GW - 22

REPORTS

YEAR(S):

1996 - 1992

Amoco Exploration And Production
U.S. NGL Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

February 22, 1996

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
2040 South PaCheco Street
Santa Fe, NM 87505

Groundwater Update
Empire Abo Gas Plant

Attached are two copies of the written report which updates the status of the groundwater project at the Empire Abo Gas Plant. The monitor wells have been measured and sampled three times since the last report. We are also currently completing the installation of our free-phase hydrocarbon recovery system. We anticipate that this system should be fully operational by the end of February.

If you have any questions or need additional information, please contact Scott Neumann at 713-366-2501.

Yours truly,

H. A. Partlow
Manager, Environmental, Health and Safety Services

cc: Energy, Minerals and Natural Resources Department
Oil Conservation Division
P.O. Drawer DD
Artesia, NM 88211

GROUNDWATER REPORT
EMPIRE ABO GAS PLANT

This report summarizes the status of the groundwater remediation project at our Empire Abo Gas Plant (EAGP) located in Eddy County, New Mexico. The report supplements the information previously reported to the New Mexico Oil Conservation Division (NMOCD).

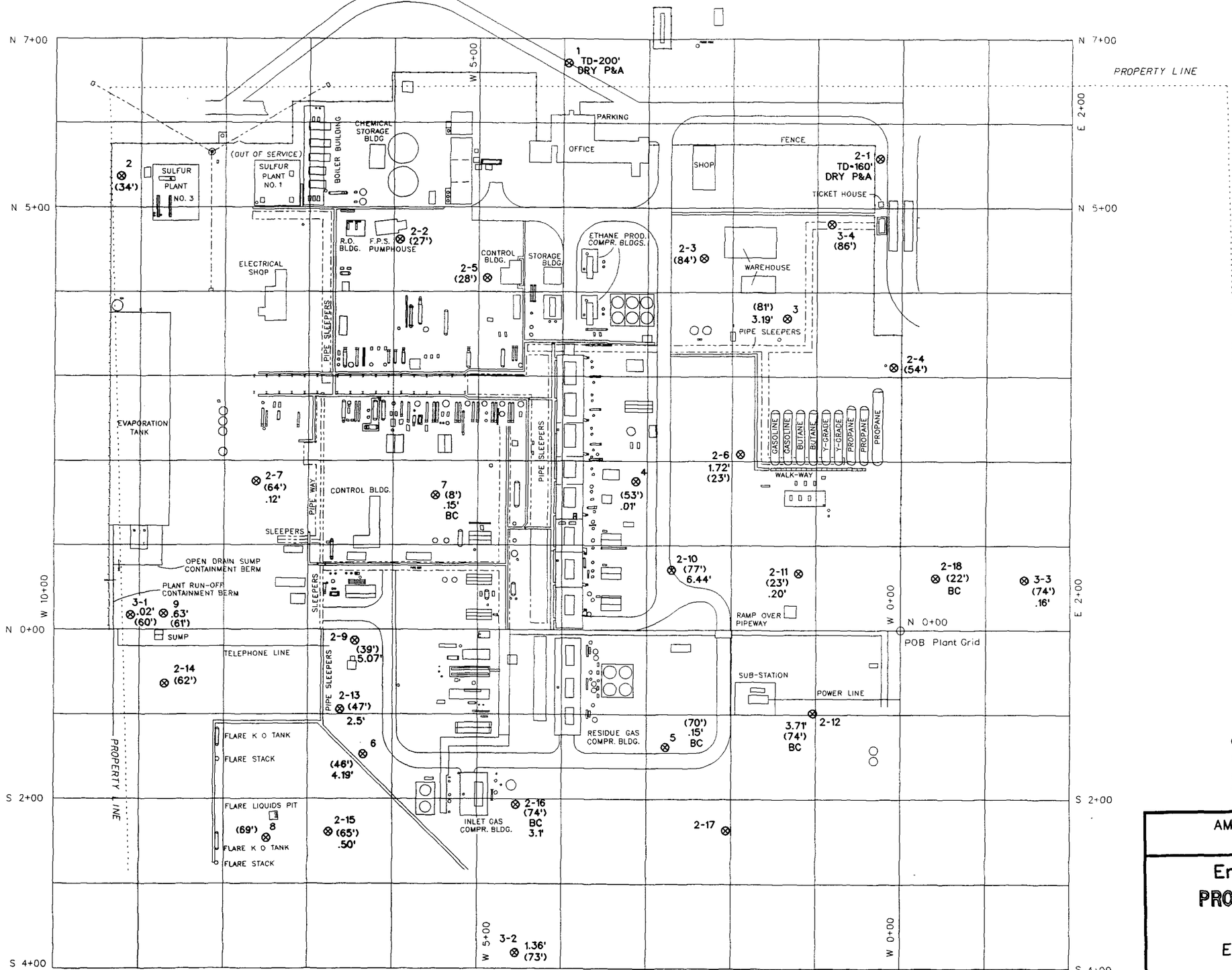
There are currently 27 active groundwater monitor wells located at the site. The wells range in depth from 28' to 113'. The depths to fluid in these wells vary from 6' to 84' from the surface (Attachment #1). In addition, 2 wells (MW-1, TD = 200 and MW 2-1, TD = 160) located on the northern edge of the plant did not encounter any fluids and were plugged. The subsurface lithology at the site consists of interbedded sands, clays and caliche, few of which are correlatable even in adjacent wells. There are no mappable water horizons found across this site and no major or minor aquifers present in the area.

The wells have been periodically measured and sampled since the inception of the project. The most recent sampling event took place on December 4, 1995. All of the data has been summarized on Attachment #2. The last measuring/sampling indicated nineteen of the wells contained free-phase hydrocarbons. The measured hydrocarbon thickness varied from 0.02' to 6.44' (see Attachment #1). A pneumatic hydrocarbon recovery system, which will recover free-phase hydrocarbons from each of the nineteen wells, is currently being installed.

The pneumatic hydrocarbon recovery system will run off plant instrument air and the plants drain system will be utilized for fluid recovery. The system has been designed to minimize water recoveries although the recovered fluids will go through a separation process to recover the hydrocarbons. Attachment #3 (Figures 1 & 2) shows the piping layout for the system.

Two types of pneumatic pumps will be utilized in order to optimize system performance. Thirteen Tierra Madre 2SK2 skimming pumps with hydrophobic filters will be employed for recovering free-phase hydrocarbons only. These pumps will run off of 7 surface mounted controllers. In addition, 6 total fluid pumps will be used where fluid level drawdown is necessary. This drawdown is necessary where fluid levels in the monitor wells are above the screened intervals. The pumps will be adjusted to recover free-phase hydrocarbons and minimal amounts of water. Evacuator II and Gladiator pumps with built-in pump controllers are being installed to recover total fluids. The information related to the pumps has been included as Attachment #4.

We anticipate that the product recovery system will be fully operational by the end of February 1996. We will continue to monitor the progress and report our findings to the New Mexico Oil Conservation Division.



NOTE: FACILITY PLOT PLAN OBTAINED
FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91

ATTACHMENT # 1

LEGEND

- ⊗ - MONITOR WELLS
- BC - TOP FLUID BEHIND CASING
- # - PRODUCT THICKNESS (12-4-95)
- (#) - DEPTH TO WATER (12-4-95)

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant
PRODUCT THICKNESS MAP
Section 3, T18S-R27E
Eddy County, New Mexico

Date: Jan. 22,1996	Scale: 1 in = 120 ft
Drawn By: RKH	NM444104.dgn Lv 14.

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2
TOTAL DEPTH OF WELL: 37.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3548.5

INITIAL WATER LEVEL: 33
TOP OF SCREEN: 22.5
BASE OF SCREEN: 37.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	32.5	3516	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	37.7	3510.8	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	27	3521.5	0.032	0.001	0.018	0.028	0.079	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	33.5	3515	SAMPLE NOT ANALYZED								<0.05	1800	6.15		2400
3/1/93	33.8	3514.7	0.016	0.03	0.035	0.074	0.155	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	32.82	3515.68	0.018	0.017	0.005	0.009	0.049	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	23.83	3524.67	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	23.8	3524.7	0.003	0.002	0.002	0.003	0.01	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	33.74	3514.76	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
6/21/94	33.82	3514.68	0.001	ND	0.001	0.002	0.004	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	33.39	3515.11	ND	0.002	ND	ND	0.002	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	33.12	3515.38	ND	0.001	0.002	0.004	0.007	NS	ND	ND	NS	NS	NS	NS	NS
3/25/95	33.67	3514.83	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	32.9	3515.6	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
12/4/95	33.79	3514.71	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 3
TOTAL DEPTH OF WELL: 91.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3555.7

INITIAL WATER LEVEL: 79
TOP OF SCREEN: 71.5
BASE OF SCREEN: 91.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	77	3478.7	111	14	238	299	662	NR	PRODUCT	PRODUCT	NS	NS	NS	NS	NS
3-11-92	83	3472.7	FREE PRODUCT; NOT ANALYZED												
10-1-92	72	3483.7	FREE PRODUCT; NOT ANALYZED												
1-13-93	85	3470.7	FREE PRODUCT; NOT ANALYZED								<0.05	1150	37.65		3458
3/1/93	85.25	3470.45	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	84.9	3470.8	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	81.75	3473.95	FREE PRODUCT; NOT ANALYZED (PRODUCT = 3.47')												
3/25/95	82.69	3473.01	FREE PRODUCT; NOT ANALYZED (PRODUCT = 4.36')												
6/30/95	81.72	3473.98	FREE PRODUCT; NOT ANALYZED (PRODUCT = 3.36')												
12/4/95	81.18	3474.52	FREE PRODUCT; NOT ANALYZED (PRODUCT = 3.19')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

Attachment 2

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 4
TOTAL DEPTH OF WELL: 62.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.3

INITIAL WATER LEVEL: 51
TOP OF SCREEN: 47.5
BASE OF SCREEN: 62.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	51	3500.3	1.25	0.464	1.76	2.26	5.734	0.49	21	ND	NS	NS	NS	NS	NS
1-24-92	51	3500.3	1.14	0.426	1.6	1.94	5.106	0.42	16	ND	NS	NS	NS	NS	NS
3-11-92	51	3500.3	3.64	86.8	38.7	109	238.14	72.7	1615	116	NS	NS	NS	NS	NS
3-11-92	51	3500.3	0.95	1.12	1.25	3.54	6.86	1.05	32	2	NS	NS	NS	NS	NS
10-1-92	34	3517.3	0.957	0.039	1.16	1.52	3.68	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	44	3507.3	0.827	0.325	0.954	1.48	3.59	NS	25	18	0.2	700	5.15		2458
3/1/93	53.6	3497.7	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	53.48	3497.82	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	57.23	3494.07	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.07')												
3/25/95	52.83	3498.47	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.09')												
6/30/95	57.3	3494	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.05')												
12/4/95	52.95	3498.35	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.01')												

MONITOR WELL NUMBER: 5
TOTAL DEPTH OF WELL: 99
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.9

INITIAL WATER LEVEL: 92
TOP OF SCREEN: 74
BASE OF SCREEN: 99

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL*	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	68.8	3475.1	0.931	3.87	1.81	5.26	11.871	0.65	57	17	NS	NS	NS	NS	NS
3-11-92	69	3474.9	0.107	0.534	0.534	1.47	2.654	0.15	8	ND	NS	NS	NS	NS	NS
10-1-92	71	3472.9	0.047	0.01	0.162	0.144	0.363	NS	1	ND	NS	NS	NS	NS	NS
1-13-93	71.5	3472.4	0.101	0.115	0.069	0.073	0.358	NS	ND	ND	<0.05	900	4.92		464
3/1/93	69.8	3474.1	0.235	0.343	0.253	0.441	1.27	NS	4	4	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	70.25	3473.65	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	70.08	3473.82	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.03')												
3/25/95	70.54	3473.36	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.03')												
6/30/95	70.05	3473.85	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.03')												
12/4/95	70.25	3473.65	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.15')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT

MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	6	INITIAL WATER LEVEL:	48
TOTAL DEPTH OF WELL:	53	TOP OF SCREEN:	33
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	53
ELEVATION (ASL):	3544.9		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
3-11-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
10-1-92	42	3502.9	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	39	3505.9	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	1000	5.05		826
3/1/93	46.8	3498.1	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	43.7	3501.2	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	46.56	3498.34	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 4.21')												
3/25/95	46.44	3498.46	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 2.73')												
6/30/95	46.71	3498.19	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 4.20')												
12/4/95	45.65	3499.25	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 4.19')												

MONITOR WELL NUMBER:	7	INITIAL WATER LEVEL:	21
TOTAL DEPTH OF WELL:	28.5	TOP OF SCREEN:	13.5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	28.5
ELEVATION (ASL):	3546.9		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	8.5	3538.4	3.13	0.795	0.658	0.919	5.502	0.03	10	2	NS	NS	NS	NS	NS
3-11-92	7.7	3539.2	313	0.759	0.625	0.907	5.171	0.06	8	ND	NS	NS	NS	NS	NS
10-1-92	16	3530.9	4.54	1.28	0.936	1.27	8.03	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	9	3537.9	1.61	0.933	0.583	1.23	4.35	NS	13	3	<0.05	1500	242		2323
3/1/93	9.4	3537.5	1.85	0.226	0.243	0.368	2.69	NS	4	ND	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	9.82	3537.08	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	8.6	3538.3	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.14')												
3/25/95	7.55	3539.35	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.12')												
6/30/95	8.66	3538.24	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.16')												
12/4/95	8.25	3538.65	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.15')												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 8
TOTAL DEPTH OF WELL: 92
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.1

INITIAL WATER LEVEL: 83
TOP OF SCREEN: 72
BASE OF SCREEN: 92

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	67.3	3476.8	ND	ND	ND	0.001	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	0.001	ND	ND	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	ND	ND	ND	0	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	76	3468.1	0.048	0.042	0.036	0.069	0.195	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	68	3476.1	0.122	0.264	0.186	0.465	1.04	NS	5	ND	<0.05	1350	4.92		2227
3/1/93	68.7	3475.4	0.042	0.109	0.08	0.166	0.397	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.014	0.011	0.004	0.007	0.036	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.023	0.014	0.004	0.007	0.048	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	68.68	3475.42	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.009	0.003	0.003	0.004	0.019	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.015	0.004	0.003	0.003	0.025	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	69.7	3474.4	0.012	0.005	0.003	0.005	0.025	NS	NS	NS	NS	NS	NS	NS	NS
6/21/94	70.01	3474.09	0.003	0.002	0.002	0.003	0.01	ND	NS	NS	NS	NS	NS	NS	NS
6/21/94	70.01	3474.09	0.002	0.001	0.001	0.002	0.006	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	68.29	3475.81	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
9/21/94	68.29	3475.81	ND	0.001	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	68.73	3475.37	Pump Failed - Not Sampled												
3/25/95	69.55	3474.55	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	69.56	3474.54	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
12/4/95	69.49	3474.61	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 9
TOTAL DEPTH OF WELL: 74.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.2

INITIAL WATER LEVEL: 66
TOP OF SCREEN: 54.5
BASE OF SCREEN: 74.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	58	3485.2	75	312	39	712	1498	FREE PRODUCT			NS	NS	NS	NS	NS
3-11-92	58	3485.2	5.57	5.89	2.27	5.51	19.24	0.79	53	18	NS	NS	NS	NS	NS
10-1-92	50	3493.2	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	61	3482.2	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	NS	12.15		NS
3/1/93	61	3482.2	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	59.66	3483.54	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	59.62	3483.58	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.24')												
3/25/95	60.65	3482.55	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.49')												
6/30/95	60.26	3482.94	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.25')												
12/4/95	60.88	3482.32	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.63')												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-2
TOTAL DEPTH OF WELL: 48
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3552.55

INITIAL WATER LEVEL: 42
TOP OF SCREEN: 38
BASE OF SCREEN: 48

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	27	3525.55	0.001	ND	ND	ND	0.001	ND	ND	ND	0.11	NS	N/A		NS
1-13-93	27.2	3525.35	0.003	ND	0.002	0.004	0.009	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	26.8	3525.75	0.005	0.022	0.036	0.09	0.153	NS	1	ND	NS	NS	NS	NS	NS
6/8/93	26.52	3526.03	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	26.9	3525.65	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	26.9	3525.65	ND	0.001	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	26.96	3525.59	0.001	ND	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS
6/21/94	27.12	3525.43	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	26.96	3525.59	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	27.05	3525.5	0.001	ND	ND	0.001	0.002	NS	ND	ND	NS	NS	NS	NS	NS
3/25/95	27.07	3525.48	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	27.28	3525.27	0.001	0.001	ND	ND	0.002	NS	NS	NS	NS	NS	NS	NS	NS
12/4/95	27.42	3525.13	0.002	ND	ND	ND	0.002	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-3
TOTAL DEPTH OF WELL: 108
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3557.98

INITIAL WATER LEVEL: 100
TOP OF SCREEN: 98
BASE OF SCREEN: 108

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	97	3460.98	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	204	N/A		1850
1-13-93	89.4	3468.58	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	650	13		2496
3/1/93	83.2	3474.78	0.033	0.103	0.083	0.166	0.385	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	83.6	3474.38	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
9/14/93	84.2	3473.78	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	84	3473.98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	84.3	3473.68	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	84.4	3473.58	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	83.11	3474.87	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	83.4	3474.58	Pump Failed												
3/25/95	83.72	3474.26	No Pump												
6/30/95	83.76	3474.22	No Pump												
12/4/95	83.5	3474.48	No Pump												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-4
TOTAL DEPTH OF WELL: 58
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3554.09

INITIAL WATER LEVEL: 53
TOP OF SCREEN: 48
BASE OF SCREEN: 58

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	50	3504.09	0.285	0.01	0.016	0.018	0.329	ND	ND	ND	<0.05	48	0	0	750
1-13-93	54	3500.09	1.1	0.531	0.144	0.274	2.05	NS	7	ND	<0.05	1150	6.75		660
3/1/93	54.9	3499.19	0.365	0.041	0.051	0.087	0.544	NS	4	ND	NS	NS	NS	NS	NS
6/8/93	55.1	3498.99	0.418	0.066	0.029	0.039	0.552	NS	3	ND	NS	NS	NS	NS	NS
9/14/93	54.6	3499.49	0.513	0.027	0.023	0.024	0.587	NS	4	ND	NS	NS	NS	NS	NS
12/8/93	54.2	3499.89	0.432	0.004	0.023	0.016	0.475	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	55.43	3498.66	0.262	0.002	0.007	0.002	0.275	NS	1	NS	NS	NS	NS	NS	NS
6/21/94	56.35	3497.74	0.505	0.004	0.009	0.004	0.522	0.03	NS	NS	NS	NS	NS	NS	NS
9/21/94	56.25	3497.84	0.499	0.004	0.014	0.006	0.523	NS	3	ND	NS	NS	NS	NS	NS
11/21/94	55.57	3498.52	Dry - Not Sampled												
3/25/95	54.48	3499.61	0.824	0.006	0.038	0.008	0.875	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	51.87	3502.22	1.61	0.004	0.074	0.017	1.71	NS	NS	NS	NS	NS	NS	NS	NS
12/4/95	54.06	3500.03	0.528	ND	0.028	0.008	0.564	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-5
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3553

INITIAL WATER LEVEL: 46
TOP OF SCREEN: 43
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	45	3508	0.001	ND	ND	ND	0.001	ND	ND	ND	0.12	NS	N/A		NS
1-13-93		3553	0.002	ND	0.001	0.002	0.005	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	27.4	3525.6	0.002	0.005	0.007	0.016	0.03	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	27.27	3525.73	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	27.3	3525.7	ND	0.01	0.001	0.008	0.019	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	27.2	3525.8	0.002	0.002	0.013	0.029	0.046	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	27.46	3525.54	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	27.4	3525.6	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	27.46	3525.54	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	27.37	3525.63	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
3/25/95	27.61	3525.39	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	27.86	3525.14	ND	0.001	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS
12/4/95	27.89	3525.11	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-6
TOTAL DEPTH OF WELL: 24
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.11

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 14
BASE OF SCREEN: 24

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3534.11	9.91	5.64	0.99	1.97	18.5	0.08	22	ND	<0.05	572	0	5	1050
1-13-93	11.3	3539.81	12.2	1.01	0.134	0.386	13.7	NS	23	ND	<0.05	600	13.75		1286
3/1/93	11.3	3539.81	28.6	2.5	0.482	1.07	32.7	NS	40	ND	NS	NS	NS	NS	NS
9/14/93	11.7	3539.41	35.4	3.32	0.936	1.8	41.5	NS	60	ND	NS	NS	NS	NS	NS
12/8/93	11.6	3539.51	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	22.6	3528.51	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	22.76	3528.35	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.30')												
3/25/95	22.81	3528.3	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 2.47')												
6/30/95	23.18	3527.93	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.36')												
12/4/95	23.02	3528.09	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 1.72')												

MONITOR WELL NUMBER: 2-7
TOTAL DEPTH OF WELL: 66
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.34

INITIAL WATER LEVEL: 60
TOP OF SCREEN: 56
BASE OF SCREEN: 66

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	55	3492.34	15.5	6.33	1.64	3.1	26.6	ND	40	7	<0.05	48	N/A		3376
1-13-93	63	3484.34	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	66	3481.34	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	62.24	3485.1	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	62.72	3484.62	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.0')												
3/25/95	63.88	3483.46	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
6/30/95	62.61	3484.73	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = ?)												
12/4/95	63.92	3483.42	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.12')												

** FEET ABOVE SEA LEVEL
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-9	INITIAL WATER LEVEL:	34
TOTAL DEPTH OF WELL:	43	TOP OF SCREEN:	33
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	43
ELEVATION (ASL):	3546.81		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	32	3514.81	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	31	3515.81	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	NS	127.5		NS
3/1/93	33	3513.81	FREE PRODUCT PRESENT; NOT ANALYZED (7.5 FEET OF FREE PRODUCT PRESENT)												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	40.8	3506.01	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	39.35	3507.46	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 4.64')												
3/25/95	39.79	3507.02	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 5.43')												
6/30/95	39.28	3507.53	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 4.60')												
12/4/95	39.22	3507.59	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 5.07')												

MONITOR WELL NUMBER:	2-10	INITIAL WATER LEVEL:	67
TOTAL DEPTH OF WELL:	78	TOP OF SCREEN:	68
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	78
ELEVATION (ASL):	3548.67		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3484.67	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	71	3477.67	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	74	3474.67	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	74.42	3474.25	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	76.21	3472.46	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 6.89')												
3/25/95	76.62	3472.05	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 7.32')												
6/30/95	76.56	3472.11	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 6.75')												
12/4/95	76.54	3472.13	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 6.44')												

** FEET ABOVE SEA LEVEL
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-11	INITIAL WATER LEVEL:	17
TOTAL DEPTH OF WELL:	23	TOP OF SCREEN:	13
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	23
ELEVATION (ASL):	3547.06		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3530.06	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	19	3528.06	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	19.5	3527.56	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	22.94	3524.12	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	23.05	3524.01	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.74')												
3/25/95	23.04	3524.02	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
6/30/95	22.91	3524.15	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.71')												
12/4/95	23.12	3523.94	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.20')												

MONITOR WELL NUMBER:	2-12	INITIAL WATER LEVEL:	77
TOTAL DEPTH OF WELL:	83	TOP OF SCREEN:	73
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	83
ELEVATION (ASL):	3543.4		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3469.4	0.18	0.042	0.027	0.107	0.356	ND	ND	ND	<0.05	616	N/A		2375
1-13-93	71.5	3471.9	0.827	0.0652	0.171	0.356	2.01	NS	6	ND	<0.05	675	8		1674
3/1/93	71.4	3472	0.008	0.013	0.017	0.037	0.075	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	71.68	3471.72	0.014	0.014	0.005	0.007	0.04	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	71.4	3472	0.048	0.079	0.032	0.063	0.222	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	71	3472.4	0.066	0.035	0.013	0.022	0.136	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	71.88	3471.52	1.02	0.269	0.233	0.386	1.91	NS	2	ND	NS	NS	NS	NS	NS
6/21/94	71.9	3471.5	4.68D	1.05	0.688	1.24	7.66	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	73.65	3469.75	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	74.05	3469.35	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.85')												
3/25/95	74.39	3469.01	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.81')												
6/30/95	73.86	3469.54	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.81')												
12/4/95	73.76	3469.64	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.71')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-13	INITIAL WATER LEVEL:	43
TOTAL DEPTH OF WELL:	49	TOP OF SCREEN:	39
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	49
ELEVATION (ASL):	3545.91		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	42	3503.91	21	2.43	26.1	42.6	92.2	3.74	567	195	<0.05	236	N/A		2250
1-13-93	44.5	3501.41	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	43	3502.91	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	49.92	3495.99	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	46.86	3499.05	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 2.73')												
3/25/95	46.76	3499.15	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 1.37')												
6/30/95	46.33	3499.58	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 2.51)												
12/4/95	46.55	3499.36	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 2.50')												

MONITOR WELL NUMBER:	2-14	INITIAL WATER LEVEL:	70
TOTAL DEPTH OF WELL:	78	TOP OF SCREEN:	66
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	76
ELEVATION (ASL):	3545.91		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	65	3480.91	0.044	0.022	0.006	0.011	0.083	ND	ND	ND	<0.05	1460	N/A		2500
1-13-93	61.8	3484.11	SAMPLE NOT ANALYZED												
3/1/93	62.1	3483.81	0.037	0.001	ND	0.003	0.041	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	62.32	3483.59	6.15	0.761	0.234	0.326	7.47	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	62.2	3483.71	0.342	0.056	0.148	0.182	0.728	NS	1	ND	NS	NS	NS	NS	NS
12/8/93	62	3483.91	0.245	0.039	0.122	0.168	0.574	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NS	NS	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	62.8	3483.11	0.115	0.056	0.078	0.164	0.413	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	61.37	3484.54	0.119	0.043	0.046	0.086	0.294	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	62.11	3483.8	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
3/25/95	62.86	3483.05	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
6/30/95	61.87	3484.04	FREE PRODUCT PRESENT; NOT ANALYZED(PRODUCT = 0.01')												
12/4/95	61.77	3484.14	FREE PRODUCT PRESENT; NOT ANALYZED (NOT MEASURED)												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-15
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.64

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 63
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3479.64	0.042	0.043	0.05	0.135	0.27	ND	2	ND	<0.05	1248	N/A		2500
1-13-93	63	3480.64	0.652	0.74	0.424	1.03	2.85	NS	12	3	0.12	875	7.9		1166
3/1/93	63.3	3480.34	0.111	0.029	0.029	0.076	0.245	NS	1	2	NS	NS	NS	NS	NS
6/8/93	63.7	3479.94	0.341	0.098	0.106	0.192	0.737	NS	2	4	NS	NS	NS	NS	NS
9/14/93	63.2	3480.44	0.103	0.009	0.005	0.008	0.125	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	63.1	3480.54	3.55	0.668	0.153	0.247	4.62	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	64.42	3479.22	10.4D	2.36D	0.91	1.55	15.2	NS	17	NS	NS	NS	NS	NS	NS
6/21/94	64.37	3479.27	0.863	0.03	0.162	0.29	1.35	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	62.94	3480.7	0.103	0.009	0.014	0.033	0.159	NS	ND	5	NS	NS	NS	NS	NS
11/21/94	63.27	3480.37	0.119	0.010	0.008	0.040	0.177	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	63.27	3480.37	0.113	0.009	0.009	0.035	0.166	NS	ND	ND	NS	NS	NS	NS	NS
3/25/95	64.28	3479.36	1.95	0.171	0.115	0.158	2.39	NS	NS	NS	NS	NS	NS	NS	NS
3/25/95	64.28	3479.36	1.04	0.082	0.058	0.082	1.26	NS	NS	NS	NS	NS	NS	NS	NS
6/30/95	64.02	3479.62	0.476	0.043	0.032	0.053	0.604	NS	NS	NS	NS	NS	NS	NS	NS
12/4/95	65.2	3478.44	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.50')												

MONITOR WELL NUMBER: 2-16
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.39

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3470.39	0.461	0.305	0.082	0.134	0.982	ND	1	ND	<0.05	624	N/A		2375
1-13-93	70	3474.39	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	70.1	3474.29	6.58	0.011	0.106	0.486	7.18	NS	11	2	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	70.51	3473.88	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	70.06	3474.33	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.0')												
3/25/95	70.55	3473.84	FREE PRODUCT; NOT ANALYZED												
6/30/95	69.81	3474.58	FREE PRODUCT; NOT ANALYZED												
12/4/95	74.2	3470.19	FREE PRODUCT; NOT ANALYZED (PRODUCT = 3.10')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-18
TOTAL DEPTH OF WELL: 39
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.79

INITIAL WATER LEVEL: 33
TOP OF SCREEN: 29
BASE OF SCREEN: 39

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	30	3515.79	8.33	0.685	0.352	0.292	9.66	0.03	10	ND	<0.05	560	1	5	2250
1-13-93	21.7	3524.09	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	975	2.41		3092
3/1/93	21.8	3523.99	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93	22	3523.79	9.71	0.492	0.294	0.3	10.8	NS	21	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	6.49	0.008	0.114	0.019	6.63	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	5.72	0.008	0.085	0.018	5.83	NS	7	ND	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	4.95	0.004	0.084	0.019	5.06	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	5.87	0.004	0.094	0.022	5.99	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	22.58	3523.21	5.17D	0.004	0.068	0.018	5.26	NS	5	ND	NS	NS	NS	NS	NS
6/21/94	22.65	3523.14	5.16D	0.008	0.088	0.022	5.28	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	21.69	3524.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	22.22	3523.57	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.0')												
3/25/95	23.14	3522.65	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
6/30/95	22.1	3523.69	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.0')												
12/4/95	22.2	3523.59	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.0')												

MONITOR WELL NUMBER: 3-1
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.04

INITIAL WATER LEVEL: 58
TOP OF SCREEN: 53
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	59.22	3483.82	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	58.49	3484.55	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	59.22	3483.82	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
3/25/95	60.01	3483.03	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
6/30/95	59.69	3483.35	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												
12/4/95	60.15	3482.89	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.02')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-2	INITIAL WATER LEVEL:	90
TOTAL DEPTH OF WELL:	103	TOP OF SCREEN:	63
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	103
ELEVATION (ASL):	3541.59		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	72.34	3469.25	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	71.8	3469.79	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	72.87	3468.72	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 1.43')												
3/25/95	74.21	3467.38	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 2.76')												
6/30/95	73.43	3468.16	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 1.51')												
12/4/95	73.24	3468.35	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 1.36')												

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-3	INITIAL WATER LEVEL:	68
TOTAL DEPTH OF WELL:	83	TOP OF SCREEN:	58
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	83
ELEVATION (ASL):	3544.93		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	74.58	3470.35	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	74.15	3470.78	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	74.2	3470.73	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.14')												
3/25/95	74.42	3470.51	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.12')												
6/30/95	73.26	3471.67	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.10')												
12/4/95	74.16	3470.77	FREE PRODUCT PRESENT; NOT ANALYZED 9PRODUCT = 0.16')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-4	INITIAL WATER LEVEL:	95
TOTAL DEPTH OF WELL:	113	TOP OF SCREEN:	68
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	113
ELEVATION (ASL):	3558.63		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	87.07	3471.56	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	86.35	3472.28	0.08	0.001	0.022	0.039	0.142	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	86.51	3472.12	NO PUMP - NOT SAMPLED												
3/25/95	86.75	3471.88	NO PUMP - NOT SAMPLED												
6/30/95	84.96	3473.67	NO PUMP - NOT SAMPLED												
12/4/95	86.44	3472.19	NO PUMP - NOT SAMPLED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

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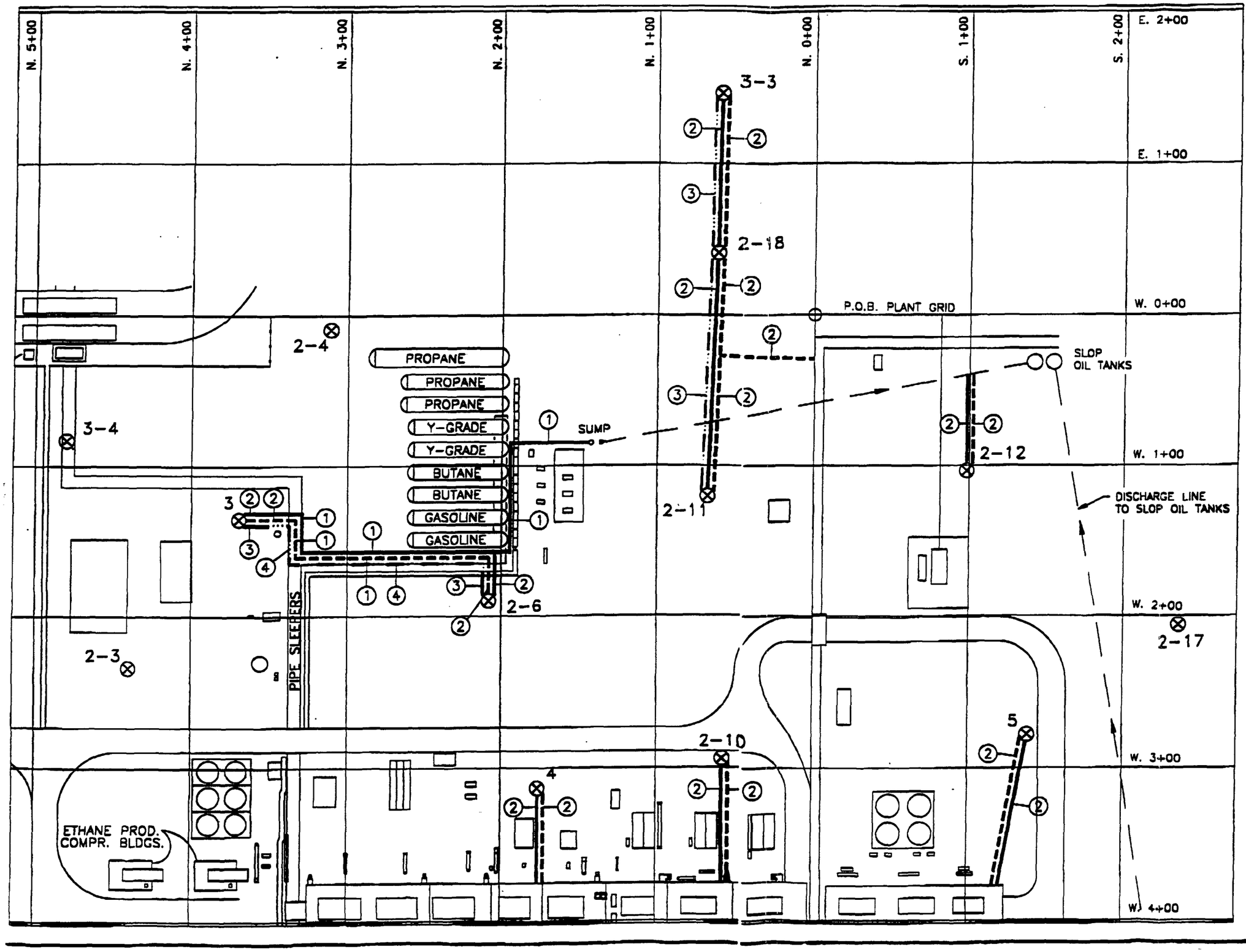


GRID NORTH

LEGEND:

- GW/ PRODUCT DISCHARGE
- AIR SUPPLY
- CONTROL LOGIC LINE
- ⊗3 MONITOR WELL AND NUMBER
- (1) 1" Sch. 40 Galvanized Pipe (above grade)
- (2) 1" SDR (rated 175 psi) (below grade)
- (3) 1" SDR (housing 1/4" control logic tubing) (below grade)
- (4) 3/4" Conduit (housing 1/4" control logic tubing) (above grade)

0 60 120

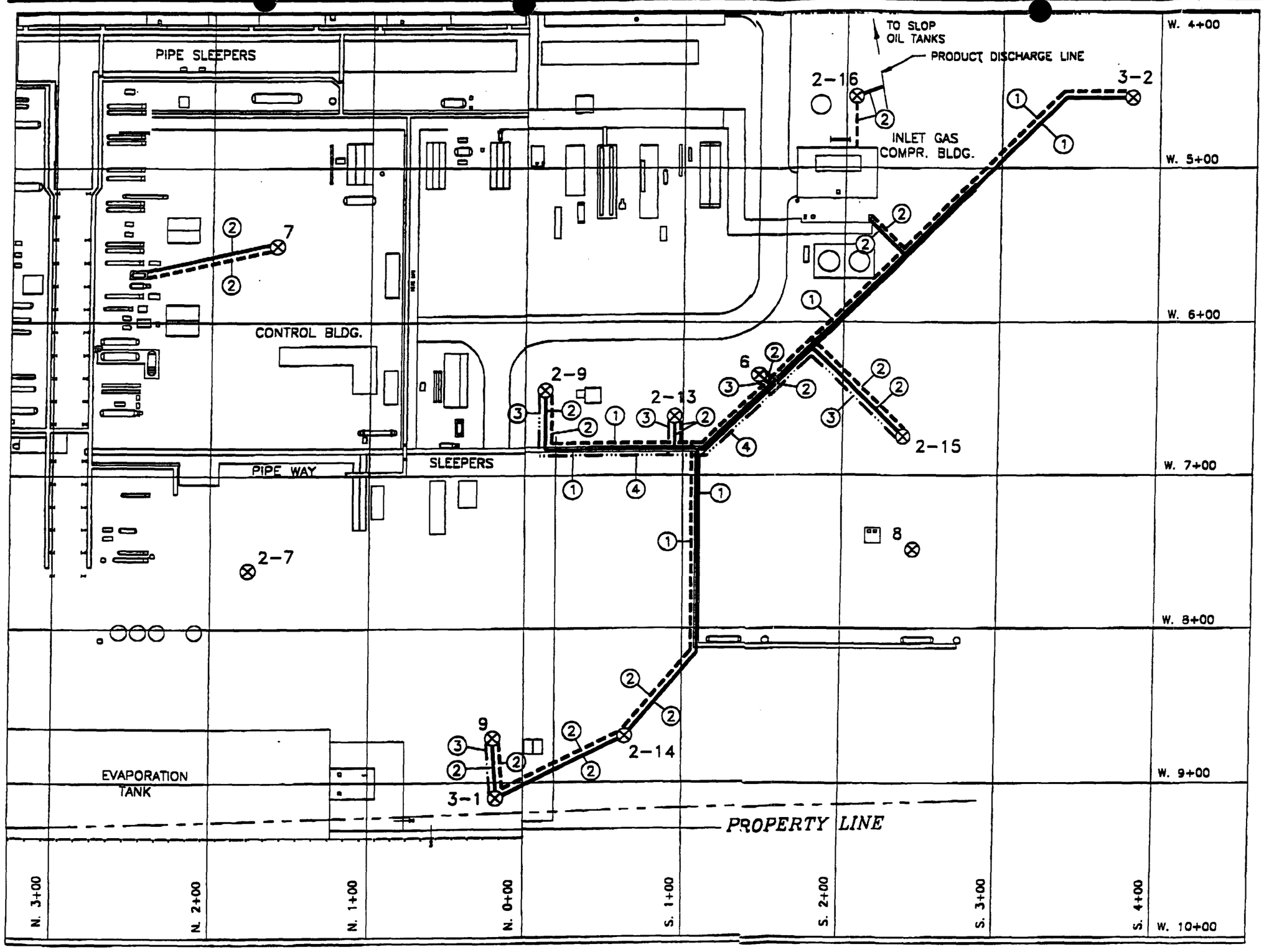
GRAPHIC SCALE

Attachment 3

ENTRIX

Figure 1
Piping Layout
Groundwater and Condensate Recovery Systems
Empire Abo Gas Plant

PROJ. NO: 146710 | CK: | DATE: 11/8/95



GRID NORTH

LEGEND:

- GW/ PRODUCT DISCHARGE
- AIR SUPPLY
- CONTROL LOGIC LINE
- ⊗3 MONITOR WELL AND NUMBER
- (1) 1" Sch. 40 Galvanized Pipe (above grade)
- (2) 1" SDR (rated 175 psi) (below grade)
- (3) 1" SDR (housing 1/4" control logic tubing) (below grade)
- (4) 3/4" Conduit (housing 1/4" control logic tubing) (above grade)

0 60 120

GRAPHIC SCALE

Attachment 3

ENTRIX

Figure 2
Piping Layout
Groundwater and Condensate Recovery Systems
Empire Abo Gas Plant

PROJ. NO: 146710 | CK: | DATE: 11/8/95

OPERATIONS AND MAINTENANCE MANUAL

PNEUMATIC PUMP CONTROLLER
MODEL PC-1T
and
2PT/4PT PNEUMATIC PUMP

TIERRA MADRE ENVIRONMENTAL CORPORATION
P.O. Box 2210, 201 E. 6th St.
Ada, OK 74820
(405)332-1700 (800)377-5129
FAX # (405)332-1716

Attachment 4

NOTICE:

Customers using **2SK2 Skimming Pump with Hydrophobic Filter**:

Installation and startup procedures for the 2SK2 skimming pump are the same as with the 2PT and 4PT pneumatic pumps with the following exceptions:

1) Both air line and discharge line are 1/4" hose barb connections. The 2SK2 air supply line is the 1/4" O.D. nylon tube and the discharge line is the S.S. pipe (filter guide rod). Please refer to drawing of 2SK2 in manual.

2) Set a long "FILL" time on the PC-1T (or PC-1EP) Main Control. A "Fill" time of 15-20 minutes is recommended to start, then adjust time up or down to maximize pumping.

PNEUMATIC CONTROL INSTALLATION
MODEL PC-1T

COMPRESSED AIR SUPPLY

The control requires a compressed air supply providing shop grade operating air that is free of excessive oil and moisture. The air source should be properly sized for the pumping system.

MOUNTING

The control should be securely mounted in vertical position and isolated from compressor vibration. Mounting holes are molded into the enclosure at each corner. Machine, wood or sheet metal screws may be used, depending on the material upon which the control is mounted.

AIR CONNECTIONS (Refer to PC-1T Diagram)

1) Connect the air line from compressed air supply to the filter/regulator at the "Air In" port of the control.

2) If using single pump, connect air line going out to pump to the "Air Out" port of the control.
If using satellite controllers (ST-1 or ST-1LS), connect multiple well manifold (MWM-X) to "AIR OUT" port of the control.

SATELLITE CONTROLLERS for multiple pump applications (Refer to ST-1 Diagram)

The PC-1T control is capable of operating multiple pumps by using satellite controllers (Models ST-1 or ST-1LS) at each well. The satellite controllers operate by receiving a "logic" air signal from the main control (PC-1T) during the pump cycle. The "logic" air signal opens the valve of the satellite controller allowing "supply" air from the compressed air source to operate the pump. When using satellite controllers with the PC-1T make the air line connections as follows:

1) The air line coming from the compressed air supply must be manifolded to provide air to the PC-1T and to each satellite controller. The air line from compressed air source attaches to 1/2" hose barb on the regulator of the satellite controller.

2) Connect 1/4" O.D. "logic" tube from multiple well manifold (MWM-X) on the PC-1T to the 1/4" quick connect of the satellite controller (refer to ST-1 diagram).

NOTE: Logic tubes from main control to all satellite controllers must be the same length to operate pumps at proper timing sequence.

PNEUMATIC PUMP INSTALLATION
MODELS 2PT AND 4PT

HOSE AND CABLE CONNECTIONS TO PUMP

1) Connect air supply hose to 1/4" barb fitting on 2PT or 1/2" hose barb on 4PT pump, secure with hose clamp.

2) Connect discharge hose to 1/2" hose barb fitting on 2PT or 4PT pump, secure with hose clamp. (Note: On 4PT pump the discharge fitting is the 3/4" NPT x 1/2" hose barb fitting.)

3) Attach suspension cable to eye-bolt on top of pump.

4) Bundle discharge hose, air supply hose, and suspension cable at 10' or less increments with nylon or equivalent cable ties.

BUBBLER TUBE (ST-1LS SATELLITE CONTROLLER)

1) Connect 1/2" O.D. x 5" S.S.bubbler head to bubbler tube by pushing the tube into the quick-connect fitting on top of the head.

2) Position the bubbler head the desired distance from top intake of pump. The bottom end of the bubbler head must be submersed 3" below fluid level before it will activate ST-1LS satellite controller.

3) Cut suspension cable, discharge hose, air supply and bubbler tube to the proper length to position the pump at the desired depth in well, making sure to leave enough excess to make the connections to the well closure and to adjust pump depth, if necessary.

HOSE AND CABLE CONNECTION TO BOTTOM OF WELL CLOSURE

1) Connect discharge hose to 1/2" hose barb.

2) Connect 1/4" O.D. bubbler tube to tubing quick-connect.

3) Connect airline to 1/2" barb fitting (4PT) or 1/4" barb fitting (2PT). When using satelitte controllers, air supply is connected to hose barb on bottom side of satellite controller quick connect on well closure.

4) Lower pump into well, slip well closure into place on top of well casing.

CONNECTIONS TO TOP OF WELL CLOSURE

1) If using satellite controllers, connect female air coupling of satellite controller to male air coupling on top of well closure. Connect air hose from compressed air supply to hose barb on regulator of satellite controller.

For single pump installations, connect air line from "AIR OUT" port on PC-1T control to 1/2" hose barb (for 4PT pump) or 1/4" hose barb (for 2PT pump) on top of well closure.

2) Connect discharge hose to 1/2" hose barb on top of well closure.

3) If using ST-1LS satellite controller, Connect 1/4" O.D. bubbler tube from ST-1LS satelitte controller to 1/4" push-to-connect fitting on top of well closure.

START-UP

1) Open air supply to control and satellite controllers from compressed air source.

2) Set air supply pressure at PC-1T control to **MINIMUM OPERATING PRESSURE OF 60 PSI.**
   For multiple pump systems, set PC-1T filter/regulator to 60-90 PSI, depending on number of satellite controllers that PC-1T is operating and lengths of the "logic" tubing going to the satellite controllers.
   For single pump systems set PC-1T filter/regulator pressure at Total Head plus 15 PSI [Total head(feet) / 2.3 = Total head (PSI)].

3) Set air supply pressure at regultor of each satellite controllers at total head plus 15 PSI [Total head(Feet)/2.3 = Total head(PSI)].

4) Set PC-1T "FILL" and "PUMP" time cycles:
   Watch the control pressure gauge on front panel of the control. The pressure will rise to approximately 40 PSI, the control valve will shift, then the pressure will begin to fall to approximately 20 PSI, the cycle will then repeat.
   The rise in pressure indicates the "Fill" cycle of the pump. The fall in pressure indicates the "PUMP" cycle of the pump. To adjust the time it takes the pressure to rise and fall use the "FILL" and "PUMP" knobs on the control panel. Precise timing can be achieved using stop watch.

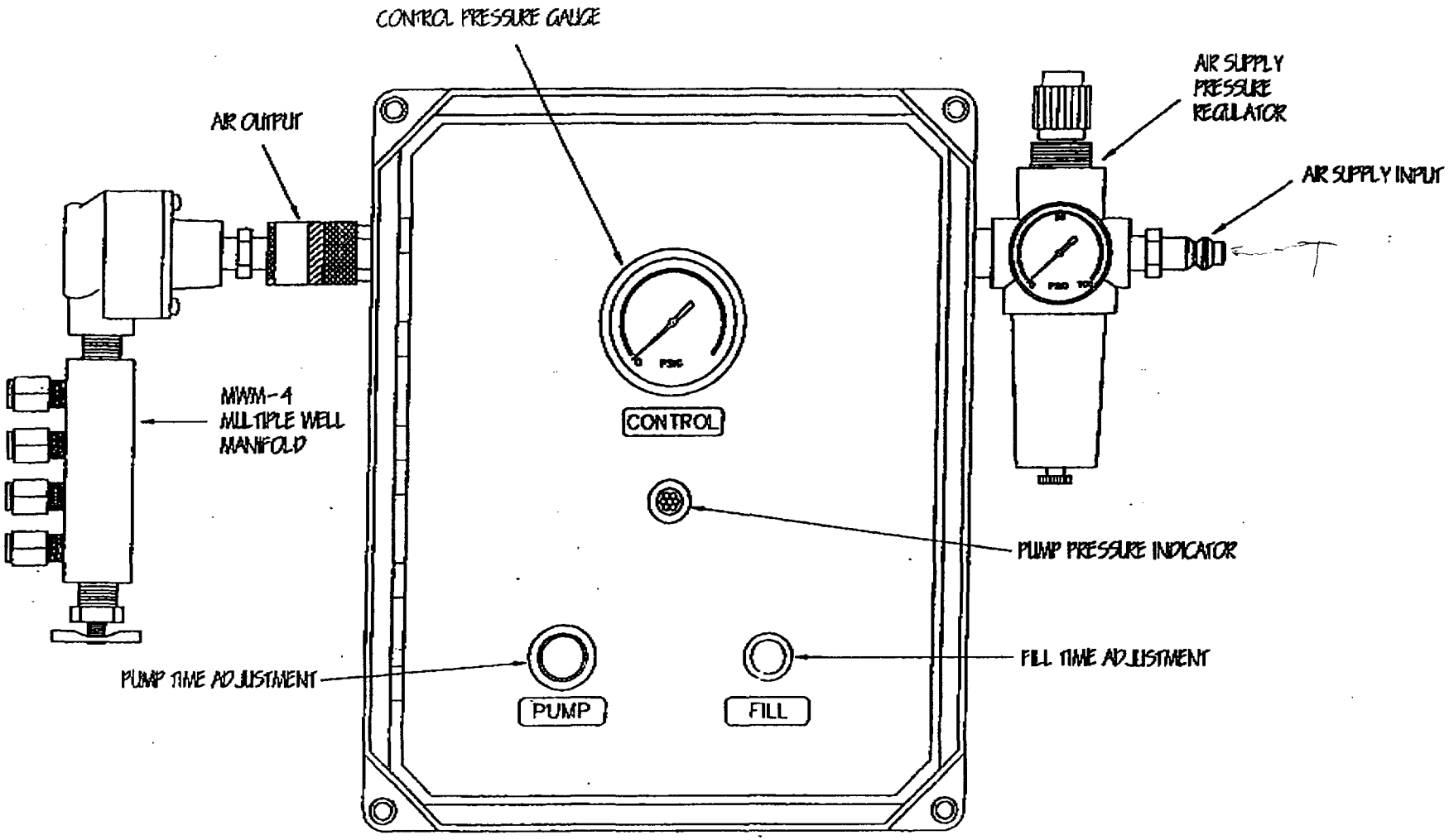
   Turning knobs clockwise increases the time, counter-clockwise decreases the time.

   - Adjust PC-1T for maximum flow rate of pump
     1) Set the "FILL" cycle time to allow pump to completely fill, 15-20 seconds is usually sufficient, but this depends on recharge rate of well.

     2) Increase "PUMP" cycle time until pump starts to blow air at the end of the cycle, then decrease time until it stops blowing air.

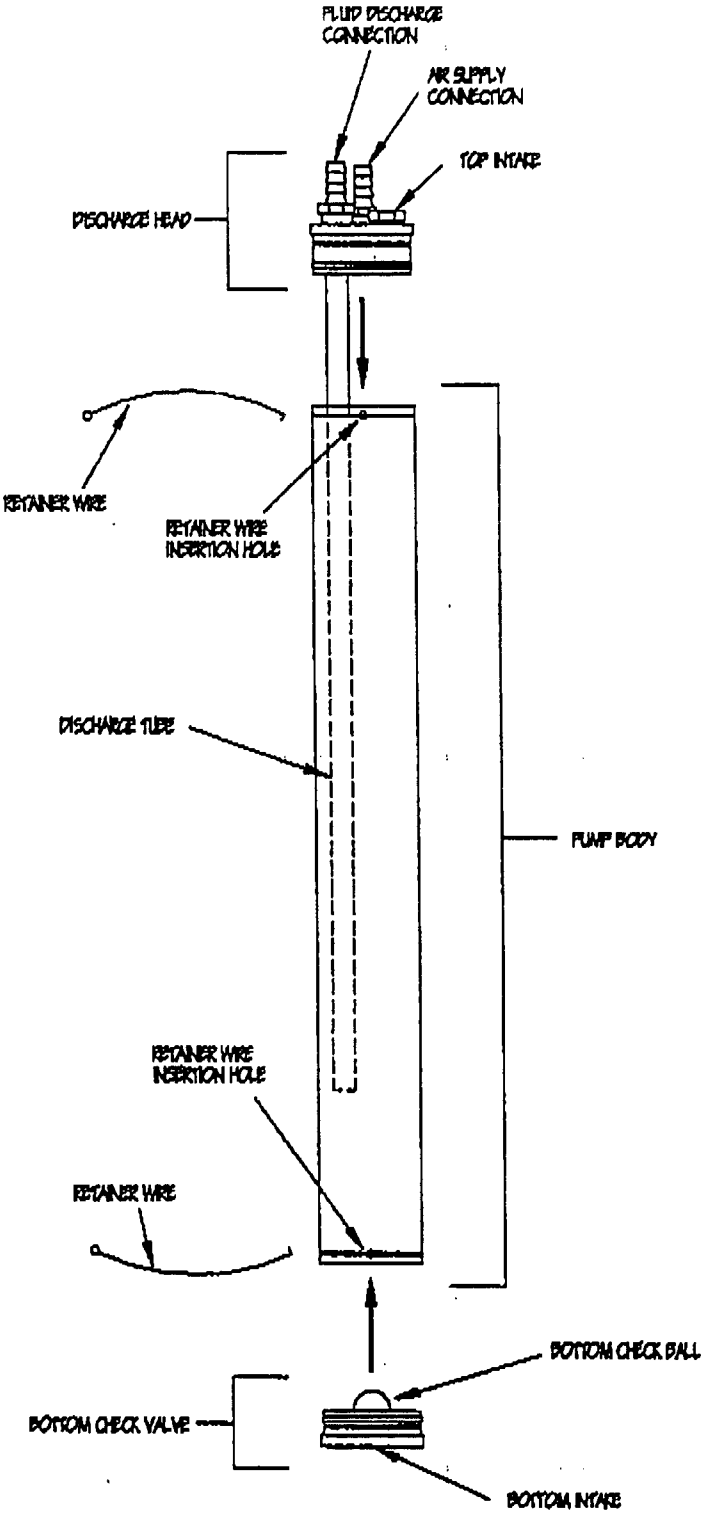
     3) Start decreasing "FILL" cycle time until pump starts to blow air, then increase until it stops.

     4) From this setting reduce "PUMP" and "FILL" cycles until the optimum flowrate for pumping application is reached.

