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INDIAN BASIN GAS PLANT TREATMENT PROJECT QUARTERLY REPORT

SECOND QUARTER 1992

AUGUST 1992

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SECOND QUARTER 1992

Submitted by
Marathon Oil Company
on behalf of the
Indian Basin Gas Plant Owners

August 6, 1992

INDIAN BASIN GAS PLANT TREATMENT PROJECT QUARTERLY REPORT

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Marathon Oil Company
INDIAN BASIN TREATMENT PROJECT
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Introduction

This report summarizes treatment activities which have taken place during the second quarter of 1992 related to environmental problems resulting from a produced liquid gathering line leak discovered in April 1991 near the Indian Basin Gas Plant. Preparation of this report is in accordance with the April 2, 1992 New Mexico Oil Conservation Division (OCD) directive for quarterly reporting on Indian Basin Treatment Project activities.

Quarterly Report Summary

The overall Indian Basin Treatment Project is now fully operational and functioning as designed per Marathon's March 1992 technical submittal to OCD. Combined withdrawals from the Lower Queen and shallow horizons are averaging approximately 1000 barrels a day and continue to be cleansed through the air stripper facility. Water discharged from the air stripper is utilized by the plant for process water. Water analyses from rancher wells and nearby surface springs have not exceeded any drinking water standards for hydrocarbons. The local ranchers are kept aware of treatment project activities via a quarterly update letter. Initial problems associated with high water levels affecting the soil venting wells have been resolved and venting is ongoing. Continued operation of the treatment system will increase the

apparent positive impacts on contaminant containment and hydrocarbon reduction.

Quarterly Point-in-time Sampling and Results

A point-in-time sampling of the Indian Basin Treatment Project monitor wells was conducted April 14, 15, 16 and 23, 1992. Forty-five wells were sampled by Southwestern Laboratories using EPA sampling protocol. The attached field log in Appendix A was prepared by Southwestern Laboratories from field notes taken during sample acquisition. It identifies the fluid levels, purge volumes and other field analysis data.

Marathon's Petroleum Technology Center (PTC) Littleton, Colorado, performed BTEX and chloride analyses for the quarterly point-in-time samples. High performance liquid chromatography (HPLC) was used to analyze water samples for BTEX concentrations and a titration method was used for chloride analysis. Numerous replicate analyses were made for each well sampled. Core Laboratories, Aurora, Colorado, performed four BTEX analyses using EPA method 8020 purge and trap gas chromatography as a quality assurance comparison of PTC's HPLC analytical techniques. Core Labs also conducted four chlorides analyses using EPA method 325.2. The results from the point-in-time analyses are contained in Appendix B. The following four wells (three shallow and one Lower Queen) were analyzed for BTEX concentrations using both HPLC and purge and trap analytical techniques: BH-41, BH-61, BH-67 and BH-83. A chart comparing the BTEX analytical results from the two

analysis techniques is attached in Appendix C. The results of this comparison indicate that the HPLC analysis technique generally portrays an accurate representation of BTEX concentration when compared with Core Labs analysis technique for the same samples.

Eight wells (four shallow and four Lower Queen) were also selected for comparative analysis based upon sample acquisition technique: Bailer sampling versus variable speed low volume pump sampling. The shallow wells were BH-61, BH-67, BH-73 and Sump 16A and the Lower Queen wells were BH-83, BH-86, BH-90 and BH-92. Results of the comparison are provided in the attached table and corresponding graph in Appendix D. The table summarizes replicate sample analyses performed on each monitor well and provides a calculated average concentration for each BTEX component. The corresponding graph compares the benzene replicate composite averages for bailer and pump sampling methodologies on each of the eight wells sampled by both methods.

Appendix E compares the results of the September 1991, December 1991 and April 1992 point-in-time benzene concentration data for the Lower Queen and shallow wells. The continued reduction of benzene concentrations in the Lower Queen suggests the contaminant plume is being contained by the present withdrawal program from six Lower Queen wells.

