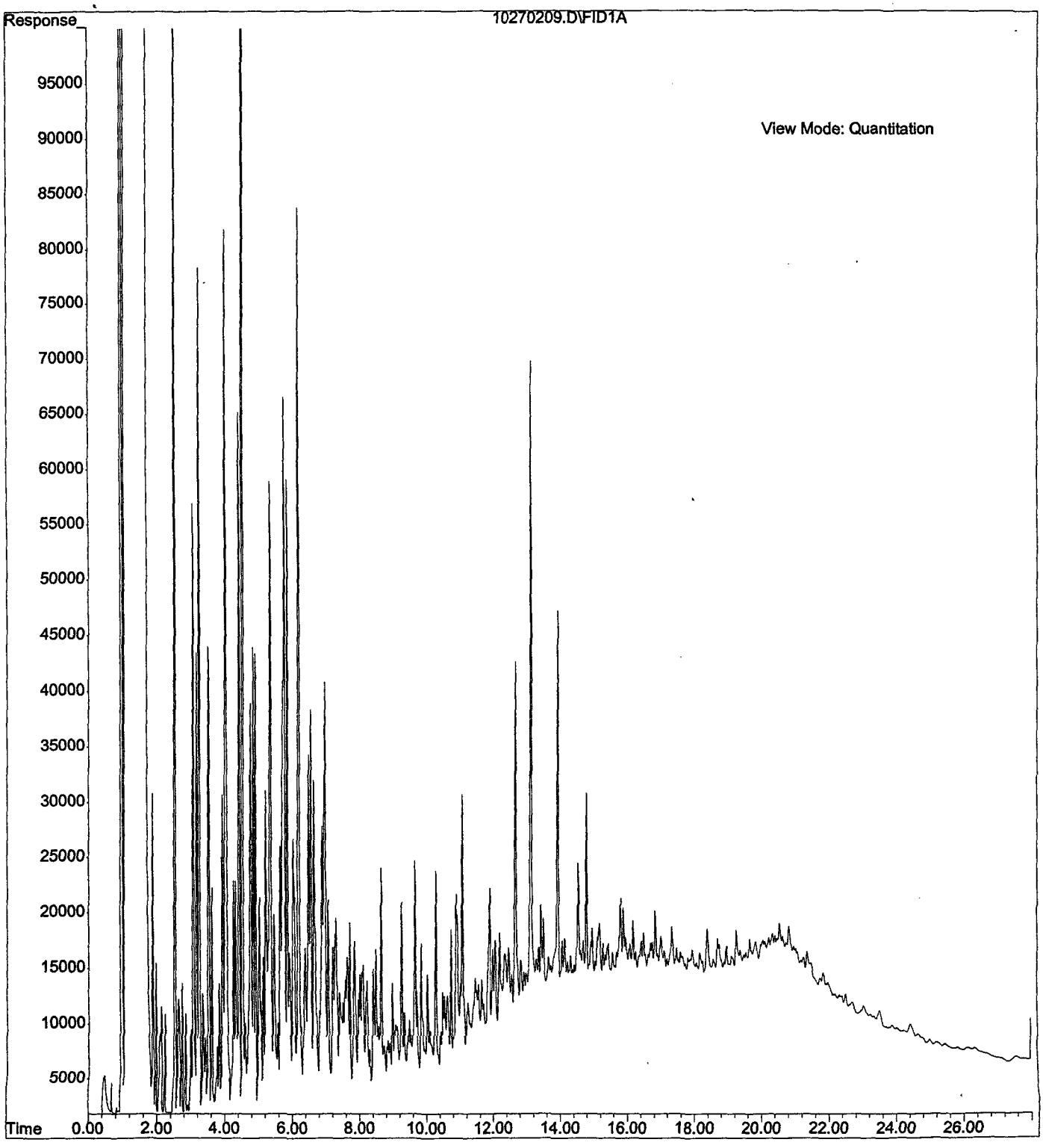
File : C:\HPCHEM\2\DATA\102702A\10270207.D
Operator : ccm
Acquired : 27 Oct 2002 21:49 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210067-01 1x
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 7



File : C:\HPCHEM\2\DATA\102702A\10270208.D
Operator : ccm
Acquired : 27 Oct 2002 22:29 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210067-02 1x
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 8



File : C:\HPCHEM\2\DATA\102702A\10270209.D
Operator : ccm
Acquired : 27 Oct 2002 23:09 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210067-03 1x
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 9



PINNACLE LABORATORIES

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Pinnacle Lab ID number **210045**
October 31, 2002

AESE
906 SAN JUAN BLVD. SUITE D
FARMINGTON, NM 87401

GIANT INDUSTRIES
111 COUNTY ROAD 4990
BLOOMFIELD, NM 87413

Project Name BLOOMFIELD CRUDE STN
Project Number 6171

Attention: MARTIN NEE/TIM KINNEY

On 10/08/02 Pinnacle Laboratories, Inc., (ADHS License No. AZ0592 pending), received a request to analyze **aqueous and non-aq** 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.

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: jt

Enclosure

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CLIENT	: AESE	PINNACLE ID	: 210045
PROJECT #	: 6171	DATE RECEIVED	: 10/08/02
PROJECT NAME	: BLOOMFIELD CRUDE STN	REPORT DATE	: 10/31/02

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
10045 - 01	MW-6	AQUEOUS	10/07/02
10045 - 02	MW-7	AQUEOUS	10/07/02
210045 - 03	IP-16	NON-AQ	10/04/02
10045 - 04	IP-7	NON-AQ	10/04/02

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS

EST : EPA 8021 MODIFIED
IENT : AESE PINNACLE I.D.: 210045
ROJECT # : 6171
ROJECT NAME : BLOOMFIELD CRUDE STN

MPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MW-6	AQUEOUS	10/07/02	NA	10/08/02	1
02	MW-7	AQUEOUS	10/07/02	NA	10/09/02	5

ARAMETER	DET. LIMIT	UNITS	MW-6	MW-7
ENZENE	0.5	**UG/L**	< 0.5	**1100 - D50**
TOLUENE	0.5	UG/L	< 0.5	< 2.5
ETHYLBENZENE	0.5	**UG/L**	< 0.5	**79**
TOTAL XYLENES	1.0	**UG/L**	**3.2**	**490**
URROGATE:				
BROMOFLUOROBENZENE (%)			96	107
SURROGATE LIMITS	(80 - 120)			

CHEMIST NOTES:
D50 = Reported from a 50X dilution run on 10/08/02.

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 210045
BLANK I. D.	: 100802	DATE EXTRACTED	: N/A
CLIENT	: AESE	DATE ANALYZED	: 10/08/02
PROJECT #	: 6171	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: BLOOMFIELD CRUDE STN		

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0
SURROGATE:		
BROMOFLUOROBENZENE (%)		100
SURROGATE LIMITS:	(80 - 120)	

CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021 MODIFIED		
BATCH #	: 100802	PINNACLE I.D.	: 210045
CLIENT	: AESE	DATE EXTRACTED	: N/A
PROJECT #	: 6171	DATE ANALYZED	: 10/08/02
PROJECT NAME	: BLOOMFIELD CRUDE STN	SAMPLE MATRIX	: AQUEOUS
		UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	18.7	94	19.1	96	2	(80 - 120)	20
TOLUENE	<0.5	20.0	18.4	92	19.0	95	3	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	18.7	94	19.4	97	4	(80 - 120)	20
TOTAL XYLENES	<1.0	60.0	55.1	92	57.2	95	4	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

TEST	: EPA 8021 MODIFIED		
MSMSD #	: 210045-01	PINNACLE I.D.	: 210045
CLIENT	: AESE	DATE EXTRACTED	: N/A
PROJECT #	: 6171	DATE ANALYZED	: 10/08/02
PROJECT NAME	: BLOOMFIELD CRUDE STN	SAMPLE MATRIX	: AQUEOUS
		UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	20.0	16.5	83	16.4	82	1	(80 - 120)	20
TOLUENE	<0.5	20.0	16.4	82	16.0	80	2	(80 - 120)	20
ETHYLBENZENE	<0.5	20.0	16.8	84	16.2	81	4	(80 - 120)	20
TOTAL XYLENES	3.2	60.0	52.4	82	50.5	79 - **M1**	4	(80 - 120)	20

CHEMIST NOTES:
M1 = Matrix spike compound does not meet criteria due to matrix effects.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

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Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

EST : EPA 8021 MODIFIED
IENT : AESE PINNACLE I.D.: 210045
ROJECT # : 6171
ROJECT NAME : BLOOMFIELD CRUDE STN

MPLE #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
03	IP-16	NON-AQ	10/04/02	10/14/02	10/14/02	10
04	IP-7	NON-AQ	10/04/02	10/14/02	10/14/02	10

RAMETER	DET. LIMIT	UNITS	IP-16	IP-7
NZENE	0.025	**MG/KG**	**0.85**	**2.9**
OLUENE	0.025	**MG/KG**	**0.78**	< 0.25
THYLBENZENE	0.025	**MG/KG**	**7.7**	**7.6**
OTAL XYLENES	0.050	**MG/KG**	**58**	**51**
URROGATE:				
ROMOFLUOROBENZENE (%)			**S3**	**S3**
URROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
S = Surrogate was diluted out.

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 210045
BLANK I. D.	: 101402	DATE EXTRACTED	: 10/14/02
CLIENT	: AESE	DATE ANALYZED	: 10/14/02
PROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STN		

PARAMETER	UNITS	
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
ETHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050
SURROGATE:		
BROMOFLUOROBENZENE (%)		96
SURROGATE LIMITS:	(80 - 120)	

CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021 MODIFIED		
BATCH #	: 101402	PINNACLE I.D.	: 210045
CLIENT	: AESE	DATE EXTRACTED	: 10/14/02
PROJECT #	: 6171	DATE ANALYZED	: 10/14/02
PROJECT NAME	: BLOOMFIELD CRUDE STN	SAMPLE MATRIX	: NON-AQ
		UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	0.93	93	0.92	92	1	(68 - 120)	20
TOLUENE	<0.025	1.00	0.93	93	0.93	93	0	(64 - 120)	20
ETHYLBENZENE	<0.025	1.00	0.93	93	0.93	93	0	(49 - 127)	20
TOTAL XYLENES	<0.050	3.00	2.80	93	2.82	94	1	(58 - 120)	20

CHEMIST NOTES:
N/A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY RESULTS

ST : EPA 8015 MODIFIED (DIRECT INJECT)
IENT : AESE PINNACLE I.D.: 210045
ROJECT # : 6171
ROJECT NAME : BLOOMFIELD CRUDE STN

MPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
03	IP-16	NON-AQ	10/04/02	10/11/02	10/26/02	10
	IP-7	NON-AQ	10/04/02	10/11/02	10/26/02	10

ARAMETER	DET. LIMIT	UNITS	IP-16	IP-7
UEL HYDROCARBONS, C7-C10	10	**MG/KG**	**3100**	**2400**
UEL HYDROCARBONS, C10-C22	10	**MG/KG**	**1700**	**1500**
UEL HYDROCARBONS, C22-C36	50	**MG/KG**	**890**	**820**
ALCULATED SUM:			**5690**	**4720**
RROGATE:				
TERPHENYL (%)			93	96
URROGATE LIMITS	(66 - 151)			

CHEMIST NOTES:
A

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	:	210045
LCS/LCSD #	: 101102	DATE EXTRACTED	:	10/11/02
CLIENT	: AESE	DATE ANALYZED	:	10/26/02
PROJECT #	: 6171	SAMPLE MATRIX	:	NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STN	UNITS	:	MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
DIESEL HYDROCARBONS	<10	200	225	113	224	112	0	(56 - 148)	20

CHEMIST NOTES:

$$\%\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
MSMSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	:	210045	
MSMSD #	: 210040-01	DATE EXTRACTED	:	10/11/02	
CLIENT	: AESE	DATE ANALYZED	:	10/26/02	
PROJECT #	: 6171	SAMPLE MATRIX	:	NON-AQ	
PROJECT NAME	: BLOOMFIELD CRUDE STN	UNITS	:	MG/KG	

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
DIESEL HYDROCARBONS	<10	200	227	114	228	114	0	(56 - 148)	20

CHEMIST NOTES:
N/A

$$\%\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 10/8/02 PAGE: 1 OF 1

PLI Accession #: 210045

SHADED AREAS ARE FOR LAB USE ONLY

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: Martin Nee

COMPANY: AESE
ADDRESS: 906 San Juan Blvd, Ste D
Farmington, NM 87401
PHONE: 505-566-9116
FAX: 505-566 9120

BILL TO: Tim Kinney
COMPANY: Giant
ADDRESS: PO Box 159
Bloomfield, NM 87401

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX) 8015 (Gasoline) MTBE	8021 ☐MTBE ☐TMB ☐PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
MW-6	10-7-02	11:35	water	01					X																				2
MW-7	10-7-02	12:09	water	02	R				X																				2
IP-16	10-4-02	~~11:52~~ 10:36	soil	03	X	X			X																				1
IP-7	10-4-02	9:20	soil	04	X	X			X																				1

PROJECT INFORMATION

PROJ. NO.: 6171
PROJ. NAME: Bloomfield Crude Stn
P.O. NO.:
SHIPPED VIA: Grey Hound Bus

SAMPLE RECEIPT

NO CONTAINERS	6
CUSTODY SEALS	Y / N / NA
RECEIVED INTACT	Yes
BLUE ICE / ICE	Ice

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐24hr ☐48hr ☐72hr ☐1 WEEK (NORMAL) ☑

CERTIFICATION REQUIRED ☐NM ☐SDWA ☐OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐
10/9 per Ashley@AESE the time for IP-16 should be 10:36. Also change analyses for soils. Run 8015 DRO & 8021 BTEX.

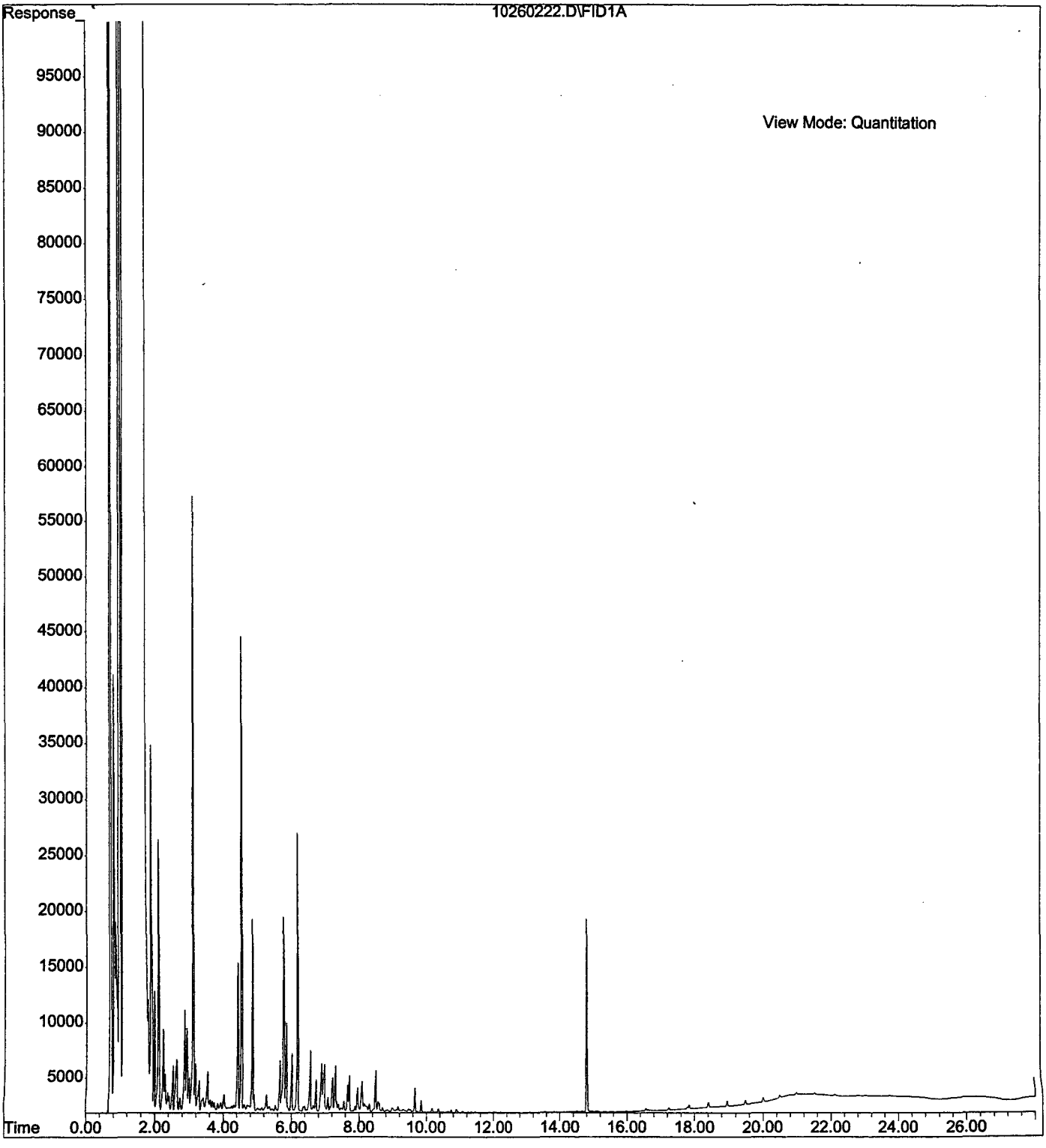
RELINQUISHED BY: 1.
Signature: Ashley Lowe Time: 8:00
Printed Name: Ashley Lowe Date: 10/8/02
Company: AESE
See reverse side (Force Majeure)

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

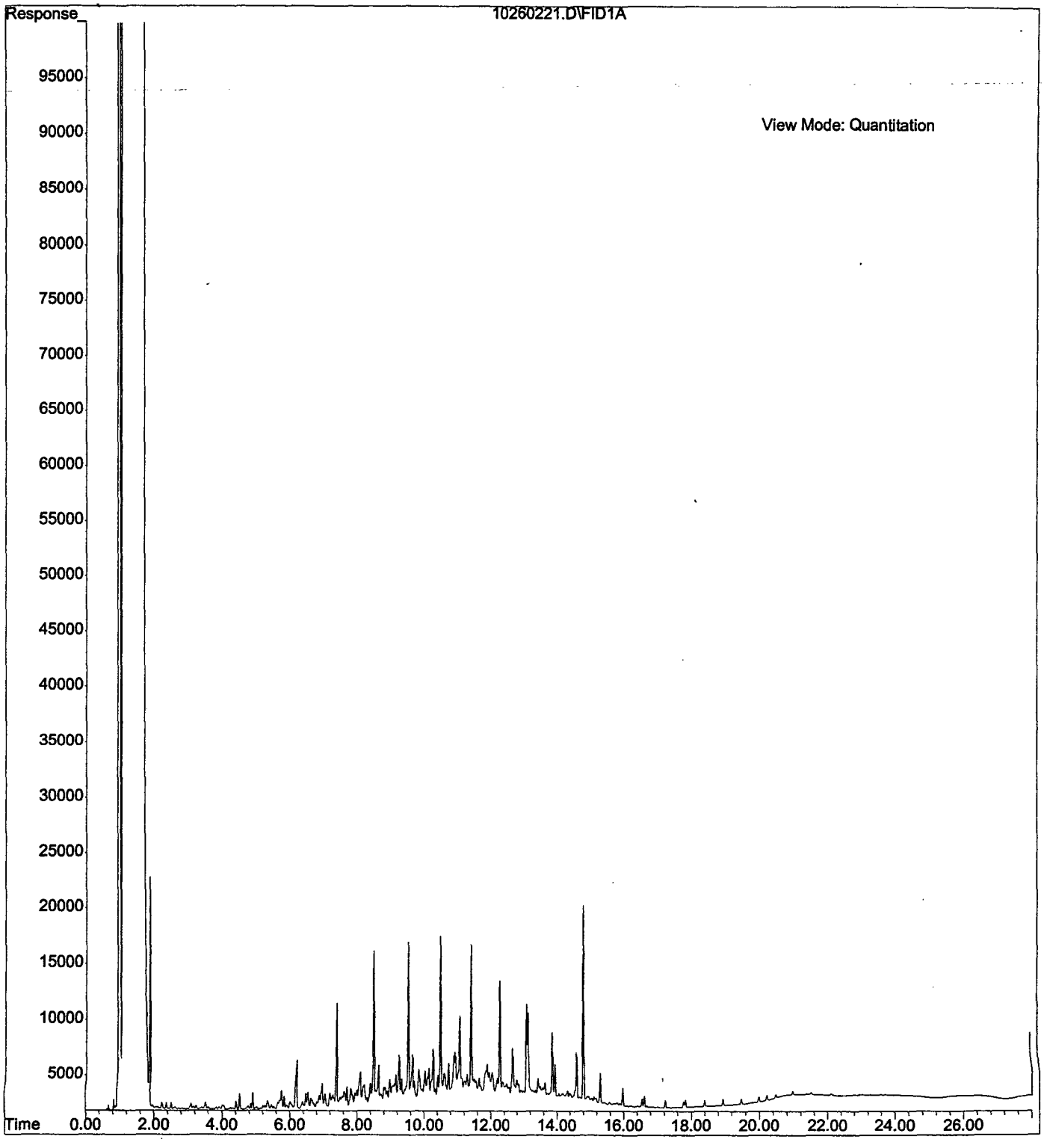
RELINQUISHED BY: 2.
Signature: Chanda Thacker Time: 9:30
Printed Name: ChandaThacker Date: 10/8/02
Company: AESE

RECEIVED BY: (LAB) 2.
Signature: Francine Time: 1655
Printed Name: Francine Tonvio Date: 10/8/02
Pinnacle Laboratories Inc.

