GW -

# MONITORING REPORTS







GPM GAS SERVICES COMPANY 7 AM 8 52 A DIVISION OF PHILLIPS PETROLEUM COMPANY

4044 PENBROOK ODESSA, TX 79762

October 5, 1994

Mr. William Olson Hydrogeologist New Mexico Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

# RE: THIRD QUARTER AND ANNUAL 1994 ANALYTICAL RESULTS, LEE PLANT DISCHARGE PLAN GW - 2

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory analytical reports and a brief summary of the results for the third quarter and annual groundwater sampling event at our Lee Plant. Groundwater samples were collected by our consultant, GCL, on July 26, 1994, pursuant to the requirements of NMOCD Discharge Plan GW - 2.

Depth to groundwater and product thickness measurements were collected from all monitor wells. Results of the measurements indicate that groundwater continues to flow northeast to southwest beneath the site. Figure 1 shows the current configuration for groundwater flow. Floating product was present in monitor wells, MW-4, and NW-5, in thicknesses of 1.15 feet and 4.08 feet, respectively. A slight hydrocarbon odor was detected in MW-15.

Quarterly and annual groundwater sampling was conducted at the following monitor wells: MW-2, MW-5, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-16, MW-18, MW-19 and MW-20. In addition to the required sampling, GCL collected samples from monitor wells, MW-21 and MW-22, the shallow and intermediate wells that monitor efficacy of the vapor extraction/air sparging system. All samples were submitted to NDRC Laboratories, Inc., in Houston, Texas, following strict chain-of-custody procedures and were analyzed for dissolved aromatic hydrocarbons using EPA method 602.

A brief summary of the analytical results is provided below:

A high concentration of benzene (3820 ppb) was detected in MW-16 which is located north of, and upgradient from the plant. We believe that upgradient, offsite sources may be contributing to hydrocarbons that are detected in this well. During the 1993 annual sampling event, benzene was measured at 1190 ppb in this well. Concentrations of BTEX in MW-18, located upgradient and to the northwest of the plant site, remain relatively unchanged. Mr. William Olson October 5, 1994 page 2

BTEX concentrations in MW-21 and MW-22 have experienced an overall decrease since May 1994. Analytical results for the last two sampling events are as follows:

	M <u>May 9</u>	<b>W-21</b> 9 <u>4</u> - <u>Jul 94</u>	<b>MW-22</b> <u>May 94</u> - <u>Jul 94</u>			
Benzene	517	77.7 ppb	6.6	4.7 ppb		
Toluene	52	51.1	2.4	1.1		
Ethylbenzene	<10	<1.0	<1.0	<1.0		
Xylenes	<30	10.5	7.1	<3.0		

BTEX concentrations in groundwater collected from interior plant monitor wells, MW-2 and MW-7, are below WQCC standards. Additional interior wells, MW-5 and MW-10 continue to experience elevated concentrations of BTEX.

BTEX concentrations in the down-gradient compliance monitor wells, MW-11, 12, 13, 19 and 20 are below WQCC standards.

If you have any questions regarding the contents of this letter or the attachments, please call me at (915) 368-1085.

Sincerely,

Vince Bernard Safety and Environmental Director New Mexico Region

cc: Maureen Gannon - GCL





GCL ALBQ OFFC





### **Inchcape Testing Services** NDRC Laboratories

11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

#### SUMMARY REPORT

CLIENT	:	H + GCL	- -	JOB
CONTACT	:	Ms. Annette Mon	toya F	REPO
PROJECT	:	GPM/Gannon		

JOB NUMBER : H94-4834 REPORT DATE : 2-AUG-1994

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	9407261335 MW-9	Groundwater	26-JUL-1994
2	9407261420 MW-19	Groundwater	26- JUL - 1994
3	9407261430 MW-19A	Groundwater	26-JUL-1994
4	9407261500 MW-13	Groundwater	26-JUL-1994

BTEX ANALYSIS, EPA 8020			1		2		3		4
Benzene	μg/l		495		5.4		5.7		6.5
Toluene	µg/L	<	10	<	1.0	<	1.0		1.2
Ethyl benzene	µg/L	<	10	<	1.0	<	1.0	<	1.0
Xylenes	µg/L	<	30	<	3.0	<	3.0	<	3.0

Inchcape Testing Services Kuei-Mei Li

Technical Director



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11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

#### SUMMARY REPORT

CLIENT	:	H + GCL	JOB NUMBER :	H94-4834
CONTACT	:	Ms. Annette Montoya	REPORT DATE :	2-AUG-1994
PROJECT	:	GPM/Gannon		

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
5	9407261520 MW-12	Groundwater	26-JUL-1994
6	9407261545 MW-11	Groundwater	26- JUL - 1994
7	9407251450 MW-7	Groundwater	25 - JUL - 1994
8	9407251520 MW-10	Groundwater	25-JUL-1994

BTEX ANALYSIS, EPA 8020			5		6	7	8
Benzene	μg/L		3.7		1.9	2.8	4160
Toluene	μg/L	<	1.0		1.1	1.8	210
Ethyl benzene	µg/L	<	1.0	<	1.0	1.2	230
Xylenes	µg/L	<	3.0	<	3.0	5.0	860

Mei Li

Kuei-Mei Li Technical Director



#### SUMMARY REPORT

CLIENT	:	H + GCL	JOB NUMBER	:	H94-4834
CONTACT	:	Ms. Annette Montoya	REPORT DATE	:	2-AUG-1994
PROJECT	:	GPM/Gannon			

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
9	9407260840 MW-20	Groundwater	26-JUL-1994
10	9407260915 MW-2	Groundwater	26-JUL-1994
11	9407251545 WS-1	Groundwater	25-JUL-1994
12	9407261000 MW-5	Groundwater	26-JUL-1994

BTEX ANALYSIS, EPA 8020			9		10		11		12
Benzene	µg/L	<	1.0	<	1.0		19.5		66400
Toluene	µg/L	<	1.0	<	1.0	<	1.0		17100
Ethyl benzene	µg/L	<	1.0	<	1.0	}	2.3		630
Xylenes	µg/L	<	3.0	<	3.0	<	3.0	<	1500

- Mei Li

Kuei-Mei Li Technical Director



#### SUMMARY REPORT

CLIENT CONTACT PROJECT	: : :	H + GCL Ms. Annette Montoya GPM/Gannon	JOB NUMBER REPORT DATE	:	H94-4834 2-AUG-1994
					4

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
13	9407261045 MW-16	Groundwater	26-JUL-1994
14	9407261130 MW-18	Groundwater	26-JUL-1994
15	9407261200 MW-21	Groundwater	26-JUL-1994
16	9407261300 MW-22	Groundwater	26-JUL-1994

BTEX ANALYSIS, EPA 8020		13	14	15	16
Benzene	μg/L	3820	56.5	77.7	4.7
Toluene	μg/L	1660	8.3	51.1	1.1
Ethyl benzene	μg/L	120	2.3	< 1.0	< 1.0
Xylenes	μg/L	< 300	< 3.0	10.5	< 3.0

- Mei Li

Kuei-Mei Li Technical Director



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-1 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY	:	H + GCL	
ADDRESS	:	505 Marguette NW, Ste. 110	0
	:	Albuquerque, NM 87102	
ATTENTION	:	Ms. Annette Montoya	
SAMDLE MATRIX		Groundwater	
JAMEDE MAIRIA	•	0407261225 MW 0	
ID MARKS	:	940/201335 MW-9	
PROJECT	:	GPM/Gannon	
DATE SAMPLED	:	26-JUL-1994	
ANALYSIS METHOD	:	EPA 8020	
ANALYZED BY	:	RGR	
ANALYZED ON	:	1-AUG-1994	
DILUTION FACTOR	:	10	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIM	IT RESULTS
Benzene	10 µg/	L 495 μg/L
Toluene	10 µg/	L < 10 μg/L
Ethyl benzene	10 µg/	L < 10 μg/L
Xylenes	30 μg/	L < 30 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	96.7 %

Inchcape Testing Services

Mei Li



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-2 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR		Groundwater 9407261420 MW-19 GPM/Gannon 26-JUL-1994 EPA 8020 RGR 1-AUG-1994 1	

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Benzene	1.0 μg/i		5.4 µ	g/L
Toluene	1.0 µg/L	<	1.0 µ	g/L
Ethyl benzene	1.0 μg/L	<	1.0 µ	g/L
Xylenes	3.0 µg/L	<	3.0 µ	g/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	99.3 %

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DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-3 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	: : : : : :	Groundwater 9407261430 MW-19A GPM/Gannon 26-JUL-1994 EPA 8020 RGR 29-JUL-1994 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	5.7 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	3.0 µg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	96.2 %

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- Mei Li



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-4 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	:::::::::::::::::::::::::::::::::::::::	Groundwater 9407261500 MW-13 GPM/Gannon 26-JUL-1994 EPA 8020
ANALYZED BY ANALYZED ON DILUTION FACTOR	::	RGR 29-JUL-1994 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	6.5 µg/L
Toluene	1.0 µg/L	1.2 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	3.0 µg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	95.9 %

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Mei Li



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-5 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	•••••••••••••••••••••••••••••••••••••••	Groundwater 9407261520 MW-12 GPM/Gannon 26-JUL-1994 EPA 8020 RGR 1-AUG-1994 1	

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT		RESULTS	
Benzene	1.0 μg/L		3.7 µg/L	
Toluene	1.0 μg/L	<	1.0 µg/L	
Ethyl benzene	1.0 μg/L	<	1.0 µg/L	
Xylenes	3.0 μg/L	<	3.0 µg/L	

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	102 %

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DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-6 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	• • • • • •	Groundwater 9407261545 MW-11 GPM/Gannon 26-JUL-1994 EPA 8020 RGR 29-JUL-1994 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	1.9 μg/L
Toluene	1.0 μg/L	1.1 µg/L
Ethyl benzene	1.0 μg/L	< 1.0 µg/L
Xylenes	3.0 μg/L	< 3.0 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	95.1 %

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DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-7 REPORT DATE : 2-AUG-1994

	/
::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque NM 87102
:	Ms. Annette Montoya
:	Groundwater
:	9407251450 MW-7
:	GPM/Gannon
:	25-JUL-1994
:	EPA 8020
:	RGR
:	1-AUG-1994
:	1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	2.8 µg/L
Toluene	1.0 µg/L	1.8 µg/L
Ethyl benzene	1.0 μg/L	1.2 µg/L
Xylenes	3.0 µg/L	5.0 <b>µg/</b> L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	101 %

Inchcape Testing Services

nei L' Kuei-Mei Li

Technical Director



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-8 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED	:	Groundwater 9407251520 MW-10 GPM/Gannon 25-JUL-1994
ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	: : :	EPA 8020 RGR 29-JUL-1994 200

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	200 µg/L	4160 μg/L
Toluene	200 µg/L	210 µg/L
Ethyl benzene	200 µg/L	230 µg/L
Xylenes	600 μg/L	860 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	89.8 %

Mei Li

Kuei-Mei Li Technical Director



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-9 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX	:	Groundwater
PROJECT	:	GPM/Gannon
DATE SAMPLED	:	26-JUL-1994
ANALYSIS METHOD	:	EPA 8020
ANALYZED BY	:	RGR
ANALYZED ON	:	1-AUG-1994
DILUTION FACTOR	:	1

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	1.0 µg/L	<	1.0 µg/L
Toluene	1.0 µg/L	<	1.0 µg/L
Ethyl benzene	1.0 µg/L	<	1.0 µg/L
Xylenes	3.0 µg/L	<	3.0 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	104 %

- Mei Li

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DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-10 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY	:	H + GCL	
ADDRESS	:	505 Marquette NW, Ste. 110	0
	:	Albuquerque, NM 87102	
ATTENTION	:	Ms. Annette Montoya	
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	9407260915 MW-2	
PROJECT	:	GPM/Gannon	
DATE SAMPLED	:	26-JUL-1994	
ANALYSIS METHOD	:	EPA 8020	
ANALYZED BY	:	RGR	
ANALYZED ON	:	1-AUG-1994	
DILUTION FACTOR	•	1	

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	1.0 µg/L	<	1.0 µg/L
Toluene	1.0 µg/L	<	1.0 µg/L
Ethyl benzene	1.0 µg/L	<	1.0 μg/L
Xylenes	3.0 μg/L	<	3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	101 %

Mei Li

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DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-11 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	•• •• •• •• ••	Groundwater 9407251545 WS-1 GPM/Gannon 25-JUL-1994 EPA 8020 RGR 29-JUL-1994 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	19.5 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	2.3 µg/L
Xylenes	3.0 μg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	83.9 %

- Mei Li

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DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-12 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX	:	Groundwater
1D MARKS	:	9407261000 MW-5
PROJECT	:	GPM/Gannon
DATE SAMPLED	:	26-JUL-1994
ANALYSIS METHOD	:	EPA 8020
ANALYZED BY	:	RGR
ANALYZED ON	:	2-AUG-1994
DILUTION FACTOR	:	500

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	500 µg/L	66400 µg/L
Toluene	500 #g/L	17100 µg/L
Ethyl benzene	500 µg/L	630 μg/L
Xylenes	1500 μg/L	< 1500 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	87.3 %

Mei Li

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DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-13 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	•••••••••••••••••••••••••••••••••••••••	Groundwater 9407261045 MW-16 GPM/Gannon 26-JUL-1994 EPA 8020 RGR 2-AUG-1994 100

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	100 μg/L	3820 μg/L
Toluene	100 μg/L	1660 µg/L
Ethyl benzene	100 μg/L	120 µg/L
Xylenes	300 μg/L	< 300 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	93.5 %

Mei Li Inchcape Testing Services



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-14 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS	:	Groundwater 9407261130 MW-18
PROJECT	:	GPM/Gannon
DATE SAMPLED	:	26-JUL-1994
ANALYSIS METHOD	:	EPA 8020
ANALYZED BY	:	RGR
ANALYZED ON	:	1-AUG-1994
DILUTION FACTOR	:	1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	56.5 μg/L
Toluene	1.0 μg/L	8.3 μg/L
Ethyl benzene	1.0 μg/L	2.3 μg/L
Xylenes	3.0 μg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	91.5 %

ei- Mei Li Inchcape Testing Services



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-15 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	:::::::::::::::::::::::::::::::::::::::	Groundwater 9407261200 MW-21 GPM/Gannon 26-JUL-1994 EPA 8020 RGR 1-AUG-1994 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	77.7 μg/L
Toluene	1.0 μg/L	51.1 μg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	3.0 μg/L	10.5 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	90.4 %

Inchcape Testing Services

Mei Li Kuei-Mei

Technical Director



DATE RECEIVED : 27-JUL-1994

REPORT NUMBER : H94-4834-16 REPORT DATE : 2-AUG-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD ANALYZED BY ANALYZED ON DILUTION FACTOR	•••••••••	Groundwater 9407261300 MW-22 GPM/Gannon 26-JUL-1994 EPA 8020 RGR 2-AUG-1994 1

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	4.7 μg/L
Toluene	1.0 µg/L	1.1 μg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	3.0 μg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	98.5 %

Inchcape Testing Services

- Mei Li Kuei-Mei 1.7

Technical Director

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OIL CONSERVATION DIVISION RECEIVED

GPM GAS SERVICES COMPANY

July 8, 1994

Mr. William Olson Hydrogeologist New Mexico Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

## RE: SECOND QUARTER 1994 ANALYTICAL RESULTS, LEE PLANT DISCHARGE PLAN GW-2

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory analytical reports for groundwater sampling at our Lee Plant for the second quarter of 1994 (see attached analytical results, report date May 12, 1994). Sample collection was conducted on May 3, 1994, pursuant to the requirements of NMOCD Discharge Plan GW-2. NDRC Laboratories Inc., Houston, Texas, performed the sample analyses. Our consultant, GCL, strictly adhered to chain-of-custody procedures to ensure integrity of the samples during transport to the laboratory.

Depth to groundwater and product thickness measurements and quarterly groundwater sampling were conducted at monitor wells MW-11, MW-12, MW-13, MW-19 and MW-20. No free-phase floating product was encountered in any of these wells. Groundwater samples from each of these wells were analyzed for dissolved aromatic hydrocarbons using EPA Method 602.

MW-11 showed benzene and toluene concentrations below detection with small increases in ethylbenzene and xylenes. MW-12 experienced decreases in benzene and toluene concentrations with slight elevations in ethylbenzene and xylene levels. BTEX concentrations were below detection levels at MW-13, MW-19 and MW-20.

In addition to quarterly sampling, GPM collected groundwater samples from MW-21 and MW-22, the shallow and middle screened wells monitoring the vapor extraction/air sparging system. Analytical results for these wells appear below:

	<b>MW-21</b>	<b>MW-22</b>
Benzene	517 ppb	6.6 ppb
Toluene	52	2.4
Ethylbenzene	<10	<1.0
Xylenes	<30	7.1

Mr. William Olson July 8, 1994 Page 2

These results show a significant decrease in BTEX concentrations from initial sampling conducted in July of 1993 (refer to Status Report - Lee Plant Remediation System, March 30, 1994) and again in March of 1994 (see attached analytical results, report date April 1, 1994).

As we indicated to the OCD via letter correspondence, February 9, 1994, recovery wells MW-8 and MW-10 were no longer operating. GPM performed well restoration activities on these wells during the week of March 21, 1994. Operations commenced at MW-8 with the removal of the pump and associated plumbing. The static water level and total depth of the well were measured and recorded. A bailer was used to remove water and any scale or debris from the well that might have been present. Significant quantities of filter sand and what appeared to be frac sand were removed from this well. In addition, small pieces of white material resembling PVC-casing were also retrieved. Based on observations about the condition of this well, GPM and our consultants, GCL and Larry's Drilling, concluded that the well was damaged to the point that no mechanical cleaning or acidization would be effective in restoring the well; thus, further clean-out operations were halted.

Operations then commenced on MW-7 where total well depth and the static water level were taken and recorded. Water bailed from this well showed no signs of sand or debris that might indicate well damage. Acidizing was done using dry acid supplied by Cotey Chemical Corporation. Following the manufacturer's recommendations, three gallons of dry acid were added to the well. Surging of the acid was performed for four hours using a 2.5-inch diameter swabbing tool. The acid was allowed to remain in the well overnight and the well was then surged for two hours the following morning. Afterwards, a water sample was recovered for pH analysis. Fresh water was then added to the well to neutralize the acid prior to removal. The pump was replaced in the well and the fresh water was removed. The pumping rate was then set to the maximum yield of the well (0.5 gallons per minute) and put on line with the recovery system.

GPM will provide OCD with a groundwater contour map of the site by next week as discussed between you and GCL in a phone conversation on Monday, June 27, 1994. If you have any questions regarding the contents of this letter or the analytical results, please call me at (915) 368-1085.

Sincerely,

Vince Bernard Safety, Environmental & Equipment Inspection Supervisor

/sm Attachments



#### SUMMARY REPORT

CLIENT	:	H + GCL	JOB	NUN	1BER	:	H94-2101
CONTACT	:	Ms. Annette Montoya	REPO	DRT	DATE	:	1-APR-1994
PROJECT	:	3023.001/GPM		•			

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	9403231030/MW-21	Groundwater	23-MAR-1994
2	9403231215/MW-22	Groundwater	23-MAR-1994

BTEX ANALYSIS, EPA 602		1		2	
Benzene	μg/L	2520		6.6	
Toluene	µg/L	260	<	1.0	
Ethyl benzene	μg/L	< 100	<	1.0	
Xylenes	μg/L	< 300	<	3.0	

Mei Li Inchcape Testing Services Kudi-Mei Li Technical Director



DATE RECEIVED : 25-MAR-1994

REPORT NUMBER : H94-2101-1 REPORT DATE : 1-APR-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••••••••••••••••••••••••••••••••••••	Groundwater 9403231030/MW-21 3023.001/GPM 23-MAR-1994 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	100 µg/L	2520 µg/L
Toluene	100 µg/L	260 µg/L
Ethyl benzene	100 µg/L	< 100 µg/L
Xylenes	300 µg/L	< 300 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	97.0 %

nei-Mei Li Inchcape Testing Services Kuei-Mei Li

Technical Director



DATE RECEIVED : 25-MAR-1994

REPORT NUMBER : H94-2101-2 REPORT DATE : 1-APR-1994

SAMPLE SUBMITTED BY	:	H + GCL	
ADDRESS	:	505 Marquette NW, Ste. 110	)0
	:	Albuquerque, NM 87102	
ATTENTION	:	Ms. Annette Montoya	
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	9403231215/MW-22	
PROJECT	:	3023.001/GPM	
DATE SAMPLED	:	23-MAR-1994	
ANALYSIS METHOD	:	EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	6.6 μg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 μg/L	< 1.0 µg/L
Xylenes	3.0 µg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	97.2 %

ei-Mei Li

Kuei-Mei Li Technical Director



#### REPORT DATE : 12-APR-1994

REPORT NUMBER : H94-2101

SAMPLE SUBMITTED BY : H + GCL ATTENTION : Ms. Annette Montoya

ANALYTE	Benzene	Toluene	Ethylbenzene	Xylenes
BATCH NO.	8020D_11	8020D_11	8020D_11	8020D_11
LCS LOT NO.				
PREP METHOD				
DATE PREPARED				
PREPARED BY				
ANALYSIS METHOD	EPA 602	EPA 602	EPA 602	EPA 602
DATE ANALYZED	31-MAR-1994	31-MAR-1994	31-MAR-1994	31-MAR-1994
ANALYZED BY	RGR	RGR	RGR	RGR
UNITS	μg/L	μg/ί	μg/L	µg/L
METHOD BLANK	< 1.00	< 1.00	< 1.00	< 3.00
MS RECOVERY %	106	106	108	105
MSD RECOVERY %	101	103	103	102
MS/MSD RPD %	4.2	3.1	4.8	3.4
BS RECOVERY %	NA	NA	NA	NA
BSD RECOVERY %	NA	NA	NA	NA
BS/BSD RPD %	NA	NA	NA	NA
DUPLICATE RPD %	NA	NA	NA	NA
TCLP RECOVERY %	NA	NA	NA	NA
LCS RECOVERY %	98.8	99.9	100.0	98.9
SPIKE SAMPLE ID	2139-2	2139-2	2139-2	2139-2
TCLP SAMPLE ID				
DUP SAMPLE ID				
••••••••••••••••••••••••••••••••••••••				

NA

Not Applicable

Kuei-Mei Li

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### Inchcape Testing Services

NDRC Laboratories

11155 South Main • Houston, TX 77025 • (713) 661-8150 • Fax (713) 661-2661

#### SAMPLE PRESERVATION INFORMATION SHEET

Field Sampling

Incoming Samples

#### GENERAL

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Company: H9GCL\_\_\_\_\_ Job No: 2101

No. of Cooler(s): \_\_\_\_\_ Temperature of Cooler(s): \_\_\_\_\_

#### PRESERVATION INFORMATION

Sample No.	Temperature of Sample	Sample Container	Volume	Preservation used *	Initial pH	Final pH	Bottles generated	Comments
1	442	3 Vons	Agn	4	Na	Na	0	
2				4				
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PRESERVATION USED.\*

- 1 Cool to 4° C
- 2  $H_2SO_4$  to pH < 2
- $3 HNO_3$  to pH < 2
- 4 HCL to pH < 2

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

Preserved by

10:30 Date/Time



# Inchcape Testing Services

5

11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

#### SUMMARY REPORT

CLIENT	:	H + GCL	JOB 1	NUMBER	:	H94-3166
CONTACT	:	Ms. Annette Montoya	REPO	RT DATE	:	12-MAY-1994
PROJECT	:	3023-001/GPM				

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	9405031045 MW-11	Groundwater	3-MAY-1994
2	9405031200 MW-12	Groundwater	3-MAY-1994
3	9405031215 MW-12a	Groundwater	3-MAY-1994
4	9405031315 MW-13	Groundwater	3-MAY-1994

BTEX ANALYSIS, EPA 602			1		2		3		4
Benzene	µg/L	<	1.0	<	1.0	<	1.0	<	1.0
Toluene	μg/L	<	1.0		1.6	<	1.0	, <b>&lt;</b>	1.0
Ethyl benzene	μg/L		1.3		1.1	<	1.0	<	1.0
Xylenes	µg/L		3.9		4.1	<	3.0	<	3.0

nei-Mei Li Inchcape Testing Services



#### SUMMARY REPORT

CLIENT	:	H + GCL
CONTACT	:	Ms. Annette Montoya
PROJECT	:	3023-001/GPM -

JOB NUMBER : H94-3166 REPORT DATE : 12-MAY-1994

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
5	9405031430 MW-19	Groundwater	3-MAY-1994
6	9405041000 MW-21	Groundwater	4-MAY-1994
7	.9405041115 MW-22	Groundwater	4-MAY-1994
8	9405041230 MW-20	Groundwater	4-MAY-1994

BTEX ANALYSIS, EPA 602			5		6		7		8
Benzene	µg/L	<	1.0		517		6.6	<	1.0
Toluene	µg/L	<	1.0		52		2.4	<	1.0
Ethyl benzene	μg/L	<	1.0	<	10	<	1.0	<	1.0
Xylenes	µg/L	<	3.0	<	30		7.1	<	3.0

· Mei Li Inchcape Testing Services Kuei-Mei Li Technical Director


DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-1 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD		Groundwater 9405031045 MW-11 3023-001/GPM 3-MAY-1994 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	1.3 µg/L
Xylenes	3.0 µg/L	3.9 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	105 %

- Mei Li Inchcape Testing Services



DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-2 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : :	Groundwater 9405031200 MW-12 3023-001/GPM 3-MAY-1994 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	1.6 μg/L
Ethyl benzene	1.0 µg/L	1.1 μg/L
Xylenes	3.0 µg/L	4.1 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	115 %

Mei Li

Kuei-Mei Li Technical Director

Inchcape Testing Services



DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-3 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	• • • • • •	Groundwater 9405031215 MW-12a 3023-001/GPM 3-MAY-1994 EPA 602

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Benzene	1.0 µg/L	< 1.0 µg/L	
Toluene	1.0 µg/L	< 1.0 µg/L	
Ethyl benzene	1.0 µg/L	< 1.0 µg/L	
Xylenes	3.0 µg/L	< 3.0 µg/L	

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	104 %

Mei Li Inchcape Testing Services Kuei-Mei Li Technical Director



DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-4 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
SAMPLE MATRIX ID MARKS	::	Groundwater 9405031315 MW-13
PROJECT	:	3023-001/GPM
DATE SAMPLED ANALYSIS METHOD	:	3-MAY-1994 EPA 602

BTEX ANALYSIS		<b>、</b>
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 μg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	3.0 μg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	106 %

nei Li Inchcape Testing Services



DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-5 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••	Groundwater 9405031430 MW-19 3023-001/GPM 3-MAY-1994 EPA 602	

BTEX ANALYSIS		•	
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Benzene	1.0 µg/L	< 1.0 µg/L	
Toluene	1.0 µg/L	< 1.0 µg/L	
Ethyl benzene	1.0 µg/L	< 1.0 µg/L	
Xylenes	3.0 µg/L	< 3.0 µg/L	

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	102 %

Mei Li

Inchcape Testing Services



DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-6 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	• • • • • •	Groundwater 9405041000 MW-21 3023-001/GPM 4-MAY-1994 EPA 602

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		
Benzene	10 µg/L	517 µg/L		
Toluene	10 μg/L	52 μg/L		
Ethyl benzene	10 #g/L	< 10 µg/L		
Xylenes	30 μg/L	< 30 µg/L		

QUALITY CONTROL DATA	<u>→ → → → → → → → → → → → → → → → → → → </u>	
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	104 %

i- Mei Li

Inchcape Testing Services



DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-7 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	• • • • • •	Groundwater 9405041115 MW-22 3023-001/GPM 4-MAY-1994 EPA 602	

BTEX ANALYSIS		4
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	6.6 µg/L
Toluene	1.0 µg/L	2.4 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	3.0 μg/L	7.1 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	104 %

Inchcape Testing Services Kueil-N Technical Director



DATE RECEIVED : 6-MAY-1994

REPORT NUMBER : H94-3166-8 REPORT DATE : 12-MAY-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	)
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	• • • • • •	Groundwater 9405041230 MW-20 3023-001/GPM 4-MAY-1994 EPA 602	

BTEX ANALYSIS		•
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 #g/L	< 1.0 µg/L
Xylenes	3.0 µg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	111 %

Mei Li

Inchcape Testing Services



#### REPORT DATE : 12-MAY-1994

REPORT NUMBER : H94-3166

SAMPLE SUBMITTED BY : H + GCL ATTENTION : Ms. Annette Montoya

ANALYTE	Benzene	Toluene	Ethylbenzene	Xylenes	Benzene
BATCH NO.	8020C_50	8020C_50	8020C_50	8020C_50	8020C_51
LCS LOT NO.					
PREP METHOD					
DATE PREPARED					
PREPARED BY					
ANALYSIS METHOD	EPA 602	EPA 602	EPA 602	EPA 602	EPA 602
DATE ANALYZED	10-MAY-1994	10-MAY-1994	10-MAY-1994	10-MAY-1994	11-MAY-1994
ANALYZED BY	RGR	RGR	RGR	RGR	RGR
UNITS	µg/L	µg∕L	μg/L	µg∕L	µg/L
METHOD BLANK	< 1.00	< 1.00	< 1.00	< 3.00	< 1.00
MS RECOVERY %	102	94.3	98.4	103	99.3
MSD RECOVERY %	104	97.3	99.3	105	103
MS/MSD RPD %	2.7	3.1	0.9	1.6	3.2
BS RECOVERY %	NA	NA	NA	NA	NA
BSD RECOVERY %	NA	NA	NA	NA	NA
BS/BSD RPD %	NA	NA	NA	NA	NA
DUPLICATE RPD %	NA	NA	NA	NA	NA
LCS RECOVERY %	99.9	92.2	94.5	101	100
SPIKE SAMPLE ID	2918-1	2918-1	2918-1	2918-1	3166-8
DUP SAMPLE ID					

NA

Not Applicable

Kuei-Mei Li



REPORT DATE : 12-MAY-1994

REPORT NUMBER : H94-3166

SAMPLE SUBMITTED BY : H + GCL ATTENTION : Ms. Annette Montoya

ANALYTE	Toluene	Ethylbenzene	Xylenes
BATCH NO.	8020C_51	8020C_51	8020C_51
LCS LOT NO.			
PREP METHOD			
DATE PREPARED			
PREPARED BY			
ANALYSIS METHOD	EPA 602	EPA 602	EPA 602
DATE ANALYZED	11-MAY-1994	11-MAY-1994	11-MAY-1994
ANALYZED BY	RGR	RGR	RGR
UNITS	μg/L	µg/L	μg/L
METHOD BLANK	< 1.00	< 1.00	< 3.00
MS RECOVERY %	89.1	89.6	86.7
MSD RECOVERY %	92.7	93.7	93.3
MS/MSD RPD %	3.9	4.5	7.4
BS RECOVERY %	NA	NA	NA
BSD RECOVERY %	NA	NA	NA
BS/BSD RPD %	NA	NA	NA
DUPLICATE RPD %	NA	NA	NA
LCS RECOVERY %	92.6	95.2	101
SPIKE SAMPLE ID	3166-8	3166-8	3166-8
DUP SAMPLE ID		•••	

NA

Not Applicable

Kuei-Mei Li

3. (Date) (Date) NIK, H+GCL	Received By (Laboratory) (Signature) (Printed Name) (Laboratory) (ANARY - LABORATORY • F	2. (Time) ( (Time) ( (Date) ( (Date) ( (Date) ( () () () () () () () () () () () () () (	1. Received By Time) (Signaure) Time) (Signaure) Time) (Signaure) (Signaure) Date) (Printed Name) Date) (Company) DISTRIBUTIO		eived By deived By ture) ture) ture) ture) ture) ture)	Received By <i>Eveloved By</i> (Signature) (Printed Name) (Company)	o No. Received By Endersof E. A. M. M. M. (Stenaure) (Printed Name) (Company)	Lab No. <i>Exclored By</i> <i>Exclored Control</i> (Signature) <i>Company</i> ) (Company)
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			Analysis Request			ing Service	cape Test	/Inch
stody 	ain of Cus 3py Page 1	Ch2 Date 5/	<ul> <li>San Francisco</li> <li>2200 Powell Street, Ste. 880</li> <li>Emeryville, CA 94608</li> <li>(510) 547-3886</li> <li>FAX: (510) 547-3631</li> </ul>	C New York 261 Madison Avenue New York, NY 10016 (212) 983-8510 FAX: (212) 983-8795	lid Atlantic Region 1 Forbes Bivd., Ste. 240 nam, MD 20706-4325 ) 459-9677 :: (301) 459-3064	Ste. 120 CJ M 5 Lant 0965 FAX	□ Los Angeles 19600 Fairchild Irvine, CA 9271 (714) 955-0201 FAX: (714) 955-	96
	GINAL °	DR	Chicago 626 W. Jackson Blvd., Ste. 800 Chicago, IL 60606 (312) 648-9988 FAX: (312) 648-0818	☐ Boston 180 Canal Street Boston, MA 02114 (617) 723-4664 FAX: (617) 367-1386	ASA-WSTF Drawer MM Cruces, NM 88004 5) 524-5353 1: (505) 524-5315	UW, Ste. 1100 DN M 87102 Las (505 6355 FAX	LA Albuquerque 505 Marquette 1 505 Marquette 2 7505) 842-0001 1 (505) 842-	entists

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# Inchcape Testing Services

NDRC Laboratories

11155 South Main • Houston, TX 77025 • (713) 661-8150 • Fax (713) 661-2661

## SAMPLE PRESERVATION INFORMATION SHEET

Field Sampling 📋

Incoming Samples

### GENERAL

Company: H+GC-	Job No: 3166
No. of Cooler(s):	Temperature of Cooler(s): 102

### PRESERVATION INFORMATION

Sample No.	Tempe of Sa	erature mple	San Cont	nple ainer	Vol	ume	Preser use	vation d *	Initia	al pH	Fina	al pH	Bo gene	ttles erated	Comments
1	10	SC	31	das	4	Inl	4		N	a	N	c.	0		
2															
3				_											
4	<u> </u>														
5															
6															
7															
8				~				k				k		e	,4%
								_							

PRESERVATION USED.\*

- 1 Cool to 4° C
- 2  $H_2SO_4$  to pH < 2
- 3  $\rm HNO_3$  to  $\rm pH < 2$
- 4 HCL to pH < 2

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

Michael Inou. Preserved by







July 7, 1994

# RECEIVED

JUL 0 8 1994

OIL CONSERVATION DIV. SANTA FE

Hydrogeologist New Mexico Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

Mr. William Olson

On behalf of GPM Gas Corporation (GPM), GCL is pleased to provide the groundwater contour map for the Lee Plant as an addendum to the Second Quarter Groundwater 1994 Analytical Results, Lee Plant, Discharge Plan GW-2, submitted by GPM to OCD at the end of June. The groundwater levels used to generate the contours were taken during the January 1994 sampling event. A complete round of water level measurements was not taken for during the March sampling event due to a GCL oversight.

In reference to the attached GPM Lee Plant Groundwater Contour Map, the 3,874 feet contour line surrounding monitor well, MW-5, may be due to low hydraulic conductivity in the area or may be an aberration. GPM is currently developing an historical database which should provide a better understanding of such variations.

Please note the correction to the Second Quarter 1994 Analytical Results in paragraph 2 on page 2. The text should read, "As we indicated to the OCD via letter correspondence, **MW-7 and MW-8**, were no longer operating." If you have any questions concerning the map or the contents of this letter, please contact me at 842-0001. Thank you.

Sincerely, Geoscience Consultants, Ltd. (GCL)

Maureen Gannon Maureen D. Gannon Senior Engineer

MDG/54030/LEE/OLSON03.LTR

Attachment

cc: V. Bernard, GPM



GPM Lee Plant January 1994 Water Level Contour

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## GPM GAS CORPORATION

4044 PENBROOK ODESSA, TEXAS 79762

'94 **A**P,

March 30, 1994

Mr. Bill Olson New Mexico Oil Conservation Division P.O. Box 2088 Santa Fe, New Mexico 87504-2088 RECEIVED APR 01 1994 OIL CONSERVATION DIV. SANTA FE

### **RE: STATUS REPORT- LEE PLANT REMEDIATION SYSTEM**

Dear Bill:

Pursuant to Discharge Plan GW-2 Modification for the Lee Gas Plant (NMOCD, April 26, 1993), GPM Gas Corporation (GPM) is submitting this status report evaluating the air sparging/vapor extraction system effectiveness, as required under section B.4 of the attachment to the GW-2 Modification. The objective of this status report is to provide a summary of system operation to date and present monitoring data obtained thus far.

