

2R - 34

REPORTS

DATE:

Nov 26, 1996



LABORATORIES, INC.

ANALYTICAL AND QUALITY CONTROL REPORT

George Robinson
ENRON CORPORATION
Env. Affairs, Rm 3 AC 3142
P.O. Box 1188
Houston, TX 77251

11/26/1996

EPIC Job Number: 96.08389

Page 1

Project Description:
Job Description: TWP/Atoka-1

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to EPIC Laboratories, Inc. for analysis:

Sample Number	Sample Description	Date Taken	Time Taken	Date Received
323008	MW-3	11/11/1996	11:25	11/14/1996
323009	MW-4	11/11/1996	11:50	11/14/1996
323010	MW-5	11/11/1996	12:45	11/14/1996
323011	MW-6	11/11/1996	12:55	11/14/1996
323012	MW-7	11/11/1996	12:48	11/14/1996
323013	MW-8	11/11/1996	11:05	11/14/1996

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Debby Skogen

Debby Skogen
Project Coordinator

NOTE: Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety.

ANALYTICAL RESULTS REPORT

George Robinson
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11/26/1996

EPIC Job Number: 96.08389
Sample Number: 323008

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Project Description:
Job Description: TWP/Atoka-1

Sample Description: MW-3

Parameter	Flag	Result	Units	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch Number	Run Batch Number	Reporting Limit
EPA-8020 AQ (PRESERVED)										
Benzene		<2	ug/L	S-8020M		11/21/1996	zst		2646	2
Ethylbenzene		<2	ug/L	S-8020M		11/21/1996	zst		2646	2
Toluene		<2	ug/L	S-8020M		11/21/1996	zst		2646	2
Xylenes, Total		<2	ug/L	S-8020M		11/21/1996	zst		2646	2
SURI: a,a,a-TFT		79	ug/L	S-8020M		11/21/1996	zst		2646	60-125

ANALYTICAL RESULTS REPORT

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11/26/1996

EPIC Job Number: 96.08389
Sample Number: 323009

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Project Description:
Job Description: TWP/Atoka-1

Sample Description: MW-4

Parameter	Flag	Result	Units	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch Number	Run Batch Number	Reporting Limit
EPA-8020 AQ (PRESERVED)										
Benzene		180	ug/L	S-8020M		11/21/1996	zst		2646	2
Ethylbenzene		<2	ug/L	S-8020M		11/21/1996	zst		2646	2
Toluene		10	ug/L	S-8020M		11/21/1996	zst		2646	2
Xylenes, Total		120	ug/L	S-8020M		11/21/1996	zst		2646	2
SUR: a,a,a-TFT		76	ug/L	S-8020M		11/21/1996	zst		2646	60-125

ANALYTICAL RESULTS REPORT

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11/26/1996

EPIC Job Number: 96.08389
Sample Number: 323010

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Project Description:
Job Description: TWP/Atoka-1

Sample Description: MW-5

Parameter	Flag	Result	Units	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch Number	Run Batch Number	Reporting Limit
EPA-8020 AQ (PRESERVED)										
Benzene		6100	ug/L	S-8020M		11/24/1996	dtw		2647	200
Ethylbenzene		430	ug/L	S-8020M		11/24/1996	dtw		2647	200
Toluene	EDL	<200	ug/L	S-8020M		11/24/1996	dtw		2647	200
Xylenes, Total	EDL	<200	ug/L	S-8020M		11/24/1996	dtw		2647	200
SUR: a,a,a-TFT		87	% Rec	S-8020M		11/24/1996	dtw		2647	60-125

EDL - Elevated Detection Limit due to matrix interference.

ANALYTICAL RESULTS REPORT

George Robinson
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11/26/1996

EPIC Job Number: 96.08389
Sample Number: 323011

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Project Description:
Job Description: TWP/Atoka-1

Sample Description: MW-6

Parameter	Flag	Result	Units	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch Number	Run Batch Number	Reporting Limit
EPA 8020 AQ (PRESERVED)										
Benzene		3700	ug/L	S-8020M		11/24/1996	dtw		2647	10
Ethylbenzene		220	ug/L	S-8020M		11/24/1996	dtw		2647	10
Toluene	EDL	<10	ug/L	S-8020M		11/24/1996	dtw		2647	10
Xylenes, Total	EDL	<10	ug/L	S-8020M		11/24/1996	dtw		2647	10
SURF: a,a,a-TFT		74	% Rec	S-8020M		11/24/1996	dtw		2647	60-125

EDL - Elevated Detection Limit due to matrix interference.

ANALYTICAL RESULTS REPORT

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11/26/1996

EPIC Job Number: 96.08389
Sample Number: 323012

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Project Description:
Job Description: TWP/Atoka-1

Sample Description: MW-7

Parameter	Flag	Result	Units	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch Number	Run Batch Number	Reporting Limit
EPA-8020 AQ (PRESERVED)										
Benzene		720	ug/L	S-8020M		11/21/1996	zst		2646	2
Ethylbenzene		170	ug/L	S-8020M		11/21/1996	zst		2646	2
Toluene		970	ug/L	S-8020M		11/21/1996	zst		2646	2
Xylenes, Total		390	ug/L	S-8020M		11/21/1996	zst		2646	2
SURF: a,a,a-TFT		89	ug/L	S-8020M		11/21/1996	zst		2646	60-125

ANALYTICAL RESULTS REPORT

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11/26/1996

EPIC Job Number: 96.08389
Sample Number: 323013

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Project Description:
Job Description: TWP/Atoka-1

Sample Description: MW-8

Parameter	Flag	Result	Units	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch Number	Run Batch Number	Reporting Limit
EPA-8020 AQ (PRESERVED)										
Benzene		11	ug/L	S-8020M		11/21/1996	zst		2646	2
Ethylbenzene		<2	ug/L	S-8020M		11/21/1996	zst		2646	2
Toluene		<2	ug/L	S-8020M		11/21/1996	zst		2646	2
Xylenes, Total		19	ug/L	S-8020M		11/21/1996	zst		2646	2
SURF: a,a,a-TFT		78	ug/L	S-8020M		11/21/1996	zst		2646	60-125

QUALITY CONTROL REPORT BLANKS

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P.O. Box 1188
Houston, TX 77251

11/26/1996

EPIC Job Number: 96.08389

Project Description:
Job Description: TWP/Atoka-1

Parameter	Flag	Blank Result	Units	Reporting Limit	Date Analyzed	Prep Batch Number	Run Batch Number
EPA-8020 AQ (PRESERVED)							
Benzene		<2	ug/L	2	11/21/1996		2646
Ethylbenzene		<2	ug/L	2	11/21/1996		2646
Toluene		<2	ug/L	2	11/21/1996		2646
Xylenes, Total		<2	ug/L	2	11/21/1996		2646
EPA-8020 AQ (PRESERVED)							
Benzene		<2	ug/L	2	11/24/1996		2647
Ethylbenzene		<2	ug/L	2	11/24/1996		2647
Toluene		<2	ug/L	2	11/24/1996		2647
Xylenes, Total		<2	ug/L	2	11/24/1996		2647

All parameters should be less than the reporting limit.

QUALITY CONTROL REPORT CONTINUING CALIBRATION VERIFICATION STANDARD

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P.O. Box 1188
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11/26/1996

EPIC Job Number: 96.08389

Project Description:
Job Description: TWP/Atoka-1

Parameter	Flag	CCVS True Concentration	Units	CCVS Concentration Found	CCVS Percent Recovery	Date Analyzed	Run Batch Number
EPA-8020 AQ (PRESERVED)							
Benzene		20	ug/L	18	90.0	11/21/1996	2646
Ethylbenzene		20	ug/L	15	75.0	11/21/1996	2646
Toluene		20	ug/L	17	85.0	11/21/1996	2646
Xylenes, Total		60	ug/L	53	88.3	11/21/1996	2646
EPA-8020 AQ (PRESERVED)							
Benzene		20	ug/L	19	95.0	11/24/1996	2647
Ethylbenzene		20	ug/L	19	95.0	11/24/1996	2647
Toluene		20	ug/L	19	95.0	11/24/1996	2647
Xylenes, Total		60	ug/L	58	96.7	11/24/1996	2647

CCVS - Continuing Calibration Verification Standard

QUALITY CONTROL REPORT MATRIX SPIKE/MATRIX SPIKE DUPLICATE

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P.O. Box 1188
Houston, TX 77251

11/26/1996

EPIC Job Number: 96.08389

Project Description:
Job Description: TWP/Atoka-1

Parameter	Flag	Units	Sample Result	Spike Amount Added	Matrix Spike Result	MS Percent Recovery	Duplicate Spike		MSD		Date Analyzed	Prep Batch Number	Run Batch Number
							Amount Added	MSD Result	Percent Recovery	MS/MSD RPD			
EPA-8020 AQ (PRESERVED)													
Benzene		ug/L	29	20	45	80.0	20	51	110.0	12.5	11/21/1996		2646
Ethylbenzene		ug/L	<2	20	19	95.0	20	22	110.0	14.6	11/21/1996		2646
Toluene		ug/L	<2	20	19	95.0	20	22	110.0	14.6	11/21/1996		2646
Xylenes, Total		ug/L	<2	40	35	87.5	40	42	105.0	18.2	11/21/1996		2646
EPA-8020 AQ (PRESERVED)													
Benzene		ug/L	<2	20	23	115.0	20	22	110.0	4.4	11/24/1996		2647
Ethylbenzene		ug/L	<2	20	22	110.0	20	21	105.0	4.7	11/24/1996		2647
Toluene		ug/L	<2	20	22	110.0	20	22	110.0	0.0	11/24/1996		2647
Xylenes, Total		ug/L	<2	40	41	102.5	40	42	105.0	2.4	11/24/1996		2647

NOTE: The Quality Control data in this report reflects the batch in which your sample was prepped and/or analyzed.
The sample selected for QA may not necessarily be your sample.

QUALITY CONTROL REPORT LABORATORY CONTROL STANDARD

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11/26/1996

EPIC Job Number: 96.08389

Project Description:
Job Description: TWP/Atoka-1

Analyte	Prep Batch No.	Run Batch No.	LCS True Conc	Units	LCS Conc Found	LCS % Rec.	LCS Dup Conc. Found	LCS Dup % Rec	LCS RPD	Flag	Date Analyzed
EPA-8020 AQ (PRESERVED)											
Benzenes		2646	20	ug/L	22	110.0	18	90.0	19.9		11/21/1996
Ethylbenzene		2646	20	ug/L	19	95.0	16	80.0	17.1		11/21/1996
Toluene		2646	20	ug/L	21	105.0	17	85.0	21.0		11/21/1996
Xylenes, Total		2646	40	ug/L	35	87.5	28	70.0	22.2		11/21/1996
EPA-8020 AQ (PRESERVED)											
Benzenes		2647	20	ug/L	22	110.0					11/24/1996
Ethylbenzene		2647	20	ug/L	22	110.0					11/24/1996
Toluene		2647	20	ug/L	22	110.0					11/24/1996
Xylenes, Total		2647	40	ug/L	42	105.0					11/24/1996

LCS - Laboratory Control Standard

For samples with insufficient sample volume, an LCS/LCS duplicate is reported instead of an MS/MSD.

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REPORTS

DATE:

MAY 2, 1996

Semi-Annual Report of Groundwater Remediation Activities

**Transwestern Pipeline Company
Atoka-1 Compressor Station
Eddy County, New Mexico**

**Submitted to:
New Mexico Oil Conservation Division**

May 2, 1996

RECEIVED

MAY 9 1996

**Environmental Bureau
Oil Conservation Division**

**Prepared For:
Transwestern Pipeline Company
6381 North Main Street
Roswell, NM 88201**

**Prepared by:
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16300 Katy Freeway, Suite 210
Houston, Texas 77094-1610**

Semi-Annual Report of Groundwater Remediation Activities

Transwestern Pipeline Company

Atoka-1 Compressor Station

I. Groundwater Assessment & Monitoring Activities

4th Quarter 1995 and 1st Quarter 1996 Groundwater Sampling Events

Transwestern has completed two quarterly sampling events since obtaining approval from the NMOCD for Transwestern's proposed remediation plan. The 4th quarter 1995 sampling event was completed on November 30, 1995 and the 1st quarter 1996 sampling event was completed on February 23, 1996.