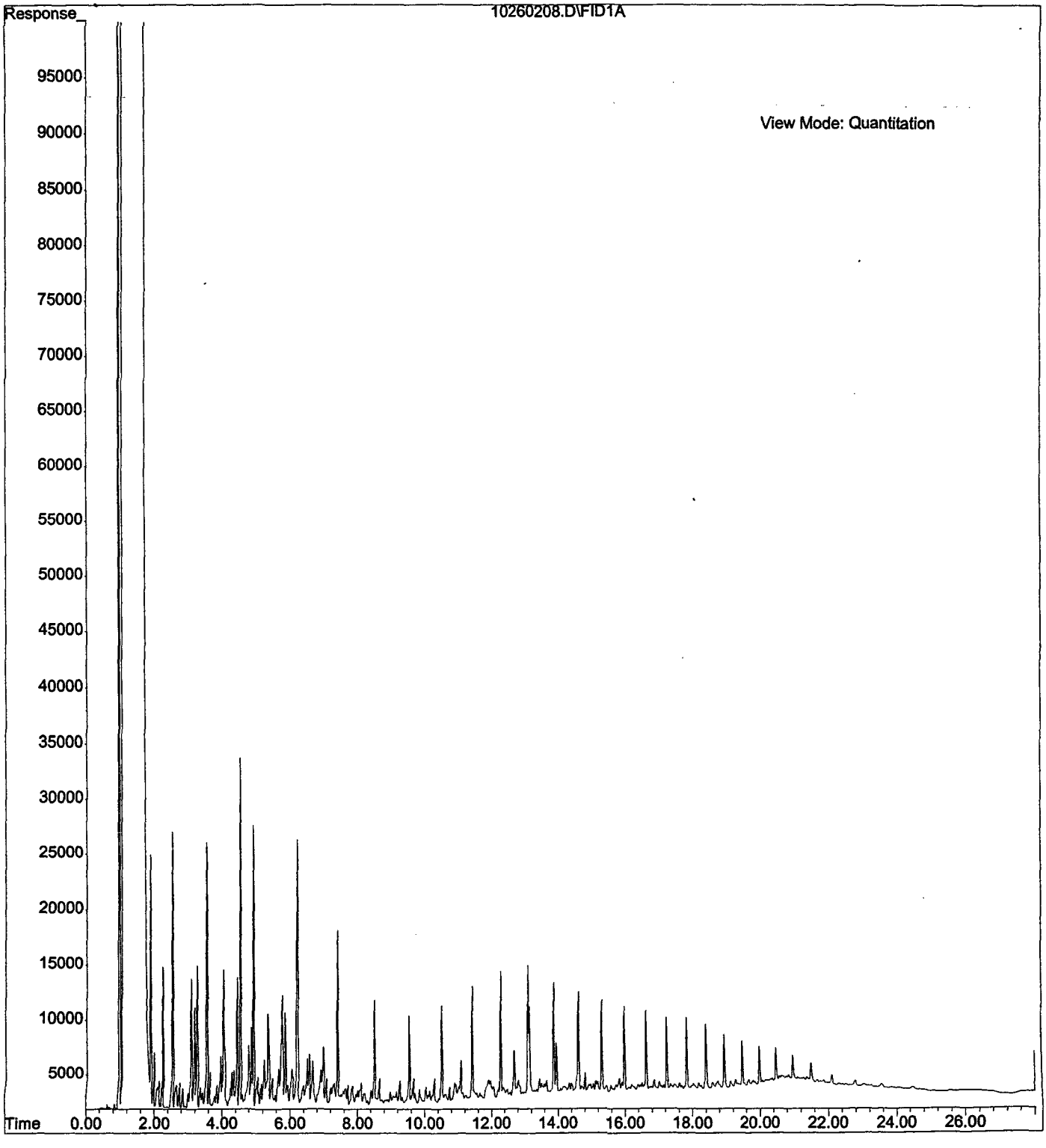
File : C:\HPCHEM\2\DATA\102602A\10260222.D
Operator : ccm
Acquired : 27 Oct 2002 7:13 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: gas ccv
Misc Info : GC4-60-19 (200 ug/ml)
Vial Number: 2



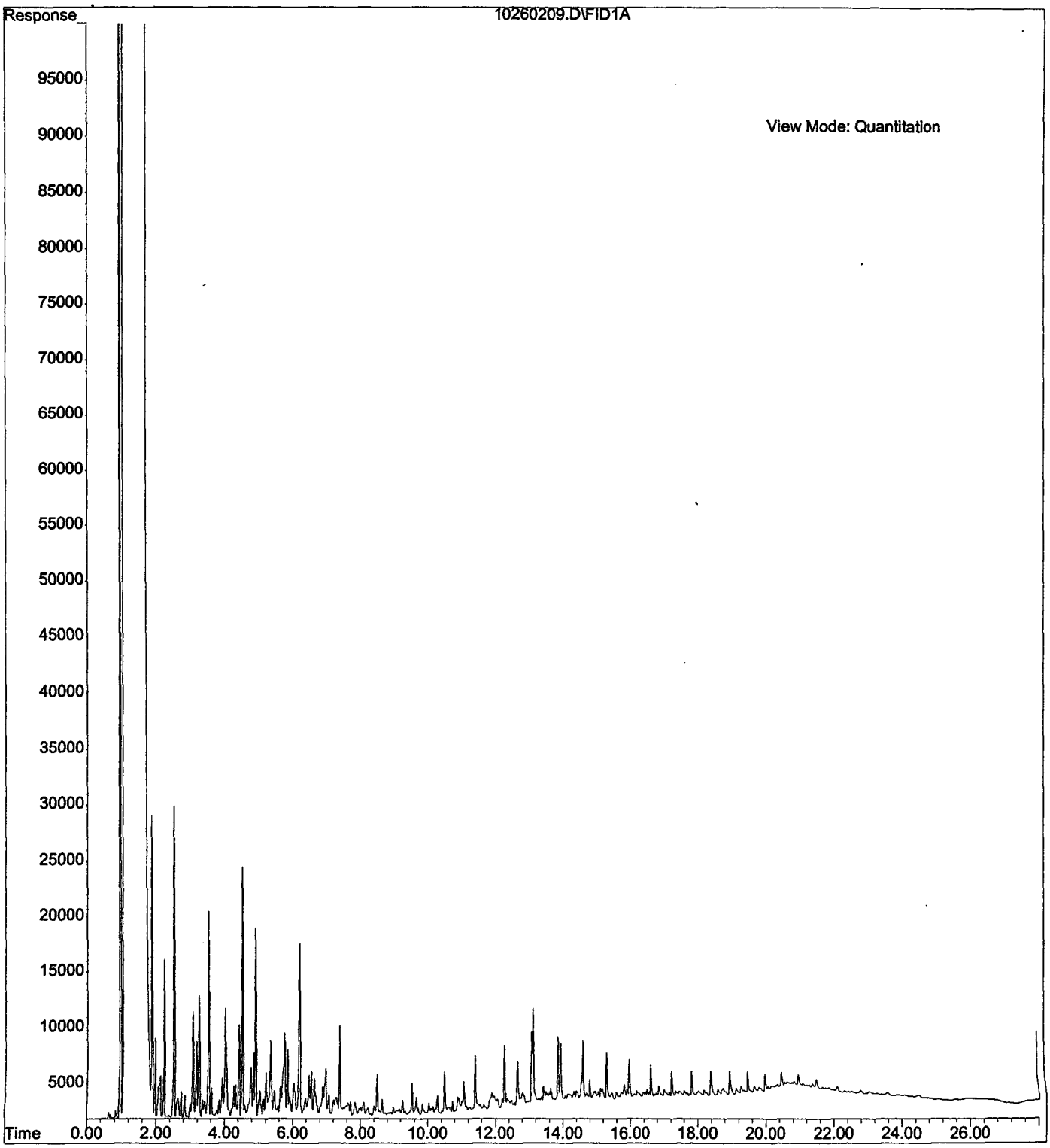
File : C:\HPCHEM\2\DATA\102602A\10260221.D
Operator : ccm
Acquired : 27 Oct 2002 6:33 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: dsl ccv
Misc Info : GC4-60-17 (200 ug/ml)
Vial Number: 3



File : C:\HPCHEM\2\DATA\102602A\10260208.D
Operator : ccm
Acquired : 26 Oct 2002 21:47 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210045-03 rr (10x)
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 8



File : C:\HPCHEM\2\DATA\102602A\10260209.D
Operator : ccm
Acquired : 26 Oct 2002 22:27 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210045-04 rr (10x)
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 9



PINNACLE LABORATORIES

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Pinnacle Lab ID number **210106**
November 12, 2002

AESE
906 SAN JUAN BLVD. SUITE D
FARMINGTON, NM 87401

GIANT INDUSTRIES
P.O. BOX 159
BLOOMFIELD, NM 87401

Project Name BLOOMFIELD CRUDE STN.
Project Number 6171

Attention: MARTIN NEE/TIM KINNEY

On 10/24/02 Pinnacle Laboratories, Inc., (ADHS License No. AZ0592 pending), received a request to analyze **non-aq** 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.

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: jt

Enclosure

PINNACLE LABORATORIES

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CLIENT	: AESE	PINNACLE ID	: 210106
PROJECT #	: 6171	DATE RECEIVED	: 10/24/02
PROJECT NAME	: BLOOMFIELD CRUDE STN.	REPORT DATE	: 11/12/02

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
210106 - 01	MP-11 12'	NON-AQ	10/21/02
210106 - 02	MP-8 9'	NON-AQ	10/21/02
210106 - 03	IP-12 12'	NON-AQ	10/21/02

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED
CLIENT : AESE
PROJECT # : 6171
PROJECT NAME : BLOOMFIELD CRUDE STN.

PINNACLE I.D.: 210106

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
	MP-11 12'	NON-AQ	10/21/02	10/28/02	10/29/02	5
	MP-8 9'	NON-AQ	10/21/02	10/28/02	10/29/02	1
03	IP-12 12'	NON-AQ	10/21/02	10/28/02	10/29/02	5

PARAMETER	DET. LIMIT	UNITS	MP-11 12'	MP-8 9'	IP-12 12'
BENZENE	0.025	**MG/KG**	**2.9**	< 0.025	< 0.13
TOLUENE	0.025	MG/KG	< 0.13	< 0.025	< 0.13
ETHYLBENZENE	0.025	**MG/KG**	**5.8**	< 0.025	**2.1**
TOTAL XYLENES	0.050	**MG/KG**	**36**	< 0.050	**16**
SURROGATE:					
BROMOFLUOROBENZENE (%)			S3	90	S3
SURROGATE LIMITS	(65 - 120)				

CHEMIST NOTES:
S3 = Surrogates were diluted out.

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 210106
LANK I. D.	: 102802	DATE EXTRACTED	: 10/28/02
LIENT	: AESE	DATE ANALYZED	: 10/29/02
ROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
ROJECT NAME	: BLOOMFIELD CRUDE STN.		

PARAMETER	UNITS	
ENZENE	MG/KG	<0.025
LUENE	MG/KG	<0.025
HYLBENZENE	MG/KG	<0.025
TAL XYLENES	MG/KG	<0.050

RROGATE:
OMOFLUOROBENZENE (%) 95
SURROGATE LIMITS: (80 - 120)
EMIST NOTES:

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 210106
ATCH #	: 102802	DATE EXTRACTED	: 10/28/02
CLIENT	: AESE	DATE ANALYZED	: 10/29/02
ROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
ROJECT NAME	: BLOOMFIELD CRUDE STN.	UNITS	: MG/KG

RAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
NZENE	<0.025	1.00	0.88	88	0.89	89	1	(68 - 120)	20
OLUENE	<0.025	1.00	0.87	87	0.90	90	3	(64 - 120)	20
THYLBENZENE	<0.025	1.00	0.89	89	0.91	91	2	(49 - 127)	20
TAL XYLENES	<0.050	3.00	2.65	88	2.72	91	3	(58 - 120)	20

CHEMIST NOTES:

$$\%\text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{(Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 210106
MSMSD #	: 210106-02	DATE EXTRACTED	: 10/28/02
CLIENT	: AESE	DATE ANALYZED	: 10/29/02
ROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
ROJECT NAME	: BLOOMFIELD CRUDE STN.	UNITS	: MG/KG

ARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
ENZENE	<0.025	1.00	0.84	84	0.84	84	0	(68 - 120)	20
OLUENE	<0.025	1.00	0.85	85	0.85	85	0	(64 - 120)	20
THYLBENZENE	<0.025	1.00	0.86	86	0.87	87	1	(49 - 127)	20
OTAL XYLENES	<0.050	3.00	2.59	86	2.61	87	1	(58 - 120)	20

HEMIST NOTES:

A

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : AESE PINNACLE I.D.: 210106
PROJECT # : 6171
PROJECT NAME : BLOOMFIELD CRUDE STN.

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MP-11 12'	NON-AQ	10/21/02	10/31/02	11/06/02	1
02	MP-8 9'	NON-AQ	10/21/02	10/31/02	11/05/02	1
03	IP-12 12'	NON-AQ	10/21/02	10/31/02	11/06/02	1

PARAMETER	DET. LIMIT	UNITS	MP-11 12'	MP-8 9'		IP-12 12'
FUEL HYDROCARBONS, C7-C10	10	**MG/KG**	**690**	< 10		**970**
FUEL HYDROCARBONS, C10-C22	10	**MG/KG**	**440**	< 10		**1100**
FUEL HYDROCARBONS, C22-C36	50	**MG/KG**	**160**	< 50	**R3**	**400**
CALCULATED SUM:			**1290**			**2470**
SURROGATE:						
O-TERPHENYL (%)			105	103		95
SURROGATE LIMITS	(66 - 151)					

CHEMIST NOTES:
R3 = Reporting limit raised due to initial calibration limits.

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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 210106
BLANK I.D.	: 103102	DATE EXTRACTED	: 10/31/02
CLIENT	: AESE	DATE ANALYZED	: 11/05/02
PROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STN.		

PARAMETER	UNITS		
FUEL HYDROCARBONS, C7-C10	MG/KG	< 10	
FUEL HYDROCARBONS, C10-C22	MG/KG	< 10	
FUEL HYDROCARBONS, C22-C36	MG/KG	< 50	**R3**
SURROGATE:			
O-TERPHENYL (%)		98	
SURROGATE LIMITS	(80 - 151)		

CHEMIST NOTES:
R3 = Reporting limit raised due to initial calibration limits.

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 210106
BATCH #	: 103102	DATE EXTRACTED	: 10/31/02
CLIENT	: AESE	DATE ANALYZED	: 11/05/02
PROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STN.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
FUEL HYDROCARBONS	<10	200	232	116	235	118	1	(56 - 148)	20

CHEMIST NOTES:
NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
MSMSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 210106
MSMSD #	: 210106-02	DATE EXTRACTED	: 10/31/02
CLIENT	: AESE	DATE ANALYZED	: 11/05/02
PROJECT #	: 6171	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STN.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
FUEL HYDROCARBONS	<10	200	236	118	236 *	118	0	(56 - 148)	20

CHEMIST NOTES:
* = 210106-02 MSD analyzed on 11/06/02.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 10/24/02 PAGE: 1 OF 1

PLI Accession #: 210106

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: Martin Nee

COMPANY: AESE
ADDRESS: 906 San Juan Blvd Ste D
Farmington, NM 87401
PHONE: 505 566 9116
FAX: 505 566 9120

BILL TO: Tim Kinney
COMPANY: Giant
ADDRESS: PO Box 159
Bloomfield, NM 87401

ANALYSIS REQUEST

SAMPLE ID		DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject		(M8015) Gas/Purge & Trap	8021 (BTEX) ~~8015 (Gasoline) MTBE~~	8021 (BTEX) ☐MTBE ☐TMB ☐PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
MP-11	12'	10-21-02	1325	soil	01		X			X																					1
MP-8	9'	10-21-02	1205	soil	02		X			X																					1
IP-12	12'	10-21-02	1412	soil	03		X			X																					1

PROJECT INFORMATION	
PROJ. NO.:	6171
PROJ. NAME:	Bloomfield Crude Stn
P.O. NO.:	
SHIPPED VIA:	Grey Hound Bus

SAMPLE RECEIPT	
NO CONTAINERS	3
CUSTODY SEALS	Y/N/(NA)
RECEIVED INTACT	Yes
BLUE ICE/ICE	4.8°C

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐24hr ☐48hr ☐72hr ☐1 WEEK (NORMAL) ☑