#### Lee Plant Remediation System

The plant remediation system involves three concurrent operations:

- pumping and disposal of free product/groundwater
- soil vapor extraction
- air/water injection

The pumping and disposal system consists of pumping groundwater and/or product from recovery well RW-1, and monitor well MW-4, and pumping groundwater from monitor wells MW-6, MW-7, MW-8, and MW-10. Recovered fluids are delivered to the Lee Plant wastewater treatment system.

The installation of the soil vapor extraction (SVE) system began with the drilling and completion of three 2-inch monitor wells, MW-21, MW-22, and MW-23, in July of 1993. These wells were installed between recovery wells RW-1 and MW-4. Plate 1 is a well location map of the plant site.

In August of 1993, a positive displacement blower was connected to RW-1 and the SVE system installation was completed. Groundwater recovery at RW-1 occurs simultaneously with vapor extraction within the same well. Vapors from the vapor extraction system are discharged to the on-site sulfur burner, providing an additional fuel source for the burner. Organic vapor concentrations, measured with an organic vapor monitor (OVM), and pressure drop readings have been recorded at RW-1 since August 1993. Attachment 1 is a copy of the field logbook used to record these measurements.

In November of 1993, air/water injection was added to the remediation system. Monitor well, MW-23, was retrofitted to accommodate a venturi injector. Figure 1 is a schematic of the MW-23 wellhead. Maximum restricted flow through the venturi is 2 gpm. A water line from the plant process water supply delivers water to the injector ranging from 27 to 50 psi. The differential pressure across the venturi draws ambient air into the water stream. Microbubbles are formed in the injection stream and transported down into the formation

Mr. Bill Olson April 5, 1994 Page 2

by a 1/2-inch drop pipe. A pneumatic packer is installed immediately above the well screen to enhance flow of the air/water mixture into the formation.

#### System Status

Production by recovery wells at the Lee Plant has declined due to a significant decrease in the water table elevation over the last four years. When MW-9 was completed in 1990, static water level was measured at 97.43 feet below top of casing. In January, 1994, the static water level in this well was found to be 102.8 feet below top of casing. Clearly, the water table has dropped several feet thereby minimizing the water column available in each recovery well. This limits drawdown and therefore recovery from each affected well.

Plate 1 provides a summary (since January of 1992) of the laboratory analyses for all Lee Plant wells sampled under the current Discharge Plan GW-2. BTEX concentrations continue to decrease throughout the plant site. In July of 1993, and March of 1994, additional sampling was conducted at MW-21 and MW-22 to determine the impact of the air/water injection system on contamination within the area of these wells. Table 1 provides results from these two sampling events. BTEX levels in MW-21 and MW-22 have decreased dramatically to levels below laboratory detection.

The SVE system is currently operating at a vacuum of 95 inches of  $H_2O$  and a flowrate of 48 cfm. Initial organic vapor concentrations from the SVE system were recorded by means of an OVM in the 500 ppm range. Air samples analyzed by NDRC Laboratories, Houston, Texas, indicate these readings correspond to 1810 mg/m<sup>3</sup> total organics or 556 ppm as benzene. After system equilibration, organic vapor concentrations as measured by the OVM have reached a steady state of approximately 85 ppm. Additional air sampling indicates the vapors are composed of approximately 66% benzene, 29% toluene, 1.5% ethyl benzene, and 3.0% xylenes. Figure 1 provides a graphical representation of organic vapor concentrations over time.

The average pumping rate of RW-1 is approximately 2.55 gpm. The air/water injection system has maintained an average injection rate of 1.79 gpm. The DO concentration of water injected into the aquifer ranges from 11 mg/l (November 1993) to 6 mg/l (March 1994). Back pressure from the formation was approximately 2 psi at start-up of the air/water injection system. In March of 1994, a pressure reading of 10 psi was recorded. Increases in back pressure may be due to scaling on the screen or decreasing induced transmissivity of the formation.

System parameters were recorded daily during the initial period of operation, followed by quarterly monitoring. Dissolved oxygen (DO), carbon dioxide (CO<sub>2</sub>), pressure (inches of H<sub>2</sub>O or psi), and depth to water were recorded at RW-1, MW-2, MW-3, MW-4, MW-8, MW-21, MW-22, and MW-23. Table 2 presents the data collected to date on the system. Current system parameter levels indicate that little if any change has occurred in the DO, CO<sub>2</sub> and water level readings at those wells affected by the SVE/air sparging system. The air sparging unit continues to inject a higher DO level than the DO concentration measured in the extracted water. With the addition of oxygen via aerated water, an increase in CO<sub>2</sub> levels would be expected at RW-1 due to increased microbial activity; however, CO<sub>2</sub> levels have remained relatively constant. This may be due to a very toxic subsurface environment and the lack of nutrients. Laboratory analysis of

Mr. Bill Olson April 5, 1994 Page 3

nutrients in a water sample taken from RW-1 indicate low to non-existent levels of nitrogen and phosphorus. See attachment 2 for results.

The pumping and disposal treatment unit has proven its effectiveness in remediating on-site groundwater contamination. The SVE system continuously draws 50 to 100 ppm of organic vapors, demonstrating active remediation of hydrocarbon contamination in soil. In order to monitor the effectiveness of the air/water injection system, samples were collected from MW-21 and MW-22 (refer to table 1). These two wells are located between the injection well and RW-1 and are completed at shallow and intermediate depths, respectively. Previous sampling identified BTEX in the tens of ppm range. GPM believes that the decrease in BTEX concentrations in MW-21 and MW-22 occurring in the past eight months has occurred because the air/water injection system, combined with pumping and vapor extraction, is working effectively in the area around these wells.

GPM will continue to monitor remediation system parameters and provide results to OCD on a quarterly basis. If you have any questions concerning the contents of this letter, please call me.

Sincerely,

Vince Bernard Director of Safety and Environmental Affairs New Mexico Region GPM Gas Corporation

cc: Maureen Gannon - GCL

## Table 1

# BTEX Concentrations for MW-21 and MW-22

	Monitoring	g Well 21	Monitorin	g Well 22
Parameters, BTEX	7/28/93	3/03/94 <sup>1</sup>	7/28/93	3/03/941
Benzene	37,000 µ/L	<2.0 µ/L	170 µ/L	<2.0 µ/L
Ethyl benzene	<2000 µ/L	<2.0 µ/L	36.0 μ/L	<2.0 µ/L
Toluene	5000 μ/L	<2.0 µ/L	65.0 μ/L	<2.0 µ/L
Xylenes	<6000 μ/L	<6.0 µ/L	48.0 μ/L	<6.0 µ/L

<sup>1</sup> Result from March 3, 1994, considered preliminary.

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54030/LEE/TAB2.TBL



Table 2

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System Parameters GPM Lee Plant SVE/Water InjectionAir Sparging

DiW	(Ft)			102.44	102.54		101.45		101.44	101.48	_	m	gpm			2.24	1.71	
um .	120	17	-95		4.5	.10			_			te = 2.91 g	ate = $2.75$		3 start up	l) gpm = 2	23) gpm =	
Vacu	(in H	17				+					g event	ump rat	u drund		1/16/9	(RW-1	-MW)	
C02	(l/gm)	1/1	1 51								y samplin	RW-1 pi	MW-23		<ul> <li>Since 1</li> </ul>	Average	Average	
DO	(l/gm)	1/7/94	2.5								Quarter							
DtW	(H)	11/17		103.42	103.48		101.28	103.1	101.24	101.36	tem parameter	3.09 gpm	= 2.75 gpm		W-1 =167689	W-23= 128130		
Vacuum	(in H2O	11/17	95.00		-0.32	+2	-0.8		-0.2	0	rage of sys	mp rate =	ump rate =		pumped R	injected M		
C02	(l/gm)	11/17	63	П	16		160	110	55		-hour ave	RW-1 pui	MW-23 p		Total gal	Total gal		
DQ	(l/gm)	11/17/93	1.8	2.6	2.2	10.0	1.6	2.1	2.0		Second 24							
DťW	(Ft)	11/16		102.12	101.92		101.34	99.40	101.80		ameters	2.51 gpm	1.97 gpm	tw-1		low water tabl		
Pressure	(in H2O	11/16	-95.30	0::	-0.60	* +2	-0.37		-0.10	-0.05	system par	np rate =	ject rate =	flow rate F	essure	cscreen be		
C02	(l/gm)	11/16	73	Ħ	18		135	100			/erage of s	RW-1 pur	MW-23 in	Adjusted	* Back Pr	** MW-23		
DQ	(l/gm)	11/16/93	1.5	2.5	2.1	10.0	1.5	2.5	0.1	0	24-hour av							
DtW	(Ft)	11/15		102.57	102.91	102.18		103.48				.64 gpm	tw-1 to					
Pressure	(in H2O)	11/15	-122.0	0	-1.0	0	-0.4		0	0	ц,	np rate = 8	flow rate I	_				f
C02	(l/gm)	11/15	62	11	11	12					ater Start	RW-1 pun	<ul> <li>adjusted</li> </ul>	to 3.1 gpm				ç
DO	(mg/l)	11/15/93	2.5	2.0	2.0	2.2					Pre-Air/W							6
Parameter [	Units	Date	RW-1	MW-22	MW-21	MW-23	MW-4	MW-8	MW-3	MW-2	*Notes							

DtW (Ft) 3/23		102.88	102.82	102.18		102.05			.70 gpm 2.W-1 .85 gpm 1.66 gpm	
Pressure (in H2O) 3/23	102.001		-4.25	10.00	-0.40		0	0	rip mp rate = 1 1 flow rate I mp rate = 1 ump rate =	
CO2 (mg/l) 3/23	45	10	15	0		25	40	25	RW-1 pur RW-1 pur adjustec RW-1 pur MW-23 p	
DO (mg/l) 3/23/94	1:75	2.50	2.00	6.00			2.50	2.50	Well Res	1
Parameter Units Date	RW-1	MW-22	MW-21	MW-23	MW-4	MW-8	MW-3	MW-2	*Notes	

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## Attachment 1

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Field Logbook for OVM and Pressure Readings on RW-1

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# Monitor well data

J/hr	Current/ppm i	maa'xeM	Interval/hrs i	HW-1/vac	mw-21/vad	mw-4/vac
Jate 9-30						
11:30 pm	87.5	1		-6.9	- , 7	- 4
Date /0 - /		i				
11:30 pm	88.7	i		-70	-, 7	
Date /0-2 ;						
11:30 pm	49.7			-7.0	8	- 8
Date (0-3)		į				
11:30 pm	64.6	·		~ 7.0	-,7	76
Date 10-4						
11:30 pm	96.4			-7.0	8	-,4
Date 10-5						
11:30 pm	95.7			-6.9		78
Date 10-6						
11:30 pm	93.8			~ 7.0	8	- 8
Date 10-7	·					
11:30 pm						· · · · · · · · · · · · · · · · · · ·
Date 10.8						
11:30 pm						
Date 10-9	84.1			70	- 8	- 6
11:30 pm		·				**************************************
Date 10-10	82.8	)		-6.5		_ 6
11:30 pm			· · ·			
Date 10-11	75.6			- ,7.0	7	r.5
11:30 pm			,	······································		
Date 10-12	90.1			- 6.9	8	5
11:30 pm				•		
Date /3	95.3			-6.7	-5	6
11:30 pm	1	ļ				
Date 10-14	96,2			- 10,6	4	-,4
11:30 pm						
Date 0/6	92.4		·	- 6.8	-,7	- ,4
[11:30 pm						
Date 10.14	43 1			- 10.3	1.7	<u>~.6</u>
11:30 pm	·	ll				
Uste 10-17	#				ii	i
111:30 pm	<u>I</u>					
Date 10-18	<u></u>		]			
11:30 pm						
Date 10-19		!				
11:30 pm		5			i	
Date 10-20	54.4			- 6.9	-,6	- 16
11:30 pm						
Uate N-21	58.6			-4.8	1 6	2
11:30 pm	172				<u> </u>	
Uare 10-22	49			- 6.4	4	-12
United pm	,; 			<u></u>		
Uate 10-23	<u> </u>		i	1 - 6 - 9	1-12	<u> </u>

1672 154

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# Monitor well data

Time/hr	Current/ppm	Max/ppm	Interval/hrs	RW-1/vac	mw-21/vao	mw-4/vac
Date 1424	48.9			- 7	-, 4	2
11:30 pm						
Date 10-25	49.2		1	- 7	5	-,4
11:30 pm						
Date 10-24						
11:30 pm						
Date 10-27						
11:30 pm	48.7	•		- 7		-,4
Date /0.28	[i					
11:30 pm	50.1			-7	-,8	-, 6
Date N-29						
11:30 pm	48.6			-7	-,6	75
Date/0-30						
11:30 pm	47.6			-7	-,5	74
Date /0-3/						
11:30 pm	53,7			- 7	-, 6	-,4
Date 11-1						
11:30 pm	55.6			-7		-15
Date 11-2					]}	
11:30 pm	55.8			-7	-,8	-,8
Date 11-3				1		·
11:30 pm	58.1		·	-7	8	6
Date 11-4				Į		
11:30 pm	52,2			-7	6	5
Date 11-5		· · · · · · · · · · · · · · · · · · ·	•	]		
11:30 pm	55.6			-5	8	-15
Date II-L						
11:30 pm	50,1	]		1-6	7	5
Date 11-7			]			
11:30 pm	47,9	·		-4	7	4
Date IF8			)	]		
11:30 pm	56,2			-7	- : 7	5
Date 11-7						
11:30 pm	53.8	<u> </u>	<u> </u>	<u>1 - 7</u>	<u></u>	
Uare //-/6	5	H	3 	1 7		
11:30 pm	54.2	<u></u>	li 	<u> </u>	-,3	
Date //-//	<u> </u>	<u> </u>	1			ļļ
11:30 pm	Shyt	Dow~				
<u>  Date //-/ </u>	2					
<u>11:30 pm</u>	62.8		1	-7	6	-14
Date //-/2	2	<u> </u>			_	
11:30 pm	52.3			7	ile	-, 5
Date //-/	<u> </u>		<u> </u>		_	
0-t- 1/	55.7	1	<u>}</u>	-6.8		ا د، ا
$\frac{1}{1120}$		101.11	1			- 2
Dete di	<u> </u>	Kesthered	<u> Pu-p 1,30p</u>	<u>aj</u>	<u>7</u>	
accale //*/	• ii	21	ş:	14		J

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# Monitor Wells Lee Plant

Date	RW-1	RW-1	MW-4	WW-21	MW-23	
	OVM	GPM	VAC	VAC	PSI	
STD.		2.5	-0.2	-1.0	50	
11/10/67	1.1.4	120	1 7		1 6 -	
11/14/13	60	3.0				
<u> </u>	1 10	7.0	+	4	20	
11/2	<u> </u>			-17	- 30	-i
1/20	<u> </u>	7.0	74	/ /		
11/24	6		$\frac{1}{1}$		- <u>-</u> 2k	2032
11/24	57	3.0	1			2236
11-25	37.6	<u>d.11</u>		-2.0	de	1092
11-26	62.3	dis_		-1.3		****
11-0	58.2	2.16	-, -, -, -, -, -, -, -, -, -, -, -, -, -	-1,2		
11-28	160,3	2.07	- 9	-1.3	26	3206
11-29	59.1	<u> </u>		1,8	2)	- 3501
11-30	61.5	d,7	.9	- did	20	3/42
12-1					1	
12-2			<u> </u>			
12.3	60,8	2.2	5	4	28	
124	62.4	2.2	5		28	_
12-5	60.5	2.2	5	-,.5	28	<u> </u>
12-6	57.8	2.5	4	- 6.	28	
12-7	59,5	7.2	5		30	
12-8	61.7	7.2	5	5.	36	
12-7			-			{
ļ	<u> </u>					!
					_ <u> </u>	
					_	
17-14	GA.(1	207	+	-71	49	
12014	1 421	2.01		-2.5	125	
12-19	1 10.4	<u>a.14</u>	1 - 7	<u> </u>	20	
12 20	28.7 CR 1				30	
12-20		<u> </u>	<u>   -,/</u>		ox	
14-01						
12- 92						
i	1	1				

Do on day lights -

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# Monitor Wells Lee Plant

Date	RW-1	RW-1	WW = 4	MW-21	WW-23	
	OVM 1	GPM	VAC	VAC	PSI	
ISTD.		2.5	-0.2	-1.0	50	
12-26-93	131	2.09	.5	4.0	36	7
					1	7
12-289:	\$ 105	3,1	.5	3.6	15	10757
12-29-93	3 66.8	2.05	15	4	38	10953
12-30-93	74	2.04	,6	4.1	38	11136
12-31-43	69.8	2.04	16	4.2	38	11316
1-1-94	72.2	205	.3	4	387	11408
1-2-94	66	2.03	1.2	4.8	38	11781
1-3-94	68.8	2.04	1.0	4.2	38	12181
1-4-94	MEXINE	1.25	./	112	38	R213
1-5-94	BROKE	2.05	.6	4.2	38	12435.
1-6-94	70	2.15	16	4.1	30	12 694
1-7-94	73	2.6	.6	3,6	21	12 84/
1-8-94	69	2.0	.5	4.0	22	
1-9-94	68	2.05	. 15	5.5	25	
1-10-94	71	2.04	•5 -	3,9	25	
-11-94	21	1.89	· 1.	4.5	27	1
1-12-94	65	2.04	1-,6	3.7	26	
1-13-94	1 72	2.05	.5	4.3	27	
1-14-94	70	2.04	1.5	4.2	24	
1-15-94	71	2.02	.6	4.0	23	
1-16-94	67	2.07	.5	4.1	24	
1-17-94	1 71	2001	.4	4.0	24	
1-18-94	70	2.02	1,5	4.2	23	
1-19-94			ļ.,		<u></u>	
1-20-99	64	2.03	1.0	418	FLOZC	15759
1-21-94	lde15	1.70	10	.6	25	15963
1-22-94	63	2.05	.6	4.4	25	16164
1-13-50	68.5	1.29	,8	4.3	25	
-20 - 24	60	1.46	1,0	416	25	16604

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# Monitor Wells Lee Plant

Date	RW-1	RW-1	ww4	MW-21	MW-23	MW-23
	OVM	GPM	VAC	VAC	PSI	ALA D.1'
STD.		2.5	-0.2	-1.0	50	NAR. KLOBING
1-25.44	64,8	1.07	.8	4.4	27	16794
1-26-94	68. 1	1.08	,8	4.4	27	17033
1-27-94	81.3		.8.	4.3	28	10278
1-28-74	82.5	-	. 8	4.4	18	78571
1-29-94	62.3		, 8	4.2	28	24711
1-30-94	68.6		.6	5.8	28	_
1-31-94	76,4	-	7	6.0	28	
			•			
2-3-94	69.2	• •	4	6	28	18904
2-4-94	60.7		~,5	4	28	19122
2-5-94	50.9		- 15	6	30	19378
2.6-94	58.3		4	1-26	28	19552
7						
8			}			_
9	59.8	23	<u>,5</u>	6	28	20197
10	62.7	2.6	5	6	28	20435
//	58.2	2.4		ek-	25	20716
12	61.3	2.3	5		27	JI 004
13	52.7	2.5	-15	6	28	212 /0
14	63.1	2.2	.4		28	28525
15	55.6	2.3	-,4	/	28	21821
17	86	1.51	7	4.3	27	22230
18	62.3	1.59	7.	4.3		22160
19	77.5	1.55	1.1	4,8	28	227150
20	81.7	1.60	1.0	4.6	28	229490
21	84.8	1.59	+ .7	4,2	28	231820
<u> </u>	107	1.60	1.8	43	27	239660
23	82	1.40		4.9	<u> </u>	236590
17.250	88	1.61	+:8-	<u></u>	- 28	74/00
レーンショク	· > > < <		11.0		1 / 5	

~ ~		N	Monitor well da	ta		2 2	
Lime/hr	time time	Maxippm	Discontines i	BW-4-vac	mw-21/vac	mw-stvac	mW-23
Date i 1	DATE			7,040		PSI-SUMAR	METEK
11:Cupm	2-76-94	82.3	1.63	. 6	4.7	27	24350
Date	2-27-94	80.4	1.64	رب	4,2	27	2458G
111 /3U pm	2-28-94	83.6	163	.6	4.0	27	24871
Date							
11130 pm	3-1-94	91.4	1.66	.6	4.2	27	25098
Date	3-2-94						
11:30pm		· ·		1			
Uate		(					
11:30 pm							
Date							
11:30 pm							]
Date							
11:80 pm	3-9-94	84.1	1.62		4.3	27	]27
Date	3.10.94	90.8	1.63		4.0		
11:BUpm	2:11.94	82.3	1.68	.7	4.5	28	j
Date	3-12.94	86.3	05.1	. 6	4.2	2.8	
11:30 pm	3-13-94	84.1	1.66	6	4.0	28	
Date	3-21-94	79,2	1159	.8	4.6	28	77820
11:BUpm				Y			<u>]</u>
Date		]			][		
11:BOpm		]		·			
Date		·				<u> </u>	
<u>11:30pm</u>		<u></u>	<u> </u>	<u> </u>		Į	
Uate		<u> </u>		<u> </u>		<u></u>	
11 SUpm		Į				<u></u>	
Date			ļ				4
11:30 pm		_ <u></u>	Į	1			-
Date		<u></u>			_ <u></u>	<u></u>	
11:3Upm		<u> </u>	<u></u>				
		<u></u>	ļ	<u></u>		<u>}</u>	<u>1</u>
Instell			<u></u>	- <u> </u>		<u></u>	귀
11:30 pm			1			1	
Date		1					
ih 30 pm							
Date		1					
11:30 pm		1	}				
Date			1			1	
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		-	1				
11:30 pm			11 				
"Uate!		3	<u> </u>			i:	2 

## Attachment 2

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Nutrient Laboratory Analytical Results for RW-1



# **Inchcape Testing Services** NDRC Laboratories

11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

#### SUMMARY REPORT

CLIENT	:	H + GCL	JOB NUMBER	:	H94-966
CONTACT	:	Ms. Annette Montoya	REPORT DATE	:	23-FEB-1994
PROJECT	:	54030.01/GPM-Lea			

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	9402091130 RW-1	Water	9-FEB-1994
2	9402091135 RW-1	Water	9-FEB-1994

MISCELLANEOUS ANALYSES		1	2	
Ammonia Nitrogen	mg/L	-	0.4	
Nitrate-Nitrogen	mg/L	-	< 0.1	
Ortho Phosphate	mg/L	< 0.10	-	

Inchcape Testing Services Kuei-Mei Li Kuei-Mei Li Technical Director





## GPM GAS CORPORATION

4044 PENBROOK ODESSA, TEXAS 79762

First Quarter 1994 Analytical Results Lee Plant Discharge Plan GW-2

Mr. William Olson, Hydrogeologist New Mexico Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

# RECEIVED

MAR 2 5 1994

OIL CONSERVATION DIV. SANTA FE

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory reports for groundwater sampling at our Lee Plant for the first quarter of 1994. Sample collection was conducted on January 6, 1994, pursuant to the requirements of NMOCD Discharge Plan GW-2. NDRC Laboratories, Inc., of Houston Texas performed the sample analyses. Our consultant, GCL, strictly adhered to chain-of-custody procedures to ensure integrity of the samples during transport to the laboratory.

Depth to groundwater and product thickness measurements were taken at all monitor wells with the exception of MW-7, MW-8, and MW-10. Downhole recovery equipment in these wells prevented access to measure water levels and product thicknesses. No free-phase floating product was encountered in any of the wells. Quarterly and semi-annual sampling was performed. The following wells were sampled and analyzed for dissolved aromatic hydrocarbons using EPA Method 602: MW-2, MW-11, MW-12, MW-13, MW-18, MW-19, and MW-20.

BTEX concentrations in MW-2 were below detection levels. In MW-13, MW-18 and MW-19, BTEX concentrations had decreased or were below detection. MW-11 and MW-12 showed very slight increases in benzene and toluene; MW-11 also showed a slight increase in xylenes. Water samples from MW-20 contained lower concentrations of benzene and toluene, and slightly elevated concentrations of ethylbenzene and xylenes.

Recovery wells MW-8 and NW-10 are no longer operating. GPM is acting to restore these wells to operating condition (see letter to NMOCD, February 1994). We will apprise NMOCD of well conditions after restoration activities are complete.

If you have any questions regarding this information or the analytical results, please contact me at (915) 368-1085.

Sincerely,

Vince Bernard Safety & Environmental Supervisor New Mexico Region

cc: Maureen Gannon - GCL

RECEIVED JAN 2 4 1994



11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

#### SUMMARY REPORT

CLIENT	:	H + GCL	
CONTACT	:	Ms. Annette Montoya	
PROJECT	:	54030.02/GPM	

JOB NUMBER : H94-138 REPORT DATE : 12-JAN-1994

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	9401060930 MW-11	Groundwater	6-JAN-1994
2	9401061030 MW-12	Groundwater	6-JAN-1994
3	9401061115 MW-13	Groundwater	6-JAN-1994
4	9401061230 MW-19	Groundwater	6-JAN-1994

BTEX ANALYSIS, EPA 602			1		2		3		4
Benzene	µg/L		3.9		2.6		2.4		2.5
Toluene	µg/L		5.5		4.0		3.4		63.4
Ethyl benzene	µg/L	<	1.0	<	1.0	<	1.0	<	1.0
Xylenes	µg/L		3.7	<	3.0	<	3.0	<	3.0

Inchcape Testing	Services	Rai	Na	lan	
		Raj Naran Vice Pres	ident,	General	Manager



#### SUMMARY REPORT

CLIENT	:	H + GCL	
CONTACT	:	Ms. Annette Montoya	
PROJECT	:	54030.02/GPM	

JOB NUMBER : H94-138 REPORT DATE : 12-JAN-1994

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
5	9401061245 MW-19A	Groundwater	6-JAN-1994
6	9401061315 MW-20	Groundwater	6-JAN-1994
7	9401061400 MW-18	Groundwater	6-JAN-1994
8	9401061500 MW-2	Groundwater	6-JAN-1994

BTEX ANALYSIS, EPA 602		5	6		7	8	
Benzene	µg/L	2.6	4.0	<	1.0	<	1.0
Toluene	µg∕L	3.5	5.0		2.1	<	1.0
Ethyl benzene	µg/L	< 1.0	3.1	<	1.0	<	1.0
Xylenes	µg/L	< 3.0	9.7	<	3.0	<	3.0

Nala Inchcape Testing Services Raj Narah Vice President, General Manager



DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-1 REPORT DATE : 12-JAN-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : : :	Groundwater 9401060930 MW-11 54030.02/GPM 6-JAN-1994 EPA 602

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Benzene	1.0 μg/L	3.9 μg/L	
Toluene	1.0 μg/L	5.5 μg/L	
Ethyl benzene	1.0 μg/L	< 1.0 μg/L	
Xylenes	3.0 μg/L	3.7 μg/L	

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	106 %

Natar Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-2 REPORT DATE : 12-JAN-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	:::::::::::::::::::::::::::::::::::::::	Groundwater 9401061030 MW-12 54030.02/GPM 6-JAN-1994 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	2.6 µg/l
Toluene	1.0 μg/L	4.0 μg/L
Ethyl benzene	1.0 μg/L	< 1.0 μg/L
Xylenes	3.0 µg/L	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	107 %

Inchcape Testing Services Raj Nara Vice President, General Manager


DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-3 REPORT DATE : 12-JAN-1994

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BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	2.4 μg/L
Toluene	1.0 µg/L	3.4 μg/L
Ethyl benzene	1.0 μg/L	< 1.0 µg/L
Xylenes	3.0 µg/l	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	105 %

Nala Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-4 REPORT DATE : 12-JAN-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••••••••••••••••••••••••••••••••••••	Groundwater 9401061230 MW-19 54030.02/GPM 6-JAN-1994 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	2.5 µg/L
Toluene	1.0 µg/L	3.4 μg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	3.0 µg/l	< 3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	109 %

la Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-5 REPORT DATE : 12-JAN-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montova
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : : : : : : : : : : : : : : : : : :	Groundwater 9401061245 MW-19A 54030.02/GPM 6-JAN-1994 EPA 602

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Benzene	1.0 #g/L	2.6 µg/	<i>′</i> L
Toluene	1.0 µg/L	3.5 μg/	<i>′</i> L
Ethyl benzene	1.0 μg/L	< 1.0 µg/	/L
Xylenes	3.0 µg/L	< 3.0 µg/	/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	110 %

Inchcape Testing Services Raj Nar Vice President, General Manager



DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-6 REPORT DATE : 12-JAN-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : :	Groundwater 9401061315 MW-20 54030.02/GPM 6-JAN-1994 EPA 602	,

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	4.0 μg/L
Toluene	1.0 μg/L	5.0 μg/L
Ethyl benzene	1.0 µg/L	3.1 µg/L
Xylenes	3.0 µg/L	9.7 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	106 %

Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-7 REPORT DATE : 12-JAN-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	••••••	Groundwater 9401061400 MW-18 54030.02/GPM 6-JAN-1994 EPA 602

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	1.0 µg/L	<	1.0 µg/L
Toluene	1.0 µg/l		2.1 µg/L
Ethyl benzene	1.0 µg/L	<	1.0 <b>µg/L</b>
Xylenes	3.0 μg/L	<	3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	110 %

Salan Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 7-JAN-1994

REPORT NUMBER : H94-138-8 REPORT DATE : 12-JAN-1994

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : :	Groundwater 9401061500 MW-2 54030.02/GPM 6-JAN-1994 EPA 602	

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	1.0 µg/L	<	1.0 µg/L
Toluene	1.0 µg/L	<	1.0 µg/L
Ethyl benzene	1.0 μg/L	<	1.0 µg/L
Xylenes	3.0 µg/L	<	3.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	109 %

ala Inchcape Testing Services Raj Narap Vice President, General Manager



DATE RECEIVED: 7-JAN-1994

REPORT NUMBER: H94-138:1-8 REPORT DATE: 12-JAN-1994

SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS:	Benzene
Technician:	MHT
Sample Extracted:	10-JAN-1994
OC Extracted:	10-JAN-1994
Sample Analyzed:	10-JAN-1994
OC Analyzed:	10-JAN-1994
OC Sample Number:	138-7
TCLP Leachate Date:	

ANALYSIS:	Toluene
Technician:	MHT
Sample Extracted:	10-JAN-1994
QC Extracted:	10-JAN-1994
Sample Analyzed:	10-JAN-1994
QC Analyzed:	10-JAN-1994
QC Sample Number:	138-7
TCLP Leachate Date:	

ANALYSIS:	Ethyl benzene
Technician:	MHT
Sample Extracted:	10-JAN-1994
QC Extracted:	10-JAN-1994
Sample Analyzed:	10-JAN-1994
QC Analyzed:	10-JAN-1994
QC Sample Number:	138-7
TCLP Leachate Date:	

ANALYSIS:	Xylenes
Technician:	MHT
Sample Extracted:	10-JAN-1994
QC Extracted:	10-JAN-1994
Sample Analyzed:	10-JAN-1994
QC Analyzed:	10-JAN-1994
QC Sample Number:	138-7
TCLP Leachate Date:	

A Ext	nalysis raction MS/	Metho Metho MSD RI	od: od: PD:	EPA EPA 0%	60 60	2 2	
Average TCLP	Spike R Duplic Metho LCS R Spike R	ecover ate RI d Blar ecover ecover	ry: PD: nk: ry: ry:	102%  < 1. 92% 	0	µg/L	
Ext	Analysis raction MS/	Metho Metho MSD RI	od: od: PD:	EPA EPA 0%	60 60	2 2	
Average	Spike R Duplic Metho LCS R	ecove: ate Ri d Blan ecove:	ry: PD: nk: ry:	108%  < 1. 98%	0	µg/L	
	Analysis	Meth	od:	EPA	60	2	
Average	MS/ Spike R Duplic	MSD R ecove ate R	PD: ry: PD: nk·	2% 115% 	00	2 	
TCLP	LCS R Spike R	lecove	ry: ry:	102%		μ9/1	
) Ext	Analysis tractior MS/	s Meth Meth MSD R	od: od: PD:	EPA EPA 0%	6 C 6 C	2	
Average	Spike F Duplic Metho	Recove cate R od Bla	ry: PD: nk:	118 <sup>8</sup>  < 3.	0	μq/L	J
TCLP	LCS F Spike F	lecove lecove	ry: ry:	107% 	5		

Inchcape Testing Services Raj Narap

Vice President, General Manager

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# **Inchcape Testing Services**

**NDRC** Laboratories

11155 South Main • Houston, TX 77025 • (713) 661-8150 • Fax (713) 661-2661

## SAMPLE PRESERVATION INFORMATION SHEET

Field Sampling 🗆

Incoming Samples 🗆

#### GENERAL

Company: HTG-CL	Job No: 138
No. of Cooler(s):	Temperature of Cooler(s):

#### PRESERVATION INFORMATION

Sample No.	Tempe of Sa	rature mple	Sample Container	Volume	Preservation used *	Initial pH	Final pH	Bottles generated	Comments
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6									
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PRESERVATION USED \*

- 1 Cool to 4° C
- 2  $H_2SO_4$  to pH < 2
- 3 HNO<sub>3</sub> to pH < 2
- 4 HCL to pH < 2

5 - NaOH to pH > 12

 $6 - Na_2S_2O_2 0.008\%$ 

- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

Preserved by

1-7 Date/Time

STATE OF NEW MEXICO

#### ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

**OIL CONSERVATION DIVISION** 



BRUCE KING GOVERNOR February 11, 1994

POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 87504 (505) 827-5800

ANITA LOCKWOOD CABINET SECRETARY

> CERTIFIED MAIL RETURN RECEIPT NO. P-667-241-903

Mr. Ray Meaux GPM Gas Corporation West Star Route Box 448 Lovington, New Mexico 88240

RE: RECOVERY WELL RESTORATION LEE GAS PROCESSING PLANT BUCKEYE, NEW MEXICO

Dear Mr. Meaux:

The New Mexico Oil Conservation Division has reviewed the February 9, 1994 correspondence submitted by H+GCL on behalf of GPM Gas Corporation requesting permission to conduct well restoration activities on recovery wells MW-7 and MW-8.

The above referenced request is approved.

Please be advised that OCD approval does not relieve GPM of liability should your activities result in contamination of surface waters, ground waters or the environment. In addition, OCD approval does not relieve GPM of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please contact me at (505) 827-5885.

Sincerely,

William C. Olson Hydrogeologist Environmental Bureau

xc: Wayne Price, OCD Hobbs District Office Vince Bernard, GPM - Odessa Maureen Gannon, H+GCL



'94 FEH 10 AM 8 35

February 9, 1994

Mr. Bill Olson New Mexico Oil Conservation Division P.O. Box 2088 Santa Fe, New Mexico 87504-2088

Dear Bill:

On behalf of GPM Gas Corporation, H<sup>+</sup>GCL is requesting approval to perform well restoration on recovery wells, MW-7 and MW-8, at the Lee Gas Processing Plant in Buckeye, New Mexico. These wells have ceased water production during the last quarter of 1993. Pursuant to our phone conversation on Wednesday, February 9, 1994, I am enclosing a copy of the specifications for well restoration and the vendor sheets on the acid we propose for use.

We would like to perform the restoration as soon as possible. Please notify Mr. Ray Meaux of GPM Gas Corporation at the Lee Plant of your decision. His address is:

> GPM Gas Corporation West Star Route Box 448 Lovington, New Mexico 88240 (505) 397-5703

We appreciate your time and consideration regarding this matter. Thank you.