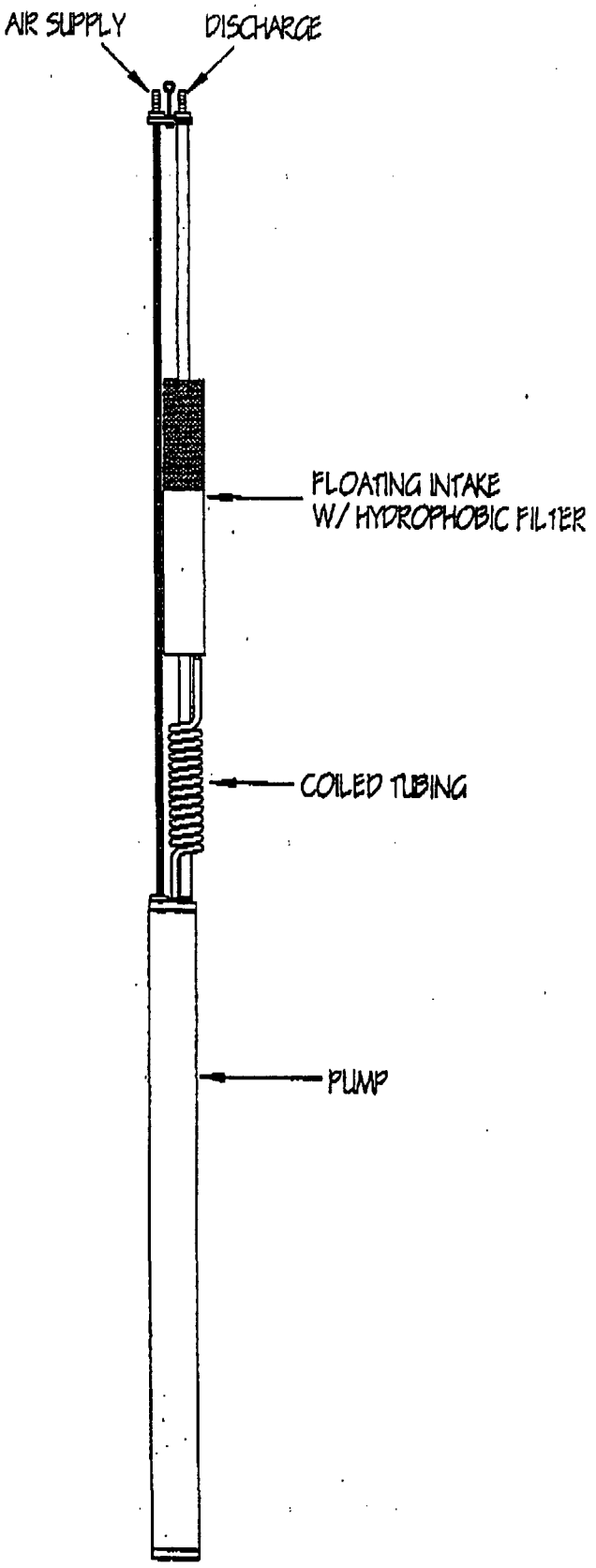


MODEL PC-IT WITH MWM-4 MULTIPLE WELL MANIFOLD

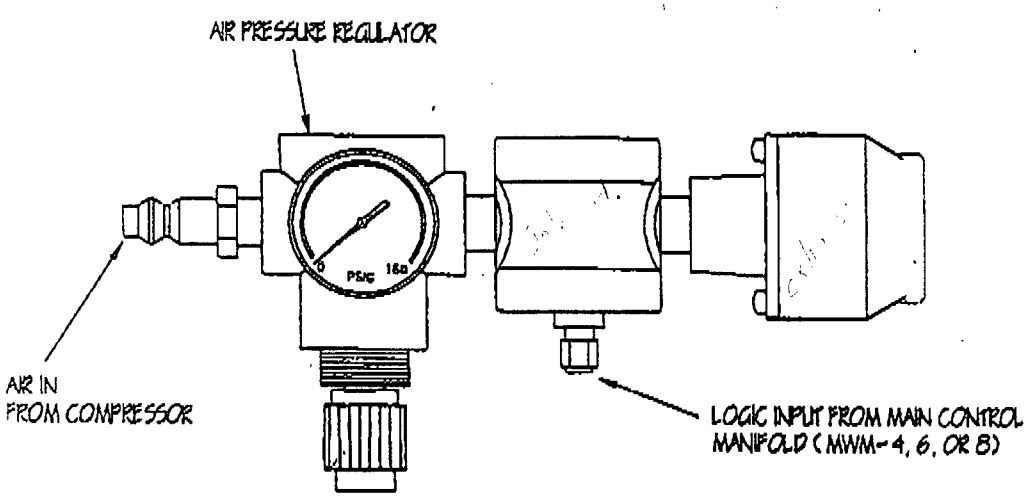
(PC-IT SHOWN WITH FRONT COVER REMOVED)



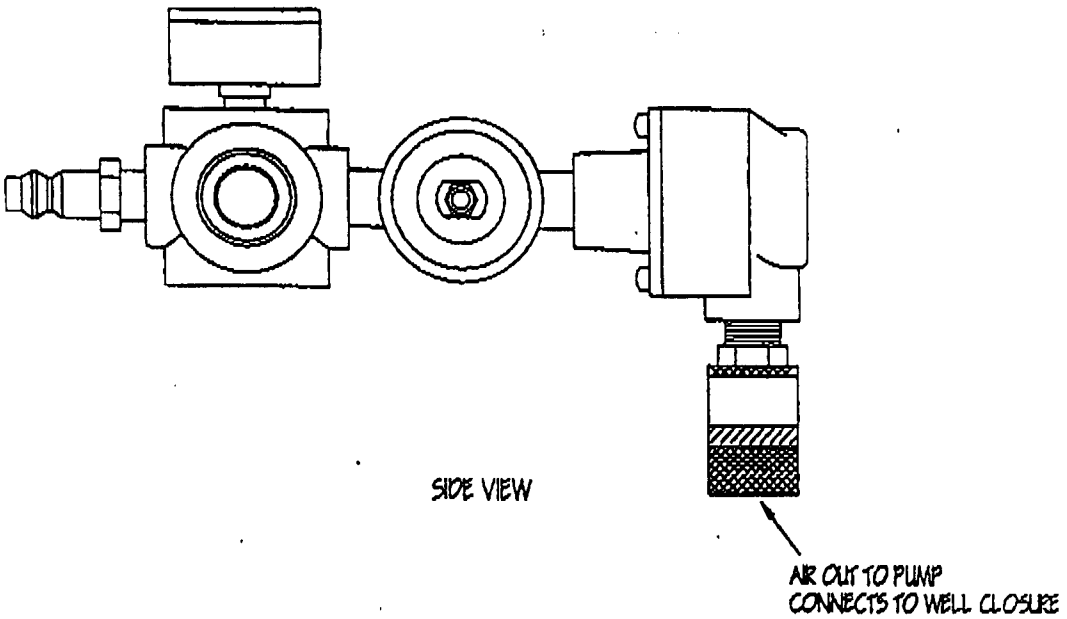
PNEUMATIC PUMP
(EXPLODED VIEW)



MODEL 2SK2 SKIMMING PUMP



TOP VIEW



SIDE VIEW

ST-1 SATELLITE CONTROLLER

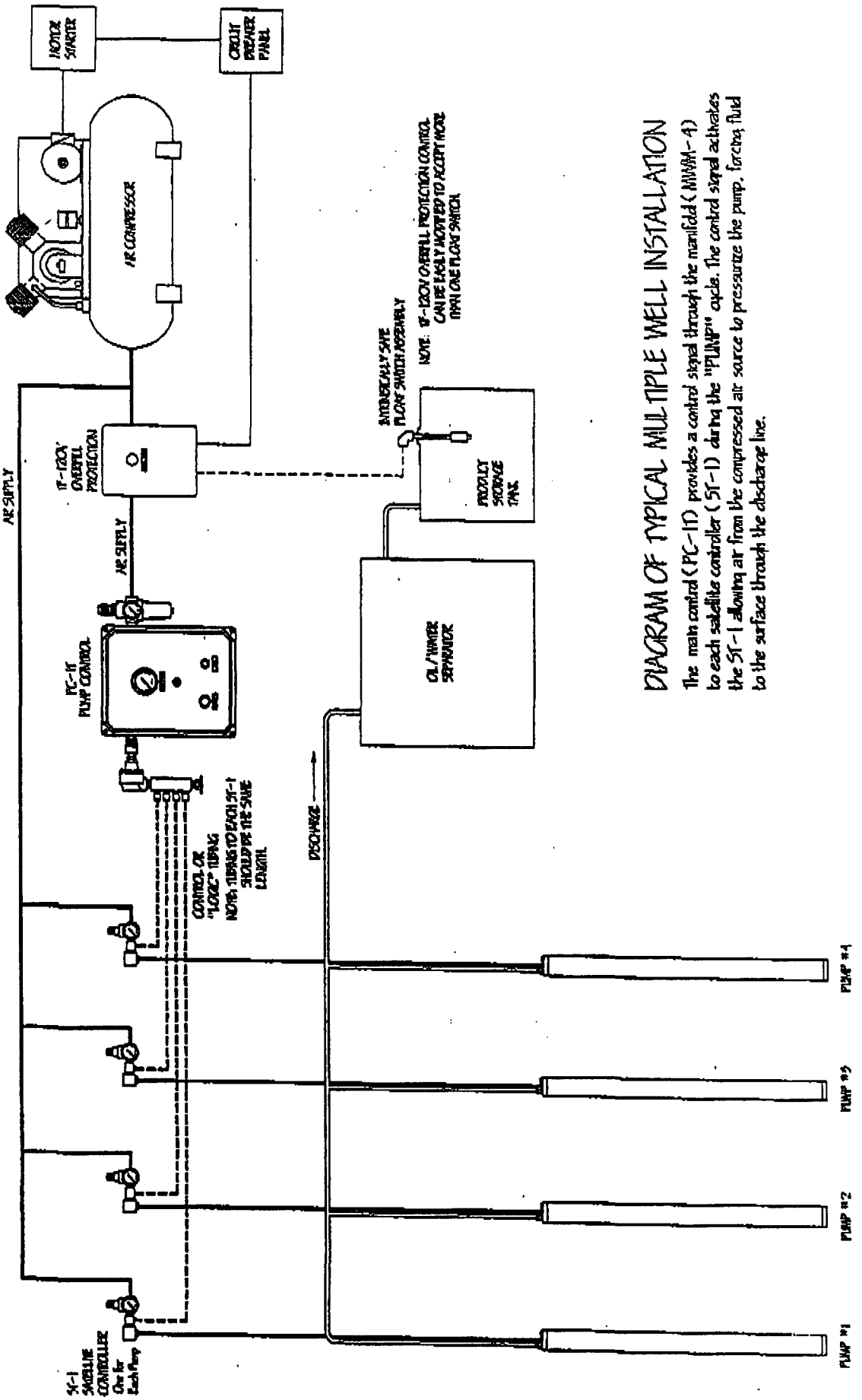
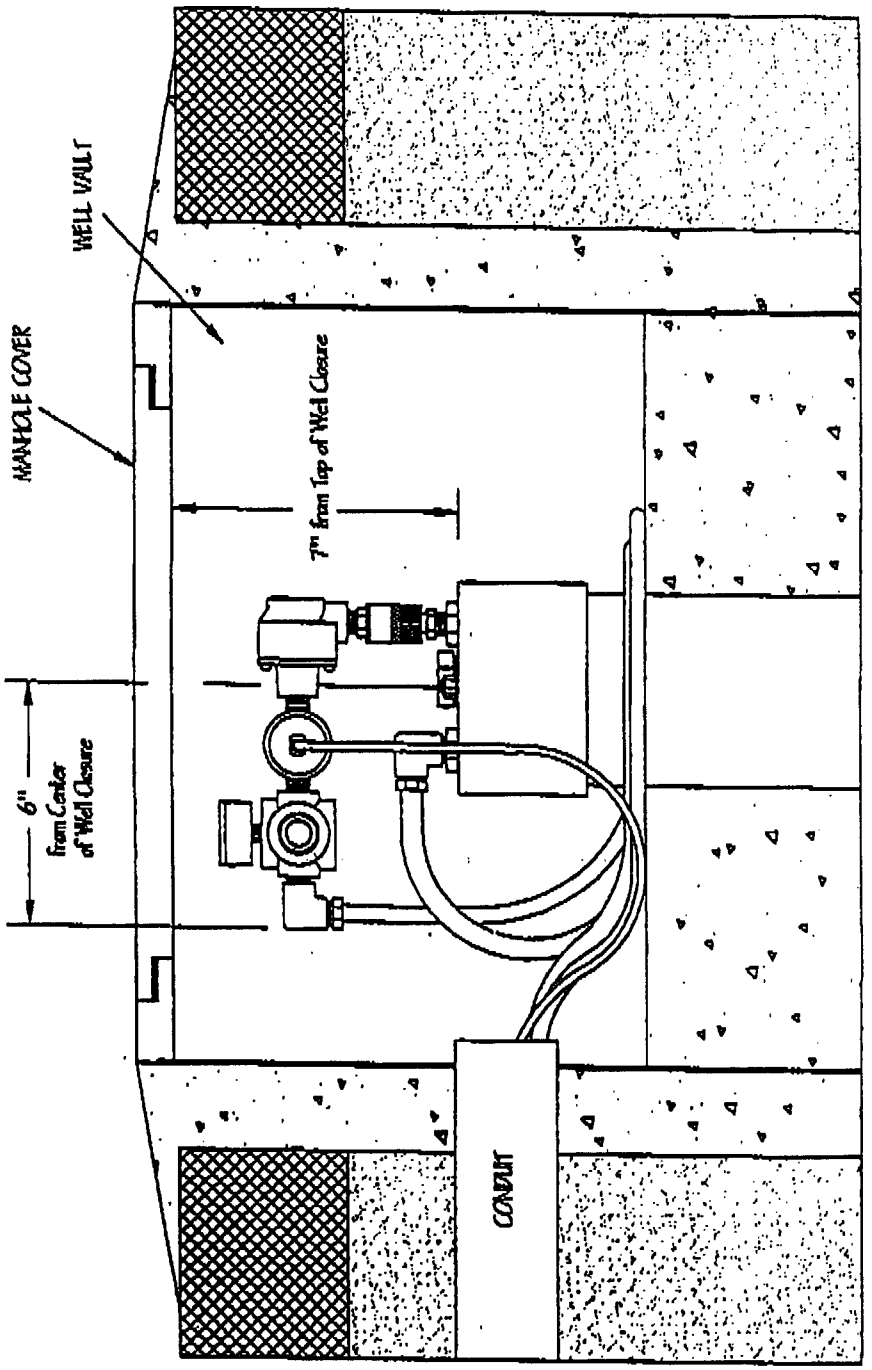
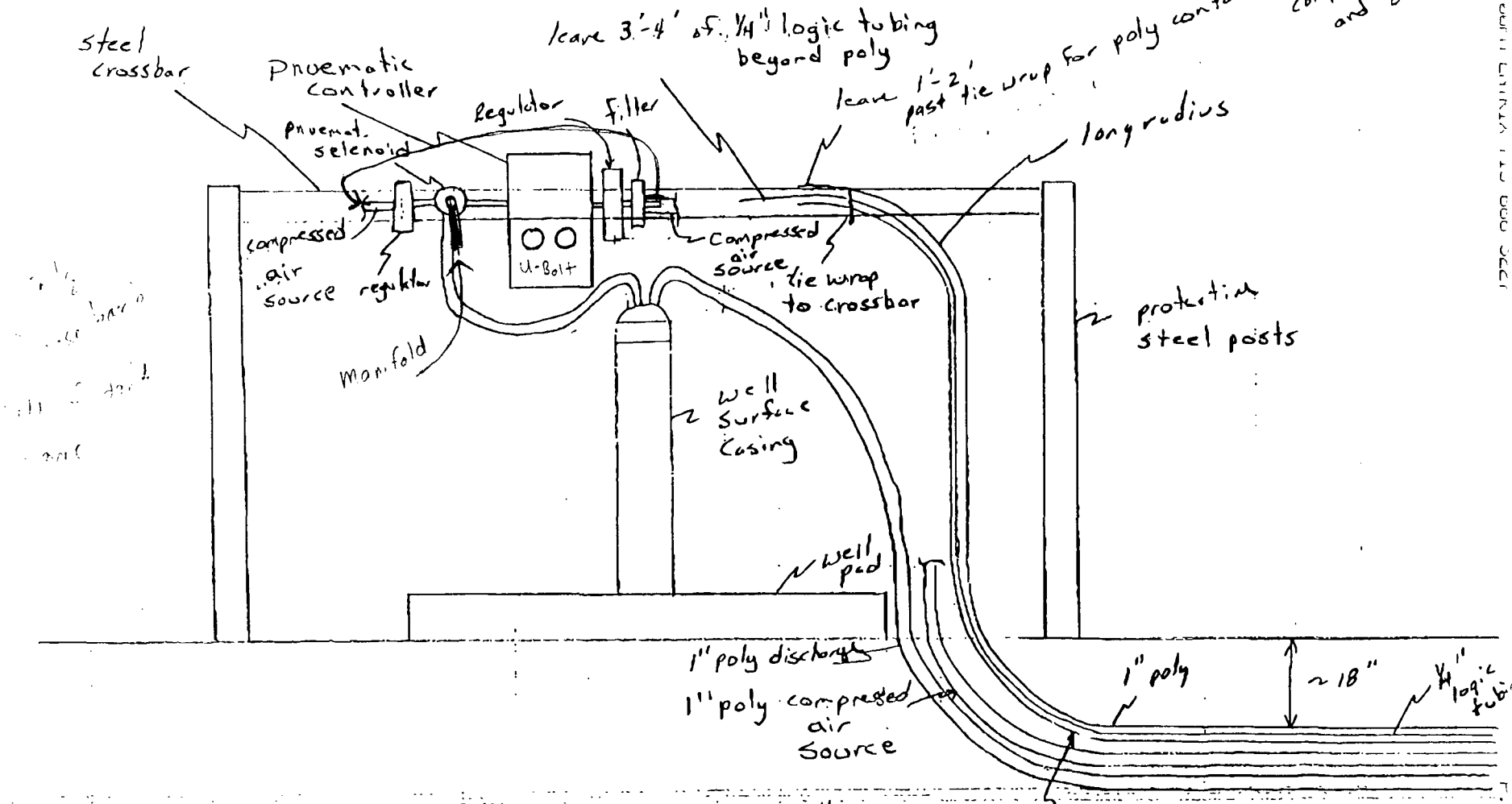


DIAGRAM OF TYPICAL MULTIPLE WELL INSTALLATION

The main control (PC-1D) provides a control signal through the manifold (MMM-4) to each satellite controller (SF-1) during the "PUMP" cycle. The control signal activates the SF-1 allowing air from the compressed air source to pressurize the pump, forcing fluid to the surface through the discharge line.



WELL VAULT CROSS-SECTION SHOWING TYPICAL INSTALLATION AND MINIMUM CLEARANCE REQUIREMENTS FOR ST-I SATELLITE CONTROLLER



long radius 90° & 45° ells required for 3/4 conduit run above ground on pipe racks to prevent kinking of 1/4 logic tubing inside conduit.

long radius on poly pipe, reduces below ground fittings and allows us to run the 1/4 O.D. tubing inside the poly from one well to another

TECHNICAL DATA SHEET

EVACUATOR™ II

DOWN-WELL CONTROL

The EVACUATOR™ II pump incorporates a down-well controller which automatically cycles the pump to maintain a desired draw-down.

INCREASED PERFORMANCE

The down-well control allows quicker air exhausting, therefore the pump cycles faster, increasing pump output. The pump's performance is further enhanced when used in vacuum applications.

FLEXIBILITY

The EVACUATOR™ II in top-loading design is used when free-phase product is present. When dissolved-phase is present, the EVACUATOR™ II can be configured as a top and bottom loading pump for greater flow rates.

PUMPING RATES

Top loading design produces 4.8 gpm (18 L/min) at 3' (0.9 m) submergence. Top and bottom loading design produces 10.0 gpm (38 L/min) at 3' (0.9 m) submergence.

CONSTRUCTION

The EVACUATOR™ II pump body is constructed of 304 stainless steel and Teflon®, providing chemical compatibility in harsh environments. The patented 3-piece "Arch" design allows for easy field serviceability.

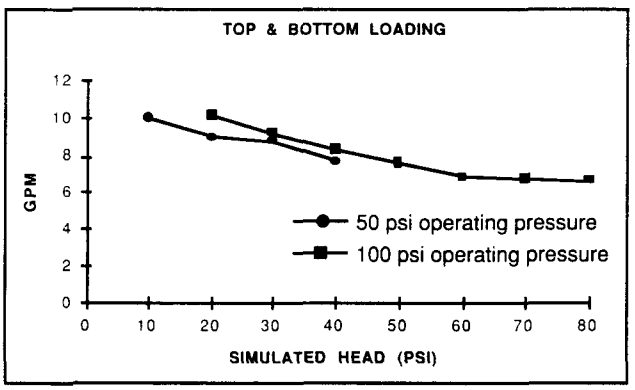
DEPENDABILITY

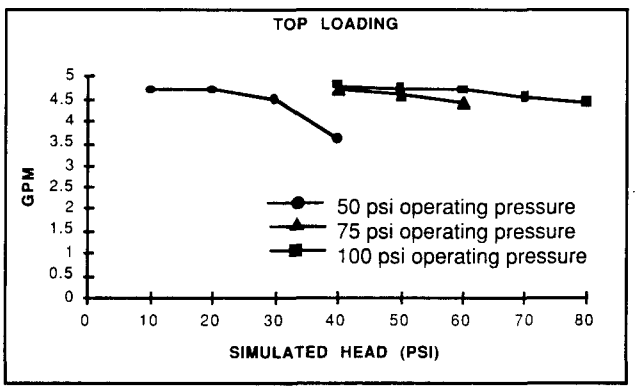
The EVACUATOR™ II uses the same rugged design as the standard EVACUATOR™ pumps feature, making the system ideal for low flow, silty conditions with minimal pump wear.

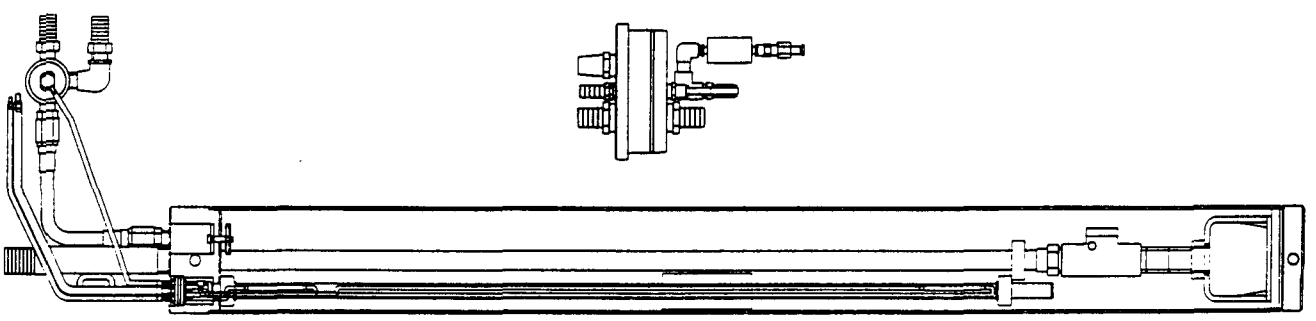
INSTALLATION

To minimize field installation time, each EVACUATOR™ II system includes a regulator, 5 micron filter with auto drain, and instruction manual. A 4" well clincher is provided for easy hose connection, pump support cable hook-up and water tight sealing.

Standard Swagelok® connections provide for simple, secure hose attachment. Down-hole tubing assembly is bundled and color-coded for fool-proof, tangle-free installation.







EVACUATOR™ II

	TOP LOADING	TOP & BOTTOM LOADING
Model No.	**TR-101**	**TR-102**
Pump Size*	3.5 in. OD x 38 in. (89 x 965 mm)	3.5 in. OD x 40 in. (89 x 1016 mm)
Weight	22 lb (10 kg)	22 lb (10 kg)
Min. Air Pressure	50 psi (330 kPa)	50 psi (330 kPa)
Max. Air Pressure	100 psi (690 kPa)	100 psi (690 kPa)
Max. Operating Temp	100°F (38°C)	100° (38°C)
Pump Construction	304 stainless steel, Buna-N check ball, Epoxy coated float	304 stainless steel, Buna-N check ball, Epoxy coated float
Air Quality Requirements	5 micron filter air	5 micron filter air
Hose Connections	Swagelok®	Swagelok®
Hoses		
Air Supply to Pump	1/2 in. (13 mm) ID	1/2 in. (13 mm) ID
Pump Discharge Line	3/4 in. (19 mm) ID	3/4 in. (19mm) ID
Air Exhaust	1/2 in. (13 mm) ID	1/2 in. (13 mm) ID
Logic Control type	Down well pneumatic	Down well pneumatic
Logic Air Lines:	Polypropylene	Polypropylene
Supply	1/8 in. (1.6 mm) tubing	1/8 in. (1.6 mm) tubing
Exhaust	1/8 in. (6.3 mm) tubing	1/8 in. (6.3 mm) tubing
Pumping Capacity	4.8 GPM, 3 ft submergence @ 10 psi	10.0 GPM 3 ft submergence @ 10 psi
Max Depth	225 ft (68 m)	225 ft (68 m)
Min. Fluid Level	39 in. (990 mm)	36 in. (914 mm)
Inlet Valve Const.	poppet - 316 stainless steel O-Ring - Viton®	poppet - 316 stainless steel O-Ring - Viton®

*Pumps are available in shorter lengths to accomodate specific site applications.

In calculating air requirements, a general rule of thumb is 1.26 cfm per gpm

OPERATING AIR PRESSURE		COMPRESSED AIR CONSUMPTION RATE	
psi	kPa	(ft^3/cycle)	cm^3/cycle
60	414	0.83	14
70	483	0.94	15
80	552	1.05	17
90	620	1.15	19
100	690	1.26	21

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Salt Lake City, UT
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BRAINARD•KILMAN™

EVACUATOR II

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. We reserve the right to make changes at any time without notice and without incurring any obligation.

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U.S. Products Group

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FAX (404)498-2841

INTRODUCTION

The Brainard-Kilman™ EVACUATOR II pneumatic pump is available in two versions: a top and bottom loading version or a top loading only version to pump fluids to the surface for treatment. The pump is designed to fit in groundwater wells as small as 4 inches (102 mm) in diameter. The EVACUATOR II uses a down-well pneumatic logic system to automatically determine the optimal pumping rate needed to maintain a constant groundwater depression level. The pneumatic valve, located on the pump, eliminates the need for any controls at the surface.

This concise manual introduces the EVACUATOR II and provides step-by-step guidelines for successful installation and operation. Please read this information carefully before using the pump and keep the manual handy for field reference.

SYSTEM COMPONENTS

This section introduces the EVACUATOR II pump system which consists of an EVACUATOR II pump, a 4-inch diameter Well Clincher, and a 5-micron filter with auto drain, all standard with the purchase of each pump. It also details the hoses required for the pump and the air compressor required to power the pump.

EVACUATOR II

The EVACUATOR II, shown in Figure 1, consists of a stainless steel assembly with intake ports at the top and bottom or top only and connections for air, exhaust, and product discharge tubing. The intake port on the top of the EVACUATOR II is a stainless steel, poppet check valve with a Viton® o-ring seal. The bottom water intake port consists of a Buna-N check ball in a stainless steel seat. An epoxy coated, Buna-N float rides on a stainless steel rod providing the mechanism to cycle the pump (Figure 2).

WELL CLINCHER

The EVACUATOR II pump system comes complete with a 4-inch (102 mm) diameter Well Clincher which is used at the well head for pump support, air and water connections, and to provide a watertight seal. The Well Clincher is made of PVC, precision machined so that its inner diameter matches the outer diameter of 4-inch PVC well monitor pipe. The Well Clincher features an o-ring seal for vacuum applications. It comes complete with brass fittings required to connect to the EVACUATOR II pump system and a stainless steel eye hook to attach a pump support cable.

HOSES

The following is a brief description of the hoses required to operate the EVACUATOR II pump system.

1. Air Supply Line (down hole): 1/2-inch I.D. (13 mm) Buna-N lined hose with twin tubing attached. The main air supply line enables the pump to quickly and efficiently evacuate the fluid from the EVACUATOR II pump. The attached polypropylene twin tubing supplies a continuous flow of air exhaust to the level logic. It is recommended to use this specific tubing for the air supply line to the pump. This tubing is custom made for the EVACUATOR II.

2. Air Exhaust Line (down hole): 1/2-inch I.D. (13 mm) Buna-N lined hose. The exhaust line allows the EVACUATOR II to quickly exhaust the air and allows the pump to begin filling with fluid. The exhaust line does not have to be run to the surface, but it cannot be submerged. Submersion of the exhaust line will not allow the EVACUATOR II to cycle properly.

3. Fluid Discharge Line (down hole): 3/4-inch I.D. (19 mm) Buna-N lined hose to transfer fluids to surface.

AIR SOURCE

The EVACUATOR II pump system uses compressed air to displace the water in the pump and force it to the surface. An air source is not included with the EVACUATOR II pump system due to the wide variation in compressor requirements for each site. We recommend clean, dry air to prolong the life of the EVACUATOR II and prevent the introduction of further contamination in the groundwater. In freezing temperatures, the addition of an air dryer may be required to avoid freeze damage to the system.

AIR FILTRATION

A coalescing filter and air regulator assembly is included with each EVACUATOR II pump system. It must be installed at the well head to assure that clean air is supplied to the EVACUATOR II, within its working pressure range of 40 psi to 100 psi (275 kPa to 690 kPa). CAUTION: air pressures greater than 100 psi (690 kPa) applied to the EVACUATOR II may damage the pneumatic logic system.

The air consumption rate of the EVACUATOR II pump system will depend on several site-specific variables including operating air pressure and total fluid recovery rate. A worksheet in Appendix A shows the air consumption for the pump system. Once the air consumption rate has been determined, a local air compressor dealer will be able to specify the appropriate size compressor (and air dryer if applicable).

PRINCIPLES OF OPERATION

The EVACUATOR II pumps fluids by air displacement: compressed air forces the fluids out of the annular space of the pump to the surface.

The EVACUATOR II operates in two stages: the ON, or discharge stage, and the OFF, or filling stage. The stages are controlled by a float inside the annular space of the pump which rides on the top of the fluid. When the pump is in the OFF stage, the bottom and top inlet valves are open and fluid is entering the annular space of the pump. As the annular space fills, the float reaches its maximum height which triggers a valve to initiate the ON stage. During the ON stage, high pressure air closes the top and bottom inlet valves, forcing the fluid to evacuate the annular space of the pump through the discharge pipe. When all of the fluid has been removed from the annular space, the float, which has now reached its lower limit, triggers the three-way valve to stop pressurizing and exhaust the annular space which closes the valve and begins the OFF stage again. This cycle is repeated as rapidly as the pump fills up with fluid; therefore, the EVACUATOR II automatically determines its own pumping rate. The pumping rate can be decreased by regulating the flow at the surface using a gate valve.

The EVACUATOR II is designed to maintain a maximum fluid level in the well which is even with the top of the pump. This level is 36 inches from the bottom of the pump and is located approximately at the white teflon o-ring that separates the pump top from the annular tube. If the EVACUATOR II is being used in the optional "top loading only" configuration, the fluid level will be maintained 39 inches from the bottom of the pump, flush with the top of the top cap.

The standard EVACUATOR II pump system, configured for top and bottom loading, is designed to pump a maximum of 10.0 gpm (40 L/min). The optional top-loading-only EVACUATOR II will pump at a maximum of 4.8 gpm (18 L/min).

INSTALLATION AND OPERATION

The EVACUATOR II may be used to remove fluids from wells that are 4 inches (102 mm) in diameter or larger. The relative location of the pump to the air supply and the recovery system on the surface may differ from site to site. Similarly, the length of discharge and air hoses required to connect the pump may vary; otherwise, the installation and operation of the EVACUATOR II is essentially the same for any application.

WARNING: Any electrical components used in an explosive atmosphere must be located in compliance with Chapter 5 of the National Electric Code and any other local codes. This would apply to electrically-powered air compressors.

INSTALLATION PROCEDURE

The following steps outline the connection of the air, exhaust, and fluid discharge hoses, lowering the EVACUATOR II into the well, and attaching the hoses to the Well Clincher.

1. Measure the distance (Hw) from the top of the well to the existing ground water level (Figure 3).

2. Add to that distance the height of the water depression (Hwd) you are trying to create (Figure 3).

3. Cut the down-hole hoses to the following lengths - (Figure 3):

   - Main air supply line (with attached twin tubing): Hwd - 21" (Hwd -533 mm)
   - Air exhaust tubing: Hwd - 21" (Hwd - 533 mm)
   - Fluid discharge tubing: Hwd - 6" (Hwd - 152 mm)

   This will bring all hoses flush with the well casing at the surface. Final cuts can be made to attach hoses to the Well Clincher.

4. NOTICE: We recommend that a teflon coated, steel safety cable be attached to the EVACUATOR II in order to minimize the tension on the down hole hoses. Stainless steel eye hooks can be found on the top of the pump and inside the top cap of the Well Clincher.

5. The 1/4" (6 mm) air logic exhaust and 1/16" (1.6 mm) logic supply hoses are connected to the Well Clincher using a Prestolok fitting. Simply cut the tubing square and insert it into the Prestolok fitting until the tube bottoms out. To release, push the locking shoulder of the fitting down and pull tubing out.

6. Place the bottom half of the Well Clincher on the top of the recovery well pipe. Make sure that the top of the recovery well is smooth and straight. The Well Clincher should fit snugly.

7. Connect the down-hole hoses and the safety cable to the top of the EVACUATOR II, see Figure 3.

8. Connect the down-hole hoses and safety cable to the under side of the Well Clincher top (Figure 4).

9. Lower the EVACUATOR II down the well and secure the top cap of the Well Clincher to the bottom half which was previously attached to the well.

10. Connect the fluid discharge line to the appropriate fitting on the top of the Well Clincher, see Figure 4.

11. Attach the air regulator/coalescing filter assembly to the side of the well vault.

12. Connect the main air supply line to the inlet of the regulator/filter assembly.

13. Connect the outlet of the regulator/filter assembly to the air supply line on the top of the Well Clincher, see Figure 4.

14. Adjust the supply air at the regulator/filter assembly to the appropriate pressure. **REMEMBER: DO NOT EXCEED 100 psi (690 kPa).**

15. Open the air supply valve to begin pump operation.

APPENDIX A

AIR CONSUMPTION

The EVACUATOR II pump uses compressed air to transport fluid from a recovery well to the surface. The volume of compressed air required will be dependent on three factors:

1. Number of EVACUATOR II pumps
2. Operating air pressure of the pumps
3. Pumping rates (gallons or liters per minute)

As the number of EVACUATOR II pumps increases, the compressed air consumption rate will also increase.

As the operating air pressure of the EVACUATOR II pump is increased, the volume of air consumed during each pump cycle increases. The following table outlines the air consumption rate per cycle of the EVACUATOR II at different operating air pressures.

TABLE A-1

Operating Air Pressure		Compressed Air Consumption Rate	
psi	kPa	(ft^3/cycle)	cm^3/cycle
60	414	0.83	14
70	483	0.94	15
80	552	1.05	17
90	620	1.15	19
100	690	1.26	21

Very few sites will require an operating air pressure of 100 psi (690 kPa), but it is recommended that the highest air consumption rate, 1.26 ft^3/cycle (21 cm^3/cycle) be used when determining the total compressed air consumption for the site.

The pumping rate required to achieve the desired water table depression will directly influence the compressed air consumption rate. The EVACUATOR II pump draws 1.2 US gallons (4.5 L) of fluid/cycle and can pump a maximum of 10.0 gpm (41 L/min) with the top and bottom loading version.. The pumping rate of each recovery well should be determined so that the total pumping rate of the site can be calculated.

The following questions will help determine the compressed air consumption rate:

1. How many recovery wells will be used on this site?
2. What is the pumping rate for each recovery well?
3. What is the total pumping rate for the site? (Add pumping rates from question 2)
4. Use the total pumping rate calculated in question 3 in the following formula to determine the air consumption rate.

$$\text{AIR CONSUMPTION } [ft^3/min] = \frac{\text{Total Pumping Rate [gal/min]}}{10.0} \times \text{Air consumption per cycle } (ft^3) \text{ at operating pressure*}$$

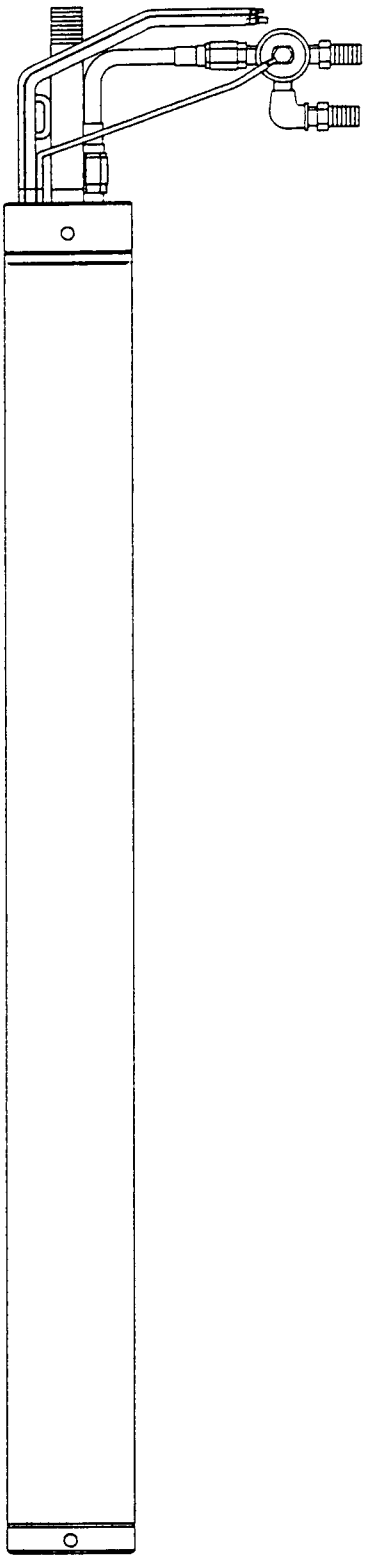
$$\text{AIR CONSUMPTION } [cm^3/min] = \frac{\text{Total Pumping Rate [L/min]}}{40} \times \text{Air consumption per cycle } (cm^3) \text{at operating pressure*}$$

The operating air pressure will depend on the amount of force the EVACUATOR II will need to push the water from the pump to the remediation equipment on the surface (total dynamic head). As the operating air pressure is set higher, more air will be consumed with each cycle of the pump due to the physical characteristics of compressed air. For example, at an operating pressure of 60 psi (414 kPa), the EVACUATOR II will consume 0.8 ft^3 (14 cm^3) of air/cycle. At an operating pressure of 100 psi (690 kPa), the EVACUATOR II will consume 1.26 ft^3 (21 cm^3) of air/cycle. The total water recovery rate will dictate how often the pump cycles.

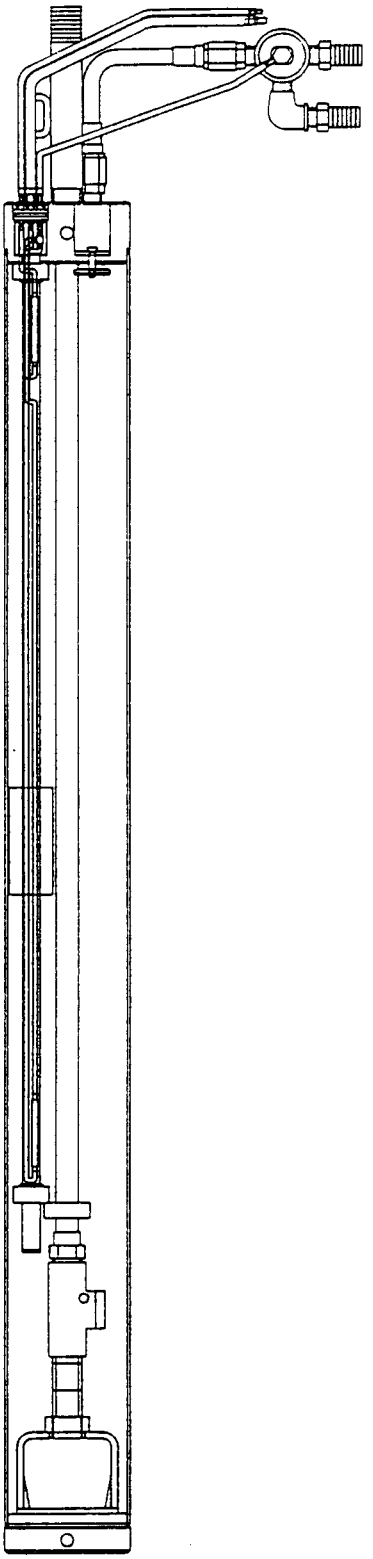
* see table A-1, page 6

LIST OF FIGURES

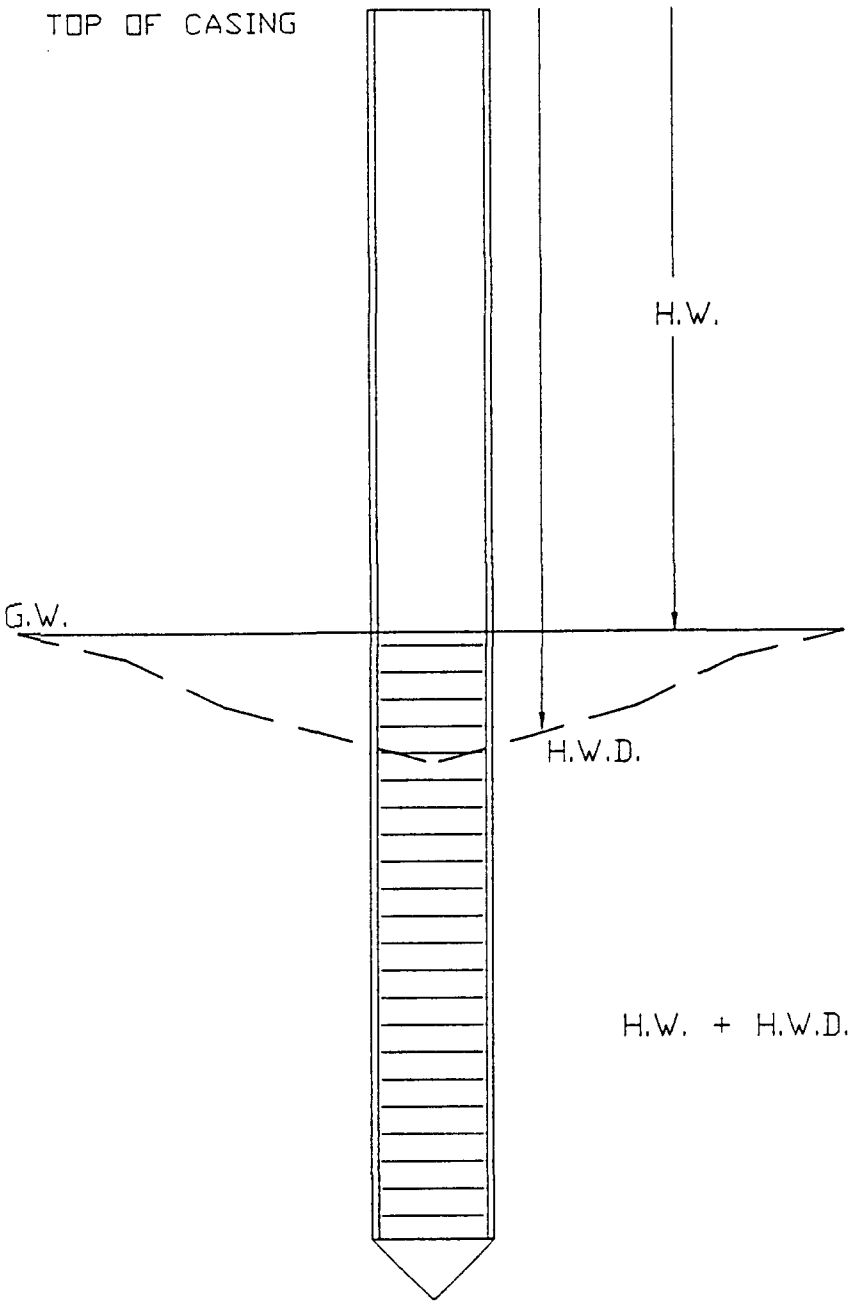
(FIG. 1)



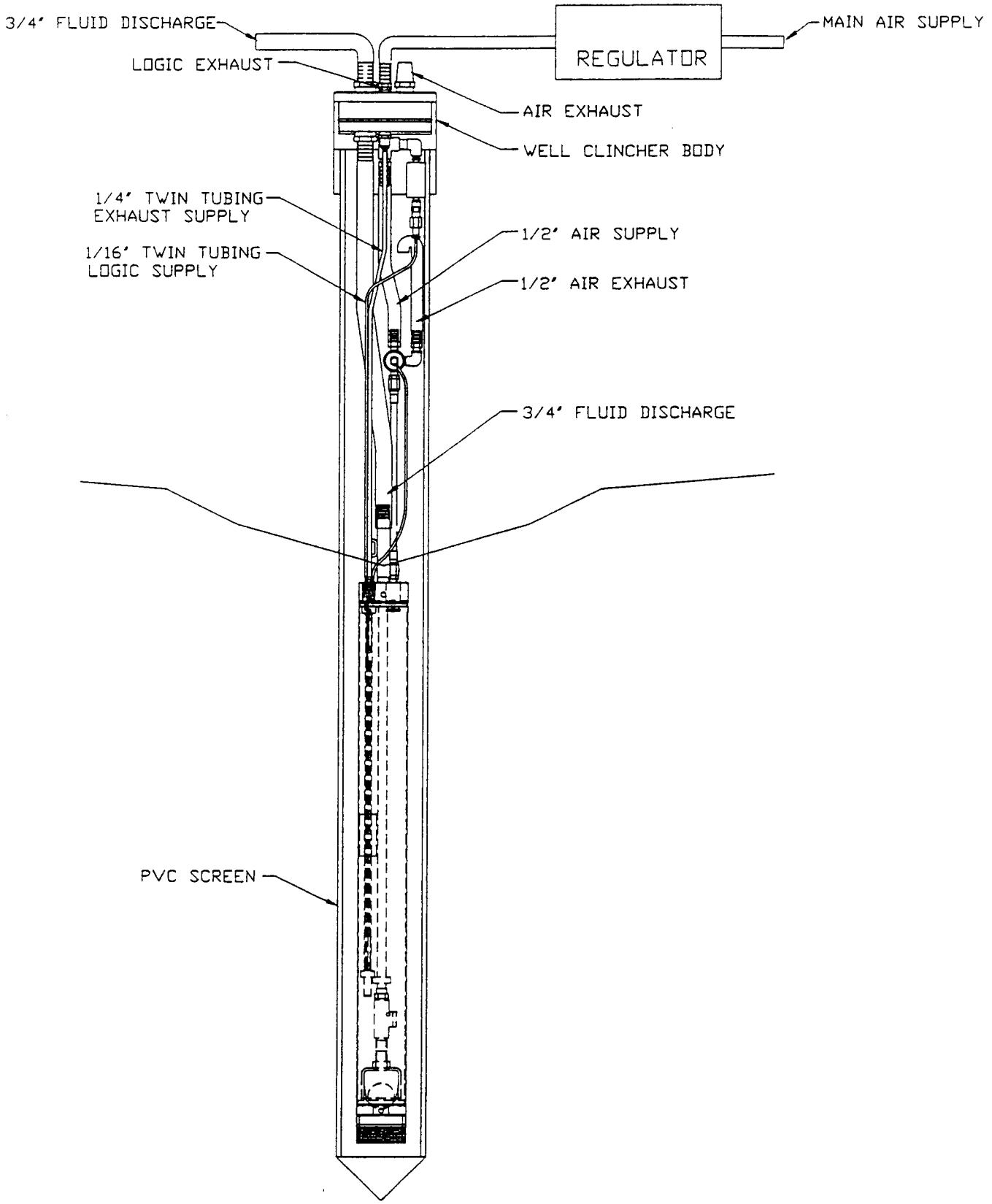
(FIG. 2)



(FIG. 3)

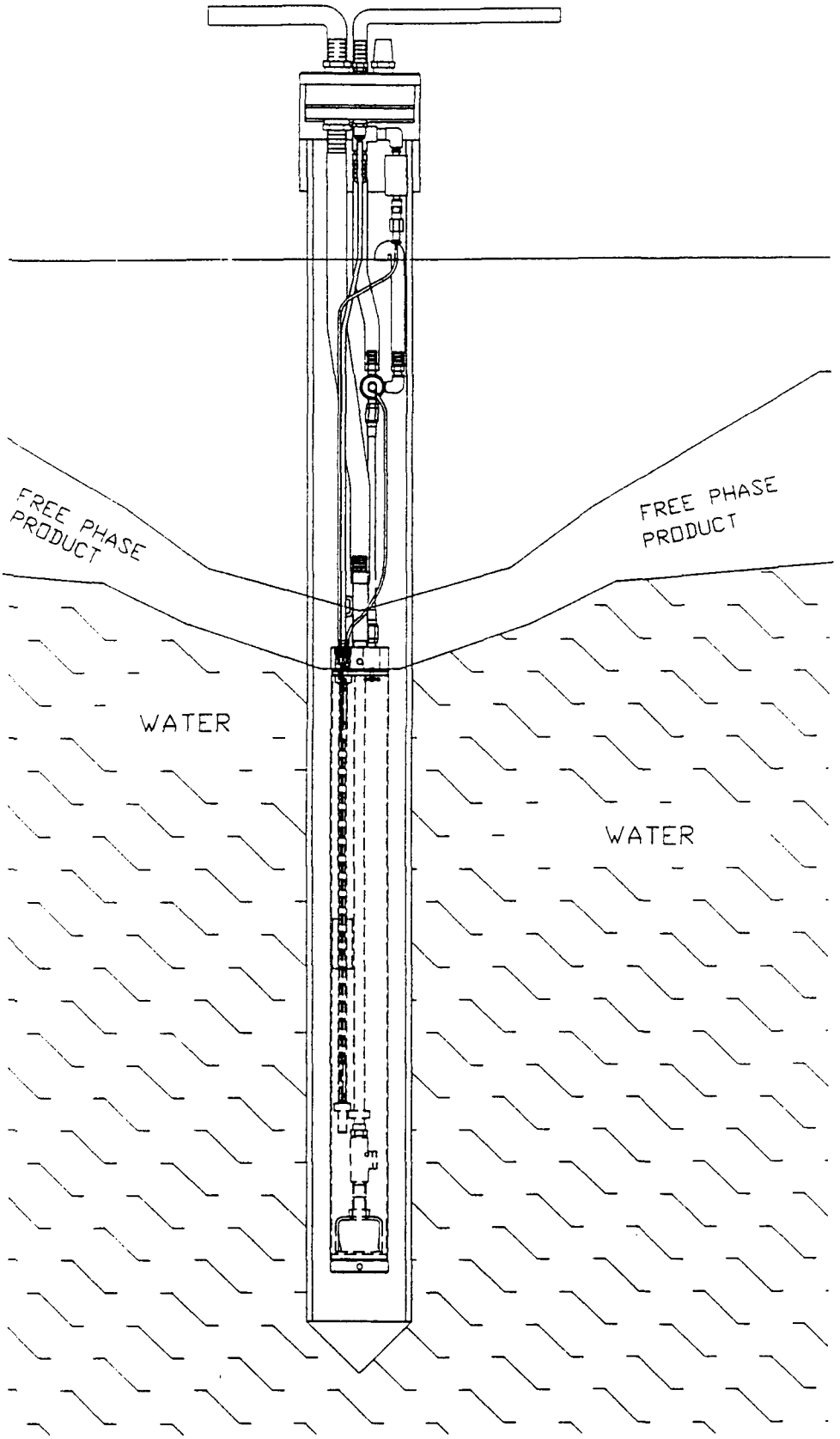


EVACUATOR II
TOP/BOTTOM LOADING
(FIG. 4)

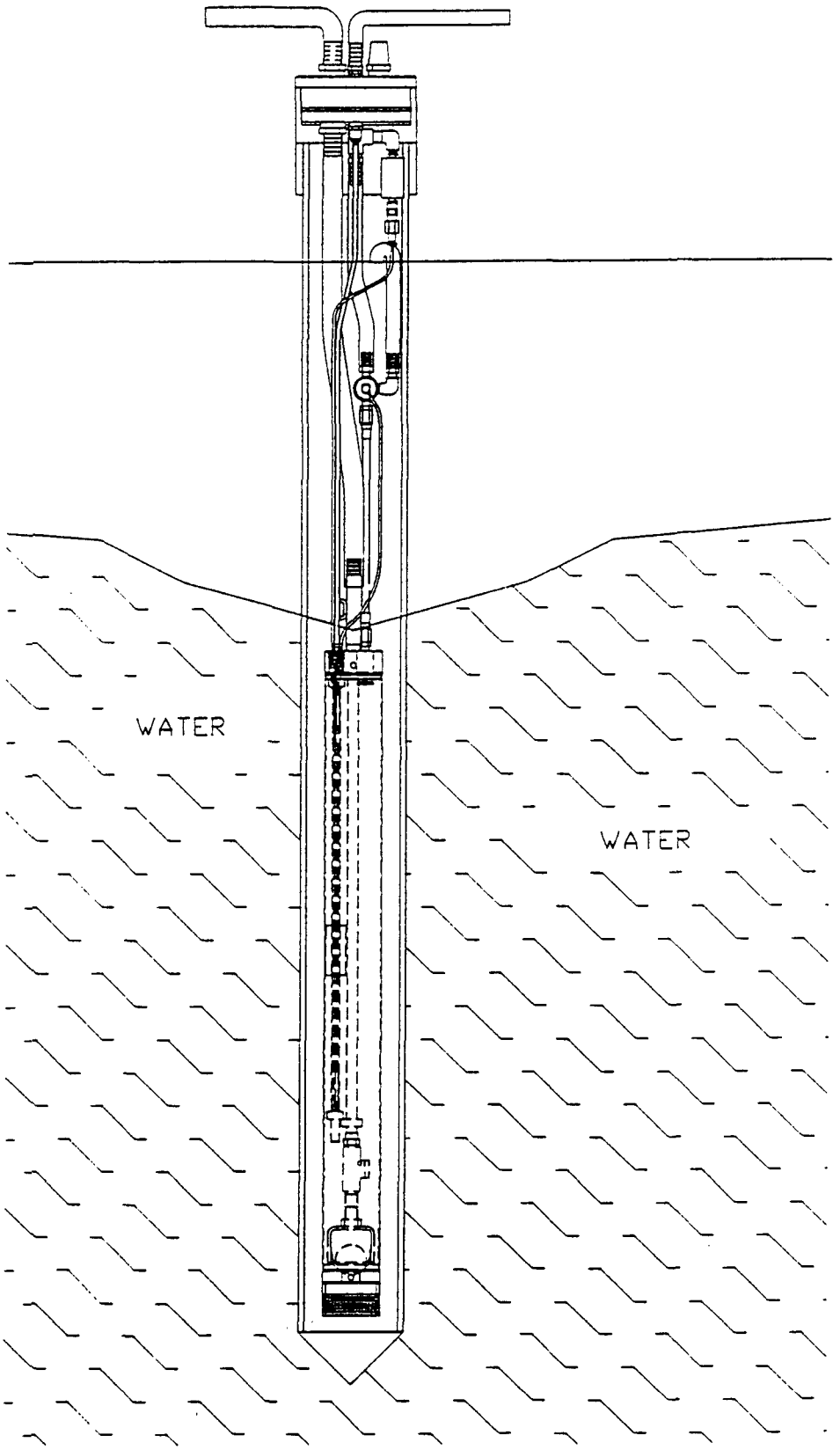


(FIG. 5)

TOP LOADING



(FIG. 6)
TOP/BOTTOM LOADING



LAIBE ENVIRONMENTAL CORPORATION
Monitoring and Remediation Equipment

EQUIPMENT DESCRIPTION

The Gladiator System

An Internally Controlled Pneumatic Ejector.

Standard Lengths: 3 and 5 feet

Diameter: 3 1/2" for installation in 4" diameter wells

Materials of Construction: Body- 304 Stainless Steel
Fittings - Bronze
Check valve flapper - Vitron

Options:
Special lengths
Air filter/regulator
All stainless steel
Counter
Well level indicator

Optional Products:
S2 Total Fluids Ejector
Product Only Ejector
Level Tracking
Puck Pump
Two-Pump Systems
Multiwell
Air Stripper
Oil / Water Separators
VES
Sparge
Packaged Systems

LAIBE ENVIRONMENTAL CORPORATION
Monitoring and Remediation Equipment

How The Gladiator Works

The Gladiator top fill ejectors needs only a few millimeters of liquid above the inlet valve to actuate the control mechanism.

The ejector shuts off when the liquid is pumped below the inlet level, conserving air, and turns back on automatically when the well level raises sufficiently to refill the ejector.

Ejector Full - Float Up - Ejector On

Float in this position slides up the actuator rod, tripping the control mechanism and causing air to enter the pump. The magnetic latching device provides positive action air valve operation for consistent cycling for fast or slow pumping rates.

Incoming air pressure seats the inlet viton flapper check valve, trapping the liquid in the ejector pressure vessel and ejecting the liquid out the discharge tube and through the discharge check valve.

Ejector Empty - Float Down - Ejector Off

Float in this position has slid down the actuator road, shutting off the air supply and allowing the compressed air in the ejector to vent. The inlet flapper check valve unseats (no longer having internal pressure holding it closed), which allows the liquid in the well to flow into the ejector. The flapper inlet valve reseats again trapping the liquid in the pressure vessel for the repeat pumping cycle.

GLADIATOR SPECIFICATIONS

Hydrocarbon Recovery Pump model:

- 3" diameter by 36" long 304 stainless steel pump body
- 304 stainless steel/viton elastomer flapper fill valve
- 3/4" bronze swing check discharge valve
- 1/4" I.D. air pressure hose
- 1/2" exhaust pressure hose
- 3/4" or larger discharge hose

Outstanding features:

- *Built-in* pump control
- 0 to 8 gpm nominal flowrate
- Field convertible to higher flowrates
- Top fill for LNAPL recovery
- Bottom fill for DNAPL recovery
- *Both* top & bottom fill where required
- Integral inlet strainer
- ***MaxFlex*** viton valve assures maintenance free valve operation

The simple, straight-forward, rugged stainless steel construction makes the ***Gladiator*** the easiest pump to install and operate of any pump on the market.

Ejector Systems Incorporated
910 National Avenue, Addison, IL 60101-9812

GLADIATOR SPECIFICATIONS

DESCRIPTION

Scope

Equipment to be furnished under this section shall be air pneumatic pumps complete with air line, discharge hose and liquid level control manufactured by Ejector Systems. The pumps shall be capable of pumping total fluids, that is, a combination of product and water without causing an emulsion. Air Compres sor or other air source is not included under this section of the specifications.

Functional Description

A. Pneumatic Pumps

The Gladiator shall be fabricated from a section of steel pipe with an appropri ate diameter and length to meet the specified conditions. Each pump shall be fabricated from schedule 5, 304 stainless steel pipe and shall have a top inlet covered by a flapper type check valve. The inlet valve shall have an integral strainer.

B. Control

Each Ejector shall have a built-in float control. Control shall be entirely pneu matic. The pump shall be capable of being submerged for long periods of time without harming the operation of the control. The control shall provide for automatic control of the on and off sequence of the Ejector. The control shall operate an air power valve which will alternately cause the Ejector to be pressurized and to vent in preparation for the "fill" cycle. Response to chang ing levels in the recovery well shall be automatic. The control shall be capable of operating on ordinary compressor quality air.

C. Hose

Discharge hose, air line and vent line of an appropriate diameter and length as specified in **Performance and Design Requirements** shall be furnished with the pumps. Material shall be able to resist deterioration from contaminants or free product likely to be found in the recovery well.

D. Hydraulic Characteristics

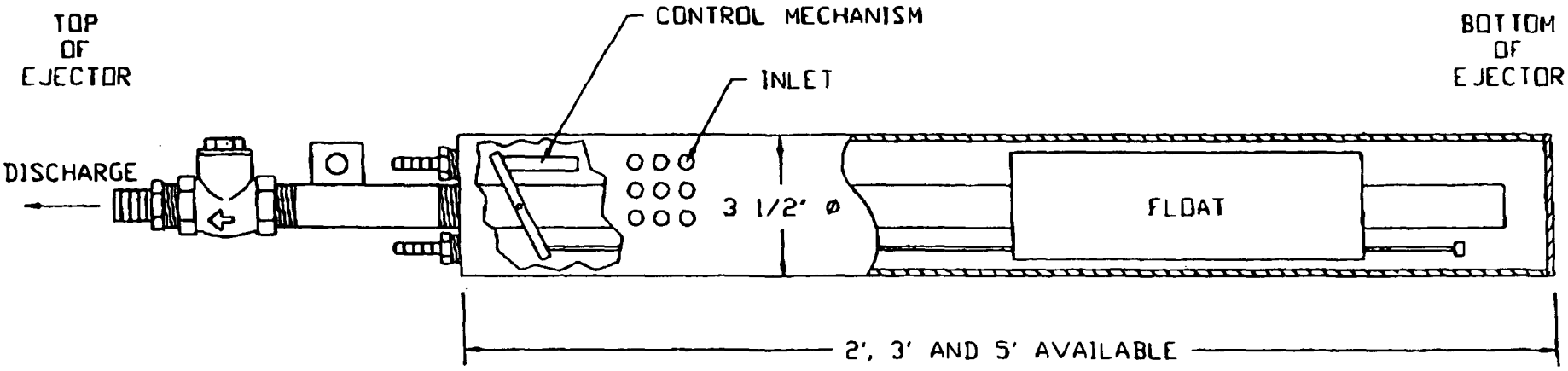
Pump and controller shall function so that design flow can be achieved with no more than 12 inches of submergence.