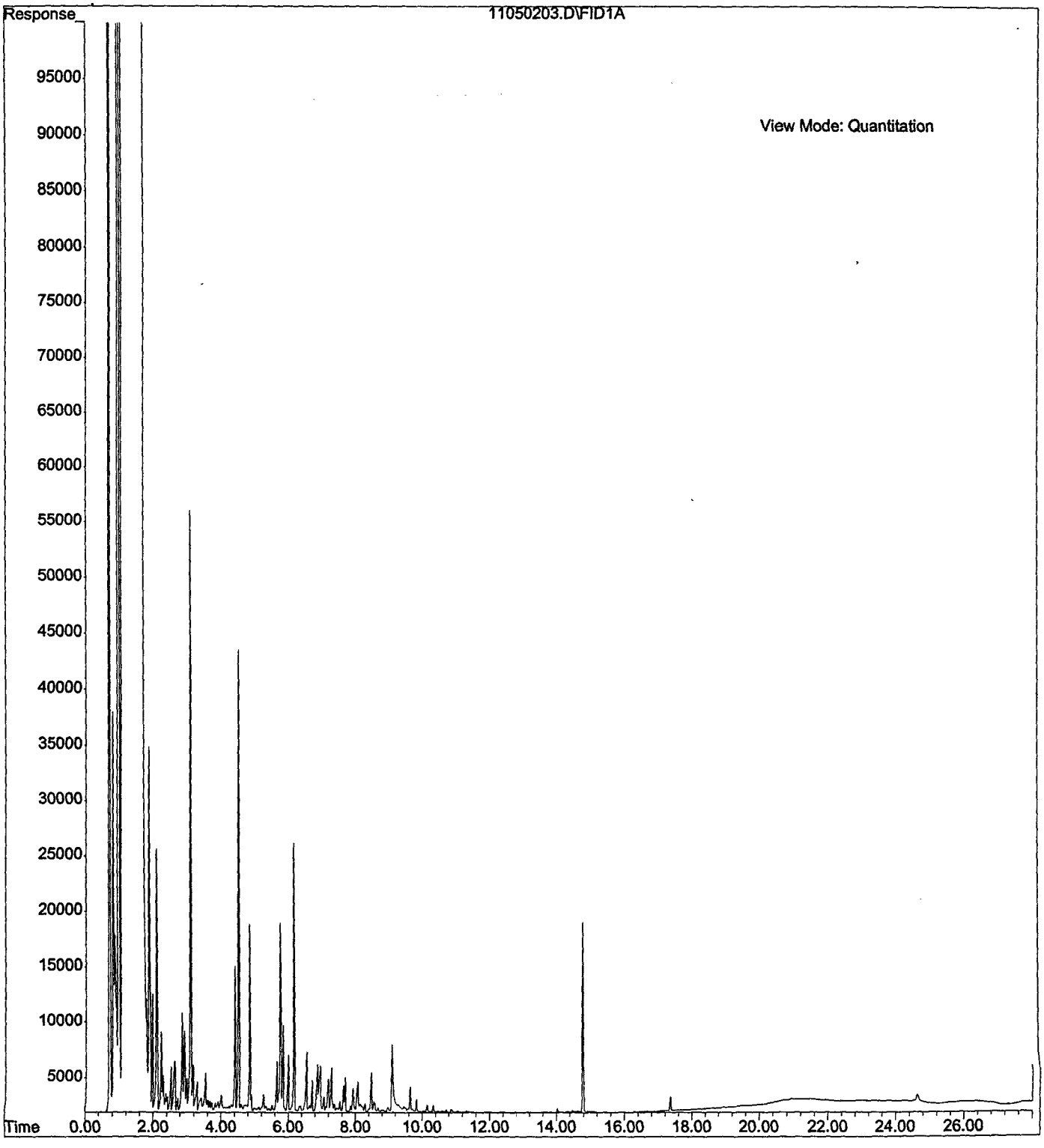
CERTIFICATION REQUIRED ☐NM ☐SDWA ☐OTHER

METHANOL PRESERVATION ☐

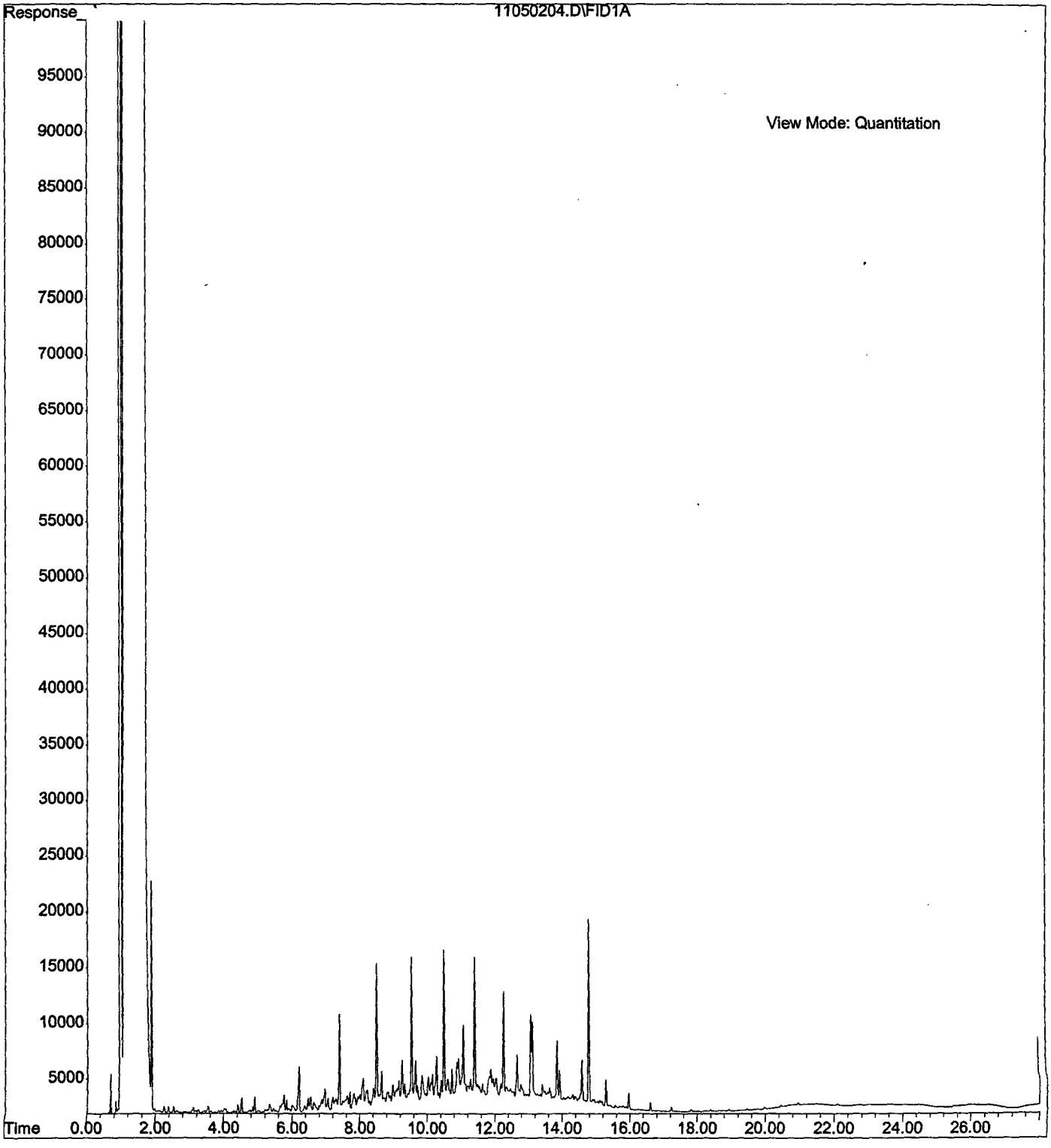
COMMENTS: FIXED FEE ☐

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Ashley Lowe Time: 9:00	Signature: Time:
Printed Name: Ashley Lowe Date: 10/24/02	Printed Name: Date:
Company: AESE	Company:
See reverse side (Force Majeure)	
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Time: 1630
Printed Name: Date:	Printed Name: Date: 10/24/02
Company:	Pinnacle Laboratories Inc.

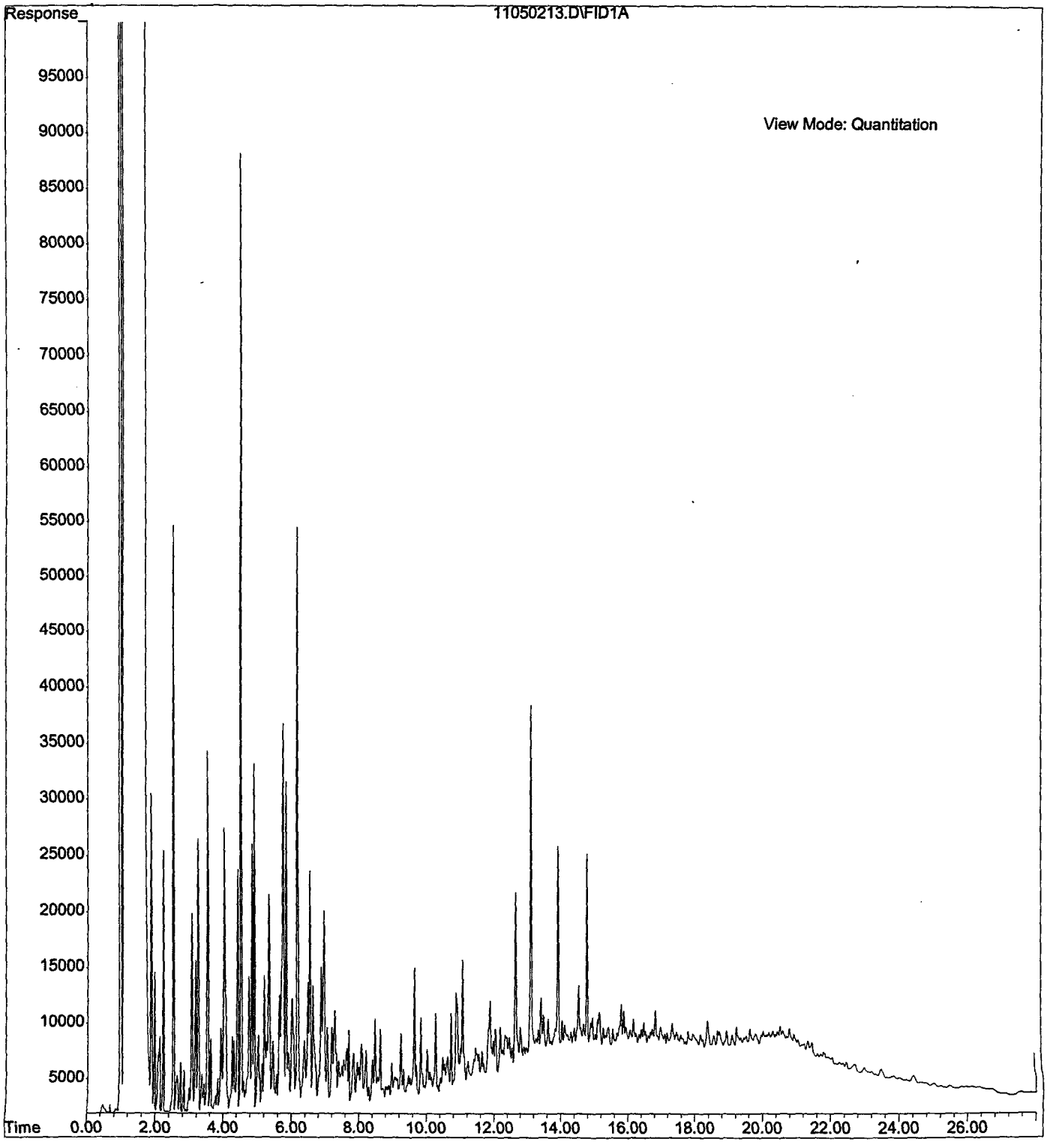
File : C:\HPCHEM\2\DATA\110502A\11050203.D
Operator : ccm
Acquired : 5 Nov 2002 18:04 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: gas ccv
Misc Info : GC4-65-15 (200 ug/ml)
Vial Number: 3



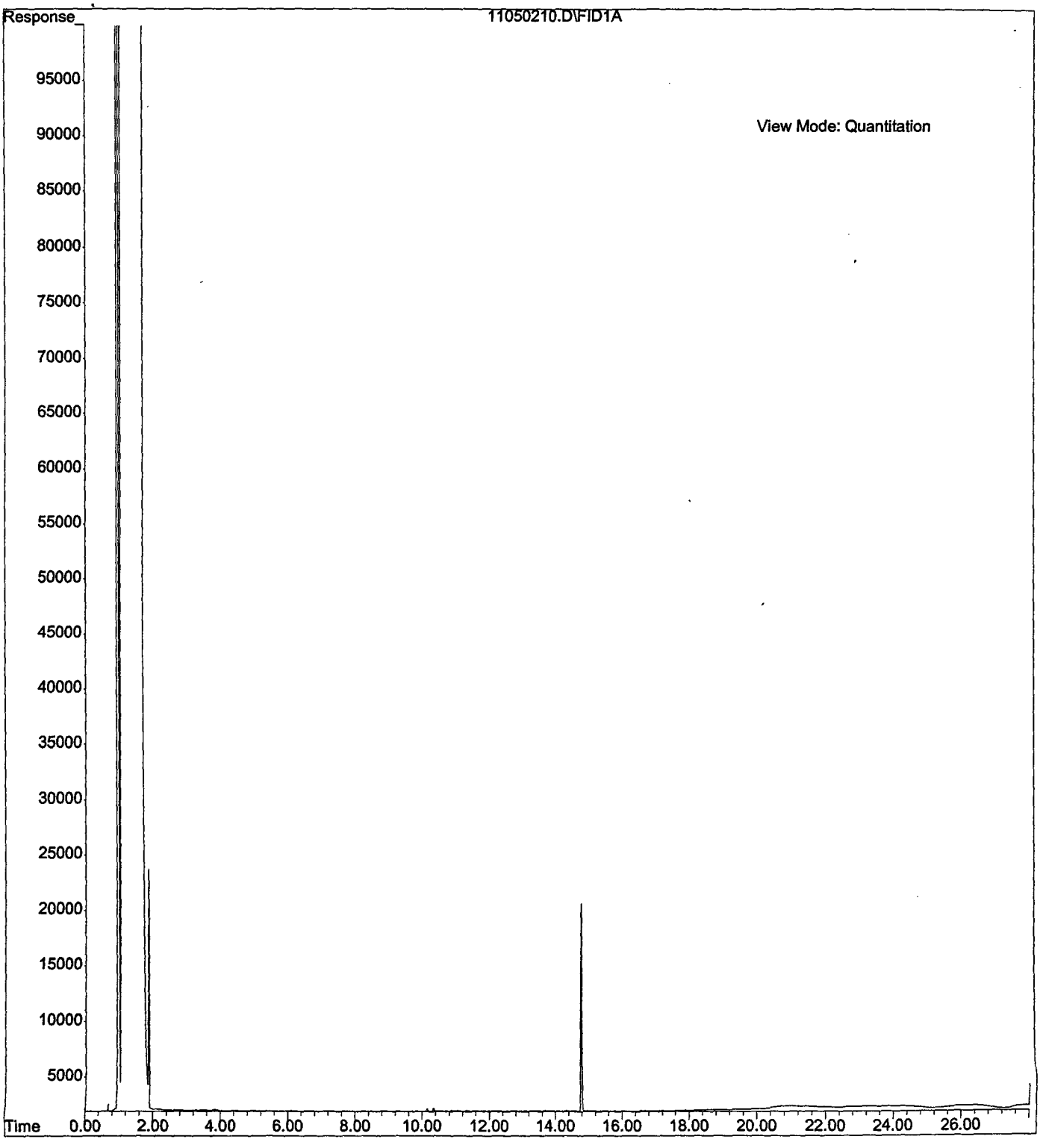
File : C:\HPCHEM\2\DATA\110502A\11050204.D
Operator : ccm
Acquired : 5 Nov 2002 18:45 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: dsl ccv
Misc Info : GC4-65-13 (200 ug/ml)
Vial Number: 4



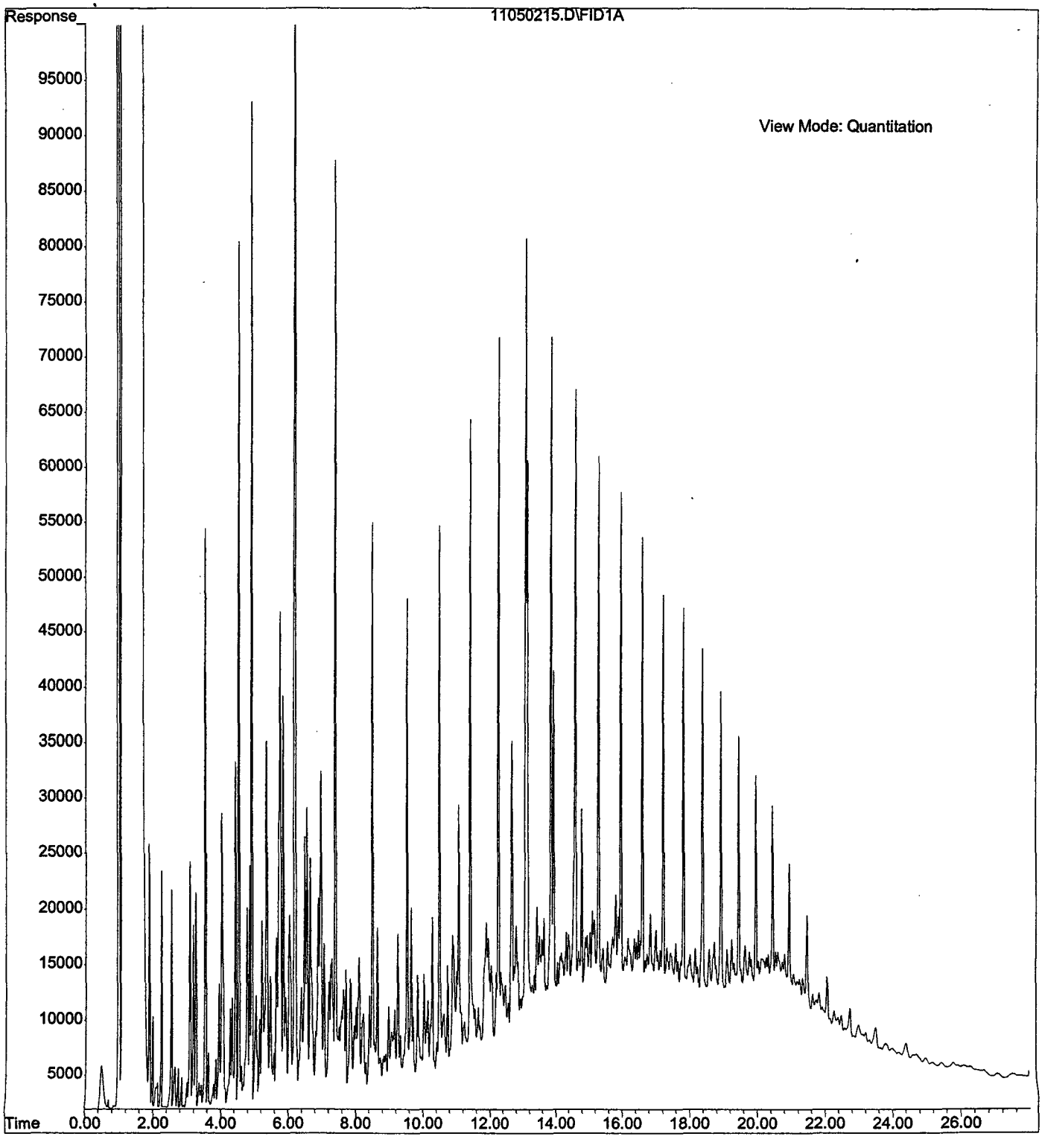
File : C:\HPCHEM\2\DATA\110502A\11050213.D
Operator : ccm
Acquired : 6 Nov 2002 00:48 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210106-01 (1x)
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 13



File : C:\HPCHEM\2\DATA\110502A\11050210.D
Operator : ccm
Acquired : 5 Nov 2002 22:47 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210106-02
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 10



File : C:\HPCHEM\2\DATA\110502A\11050215.D
Operator : ccm
Acquired : 6 Nov 2002 2:08 using AcqMethod TXDAVE.M
Instrument : FID-1
Sample Name: 210106-03 (1x)
Misc Info : soil - (25ul GC4-65-12)
Vial Number: 15



PINNACLE LABORATORIES

2709-D Pan American Freeway NE
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Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **310123**
November 06, 2003

LODESTAR
26 CR 3500
FLORA VISTA, NM 87415

GIANT INDUSTRIES
111 COUNTY ROAD 4990
BLOOMFIELD, NM 87413

Project Name BLOOMFIELD CRUDE STA.
Project Number (NONE)

Attention: MARTIN NEE/TIM KINNEY

On 10/22/03 Pinnacle Laboratories Inc., (ADHS Lincense No. AZ0643), received a request to analyze **non-aq** 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.

H. Mitchell Rubenstein, Ph.D.
General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure

PINNACLE LABORATORIES

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Fax (505) 344-4413

CLIENT	: LODESTAR	PINNACLE ID	: 310123
PROJECT #	: (NONE)	DATE RECEIVED	: 10/22/03
PROJECT NAME	: BLOOMFIELD CRUDE STA.	REPORT DATE	: 11/06/03

PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
310123 - 01	MP-11-12'	NON-AQ	10/21/03
310123 - 02	IP-16-9'	NON-AQ	10/21/03
310123 - 03	MP-8-9'	NON-AQ	10/21/03
310123 - 04	IP-12-12'	NON-AQ	10/21/03
310123 - 05	IP-7-12'	NON-AQ	10/21/03
310123 - 06	MP-3-6'	NON-AQ	10/21/03
310123 - 07	MP-7-6'	NON-AQ	10/21/03
310123 - 08	IP-10-6'	NON-AQ	10/21/03

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
Phone (505) 344-3777
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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED / 8015B GRO
CLIENT : LODESTAR — PINNACLE I.D. : 310123
PROJECT # : (NONE) — ANALYST : BP
PROJECT NAME : BLOOMFIELD CRUDE STA.

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MP-11-12'	NON-AQ	10/21/03	10/23/03	10/23/03	1
02	IP-16-9'	NON-AQ	10/21/03	10/23/03	10/23/03	1
03	MP-8-9'	NON-AQ	10/21/03	10/23/03	10/24/03	1

PARAMETER	DET. LIMIT	UNITS	MP-11-12'	IP-16-9'	MP-8-9'
FUEL HYDROCARBONS	10	MG/KG	< 10	< 10	< 10
HYDROCARBON RANGE			C6-C10	C6-C10	C6-C10
HYDROCARBONS QUANTITATED USING			GASOLINE	GASOLINE	GASOLINE
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	0.050	MG/KG	< 0.050	< 0.050	< 0.050
SURROGATE:					
BROMOFLUOROBENZENE (%)			97	91	93
SURROGATE LIMITS	(65 - 120)				

CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED / 8015B GRO
CLIENT : LODESTAR — PINNACLE I.D. : 310123
PROJECT # : (NONE) — ANALYST : BP
PROJECT NAME : BLOOMFIELD CRUDE STA.