Monthly Sampling

Monthly water samples of nearby rancher water wells and springs were taken on April 16, May 13, and June 9. Analysis of

these water samples continue to indicate the water is within standards for hydrocarbons and chlorides as established by EPA for drinking water. The attached table in Appendix F provides a summary of the monthly analyses performed on the Lyman water well, the closest down gradient water well to the leak site, and the surface water spring in Rocky Arroyo. The quarterly analysis for the Biebelle water well, the second closest down gradient well, is also reported. All rancher water well and arroyo spring samples were obtained using EPA sampling and handling procedures. Core Labs performed the BTEX and chloride analyses using EPA approved methods. Analytical data from rancher water well samples and surface water springs is provided to the local ranchers each month with a letter of explanation. Copies of these letters are sent to the New Mexico Oil Conservation Division (Santa Fe) and the Bureau of Land Management (Roswell) upon distribution to the ranchers.

The plant water supply well and backup well are also sampled and analyzed on a monthly basis. This data also indicates the plant water remains within EPA drinking water standards. Analytical reports for all the rancher wells, springs and plant wells are also included in Appendix F.

Water and Condensate Recovery

Water withdrawals from Lower Queen wells and shallow water wells are individually metered and reported to the State Engineer's Office (SEO) on a monthly basis. The reports filed with the State Engineer's Office for the second quarter of 1992 are attached in

Appendix G. Appendix G also contains stacked bar graphs depicting weekly water withdrawals from Lower Queen and shallow soil water wells. A third graph shows the combined weekly water withdrawal from the Lower Queen and shallow zone.

Six Lower Queen wells (BH-84, BH-85, BH-87A, BH-88, BH-91A, and BH-94) were routinely pumped for water withdrawal during the quarter. Monthly water withdrawals for each Lower Queen well are listed below (withdrawal data in Barrels):

WELL NUMBER	APRIL	MAY	JUNE	QTR. TOTAL	
BH-84	4,226	586	4,282	9,094	
BH-85	6,363	1,183	5,260	12,806	
BH-87A	2,912	1,072	3,245	7,229	
BH-88	3,216	1,069	3,326	7,611	
BH-91A	6,085	4,654	7,402	18,141	
BH-94	2,671	1,558	1,324	5,553	
LQ TOTAL	25,473	10,123	24,839	60,434	BBL.

Five shallow water wells (BH-14, BH-36, BH-37, BH-44 and BH-59) were pumped during the second quarter. Only three wells are presently connected to the shallow water withdrawal system (BH-36, BH-37 and BH-59). Water withdrawals from the shallow horizon began May 1 from BH-14, BH-44 and BH-59. In mid-May, BH-36 and BH-37 were substituted for BH-14 and BH-44 to provide additional water removal in the vicinity of soil venting operations and because of

low pump volumes from BH-44. Monthly shallow water withdrawals for each shallow well are listed below (withdrawal data in Barrels).

WELL NUMBER	APRIL	MAY	JUNE	QTR. TOTAL	
BH-14	-	160	-	160	
BH-36	-	5	160	165	
BH-37	-	437	3438	3875	
BH-44	-	5	-	5	
BH-59	-	0	901	901	
SHALLOW TOTAL	-	607	4,499	5,105	BBL.

Fluids from the Lower Queen and shallow withdrawal wells are piped to an air stripper facility for hydrocarbon separation and eventual plant usage. An oil/water separator is used to remove any free product prior to soluble hydrocarbon removal. The free product is transferred to a holding tank which is gauged on a weekly basis. The measured volume of condensate recovered during the second quarter of 1992 in this holding tank was 17.1 barrels.

Potentiometric Mapping

Lower Queen fluid levels were measured once a month for all non-pumping wells. The tables in Appendix H list the Lower Queen fluid levels (depths and elevations) obtained during the second quarter of 1992 as well as the cumulative monthly rainfall as measured at the gas plant. Monthly Lower Queen potentiometric maps, based on these monthly fluid level readings are also attached

in Appendix H. The March and April potentiometric maps exhibit very similar characteristics. The May and June potentiometric maps reflects the significant volume of rainfall during these months.

A shallow water potentiometric map based on data accumulated during the April point-in-time sampling round is attached in Appendix I.