PERFORMANCE AND DESIGN REQUIREMENTS

Performance

Number of wells	____
Well Diameter	____ inches
Well Depth	____ feet
Depth to Water	____ feet
Static Lift Above Grade	____ feet
Flow Rate per Well	____ GPM
Additional discharge hose beyond well depth	____ feet
Additional air line beyond well depth	____ feet
Additional vent line beyond well depth	____ feet

REVISION			
LTR.	DESCRIPTION	DATE	APPROVED
A	PRELIMINARY	/ /	
B	RELEASE	11/29/94	D.B.



UNLESS OTHERWISE SPECIFIED DIM ARE IN INCHES
TOLERANCES:
FRACTIONS: +/-
ANGLES: +/-
2 PLS. DEC. +/-
3 PLS. DEC. +/-
4 PLS. DEC. +/-

MATL:

FINISH:

		DATE
DR BY:	DAVID BARRECA	11/29/94
CHK:	D.B.	11/29/94
ENGR:	D.B.	11/29/94
APPR:	D.B.	11/29/94

DISK NO: 284 0028 001
FILE NAME: 3030006B
PART NUMBER:
USED ON:

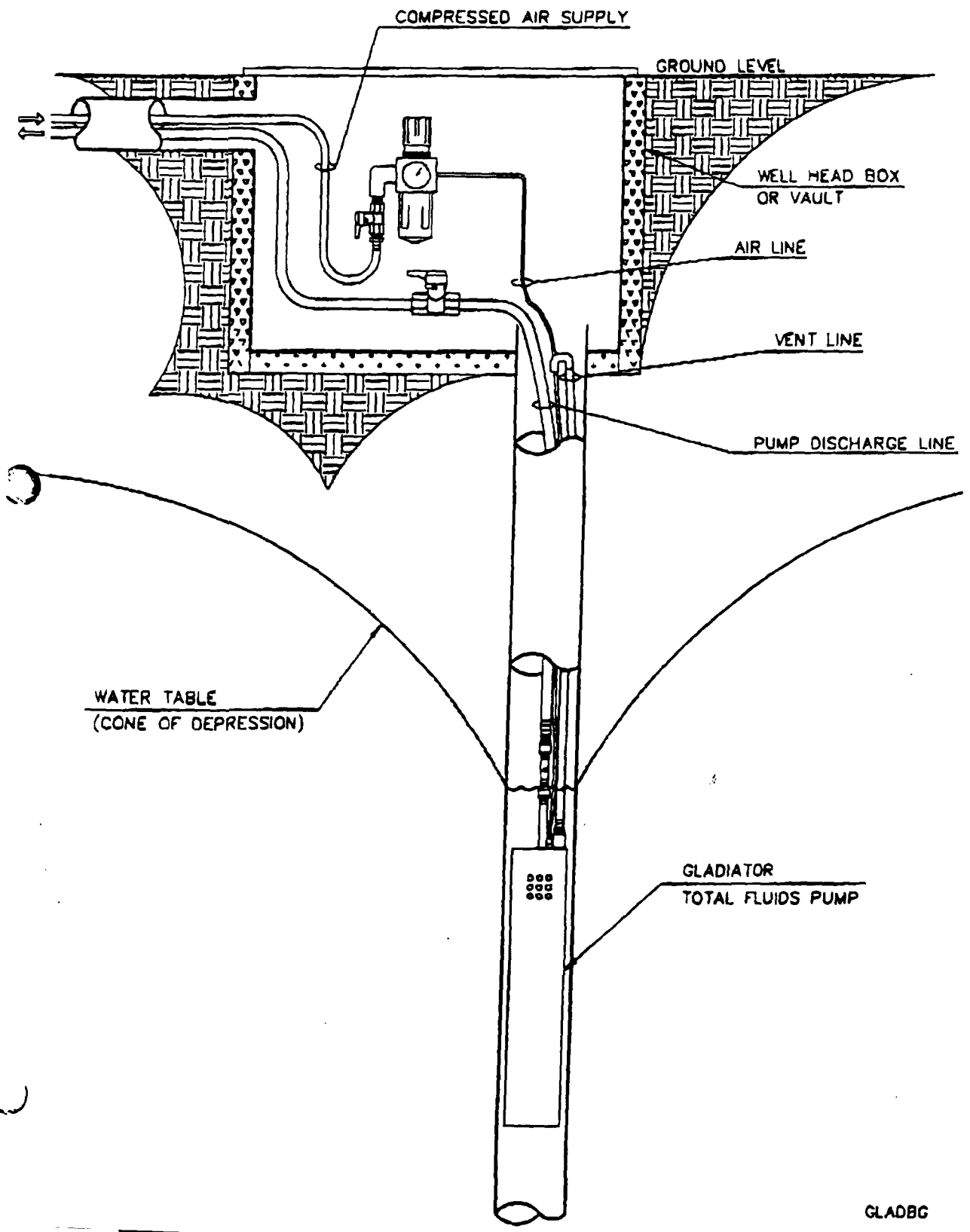
EJECTOR SYSTEMS, INC.

3" GLADIATOR EJECTOR

SIZE	DRAWING NUMBER
A	303 0006

SCALE	WEIGHT	SHEET
NONE		1 OF 1

EJECTOR SYSTEMS INC.
GLADIATOR TOTAL FLUIDS PUMPING SYSTEM



GLADBG

Amoco Exploration and Production
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

March 30, 1995

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
2040 South PaCheco Street
Santa Fe, New Mexico 87505

Groundwater Update
Empire Abo Gas Plant

Attached are two copies of the written report which updates the status of the groundwater project at the Empire Abo Gas Plant (EAGP). The wells have been measured and sampled twice since the last report and product recovery equipment has been ordered. We are currently working on the product recovery design and hope to install the equipment soon thereafter.

If you have any questions or need any additional information please contact Scott Neumann at 713-366-2501.

Yours truly,

G. D. Henry
Manager, Environment, Health & Safety
Natural Gas Liquids Business Unit

Attachments
SNN/CBW/amp

GROUNDWATER REPORT
Empire Abo Gas Plant

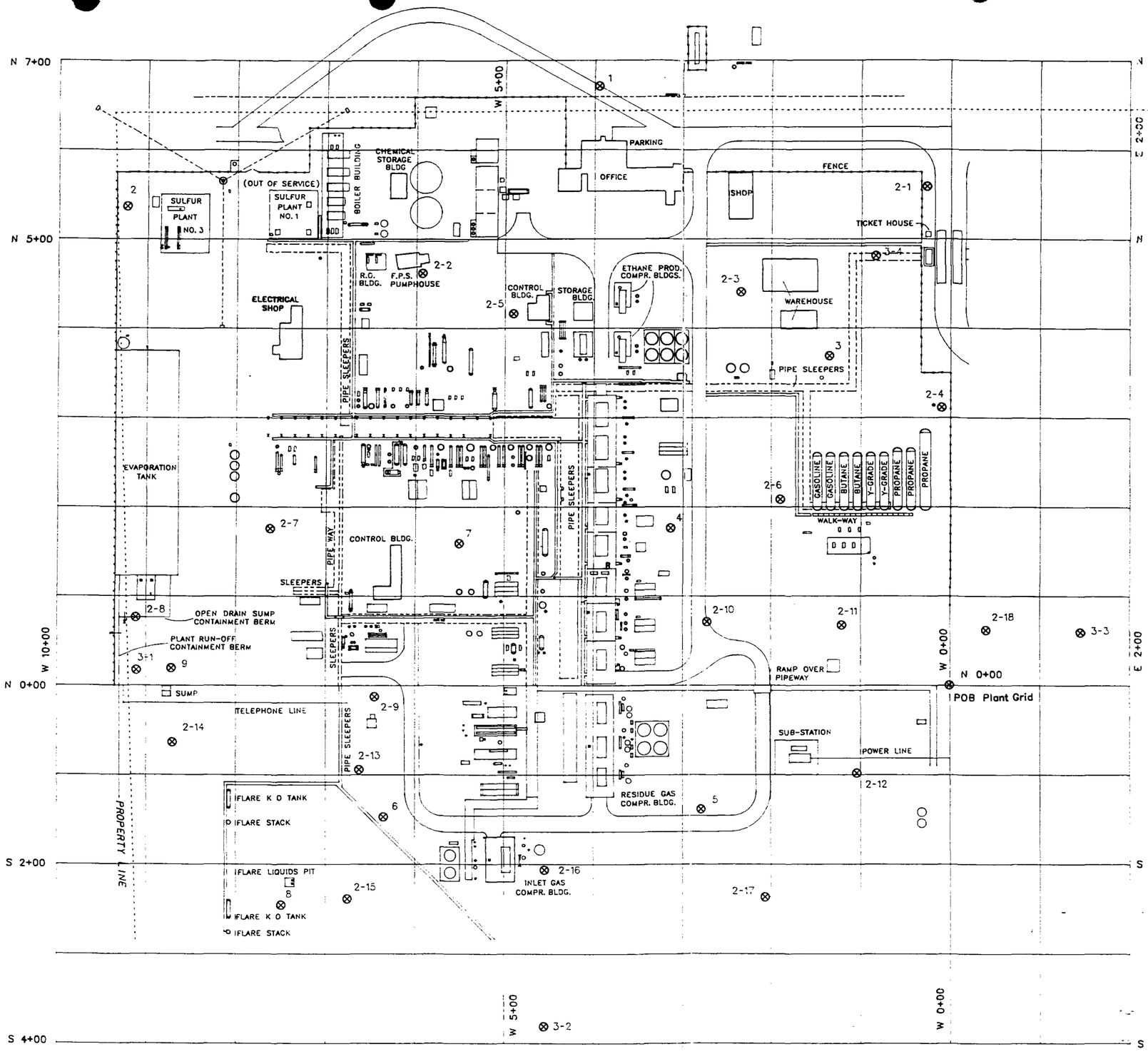
This report is a status update on the groundwater project at our Empire Abo Gas Plant (EAGP) located in Eddy County, New Mexico. The report supplements the information previously provided to the Oil Conservation Division (OCD). All actions taken at the EAGP have been of Amoco's own initiative and not part of any requests or regulatory requirements.

There are currently 27 monitor wells located at the EAGP site. Attachment #1 is a basemap which shows the locations of the wells. The wells range in depth from 28.5' to 113'. The top of fluid in these wells is also variable and ranges from 8.6' to 86.5' from the top of casing. There are no mapable water horizons found at this site and no major or minor aquifers present in the area.

On November 21, 1994, all of the wells were measured and the wells not containing free product were sampled. Attachment #2 is a product thickness map based on the November, 1994 data. The product thickness varies from .01' to a maximum of 6.89' as measured in the wellbore. Also included on this map is the depth to water. Several of the wells are screened too low and based on the high levels of dissolved constituents, it is believed that free product exists behind the casing. These wells are also shown and labeled on Attachment #2 as PBC (product behind casing). As was previously reported, the product was identified as weathered gas condensate.

A summary of all of the data collected from each well is included as Attachment #3. The benzene and total BTEX data has also been posted on the site basemap (Attachment #4). As the map shows the clean wells are found at various locations across the plant site.

We have purchased 5 pneumatic pumps for product recovery. The pump requirements have been forwarded on to the engineering group for system design. In addition to the pneumatic pumps, we will be evaluating a new pump system for some of the shallow wells. We are also reviewing our requirements for disposal and some Process Safety Management considerations. As soon as all of these issues have been addressed, we will begin system installation.



GRID NORTH
NAD'27, NMEXZ

ATTACHMENT # 1

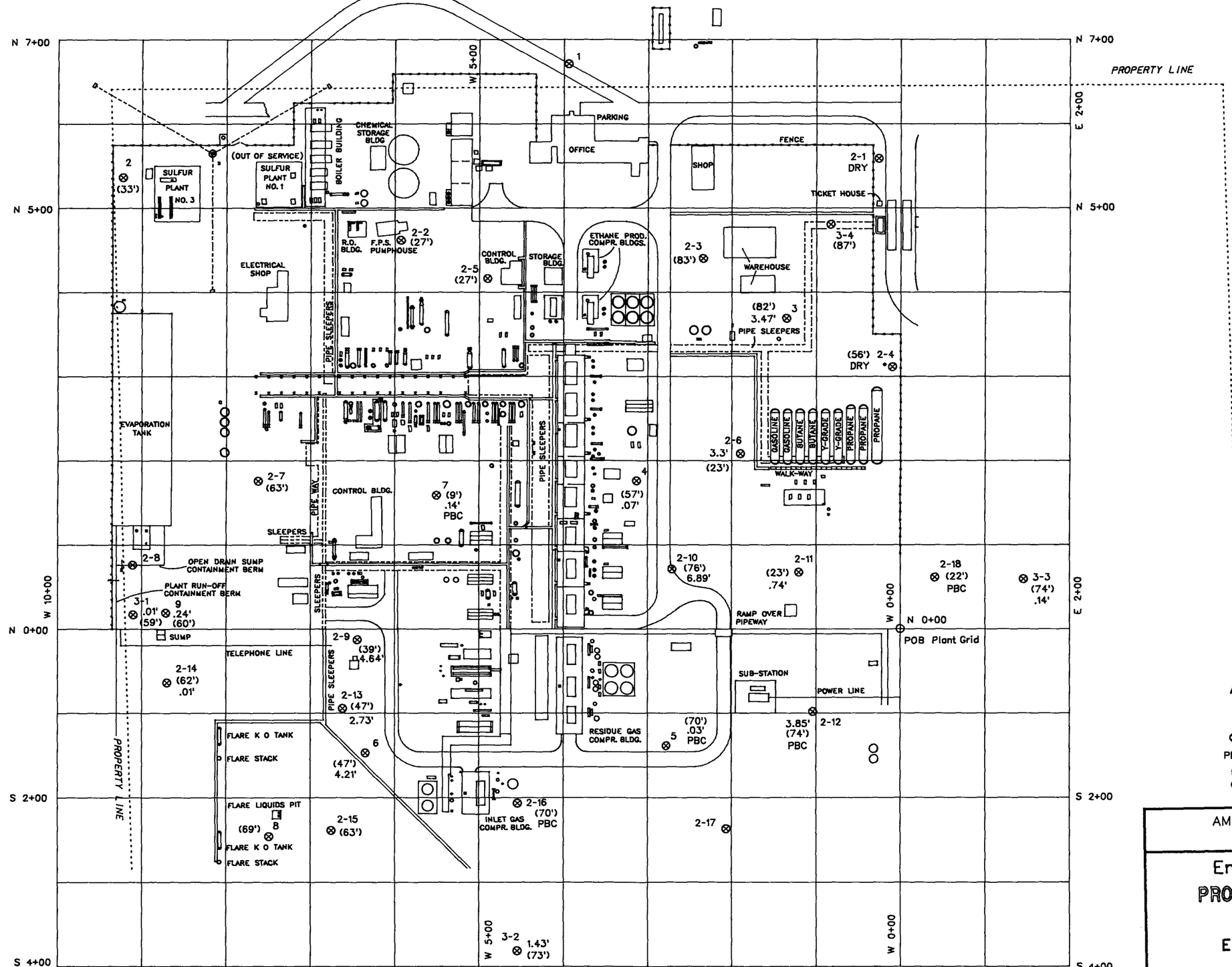
⊗ MONITOR WELLS

NOTE: PLANT EQUIPMENT, BUILDINGS, ETC. OBTAINED FROM
DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant
MONITOR WELL LOCATION MAP
Section 3, T18S-R27E
Eddy County, New Mexico

Date: Feb. 16,1994 RKH	Scale: 1 in = 120 ft
Revised: 6-23-94	NM444104.dgn Lv 1,2,4,9.



ATTACHMENT # 2

LEGEND

⊗ - MONITOR WELLS
PBC - PRODUCT BEHIND CASING
- PRODUCT THICKNESS (11-21-94)
(#) - DEPTH TO WATER 11-21-94

NOTE: FACILITY PLOT PLAN OBTAINED
FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant
PRODUCT THICKNESS MAP
Section 3, T18S-R27E
Eddy County, New Mexico

Date: Nov. 21,1994 RKH	Scale: 1 in = 120 ft
	NM444104.dgn Lv 12.

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2	INITIAL WATER LEVEL:	33
TOTAL DEPTH OF WELL:	37.5	TOP OF SCREEN:	22.5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	37.5
ELEVATION (ASL):	3548.5		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	32.5	3516	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	37.7	3510.8	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	27	3521.5	0.032	0.001	0.018	0.028	0.079	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	33.5	3515	SAMPLE NOT ANALYZED								<0.05	1800	6.15		2400
3/1/93	33.8	3514.7	0.016	0.03	0.035	0.074	0.155	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	32.82	3515.68	0.018	0.017	0.005	0.009	0.049	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	23.83	3524.67	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	23.8	3524.7	0.003	0.002	0.002	0.003	0.01	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	33.74	3514.76	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
6/21/94	33.82	3514.68	0.001	ND	0.001	0.002	0.004	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	33.39	3515.11	ND	0.002	ND	ND	0.002	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	33.12	3515.38	ND	0.001	0.002	0.004	0.007	NS	ND	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER:	3	INITIAL WATER LEVEL:	79
TOTAL DEPTH OF WELL:	91.5	TOP OF SCREEN:	71.5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	91.5
ELEVATION (ASL):	3555.7		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	77	3478.7	111	14	238	299	662	NR	PRODUCT	PRODUCT	NS	NS	NS	NS	NS
3-11-92	83	3472.7	FREE PRODUCT; NOT ANALYZED												
10-1-92	72	3483.7	FREE PRODUCT; NOT ANALYZED												
1-13-93	85	3470.7	FREE PRODUCT; NOT ANALYZED								<0.05	1150	37.65		2458
3/1/93	85.25	3470.45	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	84.9	3470.8	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	81.75	3473.95	*FREE PRODUCT; NOT ANALYZED (PRODUCT = 3.47')*												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

Attachment # 3

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2
TOTAL DEPTH OF WELL: 37.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3548.5

INITIAL WATER LEVEL: 33
TOP OF SCREEN: 22.5
BASE OF SCREEN: 37.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	32.5	3516	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	37.7	3510.8	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	27	3521.5	0.032	0.001	0.018	0.028	0.079	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	33.5	3515	SAMPLE NOT ANALYZED								<0.05	1800	6.15		2400
3/1/93	33.8	3514.7	0.016	0.03	0.035	0.074	0.155	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	32.82	3515.68	0.018	0.017	0.005	0.009	0.049	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	23.83	3524.67	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	23.8	3524.7	0.003	0.002	0.002	0.003	0.01	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	33.74	3514.76	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
6/21/94	33.82	3514.68	0.001	ND	0.001	0.002	0.004	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	33.39	3515.11	ND	0.002	ND	ND	0.002	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	33.12	3515.38	ND	0.001	0.002	0.004	0.007	NS	ND	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 3
TOTAL DEPTH OF WELL: 91.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3555.7

INITIAL WATER LEVEL: 79
TOP OF SCREEN: 71.5
BASE OF SCREEN: 91.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	77	3478.7	111	14	238	299	662	NR	PRODUCT	PRODUCT	NS	NS	NS	NS	NS
3-11-92	83	3472.7	FREE PRODUCT; NOT ANALYZED												
10-1-92	72	3483.7	FREE PRODUCT; NOT ANALYZED												
1-13-93	85	3470.7	FREE PRODUCT; NOT ANALYZED								<0.05	1150	37.65		2458
3/1/93	85.25	3470.45	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	84.9	3470.8	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	81.75	3473.95	FREE PRODUCT; NOT ANALYZED (PRODUCT = 3.47')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

Attachment # 3

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 4
TOTAL DEPTH OF WELL: 62.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.3

INITIAL WATER LEVEL: 51
TOP OF SCREEN: 47.5
BASE OF SCREEN: 62.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	51	3500.3	1.25	0.464	1.76	2.26	5.734	0.49	21	ND	NS	NS	NS	NS	NS
1-24-92	51	3500.3	1.14	0.426	1.6	1.94	5.106	0.42	16	ND	NS	NS	NS	NS	NS
3-11-92	51	3500.3	3.64	86.8	38.7	109	238.14	72.7	1615	116	NS	NS	NS	NS	NS
3-11-92	51	3500.3	0.95	1.12	1.25	3.54	6.86	1.05	32	2	NS	NS	NS	NS	NS
10-1-92	34	3517.3	0.957	0.039	1.16	1.52	3.68	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	44	3507.3	0.827	0.325	0.954	1.48	3.59	NS	25	18	0.2	700	5.15		2458
3/1/93	53.6	3497.7	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	53.48	3497.82	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	57.23	3494.07	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.07')												

MONITOR WELL NUMBER: 5
TOTAL DEPTH OF WELL: 99
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.9

INITIAL WATER LEVEL: 92
TOP OF SCREEN: 74
BASE OF SCREEN: 99

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL*	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	68.8	3475.1	0.931	3.87	1.81	5.26	11.871	0.65	57	17	NS	NS	NS	NS	NS
3-11-92	69	3474.9	0.107	0.534	0.534	1.47	2.654	0.15	8	ND	NS	NS	NS	NS	NS
10-1-92	71	3472.9	0.047	0.01	0.162	0.144	0.363	NS	1	ND	NS	NS	NS	NS	NS
1-13-93	71.5	3472.4	0.101	0.115	0.069	0.073	0.358	NS	ND	ND	<0.05	900	4.92		2464
3/1/93	69.8	3474.1	0.235	0.343	0.253	0.441	1.27	NS	4	4	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	70.25	3473.65	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	70.08	3473.82	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.03')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 6
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.9

INITIAL WATER LEVEL: 48
TOP OF SCREEN: 33
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
3-11-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
10-1-92	42	3502.9	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	39	3505.9	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	1000	5.05		826
3/1/93	46.8	3498.1	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	43.7	3501.2	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	46.56	3498.34	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 4.21')												

MONITOR WELL NUMBER: 7
TOTAL DEPTH OF WELL: 28.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3546.9

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 13.5
BASE OF SCREEN: 28.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	8.5	3538.4	3.13	0.795	0.658	0.919	5.502	0.03	10	2	NS	NS	NS	NS	NS
3-11-92	7.7	3539.2	313	0.759	0.625	0.907	5.171	0.06	8	ND	NS	NS	NS	NS	NS
10-1-92	16	3530.9	4.54	1.28	0.936	1.27	8.03	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	9	3537.9	1.61	0.933	0.583	1.23	4.35	NS	13	3	<0.05	1500	242		2323
3/1/93	9.4	3537.5	1.85	0.226	0.243	0.368	2.69	NS	4	ND	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	9.82	3537.08	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	8.6	3538.3	FREE PRODUCT; NOT ANALYZED (PRODUCT = 0.14')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 8
TOTAL DEPTH OF WELL: 92
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.1

INITIAL WATER LEVEL: 83
TOP OF SCREEN: 72
BASE OF SCREEN: 92

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	67.3	3476.8	ND	ND	ND	0.001	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	0.001	ND	ND	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	ND	ND	ND	0	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	76	3468.1	0.048	0.042	0.036	0.069	0.195	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	68	3476.1	0.122	0.264	0.186	0.465	1.04	NS	5	ND	<0.05	1350	4.92		2227
3/1/93	68.7	3475.4	0.042	0.109	0.08	0.166	0.397	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.014	0.011	0.004	0.007	0.036	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.023	0.014	0.004	0.007	0.048	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	68.68	3475.42	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.009	0.003	0.003	0.004	0.019	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.015	0.004	0.003	0.003	0.025	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	69.7	3474.4	0.012	0.005	0.003	0.005	0.025	NS	NS	NS	NS	NS	NS	NS	NS
6/21/94	70.01	3474.09	0.003	0.002	0.002	0.003	0.01	ND	NS	NS	NS	NS	NS	NS	NS
6/21/94	70.01	3474.09	0.002	0.001	0.001	0.002	0.006	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	68.29	3475.81	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
9/21/94	68.29	3475.81	ND	0.001	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	68.73	3475.37	Pump Failed - Not Sampled												

MONITOR WELL NUMBER: 9
TOTAL DEPTH OF WELL: 74.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.2

INITIAL WATER LEVEL: 66
TOP OF SCREEN: 54.5
BASE OF SCREEN: 74.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	58	3485.2	75	312	39	712	1498	FREE PRODUCT			NS	NS	NS	NS	NS
3-11-92	58	3485.2	5.57	5.89	2.27	5.51	19.24	0.79	53	18	NS	NS	NS	NS	NS
10-1-92	50	3493.2	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	61	3482.2	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	NS	12.15		NS
3/1/93	61	3482.2	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	59.66	3483.54	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	59.62	3483.58	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.24')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-2
TOTAL DEPTH OF WELL: 48
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3552.55

INITIAL WATER LEVEL: 42
TOP OF SCREEN: 38
BASE OF SCREEN: 48

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	27	3525.55	0.001	ND	ND	ND	0.001	ND	ND	ND	0.11	NS	N/A		NS
1-13-93	27.2	3525.35	0.003	ND	0.002	0.004	0.009	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	26.8	3525.75	0.005	0.022	0.036	0.09	0.153	NS	1	ND	NS	NS	NS	NS	NS
6/8/93	26.52	3526.03	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	26.9	3525.65	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	26.9	3525.65	ND	0.001	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	26.96	3525.59	0.001	ND	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS
6/21/94	27.12	3525.43	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	26.96	3525.59	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	27.05	3525.5	0.001	ND	ND	0.001	0.002	NS	ND	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-3
TOTAL DEPTH OF WELL: 108
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3557.98

INITIAL WATER LEVEL: 100
TOP OF SCREEN: 98
BASE OF SCREEN: 108

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	97	3460.98	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	204	N/A		1850
1-13-93	89.4	3468.58	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	650	13		2496
3/1/93	83.2	3474.78	0.033	0.103	0.083	0.166	0.385	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	83.6	3474.38	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
9/14/93	84.2	3473.78	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	84	3473.98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	84.3	3473.68	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	84.4	3473.58	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	83.11	3474.87	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	83.4	3474.58	Pump Failed												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-4
TOTAL DEPTH OF WELL: 58
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3554.09

INITIAL WATER LEVEL: 53
TOP OF SCREEN: 48
BASE OF SCREEN: 58

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	50	3504.09	0.285	0.01	0.016	0.018	0.329	ND	ND	ND	<0.05	48	0	0	750
1-13-93	54	3500.09	1.1	0.531	0.144	0.274	2.05	NS	7	ND	<0.05	1150	6.75		660
3/1/93	54.9	3499.19	0.365	0.041	0.051	0.087	0.544	NS	4	ND	NS	NS	NS	NS	NS
6/8/93	55.1	3498.99	0.418	0.066	0.029	0.039	0.552	NS	3	ND	NS	NS	NS	NS	NS
9/14/93	54.6	3499.49	0.513	0.027	0.023	0.024	0.587	NS	4	ND	NS	NS	NS	NS	NS
12/8/93	54.2	3499.89	0.432	0.004	0.023	0.016	0.475	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	55.43	3498.66	0.262	0.002	0.007	0.002	0.275	NS	1	NS	NS	NS	NS	NS	NS
6/21/94	56.35	3497.74	0.505	0.004	0.009	0.004	0.522	0.03	NS	NS	NS	NS	NS	NS	NS
9/21/94	56.25	3497.84	0.499	0.004	0.014	0.006	0.523	NS	3	ND	NS	NS	NS	NS	NS
11/21/94	55.57	3498.52	Dry - Not Sampled												

MONITOR WELL NUMBER: 2-5
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3553

INITIAL WATER LEVEL: 46
TOP OF SCREEN: 43
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	45	3508	0.001	ND	ND	ND	0.001	ND	ND	ND	0.12	NS	N/A		NS
1-13-93		3553	0.002	ND	0.001	0.002	0.005	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	27.4	3525.6	0.002	0.005	0.007	0.016	0.03	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	27.27	3525.73	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	27.3	3525.7	ND	0.01	0.001	0.008	0.019	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	27.2	3525.8	0.002	0.002	0.013	0.029	0.046	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	27.46	3525.54	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	27.4	3525.6	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	27.46	3525.54	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	27.37	3525.63	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-6
TOTAL DEPTH OF WELL: 24
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.11

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 14
BASE OF SCREEN: 24

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3534.11	9.91	5.64	0.99	1.97	18.5	0.08	22	ND	<0.05	572	0	5	1050
1-13-93	11.3	3539.81	12.2	1.01	0.134	0.386	13.7	NS	23	ND	<0.05	600	13.75		1286
3/1/93	11.3	3539.81	28.6	2.5	0.482	1.07	32.7	NS	40	ND	NS	NS	NS	NS	NS
9/14/93	11.7	3539.41	35.4	3.32	0.936	1.8	41.5	NS	60	ND	NS	NS	NS	NS	NS
12/8/93	11.6	3539.51	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	22.6	3528.51	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	22.76	3528.35	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.30')												

MONITOR WELL NUMBER: 2-7
TOTAL DEPTH OF WELL: 66
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.34

INITIAL WATER LEVEL: 60
TOP OF SCREEN: 56
BASE OF SCREEN: 66

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	55	3492.34	15.5	6.33	1.64	3.1	26.6	ND	40	7	<0.05	48	N/A		3376
1-13-93	63	3484.34	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	66	3481.34	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	62.24	3485.1	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	62.72	3484.62	FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-9
TOTAL DEPTH OF WELL: 43
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3546.81

INITIAL WATER LEVEL: 34
TOP OF SCREEN: 33
BASE OF SCREEN: 43

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	32	3514.81	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	31	3515.81	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	NS		127.5	NS
3/1/93	33	3513.81	FREE PRODUCT PRESENT; NOT ANALYZED							{7.5 FEET OF FREE PRODUCT PRESENT}					
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	40.8	3506.01	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	39.35	3507.46	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 4.64')												

MONITOR WELL NUMBER: 2-10
TOTAL DEPTH OF WELL: 78
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3548.67

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 68
BASE OF SCREEN: 78

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3484.67	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	71	3477.67	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	74	3474.67	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	74.42	3474.25	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	76.21	3472.46	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 6.89')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-11
TOTAL DEPTH OF WELL: 23
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.06

INITIAL WATER LEVEL: 17
TOP OF SCREEN: 13
BASE OF SCREEN: 23

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3530.06	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	19	3528.06	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	19.5	3527.56	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	22.94	3524.12	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	23.05	3524.01	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.74')												

MONITOR WELL NUMBER: 2-12
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.4

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3469.4	0.18	0.042	0.027	0.107	0.356	ND	ND	ND	<0.05	616	N/A		2375
1-13-93	71.5	3471.9	0.827	0.0652	0.171	0.356	2.01	NS	6	ND	<0.05	675	8		1674
3/1/93	71.4	3472	0.008	0.013	0.017	0.037	0.075	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	71.68	3471.72	0.014	0.014	0.005	0.007	0.04	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	71.4	3472	0.048	0.079	0.032	0.063	0.222	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	71	3472.4	0.066	0.035	0.013	0.022	0.136	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	71.88	3471.52	1.02	0.269	0.233	0.386	1.91	NS	2	ND	NS	NS	NS	NS	NS
6/21/94	71.9	3471.5	4.68D	1.05	0.688	1.24	7.66	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	73.65	3469.75	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	74.05	3469.35	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 3.85')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-13
TOTAL DEPTH OF WELL: 49
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 43
TOP OF SCREEN: 39
BASE OF SCREEN: 49

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	42	3503.91	21	2.43	26.1	42.6	92.2	3.74	567	195	<0.05	236	N/A		2250
1-13-93	44.5	3501.41	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	43	3502.91	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	49.92	3495.99	FREE PRODUCT PRESENT; NOT ANALYZED												
9/21/94			FREE PRODUCT PRESENT; NOT ANALYZED												
11/21/94	46.86	3499.05	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 2.73')												

MONITOR WELL NUMBER: 2-14
TOTAL DEPTH OF WELL: 78
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 70
TOP OF SCREEN: 66
BASE OF SCREEN: 76

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	65	3480.91	0.044	0.022	0.006	0.011	0.083	ND	ND	ND	<0.05	1460	N/A		2500
1-13-93	61.8	3484.11	SAMPLE NOT ANALYZED												
3/1/93	62.1	3483.81	0.037	0.001	ND	0.003	0.041	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	62.32	3483.59	6.15	0.761	0.234	0.326	7.47	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	62.2	3483.71	0.342	0.056	0.148	0.182	0.728	NS	1	ND	NS	NS	NS	NS	NS
12/8/93	62	3483.91	0.245	0.039	0.122	0.168	0.574	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NS	NS	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	62.8	3483.11	0.115	0.056	0.078	0.164	0.413	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	61.37	3484.54	0.119	0.043	0.046	0.086	0.294	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	62.11	3483.8	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-15
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.64

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 63
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3479.64	0.042	0.043	0.05	0.135	0.27	ND	2	ND	<0.05	1248	N/A		2500
1-13-93	63	3480.64	0.652	0.74	0.424	1.03	2.85	NS	12	3	0.12	875	7.9		1166
3/1/93	63.3	3480.34	0.111	0.029	0.029	0.076	0.245	NS	1	2	NS	NS	NS	NS	NS
6/8/93	63.7	3479.94	0.341	0.098	0.106	0.192	0.737	NS	2	4	NS	NS	NS	NS	NS
9/14/93	63.2	3480.44	0.103	0.009	0.005	0.008	0.125	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	63.1	3480.54	3.55	0.668	0.153	0.247	4.62	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	64.42	3479.22	10.4D	2.36D	0.91	1.55	15.2	NS	17	NS	NS	NS	NS	NS	NS
6/21/94	64.37	3479.27	0.863	0.03	0.162	0.29	1.35	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	62.94	3480.7	0.103	0.009	0.014	0.033	0.159	NS	ND	5	NS	NS	NS	NS	NS
11/21/94	63.27	3480.37	0.119	0.010	0.008	0.040	0.177	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	63.27	3480.37	0.113	0.009	0.009	0.035	0.166	NS	ND	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-16
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.39

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3470.39	0.461	0.305	0.082	0.134	0.982	ND	1	ND	<0.05	624	N/A		2375
1-13-93	70	3474.39	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	70.1	3474.29	6.58	0.011	0.106	0.486	7.18	NS	11	2	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	70.51	3473.88	FREE PRODUCT; NOT ANALYZED												
9/21/94			FREE PRODUCT; NOT ANALYZED												
11/21/94	70.06	3474.33	FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-18
TOTAL DEPTH OF WELL: 39
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.79

INITIAL WATER LEVEL: 33
TOP OF SCREEN: 29
BASE OF SCREEN: 39

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	30	3515.79	8.33	0.685	0.352	0.292	9.66	0.03	10	ND	<0.05	560	1	5	2250
1-13-93	21.7	3524.09	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	975	2.41		3092
3/1/93	21.8	3523.99	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93	22	3523.79	9.71	0.492	0.294	0.3	10.8	NS	21	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	6.49	0.008	0.114	0.019	6.63	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	5.72	0.008	0.085	0.018	5.83	NS	7	ND	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	4.95	0.004	0.084	0.019	5.06	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	5.87	0.004	0.094	0.022	5.99	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	22.58	3523.21	5.17D	0.004	0.068	0.018	5.26	NS	5	ND	NS	NS	NS	NS	NS
6/21/94	22.65	3523.14	5.16D	0.008	0.088	0.022	5.28	ND	NS	NS	NS	NS	NS	NS	NS
9/21/94	21.69	3524.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	22.22	3523.57	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 3-1
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.04

INITIAL WATER LEVEL: 58
TOP OF SCREEN: 53
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	59.22	3483.82	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	58.49	3484.55	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	59.22	3483.82	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.01')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-2	INITIAL WATER LEVEL:	90
TOTAL DEPTH OF WELL:	103	TOP OF SCREEN:	63
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	103
ELEVATION (ASL):	3541.59		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	72.34	3469.25	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	71.8	3469.79	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	72.87	3468.72	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 1.43')												

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-3	INITIAL WATER LEVEL:	68
TOTAL DEPTH OF WELL:	83	TOP OF SCREEN:	58
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	83
ELEVATION (ASL):	3544.93		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	74.58	3470.35	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	74.15	3470.78	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
11/21/94	74.2	3470.73	FREE PRODUCT PRESENT; NOT ANALYZED (PRODUCT = 0.14')												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

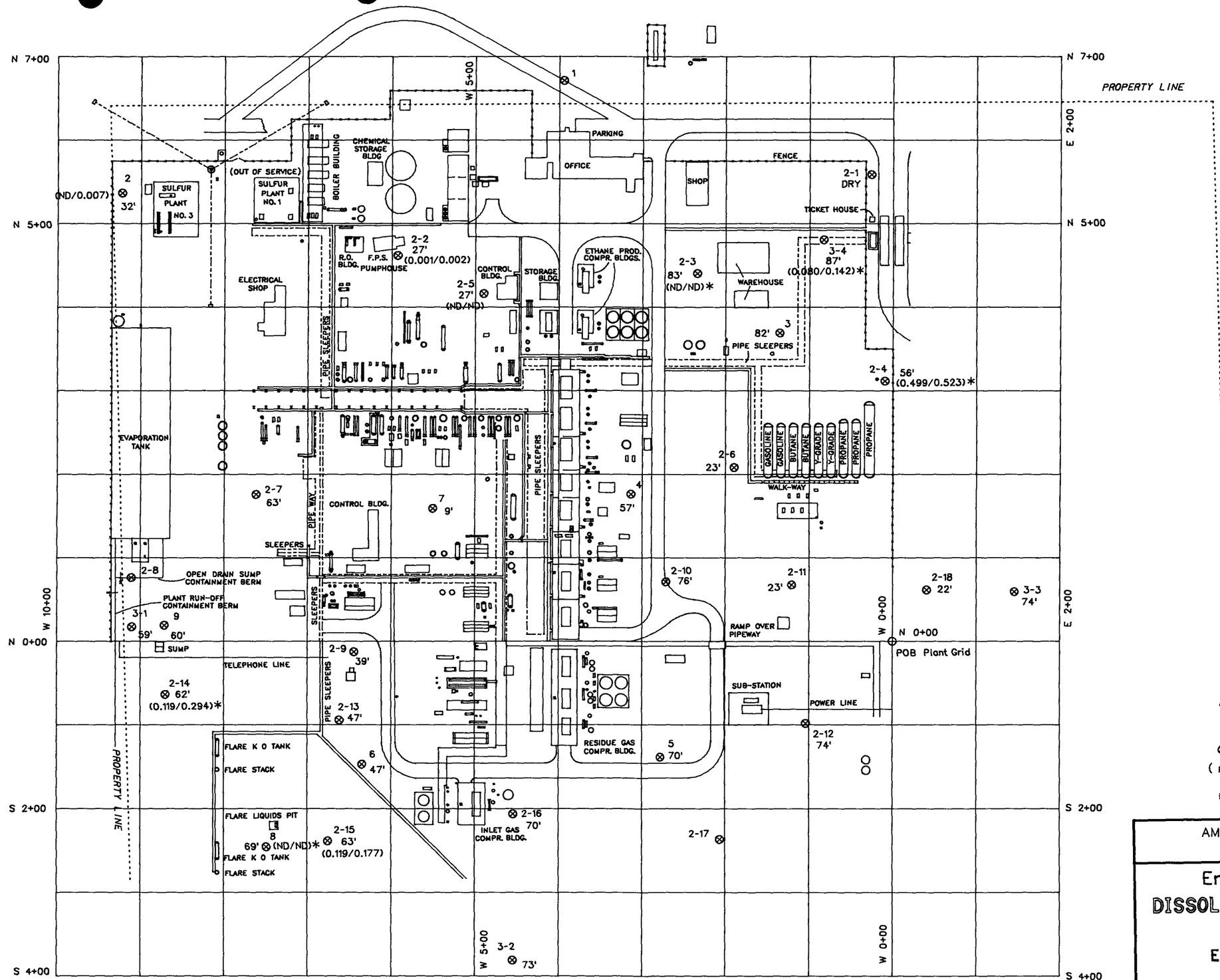
EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-4	INITIAL WATER LEVEL:	95
TOTAL DEPTH OF WELL:	113	TOP OF SCREEN:	68
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	113
ELEVATION (ASL):	3558.63		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	87.07	3471.56	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/21/94	86.35	3472.28	0.08	0.001	0.022	0.039	0.142	NS	ND	ND	NS	NS	NS	NS	NS
11/21/94	86.51	3472.12	NO PUMP - NOT SAMPLED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference



NOTE: FACILITY PLOT PLAN OBTAINED
FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

ATTACHMENT # 4

LEGEND

⊗ - MONITOR WELLS

(#) - (BENZENE/TOTAL BTEX mg/l) 11-22-94 or 9-21-94 *

- DEPTH TO WATER (11-21-94)

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant
DISSOLVED CONCENTRATION MAP
Section 3, T18S-R27E
Eddy County, New Mexico

Date: Nov. 21,1994 RKH	Scale: 1 in = 120 ft
Revised: 6-23-94	NM444104.dgn Lv 13.

NOTE: PLANT EQUIPMENT, BUILDINGS, ETC. OBTAINED FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant
MONITOR WELL LOCATION MAP
Section 3, T18S-R27E
Eddy County, New Mexico

Date: Feb. 16,1994 RKH	Scale: 1 in = 120 ft
Revised: 6-23-94	NM444104.dgn Lv 1,2,4,9.

G. D. Henry
Manager, Environment, Health & Safety
Natural Gas Liquids Business Unit

Amoco Production Company
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253

September 1, 1994

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
P. O. Box 2088
Santa Fe, New Mexico 87504

File: GDH-3428-988.GW00

Groundwater Update
Empire Abo Gas Plant

Attached are two copies of the written report which updates the status of the groundwater project at the Empire Abo Gas Plant (EAGP). Since the last report, four additional wells were drilled to further define the extent of contamination. A pump test was also conducted to determine various reservoir properties. We are currently in the process of ordering equipment in preparation for free product removal.

If you have any questions or need any additional information, please contact Scott Neumann at (713)-366-2501.

Yours truly,

G. D. Henry

G. D. Henry

Attachments

SCN/CBW

GROUNDWATER REPORT
EMPIRE ABO GAS PLANT - THIRD QUARTER 1994

This report summarizes the status of the groundwater project at our Empire Abo Gas Plant (EAGP) located in Eddy County, New Mexico. This report supplements the information previously provided to the Oil Conservation Division (OCD). All actions taken at the EAGP have been of Amoco's own initiative and not part of any request or regulatory requirements.

Since our last report, four additional wells were drilled around the perimeter of the plant. There are currently 27 active monitor wells at this site. Attachment No. 1 is a base which shows the locations of the monitor wells with respect to the plant operations. The wells numbered 3-1, 3-2, 3-3 and 3-4 represent the wells drilled in May 1994. The new wells vary in depth from 70-110 feet. The well records for the new wells are included as Attachment No. 2.

Soil samples were collected in glass jars from five foot intervals while drilling. A photoionization detector (PID) was used on-site to determine the areas of contamination. The soils exhibiting high PID readings were sent to Cardinal Laboratories and analyzed for TPH and BTEX. Attachment No. 3 summarizes the soil sampling results. The data shows that the highest contamination was associated with the surface and near surface zones in MW 3-1. This is not surprising since this well is located in a topographically low area where standing water from runoff has been seen following heavy rainfalls.

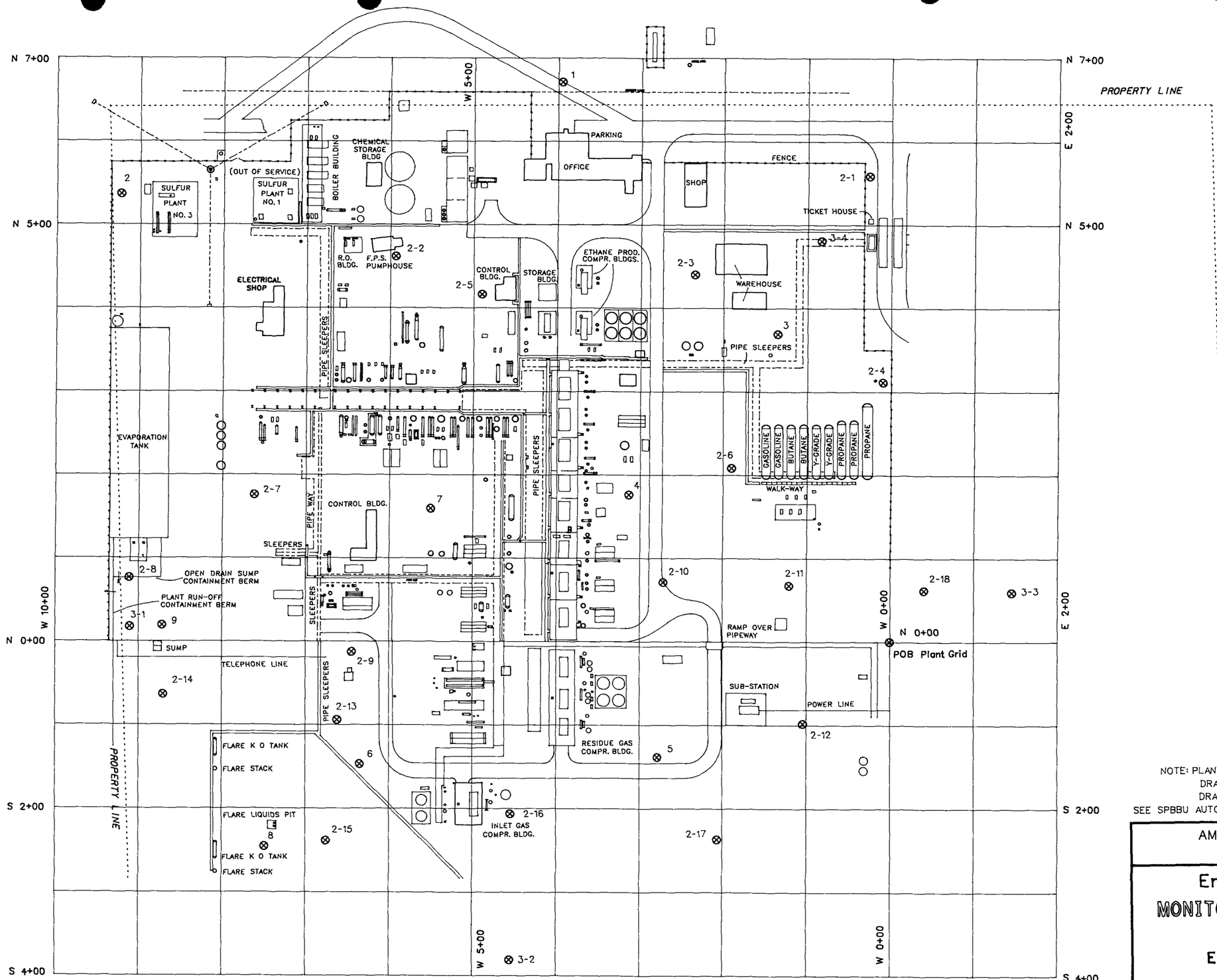
On June 16, 1994, all the monitor well fluid levels were measured. Attachment No. 4 shows the water levels which have been corrected for the wells containing free product. Various 10 foot intervals have been highlighted to show the inhomogeneity of the first water berring zone in each well. As was mentioned in previous reports, it appears that the waters underlying the plant are found in numerous perched aquitards. A pump/recovery test was run in May in MW-9 and we were able to observe minimal effects in MW 3-1. Attachment No. 5 contains the information related to our test.

Attachment No. 6 shows the thickness of the product seen in the wells as of June 16, 1994. The maximum product thickness measured was 10.34' in MW 2-10. We are currently testing one product recovery system for shallow hydrocarbon removal and we have ordered pneumatic pumps for the deeper wells. The product and water recovered will be sent to the plant's drain system and through a separation process where the product will be recovered and the water will be disposed of in a Class II disposal well. The various pumps will be positioned within the plant in such a way that maximum system efficiency will occur.

All of the wells which do not contain product have been sampled for BTEX and TPH on a quarterly basis. The results of the sampling to date are summarized on Attachment No. 7. Five of the wells sampled in June were clean based on drinking

water standards. Four of these wells were located on the north end of the plant and the other in the southwest corner. Samples from the new wells have not been collected at this time. We will be measuring and sampling the wells again in October at which time we will gather water quality data on the four new wells.

The plan is to install a product recovery system to remove the free phase hydrocarbons from beneath the plant. Several pumps have been tested at the EAGP and some recovery pumps have been ordered. We anticipate that by year end we should have the product recovery system in place. We will also continue collecting water samples from the monitor wells which do not contain free product.



GRID NORTH
NAD'27, NMEXZ

ATTACHMENT # 1

⊗ MONITOR WELLS

NOTE: PLANT EQUIPMENT, BUILDINGS, ETC. OBTAINED FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant
MONITOR WELL LOCATION MAP
Section 3, T18S-R27E
Eddy County, New Mexico

Date: Feb. 16,1994 RKH	Scale: 1 in = 120 ft
Revised: 6-23-94	NM444104.dgn Lv 1,2,4,9.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P.O. Box 3092
City and State Houston, Texas 77253-3092

Well was drilled under Permit No. Monitor Well #3-1 and is located in the:

a. ____ ¼ ____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.
Empire Abo

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender Blvd., Hobbs, NM 88240

Drilling Began 5-2-94 Completed 5-3-94 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 70 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well _____ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
58	70	12	Red Sandy Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				70		50	70

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

ATTACHMENT 2

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Top Soil
1	2	1	Caliche
2	4	2	Black Caliche
4	6	2	Gray Caliche
6	21	15	White Caliche
21	22	1	Red Clay
22	52	30	White Caliche
52	70	18	Red Sandy Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Dan Cook

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 3092

City and State Houston, Texas 77253-3092

Well was drilled under Permit No. Monitor Well #3-2 and is located in the:

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

Empire Abo

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender Blvd., Hobbs, NM 88240

Drilling Began 5-3-94 Completed 5-4-94 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 100 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well _____ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
90	100	10	Red Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				100		60	100

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	12	12	Caliche
12	14	2	Brown Clay
14	16	2	Red Clay
16	63	47	Hard White Caliche
63	64	1	Gray Clay
64	66	2	Brown Clay
66	68	2	Hard White Caliche
68	74	6	Brown Clay
74	78	4	Red Clay
78	81	3	Hard White Clay
81	90	9	Brown Clay and Rock
90	100	10	Red Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P.O. Box 3092
City and State Houston, Texas 77253-3092

Well was drilled under Permit No. Monitor Well #3-3 and is located in the:
Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender Blvd., Hobbs, NM 88240

Drilling Began 5-4-94 Completed 5-4-94 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 80 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well _____ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
68	80	12	Gray Clay and Rock	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				80		55	80

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	3	3	Top Soil
3	6	3	Red Clay
6	18	12	White Caliche
18	21	3	Gray Clay
21	42	21	White Caliche
42	44	2	Brown Clay
44	52	8	White Clay and Rock
52	54	2	Brown Clay and Rock
54	64	10	White Clay and Rock
64	66	2	Gray Clay and Rock
66	68	2	White Clay and Rock
68	80	12	Gray Clay and Rock

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P.O. Box 3092
City and State Houston, Texas 77253-3092

Well was drilled under Permit No. Monitor Well #3-4 and is located in the:
Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender Blvd., Hobbs, NM 88240

Drilling Began 5-4-94 Completed 5-5-94 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 110 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well _____ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
95	110	15	Brown Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				110		65	110

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:
_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	4	4	Top Soil
4	17	13	Red Clay
17	19	2	White Caliche
19	21	2	Brown Clay
21	78	57	White Rock
78	82	4	Brown Clay and Rock
82	89	7	White Rock
89	94	5	Red Clay
94	95	1	White Rock
95	110	15	Brown Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alan Gates

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O.Box 3092
City, State: Houston, TX 77250-3092

Date: 5/11/94
Lab#: H1649

Project Name: not supplied
Project Location: Empire Abo Gas Plant
Sampled by: SN Date: various Time: various
Analyzed by: HM Date: 5/10/04 Time: 1000
Type of Samples: Soil Sample Condition: GIST Units: mg/kg

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE
1	EAGP 3-1 5'	6,593	1.095	1.199	1.997	0.974	2.481	1.350
2	EAGP 3-1 55'	1,457	0.614	0.148	2.070	0.960	2.036	0.311
3	EAGP 3-1 60'	840.9	0.151	0.055	0.275	0.120	0.195	0.081
4	EAGP 3-1 65'	160.2	0.144	0.103	0.288	0.119	0.241	0.129
5	EAGP 3-2 65'	358.7	0.042	0.015	0.032	0.013	0.042	0.029
6	EAGP 3-2 90'	12.9	<0.001	0.005	<0.001	<0.001	<0.001	<0.001
7	EAGP 3-3 20'	73.6	3.170	0.324	6.829	2.508	4.227	0.120
8	EAGP 3-3 65'	397.4	0.067	0.026	0.031	0.011	0.036	0.026
9	EAGP 3-3 75'	204.8	0.127	0.032	0.054	0.022	0.042	0.025
10	EAGP 3-4 80'	29.6	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
11	EAGP 3-4 100'	42.1	<0.001	0.009	<0.001	<0.001	0.009	<0.001
	QC Recovery	411.7	0.887	0.839	0.884	0.866	0.849	0.884
	QC Spike	405.9	0.881	0.867	0.874	0.877	0.869	0.893
	Accuracy	101.4%	100.7%	96.8%	101.1%	98.7%	97.7%	99.0
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - AUTOMATED HEADSPACE GC; INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 8020, 418.1, 3540 OR 3510

Michael R. Fowler

Date 5-11-94

ATTACHMENT 3

GRID NORTH
NAD'27, NMEXZ

10' INTERVALS

- 3460-70
- 3470-80
- 3480-90
- 3490-3500
- 3500-10
- 3510-20
- 3520-30
- 3530-40

ATTACHMENT # 4

CORRECTED TOP OF WATER ELEVATIONS ( )

⊗ MONITOR WELLS

NOTE: PLANT EQUIPMENT, BUILDINGS, ETC. OBTAINED FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant

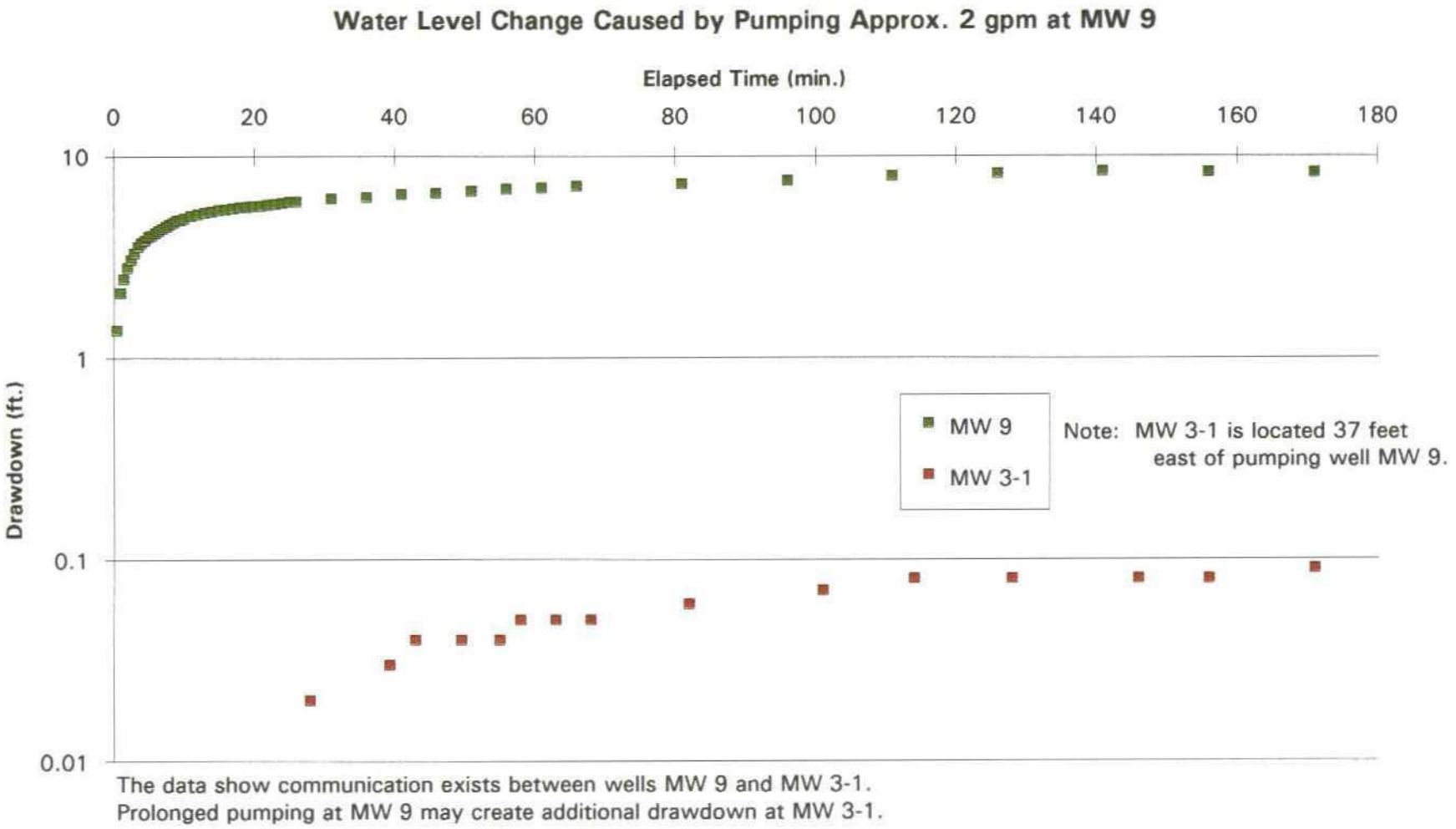
CORRECTED TOP OF WATER ELEVATIONS

Section 3, T18S-R27E

Eddy County, New Mexico

Date: Feb. 16,1994 RKH	Scale: 1 in = 120 ft
Revised: 6-23-94	NM444104.dgn Lv 1,2,4,9,10

HYDRAULIC COMMUNICATION PUMP TEST
EMPIRE ABO GAS PLANT
ARTESIA, NEW MEXICO



The data show communication exists between wells MW 9 and MW 3-1.
Prolonged pumping at MW 9 may create additional drawdown at MW 3-1.