Prior to sampling, the depth to water, and the depth to hydrocarbon where phase separated hydrocarbon (PSH) was present, was determined for each monitor well. Table 1 presents a summary of groundwater and PSH surface elevation information. A groundwater surface elevation map for the February, 1996, sampling event is included as Figure 2.

Groundwater samples were collected from the six monitor wells which did not contain PSH. Groundwater samples were delivered to a lab for analysis by EPA Method 8020 for benzene, toluene, ethylbenzene, and xylenes (BTEX). Table 2 presents a summary of BTEX results. A BTEX distribution map for the February, 1996, sampling event is included as Figure 3.

There were 40 gallons of purge water generated during the 4th quarter 1995 sampling event and 28 gallons generated during the 1st quarter 1996 sampling event. The purge water from both sampling events is contained on-site in approved DOT drums. Based on the analytical results indicated in Table 3, the purge water can be expected to contain BTEX levels above the NMWQCC Standards.

Results/Conclusions from Groundwater Sampling Events

Occurrence and Direction of Groundwater Flow

Water table elevations measured during the 1st quarter 1996 sampling event are indicated on Figure 2, attached. Consistent with previous sampling events, the elevation of shallow ground water measured in monitor wells at the site do not define a consistent ground water table. This is likely because there is very little shallow ground water present.

The apparent direction of groundwater flow, based on elevations measured in monitor wells MW-3, MW-6, and MW-7, is toward to southeast. This is consistent with what would be expected based upon ground surface topography.

Lateral Extent of Phase Separated Hydrocarbon

The lateral extent of PSH is currently defined by the occurrence of PSH at the water table in monitor wells MW-1 and MW-2 and the absence of PSH in all other monitor wells. The thickness of accumulated PSH in the monitor well MW-1 and MW-2 well casings was measured in February 1996 at 0.37 ft. and 0.02 ft., respectively. The recently installed SVE wells have not yet been checked for the presence of PSH. Based on the information currently available, the volume and lateral extent of PSH in the area appears to be relatively limited.

At this time, the presence of PSH does not appear to require a modification of the existing remediation plan due to the relatively limited lateral extent of PSH and the existing plan for soil vapor extraction from the fourteen SVE wells.

Condition of Affected Groundwater

The condition of affected groundwater at previously existing monitor wells has not changed significantly from previous sampling events as evidenced by the information presented in Table 2.

Planned Changes to the Groundwater Monitoring Program

Disposal of Monitor Well Sampling Purge Water

Due to the small volume of purge water expected to be generated during any sampling event (50 gallons maximum from six monitor wells) and BTEX levels expected to be above the NMWQCC Standards, TW will dispose of all purge water currently stored on-site and all future volumes of purge water generated by placing it inside the secondary containment of the condensate tank so that the water may evaporate.

II. Summary of Remediation Activities

Remediation Activities Completed During 1995

The following remediation activities were completed during 1995: 1) Transwestern prepared and obtained approval from the NMOCD for a groundwater remediation plan, and 2) Transwestern installed fourteen SVE wells in accordance with the remediation plan.

Installation of Nine Soil Vapor Extraction (SVE) Wells

In accordance with the remediation plan submitted to the NMOCD, during August 1995, thirteen SVE wells were installed in the immediate vicinity of the petroleum hydrocarbon release area. Field observations during drilling activities indicated that an extension of the SVE well field toward the west of SVE-1 might be necessary for complete coverage of the area affected by petroleum hydrocarbons. Therefore, three additional soil borings were drilled west and northwest of SVE-1 as indicated in Figure 1. Only soil boring SB-14 indicated the presence of residual petroleum hydrocarbons and this boring was subsequently completed as SVE-14. As a result, a total of fourteen SVE wells were installed in the immediate vicinity of the petroleum hydrocarbon release area. The location of the fourteen SVE wells is indicated on an attached figure, Figure 1, as SVE-1 through SVE-14. A summary of completion details for each of the SVE wells is included in Table 3. A copy of the field generated soil boring logs is included as Attachment #3.

Current Status of Remediation Activities

Remediation activities, other than groundwater monitoring, are currently on hold pending completion of SVE activities at TW's Bell Lake Plant. The SVE blower/incinerator equipment currently located at the Bell Lake facility will be transferred to the Atoka-1 facility upon completion of SVE activities at the Bell Lake facility.

Initially, TW anticipated activities at the Bell Lake facility would be complete within approximately six months of system start-up. However, information obtained from more recent assessment activities indicate that the duration of SVE activities at the Bell Lake facility will likely take on the order of 12 months to complete. Furthermore, start-up of operation at the Bell Lake facility has been delayed pending the issuance of a permit from the NMED Air Pollution Control Bureau for air emissions from the SVE system. Transwestern has been informed that, due to a backlog of work at the NMED Air Pollution Control Bureau, the permit application is not likely to be processed until the latter part of May 1996. The remediation system at the Bell Lake facility will be placed in service as soon as practicable after obtaining the air permit. Assuming an operating duration of 12 months at the Bell Lake facility, TW anticipates the start-up of SVE activities at the Atoka-1 facility during mid-1997.

Remediation Activities Planned for 1996

As described in the previous section, no additional remediation activities other than groundwater monitoring are planned in 1996.

Semi-Annual Report of Groundwater Remediation Activities

**Transwestern Pipeline Company
Atoka-1 Compressor Station**

Figures

F:\USER\KILLIAN\DRAWINGS\ATOKA\ATKSITE.DWG

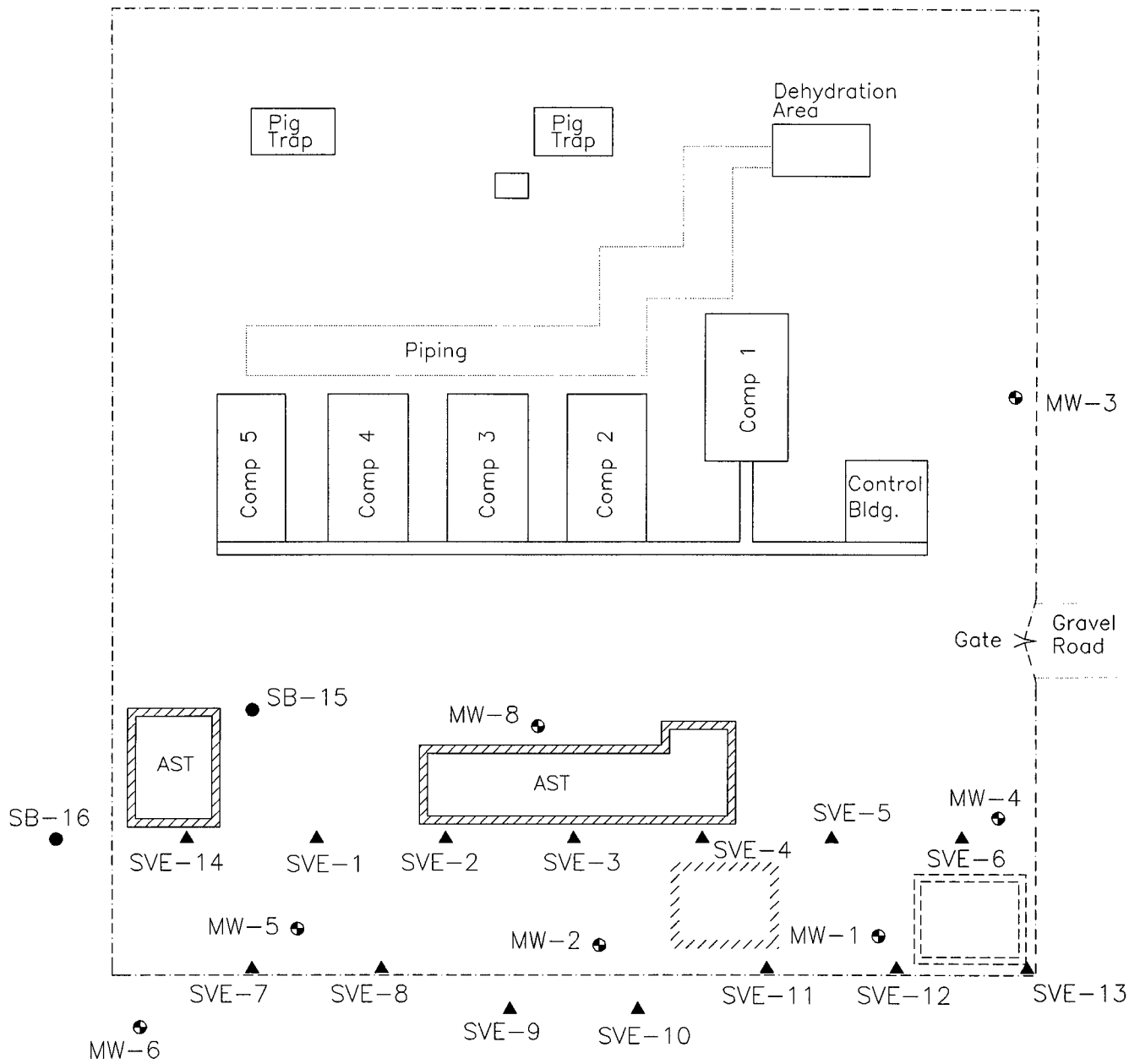


FIGURE 1

SITE MAP

Explanation

-  Containment wall
-  Fence

-  Monitor well
-  Soil vapor extraction well
-  Soil boring

ATOKA-1 COMPRESSOR STATION
TRANSWESTERN PIPELINE COMPANY

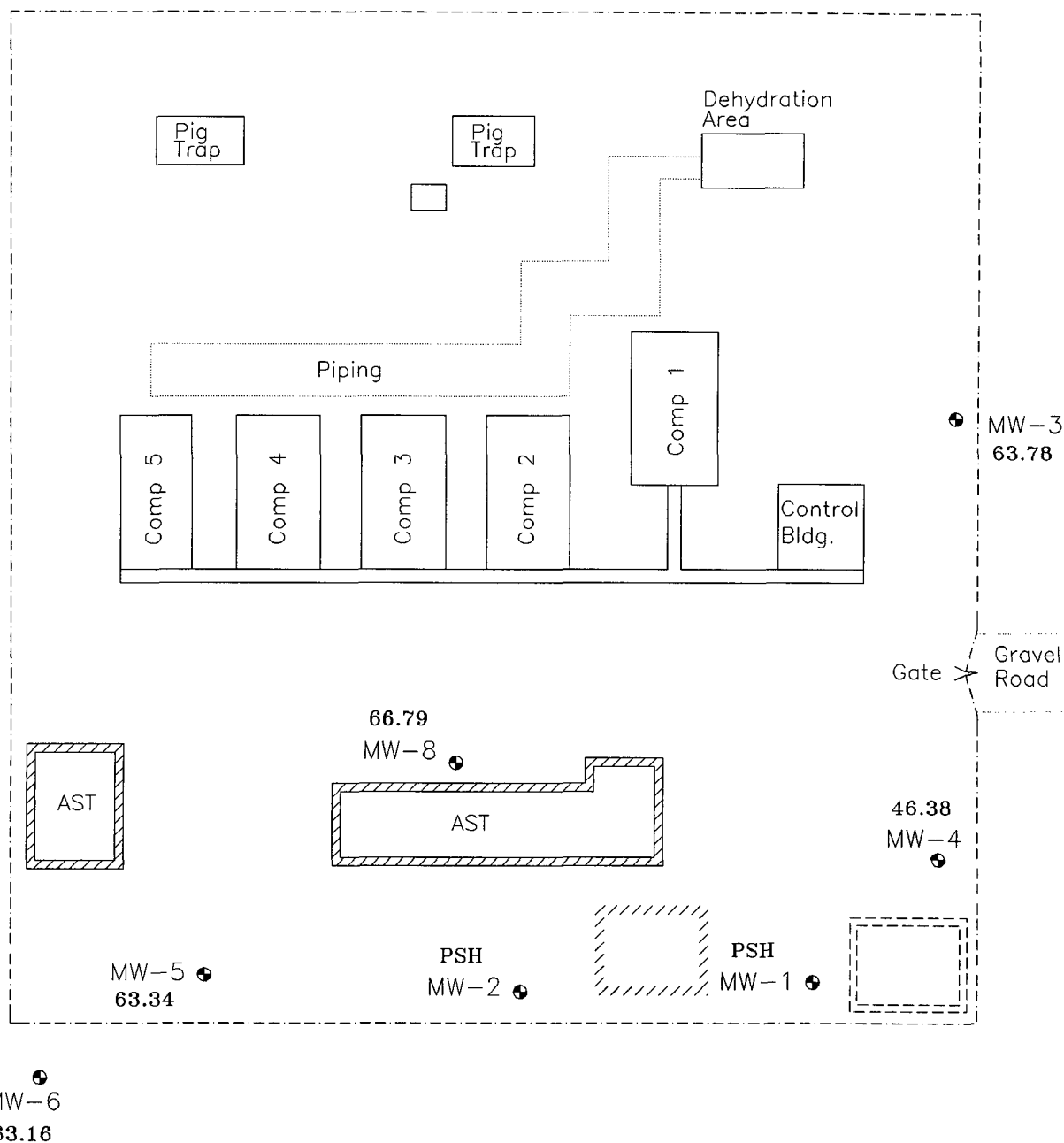
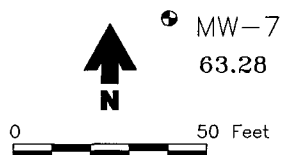