Sincerely, H<sup>+</sup>GCL

Maureen

Maureen D. Gannon Project Engineer

Enclosures

cc: Vince Bernard, GPM- Odessa Ray Meaux, GPM- Lee Plant

\54030\OLSON02.MEM

#### Well Redevelopment

#### A. SCOPE

This specification covers the labor, materials, and equipment necessary for redevelopment of monitoring wells, MW-7 and MW-8.

#### B. MATERIALS AND EQUIPMENT

The subcontractor shall provide all materials, labor, and equipment necessary for redevelopment of monitoring wells, MW-7 and MW-8. Redevelopment of these wells shall be accomplished by air surge and/or surge block and pump (unless otherwise approved by the on-site geologist).

The subcontractor shall provide all pumps, pipes, hoses, fittings, and accessories required to redevelop this well.

#### C. PROCEDURES

Air surging or a swab shall be used to remove fines near the well screen. Surging shall be performed immediately above and within the screened interval. Development shall be initiated gently. As flow is established through the screened interval, the degree of agitation shall be slowly increased. Surging shall be stopped periodically and the well bailed or sand pumped to remove debris and sediment.

The implementation of the following sequence of activities is recommended to remove turbidity and to expedite the well redevelopment efforts:

- Following acid treatment, the well shall be chemically treated with a sodium acid pyrophosphate solution. The well should be subjected to continuous surging for approximately 10 minutes following the introduction of this solution.
- Over a 6 to 18 hour contact time, the well should be periodically subjected to continuous surging every three hours (i.e., for 10 to 15 minute intervals). Following this contact period the waste solution in the well shall be pumped (until the pH stabilizes) and neutralized prior to discharge to the Lee Plant wastewater collection system.
- Pump, bail, or air-lift the loosened debris and particulates from the well.





The subcontractor shall take all necessary precautions to prevent contaminated water, gasoline, or other deleterious substances from entering the well, either through the wellhead or by seepage through the ground surface. The subcontractor shall maintain necessary precautions prior, during, and after well restoration activities.

All wastes generated from mechanical cleaning and chemical treatment activities (fluids and other debris) shall be field screened by the on-site geologist to determine pH levels. Based on results from the field screening and as directed by GPM, the subcontractor shall contain and neutralize these wastes prior to discharge to the Lee Plant wastewater collection system.

GPM shall provide means for the disposal of well restoration wastes.

Well redevelopment shall be initiated following completion of well restoration activities and continue uninterrupted until, in the opinion of GPM and H<sup>+</sup>GCL, the well is:

- Producing water free of debris and sediment,
- Responsive to water level changes in the aquifer, and
- Temperature, conductivity, and pH have stabilized.



"Better Wells with Chemicals"



USE

- **REMOVE:** Clays, shales, and commercial drilling muds from water wells producing in sand and gravel formations.
- **DEVELOP:** New wells to their maximum specific capacity.
- **REDEVELOP:** Old wells to their original flow or greater.
- DRY ACID\* is a dry granular mixture of chemicals. When dissolved in water, DRY ACID\*. produces a catalyzed acid solution that chemically dissolves, disintegrates, and disperses clay, shale and mud.

DRY ACID\* is packaged in 50 pound steel pails.

DRY ACID\* has a beneficial bacteriacidal effect.

Many wells do not produce as much water as desired or is indicated from the log of the sand and gravel formation. This may be due to low permeability and porosity of the formation, particularly where appreciable amounts of clays are present in the formation.

Clays and fine drill cuttings may be forced into the formation . by the force of the bit in spudder or cable tool drilling. The force of the bit also has a tendency to compact the formation around the well bore reducing the permeability and restricting the flow of water.

A mud or filter cake, developed from the clays in the formation or the use of commercial drilling mud, is built up on the walls of the hole in direct or reverse circulation rotary drilling. In order for a well to produce at maximum capacity all of the mud or filter cake must be removed.

DRY ACID\* was developed specifically for treating water wells to dissolve, disintegrate and disperse clays, shales, fine drill cuttings and commercial drilling mud and to open up tight sand and gravel formations so that the well will produce at maximum capacity.

\*DRY ACID, WELGICIDE, DRY-DE-TRADEMARKS, COTEY CHEMICAL COMPANY, REG. U. S. PATENT OFFICE



TELEPHONE SHerwood 7-2005

Diameter inches of casing or hole	Gallons per foot of depth	
1	0.041	HOW TO USE DRY ACID <sup>®</sup> IN LARGE DIAMETER WELLS
11/2	0.092	
2	0.163	1. Use 4 to 1 pound of DRT ACID per gallon of water in the well.
21/2	0.255	amount of DRY ACID at a time, between the pump column and cas-
3	0.367	ing. Agitate by backwashing after each addition of acid. If a rig
31/2	0.500	is over the hole add the acid to the casing and agitate with a bailer,
4	0.653	3 Acid should remain in the well 12 to 24 hours and should be apitated
41/2	0.737	every few hours.
5	1.020	4. If well is gravel packed displace the acid back through the gravel
51/2	1.234	wall by adding water equal to about ¾ the volume of water standing
6	1.469	in the hole. In new we is the water should be added atter all the acid has been added and thoroughly mixed by backwashing. In old
7	2.000	wells allow the acid to stay in the casing for a few hours before add-
8	2.611	ing the water. Water should be added slowly or in several batches
9	3.305	at 30 minute intervois. 5. Pump or bail the bale sleap, develop and test
10	4.080	3. Fump of bait me note clean, develop and test.
11	4.937	
12	5.875	HOW TO USE DRY ACID $^{\circ}$ IN SMALL DIAMETER WELLS
13	6.895	Treat with a solution made by dissolving about 1 pound of DPX ACID
14	8.000	per gallon of water.
15	9.18	2. Use about two to three times the volume of the casing.
16	10.00	3. Add solution and agitate with a bailer, surge block or other device.
17	11.79	4. As the fluid level drops continue to add the acid solution.
18	13.22	5. Agitate several times curing a 12 to 24 hour soaking period.
19	14.73	6. Bail the hole and test.
20	16.32	
22	19.75	
24	23.50	IN MANY WELLS TWO OF MODE TREATMENTS MAY PROVE REVE
26	27.58	FICIAL
28	31.99	INITIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS
30	36.72	and should be pumped or bailed to waste:
32	41.78	DRY ACID IS PACKAGED IN 50 POUND STEEL PAILS.
34	47.16	
36	52.88	

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Effective March 30, 1992

# WELL CHEMICALS

**DRY CHLORINE** 

#### DISCOUNT SCHEDULE 30% 3 or more 30/10%

Quantity of hypochiorite needed to provide 100 PPM active chiorine in well water.

Feel of	water	x gallons per foot = Ound	ces needed	TAE	LETS	PART NO.	LIST PRICE
		37	Ounces needed	5 1/2	2 lb. jug	HTHT	\$20.24
<u>Nominal size</u> 4	(inches	) Gallons per linear foot 0.653	<u>per 100 ft.</u> 1.8	CP			
5		1.020	2.9	<u>un</u>	ANULES	PART NO.	LIST PRICE
6		1.469	3.9	5 1/2	2 lb. jug	HTHG 5	\$ 16.14
8		2.611	7.1	35 lt	o. pail	HTHG 35	102.84
10		4.080	11.0				
12		5.875	15.9				
16		10.445	28.2 [	Dry chlorir	ne is availa	ble in granular c	or tablet form.
ΠΡΔ					- Dian	neter	
DIA		Dry Men	Spearat		incl	nes	Gallons
	Davia				of ca	sing	per foot
USE IU.	Devel	op new wens producing from	Infinestone or calca	reous	<u>or</u> h	ole	of depth
	sano	and gravel of to re-develop d	na wens piuggea by	r naro-	3	3	0.37
	water	scale, rust or corrosion.			31	/2	0.50
DIRECTIONS:	(1) U	lse 1/2 pound per gallon of w	ater in the well.		4	-	0.65
	(., .				41	/2	0.74
	(2) A	gitate as often as possible b	y surging, swabbing	g or	£	5	1.02
	ir	njecting compressed air for 4	8 hours.		51	/2	1.23
	(2) 0	ump or bail the hole clean. T	reated water about	dha	6	5	1.47
	(J) F	ump of Dali me note clean. I	realed water should	u be	ī	7	2.00
	þ	umped to waste.			8	3	2,61
			<u></u>		<u> </u>	)	3.31
					1	0	4.08
					1	1	4,94
		•			1	2	5.88
					1	3	6.90
					1	4	8.00
					1	5	9,18
					1	6	10,00

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September 29, 199

L DONSERVATION DIVISION RECEIVED

#### GPM GAS SERVICES COMPANY A DIVISION OF PHILLIPS PETROLEUM COMPANY

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4044 PENBROOK ODESSA, TX 79762

Third Quarter 1993 Analytical Results Lee Plant Discharge Plan GW-2

Mr. William Olson Hydrogeologist New Mexico Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory analytical reports for groundwater sampling at our Lee Plant for the third quarter of 1993. Sample collection was conducted during the period of July 19 through July 21, 1993 pursuant to the requirements of NMOCD Discharge Plan GW-2. NDRC Laboratories, Inc., of Houston, Texas performed the sample analyses. Our consultant, H+GCL strictly adhered to chain-of-custody procedures to ensure integrity of the samples during transport to the laboratory.

Depth to ground water and product thickness measurements were taken at all monitor wells with the exception of MW-7. Downhole recovery equipment in MW-7 prevented access for measuring water levels and product thickness. The following wells were sampled and analyzed for dissolved aromatic hydrocarbons using EPA Method 602: MW-2, MW-5, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-16, MW-18, MW-19, and MW-20.

Groundwater flows northeast to southwest beneath the site, following the historical hydraulic gradient. Product was found in MW-5 at an approximate thickness of 0.15 feet within the well casing. Product was also observed in MW-4 and MW-6 in thicknesses too small to measure.

An order of magnitude increase of benzene concentration from the last annual sampling of MW-16, the furthest up-gradient monitor well on the site, may have resulted from an off-site source(s). Hydrocarbons originating from oil field activities to the north and northeast, and up-gradient from the Lee Plant, may be migrating under the site. BTEX concentrations in down-gradient compliance monitor wells (MW-11, MW-12, MW-13, MW-19 and MW-20) remained relatively unchanged from the previous annual sampling event.

During the third quarter of 1993, recovery well RW-1 was retrofitted for vapor extraction. The vapor extraction system is currently operational. Daily organic vapor

🕐 William Olson

Third Quarter 1993 Analytical Results Lee Plant Discharge Plan GW-2 Page

readings have been registering approximately 88 ppm of organic vapors for the past several weeks of system operation. Three monitor wells have also been installed near RW-1 in preparation for the installation of the air sparging scheduled for the fourth quarter of 1993.

If you have any questions regarding the contents of this letter or the analytical results, please call me at (915) 368-1085.

Sincerely,

f BE A

Vincent B. Bernard Safety & Environmental Supervisor New Mexico Region

/sm

cc: Maureen Gannon - H+GCL Albuquerque S.J. Seeby M.S. Nault

- William Olson
- Third Quarter 1993 Analytical Results
   Lee Plant Discharge Plan GW-2
   Page
  - bcc: R.D. Dunham
    - D.A. Stell
    - R.G. Stubbs
      - (r) G.A. Jones
    - S.E. Godby
      - (r) D.J. Jelmini

A DIVISION OF PHILLIPS PETROLEUM COMPANY

December 29, 1993

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CORPORATION

AM4049 PENBROOK ODESSA, TX 79762

IUN DIVISION

Fourth Quarter 1993 Analytical Results Lee Plant Discharge Plan GW-2

Mr. William Olson, Hydrogeologist New Mexico Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory analytical reports for groundwater sampling at our Lee Plant for the fourth quarter of 1993. Sample collection was conducted on October 26, 1993, pursuant to the requirements of NMOCD Discharge Plan GW-2. NDRC Laboratories Inc., of Houston performed the sample analyses. Our consultant, H+GCL, strictly adhered to chain-of-custody procedures to ensure integrity of the samples during transport to the laboratory.

Depth to ground water and product thickness measurements were taken at all monitor wells with the exception of MW-6, MW-7 and MW-8. Downhole recovery equipment in these wells prevented access to measure water levels and product thicknesses. No free-phase floating product was encountered in any of the wells. The following wells were sampled and analyzed for dissolved aromatic hydrocarbons using EPA Method 602: MW-11, MW-12, MW-13, MW-19, and MW-20.

All monitor wells sampled showed a decrease in benzene, ethylbenzene, and xylenes. All wells except MW-13 demonstrated a decrease in toluene. The toluene concentration in MW-13 rose slightly since the previous sampling event in July of 1993. In monitor wells, MW-11 and MW-12, BTEX concentrations were below detection limits.

During the fourth quarter of 1993, an air/water injection system was successfully installed and activated at monitor well, MW-23. This system employs a venturi nozzle in which air and water are blended prior to injection into the formation. After installation and start-up, carbon dioxide, dissolved oxygen, and organic vapor readings were taken to monitor microbial activity and progress of the system. These readings were also taken prior to system start-up. We will continue to closely monitor the vapor extraction and air/water injection systems.

Mr. William Olson Fourth Quarter 1993 Analytical Results Lee Plant Discharge Plan GW-2 December 29, 1993 Page 2

If you have any questions regarding this information or the analytical results, please call me at (915) 368-1085.

Sincerely,

Vince Bernard Safety & Environmental Supervisor New Mexico Region

/sm

cc: Maureen Gannon - H+GCL Albuquerque S.J. Seeby M.S. Nault



## **Inchcape Testing Services** NDRC Laboratories

11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

#### SUMMARY REPORT

CLIENT	:	H + GCL	JOB	NUN	<b>1</b> BER	:	H93-7212
CONTACT	:	Ms. Annette Montoya	REPC	DRT	DATE	:	2-NOV-1993
PROJECT	:	54030.01/GPM					

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1 .	9310260915	Groundwater	26-0CT-1993
2	9310261030	Groundwater	26-0CT-1993
3	9310261120	Groundwater	26-0CT-1993
4	9310261300	Groundwater	26-0CT-1993

PURGEABLE AROMATICS, EPA 602			1		2		3		4
Benzene	µg/L		18.3		11.2		28.6	<	2.0
Chlorobenzene	µg/L	<	2.0	<	2.0	<	2.0	<	2.0
1,2-Dichlorobenzene	µg∕L	<	4.0	<	4.0	<	4.0	<	4.0
1,3-Dichlorobenzene	µg∕L	<	4.0	<	4.0	<	4.0	<	4.0
1,4-Dichlorobenzene	µg∕L	<	3.0	<	3.0	<	3.0	<	3.0
Ethyl benzene	µg/L	<	2.0	<	2.0	<	2.0	<	2.0
Toluene	µg/L		17.0		12.3		29.6	<	2.0
Xylenes	µg/L	<	6.0	<	6.0		10.2	<	6.0

alar Raj Naran

Inchcape Testing Services

Vice President, General Manager



#### SUMMARY REPORT

CLIENT	:	H + GCL	
CONTACT	:	Ms. Annette Montoya	
PROJECT	:	54030.01/GPM	

JOB NUMBER : H93-7212 REPORT DATE : 2-NOV-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
5	9310261430	Groundwater	26-0CT-1993
6	9310261440	Groundwater	26-0CT-1993

PURGEABLE AROMATICS, EPA 602			5		6		
Benzene	µg/L	<	2.0	<	2.0		
Chlorobenzene	µg/L	<	2.0	<	2.0		
1,2-Dichlorobenzene	µg/L	<	4.0	<	4.0		
1,3-Dichlorobenzene	µg/L	<	4.0	<	4.0		
1,4-Dichlorobenzene	µg∕L	<	3.0	<	3.0		
Ethyl benzene	µg/L	<	2.0	<	2.0	and and the stand of the stand	
Toluene	μg/L	<	2.0	<	2.0		
Xylenes	µg/L	<	6.0	<	6.0		

Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 28-OCT-1993

REPORT NUMBER : H93-7212-1 REPORT DATE : 2-NOV-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	:::::::::::::::::::::::::::::::::::::::	Groundwater 9310260915 54030.01/GPM 26-OCT-1993 EPA 602	

PURGEABLE AROMATICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 μg/L	18.3 µg/L
Chlorobenzene	2.0 μg/L	< 2.0 µg/L
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L
Ethyl benzene	2.0 μg/L	< 2.0 μg/L
Toluene	2.0 µg/L	17.0 μg/L
Xylenes	6.0 μg/L	< 6.0 µg/L

QUALITY CONTROL DATA		nn
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 μg/L	96.0 %

Raj Naran Vice President, General Manager

Inchcape Testing Services



DATE RECEIVED : 28-OCT-1993

REPORT NUMBER : H93-7212-2 REPORT DATE : 2-NOV-1993

SAMPLE SUBMITTED BY ADDRESS	::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102	1100
ATTENTION	:	Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS	:	Groundwater 9310261030	
PROJECT	:	54030.01/GPM	
DATE SAMPLED	:	26-OCT-1993	
ANALYSIS METHOD	:	EPA 602	

PURGEABLE AROMATICS					
TEST REQUESTED	DETECTION LIMIT	RESULTS			
Benzene	2.0 µg/L	11.2 μg/L			
Chlorobenzene	2.0 µg/L	< 2.0 µg/L			
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L			
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L			
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L			
Ethyl benzene	2.0 µg/L	< 2.0 μg/L			
Toluene	2.0 µg/L	12.3 μg/L			
Xylenes	6.0 μg/L	< 6.0 µg/L			

QUALITY CONTROL DATA		
SURROGATE COMPOUND -	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 µg/L	97.0 %

Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 28-OCT-1993

REPORT NUMBER : H93-7212-3 REPORT DATE : 2-NOV-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : :	Groundwater 9310261120 54030.01/GPM 26-OCT-1993 EPA 602

PURGEABLE AROMATICS						
TEST REQUESTED	DETECTION LIMIT		RESULTS			
Benzene	2.0 µg/L		28.6	μg/L		
Chlorobenzene	2.0 µg/L	<	2.0	µg/L		
1,2-Dichlorobenzene	4.0 μg/L	<	4.0	μg/L		
1,3-Dichlorobenzene	4.0 μg/L	<	4.0	μg/L		
1,4-Dichlorobenzene	3.0 µg/L	<	3.0	μg/L		
Ethyl benzene	2.0 µg/L	<	2.0	µg∕L		
Toluene	2.0 µg/L		29.6	µg/L		
Xylenes	6.0 μg/L		10.2	μg/L		

QUALITY CONTROL DATA	E THE THE OWN HAVE NOT BE THE OWN OF THE OWN	аналан (уру, , , , , , , , , , , , , , , , , , ,
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 µg/L	100 %

Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 28-OCT-1993

REPORT NUMBER : H93-7212-4 REPORT DATE : 2-NOV-1993

SAMPLE SUBMITTED BY ADDRESS	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montova
SAMPLE MATRIX ID MARKS	:	Groundwater 9310261300 54030 01/CPM

PROJECT : 54030.01/GPM DATE SAMPLED : 26-OCT-1993 ANALYSIS METHOD : EPA 602

PURGEABLE AROMATICS					
TEST REQUESTED	DETECTION LIMIT	RESULTS			
Benzene	2.0 µg/L	< 2.0 μg/L			
Chlorobenzene	2.0 µg/L	< 2.0 μg/L			
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L			
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L			
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L			
Ethyl benzene	2.0 µg/L	< 2.0 μg/L			
Toluene	2.0 µg/L	< 2.0 µg/L			
Xylenes	6.0 μg/L	< 6.0 µg/L			

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SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 μg/L	100 %

Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 28-OCT-1993

REPORT NUMBER : H93-7212-5 REPORT DATE : 2-NOV-1993

ADDRESS : 505 Marquette NW, Ste. 11	00
-	
: Albuquerque, NM 87102	
ATTENTION : Ms. Annette Montoya	
-	
SAMPLE MATRIX : Groundwater	
ID MARKS : 9310261430	
PROJECT : 54030.01/GPM	
DATE SAMPLED : 26-OCT-1993	
ANALYSIS METHOD : EPA 602	

PURGEABLE AROMATICS					
TEST REQUESTED	DETECTION LIMIT		RESULTS		
Benzene	2.0 µg/L	<	2.0 µg/L		
Chlorobenzene	2.0 µg/L	<	2.0 µg/L		
1,2-Dichlorobenzene	4.0 μg/L	<	4.0 μg/L		
1,3-Dichlorobenzene	4.0 μg/L	<	4.0 μg/L		
1,4-Dichlorobenzene	3.0 μg/L	<	3.0 µg/L		
Ethyl benzene	2.0 µg/L	<	2.0 µg/L		
Toluene	2.0 μg/L	<	2.0 µg/L		
Xylenes	6.0 µg/L	<	6.0 µg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 μg/L	100 %

Inchcape Testing Services Raj Naran Vice President, General Manager



DATE RECEIVED : 28-OCT-1993

REPORT NUMBER : H93-7212-6 REPORT DATE : 2-NOV-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•	Groundwater 9310261440 54030.01/GPM 26-OCT-1993 EPA 602

PURGEABLE AROMATICS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	2.0 µg/L	<	2.0 µg/L
Chlorobenzene	2.0 µg/L	<	2.0 µg/L
1,2-Dichlorobenzene	4.0 μg/L	<	4.0 µg/L
1,3-Dichlorobenzene	4.0 μg/L	<	4.0 μg/L
1,4-Dichlorobenzene	3.0 μg/L	<	3.0 µg/L
Ethyl benzene	2.0 µg/L	<	2.0 µg/L
Toluene	2.0 µg/L	<	2.0 µg/L
Xylenes	6.0 µg/L	<	6.0 µg/L

QUALITY CONTROL DATA	an a	an a
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 µg/L	101 %

Raj Naran

Vice President, General Manager

Inchcape Testing Services



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DATE RECEIVED: 28-OCT-1993

REPORT NUMBER: H93-7212:1-6 REPORT DATE: 2-NOV-1993

#### SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Benzene MHT 29-OCT-1993 29-OCT-1993 29-OCT-1993 29-OCT-1993 7197-4	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 602 EPA 602 4% 112%  < 2.0 μg/L 108% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Toluene MHT 29-OCT-1993 29-OCT-1993 29-OCT-1993 29-OCT-1993 7197-4	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 602 EPA 602 2% 111%  < 2.0 µg/L 106% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Ethyl benzene MHT 29-OCT-1993 29-OCT-1993 29-OCT-1993 29-OCT-1993 7197-4	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 602 EPA 602 4% 104%  < 2.0 µg/L 100% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Chlorobenzene MHT 29-OCT-1993 29-OCT-1993 29-OCT-1993 29-OCT-1993 7197-4	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 602 EPA 602 2% 103%  < 2.0 μg/L 100% 

Inchcape Testing Services

MAN

Raj Naraŋ

Vice President, General Manager



DATE RECEIVED: 28-OCT-1993

REPORT NUMBER: H93-7212:1-6 REPORT DATE: - 2-NOV-1993

SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS:	1,2-Dichlorobenze	ene Analysis Method:	EPA 602
Technician:	MHT	Extraction Method:	EPA 602
Sample Extracted:	29-OCT-1993	MS/MSD RPD:	6%
QC Extracted:	29-OCT-1993	Average Spike Recovery:	99%
Sample Analyzed:	29-OCT-1993	Duplicate RPD:	
QC Analyzed:	29-OCT-1993	Method Blank:	< 4.0 µg/L
QC Sample Number:	7197-4	LCS Recovery:	96%
TCLP Leachate Date:		TCLP Spike Recovery:	

Laj Naran

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## **Inchcape Testing Services**

NDRC Laboratories

11155 South Main • Houston, TX 77025 • (713) 661-8150 • Fax (713) 661-2661

### SAMPLE PRESERVATION INFORMATION SHEET

Field Sampling 🛛

Incoming Samples 🗆

#### GENERAL

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Company:	H+GCZ	Job No:	7212	-	
No. of Coolor(s):	Tomperature	of Cooler(s):	42		
NO. OF COOLET(S):		01 COOler(s)			

#### **PRESERVATION INFORMATION**

Sample No.	Temper of Sar	rature nple	Sample Container	Volume	Prese us	rvation ed *	Initial pH	Final pH	Bottles generated	Comments
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**PRESERVATION USED \*** 

- 1 Cool to 4° C
- 2  $H_2SO_4$  to pH < 2
- $3 HNO_3$  to pH < 2
- 4 HCL to pH < 2

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

R Preserved by

10-28-93 Date/Time



## RECEIVED AUG 2 0 1993

DATE RECEIVED : 4-AUG-1993

REPORT NUMBER : H93-5123-1 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	 MW-23
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	:::::::::::::::::::::::::::::::::::::::	Groundwater 9308031145 MW-23 54030.02/GPM 3-AUG-1993 EPA 602	,

BTEX ANALYSIS	<u>`````````````````````````````````````</u>	
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	10 μg/L	190 µg/L
Toluene	10 µg/i	130 µg/L
Ethyl benzene	10 µg/L	19 µg/L
Xylenes	30 μg/L	46 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	106 %

NDRC Laboratories, Inc.

Raj Naran

Vice President, General Manager



DATE RECEIVED : 4-AUG-1993

REPORT NUMBER : H93-5123-1 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : :	Groundwater 9308031145 MW-23 54030.02/GPM 3-AUG-1993 EPA 8015	

TRPH BY MODIFIED EPA 8015		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbons as Diesel	0.25 mg/L	1.31 mg/L

NDRC Laboratories, Inc. Raj Naran Vice President, General Manager



DATE RECEIVED : 4-AUG-1993

REPORT NUMBER : H93-5123-1 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	:::::::::::::::::::::::::::::::::::::::	Groundwater 9308031145 MW-23 54030.02/GPM 3-AUG-1993 EPA 8015

TRPH BY MODIFIED EPA 8015 (PURGE + TRAP)					
TEST REQUESTED	DETECTION LIMIT	RESULTS			
Total Petroleum Hydrocarbons	500 µg/L	2900 µg/L			

Nalar NDRC Laboratories, Inc. Raj Naran Vice President, General Manager


DATE RECEIVED: 4-AUG-1993

REPORT NUMBER: H93-5123:1 REPORT DATE: 11-AUG-1993

SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

#### LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS:	Benzene
Technician:	HYL
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
QC Sample Number:	Blank Spike
ICLP Leachate Date:	

ANALYSIS:	Toluene
Technician:	HYL
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
QC Sample Number:	Blank Spike
TCLP Leachate Date:	

	ANALYSIS:	Ethyl benzene
	Technician:	HYL
San	nple Extracted:	10-AUG-1993
	QC Extracted:	10-AUG-1993
Sa	ample Analyzed:	10-AUG-1993
	QC Analyzed:	10-AUG-1993
QC	Sample Number:	Blank Spike
TCLP	Leachate Date:	

	ANALYSIS:	Xylenes
	Technician:	HYL
San	nple Extracted:	10-AUG-1993
	QC Extracted:	10-AUG-1993
Sa	ample Analyzed:	10-AUG-1993
	QC Analyzed:	10-AUG-1993
QC	Sample Number:	Blank Spike
TCLP	Leachate Date:	

1	Analysis Method:	EPA 602
Ext	raction Method:	EPA 602
	BS/BSD RPD:	10%
Average	Spike Recovery:	93%
-	Duplicate RPD:	
	Method Blank:	< 1.0 $\mu g/L$
	LCS Recovery:	
TCLP	Spike Recovery:	

1	Analysis Method:	EPA 602
Ext	craction Method:	EPA 602
	BS/BSD RPD:	12%
Average	Spike Recovery:	94%
_	Duplicate RPD:	
	Method Blank:	< 1.0 $\mu g/L$
	LCS Recovery:	
TCLP	Spike Recovery:	

Analysis Method:	EPA 602
Extraction Method:	EPA 602
BS/BSD RPD:	12%
Average Spike Recovery:	96%
Duplicate RPD:	
Method Blank:	< 1.0 µg/L
LCS Recovery:	
TCLP Spike Recovery:	

E E E E E E E E E E E E E E E E E E E	marysis i	methoa:	EPA 60	) 2
Ext	raction 1	Method:	EPA 60	)2
	BS/B	SD RPD:	11%	
Average	Spike Re	covery:	101%	
	Duplica	te RPD:		
	Method	Blank:	< 3.0	μg/L
	LCS Re	covery:		
TCLP	Spike Re	covery:		

Raj Naran

NDRC Laboratories, Inc.

lain



DATE RECEIVED: 4-AUG-1993

REPORT NUMBER: H93-5123:1 REPORT DATE: 11-AUG-1993

#### SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS:	Diesel
Technician:	YH
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
QC Sample Number:	Blank Spike
TCLP Leachate Date:	

ANALYSIS:	TPH-Gas
Technician:	HYL
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
OC Sample Number:	Blank Spike
TCLP Leachate Date:	

Average TCLP	Analysis Method traction Method BS/BSD RPD Spike Recovery Duplicate RPD Method Blank LCS Recovery Spike Recovery	1:       EPA         1:       EPA         0:       2.2         7:       90%         0:          6:          7:          7:	8015 3510 } .25 mg/L
) Ext Average TCLP	Analysis Method traction Method BS/BSD RPI Spike Recovery Duplicate RPI Method Blank LCS Recovery Spike Recovery	l: EPA l: EPA D: 6% 7: 93% D: c: < 5 7: 95% 7:	8015 5030 0 µg/L

g Naran

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Z NAL 7	Chain of Cu			Ðļ	រាក ភាព	e AVet (DO)	ytivity 8 Greas 7 Ote To 7 Ote	Che Che Che Der	1+2015							2	2. Relinquished By	(Times) (Simerus)	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	(Date) (Printed Name)	(Company)	2. Received By (Laboratory	(Time) (Signature)	(Date) (Printed Name)	(Lipteroquel)	WHITE, CANARY - LABORATORY
Chicago 626 W. Jackson Blvd Sa 800 C Chicago, IL. 60606 (312) 648-998 FAX: (312) 648-0818	□ San Francisco 2200 Powell Street, Ste. 880 Emeryville, CA 94608 (510) 547-3886 FAX: (510) 547-3631	Analysis Request	MONTALY M AC	100	sopioi	Pesti Pesti sli tnsh	P- Vol., picides, P- Meta AA als(8) M Metals (13) M Metals	TCL Hert Price Meti Price Meti TTL TTL TTL TTL TTL TTL					<u> </u>	MC: 0 19			Relinquished By	0	T (c)	(Printed Name)	(Company)	Received By	) (Signature)	(Printed Name)	(Company)	DISTRIBUTION:
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© NASA-WSTF PO Drawer MM Las Cruces, NM 88004 (505) 524-5353 FAX: (505) 524-5315	<ul> <li>Mid Atlantic Region</li> <li>421 Forbes Blvd., Sie. 240 Lanham, MD 20706-4325</li> <li>(301) 459-9677</li> <li>FAX: (301) 459-3064</li> </ul>				euois EX s	P Pho 1211163	9ensneg 108 selit 05 selit 0508 0508 0400 1cides/P 1cides/P 15000	Volar Phere Phere Volar Phere		<u> </u>	 					 ,	keceipt Relin	ers	als	on/Cold (Printer		Recei	: (Signatu	60Z Printee	auly (Comp	
uquerque Marquette NW, Ste. 1100 querque, NM 87102 842-0001 (505) 842-0595	s Angeles o Fairchild, Ste. 120 i, CA 92715 955-0201 (714) 955-0965	r Testing Servic	lain	77025	0		and a second	1atrix Location	1 13 MILL 7 2	20 1111 62							Sample F	Total No. of Contain	/ Chain of Custody Se	Rec'd Good Condition	Conforms to Record	Lab No.			11 r r w w w w	
Environmental Scientists (SGS) and Engineers FAX:	□ Hartford □ Lo 380 South Center Street 1960 Windsor Locks, CT 06096 [vine (203) 627-6528 (714) FAX: (203) 627-7815 FAX:	Lab Name NDRC/Inchcape	Address 11155 South M	Houston, TX	Telephone (713) 661-815		Samplers PIGINALUKES	Sample Number	9 2 10 2 2 2 11/15	N LYNCORACY							Project Information	Project C VII	Project Director	Charge Code No. $5 \sqrt{5}$	Shipping ID. No.	7885359425	Via: PER D X	Special Instructions/Comments:	TOMION	

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## Inchcape Testing Services

NDRC Laboratories

11155 South Main • Houston, TX 77025 • (713) 661-8150 • Fax (713) 661-2661

### SAMPLE PRESERVATION INFORMATION SHEET

Field Sampling 🗆

Incoming Samples 🗆

#### GENERAL

Company:	HTGCZ JOD	No:5123
No. of Cooler(s):	Temperature of Cooler(	s):

#### PRESERVATION INFORMATION

Sample No.	Temperature of Sample	Sample Container	Volume	Preservation used *	Initial pH	Final pH	Bottles generated	Comments
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PRESERVATION USED \*

- 1 Cool to 4° C
- 2  $H_2SO_4$  to pH < 2
- $3 HNO_3$  to pH < 2
- 4 HCL to pH < 2

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

n

Preserved by

Date/Time

**Inchcape Testing Services** NDRC Laboratories

11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

## RECEIVED ANG 2 3 1993

SUMMARY REPORT

CLIENT	:	H + GCL
CONTACT	:	Ms. Annette Montoya
PROJECT	:	54030.03/GPM

JOB NUMBER : H93-4983 REPORT DATE : 11-AUG-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	MW 21 9307281150	Groundwater	28- JUL - 1993
2	MW 22 9307281010	Groundwater	28- JUL - 1993

PURGEABLE AROMATICS, EPA 602	77.07.000 and a second s		1		2		
Benzene	μg/L		37000		170		
Chlorobenzene	µg/L	<	2000	<	2.0		
1,2-Dichlorobenzene	μg/L	<	4000	<	4.0		
1,3-Dichlorobenzene	µg/L	<	4000	<	4.0	арана (разна) Страна	
1,4-Dichlorobenzene	µg/L	<	3000	<	3.0		
Ethyl benzene	µg/L	<	2000		36.0		
Toluene	µg/L		5000		65.0		
Xylenes	µg/L	<	6000		48.0		

TRPH BY MODIFIED EPA 8015, EPA 8015	1	2	
Total Petroleum Hydrocarbons as Diesel mg/L	1.10	0.60	

TRPH BY MODIFIED EPA 8015 (PURGE + T EPA 8015	RAP),	1	2	 
Total Petroleum Hydrocarbons	µg/L	400000	2800	

MW 21, 22

Ray Naran



DATE RECEIVED : 30-JUL-1993

REPORT NUMBER : H93-4983-1 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	••••••	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	••••••	Groundwater MW 21 9307281150 54030.03/GPM 28-JUL-1993 EPA 602	

PURGEABLE AROMATICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2000 µg/L	37000 μg/L
Chlorobenzene	2000 µg/L	< 2000 µg/L
1,2-Dichlorobenzene	4000 #g/L	< 4000 μg/L
1,3-Dichlorobenzene	4000 #g/L	< 4000 μg/L
1,4-Dichlorobenzene	3000 μg/L	< 3000 µg/L
Ethyl benzene	2000 µg/L	< 2000 μg/L
Toluene	2000 µg/L	5000 μg/L
Xylenes	6000 μg/L	< 6000 µg/L

QUALITY CONTROL DATA	<u>– 1999 – C. Barres Constantino (B. C. C.</u>	
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 μg/L	104 %

NDRC Laboratories, Inc.

Raj Naran



DATE RECEIVED : 30-JUL-1993

REPORT NUMBER : H93-4983-1 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY	:	H + GCL	
ADDRESS	:	505 Marquette NW, Ste. 1100	
	:	Albuquerque, NM 87102	
ATTENTION	:	Ms. Annette Montoya	
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	MW 21	
	:	9307281150	
PROJECT	:	54030.03/GPM	
DATE SAMPLED	:	28-JUL-1993	
ANALYSIS METHOD	:	EPA 8015	

TRPH BY MODIFIED EPA 8015		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbons as Diesel	0.25 mg/L	1.10 mg/L

NDRC Laboratories, Inc.