ATTACHMENT 5

ATTACHMENT # 6

PRODUCT THICKNESS ( )

⊗ MONITOR WELLS

NOTE: PLANT EQUIPMENT, BUILDINGS, ETC. OBTAINED FROM DRAWING NO. D-63630-301 & D-63630-302
DRAWN BY: MTWC, DATED 9-11-91 & 9-12-91
SEE SPBBU AUTOCAD DWG FILE - 63630301.DWG & 63630302.DWG

AMOCO PRODUCTION COMPANY
LAND SURVEY DEPT.

Empire Abo Gas Plant
PRODUCT THICKNESS MAP
Section 3, T18S-R27E
Eddy County, New Mexico

Date: Feb. 16,1994 RKH	Scale: 1 in = 120 ft
Revised: 6-23-94	NM444104.dgn Lv 1,2,4,9,11

ATTACHMENT 7

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2
TOTAL DEPTH OF WELL: 37.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3548.5

INITIAL WATER LEVEL: 33
TOP OF SCREEN: 22.5
BASE OF SCREEN: 37.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	32.5	3516	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	37.7	3510.8	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	27	3521.5	0.032	0.001	0.018	0.028	0.079	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	33.5	3515	SAMPLE NOT ANALYZED								<0.05	1800	6.15		2400
3/1/93	33.8	3514.7	0.016	0.03	0.035	0.074	0.155	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	32.82	3515.68	0.018	0.017	0.005	0.009	0.049	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	23.83	3524.67	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	23.8	3524.7	0.003	0.002	0.002	0.003	0.01	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	33.74	3514.76	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
6/21/94	33.82	3514.68	0.001	ND	0.001	0.002	0.004	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 3
TOTAL DEPTH OF WELL: 91.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3555.7

INITIAL WATER LEVEL: 79
TOP OF SCREEN: 71.5
BASE OF SCREEN: 91.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	77	3478.7	111	14	238	299	662	NR	PRODUCT	PRODUCT	NS	NS	NS	NS	NS
3-11-92	83	3472.7	FREE PRODUCT; NOT ANALYZED												
10-1-92	72	3483.7	FREE PRODUCT; NOT ANALYZED												
1-13-93	85	3470.7	FREE PRODUCT; NOT ANALYZED								<0.05	1150	37.65		2458
3/1/93	85.25	3470.45	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	84.9	3470.8	FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 4
TOTAL DEPTH OF WELL: 62.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.3

INITIAL WATER LEVEL: 51
TOP OF SCREEN: 47.5
BASE OF SCREEN: 62.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	51	3500.3	1.25	0.464	1.76	2.26	5.734	0.49	21	ND	NS	NS	NS	NS	NS
1-24-92	51	3500.3	1.14	0.426	1.6	1.94	5.106	0.42	16	ND	NS	NS	NS	NS	NS
3-11-92	51	3500.3	3.64	86.8	38.7	109	238.14	72.7	1615	116	NS	NS	NS	NS	NS
3-11-92	51	3500.3	0.95	1.12	1.25	3.54	6.86	1.05	32	2	NS	NS	NS	NS	NS
10-1-92	34	3517.3	0.957	0.039	1.16	1.52	3.68	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	44	3507.3	0.827	0.325	0.954	1.48	3.59	NS	25	18	0.2	700	5.15		2458
3/1/93	53.6	3497.7	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	53.48	3497.82	FREE PRODUCT; NOT ANALYZED												

MONITOR WELL NUMBER: 5
TOTAL DEPTH OF WELL: 99
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.9

INITIAL WATER LEVEL: 92
TOP OF SCREEN: 74
BASE OF SCREEN: 99

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL*	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	68.8	3475.1	0.931	3.87	1.81	5.26	11.871	0.65	57	17	NS	NS	NS	NS	NS
3-11-92	69	3474.9	0.107	0.534	0.534	1.47	2.654	0.15	8	ND	NS	NS	NS	NS	NS
10-1-92	71	3472.9	0.047	0.01	0.162	0.144	0.363	NS	1	ND	NS	NS	NS	NS	NS
1-13-93	71.5	3472.4	0.101	0.115	0.069	0.073	0.358	NS	ND	ND	<0.05	900	4.92		2464
3/1/93	69.8	3474.1	0.235	0.343	0.253	0.441	1.27	NS	4	4	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	70.25	3473.65	FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 6
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.9

INITIAL WATER LEVEL: 48
TOP OF SCREEN: 33
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
3-11-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
10-1-92	42	3502.9	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	39	3505.9	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	1000	5.05		826
3/1/93	46.8	3498.1	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	43.7	3501.2	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 7
TOTAL DEPTH OF WELL: 28.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3546.9

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 13.5
BASE OF SCREEN: 28.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	8.5	3538.4	3.13	0.795	0.658	0.919	5.502	0.03	10	2	NS	NS	NS	NS	NS
3-11-92	7.7	3539.2	313	0.759	0.625	0.907	5.171	0.06	8	ND	NS	NS	NS	NS	NS
10-1-92	16	3530.9	4.54	1.28	0.936	1.27	8.03	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	9	3537.9	1.61	0.933	0.583	1.23	4.35	NS	13	3	<0.05	1500	242		2323
3/1/93	9.4	3537.5	1.85	0.226	0.243	0.368	2.69	NS	4	ND	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	9.82	3537.08	FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 8
TOTAL DEPTH OF WELL: 92
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.1

INITIAL WATER LEVEL: 83
TOP OF SCREEN: 72
BASE OF SCREEN: 92

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	67.3	3476.8	ND	ND	ND	0.001	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	0.001	ND	ND	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	ND	ND	ND	0	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	76	3468.1	0.048	0.042	0.036	0.069	0.195	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	68	3476.1	0.122	0.264	0.186	0.465	1.04	NS	5	ND	<0.05	1350	4.92		2227
3/1/93	68.7	3475.4	0.042	0.109	0.08	0.166	0.397	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.014	0.011	0.004	0.007	0.036	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.023	0.014	0.004	0.007	0.048	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	68.68	3475.42	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.009	0.003	0.003	0.004	0.019	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.015	0.004	0.003	0.003	0.025	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	69.7	3474.4	0.012	0.005	0.003	0.005	0.025	NS	NS	NS	NS	NS	NS	NS	NS
6/21/94	70.01	3474.09	0.003	0.002	0.002	0.003	0.01	ND	NS	NS	NS	NS	NS	NS	NS
6/21/94	70.01	3474.09	0.002	0.001	0.001	0.002	0.006	ND	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 9
TOTAL DEPTH OF WELL: 74.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.2

INITIAL WATER LEVEL: 66
TOP OF SCREEN: 54.5
BASE OF SCREEN: 74.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	58	3485.2	75	312	39	712	1498	FREE PRODUCT			NS	NS	NS	NS	NS
3-11-92	58	3485.2	5.57	5.89	2.27	5.51	19.24	0.79	53	18	NS	NS	NS	NS	NS
10-1-92	50	3493.2	FREE PRODUCT PRESENT; NOT SAMPLED												
1-13-93	61	3482.2	FREE PRODUCT PRESENT; NOT SAMPLED								<0.05	NS	12.15		NS
3/1/93	61	3482.2	FREE PRODUCT PRESENT; NOT SAMPLED												
6/8/93			FREE PRODUCT PRESENT; NOT SAMPLED												
9/14/93			FREE PRODUCT PRESENT; NOT SAMPLED												
12/8/93			FREE PRODUCT PRESENT; NOT SAMPLED												
3/15/94			FREE PRODUCT PRESENT; NOT SAMPLED												
6/21/94	59.66	3483.54	FREE PRODUCT PRESENT; NOT SAMPLED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-2
TOTAL DEPTH OF WELL: 48
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3552.55

INITIAL WATER LEVEL: 42
TOP OF SCREEN: 38
BASE OF SCREEN: 48

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	27	3525.55	0.001	ND	ND	ND	0.001	ND	ND	ND	0.11	NS	N/A		NS
1-13-93	27.2	3525.35	0.003	ND	0.002	0.004	0.009	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	26.8	3525.75	0.005	0.022	0.036	0.09	0.153	NS	1	ND	NS	NS	NS	NS	NS
6/8/93	26.52	3526.03	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	26.9	3525.65	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	26.9	3525.65	ND	0.001	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	26.96	3525.59	0.001	ND	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS
6/21/94	27.12	3525.43	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-3
TOTAL DEPTH OF WELL: 108
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3557.98

INITIAL WATER LEVEL: 100
TOP OF SCREEN: 98
BASE OF SCREEN: 108

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	97	3460.98	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	204	N/A		1850
1-13-93	89.4	3468.58	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	650	13		2496
3/1/93	83.2	3474.78	0.033	0.103	0.083	0.166	0.385	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	83.6	3474.38	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
9/14/93	84.2	3473.78	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	84	3473.98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	84.3	3473.68	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	84.4	3473.58	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-4
TOTAL DEPTH OF WELL: 58
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3554.09

INITIAL WATER LEVEL: 53
TOP OF SCREEN: 48
BASE OF SCREEN: 58

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	50	3504.09	0.285	0.01	0.016	0.018	0.329	ND	ND	ND	<0.05	48	0	0	750
1-13-93	54	3500.09	1.1	0.531	0.144	0.274	2.05	NS	7	ND	<0.05	1150	6.75		660
3/1/93	54.9	3499.19	0.365	0.041	0.051	0.087	0.544	NS	4	ND	NS	NS	NS	NS	NS
6/8/93	55.1	3498.99	0.418	0.066	0.029	0.039	0.552	NS	3	ND	NS	NS	NS	NS	NS
9/14/93	54.6	3499.49	0.513	0.027	0.023	0.024	0.587	NS	4	ND	NS	NS	NS	NS	NS
12/8/93	54.2	3499.89	0.432	0.004	0.023	0.016	0.475	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	55.43	3498.66	0.262	0.002	0.007	0.002	0.275	NS	1	NS	NS	NS	NS	NS	NS
6/21/94	56.35	3497.74	0.505	0.004	0.009	0.004	0.522	0.03	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-5
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3553

INITIAL WATER LEVEL: 46
TOP OF SCREEN: 43
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	45	3508	0.001	ND	ND	ND	0.001	ND	ND	ND	0.12	NS	N/A		NS
1-13-93		3553	0.002	ND	0.001	0.002	0.005	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	27.4	3525.6	0.002	0.005	0.007	0.016	0.03	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	27.27	3525.73	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	27.3	3525.7	ND	0.01	0.001	0.008	0.019	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	27.2	3525.8	0.002	0.002	0.013	0.029	0.046	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	27.46	3525.54	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	27.4	3525.6	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-6
TOTAL DEPTH OF WELL: 24
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.11

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 14
BASE OF SCREEN: 24

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3534.11	9.91	5.64	0.99	1.97	18.5	0.08	22	ND	<0.05	572	0	5	1050
1-13-93	11.3	3539.81	12.2	1.01	0.134	0.386	13.7	NS	23	ND	<0.05	600	13.75		1286
3/1/93	11.3	3539.81	28.6	2.5	0.482	1.07	32.7	NS	40	ND	NS	NS	NS	NS	NS
9/14/93	11.7	3539.41	35.4	3.32	0.936	1.8	41.5	NS	60	ND	NS	NS	NS	NS	NS
12/8/93	11.6	3539.51	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94			FREE PRODUCT PRESENT; NOT SAMPLED												
6/21/94	22.6	3528.51	FREE PRODUCT PRESENT; NOT SAMPLED												

MONITOR WELL NUMBER: 2-7
TOTAL DEPTH OF WELL: 66
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.34

INITIAL WATER LEVEL: 60
TOP OF SCREEN: 56
BASE OF SCREEN: 66

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	55	3492.34	15.5	6.33	1.64	3.1	26.6	ND	40	7	<0.05	48	N/A		3376
1-13-93	63	3484.34	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	66	3481.34	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	62.24	3485.1	FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-9
TOTAL DEPTH OF WELL: 43
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3546.81

INITIAL WATER LEVEL: 34
TOP OF SCREEN: 33
BASE OF SCREEN: 43

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	32	3514.81	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	31	3515.81	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	NS	127.5		NS
3/1/93	33	3513.81	FREE PRODUCT PRESENT; NOT ANALYZED							(7.5 FEET OF FREE PRODUCT PRESENT)					
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	40.8	3506.01	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 2-10
TOTAL DEPTH OF WELL: 78
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3548.67

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 68
BASE OF SCREEN: 78

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3484.67	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	71	3477.67	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	74	3474.67	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	74.42	3474.25	FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-11
TOTAL DEPTH OF WELL: 23
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.06

INITIAL WATER LEVEL: 17
TOP OF SCREEN: 13
BASE OF SCREEN: 23

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3530.06	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	19	3528.06	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	19.5	3527.56	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	22.94	3524.12	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 2-12
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.4

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3469.4	0.18	0.042	0.027	0.107	0.356	ND	ND	ND	<0.05	616	N/A		2375
1-13-93	71.5	3471.9	0.827	0.0652	0.171	0.356	2.01	NS	6	ND	<0.05	675	8		1674
3/1/93	71.4	3472	0.008	0.013	0.017	0.037	0.075	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	71.68	3471.72	0.014	0.014	0.005	0.007	0.04	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	71.4	3472	0.048	0.079	0.032	0.063	0.222	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	71	3472.4	0.066	0.035	0.013	0.022	0.136	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	71.88	3471.52	1.02	0.269	0.233	0.386	1.91	NS	2	ND	NS	NS	NS	NS	NS
6/21/94	71.9	3471.5	4.68D	1.05	0.688	1.24	7.66	ND	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-13
TOTAL DEPTH OF WELL: 49
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 43
TOP OF SCREEN: 39
BASE OF SCREEN: 49

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	42	3503.91	21	2.43	26.1	42.6	92.2	3.74	567	195	<0.05	236	N/A		2250
1-13-93	44.5	3501.41	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	43	3502.91	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
3/15/94			FREE PRODUCT PRESENT; NOT ANALYZED												
6/21/94	49.92	3495.99	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 2-14
TOTAL DEPTH OF WELL: 78
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 70
TOP OF SCREEN: 66
BASE OF SCREEN: 76

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	65	3480.91	0.044	0.022	0.006	0.011	0.083	ND	ND	ND	<0.05	1460	N/A		2500
1-13-93	61.8	3484.11	SAMPLE NOT ANALYZED												
3/1/93	62.1	3483.81	0.037	0.001	ND	0.003	0.041	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	62.32	3483.59	6.15	0.761	0.234	0.326	7.47	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	62.2	3483.71	0.342	0.056	0.148	0.182	0.728	NS	1	ND	NS	NS	NS	NS	NS
12/8/93	62	3483.91	0.245	0.039	0.122	0.168	0.574	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NS	NS	NS
3/15/94	62.96	3482.95	0.007	0.002	0.002	0.005	0.016	NS	ND	ND	NS	NS	NS	NS	NS
6/21/94	62.8	3483.11	0.115	0.056	0.078	0.164	0.413	ND	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-15
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.64

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 63
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3479.64	0.042	0.043	0.05	0.135	0.27	ND	2	ND	<0.05	1248	N/A		2500
1-13-93	63	3480.64	0.652	0.74	0.424	1.03	2.85	NS	12	3	0.12	875	7.9		1166
3/1/93	63.3	3480.34	0.111	0.029	0.029	0.076	0.245	NS	1	2	NS	NS	NS	NS	NS
6/8/93	63.7	3479.94	0.341	0.098	0.106	0.192	0.737	NS	2	4	NS	NS	NS	NS	NS
9/14/93	63.2	3480.44	0.103	0.009	0.005	0.008	0.125	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	63.1	3480.54	3.55	0.668	0.153	0.247	4.62	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	64.42	3479.22	10.4D	2.36D	0.91	1.55	15.2	NS	17	NS	NS	NS	NS	NS	NS
6/21/94	64.37	3479.27	0.863	0.03	0.162	0.29	1.35	ND	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-16
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.39

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3470.39	0.461	0.305	0.082	0.134	0.982	ND	1	ND	<0.05	624	N/A		2375
1-13-93	70	3474.39	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	70.1	3474.29	6.58	0.011	0.106	0.486	7.18	NS	11	2	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												
3/15/94			FREE PRODUCT; NOT ANALYZED												
6/21/94	70.51	3473.88	FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL
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EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-18
TOTAL DEPTH OF WELL: 39
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.79

INITIAL WATER LEVEL: 33
TOP OF SCREEN: 29
BASE OF SCREEN: 39

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	30	3515.79	8.33	0.685	0.352	0.292	9.66	0.03	10	ND	<0.05	560	1	5	2250
1-13-93	21.7	3524.09	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	975	2.41		3092
3/1/93	21.8	3523.99	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93	22	3523.79	9.71	0.492	0.294	0.3	10.8	NS	21	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	6.49	0.008	0.114	0.019	6.63	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	5.72	0.008	0.085	0.018	5.83	NS	7	ND	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	4.95	0.004	0.084	0.019	5.06	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	5.87	0.004	0.094	0.022	5.99	NS	NS	NS	NS	NS	NS	NS	NS
3/15/94	22.58	3523.21	5.17D	0.004	0.068	0.018	5.26	NS	5	ND	NS	NS	NS	NS	NS
6/21/94	22.65	3523.14	5.16D	0.008	0.088	0.022	5.28	ND	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 3-1
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.04

INITIAL WATER LEVEL: 58
TOP OF SCREEN: 53
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	59.22	3483.82													

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-2	INITIAL WATER LEVEL:	90
TOTAL DEPTH OF WELL:	103	TOP OF SCREEN:	63
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	103
ELEVATION (ASL):	3541.59		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	72.34	3469.25													

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-3	INITIAL WATER LEVEL:	68
TOTAL DEPTH OF WELL:	83	TOP OF SCREEN:	58
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	83
ELEVATION (ASL):	3544.93		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	74.58	3470.35													

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3-4	INITIAL WATER LEVEL:	95
TOTAL DEPTH OF WELL:	113	TOP OF SCREEN:	68
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	113
ELEVATION (ASL):	3558.63		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
6/16/94	87.07	3471.56													

** FEET ABOVE SEA LEVEL
ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

Amoco Production Company
South Permian Basin
Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

G. D. Henry
Manager, Environment,
Health and Safety

February 3, 1994

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
P. O. box 2088
Santa Fe, New Mexico 87504

File: GDH-2155-988.GW00

Groundwater Update
Empire Abo Gas Plant

Attached are two copies of the written report which will update the status of the groundwater project at the Empire Abo Gas Plant (EAGP). We have nearly completed our preliminary investigation and anticipate beginning our free-product recovery later this quarter. We plan to take an aggressive approach toward this project this year and anticipate significant accomplishments by year-end.

If you have any questions or need any additional information please contact Scott Neumann at 713/366-2501.

Sincerely,

G. D. Henry

SNN/jsl
Attachments

GROUNDWATER MONITORING FOLLOW-UP REPORT
EMPIRE ABO GAS PLANT - FIRST QUARTER 1994

This report summarizes the status of the groundwater project at our Empire Abo Gas Plant (EAGP) located in Eddy County, New Mexico. This report supplements the information previously provided to the Oil Conservation Division.

There are currently 23 active monitor wells located at the site. We are sampling the ten wells which do not contain free-product. These wells are sampled on a quarterly basis. Attachment #1 contains the well summaries which includes the depths to water as well as the hydrocarbon analyses from each water sample. Three sampling events occurred since the last report was submitted in June of 1993. Product samples from the wells which contain free-product have been analyzed. The product has been identified in all cases as a gas condensate. Attachment #2 summarizes the product analyses for the wells. The products found were weathered and do not appear to be the results of current practices.

On February 8, 1994, we will be meeting at the EAGP to review the groundwater information with the plant personnel. We anticipate that the senior employees at the plant will be able to give significant input as to potential sources of the gas condensate. At this meeting we will also review several options which have been determined to be appropriate for free-product removal. The field personnel will help determine which method will work best for them. We anticipate beginning installation of this equipment by mid-March 1994. Prior to the installation of the product recovery equipment we will remove all sampling pumps from all the wells in order to determine accurate product thickness' and depths to water.

We are currently having all of our monitor wells surveyed into the plant's plot plan. We anticipate that this will be completed by the end of February at which time we will forward you a copy of the map.

ATTACHMENT #1

EMPIRE ABO GAS PLANT

MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2	INITIAL WATER LEVEL:	33
TOTAL DEPTH OF WELL:	37.5	TOP OF SCREEN:	22.5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	37.5
ELEVATION (ASL):	3548.5		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	32.5	3516	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	37.7	3510.8	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	27	3521.5	0.032	0.001	0.018	0.028	0.079	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	33.5	3515	SAMPLE NOT ANALYZED								<0.05	1800	6.15		2400
3/1/93	33.8	3514.7	0.016	0.03	0.035	0.074	0.155	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	32.82	3515.68	0.018	0.017	0.005	0.009	0.049	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	23.83	3524.67	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	23.8	3524.7	0.003	0.002	0.002	0.003	0.01	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER:	3	INITIAL WATER LEVEL:	79
TOTAL DEPTH OF WELL:	91.5	TOP OF SCREEN:	71.5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	91.5
ELEVATION (ASL):	3555.7		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	77	3478.7	111	14	238	299	662	NR	PRODUCT	PRODUCT	NS	NS	NS	NS	NS
3-11-92	83	3472.7	FREE PRODUCT; NOT ANALYZED												
10-1-92	72	3483.7	FREE PRODUCT; NOT ANALYZED												
1-13-93	85	3470.7	FREE PRODUCT; NOT ANALYZED								<0.05	1150	37.65		2458
3/1/93	85.25	3470.45	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												

** *FEET ABOVE SEA LEVEL*

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 4
TOTAL DEPTH OF WELL: 62.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.3

INITIAL WATER LEVEL: 51
TOP OF SCREEN: 47.5
BASE OF SCREEN: 62.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	51	3500.3	1.25	0.464	1.76	2.26	5.734	0.49	21	ND	NS	NS	NS	NS	NS
1-24-92	51	3500.3	1.14	0.426	1.6	1.94	5.106	0.42	16	ND	NS	NS	NS	NS	NS
3-11-92	51	3500.3	3.64	86.8	38.7	109	238.14	72.7	1615	116	NS	NS	NS	NS	NS
3-11-92	51	3500.3	0.95	1.12	1.25	3.54	6.86	1.05	32	2	NS	NS	NS	NS	NS
10-1-92	34	3517.3	0.957	0.039	1.16	1.52	3.68	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	44	3507.3	0.827	0.325	0.954	1.48	3.59	NS	25	18	0.2	700	5.15		2458
3/1/93	53.6	3497.7	FREE PRODUCT; NOT ANALYZED												
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												

MONITOR WELL NUMBER: 5
TOTAL DEPTH OF WELL: 99
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.9

INITIAL WATER LEVEL: 92
TOP OF SCREEN: 74
BASE OF SCREEN: 99

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL*	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	68.8	3475.1	0.931	3.87	1.81	5.26	11.871	0.65	57	17	NS	NS	NS	NS	NS
3-11-92	69	3474.9	0.107	0.534	0.534	1.47	2.654	0.15	8	ND	NS	NS	NS	NS	NS
10-1-92	71	3472.9	0.047	0.01	0.162	0.144	0.363	NS	1	ND	NS	NS	NS	NS	NS
1-13-93	71.5	3472.4	0.101	0.115	0.069	0.073	0.358	NS	ND	ND	<0.05	900	4.92		2464
3/1/93	69.8	3474.1	0.235	0.343	0.253	0.441	1.27	NS	4	4	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

[EAGPSUM.XLW]BFGP.xls 2/3/94

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 6
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.9

INITIAL WATER LEVEL: 48
TOP OF SCREEN: 33
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
3-11-92		3544.9	FREE PRODUCT PRESENT; NOT ANALYZED												
10-1-92	42	3502.9	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	39	3505.9	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	1000	5.05		826
3/1/93	46.8	3498.1	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 7
TOTAL DEPTH OF WELL: 28.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3546.9

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 13.5
BASE OF SCREEN: 28.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	8.5	3538.4	3.13	0.795	0.658	0.919	5.502	0.03	10	2	NS	NS	NS	NS	NS
3-11-92	7.7	3539.2	313	0.759	0.625	0.907	5.171	0.06	8	ND	NS	NS	NS	NS	NS
10-1-92	16	3530.9	4.54	1.28	0.936	1.27	8.03	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	9	3537.9	1.61	0.933	0.583	1.23	4.35	NS	13	3	<0.05	1500	242		2323
3/1/93	9.4	3537.5	1.85	0.226	0.243	0.368	2.69	NS	4	ND	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING [EAGPSUM.XLW]BFGP.xls 2/3/94

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 8
TOTAL DEPTH OF WELL: 92
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.1

INITIAL WATER LEVEL: 83
TOP OF SCREEN: 72
BASE OF SCREEN: 92

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	67.3	3476.8	ND	ND	ND	0.001	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	0.001	ND	ND	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	ND	ND	ND	0	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	76	3468.1	0.048	0.042	0.036	0.069	0.195	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	68	3476.1	0.122	0.264	0.186	0.465	1.04	NS	5	ND	<0.05	1350	4.92		2227
3/1/93	68.7	3475.4	0.042	0.109	0.08	0.166	0.397	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.014	0.011	0.004	0.007	0.036	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	69.02	3475.08	0.023	0.014	0.004	0.007	0.048	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	68.68	3475.42	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.009	0.003	0.003	0.004	0.019	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	68.6	3475.5	0.015	0.004	0.003	0.003	0.025	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 9
TOTAL DEPTH OF WELL: 74.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.2

INITIAL WATER LEVEL: 66
TOP OF SCREEN: 54.5
BASE OF SCREEN: 74.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	58	3485.2	75	312	39	712	1498	FREE PRODUCT			NS	NS	NS	NS	NS
3-11-92	58	3485.2	5.57	5.89	2.27	5.51	19.24	0.79	53	18	NS	NS	NS	NS	NS
10-1-92	50	3493.2	FREE PRODUCT PRESENT; NOT SAMPLED												
1-13-93	61	3482.2	FREE PRODUCT PRESENT; NOT SAMPLED								<0.05	NS	12.15		NS
3/1/93	61	3482.2	FREE PRODUCT PRESENT; NOT SAMPLED												
6/8/93			FREE PRODUCT PRESENT; NOT SAMPLED												
9/14/93			FREE PRODUCT PRESENT; NOT SAMPLED												
12/8/93			FREE PRODUCT PRESENT; NOT SAMPLED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-2
TOTAL DEPTH OF WELL: 48
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3552.55

INITIAL WATER LEVEL: 42
TOP OF SCREEN: 38
BASE OF SCREEN: 48

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	27	3525.55	0.001	ND	ND	ND	0.001	ND	ND	ND	0.11	NS	N/A		NS
1-13-93	27.2	3525.35	0.003	ND	0.002	0.004	0.009	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	26.8	3525.75	0.005	0.022	0.036	0.09	0.153	NS	1	ND	NS	NS	NS	NS	NS
6/8/93	26.52	3526.03	0.001	ND	ND	ND	0.001	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	26.9	3525.65	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	26.9	3525.65	ND	0.001	ND	ND	0.001	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-3
TOTAL DEPTH OF WELL: 108
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3557.98

INITIAL WATER LEVEL: 100
TOP OF SCREEN: 98
BASE OF SCREEN: 108

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	97	3460.98	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	204	N/A		1850
1-13-93	89.4	3468.58	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	650	13		2496
3/1/93	83.2	3474.78	0.033	0.103	0.083	0.166	0.385	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	83.6	3474.38	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
9/14/93	84.2	3473.78	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	84	3473.98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-4
TOTAL DEPTH OF WELL: 58
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3554.09

INITIAL WATER LEVEL: 53
TOP OF SCREEN: 48
BASE OF SCREEN: 58

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	50	3504.09	0.285	0.01	0.016	0.018	0.329	ND	ND	ND	<0.05	48	0	0	750
1-13-93	54	3500.09	1.1	0.531	0.144	0.274	2.05	NS	7	ND	<0.05	1150	6.75		660
3/1/93	54.9	3499.19	0.365	0.041	0.051	0.087	0.544	NS	4	ND	NS	NS	NS	NS	NS
6/8/93	55.1	3498.99	0.418	0.066	0.029	0.039	0.552	NS	3	ND	NS	NS	NS	NS	NS
9/14/93	54.6	3499.49	0.513	0.027	0.023	0.024	0.587	NS	4	ND	NS	NS	NS	NS	NS
12/8/93	54.2	3499.89	0.432	0.004	0.023	0.016	0.475	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-5
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3553

INITIAL WATER LEVEL: 46
TOP OF SCREEN: 43
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	45	3508	0.001	ND	ND	ND	0.001	ND	ND	ND	0.12	NS	N/A		NS
1-13-93		3553	0.002	ND	0.001	0.002	0.005	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	27.4	3525.6	0.002	0.005	0.007	0.016	0.03	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	27.27	3525.73	ND	ND	ND	ND	ND	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	27.3	3525.7	ND	0.01	0.001	0.008	0.019	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	27.2	3525.8	0.002	0.002	0.013	0.029	0.046	NS	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-6
TOTAL DEPTH OF WELL: 24
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.11

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 14
BASE OF SCREEN: 24

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3534.11	9.91	5.64	0.99	1.97	18.5	0.08	22	ND	<0.05	572	0	5	1050
1-13-93	11.3	3539.81	12.2	1.01	0.134	0.386	13.7	NS	23	ND	<0.05	600	13.75		1286
3/1/93	11.3	3539.81	28.6	2.5	0.482	1.07	32.7	NS	40	ND	NS	NS	NS	NS	NS
9/14/93	11.7	3539.41	35.4	3.32	0.936	1.8	41.5	NS	60	ND	NS	NS	NS	NS	NS
12/8/93	11.6	3539.51	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-7
TOTAL DEPTH OF WELL: 66
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.34

INITIAL WATER LEVEL: 60
TOP OF SCREEN: 56
BASE OF SCREEN: 66

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	55	3492.34	15.5	6.33	1.64	3.1	26.6	ND	40	7	<0.05	48	N/A		3376
1-13-93	63	3484.34	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	66	3481.34	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-9
TOTAL DEPTH OF WELL: 43
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3546.81

INITIAL WATER LEVEL: 34
TOP OF SCREEN: 33
BASE OF SCREEN: 43

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	32	3514.81	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	31	3515.81	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	NS	127.5		NS
3/1/93	33	3513.81	FREE PRODUCT PRESENT; NOT ANALYZED							{7.5 FEET OF FREE PRODUCT PRESENT}					
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 2-10
TOTAL DEPTH OF WELL: 78
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3548.67

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 68
BASE OF SCREEN: 78

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3484.67	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	71	3477.67	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	74	3474.67	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-11	INITIAL WATER LEVEL:	17
TOTAL DEPTH OF WELL:	23	TOP OF SCREEN:	13
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	23
ELEVATION (ASL):	3547.06		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3530.06	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	19	3528.06	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	19.5	3527.56	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER:	2-12	INITIAL WATER LEVEL:	77
TOTAL DEPTH OF WELL:	83	TOP OF SCREEN:	73
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	83
ELEVATION (ASL):	3543.4		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3469.4	0.18	0.042	0.027	0.107	0.356	ND	ND	ND	<0.05	616	N/A		2375
1-13-93	71.5	3471.9	0.827	0.0652	0.171	0.356	2.01	NS	6	ND	<0.05	675	8		1674
3/1/93	71.4	3472	0.008	0.013	0.017	0.037	0.075	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	71.68	3471.72	0.014	0.014	0.005	0.007	0.04	NS	ND	ND	NS	NS	NS	NS	NS
9/14/93	71.4	3472	0.048	0.079	0.032	0.063	0.222	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	71	3472.4	0.066	0.035	0.013	0.022	0.136	NS	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-13
TOTAL DEPTH OF WELL: 49
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 43
TOP OF SCREEN: 39
BASE OF SCREEN: 49

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	42	3503.91	21	2.43	26.1	42.6	92.2	3.74	567	195	<0.05	236	N/A		2250
1-13-93	44.5	3501.41	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	43	3502.91	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												
9/14/93			FREE PRODUCT PRESENT; NOT ANALYZED												
12/8/93			FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 2-14
TOTAL DEPTH OF WELL: 78
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 70
TOP OF SCREEN: 66
BASE OF SCREEN: 76

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	65	3480.91	0.044	0.022	0.006	0.011	0.083	ND	ND	ND	<0.05	1460	N/A		2500
1-13-93	61.8	3484.11	SAMPLE NOT ANALYZED												
3/1/93	62.1	3483.81	0.037	0.001	ND	0.003	0.041	NS	ND	ND	NS	NS	NS	NS	NS
6/8/93	62.32	3483.59	6.15	0.761	0.234	0.326	7.47	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	62.2	3483.71	0.342	0.056	0.148	0.182	0.728	NS	1	ND	NS	NS	NS	NS	NS
12/8/93	62	3483.91	0.245	0.039	0.122	0.168	0.574	NS	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-15
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.64

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 63
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3479.64	0.042	0.043	0.05	0.135	0.27	ND	2	ND	<0.05	1248	N/A		2500
1-13-93	63	3480.64	0.652	0.74	0.424	1.03	2.85	NS	12	3	0.12	875	7.9		1166
3/1/93	63.3	3480.34	0.111	0.029	0.029	0.076	0.245	NS	1	2	NS	NS	NS	NS	NS
6/8/93	63.7	3479.94	0.341	0.098	0.106	0.192	0.737	NS	2	4	NS	NS	NS	NS	NS
9/14/93	63.2	3480.44	0.103	0.009	0.005	0.008	0.125	NS	ND	ND	NS	NS	NS	NS	NS
12/8/93	63.1	3480.54	3.55	0.668	0.153	0.247	4.62	NS	NS	NS	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-16
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.39

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3470.39	0.461	0.305	0.082	0.134	0.982	ND	1	ND	<0.05	624	N/A		2375
1-13-93	70	3474.39	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	70.1	3474.29	6.58	0.011	0.106	0.486	7.18	NS	11	2	NS	NS	NS	NS	NS
6/8/93			FREE PRODUCT; NOT ANALYZED												
9/14/93			FREE PRODUCT; NOT ANALYZED												
12/8/93			FREE PRODUCT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-18	INITIAL WATER LEVEL:	33
TOTAL DEPTH OF WELL:	39	TOP OF SCREEN:	29
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	39
ELEVATION (ASL):	3545.79		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	30	3515.79	8.33	0.685	0.352	0.292	9.66	0.03	10	ND	<0.05	560	1	5	2250
1-13-93	21.7	3524.09	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	975	2.41		3092
3/1/93	21.8	3523.99	FREE PRODUCT PRESENT; NOT ANALYZED												
6/8/93	22	3523.79	9.71	0.492	0.294	0.3	10.8	NS	21	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	6.49	0.008	0.114	0.019	6.63	NS	8	ND	NS	NS	NS	NS	NS
9/14/93	22.99	3522.8	5.72	0.008	0.085	0.018	5.83	NS	7	ND	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	4.95	0.004	0.084	0.019	5.06	NS	NS	NS	NS	NS	NS	NS	NS
12/8/93	22.9	3522.89	5.87	0.004	0.094	0.022	5.99	NS	NS	NS	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ATTACHMENT #2

Amoco Corporation
7201 E. 38th Street (Space 7253)
Tulsa, Oklahoma 74145-3207

Post Office Box 3385
Tulsa, OK 74102-3385

Environment, Health & Safety Department
Groundwater Management Services
Telephone: 918-660-4420
Facsimile: 918-660-4443

August 13, 1993

GMS 93-295M

Scott Neumann
Amoco Production Company
501 Westlake Park Blvd
Houston, TX 77029

Empire Abo Gas Plant, Artesia, New Mexico

The Groundwater Management Section (GMS) laboratory received 13 samples from the subject site for hydrocarbon identification by capillary column gas chromatography. Four of the samples, which were from wells EAGP #4, #7, #2-6, and #2-16, had insufficient product for analysis. The rest of the samples are tentatively identified as:

Well ID/Sample No.	Type Product
#3	gas condensate, with a high concentration of hydrocarbons in the boiling point range of C5 and lower; no evidence of refined products in this and all other samples
#5	highly weathered gas condensate, indicated by the high pristane/C17 and phytane/C18 ratios and absence of C5 hydrocarbons
#6	slightly weathered gas condensate, indicated by the decrease in C5 boiling point range hydrocarbons.
#9	weathered gas condensate, with decreased C5 hydrocarbons and high pristane/C17 and phytane/C18 ratios
#2-7	weathered gas condensate, with decreased C5 hydrocarbons and high pristane/C17 and phytane/C18 ratios
#2-9	slightly weathered gas condensate, indicated by the decrease in C5 boiling point range hydrocarbons.
#2-10	slightly weathered gas condensate, indicated by the decrease in C5 boiling point range hydrocarbons.

Well ID/Sample No.	Type Product
#2-11	gas condensate, with high concentration of hydrocarbons in the boiling point range of C5 and lower
#2-13	highly weathered gas condensate, indicated by the high pristane/C17 and phytane/C18 ratios and absence of C5 hydrocarbons

Please contact the GMS at 918/660-4420 if you have questions regarding these data.

Stephanie Fiorenza

Stephanie Fiorenza, Ph. D.

SF/sf
Attachment

93-082-W-GMS295M

cc. R. Carey Cook, 1017 W. Stanolind Rd., Hobbs, NM 88240
W. P. Weisrock/E. L. Hockman - Tulsa

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

July 7, 1993

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

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-357

Mr. G.D. Henry
Environmental Affairs and Safety Manager
Amoco Production Company
South Permian Basin Business Unit
P.O. Box 3092
Houston, Texas 77253-3092

RE: GROUND WATER INVESTIGATION
AMOCO EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO

Dear Mr. Henry:

The New Mexico Oil Conservation Division (OCD) has completed a review of Amoco's June 1993 "EMPIRE ABO GAS PLANT, EDDY COUNTY, NEW MEXICO GROUND WATER STUDY VOLUME 2" which was hand-delivered to OCD on June 25, 1993. This document details Amoco's investigation of ground water quality underlying the Empire Abo Gas Plant and proposes corrective actions for contaminated ground water related to Amoco's activities.

The ground water quality investigations and the proposed corrective actions contained in the above referenced document **are hereby approved with the following conditions:**

1. The proposed semiannual reports containing all sampling results will be submitted to OCD by January 31 and July 31 of each year.

2. Amoco will provide copies of the semiannual reports to the OCD Artesia District Office.

3. Amoco will notify the OCD at least one week prior to sampling events such that OCD may have the opportunity to witness the activities and/or split samples.

Please be advised that OCD approval does not relieve Amoco of liability should contaminants pose a threat to human health or migrate into surface waters or ground waters of foreseeable beneficial use. In addition, OCD approval does not relieve Amoco 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: OCD Artesia District Office

Amoco Production Company
South Permian Basin
Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

G.D. Henry
Manager, Environmental
Affairs and Safety

June 25, 1993

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
P.O. Box 2088
Santa Fe, New Mexico 87504

File: GDH-1927-988.GW00

Groundwater Monitoring Follow-up Report
Empire Abo Gas Plant

Attached are two copies of the written report to provide an update on the Amoco initiated program to evaluate the quality of groundwater beneath the Empire Abo Gas Plant (EAGP). This report supplements the report submitted by Amoco in July, 1992.

Detailed in this report are:

1. Actions to Date
2. Discussion of Findings
3. Proposed Actions

In summary, the 26 wells drilled indicated that there are no continuous groundwater sources in this area, including major or minor aquifers. Because of the lithology of the area, there is very little risk of any groundwater migration.

Of the 26 wells drilled, 23 encountered groundwater at various levels, all of which are considered perched aquicludes. The majority of these wells contained hydrocarbons, either free-phase or dissolved. Some wells also contained H_2S, Chromium, Nitrates/Nitrites, Chlorides and Sulfates. It appears that all of the contaminants are contained in place by the nature of the lithology.

Amoco intends to begin by removing the free product from the monitor wells. This will be fed back into the plant. Once this is completed, samples will be retaken. Amoco then plans to conduct a risk assessment to evaluate necessary clean-up and/or containment based on risks to both the environment and human health.

If further information is required please contact Scott Neumann, at 713/556-2501.

Sincerely,

G. D. Henry

SFL/
Attachments

TABLE OF CONTENTS

SECTION 1

ACTIONS TO DATE

ACTIONS TO DATE

As explained in the previous report, all actions taken to date have been on Amoco's own initiative and not driven by any regulatory requirement.

Initially, nine monitor wells (numbered 1-9) were drilled at the Empire Abo Gas Plant (EAGP) in December, 1991. Well number 1 was not found to have any water to a depth of 200 feet and was therefore plugged and abandoned. The remaining eight monitor wells have been sampled and tested for BTEX and TPH on a quarterly basis. In addition, these wells were also sampled for Chromium, Chlorides, Nitrates/Nitrites, and Sulfates. In July, 1992 a written report was submitted to the NMOCD outlining the evaluations of these results and future plans for further evaluation.

In September, 1992 17 additional monitor wells (2-1 to 2-18 - 2-8 not drilled) were drilled at EAGP, two of which were found not to contain any groundwater to depths of 160 and 180 feet (monitor wells 2-1 and 2-17 respectively) and were therefore plugged and abandoned. The location of these wells, as well as the original nine wells, can be seen relative to the plant boundary on Figure 1. Water samples were collected from the wells after installation and tested for BTEX, MTBE, TPH, Chromium, Chlorides, Nitrates, Nitrites, and Sulfates and have since been tested on a quarterly basis.

The data collected in the past six months has been added to the preexisting database, re-evaluated, and outlined in detail in this report.

SECTION 2

DISCUSSION OF FINDINGS

DISCUSSION OF FINDINGS

The lithologies of the area underlying the Empire Abo Gas Plant have been defined using data obtained from the 26 monitor wells drilled. Cross sections for this area have been generated and are included as Appendix A1. As can be seen, the subsurface consists of highly weathered, multi-colored clay, sand and rock combinations. (Because of the large number of colors and combinations found, the cross-sections are set up such that a white area with a number 6 on it is described as "white clay and rock", or a brown area with a number three on it is a "brown clay".) There is little stratigraphic continuity between wells throughout the entire plant area and therefore no definite correlations can be made.

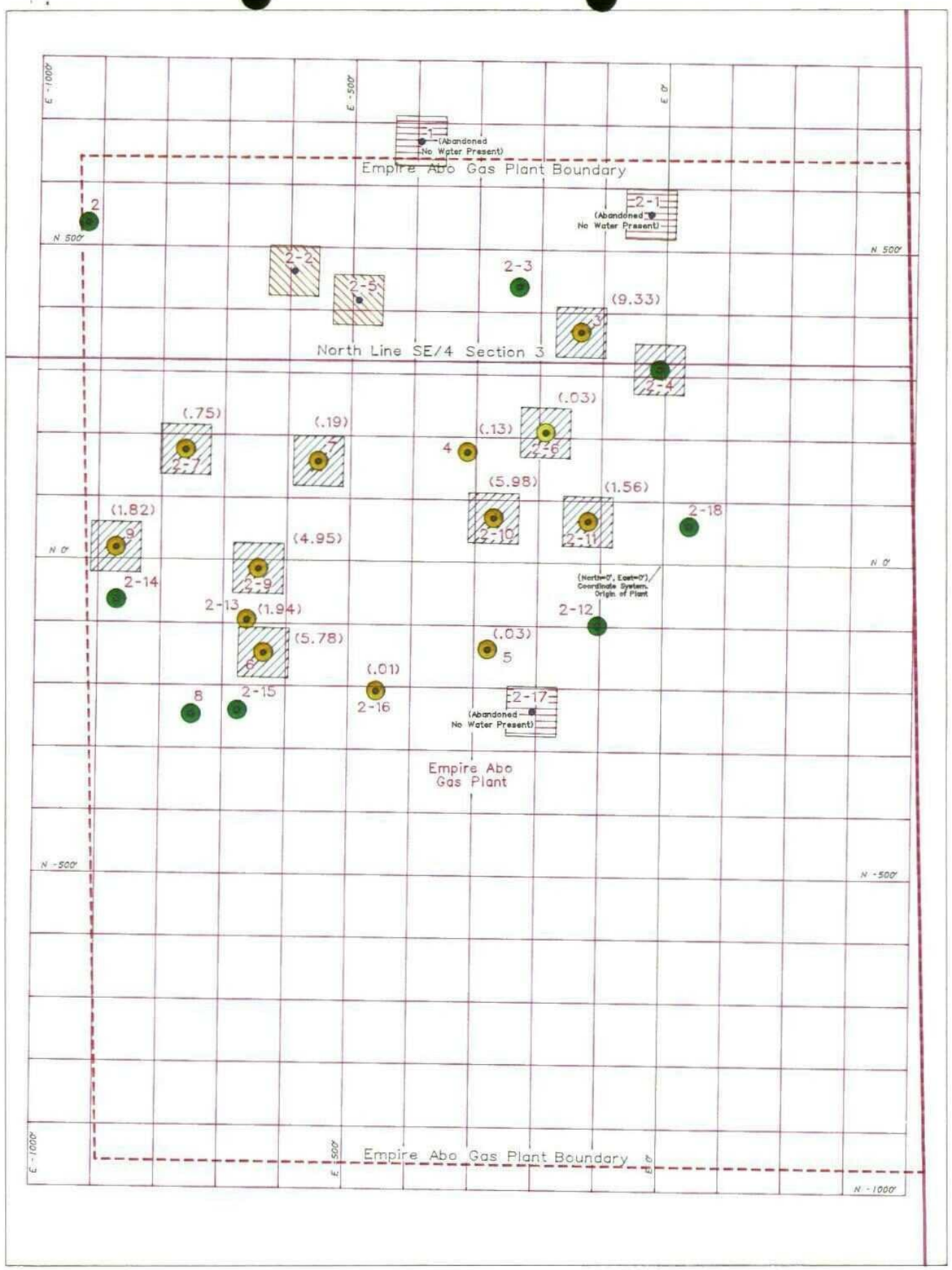
Several shallow perched aquicludes are found throughout the plant at various depths. No continuous units were found. Monitor wells were drilled to depths up to 200 feet and no major or minor aquifers were encountered.

Of the 26 wells drilled, 23 encountered groundwater at various depths, all of which are perched aquicludes. The pumps were removed from all of the wells and the water levels were allowed to stabilize for several days prior to taking measurements. Of these 23 wells measured and/or sampled on 3/1/93, 9 contained only dissolved hydrocarbons, and 12 had free-phase hydrocarbons. Ten of the 23 had H_2S present at the time of drilling. A map showing the layout of the wells with a summary of the findings is included as Figure 2. Table 1, the monitor well sampling worksheet from the April, 1993 sampling event, summarizes the depth to water and product as well as the well development information. The product thickness associated with each well is also shown in Figure 2. In addition to this, Appendix A2 includes Well Summaries of the analyses for each well.

Relatively high levels of Chlorides and Sulfates, compared to drinking water standards, were found in some of the monitor wells. Chromium and Nitrates/Nitrites mostly appeared at lower levels. It is important to recognize that a comparison to drinking water standards is very conservative for this groundwater since it poses no risk of migration or threat of reaching a drinking water source.

This new data supports the earlier interpretations that the water associated with the zones of contamination may be the result of previous plant operations and the discharge of water to the ground surface. There are no indications that any major or minor aquifers are or will be affected by these zones of contamination. The water zones are exclusively limited to perched aquicludes.

"FIGURE 2"



Amoco Production Company, Land Survey Department
Project: NM444000

The following data is based on an actual field survey conducted by the Land Survey Dept.

Empire Abo Gas Plant, Eddy County, New Mexico
Monitor Well Coordinates.

Elevations were measured to top rim of PVC of Monitor Wells

Empire Abo Gas Plant Monitor Wells

Well Name	New Mexico East Zone X(Ft USS)	Y(Ft USS)	North American Datum 1927 Latitude(N)	Longitude(W)	Casing Elev.(MSL)	
MW 01	522597.670'	646445.606'	32°46' 37.736"	104° 15' 35.314"	3554.99'	abandoned
MW 02	522067.376'	646318.695'	32°46' 36.484"	104° 15' 41.526"	3548.52'	
MW 03	522852.413'	646140.018'	32°46' 34.710"	104° 15' 32.332"	3555.72'	
MW 04	522671.652'	645949.711'	32°46' 32.828"	104° 15' 34.451"	3551.39'	
MW 05	522702.883'	645634.618'	32°46' 29.710"	104° 15' 34.088"	3543.96'	
MW 06	522346.000'	645630.968'	32°46' 29.676"	104° 15' 38.268"	3544.96'	
MW 07	522434.483'	645935.936'	32°46' 32.693"	104° 15' 37.229"	3546.93'	
MW 08	522230.384'	645533.805'	32°46' 28.716"	104° 15' 39.263"	3544.18'	
MW 09	522111.500'	645800.591'	32°46' 31.356"	104° 15' 41.013"	3543.21'	
MW 2-1	522964.201'	646328.234'	32°46' 36.572"	104° 15' 31.022"	3558.00'	abandoned
MW 2-2	522395.968'	646239.328'	32°46' 35.696"	104° 15' 37.678"	3552.55'	
MW 2-3	522755.070'	646212.801'	32°46' 35.431"	104° 15' 33.472"	3557.98'	
MW 2-4	522977.485'	646080.613'	32°46' 34.121"	104° 15' 30.868"	3554.09'	
MW 2-5	522498.382'	646192.323'	32°46' 35.230"	104° 15' 36.479"	3553.00'	
MW 2-6	522795.845'	645980.117'	32°46' 33.128"	104° 15' 32.996"	3551.11'	
MW 2-7	522223.078'	645955.554'	32°46' 32.889"	104° 15' 39.705"	3547.34'	
MW 2-8	522072.894'	645858.087'	32°46' 31.926"	104° 15' 41.465"	0.00'	not drilled
MW 2-9	522338.046'	645765.474'	32°46' 31.007"	104° 15' 38.360"	3546.81'	
MW 2-10	522712.903'	645844.133'	32°46' 31.783"	104° 15' 33.969"	3548.67'	
MW 2-11	522863.169'	645838.231'	32°46' 31.724"	104° 15' 32.209"	3547.06'	
MW 2-12	522877.611'	645672.361'	32°46' 30.082"	104° 15' 32.041"	3543.40'	
MW 2-13	522319.745'	645684.117'	32°46' 30.202"	104° 15' 38.575"	3545.91'	
MW 2-14	522111.643'	645717.774'	32°46' 30.537"	104° 15' 41.012"	3544.65'	
MW 2-15	522304.146'	645539.933'	32°46' 28.776"	104° 15' 38.759"	3543.64'	
MW 2-16	522525.703'	645569.170'	32°46' 29.064"	104° 15' 36.164"	3544.39'	
MW 2-17	522773.241'	645535.278'	32°46' 28.726"	104° 15' 33.265"	0.00'	abandoned
MW 2-18	523024.293'	645830.137'	32°46' 31.642"	104° 15' 30.322"	3545.79'	

LEGEND

- Dry, No Water Present
- H_2S Present
- No Hydrocarbons Found at levels exceeding drinking water standards
- Free-phase Hydrocarbons (thickness in feet)
- Dissolved Hydrocarbons

April 1993

Amoco Production Company
Land Survey Department

Empire Abo Gas Plant Monitor Well Survey Summary

Township 18 South,
Range 27 East

Eddy County, New Mexico

Scale: 1"= 200'

SECTION 3

PROPOSED COURSE OF ACTION

PROPOSED COURSE OF ACTION

The information collected from the 26 monitor wells at the Empire Abo Gas Plant indicates that all aquicludes affected by the contamination are localized and perched and no major or minor aquifers should be effected by this contamination. Because there are no continuous groundwater units, we feel that the area has been adaquately delineated at this time. The following is the proposed course of action in dealing with the contamination:

1. Recover the free product in the monitor wells by year end 1993. All sampling from the wells containing free product will be discontinued until this can be completed. After the free product has been removed, one round of sampling will be done to evaluate future actions.

2. Perform a health and risk based assessment (by year end 1994) and take further actions as required based on the findings.

3. Submit follow-up reports to the NMOCD every six months.

APPENDIX

APPENDIX A1

STRATA CROSS SECTIONS

APPENDIX A–1

GROUNDWATER CROSS SECTION LEGEND

COLOR OF FORMATION

CALICHE

COLOR OF MATERIAL

LIGHT BROWN

RED

WHITE

GRAY

YELLOW

TYPE OF MATERIAL

1. SAND
2. ROCK
3. CLAY
4. SAND & ROCK
5. SAND & CLAY
6. CLAY & ROCK
7. SANDSTONE
8. CLAY & SANDSTONE

EXAMPLES

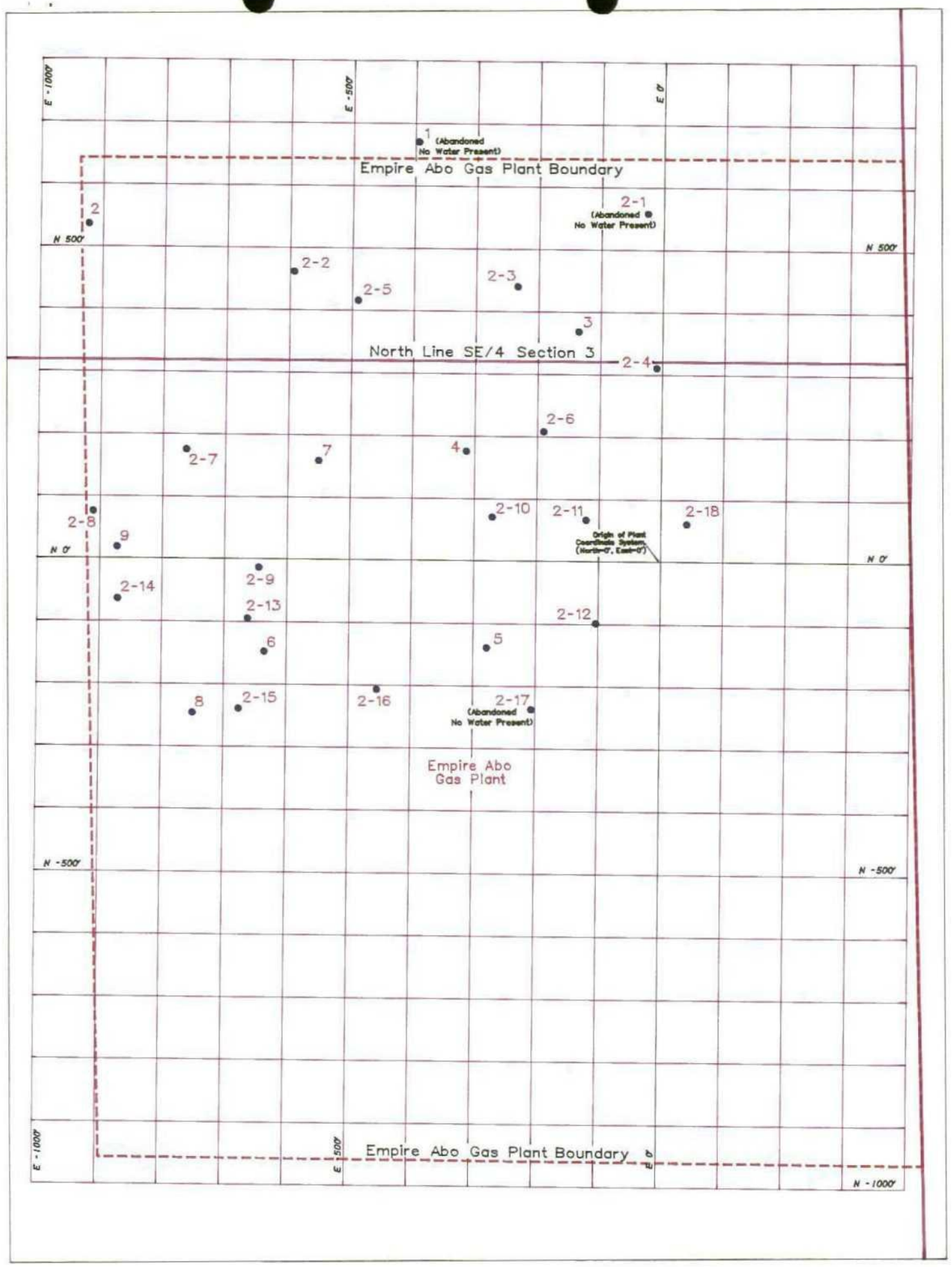
LIGHT BROWN CLAY

WHITE CLAY & ROCK

GRAY CLAY & ROCK / GRAY CLAY

NM444103.dgn Lv 40 & 41.

"FIGURE 1"



Amoco Production Company, Land Survey Department
Project: NM444000

The following data is based on an actual field survey conducted by the Land Survey Dept.

Empire Abo Gas Plant, Eddy County, New Mexico
Monitor Well Coordinates.