FIGURE 2

GROUND WATER ELEVATIONS (FEBRUARY 1996)

ATOKA-1 COMPRESSOR STATION
TRANSWESTERN PIPELINE COMPANY



Explanation

- Containment wall
- Fence

- Monitor well
- Ground water elevation
- PSH Phase separated hydrocarbon

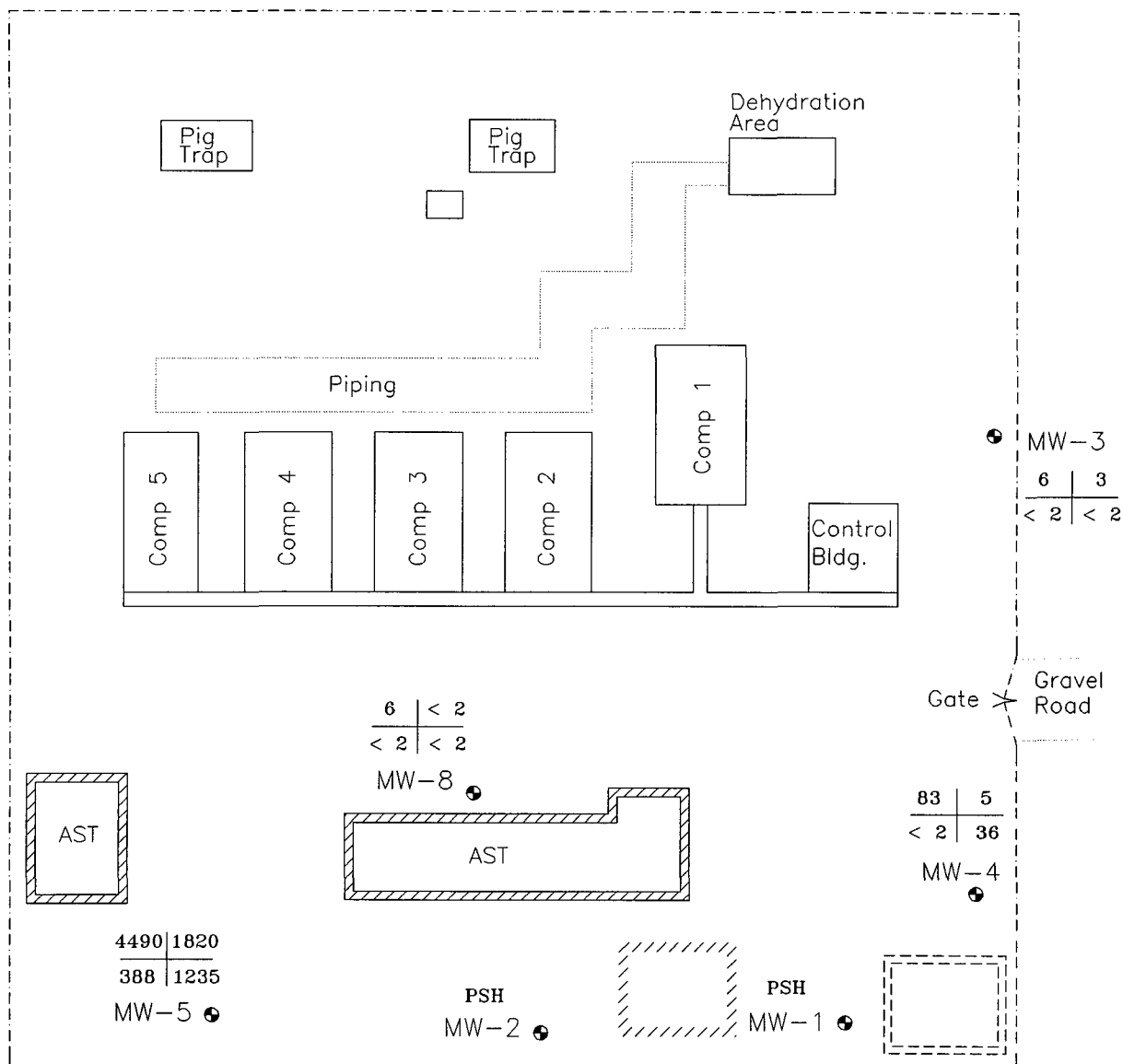
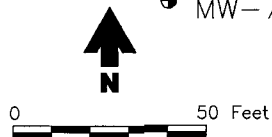


FIGURE 3

BTEX DISTRIBUTION (FEBRUARY 1996)

ATOKA-1 COMPRESSOR STATION
TRANSWESTERN PIPELINE COMPANY



Explanation

- Containment wall
- Fence

Monitor well

B	T
E	X

 BTEX concentration, ppb

Semi-Annual Report of Groundwater Remediation Activities

**Transwestern Pipeline Company
Atoka-1 Compressor Station**

Tables

**Table 1. Summary of Ground Water Surface Elevations
TW Atoka-1 Station**

Well	Top of Casing (ft)	Screen Interval (ft. bgs)	Sampling Date 7/21/93			Sampling Date 12/02/94			Sampling Date 10/30/95			Sampling Date 2/23/96		
			Depth to Hydrocarbon (HC) (ft)	Depth to Water or HC/Water Interface (ft)	Groundwater Surface Elevation (ft)	Depth to Hydrocarbon (HC) (ft)	Depth to Water or HC/Water Interface (ft)	Groundwater Surface Elevation (ft)	Depth to Hydrocarbon (HC) (ft)	Depth to Water or HC/Water Interface (ft)	Groundwater Surface Elevation (ft)	Depth to Hydrocarbon (HC) (ft)	Depth to Water or HC/Water Interface (ft)	Groundwater Surface Elevation (ft)
MW-1	94.65	53.5 - 63.5	(b)	(b)	(b)	56.12	56.82	38.39	(b)	56.83	(b)	57.52	57.89	37.06
MW-2	96.45	39 - 49	(a)	42.38	54.07	42.31	42.35	54.13	(b)	42.54	(b)	43.34	43.36	53.11
MW-3	95.00	45 - 55	(a)	36.55	58.45	(a)	32.23	62.77	(a)	31.80	63.20	(a)	31.22	63.78
MW-4	94.02	45 - 55	(a)	49.92	44.10	(a)	46.38	47.64	(a)	46.05	47.97	(a)	47.64	46.38
MW-5	98.22	29 - 54				(a)	34.40	63.82	(a)	34.80	63.42	(a)	34.88	63.34
MW-6	99.62	31 - 46				(a)	36.00	63.62	(a)	36.34	63.28	(a)	36.46	63.16
MW-7	99.14	31 - 46				(a)	45.58	53.56	(a)	35.87	63.27	(a)	35.86	63.28
MW-8	95.98	29 - 54				(a)	28.70	67.28	(a)	29.16	66.82	(a)	29.19	66.79

NOTES:

(a) Not applicable since no measurable thickness of hydrocarbon is present

(b) Information not available

(c) Corrections to ground water surface elevation for presence of hydrocarbon is calculated assuming a specific gravity of 0.8

**Table 2. Summary of Ground Water Analyses
TW Atoka-1 Station**

Well	Sampling Date	BTEX Concentration - (ug/L)			
		Benzene	Toluene	Ethylbenzene	Total xylenes
NMWQCC Standard		10	750	750	620
MW-1	07/21/93	(a)	(a)	(a)	(a)
	12/02/94	(a)	(a)	(a)	(a)
	10/30/95	(a)	(a)	(a)	(a)
	02/23/96	(a)	(a)	(a)	(a)
MW-2	07/21/93	3,600	400	9,800	3,170
	12/02/94	(a)	(a)	(a)	(a)
	10/30/95	(a)	(a)	(a)	(a)
	02/23/96	(a)	(a)	(a)	(a)
MW-3	07/21/93	7	<2	6	<2
	12/02/94	14	<2	<2	<4
	10/30/95	8.8	<0.5	<0.5	<0.5
	02/23/96	6	3	<2	<2
MW-4	07/21/93	61	4	20	68
	12/02/94	230	<2	60	130
	10/30/95	240	2.1	<0.5	92
	02/23/96	83	5	<2	36
MW-5	12/02/94	6,200	1,100	13,000	7,400
	11/02/95	6,800	4,500	930	3,500
	02/23/96	4,490	1,820	388	1,235
MW-6	12/02/94	360	50	<10	<20
	10/30/95	4,600	<5.0	190	<5.0
	02/23/96	1,000	9	222	9
MW-7	12/02/94	620	170	1,100	1,100
	10/30/95	2,200	440	460	270
	02/23/96	832	463	318	422
MW-8	01/01/95	<2	<2	<2	<4
	10/30/95	110	1.3	<0.5	130
	02/23/96	6	<2	<2	<2

a - No sample, phase separated hydrocarbon present

**Table 3. Summary of SVE Completions
TW Atoka-1 Compressor Station**

SVE Well	SVE-1	SVE-2	SVE-3	SVE-4	SVE-5	SVE-6	SVE-7	SVE-8	SVE-9	SVE-10	SVE-11	SVE-12	SVE-13	SVE-14
Completion Date	10/95	10/95	10/95	10/95	11/95	11/95	10/95	10/95	10/95	10/95	10/95	11/95	11/95	11/95
Hole Diameter	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"	6.125"
Completion Material	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC
Total Depth (bgs)	35'	43'	45'	53'	46'	43'	39.5'	41'	45'	58'	44'	45'	58'	40'
Screen Length (2" sch 40 - 0.010 slot)	20'	15'	20'	25'	20'	20'	20'	20'	20'	30'	20'	20'	30'	25'
Top of Screen (bgs)	15'	18'	25'	28'	26'	23'	19.5'	21'	24'	28'	24'	25'	28'	15'
Top of Sand (bgs)	13'	16'	23'	25'	22.5'	21.5'	17.5'	19'	21'	26.5'	22'	23'	24'	14'
Top of Bentonite Plug (bgs)	11'	14'	21'	22.5'	19'	18'	15'	17'	19'	23'	20'	20.5'	22'	11.5'
Top of Grout (bgs)	2'	2'	2'	2'	2'	2'	2'	2'	2'	2'	2'	2'	2'	2'

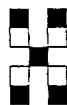
NOTE:
bgs - below ground surface

Semi-Annual Report of Groundwater Remediation Activities

**Transwestern Pipeline Company
Atoka-1 Compressor Station**

Attachment #1

**Lab Reports for the October 1995
Groundwater Sampling Event**



**Hall Environmental
Analysis Laboratory**

Hall Environmental Analysis Laboratory
4901 Hawkins, NE Suite C
Albuquerque, NM 87109
(505)345-3975

11/13/95

Daniel B. Stephens and Associates, Inc.
6020 Academy NE, Suite 100
Albuquerque, NM 87109

Dear Mr. Bob Marley,

Enclosed are the results for the analyses that were requested. These were done according to EPA procedures or the equivalent.

Detection limits are determined by EPA methodology. No determination of compounds below these levels (denoted by the < sign) has been made.

Please don't hesitate to contact me for any additional information or clarifications.