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	IP-12-12'	NON-AQ	10/21/03	10/23/03	10/24/03	1
05	IP-7-12'	NON-AQ	10/21/03	10/23/03	10/24/03	1
06	MP-3-6'	NON-AQ	10/21/03	10/23/03	10/24/03	1

PARAMETER	DET. LIMIT	UNITS	IP-12-12'	IP-7-12'	MP-3-6'
FUEL HYDROCARBONS	**10**	**MG/KG**	< 10	**78**	< 10
HYDROCARBON RANGE			C6-C10	**C6-C10**	C6-C10
HYDROCARBONS QUANTITATED USING			GASOLINE	**GASOLINE**	GASOLINE
BENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOLUENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	**0.050**	**MG/KG**	< 0.050	**0.29**	< 0.050
SURROGATE:					
BROMOFLUOROBENZENE (%)			89	110	91
SURROGATE LIMITS	(65 - 120)				

CHEMIST NOTES:
N/A

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021B MODIFIED / 8015B GRO
CLIENT : LODESTAR — PINNACLE I.D. : 310123
PROJECT # : (NONE) — ANALYST : BP
PROJECT NAME : BLOOMFIELD CRUDE STA.

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
07	MP-7-6'	NON-AQ	10/21/03	10/23/03	10/24/03	50
08	IP-10-6'	NON-AQ	10/21/03	10/23/03	10/24/03	1

PARAMETER	DET. LIMIT	UNITS	MP-7-6'	IP-10-6'
FUEL HYDROCARBONS	**10**	**MG/KG**	**1700**	< 10
HYDROCARBON RANGE			**C6-C10**	C6-C10
HYDROCARBONS QUANTITATED USING			**GASOLINE**	GASOLINE
BENZENE	**0.025**	**MG/KG**	**3.5**	< 0.025
TOLUENE	0.025	MG/KG	< 1.3	< 0.025
ETHYLBENZENE	**0.025**	**MG/KG**	**10**	< 0.025
TOTAL XYLENES	**0.050**	**MG/KG**	**89**	< 0.050
SURROGATE:				
BROMOFLUOROBENZENE (%)			**S3**	95
SURROGATE LIMITS	(65 - 120)			

CHEMIST NOTES:
S3 = Surrogate was diluted out.

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GAS CHROMATOGRAPHY RESULTS
EXTRACTION BLANK

TEST	: EPA 8021 MODIFIED / 8015B GRO	PINNACLE I.D.	: 310123
BLANK I.D.	: 102303	DATE EXTRACTED	: 10/23/03
CLIENT	: LODESTAR	DATE ANALYZED	: 10/23/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STA.	ANALYST	: BP

PARAMETER	UNITS	
FUEL HYDROCARBONS	MG/KG	<10
HYDROCARBON RANGE		C6-C10
HYDROCARBONS QUANTITATED USING		GASOLINE
BENZENE	MG/KG	<0.025
TOLUENE	MG/KG	<0.025
ETHYLBENZENE	MG/KG	<0.025
TOTAL XYLENES	MG/KG	<0.050
SURROGATE:		
BROMOFLUOROBENZENE (%)		94
SURROGATE LIMITS (80 - 120)		

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8015B GRO	PINNACLE I.D.	: 310123
BATCH #	: 102303	DATE EXTRACTED	: 10/23/03
CLIENT	: LODESTAR	DATE ANALYZED	: 10/23/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STA.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
FUEL HYDROCARBONS	<10	50.0	50.1	100	51.4	103	3	(70-130)	20
HYDROCARBON RANGE		C6-C10							

HYDROCARBONS QUANTITATED USING GASOLINE

CHEMIST NOTES:
N/A

$$\frac{\text{(Spike Sample Result - Sample Result)}}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{\text{(Sample Result - Duplicate Result)}}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310123
BATCH #	: 102303	DATE EXTRACTED	: 10/23/03
CLIENT	: LODESTAR	DATE ANALYZED	: 10/23/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STA.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.03	103	1.04	104	1	(68 - 120)	20
TOLUENE	<0.025	1.00	1.01	101	1.03	103	2	(64 - 120)	20
ETHYLBENZENE	<0.025	1.00	1.04	104	1.06	106	2	(49 - 127)	20
TOTAL XYLENES	<0.050	3.00	3.10	103	3.19	106	3	(58 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

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GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

TEST	: EPA 8015B GRO	PINNACLE I.D.	: 310123
MSMSD #	: 310125-02	DATE EXTRACTED	: 10/25/03
CLIENT	: LODESTAR	DATE ANALYZED	: 10/25/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STA.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
FUEL HYDROCARBONS	43	50.0	122	158-**M1**	129	172-**M1**	6	(70-130)	20
HYDROCARBON RANGE		C6-C10							

HYDROCARBONS QUANTITATED USING GASOLINE

CHEMIST NOTES:

$$\frac{\text{(Spike Sample Result - Sample Result)}}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{\text{(Sample Result - Duplicate Result)}}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY QUALITY CONTROL
MS/MSD

TEST	: EPA 8021B MODIFIED	PINNACLE I.D.	: 310123
MSMSD #	: 310125-02	DATE EXTRACTED	: 10/23/03
CLIENT	: LODESTAR	DATE ANALYZED	: 10/24/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STA.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	0.941	94	1.01	101	7	(68 - 120)	20
TOLUENE	<0.025	1.00	1.15	115	1.07	107	7	(64 - 120)	20
ETHYLBENZENE	<0.025	1.00	1.08	108	1.24	124	14	(49 - 127)	20
TOTAL XYLENES	0.21	3.00	3.47	109	3.91	123-**M4**	12	(58 - 120)	20

CHEMIST NOTES:
M4 = % REC is outside of PLI criteria.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : LODESTAR — PINNACLE I.D. : 310123
PROJECT # : (NONE) — ANALYST : VPH
PROJECT NAME : BLOOMFIELD CRUDE STA.

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	MP-11-12'	NON-AQ	10/21/03	10/24/03	10/27/03	1
02	IP-16-9'	NON-AQ	10/21/03	10/24/03	10/28/03	2
03	MP-8-9'	NON-AQ	10/21/03	10/24/03	10/28/03	1

PARAMETER	DET. LIMIT	UNITS	MP-11-12'	IP-16-9'	MP-8-9'
FUEL HYDROCARBONS, C6-C10	10	MG/KG	< 10	< 20	< 10
FUEL HYDROCARBONS, C10-C22	10	**MG/KG**	**68**	**1500**	< 10
FUEL HYDROCARBONS, C22-C36	10	**MG/KG**	**89**	**1100**	< 10
CALCULATED SUM:			**157**	**2600**	
SURROGATE:					
O-TERPHENYL (%)			82	76	76
SURROGATE LIMITS	(70-130)				

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : LODESTAR — PINNACLE I.D. : 310123
PROJECT # : (NONE) — ANALYST : VPH
PROJECT NAME : BLOOMFIELD CRUDE STA.

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
04	IP-12-12'	NON-AQ	10/21/03	10/24/03	10/27/03	1
05	IP-7-12'	NON-AQ	10/21/03	10/24/03	10/27/03	1
06	MP-3-6'	NON-AQ	10/21/03	10/24/03	10/28/03	1

PARAMETER	DET. LIMIT	UNITS	IP-12-12'	IP-7-12'	MP-3-6'
FUEL HYDROCARBONS, C6-C10	10	**MG/KG**	< 10	**79**	< 10
FUEL HYDROCARBONS, C10-C22	10	**MG/KG**	**390**	**730**	**190**
FUEL HYDROCARBONS, C22-C36	10	**MG/KG**	**330**	**490**	**210**
CALCULATED SUM:			**720**	**1299**	**400**
SURROGATE:					
O-TERPHENYL (%)			81	72	71
SURROGATE LIMITS	(70-130)				

CHEMIST NOTES:
N/A

PINNACLE LABORATORIES

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Albuquerque, New Mexico 87107
Phone (505) 344-3777
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GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8015 MODIFIED (DIRECT INJECT)
CLIENT : LODESTAR — PINNACLE I.D. : 310123
PROJECT # : (NONE) — ANALYST : VPH
PROJECT NAME : BLOOMFIELD CRUDE STA.

SAMPLE I.D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
07	MP-7-6'	NON-AQ	10/21/03	10/24/03	10/28/03	2
08	IP-10-6'	NON-AQ	10/21/03	10/24/03	10/28/03	1

PARAMETER	DET. LIMIT	UNITS	MP-7-6'	IP-10-6'
FUEL HYDROCARBONS, C6-C10	10	**MG/KG**	**1800**	< 10
FUEL HYDROCARBONS, C10-C22	10	**MG/KG**	**1700**	**11**
FUEL HYDROCARBONS, C22-C36	10	**MG/KG**	**1200**	**10**
CALCULATED SUM:			**4700**	**21**
SURROGATE:				
O-TERPHENYL (%)			84	93
SURROGATE LIMITS	(70-130)			

CHEMIST NOTES:
N/A

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Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL
MSMSD

TEST	: EPA 8015 MODIFIED (DIRECT INJECT)	PINNACLE I.D.	: 310123
MSMSD #	: 310126-01	DATE EXTRACTED	: 10/24/03
CLIENT	: LODESTAR	DATE ANALYZED	: 10/28/03
PROJECT #	: (NONE)	SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: BLOOMFIELD CRUDE STA.	UNITS	: MG/KG

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
FUEL HYDROCARBONS	<10	200	190	95	212	106	11	(70-130)	20

CHEMIST NOTES:
N/A

$$\frac{\text{(Spike Sample Result - Sample Result)}}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{\text{(Sample Result - Duplicate Result)}}{\text{Average Result}} \times 100$$

PINNACLE LABORATORIES

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 10-21-03 PAGE: 1 OF 1

PLI Accession #: 310123

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: M Nee

COMPANY: Lodestar
ADDRESS: 26 CR 3500
Flora Vista NM 87415
PHONE: 505 334 2791
FAX:

BILL TO: Tim Kings
COMPANY: Giant
ADDRESS: 111 Bm CR 4990
Bloomfield NM 87413

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline) MTBE	8021 (BTEX) ☐MTBE ☐TMB ☐PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides/PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
MP-11-12'	10-21-03	1300	Soil	-01		X		X																					1
IP-16-9'	10-21-03	1330		-02		X		X																					1
MP-8-9'	10-21-03	1400		-03		X		X																					1
IP-12-12'	10-21-03	1430		-04		X		X																					1
IP-7-12'	10-21-03	1500		-05		X		X																					1
MP-3-6'	10-21-03	1530		-06		X		X																					1
MP-7-6'	10-21-03	1600		-07		X		X																					1
IP-10-6'	10-21-03	1630	Soil	-08		X		X																					1

PROJECT INFORMATION

PROJ. NO.:
PROJ. NAME: Bloomfield Crude Sta.
P.O. NO.:
SHIPPED VIA: TRUCK

SAMPLE RECEIPT

NO CONTAINERS	9	
CUSTODY SEALS	(Y) N / NA	
RECEIVED INTACT	Y	
BLUE ICE/ICE	6.4°C	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐24hr ☐48hr ☐72hr ☐1 WEEK (NORMAL) ☒

CERTIFICATION REQUIRED ☐NM ☐SDWA ☐OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐
NO MTBE

RELINQUISHED BY: 1.

Signature: Time: 0650
Printed Name: MJ Nee Date: 10-21-03
Company:
See reverse side (Force Majeure)

RECEIVED BY: 1.

Signature: Time:
Printed Name: Date:
Company:

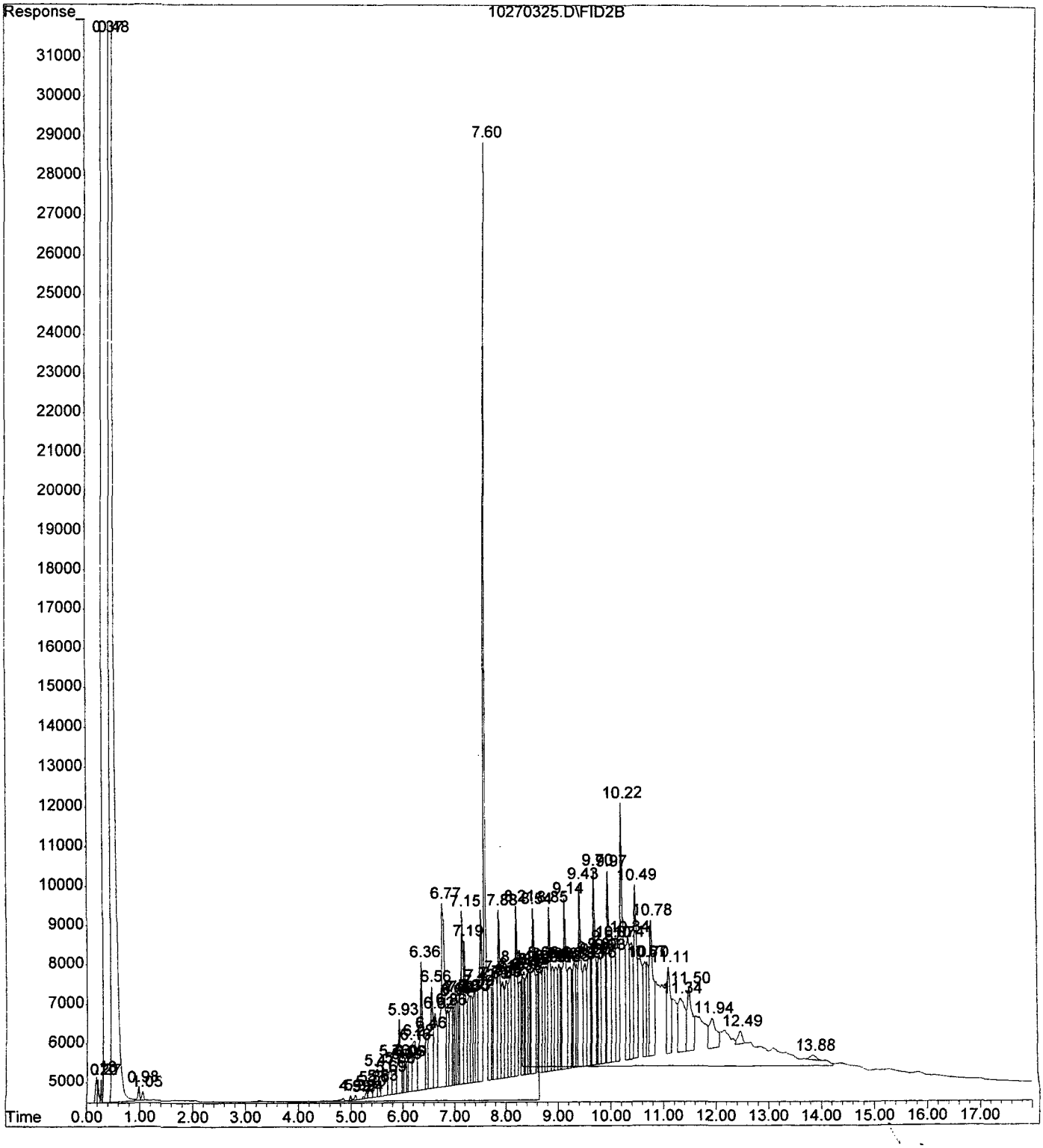
RELINQUISHED BY: 2.

Signature: Time:
Printed Name: Date:
Company:

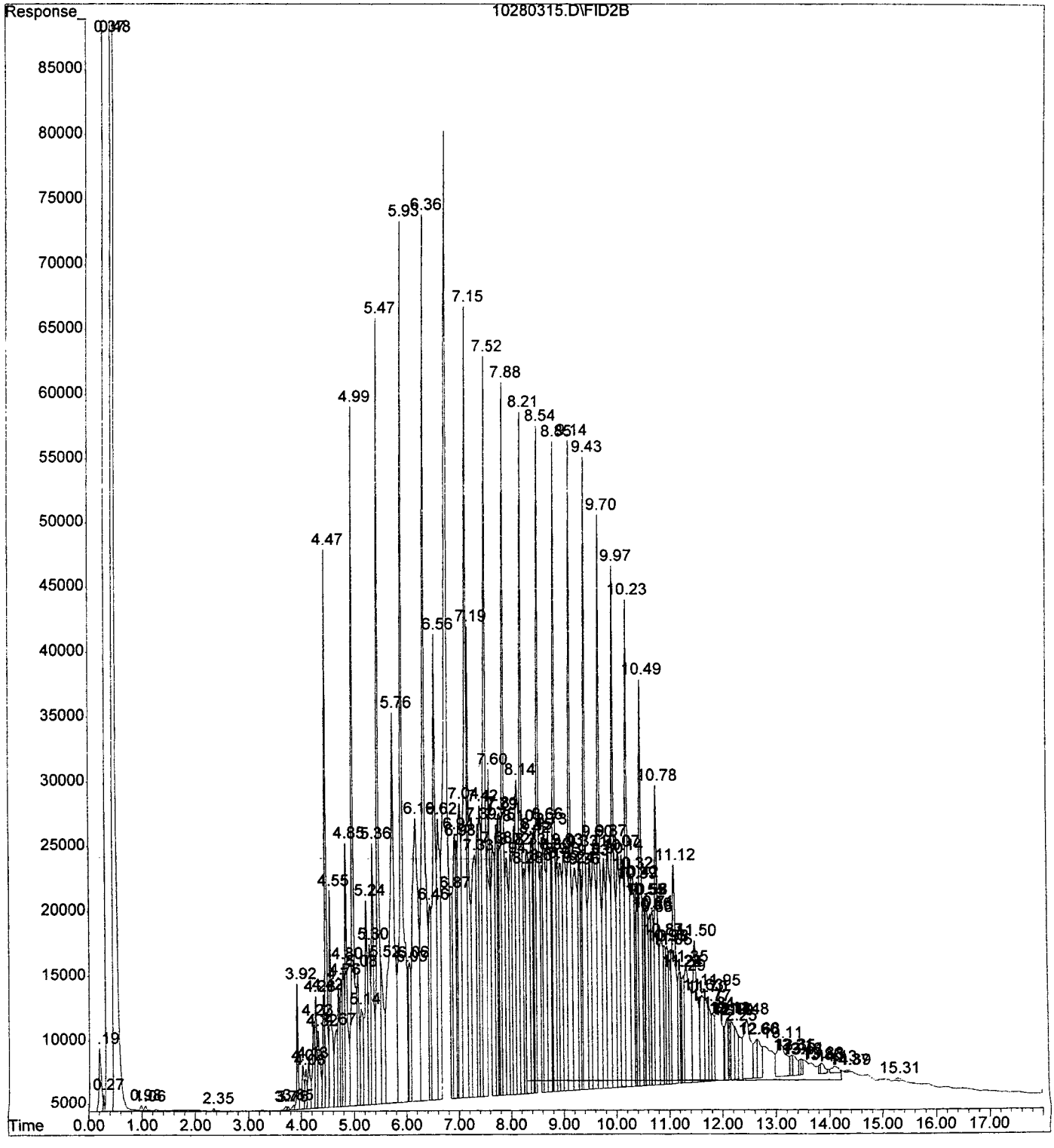
RECEIVED BY: (LAB) 2.

Signature: Time: 1600
Printed Name: Date: 10-22-03
Pinnacle Laboratories Inc.