Elevations were measured to top rim of PVC of Monitor Wells

Empire Abo Gas Plant Monitor Wells

Well Name	New Mexico East Zone X(Ft USS)	Y(Ft USS)	North American Datum 1927 Latitude(N)	Longitude(W)	Casing Elev.(MSL)	
MW 01	522597.670'	646445.606'	32°46' 37.736"	104° 15' 35.314"	3554.99'	abandoned
MW 02	522067.376'	646318.695'	32°46' 36.484"	104° 15' 41.526"	3548.52'	
MW 03	522852.413'	646140.018'	32°46' 34.710"	104° 15' 32.332"	3555.72'	
MW 04	522671.652'	645949.711'	32°46' 32.828"	104° 15' 34.451"	3551.39'	
MW 05	522702.883'	645634.618'	32°46' 29.710"	104° 15' 34.088"	3543.96'	
MW 06	522346.000'	645630.968'	32°46' 29.676"	104° 15' 38.268"	3544.96'	
MW 07	522434.483'	645935.936'	32°46' 32.693"	104° 15' 37.229"	3546.93'	
MW 08	522230.384'	645533.805'	32°46' 28.716"	104° 15' 39.263"	3544.18'	
MW 09	522111.500'	645800.591'	32°46' 31.356"	104° 15' 41.013"	3543.21'	
MW 2-1	522964.201'	646328.234'	32°46' 36.572"	104° 15' 31.022"	3558.00'	abandoned
MW 2-2	522395.968'	646239.328'	32°46' 35.696"	104° 15' 37.678"	3552.55'	
MW 2-3	522755.070'	646212.801'	32°46' 35.431"	104° 15' 33.472"	3557.98'	
MW 2-4	522977.485'	646080.613'	32°46' 34.121"	104° 15' 30.868"	3554.09'	
MW 2-5	522498.382'	646192.323'	32°46' 35.230"	104° 15' 36.479"	3553.00'	
MW 2-6	522795.845'	645980.117'	32°46' 33.128"	104° 15' 32.996"	3551.11'	
MW 2-7	522223.078'	645955.554'	32°46' 32.889"	104° 15' 39.705"	3547.34'	
MW 2-8	522072.894'	645858.087'	32°46' 31.926"	104° 15' 41.465"	0.00'	not drilled
MW 2-9	522338.046'	645765.474'	32°46' 31.007"	104° 15' 38.360"	3546.81'	
MW 2-10	522712.903'	645844.133'	32°46' 31.783"	104° 15' 33.969"	3548.67'	
MW 2-11	522863.169'	645838.231'	32°46' 31.724"	104° 15' 32.209"	3547.06'	
MW 2-12	522877.611'	645672.361'	32°46' 30.082"	104° 15' 32.041"	3543.40'	
MW 2-13	522319.745'	645684.117'	32°46' 30.202"	104° 15' 38.575"	3545.91'	
MW 2-14	522111.643'	645717.774'	32°46' 30.537"	104° 15' 41.012"	3544.65'	
MW 2-15	522304.146'	645539.933'	32°46' 28.776"	104° 15' 38.759"	3543.64'	
MW 2-16	522525.703'	645569.170'	32°46' 29.064"	104° 15' 36.164"	3544.39'	
MW 2-17	522773.241'	645535.278'	32°46' 28.726"	104° 15' 33.265"	0.00'	abandoned
MW 2-18	523024.293'	645830.137'	32°46' 31.642"	104° 15' 30.322"	3545.79'	

Amoco Production Company
Land Survey Department

Empire Abo Gas Plant Monitor Well Survey

Township 18 South, Range 27 East

Eddy County, New Mexico

Scale: 1"= 200'

Drw.by RWB 1/8/93 NM444101.dgn - 20

Table 1

MONITOR WELL SAMPLING WORKSHEET

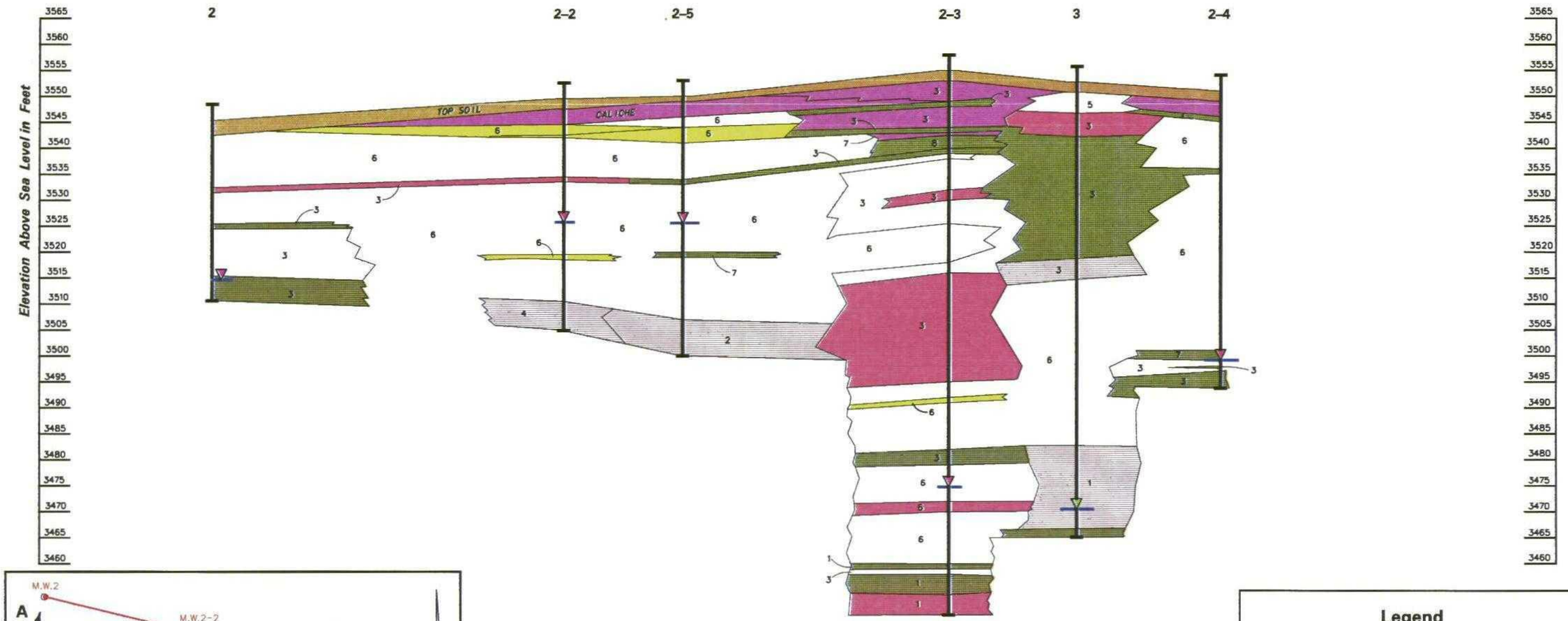
Location: Empire Abo Gas Plant
Date: April 13, 1993
Sampled by: Carey Cook

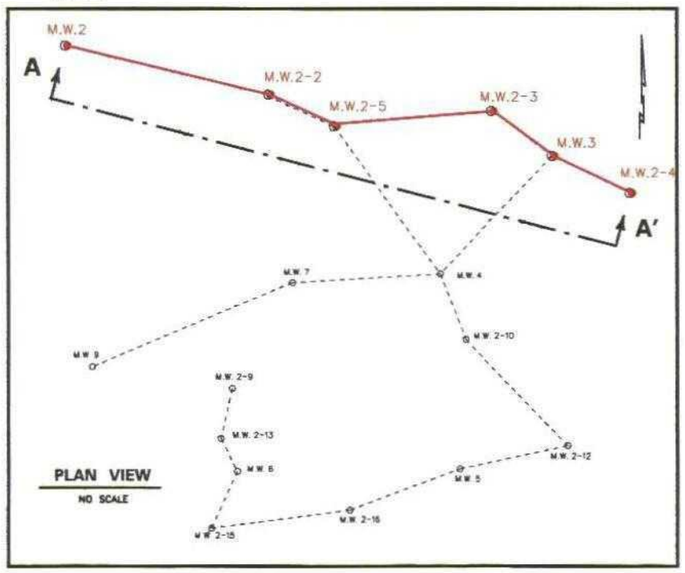
Well Number	Sampling Order	Total Depth Of Well (ft)	-	Depth To Water (ft)	=	Standing Water Height (ft)	x	Well Volume (**) (gal/ft)	=	Total Well Volume (gal)	x	3 Well Volumes	=	Total Volume Removed (gal)	Depth To Product (ft)	*Product Thickness (ft)
EX #1	0	45.00	-	39.00	=	6.00	x	0.653	=	3.918	x	3	=	11.754	37.00	2.00
2	5	37.50	-	33.45	=	4.05	x	0.653	=	2.645	x	3	=	7.934		
3	18	91.50	-	88.50	=	3.00	x	0.653	=	1.959	x	3	=	5.877	79.17	9.33
4	20	62.50	-	53.33	=	9.17	x	0.653	=	5.988	x	3	=	17.964	53.20	0.13
5	10	99.00	-	70.35	=	28.65	x	0.653	=	18.708	x	3	=	56.125	70.32	0.03
6	13	53.00	-	47.85	=	5.15	x	0.653	=	3.363	x	3	=	10.089	42.07	5.78
7	11	28.50	-	9.45	=	19.05	x	0.653	=	12.440	x	3	=	37.319	9.26	0.19
8	7	92.00	-	68.62	=	23.38	x	0.653	=	15.267	x	3	=	45.801		
9	16	74.50	-	61.01	=	13.49	x	0.653	=	8.809	x	3	=	26.427	59.19	1.82
2-2	4	48.00	-	26.53	=	21.47	x	0.653	=	14.020	x	3	=	42.060		
2-3	8	108.00	-	83.41	=	24.59	x	0.653	=	16.057	x	3	=	48.172		
2-4	9	58.00	-	54.80	=	3.20	x	0.653	=	2.090	x	3	=	6.269		
2-5	1	53.00	-	27.25	=	25.75	x	0.653	=	16.815	x	3	=	50.444		
2-6	19	24.00	-	12.85	=	11.15	x	0.653	=	7.281	x	3	=	21.843		
2-7	17	67.00	-	63.15	=	3.85	x	0.653	=	2.514	x	3	=	7.542	62.40	0.75
2-9	15	43.00	-	38.82	=	4.18	x	0.653	=	2.730	x	3	=	8.189	33.87	4.95
2-10	21	78.00	-	75.71	=	2.29	x	0.653	=	1.495	x	3	=	4.486	69.73	5.98
2-11	22	23.00	-	23.00	=	0.00	x	0.653	=	0.000	x	3	=	0.000	21.44	1.56
2-12	3	83.00	-	71.38	=	11.62	x	0.653	=	7.588	x	3	=	22.764		
2-13	14	49.00	-	46.26	=	2.74	x	0.653	=	1.789	x	3	=	5.368	44.32	1.94
2-14	2	76.00	-	62.09	=	13.91	x	0.653	=	9.083	x	3	=	27.250		
2-15	6	73.00	-	63.21	=	9.79	x	0.653	=	6.393	x	3	=	19.179		
2-16	12	83.00	-	70.11	=	12.89	x	0.653	=	8.417	x	3	=	25.252	70.10	0.01
2-18	23	39.00	-	21.75	=	17.25	x	0.653	=	11.264	x	3	=	33.793		

*Product Thickness = Depth to Water (ft.) - Depth to Product (ft.)
**If Well Diameter is 2", use 0.16
**If Well Diameter is 4", use 0.653
All measurements are from top of casing

CROSS SECTION A – A'

SCALE: VERT. 1 in = 20 ft / HORIZ. 1 in = 100 ft





EMPIRE ABO GAS PLANT
GROUNDWATER CROSS SECTIONS

EDDY COUNTY, NEW MEXICO

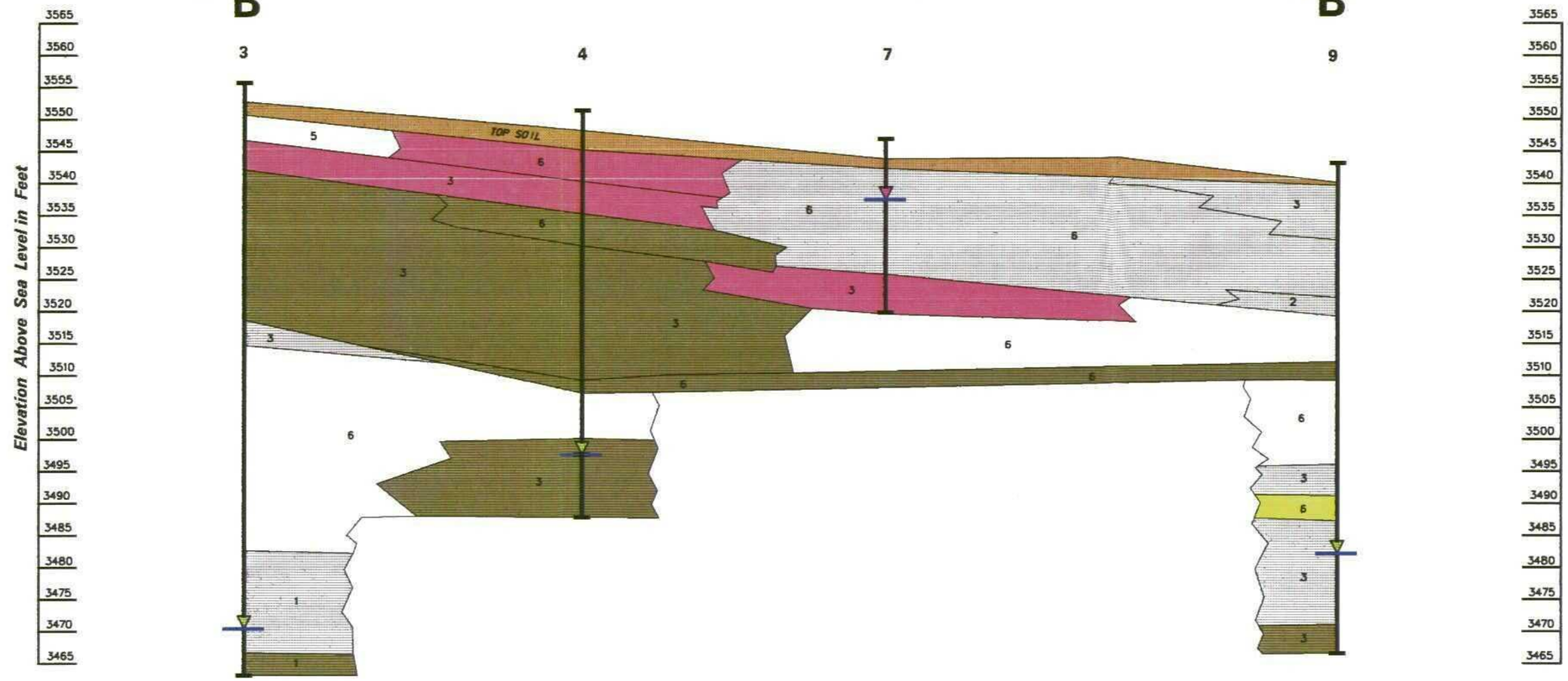
JUNE 21,1993 DR. BY: LAND SURVEY DEPT./R.K.H.

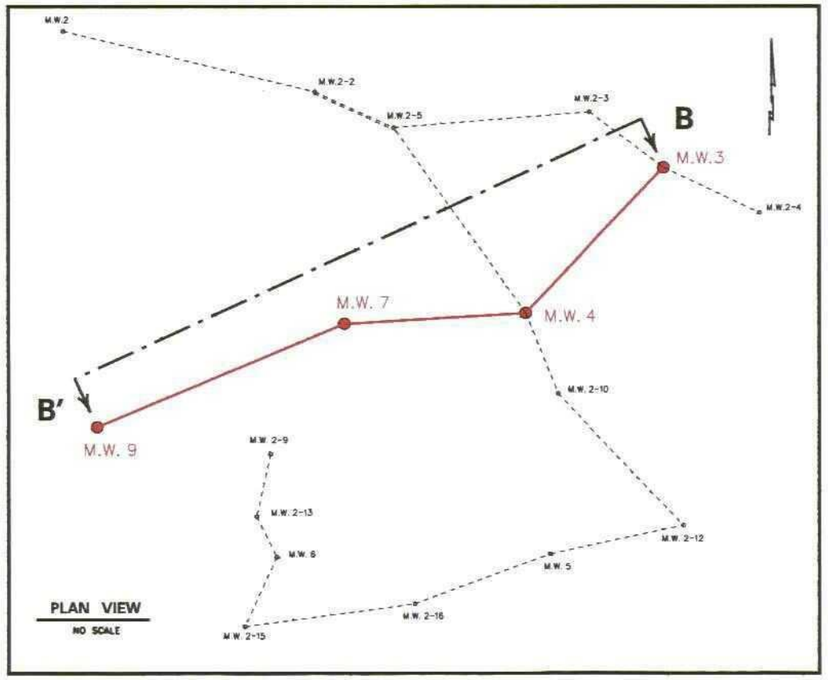
Legend

- Ground Water Table
- Ground Water Table with BTEX (dissolved hydrocarbons) Contamination
- Ground Water Table with Free Phase Hydrocarbons
- Facies Change

1. Sand	5. Sand & Clay
2. Rock	6. Clay & Rock
3. Clay	7. Sandstone
4. Sand & Rock	8. Clay & Sandstone

NM444103.dgn Lv 1,2.





CROSS SECTION B – B′

SCALE: VERT. 1 in = 20 ft / HORIZ. 1 in = 100 ft

EMPIRE ABO GAS PLANT
GROUNDWATER CROSS SECTIONS

EDDY COUNTY, NEW MEXICO

JUNE 21,1993 DR. BY: LAND SURVEY DEPT./R.K.H.

Legend

- Ground Water Table
- Ground Water Table with BTEX (dissolved hydrocarbons) Contamination
- Ground Water Table with Free Phase Hydrocarbons
- Facies Change

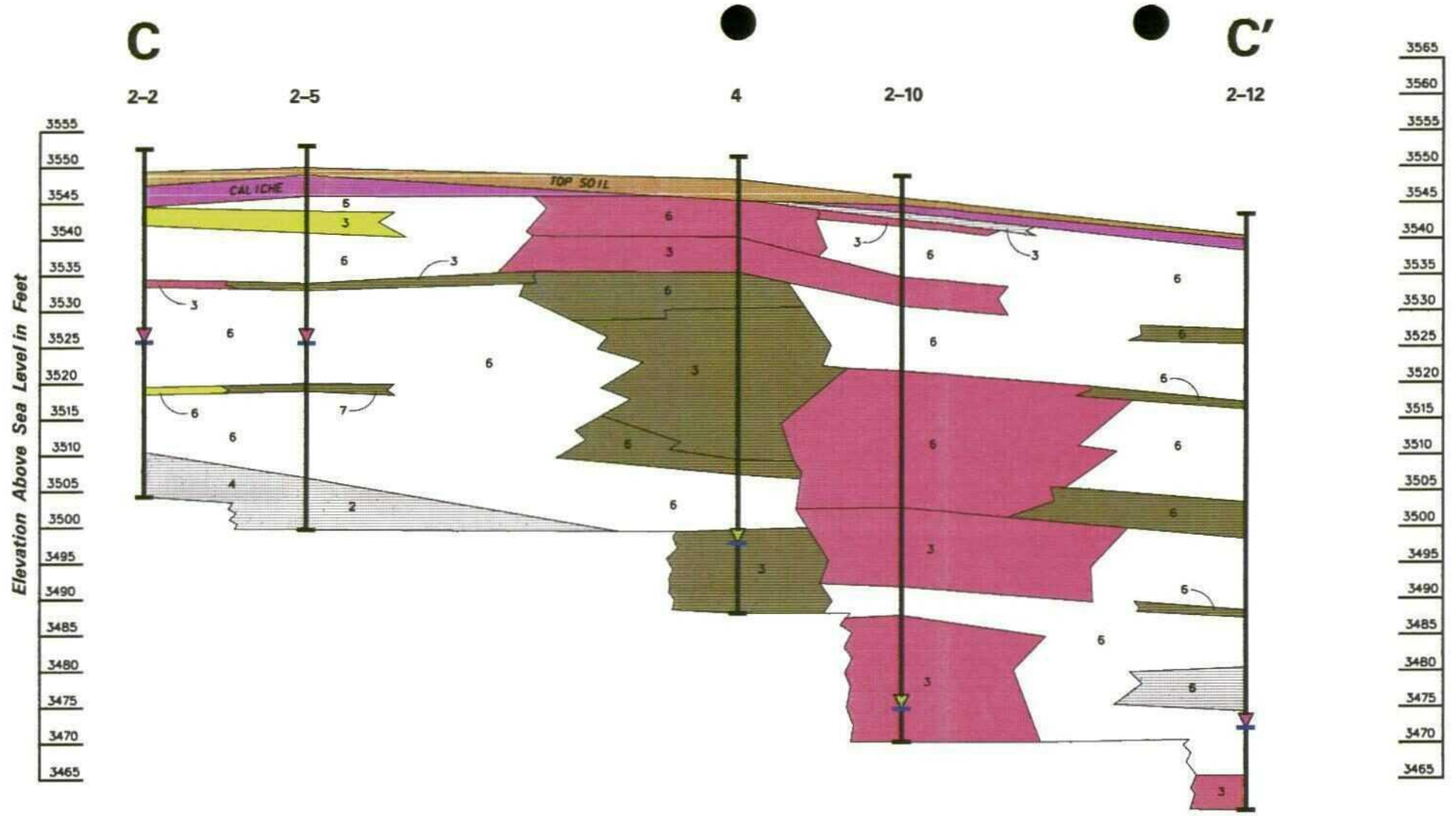
1. Sand	5. Sand & Clay
2. Rock	6. Clay & Rock
3. Clay	7. Sandstone
4. Sand & Rock	8. Clay & Sandstone

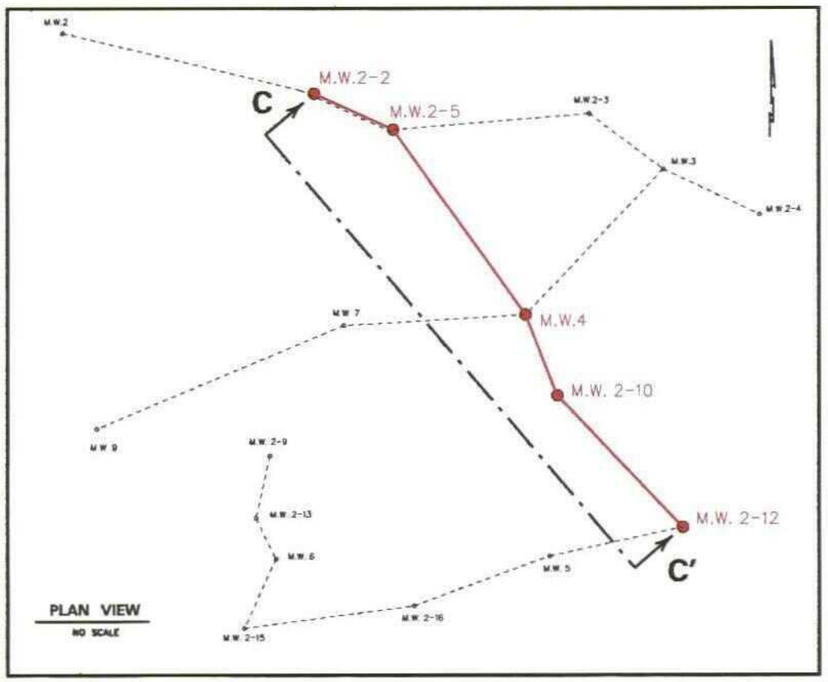
NM444103.dgn Lv 10 & 11.

Legend

- Ground Water Table
- Ground Water Table with BTEX (dissolved hydrocarbons) Contamination
- Ground Water Table with Free Phase Hydrocarbons
- Facies Change

1. Sand	5. Sand & Clay
2. Rock	6. Clay & Rock
3. Clay	7. Sandstone
4. Sand & Rock	8. Clay & Sandstone





CROSS SECTION C – C′

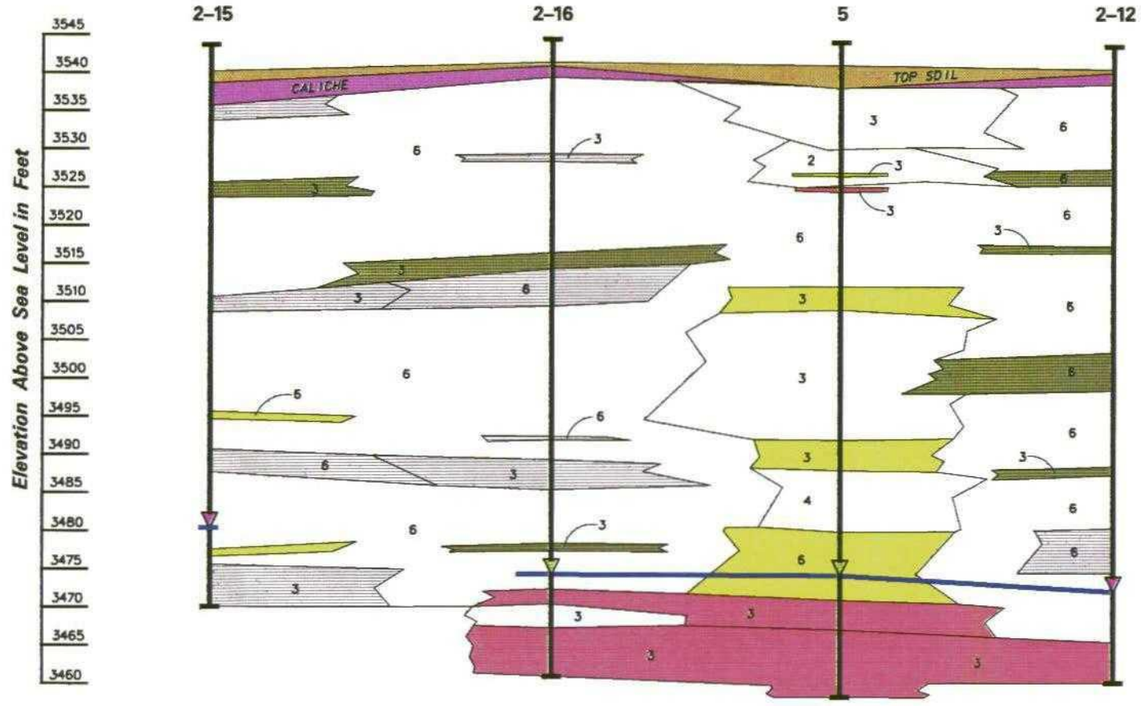
SCALE: VERT. 1 in = 20 ft / HORIZ. 1 in = 100 ft

EMPIRE ABO GAS PLANT
GROUNDWATER CROSS SECTIONS

EDDY COUNTY, NEW MEXICO

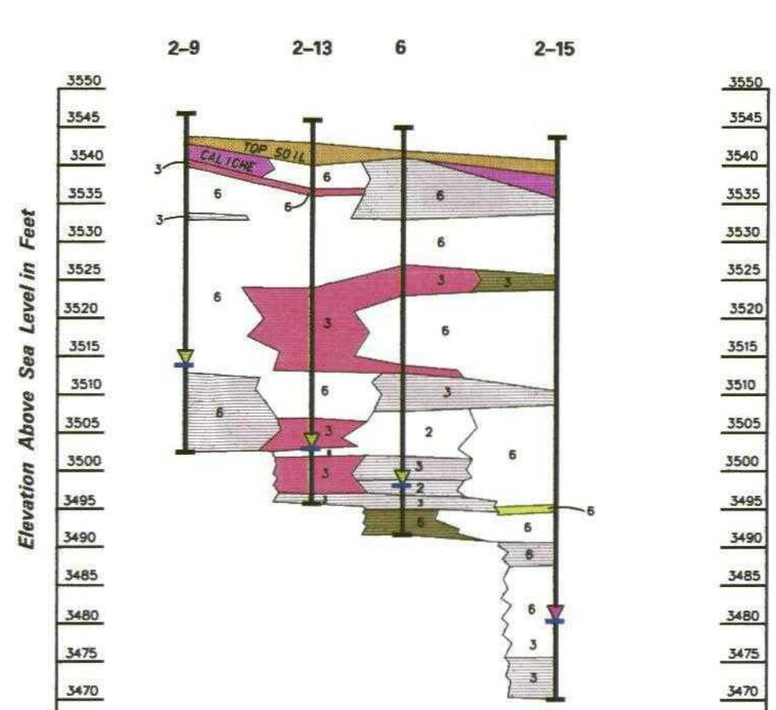
JUNE 21,1993 DR. BY: LAND SURVEY DEPT./R.K.H.

NM444103.dgn Lv 20 & 21.



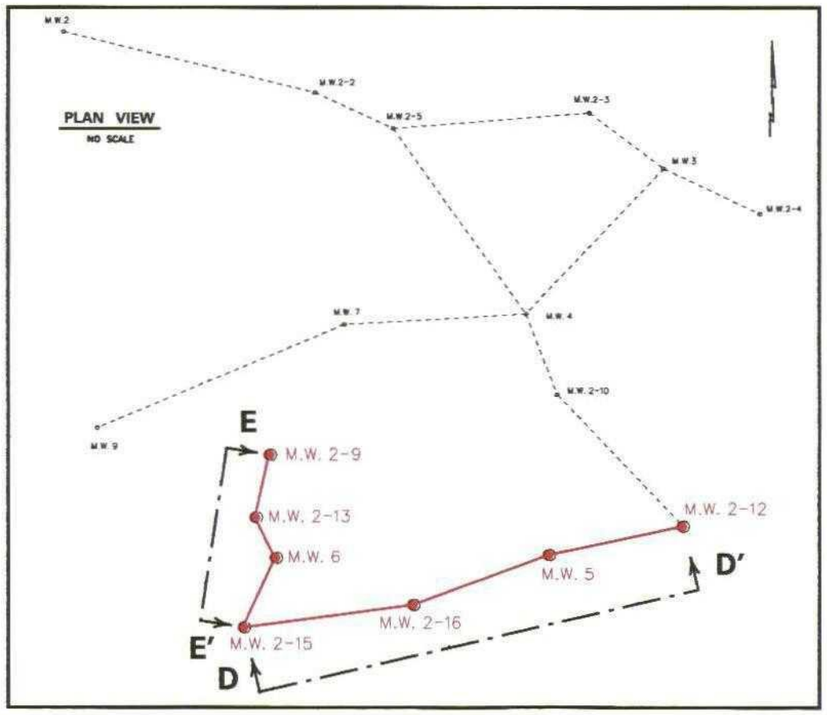
CROSS SECTION D – D'

SCALE: VERT. 1 in = 20 ft / HORIZ. 1 in = 100 ft



CROSS SECTION E – E'

SCALE: VERT. 1 in = 20 ft / HORIZ. 1 in = 100 ft



EMPIRE ABO GAS PLANT
GROUNDWATER CROSS SECTIONS

EDDY COUNTY, NEW MEXICO

JUNE 21,1993 DR. BY: LAND SURVEY DEPT./R.K.H.

Legend

- Ground Water Table
- Ground Water Table with BTEX (dissolved hydrocarbons) Contamination
- Ground Water Table with Free Phase Hydrocarbons
- Facies Change

1. Sand	5. Sand & Clay
2. Rock	6. Clay & Rock
3. Clay	7. Sandstone
4. Sand & Rock	8. Clay & Sandstone

NM444103.dgn Lv 30 & 31.

APPENDIX A2

WELL SUMMARIES

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2
TOTAL DEPTH OF WELL: 37.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3548.5

INITIAL WATER LEVEL: 33
TOP OF SCREEN: 22.5
BASE OF SCREEN: 37.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	32.5	3516	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	37.7	3510.8	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	27	3521.5	0.032	0.001	0.018	0.028	0.079	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	33.5	3515	SAMPLE NOT ANALYZED								<0.05	1800	6.15		2400
3/1/93	33.8	3514.7	0.016	0.03	0.035	0.074	0.155	NS	ND	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 3
TOTAL DEPTH OF WELL: 91.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3555.7

INITIAL WATER LEVEL: 79
TOP OF SCREEN: 71.5
BASE OF SCREEN: 91.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	77	3478.7	111	14	238	299	662	NR	PRODUCT	PRODUCT	NS	NS	NS	NS	NS
3-11-92	83	3472.7	FREE PRODUCT; NOT ANALYZED												
10-1-92	72	3483.7	FREE PRODUCT; NOT ANALYZED												
1-13-93	85	3470.7	FREE PRODUCT; NOT ANALYZED								<0.05	1150	37.65		2458
3/1/93	85.25	3470.45	FREE PRODUCT; NOT ANALYZED												

** *FEET ABOVE SEA LEVEL*

ALL MEASUREMENTS ARE FROM TOP OF CASING

[EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 4
TOTAL DEPTH OF WELL: 62.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.3

INITIAL WATER LEVEL: 51
TOP OF SCREEN: 47.5
BASE OF SCREEN: 62.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	51	3500.3	1.25	0.464	1.76	2.26	5.734	0.49	21	ND	NS	NS	NS	NS	NS
1-24-92	51	3500.3	1.14	0.426	1.6	1.94	5.106	0.42	16	ND	NS	NS	NS	NS	NS
3-11-92	51	3500.3	3.64	86.8	38.7	109	238.14	72.7	1615	116	NS	NS	NS	NS	NS
3-11-92	51	3500.3	0.95	1.12	1.25	3.54	6.86	1.05	32	2	NS	NS	NS	NS	NS
10-1-92	34	3517.3	0.957	0.039	1.16	1.52	3.68	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	44	3507.3	0.827	0.325	0.954	1.48	3.59	NS	25	18	0.2	700	5.15		2458
3/1/93	53.6	3497.7	FREE PRODUCT; NOT ANALYZED												

MONITOR WELL NUMBER: 5
TOTAL DEPTH OF WELL: 99
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.9

INITIAL WATER LEVEL: 92
TOP OF SCREEN: 74
BASE OF SCREEN: 99

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL*	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	68.8	3475.1	0.931	3.87	1.81	5.26	11.871	0.65	57	17	NS	NS	NS	NS	NS
3-11-92	69	3474.9	0.107	0.534	0.534	1.47	2.654	0.15	8	ND	NS	NS	NS	NS	NS
10-1-92	71	3472.9	0.047	0.01	0.162	0.144	0.363	NS	1	ND	NS	NS	NS	NS	NS
1-13-93	71.5	3472.4	0.101	0.115	0.069	0.073	0.358	NS	ND	ND	<0.05	900	4.92		2464
3/1/93	69.8	3474.1	0.235	0.343	0.253	0.441	1.27	NS	4	4	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING [EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 6
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.9

INITIAL WATER LEVEL: 48
TOP OF SCREEN: 33
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92			FREE PRODUCT PRESENT; NOT ANALYZED												
3-11-92			FREE PRODUCT PRESENT; NOT ANALYZED												
10-1-92	42	3502.9	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	39	3505.9	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	1000	5.05		826
3/1/93	46.8	3498.1	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 7
TOTAL DEPTH OF WELL: 28.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3546.9

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 13.5
BASE OF SCREEN: 28.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	8.5	3538.4	3.13	0.795	0.658	0.919	5.502	0.03	10	2	NS	NS	NS	NS	NS
3-11-92	7.7	3539.2	313	0.759	0.625	0.907	5.171	0.06	8	ND	NS	NS	NS	NS	NS
10-1-92	16	3530.9	4.54	1.28	0.936	1.27	8.03	NS	7	ND	NS	NS	NS	NS	NS
1-13-93	9	3537.9	1.61	0.933	0.583	1.23	4.35	NS	13	3	<0.05	1500	242		2323
3/1/93	9.4	3537.5	1.85	0.226	0.243	0.368	2.69	NS	4	ND	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING [EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 8
TOTAL DEPTH OF WELL: 92
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.1

INITIAL WATER LEVEL: 83
TOP OF SCREEN: 72
BASE OF SCREEN: 92

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	67.3	3476.8	ND	ND	ND	0.001	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	0.001	ND	ND	0.001	ND	ND	ND	NS	NS	NS	NS	NS
3-11-92	67.4	3476.7	ND	ND	ND	ND	0	ND	ND	ND	NS	NS	NS	NS	NS
10-1-92	76	3468.1	0.048	0.042	0.036	0.069	0.195	NS	ND	ND	NS	NS	NS	NS	NS
1-13-93	68	3476.1	0.122	0.264	0.186	0.465	1.04	NS	5	ND	<0.05	1350	4.92		2227
3/1/93	68.7	3475.4	0.042	0.109	0.08	0.166	0.397	NS	ND	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 9
TOTAL DEPTH OF WELL: 74.5
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.2

INITIAL WATER LEVEL: 66
TOP OF SCREEN: 54.5
BASE OF SCREEN: 74.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
1-24-92	58	3485.2	75	312	39	712	1498	FREE PRODUCT			NS	NS	NS	NS	NS
3-11-92	58	3485.2	5.57	5.89	2.27	5.51	19.24	0.79	53	18	NS	NS	NS	NS	NS
10-1-92	50	3493.2	FREE PRODUCT PRESENT; NOT SAMPLED												
1-13-93	61	3482.2	FREE PRODUCT PRESENT; NOT SAMPLED								<0.05	NS	12.15		NS
3/1/93	61	3482.2	FREE PRODUCT PRESENT; NOT SAMPLED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING [EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-2
TOTAL DEPTH OF WELL: 48
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3552.55

INITIAL WATER LEVEL: 42
TOP OF SCREEN: 38
BASE OF SCREEN: 48

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	27	3525.55	0.001	ND	ND	ND	0.001	ND	ND	ND	0.11	NS	N/A		NS
1-13-93	27.2	3525.35	0.003	ND	0.002	0.004	0.009	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	26.8	3525.75	0.005	0.022	0.036	0.09	0.153	NS	1	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-3
TOTAL DEPTH OF WELL: 108
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3557.98

INITIAL WATER LEVEL: 100
TOP OF SCREEN: 98
BASE OF SCREEN: 108

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	97	3457	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	204	N/A		1850
1-13-93	89.4	3468.58	ND	ND	ND	ND	ND	ND	ND	ND	<0.05	650	13		2496
3/1/93	83.2	3474.78	0.033	0.103	0.083	0.166	0.385	NS	ND	ND	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

[EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-4
TOTAL DEPTH OF WELL: 58
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3554.09

INITIAL WATER LEVEL: 53
TOP OF SCREEN: 48
BASE OF SCREEN: 58

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	50	3501.09	0.285	0.01	0.016	0.018	0.329	ND	ND	ND	<0.05	48	0	0	750
1-13-93	54	3500.09	1.1	0.531	0.144	0.274	2.05	NS	7	ND	<0.05	1150	6.75		660
3/1/93	54.9	3499.19	0.365	0.041	0.051	0.087	0.544	NS	4	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-5
TOTAL DEPTH OF WELL: 53
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3553

INITIAL WATER LEVEL: 46
TOP OF SCREEN: 43
BASE OF SCREEN: 53

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	45	3505	0.001	ND	ND	ND	0.001	ND	ND	ND	0.12	NS	N/A		NS
1-13-93			0.002	ND	0.001	0.002	0.005	NS	ND	ND	NS	NS	NS	NS	NS
3/1/93	27.4	3525.6	0.002	0.005	0.007	0.016	0.03	NS	ND	ND	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

[EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-6
TOTAL DEPTH OF WELL: 24
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3551.11

INITIAL WATER LEVEL: 21
TOP OF SCREEN: 14
BASE OF SCREEN: 24

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3531.11	9.91	5.64	0.99	1.97	18.5	0.08	22	ND	<0.05	572	0	5	1050
1-13-93	11.3	3539.81	12.2	1.01	0.134	0.386	13.7	NS	23	ND	<0.05	600	13.75		1286
3/1/93	11.3	3539.81	28.6	2.5	0.482	1.07	32.7	NS	40	ND	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-7
TOTAL DEPTH OF WELL: 66
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.34

INITIAL WATER LEVEL: 60
TOP OF SCREEN: 56
BASE OF SCREEN: 66

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	55	3489.34	15.5	6.33	1.64	3.1	26.6	ND	40	7	<0.05	48	N/A		3376
1-13-93	63	3484.34	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	66	3481.34	FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING [EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-9	INITIAL WATER LEVEL:	34
TOTAL DEPTH OF WELL:	43	TOP OF SCREEN:	33
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	43
ELEVATION (ASL):	3546.81		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	32	3511.81	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	31	3515.81	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	NS	127.5		NS
3/1/93	33	3513.81	FREE PRODUCT PRESENT; NOT ANALYZED							(7.5 FEET OF FREE PRODUCT PRESENT)					

MONITOR WELL NUMBER:	2-10	INITIAL WATER LEVEL:	64
TOTAL DEPTH OF WELL:	75	TOP OF SCREEN:	65
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	75
ELEVATION (ASL):	3548.67		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3481.67	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	71	3477.67	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	74	3474.67	FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING [EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-11
TOTAL DEPTH OF WELL: 23
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3547.06

INITIAL WATER LEVEL: 17
TOP OF SCREEN: 13
BASE OF SCREEN: 23

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	17	3527.06	FREE PRODUCT PRESENT; NOT ANALYZED												
1-13-93	19	3528.06	FREE PRODUCT PRESENT; NOT ANALYZED												
3/1/93	19.5	3527.56	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 2-12
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.4

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3466.4	0.18	0.042	0.027	0.107	0.356	ND	ND	ND	<0.05	616	N/A		2375
1-13-93	71.5	3471.9	0.827	0.0652	0.171	0.356	2.01	NS	6	ND	<0.05	675	8		1674
3/1/93	71.4	3472	0.008	0.013	0.017	0.037	0.075	NS	ND	ND	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

[EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-13
TOTAL DEPTH OF WELL: 49
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 43
TOP OF SCREEN: 39
BASE OF SCREEN: 49

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	42	3500.91	21	2.43	26.1	42.6	92.2	3.74	567	195	<0.05	236	N/A		225
1-13-93	44.5	3501.41	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	43	3502.91	FREE PRODUCT PRESENT; NOT ANALYZED												

MONITOR WELL NUMBER: 2-14
TOTAL DEPTH OF WELL: 78
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3545.91

INITIAL WATER LEVEL: 70
TOP OF SCREEN: 66
BASE OF SCREEN: 76

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	65	3476.65	0.044	0.022	0.006	0.011	0.083	ND	ND	ND	<0.05	1460	N/A		2500
1-13-93	61.8	3484.11	SAMPLE NOT ANALYZED												
3/1/93	62.1	3483.81	0.037	0.001	ND	0.003	0.041	NS	ND	ND					

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

[EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2-15
TOTAL DEPTH OF WELL: 73
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3543.64

INITIAL WATER LEVEL: 67
TOP OF SCREEN: 63
BASE OF SCREEN: 73

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	64	3476.64	0.042	0.043	0.05	0.135	0.27	ND	2	ND	<0.05	1248	N/A		2500
1-13-93	63	3480.64	0.652	0.74	0.424	1.03	2.85	NS	12	3	0.12	875	7.9		1166
3/1/93	63.3	3480.34	0.111	0.029	0.029	0.076	0.245	NS	1	2	NS	NS	NS	NS	NS

MONITOR WELL NUMBER: 2-16
TOTAL DEPTH OF WELL: 83
WATER WELL DRILLER: EADES
ELEVATION (ASL): 3544.39

INITIAL WATER LEVEL: 77
TOP OF SCREEN: 73
BASE OF SCREEN: 83

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	74	3467.39	0.461	0.305	0.082	0.134	0.982	ND	1	ND	<0.05	624	N/A		2375
1-13-93	70	3474.39	PUMP IN WELL NOT OPERABLE; NO SAMPLE TAKEN												
3/1/93	70.1	3474.29	6.58	0.011	0.106	0.486	7.18	NS	11	2	NS	NS	NS	NS	NS

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING

[EAGPSUM.XLW]A 6/22/93

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2-18	INITIAL WATER LEVEL:	30
TOTAL DEPTH OF WELL:	36	TOP OF SCREEN:	26
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	36
ELEVATION (ASL):	3545.79		

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	WATER LEVEL**	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX	MTBE	VOLATILES	SEMI-VOLATILES	CHROMIUM	CHLORIDES	NITRATES	NITRITES	SULFATES
10-12-92	30	3512.79	8.33	0.685	0.352	0.292	9.66	0.03	10	ND	<0.05	560	1	5	2250
1-13-93	21.7	3524.09	FREE PRODUCT PRESENT; NOT ANALYZED								<0.05	975	2.41		3092
3/1/93	21.8	3523.99	FREE PRODUCT PRESENT; NOT ANALYZED												

** FEET ABOVE SEA LEVEL

ALL MEASUREMENTS ARE FROM TOP OF CASING [EAGPSUM.XLW]A 6/22/93

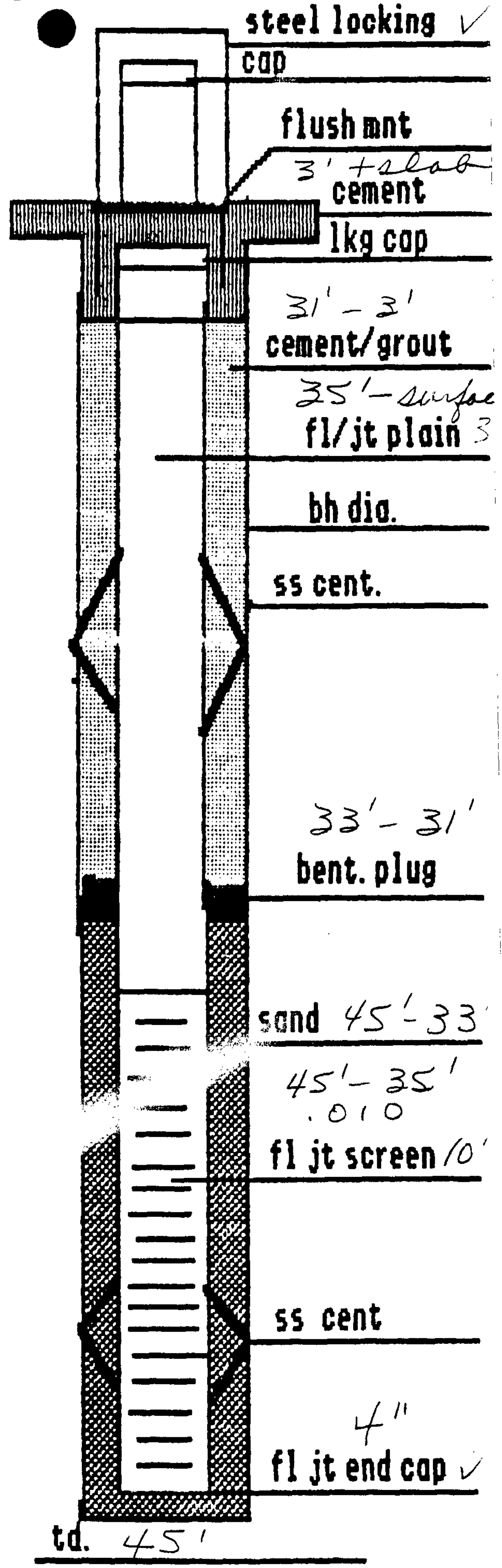
APPENDIX A3

WELL CONSTRUCTION OF NEW WELLS

CUSTOMER: Amoco DATE: 10-6-92

LOCATION: EAGP WELL #: 2-2

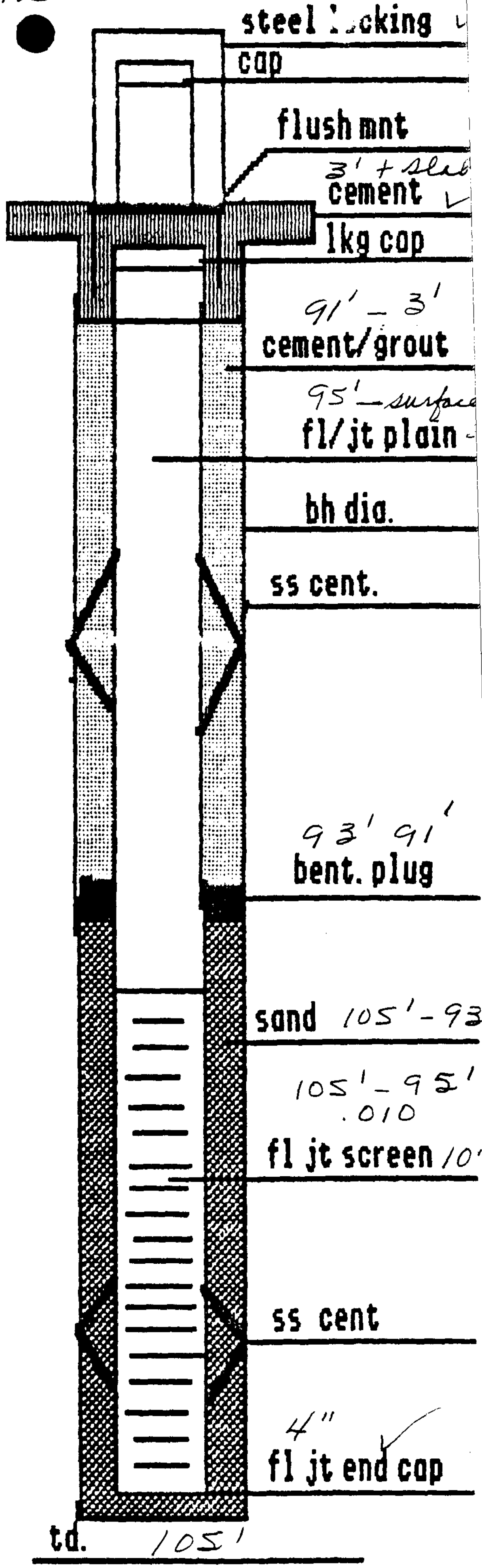
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



DATE: 9-28-92

LOCATION: EAGP WELL #: 2-3

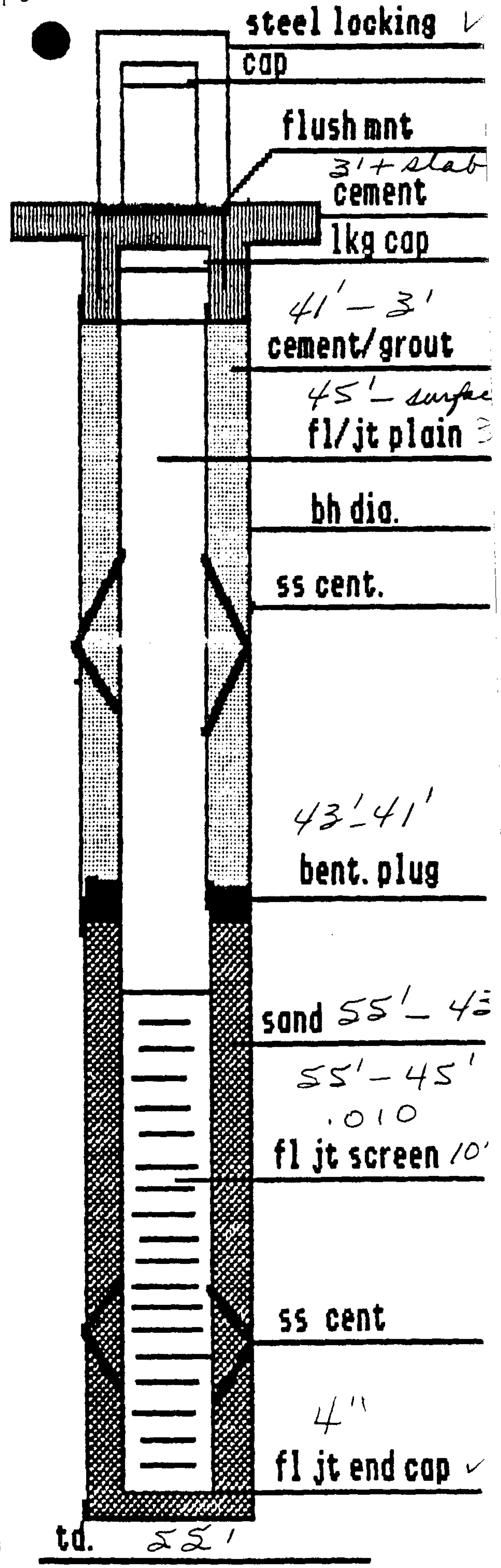
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



DATE: 4-30-92

LOCATION: EAGP WELL #: 2-4

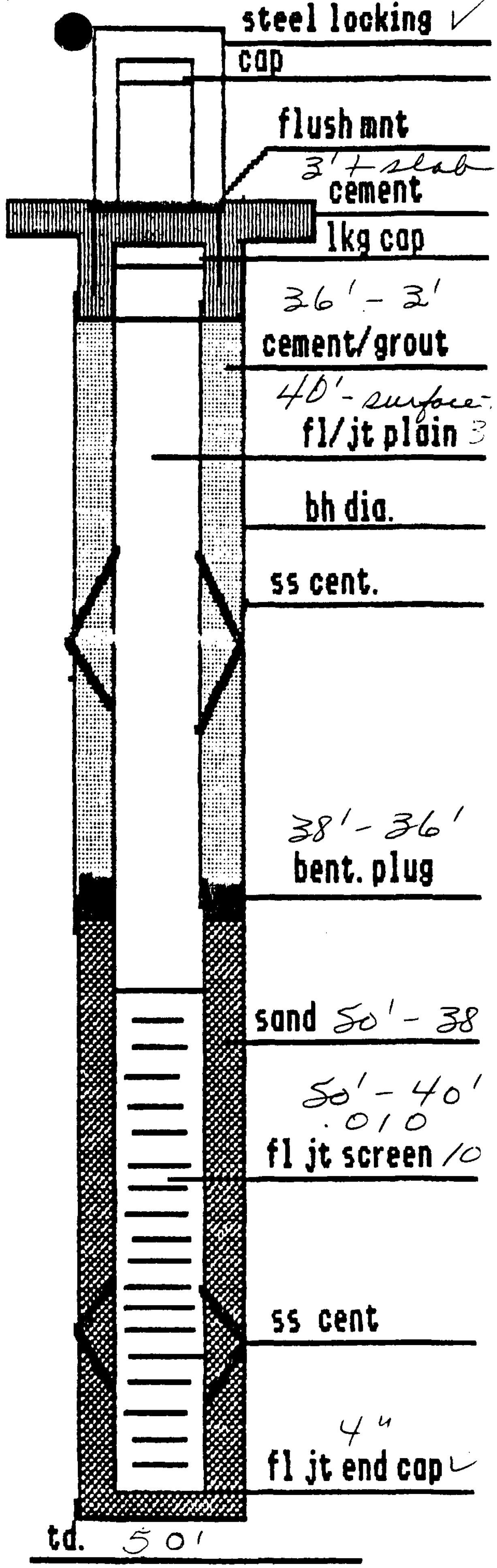
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: Amoco DATE: 10-6-92

LOCATION: EaGP WELL #: 2-5

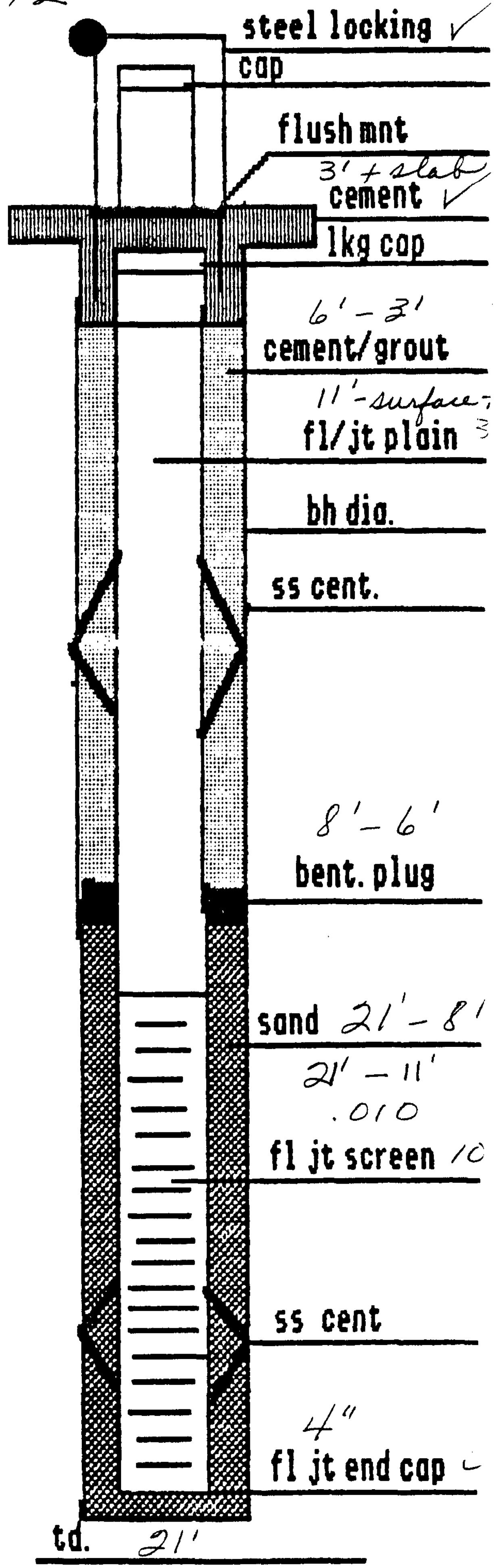
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: amoco DATE: 9-29-92

LOCATION: EAGP WELL #: 2-6

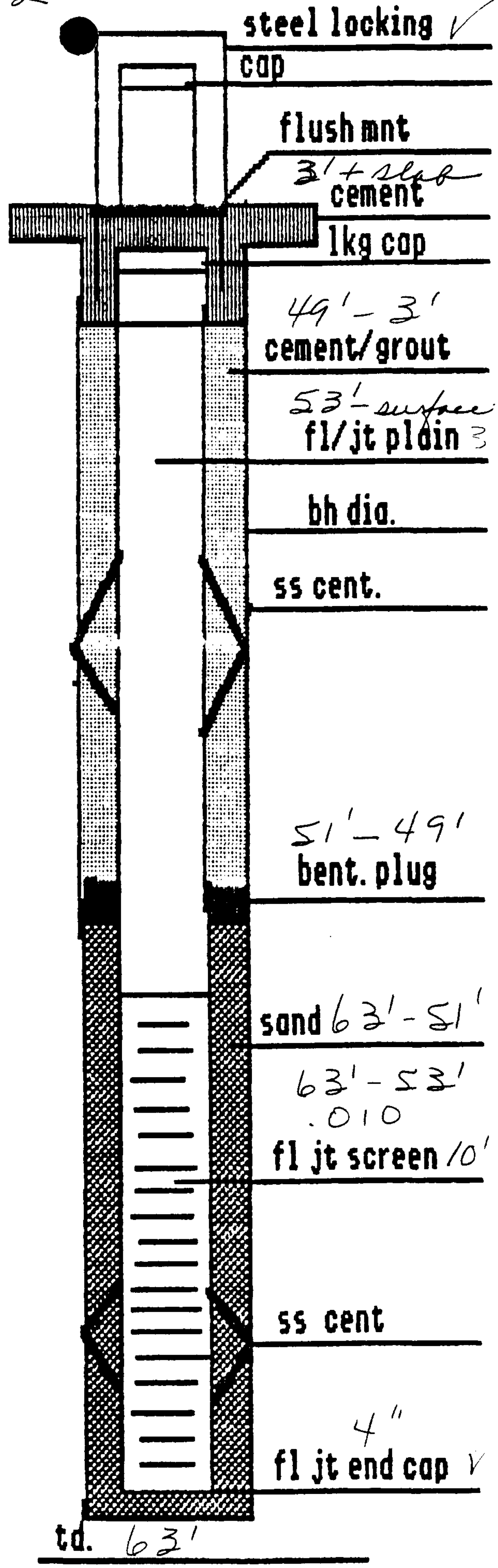
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: amoco DATE: 10-5-92