Raj Naran



DATE RECEIVED : 30-JUL-1993

REPORT NUMBER : H93-4983-1 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	:::::::::::::::::::::::::::::::::::::::	Groundwater MW 21 9307281150 54030.03/GPM 28-JUL-1993 EPA 8015

TRPH BY MODIFIED EPA 8015 (PURGE + TRAP)			
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Total Petroleum Hydrocarbons	50000 μg/L	400000 μg/L	

NDRC Laboratories, Inc. Raj Naran Vice President, General Manager



DATE RECEIVED : 30-JUL-1993

REPORT NUMBER : H93-4983-2 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : : : : : : : : : : : : : : : : : :	Groundwater MW 22 9307281010 54030.03/GPM 28-JUL-1993 EPA 602

PURGEABLE AROMATICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/L	170 µg/L
Chlorobenzene	2.0 µg/L	< 2.0 µg/i
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L
1,4-Dichlorobenzene	3.0 μg/L	< 3.0 µg/L
Ethyl benzene	2.0 µg/L	36.0 μg/L
Toluene	2.0 μg/L	65.0 μg/L
Xylenes	6.0 μg/L	48.0 μg/L

QUALITY CONTROL DATA		<u></u>
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	50.0 μg/L	103 %

NDRC Laboratories, Inc.

Raj Naran Vice President, General Manager



DATE RECEIVED : 30-JUL-1993

REPORT NUMBER : H93-4983-2 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	••••••	Groundwater MW 22 9307281010 54030.03/GPM 28-JUL-1993 EPA 8015	

TRPH BY MODIFIED EPA 8015		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbons as Diesel	0.25 mg/L	0.60 mg/L

NDRC Laboratories, Inc.

Raj Narap



DATE RECEIVED : 30-JUL-1993

REPORT NUMBER : H93-4983-2 REPORT DATE : 11-AUG-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : : : :	Groundwater MW 22 9307281010 54030.03/GPM 28-JUL-1993 EPA 8015	

TRPH BY MODIFIED EPA 8015 (PURGE + TRAP)		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Total Petroleum Hydrocarbons	500 µg/L	2800 µg/L

NDRC Laboratories, Inc. Raj Naran

Valan



DATE RECEIVED: 30-JUL-1993

REPORT NUMBER: H93-4983:1-2 REPORT DATE: 12-AUG-1993

#### SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

Benzene
HYL
10-AUG-1993
10-AUG-1993
10-AUG-1993
10-AUG-1993
Blank Spike

ANALYSIS:	Toluene
Technician:	HYL
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
QC Sample Number:	Blank Spike
TCLP Leachate Date:	

ANALYSIS:	Ethyl benzene
Technician:	HYL
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
QC Sample Number:	Blank Spike
TCLP Leachate Date:	

	ANALYSIS:	Xylenes
	Technician:	HYL
Sat	nple Extracted:	10-AUG-1993
	QC Extracted:	10-AUG-1993
Sa	ample Analyzed:	10-AUG-1993
	QC Analyzed:	10-AUG-1993
QC	Sample Number:	Blank Spike
TCLP	Leachate Date:	

A Ext	nalysis Method: EPA 602 raction Method: EPA 602 BS/BSD RPD: 10%	
Average TCLP	Spike Recovery: 93% Duplicate RPD: Method Blank: < 2.0 μg/L LCS Recovery: Spike Recovery:	
/ Ext	nalysis Method: EPA 602 raction Method: EPA 602 BS/BSD RPD: 12%	
Average	Spike Recovery: 94% Duplicate RPD: Method Blank: < 2.0 µg/L LCS Recovery:	
TCLP	Spike Recovery:	
Ext	raction Method: EPA 602 BS/BSD RPD: 12%	
Average	Spike Recovery: 96% Duplicate RPD: Method Blank: < 2.0 µg/L LCS Recovery:	
TCLP	Spike Recovery:	
i Ext	nalysis Method: EPA 602 raction Method: EPA 602 BS/BSD RPD: 11%	
Average	Spike Recovery: 102% Duplicate RPD: Method Blank: < 6.0 µg/L	
TCLP	Spike Recovery:	

NDRC Laboratories, Inc.

Raj Naran Vice President, General Manager



DATE RECEIVED: 30-JUL-1993

#### SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

#### LABORATORY ANALYSIS QUALITY CONTROL REPORT

	1 0 Dichlemehenze
ANALISIS:	I, Z-DIChiorobenze
Technician:	HYL
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
QC Sample Number:	Blank Spike
TCLP Leachate Date:	

ANALYSIS:	Diesel
Technician:	YH
Sample Extracted:	4-AUG-1993
QC Extracted:	4-AUG-1993
Sample Analyzed:	4-AUG-1993
QC Analyzed:	4-AUG-1993
QC Sample Number:	Blank Spike
TCLP Leachate Date:	

ANALYSIS:	TPH-Gas
Technician:	HYL
Sample Extracted:	10-AUG-1993
QC Extracted:	10-AUG-1993
Sample Analyzed:	10-AUG-1993
QC Analyzed:	10-AUG-1993
QC Sample Number:	Blank Spike
TCLP Leachate Date:	

ne j	Analysis Method:	EPA 602
EX	BS/BSD RPD.	RPA 602
Average	Spike Recovery: Duplicate RPD: Method Blank:	98%  < 4.0 μg/L
TCLP	Spike Recovery:	
Ex	Analysis Method: traction Method: BS/BSD RPD:	EPA 8015 EPA 3510 0%
Average	Spike Recovery: Duplicate RPD: Method Blank:	87%  < 0.25 mg/L
TCLP	Spike Recovery:	
Ex	Analysis Method: traction Method: BS/BSD RPD:	EPA 8015 EPA 5030 6%
Average	Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery:	93%  < 50 μg/L 95%
TCLP	Spike Recovery:	

NDRC Laboratories, Inc.

Raj Naran

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W, Ste. 1100 PO Dre 1 87102 Las Cr (505) 5 595 FAX: (t	Ste. 120 □ Mid. Lanhan (301) 4: 965 FAX: (3	ing Service							M/M 61	mw 22						Sample Receipt	No. of Containers	n of Custody Seals	d Good Condition/Cold	forms to Record	4o.			
505 Marquette NV 505 Marquette NV Albuquerque, NM (505) 842-0001 FAX: (505) 842-0	□ Los Angeles 19600 Fairchild, S Irvine, CA 92715 (714) 955-0201 FAX: (714) 955-0	cape Testi	<u>h Main</u>	<u>X 77025</u> 8150			Matrix		H20	024							Total	Chai	53 Rec'o	Conf	ر العل			
Environmental Scientists and Engineers	Hartford 0 South Center Street ndsor Locks, CT 06096 33) 627-6528 XX: (203) 627-7815	ab Name_NDRC/Inchc	Address 11155 Sout	<u>Houston, T</u> Telephone <u>(713) 661-</u>		Samplers (SIGNATURES)	Cample Nirmher	aline runte	1/1/2010/1	9307281010						Project Information	roject GRM	roject Director May 1/201	Charge Code No. 54030 (	Shipping ID. No.	788535941	/a: Ved X	special Instructions/Comments:	

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		SAMPLE	E PRESE	RVATIO	N INFC	RMATI	ON SHEE	T
		Fiel	d Sampling		Inc	coming Sa	mples 🗆	
IERAL								
Company:	14+6	SCL			Job No:	4		
No. of Cool	er(s):	1	Temp	erature of Co	oler(s):	248		······································
SERVATIO							<u> </u>	
Sample No.	Temperature of Sample	Sample Container	Volume	Preservation used *	Initial pH	Final pH	Bottles generated	Comments
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#### PRESERVATION USED \*

- 1 Cool to 4° C
- 2  $H_2 SO_4$  to pH < 2
- 3 HNO $_3$  to pH < 2
- 4 HCL to pH < 2
- Preserved by

<u>)-30-93</u> Date/Time

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required



**Inchcape Testing Services** NDRC Laboratories

11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

# RECEIVED AUG 0 5 1993

#### SUMMARY REPORT

CLIENT	:	H +	GCL	JOB	NUM	IBER	:	H93-4770
CONTACT	:	Ms.	Annette Montoya	REPO	RT	DATE	:	30-JUL-1993
PROJECT	:	GPM	Buckeye/54030.02					

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	MW-11 9307200830	Groundwater	20- JUL - 1993
2	MW-12 9307200945	Groundwater	20- JUL - 1993
3	MW-13 9307201045	Groundwater	20- JUL - 1993
4	MW-19 9307201200	Groundwater	20- JUL - 1993

PURGEABLE AROMATIC ORGANICS,	EPA 8020		1		2		3		4
Benzene	μg/l		15.5		11.4		14.6		15.3
Chlorobenzene	μg/L	<	2.0	<	2.0	<	2.0	<	2.0
1,4-Dichlorobenzene	μg/L	<	3.0	<	3.0	<	3.0	<	3.0
1,3-Dichlorobenzene	μg/L	<	4.0	<	4.0	<	4.0	<	4.0
1,2-Dichlorobenzene	μg/L	<	4.0	<	4.0	<	4.0	<	4.0
Ethyl benzene	μg/L	<	2.0	<	2.0	<	2.0	<	2.0
Toluene	μg/L		31.3		29.2		34.3		35.8
Xylenes	μg/L		11.6		12.1		13.4		13.5

MW-2,5,7,9,10,104

Raj Naran

**Inchcape Testing Services** NDRC Laboratories

11155 South Main Houston, TX 77025 Tel. 713-661-8150 Fax. 713-661-2661

#### SUMMARY REPORT

CLIENT	:	H +	GCL
CONTACT	:	Ms.	Annette Montoya
PROJECT	:	GPM	Buckeye/54030.02

- 2

JOB NUMBER : H93-4770 REPORT DATE : 30-JUL-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
5	MW-18 9307201250	Groundwater	20-JUL-1993
6	MW-16 9307201400	Groundwater	20-JUL-1993
7	MW-5 9307210900	Groundwater	20-JUL-1993
8	мพ-7 9307211000	Groundwater	20-JUL-1993

PURGEABLE AROMATIC ORGANICS, EP	A 8020		5		6		7		8
Benzene	µg/L		10.7		1190		22000		40.4
Chlorobenzene	μg/L	<	2.0	<	10.0	<	200	<	10.0
1,4-Dichlorobenzene	µg/L	<	3.0	<	15.0	<	300	<	15.0
1,3-Dichlorobenzene	μg/L	<	4.0	<	20.0	<	400	<	20.0
1,2-Dichlorobenzene	μg/L	<	4.0	<	20.0	<	400	<	20.0
Ethyl benzene	µg/L	<	2.0		30.0		570	<	10.0
Toluene	μg/L		28.9		157		7870	<	10.0
Xylenes	μg/L	1	12.1		48.0		1270	<	30.0

Raj Naran



#### SUMMARY REPORT

CLIENT	:	H +	GCL
CONTACT	:	Ms.	Annette Montoya
PROJECT	:	GPM	Buckeye/54030.02

JOB NUMBER	:	H93-4770
REPORT DATE	:	30-JUL-1993

	SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
	9	MW-9 9307211045	Groundwater	20- JUL - 1993
	10	MW-2 9307211115	Groundwater	20-JUL-1993
	11	MW-20 9307201455	Groundwater	20- JUL - 1993
1	12	MW-10 9307211145	Groundwater	20- JUL - 1993

PURGEABLE AROMATIC ORGANICS, EPA 8020			9		10		11		12
Benzene	µg/L		673	<	2.0		217		3.5
Chlorobenzene	µg/L	<	10.0	<	2.0	<	2.0	<	2.0
1,4-Dichlorobenzene	µg/L	<	15.0	<	3.0	<	3.0	<	3.0
1,3-Dichlorobenzene	μg/l	<	20.0	<	4.0	<	4.0	<	4.0
1,2-Dichlorobenzene	µg/L	<	20.0	<	4.0	<	4.0	<	4.0
Ethyl benzene	µg/L		28.8	<	2.0		10.6	<	2.0
Toluene	µg/L		314	<	2.0		102	<	2.0
Xylenes	µg∕L		69.4	<	6.0		33.6	<	6.0

Ly Naran



#### SUMMARY REPORT

CLIENT	:	H +	GCL
CONTACT	:	Ms.	Annette Montoya
PROJECT	:	GPM	Buckeye/54030.02

JOB NUMBER : H93-4770 REPORT DATE : 30-JUL-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
13	MW-10A 9307211200	Groundwater	20- JUL - 1993

PURGEABLE AROMATIC ORGANICS, EPA 8020			13		
Benzene µg	/L		60.5		
Chlorobenzene #g	I/L	<	2.0		
1,4-Dichlorobenzene µg	1/L	<	3.0		 
1,3-Dichlorobenzene µg	I/L	<	4.0		
1,2-Dichlorobenzene µg	1/L	<	4.0		
Ethyl benzene #g	I/L	<	2.0		 
Toluene #g	1/L	<	2.0		 
Xylenes µg	j/L	<	6.0		

Lay Naran



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-1 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	9307200830	
PROJECT	:	GPM Buckeye/54030.02	
DATE SAMPLED	:	20-JUL-1993	
ANALYSIS METHOD	:	EPA 8020	

PURGEABLE AROMATIC ORGANICS						
TEST REQUESTED	DETECTION LIMIT	RESULTS				
Benzene	2.0 µg/L	15.5 µg/L				
Chlorobenzene	2.0 µg/L	< 2.0 µg/L				
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L				
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L				
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L				
Ethyl benzene	2.0 µg/L	< 2.0 µg/L				
Toluene	2.0 µg/L	31.3 μg/L				
Xylenes	6.0 μg/L	11.6 µg/L				

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	105 %

NDRC Laboratories, Inc.

lalar Raj Naran



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-2 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1 Albuquerque, NM 87102 Ms. Annette Montoya	L100
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	MW-12	
	:	9307200945	
PROJECT	:	GPM Buckeye/54030.02	
DATE SAMPLED	:	20-JUL-1993	
ANALYSIS METHOD	:	EPA 8020	

PURGEABLE AROMATIC ORGANICS	<u> </u>	
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/L	11.4 μg/L
Chlorobenzene	2.0 µg/L	< 2.0 µg/L
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
Ethyl benzene	2.0 µg/L	< 2.0 μg/L
Toluene	2.0 µg/L	29.2 μg/L
Xylenes	6.0 μg/L	12.1 μg/L

QUALITY CONTROL DATA	an man an hini a sa a sa a gan an gan an a	<u>, , , , , , , , , , , , , , , , , , , </u>
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	106 %

NDRC Laboratories, Inc.

ala Raj Narap



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-3 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY	:	H + GCL	
ADDRESS	:	505 Marguette NW, Ste.	1100
	:	Albuquerque, NM 87102	
ATTENTION	:	Ms. Ānnette Montoya	
		Croundwater	
SAMPLE MAIKIA	:	Groundwater	
ID MARKS	:	MW-13	
	:	9307201045	
PROJECT	:	GPM Buckeye/54030.02	
DATE SAMPLED	:	20-JUL-1993	
ANALYSIS METHOD	:	EPA 8020	

PURGEABLE AROMATIC ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/L	14.6 μg/L
Chlorobenzene	2.0 µg/L	< 2.0 μg/L
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 μg/L
1,3-Dichlorobenzene	4.0 µg/L	< 4.0 μg/L
1,2-Dichlorobenzene	4.0 µg/L	< 4.0 µg/L
Ethyl benzene	2.0 µg/L	< 2.0 μg/L
Toluene	2.0 µg/L	34.3 μg/L
Xylenes	6.0 µg/L	13.4 μg/L

QUALITY CONTROL DATA		nadius na kat <sup>ala</sup> , y ya an an an ananyoki ikon kata <sub>na</sub> nya na an
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	104 %

NDRC Laboratories, Inc.

Sala Raj Naran



DATE RECEIVED : 22-JUL-1993

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REPORT NUMBER : H93-4770-4 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS	:	Groundwater MW-19	

	:	9307201200
PROJECT	:	GPM Buckeye/54030.02
DATE SAMPLED	:	20-JUL-1993
ANALYSIS METHOD	:	EPA 8020

PURGEABLE AROMATIC ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/L	15.3 μg/L
Chlorobenzene	2.0 µg/L	< 2.0 μg/L
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
Ethyl benzene	2.0 µg/L	< 2.0 μg/L
Toluene	2.0 µg/L	35.8 μg/L
Xylenes	6.0 µg/L	13.5 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 μg/L	105 %

NDRC Laboratories, Inc.

Raj Narap



DATE RECEIVED : 22-JUL-1993

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> REPORT NUMBER : H93-4770-5 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY	:	H + GCL	
ADDRESS	:	505 Marquette NW, Ste.	1100
	:	Albuquerque, NM 87102	
ATTENTION	:	Ms. Annette Montoya	
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	MW-18	
	:	9307201250	
PROJECT	:	GPM Buckeye/54030.02	
DATE SAMPLED	:	20-JUL-1993	
ANALYSIS METHOD	:	EPA 8020	

PURGEABLE AROMATIC ORGANICS					
TEST REQUESTED	DETECTION LIMIT	RESULTS			
Benzene	2.0 µg/L	10.7 µg/L			
Chlorobenzene	2.0 µg/L	< 2.0 µg/L			
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L			
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L			
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L			
Ethyl benzene	2.0 µg/L	< 2.0 µg/L			
Toluene	2.0 µg/L	28.9 µg/L			
Xylenes	6.0 µg/L	12.1 μg/L			

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	106 %

NDRC Laboratories, Inc.

lara Raj Narap



DATE RECEIVED : 22-JUL-1993

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REPORT NUMBER : H93-4770-6 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY	:	H + GCL
ADDRESS	:	505 Marguette NW, Ste. 1100
	:	Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
SAMPLE MATRIX	:	Groundwater
ID MARKS	:	MW-16
	:	9307201400
PROJECT	:	GPM Buckeye/54030.02
DATE SAMPLED	:	20-JUL-1993
ANALYSIS METHOD	:	EPA 8020

PURGEABLE AROMATIC ORGANICS					
TEST REQUESTED	DETECTION LIMIT	RESULTS			
Benzene	10.0 μg/L	1190 µg/L			
Chlorobenzene	10.0 µg/L	< 10.0 µg/L			
1,4-Dichlorobenzene	15.0 µg/L	< 15.0 µg/L			
1,3-Dichlorobenzene	20.0 µg/L	< 20.0 μg/L			
1,2-Dichlorobenzene	20.0 µg/L	< 20.0 μg/L			
Ethyl benzene	10.0 μg/L	30.0 μg/L			
Toluene	10.0 µg/L	157 μg/L			
Xylenes	30.0 μg/L	48.0 μg/L			

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 μg/L	98.0 %

NDRC Laboratories, Inc.

Raj Naran



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-7 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX ID MARKS	::	Groundwater MW-5 9307210900	
PROJECT DATE SAMPLED ANALYSIS METHOD	:	GPM Buckeye/54030.02 20-JUL-1993 EPA 8020	

PURGEABLE AROMATIC ORGANICS						
TEST REQUESTED	DETECTION	I LIMIT		RESULT	5	
Benzene	200	µg∕L		22000	µg/L	
Chlorobenzene	200	μg/L	<	200	µg∕L	
1,4-Dichlorobenzene	300	μg/L	<	300	µg∕l	
1,3-Dichlorobenzene	400	µg∕L	<	400	μg/L	
1,2-Dichlorobenzene	400	μg/L	<	400	μg/L	
Ethyl benzene	200	μg/L		570	µg∕L	
Toluene	200	μg/L		7870	µg∕L	
Xylenes	600	μg/L		1270	µg∕L	

QUALITY CONTROL DATA	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	98.0 %

NDRC Laboratories, Inc.

Raj Naran



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-8 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	: : :	Groundwater MW-7 9307211000 GPM Buckeye/54030.02 20-JUL-1993 EPA 8020

PURGEABLE AROMATIC ORGANICS					
TEST REQUESTED	DETECTION LIMIT	RESULTS			
Benzene	10.0 µg/L	40.4 μg/L			
Chlorobenzene	10.0 µg/L	< 10.0 µg/L			
1,4-Dichlorobenzene	15.0 µg/L	< 15.0 µg/L			
1,3-Dichlorobenzene	20.0 µg/L	< 20.0 µg/L			
1,2-Dichlorobenzene	20.0 µg/L	< 20.0 µg/L			
Ethyl benzene	10.0 µg/L	< 10.0 µg/L			
Toluene	10.0 µg/L	< 10.0 µg/L			
Xylenes	30.0 µg/L	< 30.0 µg/L			

QUALITY CONTROL DATA	and a shirth of the second state of the	
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 μg/L	112 %

NDRC Laboratories, Inc.

lavar Raj Naran

Vice President, General Manager



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-9 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX	:	Groundwater
ID MARKS	:	MW - 9
	:	9307211045
PROJECT	:	GPM Buckeye/54030.02
DATE SAMPLED	:	20-JUL-1993
ANALYSIS METHOD	:	EPA 8020

PURGEABLE AROMATIC ORGANICS					
TEST REQUESTED	DETECTION LIMIT	RESULTS			
Benzene	10.0 μg/L	673 µg/L			
Chlorobenzene	10.0 μg/L	< 10.0 µg/L			
1,4-Dichlorobenzene	15.0 µg/L	< 15.0 µg/L			
1,3-Dichlorobenzene	20.0 µg/L	< 20.0 μg/L			
1,2-Dichlorobenzene	20.0 μg/L	< 20.0 μg/L			
Ethyl benzene	10.0 μg/L	28.8 µg/L			
Toluene	10.0 µg/L	314 μg/L			
Xylenes	30.0 µg/L	69.4 μg/L			

QUALITY CONTROL DATA	entitien nuturigaan na nuti'eeriggegeneene seitte <sub>n ee</sub> geneen	
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	103 %

NDRC Laboratories, Inc.

Raj Narap



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-10 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	MW-2	
	:	9307211115	
PROJECT	:	GPM Buckeye/54030.02	
DATE SAMPLED	:	20-JUL-1993	
ANALYSIS METHOD	:	EPA 8020	

PURGEABLE AROMATIC ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/L	< 2.0 µg/L
Chlorobenzene	2.0 µg/L	< 2.0 µg/L
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L
Ethyl benzene	2.0 µg/L	< 2.0 µg/L
Toluene	2.0 µg/L	< 2.0 μg/L
Xylenes	6.0 μg/L	< 6.0 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	113 %

NDRC Laboratories, Inc.

Raj Naran



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-11 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY	:	H + GCL
ADDRESS	:	505 Marguette NW, Ste. 1100
	:	Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
		Change de la base
SAMPLE MATRIX	:	Groundwater
ID MARKS	:	MW-20
	:	9307201455
PROJECT	:	GPM Buckeye/54030.02
DATE SAMPLED	:	20-JUL-1993
ANALYSIS METHOD	:	EPA 8020

PURGEABLE AROMATIC ORGANICS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	2.0 µg/L	217 µg/L
Chlorobenzene	2.0 µg/L	< 2.0 µg/L
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L
1,2-Dichlorobenzene	4.0 μg/l	< 4.0 µg/L
Ethyl benzene	2.0 µg/L	10.6 µg/L
Toluene	2.0 µg/L	102 µg/L
Xylenes	6.0 µg/L	33.6 µg/L

QUALITY CONTROL DATA	an a	<u>, , , , , , , , , , , , , , , , , , , </u>
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 μg/L	104 %

NDRC Laboratories, Inc.

Natar Raj Naran



DATE RECEIVED : 22-JUL-1993

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: :

REPORT NUMBER : H93-4770-12 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX ID MARKS	:	Groundwater MW-10 9307211145	
PROJECT DATE SAMPLED ANALYSIS METHOD	::	GPM Buckeye/54030.02 20-JUL-1993 EPA 8020	

PURGEABLE AROMATIC ORGANICS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		
Benzene	2.0 µg/L	3.5 μg/L		
Chlorobenzene	2.0 µg/L	< 2.0 µg/L		
1,4-Dichlorobenzene	3.0 µg/L	< 3.0 µg/L		
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L		
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 µg/L		
Ethyl benzene	2.0 µg/L	< 2.0 µg/L		
Toluene	2.0 µg/L	< 2.0 µg/L		
Xylenes	6.0 µg/l	< 6.0 µg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	116 %

NDRC Laboratories, Inc.

Raj Naran



DATE RECEIVED : 22-JUL-1993

REPORT NUMBER : H93-4770-13 REPORT DATE : 30-JUL-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Groundwater	
ID MARKS	:	MW-10A	
	:	9307211200	
PROJECT	:	GPM Buckeye/54030.02	
DATE SAMPLED	:	20-JUL-1993	
ANALYSIS METHOD	:	EPA 8020	

PURGEABLE AROMATIC ORGANICS			
TEST REQUESTED	DETECTION LIMIT	RESULTS	
Benzene	2.0 µg/L	60.5 μg/L	
Chlorobenzene	2.0 µg/L	< 2.0 μg/L	
1,4-Dichlorobenzene	3.0 μg/L	< 3.0 µg/L	
1,3-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L	
1,2-Dichlorobenzene	4.0 μg/L	< 4.0 μg/L	
Ethyl benzene	2.0 µg/L	< 2.0 µg/L	
Toluene	2.0 µg/L	< 2.0 μg/L	
Xylenes	6.0 µg/L	< 6.0 µg/L	

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	109 %

NDRC Laboratories, Inc.

Raj Narap



DATE RECEIVED: 22-JUL-1993

REPORT NUMBER: H93-4770:1-13 REPORT DATE: 30-JUL-1993

SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Benzene MHT 28-JUL-1993 28-JUL-1993 28-JUL-1993 28-JUL-1993 47778-10	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 8020 EPA 5030 8% - 104%  < 2.0 μg/L 104% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Toluene MHT 28-JUL-1993 28-JUL-1993 28-JUL-1993 28-JUL-1993 4778-10	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 8020 EPA 5030 8% 102%  < 2.0 μg/L 104% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Ethyl benzene MHT 28-JUL-1993 28-JUL-1993 28-JUL-1993 28-JUL-1993 4778-10	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery:	EPA 8020 EPA 5030 6% 101%  < 2.0 μg/L 101%
		TCLP Spike Recovery:	

NDRC Laboratories, Inc.

Raj Naran Vice President, General Manager



DATE RECEIVED: 22-JUL-1993

REPORT NUMBER: H93-4770:1-13 REPORT DATE: 30-JUL-1993

SAMPLE SUBMITTED BY: H + GCL

4

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS:	1,2-Dichlorobenze	ene A	Analysis	Method:	EPA 8	020
Technician:	MHT	Ext	raction	Method:	EPA 5	030
Sample Extracted:	28-JUL-1993		MS/	MSD RPD:	8%	
QC Extracted:	28-JUL-1993	Average	Spike R	ecovery:	86%	
Sample Analyzed:	28-JUL-1993	-	Duplic	ate RPD:		
QC Analyzed:	28-JUL-1993		Metho	d Blank:	< 4.0	µg/L
QC Sample Number:	4778-10		LCS R	ecovery:	89%	
TCLP Leachate Date:		TCLP	Spike R	ecovery:		

NDRC Laboratories, Inc. Raj Naran Vice President, General Manager

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	Houston - 11155 South Main • Houston, Texas 77025 • (713) 661-8150 • Fax (713) 661-2661																													

## SAMPLE PRESERVATION INFORMATION SHEET

Field Sampling 🗆

Incoming Samples

**JENERAL** 

Company: H+GCL	Job No: 4770
No. of Cooler(s):	Temperature of Cooler(s):

#### **PRESERVATION INFORMATION**

Sample No.	Tempe of Sa	erature Imple	San Cont	nple ainer	Vol	ume	Prese us	rvation ed *	Initia	at pH	Fina	l pH	Bottles generated	Comments
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#### **RESERVATION USED \***

- 1 Cool to 4° C
- 2 H<sub>2</sub>SO<sub>4</sub> to pH < 2
- 3 HNO<sub>3</sub> to pH < 2
- 4 HCL to pH < 2



Date/Time

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

07/15/93 15:44 🖀



505 Marquette NW, Ste. 1100 • Albuquerque, NM 87102 (505) 842-0001 • FAX: (505) 842-0595

#### MEMO

Sent via fax

TO: Bill Olson, OCD

FROM: Maureen Gannon, H\*GCL

DATE: July 15, 1993

SUBJ: Well Restoration of RW-1

Pursuant to our phone conversation on Thursday, July 15, 1993, I am enclosing a copy of the specifications for well restoration of recovery well, RW-1, at GPM's Lee Plant, Buckeye, New Mexico. RW-1 ceased water production in January of 1993.

H<sup>+</sup>GCL will be overseeing restoration of RW-1 the week of July 19. On behalf of GPM, we request approval to perform redevelopment of RW-1 as outlined in item 020 attached.

Please call me as soon as possible. We would like to begin work on Monday, July 19. Thank you.

cc: V. Bernard, GPM

G:\\$4030\OLSON01.MEM

Verbal OK to Mauseen Gannon Mauseen On 115/93, ~

07/15/93 15:44

#### Item 020: Well Restoration

#### A. SCOPE

This section covers the labor, materials, and equipment necessary for well restoration at monitoring well RW-1.

#### B. MATERIALS AND EQUIPMENT

The subcontractor shall provide all materials, labor, and equipment necessary for completion of the well restoration services specified herein. The well restoration methods to be used for monitoring well RW-1 shall consist of mechanical cleaning followed by chemical treatment.

All equipment shall be maintained in good operating condition prior to and during use in the work. All well restoration activities shall be coordinated with GPM's Site Coordinator or designee.

Only potable quality water (from a source approved by GPM prior to start of work) shall be permitted to be used during well restoration activities. It is the responsibility of the subcontractor to identify the source of the water and arrange for its transportation to the work site when needed, by use of a tank or tank trucks that can be easily moved about the site and can be refilled without contamination.

#### C. PROCEDURES

H\*GCL recommends implementation of the following sequence of well restoration activities:

- Mechanically clean the screened interval of the well casing with a wire brush. Pump, bail, or air-lift the loosened debris and particulates from the well prior to acidizing.
- Acid treat wells with Cotey Chemical Company Dry Acid Special (or approved equal). A swab (i.e., a rubber-flanged mud scow) or surge block shall be used to increase the acid contact with the well screen materials and with the geologic formation surrounding the borehole. The well should be subjected to continuous surging for 15 to 20 minutes following introduction of the acid solution. Over a 12 to 24 hour contact time, the well should be periodically subjected to continuous surging every three hours (i.e., for 10 to 15 minute intervals).
- Upon completion of acid treatment, the waste acid solution in each well shall be pumped (until the pH stabilizes) and neutralized prior to discharge to the Lee Plant wastewater collection system.
- Pump, bail, or air-lift the loosened debris and particulates from the well prior to redevelopment.

The subcontractor shall take all necessary precautions to prevent contaminated water, gasoline, or other deleterious substances from entering the well, either through the wellhead or by seepage through the ground surface. The subcontractor shall maintain necessary precautions prior, during, and after well restoration activities.

All wastes generated from mechanical cleaning and chemical treatment activities (fluids and other debris) shall be field screened by the on-site geologist to determine pH levels. Based on results from the field screening and as directed by GPM, the subcontractor shall contain and neutralize these wastes prior to discharge to the Lee Plant wastewater collection system.

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GPM shall provide means for the final disposal of well restoration wastes.

A Daily Field Activity Log shall be compiled and signed by the on-site geologist. The following information shall be recorded within the Field Activity Log:

- names of on-site personnel during well restoration activities;
- all field equipment used during well restoration activities;
- date and weather conditions;
- descriptions/observations of well restoration activities including start-up and completion times;
- any deviations from the well restoration criteria specified herein;
- references to any field generated paperwork; and
- control, management, and disposal of all wastes generated from mechanical cleaning and chemical treatment activities (fluids and other debris).

All field notebook entries shall include the recorder's signature and date.

#### D. PAYMENT

Payment for well restoration activities shall be based on the unit price quotation stated in the Subcontractor's Bid Schedule for Item 020: WELL RESTORATION.





REMOVE: Limestone, water deposited scale, rust and corrosion. DEVELOP: New wells producing from limestone or calcareous sand and gravel formations.

REDEVELOP: Old wells that have water deposited scale, rust or corrosion plugging the perforations, screen or formation.

DRY ACID\* SPECIAL, when dissolved in water, produces an inhibited acid solution that chemically dissolves limestone, scale, rust and corrosion.

DRY ACID\* SPECIAL is fully inhibited and is safe on plastics, rubber and metals commonly used in water wells.

DRY ACID\* SPECIAL is packaged in 50 pound steel pails.

DRY ACID\* SPECIAL has a baneficial bacteriacidal affect.

Wells producing from water bearing limestone or sand and gravel formations cemented with calcareous deposits may have only a limited initial flow rate.

Substantial increases in flow can be obtained by dissolving the limestone or calcareous deposits with DRY ACID<sup>+</sup> SPECIAL thus increasing the size of the openings permitting the water to enter the well bore at a higher rate.

The minerals dissolved in most ground waters have a tendency to precipitate out of solution at or near the well bore, where the temperature and pressure of the water changes. These deposits will accumulate on the strainer, screen or perforated pipe and on the face of the water bearing formation and gradually restrict the flow of water. To keep a well producing at a satisfactory rate these, deposits must be removed periodically. The most effective way is with a properly designed chemical treatment. Most water deposited scales are readily soluble in DRY ACID\* SPECIAL.

Other causes of decreased water flow from wells are: build-up of deposits due to corrosion of well equipment and accumulation of organic growths, such as algae, molds, fungi and bacteria. Both of these conditions can be corrected with periodic treatments using DRY ACID<sup>+</sup> SPECIAL.