Soil Venting Activities

The Phase I soil venting program originally included three wells: BH-39, BH-40 and BH-59. During initial testing of the Phase I vent program in late March, it was determined that shallow water levels were too high to operate the system on a continuous basis. Two of the three originally selected Phase I wells produced too much water for the soil blower to operate, resulting in automatic shut down of the blower within short time periods (i.e. 1 hour to 24 hours). To overcome the high water levels, shallow water withdrawal had to be implemented to lower the water table in the vicinity of the Phase I soil vent wells. By lowering the water table, more soil would be exposed for hydrocarbon extraction by venting. As a consequence, shallow water withdrawals were initiated on May 1. The occurrence of unusually large rainfall during May required further adjustments to the shallow water withdrawal system in order to impact the shallow water levels in the vicinity of the venting program. Changes made included the exchange of BH-44 for BH-59 as a vent well with BH-59 becoming a shallow water withdrawal well, and the substitution of BH-36 for

BH-14 as a shallow water withdrawal well. This shallow water withdrawal scheme focused all three shallow withdrawal points close to the soil vent wells, thus providing maximum relief to the unseasonably high water table.

The present Phase I soil vent wells are BH-39, BH-40 and BH-44. When full scale water withdrawals from the shallow horizon commenced in mid June, soil venting operations improved.

APPENDIX A

APRIL POINT-IN-TIME FIELD NOTES

SOUTHWESTERN LABORATORIES

Materials, environmental and geotechnical consultation, fundamental testing and analytical services
P.O. Box 2150 • 1703 West Industrial • Midland, Texas 79702 • 915/683-3348

April 30, 1992

Mr. Jeff Lynn
Marathon Oil Company
P. O. Box 552
Midland, Texas 79702

Re: Marathon Indian Basin Remediation Project

Dear Mr. Lynn:

The monitoring project was started at 3:00 a. m. on April 14, 1992. Due to a malfunction in the purge pumping system, the decision was made to sample only the shallow wells and the Lower Queen wells equipped with a pump during this sample event. Thirty-seven (37) wells were checked during this three (3) day period.

The malfunction was corrected in the pump system and the remaining six (6) Lower Queen wells were sampled on April 23, 1992. In addition BH 29 and BH 30 was located at this time and the condition reported.

If you have any questions, please do not hesitate to call.

Sincerely,

Jack H. Barton
Manager, Midland EAS

JHB:jjc

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.		Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-24	MW-3	17.40		Dry	4-15-92						
BH-26	MW-4	18.68	18.58		4-15-92						Insufficient Sample
BH-28	MW-5	13.10		Dry	4-16-92						
BH-29	MW-6	13.98		Dry	4-23-92						
BH-55	MW-31	19.93	19.83	[illegible]	4-15-92	N	Bailed Dry				No Recovery in 2 hrs.
BH-30	MW-7	17.31		Dry	4-23-92						
BH-45	MW-22	17.30	17.16	0.14	4-15-92						Insufficient Sample
BH-31	MW-8	17.74		Dry	4-16-92						
BH-32	MW-9	13.65		Dry	4-16-92						
BH-33	MW-10	19.08	16.70	2.38	4-15-92	N	6.6	20	6.64	2713	
BH-34	MW-11	24.85	22.73	2.12	4-15-92	Y	7.9	21	6.82	2944	0.25" Free Product
BH-36	MW-13	22.07	18.92	3.15	4-15-92	Y	8.8	21	6.38	4531	0.125" Free Product
BH-42	MW-19	19.11	16.50	2.61	4-15-92	trace	9.7	20	6.79	3021	
BH-47	MW-24	14.09	12.90	1.19	4-15-92	N	Bailed Dry				No Recovery in 2 hrs.
BH-41	MW-18	17.42	15.25	2.14	4-15-92	N	8.1	20	6.85	3127	
BH-53	MW-29	14.76		Dry	4-15-92						