LOCATION: EAGP WELL #: 2-7

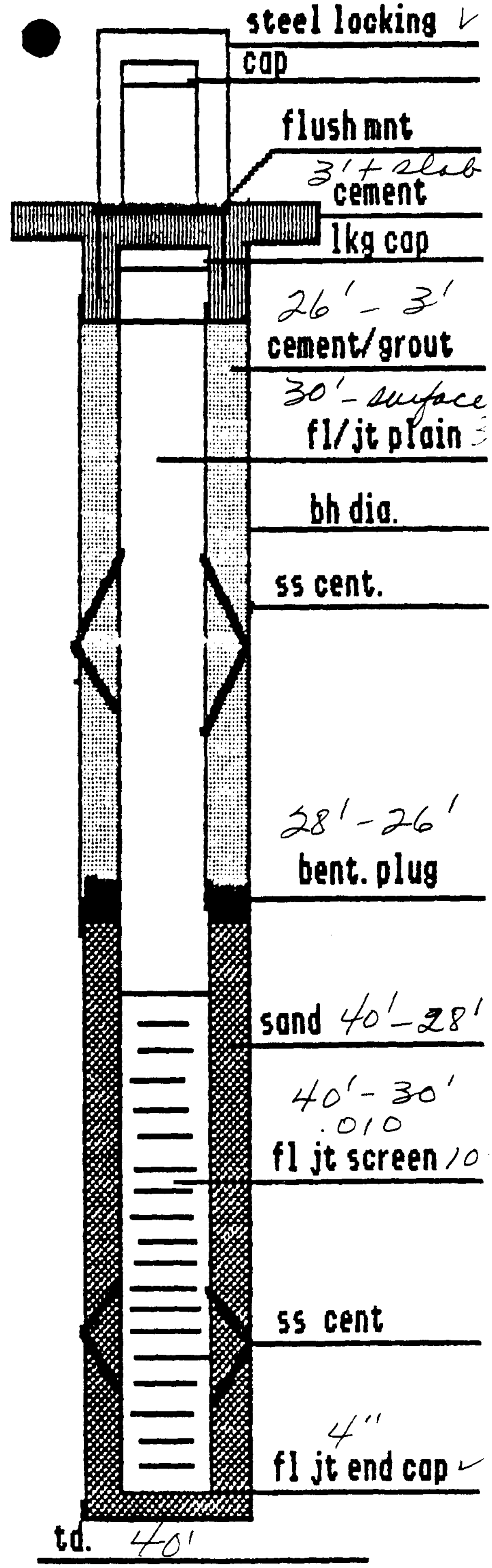
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



...: amoco DATE: 10-7-92

LOCATION: EaGP WELL #: 2-9

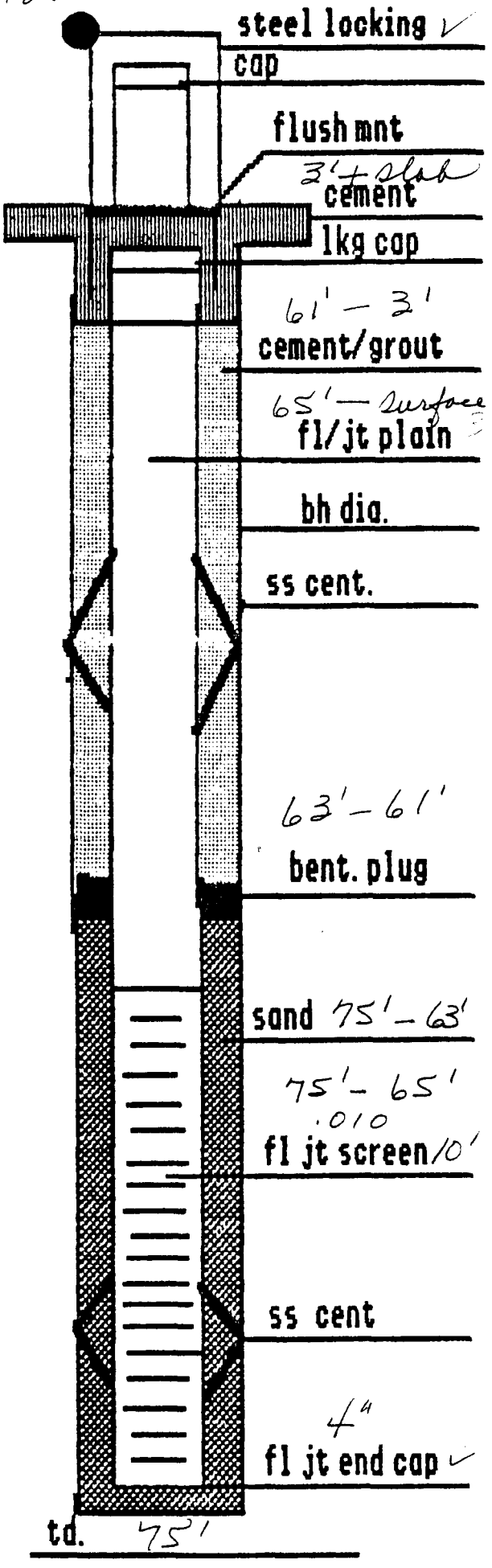
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: Amoco DATE: 9-29-92

LOCATION: EAGP WELL #: 2-10

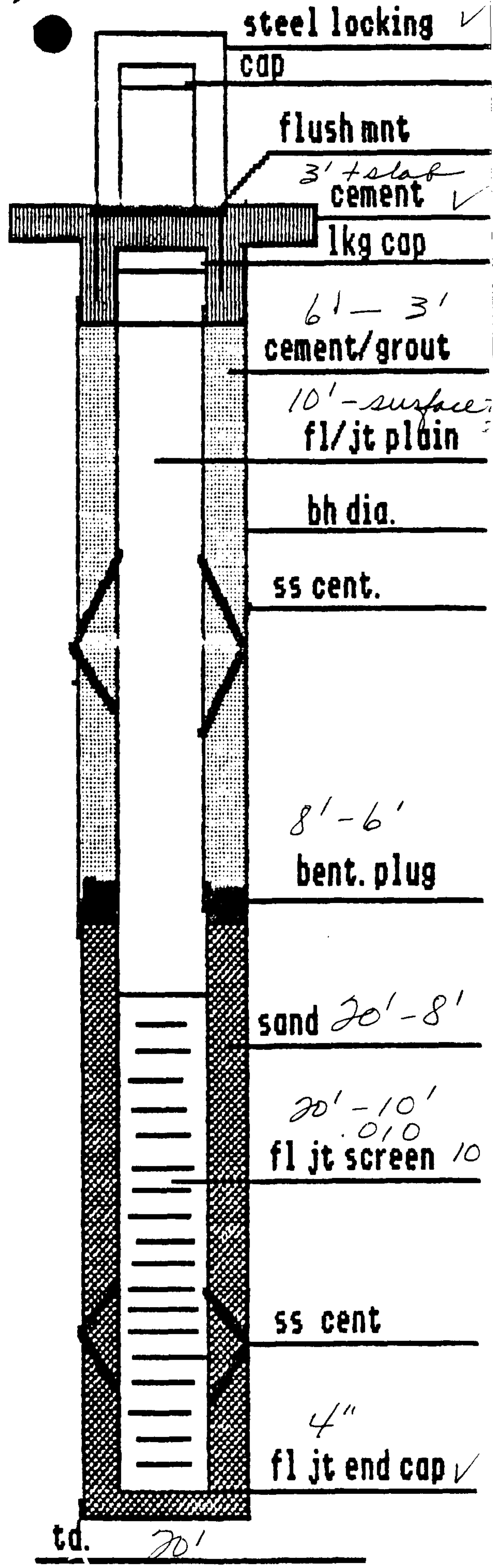
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: amoco DATE: 4-29-92

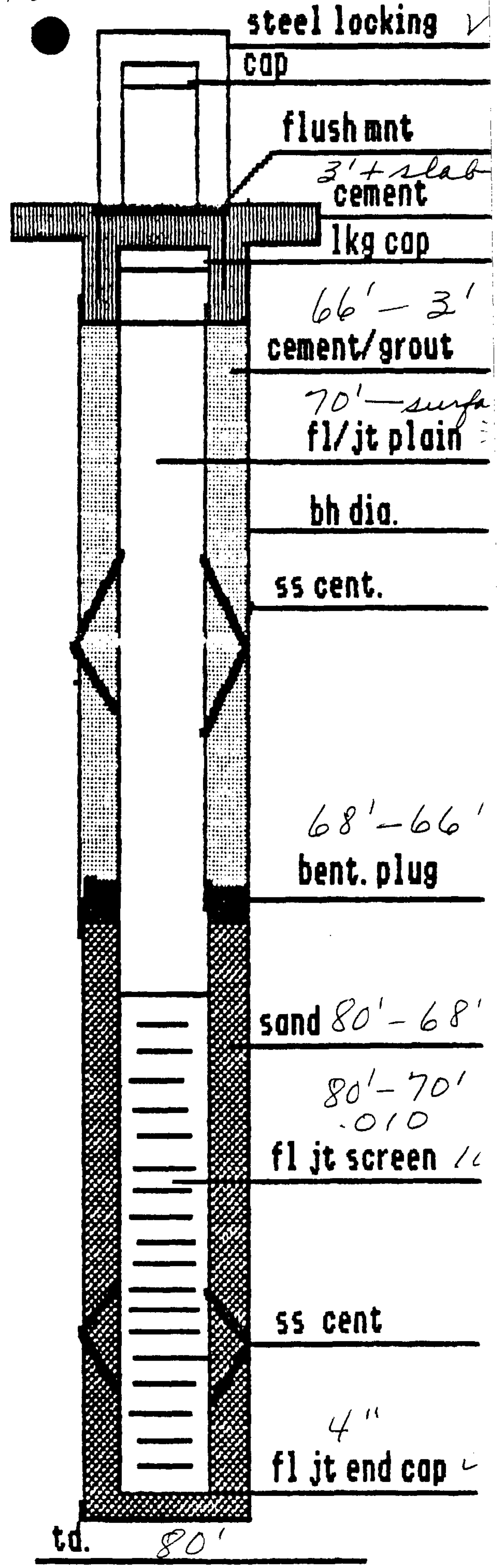
LOCATION: EAGP WELL #: 2-11

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: *Amoco* DATE: *10-1-92*

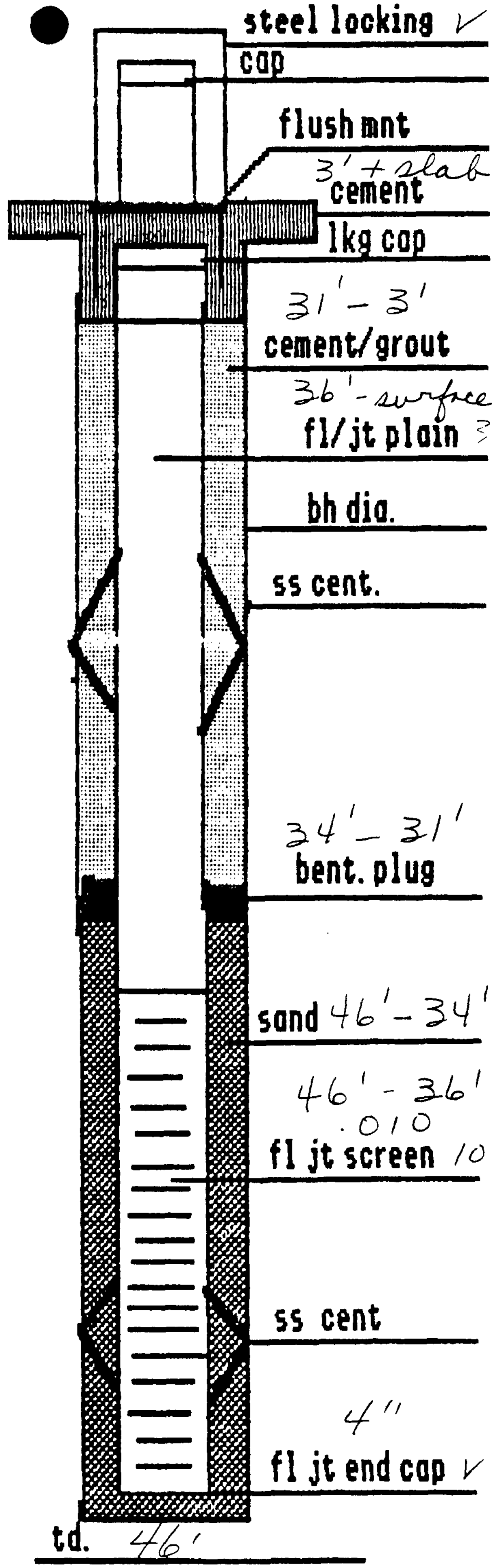
LOCATION: *EAGP*							WELL #: *2-12*	
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: amoco DATE: 10-7-92

LOCATION: EAGP WELL #: 213

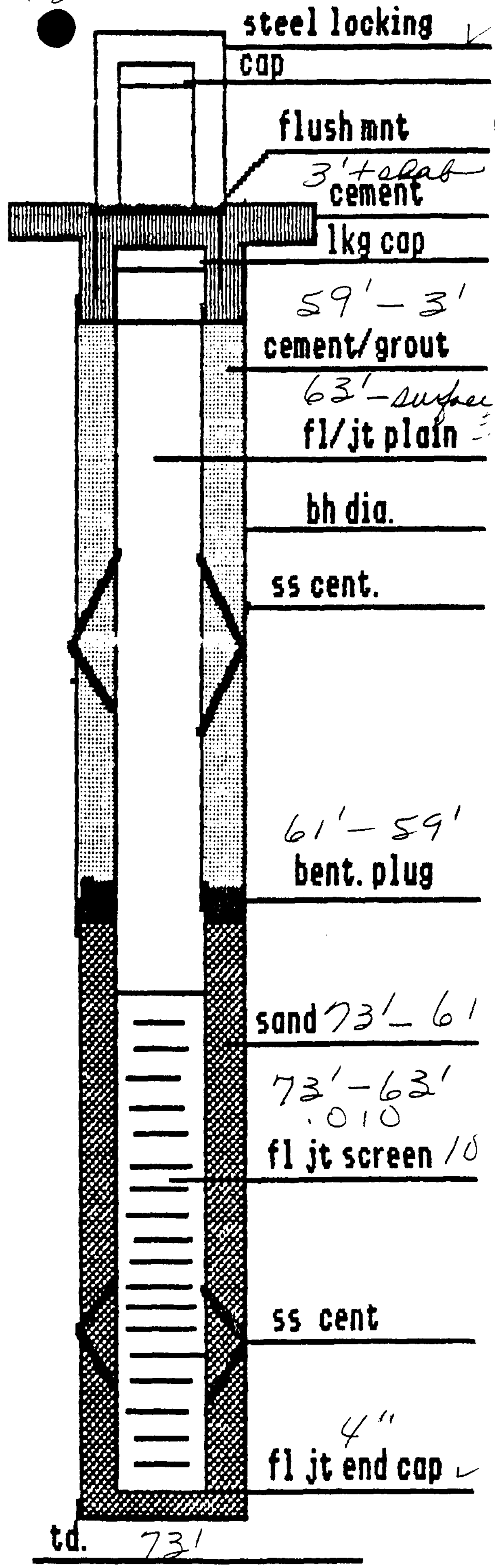
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: Amoco DATE: 10-5-92

LOCATION: EaGP WELL #: 2-14

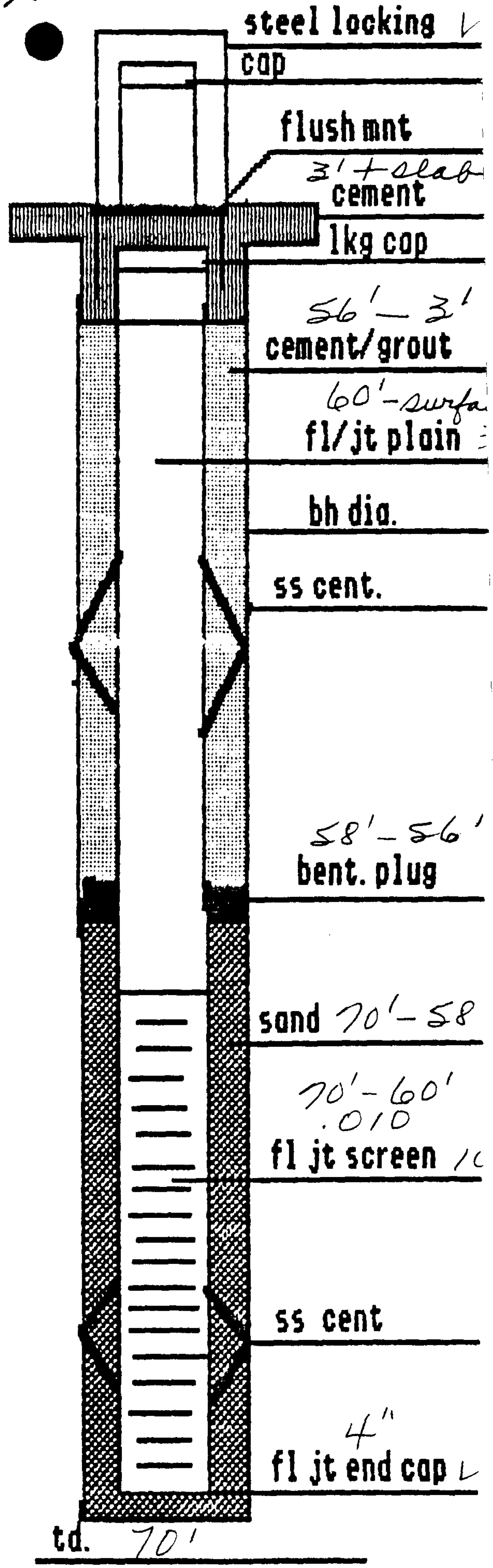
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



…: Wimaco DATE: 10-2-92

LOCATION: EAGP WELL #: 2-15

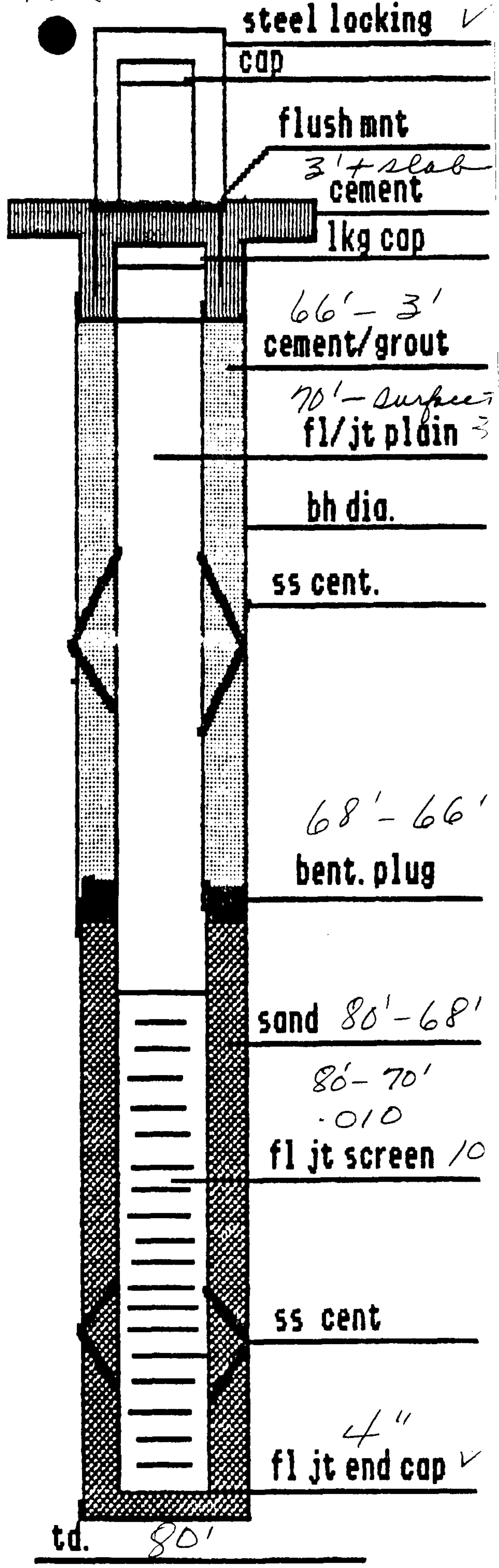
DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



CUSTOMER: amoco DATE: 9-30-92

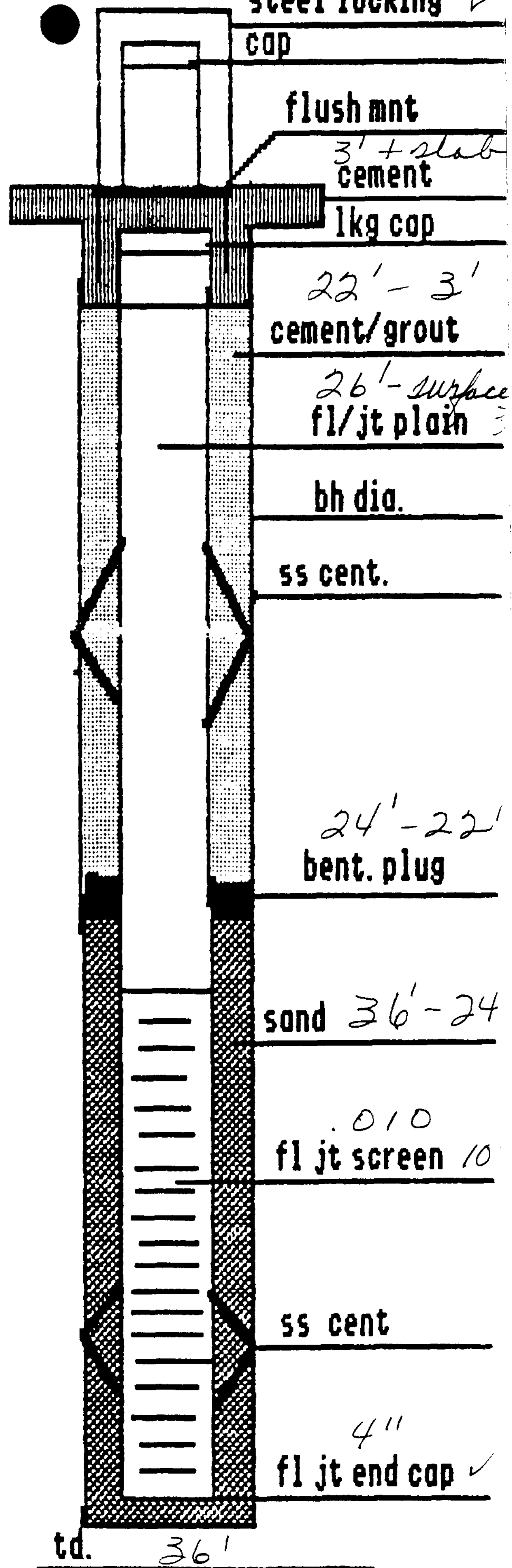
LOCATION: E&GP WELL #: 2-16

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



LOCATION: EAGP WELL #: 2-18

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM



APPENDIX A4

NEW MEXICO STATE ENGINEER OFFICE WATER WELL REPORT

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P.O. Box 249
City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-1 and is located in the:
Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-6-92 Completed 10-6-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 160 ft.

Completed well is ☐ shallow ☐ artesian. Depth to water upon completion of well Dry ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Fill
1	3	2	Top Soil
3	4	1	Caliche
4	14	10	Brown Clay
14	17	3	White Clay & Rock
17	20	3	Yellow Clay & Sandstone
20	22	2	Yellow Clay
22	28	6	White Clay & Rock
28	31	3	Red & White Clay
31	45	14	White Clay & Rock
45	46	1	Yellow Clay & Rock
46	47	1	Yellow Clay
47	80	33	White Clay & Rock
80	81	1	Yellow Clay & Rock
81	85	4	White Clay & Rock
85	95	10	Red Clay
95	104	9	White Clay & Rock
104	123	19	Red Clay
123	127	4	Red & White Clay
127	152	25	Red Clay
152	160	8	Red & White Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alan Eades by Kathleen Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-2 and is located in the:

Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____

Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone i

the _____ Gran

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-6-92 Completed 10-6-92 Type tools Rotary Size of hole 6 3/4 in

Elevation of land surface or _____ at well is _____ ft. Total depth of well 45 ft

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 39 ft

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
39	45	6	Gray Sand & Rock	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				45		35	45

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Fill
2	5	3	Caliche
5	7	2	Yellow Clay & Rock
7	7.5	.5	Yellow Clay
7.5	15	7.5	White Clay & Rock
15	16	1	Red Clay
16	30	14	White Clay & Rock
30	31	1	Yellow Clay & Rock
31	39	8	White Clay & Rock
39	45	6	Gray Sand & Rock

Section 7. REMARKS AND ADDITIONAL INFORMATION

e undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Dick Eades by Kathy Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P.O. Box 249
City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-3 and is located in the:
Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 9-28-92 Completed 9-28-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 105 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 97 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
97	105	8	Wet Brown Sand & Red Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				105		95	105

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Top Soil
2	6	4	White Caliche & Clay
6	7	1	Brow Clay
7	11	4	White Caliche & Clay
11	12	1	Brown Clay
12	12.5	.5	Brown Sandstone
12.5	15	2.5	Brown Clay & Sandstone
15	16	1	Yellow Clay
16	17	1	White Clay & Rock
17	23	6	White Clay
23	25	2	Red Clay
25	29.5	4.5	white Clay
29.5	37	7.5	White Clay & Rock
37	39	2	Rock
39	60	21	White Clay & Rock
60	60.5	.5	Brown Clay
60.5	63	2.5	White Clay & Rock
63	64	1	Yellow Clay & Rock
64	73	9	White Clay & Rock
73	76	3	Brown Clay
76	83	7	White Clay & Rock
83	84	1	Red Clay
84	85	1	Red Clay & Rock
85	95	10	White Clay & Rock
95	96	1	Brown Sand
96	97	1	White Clay
97	101	4	Brown Sand
101	105	4	Red Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Don Eades for Kathey Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P. O. Box 249
City and State Andrews, Tx 79714-0249

Well was drilled under Permit No. Monitor Well #2-4 and is located in the:
Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 9-30-92 Completed 9-30-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 55 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 50 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
50	55	5	Brown Clay & White Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				55		45	55

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Top Soil
2	5	3	Caliche
5	6	1	Brown Clay
6	15	9	White Clay & Rock
15	16	1	Brown Clay
16	50	34	White Clay & Rock
50	52	2	Brown Clay & Rock
52	53	1	White Clay
53	53.5	.5	Brown Clay
53.5	54	.5	White Clay with Rock
54	55	1	Brown Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allen Eades by Kathryn Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-5 and is located in the:

Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____

Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-6-92 Completed 10-6-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 50 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 43 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
43	50	7	Gray Sand & Rock	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch.40				50		40	50

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Top Soil & Fill
1	4	3	Caliche
4	6	2	White Clay & Rock
6	9	3	Yellow Clay
9	16	7	White Clay & Rock
16	17	1	Brown Clay
17	30	13	White Clay & Rock
30	31	1	Brown Sandstone
31	43	12	White Clay & Rock
43	50	7	Gray Sand & Rock

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allen Eddins by Kathy Eddins
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrew, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-6 and is located in the: Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 9-29-92 Completed 9-29-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 21 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 18 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
18	21	4	Gray Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				21		11	21

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
			Top Soil
		3	Caliche
	15	12	White Clay
15	21	6	Gray Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allen Eades Lisa Kathleen Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OF

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P.O. Box 249
City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-7 and is located in the:
Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-5-92 Completed 10-5-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 63 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 57 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
57	63	6	Gray Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				63		53	63

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Fill
1	4	3	Top Soil
4	7	3	Caliche
7	10	3	Black Clay
10	13	3	White Clay & Rock
13	16	3	Gray Clay
16	24	8	White Clay & Rock
24	26	2	Brown Clay
26	40	14	White Clay & Rock
40	41	1	Gray Clay
41	55	14	White Clay & Rock
55	63	8	Gray Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alan Eades by Kathleen Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well: Amoco Production Company — Owner's Well No.: _____
Street or Post Office Address: P.O. Box 249
City and State: Andrews, TX 79714-0249

Well was drilled under Permit No.: Monitor Well #2-9 and is located in the: Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor: Alan Eades — License No.: WD-1044

Address: 1200 E. Bender

Drilling Began: 10-7-92 Completed: 10-7-92 Type tools: Rotary Size of hole: 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well: 40 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well: 31 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
31	40	9	Gray Clay & Rock	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch.40				40		30	40

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Fill & Top Soil
1	3	2	Caliche
3	4	1	Red Clay
4	10	6	White Clay & Rock
10	11	1	Gray Clay
11	31	20	White Clay & Rock
31	40	9	Gray Clay & Rock

Section 7. REMARKS AND ADDITIONAL INFORMATION

...e undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor well #2-10 and is located in the:

Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____

Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 9-29-92 Completed 9-29-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 75 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 64 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
64	75	11	Red Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				75		65	75

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Fill
1	2	1	Caliche
2	3	1	Gray Clay & Caliche
3	4	1	Red Clay
4	11	7	White Clay & Rock
11	15	4	Red Clay
15	24	9	White Clay & Rock
24	43	19	Red Clay & Rock mixed with White Clay
43	54	11	Red Clay
54	58	4	White Clay & Rock
58	64	6	Red & White Clay
64	75	11	Red Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Wm Eades Dba Keith Eades
Driller

INSTRUCTIONS. This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-11 and is located in the: Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 37E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 9-29-92 Completed 9-29-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 20 ft.

Completed well is [X] shallow [ ] artesian. Depth to water upon completion of well _____ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
14	20		Gray Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				20		10	20

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by: _____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Top Soil
2	6	4	Caliche
6	7	1	Brown & Gray Clay
7	9	2	Brown Clay
9	19	10	White Clay & Rock
19	20	1	Gray Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P. O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-12 and is located in the:

Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-1-92 Completed 10-1-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 80 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 74 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
74	80	6	Red Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				80		70	80

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	.5	.5	Top Soil
.5	2	1.5	Caliche
2	13	11	White Clay & Rock
13	15	2	Brown Clay & Rock
15	23	8	White Clay & Rock
23	24	1	Brown Clay
24	37	13	White Clay & Rock
37	42	5	Brown Clay & Rock
42	52	10	White Clay & Rock
52	53	1	Brown Clay
53	60	7	White Clay & Rock
60	66	6	Gray Clay & Rock
66	75	9	White Clay & Rock
75	80	5	Red Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Ola Eades by Kathy Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well # 2-13 and is located in the: Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-7-92 Completed 10-7-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 46 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 40 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
40	41	1	White Clay & Rock	
41	43	2	Red Clay	
43	46	3	Gray Clay & Rock	
46			Gray Clay	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				46		36	46

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by: _____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Fill
1	3	2	Top Soil
3	6	3	White Clay & Rock
6	7	1	Red Clay & Rock
7	19	12	White Clay & Rock
19	30	11	Red Clay
30	36	6	White Clay & Rock
36	40	4	Red Clay
40	41	1	White Clay & Rock
41	43	2	Red Clay
43	46	3	Bray Clay & Rock
46			Gray Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

e undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allan Eades by Kathleen Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-14 and is located in the:

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-5-92 Completed 10-5-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 73 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 67 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
67	73	6	Red Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				73		63	73

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Top Soil
2	4	2	Caliche
4	5	1	Gray Clay
5	6	1	White Clay & Rock
6	7	1	Red Clay
7	12	5	White Clay & Rock
12	14	2	Brown Clay
14	19	5	White Clay & Rock
19	19.5	.5	Hard Sandstone
19.5	20	.5	Yellow Clay
20	27	7	White Clay & Rock
27	31	4	Gray Clay
31	50	19	White Clay & Rock
50	53	3	Gray Clay
53	60	7	White Clay & Rock
60	65	5	Gray Clay
65	66	1	Brown Clay
66	73	7	Red Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alla Eades by Kristin Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 197

STATE ENGI[illegible] OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____
Street or Post Office Address P.O. Box 249
City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-15 and is located in the:

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 37E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Benger, Hobbs, N.M. 88240

Drilling Began 10-2-92 Completed 10-2-92 Type tools Rotary Size of hole 6 3/4 in

Elevation of land surface or _____ at well is _____ ft. Total depth of well 70 ft

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 64 ft

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
64	70	6	White Clay & Rock (64-65)	
			Gray Clay (65-70)	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				70		60	70

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Top Soil
2	5	3	Caliche
5	7	2	Gray Caliche
7	15	8	White Clay & Rock
15	17	2	Brown Clay
17	30	13	White Clay & Rock
30	32	2	Gray Clay
32	45	13	White Clay & Rock
45	46	1	Yellow Clay & Rock
46	50	4	White Clay & Rock
50	53	3	Gray Clay & Rock
53	63	10	White Clay & Rock
63	64	1	Yellow Clay
64	65	1	White Clay & Rock
65	70	5	Gray Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714

Well was drilled under Permit No. Monitor Well #2-16 and is located in the:

Empire ADO

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 9-30-92 Completed 9-30-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 80 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 74 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
74	80	6	Red Clay	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch. 40				80		70	80

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor Well #2-17 and is located in the:

Empire Abo

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____

Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-1-92 Completed 10-1-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 180 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well Dry ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	6"	6"	Top Soil
6"	2	1.5	Caliche
2	12	10	White Clay & Rock
12	13	1	Gray Clay
13	25	12	White Clay with Rock
25	27	2	Brown Clay
27	32	5	Gray Clay
32	49	17	White Clay & Rock
49	49.5	.5	Gray Clay & Rock
49.5	52	2.5	White Clay & Rock
52	56	4	Gray Clay
56	63	7	White Clay & Rock
63	64	1	Brown Clay
64	69	5	White Clay & Rock
69	71	2	Brown Clay
71	74	3	White Clay
74	80	6	Red Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
		2	Top Soil
		4	Caliche
			White Clay & Rock
			Red Clay
			Red & White Clay
			White Clay & Rock
			Brown Clay
	45	16	White Clay & Rock
45	48	3	Brown Clay
48	50	2	White Clay & Rock
50	52	2	BrownClay & Rock
52	61	9	White Clay & Rock
61	64	3	Gray Clay
64	68	4	White Clay & Rock
68	70	2	Gray Clay
	71	1	White Clay & Rd Clay
71	78	7	Red Clay
78	87	9	Red & White Clay
87	90	3	Brown Clay
90	92	2	Red Clay
92	99	7	Red & White Clay
99	136	37	Red Clay
136	165	29	Red & White Clay
165		9	Red Clay
174	180	6	Red & White Clay

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Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No.

Street or Post Office Address P.O. Box 249

City and State Andrews, TX 79714-0249

Well was drilled under Permit No. Monitor well #2-18 and is located in the: Empire Abo

a. ¼ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. of Map No. of the

c. Lot No. of Block No. of the Subdivision, recorded in County.

d. X= feet, Y= feet, N.M. Coordinate System Zone in the Grant.

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender, Hobbs, N.M. 88240

Drilling Began 10-7-92 Completed 10-7-92 Type tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or at well is ft. Total depth of well 36 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 30 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
30	36	6	Yellow Clay & Rock	2

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch.40				36		26	36

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor

Address

Plugging Method

Date Well Plugged

Plugging approved by:

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad FWL FSL

File No. Use Location No.

tion 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	Caliche
2	9	7	Caliche & Brown Clay
9	14	5	Gray Clay & Rock
14	15	1	White Clay & Rock
15	17	2	Red Clay
17	21	4	White Clay & Rock
21	30	9	Red Clay & Rock
30	36	6	Yellow Clay & Rock

Section 7. REMARKS AND ADDITIONAL INFORMATION

e undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

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State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal	Time 1515	Date 10/19/92

Originating Party	Other Parties
Bill Olson - OCD	Troy Vickers - Amoco (713) 596-7668

Subject

Amoco Empire Abo Gas Plant Ground Water Investigation

Discussion

Amoco has already begun Phase II work

MW's installed and completed last week

Waiting for pumps to begin sampling

Told him phase I work appears good and that OCD will review report on additional work to determine remedial action required.

Conclusions or Agreements

Amoco will submit report on phase II work in approx. three months. Report will include recommendations for remediation

Distribution

file

Signed Bill Olson

Amoco Production Company
South Permian Basin
Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

G.D. Henry
Manager, Environmental
Affairs and Safety

July 13, 1992

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
P.O. Box 2088
Santa Fe, New Mexico 87504

988.GW00-1868-GDH

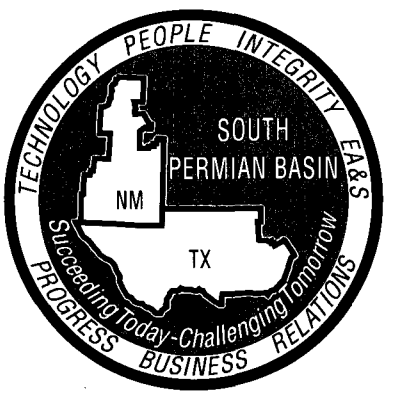
Groundwater Monitoring Report
Empire Abo Gas Plant

This letter submits the initial report (2 copies) on an Amoco initiated program to evaluate the quality of groundwater beneath the subject facility. Your office was initially verbally notified of this program and initial results on January 27, 1992. At that time you requested a follow-up written report of results todate and future plans for further evaluation.

The initial monitor wells were drilled at Empire Abo Gas Plant (EAGP) during December, 1991. These wells were drilled at Amoco's discretion to evaluate the quality of groundwater beneath the subject plant. There was no request by offset landowners or regulatory agencies to perform this work.

Detailed in this report are:

1. Discussion of Findings
2. Proposed Course of Action
3. Well Location Map of Proposed Second Round Monitor Well Drilling
4. USGS 7.5' Quad Topo map
5. New Mexico Highway Map
6. Cross Section (A-A'), (B-B'), (C-C')
7. Strata Marker No. 1 Contour Map
8. Strata Marker No. 3 Contour Map
9. Drill Log with Soil Analysis per well
10. Water Analysis per well
11. Well Construction per well
12. New Mexico State Engineer Office Water Well Records



As detailed within this report shallow perched zones in the upper strata was discovered to have hydrocarbon contamination including free and dissolved hydrocarbons.

As discussed in previous meetings and outlined within this report, Amoco proposes to drill additional monitor wells into the shallow zones to further delineate the areal extent and the origination of the plumes. Additional water analysis will be performed and reports filed with the NMOCD. At this time Amoco proposes no remedial or containment measures to be implemented.

If further information on this matter is required please advise or contact Mr. Troy Vickers, Environmental Supervisor at 713-596-7668.

Sincerely

G. D. Henry

G. D. Henry

DTV/

Attachments

AMOCO PRODUCTION COMPANY
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO

TABLE OF CONTENTS

EMPIRE ABO GAS PLANT

DISCUSSION OF FINDINGS

SECTION 1

DISCUSSION OF FINDINGS
AMOCO PRODUCTION COMPANY
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO

The Empire Abo Gas Plant is located in northeastern Eddy County at approximately latitude 32° 46' 30" and longitude 104° 15' 35". The Empire Abo Gas Plant is located on Amoco owned property. The plant lies in the Pecos River Valley on the Artesia Vacuum Trend. The generalized geology of the Eddy County area is shown in Figure 1.

Gypsiferous rocks of the Permian System underlie these plains. The Permian System is the oldest of the geologic systems in Eddy County. The gypsiferous group includes the Rustler, Castile, Tansill and undifferentiated rocks of the Guadalupe Group. Of the underlying carbonatic rock formations, the Capitan consists of fossiliferous, calcitic limestone. The Dewey Lake Redbeds lie above. The generalized stratigraphic section characterized in the area of the Empire Abo Gas Plant is detailed in Figure 2. The near surface strata consist of primarily clay or loamy materials and gypsiferous rock.

The Tertiary system comprised of the Pliocene system (commonly known as the Ogallala) is found northeast of the Empire Abo Gas Plant where the Ogallala formation is prominently exposed in the Mescalero Escarpment. The is normally considered to be the zero line of saturated thickness and the Ogallala aquifer lies to the northeast with thicknesses up to 200 feet in the Lovington, New Mexico Area.

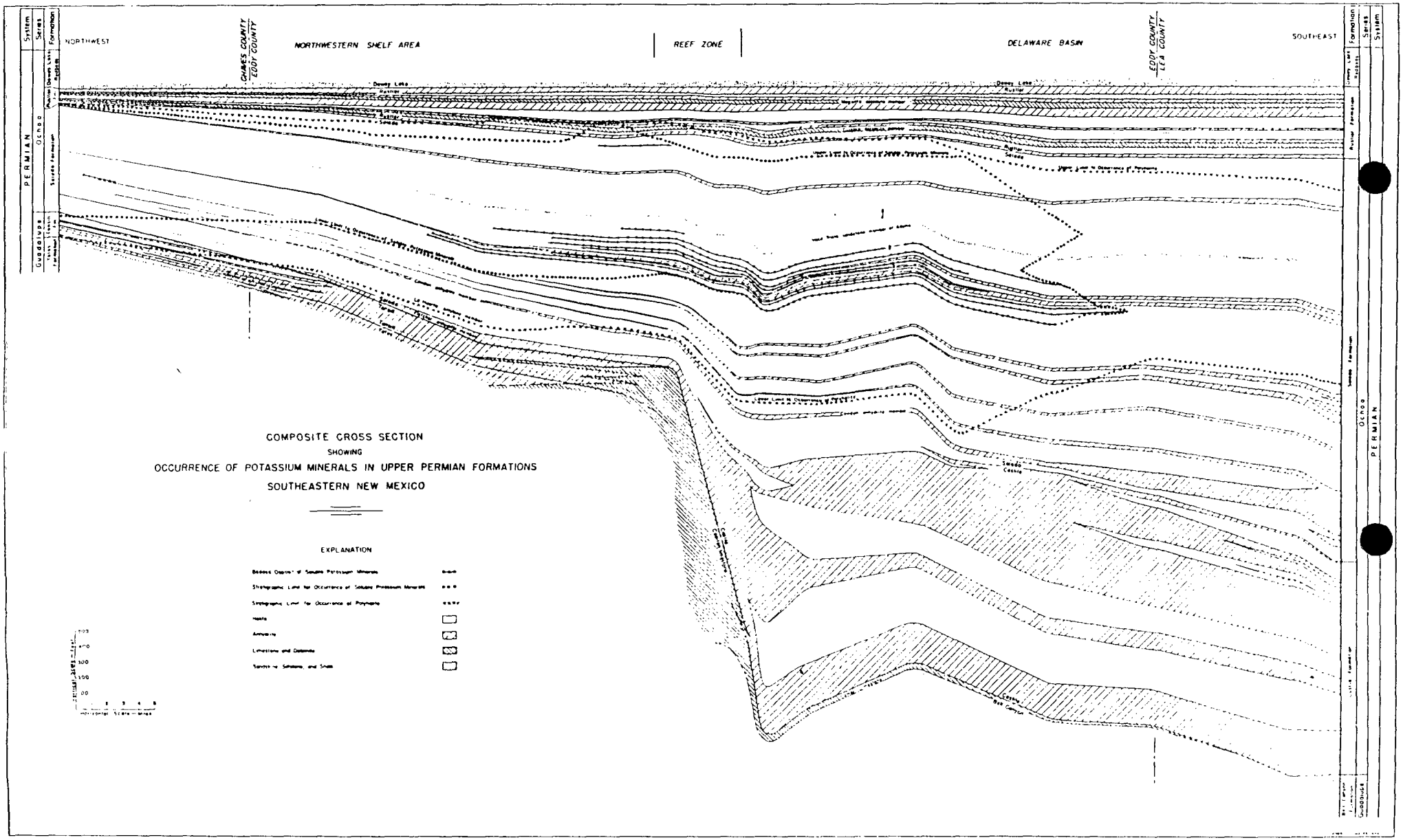
Monitor wells were drilled to a maximum depth of 200'. Most wells were drilled to depths of 50'-70' stopping in the first water bearing zone. Shallow perched water zones were encountered at various depths by all wells except No.1 which was drilled to a depth of 200' into a dry red clay strata (possibly red bed) and no water discovered and subsequently plugged and abandoned. Other wells (Nos. 3, 4, 6, and 9) were found to have varying amounts of free phase hydrocarbon on water. The depth to the zone of contamination and water was varying and does not appear that the zones are connected. In addition wells Nos. 5 and 7 had dissolved phase hydrocarbons present.

It appears that the water associated with the zones of contamination may be the result of plant operations and discharge of water to the ground surface. It is believed that no major or minor aquifer is associated with the zones of contamination and that the zones are extremely limited perched zones of water.

ERA	SYSTEM	SERIES/GROUP	ROCK CHARACTERISTICS
CENOZOIC	QUATERNARY	RECENT PLEISTOCENE	CALICHE, SAND, GRAVEL, AND CLAY
	TERTIARY	PLIOCENE (OGALLALA)	CALICHE, SANDY CLAY, AND SAND
MESOZOIC	CRETACEOUS	FREDERICKSBURG	CLAY, LIMESTONE, AND SHELL AGGREGATE
		TRINITY	CLAY, FINE-TO-MEDIUM GRAINED SAND, AND GRAVEL
	TRIASSIC	DOCKUM	RED SHALE INTERBEDDED WITH SANDSTONE AND CONGLOMERATE
PALEOZOIC	PERMIAN	OCHOA	ROCK SALT, ANHYDRITE, RED SHALE, SANDSTONE, LIMESTONE, AND CONGLOMERATE
		GUADALUPE	

GENERALIZED GEOLOGIC FORMATIONS OF EDDY COUNTY, NEW MEXICO

(Figure 1)



COMPOSITE CROSS SECTION

SHOWING

OCCURRENCE OF POTASSIUM MINERALS IN UPPER PERMIAN FORMATIONS

SOUTHEASTERN NEW MEXICO

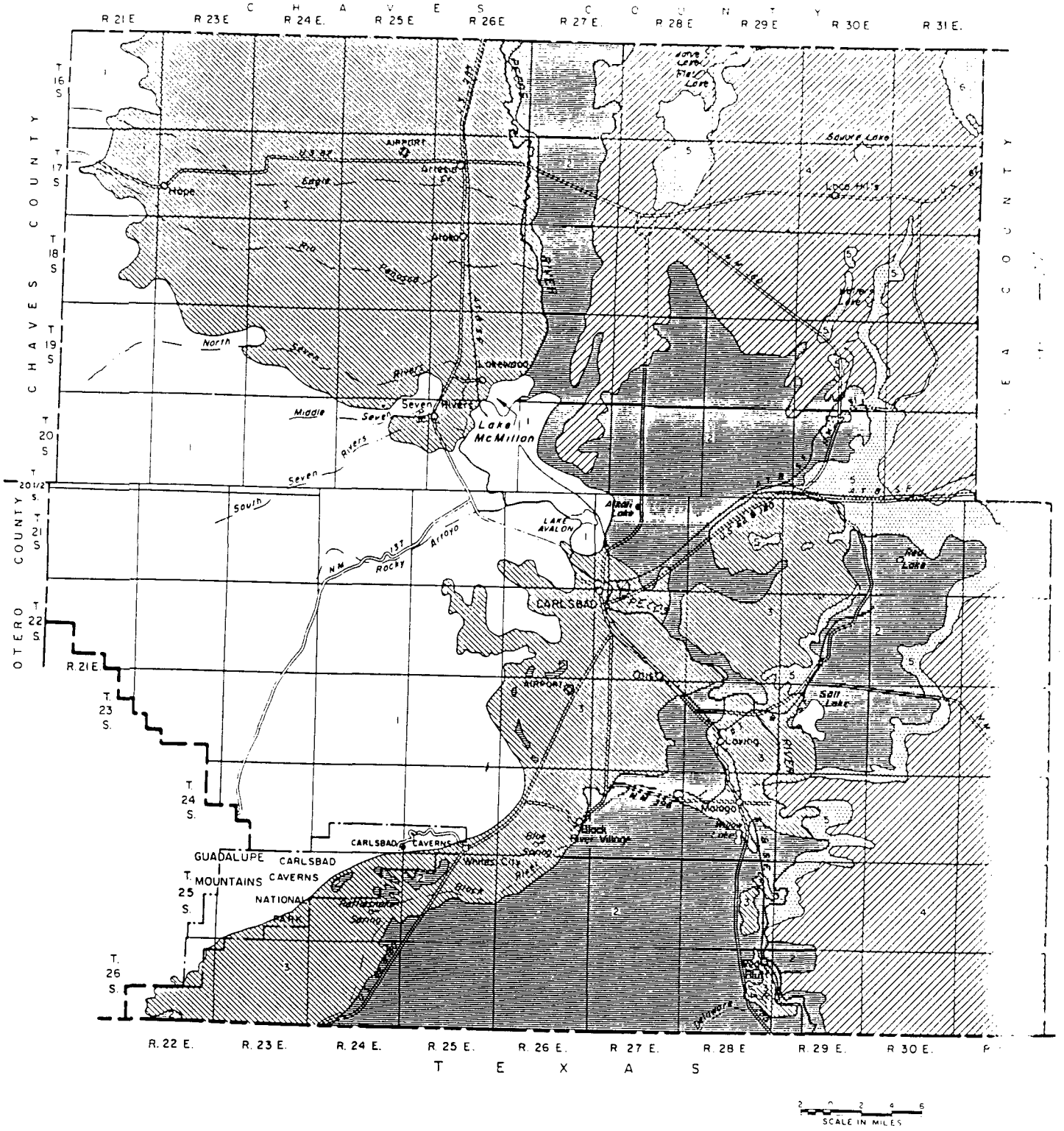


Figure 19.—Generalized geologic map of the Eddy Area, New Mexico:

1. Rocks of Permian age, primarily carbonatic.
2. Rocks of Permian age, primarily gypsiferous.
3. Loamy deposits of Quaternary age.
4. Sandy deposits of Quaternary age.
5. Rocks of Triassic age.
6. Rocks of Tertiary age.

EMPIRE ABO GAS PLANT

PROPOSED COURSE OF ACTION

SECTION 2

DISCUSSION OF PROPOSED ACTION
AMOCO PRODUCTION COMPANY
EMPIRE ABO GAS PLANT
EDDY COUNTY, NEW MEXICO

The information gathered from the drilling of 9 monitor wells has allowed initial evaluation of the quality of groundwater with respect to hydrocarbon contamination. Since it is necessary to first identify the areal extent and levels of contamination remediation and/or containment actions will not be detailed in this report. The following is the proposed course of action that will be followed to further delineate the area of contamination.

1. Additional shallow aquifer monitor wells (17) will be drilled as indicated on the map in Section 3. These will allow for further definition of the plumes of dissolved and free hydrocarbon. These wells are planned for drilling in September, 1992.

2. Samples will be collected on a quarterly basis and analysis performed for BTEX, (individually and together), MTBE, Volatiles and Semi-volatiles.

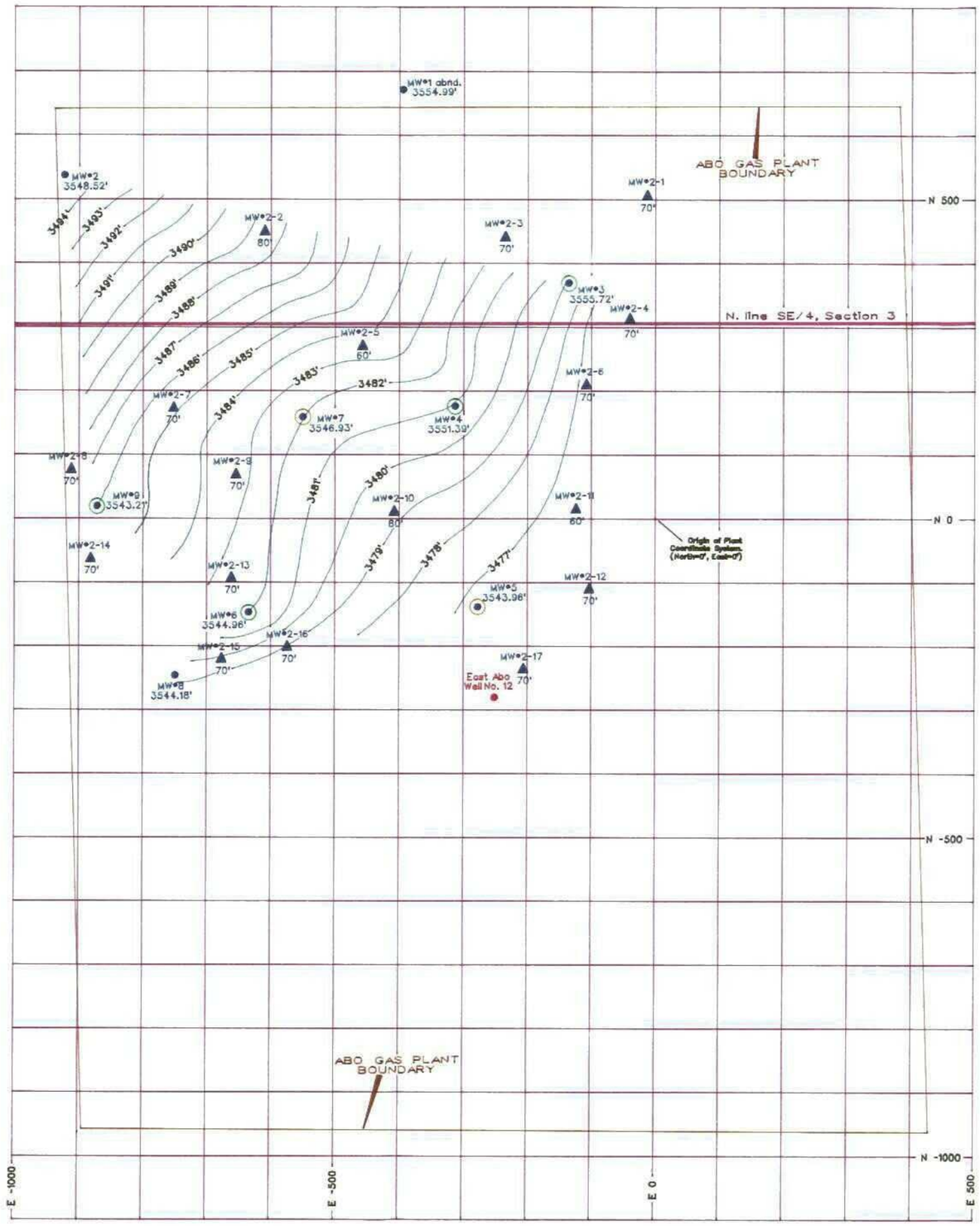
3. Samples will be collected on a quarterly basis and analysis performed for Chromium, Chlorides, Nitrates, Nitrites, and Sulfates.

4. Provide updates to the NMOCD on a biannual basis of results of water analysis and provide within 4 months of completion of new wells, updated maps and interpretation of new data generated from additional wells.