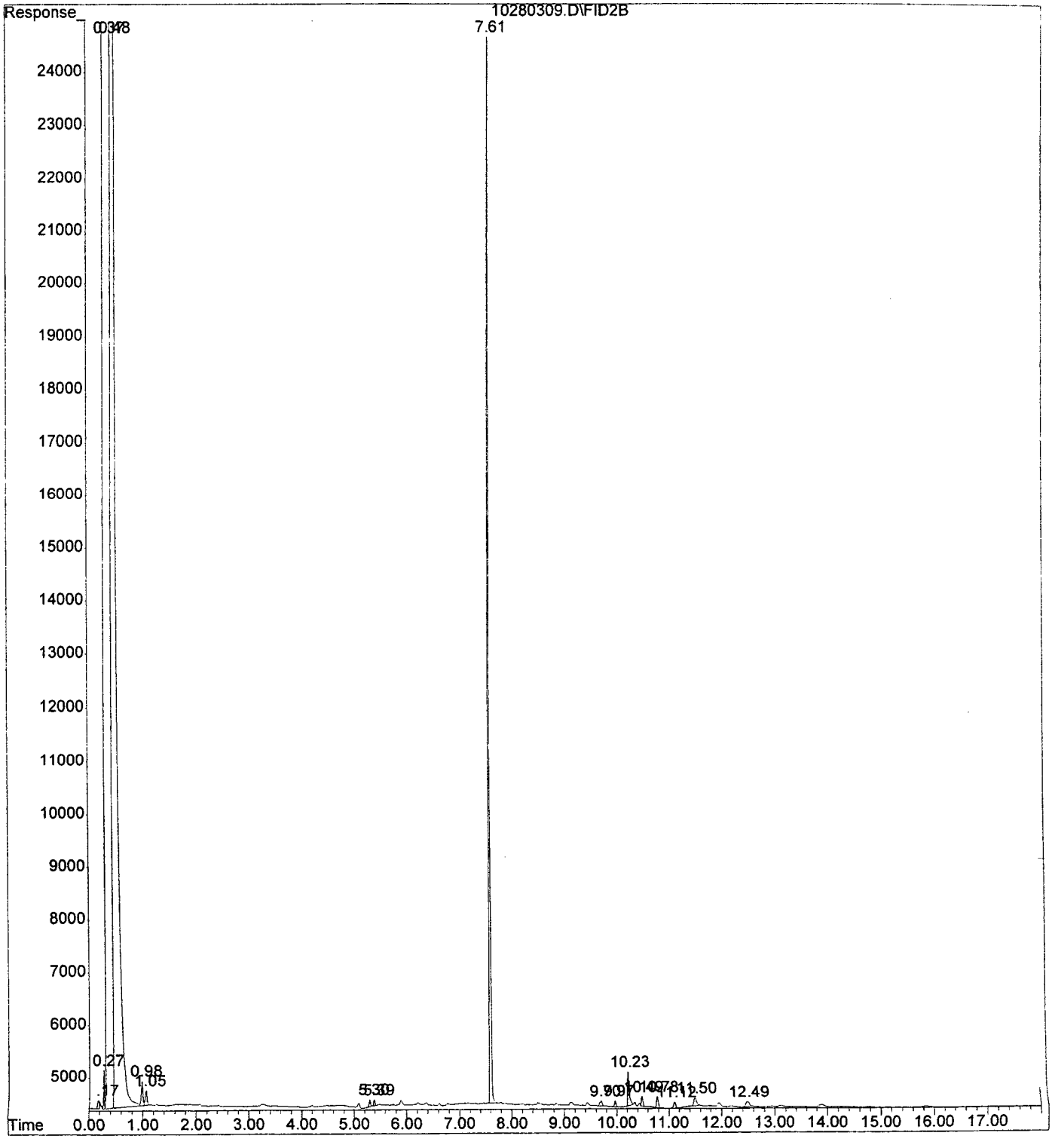
File : C:\HPCHEM\2\DATA\102703F\10270325.D
Operator : VPH
Acquired : 27 Oct 2003 21:29 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-01
Misc Info : 10G/10ML 10/24
Vial Number: 24



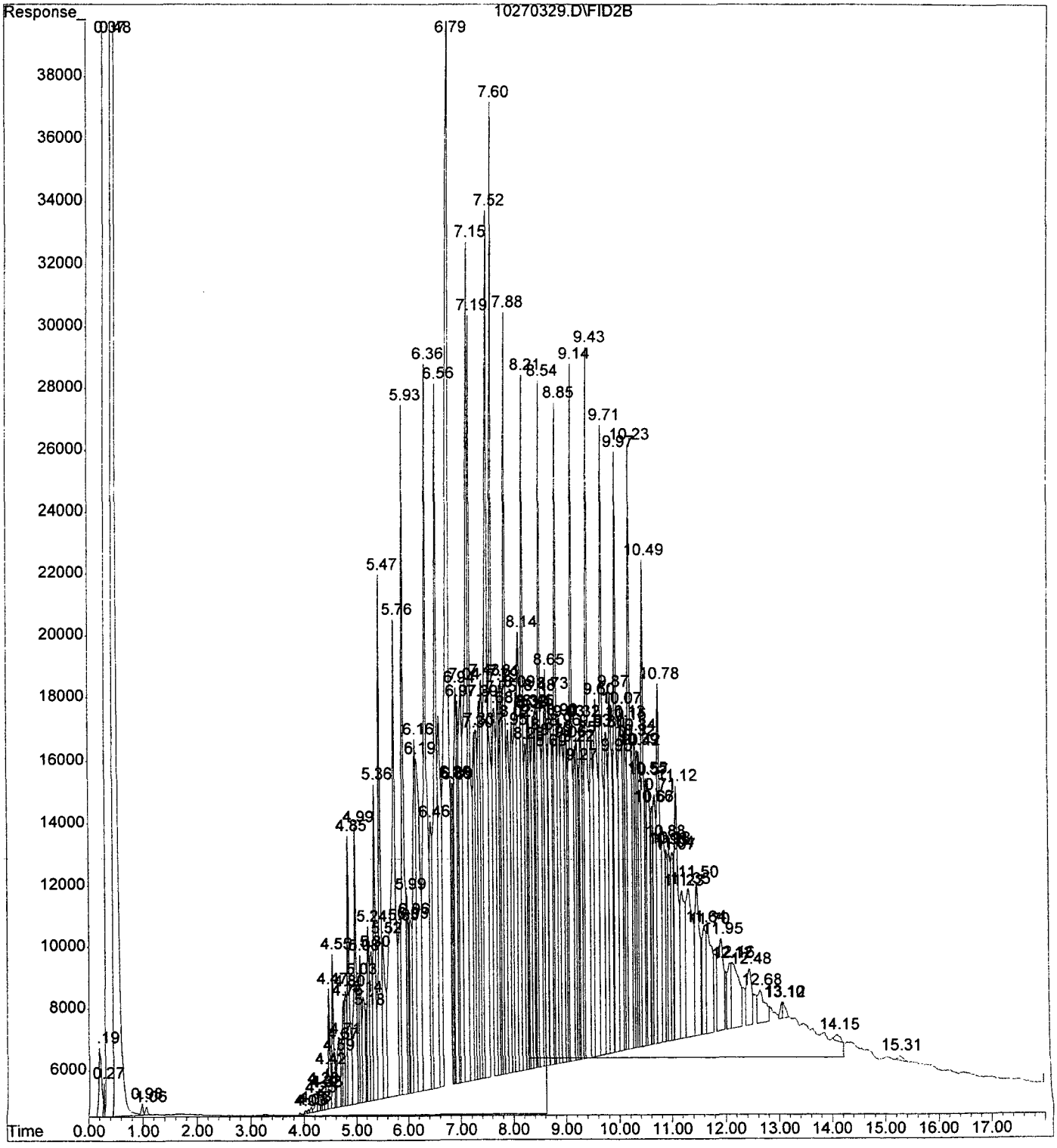
File : C:\HPCHEM\2\DATA\102803F\10280315.D
Operator : VPH
Acquired : 28 Oct 2003 18:14 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-02 2X RR
Misc Info : 10G/10ML 10/24 500UL/1ML
Vial Number: 14



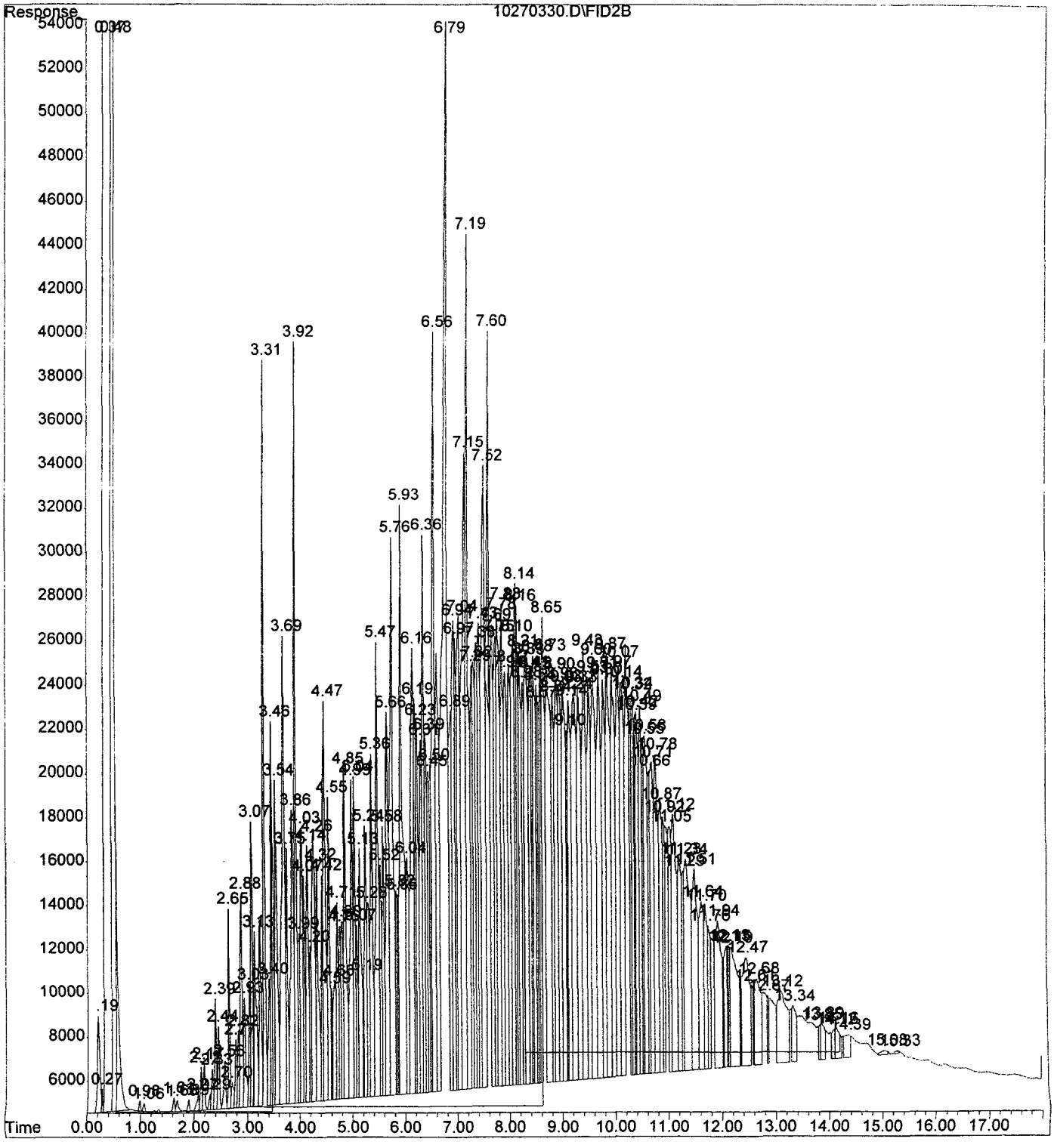
File : C:\HPCHEM\2\DATA\102803F\10280309.D
Operator : VPH
Acquired : 28 Oct 2003 15:25 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-03 RR
Misc Info : 10G/10ML 10/24
Vial Number: 8



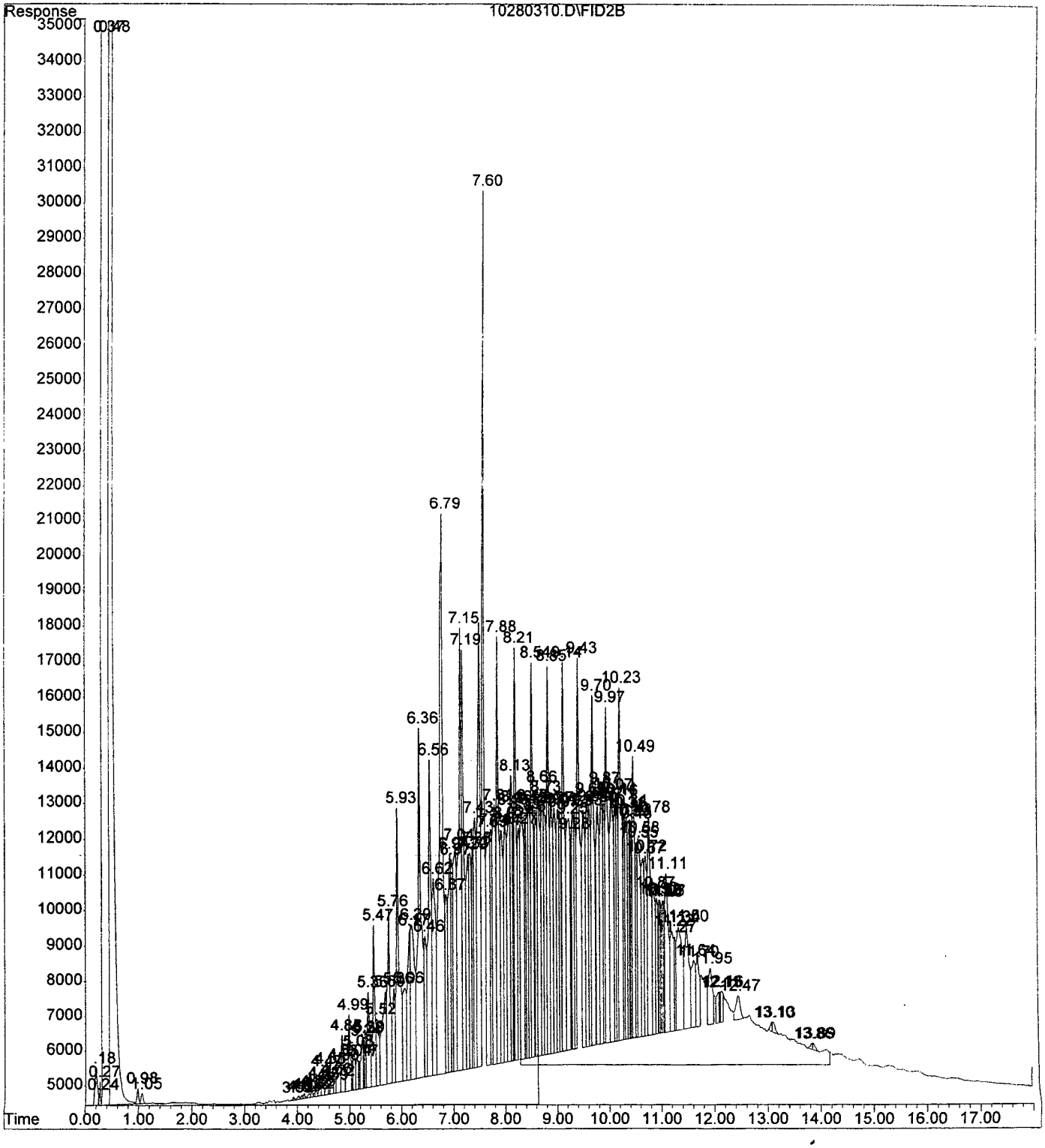
File : C:\HPCHEM\2\DATA\102703F\10270329.D
Operator : VPH
Acquired : 27 Oct 2003 23:22 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-04
Misc Info : 10G/10ML 10/24
Vial Number: 28



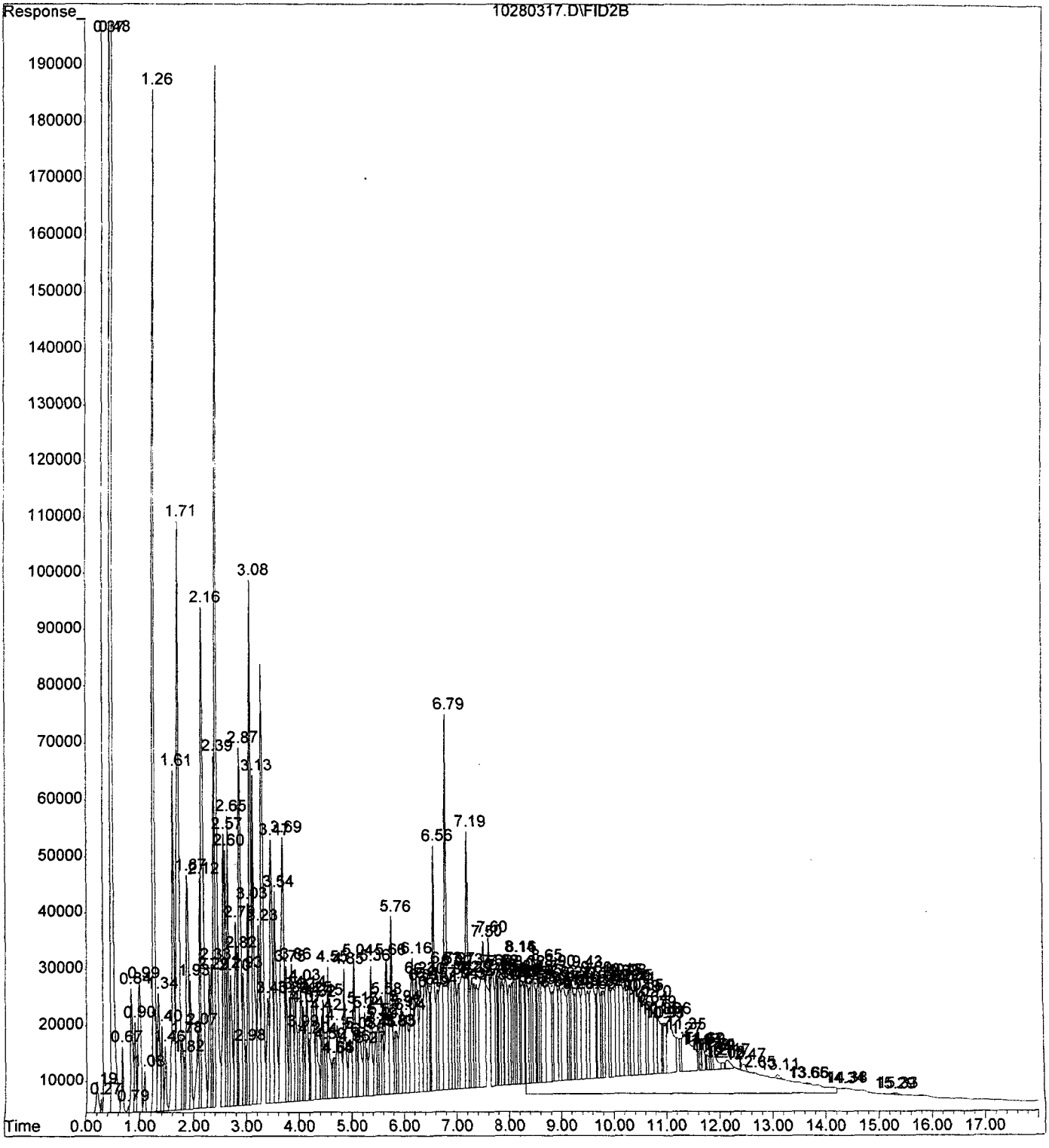
File : C:\HPCHEM\2\DATA\102703F\10270330.D
Operator : VPH
Acquired : 27 Oct 2003 23:50 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-05
Misc Info : 10G/10ML 10/24
Vial Number: 29