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.		Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-56	MW-32	16.77		Dry	4-15-92						
BH-44	MW-21	23.31			4-15-92						Well Pump Inoperative
BH-61	MW-38	20.62	16.54	4.08	4-14-92	N	5 (a)	19	6.89	1898	
BH-67	MW-44	25.34	19.40	5.94	4-14-92	N	25	19	7.04	2569	
BH-71	MW-48	19.98	19.44	0.54	4-15-92	N	Bailed Dry				No Recovery in 2 hrs.
BH-73	MW-50	37.15	22.83	14.32	4-14-92	N	13 (b)	21	6.70	5936	
BH-75	MW-52	21.44		Dry	4-14-92						
BH-77	MW-53	16.02		Dry	4-16-92						
BH-80	MW-54	78.15	44.77	33.38	4-16-92	N	43 (c)	21	7.25	2617	
BH-81	MW-55	66.80	24.77	42.03	4-16-92	N	157	19	6.98	3213	
BH-82	MW-56	43.76	9.26	34.50	4-16-92	Y					3.25" Free Product
BH-95	MW-69	59.41	31.63	27.78	4-16-92	Y					1.75" Free Product
Sump A11			15.50	1.70	4-15-92		45	20	6.73	2184	
Sump 16A		15.46	12.02	3.44	4-15-92		83	20	6.91	2722	

(a) Bailed dry after 5 gallons (b) Bailed dry after 13 gallons (c) Bailed dry after 43 gallons

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

QUEENS WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well ID		Reported Total Depth (ft.)	TTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-83	MW-57	177.20	157.59	19.61	4-23-92	N	73.2 Pump	21	6.98	885	
BH-84	MW-58	218.71			4-14-92	N	Present Pump	21	6.92	1712	
BH-85	MW-59	211.29			4-14-92	N	Present	19	7.42	1154	
BH-86	MW-60	223.08	185.79	37.29	4-23-92	N	139.3 Pump	22	7.23	938	
BH-87A	MW-61A	216.37			4-14-92	N	Present Pump	22	7.30	1253	
BH-88	MW-62	225.90			4-14-92	N	Present	21	7.01	1853	
BH-89	MW-63	221.19	197.02	24.17	4-23-92	N	90.3	21	6.89	673	
BH-90	MW-64	202.37	169.00	33.37	4-23-92	N	124.6 Pump	21	7.18	968	
BH-91A	MW-65A	168.56			4-14-92	N	Present	20	7.31	920	
BH-92	MW-66	235.18	200.25	34.93	4-23-92	N	130.5	21	7.16	1135	
BH-93	MW-67	165.77	136.25	29.52	4-14-92	N	110 Pump	20.5	7.30	765	
BH-94	MW-68	203.43			4-14-92	Y	Present				Pump Inoperative
BH-97	MW-70	225.20	192.75	32.45	4-23-92	N	121.2 Pump	21	7.20	590	
SW-1	Plant Well				4-14-92	N	Present	21	7.74	888	
SW-2	Backup Well		180		4-16-92		none				