Sincerely,

11/13/95

Scott Hallenbeck, Lab Manager

Project: Enron-Atokal

4901 Hawkins NE Suite C Albuquerque, NM 87109

Results for sample: MW-3

Date collected: 10/30/95	Date received: 10/31/95
Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: 9510123-1
Project Manager: Bob Marley	Sampled by: B.M./C.P.
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	8.8	0.5	PPB (µg/L)
Toluene	nd	0.5	PPB (µg/L)
Ethylbenzene	nd	0.5	PPB (µg/L)
Total Xylenes	nd	0.5	PPB (µg/L)

BFB (Surrogate) Recovery = 100 %

Dilution Factor = 1

Results for sample: MW-4

Date collected: 10/30/95	Date received: 10/31/95
Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: 9510123-2
Project Manager: Bob Marley	Sampled by: B.M./C.P.
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	240	0.5	PPB (µg/L)
Toluene	2.1	0.5	PPB (µg/L)
Ethylbenzene	nd	0.5	PPB (µg/L)
Total Xylenes	92	0.5	PPB (µg/L)

BFB (Surrogate) Recovery = 110 %

Dilution Factor = 1

Results for sample: MW-6

Date collected: 10/30/95	Date received: 10/31/95
Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: 9510123-3
Project Manager: Bob Marley	Sampled by: B.M./C.P.
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	4,600	5.0	PPB (µg/L)
Toluene	nd	5.0	PPB (µg/L)
Ethylbenzene	190	5.0	PPB (µg/L)
Total Xylenes	nd	5.0	PPB (µg/L)

BFB (Surrogate) Recovery = 101 %

Dilution Factor = 10

Results for sample: MW-7

Date collected: 10/30/95	Date received: 10/31/95
Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: 9510123-4
Project Manager: Bob Marley	Sampled by: B.M./C.P.
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	2,200	10.0	PPB (µg/L)
Toluene	440	10.0	PPB (µg/L)
Ethylbenzene	460	10.0	PPB (µg/L)
Total Xylenes	270	10.0	PPB (µg/L)

BFB (Surrogate) Recovery = 98 %

Dilution Factor = 20

Results for sample: MW-8

Date collected: 10/30/95	Date received: 10/31/95
Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: 9510123-5
Project Manager: Bob Marley	Sampled by: B.M./C.P.
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	110	0.5	PPB (µg/L)
Toluene	1.3	0.5	PPB (µg/L)
Ethylbenzene	nd	0.5	PPB (µg/L)
Total Xylenes	130	0.5	PPB (µg/L)

BFB (Surrogate) Recovery = 104 %

Dilution Factor = 1

Results for sample: Trip Blank

Date collected: 10/26/95	Date received: 10/31/95
Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: 9510123-6
Project Manager: Bob Marley	Sampled by: NA
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	nd	0.5	PPB (µg/L)
Toluene	nd	0.5	PPB (µg/L)
Ethylbenzene	nd	0.5	PPB (µg/L)
Total Xylenes	nd	0.5	PPB (µg/L)

BFB (Surrogate) Recovery = 96 %

Dilution Factor = 1

Results for QC: Reagent Blank

Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: RB 10/31
Project Manager: Bob Marley	Sampled by: NA
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	nd	0.5	PPB (µg/L)
Toluene	nd	0.5	PPB (µg/L)
Ethylbenzene	nd	0.5	PPB (µg/L)
Total Xylenes	nd	0.5	PPB (µg/L)

BFB (Surrogate) Recovery = 109 %

Dilution Factor = 1

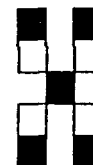
Results for QC: Matrix Spike / Matrix Spike Dup

Date extracted: NA	Date analyzed: 10/31/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atokal	HEAL #: 9510106-1 MS/MSD
Project Manager: Bob Marley	
Matrix: Aqueous	Units: PPB (µg/L)

Test: EPA 8020

Compound	Sample Result	Amount Added	Matrix Spike	MS %	Dup	MS MSD %	RPD
Benzene	< 0.5	20.0	18.7	94	20.1	101	7
Toluene	< 0.5	20.0	18.4	92	19.1	96	4
Ethylbenzene	< 0.5	20.0	17.7	89	18.5	93	4
Total Xylenes	< 0.5	60.0	54.8	91	57.8	96	5

CHAIN-OF-CUSTODY RECORD



HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: Daniel B. Stephens : Assoc

Project Name:

ENRON - Atoka

Address: 6020 Academy NE Suite 100
Albuquerque NM 87109

Project #:

5151

Project Manager:

Bob Marley

Phone #: 822 - 9400

Sampler: BM/CP

Fax #: 822 - 8877

Samples Cold?

☐ Yes

☐ No

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative			HEAL No.	BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles	EDB (Method 504.1)	EDC	610 (PNA or PAH)			Air Bubbles or Headspace (Y or N)
					HgCl ₂	HCl	Other														
10/30/95	1610	H ₂ O	MW-3	2/40ml	X			9510123-1	X												N
10/30/95	1650	H ₂ O	MW-4	2/40ml	X			-2	X												N
10/30/95	1050	H ₂ O	MW-6	2/40ml	X			-3	X												N
10/30/95	0915	H ₂ O	MW-7	3/40ml	X			-4	X												N
10/30/95	1430	H ₂ O	MW-8	2/40ml	X			-5	X												N
10/26/95	—	H ₂ O	Trip Blank	1/40ml	X			-6	X												N

Date: 10/31/95 Time: 1130 Relinquished By: (Signature)

Bob Marley

Received By: (Signature)

Bob Marley

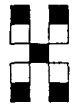
Remarks:

Date: 10/31/95 Time: 1130 Relinquished By: (Signature)

Bob Marley

Received By: (Signature)

Bob Marley



**Hall Environmental
Analysis Laboratory**

Hall Environmental Analysis Laboratory
4901 Hawkins, NE Suite C
Albuquerque, NM 87109
(505)345-3975

11/13/95

Daniel B. Stephens and Associates, Inc.
6020 Academy NE, Suite 100
Albuquerque, NM 87109

Dear Mr. Bob Marley,

Enclosed are the results for the analyses that were requested. These were done according to EPA procedures or the equivalent.

Detection limits are determined by EPA methodology. No determination of compounds below these levels (denoted by the < sign) has been made.

Please don't hesitate to contact me for any additional information or clarifications.

Sincerely,

Scott Hallenbeck, Lab Manager

Project: Enron-Atoka-1

4901 Hawkins NE Suite C Albuquerque, NM 87109

Results for sample: MW-5

Date collected: 11/2/95	Date received: 11/3/95
Date extracted: NA	Date analyzed: 11/8/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atoka-1	HEAL #: 9511019-1
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	6,800	0.5	PPB (µg/L)
Toluene	4,500	0.5	PPB (µg/L)
Ethylbenzene	930	0.5	PPB (µg/L)
Total Xylenes	3,500	0.5	PPB (µg/L)

BFB (Surrogate) Recovery = 102 %

Dilution Factor = 100

Results for sample: Composite Cuttings

Date collected: 11/2/95	Date received: 11/3/95
Date extracted: 11/3,6/95	Date analyzed: 11/6/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atoka-1	HEAL #: 9511019-2
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Non-Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	nd	0.05	PPM (mg/kg)
Toluene	nd	0.05	PPM (mg/kg)
Ethylbenzene	nd	0.05	PPM (mg/kg)
Total Xylenes	nd	0.05	PPM (mg/kg)

BFB (Surrogate) Recovery = 117 %

Dilution Factor = 1

Test: EPA 418.1

Compound	Result	Det. Limit	Units
Petroleum Hydrocarbons	62	20	PPM (mg/kg)

Dilution Factor = 1

Results for QC: Reagent Blank

Date extracted: NA	Date analyzed: 11/8/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atoka-1	HEAL #: RB 11/8
Project Manager: Bob Marley	Sampled by: NA
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	nd	0.5	PPB (µg/L)
Toluene	nd	0.5	PPB (µg/L)
Ethylbenzene	nd	0.5	PPB (µg/L)
Total Xylenes	nd	0.5	PPB (µg/L)

BFB (Surrogate) Recovery = 101 %

Dilution Factor = 1

Results for QC: Reagent Blank

Date extracted: 11/6/95	Date analyzed: 11/6/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atoka-1	HEAL #: RB 11/6
Project Manager: Bob Marley	Sampled by: NA
Matrix: Non-Aqueous	

Test: EPA 8020

Compound	Result	Det. Limit	Units
Benzene	nd	0.05	PPM (mg/kg)
Toluene	nd	0.05	PPM (mg/kg)
Ethylbenzene	nd	0.05	PPM (mg/kg)
Total Xylenes	nd	0.05	PPM (mg/kg)

BFB (Surrogate) Recovery = 98 %

Dilution Factor = 1

Results for QC: Reagent Blank / Blank Spike / Duplicate

Date extracted: 11/3/95	Date analyzed: 11/6/95
Client: Daniel B. Stephens and Associates	
Project Name: Enron Atoka-1	HEAL #: 9511013-1 Dup/BS
Project Manager: Bob Marley	
Matrix: Non- Aqueous	Units: PPM (mg/kg)

Test: EPA 418.1

Reagent Blank:

<u>Compound</u>	<u>Result</u>	<u>Units</u>
Total Petroleum Hydrocarbons	<20	PPM (mg/kg)

Dilution Factor = 1

Test: EPA 418.1

Blank Spike:

<u>Compound</u>	<u>Sample</u>	<u>Amount Spiked</u>	<u>Result Recovered</u>	<u>% Recovery</u>
Total Petroleum Hydrocarbons	<20	100	102	102

Sample Duplicate 9511013-1:

<u>Compound</u>	<u>Sample</u>	<u>Sample Duplicate</u>	<u>RPD</u>
Total Petroleum Hydrocarbons	<20	<20	NA

Results for QC: Matrix Spike / Matrix Spike Dup

Date extracted: 11/6/95	Date analyzed: 11/7/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atoka-1	HEAL #: 9511016-8 MS/MSD
Project Manager: Bob Marley	
Matrix: Non-Aqueous	Units: PPM (mg/kg)

Test: EPA 8020

Compound	Sample Result	Amount Added	Matrix Spike	MS %	MS Dup	MSD %	RPD
Benzene	<0.05	1.00	1.01	101	1.02	102	1
Toluene	<0.05	1.00	1.01	101	1.01	101	0
Ethylbenzene	<0.05	1.00	1.01	101	1.01	101	0
Total Xylenes	<0.05	3.00	3.01	100	2.96	99	2

Results for QC: Blank Spike / Blank Spike Dup

Date extracted: NA	Date analyzed: 11/8/95
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron-Atoka-1	HEAL #: BS/BSD 11/8.
Project Manager: Bob Marley	
Matrix: Aqueous	Units: PPB (µg/L)

Test: EPA 8020

Compound	Sample Result	Amount Added	Blank Spike	BS %	BS Dup	BSD %	RPD
Benzene	<0.5	20.0	20.1	101	19.7	99	2
Toluene	<0.5	20.0	20.3	102	20.2	101	0
Ethylbenzene	<0.5	20.0	20.3	102	20.2	101	0
Total Xylenes	<0.5	60.0	59.7	100	59.6	99	0

CHAIN-OF-CUSTODY RECORD

Client: DANIEL B. STEPHENS &
ASSOC.

Address: 602D ACADEMY NE
#150

ALBUQUERQUE NM
87109

Phone #: 505-822-9460

Fax #:

Project Name: ENRON ATOKA-)

Project #:
5151

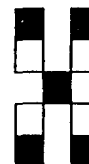
Project Manager:
BOB MARLEY

Sampler: C, P16MAN

Samples Cold? ☒ Yes ☐ No

[illegible]

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
3/95	1610		
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)



HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

ANALYSIS REQUEST

			X	X	BTEX (Method 602/8020)
					BTEX + MTBE (602/8020)
					TPH Method 8015 MOD (Gas/Diesel)
					BTEX + TPH + MTBE (Gasoline Only) .
					BTEX + MTBE + TPH (Gas + Diesel)
			X		TPH (Method 418.1)
					601/602 Volatiles
					EDB (Method 504.1)
					EDC
					610 (PNA or PAH)
					Air Bubbles or Headspace (Y or N)

Remarks: Chlorinated solvents?

Semi-Annual Report of Groundwater Remediation Activities

**Transwestern Pipeline Company
Atoka-1 Compressor Station**

Attachment #2

**Lab Reports for the February 1996
Groundwater Sampling Event**



NATIONAL
ENVIRONMENTAL
TESTING, INC.

Dallas Division
1548 Valwood Parkway
Suite 118
Carrollton, TX 75006
Tel: (214) 406-8100
Fax: (214) 484-2969

ANALYTICAL AND QUALITY CONTROL REPORT

George Robinson
ENRON CORPORATION
Env. Affairs, Rm 3 AC 3142
P.O. Box 1188
Houston, TX 77251

03/04/1996

NET Job Number: 96.01432

Enclosed is the Analytical and Quality Control report for the following samples submitted to the Dallas Division of NET, Inc. for analysis. Reproduction of this analytical report is permitted only in its entirety.