\*DRY ACID, WEI,GICIDE, DRY.DE-TR=DEMARKS, COTEY CHEMICAL COMPANY, REG. U. S. PATENT OFFICE



JUL-15-93 THU

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Index of casing or hole       per feat of depth         1       0.041       HOW TO USE DRY ACID <sup>®</sup> SPECIAL IN LARGE DIAMETER WELLS         2       0.163       IN LARGE DIAMETER WELLS         2       0.255       I. Use % to 1 pound of DRY ACID <sup>®</sup> SPECIAL per gallon of water in the well.         3       0.367       2. If a deep well turbine pump is in the hole, add about ½ the required omount of DRY ACID <sup>®</sup> SPECIAL at a time, between the pump 4         4       0.653       column and casing. Agitate by backwashing after each addition of acid. If a rig is over the hole add the acid to the casing and agitate with a bailer, surge block or other tool.         5       1.020       3. Acid should remain in the well 12 to 24 hours and should be agitated every few hours.         6       1.469       4. If well is gravel packed displace the acid back through the gravel well by adding water equal to about ½ the volume of water standing the ble. In new wells the water should be added after all the acid has been added and thoroughly mixed by backwashing. In old wells allow the acid to stay in the casing or a few hours before add- ing the water. Water should be added slowly or in several batches at 30 minute intervals.         11       4.937       at 30 minute intervals.         12       5.875       Pump or bail the hole clean, develop and test.         13       6.895       HOW TO USE DRY ACID <sup>®</sup> SPECIAL IN SMALL DIAMETER WELLS         16       10.00       1. Trear with a solution made by dissolving about 1 pound o	Digmeter	Gallons	
at caring ar hole       at depth         1       0.041         1½       0.092         2       0.163         2½       0.255         1       Use % to 1 pound of DRY ACID <sup>®</sup> SPECIAL per gallon of water in the well.         3       0.367         3½       0.500         4       0.653         1       0.633         1       0.453         2       0.737         1       0.616         5       1.020         2       0.453         1       0.453         1       0.453         1       0.453         1       0.453         1       0.453         1       0.453         1       0.453         1.020       aptice with a bailes, surge block or other tool.         5       1.020         3       Acid should remain in the well 12 to 24 hours and should be agitated         9       3.305         11       1.469         4       If well is gravel packed displace the acid back through the gravel         12       5.875         13       6.895         14       8.000	inches	per foot	
1       0.041       HOW TO USE DRY ACID <sup>®</sup> SPECIAL         1½       0.092       IN LARGE DIAMETER WELLS         2       0.163       I. Use ¾ to 1 pound of DRY ACID <sup>®</sup> SPECIAL per gallon of water in the well.         3       0.367       2. If a deep well turbine cump is in the hole, add about ¼ the required amount of DRY ACID <sup>®</sup> SPECIAL at a time, between the pump column and casing. Agitate by backwashing after each addition of acid. If a rig is over the hole add the acid to the casing and agitate with a bailer, surge block or other tool.         5       1.020       aditate with a bailer, surge block or other tool.         5½       1.234       every few hours.         6       1.469       4. If well is gravel packed displace the acid to back through the gravel well by adding water equal to about ¾ the volume of water stranding in the hole. In new wells the water should be added after all the acid has been added and thoroughly mixed by backwashing. In old wells allow the acid to stay in the casing for a few hours before add-ing the water.         11       4.937       at 30 minute intervals.         12       5.875       5. Pump or bail the hole clean, develop and test.         13       6.895         14       8.000         15       9.18         16       10.00         17       17.79         17.79       SPECIAL per gallon of water.         18       13.22	of casing or hole	of depth	
1½0.092IN LARGE DIAMETER WELLS20.1631. Use ½ to 1 pound of DRY ACID®SPECIAL per gallon of water in the well.30.3672. If a deep well turbine pump is in the hole, add about ½ the required amount of DRY ACID®SPECIAL at a time, between the pump column and casing. Agitate by backwashing offer each addition of acid. If a rig is over the hole add the acid to the casing and cgitate with a bailer, surge block or other tool.51/21.2343. Acid should remain in the well 12 to 24 hours and should be agitate every few hours.61.4694. If well is grevel packed displace the acid back through the gravel woll by adding water equal to about ¾ the volume of water standing in the hole. In new wells the water should be added after all the acid has been added and thoroughly mixed by backwashing. In old wells allow the acid to stay in the casing for a few hours before add- ing the water.114.937at 30 minute intervals.125.8755. Pump or bail the hole clean, develop and test.136.895HOW TO USE DRY ACID®SPECIAL ing the volar.148.0001. Treot with a solution made by dissolving about 1 pound of DRY ACID®159.18IN SMALL DIAMETER WELLS1610.001. Treot with a solution and agitate with a bailer, surge block or other device.2016.324. As the fluid level drops continue to add the caid solution.2119.755. Agitate several times during a 12 to 24 hour sooking period.2219.756. Bail the hole and agitate with a bailer, surge block or other device.2111.79SPECIAL per gallon of water. </td <td>1</td> <td>0.041</td> <td>HOW TO USE DRY ACID<sup>®</sup> SPECIAL</td>	1	0.041	HOW TO USE DRY ACID <sup>®</sup> SPECIAL
20.1632½0.2551Use % to 1 pound of DRY ACID*SPECIAL per gallon of water in the well.30.3673½0.5003½0.50040.65361.45751.02061.46972.00072.00082.61182.61193.30593.305104.080114.937125.75136.895148.000151.000161.179171.791813.221914.73101.322101.322111.79121.795131.322141.795151.18161.000171.791813.221914.73101.322111.322121.473131.322141.3001711.791711.791813.221914.73101.322101.322111.493121.493131.322141.500159.181610.001711.791711.791711.791711.7917 <t< td=""><td>11/2</td><td>0.092</td><td>IN LARGE DIAMETER WELLS</td></t<>	11/2	0.092	IN LARGE DIAMETER WELLS
2½0.2531. Use will point of point point point point point point point point point poin	2	0.163	1. Use 34 to 1 pound of DPY ACID <sup>®</sup> SPECIAL per gallon of water in
3       0.367       2. If a deep well turbine cump is in the hole, add about ¼ the required amount of DRY ACID <sup>5</sup> SPECIAL at a time, between the pump column and casing. Agitate by backwashing after each addition of acid. If a rig is over the hole add the acid to the cosing and for acid. If a rig is over the hole add the acid to the cosing and for acid. If a rig is over the hole add the acid to the cosing and avery few hours.         6       1.469       4. If well is gravel packed displace the acid back through the gravel will by adding water equal to about ¼ the volume of water standing in the hole. In new wells the water should be added after all the acid has been added and thoroughly mixed by backwashing. In old wells allow the acid to stay in the casing for a few hours before adding the water. Water should be added slowly or in several batches at 30 minute intervals.         11       4.937       at 30 minute intervals.         12       5.875       5. Pump or bail the hole clean, develop and test.         13       6.895       1. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>6</sup> 14       8.000       1. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>6</sup> 15       9.18       1. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>6</sup> 16       10.00       1. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>6</sup> 17       11.79       SPECIAL per gallon of water.         18       13.22       1. Use about two to three times the volume of the casing ., <t< td=""><td>21/2</td><td>0.255</td><td></td></t<>	21/2	0.255	
$3\frac{1}{2}$ 0.500amount of DRY ACID*SPECIAL at a time, between the pump column and casing. Agitate by backwashing after each addition of acid. If a rig is over the hole add the acid to the casing and agitate with a bailer, surge black or other tool. $4\frac{1}{2}$ 0.737of acid. If a rig is over the hole add the acid to the casing and agitate with a bailer, surge black or other tool. $5\frac{1}{2}$ 1.2343. Acid should remain in the well 12 to 24 hours and should be agitated every few hours. $6$ 1.4694. If well is gravel packed displace the acid back through the gravel well by adding water equal to about 34 the volume of water standing in the hole. In new wells the water should be added after all the acid has been added and thoroughly mixed by backwashing. In old wells allow the acid to stay in the casing for a few hours before add- ing the water. Water should be added slowly or in several batches ar 30 minute intervals. $11$ 4.9375. Pump or bail the hole clean, develop and test. $13$ 6.8951. Treot with a solution made by dissolving about 1 pound of DRY ACID* SPECIAL 	3	0.367	2. If a deep well turbine pump is in the hole, add about ½ the required
4       0.653       column and casing. Agitate by backwashing offer each addition of acid. If a rig is over the hole add the acid to the casing and agitate with a bailer, surge block or other tool.         5       1.020       3. Acid should remain in the well 12 to 24 hours and should be agitated every few hours.         6       1.469       4. If well is gravel packed displace the acid back through the gravel well by adding water equal to about 34 the volume of water standing         8       2.611       in the hole. In new well's the water should be added after all the acid has been added and theroughly mixed by backwashing. In old wells allow the acid to stay in the casing for a few hours before add-ing the water. Water should be added slowly or in several batches at 30 minute intervals.         10       4.080       ing the water. Water should be added slowly or in several batches at 30 minute intervals.         11       4.937       at 30 minute intervals.         12       5.875       5. Pump or bail the hole clean, develop and test.         13       6.895         14       8.000       HOW TO USE DRY ACID <sup>®</sup> SPECIAL IN SMALL DIAMETER WELLS         16       10.00       1. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>®</sup> 17       11.79       SPECIAL per gallon of water.         18       13.22       2. Use about two to three times the volume of the casing.         19       14.73       3. Add solution and agitate with a bailer, s	31⁄2	0.500	amount of DRY ACID <sup>3</sup> SPECIAL at a time, between the pump
4½0.737of acid. If a rig is over the hole add the acid to the casing und agitate with a bailer, surge block or other tool.51.0203. Acid should remain in the well 12 to 24 hours and should be agitated every few hours.61.4694. If well is gravel packed displace the acid back through the gravel wall by adding water equal to about 34 the volume of water standing in the hole. In new well's the water should be added after all the acid wells allow the acid to stay in the casing for a few hours before add- ing the water. Water should be added after all the acid wells allow the acid to stay in the casing for a few hours before add- ing the water. Water should be added slowly or in several batches at 30 minute intervals.114.937at 30 minute intervals.125.8755. Pump or bail the hole clean, develop and test.136.895HOW TO USE DRY ACID <sup>®</sup> SPECIAL IN SMALL DIAMETER WELLS1610.001. Treot with a solution made by dissolving about 1 pound of DRY ACID SPECIAL per gallon of water.1813.222. Use about two to three times the volume of the casing .1914.733. Add solution and agitate with a bailer, surge block or other device.2016.324. As the fluid level drops continue to add the acid solution.219.756. Bail the hole and test.2219.756. Bail the hole and test.2310.9711. WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS2423.5011. WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS2627.5811. WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS2627.5810	4	0.653	column and casing. Agitate by backwashing after each addition
5       1.020       3. Acid should remain in the well 12 to 24 hours and should be agitated every few hours.         6       1.469       3. Acid should remain in the well 12 to 24 hours and should be agitated every few hours.         7       2.000       wall by adding water equal to about 34 the volume of water standing in the hole. In new wells the water should be added after all the acid has been added and thoroughly mixed by backwashing. In old wells allow the acid to stay in the casing for a few hours before adding the water. Water should be added slowly or in several batches at 30 minute intervals.         10       4.080       in the hole clean, develop and test.         11       4.937       at 30 minute intervals.         12       5.875       5. Pump or bail the hole clean, develop and test.         13       6.895       HOW TO USE DRY ACID <sup>16</sup> SPECIAL         14       8.000       1. Treot with a solution made by dissolving about 1 pound of DRY ACID <sup>8</sup> 15       9.18       IN SMALL DIAMETER WELLS         16       10.00       1. Treot with a solution and agitate with a bailer, surge black or other device.         18       13.22       2. Use about two to three times the volume of the casing.,         19       14.73       3. Add solution and agitate with a bailer, surge black or other device.         20       16.32       4. As the fluid level drops continue to add the acid solution.         21       19	41⁄2	0.737	of acid. If a rig is over the hole add the acid to the casing and
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72.000wall by adding water equal to about % the volume of water standing82.611in the hole. In new wells the water should be added after all the acid93.305in the hole. In new wells the water should be added after all the acid93.305wells allow the acid to stay in the casing for a few hours before add-104.080ing the water. Water should be added slowly or in several batches114.937at 30 minute intervals.125.8755. Pump or bail the hole clean, develop and test.136.895HOW TO USE DRY ACID <sup>16</sup> SPECIAL159.18IN SMALL DIAMETER WELLS1610.001. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>8</sup> 1711.79SPECIAL per gallon of water.1813.222. Use about two to three times the volume of the casing.,2016.324. As the fluid level drops continue to add the acid solution.2119.756. Bail the hole and test.2219.756. Bail the hole and test.2423.50IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-2627.58IN MANY WELLS TWO OR MORE TREATMENTS SPENT CHEMICALS2831.99INTIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS3036.72IN DEFUNDER CREATER TREATMENT CONTAINS SPENT CHEMICALS	6	1.469	4. If well is gravel packed displace the acid back through the gravel
8       2.611       in the hole. In new wells the water should be added after all the acid has been added and thoroughly mixed by backwashing. In old wells allow the acid to stay in the casing for a few hours before adding the water. Water should be added slowly or in several batches at 30 minute intervals.         10       4.080       ing the water. Water should be added slowly or in several batches at 30 minute intervals.         11       4.937       at 30 minute intervals.         12       5.875       5. Pump or bail the hole clean, develop and test.         13       6.895         14       8.000       HOW TO USE DRY ACID <sup>®</sup> SPECIAL         15       9.18       IN SMALL DIAMETER WELLS         16       10.00       1. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>®</sup> SPECIAL per gallon of water.         18       13.22       2. Use about two to three times the volume of the casing.,         19       14.73       3. Add solution and agitate with a bailer, surge black or other device.         20       16.32       4. As the fluid level drops continue to add the acid solution.         21       19.75       5. Agitate several times during a 12 to 24 hour soaking period.         24       23.50       IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-FICIAL.         26       27.58       IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-FICIAL.         28       31.9	7	2.000	wall by adding water equal to about 34 the volume of water standing
93.305Note been daded and indicaging initial of output initial ou	8	2.611	in the hole. In new wells the water should be added after all the acta
104.080ing the water.Water should be added slowly or in several batches114.937at 30 minute intervals.125.875S. Pump or bail the hole clean, develop and test.136.895148.000HOW TO USE DRY ACID <sup>®</sup> SPECIAL159.18IN SMALL DIAMETER WELLS1610.001. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>®</sup> 1711.79SPECIAL per gallon of water.1813.222. Use about two to three times the volume of the casing.,1914.733. Add solution and agitate with a bailer, surge block or other device.2016.325. Agitate several times during a 12 to 24 hour sooking period.2119.756. Bail the hole and test.2627.58IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-2831.99INITIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS3036.72MATER AFTER TREATMENT CONTAINS SPENT CHEMICALS	9	3.305	wells allow the acid to stay in the casing for a few hours before add-
114.937at 30 minute intervals.125.8755. Pump or bail the hole clean, develop and test.136.895148.000159.181610.001711.791813.221914.732016.322119.752219.752423.502627.582719.753036.72	10	4.080	ing the water. Water should be added slowly or in several batches
125.8755. Pump or bail the hole clean, develop and test.136.895148.000159.181610.001711.791813.221914.732016.322119.752219.752423.502627.583036.72	11	4.937	at 30 minute intervals.
136.895148.000159.181610.001711.791813.221914.732016.322119.752219.752423.502627.5827.58IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-FICIAL1914.732036.72	12	5.875	5. Pump or bail the hole clean, develop and test.
148.000HOW TO USE DRY ACID "SPECIAL159.18IN SMALL DIAMETER WELLS1610.001. Treat with a solution made by dissolving about 1 pound of DRY ACID"1711.79SPECIAL per gallon of water.1813.222. Use about two to three times the volume of the casing1914.733. Add solution and agitate with a bailer, surge block or other device.2016.324. As the fluid level drops continue to add the acid solution.2119.756. Bail the hole and test.2423.50IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-FICIAL.2831.99INITIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS3036.72IN DEFINITE DE FILMERED OR BALLED TO WASTE	13	6.895	<b>*</b>
159.18IN SMALL DIAMETER WELLS1610.001. Treat with a solution made by dissolving about 1 pound of DRY ACID <sup>3</sup> 1711.79SPECIAL per gallon of water.1813.222. Use about two to three times the volume of the casing.,1914.733. Add solution and agitate with a bailer, surge block or other device.2016.324. As the fluid level drops continue to add the acid solution.2016.325. Agitate several times during a 12 to 24 hour soaking period.2423.50IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-FICIAL.2831.99INITIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS3036.72NANT WELLS TREATMENT CONTAINS SPENT CHEMICALS	14	8.000	HOW TO USE DRY ACID SPECIAL
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2016.324. As the fluid level drops continue to add the acid solution.2016.325. Agitate several times during a 12 to 24 hour soaking period.2219.756. Bail the hole and test.2423.501N MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-2627.58IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-2831.99INITIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS3036.72AND SHOULD DE DUMPED OR BALLED TO WASTE	19	14.73	3. Add solution and agitate with a bailer, surge block or other device.
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2423.502627.582831.993036.72	22	19.75	5. Agitate several times during a 12 to 24 hour soaking period.
2627.58IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE- FICIAL.2831.99INITIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS3036.72AND SHOULD DE RUMPED OF BALLED TO WASTER	24	23.50	6. Bails the hole and lest.
28 31.99 FICIAL. 30 36.72 FICIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS	26	27.58	IN MANY WELLS TWO OR MORE TREATMENTS MAY PROVE BENE-
INITIAL WATER AFTER TREATMENT CONTAINS SPENT CHEMICALS	28	31.99	FICIAL
	30	36.72	AND SHOULD BE PUMPED OR BAILED TO WASTE.
32 41.78 DRY ACID SPECIAL IS PACKAGED IN 50 POUND STEEL PAILS.	32	41.78	DRY ACID SPECIAL IS PACKAGED IN 50 POUND STEEL PAILS.
34 47.16	34	47.16	
36 52.88	36	52.88	

		Effective May	4, 1990
	Cotev Chemicals		.,
	DRY ACID		
USE TO:	Remove clays, shates, drilled cuttings and drilling muds. Develop new wells and	. <del></del>	
	re-develop old ones.	Diameter	Galio per fo
DIRECTIONS:	(1) Use ½ to ¾ pounds per gallon of water in large wells; ¾ to 1 pound in small wells.	or casing or hole 3	0.3
	(2) If a deep well turbine is in the hole, add 1/4 the required amount of Dry Acid at a	31/2	0.5
	time between pump and casing. Backwash after each treatment.	4	0.6
	(3) If the well is gravel packed, surge or add slowly water equal to 34 of the volume	4 1/2	0.7
	of water in the hole.	5 51/	1.0
	(4) Agitate well every few hours and allow Dry Acid to remain at least 24 hours.	3 72 B	1.4
	(5) Pump or bail the hole clean. Treated water should be pumped to waste.	7	2.0
		å	2.0
	DRY ACID SPECIAL	9	3.
		10	4.
	Develop new wells producing from limestone or calcareous sand and gravel or to	11	4.
USE IU:	re-develop old wells plugged by hard-water scale, rust or corrosion.	12	5.
		13	6.
DIRECTIONS:	(1) Use 34 to 1 pound per gallon of water in the well.	14	8.0
	(2) Follow Steps 2 thru 5 under directions for "Dry Acid".	15	9. 10
		10	11
		18	13.
		19	14.
	Remove allow sust all coucing pluceing of wells using oil-lube turbines.	20	16.
USE TO:	Remove sime-rust-on causing progging of mens comg of recent	22	19.
DIDECTIONS	(1) Lise 14 pound per gallon of water in casing.	24	23.
DIRECTIONS.	(2) Pour in dry between casing and column pipe. Backwash to mix and distribute.	26	27.
	Add the chemical carefully since considerable heat is generated when Welgloide	28	31.
	Cleaner is dissolved in water.	30	36.
	(3) Agitate occasionally with the pump. Leave chemical in well for at least 24 hours, then pump to waste.		41.
	LIQUID ANTIBACTERIAL ACID		
USE TO:	Dissolves iron bacteria incrustations, organic deposits of iron bacteria, slime, hard water scale on performations and screens, and in the strata, sulfides, and metallic oxides and holds them in suspension.	:	
DIRECTIONS:	<ol> <li>Use .061 gallon of LBA per gallon of water in well.</li> <li>LBA can be pumped or drained by gravity flow directly into the well. The pump and piping may be left in place with no fear of corrosion. Periodic surging during the treatment period of 36 hours or continuous circulation with the pump is desirable. If the pump and bowls have been removed, balling or swabbing inter mittently during the treatment period of 36 hours would be considered ample</li> </ol>	) ] ] 9	

H+GCL ALB

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agitation. (3) After 36 hours the LBA can then be pumped to waste.

DISCOUNT SCHEDULE 25%

P.07

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June 10, 1993

GIL CONSERVATION DIVISION RECEVED

#### GPM GAS SERVICES COMPANY

A DIVISION OF PHILLIPS PETROLEUM COMPANY '93 JUN 17 AM 9 06

4044 PENBROOK ODESSA, TX 79762

Second quarter 1993 Analytical Results Lee Plant Discharge Plan GW-2

Mr. William C. Olson Hydrogeologist Oil Conservation Division Post Office Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory analytical reports for groundwater sampling at our Lee Plant for the second quarter of 1993. Sample collection was conducted on April 15 and 16, 1993 pursuant to the requirements of NMOCD Discharge Plant GW-2. NDRC Laboratories, Inc., Houston, Texas, performed the sample analyses. Our consultant, H + GCL strictly adhered to chain-of-custody procedures to ensure the integrity of the samples during transport to the laboratory.

Groundwater samples from monitor wells MW-9, MW-11, MW-12, MW-13, MW-14 and MW-20 were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 602. Semi-annual sampling of supply wells, WS-1 and WS-2 was also conducted during the sampling event.

Monitor wells MW-9, MW-11, MW-12, MW-13 and MW-14 showed decreasing levels of BTEX. Hydrocarbon levels in MW-20 were at or very near detection levels. Overall results continue to verify that the size of the plume is diminishing.

Analytical results from WS-1 indicated hydrocarbon levels ranging from 2 to 7 mg/L (well below standard). Results for WS-2 indicated a significant increase in benzene concentration since previous sampling. The April 1993 results showed benzene at 1600 ppm while July 1992 sampling at the same well provided a benzene concentration of 460 mg/L. WS-2 is an inactive supply well situated within the central portion of the plume and near MW-9 which had a benzene concentration of 2200 mg/L during the April event. It is evident that WS-2 has been impacted by the down-gradient transport of the plume.

Monitor well, MW-4, is no longer pumping free product. After inspection of the product recovery pump and confirmation of the pump's working condition, product level thickness measurement revealed no free product in the well. This may indicate that the product has been removed in the immediate area and it may take some time for the plume to equilibrate and product to once again appear in the vicinity. Another possibility is that free product has, in fact, been completely recovered from this area. Continued product thickness measurement of this well will provide additional data to determine what is actually occurring in the area.

Mr. William C. Olson June 10, 1993 Page 2

GPM has now revised the sampling schedule to comply with the Discharge Plan GW-2 Modification approved on April 26, 1993. The new quarterly, semi-annual and annual sampling schedules are provided below.

#### Quarterly

- MW-11, MW-12, MW-13, MW-19 and MW-20 for dissolved aromatics (BTEX) using EPA method 602
- Depth to groundwater and product thickness measurements from all monitor wells

#### Semi-annually

• MW-2 and MW-18 for dissolved aromatics (BTEX) using EPA method 602

#### Annually

 MW-5, MW-7, MW-9, MW-10 and MW-16 for dissolved aromatics (BTEX) using EPA method 602

This new schedule will be adopted during our next quarterly sampling event set for July. We will conduct semi-annual and annual sampling during this time as well. If you have any questions or comments regarding the contents of this letter, please call me at (915) 368-1085.

Sincerely,

Vince Bernard Safety & Environmental Supervisor New Mexico Region

cc: Maureen Gannon - H+GCL Albuquerque S.J. Seeby M.S. Nault



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HOUSTON

DATE RECEIVED : 20-APR-1993

REPORT NUMBER : H93-2510-1 REPORT DATE : 22-APR-1993

SAMPLE SUBMITTED BY	:	H + GCL
ADDRESS	:	505 Marguette NW, Ste. 1100
	:	Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
		/
SAMPLE MATRIX	:	Water
ID MARKS	:	9304151200
	:	MW-20
PROJECT	:	54030.02/GPM
DATE SAMPLED	:	15-APR-1993
ANALVETS METHOD		FDA 602

BTEX ANALYSIS							
TEST REQUESTED	DETECTION LIMIT	RESULTS					
Benzene	1.0 µg/L	1.3 μg/L					
Toluene	1.0 µg/L	< 1.0 µg/L					
Ethyl benzene	1.0 μg/L	< 1.0 µg/L					
Xylenes	1.0 µg/L	2.0 µg/L					

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	98.0 %

NDRC Laboratories, Inc.

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HOUSTON

DATE RECEIVED : 20-APR-1993

REPORT NUMBER : H93-2510-2 REPORT DATE : 22-APR-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	••••••	Water 9304151315 MW-11 54030.02/GPM 15-APR-1993 EPA 602

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	1.0 μg/L		1.1 μg/L
Toluene	1.0 μg/L	<	1.0 µg/L
Ethyl benzene	1.0 µg/L	<	1.0 µg/L
Xylenes	1.0 μg/L	<	1.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	101 %

NDRC Laboratories, Inc.

odwar Equ David R. Godwin, Ph.D.

Chief Executive Officer



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HOUSTON

DATE	RECEIVED	:	20-APR-1993	REPORT	Ν	UMBER	:	H93-2510-3
				REPO	RT	DATE	:	22-APR-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	:::::::::::::::::::::::::::::::::::::::	Water 9304151400 MW-9 54030.02/GPM 15-APR-1993 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	10 µg/L	2200 µg/L
Toluene	10 µg/L	11 μg/L
Ethyl benzene	10 #g/L	20 µg/L
Xylenes	10 µg/L	40 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	91.0 %

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Godeven Equ NO David R. Godwin, Ph.D. Chief Executive Officer



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DATE RECEIVED : 20-APR-1993

REPORT NUMBER : H93-2510-4 REPORT DATE : 22-APR-1993

SAMPLE SUBMITTED BY	:	H + GCL
ADDRESS	:	505 Marquette NW, Ste. 1100
	:	Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
	_	Wataw
SAMPLE MAIRIA	:	Waler
ID MARKS	:	9304151445
	:	MW-12
PROJECT	:	54030.02/GPM
DATE SAMPLED	:	15-APR-1993
ANALYSIS METHOD	:	EPA 602

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
ßenzene	1.0 µg/L	30.0 μg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 μg/L	< 1.0 μg/L

QUALITY CONTROL DATA	<u>ан и полу нева с на страна на </u>	
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	92.0 %

NDRC Laboratories, Inc. Navid K. Godwan Kgur





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DATE	RECEIVED	:	20-APR-1993	REPO	۲S	NU	JMBER	:	H93-2510-5
				RE	201	RT	DATE	:	22-APR-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••	Water 9304151535 MW-13 54030.02/GPM 15-APR-1993 EPA 602	

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	1.0 μg/L		13.0 µg/L
Toluene	1.0 µg/L	<	1.0 µg/L
Ethyl benzene	1.0 µg/L	<	1.0 µg/L
Xylenes	1.0 µg/L	<	1.0 µg/L

QUALITY CONTROL DATA		<u>ن الموادر (1993)، من الموادر الموادر (1993)، موادر الموادر الم</u>
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	95.0 %

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David R. Godivin Equ



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DATE	RECEIVED	:	20-APR-1993	REPORT	N	UMBER	:	H93-2510-6
				REPC	RT	DATE	:	22-APR-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS	:	Water 9304151615 MW-14	
PROJECT	:	54030.02/GPM	
DATE SAMPLED	:	15-APR-1993	
ANALISIS METHOD	:	EPA 60Z	

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		
Benzene	1.0 μg/L	13.0 μg/L		
Toluene	1.0 µg/L	3.0 μg/L		
Ethyl benzene	1.0 µg/L	3.0 μg/L		
Xylenes	1.0 µg/L	6.0 μg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	96.0 %

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DATE	RECEIVED	:	20-APR-1993	REP

REPORT NUMBER : H93-2510-7 REPORT DATE : 22-APR-1993

SAMPLE SUBMITTED BY ADDRESS	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102	
SAMPLE MATRIX ID MARKS	::	Water 9304151050 WS-2	
PROJECT DATE SAMPLED ANALYSIS METHOD	: : :	54030.02/GPM 15-APR-1993 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	1600 µg/L
Toluene	1.0 μg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	19.0 µg/L
Xylenes	1.0 μg/L	14.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	100 %

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DATE	RECEIVED	:	20-APR-1993	REPORT	NU	JMBER	:	H93-2510-8
				REPOI	₹T	DATE	:	22-APR-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••••••••••••••••••••••••••••••••••••	Water 9304161100 WS-1 54030.02/GPM 16-APR-1993 EPA 602	

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		
Benzene	1.0 µg/L	7.0 μg/L		
Toluene	1.0 µg/L	3.0 µg/L		
Ethyl benzene	1.0 µg/L	2.0 µg/L		
Xylenes	1.0 µg/L	2.0 µg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 μg/L	103 %

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DATE RECEIVED : 20-APR-1993

REPORT NUMBER : H93-2510-9 REPORT DATE : 22-APR-1993

SAMPLE SUBMITTED BY	:	H + GCL	
ADDRESS	:	505 Marquette NW, Ste. 1100	
	:	Albuquerque, NM 87102	
ATTENTION	:	Ms. Annette Montoya	
SAMPLE MATRIX	:	Water	
ID MARKS	:	9304161115	
	:	WS-1A	
PROJECT	:	54030.02/GPM	
DATE SAMPLED	:	16-APR-1993	
ANALYSIS METHOD	:	EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 μg/L	28.0 µg/L
Toluene	1.0 µg/L	12.0 μg/L
Ethyl benzene	1.0 µg/L	7.0 μg/L
Xylenes	1.0 μg/L	8.0 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 μg/L	95.0 %

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DATE RECEIVED : 20-APR-1993

REPORT NUMBER : H93-2510-10 REPORT DATE : 22-APR-1993

SAMPLE SUBMITTED BY	:	H + GCL
ADDRESS	:	505 Marquette NW, Ste. 1100
	:	Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
SAMPLE MATRIX	:	Water
ID MARKS	:	9304161130
	:	Field Blank
PROJECT	:	54030.02/GPM
DATE SAMPLED	:	16-APR-1993

ANALYSIS METHOD : H	EPA	602
---------------------	-----	-----

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT		RESULTS           1.0         μg/L           1.0         μg/L           1.0         μg/L	
Benzene	1.0 µg/L	<	1.0	μg/L
Toluene	1.0 μg/L	<	1.0	µg∕L
Ethyl benzene	1.0 µg/L	<	1.0	μg/L
Xylenes	1.0 µg/L	<	1.0	µg∕L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 #g/L	95.0 %

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Jodwin Kgw Naved David R. Godwin, Ph.D.

Chief Executive Officer



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#### SUMMARY REPORT

CLIENT : H + GCL PROJECT : 54030.02/GPM JOB NUMBER : H93-2510 REPORT DATE : 22-APR-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	9304151200 MW-20	Water	15-APR-1993
2	9304151315 MW-11	Water	15-APR-1993
3	9304151400 MW-9	Water	15-APR-1993
4	9304151445 MW-12	Water	15-APR-1993

BTEX ANALYSIS, EPA 602			1		2	3		4
Benzene	µg/L		1.3		1.1	2200		30.0
Toluene	µg/L	<	1.0	<	1.0	11	<	1.0
Ethyl benzene	µg/L	<	1.0	. <	1.0	20	<	1.0
Xylenes	µg/L		2.0	<	1.0	40	<	1.0

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#### SUMMARY REPORT

CLIENT : H + GCL PROJECT : 54030.02/GPM JOB NUMBER : H93-2510 REPORT DATE : 22-APR-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
5	9304151535 MW-13	Water	15-APR-1993
6	9304151615 MW-14	Water	15-APR-1993
7	9304151050 WS-2	Water	15-APR-1993
8	9304161100 WS-1	Water	16-APR-1993

BTEX ANALYSIS, EPA 602			5	6		7	8
Benzene	µg∕L		13.0	13.0		1600	7.0
Toluene	µg∕L	<	1.0	3.0	<	1.0	3.0
Ethyl benzene	µg/L	<	1.0	3.0		19.0	2.0
Xylenes	µg/L	<	1.0	6.0		14.0	2.0

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#### SUMMARY REPORT

CLIENT : H + GCL PROJECT : 54030.02/GPM JOB NUMBER : H93-2510 REPORT DATE : 22-APR-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
9	9304161115 WS-1A	Water	16-APR-1993
10	9304161130 Field Blank	Water	16-APR-1993

BTEX ANALYSIS, EPA 602		9		10	
Benzene	µg/L	28.0	<	1.0	 
Toluene	µg/L	12.0	<	1.0	
Ethyl benzene	µg/L	7.0	<	1.0	
Xylenes	µg/L	8.0	<	1.0	

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DATE RECEIVED: 20-APR-1993

REPORT NUMBER: H93-2510:1-10 REPORT DATE: 22-APR-1993

SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Benzene MHT 21-APR-1993 21-APR-1993 21-APR-1993 21-APR-1993 2510-10	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 602 EPA 5030 6% 107%  < 1.0 μg/L 98% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Toluene MHT 21-APR-1993 21-APR-1993 21-APR-1993 21-APR-1993 2510-10	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 602 EPA 5030 6% 109%  < 1.0 μg/L 100% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number: TCLP Leachate Date:	Ethyl benzene MHT 21-APR-1993 21-APR-1993 21-APR-1993 21-APR-1993 2510-10	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery: TCLP Spike Recovery:	EPA 602 EPA 5030 8% 106%  < 1.0 μg/L 100% 
ANALYSIS: Technician: Sample Extracted: QC Extracted: Sample Analyzed: QC Analyzed: QC Sample Number:	Xylenes MHT 21-APR-1993 21-APR-1993 21-APR-1993 21-APR-1993 2510-10	Analysis Method: Extraction Method: MS/MSD RPD: Average Spike Recovery: Duplicate RPD: Method Blank: LCS Recovery:	EPA 602 EPA 5030 14% 93%  < 1.0 μg/L 99%

NDRC Laboratories, Inc.

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# NDRC LABORATORIES, INC.

№10574

Houston - 11155 South Main • Houston, Texas 77025 • (713) 661-8150 • Fax (713) 661-2661

## SAMPLE PRESERVATION INFORMATION SHEET

Field Sampling 🗆

Incoming Samples 🗆

#### GENERAL

Company: H+GCL	JOD NO: 250	
No. of Cooler(s):	_ Temperature of Cooler(s):	

#### PRESERVATION INFORMATION

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PRESERVATION USED \*

- 1 Cool to 4° C
- 2  $\rm H_2SO_4$  to pH < 2
- $3 HNO_3$  to pH < 2
- 4 HCL to pH < 2

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

Preserved by

リーこのや Date/Time

 STATE OF NEW MEXICO

#### ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION



BRUCE KING GOVERNOR

April 26, 1993

POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 87504 (505) 827-5800

ANITA LOCKWOOD CABINET SECRETARY

> CERTIFIED MAIL RETURN RECEIPT NO. P-667-242-341

Vincent B. Bernard GPM Gas Corporation 4044 Penbrook Odessa, TX 79762

RE: DISCHARGE PLAN GW-2 MODIFICATION LEE GAS PROCESSING PLANT BUCKEYE, NEW MEXICO

Dear Mr. Bernard:

The New Mexico Oil Conservation Division (OCD) has completed a review of GPM's April 7, 1993 "DISCHARGE PLAN GW-2 MODIFICATION AND REMEDIAL STRATEGY, LEE PLANT, BUCKEYE, NEW MEXICO" and GPM's accompanying February 25, 1993 correspondence. These documents, which were submitted to OCD on April 16, 1993, propose modifications to the current ground water monitoring and remediation system at the GPM Lee Gas Plant.

The above requested modification of the previously approved ground water discharge plan, GW-2, for the Phillips Lee Gas Plant located in the SW/4 SE/4, Section 30, Township 17 South, Range 35 East (NMPM), Lea County, New Mexico is hereby approved under the conditions contained in the enclosed attachment. The discharge plan (GW-2) was previously approved on March 18, 1991.

The discharge plan modification was submitted pursuant to Section 3-106 of the Water Quality Control Commission (WQCC) Regulations. It is approved pursuant to section 3-109.A. Please note Section 3-109.F., which provides for possible future amendments of the plan. The modification does not significantly alter the discharge streams, therefore, public notice was not issued.

Please note that section 3-104 of the WQCC regulations requires that "When a plan has been approved, discharges must be consistent with the terms and conditions of the plan". Pursuant to Section 3-107.C. you are required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the discharge of water quality or volume. Mr. Vincent B. Bernard April 26, 1993 Page 2

The discharge plan modification for the GPM Lee Gas Plant is subject to the WQCC Regulation 3-114 discharge plan fee. Every billable facility submitting a discharge plan modification will be assessed a filing fee of fifty (50) dollars plus a flat rate of one-thousand six-hundred and sixty-seven dollars and fifty cents (\$1667.50) for gas processing plants. Pursuant to Section 3-114.B.5. the OCD waives the flat fee assessed for this modification. However, GPM still must pay the \$50.00 filing fee.

Please be advised that approval of this plan does not relieve you of liability should your operation result in actual pollution of surface or ground waters or the environment which may be actionable under other laws and/or regulations. In addition, this approval does not relieve GPM of responsibility for compliance with other state, federal or local laws and/or regulations.

On behalf of the staff of the Oil Conservation Division, I wish to commend GPM for their initiative in exploring innovative techniques for timely and cost effective remediation of contaminated ground water.

If you have any questions please contact Bill Olson of my staff at (505) 827-5885.

Sincerely, William J. LeMay Director

WJL/WCO

xc: OCD Hobbs District Office

#### ATTACHMENT TO DISCHARGE PLAN GW-2 MODIFICATION GPM LEE GAS PROCESSING PLANT DISCHARGE PLAN REQUIREMENTS (April 26, 1993)

#### A. DISCHARGE PLAN MODIFICATION FEE

1. The \$50 filing fee will be paid upon receipt of this approval. Please make the check payable to: NMED-Water Quality Management and addressed to the OCD Santa Fe Office.

#### B. REMEDIATION

- 1. The annular space above the water table in the three well cluster to be installed near recovery well RW-1 will be cemented to the surface with a bentonite grout.
- 2. Information on the type of surfactant and nutrients injected in the air sparging system will be supplied to OCD prior to use.
- 3. If underground piping is to be used to convey contaminated fluids from recovery well MW-6, the piping will be designed such that it can be pressure tested to 3 psi above operating pressure. The piping will also be pressure tested prior to operation with the testing results submitted to OCD.
- 4. A report containing an evaluation of the air sparging systems effectiveness will be submitted to OCD on April 1, 1994.