APPENDIX B

APRIL POINT-IN-TIME ANALYTICAL RESULTS

INDIAN BASIN ENVIRONMENTAL SAMPLING RESULTS
April, 1992

	Chlorides (ppm) By Titration			BTEX (ppb) BY HPLC				
Well No.	Date	Chlorides	NOTES	Benzene	Toluene	E-benzene	Xylenes	BTEX
BH-33	4/15/92	319		1840	106	nd	2415.3	4361.3
BH-33	4/15/92			1720	50	nd	2334.3	4104.3
BH-34	4/15/92	653	Dil	2600	2710	484	4700	10494
BH-34	4/15/92		Dil	3573	2979	0	6714	13266
BH-36	4/15/92	1240	Dil	3501	121.5	0	7137	10759.5
BH-36	4/15/92		Dil	3483	142.2	0	6903	10528.2
BH-41	4/15/92	455		2280	66.4	653	1033.3	4032.7
BH-41	4/15/92	461	Dil	2934	141.3	704.7	1298.7	5078.7
BH-41	4/15/92		Dil	2934	333.9	618.3	1143	5029.2
BH-41	4/15/92		Dup,Dil	2817	180	690.3	1161	4848.3
BH-41	4/15/92		Dup	2230	96	623	984.4	3933.4
BH-42	4/15/92	463	Dil	3150	347.4	723.6	199.8	4420.8
BH-42	4/15/92		Dil	3240	333	807.3	325.8	4706.1
BH-61	4/14/92	142	Bail	105	13.2	94	8.5	220.7
BH-61	4/14/92		Bail	98	16.9	75.2	7.5	197.6
BH-61	4/14/92	151		33	21	8.1	5.5	67.6
BH-61	4/14/92			50	3.1	3.3	4.9	61.3
BH-61	4/14/92			30.4	14.4	6.8	1.4	53
BH-61	4/14/92		Dup	33.4	11.7	6.6	0	51.7
BH-61	4/14/92		Dup	30.7	18.5	5.4	5.5	60.1
BH-61	4/14/92		Bail	98.6	4.6	95.3	5.8	204.3
BH-67	4/14/92	1190	Bail	22.2	16.3	12.4	3.1	54
BH-67	4/14/92	218		11	15.2	13.4	4.8	44.4
BH-67	4/14/92		Bail	15.3	16.8	12.9	3.9	48.9
BH-67	4/14/92		Dup	11.6	16.5	15.9	0	44
BH-67	4/14/92			16.7	16.5	11.4	3	47.6
BH-67	4/14/92			16	17.7	14.3	2	50
BH-67	4/14/92		Dup	10.9	41.5	35.2	0	87.6
BH-67	4/14/92		Bail	10.7	6.9	12.6	2.7	32.9
BH-73	4/14/92	369		6.9	6.6	nd	0	13.5
BH-73	4/14/92	397	Bail	3.6	6.8	nd	4.2	14.6
BH-73	4/14/92		Bail	5.2	6.7	nd	3.6	15.5
BH-73	4/14/92			5.1	7.8	nd	11.4	24.3
BH-73	4/14/92			1.1	17.9	nd	16.7	35.7
BH-73	4/14/92		Bail	3.9	7.5	nd	4.7	16.1
BH-80	4/16/92	151		7.8	9.6	nd	13.6	31
BH-80	4/16/92			10.4	8.5	nd	11.9	30.8
BH-81	4/16/92	385		297	23.5	14.9	33.7	369.1
BH-81	4/16/92			294	23.3	14.1	26.3	357.7

INDIAN BASIN ENVIRONMENTAL SAMPLING RESULTS

April, 1992

	Chlorides (ppm) By Titration			BTEX (ppb) BY HPLC				
Well No.	Date	Chlorides	NOTES	Benzene	Toluene	E-benzene	Xylenes	BTEX
BH-83	4/23/92	89	Bail	12.9	16.1	nd	15.1	44.1
BH-83	4/23/92	117		127	24.8	nd	5.3	157.1
BH-83	4/23/92		Dup	122	29.1	nd	9.2	160.3
BH-83	4/23/92		Bail	14.5	8.2	nd	16.4	39.1
BH-83	4/23/92			125	24	nd	5	154
BH-83	4/23/92		Bail	11.3	8.6	nd	15.3	35.2
BH-83	4/23/92		Dup	126	23.3	nd	4.9	154.2
BH-83	4/23/92			127	23.5	nd	5	155.5
BH-84	4/14/92	156		203	32.2	55.8	68	359
BH-84	4/14/92			201	29.8	43.4	60.5	334.7
BH-85	4/14/92	52		39.1	11.5	19.7	20.1	90.4
BH-85	4/14/92			41.7	8.7	17.6	16.3	84.3
BH-86	4/23/92	8.3		2.8	5.2	nd	3.6	11.6
BH-86	4/23/92	9.5	Bail	3.5	7.2	nd	0	10.7
BH-86	4/23/92		Bail	2	8.9	nd	1.4	12.3
BH-86	4/23/92			4.6	7.5	nd	3.5	15.6
BH-86	4/23/92		Bail	2.7	8.2	nd	0	10.9
BH-86	4/23/92			3	6.4	nd	2.4	11.8
BH-87A	4/14/92	12		4.4	6.5	nd	13	23.9
BH-87A	4/14/92			5.5	6	nd	10.3	21.8
BH-88	4/14/92	218		263	39	170	297.6	769.6
BH-88	4/14/92			252	48.1	160	291.6	751.7
BH-89	4/23/92	14		4.5	6.2	nd	7.2	17.9
BH-89	4/23/92			3.7	5.3	nd	8	17
BH-90	4/23/92	10.4		68.5	7.3	18.9	77.7	172.4
BH-90	4/23/92	13	Bail	245	10.9	81.8	293.8	631.5
BH-90	4/23/92			69.2	5.4	14	66.5	155.1
BH-90	4/23/92		Bail	219	32.3	nd	330.7	582
BH-90	4/23/92			68.6	7	nd	77	152.6
BH-90	4/23/92		Dup	65.3	4.8	nd	75.7	145.8
BH-90	4/23/92		Dup	69.9	7.1	nd	80.9	157.9
BH-90	4/23/92		Bail	235	9.3	nd	311.4	555.7
BH-91A	4/14/92	33		25	9.6	nd	11.2	45.8
BH-91A	4/14/92			25.6	14.8	nd	11.9	52.3
BH-92	4/23/92		Bail	2.3	6.5	nd	0	8.8
BH-92	4/23/92	4.6	Bail	3.5	6.8	nd	0	10.3
BH-92	4/23/92	8.2		2.7	5.4	nd	3.4	11.5
BH-92	4/23/92			4	6	nd	3.6	13.6
BH-92	4/23/92		Bail	3	6	nd	0	9
BH-92	4/23/92			3.1	5.1	nd	2.3	10.5