<u>Sample Number</u>	<u>Sample Description</u>	<u>Date Taken</u>	<u>Date Received</u>
295899	MW-3	02/23/1996	02/26/1996
295900	MW-4	02/23/1996	02/26/1996
295901	MW-5	02/23/1996	02/26/1996
295902	MW-6	02/23/1996	02/26/1996
295903	MW-7	02/23/1996	02/26/1996
295904	MW-8	02/23/1996	02/26/1996

National Environmental Testing, Inc. certifies that the analytical results contained herein apply only to the specific samples analyzed.

Holding Times: All holding times were within method criteria.

Method Blanks: All method blanks were within quality control criteria.

Instrument calibration: All calibrations were within method quality control criteria.

Analysis Comments: No Unusual Comments


Gregory K. Horton
Project Manager



ANALYTICAL REPORT

George Robinson
ENRON CORPORATION
Env. Affairs, Rm 3 AC 3142
P.O. Box 1188
Houston, TX 77251

03/04/1996
Job No.: 96.01432

Page: 2

Project Name: TWP-ATORA-1 COMPRESSOR STATION

Date Received: 02/26/1996

295899 MW-3
Taken: 02/23/1996 13:40

EPA-8020 AQ (PRESERVED)

Benzene	6	ug/L
Ethylbenzene	<2	ug/L
Toluene	3	ug/L
Xylenes, Total	<2	ug/L
SURR: a,a,a-TFT	90	% Rec

295900 MW-4
Taken: 02/23/1996 14:00

EPA-8020 AQ (PRESERVED)

Benzene	83	ug/L
Ethylbenzene	<2	ug/L
Toluene	5	ug/L
Xylenes, Total	36	ug/L
SURR: a,a,a-TFT	80	% Rec

295901 MW-5
Taken: 02/23/1996 14:35

EPA-8020 AQ (PRESERVED)

Benzene	4490	ug/L
Ethylbenzene	388	ug/L
Toluene	1820	ug/L
Xylenes, Total	1235	ug/L
SURR: a,a,a-TFT	82	% Rec

295902 MW-6
Taken: 02/23/1996 14:20

EPA-8020 AQ (PRESERVED)

Benzene	1000	ug/L
Ethylbenzene	222	ug/L
Toluene	9	ug/L
Xylenes, Total	9	ug/L
SURR: a,a,a-TFT	88	% Rec



ANALYTICAL REPORT

George Robinson
ENRON CORPORATION
Env. Affairs, Rm 3 AC 3142
P.O. Box 1188
Houston, TX 77251

03/04/1996
Job No.: 96.01432

Page: 3

Project Name: TWP-ATORA-1 COMPRESSOR STATION

Date Received: 02/26/1996

295903 MW-7
Taken: 02/23/1996 14:15

EPA-8020 AQ (PRESERVED)

Benzene	832	ug/L
Ethylbenzene	318	ug/L
Toluene	463	ug/L
Xylenes, Total	422	ug/L
SURR: a,a,a-TFT	100	% Rec

295904 MW-8
Taken: 02/23/1996 13:50

EPA-8020 AQ (PRESERVED)

Benzene	6	ug/L
Ethylbenzene	<2	ug/L
Toluene	<2	ug/L
Xylenes, Total	<2	ug/L
SURR: a,a,a-TFT	110	% Rec



QUALITY CONTROL REPORT
Continuing Calibration Verification
(CCV)

JOB NUMBER: 96.01432

PARAMETER	ANALYST	DATE ANALYZED	METHOD	CCV RESULT	CCV TRUE CONCENTRATION	% REC.	FLAG
EPA-8020 AQ (PRESERVED)			S-8020M				
Benzene	bgm	02/29/1996	S-8020M	20	20	100	NA
Ethylbenzene	bgm	02/29/1996	S-8020M	22	20	110	NA
Toluene	bgm	02/29/1996	S-8020M	20	20	100	NA
Xylenes, Total	bgm	02/29/1996	S-8020M	66	60	110	NA
EPA-8020 AQ (PRESERVED)			S-8020M				
Benzene	bgm	03/01/1996	S-8020M	20	20	100	NA
Ethylbenzene	bgm	03/01/1996	S-8020M	22	20	110	NA
Toluene	bgm	03/01/1996	S-8020M	21	20	105	NA
Xylenes, Total	bgm	03/01/1996	S-8020M	67	60	112	NA
EPA-8020 AQ (PRESERVED)			S-8020M				
Benzene	bgm	03/04/1996	S-8020M	16	20	80	NA
Ethylbenzene	bgm	03/04/1996	S-8020M	18	20	90	NA
Toluene	bgm	03/04/1996	S-8020M	16	20	80	NA
Xylenes, Total	bgm	03/04/1996	S-8020M	56	60	93	NA

Method References and Codes

The Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

E-100 through 493: "Methods for Chemical Analysis of Water & Wastes",
U.S. EPA, 600/4-79-020, rev. 1983.

E-601 through 625: "Guidelines Establishing Test Procedures for the
Analysis of Pollutants", U.S. EPA, 40CFR, Part 136,
rev. 1990.

S-1000 through 9999: "Test Methods for Evaluating Solid Waste", U.S. EPA
SW-846, 3rd Edition, 1986.

A: "Standard Methods for the Examination of Water and
Wastewater", 16th Edition, APHA, 1985.

SM: "Standard Methods for the Examination of Water and
Wastewater", 18th Edition, APHA, 1992.

D: ASTM Method

M: Method has been modified

*: Other Reference



QUALITY CONTROL REPORT BLANKS

JOB NUMBER: 96.01432

PARAMETER	DATE	BLANK	UNITS	REPORTING	FLAG
	ANALYZED			LIMIT	
EPA-8020 AQ (PRESERVED)					
Benzene	02/29/1996	<2	ug/L	2	NA
Ethylbenzene	02/29/1996	<2	ug/L	2	NA
Toluene	02/29/1996	<2	ug/L	2	NA
Xylenes, Total	02/29/1996	<2	ug/L	2	NA

Advisory Control Limits for Blanks

Metals/Wet Chemistry/Conventionals/GC - All compounds should be less than the Reporting Limit.

GC/MS Semi-Volatiles - All compounds should be less than the Reporting Limit except for phthalates which should be less than 5 times the Reporting Limit.

GC/MS Volatiles - Toluene, Methylene chloride, Acetone and Chloroform should be less than 5 times the Reporting Limit. All other volatile compounds should be less than the Reporting Limit.



QUALITY CONTROL REPORT
Laboratory Control Sample
(LCS)

JOB NUMBER: 96.01432

PARAMETER	LCS	TRUE	LCS	FLAG
	RESULT	CONC.	% REC.	
EPA-8020 AQ (PRESERVED)				
Benzene	21	20	105	
Ethylbenzene	22	20	110	
Toluene	19	20	95	
Xylenes, Total	65	60	108	

Advisory Control Limits for LCS

Inorganic Parameters - The LCS recovery should be 80-120%.



QUALITY CONTROL REPORT
Matrix Spike / Matrix Spike Duplicate
(MS / MSD)

JOB NUMBER: 96.01432

PARAMETER	SAMPLE RESULT	MS RESULT	MSD RESULT	SPIKE AMOUNT	MS % REC.	MSD % REC.	MS/MSD RPD	FLAG
EPA-8020 AQ (PRESERVED)								
Benzene	<2	16	18	20	80	90	12	
Ethylbenzene	<2	17	20	20	85	100	16	
Toluene	<2	16	19	20	80	95	17	
Xylenes, Total	<2	53	62	60	88	103	16	

Advisory Control Limits for MS/MSDs

Inorganic Parameters - The spike recovery should be 75-125% if the spike amount value is greater than or equal to one fourth of the sample result value. The RPD for the MS/MSD should be less than 20.

NOTE: Matrix Spike Samples may not be samples from this job.



COMPANY ENRON OPERATIONS (CORP)
ADDRESS P.O. BOX 1188 HOUSTON, TX 77251
PHONE (713) 646-7252 FAX (713) 646-7867
PROJECT NAME/LOCATION TWP-ATOKA-1 COMPRESSOR STATION
PROJECT NUMBER 00000000000000000000
PROJECT MANAGER 00000000000000000000

GEORGE ROBINSON,
TULSA OPERATIONS (LORD)
ATTN: 3AC 312/2
REPORT TO: F.O. BOX 1188
INVOICE TO: HOUSTON, TX 7725
P.O. NO. _____
NET QUOTE NO. _____

SAMPLED BY
SANDY SHARP
(PRINT NAME)

SIGNATURE _____

SIGNATURE _____

			# and Type of Containers							OTHER
DATE	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	HCl	NaOH	HNO ₃	H ₂ SO ₄	
2/23	1340	MW-3	A	X						
(	1400	MW-4	(	(	(					
{	1435	MW-5	{	{	{					
}	1420	MW-6	}	}	}					
)	1415	MW-7	)	)	)					
	350	MW-8								

To assist us in selecting the proper method

Is this work being conducted for regulatory compliance monitoring? Yes ☒ No ☐

Is this work being conducted for regulatory enforcement action? Yes ☐ No ☒

Which regulations apply: RCRA ☐ NPDES Wastewater ☐
UST ☐ Drinking Water ☐
Other ☒ None ☐

COMMENTS

CONDITION OF SAMPLE: BOTTLES INTACT? YES / NO
FIELD FILTERED? YES / NO NA

COC SEALS PRESENT AND INTACT? YES/NO
VOLATILES FREE OF HEADSPACE? YES/NO

TEMPERATURE UPON RECEIPT: _____
Bottles supplied by NET? YES/ NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA _____
I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS

DATE 2/23/90

RELINQUISHED BY: <i>[Signature]</i>	DATE <i>2/27/96</i>	TIME <i>1500</i>
--	------------------------	---------------------

RECEIVED BY:	RELINQUISHED BY:
--------------	------------------

DATE 2/26/96	TIME 10:00	RECEIVED FOR NET BY: RS Devitt
-----------------	---------------	-----------------------------------

METHOD OF SHIPMENT

REMARKS:

AM



Semi-Annual Report of Groundwater Remediation Activities

**Transwestern Pipeline Company
Atoka-1 Compressor Station**

Attachment #3

**Boring Logs for the SVE Soil Borings
Drilled During October 1995**

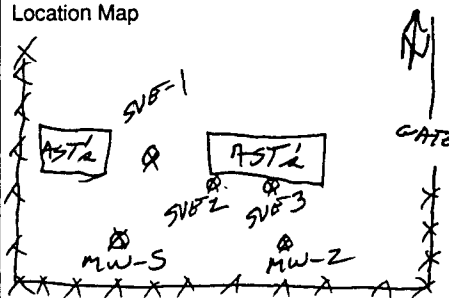


Site ENRON ATOKA -1							Location Map	
Logged by C. PIGMAN			Client/Project # 5151					
Boring Number SVE-1			Drilling Co. EAD&Z					
Drilling Method AIR ROTARY 6 1/8 DIA BIT			Drill Rig WINGERSOL RANKO TIT 75W					
Date Started 10/30/95			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
424		GRAB CUTTINGS		4'-5'			5	SANDY LIMESTONE (CALICHE) PINK (7.5YR 8/3) 85% LIMESTONE W/ 15% V FINE GR SAND, SLIGHTLY CONSOLIDATED, DRY
885		"		9-10	11' TOP BOUNDARY	CALICHE SANDY LIMESTONE	10	SANDY LIMESTONE (CALICHE) PINKISH WHITE (7.5YR 8/2) 75% LIMESTONE W/ 25% V FINE GR SAND TO FINE GR SAND, SLIGHTLY CONSOLIDATED, DRY
540		"		14-15	13' TOP SAND		15	12' STRONG H.C. odor SANDY LIMESTONE, SAME AS ABOVE
444		"		19-20		CALICHE SANDY LIMESTONE	19	
689		"		24-25		CALICHE SANDY LIMESTONE	25	CALCAREOUS SILTY SAND PINK (7.5YR 8/3) V. FINE TO FINE GR, MOD TO POORLY SORTED, ROUNDED GR, 65% SAND IN 35% MATRIX OF CARBONATE & SILT SLIGHTLY CONSOLIDATED, DRY
886		"		29-30		CALICHE SANDY LIMESTONE	29	CALCAREOUS SILTY SAND PINK (5YR 7/4) V. FINE TO MED GR, POORLY SORTED, SUBROUNDED GR, 80% SAND WITH 10% SILT & CARBONATE MATRIX, SLIGHTLY CONSOLIDATED, DAMP
546		GRAB CUTTINGS		34-35		CALICHE SANDY LIMESTONE	34	SANDY CLAY DUSKY RED (2.5YR 4/4) V. FINE TO FINE GR, MOD SORTED, UNCONSOLIDATED, WET 90% SAND W/ 10% SILT & SCLAY
251		GRAB CUTTINGS		36-36.5		CALICHE SANDY LIMESTONE	36	34' DRY W/ SOME GYPSUM
						CLAY W/ INTERBEDS OF GYPSUM	35	CLAY W/ INTERBEDS OF GYPSUM, CLAY DARK RED (10R 3/6) MOD PLASTICITY, GYPSUM, WHITE AND CRYSTALLINE
							40	T.O. 35'
							45	