#### C. GROUND WATER MONITORING

Due to the lack of consistent trends in the analytic data obtained from the monitor wells to date, the OCD requires that the monitoring schedule proposed by GPM be modified as shown below.

- 1. Depth to ground water and product thickness measurements will be taken from all monitor wells on a quarterly basis.
- 2. Monitor wells MW-11, MW-12, MW-13, MW-19 and MW-20 will be sampled and analyzed for dissolved aromatic hydrocarbons using EPA method 602 on a quarterly basis.
- 3. Monitor wells MW-2 and MW-18 will be sampled and analyzed for dissolved aromatic hydrocarbons using EPA method 602 on a semi-annual basis.
- 4. Monitor wells MW-5, MW-7, MW-9, MW-10 and MW-16 will be sampled and analyzed for dissolved aromatic hydrocarbons using EPA method 602 on a annual basis.

#### D. <u>REPORTING</u>

Quarterly reports with the results of all monitoring during the quarter will be submitted to OCD on January 1, April 1, July 1 and October 1 of the respective year.

Discharge Plan GW-2 Modification and Remedial Strategy Lee Plant, Buckeye, New Mexico

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RECEIVED

April 7, 1993

APR 7 6 1993

OIL CONSERVATION DIV. SANTA FE

Prepared for:

GPM Gas Corporation Lee Plant

Prepared by:

#### H<sup>+</sup>GCL

ALBUQUERQUE OFFICE 505 Marquette Avenue, NW Suite 1100 Albuquerque, New Mexico 87102 (505) 842-0001 FAX (505) 842-0595

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### Discharge Plan GW-2 Modification and Remedial Strategy Lee Plant, Buckeye, New Mexico

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#### 1.0 Executive Summary

GPM Gas Corporation (GPM), formerly Phillips 66 Natural Gas Company, of 4044 Penbrook, Odessa, Texas, proposes to modify their previously approved Discharge Plan, GW-2, for the Lee natural gas processing plant. The facility is located in the northeast quarter of Section 31 and the southeast quarter of section 30, Township 17S Range 35E; Lea County, New Mexico. This proposal describes the remedial strategy and associated discharge plan modifications to enhance the removal of free-phased hydrocarbons and dissolved hydrocarbon constituents in the groundwater. This plan also includes initiating the removal of hydrocarbon constituents from the unsaturated zone at the site. Under the current New Mexico Oil Conservation Division (NMOCD) discharge plan for the site, contaminated groundwater is pumped from the aquifer to the Lee plant wastewater treatment facility for removal of natural gas liquids. The proposed amendment to the discharge plan provides in situ remediation of the groundwater.

Groundwater at the site is unconfined at approximately 100 feet beneath the ground surface. The direction of groundwater flow is to approximately 30 degrees west of south. The hydraulic gradient at the site is approximately .0045 vertical drop per foot of horizontal distance.

This plan proposes the continued pumping of contaminated groundwater from the uppermost portion of the aquifer. This water will be discharged to the wastewater treatment and disposal system pursuant to the previously-approved discharge plan. One existing groundwater recovery well will be retrofitted for vapor extraction. Another well will be drilled to determine the vertical extent of contamination and to facilitate an air-sparging pilot test. Aerated, non-contaminated water from the on-site water supply well will be injected into the aquifer immediately below the zone of known hydrocarbon contamination. Air bubbles, and eventually added nutrients, combined with vapor extraction will enhance the removal and bioremediation of the dissolved hydrocarbons in the soil and those generated from the free-phase hydrocarbons and the contaminated groundwater in the aquifer.

### Discharge Plan GW-2 Modification and Remedial Strategy Lee Plant, Buckeye, New Mexico

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#### 2.0 Introduction

#### 2.1 Description of Existing Discharges

Pursuant to NMOCD discharge plan GW-2, GPM pumps approximately 8 gallons-perminute of groundwater from an existing recovery well network. The groundwater is treated in the plant wastewater treatment facility for removal of natural gas liquids. Recovered separate-phase hydrocarbons are recycled.

#### 2.2 Summary of Hydrogeological Conditions

Recharge in the region surrounding the Lee Plant occurs primarily as a result of infiltration of water from short drainages and temporary lakes that are the result of heavy rainfall events (Nicholson and Clebsch, 1961). Discharge takes place principally in the form of evapo-transpiration and pumping from wells; very small volumes of groundwater discharge at springs (GCL, 1988a).

Potable water supplies in the region are derived primarily from aquifers hosted by Quaternary alluvium and the Tertiary Ogallala Formation. Groundwater occurring in Triassic sediments is potable, but has a poorer quality and is hosted on lithologic units that produce lower well yields than younger formations in the area. The Ogallala Formation mantles the High Plains in the Lee Gas Plant area and has a saturated thickness ranging from 25 to 175 feet (Nicholson and Clebsch, 1961). Groundwater in these shallow aquifers generally flows to the southeast at a low hydraulic gradient (GCL, 1988a).

Shallow groundwater at the Lee Gas Plant is unconfined. The groundwater beneath the site is found in unconsolidated, fine-grained sands and silts, which typically exhibits hydraulic conductivities of .001 to 100 gallons per day per square foot (GCL, 1988a). During recovery operations, low well yields are observed. Recovery wells yield a sustainable pumping rate of up to 3.0 gallons per minute. This pumping rate is consistent for the fine-grained sediments that occur beneath the site.

The potentiometric surface at the Lee Gas Plant is shown on figure 1. Groundwater flows to the southwest in a direction of approximately 30 degrees west of due south. The direction of groundwater flow based on calculations from October 1991 water level

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G H I J K ND ND 11 43 19 ND ND 3 99 <1 ND ND 1 19 <1 ND ND 1 45 1.2 Omg/I <10 NS * * *	PLATE 1 MONITOR WELL LOCATION MAP WITH BTEX AND TPH CONCENTRATIONS FROM 1990 TO PRESENT CLIENT: PHILLIPS PETROLEUM COMPANY
	DATE: FEBRUARY 4, 1993 CHECKED BY: M. NEE DRAWN BY: J.T.N. DWG. NO. BTEXTV2 OIL CONSERVATION DIV. CANTA FE

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elevations correlates very well with the flow direction presented in previous reports. The well casing elevations, depth to groundwater, and water surface elevations are shown in table 4-1 of *Final Phase Investigation Report Lee Gas Plant, Buckeye, New Mexico.* 

### 2.3 Summary of the Observational Approach to Remedial Actions

The requirements of this remedial program will be met by utilizing the observational approach in our planning process. This approach has been accepted by DOE and other Federal agencies as a critical element of their environmental compliance programs. EPA has recognized the effectiveness of the observational approach in reducing the time and expense of site investigations and remedial actions. The observational approach has been written into compliance documents at many RCRA and CERCLA sites.

The success of the observational approach depends upon the ability of the project staff to manage uncertainty. First, available site data is evaluated and previous experience at similar sites is utilized. Then, a series of possible remedial action strategies are developed and are considered to be working hypotheses. As data is collected during the remediation, these strategies are continually tested. For the Lee Plant, a remedial strategy with several contingencies has been developed that will work with, not against, the uncertainties typical to subsurface remedial programs.

This document presents a conceptual design and implementation schedule. Detailed plans and specifications for the system will be submitted to NMOCD after comments or questions by NMOCD concerning the remedial strategy are received. It must be understood that the observational approach calls for a great deal of design development during initial phases of the remedial action operation.

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#### 3.0 Proposed Modifications to the Discharge Plan

This section describes the conceptual design elements of an integrated remediation system proposed to remediate contaminated groundwater and the overlying soils. A combination of aeration and bioremediation systems are proposed for the Lee Plant site, with the contingency of adding other subsystems if deemed necessary. Pump and dispose operations will continue for plume control and separate-phase hydrocarbon removal. Vapor extraction from the unsaturated zone will remove hydrocarbons from the capillary fringe and overlying sediments, eliminating this threat of future re-contamination of groundwater.

The pump and dispose system at the Lee Plant is recovering dissolved- and separate-phase hydrocarbons and is providing a measure of control over the migration of the existing plume. When used alone, this system is (1) very time intensive and (2) not cost-efficient to operate. Nevertheless, the existing pump and dispose system is integral to implementing the proposed remedial system at the Lee Plant for the purpose of controlling contamination zones within the aquifer. Addition of groundwater and separate-phase hydrocarbon recovery at monitor well MW-6 is the only change to this system presently proposed.

Previous work has demonstrated that aeration is very effective in the remediation of contaminated soil and groundwater. Two emerging in situ techniques have shown dramatic results in removing volatile organic compounds (VOCs) from below ground, especially in multi-phase cleanup programs. These techniques are soil-vapor extraction (SVE) and air sparging (AS), which form an effective and economical remediation program when used together. Also, addition of water, nutrients, and surfactant to the system enhances natural biodegradation and further increases the system's effectiveness.

3.1 Initiation of Recovery Operations at Monitor Well MW-6

Immediately following approval of this plan, GPM will initiate recovery of groundwater and separate-phase hydrocarbons from monitor well MW-6.

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#### 3.2 Addition of Soil-Vapor Extraction System

Vapor extraction is a simple, proven technology for removing volatile contaminants from soil. Induced air flow through contaminated areas volatilizes and removes VOCs and supplies oxygen to support biodegradation. The system is effective as long as air contacts the contaminated soils. Proper air flow is maintained by careful spacing of vapor extraction points and by locating the horizon of contamination and screening the vapor extraction wells accordingly.

As plate 1 shows, vertical extraction wells placed in the contaminated zones are individually connected to transfer pipes that are manifolded to a high capacity vacuum blower. The withdrawn soil vapor is often discharged to the air untreated, but this option is not allowed in many areas. GPM will use the vapor exhaust as intake air at their sulfur plant to thermally treat the hydrocarbon-rich exhaust. Any BTU values of the extraction system vapor will replace fuel consumption, eliminating a net increase of emissions at the plant.

Dual purpose vapor/water extraction wells are screened in the vadose zone, as well as in the aquifer, and are used for removing vapors from the soil and contaminated groundwater from the aquifer. These vapor/water extraction wells are part of the existing pump and dispose component, which maintains a certain level of hydraulic control in the zone of contamination. This withdrawal of groundwater is important in controlling possible movement of the plume during the proposed air-sparging. Also, any separate-phase product that may exist is removed through these wells.

#### 3.3 Addition of Air Sparging

Air sparging removes VOCs from the groundwater and volatilizes portions of the freephase hydrocarbons. The approach effectively creates a crude air stripper in the subsurface, with aquifer materials acting as the packing. As plate 2 shows, air is injected and allowed to flow up through the water column and the soil "packing". Air bubbles that contact dissolved- and adsorbed-phase contaminants in the aquifer cause the VOCs to volatilize. The gas-phase hydrocarbons are then carried by the air bubbles to the vadose zone where they are captured by a vapor-extraction system.

There are two potential concerns with air sparging that must be understood. They are (1) the possibility of spreading dissolved hydrocarbon constituents in the aquifer and (2) the chance that vapors can migrate in the subsurface. Air sparging induces movement of

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groundwater within the aquifer and increases the concentration of vapors in the soil. Therefore, precautions must be taken to prevent any possible adverse effects. When properly designed, the combined techniques of soil-vapor extraction, the withdrawal of water, and air sparging can provide very effective remediation in a relatively short time and at a reasonable cost.

The implementation of the proposed system presupposes accurate knowledge of the maximum vertical extent of groundwater contamination. Although dissolved-phase hydrocarbons are probably restricted to the upper few feet of the aquifer, such information does not exist at present for the site. To remedy this situation, the installation of a multiport injection/monitor well at a position adjacent to the recovery well, RW-1, is proposed.

A three casing, 2-inch diameter well cluster will be installed near the recovery well, RW-1, to determine the depth of contamination and to complete the air-sparging remediation system. The three casing 2-inch diameter wells will be completed as follows:

- One will be screened across the water table. This well will be used to monitor separate-phase thickness as well as to measure the effects of the vapor extraction system during subsequent operation.
- The second 2-inch well will be screened just beneath the bottom of the existing groundwater recovery well, RW-1, approximately 15 to 20 feet beneath the water table. The purpose of this well is to assess the vertical extent of dissolved-phase contamination and to determine if any vertical gradients are present at the site.
- The third 2-inch well will be completed approximately 20 feet beneath the second 2-inch well. Completing a well at this depth allows injection of air, air/water, and air/water/nutrients beneath the contaminated interval.

Boreholes will be pressure grouted between screened intervals using a tremie pipe to ensure effective isolation of individual screens. The wells will be sampled individually to determine the maximum depth of groundwater contamination.

Water derived from the on-site water supply well will be reinjected into the aquifer immediately below the hydrocarbon plume using the newly installed multi-port well. Prior to reinjection, however, the water will be subjected to two additional treatment steps:

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- Microbubbles or colloidal gas aphrons (CGAs) will be manufactured within the water using a Mazzei injector (venturi). Creation of the CGA-rich solution may require the addition of a mild food-grade surfactant (approved by NMOCD) to the treated water; such additions will be specified in the monitoring program and schedule. Using this technology, it is possible to create an air/water mixture that contains as much as 50 percent air by volume. Dilution of a food-grade surfactant will ensure that concentrations of phosphorous in excess of WQCC standards will not occur in the injected water.
- Nutrients may be added, as needed and specified in the monitoring program and schedule, to the input stream to enhance natural microbiologic activity.

Upon injection, buoyancy effects will cause the CGAs to rise to the water table. Contrasts between the aquifer's horizontal and vertical hydraulic conductivities will promote radial migration of the air-rich water. The microbubbles will migrate through the contaminated groundwater, introducing oxygen to the system and stripping volatile organic compounds in situ along their path to the water table. Initially, a total flow rate of 2 gpm of water and an equal volume of entrained air will be injected into the aquifer.

Injection of a buoyant, air-rich solution beneath the hydrocarbon plume creates a certain risk – the risk that the added water and air will displace portions of the dissolved-phase hydrocarbons and, consequently, may promote lateral migration of the dissolved-phase hydrocarbons. For this reason, it is essential that the dissolved-phase hydrocarbons be hydraulically controlled to prevent additional migration. The hydraulic control will be provided by continued pumping of recovery well RW-1. Initially, pumpage from this unit will be set at a minimum of 4 gpm, twice the rate of water injection but equal to the volume of water plus air injection. After air begins to transverse into the vadose zone from the aquifer, the volume of fluid removed from the paired pumping and injection wells will be greater than the volume of injected fluid (air plus water). This net withdrawal should effectively prevent the spread of dissolved-phase hydrocarbons. The response of this treatment system will be observed and the flow rates adjusted in accordance with the monitoring program and schedule. Engineering analysis of aquifer response will be utilized to help us predict the response of injection and pumping.





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The air within the introduced microbubbles will escape across the water table into unsaturated zone. This air can be expected to contain VOCs; it will be exhausted to the surface via a vacuum blower on monitor well RW-1. RW-1 has a screened interval above the water table within the vadose zone to permit use as a vapor-extraction well.

#### 3.4 Addition of In Situ Bioremediation

Bioremediation uses natural microorganisms to degrade contaminants in both soil and water. It can be used in situ along with aeration and other methods to provide efficient and economical treatment. Microorganisms are typically present in contaminated soil and groundwater and have adapted themselves to the use of hydrocarbons as a food source. They often only need encouragement by the provision of oxygen and/or other nutrients to thrive and quickly digest the contaminants.

Various mechanisms can be used for the care and feeding of bioremediation cells. For groundwater remediation, the use of water as a carrier for both oxygen and nutrients is recommended. In this air sparging technique, water containing nutrients and air (in the form of micro-bubbles) is injected under pressure into the aquifer beneath any contamination. Water, at the same flow rate or greater, is removed from the upper portion of the aquifer to minimize potential movement of the contamination plume. This action induces horizontal as well as vertical flow paths for the distribution of the enriched water through the contaminated zone. Plate 3 presents this conceptual design.

The oxygen transferred from the bubbles into groundwater will stimulate the native population of microorganisms in the aquifer. These microorganisms have already adapted themselves to an environment that is rich in the site-specific hydrocarbons and, in fact, use these hydrocarbons as a "carbon source" for their metabolism. The introduced air will add oxygen to the groundwater, thereby promoting microbiologic degradation of the hydrocarbons.

#### 3.5 Combined Technology System

To keep the system as simple and effective as possible, the above subsystems of pump and dispose, soil-vapor extraction, air sparging, and bioremediation are combined as required to create a combined technology system (CTS) for both soil and groundwater restoration (plate 4). Two separate wells are used for vacuum extraction and air sparging. This

#### H<sup>+</sup>GCL

eliminates the possibility of "short circuiting" of air within a single bore hole, and normal well construction methods can be used. Future well pairs can be distributed across the contaminated portions of the site when their effectiveness is demonstrated under the monitoring program. The addition and spacing of these future remediation wells can be determined after we observe the impact of the system proposed at RW-1.

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#### 4.0 Implementation Schedule

Groundwater and product recovery will begin at monitor well MW-6. A 1/2-horsepower submersible pump will be installed, and the groundwater and separate-phase hydrocarbons will be pumped to the plant's oil-water separator for processing and disposal. Installation and recovery will be complete within 30 days following NMOCD approval of this plan.

The existing recovery well RW-1 will be retrofitted with a system that employs vapor extraction from the unsaturated zone. Construction specifications for the SVE system will be determined during final design. Vapor extraction will be initiated within 90 days following NMOCD approval of this plan.

The vapor extraction rates will be determined in the field by observing the operational response of the system. During the initial start up, the SVE system exhaust will be closely monitored for VOCs. Because of the relatively high vapor pressure of the separate-phase constituents, these compounds are extremely susceptible to volatilization. Once the SVE is started, high volumes of VOCs will be recovered from the unsaturated zone until one pore space volume of air is removed from the area of influence. Following the peak, a predictable decline in concentration is expected. The system will be operated for a period of not less than three (3) months. Startup of the SVE system will coincide with scheduled groundwater sampling at the site.

The three casing, 2-inch diameter well cluster will be installed prior to SVE operation, allowing observation of the response in the unsaturated zone.

During the second quarter of system operation, air sparging will be initiated to treat contaminated groundwater. Air and microbubbles will be injected through the 2-inch PVC well that is screened immediately below the zone of contamination.

During the third quarter of system operation, nutrient injection may be initiated. Air and nutrient enriched water will be injected through the 2-inch PVC well that is screened immediately below the zone of contamination to enhance air sparging.

During the fourth quarter of operation, review and evaluation of the data from the first nine months of operation will be conducted. Subsequently, recommendations for enhanced operation, expansion, and monitoring of the system will be presented to the NMOCD.





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After evaluation of sufficient operational data, additional remediation well clusters may be installed at existing wells with the option of installing additional monitor wells if required. The spacing of these additional monitor wells will permit their use in any required expansion of the remedial system.

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#### 5.0 Monitoring and Reporting

Monitoring and reporting criteria will be finalized following completion of construction design documents.

#### 5.1 Proposed Monitoring Protocol

The in situ remediation strategy proposed in this document involves movement of subsurface vapors and groundwater and the delivery of bubbles, oxygen, and possibly nutrients to the contaminated groundwater. This movement of fluids will create a series of hydraulic and chemical responses.

#### 5.1.1 Soil Vapor Extraction Monitoring

During the first few days of SVE operation, it is very important that a sufficient amount of accurate data is collected. Prior to initiation of SVE operation, all recovery wells will stop pumping for a period of time to be specified in the final design plans. Water levels will be recorded for all monitor wells at the site before re-starting operation. Pumping from RW-1 will then be initiated and depth to groundwater/separate-phase hydrocarbon measurements will be recorded at wells MW-2, MW-3, MW-4, MW-7, MW-8, MW-10, and in the newly-installed 2-inch multi-port well adjacent to RW-1 (figure 5-1). Depth to groundwater and separate-phase measurements will be recorded pursuant to standard test-pumping procedures. After a predetermined period of pumping RW-1, the vapor extraction system will commence operation.

Vacuum measurements will be recorded frequently during the initial period of operation, followed by expanded periods of monitoring for the first week, month, quarter and year etc. Vacuum will be recorded at wells MW-2, MW-3, MW-4, MW-7, MW-8, MW-10, and the 2-inch cluster (3 casing, 2-inch PVC well).

The SVE exhaust gas will also be monitored frequently during the initial period of operation using a VOC meter with data logging capabilities. This instrument will be programmed to record VOC concentrations (linear scale) versus time (logarithmic scale)



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during the initial portion of the test, followed by longer frequency monitoring as the operation continues. Our proposed schedules for pressure and vapor monitoring are presented in tables 1 and 2.

Following routine operation of the system, a permanent monitoring schedule will be submitted for NMOCD approval. The groundwater sampling program will continue as previously approved.

#### 5.1.2 Air/Water Injection Monitoring

Air/water injection will start following quarterly groundwater sampling. Following initiation of the air/water injection, depth to groundwater/separate-phase hydrocarbon measurements will be recorded at wells MW-2, MW-3, MW-4, MW-7, MW-8, MW-10, as well as in each three casing, 2-inch PVC well. Depth to groundwater/separate-phase measurements will be recorded pursuant to a protocol similar to a pump test. It is anticipated that four pressure transducers attached to a four channel data logger will record hydraulic head measurements during the initial three days of the air/water injection. Hydraulic head will be recorded in each of the cluster wells, as well as in RW-1, the pumping well. It is anticipated that demonstration of hydraulic control will be established during the first three months of operation by comparing the observed results with results predicted by an engineering analysis.

Before the injection starts, the concentration of dissolved oxygen in groundwater will be measured and recorded at wells MW-2, MW-3, MW-4, MW-7, MW-8, MW-10, and at the cluster (three casing, 2-inch PVC well). The frequency of dissolved oxygen measurements will be determined and specified in the final design documents.

Additionally, final design will determine the frequency for measuring VOC concentrations in the adjacent shallowest well of the multi-port cluster.

For the first three days of water injection, SVE exhaust gas will be monitored frequently using a VOC meter with data logging capabilities. This instrument will be programmed to record VOC concentrations (linear scale) versus time (logarithmic scale) during the initial portion of the test, followed by longer frequency measurements as the operation continues. A final monitoring schedule will be proposed in the final design submission.

Table :	L
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### Pressure Monitoring Schedule For Vapor Extraction System

Monitor Location	Frequency First Day	First Week	Year
MW-2	2 hours	Daily	Weekly
MW-3	2 hours	Daily	Weekly
MW-4	2 hours	Daily	Weekly
MW-7	2 hours	Daily	Weekly
MW-8	2 hours	Daily	Weekly
MW-10	2 hours	Daily	Weekly
New Well	2 hours	Daily	Weekly

Ì

### Table 2

## Vapor Monitoring Schedule For Vapor Extraction System

Monitor Location	First Day (1,440 minutes) Log Cycle	Elapsed Time	Sample Interval
RW-1	1	0-5 seconds	0.5 seconds
	2	5-20 seconds	1.0 seconds
	3	20-120 seconds	5.0 seconds
	4	2-10 minutes	0.5 minutes
	5	10-100 minutes	2.0 minutes
	6	100-1,000 minutes	10 minutes
	6	1,000-1,440 minutes	100 minutes
	Day 2-3 Linear	2-3 days	4 hours
	Day 3-7 Linear	3-7 days	12 hours
	Weeks 2-52 Linear	7-365 days	1 Week

54030/DISCHR01.TBL

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### 5.2 Reporting

Quarterly reports are proposed for the first year of operation. In addition to the groundwater sampling analytical results, each quarterly report will contain operational data from the previous quarter.

Subsequent reports will contain operational data and recommendations for system improvement.

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#### 6.0 Contingency Plans

Using the observational approach, the CTS allows for proper expansion of the proposed technology or implementation of alternative technologies at the site to enhance remediation efforts. The following are some of the options available:

- Changes in the volume of injection air
- Changes in the volume of air-water injection
- Changes in the vapor extraction flow rate from the VES
- Changes in the amount of nutrients supplied to microorganisms
- Elimination of any of the above techniques without compromising enhanced remediation



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#### 7.0 Demonstration of System Effectiveness

This proposed system uses project-proven technologies to restore groundwater quality and to eliminate soil contamination, which currently presents a threat to groundwater quality. The system employs vapor venting of the deep unsaturated zone, in situ air sparging of the aquifer, and in situ bioremediation. Numerous contingencies are built-in to address the expected uncertainty associated with groundwater remediations.

Information on in situ air sparging, colloidal gas aprons and bioremediation is included in appendix A. A phased approach to pumping and injection will ensure that actual site conditions govern the operation of the system rather than theoretical models based upon short-term pumping data or published information.

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#### 8.0 References

1

- Fenneman, N.M., 1931, Physiography of Western United States, New York, McGraw-Hill Book Company, 534 p.
- Geoscience Consultants Limited, For Phillips Petroleum Company, 1988a, Report On The Installation Of A Ground Water Monitoring System at Phillips 66 Natural Gas Company.
- Hunt, C.B., 1977, Surficial Geology of Southeast New Mexico, Geologic map 41, N.M. Bureau of Mines and Mineral Resources.
- Nicholson, A., and Clebsch, A., 1961, Geology and Ground Water Conditions in Southern Lea County, New Mexico, Ground Water Report 6, New Mexico Institute of Mining & Technology, State Bureau of Mines and Mineral Resources, Socorro, New Mexico.

54030/DISCHA01.PLN



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## Legend

Air Flow





Plate 4 Combined Technology System



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<pre>{</pre>	•
· ·	
	-
d Hydrocarbon In vater To Treatment/Disposal	
Vapor And Groundwater Recovery Well	
- Product Surface	
- Free-Phase Hydrocarbons - Groundwater Surface	
- Injected Air Volatilizes Dissolved Phase Hydrocarbons	
Free-Phased Hydrocarbons	
— In Groundwater	
-Groundwater Bioremediation Zone	
High Dissolved Oxygen	
· · · · · · · · · · · · · · · · · · ·	
Air Flow	
→ Groundwater Flow	
	<b>J</b>



# CAS CORPORATION

GPM GAS SERVICES COMPANY A DIVISION OF PHILLIPS PETROLEUM COMPANY

4044 PENBROOK ODESSA, TX 79762

February 25, 1993

Lee Plant 1st Quarter 1993 Analytical Results and Discharge Plan GW-2



Mr. William C. Olson Hydrogeologist Oil Conservation Division Post Office Box 2088 State Land Office Building Santa Fe, New Mexico 87504

APR 1 6 1993

OIL CONSERVATION DIV. SANTA FE

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory reports for groundwater sampling at our Lee Plant for the first quarter of 1993. In addition, a site map is enclosed that summarizes past groundwater analytical results at the Lee Plant.

Sample collection was conducted on January 20, 1993, pursuant to discharge plan GW-2. NDRC Laboratories Inc. of Houston, Texas, performed the sampling analyses. Our consultant, H+GCL, followed standard operating procedures for collecting the samples. These procedures are consistent with the requirements for sample collection in EPA publication SW-846. In addition, H+GCL followed strict chain-of-custody procedures to ensure the integrity of the samples during transport to the laboratory.

Groundwater samples from monitor wells MW-9, MW-11, MW-12, MW-13 and MW-14 were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX) using EPA Method 602.

In my November 1992 letter to you, we presented the hypothesis that increased rainfall during the summer months of 1992 resulted in perturbation of the groundwater plume beneath the facility. We concluded that several months of dry weather should result in decreased concentrations of hydrocarbons in monitor wells. The enclosed analytical results demonstrate that the plume has diminished in size, as expected.

Based upon these recent results and more than two years of consistent groundwater monitoring data, we conclude that the hydrocarbon plume beneath the Lee Plant facility is in dynamic equilibrium - the plume is not enlarging. The addition of BTEX components to the groundwater system in the area of the floating hydrocarbons is offset by natural volatilization and biodegradation during down-gradient transport. Wells MW-1, MW-2, MW-3, MW-11, MW-12, MW-13, MW- 14, MW-19, and MW-20 show hydrocarbon concentrations between non-detection and 100ppm; these wells define the down- gradient edge of the plume. Wells MW-5, MW-7, MW-8, MW-9, and MW-10 consistently show concentrations well above

Mr. William C. Olson February 25, 1993 page 2

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standards; these wells define the central portion of the plume. Considering these facts, dynamic equilibrium of the plume is a logical conclusion.

If the plume was not in equilibrium, its size would be significantly larger than presently observed. We base this conclusion on the assumption that the plume originated from the evaporation ponds in the 1970's and 1980's when the ponds were active. Because of this conclusion, we recommend that current groundwater monitoring be revised to the following schedule:

Annually

- Sample the groundwater at recovery wells MW-7 and MW- 10 for benzene, toluene, ethylbenzene, and xylene

Semi-annually

- Sample the groundwater from monitor wells MW-11, MW- 12, MW-13, MW-19, and MW-20 for benzene, toluene, ethylnenzene, and xylene
- Collect depth to groundwater and product thickness measurements at all monitor well locations.

In addition, and as follow-up to my letter of August 19, 1992 to you, we have enclosed our proposed remedial strategy plan for the Lee Plant. This plan includes (1) recovering product at monitor well MW-6 (downgradient of the closed north evaporation pond), (2) retrofiting select existing groundwater recovery wells for vapor extraction, and (3) installing air sparging wells to enhance vapor extraction. Our remedial strategy plan also allows for the initiating of in situ bioremedeation and enhanced vapor extraction through nutrient and oxygenated water injection.

If you have any questions or comments regarding our proposed monitoring schedule or remedial action plan, please feel free to call me at (915) 368-1085.

Sincerely,

18

Vincent B. Bernard

VBB:mdp Enclosure

cc: Martin Nee - H + GCL Albuquerque S.J. Seeby - Odessa M.S. Nault - Lee Plant



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HOUSTON

DATE RECEIVED : 22-JAN-1993

REPORT NUMBER : H93-427-1 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••••	Water 9301201030 MW-20 54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS			
TEST REQUESTED	DETECTION LIMIT		RESULTS
Benzene	1.0 µg/L	<	1.0 µg/L
Toluene	1.0 µg/L	<	1.0 µg/L
Ethyl benzene	1.0 µg/L	<	1.0 µg/L
Xylenes	1.0 µg/L	<	1.0 µg/L

QUALITY CONTROL DATA	· · · · · · · · · · · · · · · · · · ·	
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	108 %

NDRC Laboratories, Inc. David R. Godwin, Ph.D. Chief Executive Officer MA.



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REPORT NUMBER : H93-427-2 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS	::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD		Water 9301201135 MW-11 54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS		
test requested	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	1.3 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	1.1 μg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	101 %

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REPORT NUMBER : H93-427-3 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	••••••••	Water 9301201210 MW-9 54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS		
TEST REDUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	5900 µg/L
Toluene	1.0 µg/L	3.8 µg/L
Ethyl benzene	1.0 µg/L	22.0 µg/L
Xylenes	1.0 µg/L	11.0 µg/L

QUALITY CONTROL DATA			
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED	
Bromofluorobenzene(SS)	100 µg/L	100 %	

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Chief Executive Officer





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REPORT NUMBER : H93-427-4 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••••••••••••••••••••••••••••••••••••	H + GCL 505 Marquette NW, Ste. 11 Albuquerque, NM 87102 Ms. Annette Montoya	00
SAMPLE MATRIX ID MARKS	:	Water 9301201245	
PROJECT DATE SAMPLED	:	MW-12 54030.02/GPM 20-JAN-1993	
ANALYSIS METHOD	:	EPA 602	

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		
Benzene	1.0 µg/L	67.0 µg/L		
Toluene	1.0 µg/L	1.1 μg/L		
Ethyl benzene	1.0 µg/L	< 1.0 µg/L		
Xylenes	1.0 µg/L	< 1.0 µg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	99.0 %

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REPORT NUMBER : H93-427-5 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS	••••••	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102
ATTENTION	:	Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••••	Water 9301201300 MW-12A 54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	72.0 µg/L
Toluene	1.0 µg/L	1.2 µg/L
Ethyl benzene	1.0 μg/L	1.7 µg/L
Xylenes	1.0 µg/L	2.3 µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED		
Bromofluorobenzene(SS)	100 µg/L	102 %		

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REPORT NUMBER : H93-427-6 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD		Water 9301201305 Field Blank 54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED		
Bromofluorobenzene(SS)	100 µg/L	107 %		

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SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD	•••••••••	Water 9301201310 Pump Rinsate 54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS					
test requested	DETECTION LIMIT		RESULTS		
Benzene	1.0 µg/L		4.7 µg/L		
Toluene	1.0 µg/L	<	1.0 µg/L		
Ethyl benzene	1.0 µg/L	<	1.0 µg/L		
Xylenes	1.0 µg/L	<	1.0 µg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bramofluorobenzene(SS)	100 µg/L	103 %

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REPORT NUMBER : H93-427-8 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD		Water 9301201315 Trip Blank 54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	< 1.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	< 1.0 µg/L

QUALITY CONTROL DATA				
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED		
Bromofluorobenzene(SS)	100 µg/L	108 %		

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REPORT NUMBER : H93-427-9 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya
SAMPLE MATRIX ID MARKS	:	Water 9301201355 MW-13
PROJECT DATE SAMPLED ANALYSIS METHOD	: :	54030.02/GPM 20-JAN-1993 EPA 602

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	28.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 μg/L	< 1.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	102 %

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REPORT NUMBER : H93-427-10 REPORT DATE : 29-JAN-1993

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••	H + GCL 505 Marquette NW, Ste. 1100 Albuquerque, NM 87102 Ms. Annette Montoya	
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD		Water 9301201430 MW-14 54030.02/GPM 20-JAN-1993 EPA 602	

BTEX ANALYSIS		
test requested	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	19.0 µg/L
Toluene	1.0 µg/L	< 1.0 µg/L
Ethyl benzene	1.0 µg/L	< 1.0 µg/L
Xylenes	1.0 µg/L	1.2 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bramofluorobenzene(SS)	100 µg/L	102 %

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SUMMARY REPORT

CLIENT : H + GCL PROJECT : 54030.02/GPM

JOB NUMBER : H93-427 REPORT DATE : 29-JAN-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	9301201030 Mw-20	Vater	20-JAN-1993
2	9301201135 M/-11	Vater	20-JAN-1993
3	9301201210 MW-9	Vater	20-JAN-1993
. 4	9301201245 MJ-12	Vater	20-JAN-1993

BTEX ANALYSIS, EPA 602			1		2	3		4
Benzene	µg/L	<	1.0		1.3	5900		67.0
Toluene	µg/L	<	1.0	<	1.0	3.8		1.1
Ethyl benzene	µg/L	<	1.0	<	1.0	22.0	<	1.0
Xylenes	µg∕L	<	1.0		1.1	11.0	<	1.0

David R. Godine V ....