INDIAN BASIN ENVIRONMENTAL SAMPLING RESULTS
April, 1992

		Chlorides (ppm) By Titration		BTEX (ppb) BY HPLC				
Well No.	Date	Chlorides	NOTES	Benzene	Toluene	E-benzene	Xylenes	BTEX
BH-93	4/14/92	6.3		3.5	7.1	nd	4.22	14.82
BH-93	4/14/92			5	8.14	nd	11.6	24.74
BH-94	4/14/92	82		1260	2910	444	3668	8282
BH-94	4/14/92			2470	3370	550	3866	10256
BH-97	4/23/92	8		nd	16.5	nd	7.6	24.1
BH-97	4/23/92			3.3	4.5	nd	4.1	11.9
Sump 11A	4/15/92	433		2600	2860	306	3373	9139
Sump 11A	4/15/92		Dil	3465	3303	0	4158	10926
Sump 16A	4/15/92	521		1240	119	nd	3052	4411
Sump 16A	4/15/92			1220	119	nd	2887	4226
Sump 16A	4/15/92			1240	189	nd	3376	4805
Sump 16A	4/15/92	522	Bail	1110	92.8	nd	3207	4409.8
Sump 16A	4/15/92		Bail	1150	109	nd	3137	4396
Sump 16A	4/15/92		Bail	1150	105	nd	3122	4377
SW-1	4/14/92	16		5.4	5.9	nd	13.7	25
SW-1	4/14/92			4.6	5.4	nd	13.8	23.8
SW-2	4/16/92	10.3		4.4	6.6	nd	4.6	15.6
SW-2	4/16/92			11.3	11.7	nd	1.4	24.4
Equip. Blk.	4/14/92	0		2.4	22.1	nd	0	24.5
Equip. Blk.	4/14/92	16		4	11.4	nd	0	15.4
Equip. Blk.	4/15/92			23.6	14.3	nd	245.4	283.3
Equip. Blk.	4/23/92	3.7		3.5	8	nd	12.2	23.7
Equip. Blk.	4/16/92	0		9	26.1	nd	71.3	106.4
Equip. Blk.	4/23/92	0		5.4	29.4	nd	15.6	50.4
Trip Blank	4/23/92	0		2.3	26.4	nd	0	28.7
Trip Blank	4/16/92	0		3.4	5.9	nd	0	9.3
Trip Blank	4/14/92	0		3	9	nd	0	12
Trip Blank	4/23/92	0		3.3	6.1	nd	0	9.4