Site <u>ENRON ATOKA -</u>							Location Map	
Logged by <u>C. PIGMAN</u>			Client/Project # <u>5151</u>					
Boring Number <u>SVE-2</u>			Drilling Co. <u>EAPES</u>					
Drilling Method <u>AIR ROTARY 6 1/8" BIT</u>			Drill Rig <u>TH 75W INGER SOL-RAND</u>					
Date Started <u>10/31/95</u>			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
0.1		<u>GRAD CUTTINGS</u>		4-5			5	LIMESTONE (CALICHE), PINK (7.5YR 8/3) SILT TO GRAVEL SIZE LIMESTONE CLASTS, MINDA SAND, SLIGHTLY CONSOLIDATED, DRY
0.1		11		7-10			10	SANDY LIMESTONE (CALICHE) PINK (7.5YR 8/3) 45% SAND IN 55% MATRIX OF SILT + CARBONATE SAND FINE GR, WELL SORTED, ROUNDED GR, SLIGHTLY CONSOLIDATED, DRY
0.3		11		14-15			15	SANDY LIMESTONE SAME AS ABOVE
0.4		11		19-20			19 20	CALCAREOUS SANDSTONE, PINK (5YR 7/4) V. FINE TO FINE GR, POORLY SORTED, SUB ROUNDED GR, 55% SAND IN 45% SILT + CARBONATE MATRIX, SLIGHTLY CONSOLIDATED, DAMP
0.5		11		24-25			25	CALCAREOUS SILTY SANDSTONE, WEAK RED (2.5YR 6/4) V. FINE TO MED GR, POORLY SORTED, SUBANGULAR GR, SLIGHTLY CONSOLIDATED, MOIST 65% SAND 25% SILT, 10% CLAY
1.0		11		29-30		CLAY SAND INTERBEDS OF MUDST.	28 30	CLAY SANDSTONE, WEAK RED (4.0YR 4/4) V. FINE TO FINE GR, POORLY SORTED, SUB ROUNDED GR, UNCONSOLIDATED, WET 80% SAND 20-100% CLAY, INTERBEDS OF MUDSTONE
24.3		11		34-35			35	GYP SUM W/ INTERBEDS OF MUDSTONE GYP SUM WHITE, MUDSTONE WEAK RED MUDSTONE HAS HIGH PLASTICITY
104.3		<u>GRAD CUTTINGS</u>		39-40			46	MUDSTONE W/ INTERBEDS OF GYP SUM SAME AS ABOVE, MUDSTONE WET
86.5		<u>GRAD CUTTINGS</u>		42-43			45	HOSTLY MUDSTONE W/ FEW INTERBEDS OF GYP SUM MUDSTONE T.D. = 43 RED (2.5YR 5/6), HIGH PLASTICITY SLIGHTLY CONSOLIDATED, WET

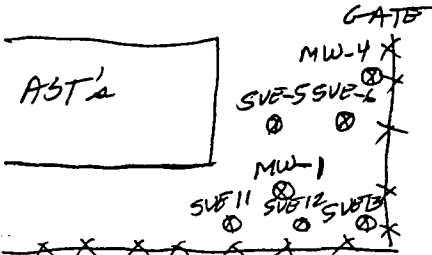


Site <u>ENRON ATOKA - 1</u>							Location Map	
Logged by <u>C. PIGMAN</u>			Client/Project # <u>5151</u>					
Boring Number <u>SUB-3</u>			Drilling Co. <u>ENRONS</u>					
Drilling Method <u>AIR ROTARY 6 1/2" BIT</u>			Drill Rig <u>INGERSOLL RAND TH 75W</u>					
Date Started <u>10/31/95</u>			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
15.8		<u>GRAB CUTTINGS</u>		4-5			5	SANDY L.S. AND CALCAREOUS S.S., PINKISH WHITE (7.5YR 8/2) FINE TO MED GR SAND WELL SORTED, ROUND GR, SLIGHTLY CONSOLIDATED, MOIST, 40-70% SAND IN
4.5		11		9-10			10	60-30% CARBONATE MATRIX CALCAREOUS S.S., PINKISH WHITE (7.5YR 8/2) FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DAMP, 75% SAND IN 25% MATRIX OF SILT + CARBONATE
3.0		11		14-15			15	CALCAREOUS S.S., SAME AS ABOVE SLIGHTLY DARKER IN COLOR PINK (7.5YR 8/3)
5.2		11		19-20			20	CALCAREOUS SILTY S.S., PINK 7.5YR 8/3 VERY FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DAMP, 80% SAND 20% SILT + CARBONATE
2.2		11		24-25			25	CALCAREOUS S.S., PALE RED (2.5YR 7/4) FINE TO FINE GR, POORLY SORTED, SUBANGULAR TO SUBROUND GR, SLIGHTLY CONSOLIDATED, MOIST, 80% SAND 20% CARBONATE SILT AT 26' ENCOUNTER CLAY
13.5		11		29-30			30	CLAY W/ INTER BEDS OF GYPSUM CLAY RED (2.5YR 5/6) HIGH PLASTICITY, UNCONSOLIDATED, WET GYPSUM, PINK TO RED, CRYSTALLINE, DRY
10.3		11		34-35		CLAY W/ INTER BEDS OF GYPSUM	35	32' BECOMES DRIER W/ GYPSUM. DAMP AGAIN AT 34'. CLAY W/ INTER BEDS OF GYPSUM SAME AS ABOVE
14.1		11		39-40			40	CLAY W/ INTER BEDS OF GYPSUM SAME AS ABOVE - SOME CLAY BEDS SATURATED
8.2		<u>GRAB CUTTINGS</u>		44-45			45	CLAY W/ INTER BEDS OF GYPSUM SAME AS ABOVE, SOME CLAY BEDS SATURATED, FEWER GYPSUM LAYERS



Site ENRON ATO KA-1							Location Map	
Logged by C. PIGMAN			Client/Project # 5151					
Boring Number SVE-4			Drilling Co. EAD03					
Drilling Method AIR ROTARY 6 1/2" BIT			Drill Rig INGERSOLL RAND TH 75W					
Date Started 10/31/95			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks
19.9		GRAB CUTTINGS		4-5		CLAYEY SAND	5	CALCAREOUS SAND, PINKISH GRAY (5YR 6/2) FINE TO MED GR, MOD SORTED, ROUNDED GR, SUBCONSOLIDATED, DRY, 60% SAND IN 40% MATRIX OF SILT + CARBONATE
30.9		11		9-10		CLAYEY SAND	10	SAND W/ CLAY, PINKISH GRAY (5YR 6/2) FINE TO MED GR, POORLY SORTED, SUBROUND GR, UNCONSOLIDATED, DAMP, 85% SAND, 15% SILT, 10% CLAY
NA		NA	NO RECOVERY OF CUTTINGS	14-15		CLAYEY SAND	15	SAME AS ABOVE ??
68.4		11		19-20		CLAYEY SAND	20	CLAYEY SAND, BROWN (5YR 5/3) FINE TO COARSE GR, POORLY SORTED
							22	SUBANGULAR TO ROUNDED GR, UNCONSOLIDATED, WET, 85% SAND, 15% CLAY
NA		11	POOR RECOVERY OF CUTTINGS	24-25		CLAYEY SAND	25	CALCAREOUS SAND, PINKISH GRAY (5YR 7/2) VERY FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DRY
93.5		11		29-30		CLAYEY SAND	30	SILTY SAND ST, WEAK RED (2.5YR 5/4) FINE TO MED GR, POORLY SORTED, SUBROUND TO ROUNDED GR, SLIGHTLY CONSOLIDATED, DAMP, 90% SAND, 10% SILT
58.1		11		34-35		CLAYEY SAND	35	SILTY SAND ST, SAME AS ABOVE W/ POSSIBLY SOME GRAY L.S. LAYERS OR GRAVEL
74.8		11		39-40		CLAYEY SAND	40	SILTY SAND ST, SAME AS ABOVE W/ GRAY L.S. CHIPS IN CUTTINGS EITHER THIN L.S. LAYERS OR GRAVEL
130		GRAB CUTTINGS		44-45		CLAYEY SAND	45	CLAYEY SAND ST AND MUD ST, DARK RED (2.5YR 4/6), HIGH PLASTICITY, SLIGHTLY CONSOLIDATED, WET
222							50	SAME AS ABOVE W/ WHITE TO BLACK PYPGUM ENCOUNTERED AT 50'



Site <u>ENRON ATOKA-1</u>							Location Map	
Logged by <u>C. PIGMAN</u>			Client/Project # <u>5151</u>					
Boring Number <u>SVE-5</u>			Drilling Co. <u>EADBS</u>					
Drilling Method <u>AIR ROTARY 6 1/8" BIT</u>			Drill Rig <u>INDEPENDENT-RAND TH 75W</u>					
Date Started <u>11/1/95</u>			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
							5	GRAVELLY SAND W/ CLAY, LIGHT BROWN (1.5 YR 6/4) FINE SAND TO GRAVEL POORLY SORTED, ANGULAR CLASTS, UNCONSOLIDATED, MOIST, 30% GRAVEL, 60% SAND, 10% CLAY
		GRAB CUTTINGS		4-5		GRAVELLY SAND W/ CLAY	14	SAME AS ABOVE, PROBABLY FILL
		"		9-10			14	
		"		14-15			15	CALCAREOUS SILTY SAND, PINK (5 YR 7/4) FINE GR. POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DAMP, 80% SAND, 10-20% CARBONATE SILT MATRIX
		"		19-20			20	SAME AS ABOVE
		"		24-25			25	CALCAREOUS SILTY SAND, SAME AS ABOVE
		"		29-30			30	CALCAREOUS SILTY SAND, SAME AS ABOVE
		GRAB CUTTINGS		34-35			35	CALCAREOUS SAND W/ SILT & CLAY, LIGHT REDDISH BROWN (5 YR 6/4) FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DAMP, 85% SAND, 10% SILT, 5% CLAY CARBONATE CEMENT + MATRIX
		NA		NA		CAVITY NOTHING	40	NA - NOTHING
		GRAB FROM BIT		46'		CLAY	45	CLAY, DARK RED, (2.5 YR 4/6) HIGH PLASTICITY, UNCONSOLIDATED, WET

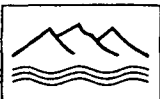
T.D. 46'



Site ENRON ATOKA-1						Location Map		
Logged by C. PIGMAN			Client/Project # 5151			ASTH MW-4 SUB-6 SUB-13		
Boring Number SVB-6			Drilling Co. EADES					
Drilling Method AIR ROTARY 6 1/8" BIT			Drill Rig INGERSOLL RAND TH 75W					
Date Started 11/1/95			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
7		GRAB CUTTINGS		4-5		GRAVELLY SAND w/ CLAY (CLC)	5	GRAVELLY SAND SANDY CLAY w/ CLAY, BROWN (1.5YR 5/3) CLAY TO GRAVEL, POORLY SORTED, ANGULAR CLASTS, UNCONSOLIDATED, MOIST, SUBGRAVEL SAND, 20% CLAY
15		"		9-10			10	GRAVELLY SAND w/ CLAY, LIGHT BROWN (1.5YR 6/4) CLAY TO GRAVEL, POORLY SORTED, ANGULAR TO SUBROUND CLASTS, UNCONSOLIDATED, MOIST 40% GRAVEL SAND, 10% CLAY
10		"		14-15			15	GRAVELLY SAND w/ SILT, SAME AS ABOVE w/ LESS CLAY 40% GRAVEL, 50% SAND, 5% SILT 5% CLAY
32		"		19-20			20	CALCAREOUS SILTY S.S., PINKISH GRAY (7.5YR 7/2) V. FINE TO MED GR POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DAMP, 75% SAND IN 25% MATRIX OF CARBONATE AND SILT AT 23' GRAVEL
480		"		24-25			25	CALCAREOUS SILTY S.S., LIGHT GRAY (5Y 7/1) V. FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DAMP, 95% SAND IN 15% MATRIX OF SILT & CARBONATE
500		"		29-30		30	CALCAREOUS SILTY SAND, PINK (5YR 8/3) V. FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DRY, 85% SAND IN 15% MATRIX OF SILT & CARBONATE	
420		"		37-35		35	CALCAREOUS SILTY SS, SAME AS ABOVE ONLY RUBBER IN COARSE PALE RED (2.5YR 7/4)	
500		GRAB CUTTINGS		39-40		40	CALCAREOUS SILTY SS, SAME AS ABOVE	
						42	AT 42' ENCOUNTER CLAY, REDDISH BROWN, HIGH PLASTICITY, NOT TO SATURATED	
								TO 42.5'