EMPIRE ABO GAS PLANT

MAP OF PROPOSED LOCATION OF SECOND ROUND OF DELINEATION MONITORING WELLS

SECTION 3



Empire Abo Gas Plant Monitor Wells

Well No.	North American Datum 1927 Latitude(N)	Longitude(W)	NMEZ Northing(Y')	Easting(X')	Elev.
1	32° 46' 37.736"	104° 15' 35.314"	646445.61'	522597.67'	3554.99' (ground)
2	32° 46' 36.484"	104° 15' 41.527"	646318.70'	522067.38'	3548.52' (top of casing)
3	32° 46' 34.711"	104° 15' 32.333"	646140.02'	522852.41'	3555.72' (top of casing)
4	32° 46' 32.829"	104° 15' 34.452"	645949.71'	522671.65'	3551.39' (top of casing)
5	32° 46' 29.710"	104° 15' 34.089"	645634.62'	522702.88'	3543.96' (top of casing)
6	32° 46' 29.677"	104° 15' 38.269"	645630.97'	522346.00'	3544.96' (top of casing)
7	32° 46' 32.694"	104° 15' 37.230"	645935.94'	522434.48'	3546.93' (top of casing)
8	32° 46' 28.716"	104° 15' 39.624"	645533.81'	522230.39'	3544.18' (top of casing)
9	32° 46' 31.357"	104° 15' 41.014"	645800.59'	522111.50'	3543.21' (top of casing)

Proposed Empire Abo Gas Plant Monitor Wells

Well No.	North American Datum 1927 Latitude(N)	Longitude(W)	NMPM Northing(Y')	Easting(X')	Elev.
2-1	32° 46' 35.571"	104° 15' 37.865"	646226.70'	522380.03'	
2-2	32° 46' 35.427"	104° 15' 33.475"	646212.43'	522754.77'	
2-3	32° 46' 34.133"	104° 15' 31.214"	646081.73'	522947.90'	
2-4	32° 46' 33.778"	104° 15' 36.104"	646045.61'	522530.46'	
2-5	32° 46' 36.038"	104° 15' 30.865"	646274.28'	522977.61'	
2-6	32° 46' 33.124"	104° 15' 32.028"	645979.72'	522878.48'	
2-7	32° 46' 32.852"	104° 15' 39.575"	645951.80'	522234.18'	
2-8	32° 46' 31.926"	104° 15' 41.465"	645858.08'	522072.89'	
2-9	32° 46' 31.809"	104° 15' 38.457"	645846.47'	522329.69'	
2-10	32° 46' 31.199"	104° 15' 35.575"	645785.01'	522575.78'	
2-11	32° 46' 31.197"	104° 15' 32.250"	645785.02'	522859.74'	
2-12	32° 46' 29.958"	104° 15' 32.025"	645659.77'	522878.97'	
2-13	32° 46' 30.207"	104° 15' 38.567"	645684.63'	522320.41'	
2-14	32° 46' 30.536"	104° 15' 41.138"	645717.71'	522100.91'	
2-15	32° 46' 28.954"	104° 15' 38.777"	645557.90'	522302.63'	
2-16	32° 46' 29.126"	104° 15' 37.567"	645575.44'	522405.86'	
2-17	32° 46' 28.726"	104° 15' 33.265"	645535.27'	522773.24'	

MW•7 3546.93' • Monitor Well

Empire Abo Gas Plant Boundary

MW•7 3546.93' ◉ Well Containing Free Phase Hydrocarbon

MW•7 3546.93' ◉ Well Containing BTEX (dissolved) Hydrocarbon

MW•2-1 ▲ 70' Proposed Well Location and Proposed Depth

Amoco Production Company
Land Survey Department

Empire Abo Gas Plant
Top of Unit No. 3, Gradient Map
Monitor Well Survey

Township 18 South, Range 27 East

Eddy County, New Mexico

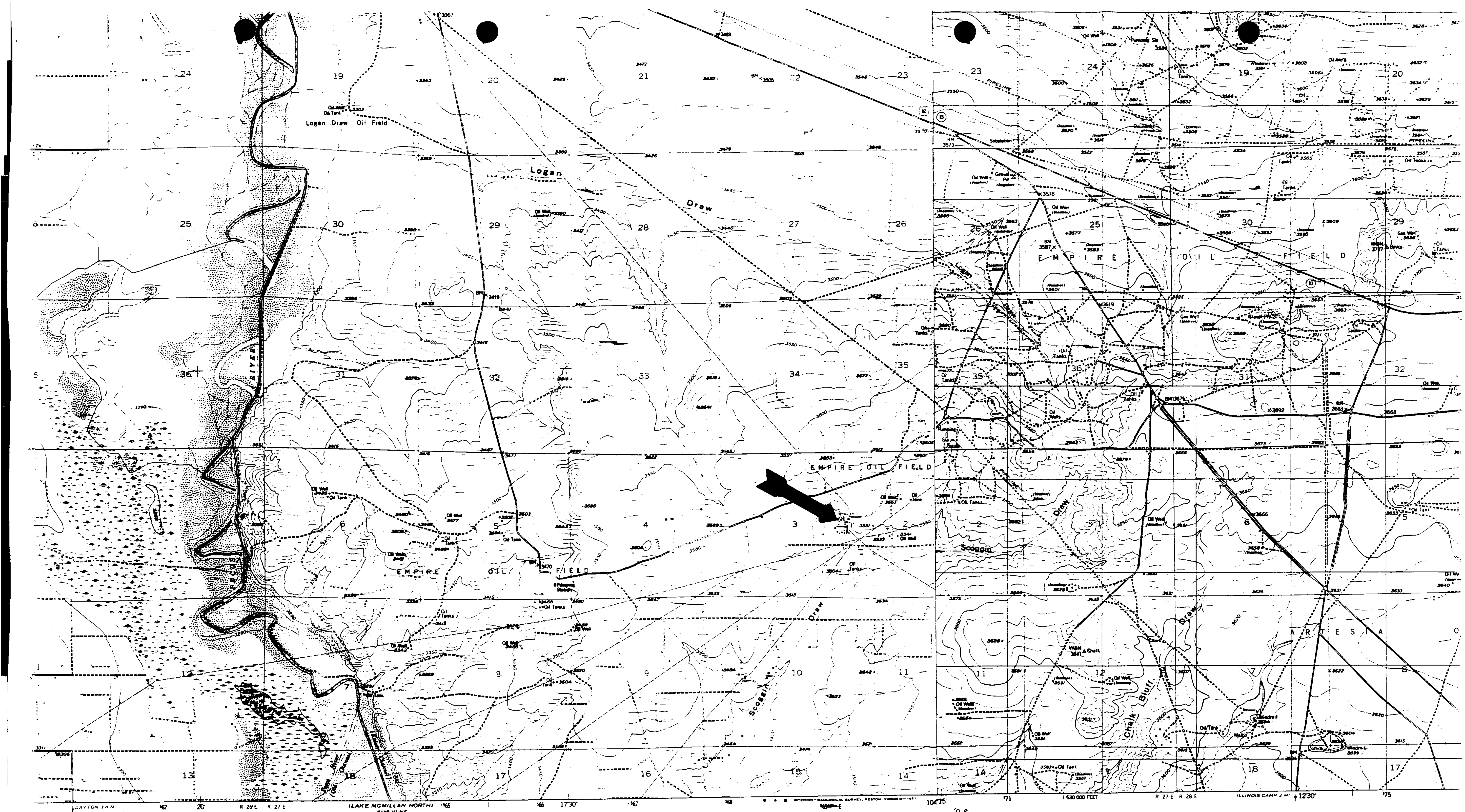
Scale: 1" = 200' Contour Interval: 1.0'

EMPIRE ABO GAS PLANT

U.S. GEOLOGICAL SURVEY
7.5' TOPOGRAPHIC MAP

SPRING LAKE, NEW MEXICO QUAD

SECTION 4



SCALE 1:24000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0°22' 7 MILS

10½° 187 MILS

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

NEW MEXICO

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt

U. S. Route — State Route

SPRING LAKE, N. MEX.
N3245—W10415/7.5

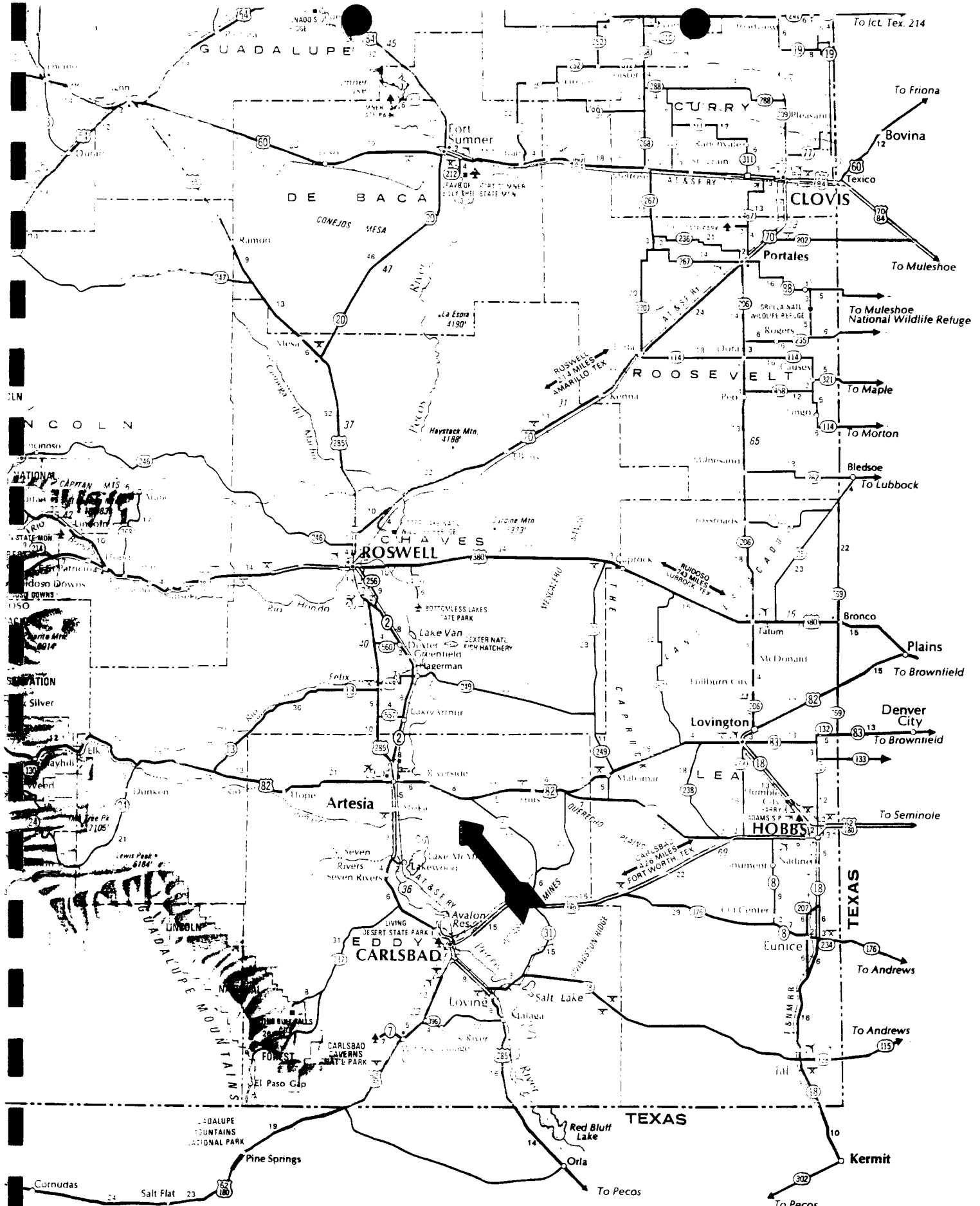
1955
PHOTOREVISED 1975
AMS 5149 IV SE—SERIES V881

EMPIRE ABO GAS PLANT

HIGHWAY MAP

EDDY COUNTY, NEW MEXICO
NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

SECTION 5


To Jct. Tex. 214
To Friona
Bovina
Texico
CLOVIS
CURRY
DE BACA
Fort Sumner
Portales
To Muleshoe
To Muleshoe National Wildlife Refuge
ROOSEVELT
To Maple
To Morton
Bledsoe
To Lubbock
LINCOLN
CHAVES
ROSWELL
Bronco
Plains
To Brownfield
Tatum
Lovington
Denver City
To Brownfield
LEA
HOBBS
To Seminole
Artesia
Eunice
To Andrews
To Andrews
EDDY
CARLSBAD
TEXAS
Pine Springs
Orla
Red Bluff Lake
Kermit
To Pecos
To Pecos
Cornudas
Salt Flat
Official Highway Map of
NEW MEXICO
Issued By
New Mexico State Highway
and Transportation Department
and
New Mexico Economic Development
and Tourism Department

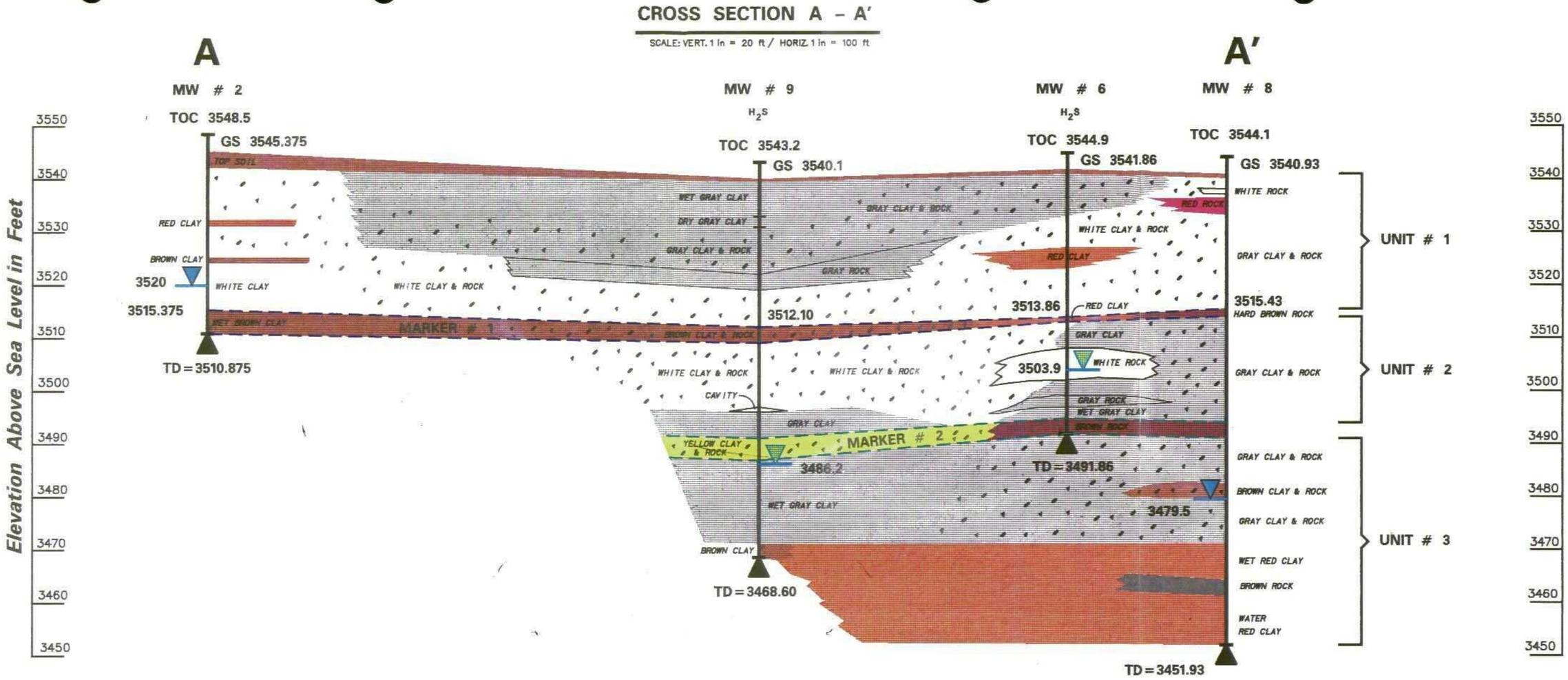
EMPIRE ABO GAS PLANT

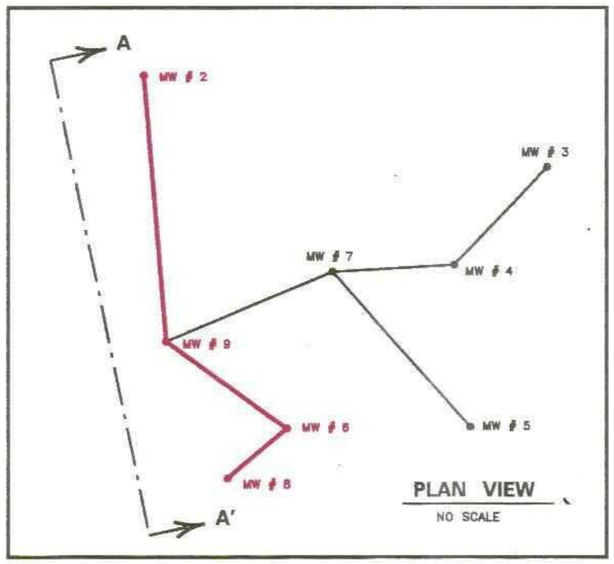
SHALLOW STRATA CROSS SECTIONS
A - A', B - B', and C - C'

SECTION 6

CROSS SECTION A – A'

SCALE: VERT. 1 in = 20 ft / HORIZ. 1 in = 100 ft





EMPIRE ABO GAS PLANT
GROUNDWATER CROSS SECTIONS

EDDY COUNTY, NEW MEXICO

JUNE 15,1992 DR. BY: J.E.M. & LAND SURVEY DEPT.

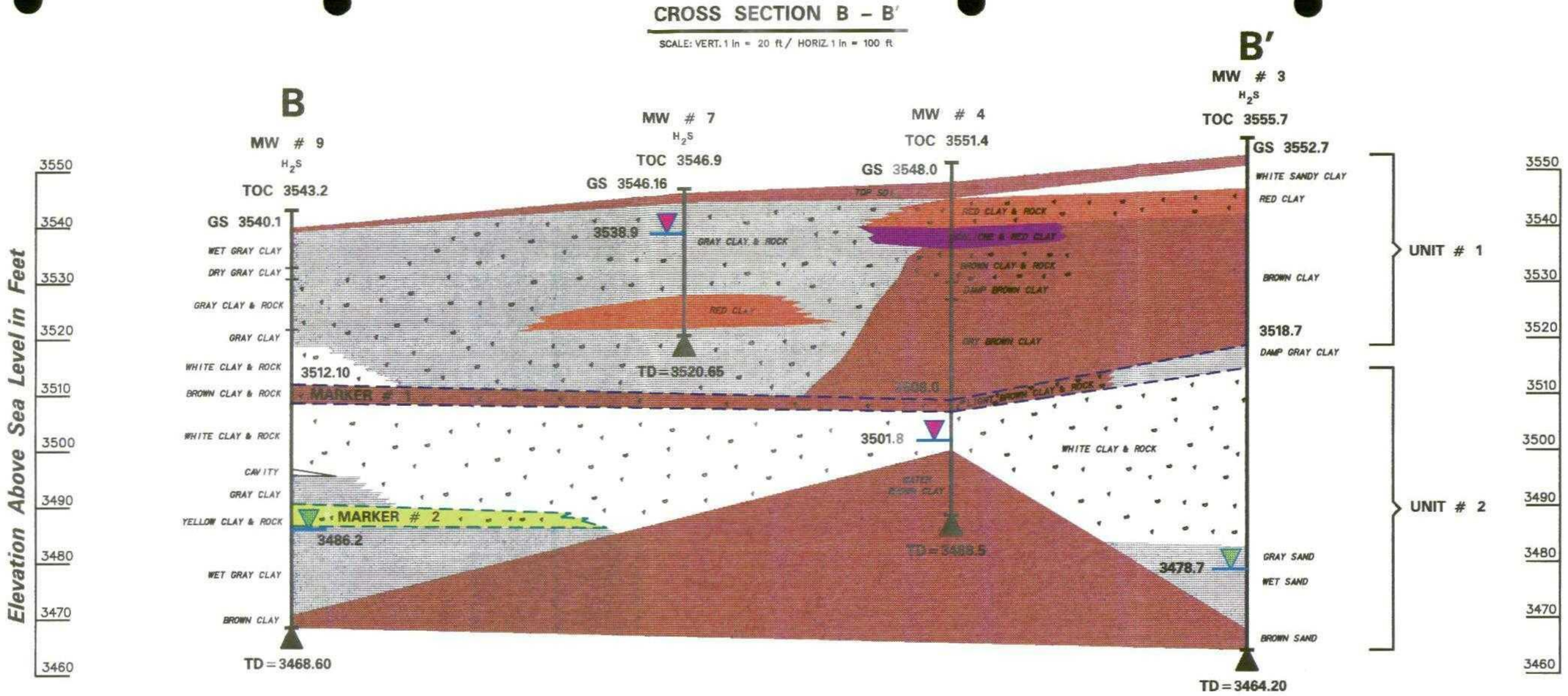
Legend

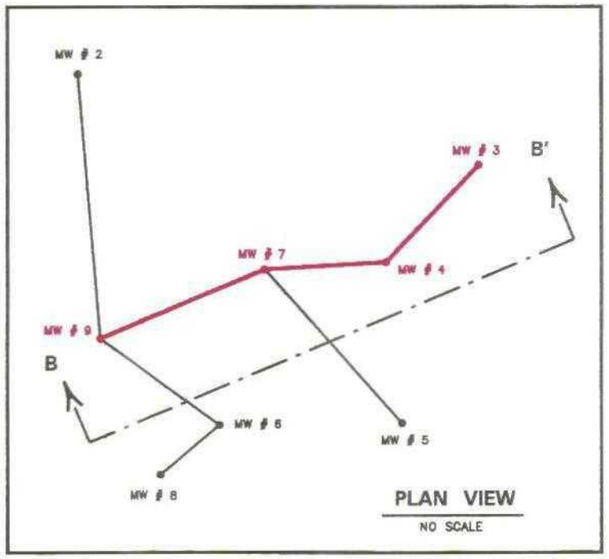
- Ground Water Table
- Ground Water Table with BTEX (dissolved hydrocarbons) Contamination
- Ground Water Table with Free Phase Hydrocarbons
- Total Depth Marker
- Facies Change
- Clay & Rock (Mixed)
- H_2S – indicates H_2S detected in wellbore

ABOGASPL.dgn Lv 18–20.

CROSS SECTION B – B′

SCALE: VERT. 1 In = 20 ft / HORIZ. 1 In = 100 ft





EMPIRE ABO GAS PLANT
GROUNDWATER CROSS SECTIONS

EDDY COUNTY, NEW MEXICO

JUNE 15,1992 DR. BY: J.E.M. & LAND SURVEY DEPT.

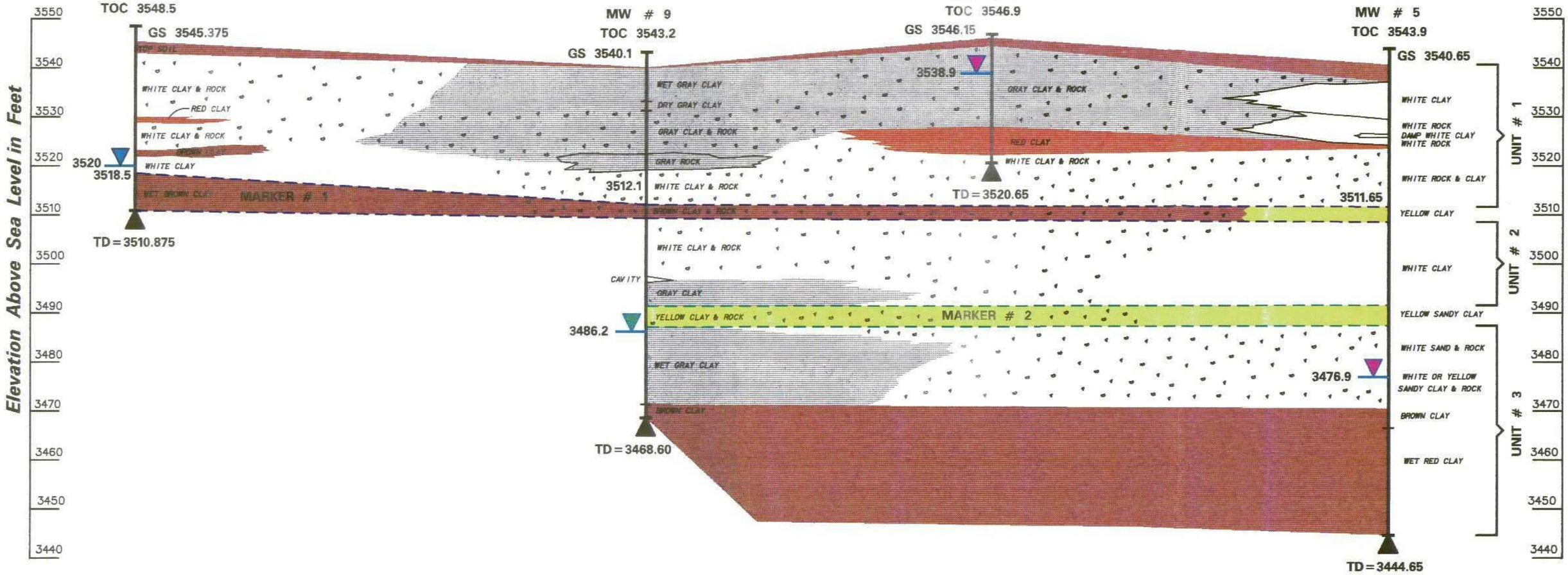
Legend

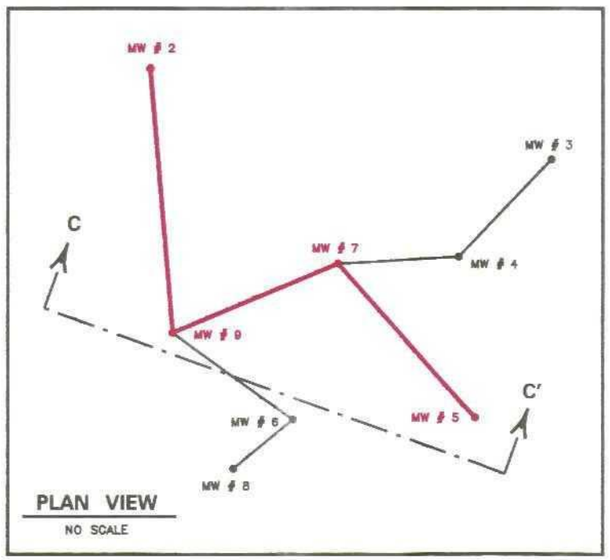
- Ground Water Table
- Ground Water Table with BTEX (dissolved hydrocarbons) Contamination
- Ground Water Table with Free Phase Hydrocarbons
- Total Depth Marker
- Facies Change
- Clay & Rock (Mixed)
- H_2S – indicates H_2S detected in wellbore

ABOGASPL.dgn Lv 24-26.

CROSS SECTION C – C′

SCALE: VERT. 1 in = 20 ft / HORIZ. 1 in = 100 ft





EMPIRE ABO GAS PLANT
GROUNDWATER CROSS SECTIONS

EDDY COUNTY, NEW MEXICO

JUNE 15,1992 DR. BY: J.E.M. & LAND SURVEY DEPT.

Legend

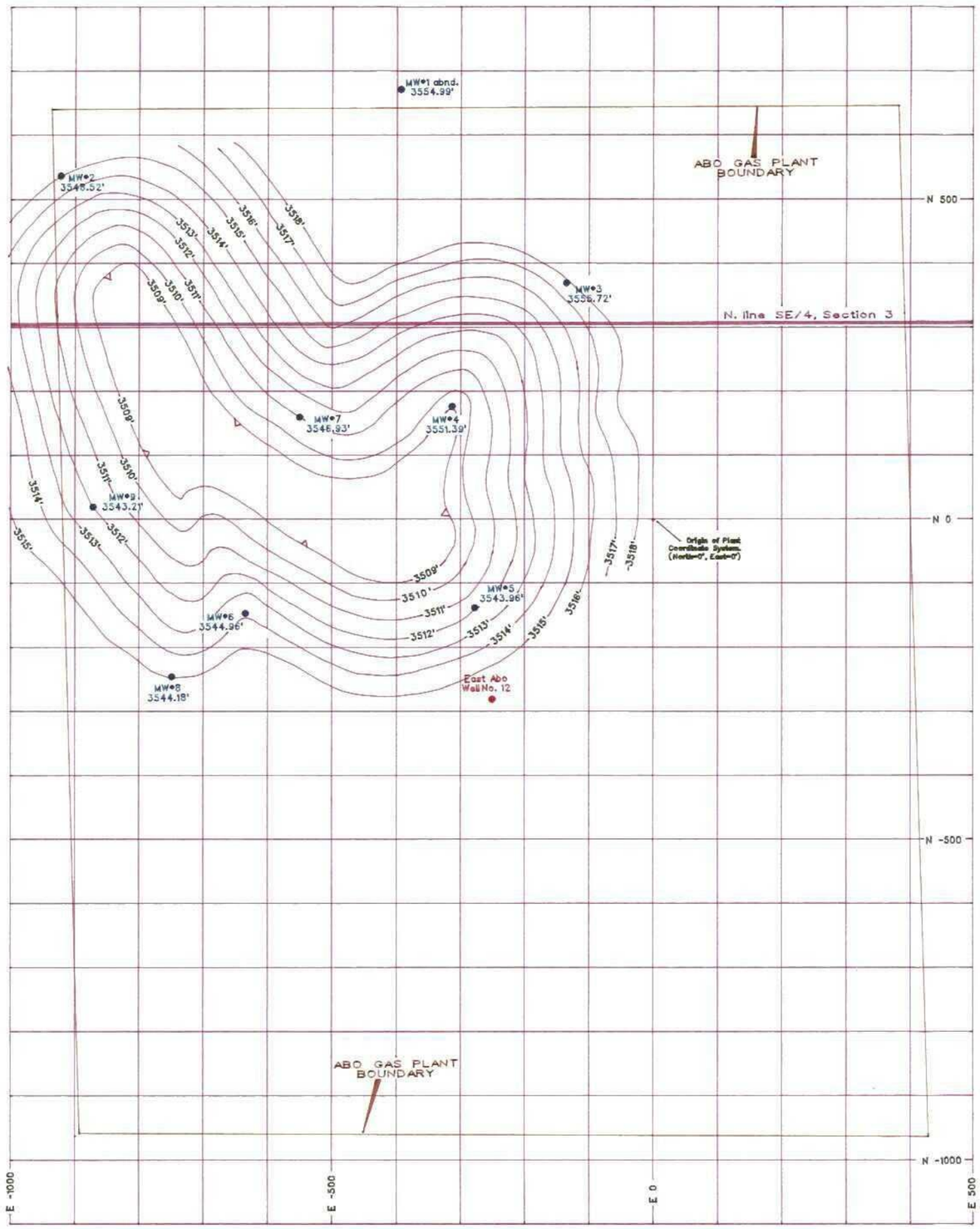
- Ground Water Table
- Ground Water Table with BTEX (dissolved hydrocarbons) Contamination
- Ground Water Table with Free Phase Hydrocarbons
- Total Depth Marker
- Facies Change
- Clay & Rock (Mixed)
- H_2S – indicates H_2S detected in wellbore

ABOGASPL.dgn Lv 30–32.

EMPIRE ABO GAS PLANT

STRATA MARKER NO. 1
CONTOUR MAP

SECTION 7



Empire Abo Gas Plant Monitor Wells

Well No.	North American Datum 1927 Latitude(N)	Longitude(W)	NMEZ Northing(Y')	Easting(X')	Elev.
1	32°46' 37.736"	104° 15' 35.314"	646445.61'	522597.67'	3554.99' (ground)
2	32°46' 36.484"	104° 15' 41.527"	646318.70'	522067.38'	3548.52' (top of casing)
3	32°46' 34.711"	104° 15' 32.333"	646140.02'	522852.41'	3555.72' (top of casing)
4	32°46' 32.829"	104° 15' 34.452"	645949.71'	522671.65'	3551.39' (top of casing)
5	32°46' 29.710"	104° 15' 34.089"	645634.62'	522702.88'	3543.96' (top of casing)
6	32°46' 29.677"	104° 15' 38.269"	645630.97'	522346.00'	3544.96' (top of casing)
7	32°46' 32.694"	104° 15' 37.230"	645935.94'	522434.48'	3546.93' (top of casing)
8	32°46' 28.716"	104° 15' 39.624"	645533.81'	522230.39'	3544.18' (top of casing)
9	32°46' 31.357"	104° 15' 41.014"	645800.59'	522111.50'	3543.21' (top of casing)

MW•7 3546.93' • Monitor Well

——— Empire Abo Gas Plant Boundary

Amoco Production Company
Land Survey Department

Empire Abo Gas Plant
Top of Marker No. 1
Monitor Well Survey

Township 18 South, Range 27 East

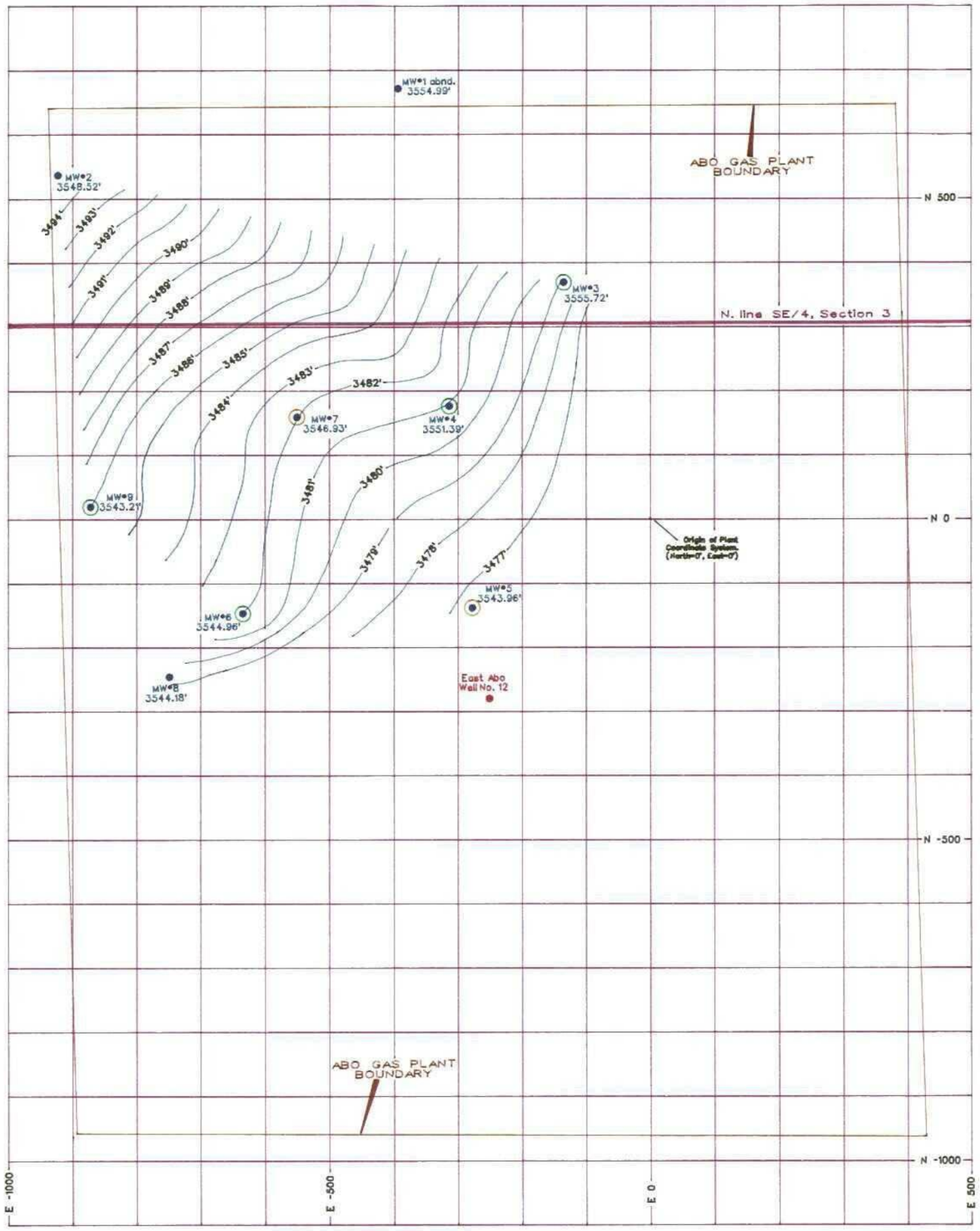
Eddy County, New Mexico

Scale: 1" = 200' Contour Interval: 1.0'

EMPIRE ABO GAS PLANT

STRATA MARKER NO. 3 CONTOUR MAP

SECTION 8



Empire Abo Gas Plant Monitor Wells

Well No.	North American Datum 1927 Latitude(N)	Longitude(W)	NMEZ Northing(Y)	Easting(X)	Elev.
1	32° 46' 37.736"	104° 15' 35.314"	646445.61'	522597.67'	3554.99' (ground)
2	32° 46' 36.484"	104° 15' 41.527"	646318.70'	522067.38'	3548.52' (top of casing)
3	32° 46' 34.711"	104° 15' 32.333"	646140.02'	522852.41'	3555.72' (top of casing)
4	32° 46' 32.829"	104° 15' 34.452"	645949.71'	522671.65'	3551.39' (top of casing)
5	32° 46' 29.710"	104° 15' 34.089"	645634.62'	522702.88'	3543.96' (top of casing)
6	32° 46' 29.677"	104° 15' 38.269"	645630.97'	522346.00'	3544.96' (top of casing)
7	32° 46' 32.694"	104° 15' 37.230"	645935.94'	522434.48'	3546.93' (top of casing)
8	32° 46' 28.716"	104° 15' 39.624"	645533.81'	522230.39'	3544.18' (top of casing)
9	32° 46' 31.357"	104° 15' 41.014"	645800.59'	522111.50'	3543.21' (top of casing)

MW•7 3546.93' • Monitor Well

Empire Abo Gas Plant Boundary

MW•7 3546.93' ◉ Well Containing Free Phase Hydrocarbon

MW•7 3546.93' ◉ Well Containing BTEX (dissolved) Hydrocarbon

Amoco Production Company
Land Survey Department

Empire Abo Gas Plant
Top of Unit No. 3, Gradient Map
Monitor Well Survey

Township 18 South, Range 27 East

Eddy County, New Mexico

Scale: 1" = 200' Contour Interval: 1.0'

EMPIRE ABO GAS PLANT

DRILLER'S LOG
AND
SOIL TPH ANALYSIS
WITH DEPTH

SECTION 9

GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: Legend

Drawn By: S. Fiorenza

Elevation asl, ft	Sample Description	TRPHC, ppb soil
	TOC	
		0
		10
		20
		30
		40
		50
		60
		70
		80
		90
		100

clay and rock

clay

rock

sand

clay and sand

screen

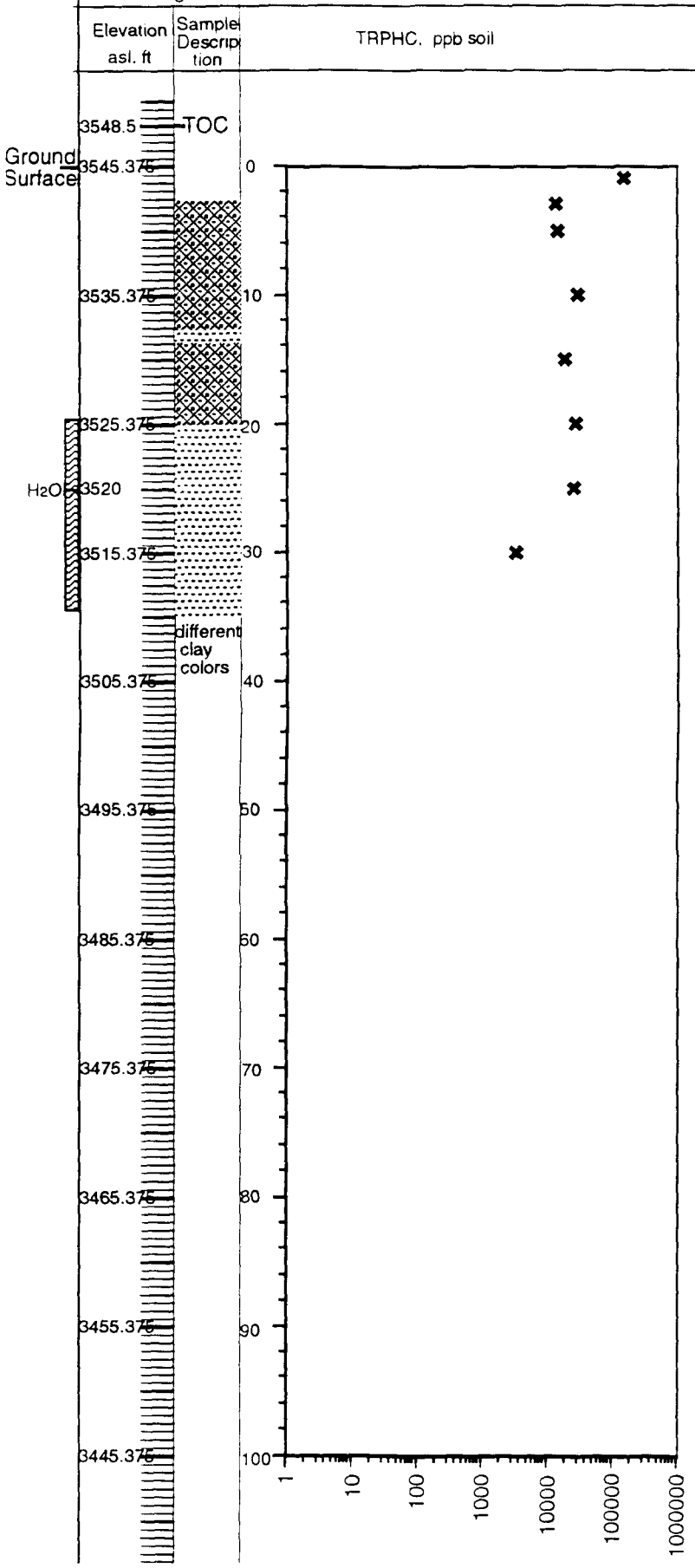
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #2

Drawn By: S. Fiorenza



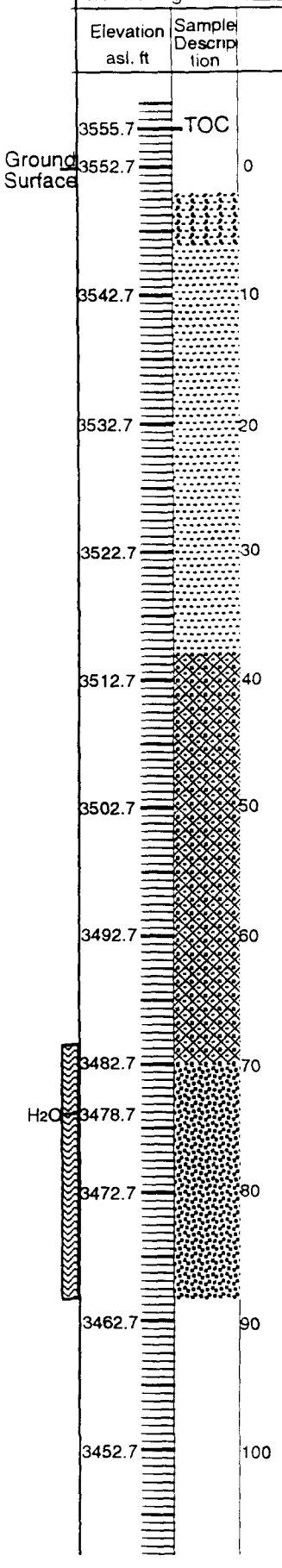
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #3

Drawn By: S. Fiorenza



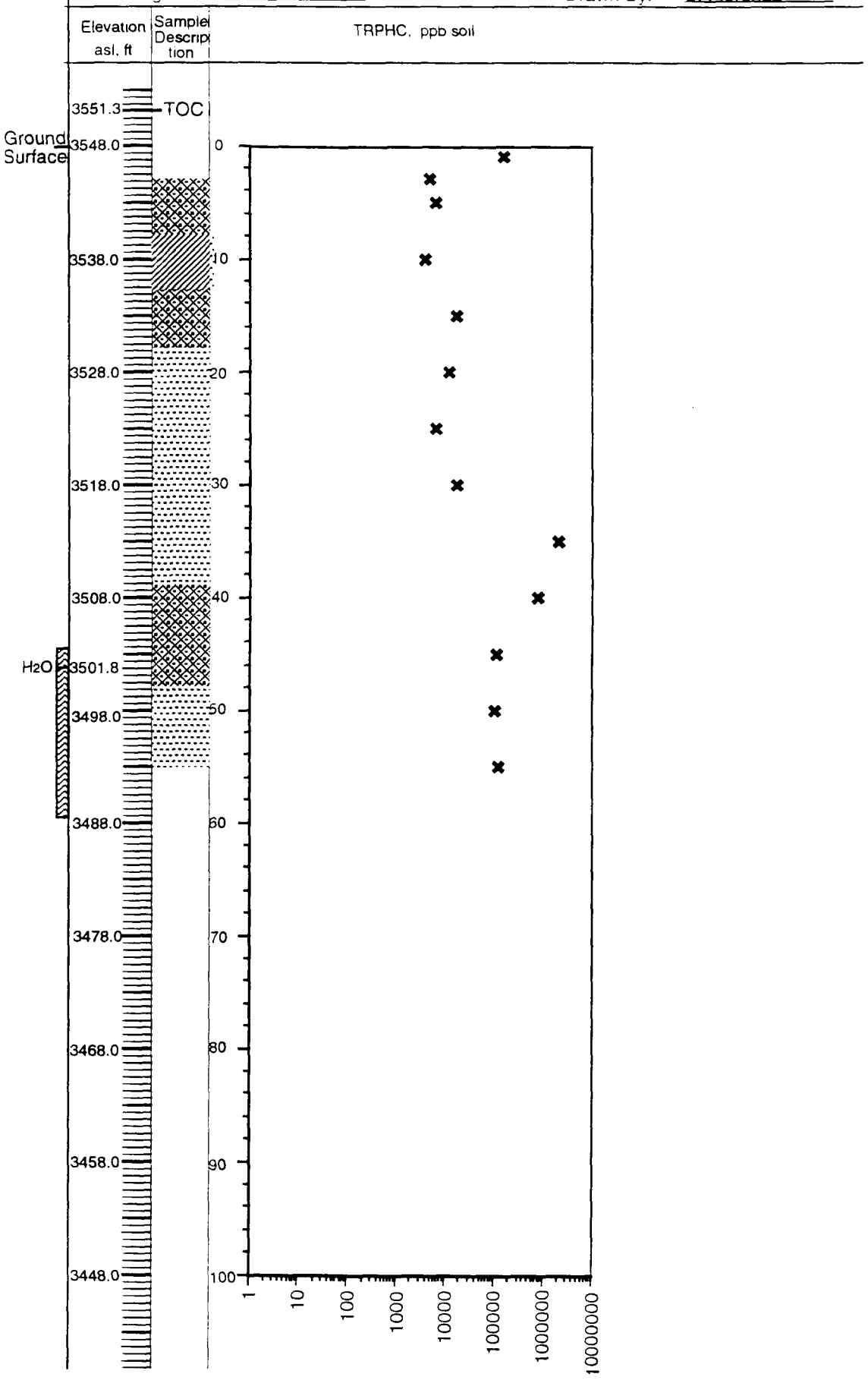
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #4

Drawn By: S. Fiorenza



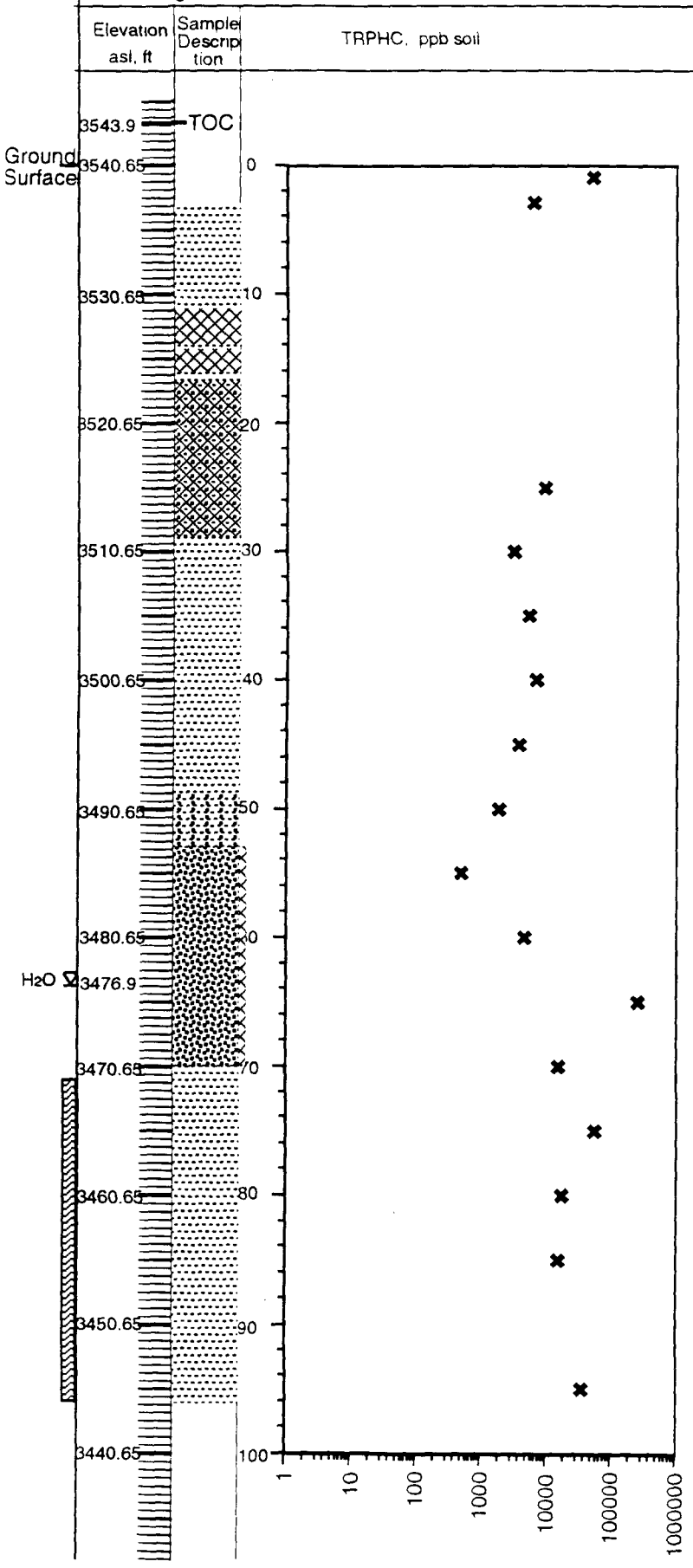
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #5

Drawn By: S. Fiorenza



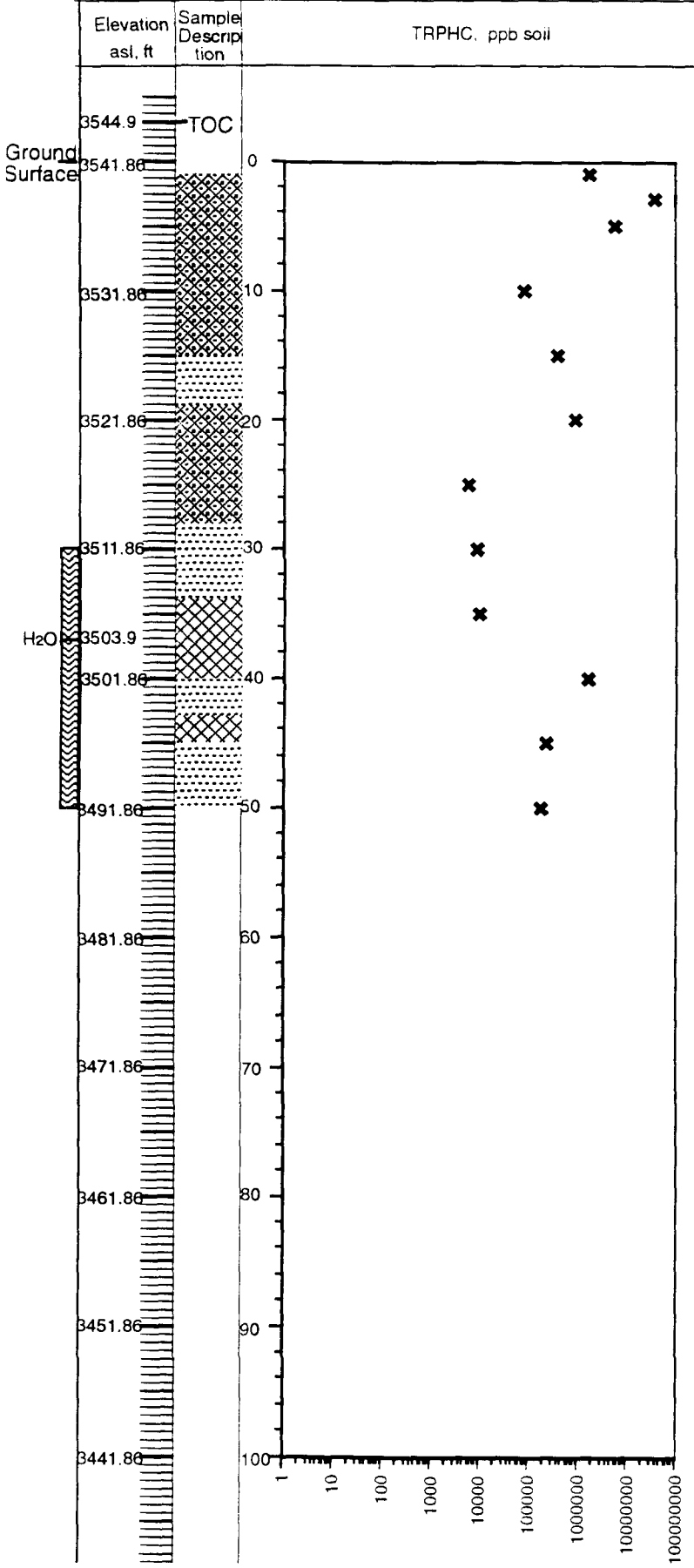
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #6

Drawn By: S. Fiorenza



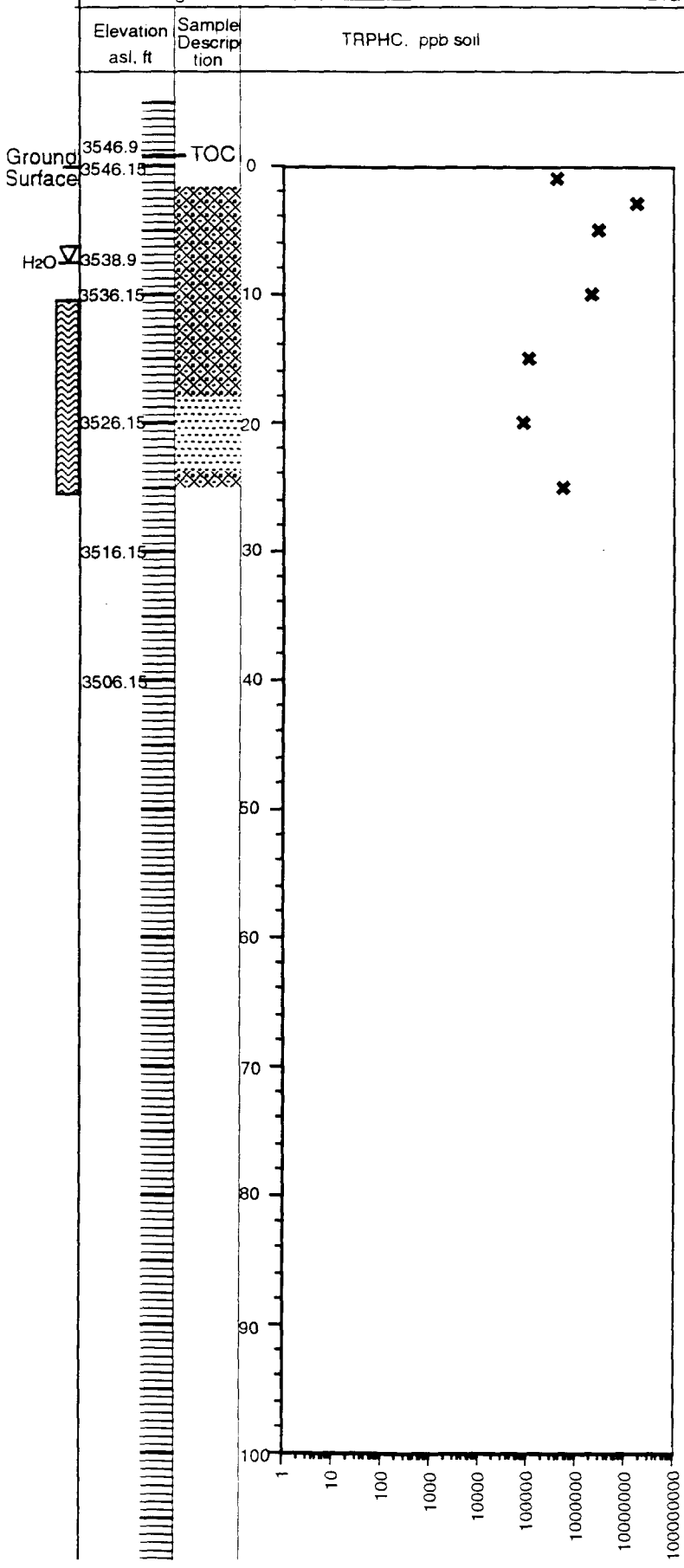
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #7

Drawn By: S. Fiorenza



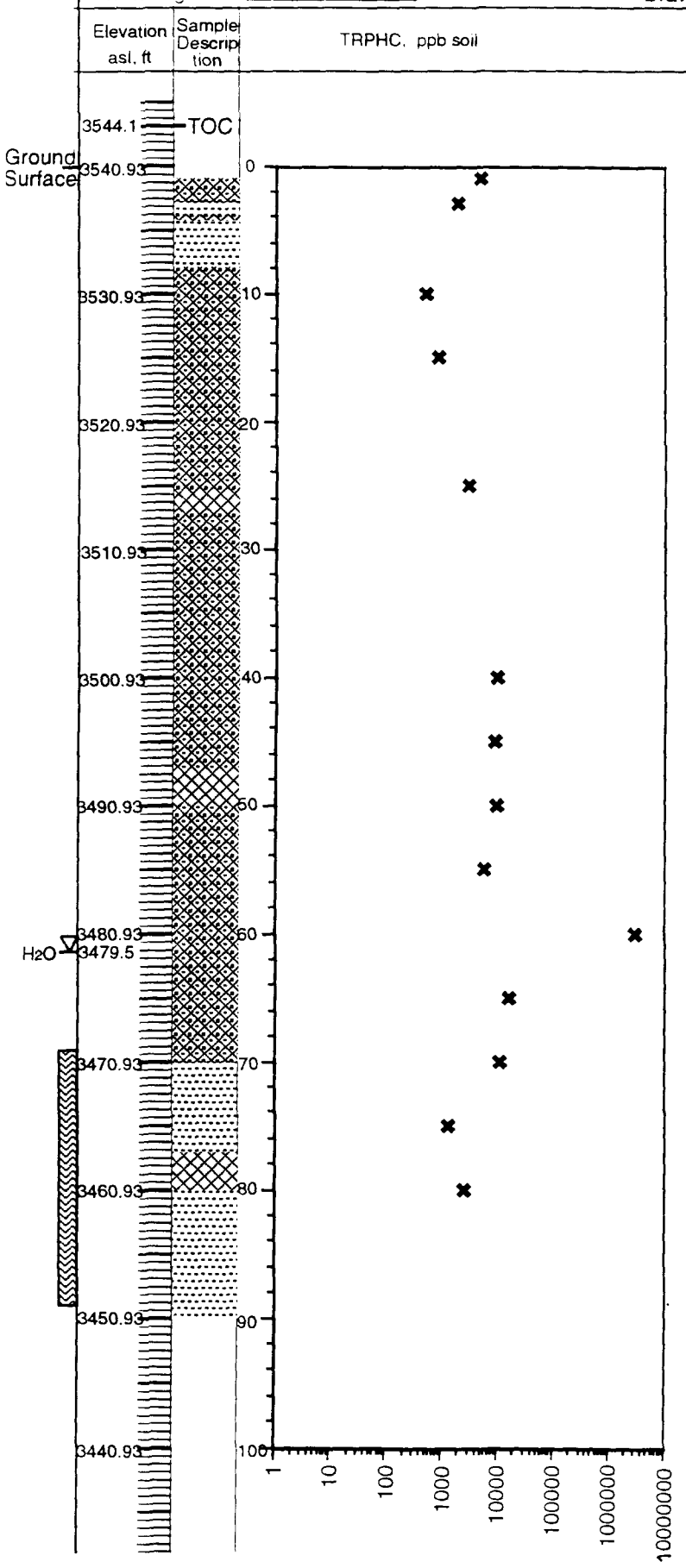
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #8