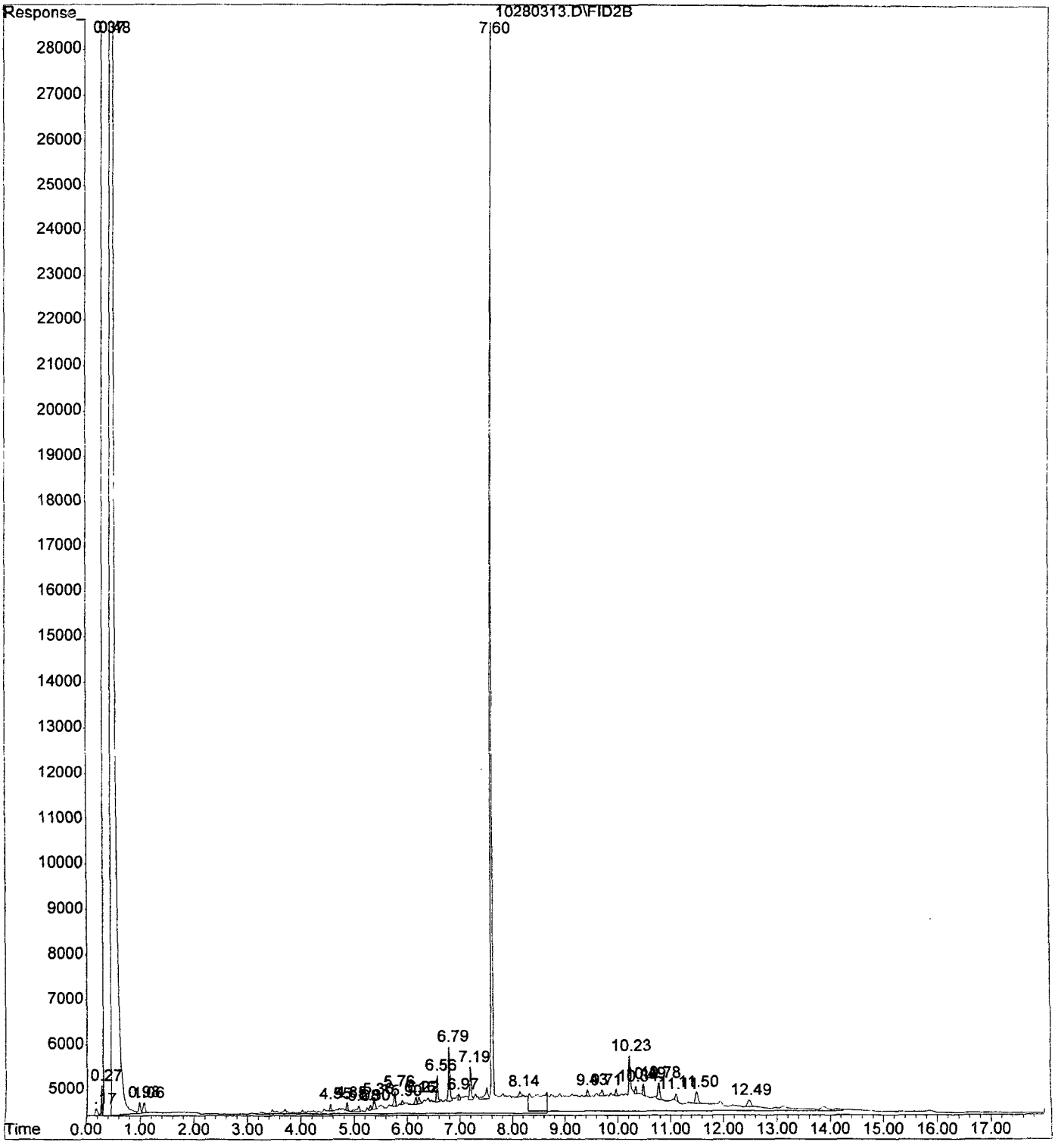
File : C:\HPCHEM\2\DATA\102803F\10280310.D
Operator : VPH
Acquired : 28 Oct 2003 15:53 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-06 RR
Misc Info : 10G/10ML 10/24
Vial Number: 9



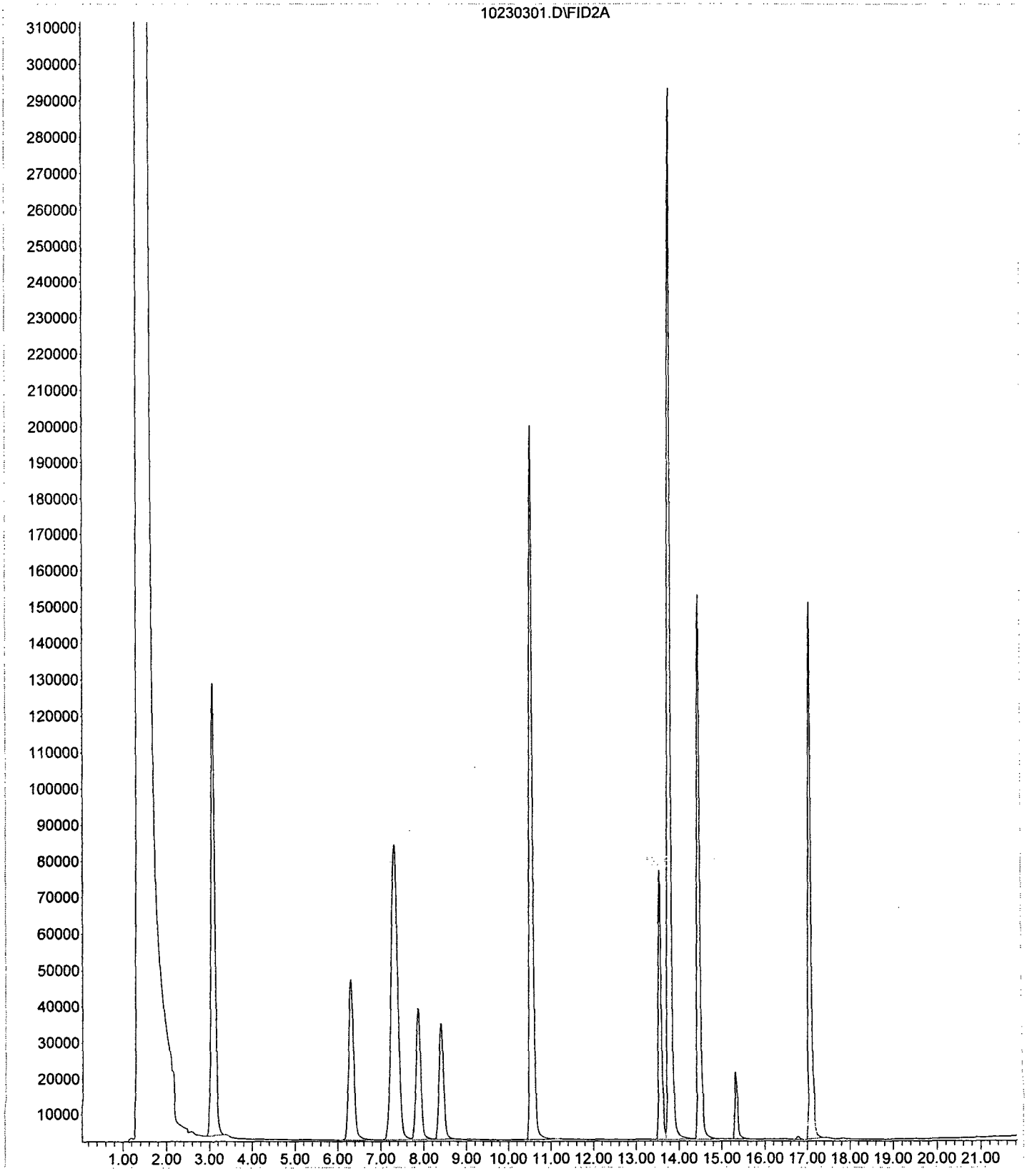
File : C:\HPCHEM\2\DATA\102803F\10280317.D
Operator : VPH
Acquired : 28 Oct 2003 19:10 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-07 2X RR
Misc Info : 10G/10ML 10/24 500UL/1ML
Vial Number: 16



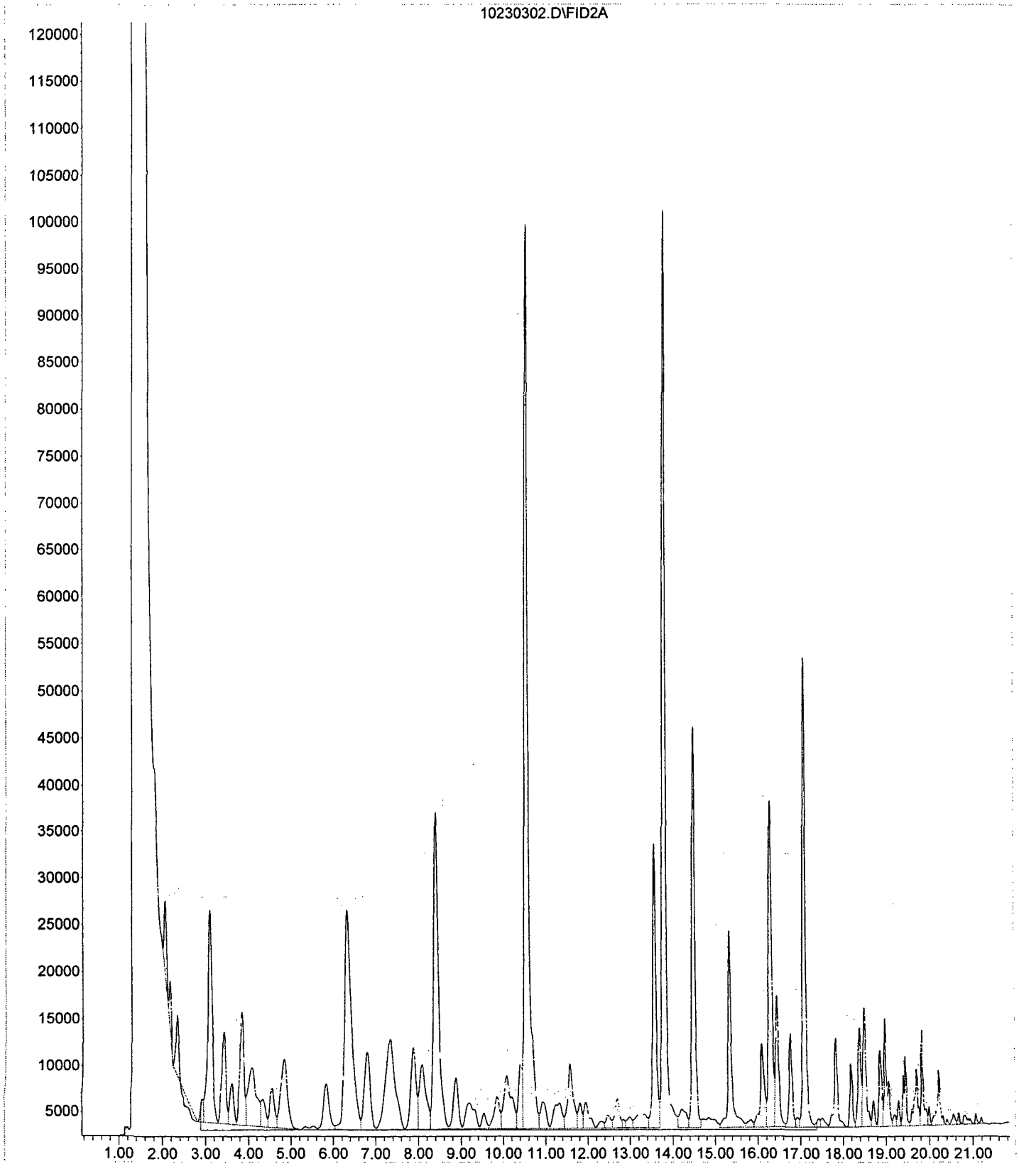
File : C:\HPCHEM\2\DATA\102803F\10280313.D
Operator : VPH
Acquired : 28 Oct 2003 17:18 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310123-08 RR
Misc Info : 10G/10ML 10/24
Vial Number: 12



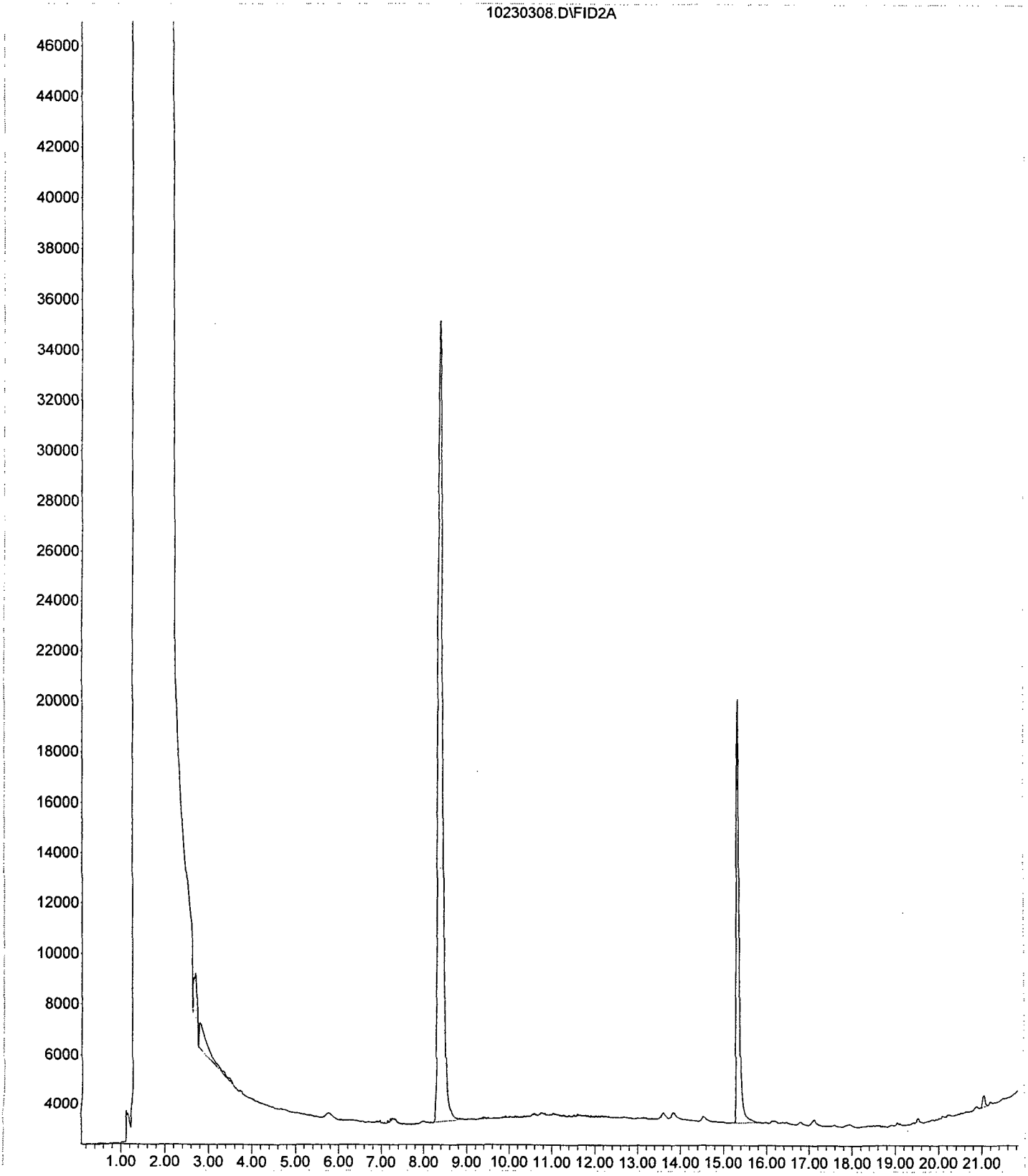
File : C:\HPCHEM\1\DATA\102303\10230301.D
Operator : BP
Acquired : 23 Oct 2003 16:35 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: GRO RT STD
Misc Info : 10uL GC4-112-20
Vial Number: 1



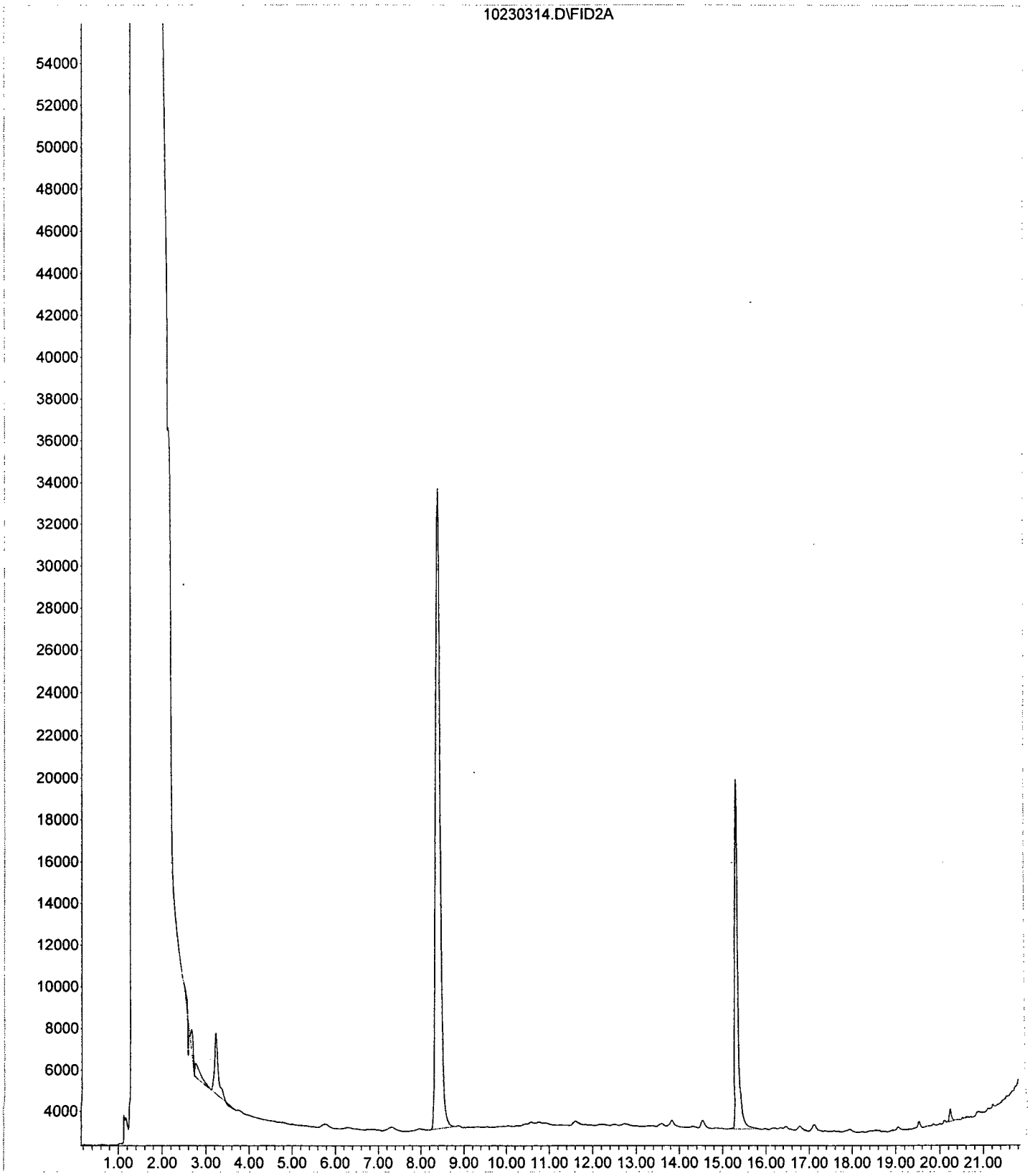
File : C:\HPCHEM\1\DATA\102303\10230302.D
Operator : BP
Acquired : 23 Oct 2003 17:06 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: GRO CCV 1000ppb
Misc Info : 10uL GC4-109-15
Vial Number: 2



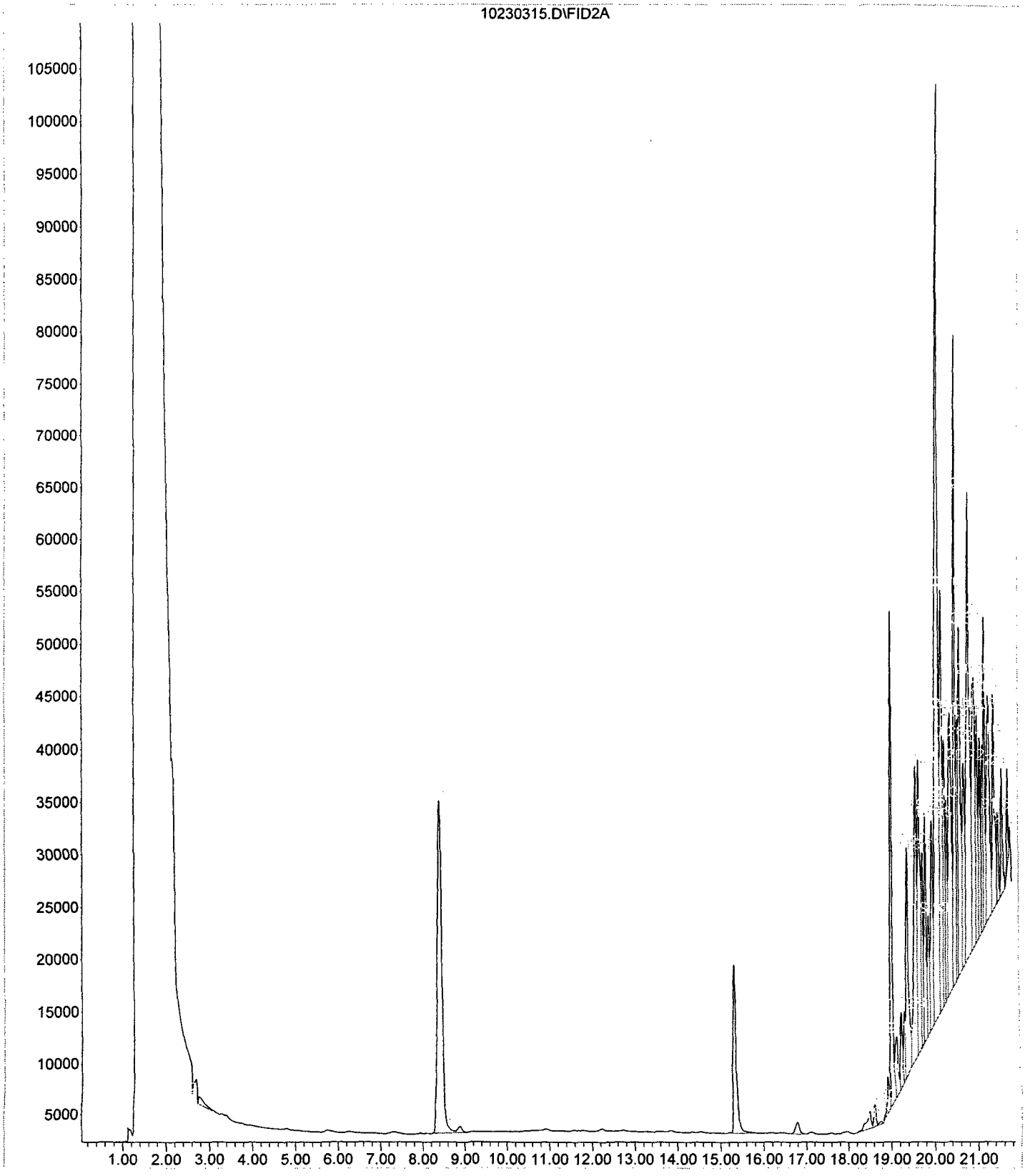
File : C:\HPCHEM\1\DATA\102303\10230308.D
Operator : BP
Acquired : 23 Oct 2003 20:12 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: SRB-102303
Misc Info : 100uL SOIL
Vial Number: 8