Site <u>ENRON ATOKA - 1</u>							Location Map	
Logged by <u>C. PIGMAN</u>			Client/Project # <u>5151</u>					
Boring Number <u>SUB-7</u>			Drilling Co. <u>ENRDS</u>					
Drilling Method <u>AIR ROTARY 6 1/8" BIT</u>			Drill Rig <u>INVERSOUL RAND TH 75 W</u>					
Date Started <u>10/31/95</u>			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
10		GRAB CUTTINGS		4-5		CALCAREOUS SILTY SS (CALCITE)	5	CALCAREOUS SILTY SS, PINK (7.5YR 8/3) FINE TO MED GR, MOD SORTED, ROUNDED GR, SLIGHTLY CONSOLIDATED, 10% SAND IN 30% CARBONATE MATRIX.
38		"		9-10			10	SAME AS ABOVE
28		"		14-15			15	CALCAREOUS SILTY SS, SAME AS ABOVE SLIGHTLY GREYER IN COLOR (7.5YR 7/3)
100		"		19-20		CALCAREOUS SILTY SS (CALCITE)	19	
80		"		24-25			20	CALCAREOUS SILTY SS, PINK (5YR 7/3) V. FINE TO MED GR, POORLY SORTED, SUB-ROUND GR, SLIGHTLY CONSOLIDATED, DRY, 8% SAND IN 15% MATRIX OF SILT + CARBONATE
68		"		29-30		CALCAREOUS SILTY SS (CALCITE)	25	CALCAREOUS SILTY SS, SAME AS ABOVE ONLY SLIGHTLY DARKER IN COLOR
180		"		34-35			28	LIGHT REDDISH BROWN (5YR 6/4)
600		GRAB CUTTINGS		38-40		CLAYEY SAND INTERBEDDED W/ L.S.	30	SAND W/ CLAY WEAK RED (2.5YR 6/4) V. FINE TO MED GR, POORLY SORTED, SLIGHTLY CONSOLIDATED, MOIST, SOME DARK GRAY L.S. BEDS
							35	GRAY H.C. STAINING AT 34' CLAYEY SAND W/ L.S. INTER BEDDED W/ L.S. MOD RED 2.5YR 5/6 V. FINE TO FINE GR, HEAVY STAIN, SLIGHTLY TO UNCONSOLIDATED, WET L.S. DARK REDDISH GRAY (2.5YR 4/1) FINELY CRYSTALLINE, STRONGLY CONSOLIDATED
							40	
								T.D. = 39.5



Site <u>ENRDO ATOKA-1</u>							Location Map	
Logged by <u>C. PIGMAN</u>			Client/Project # <u>5151</u>					
Boring Number <u>SVE-8</u>			Drilling Co. <u>FADE'S</u>					
Drilling Method <u>AIR ROTARY 6 1/8" BIT</u>			Drill Rig <u>INGERSOLL RANDO TH 75W</u>					
Date Started <u>10/31/95</u>			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
18.8		GRAD CUTTINGS		4-5		CLAYEUS S.S.	5	SANDY L.S. + CALCAREOUS S.S., PINK (7.5YR 8/3) 40-60% MED GR SAND, ROUNDED GR, WELL SORTED, IN 40% SILT + CARBONATE MATRIX, SLIGHTLY CONSOLIDATED DRY
22.0		"		9-10		CLAYEUS S.S.	10	CALCAREOUS S.S., PINKISH WHITE (7.5YR 8/2) 70% FINE TO MED GR SAND, SUBROUNDED GR, POORLY SORTED, IN 30% MATRIX OF SILT + CARBONATE, SLIGHTLY CONSOLIDATED DRY
16		"		14-15		CLAYEUS S.S.	15	SAME AS ABOVE
12		"		19-20		CLAYEUS SILTY S.S.	19	CALCAREOUS SILTY S.S., PINK (5YR 7/3) V. FINE TO MED GR, POORLY SORTED, SUBROUNDED GR, SLIGHTLY CONSOLIDATED DRY 85% SAND IN 15% SILT + CARBONATE MATRIX
18		"		24-25		CLAYEUS SILTY S.S.	25	CALCAREOUS SILTY S.S., PALE RED (2.5YR 7/4) V. FINE TO COARSE GR, POORLY SORTED, SUBANGULAR GR, SLIGHTLY CONSOLIDATED
16		"		29-30		CLAYEUS SILTY S.S.	28	MOIST, 90% SAND 10% SILT W/ MILD CARBONATE AT 1 GUEWATER
16		"		29-30		CLAYEUS SILTY S.S.	30	28% GRAY L.S. LAYERS
180		"		34-35		CLAYEUS SAND	35	CLAYEY SAND W/ L.S. INTERBEDS, RED, (10R 5/6) V. FINE TO FINE GR, POORLY SORTED, SUBROUNDED GR, POORLY CONSOLIDATED, 80% SAND WBT, L.S. DARK GRAY, STRONGLY CONSOLIDATED 20%
40		GRAD CUTTINGS		39-40		CLAYEUS SAND	40	CLAYEY SAND, SAME AS ABOVE WITHOUT L.S. INTERBEDS
		GRAD CUTTINGS		40-41		CLAYEUS SAND	40	GRAY H.C. STAINING + ORDR
		GRAD CUTTINGS		40-41		CLAYEUS SAND	40	CLAYEY SAND W/ INTERBEDS OF CLAY GYPSUM WHITE TO PINK CRYSTALLINE, CONSOLIDATED OR CLAY, RED (10R 5/6) + HIGH PLASTICITY, UNCONSOLIDATED, MOIST
		GRAD CUTTINGS		40-41		CLAYEUS SAND	45	TID = 41'

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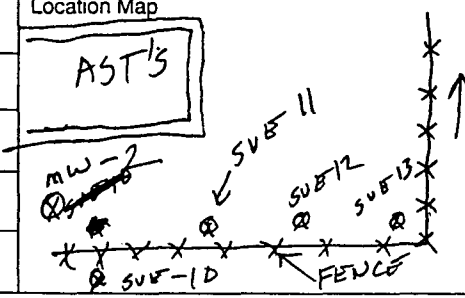
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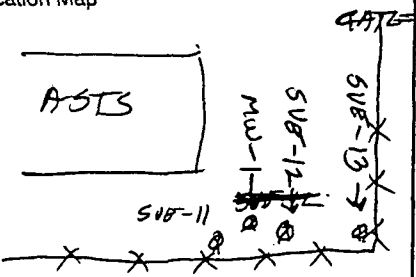
Site <u>ENRON ATOKA - 1</u>							Location Map	
Logged by <u>C. PIGMAN</u>			Client/Project # <u>5151</u>					
Boring Number <u>SVB-10</u>			Drilling Co. <u>EADBS</u>					
Drilling Method <u>AIR ROTARY 6 1/8" BIT</u>			Drill Rig <u>INDEPENDENT RAND TH 75W</u>					
Date Started <u>10/31/95</u>			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks
15		GRAB CUTTINGS		4-5			5	SANDY L.S. & CALCAREOUS S.S. VERY POORLY BROWN (GYR 8/2) 30-60% SAND, IN SILTY CARBONATE MATRIX FINE TO MED GR. SUB-ANGULAR GR, MED SORTED SLIGHTLY CONSOLIDATED, DRY
20		"		9-10			10	CALCAREOUS SILTY S.S. PINKISH WHITE (7.5YR 8/2) FINE TO MED GR, MED SORTED, ROUNDED GR, SLIGHTLY CONSOLIDATED, DRY
0.10		"		14-15			15	CALCAREOUS SILTY S.S. VERY PALE BROWN (GYR 8/2) V. FINE TO MED GR, SUB-ANGULAR GR, POORLY SORTED, SLIGHTLY CONSOLIDATED, DRY
4.8		"		19-20			20	80% SAND IN 20% CARBONATE & SILT MATRIX
2.0		"		24-25			21	SAME AS ABOVE ONLY SLIGHTLY DARKER IN COLOR PINKISH WHITE (7.5YR 8/2)
8.0		"		29-30			25	CALCAREOUS SILTY S.S. PINK (5YR 7/3) V. FINE TO MED GR, POORLY SORTED, SUB-ANGULAR GR, SLIGHTLY CONSOLIDATED, DRY
24		"		34-35			29	DRY 85% SAND IN 15% MATRIX OF CARBONATE & SILT
18		"		39-40			30	SILTY SAND W/ INTER BEDS OF L.S. LIGHT REDDISH BROWN (GYR 6/4) V. FINE TO MED GR, SLIGHTLY CONSOLIDATED, DAMP
		"					35	85% SAND W/ 10% SILT, 5% CLAY
		"					37	INTER BEDS OF DARK GRAY CRYSTALLINE L.S. CALCAREOUS SILTY S.S. PINK (5YR 7/3) V. FINE TO MED GR, POORLY SORTED, SUB-ANGULAR TO SUB-ROUND GR, SLIGHTLY CONSOLIDATED, DRY
		"					40	85% SAND IN 15% CARBONATE & SILT MATRIX
		"					40.5	37' ENCOUNTER GYPSUM AND L.S. W/ INTER BEDS OF GYPSUM, DARK RED (2.5YR 4/4), HIGH PLASTICITY, MOIST
5		GRAB CUTTINGS		44-45			45	GYPSUM - WHITE TO PINK, CRYSTALLINE
		"						40.5' ENCOUNTER GYPSUM GYPSUM - PINKISH WHITE (5YR 8/2) WHITE TO PINK, CRYSTALLINE, CONSOLIDATED DRY

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Site ENRON ATDKA -1							Location Map	
Logged by C. PIGMAN			Client/Project # 5151					
Boring Number SUB-11			Drilling Co. EAPB3					
Drilling Method AIR ROTARY			Drill Rig INGEBOLE RANO TH 75W					
Date Started 10/30/95			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks
11.7		GAB CUTTINGS		4-5		FILL	5	SANDY LIMESTONE (CALICHE) LIGHT REDDISH BROWN (5YR 6/3)
36.8		"		9-10		SANDY CLAY FILL	9-10	60% CARBONATE GRAINS, 40% SAND SAND FINE TO MED GR, WELL SORTED ROUNDED GR UNCONSOLIDATED (FILL) MOIST SANDY CLAY W/ GRAVEL, LIGHT BROWN
34.3		"		14-15		FILL	15	60% CLAY 30% SAND 10% GRAVEL, FILL? CLAY, HIGH TO MID PLASTICITY, SAND MED TO COARSE GR, SUBANGULAR, POORLY SORTED, UNCONSOLIDATED
8.7		"		19-20	20 FT IDENTIFIED TOP SAND	CLAY (CALICHE)	20	CALCAREOUS SANDY PINKISH GRAY, V. FINE TO COARSE GR, POORLY SORTED, SUBANGULAR TO SUBROUNDED GR, 85% SAND, 5% SILT 10% CLAY, SLIGHTLY CONSOLIDATED, MOIST, H.C. ODR
4.9		"		24-25		CALCAREOUS SILTY SAND (CALICHE)	25	CALCAREOUS SILTY SAND, PINK (5YR 7/4) V. FINE TO FINE GR, MED SORTED SUBROUNDED GR, 90% SAND IN 10% SILT & CARBONATE MATRIX, SLIGHTLY CONSOLIDATED, MOIST
3.8		"		29-30		CALCAREOUS SILTY SAND (CALICHE)	30	CALCAREOUS SILTY SAND, PINK (5YR 8/3) FINE TO MED GR, WELL SORTED, ROUNDED GR, 80% SAND IN 20% SILT & CARBONATE MATRIX, SLIGHTLY CONSOLIDATED, DAMP
8.4		"		34-35		AAA	35	SAME AS ABOVE
3.7		"		39-40		AAA	39.5	COLOR CHANGE AT 33' FROM PINK TO DARKER PINK CALCAREOUS SILTY SAND PINK (5YR 7/4) FINE TO MED GR, WELL SORTED, ROUNDED GR, 60% SAND IN 40% SILT & CARBONATE MATRIX, SLIGHTLY CONSOLIDATED, DAMP
81.8		GAB CUTTINGS		44-45		CLAY W/ SILT	42	GRAY LIMESTONE AT 40' TO 40.5' SILTY SAND W/ CLAY, WEAK RED (2.5YR 5/4) V. FINE TO MED GR, POORLY SORTED, ROUNDED GR, 85% SAND, 10% SILT, 5% CLAY, UNCONSOLIDATED, MOIST
							45	43' ENCOUNTER WATER ALTERNATING GRAY LIMESTONE AND RED CLAY MED PLASTICITY, UNCONSOLIDATED, WET T.D. 44' L.S. STRONGLY CONSOLIDATED