Drawn By: S. Fiorenza



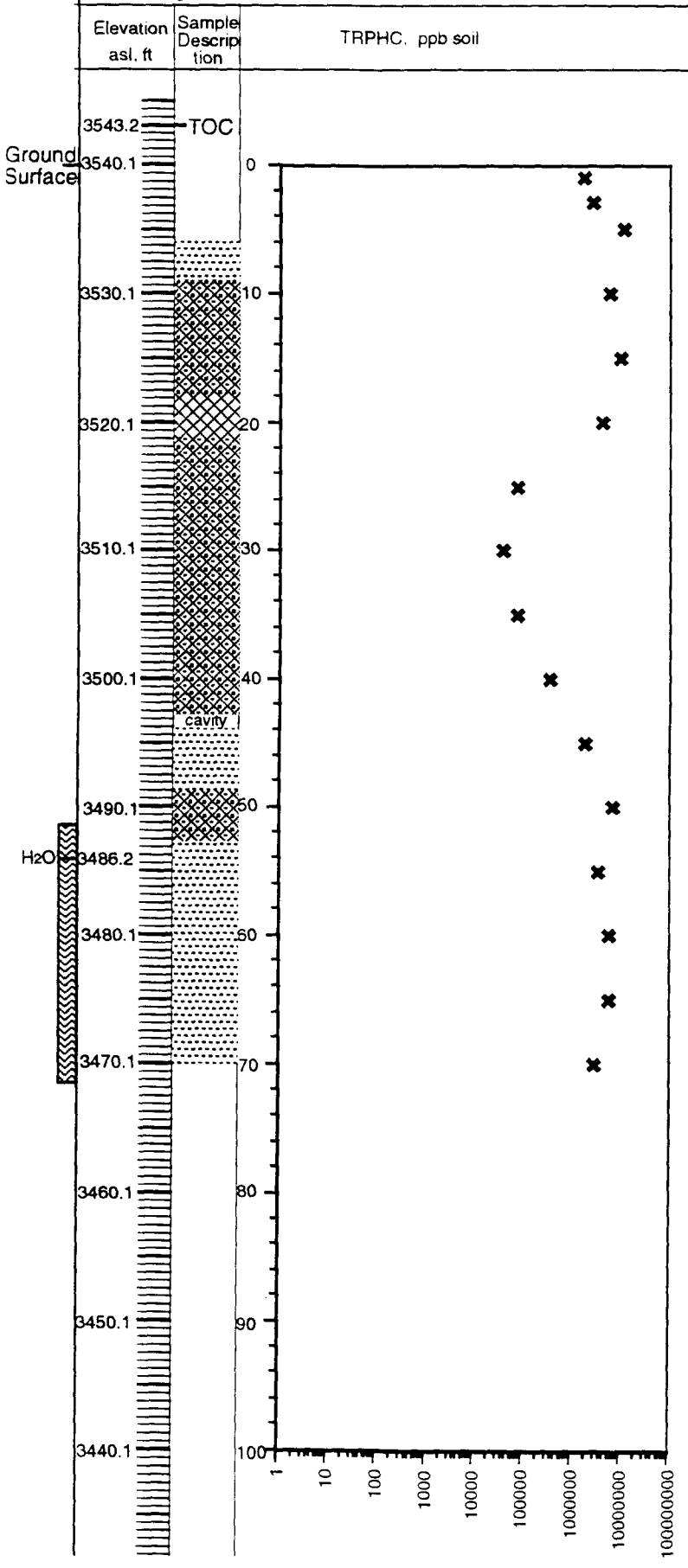
GROUNDWATER MANAGEMENT SECTION
Amoco Corporation - Environmental Affairs and Safety Department

Site: Amoco Production Company
Empire Abo Gas Plant, New Mexico

Date Drawn: April 27, 1992

Monitoring Well: #9

Drawn By: S. Fiorenza



EMPIRE ABO GAS PLANT

WATER SAMPLE ANALYSIS

SECTION 10

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2	NORMALIZED (ASL) WATER LEVEL:	
TOTAL DEPTH (FS):	34.5	INITIAL WATER LEVEL:(FS)	30
WATER WELL DRILLER:	EADES	TOP OF SCREEN:	19.5
ELEVATION (TOCsg ASL):	3548.5	BASE OF SCREEN:	34.5

						WATER SAMPLE ANALYSIS mg/l							
DATE	WATER LEVEL FEET FROM TOP OF CASING	WATER LEVEL FEETABOVE SEA LEVEL	FREE PRODUCT INCHES	SAMPLE ID	BENZENE	TOULENE	ETHYL-BENZENE	XYLENE M.P.O	BTEX TOTAL	MTBE	VIOLATILES	SEMI-VIOLATILES	CHROMIUM	CHLORIDES
1/24/92	32.5	3516	0	#1	ND	ND	ND	ND	0	ND	ND	ND	NS	NS
3/11/92	37.7	3510.8	0	#2	ND	ND	ND	ND	0	ND	ND	ND	NS	NS

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	3	NORMALIZED (ASL) WATER LEVEL:	
TOTAL DEPTH (FS):	88.5	INITIAL WATER LEVEL:(FS)	76
WATER WELL DRILLER:	EADES	TOP OF SCREEN:	68.5
ELEVATION (TOCsg ASL):	3555.7	BASE OF SCREEN:	88.5

					WATER SAMPLE ANALYSIS mg/l								
DATE	WATER LEVEL FEET FROM TOP OF CASING	WATER LEVEL FEETABOVE SEA LEVEL	FREE PRODUCT INCHES	SAMPLE ID	BENZENE	TOULENE	ETHYL-BENZENE	XYLENE M.P.O	BTEX TOTAL	MTBE	VIOLATILES	SEMI-VIOLATILES	CHROMIUM	CHLORIDES
1/24/92	77	3478.7	42	#1	111	14	238	299	662	NR	PRODUCT	PRODUCT	NS	NS
3/11/92	83	3472.7	19	#3	ANALYZED	AS	PRODUCT	-	-	-	PRODUCT	PRODUCT	NS	NS

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	4	NORMALIZED (ASL) WATER LEVEL:	
TOTAL DEPTH (FS):	59.5	INITIAL WATER LEVEL:(FS)	48
WATER WELL DRILLER:	EADES	TOP OF SCREEN:	44.5
ELEVATION (TOCSG ASL):	3551.3	BASE OF SCREEN:	59.5

					WATER SAMPLE ANALYSIS mg/l								
DATE	WATER LEVEL FEET FROM TOP OF CASING	WATER LEVEL FEETABOVE SEA LEVEL	FREE PRODUCT INCHES	SAMPLE ID	BENZENE	TOULENE	ETHYL-BENZENE	XYLENE M.P.O	BTEX TOTAL	MTBE	VIOLATILES	SEMI-VIOLATILES	CHROMIUM	CHLORIDES
1/24/92	51	3500.3	2	#1	1.25	0.464	1.76	2.26	5.734	0.49	21	ND	NS	NS
1/24/92	51	3500.3	-	#1DUP	1.14	0.426	1.6	1.94	5.106	0.42	16	ND	NS	NS
3/11/92	51	3500.3	-	#4	3.64	86.8	38.7	109	238.14	72.7	1615	116	NS	NS
3/11/92	51	3500.3	-	#4DUP	0.95	1.12	1.25	3.54	6.86	1.05	32	2	NS	NS

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	5	NORMALIZED (ASL) WATER LEVEL:	
TOTAL DEPTH (FS):	96	INITIAL WATER LEVEL:(FS)	89
WATER WELL DRILLER:	EADES	TOP OF SCREEN:	71
ELEVATION (TOCsg ASL):	3543.9	BASE OF SCREEN:	96

					WATER SAMPLE ANALYSIS mg/l									
DATE	WATER LEVEL FEET FROM TOP OF CASING	WATER LEVEL FEETABOVE SEA LEVEL	FREE PRODUCT INCHES	SAMPLE ID	BENZENE	TOULENE	ETHYL-BENZENE	XYLENE M.P.O	BTEX TOTAL	MTBE	VIOLATILES	SEMI-VIOLATILES	CHROMIUM	CHLORIDES
1/24/92	68.8	3475.1	0	#1	0.931	3.87	1.81	5.26	11.871	0.65	57	17	NS	NS
3/11/92	69	3474.9	0	#5	0.107	0.534	0.543	1.47	2.654	0.15	8	ND	NS	NS

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	7	NORMALIZED (ASL) WATER LEVEL:	
TOTAL DEPTH (FS):	25.5	INITIAL WATER LEVEL:(FS)	18
WATER WELL DRILLER:	EADES	TOP OF SCREEN:	10.5
ELEVATION (TOCsg ASL):	3546.9	BASE OF SCREEN:	25.5

WATER SAMPLE ANALYSIS
mg/l

DATE	WATER LEVEL FEET FROM TOP OF CASING	WATER LEVEL FEETABOVE SEA LEVEL	FREE PRODUCT INCHES	SAMPLE ID	BENZENE	TOULENE	ETHYL-BENZENE	XYLENE M.P.O	BTEX TOTAL	MTBE	VIOLATILES	SEMI-VIOLATILES	CHROMIUM	CHLORIDES
1/24/92	8.5	3538.4	0	#1	3.13	0.795	0.658	0.919	5.502	0.03	10	2	NS	NS
3/11/92	7.7	3539.2	-	#7	2.88	0.759	0.625	0.907	5.171	0.06	8	ND		

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	8	NORMALIZED (ASL) WATER LEVEL:	
TOTAL DEPTH (FS):	89	INITIAL WATER LEVEL:(FS)	80
WATER WELL DRILLER:	EADES	TOP OF SCREEN:	69
ELEVATION (TOCsg ASL):	3544.1	BASE OF SCREEN:	89

					WATER SAMPLE ANALYSIS mg/l								
DATE	WATER LEVEL FEET FROM TOP OF CASING	WATER LEVEL FEETABOVE SEA LEVEL	FREE PRODUCT INCHES	SAMPLE ID	BENZENE	TOULENE	ETHYL-BENZENE	XYLENE M.P.O	BTEX TOTAL	MTBE	VIOLATILES	SEMI-VIOLATILES	CHROMIUM	CHLORIDES
1/24/92	67.3	3476.8	0	#1	ND	ND	ND	0.001	0.001	ND	ND	ND	NS	NS
3/11/92	67.4	3476.7	-	#8	ND	0.001	ND	ND	0.001	ND	ND	ND	NS	NS
3/11/92	67.4	3476.7	-	#8DUP	ND	ND	ND	ND	0	ND	ND	ND	NS	NS

EMPIRE ABO GAS PLANT
MONITOR WELL INFORMATION SUMMARY

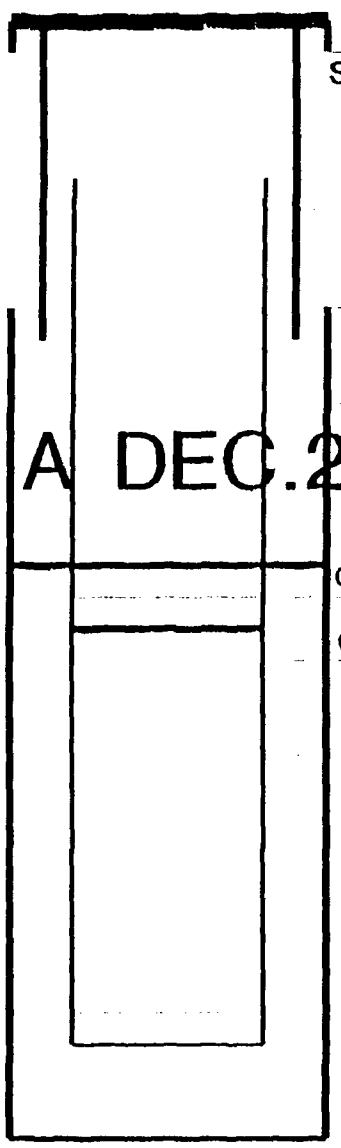
MONITOR WELL NUMBER:	9	NORMALIZED (ASL) WATER LEVEL:	
TOTAL DEPTH (FS):	71.5	INITIAL WATER LEVEL:(FS)	63
WATER WELL DRILLER:	EADES	TOP OF SCREEN:	51.5
ELEVATION (TOCsg ASL):	3543.2	BASE OF SCREEN:	71.5

					WATER SAMPLE ANALYSIS mg/l									
DATE	WATER LEVEL FEET FROM TOP OF CASING	WATER LEVEL FEETABOVE SEA LEVEL	FREE PRODUCT INCHES	SAMPLE ID	BENZENE	TOULENE	ETHYL-BENZENE	XYLENE M.P.O	BTEX TOTAL	MTBE	VIOLATILES	SEMI-VIOLATILES	CHROMIUM	CHLORIDES
1/24/92	58	3485.2	10	#1	75	312	399	712	1498	X	X	X	NS	NS
3/11/92	58	3485.2	-	#9	5.57	5.89	2.27	5.51	19.24	0.79	53	18	NS	NS

EMPIRE ABO GAS PLANT

MONITOR WELL CONSTRUCTION DIAGRAM

SECTION 11



SECURED STEEL CAP AND LOCK

STEEL PROTECTIVE CASING

0 SOLID RISER PIPE

5' CEMENT SEAL

CEMENT & BENTONITE

P & A DEC.29,1991

0 BENTONITE SEAL

2' 0 THREADED JOINT

SAND & GRAVEL PACK
TO SURFACE

0 WATER TABLE

0 SLOTTED WELL SCREEN

10'

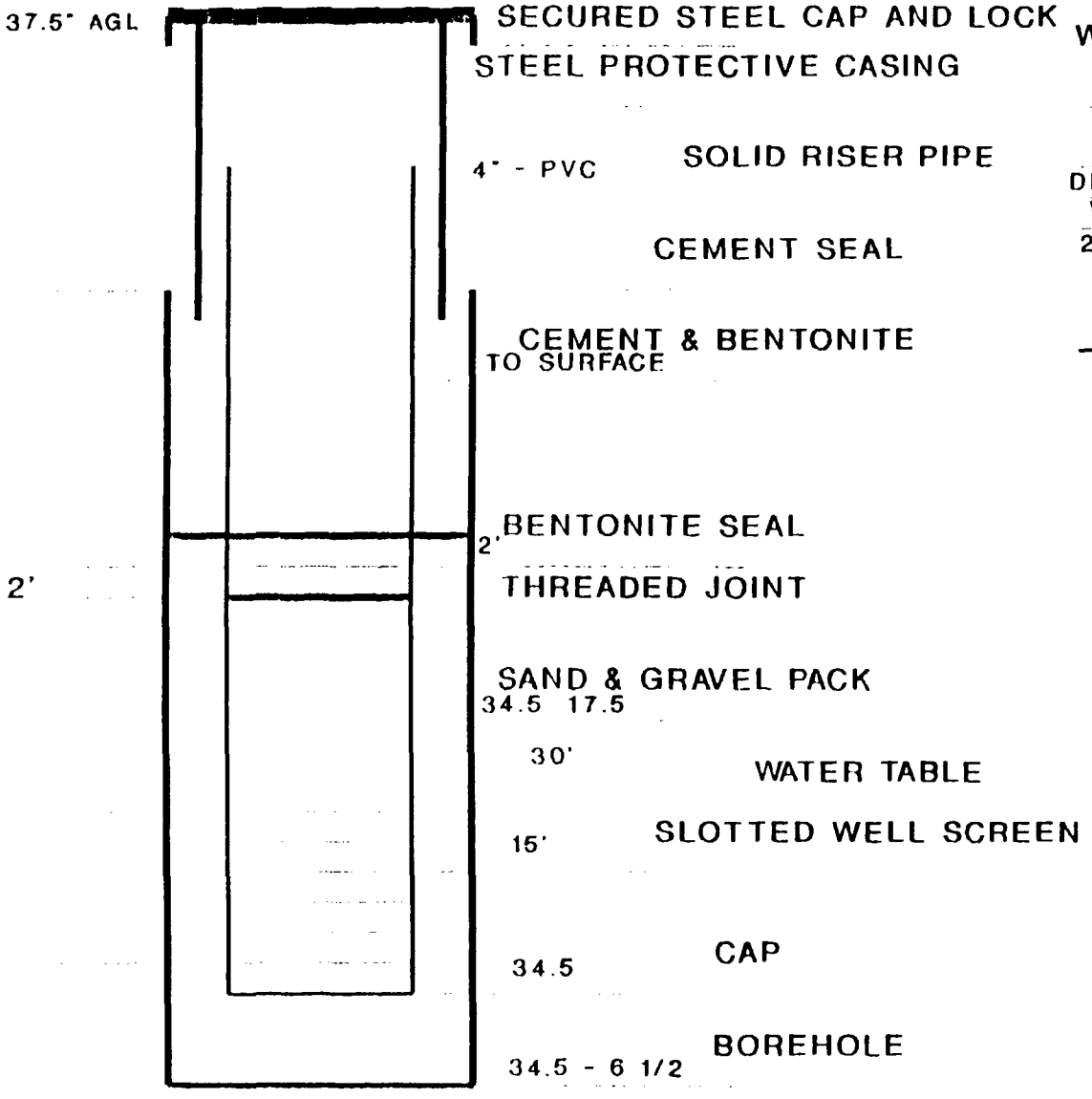
0 CAP

6 1/2" BOREHOLE

WELL # 1

EMPIRE ABO GAS PLANT
DEC. 29, 1991
NO TRACE OF WATER TO 200'

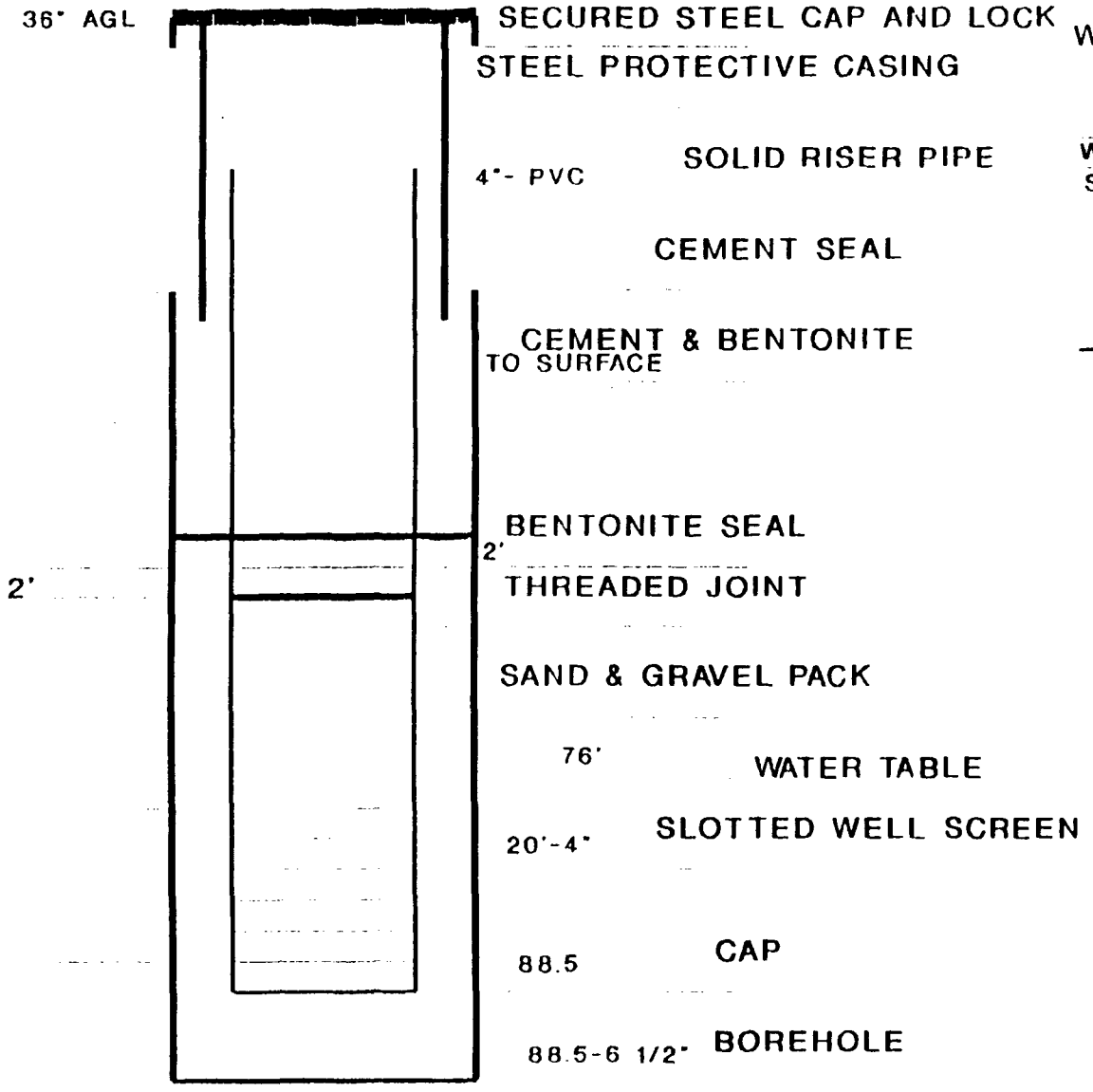
5'



WELL # 2

EMPIRE ABO GAS PLANT
DEC. 28, 1991
WET @ 28'
DEVELOPMENT OF WELL
WATER LEVEL 28.5' FS
28 GPM 440 PPM

32.50 FEET TO FLUID NO H2S AND NO FILM OF HYDROCARBONS
1/24/92



WELL # 3

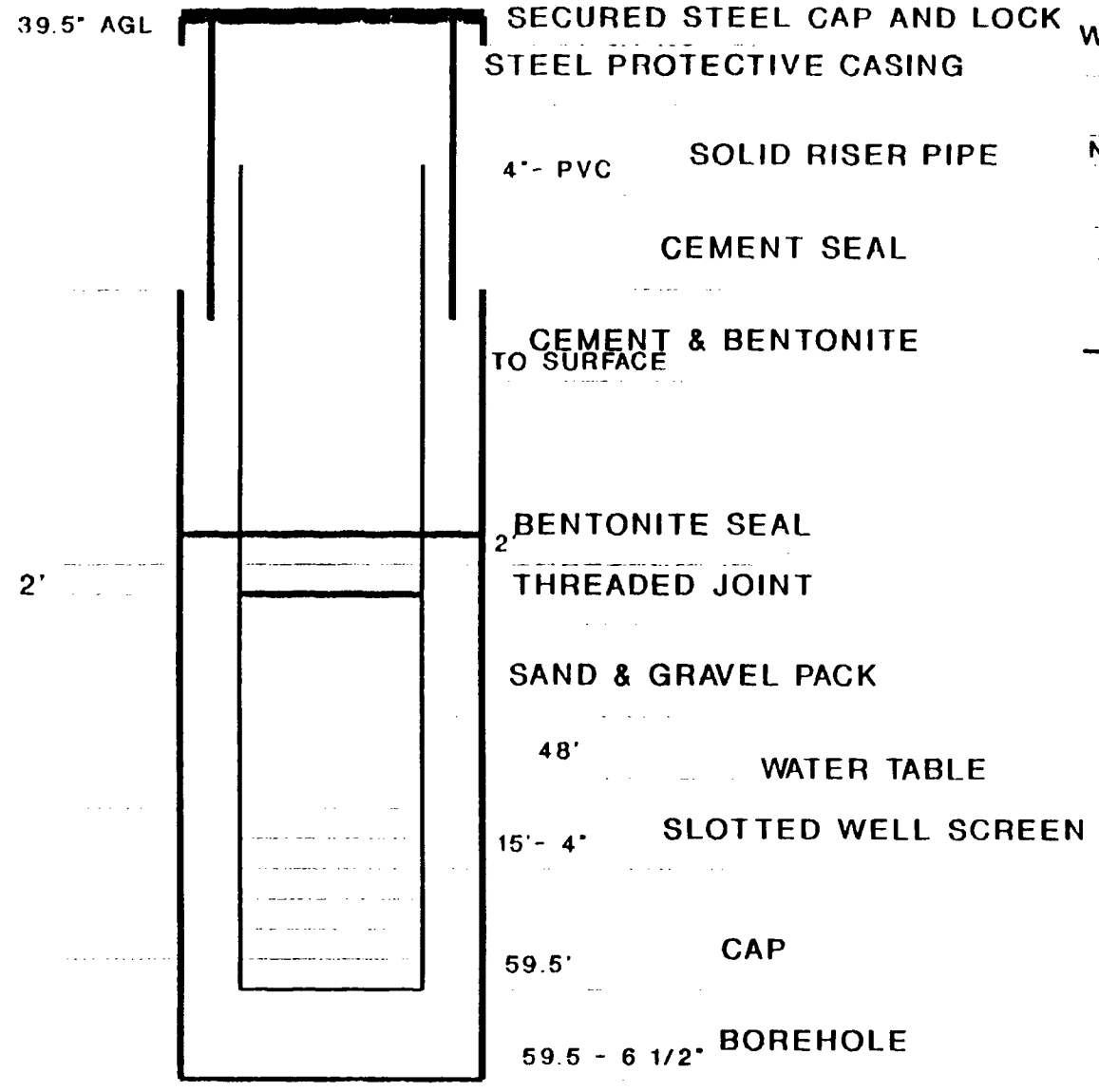
EMPIRE ABO GAS PLANT
DEC. 20, 1991
WET @ 76'
STRONG H2S @ 70'-27PPM-

FLUID AT 81.70FT - NO H2S
1/24/92

42" OF HYDROCARBONS AT TIME OF SAMPLING 19" FREE HYDROCARBONS

WELL # 4

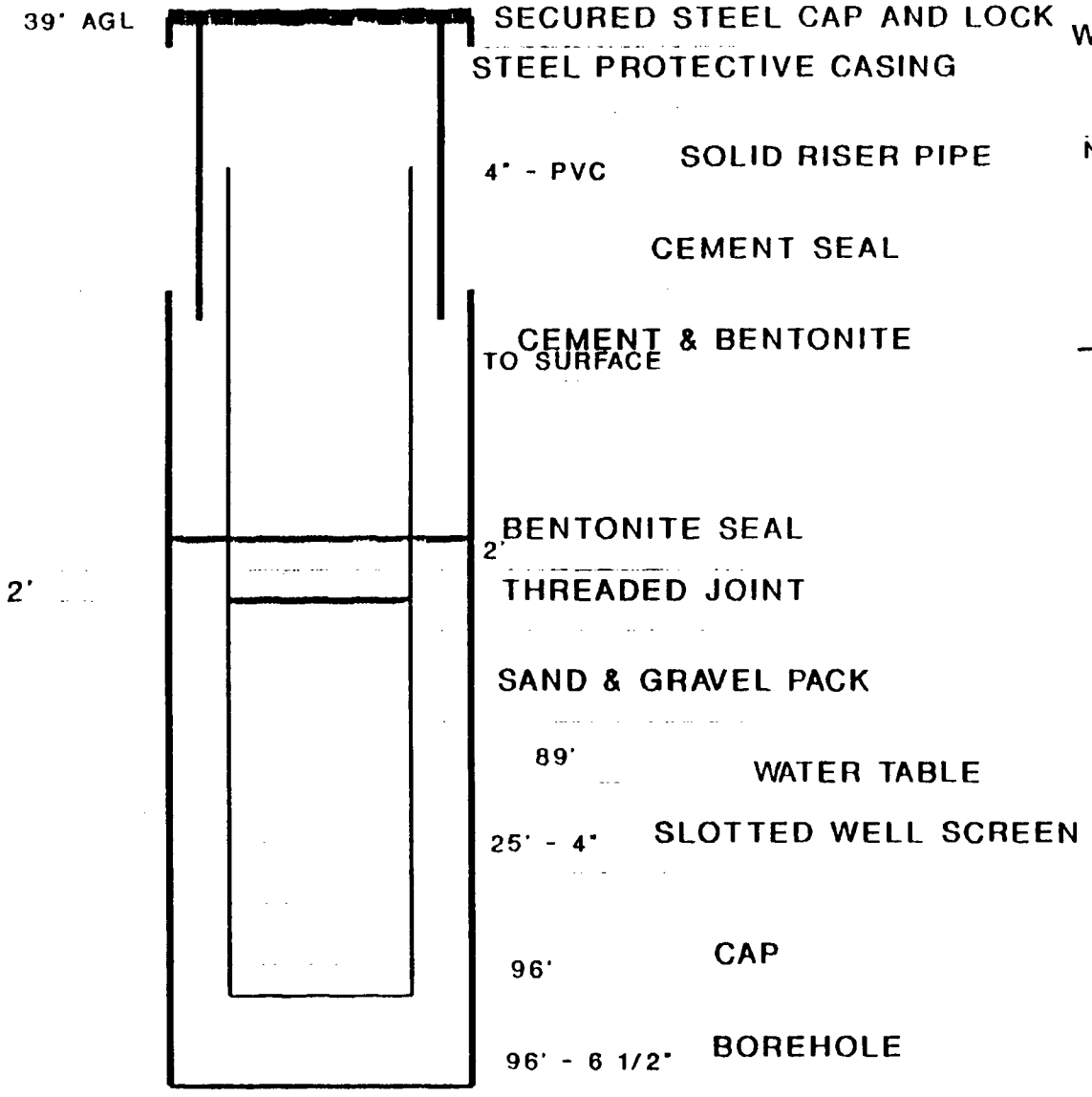
EMPIRE ABQ GAS PLANT
DEC. 20, 1991
NO H2S WET @ 48'



51' TO FLUID
2" FREE HYDROCARBONS ON FLUID NO H2S AT TIME OF SAMPLING 1/24/92

WELL # 5

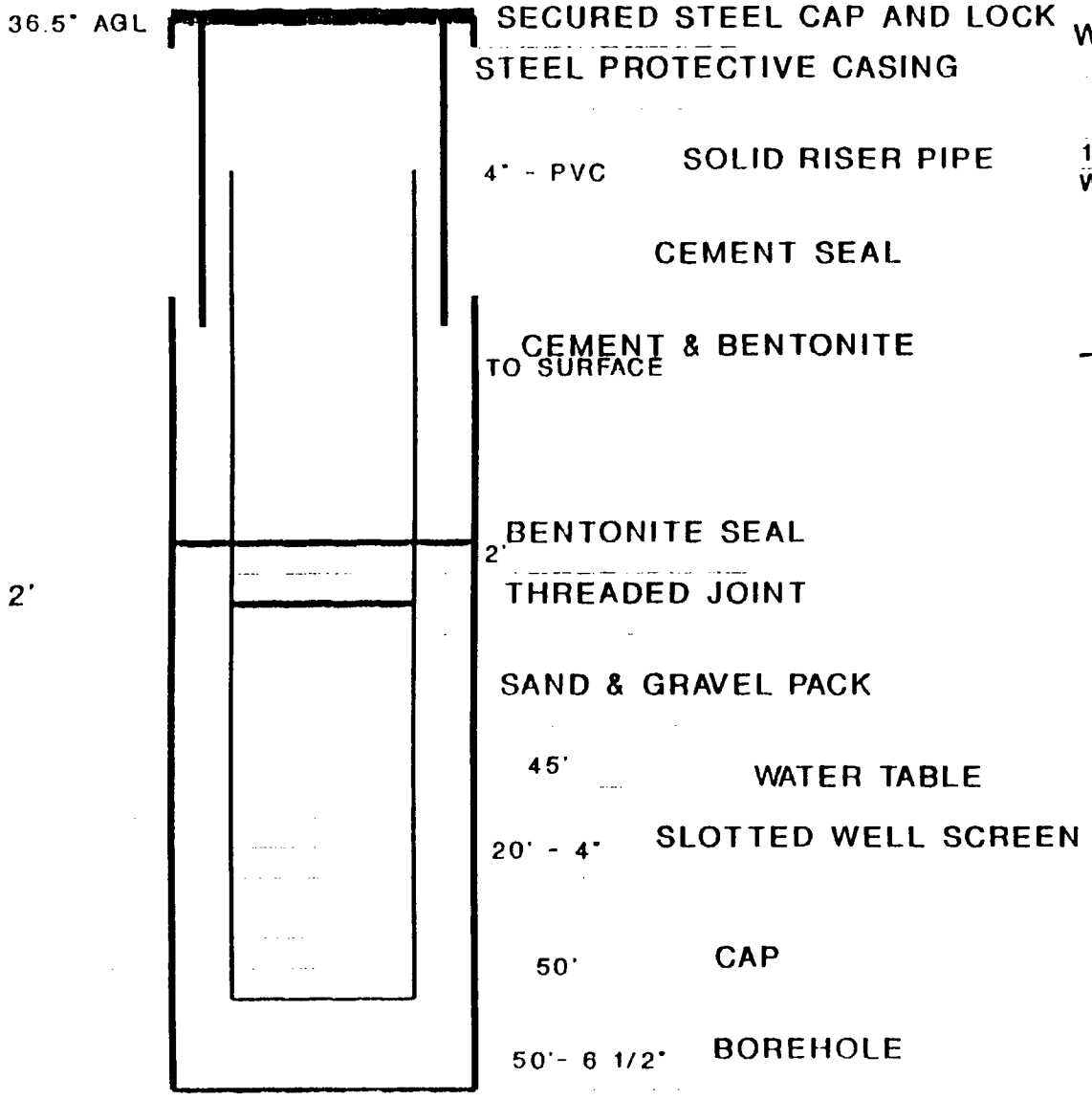
EMPIRE ABO GAS PLANT
DEC. 21,1991
NO H2S - WET @ 89'



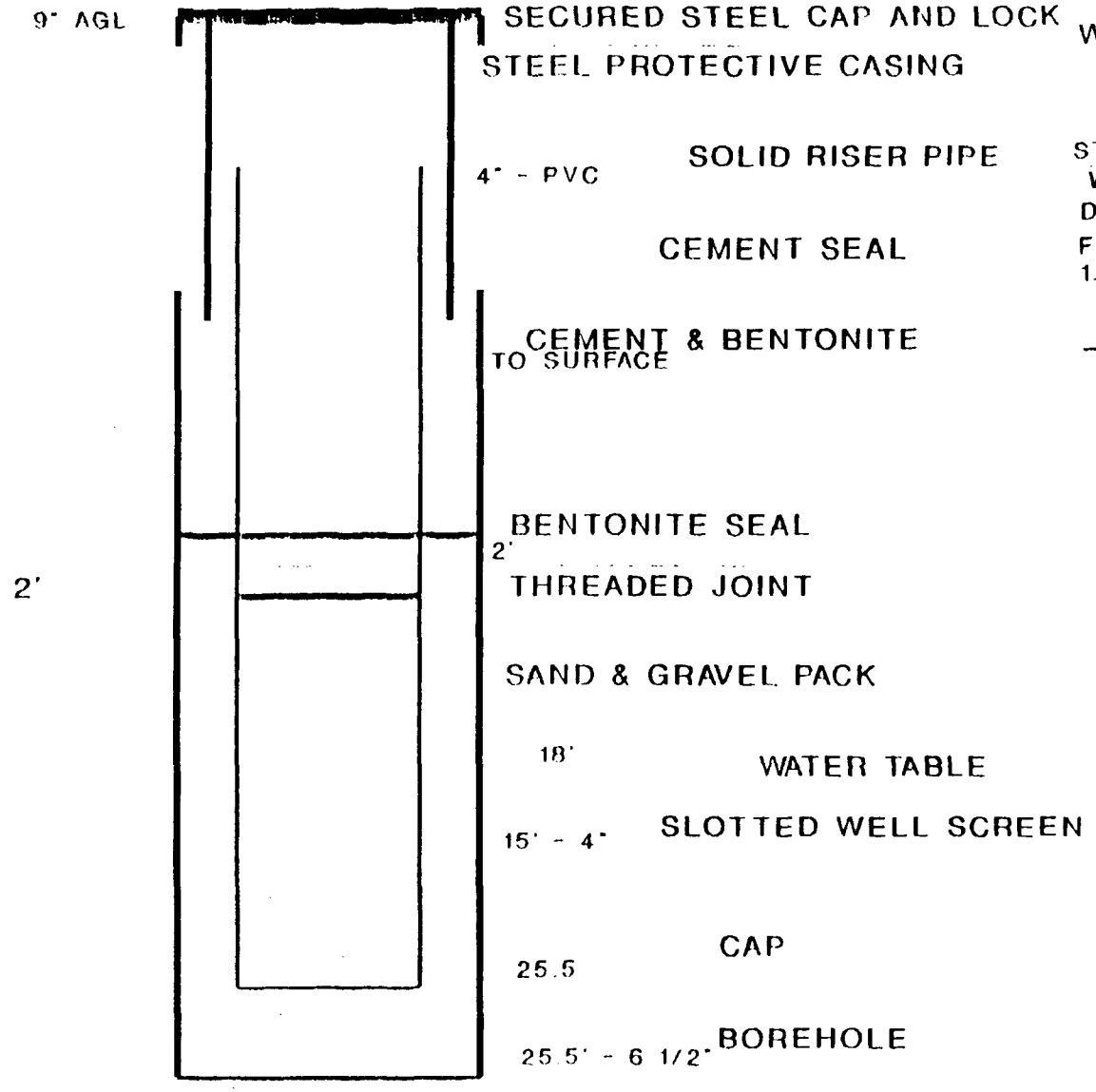
FL AT 68.80' NO H2S AND NO HYDROCARBONS 1/24/92

WELL # 6

EMPIRE ABO GAS PLANT
DEC. 21, 1991
15 PPM H2S @ 40'
WET @ 45'



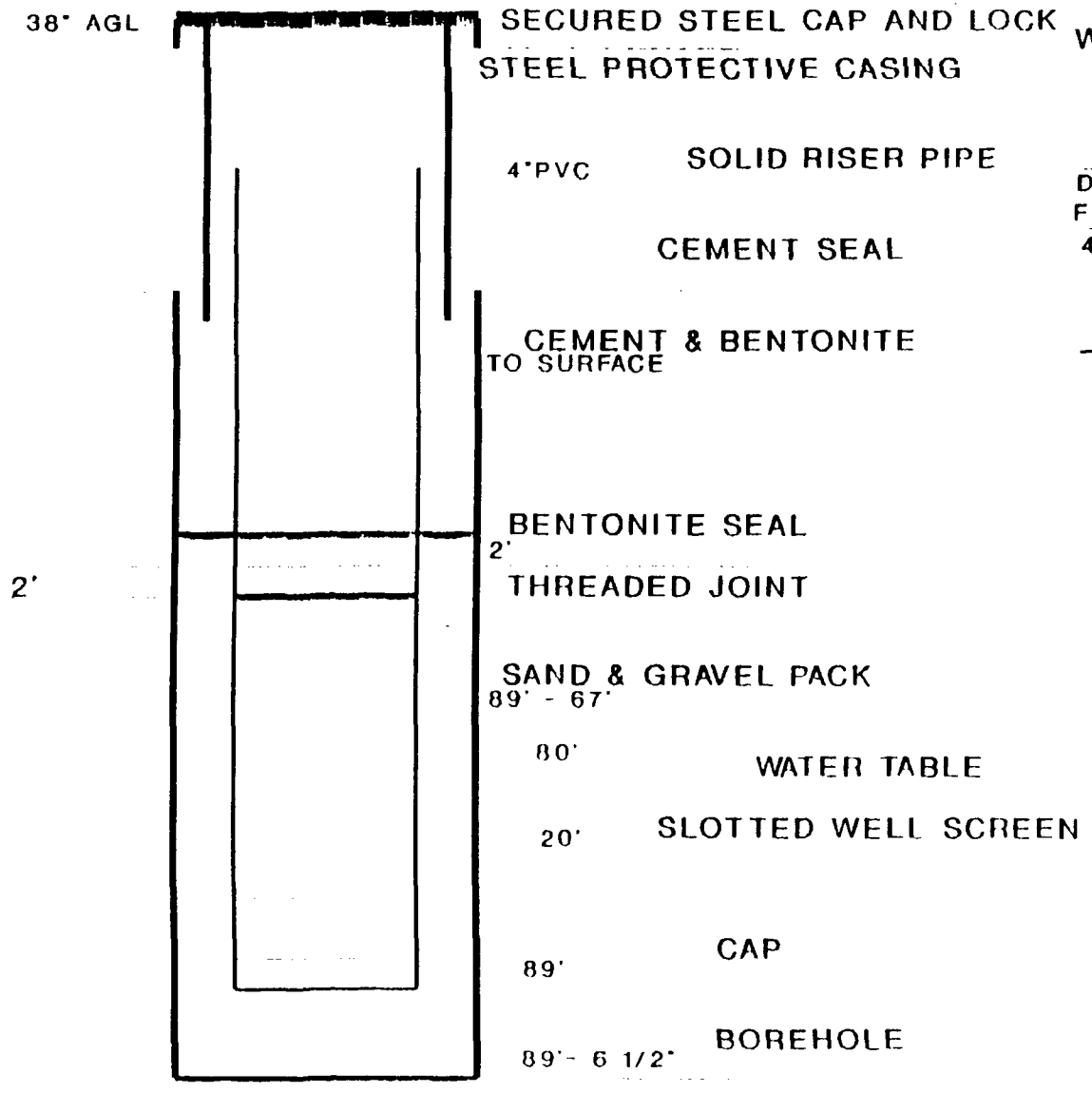
FL @ 39.50 FS 240PPM H2S BLEED TO 0 WELL PRESSURE UP
13" FREE HYDROCARBONS ON FLUID & 2" MIXED 1/24/92



WELL # 7

EMPIRE ABO GAS PLANT
DEC. 22, 1991
STRONG H2S - 25/35 PPM @ 18'
WET @ 18'
DEVELOPMENT OF WELL
FLUID LEVEL 8' FS
1.5 GPM WITH 1458 PPM H2S

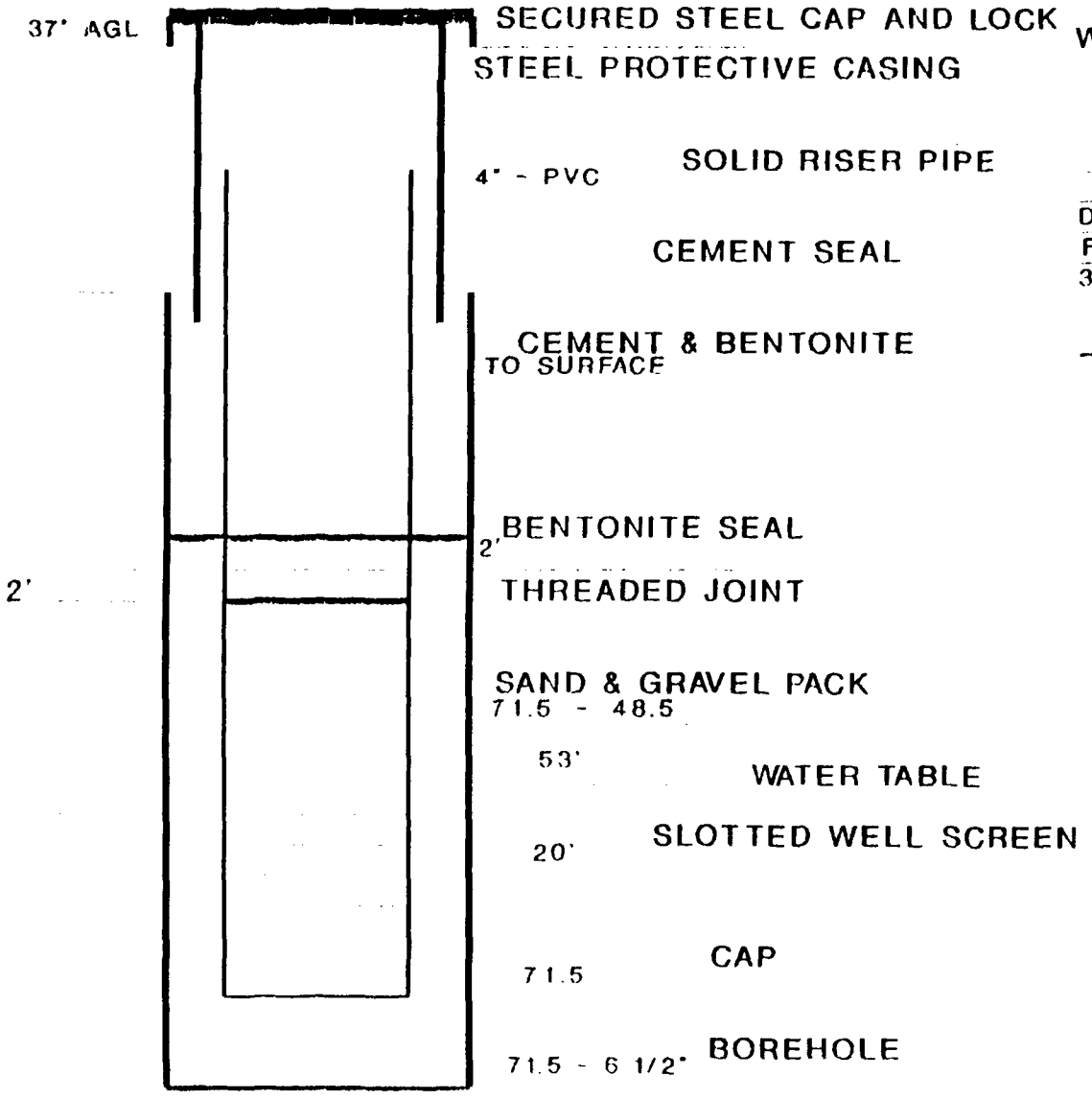
FLUID 8.50 FS - 340PPM H2S NO FREE HYDROCARBONS 1/24/92



WELL # 8

EMPIRE ABO GAS PLANT
DEC. 28, 1991
NO H2S WET @ 70'
DEVELOPMENT OF WELL
FLUID LEVEL 64.5' FS
4 GPM WITH 0 H2S

FL @ 67.30 FS NO H2S AND NO FREE HYDROCARBONS 1/24/92



WELL # 9

EMPIRE ABO GAS PLANT
DEC. 28, 1991
39 PPM H2S @ 48' - @ 60'
WET @ 53'
DEVELOPMENT OF WELL
FLUID LEVEL 57' FS
3 GPM WITH 58PPM H2S

FL @ 58.0 FS - NO H2S AND 10'FREE AND 4" MIX HYDROCARBONS
1/24/92

EMPIRE ABO GAS PLANT

NEW MEXICO STATE ENGINEER OFFICE
WELL RECORD REPORT

SECTION 12

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION CO. Owner's Well No. ____
Street or Post Office Address ~~BOX 3092~~
City and State ~~HOUSTON, TX 77253-3092~~

Well was drilled under Permit No. MW#1 EMPIRE ABO / soil boring and is located in the:

a. ____ ¼ ____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. ____ of Map No. ____ of the ____

c. Lot No. ____ of Block No. ____ of the ____
Subdivision, recorded in ____ County.

d. X= ____ feet, Y= ____ feet, N.M. Coordinate System ____ Zone in the ____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1022

Address 3521 CAMINO REAL HOBBS NM 88240

Drilling Began 12-29-91 Completed 12-29-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or ____ at well is ____ ft. Total depth of well 200 ft.

Completed well is ☐ shallow ☐ artesian. Depth to water upon completion of well DRY ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				

Section 5. PLUGGING RECORD

Plugging Contractor ____
Address ____
Plugging Method ____
Date Well Plugged ____
Plugging approved by:

____
State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad ____ FWL ____ FSL ____

File No. ____ Use ____ Location No. ____

From	To	In feet	
0	4"	4"	ASPHALT MW #1 EMPIRE ABO
4"	1	6	FILL/TOP SOIL
1	2	1	WHITE CLAY
2	3.5	1.5	BROWN SAND
3.5	9	5.5	WHITE CLAY & ROCK
9	12	3	BROWN CLAY
12	20	8	GRAY CLAY & ROCK
20	22	2	BROWN CLAY & ROCK
22	61	39	GRAY CLAY & ROCK
61	63	2	BROWN ROCK
63	73	10	WHITE CLAY & ROCK
73	81	8	GRAY CLAY & ROCK
81	86	5	RED CLAY
86	98	12	BROWN CLAY
98	103	5	BROWN CLAY
~~103~~	~~109~~	~~6~~	~~RED CLAY & ROCK~~
~~109~~	~~121~~	~~12~~	~~PINK CLAY & ROCK~~
~~121~~	~~148~~	~~27~~	~~DAMP RED CLAY~~
~~148~~	~~200~~	~~52~~	~~DRY RED CLAY & ROCK~~

Section 7. REMARKS AND ADDITIONAL INFORMATION

Back filled with cuttings and cement plug to surface.

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alan Eades by Sue Eades

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION CO. Owner's Well No. _____

Street or Post Office Address BOX 3092

City and State HOUSTON, TX 77253-3092

Well was drilled under Permit No. MW#2 EMPIRE ABO and is located in the:

a. ___ ¼ ___ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1022

Address 3521 CAMINO REAL HOBBS NM 88240

Drilling Began 12-28-91 Completed 12-29-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 34.5 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 30 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
30	35	5	WET BROWN CLAY	5

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	SCH 40				37.5		19.5	34.5

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

From	To	Thickness in Feet	Color and Type of Material Encountered
0	3	3	TOP SOIL MW #2 EMPIRE ABO
3	13	10	WHITE CLAY W/ROCK STRINGERS
13	14	1	RED CLAY
14	20	6	WHITE CLAY W/ROCK STRINGERS
20	21	1	BROWN CLAY
21	30	9	WHITE CLAY
30	34.5	4.5	WET BROWN CLAY

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allan Eades by Joe Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION COMPANY Owner's Well No. _____

Street or Post Office Address POST OFFICE BOX 3092

City and State HOUSTON, TX. 77253-3092

Well was drilled under Permit No. Monitor Well #8 EMPIRE ABO and is located in the:

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 2 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN GADDIS License No. WD1044

Address 1325 Katy Lane Hobbs,N.M. 88240

Drilling Began 12-20-91 Completed 12-21-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 88.5 ft.

Completed well is ☑ shallow ☐ artesian. Depth to water upon completion of well 70 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
70	88.5	18.5	GRAY AND BROWN SAND	10

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch 40				91.5		68.5	88.5

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

0	1	1	FILL
1	2	1	TOP SOIL
2	6	4	WHITE SANDY CLAY
6	10.5	3.5	RED CLAY
10.5	34	23.5	BROWN CLAY
34	38	4	DAMP GRAY CLAY
38	70	42	WHITE CLAY W/ROCK STRINGERS
70	80	10	GRAY WET SAND
80	85	5	GRAY WET SAND
85	88.5	3.5	BROWN SAND
			MW #3, EMPIRE ABO

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Ellen Eades by Joe Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION COMPANY Owner's Well No. _____
Street or Post Office Address POST OFFICE BOX 3092
City and State HOUSTON, TX 772592-3092

Well was drilled under Permit No. Monitor Well #4 EMPIRE ABO and is located in the:

a. ____ ¼ ____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1044

Address 1335 Katy Lane Hobbs,N.M. 88240

Drilling Began 12-20-91 Completed 12-21-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 59.5 ft.

Completed well is [X] shallow [ ] artesian. Depth to water upon completion of well 48 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
48	59.5	11.5	BROWN CLAY	10

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch 40				62.5		44.5	59.5

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

From	To	Thickness in Feet	Color and Type of Material Encountered
0	3	3	TOP SOIL
3	8	5	RED CLAY & ROCK
8	13	5	CALICHE W/RED CLAY STRINGERS
13	18	3	BROWN CLAY W/ROCK STRINGERS
18	21	3	DAMP BROWN CLAY
21	39	18	DRY BROWN CLAY
39	41	2	LIGHT BROWN CLAY W/ROCK STRINGERS
41	48	7	WHITE CLAY W/ROCK STRINGERS
48	59.5	11.5	WET BROWN CLAY
			MW #4 EMPIRE ABO

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alan Eades by Lee Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION COMPANY Owner's Well No. _____

Street or Post Office Address POST OFFICE BOX 3092

City and State HOUSTON, TX. 772532-3092

Well was drilled under Permit No. Monitor Well #5 EMPIRE ABO and is located in the:

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1044

Address 1335 Katy Lane Hobbs,N.M. 88240

Drilling Began 12-22-91 Completed 12-22-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 96 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 74 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
74	96	22	RED CLAY	10

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch 40				99		71	96

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

From	To	Thickness in Feet	Color and Type of Material Encountered
0	3	3	TOP SOIL/FILL MW #5 EMPIRE ABO
3	11	8	WHITE CLAY
11	14	3	WHITE ROCK
14	14.5	.5	DAMP YELLOW CLAY
14.5	16	1.5	WHITE ROCK
16	16.5	.5	RED CLAY
16.5	29	22.5	WHITE ROCK W/CLAY STRINGERS
29	32	3	YELLOW CLAY
32	49	17	WHITE CLAY
49	53	4	YELLOW SANDY CLAY
53	61	8	WHITE SAND W/ROCK STRINGERS
61	70	7	YELLOW SANDY CLAY W/ROCK STRINGERS
70	74	4	BROWN CLAY
74	96	22	WET RED CLAY

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allan Eades by Joe Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION COMPANY Owner's Well No. _____

Street or Post Office Address POST OFFICE BOX 3092

City and State HOUSTON, TX. 772532-3092

Well was drilled under Permit No. Monitor Well #6 EMPIRE ABO and is located in the:

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1044

Address 1335 Katy Lane Hobbs,N.M. 88240

Drilling Began 12-21-91 Completed 12-22-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 50 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 35 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
35	50	15	WHITE,GRAY & BROWN CLAY	10

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch 40				53		30	50

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

From	To	in Feet	Color and Type of Material Encountered
0	1	1	TOP SOIL MW #6 EMPIRE ABO
1	9	8	GRAY CLAY W/ROCK STRINGERS
9	15	6	WHITE CLAY W/ROCK STRINGERS
15	19	4	RED CLAY
19	28	9	WHITE CLAY W/ROCK STREINGERS
28	29	1	RED CLAY
29	34	5	GRAY CLAY
34	40	6	WHITE ROCK
40	43	3	GRAY CLAY
43	45	2	GRAY ROCK
45	47	2	WET GRAY CLAY
47	50	3	BROWN CLAY W/ROCK STRINGERS

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allan Eades by Sue Eades
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION COMPANY Owner's Well No. _____

Street or Post Office Address POST OFFICE BOX 3092

City and State HOUSTON, TX 772582-3092

Well was drilled under Permit No. Monitor Well #7 EMPIRE ABO and is located in the:

a. _____ ¼ _____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1044

Address 1335 Katy Lane Hobbs,N.M. 88240

Drilling Began 12-21-01 Completed 12-22-01 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 25.5 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 15 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
15	25.5	10.5	GRAY,RED & WHITE CLAY	10

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	Sch 40				28.5		10.5	25.5

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

om	To	in Feet	Color and Type of Material Encountered
0	1.5	1.5	TOP SOIL/FILL
1.5	18	16.5	GRAY CLAY W/ROCK STRINGERS
18	24	6	RED CLAY
24	25.5	1.5	WHITE CLAY W/ROCK STRINGERS
			MW #7 EMPIRE ABO

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allan Enders by Joe Enders
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION CO. Owner's Well No. _____
Street or Post Office Address BOX 3092
City and State HOUSTON, TX 77253-3092

Well was drilled under Permit No. MW#8 EMPIRE ABO and is located in the:

a. ___ ¼ ___ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1022

Address 3521 CAMINO REAL HOBBS NM 88240

Drilling Began 12-28-91 Completed 12-29-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 89 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 80 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
80	89	9	WET RED CLAY	5

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	SCH 40				92		69	89

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:
_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Depth in Feet		Thickness in Feet	Color and Type of Material Encountered
From	To		
0	8"	8"	FILL/TOP SOIL MW #8 EMPIRE ABO
8"	13	10	WHITE CLAY W/ROCK STRINGERS
3	4	1	YELLOW ROCK
4	4.5	.5	WHITE CLAY W/ROCK STRINGERS
4.5	8	3.5	RED ROCK
8	25.5	16.5	GRAY CLAY W/ROCK STRINGERS
25.5	27	1.5	HARD BROWN ROCK
27	47	20	GRAY CLAY W/ROCK STRINGERS
47	50	13	BROWN ROCK
50	59	9	GRAY CLAY W/ROCK STRINGERS
59	61	2	BROWN CLAY W/ROCK STRINGERS
61	70	9	GRAY CLAY W/ROCK STRINGERS
70	77	7	WET RED CLAY
77	80	3	BROWN ROCK
80	89	9	WET RED CLAY

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Allan Endes by Jane Endes
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 2 shall be completed.

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well AMOCO PRODUCTION CO. Owner's Well No. _____

Street or Post Office Address BOX 3092

City and State HOUSTON, TX 77253-3092

Well was drilled under Permit No. MW#9 EMPIRE ABO and is located in the:

a. ____ ¼ ____ ¼ SE ¼ NE ¼ of Section 3 Township 18S Range 27E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor ALAN EADES License No. WD1022

Address 3521 CAMINO REAL HOBBS NM 88240

Drilling Began 12-28-91 Completed 12-29-91 Type tools ROTARY Size of hole 6.5 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 71.5 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 61 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
61	71.5	10.5	WET GRAY & BROWN CLAY	5

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4	SCH 40				74.5		51.5	71.5

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Depth in Feet From	To	Thickness in Feet	Color and Type of Material Encountered
0	6"	6"	TOP SOIL
6"	7	6.5	WET GRAY CLAY
7	9	2	DRY GRAY CLAY
9	18	9	GRAY CLAY W/ROCK STRINGERS
18	21	3	GRAY ROCK
21	28	7	WHITE CLAY W/ROCK STRINGERS
28	31	3	BROWN CLAY W/ROCK STRINGERS
31	43	12	WHITE CLAY W/ROCK STRINGERS
43	44	1	CAVITY
44	49	5	GRAY CLAY
49	53	4	YELLOW CLAY W/ROCK STRINGERS
53	69	16	WET GRAY CLAY
69	71.5	2.5	BROWN CLAY

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be a... completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging re... Section 1(a) and Section 5 need be completed.