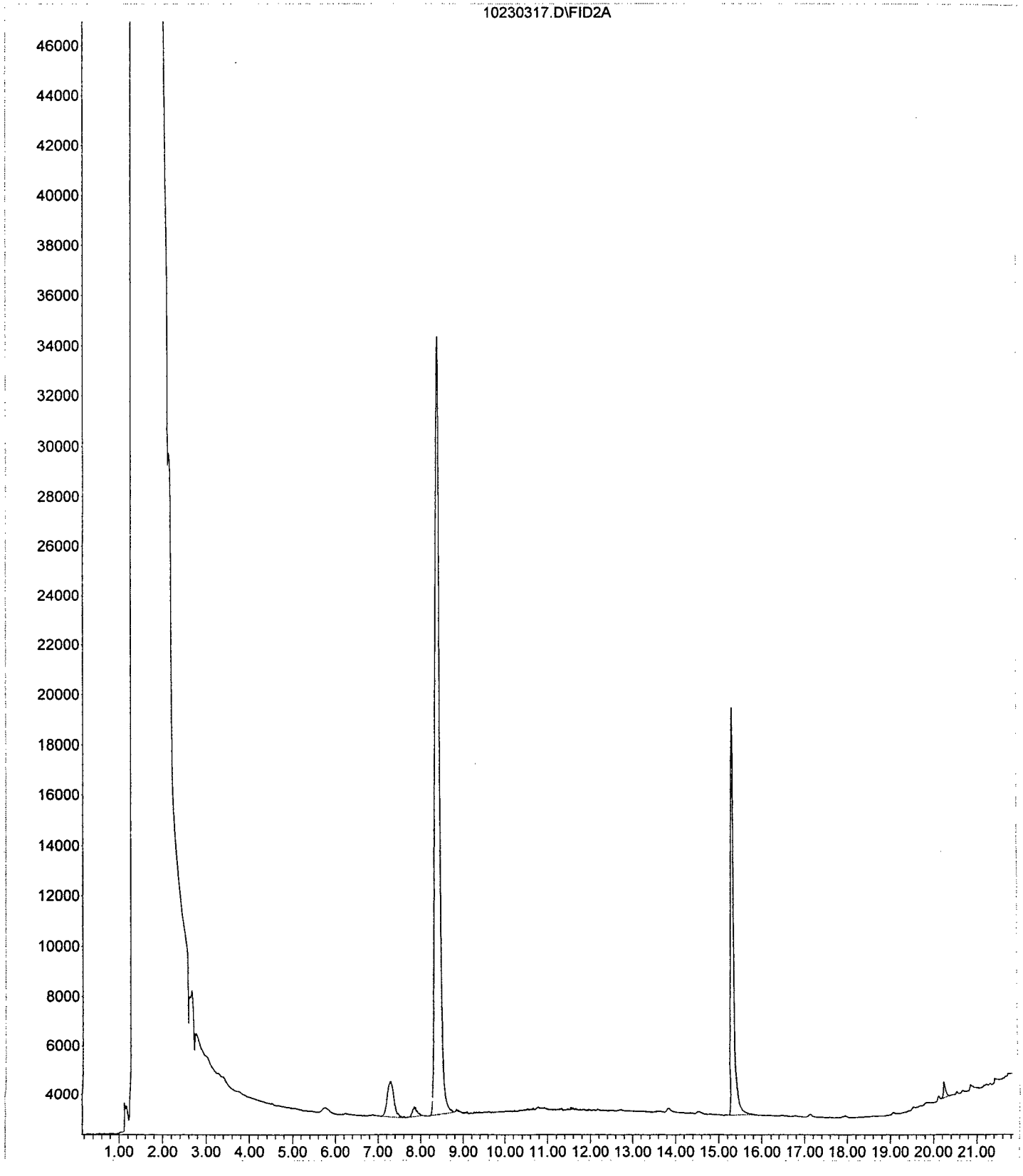
File : C:\HPCHEM\1\DATA\102303\10230314.D
Operator : BP
Acquired : 23 Oct 2003 23:20 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-01 1X
Misc Info : 100uL SOIL
Vial Number: 14



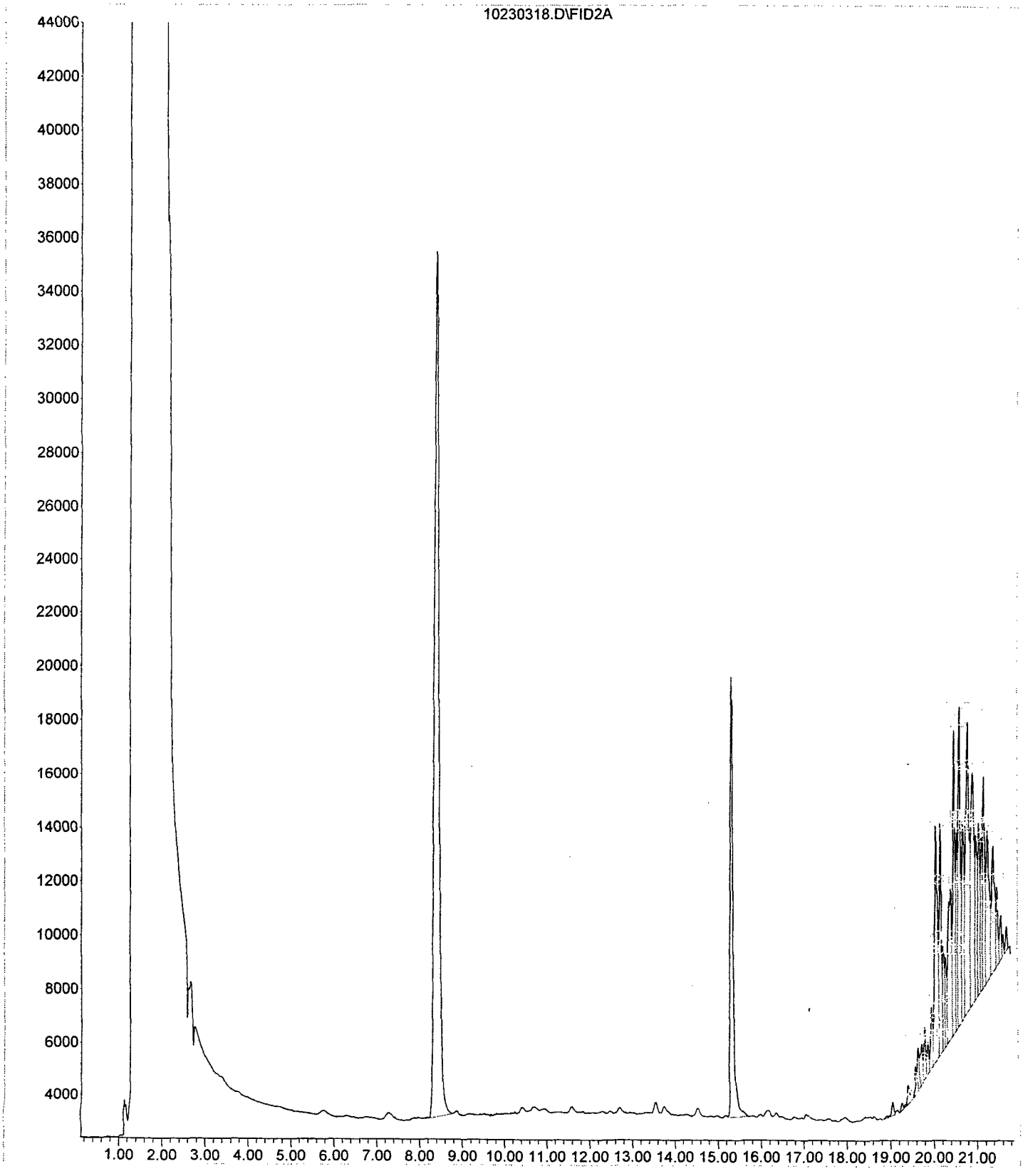
File : C:\HPCHEM\1\DATA\102303\10230315.D
Operator : BP
Acquired : 23 Oct 2003 23:51 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-02 1X
Misc Info : 100uL SOIL
Vial Number: 15



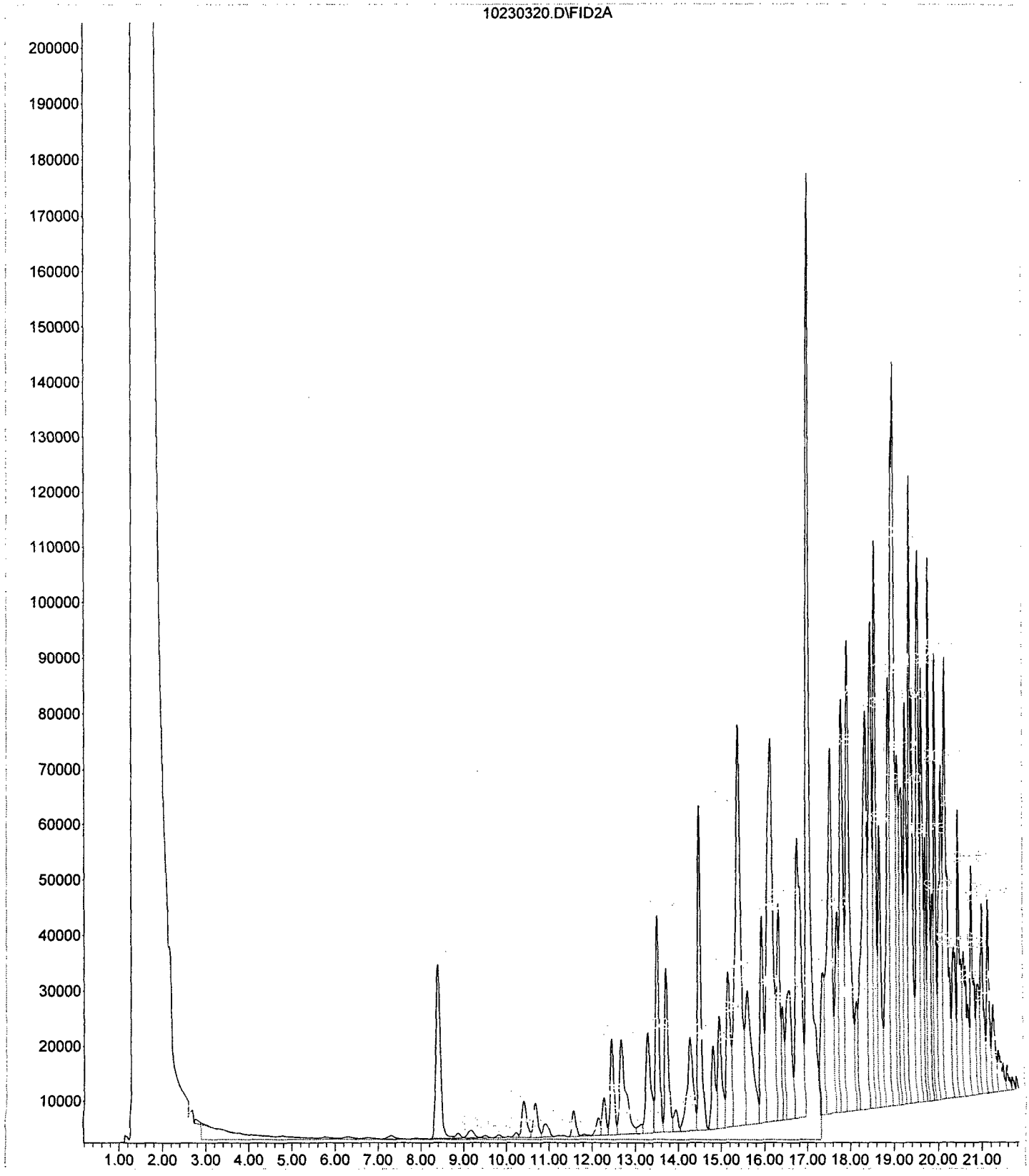
File : C:\HPCHEM\1\DATA\102303\10230317.D
Operator : BP
Acquired : 24 Oct 2003 00:52 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-03 1X
Misc Info : 100uL SOIL
Vial Number: 1



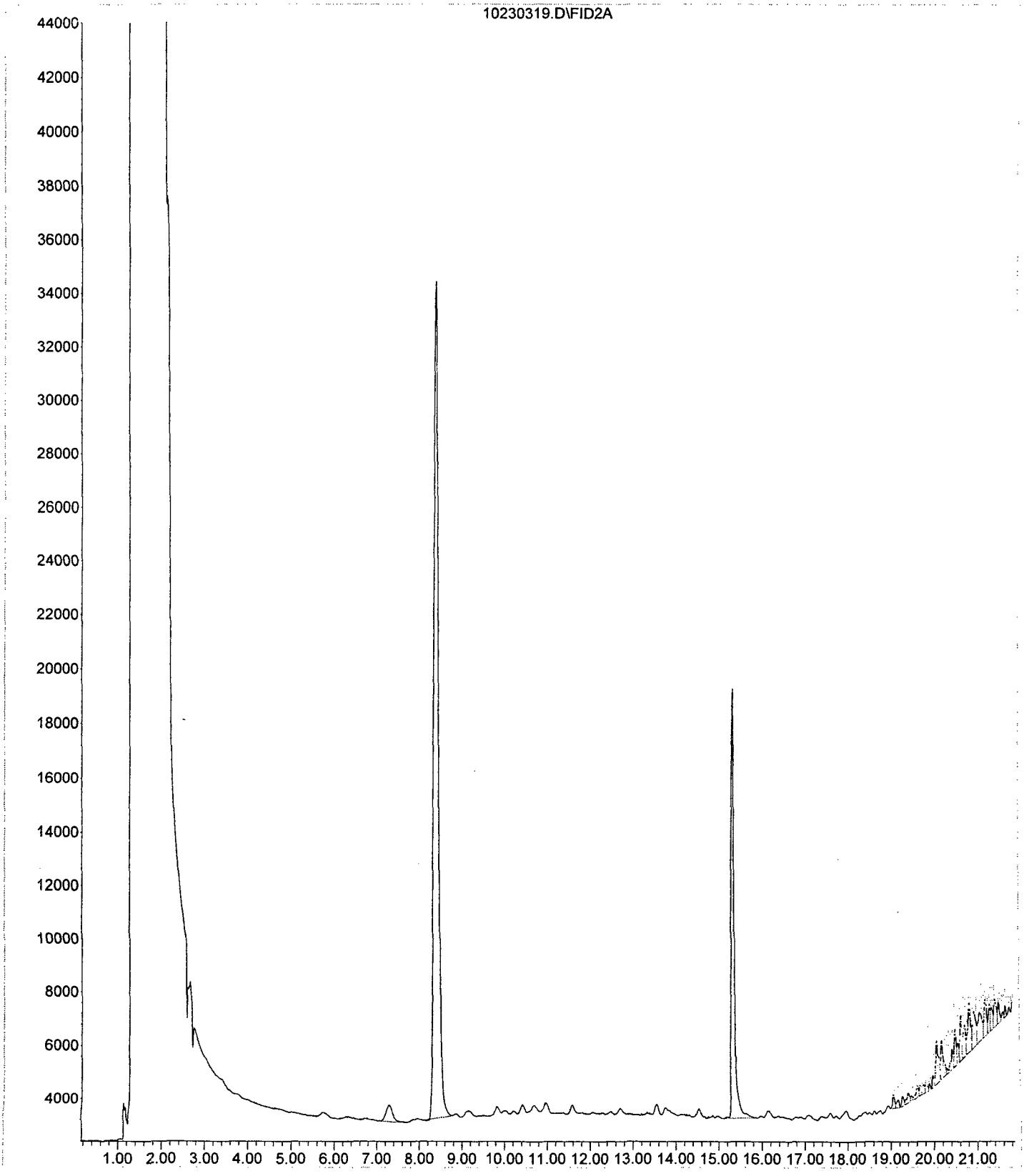
File : C:\HPCHEM\1\DATA\102303\10230318.D
Operator : BP
Acquired : 24 Oct 2003 1:23 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-04 1X
Misc Info : 100uL SOIL
Vial Number: 2



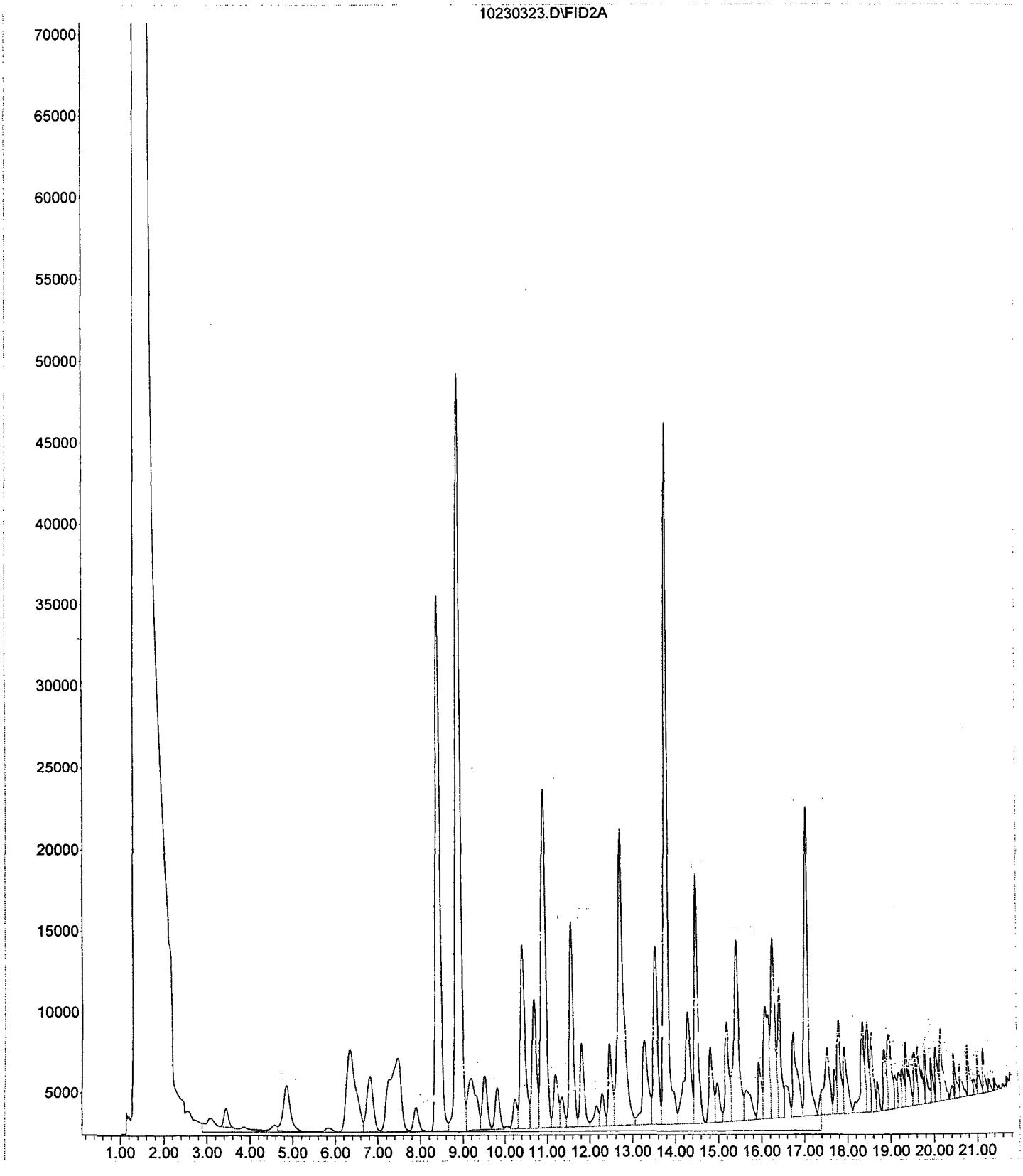
File : C:\HPCHEM\1\DATA\102303\10230320.D
Operator : BP
Acquired : 24 Oct 2003 2:25 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-05 1X
Misc Info : 100uL SOIL
Vial Number: 4