Site <u>ENRON ATOKA -1</u>							Location Map	
Logged by <u>C. PIRMAN</u>			Client/Project # <u>5151</u>					
Boring Number <u>SVB-12</u>			Drilling Co. <u>FADEB</u>					
Drilling Method <u>AIR ROTARY 6 1/8" BIT</u>			Drill Rig <u>INGERSOLL-RAND TH 75W</u>					
Date Started <u>11/1/95</u>			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
3		SAND CUTTING		4-5			5	SANDY GRAVEL W/ CLAY, LIGHT BROWN (7.5YR 6/3) CLAY TO GRAVEL, SUBCOMPACTED AND NEAR TO SUBSURFACED LAYERS, POORLY SORTED, UNCONSOLIDATED, DAMP, SAND GRAVEL 25% SAND
12		"		9-10			10	5% SILT, LOOSE CLAY SAND GRAVEL W/ CLAY, SAME AS ABOVE LESS GRAVEL MORE SAND
26		"		14-15			14	SAND GRAVEL 31% SAND 10% SILT 10% CLAY
24		"		19-20			15	CALLICAREOUS SILTY SS, PINK (7.5YR 7/4) V. FINE TO MED GR, POORLY SORTED, SUBCOMPACTED GR, SLIGHTLY CONSOLIDATED, DAMP 85% SAND IN 15% MATRIX OF SILT & CLAY
88		"		24-25			20	SAME AS ABOVE, GRAYER IN COLOR PINKISH GRAY (7.5YR 7/2)
400		"		29-30			25	CALLICAREOUS SILTY SS, PINKISH GRAY SAME AS ABOVE
420		"		34-35			30	CALLICAREOUS SILTY SS, LIGHT REDDISH BROWN (5YR 6/4) V. FINE TO MED GR, POORLY SORTED, SUBCOMPACTED GR, SLIGHTLY CONSOLIDATED, MOIST, 85% SAND IN 15% MATRIX OF SILT & CLAY
100		"		39-40			35	CALLICAREOUS SILTY SS, SAME AS ABOVE
480		GRAD CUTTING		44-45			36	ENCOUNTER REDDISH BROWN CLAY AT 36'
							38	AND WHITE TO PINK CRYSTALLINE GYPSUM AT 38'
							40	GYPSUM, WHITE TO RED, CRYSTALLINE, CONSOLIDATED DRY
							42	
							45	CLAY W/ INTER BEDS OF GYPSUM CLAY, DARK RED (2.5YR 4/6) HIGH PLASTICITY UNCONSOLIDATED, WET, GYPSUM SAME AS ABOVE

Site ENRON ATOKA-1						Location Map		
Logged by C. PIGMAN			Client/Project # 5151			AST-1 GATE		
Boring Number SVE-13			Drilling Co. EADEB3					
Drilling Method AIR ROTARY 6 1/8" BIT			Drill Rig INTEGRAL RIG THT 75W					
Date Started 11/1/95			Date Completed					
FID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
10		GRAB CUTTINGS		4-5	5			CALCAREOUS SAND GRAVELLY SAND W/CLAY, PINKISH GRAY (7.5YR 6/2), CALICHE GRAVEL & SAND W/CLAY, 30% GRAVEL (LIS), 70% SAND 10% CLAY, POORLY SORTED, ANGULAR CLASTS, UNCONSOLIDATED
110		"		9-10	10			CALCAREOUS GRAVELLY SAND W/CLAY SAME AS ABOVE, PROBABLY FILL
64		"		14-15	15			SANDY LIMESTONE, PINKISH GRAY (7.5YR 7/2) 30% FINE GR SAND IN 70% CARBONATE & SILT MATRIX, SLIGHTLY CONSOLIDATED, DRY
380		"		19-20	20			CALCAREOUS SANDST WHITE (10YR 8/1) FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DRY
240		"		24-25	24-25			85% SAND IN 15% CARBONATE & SILT MATRIX SILTY SANDST, PINK (5YR 7/3) V. FINE TO COARSE GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DRY, 85% SAND 15% SILT
400		"		29-30	30			SILTY SAND ST, WEAK RED (2.5YR 5/3) V. FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DAMP
380		"		34-35	35			80% SAND 20% SAT SAME AS ABOVE - 37' ENCOUNTER WHITE TO PINK GYPSUM
400		"		39-40	40	GYPSUM w/ INTERBEDS OF MUDST & LIMEST		GYPSUM W/ INTER BEDS OF MUDST (CLAY) AND LIS, GYPSUM, WHITE TO PINK, CRYSTALLINE, DRY MUD ST, WEAK RED, (DRY 4/4) MOD PLASTICITY, UNCL. LIMESTONE - GRAY, STRONGLY CONSOLIDATED, DRY
320		GRAB CUTTINGS		44-45	45			SAME AS ABOVE, FEWER LIS, LAYERS
								48' FEW INTER BEDS OF CLAY



Site ENRDN ATDKA -						Location Map		
Logged by C. PLEMAN			Client/Project # 5151					
Boring Number SUE-14			Drilling Co. EADEB					
Drilling Method AIR ROTARY 6 1/8" BIT			Drill Rig INGRESS-RAND TH 75W					
Date Started 11/2/95			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
210		GRAB CUTTINGS		4-5		CLAYEY S.S.	5	SANDY LS & CALCAREOUS SS, SAND PINKISH WHITE (7.5YR 8/2) 40-70% SAND IN SILT + CARBONATE MATRIX (CALICHE), SAND FINE TO MED GR. WELL SORTED, ROUNDED GR, SLIGHTLY CONSOLIDATED, DRY.
500		"		9-10		CLAYEY S.S.	10	CALCAREOUS S.S., SAND PINKISH WHITE (7.5YR 8/2) 60-80% FINE TO MED GR. SAND IN SILT + CARBONATE MATRIX, POORLY SORTED, SUB ROUNDED GR, SLIGHTLY CONSOLIDATED, DAMP.
500		"		14-15			15	CALCAREOUS S.S., PINKISH WHITE (7.5YR 8/2) SLIGHTLY DARKER IN COLOR, V. FINE TO MED GR. SUB ROUNDED GR, SLIGHTLY CONSOLIDATED, DRY, 80% SAND IN SILT + CARBONATE MATRIX.
480		"		19-20			20	CALCAREOUS SILTY SANDST, PINK (5YR 8/3) SAME AS ABOVE ONLY SLIGHTLY DARKER IN COLOR.
320		"		24-25			25	CALCAREOUS SILTY S.S., WEAK RED (2.5YR 6/4) SAME AS ABOVE ONLY DARKER IN COLOR + MOIST.
							28	28' ENCOUNTER GRAY L.S., BUELY PILE. REDDISH BROWN CLAYEY S.S.
320		"		29-30		CLAYEY S.S.	30	29' L.S. IN CUTTINGS. LIMEST + CLAYEY SANDST, INTERBODDED L.S., DARK GRAYISH BROWN (10YR 4/2) FINELY CRYSTALLINE, S.S., V. FINE TO FINE GR. POORLY SORTED, SUBANGULAR GR, SLIGHTLY CONSOLIDATED, WET, 80% SAND 6% SILT 15% CLAY.
340		"		34-35		CLAYEY S.S.	34	CLAY INTERBODDED W/ GYPSUM.
							35	CLAY, DARK RED (2.5YR 3/6) HIGH PLASTICITY, UNCONSOLIDATED, WET.
							36	GYPSUM, WHITE TO PINK, CRYSTALLINE.
180		GRAB CUTTINGS		39-40		CLAY INTERBODDED W/ GYPSUM	40	36' ENCOUNTER GYPSUM THICK GYPSUM LAYER. CLAY INTERBODDED W/ GYPSUM. SAME AS ABOVE.
							45	
								T.P., 40'



Site ENRON ATOKA -1							Location Map	
Logged by C. PIGMAN				Client/Project # 5151				
Boring Number SVE-15				Drilling Co. FADE'S				
Drilling Method AIR ROTARY 6 1/8" BIT				Drill Rig INGERSOLL-RAND TH 75W				
Date Started 11/2/95				Date Completed				
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
3		GRAB CUTTINGS		4-5		CALCAREOUS S.S. (CALICHE)	5	SANDY L.S. + CALCAREOUS S.S., PINK (7.5YR 8/3) 40-60% FINE TO MED GR SAND WELL SORTED, ROUNDED GR IN 40-60% CARBONATE + SILT MATRIX SLIGHTLY CONSOLIDATED, DRY
2.5		"		9-10			10	CALCAREOUS SILTY S.S., PINK (7.5YR 8/3) 70% SAND, FINE TO MED GR, MOD SORTED, ROUNDED GR, IN 30% MATRIX OF SILT + CARBONATE, SLIGHTLY CONSOLIDATED DAMP
4		"		14-15			15	SAME AS ABOVE
6		"		19-20		CALCAREOUS SILTY S.S. 6.5	19	
							20	CALCAREOUS SILTY S.S., PINK (5YR 7/4) V. FINE TO MED GR, POORLY SORTED, SUBANGULAR GR, SLIGHTLY CONSOLIDATED, DAMP 85% SAND IN 15% SILT + CARBONATE M.
1.0		GRAB CUTTINGS		24-25			25	CALCAREOUS SILTY S.S., WEAK RED (2.5YR 6/4) SAME AS ABOVE ONLY DARKER IN COLOR
							30	
							35	
							40	
							45	



Site ENRON ATOKA-1							Location Map	
Logged by C. PIGMAN			Client/Project # 5151					
Boring Number SVE-16			Drilling Co. EADE'S					
Drilling Method AIR ROTARY 6 1/2" BIT			Drill Rig INGERSOLL RAND TH 75 W					
Date Started 11/2/95			Date Completed					
PID/FID Reading	Blow Counts	Sampling Device	Sample Recovery	Sample Interval	Sample Number	USCS Symbol	Depth (feet)	Soil Description/Remarks Soil type, color, texture, grain size, sorting, roundness, plasticity, consistency, moisture content
1.5		CRAB CUTTINGS		4-5		SANDY L.S. (CALICHE)	5	SANDY L.S., PINKISH WHITE (5YR 8/2) 30% SAND IN SILT + CARBONATE MATRIX SLIGHTLY CONSOLIDATED, DRY
0.8		"		9-10		SANDY L.S. (CALICHE)	10	CALCAREOUS S.S., PINK (7.5YR 8/3) 60% SAND, FINE TO MED GR, WELL SORTED, ROUNDED GR, 60% SA SLIGHTLY CONSOLIDATED, DRY 60% SAND IN 40% SILT + CARBONATE MA
1.6		"		14-15			15	CALCAREOUS SILTY S.S., PINKISH WHITE (7.5YR 8/2) 4, FINE TO MED GR, POORLY SORTED, SUBROUND GR, SLIGHTLY CONSOLIDATED, DRY 80% SAND
2.0		"		19-20		CALCAREOUS SILTY S.S.	20	CALCAREOUS SILTY S.S., PINK (7.5YR 8/2) SAME AS ABOVE ONLY SLIGHTLY DARKER IN COLOR
1.5		CRAB CUTTINGS		24-25		CALCAREOUS SILTY S.S.	25	CALCAREOUS SILTY S.S., PINK (5YR 8/2) SAME AS ABOVE ONLY DARKER IN COLOR