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HOUSTON

SUMMARY REPORT

CLIENT	:	H + GCL
PROJECT	:	54030.02/GPM

JOB NUMBER : H93-427 REPORT DATE : 29-JAN-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
5	9301201300 M-12A	Vater	20-JAN-1993
6	9301201305 Field Blank	Vater	20-JAN-1993
7	9301201310 Pump Rinsate	Water	20-JAN-1993
8	9301201315 Trip Blank	Vater	20-JAN-1993

BTEX ANALYSIS, EPA 602		5 6 7			8			
Benzene	µg/L	72.0	<	1.0		4.7	<	1.0
Toluene	µg/L	1.2	<	1.0	<	1.0	<	1.0
Ethyl benzene	µg/L	1.7	<	1.0	<	1.0	<	1.0
Xylenes	µg∕L	2.3	<	1.0	<	1.0	<	1.0

David R. Godinin 1000


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HOUSTON

SUMMARY REPORT

CLIENT : H + GCL PROJECT : 54030.02/GPM

JOB NUMBER : H93-427 REPORT DATE : 29-JAN-1993

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
<b>9</b> ·	9301201355 M-13	Vater	20-JAN-1993
10	9301201430 M-14	Vater	20-JAN-1993

BTEX ANALYSIS, EPA 602			9		10	
Benzene	µg/L		28.0		19.0	
Toluene	µg/L	<	1.0	<	1.0	
Éthyl benzene	µg∕L	<	1.0	<	1.0	
Xylenes	µg/L	<	1.0		1.2	

David R. Godivin Para

6752	n of Custody			SJ.	n n n n n istr	negy (OC	ato T ata kC lissi nd (CC 	Cyanic Chema Dema	<u> </u>		NDT S		3	3	3				nquished By 3.	(ure) (Time)		ed Name) (Date)	pany)	aived By (Laboratory) . 3.	Weby T RANKIA 1. ZZ.	ANTEL - Neurston (Date)	
00	Chai						Point sivity Grease	Flash ( Corros Reacti			000					8-43			2. Reli	(Jime)		(Date) (Print	(Con	2. Rec	(Time) (Signa	(Date) (Print	
LJ Chicago 626 W. Jackson Blvd., Sle. E Chicago, IL 60606 (312) 648-9988 FAX: (312) 648-0818	L San Francisco 2200 Powell Street, Ste. 880 Emeryville, CA 94608 (510) 547-3866 FAX: (510) 547-3631	Analysis Request			Sebic .loV-	sestic s tnat (81)	Vol., 5 Metal: Metal: (8) (13) (13)	TCLP- Herbic Priority Metals Metals TTLC/ Priority			C	うう			Waters	706:1.1.0	Uo/ Lolo		Relinquished By	(Signature)		(Printed Name)	(Company)	Received By	(Signature)	(Printed Name)	
LJ Boston 180 Canal Street Boston, MA 02114 (617) 723-4664 FAX: (617) 367-1386	<ul> <li>New York</li> <li>261 Madison Avenue</li> <li>New York, NY 10016</li> <li>(212) 983-8510</li> <li>FAX: (212) 983-8795</li> </ul>			spu	r.8 0163/0 noqmo ( 28bi 28bi	5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2510000 2510000 25.624/8 25.625/ 25.655/ 25	чучгос чучгос чучгос тога! то тоса! то тоса!	1-4817	~	<u>10</u>			5	~	<u>x</u>	6	01	inquished By	1500 1, (Time)	DAVID NEE 1/21/95	ited Name) (Date)	npany)	ice By	ature) (Time)	ted Name) (Date)	
ASA-WSTF Drawer MM Cruces, NM 88004 ) 524-5353 : (505) 524-5315	id Atlantic Region Forbes Blvd., Ste. 24 aam, MD 20706-4325 1 459-9677 (3011 459-3064			<i>አ</i> ካ	sjour 7 <i>NO /</i> 9	8010 8010 8010 8010	as 601/ se 601/ lic Vols ls, Sub 40 80 80 80 80 80 80 80 80 80 80 80 80 80	raioge volatiic volatiic volatiic volatici volatici		7	7	2	2	2	>	2	7	7	pt Rel			old (Prir	(Cor	Rec	(Sign	(Prin	
MW, Ste. 1100 PO I NW, Ste. 1100 PO I M 87102 Las (505) FAX	L, Ste. 120 (301) 15 (301) -0965 FAX:	Inc.						Location	00-1114		6-mm	RI-INM	min-12 A	Field Blank	Pump Rusate	TEIP BLANK	Tep-Bland 13	H-MW	Sample Recei	tal No. of Containers	nain of Custody Seals	c'd Good Condition/Co	informs to Record	b No.			
La Albuquerqui 505 Marquette Albuquerque, 1 (505) 842-0001 FAX: (505) 842	□ Los Angeles 19600 Fairchlic Irvine, CA 927 (714) 955-0201 FAX: (714) 955	ratories,	th Main	TX 77025	-8150			Matrix	12 C	C -H	H10	470	120	U20	420	HrO	DIH	HZO		۲	NEE	.02 Re	Ŭ	<u> </u>			
Environmental Scientists and Engineers	<ul> <li>Hartford</li> <li>Hartford</li> <li>380 South Center Street</li> <li>Windsor Locks, CT 06096</li> <li>(203) 627-5528</li> <li>FAX: (203) 627-7815</li> </ul>	Lab Name NDRC Labo	Address 11155 Sou	Houston.	Telephone (713) 661		Samplers (SIGNATURES)	Sample Number	9201201030	9201201125	9201201210	9201201245	93012.0 1300	9301 201305	9301201310	930120 1315	930120 1355	930120 H 20	Project Information	Project (JPM	Project Director MIPTIN	Charge Code No. 54 030	Shipping ID. No.	5394481536	Via: Fed X	Special Instructions/Comment	

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Company: .	H+G-	.c u			Job No: _	42-	7	
No. of Cool	er(s):		Temp	erature of Co	oler(s):	<u> </u>		
ESERVATIC		ATION						
Sample No.	Temperature of Sample	Sample Container	Volume	Preservation used *	Initial pH	Final pH	Bottles generated	Comments
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#### PRESERVATION USED \*

- 1 Cool to 4° C
- 2  $H_2SO_4$  to pH < 2
- 3 HNO<sub>3</sub> to pH < 2
- 4 HCL to pH < 2

- 5 NaOH to pH > 12
- 6 Na2S2O2 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12
- 8 None required

Preserved by

1-22-93 Date/Time

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#### GPM GAS CORPORATION

4044 PENBROOK ODESSA, TEXAS 79762 OIL CONSERVATION DIVISION RECEIVED

'92 DE: 10 PM 9 12

December 7, 1992

4th Quarter 1992 Analytical Results Lee Plant-Discharge Plan GW-2

Mr. William C. Olson Hydrogeologist Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

GPM Gas Corporation herein submits the laboratory results for groundwater sampling at Lee Plant for the fourth quarter of 1992. Sample collection was conducted on October 21, 1992, pursuant to discharge plan GW-2. NDRC Laboratories Inc. of Houston, Texas performed the sample analyses.

Our consultant, H+GCL, followed standard operating procedures for collecting the groundwater samples. These procedures are consistent with the requirements for sample collection in the EPA publication SW-846. In addition, H+GCL followed strict chain-of-custody procedures to ensure the integrity of the samples during transport to the laboratory.

Groundwater samples from monitor wells MW-9, MW-11, MW-12, MW-13 and MW-14 were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX) using EPA Method 602.

You will note in the laboratory analytical reports, concentrations of BTEX constituents generally increase over the last two sampling events, July and October 1992. We believe that this increase is due to above-average precipitation infiltrating contaminated soil and causing hydrocarbons to migrate to the water table. The average annual precipitation for Hobbs, New Mexico is 14.77 inches. The precipitation through the July 1992 sampling event was 21.58 inches, and the total precipitation through November 15 has been 25.79 inches. Much of this overage occurred as a single event in late May.

We have also considered other possible causes for these site-wide increases, such as recovery system shutdown and changes in withdrawal rate from plant supply wells. However, nothing has changed in the recovery system or the plant water supply system that would effect these increases.

The concentrations of BTEX constituents should equilibrate and return to pre-July conditions following a period of normal precipitation. Additionally, we are in the process of finalizing a more aggressive approach to site reclamation that will initiate the recovery of free product at monitor well MW-6.

If you should have any questions regarding these results, please call me at (915) 368-1085.

Sincerely,

Vincent B. Bernard Safety & Environmental Supervisor New Mexico Region

cc: S.J. Seeby w/attach M.S. Nault R.D. Dunham J.L. Bowles R.G. Stubbs (r) G.A. Jones





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HOUSTON

DATE RECEIVED : 23-OCT-1992 REPORT NUMBER : H92-4577-1 REPORT DATE : 31-OCT-1992

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Water	
ID MARKS	:	9210210950	
PROJECT	:	54030.02/GPM	
DATE SAMPLED	:	21-OCT-1992	
ANALVSTS METHOD		FPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	10 µg/L	3000 µg/L
Toluene	10 µg/L	280 #g/L
Ethyl benzene	10 #g/L	110 #g/L
Xylenes	10 µg/L	120 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	97.0 X

liver Kow NDRC Laboratories, Inc. David R. Godwin, Ph.D. Chief Executive Officer





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HOUSTON

DATE RECEIVED : 23-OCT-1992 REPORT NUMBER : H92-4577-2 REPORT DATE : 31-OCT-1992

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Water	
ID MARKS	:	9210211025	
PROJECT	:	54030.02/GPM	
DATE SAMPLED	:	21-OCT-1992	
ANALYSIS METHOD	:	EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 #g/L	78.0 #g/L
Toluene	1.0 µg/L	130 #g/L
Ethyl benzene	1.0 µg/L	22.0 #g/L
Xylenes	1.0 µg/L	51.0 #g/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	99.0 X

deven Kow NDRC Laboratories, Inc. David R. Godwin, Ph.D. Chief Executive Officer





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HOUSTON

DATE RECEIVED : 23-OCT-1992

REPORT NUMBER : H92-4577-3 REPORT DATE : 31-OCT-1992

SAMPLE SUBMITTED BY ADDRESS ATTENTION	:::::::::::::::::::::::::::::::::::::::	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Water	
ID MARKS	:	9210211030	
PROJECT	:	54030.02/GPM	
DATE SAMPLED	:	21-OCT-1992	
ANALYSIS METHOD	:	EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	87.0 #g/L
Toluene	1.0 µg/L	150 #g/L
Ethyl benzene	1.0 µg/L	24.0 #g/L
Xylenes	1.0 µg/L	56.0 #g/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 µg/L	102 X

id R. Godwen Kow NDRC Laboratories, Inc.

David R. Godwin, Ph.D. Chief Executive Officer



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HOUSTON

DATE RECEIVED : 23-OCT-1992

REPORT NUMBER : H92-4577-4 REPORT DATE : 31-OCT-1992

SAMPLE SUBMITTED BY ADDRESS ATTENTION	: : :	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Water	
ID MARKS	:	9210211115	
PROJECT	:	54030.02/GPM	
DATE SAMPLED	:	21-OCT-1992	
ANALYSIS METHOD	:	EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 µg/L	64.0 µg/L
Toluene	1.0 µg/L	130 #g/L
Ethyl benzene	1.0 µg/L	24.0 #g/L
Xylenes	1.0 µg/L	56.0 µg/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 #g/L	101 X

rid R. Godever Kow NDRC Laboratories, Inc. David R. Godwin, Ph.D.

Chief Executive Officer



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DATE RECEIVED : 23-OCT-1992

REPORT NUMBER : H92-4577-5 REPORT DATE : 31-OCT-1992

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••••••••••••••••••••••••••••••••••••	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX ID MARKS PROJECT DATE SAMPLED ANALYSIS METHOD		Water 9210211200 54030.02/GPM 21-OCT-1992 EPA 602	

BTEX ANALYSIS		
TEST REQUESTED	DETECTION LIMIT	RESULTS
Benzene	1.0 #g/L	84.0 #g/L
Toluene	1.0 Ag/L	150 #g/L
Ethyl benzene	1.0 µg/L	26.0 #g/L
Xylenes	1.0 #g/L	62.0 #g/L

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 #g/L	102 X

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Chief Executive Officer





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HOUSTON

DATE RECEIVED : 23-OCT-1992

REPORT NUMBER : H92-4577-6 REPORT DATE : 31-OCT-1992

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••••••••••••••••••••••••••••••••••••	H + GCL 505 Marquette NW, Ste. Albuquerque, NM 87102 Ms. Annette Montoya	1100
SAMPLE MATRIX	:	Water	
ID MARKS	:	9210211240	
PROJECT	:	54030.02/GPM	
DATE SAMPLED	:	21-OCT-1992	
ANALYSIS METHOD	:	EPA 602	

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		
Benzene	1.0 #g/L	43.0 #g/L		
Toluene	1.0 #g/L	99.0 #g/L		
Ethyl benzene	1.0 µg/L	19.0 #g/L		
Xylenes	1.0 µg/L	45.0 µg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 #g/L	102 %

ven Kow NDRC Laboratories, Inc. David R. Godwin, Ph.D. Chief Executive Officer





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HOUSTON

DATE RECEIVED : 23-OCT-1992

REPORT NUMBER : H92-4577-7 REPORT DATE : 31-OCT-1992

SAMPLE SUBMITTED BY ADDRESS ATTENTION	•••••	H + GCL 505 Marquette NW, Ste. 1 Albuquerque, NM 87102 Ms. Annette Montoya	100
SAMPLE MATRIX	:	Water	
ID MARKS	:	9210211250	
PROJECT	•	54030.02/GPM	

DATE SAMPLED : 21-OCT-1992 ANALYSIS METHOD : EPA 602

BTEX ANALYSIS				
TEST REQUESTED	DETECTION LIMIT	RESULTS		
Benzene	1.0 µg/L	< 1.0 µg/L		
Toluene	1.0 #g/L	< 1.0 µg/L		
Ethyl benzene	1.0 #g/L	< 1.0 µg/L		
Xylenes	1.0 µg/L	< 1.0 µg/L		

QUALITY CONTROL DATA		
SURROGATE COMPOUND	SPIKE LEVEL	SPIKE RECOVERED
Bromofluorobenzene(SS)	100 #g/L	108 X

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HOUSTON

DATE RECEIVED: 10/23/92

. REPORT NUMBER: H92-4577-1-7 REPORT DATE: 10/31/92

SAMPLE SUBMITTED BY: H + GCL

ATTENTION: Ms. Annette Montoya

LABORATORY ANALYSIS QUALITY CONTROL REPORT

ANALYSIS:	Benzene	Analysis Method:	EPA 8020
Technician:	MHT	Extraction Method:	EPA 5030
Date Sampled:	10/21/92	MS/MSD RPD:	8%
Extraction Date:	10/29/92	Average Spike Recovery:	110%
Date Analyzed:	10/29/92	Duplicate RPD:	
QC Date:	10/29/92	Method Blank:	< 1 μg/L
QC Sample Number:	4577-7	LCS Recovery:	108%
ANALYSIS:	Toluene	Analysis Method:	EPA 8020
Technician:	MHT	Extraction Method:	EPA 5030
Date Sampled:	10/21/92	MS/MSD RPD:	6%
Extraction Date:	10/29/92	Average Spike Recovery:	113%
Date Analyzed:	10/29/92	Duplicate RPD:	
QC Date:	10/29/92	Method Blank:	< 1 μg/L
QC Sample Number:	4577-7	LCS Recovery:	114%
ANALYSIS:	Ethylbenzene	Analysis Method:	EPA 8020
Technician:	MHT	Extraction Method:	EPA 5030
Date Sampled:	10/21/92	MS/MSD RPD:	6%
Extraction Date:	10/29/92	Average Spike Recovery:	107%
Date Analyzed:	10/29/92	Duplicate RPD:	
QC Date:	10/29/92	Method Blank:	< 1 μg/L
QC Sample Number:	4577-7	LCS Recovery:	108%
ANALYSIS:	Xylenes	Analysis Method:	EPA 8020
Technician:	MHT	Extraction Method:	EPA 5030
Date Sampled:	10/21/92	MS/MSD RPD:	2%
Extraction Date:	10/29/92	Average Spike Recovery:	110%
Date Analyzed:	10/29/92	Duplicate RPD:	
QC Date:	10/29/92	Method Blank:	< 1 μg/L
QC Sample Number:	4577-7	LCS Recovery:	112%

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Drawer MM         Suite 200       Suite 200       Suite 200       Las Cruces, IM 88004         Albuquerque. NM 87102       Lanham, MD 20706       Englewood. C0 80112       (505) 524-5364         Albuquerque. NM 87102       Lanham, MD 20706       Englewood. C0 80112       (505) 524-5364       DATE       Art         (505) 842-0001       (301) 459-9677       (303) 649-9001       DATE       Art       Art       Art         Laborator1cs. Inc.       MALYSIS REQUEST       AnaLYSIS REQUEST       AnaLYSIS REQUEST       AnaLYSIS REQUEST | GGL       Coscience Consultants, Ltd.         Obscience Consultants, Ltd.       Cost       Procky Mountain       Las Cruces         Albrequierque       East Coast       Procky Mountain       Las Cruces         Son cooper NW       Az21 Febres BNd.       13111 E. Bhawood Ave.       D. Draver MM         Son cooper NW       Az21 Febres BNd.       13111 E. Bhawood Ave.       D. Draver MM         Suite 200       Suite 200       Suite 200       Suite 200       Suite 200         Numperque. NM 87102       Lantam, MD 2706       Englewood, CO 80112       (305) 524-5564       DATE       DATE       DATE         Numperque. NM 87102       Lantam, MD 2706       Englewood, CO 80112       (305) 524-5564       DATE       DATE | CGL     COSCIENCE Consultants, Ltd.       COSCIENCE Consultants, Ltd.     East Coast       Consultants, Ltd.     East Coast       Soo Copper N.W.     221 Forbes BNG.       Suite 200     Suite 200       Suite 200     Suite 200 <tr< td=""><td>Cite     Costience     Consultants, Ld.       Alberquierque     East Coast     Alberquierque       Alberquierque     East Coast     Alberquierque       Alberquierque     East Coast     Alberquierque       Alberquierque     East Coast     Alberquierque       Sono conserviw     4221 Forbes Biva,<br/>stan 200     1311 E. 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Alberquerue         East Coast<br/>Sup 200         Packy Mountain<br/>sup 200         Last Coast<br/>Sup 200         Date           Alberquerue         East Coast<br/>Sup 200         Marcuration<br/>Sup 200         Last Coast<br/>Sup 200         Date           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Albertoric Each         Anne         Man         Mark Sup 200         Sup 200         Sup 200           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Sup 200         Sup 200         Sup 200         Sup 200         Sup 200         Sup 200           Sup 200         Sup 200</td><td>Cite     Cosscience Consultants, Ltd.       Cite     Cosscience Consultants, Ltd.       Cite     Cosst       Cite<td>Cost         Cost         <thcost< th="">         Cost         Cost         <th< td=""><td>Обстанования         Совестенсе Consultants, Ltd.           Данационцие         Саята совят         Данационцие         Саята совят           Данационцие         Саята совят         Данационцие         Саята совят           Данационцие         Саята совят         Данационцие         Саята совят           Данационцие         Саята совят         Данаристатоги         Саята совят           Данаристатоги         Саята совят         1311 [E. Binwoorkson         Пар. Сорования           Данаристатоги         Саята совят         1311 [E. Binwoorkson         Пар. Совенания         Пар. Совенания           Данаристатоги         Пар. Совенания         Совенания         Пал. Совенания         Пал. Совенания           Данаристатоги         Пал. Мато         Пал. Мато         Пал. Кар. Совенания водо         Дан. 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NDROLABO	RATORIES, INC.	Nº	4206
Houston - 11155 South Main • Houston, Te	xas 77025 • (713) 661-8150 • Fax (713) 6	61-2661	
SAMPLE PRESERVATIO	ON INFORMATION SHEE	Т	
Field Sampling 🗅	Incoming Samples D		

#### GENERAL

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Company: H+G	Job No:	4577	
No. of Cooler(s):	Temperature of Cooler(s):	6°L	

#### **PRESERVATION INFORMATION**

Sample No.	Temperature of Sample	Sample Container	Volume	Preservation used *	Initial pH	Final pH	Bottles generated	Comments
1	52	cls.	47ml			-		BIEL
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4	50			}				
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#### PRESERVATION USED \*

- 1 Cool to 4° C
- 2  $H_2 SO_4$  to pH < 2
- $3 HNO_3$  to pH < 2
- 4 HCL to pH < 2

- 5 NaOH to pH > 12
- 6 Na<sub>2</sub>S<sub>2</sub>O<sub>2</sub> 0.008%
- 7 2 mL Zinc Acetate and NaOH to pH > 12

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8 - None required

Preserved by

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Monitor Well Location Map With BTEX Concentrations From July, 1992



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State of Ne ENERGY, MINERALS and NATUR Santa Fe, New	W Mexico AL RESOURCES DEPARTMENT Mexico 87505
STATE OF NEW MEXICO CONSERVATION OVISION MEMORANDUM OF MEETIN	G OR CONVERSATION
Telephone Personal Time 150	0 Date 10/21/92
Originating Party	Other Parties
Vince Bernard - GPA Ges Corp.	Bill Olson - OCA Sunk Fe
Subject	
Lee Ges Processing Mant	lemediction
Discussion They are having transle dealing in renediction plan Will be proposing soil venting to along with product removal	the air quality issues in Pair sparsing for remediation
Conclusions or Agreements Report on remedial altonate in approx 2 month	ives will be to OCD
Distribution file	gned Bill Office

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GPM GAS CORPORATION, 92 00-

4044 PENBROOK ODESSA, TEXAS 79762 -PM 8 58 September 28, 1992

OIL CONSERVITION DIVISION RECEIVED

Mr. William C. Olson Hydrogeologist Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

GPM Gas Corporation herein submits the laboratory reports for our 1992 annual groundwater sampling at Lee Plant. This annual report includes quarterly sampling for the third quarter of 1992. Samples were collected on July 27, 28 and 29, 1992, pursuant to the Lee Plant discharge plan GW-2. Core Laboratories of Aurora, Colorado performed the sample analyses.

Our consultant, H+GCL, followed standard operating procedures for collecting the groundwater samples. These procedures are consistent with the requirements for sample collection in the EPA's publication, SW-846. In addition, H+GCL followed strict chain-of-custody procedures to ensure the integrity of the samples during transport to the laboratory.

Groundwater samples from monitor wells were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX) using EPA Method 602 (purgeable aromatics). Pursuant to your letter of May 14, 1992, we have discontinued analysis for total petroleum hydrocarbons and major cations and anions.

All of the monitor and recovery wells and the water supply wells WS-1 and WS-2 were sampled, except those that contained free-phase hydrocarbons. Those exceptions, RW-1, MW-6 and MW-4 contained free-phase hydrocarbons with the following thicknesses, respectively: 0.6 feet, 0.52 feet and 1.2 feet.

If you have any questions or comments regarding this information, please call me at (915) 368-1085.

Sincerely,

Vincent B. Bernard Safety & Environmental Supervisor New Mexico Region

VBB/smm

cc: S.E. Seeby w/attachment M.S. Nault R.D. Dunham R.G. Stubbs (r) G.A. Jones

vbb45







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# CORE LABORATORIES A N A L Y T I C A L R E P O R T Job Number: 921371 Prepared For: HYGIENETICS/GCL 505 MARQUETTE AVE. N.W.-SUITE 1100 ALBUQUERQUE, NM 87102 Date: 08/21/92

Signature

Name: David A. McWharter

8/21/92 Date:

Core Laboratories 1300 South Potomac, Suite 130 Aurora, CO 80012

Title: LABORATORY MANAGER



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	LABORATO	0 R Y T E S T S 08/21/92	RESULTS		
JOB NUMBER: 921371 CUSTOMER	: HYGIENETICS/GCL		ATTN:		
CLIENT 1.D: GPM COC #1085 DATE SAMPLED: 07/29/92 TIME SAMPLED: 09:50 WORK DESCRIPTION: 9207290950	WS-	2	LABORATORY DATE RECEIV TIME RECEIV REMARKS	I.D: 921371-0001 VED: 07/30/92 VED: 10:20	
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/07/92 MAD
Benzene Toluene Ethyi Benzene Xylenes	460 11 5 2	10 1 1	ug/L ug/L ug/L ug/L		
			1300 Sc Aurora (303)	Duth Potomac, Suite 13 , CO 80012 751-1780	0

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FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	JEST METHOD	DATE	TECHN
	*1		8020 (2)	08/07/92	MAD
15 3 3 2	1 1 1 1	ug/L ug/L ug/L ug/L			
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	LABORATO	RY TESTS 08/21/92	RESULTS					
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CLIENT 1.D: GPM COC #1085         DATE SAMPLED: 07/29/92         TIME SAMPLED: 11:30         WORK DESCRIPTION: 9207291130             MMM - S Dup             LABORATORY 1.D: 921371-0003         DATE RECEIVED: 07/30/92         TIME SAMPLED: 11:30             WORK DESCRIPTION: 9207291130								
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN		
8020 - AROMATIC VOLATILE ORGANICS		*10		8020 (2)	08/07/92	MAD		
Benzene Toluene Ethyl Benzene Xylenes	11000 370 350 190	200 200 10	ug/L ug/L ug/L ug/L					
			1300 Sc Aurora (303) T	outh Potomac, Suite 13 CO 80012 751-1780	0			

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	LABORATO	RY TESTS 08/21/92	RESULTS						
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TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN			
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/07/92	MAD			
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	1	1	1 1300 Sc Aurora, (303) 7	 Duth Potomac, Suite 13 CO 80012 751-1780	0				

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TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN				
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/07/92 MAD				
Benzene Toluene Ethyl Benzene Xylenes	ND ND ND	1 1 1 1	ug/L ug/L ug/L ug/L						
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CORE LABORATORIES A N A L Y T I C A L R E P O R T Job Number: 921370 Prepared For: HYGIENETICS/GCL 505 MARQUETTE AVE. N.W.-SUITE 1100 ALBUQUERQUE, NM 87102 Date: 08/12/92

Signature

Name: David A. McWharter

12/an

Core Laboratories 1300 South Potomac, Suite 130 Aurora, CO 80012

Title: Laboratory Manager



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## CORE LABORATORIES

	LABORATO	RY TESTS 08/12/92	RESULTS	<u>18-76-79-78-78-68-69-69-69-69-69-69-69-69-69-69-69-69-69-</u>		
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CLIENT I.D GPM COC #1084 DATE SAMPLED 07/28/92 TIME SAMPLED 08:40 WORK DESCRIPTION: 9207280840	LABORATORY DATE RECEIN TIME RECEIN REMARKS	I.D: 921370-0001 /ED: 07/30/92 /ED: 10:20				
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE 1	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/31/92	MAD
Benzene Toluene Ethyl Benzene Xylenes	18 4 1 1		ug/L ug/L ug/L			
	ı <u> </u>		1300 So Aurora, (303) 7	1 uth Potomac, Suite 130 CO 80012 51-1780	)	

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#### RESULTS LABORATORY TESTS 08/12/92 JOB NUMBER: 921370 CUSTOMER: HYGIENETICS/GCL ATTN: CLIENT I.D..... GPM COC #1084 LABORATORY I.D...: 921370-0002 MW-13 DATE SAMPLED.....: 07/28/92 DATE RECEIVED....: 07/30/92 TIME RECEIVED....: 10:20 TIME SAMPLED.....: 09:15 WORK DESCRIPTION...: 9207280915 REMARKS..... LIMITS/\*DILUTION UNITS OF MEASURE DATE FINAL RESULT TEST METHOD TECHN TEST DESCRIPTION MAD 8020 (2) 07/31/92 8020 - AROMATIC VOLATILE ORGANICS \*1 1 Benzene 16 ug/L ug/L Toluene 4 1 Ethyl Benzene 1 1 ug/L Xylenes 1 ug/L 1 1300 South Potomac, Suite 130 Aurora, CO 80012 (303) 751-1780

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LABORATORY TESTS RESULTS 08/12/92									
JOB NUMBER: 921370 CUSTOMER: HYGIENETICS/GCL ATTN:									
CLIENT I.D GPM COC #1084 DATE SAMPLED: 07/28/92 TIME SAMPLED: 10:37 WORK DESCRIPTION: 9207281037	MW-	- 14	LABORATORY 1.D: 921370-0003 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS: BUBBLE IN 1 VOA						
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN				
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/31/92 NAD				
Benzene Toluene Ethyl Benzene Xylenes	11 3 ND		ug/L ug/L ug/L ug/L						
			1300 Sou Aurora,	uth Potomac, Suite 13 CO 80012	D				

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EST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECH			
020 - AROMATIC VOLATILE ORGANICS		*2		8020 (2)	08/01/92	MAD			
Benzene Toluene Ethyl Benzene Xylenes	6600 280 150 150	100 100 100 100 100	ug/L ug/L ug/L ug/L						
				- 					

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JOB MUMBER: 921370 CUSTONER;	JOB NUMBER: 921370 CUSTOMER: HYGIENETICS/GCL ATTN:									
CLIENT I.D GPM COC #1084 DATE SAMPLED 07/27/92 TIME SAMPLED 15:45 WORK DESCRIPTION: 9207271545	MW	- 16	LABORATORY DATE RECEI TIME RECEI REMARKS	LABORATORY I.D: 921370-0005 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS						
TEST DESCRIPTION	FINAL RESULT	LIMITS/#DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN				
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/31/92	MAD				
Benzene Toluene Ethyl Benzene Xylenes	420 77 8 8	25 25 1	ug/L ug/L ug/L							
			1300 Si Aurora	outh Potomac, Suite 1 co 80012	30					

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JOB MUMBER: 921370 CUSTOMER	: HYGIENETICS/GCL		ATT#:							
CLIENT I.D GPM COC #1084 DATE SAMPLED 07/28/92 TIME SAMPLED 06:25 WORK DESCRIPTION: 9207280625	NW	-17	LABORATORY DATE RECEI TIME RECEI REMARKS	LABORATORY 1.D: 921370-0006 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS						
TEST DESCRIPTION	FINAL RESULT	LIMITS/#DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN					
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/31/92 MAD					
Benzene Toluene Ethyl Benzene Xylenes	99 9 3 2	5 1 1 1 1	ug/L ug/L ug/L ug/L							
			1300 Si Aurora (303)	buth Potomac, Suite 13, CO 80012 751-1780	0 0					

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JOB WUMBER: 921370 CUSTOMER:	HYG1ENET1CS/GCL		: NETA							
LIENT I.D: GPM COC #1084 ATE SAMPLED: 07/28/92 IME SAMPLED: 07:30 AORK DESCRIPTION: 9207280730 LABORATORY I.D: 921370-0007 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS										
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN					
8020 - AROMATIC VOLATILE ORGANICS		.*1		8020 (2)	07/31/92 MAD					
Benzene Toluene Ethyl Benzene Xylenes	23 6 2 1	1 1 1	ug/L ug/L ug/L							
			1300 So Aurora, (303) 7	uth Potomac, Suite 13 CO 80012 51-1780	D					

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JOB NUMBER: 921370 CUSTOMER:	HYGIENETICS/GCL		ATTN:		
CLIENT I.D GPM COC #1084 DATE SAMPLED 07/28/92 TIME SAMPLED 09:50 WORK DESCRIPTION: 9207280950	JM	5-19	LABORATORY DATE RECEIV TIME RECEIV REMARKS	I.D: 921370-0008 ED: 07/30/92 ED: 10:20	
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE DRGANICS Benzene Toluene Ethyl Benzene Xylenes	14 4 2 1	.*1 1 1 1	ug/L ug/L ug/L ug/L	8020 (2)	07/31/92 MAD
			1300 So Aurora, (303) 7	uth Potomac, Suite 13 CO 80012 51-1780	D

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JOB NUMBER: 921370 CUSTONER:	HYGIENETICS/GCL		ATT#:		
CLIENT I.D: GPM COC #1084 DATE SAMPLED: 07/28/92 TIME SAMPLED: 13:35 WORK DESCRIPTION: 9207281335	ML	1-20	LABORATORY DATE RECEIV TIME RECEIV REMARKS	I.D: 921370-0009 ED: 07/30/92 ED: 10:20	
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS		.*1		8020 (2)	07/31/92 NAD
Benzene Toluene Ethyl Benzene Xylenes	220 76 6 6	10 10 1 1	ug/L ug/L ug/L ug/L		
			1300 Sou Aurora, (303) 75	uth Potomac, Suite 130 CO 80012 51-1780	)

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CORE LABORATORIES ANALYTICAL REPORT Job Number: 921369 Prepared For: HYGIENETICS/GCL 505 MARQUETTE AVE. N.W.-SUITE 1100 ALBUQUERQUE, NM 87102 'yadî liha <sup>y</sup> Date: 08/21/92

Signatur

Name: David A. McWharter

Title: LABORATORY MANAGER

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Core Laboratories 1300 South Potomac, Suite 130 Aurora, CO 80012

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JOB NUMBER: 921369 CUSTOMER:	HYGIENETICS/GCL		ATTN:	:	
CLIENT 1.D GPM COC #1083 DATE SAMPLED 07/29/92 TIME SAMPLED 08:20 WORK DESCRIPTION: 9207290820			LABORATO DATE REC TIME REC REMARKS.	DRY 1.D: 921369-0 CEIVED: 07/30/92 CEIVED: 10:20	0001
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS Benzene Toluene Ethyl Benzene Xylenes	2 ND ND ND	*1	ug/L ug/L ug/L ug/L	8020 (2)	08/03/92 MAD
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			1300 Auro (303	South Potomac, Sui bra, CO 80012 ) 751-1780	te 130

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	LABORATO	RY TESTS 08/21/92	RESULTS				
JOB NUMBER: 921369 CUSTOMER:	HYGIENETICS/GCL		ATTN:				
CLIENT 1.D GPM COC #1083 DATE SAMPLED: 07/29/92 TIME SAMPLED: 06:45 WORK DESCRIPTION: 9207290645		LABORATORY I.D: 921369-0002 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS 2 VOA HAVE BUBBLES					
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN		
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/03/92 MAD		
Benzene Toluene Ethyl Benzene Xylenes	ND ND ND ND	1 1 1	ug/l ug/l ug/l ug/l				
			1300	South Potomac, Suite 1	30		
			Auror (303)	a, CO 80012 751-1780			

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JOB NUMBER: 921369 CUSTOME	R: HYGIENETICS/GCL		ATTN:			
CLIENT 1.D: GPM COC #1083   LABORATORY 1.D: 921369-0003     DATE SAMPLED: 07/29/92   DATE RECEIVED: 07/30/92     TIME SAMPLED: 07:15   TIME RECEIVED: 10:20     WORK DESCRIPTION: 9207290715   REMARKS: 2 VOA HAVE BUBBLES						
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN	
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/03/92 MAD	
Benzene Toluene Ethyl Benzene Xylenes	5 2 ND ND	1 1 1 1	ug/L ug/L ug/L ug/L			
·	<u> </u>	l	1300 S Aurora (303)	 outh Potomac, Suite 13 , CO 80012 751-1780	0	

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	LABORATO	RY TESTS 08/21/92	RESULTS				
JOB NUMBER: 921369 CUSTOMER:	HYGIENETICS/GCL		ATTN:				
CLIENT I.D GPM COC #1083 DATE SAMPLED: 07/28/92 TIME SAMPLED: 12:40 WORK DESCRIPTION: 9207281240		LABORATORY I.D: 921369-0004 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS					
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECI		
8020 - AROMATIC VOLATILE ORGANICS		*2		8020 (2)	08/04/92 MAI		
Benzene Toluene Ethyl Benzene Xylenes	10000 1400 59 70	200 100 2 2	ug/L ug/L ug/L ug/L				
			1300 So	uth Potomac, Suite 13	9		

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#### LABORATORY TESTS RESULTS D8/21/92

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### JOB NUMBER: 921369 CUSTOMER: HYGIENETICS/GCL

ATTN:

CLIENT I.D...... GPM COC #1083 DATE SAMPLED.....: 07/29/92 TIME SAMPLED.....: 10:55 WORK DESCRIPTION...: 9207291055 LABORATORY I.D...: 921369-0005 DATE RECEIVED....: 07/30/92 TIME RECEIVED....: 10:20 REMARKS..........: 1 VOA HAS A BUBBLE

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/05/92 MAD
Benzene Toluene Ethyl Benzene Xylenes	1 ND ND ND	1 1 1 1	ug/L ug/L ug/L ug/L		
		- -			
			1300 Sou Aurora, (303) 7	uth Potomac, Suite 130 CD 80012 51-1780	)

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	LABORATO	RY TESTS 08/21/92	RESULTS		
JOB NUMBER: 921369 CUSTOMER	HYGIENETICS/GCL		: KTTA		
CLIENT I.D GPM COC #1083 DATE SAMPLED 07/29/92 TIME SAMPLED 11:10 WORK DESCRIPTION: 9207291110			LABORATORY DATE RECEIV TIME RECEIV REMARKS	I.D: 921369-0006 ED: 07/30/92 ED: 10:20 : BUBBLE IN ALL	VOA
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECH
8020 - AROMATIC VOLATILE ORGANICS		*2		8020 (2)	08/04/92 MAD
Benzene Toluene Ethyl Benzene Xylenes	13000 380 370 180	200 100 100 2	ug/L ug/L ug/L ug/L		
		1	1300 So Aurora, (303) 7	 uth Potomac, Suite 13 CO 80012 51-1780	0

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#### JOB NUMBER: 921369 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT 1.D...... GPM COC #1083 DATE SAMPLED...... 07/28/92 TIME SAMPLED...... 11:10 WORK DESCRIPTION...: 9207281110

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TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS Benzene Toluene Ethyl Benzene Xylenes	310 4 10 3	*1 10 1 1 1	ug/L ug/L ug/L ug/L	8020 (2)	08/03/92 MAD
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			1300 Sou Aurora, (303) 75	uth Potomac, Suite 13 CO 80012 51-1780	0

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JOB NUMBER: 921369 CUSTOMER	HYGIENETICS/GCL		ATTN:				
CLIENT J.D GPM COC #1083 DATE SAMPLED 07/29/92 TIME SAMPLED 12:10 WORK DESCRIPTION: 9207291210	LABORATORY 1.D: 921369-0008 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS:						
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN	
8020 - AROMATIC VOLATILE ORGANICS Benzene Toluene Ethyl Benzene Xylenes	3900 16 12 5	*1	ug/L ug/L ug/L ug/L	8020 (2)	08/03/92	MAD	
			1300 S	buth Potomac, Suite	130		

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JOB NUMBER: 921369 CUSTOMER:	HYGIENETICS/GCL		ATTN:				
CLIENT I.D GPM COC #1083 DATE SAMPLED 07/28/92 TIME SAMPLED 07:50 WORK DESCRIPTION: 9207280750	LABORATORY J.D: 921369-0009 DATE RECEIVED: 07/30/92 TIME RECEIVED: 10:20 REMARKS						
TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN	
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/04/92	MAD	
Benzene Toluene Ethyl Benzene Xylenes	31 7 2 1		ug/L ug/L ug/L ug/L				
			1300 So Aurora, (303) 7	uth Potomac, Sui CO 80012 51-1780	te 130		

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## GPM GAS CORPORATION

4044 PENBROOK ODESSA, TEXAS 79762

August 19, 1992

Letter Response to Groundwater Issues Meeting - Lee Gas Plant

Mr. William C. Olson Hydrogeologist State of New Mexico Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

Based on our August 5, 1992 discussions between Roger Anderson and yourself, Scott Seeby and myself of GPM Gas Corporation (GPM), and Dennis Newman of Phillips Petroleum Company (PPCo), this letter responds to the Oil Conservation Division (OCD) letter dated April 22, 1992 concerning the Lee Gas Processing Plant located in Buckeye, New Mexico.