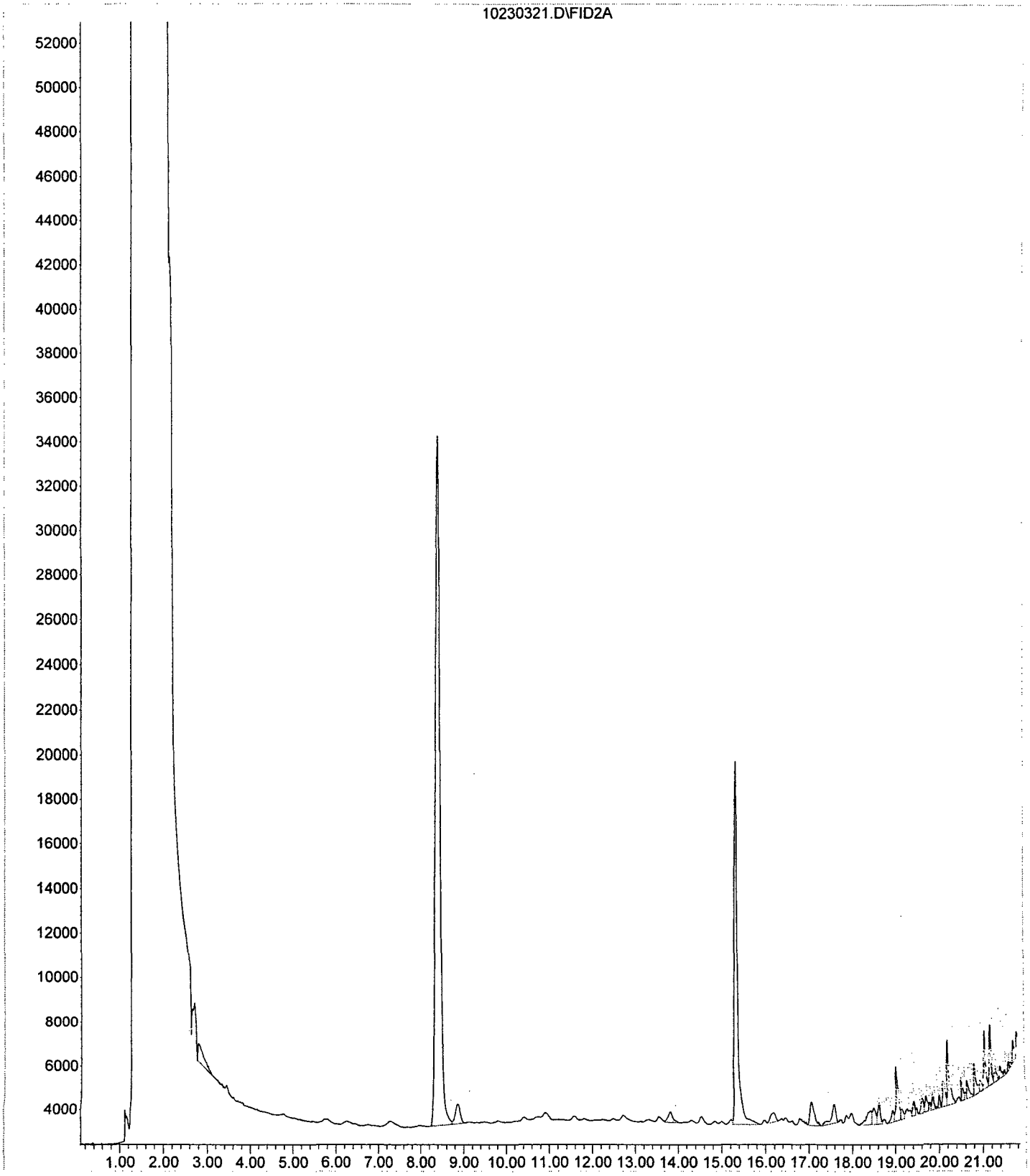
File : C:\HPCHEM\1\DATA\102303\10230319.D
Operator : BP
Acquired : 24 Oct 2003 1:54 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-06 1X
Misc Info : 100uL SOIL
Vial Number: 3



File : C:\HPCHEM\1\DATA\102303\10230323.D
Operator : BP
Acquired : 24 Oct 2003 3:58 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-07 50X
Misc Info : 2uL SOIL
Vial Number: 7



File : C:\HPCHEM\1\DATA\102303\10230321.D
Operator : BP
Acquired : 24 Oct 2003 2:56 using AcqMethod BG082303.M
Instrument : GC-2
Sample Name: 310123-08 1X
Misc Info : 100uL SOIL
Vial Number: 5



Appendix B

Summary of Ground Water Analyses

Lodestar Services, Incorporated
PO Box 3861 Farmington, NM 87499-3861 Office (505) 334-2791

Appendix B

Summary of Ground Water Analyses

Lodestar Services, Incorporated
PO Box 3861 Farmington, NM 87499-3861 Office (505) 334-2791

Summary of Ground Water Analytical Results for BTEX - September 1994 Through January 2004

NMWQCC Standards		Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
		10	750	750	620
MW-1*	Sep-94	NS	NS	NS	NS
	Apr-95	NS	NS	NS	NS
	Sep-99	NS	NS	NS	NS
	Dec-99	NS	NS	NS	NS
	May-01	NS	NS	NS	NS
	May-02	NS	NS	NS	NS
MW-2	Sep-94	640	600	82	690
	Apr-95	220	280	53	430
	Sep-99	NSP	NSP	NSP	NSP
	Dec-99	NSP	NSP	NSP	NSP
	May-01	NSP	NSP	NSP	NSP
	May-02	NSP	NSP	NSP	NSP
	Jan-03	1700	ND	650	3200
	Jan-04	1100	ND	340	1800
MW-3	Sep-94	ND	ND	ND	ND
	Apr-95	ND	ND	ND	ND
	Sep-99	ND	ND	ND	ND
	Dec-99	ND	ND	ND	ND
	May-01	ND	ND	ND	ND
	May-02	ND	ND	ND	ND
	Jan-03	ND	ND	ND	ND
	Jan-04	ND	ND	ND	ND
MW-4	Sep-94	2.1	ND	ND	1.2
	Apr-95	ND	ND	ND	ND
	Sep-99	ND	ND	ND	ND
	Dec-99	ND	ND	ND	ND
	May-01	ND	ND	ND	ND
	May-02	ND	ND	ND	ND
	Jan-03	ND	ND	ND	ND
	Jan-04	ND	ND	ND	ND
MW-5	Sep-94	NS	NS	NS	NS
	Apr-95	ND	ND	ND	ND
	Sep-99	ND	ND	ND	ND
	Dec-99	ND	ND	ND	ND
	May-01	ND	ND	ND	ND
	May-02	ND	ND	ND	ND
	Jan-03	ND	ND	ND	ND
	Jan-04	ND	ND	ND	1.1
MW-6**	May-01	12	15	13	83
	May-02	ND	ND	0.53	1.4
	Oct -02	ND	ND	ND	3.2
	Jan-03	6.0	20	87	350
	Jul-03	ND	2.7	3.2	16
	Sept-03	0.8	3.7	4.0	24

NMWQCC Standards		Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
		10	750	750	620
	Jan-04	0.9	1.6	2.9	16
MW-7**	May-01	2,400	ND	380	2,800
	June-02	2,000	ND	140	1,100
	Oct-02	1100	ND	79	490
	Jan-03	3200	ND	400	3100
	Jan-04	3300	ND	460	3300

Notes:
µg/L = micrograms per liter
ND = not detected
NS = not sampled
NSP = not sampled due to product in well
*MW-1 was not screened within the aquifer
**MW-6 and MW-7 were installed in May 2001
NMWQCC = New Mexico Water Quality Control Commission

Summary of Ground Water Analytical Results for General Water Chemistry - 1994, 2001 ,2002, 2003, and 2004

NMWQCC Standards		Lab pH (su)	Conductivity (µmhos/cm)	TDS (mg/L)	Alkalinity ($CaCO_3$) (mg/L)	Hardness ($CaCO_3$) (mg/L)	Sodium Absorption Ratio	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)
		6-9	**No Std**	**1,000**	**No Std**	**No Std**	**No Std**	**No Std**	**No Std**	**No Std**	**250**	**600**	**No Std**	**No Std**	**No Std**	**No Std**
MW1	1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2001	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2002	MW-1 Abandoned														
MW2	1994	6.6	4,920	3,049	957	NT	11.785	1,170	0	0	1,050	245	325	30	1.4	828
	2001	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP
	2002	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP	NSP
	2003	7	3230	3220	1520	416	NT	1850	<1	<1	51	369	133	20	1	660
	2004	7	3100	2000	1500	420	NT	1500	<1	<1	85	130	140	18	3	680
MW3	1994	7.1	4,250	3,413	521	NT	8.147	635	0	0	48	1,920	439	37	1.4	661
	2001	7.3	4,500	3,960	459	1,220	NT	559	<1	<1	78	2,250	423	40.4	2.5	711
	2002	7	4,440	3,820	358	1,290	NT	437	<1	<1	46	2,520	446	43	0.6	705
	2003	7	4320	3660	560	1230	NT	683	<1	<1	56	2330	428	39.4	1.6	671
	2004	7.3	4500	4000	560	1400	NT	560	1	<1	44	2300	320	44	3.6	780
MW4	1994	7.0	5,420	4,389	576	NT	10.883	703	0	0	175	2,470	439	53	3.5	907
	2001	7.1	5,090	4,630	490	1,460	NT	597	<1	<1	77	2,680	500	52.5	4.2	900
	2002	6.9	5,140	4,420	358	1,310	NT	437	<1	<1	47	2,930	449	47	2.6	873
	2003	7	4460	3850	400	1070	NT	488	<1	<1	40	2570	361	40.8	2.8	667
	2004	7.3	4500	3900	400	1200	NT	400	3	<1	27	2500	390	44	6.7	810
MW5	1994	6.9	6,000	4,410	775	NT	8.84	945	0	0	996	1,390	634	51	6.6	861
	2001	6.7	7,000	5,230	757	2,010	NT	923	<1	<1	1,320	1,230	700	63.2	5.6	924
	2002	6.5	6,880	4,810	567	1,880	NT	692	<1	<1	1,200	1,230	661	55.3	4.9	855
	2003	6.6	6910	5080	830	1780	NT	1010	<1	<1	1090	1330	616	58.1	4.8	829
	2004	6.8	6700	4600	840	2000	NT	840	1	<1	1300	1400	690	57	11	1000
MW6	2001	6.9	5,470	4,580	740	1,550	NT	903	<1	<1	80	2,780	534	53.3	6.3	1,030
	2002	6.8	4,460	3,560	669	932	NT	816	<1	<1	55	1,900	319	33	2.5	830
	2003	7	3070	2180	1140	602	NT	1390	<1	<1	79	540	203	23.1	2.1	514
	2004	7.2	4100	3000	1000	1100	NT	1000	<1	<1	96	1400	390	63	29	870
MW7	2001	6.7	2,160	1,710	600	843	NT	732	<1	<1	52	642	296	25.6	1.6	234
	2002	6.8	1,870	1,570	432	758	NT	527	<1	<1	20	700	258	27.8	2.2	151
	2003	6.7	1310	810	696	531	NT	849	<1	<1	35	57	152	36.8	1.0	126
	2004	6.8	1400	920	720	520	NT	720	<1	<1	13	120	170	23	7.0	170

Notes for this table are shown on the following page

Notes: For Summary of Ground Water Analytical Results for General Water Chemistry - 1994, 2001 ,2002, 2003, and 2004

s.u. = standard units
µmhos/cm = micromhos per centimeter
mg/L = milligrams per liter
NMWQCC = New Mexico Water Quality Control Commission
No Std = no standard
NS = not sampled; MW-1 was not screened within the aquifer
NSP = no sample collected due to product in well
NT = Not Tested

Summary of Ground Water Analytical Results for Polynuclear Aromatic Hydrocarbons (EPA 610) - September 1994

Units: µg/L	MW-3	MW-2	MW-4
Naphthalene	<0.5	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
1-Methylnaphthalene	<0.30	5.8	<0.30

Notes:
µg/L = micrograms per liter

Summary of Ground Water Analytical Results for Priority Pollutant Metals - September 1994

Metal	NMWQCC Standards	MW-2	MW-3	MW-4
Silver (mg/L)	0.05	<0.01	<0.01	<0.01
Arsenic (mg/L)	0.1	<0.005	<0.005	<0.005
Beryllium (mg/L)	No Std	<0.004	<0.004	<0.004
Cadmium (mg/L)	0.01	<0.0005	<0.0005	<0.0005
Chromium (mg/L)	0.05	0.010	<0.01	<0.01
Copper (mg/L)	1	0.012	<0.01	<0.01
Mercury (mg/L)	0.002	<0.0002	<0.0002	<0.0002
Nickel (mg/L)	0.2	<0.02	<0.02	<0.02
Lead (mg/L)	<0.05	<0.002	<0.002	<0.002
Antimony (mg/L)	No Std	<0.05	<0.05	<0.05
Selenium (mg/L)	0.05	<0.005	<0.005	<0.005
Thallium (mg/L)	No Std	<0.005	<0.005	<0.005
Zinc (mg/L)	10	0.032	0.023	0.026

Notes:
mg/L = milligrams per liter
NMWQCC = New Mexico Water Quality Control Commission
No Std = no standard

Bioventing Data Table: Carbon Dioxide Concentrations at Monitoring Points

	2/10/04	2/17/03 1332 hours	2/17/03 1601 hours	2/18/03	2/19/03	2/21/03	2/24/03	2/25/03	3/5/03	3/19/03	10/21/03	1/20/04	Average Conentration During Operations	Percentage of Pretest Reading
IP10	1.8	5.8	5.4	7.6	6	5.6	7.8	7.8	5.4	8.8	11.5	0	6.52	362%
IP11	0	0	0	0	0	0	0	0	0	0	10	1.3	1.03	
IP13	0.2	0.2	2	1.8	1.4	2	1.8	1.8	2.9	2.6	0.4	2.2	1.74	868%
IP14	1	2.8	9.2	2.8	7.4	9.4	4.2	6.6	7.2	5.4	9.6	10.6	6.84	684%
IP15	0.8	0.2	2.4	1.2	0	0	0	0.8	0.6	0.8	1.8	5.5	1.21	151%
IP17	1	0.6	1	1	1.2	0.8	1	0.8	0.8	1.2	2.2	1.5	1.10	110%
IP19	0.4	1.4	1.8	1.2	1.6	1	1.8	1.6	1.6	0.2	0.8	0.6	1.24	309%
IP20	0.6	3.2	3.2	3.6	3.8	4.2	4.8	4.6	5.8	8	15.2	13.6	6.36	1061%
IP21	1.4	0.6	1	0.8	1	0.6	0.8	1	1.2	2	0.9	3.3	1.20	86%
IP22	0.4	1	1	1.2	0.8	0.2	0.8	1	1.2	1.6	0	1.5	0.94	234%
IP23	0.6	0.4	0.8	0.6	0.6	0.4	0.6	0.6	0.6	1	0.5	1.2	0.66	111%
IP8	0.8	10.8	14.2	13	14.4	13.4	6.2	14	14.6	15.8	17.1	14.2	13.43	1678%
MP14	1	3.6	3.6	3	3.4	3.4	2.2	2.8	3.2	4	1.1	6.4	3.34	334%
MP15	0.6	2	1.2	2.4	1.8	1.4	1.6	2	2.2	2.2	1.5	1.7	1.82	303%
MP16	0.06	0.8	1.4	1	1.2	0.8	1.2	1.2	1	1.4	0.4	0.3	0.97	1621%
MP4	1.2	10.4	11.4	10.4	11	11	10	10.6	10.2	12	20	15.5	12.05	1004%
MP7	1.4	4.4	7	7.8	8.2	5.6	5.4	4.4	7.2	8.4	3.2	0	5.60	400%
MP9	1	1.2	1.8	1.6	2	1.2	1.2	1.4	1.6	2	4	2.8	1.89	189%
Ave.	0.79	2.74	3.80	3.39	3.66	3.39	2.86	3.50	3.74	4.30	5.57	4.57	3.77	476%

System was started on 2/17/03 0900 hrs

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Bioventing Data Table: Oxygen Concentrations in Monitoring Points

	2/10/04	2/17/03	2/17 03	2/18/03	2/19 03	2/21/03	2/24/03	2/25 03	3/5/03	3/19/03	10/21/04	1/20/04	Average Conentration During Operations	Percentage of Pretest Reading
		1332 hrs	1601hrs											
IP10	17.20	2.00	5.50	0.90	2.80	2.90	0.90	0.90	6.00	1.00	10.10	1.60	3.15	18%
IP11	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.00	20.90	9.20	18.20	19.51	93%
IP13	20.90	20.60	18.40	18.60	19.60	18.00	18.60	18.60	17.90	16.70	20.50	17.30	18.62	89%
IP14	19.90	15.70	1.70	14.70	5.60	0.90	10.40	6.50	3.10	3.30	0	1.60	5.77	29%
IP15	20.90	20.90	20.70	17.30	20.90	20.90	20.90	20.70	20.40	20.80	18.70	18.60	20.07	96%
IP17	20.90	20.60	20.80	20.30	20.60	20.90	20.90	20.80	20.70	20.40	19.60	19.20	20.44	98%
IP19	20.90	18.30	18.80	18.90	18.80	20.20	19.20	19.10	18.00	20.90	20.40	19.40	19.27	92%
IP20	20.50	14.00	14.00	13.30	10.40	2.20	3.20	3.00	2.20	0.90	0	1.50	5.88	29%
IP21	20.90	19.70	19.50	19.90	19.80	18.10	19.20	18.00	16.20	13.80	19.90	17.50	18.33	88%
IP22	20.90	19.60	20.80	19.90	20.40	20.90	20.90	20.30	19.80	19.10	21.10	18.70	20.14	96%
IP23	20.90	20.90	20.90	20.70	20.90	20.90	20.90	20.90	20.30	20.90	20.70	19.60	20.69	99%
IP8	20.20	4.60	2.10	4.00	2.90	3.30	11.50	1.80	2.00	2.20	0	1.40	3.25	16%
MP14	19.20	13.10	13.70	14.80	14.30	13.70	17.30	15.40	13.10	11.20	19.30	10.30	14.20	74%
MP15	20.90	17.90	18.10	19.90	18.50	19.70	20.30	18.80	17.60	18.50	19.30	13.80	18.40	88%
MP16	20.90	19.90	20.20	19.70	20.30	20.90	20.80	20.10	19.20	19.40	20.90	19.80	20.11	96%
MP4	19.00	1.10	1.00	3.40	2.60	1.80	3.00	1.70	3.10	3.40	0	0.20	1.94	10%
MP7	18.60	7.70	2.40	1.20	1.20	5.30	8.20	10.40	3.10	1.10	15.70	15.90	6.56	35%
MP9	20.50	19.40	19.30	19.00	18.90	19.90	20.60	19.30	18.80	18.40	16.00	17.70	13.13	64%
Ave.	20.23	15.38	14.38	14.86	14.41	13.97	15.43	14.29	13.42	12.94	13.97	12.91	13.86	69%

System was started on 2/17/03 0900 hrs

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