The following activities were agreed upon regarding items No. 1 and 2 in your April 22nd letter:

- No. 1 GPM will provide a work plan in approximately one month describing the remediation system design to recover the product identified downgradient of the closed North Evaporation Pond.
- No. 2 Based on the first quarter 1992 groundwater monitoring data submitted to the OCD on May 19, 1992, analytical results for BTEX and TPH were non-detect on MW-20. Consequently, it appears that the previous quarter (4th quarter 1991) groundwater monitor data is an anomaly, therefore, GPM will not be submitting a proposal to investigate the area around MW-20.

In addition, it was agreed that GPM has completed the assessment phase of the ponds. Consequently, the extent of long term remediation and groundwater monitoring will need to be determined by GPM. As discussed, the site groundwater monitor plan may be modified (reduced) if sufficient groundwater data is collected to show constituent trends, and if the proposed monitoring program adequately evaluates the impact of the ongoing remediation of the groundwater and free product. OCD also indicated that the current remediation system is adequate, however, GPM may want to consider a more active remediation system, since the required long term monitoring will be very costly. GPM appreciates the OCD's willingness to work with us to resolve this issue. If you have any further questions or need additional information, please call me at (915) 368-1085 or Scott Seeby at (915) 368-1142. Thank you.

0-fBB

Vincent B. Bernard Safety & Environmental Supervisor New Mexico Region

VBB:smm

cc: S.J. Seeby - Odessa Office M.S. Nault - Lee Plant Martin Nee - H+GCL Albuquerque



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## GPM GAS CORPORATION

4044 PENBROOK ODESSA, TEXAS 79762 OIL CONSERVE ON DIVISION RECEIVED

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August 18, 1992

2nd Quarter 1992 Analytical Results Lee Plant Discharge Plant GW-2

Mr. William C. Olson Hydrogeologist Oil Conservation Division P.O. Box 2088 State Land Office Building Santa Fe, New Mexico 87504

Dear Mr. Olson:

GPM Gas Corporation (GPM) herein submits the laboratory analytical reports for our groundwater sampling for the second quarter of 1992. Sample collection was conducted pursuant to discharge plan GW-2 for the Lee Plant. Core Laboratories of Aurora, Colorado performed the sample analyses.

Our consultant, H+GCL, followed standard operating procedures for collecting the groundwater samples. These procedures are consistent with the requirements for sample collection of the EPA's publication SW-846.

Groundwater samples from monitor wells MW-9, MW-11, MW-12, MW-13 and MW-14 were analyzed for BTEX using EPA Method 602 (Purgeable Aromatics), for chloride using Method 325.2, and for total dissolved solids (TDS) by using Method 160.1.

Please call me at (915) 368-1085 should you have any questions regarding these results. Thank you.

Sincerely,

Vincent B. Bernard Safety & Environmental Supervisor New Mexico Region

cc: S.J. Seeby w/att.M.S. Nault - Lee Plant w/o att.R.D. Dunham - Hobbs Office w/o att.



CORE LABORATORIES

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Signature

 $\frac{6/9}{92}$ 

Core Laboratories 1300 South Potomac, Suite 130 Aurora, CO 80012

Name: David A. McWharter

Title: LABORATORY MANAGER





### Sample Delivery Group Narrative

June 9, 1992

Customer: Hygienetics/GCL Project: GDM COC **#**5190 Core Laboratories Project Number: 920777

On May 1, 1992 Core Laboratories received 6 liquid samples for TDS, EPA method 602 volatile organics and chloride analysis. Sampling was performed on April 28 and April 29, 1992 by representatives of Hygienetics/GCL. The following information is pertinent to the interpretation of this data package.

Holding times were exceeded for all of the chloride analyses. This particular batch of samples was accidently missed on the holding time backlog report used in that laboratory section. The supervisor of this laboratory section is aware of the holding time violation and has taken appropriate action to eliminate the problem.

I apologize for any inconvenience this has caused Hygienetics/GCL.

Linda L. Berken

Linda L. Benkers Supervising Chemist



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# CORE LABORATORIES

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#### LABORATORY TESTS RESULTS 06/10/92

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### 06/10/92

# JOB NUMBER: 920777 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D......: GDM COC #5190 ( DATE SAMPLED.....: 04/28/92 TIME SAMPLED.....: 15:10 WORK DESCRIPTION...: 9204281510

LABORATORY I.D:	920777-0001
DATE RECEIVED:	05/01/92
TIME RECEIVED:	09:55
REMARKS	

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	510	6	mg/L	325.2 (1)	06/05/92	PJM
Solids, Total Dissolved (TDS)	1420	10	mg/L	160.1 (1)	05/05/92	RMN
602 - VOLATILE AROMATIC ORGANICS		*1		602 (1)	05/11/92	KRB
602 - VOLATILE AROMATIC ORGANICS Benzene Chiorobenzene 1,2-Dichiorobenzene 1,3-Dichiorobenzene Ethyl Benzene Toluene Xylenes-total	2 ND ND ND ND ND ND		ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	602 (1)	05/11/92	KRB
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# CORE LABORATORIES

LABORATORY I.D...: 920777-0002

DATE RECEIVED....: 05/01/92

TIME RECEIVED....: 09:55

REMARKS.....



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#### LABORATORY TESTS RESULTS 06/10/92

### JOB NUMBER: 920777 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D...... GDM COC #5190 1 7 DATE SAMPLED...... 04/28/92 TIME SAMPLED...... 16:20 WORK DESCRIPTION...: 9204281620

IEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE T	ECHN
Chloride (Unfilt.)	127	1	mg/L	325.2 (1)	06/05/92	PJM
Solids, Total Dissolved (TDS)	698	10	mg/L	160.1 (1)	05/05/92	RMN
502 - VOLATILE AROMATIC ORGANICS		*1		602 (1)	05/11/92	KRB
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene Ethyl Benzene Toluene Xylenes-total	ND ND ND ND ND ND		ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L			
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CLIENT J.D.....: GDM COC #5190 リン DATE SAMPLED.....: 04/28/92 TIME SAMPLED.....: 17:25 WORK DESCRIPTION...: 9204281725

LABORATORY I.D:	920777-0003			
DATE RECEIVED:	05/01/92			
TIME RECEIVED:	09:55			
REMARKS	SMALL BUBBLE	IN	1	VOA

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECH
Chloride (Unfilt.)	293	3	mg/L	325.2 (1)	06/05/92 PJM
Solids, Total Dissolved (TDS)	1060	10	mg/L	160.1 (1)	05/05/92 RMN
602 - VOLATILE AROMATIC ORGANICS		*1		602 (1)	05/11/92 KRB
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CLIENT I.D......: GDM COC #5190 1 4 DATE SAMPLED.....: 04/28/92 TIME SAMPLED.....: 18:55 WORK DESCRIPTION...: 9204281855

LABORATORY I.D:	920777-0004
DATE RECEIVED:	05/01/92
TIME RECEIVED:	09:55
REMARKS:	

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
Chloride (Unfilt.)	147	1	mg/L	325.2 (1)	06/05/92 PJM
Solids, Total Dissolved (TDS)	892	10	mg/L	160.1 (1)	05/05/92 RMN
602 - VOLATILE AROMATIC ORGANICS		*1		602 (1)	05/11/92 KRB
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene Ethyl Benzene Toluene Xylenes-total	ND ND ND ND ND ND		ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	602 (1)	
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CLIENT I.D...... GDM COC #5190 Blunk DATE SAMPLED...... 04/29/92 TIME SAMPLED...... 08:35 WORK DESCRIPTION...: 9204290835

LABORATORY I.D:	920777-0005
DATE RECEIVED:	05/01/92
TIME RECEIVED:	09:55
REMARKS:	

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	rechn
602 - VOLATILE AROMATIC ORGANICS		*1		602 (1)	05/11/92	KRB
Benzene	ND	1	ug/L			
Chlorobenzene	ND		ug/L			
1,3-Dichlorobenzene	ND	1	ug/L			
1,4-Dichlorobenzene	ND	1	ug/L			
Toluene	ND ND	1	ug/L			
Xylenes-total	ND	1	ug/L		1	
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CLIENT I.D:	GDM COC #5190 5
DATE SAMPLED	04/29/92
TIME SAMPLED	08:50
WORK DESCRIPTION:	9204290850

LABORATORY I.D:	920777-0006
DATE RECEIVED:	05/01/92
TIME RECEIVED:	09:55
REMARKS:	SMALL BUBBLE IN 1 VOA

TEST DESCRIPTION	FINAL RESULT	LIMITS/ +DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN				
Chloride (Unfilt.)	293	3	mg/L	325.2 (1)	06/05/92	PJM				
Solids, Total Dissolved (TDS)	1210	10	mg/L	160.1 (1)	05/05/92	RMN				
602 - VOLATILE AROMATIC ORGANICS	}	*1		602 (1)	05/11/92	KRB				
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene Ethyl Benzene Toluene Xylenes-total	ND ND ND ND ND 1 ND		ug/L ug/L ug/L ug/L ug/L ug/L ug/L	602 (1)	US/11/92	KRB				
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GPM GAS CORPORATION ,92 MP 26

4044 PENBROOK ODESSA, TEXAS 79762 May 19, 1992

Analytical Results First Quarter - 1992 Lee Gas Processing Plant Groundwater Sampling Event

OFL CONSERVATION DIVISION RECEIVED

AM 9 29

### CERTIFIED MAIL NO. P-512-092-851 RETURN RECEIPT REQUESTED

Roger C. Anderson, Acting Director Environmental Bureau, Oil Conservation Division Land Office Building P.O. Box 2088 Santa Fe, New Mexico 87504-2088

Dear Mr. Anderson:

GPM Gas Corporation submits to the Environmental Bureau of the New Mexico Oil Conservation Division the analytical results for the first quarter of 1992 for the Lee Plant Groundwater Investigation project. In addition to the results for the New Mexico Oil Conservation Division required sampling, the results for sampling monitor well MW-20 and the domestic supply well south of the plant are also enclosed.

Core Laboratories of Aurora, Colorado performed the sample analyses for benzene, toluene, ethylbenzene, xylenes, (BTEX) and total petroleum hydrocarbon (TPH) constituents. Inter-Mountain Laboratories of Farmington, New Mexico performed the sample analyses for major ions and nitrates. Our consultant,  $H^+GCL$ , followed standard operating procedures for collecting the groundwater samples. These procedures, outlined in the site specific sampling plan, are consistent with the requirements for sample collection as outlined in the EPA's publication, SW-846.  $H^+GCL$  followed strict chain-of-custody procedures to ensure the integrity of the samples during transport to the laboratories.

At special request, the groundwater from the domestic supply well was also sampled for BTEX and TPH. Sample analysis indicated that no BTEX or TPH constituents were detected in these samples.

Please contact me at (915) 368-1085 should any questions arise concerning this information. Thank you.

Sincerely,

1 E E

Vincent B. Bernard Safety & Environmental Supervisor New Mexico Region

VBB:smm

Attachment

cc: w/o attachment M.S. Nault, Lee Plant R.D. Dunham, Hobbs Office

c:vbb25



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CORE LABORATORIES

RECEIVED FEE 1 0 1992

CORE LABORATORIES A N A L Y T I C A L R E P O R T Job Number: 920139 Prepared For: HYGIENETICS/GCL 505 MARQUETTE AVE N.W. ALBUQUERQUE, NM 87102 Date: 02/06/92

Signature

Name: David A. McWharter

2/6/97 Date:

Core Laboratories 1300 South Potomac, Suite 130 Aurora, CO 80012

Title: LABORATORY MANAGER



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# LABORATORY TESTS RESULTS 02/06/92

### JOB NUMBER: 920139 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D...... PHILLIPS COC #5257 DATE SAMPLED...... 01/25/92 TIME SAMPLED...... 09:10 WORK DESCRIPTION...: 9201250910 LABORATORY I.D...: 920139-0001 DATE RECEIVED....: 01/28/92 TIME RECEIVED....: 09:54 REMARKS......

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	01/31/92 MRC
Benzene	ND	1	ug/L		
Ethyl Benzene	ND	1	ug/L ug/L		
Xylenes	ND	1	ug/L		
8015(Mod) - Hydrocarbon ID - TPH	<10	10	ແຜ່/L Diesel	8015 (Modified) (2)	01/30/92 MRC
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			1300 So Aurora	uth Potomac, Suite 13 CO - 80012	0
			(303) 7	51-1780	

PAGE:1



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## CORE LABORATORIES

# LABORATORY TESTS RESULTS 02/06/92

# JOB NUMBER: 920139 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D..... PHILLIPS COC #5257 DATE SAMPLED.....: 01/25/92 TIME SAMPLED.....: 11:17 WORK DESCRIPTION...: 9201251117

LABORATORY 1.D:	920139-0002	
DATE RECEIVED:	01/28/92	
TIME RECEIVED:	09:54	
REMARKS:	1-TPH VOA HAS INCORRECT I	lD

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	01/31/92 MRC
Benzene Toluene Ethyl Benzene Xylenes	10 ND ND ND	1 1 1 1	նց/Լ ug/L ug/L ug/L		
8015(Mod) - Hydrocarbon ID - TPH	<10	10	ng/L Diesel	8015 (Modified) (2)	01/30/92 MRC
			1300 So Aurora, (303) 7	uth Potomac, Suite 13 CO 80012 51-1780	0

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## CORE LABORATORIES

# LABORATORY TESTS RESULTS 02/06/92

### JOB NUMBER: 920139 CUSTOMER: HYGIENETICS/GCL

CLIENT I.D..... PHILLIPS COC #5257 DATE SAMPLED.....: 01/25/92 TIME SAMPLED.....: 12:20 WORK DESCRIPTION...: 9201251220

#### LABORATORY I.D...: 920139-0003 DATE RECEIVED...: 01/28/92 TIME RECEIVED...: 09:54 REMARKS.....

ATTN:

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TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTI N	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	01/31/92 MRC
Benzene Toluene Ethyl Benzene Xylenes	ND ND ND ND	1 1 1 1	ug/L u;j/L ug/L ug/L		
8015(Mod) - Hydrocarbon ID - TPH	<10	10	mg/L Diesel	8015 (Modified) (2)	01/30/92 MRC
	I	1	1300 So	uth Potomac, Suite 13	1 0
			Aurora, (303) 7	CO 80012 51-1780	

PAGE:3

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## CORE LABORATORIES

#### LABORATORY TESTS RESULTS 02/06/92

#### JOB NUMBER: 920139 CUSTOMER: HYGIENETICS/GCL

### ATTN:

CLIENT I.D..... PHILLIPS COC #5257 DATE SAMPLED.....: 01/25/92 TIME SAMPLED.....: 13:02 WORK DESCRIPTION...: 9201251302

### LABORATORY I.D...: 920139-0004 DATE RECEIVED....: 01/28/92 TIME RECEIVED....: 09:54 REMARKS.....

BO20 - AROMATIC VOLATILE ORGANICS Benzene Toluene	110 20 20	*5 5 5	ua/I	8020	(2)	02/03/92	MRC
Benzene	110 20 20	5	ug/L	ł		*	
Ethyl Benzene Xylenes	10	5	ug/L Ug/L ug/L				
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CORE LABORATORIES

# RECEIVED FEB 1 0 1092

CORE LABORATORIES ANALYTICAL REPORT

> Job Number: 920128 Prepared For:

HYGIENETICS/GCL

505 MARQUETTE AVE. N.W. ALBUQUERQUE, NM 87102

Date: 02/06/92

Signature

2/6/92 Date:

Name: David A. McWharter

Core Laboratories 1300 South Potomac, Suite 130 Aurora, CO 80012

Title: LABORATORY MANAGER



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## CORE LABORATORIES

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#### LABORATORY TESTS RESULTS 02/06/92

# JOB NUMBER: 920128 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D..... PHILLIPS LEE COC #4800 DATE SAMPLED...... 01/23/92 TIME SAMPLED...... 17:00 WORK DESCRIPTION...: 9201231700

#### LABORATORY I.D...: 920128-0001 DATE RECEIVED....: 01/25/92 TIME RECEIVED....: 11:00 REMARKS.....

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	01/27/92	KRC
Benzene Toluene	ND ND	1	ug/L			
Ethyl Benzene Xvlenes	ND ND		Ly/L			
8015(Mod) - Hydrocarbon ID - TPH	<10	10	mu/l Diesel	8015 (Modified) (2)	01/20/02	MPC
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# CORE LABORATORIES

# LABORATORY TESTS RESULTS 02/06/?2

### JOB NUMBER: 920128

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CUSTOMER: HYGIENETICS/GCL

# ATTN:

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CLIENT I.D..... PHILLIPS LEE COC #4800 DATE SAMPLED..... 01/23/92 TIME SAMPLED..... 18:55 WORK DESCRIPTION...: 9201231855

#### LABORATORY I.D...: 920128-0032 DATE RECEIVED...: 01/25/92 TIME RECEIVED...: 11:00 REMARKS.....

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	01/27/92 MRC
Benzene	ND	1	ug/L		
Toluene Ethyl Benzene	ND ND		ug/L		
Xylenes	ND	1	ug/L		
8015(Mod) - Hydrocarbon ID - TPH	<10	10	mg/L Diesel	8015 (Modified) (2)	01/29/92 MRC
	I	<u> </u>	1300 Sc Aurora, (303) 7	uth Potomac, Suite 13 CO 80012 51-1780	0
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## CORE LABORATORIES

## LABORATORY TESTS RESULTS 02/06/92

JOB NUMBER: 920128

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## ATTN:

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CLIENT I.D.....: PHILLIPS LEE COC #4800 DATE SAMPLED.....: 01/24/92 TIME SAMPLED.....: 11:58 WORK DESCRIPTION...: 9201241158

CUSTOMER: HYGIENETICS/GCL

## LABORATORY I.D...: 920128-0003 DATE RECEIVED...: 01/25/92 TIME RECEIVED...: 11:00 REMARKS.....

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	01/27/92	MRC
Benzene Toluene Ethyl Benzene Xylenes	ND ND ND ND	1 1 1 1	սց/Լ սց/Լ սց/Լ սց/Լ			
8015(Mod) - Hydrocarbon ID - TPH	<10	10	mg/L Diesel	8015 (Modified) (2)	56/62/10	MRC
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			1300 So Aurora, (303) 7	uth Potemac, Suite 13 CO 80012 51-1780	0	
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JOB NUMBER: 920128

## CORE LABORATORIES

#### LABORATORY TESTS RESULTS 02/06/92

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ATTN:

CLIENT I.D..... PHILLIPS LEE COC #4800 DATE SAMPLED.....: 01/24/92 TIME SAMPLED.....: 13:20 WORK DESCRIPTION...: 9201241320

CUSTOMER: HYGIENETICS/GCL

#### LABORATORY I.D...: 920128-0004 DATE RECEIVED...: 01/25/92 TIME RECEIVED...: 11:00 REMARKS.....

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE
8020 - AROMATIC VOLATILE ORGANICS Benzene Toluene Ethyl Benzene Xylenes	ND ND ND ND	*1 1 1 1	ug/L ug/L ug/L ug/L	8020 (2)	01/27/92 MF
8015(Mod) - Hydrocarbon ID - TPH	<10	10	mg/L Diesel	8015 (Modified) (2)	01/29/92 MF
			1300 Sc Aurora, (303) 7	outh Potomac, Suite 1 CO 80012 751-1780	30

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JOB NUMBER: 920128

## CORE LABORATORIES

## LABORATORY TESTS RESULTS 02/06/92

CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: PHILLIPS LEE COC #4800 DATE SAMPLED.....: 01/24/92 TIME SAMPLED.....: 15:00 WORK DESCRIPTION...: 9201241500

## LABORATORY I.D...: 920128-0005 DATE RECEIVED...: 01/25/92 TIME RECEIVED...: 11:00 REMARKS.....

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	01/27/92 MRC
Benzene	ND	1	ug/L		
Ethyl Benzene	15	1	ug/L lug/L		
Xylenes	ND	1	ug/L		
8015(Mod) - Hydrocarbon ID - TPH	<10	10	mg/L Diesel	8015 (Modified) (2)	01/30/92 MRC
			1300 So Aurore, (303) 7	uth Potomac, Suite 13 CO 80012 51-1780	0
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JOB NUMBER: 920128

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## CORE LABORATORIES

#### LABORATORY TESTS RESULTS 02/06/92

## CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D..... PHILLIPS LEE COC #4800 DATE SAMPLED.....: 01/24/92 TIME SAMPLED.....: 15:38 WCRK DESCRIPTION...: 9201241538

#### LABORATORY I.D...: 920128-0006 DATE RECEIVED...: 01/25/92 TIME RECEIVED...: 11:00 REMARKS..... SMALL BUBBLE IN VOA

TEST DESCRI	IPTION		FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE TECHN
8015(Mod)	- Hydrocarben IC	) - TPH	<10	10	mg/L Diesel	8015 (Modified) (2)	01/36/92 MRC
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2506 W. Mem Street Farmington, Nev/ Mexico 87401

CLIENT:	H+GCL, Inc.	DATE RE	PORTED:	02/06/92
SITE: LAB NO:	MW-14 F8044	DATE RE DATE COL	CEIVED: LECTED:	01/28/92 01/25/92
	Lab pH (s.u.) Lab Conductivity, umhos/cm Lab Resistivity, ohm-m Total Dissolved Solids (18 Total Dissolved Solids (ca Total Alkalinity as CaC03, Total Hardness as CaC03, m Sodium Adsorption Ratio Total Nitrate and Nitrite,	ι ( 25C OC), mg/L lc), mg/L ng/L ng/L	. 7.49 . 1340 . 7.45 . 848 . 795 . 552 . 679 . 0.75 . 0.17	
	Bicarbonate as HC03 Carbonate as C03 Chloride Sulfate Calcium Magnesium Potassium Sodium Major Cations Major Anions Cation/Anion Difference	mg/L 671 0 131 16.1 260 7.30 4.92 44.8	meq/L 11 0 3.69 0.33 13.0 0.60 0.13 1.95 15.7 15.1 1.85	<b>9</b>

Ma Mary Stepp Lab Director V

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Wanda Orso Water Lab Supervisor

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2506 W. Main Street Farmington, New Mexico 87401

CLIENT:	H+GCL,	Inc.	DATE	REPORTED:	02/06/92
SITE:	WS-1		DATE	RECEIVED:	01/28/92
LAB NO:	F8045		DATE	COPPECIED:	01/25/92

Lab pH (s.u.)		1.31	
Lab Conductivity, umhos/cm @	25C	685	
Lab Resistivity, ohm-m		14.6	
Total Dissolved Solids (180C)	, mg/L.	428	
Total Dissolved Solids (calc)	, mg/L.	378	
Total Alkalinity as CaC03, mg	/L	201	
Total Hardness as CaCO3, mg/L	1	280	
Sodium Adsorption Ratio		0.87	
Total Nitrate and Nitrite, mg	/L	2.62	
	mg/L	meg/L	
Bicarbonate as HC03	245	4.01	
Carbonate as C03	0	0	
Chloride	69.1	1.95	
Sulfate	43.4	0.90	
Calcium	102	5.10	
Magnesium	6.02	0.50	
Potassium	2.98	0.08	
Sodium	33.4	1.45	
Major Cations		7.13	
Major Anions	• • • • • •	7.06	
Cation/Anion Difference	• • • • • •	0.49	£

Mary Stepp Lab Divector

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Wanda Orso Water Lab Supervisor

2506 W. Main Street Farmington, New Mexico 87401

CLIENT:	H+GCL, Inc.	DATE REPORTED:	02/06/92
SITE:	WS-2	DATE RECEIVED:	01/28/92
LAB NO:	F8046	DATE COLLECTED:	01/25/92
	Lab pH (s.u.)	7.22	
	Lab Conductivity, umhos/cm	@ 25C 1280	)
	Lab Resistivity, ohm-m		
	Total Dissolved Solids (18	0C), mg/L. 740	).
	Total Dissolved Solids (ca	.lc), mg/L. 634	
	Total Alkalinity as CaC03,	mg/L 143	Ĺ
	Total Hardness as CaC03, m	ıg/L 521	L
	Sodium Adsorption Ratio	0.76	5
	Total Nitrate and Nitrite,	mg/L <0.02	2

1200

,		
	mg/L	meq/L
Bicarbonate as HC03	<b>1</b> 72	2.82
Carbonate as C03	0	0
Chloride	317	8.95
Sulfate	1.23	0.03
Calcium	152	7.60
Magnesium	34.2	1ن. 2
Potassium	4.22	0.11
Sodium	39.9	1.74
Major Cations		12.3
Major Anions		11.8
Cation/Anion Difference		1.93 %

Mary Stepp / Lab Director

Wanda Orso

Water Lab Supervisor

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2506 W. Main Street Farmington, New Mexico 87401

02/05/92

01/25/92 01/23/92

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and the second 
	••••	1.50	
Lab Conductivity, umhos/cm @ 2	5C	1630	
Lab Resistivity, ohm-m		6.12	
Total Dissolved Solids (180C),	mg/L.	930	*
Total Dissolved Solids (calc),	mg/L.	991	
Total Alkalinity as CaC03, mg/	L	472	
Total Hardness as CaCO3. mg/L.		568	
Sodium Adsorption Ratio		3.01	
Total Nitrate and Nitrite, mg/	Τ	<0.02	
Total Mitiate and Mitiite, mg,	11		
· · · ·	$m\sigma/T$	mea/r.	
Picarbonato ac MC03	576	0 1 1	
Combonate og 002	570		
Carbonate as CU3	0	U 0	
Chloride	287	8.09	
Sulfate	28	0,58	
Calcium	210	10.5	
Magnesium	10.8	0.88	
Potassium	7.64	0.20	
Sodium	165	7,18	
Major Cations		18 7	
Major Aniong		18 1	
$\frac{11}{2} \frac{1}{2} 1$	• • • • •		6
cation/Anion Difference	• • • • •	1.08	も

\* Sample reanalyzed, no significant change.

Lab Director

Wanda Orso Water Lab Supervisor

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2506 W. Main Street Farmington, New Mexico 87401

CLIENT:	H+GCL,	Inc.	DATE	REPORTED:	02/05/92
SITE: LAB NO:	MW-20 F8037		DATE DATE	RECEIVED: COLLECTED:	01/25/92 01/23/92
TOND NO.	F00.57			COLUECIED.	01/23/32

Lab pH (s.u.)		1.19	
Lab Conductivity, umhos/cm @	25C	508	
Lab Resistivity, ohm-m		19.7	
Total Dissolved Solids (180C)	), mg/L.	290	
Total Dissolved Solids (calc)	, mg/L.	256	
Total Alkalinity as CaC03, mo	4/L	172	
Total Hardness as CaC03, mg'I	- 	196	
Sodium Adsorption Ratio		0.76	
Total Nitrate and Nitrite, mo	g/L	3.19	
	-		
	mg/L	meq/L	
Bicarbonate as HC03	<b>Ž10</b>	3.44	
Carbonate as C03	0	0	
Chloride	25.2	0.71	
Sulfate	23.0	0.48	
Calcium	76.8	3.83	
Magnesium	1.12	0.09	
Potassium	2.68	0.07	
Sodium	24.4	1.06	
Major Cations		5.05	
Major Anions		4.85	
Cation/Anion Difference		2.00	8

Mary Stepp Lab Director

SO Wanda Orso Water Lab Supervisor

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2506 W. Main Street Farmington, New Mexico 87401

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CLIENT:	H+GCL, Inc. 1158	DATE REPOF	TED:	02/05/92
STUE.	MW-13	DATE RECET	VED.	01/25/92
	F8038	DATE COLLEC	'UED•	01/23/92 01/24/92
LAB NO:	Lab pH (s.u.) Lab Conductivity, umhos/cm Lab Resistivity, ohm-m Total Dissolved Solids (18 Total Dissolved Solids (ca Total Alkalinity as CaCO3, Total Hardness as CaCO3, m	DATE COLLEC a @ 25C alc), mg/L. mg/L ag/L	7.48 1690 5.93 980 971 499 599	01/24/92
	Sodium Adsorption Ratio		2.55	
	Total Nitrate and Nitrite,	mg/L	1.12	
		ma/L	meg/L	
	Bicarbonate as HC03	609	9,98	
	Carbonate as CO3	. 0	0	
	Chloride	247	6.96	
	Sulfate	35.4	0.74	
	Calcium	236	11.8	
	Magnesium	2,29	0.19	
	Potassium	7.45	0.19	
	Sodium	143	6.23	
	Major Cations		18.4	
	Major Anjons		17.8	
	Cation/Anion Difference		1.73	<del>3</del> 5

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Mary Stepp Lab Director

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Nanda Orso Water Lab Supervisor

2506 W. Main Street Farmington, New Mexico 87401

CLIENT:	H+GCL,	Inc.	DATE	REPORTI	ED:	02/05/92
SITE: LAB NO:	MW-12 F8039		DATE DATE	RECEIVI COLLECTI	ED: ED:	01/25/92 01/24/92
	Lab pH	(s.u.)			7.53	

32 5 The Alter And Alter And Alter 
Lab Conductivity, umhos/cm @	25C	1100	
Lab Resistivity, ohm-m		9.11	
Total Dissolved Solids (1890)	mg/T	680	
Total Dissolved Solids (1990)	$m_{\rm C}/{\rm L}$	660	
Notal Alkalivity of CoCO2 mg	T T	127	
Total Aikarinity as calos, ing	• • • • • • • • •	サ <i>ム /</i> つつの	
Total Hardness as Cacu3, mg/L	• • • • • • •	330	
Sodium Adsorption Ratio	•••••	3.04	
Total Nitrate and Nitrite, mg	/L	<0.02	
	mq/L	meg/L	
Bicarbonate as HC03	520	8.53	
Carbonate as CO3	0	0	
Chloride	105	2.97	
Sulfato	35 1	$\tilde{0}$ $71$	
Calgium	120	6 51	
	1 00	0.51	
Magnesium	1.02	0.08	
Potassium	5.50	0.14	
Sodium	127	5.52	
Major Cations		12.2	
Major Anions		12.2	
Cation/Anion Difference		0.05	z
Successive and a structure of the struct		0.05	0

Lab Director

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Wanda Orso Water Lab Supervisor

2506 W. Main Street Farmington, New Mexico 87401

CLIENT: H+GCL,	Inc.	DATE REPORT	ED: 02/05/92
ID: 1500			
SITE: MW-9		DATE RECEIV	ED: 01/25/92
LAB NO: F8040		DATE COLLECT	ED: 01/24/92

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Lab pH (s.u.)		7.23	
Lab Conductivity, umhos/cm @ 2	5C	1620	
Lab Resistivity, ohm-m		6.18	
Total Dissolved Solids (180C),	mg/L.	900	
Total Dissolved Solids (calc),	mg/L.	849	
Total Alkalinity as CaC03, mg/	L	511	
Total Hardness as CaC03, mg/L.		680	
Sodium Adsorption Ratio	• • • • • •	0.84	
Total Nitrate and Nitrite, mg/	L	<0.02	
•			
	mg/L	meq/L	
Bicarbonate as HC03	622	10.2	
Carbonate as C03	0	0	
Chloride	218	6.15	
Sulfate	6.59	0.14	
Calcium	240	12.0	
Magnesium	19.4	1.59	
Potassium	7.62	0.19	
Sodium	50.4	2.19	
Major Cations	• • • • •	16.0	
Major Anions	• • • • •	16.5	
Cation/Anion Difference	• • • • •	1.64	Ş

Mary Stepp Lab Director

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Wanda Orso Water Lab Supervisor

2506 W. Main Street Farmington, New Mexico 87401

CLIENT:	H+GCL, Inc.	DATE REPORTED:	02/05/92
SITE: LAB NO:	MW-13 F8041	DATE RECEIVED: DATE COLLECTED:	01/25/92 01/24/92

Lab pH (s.u.)		1.52	
Lab Conductivity, umhos/cm @	25C	1670	
Lab Resistivity, ohm-m	• • • • • • • •	5.97	
Total Dissolved Solids (180C)	, mg/L.	990	
Total Dissolved Solids (calc)	, mg/L.	964	
Total Alkalinity as CaCO3, mg	/L	498	
Total Hardness as CaCO3, mg/L		592	
Sodium Adsorption Ratio		2.58	
Total Nitrate and Nitrite, mg	/L	1.37	
· ·	mg/L	meq/L	
Bicarbonate as HC03	608	9,96	
Carbonate as C03	0	0	
Chloride	243	6.85	
Sulfate	37.9	0.79	
Calcium	225	11.2	
Magnesium	7.15	0.59	
Potassium	7.49	0.19	
Sodium	144	6.27	
Major Cations	• • • • • •	18.3	
Major Anions		17.7	
Cation/Anion Difference		1.66	ક્ષ

Mary Stepp / Lab Director

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Wanda Orso Water Lab Supervisor

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## GPM GAS CORPORATION

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4044 PENBROOK ODESSA, TEXAS 79762

April 29, 1992

Lee Plant Sample Analyses Requirements, Discharge Plan GW-2

Mr. William C. Olson, Hydrogeologist Environmental Bureau, Oil Conservation Division Energy, Minerals & Natural Resources Department State Land Office Building P. O. Box 2088 Santa Fe, New Mexico 87504-2088

Dear Mr. Olson:

GPM Gas Corporation (formerly Phillips 66 Natural Gas Company) requests that quarterly groundwater monitoring analytical requirements pursuant to discharge plan GW-2 be revised. As we discussed during our April 23, 1992, telephone conversation, GPM requests that analyses conducted on groundwater samples include benzene, toluene, ethylbenzene, xylene (BTEX), and chloride. We further request that analyses for total petroleum hydrocarbons and other major ions be discontinued, and that depth to groundwater measurements be collected on a quarterly basis as opposed to monthly.

If you should have any questions regarding this proposed amendment, please call me at (915) 368-1085.

Sincerely,

V. B. Bernard Safety & Environmental Supervisor

VBB:mdp VB2016.NMR

cc: Martin J. Nee H + GCL Albuquerque, NM R. C. Anderson Oil & Conservation Division Santa Fe, NM