INDIAN BASIN ENVIRONMENTAL SAMPLING RESULTS

April, 1992

		Chlorides (ppm) By Titration		BTEX (ppb) BY HPLC				
Well No.	Date	Chlorides	NOTES	Benzene	Toluene	E-benzene	Xylenes	BTEX
								0
Instrument blank with reagent water				2.1	5.4	nd	0	7.5
Instrument blank with reagent water				1.5	6.8	nd	0	8.3
Instrument blank with reagent water				3.3	4.9	nd	0	8.2
Instrument blank with reagent water				3.3	4.9	nd	5.9	14.1
Instrument blank with reagent water				2.9	5	nd	0	7.9
Instrument blank with reagent water				2.9	4.6	nd	7	14.5
HPLC Certification Standards				benzene	toluene	e-benzene	o-xylene	m,p-xylene
Certified Solution .005ml/20 ml Dilution				487	494	483	509	996
Calculated amount taken				500.8	500.9	500.9	500.8	1001
Recovery %				97.2%	98.6%	96.4%	102%	99.5%

Notes: Bail=bailer sampled, Dup=duplicate, Dil=dilution by 9-fold

The following data are from Core Lab, D. McWharter, 5/1/92

		Chlorides (mg/l) By 325.2		BTEX (ug/l) BY P&T 8020				
Well No.	Date	Chlorides	NOTES	Benzene	Toluene	E-benzene	Xylenes	BTEX
BH-61 MW38	04/14/92	127		67	17	55	7	146
BH-67 MW44	04/14/92	660		6	22	24	2	54
BH-41 MW18	04/15/92	464		2900	82	750	1200	4932
BH-83 MW57	04/23/92	90		150	10	nd	15	175
#1	04/16/92	12.6		nd	nd	nd	nd	0
#2	04/16/92	16.2		nd	nd	nd	nd	0
#4	04/16/92	13.5		nd	nd	nd	nd	0

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CORE LABORATORIES

LABORATORY TESTS RESULTS
05/01/92

JOB NUMBER: 920669 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

LIENT I.D.....: MARATHON OIL CO.
ATE SAMPLED.....: 04/14/92
TIME SAMPLED.....: 16:25
ORK DESCRIPTION...: BH61 MW38

LABORATORY I.D...: 920669-0001
DATE RECEIVED....: 04/21/92
TIME RECEIVED....: 09:32
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
hloride (Unfilt.)	127	1	mg/L	325.2 (1)	04/22/92	DTJ
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	04/24/92	KRB
Benzene	67	30	ug/L			
Toluene	17	1	ug/L			
Ethyl Benzene	55	1	ug/L			
Xylenes	7	1	ug/L			

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an Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
05/01/92

JOB NUMBER: 920669 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL CO.
DATE SAMPLED.....: 04/14/92
TIME SAMPLED.....: 11:45
WORK DESCRIPTION...: BH67 MW44

LABORATORY I.D...: 920669-0002
DATE RECEIVED....: 04/21/92
TIME RECEIVED....: 09:32
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	660	5	mg/L	325.2 (1)	04/22/92	DTJ
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	04/24/92	KRB
Benzene	5	1	ug/L			
Toluene	22	1	ug/L			
Ethyl Benzene	24	1	ug/L			
Xylenes	2	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
05/01/92

JOB NUMBER: 920669 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL CO.
DATE SAMPLED.....: 04/15/92
TIME SAMPLED.....: 17:30
WORK DESCRIPTION...: BH41 MW18

LABORATORY I.D...: 920669-0003
DATE RECEIVED....: 04/21/92
TIME RECEIVED....: 09:32
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	464	-	mg/L	325.2 (1)	04/22/92	DTJ
8020 - AROMATIC VOLATILE ORGANICS		*50		8020 (2)	04/24/92	KRB
Benzene	2900	50	ug/L			
Toluene	82	50	ug/L			
Ethyl Benzene	750	50	ug/L			
Xylenes	1200	50	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
05/13/92

JOB NUMBER: 920716 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 04/23/92
TIME SAMPLED.....: 17:15
WORK DESCRIPTION...: BH83MW57

LABORATORY I.D...: 920716-0001
DATE RECEIVED....: 04/28/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	90	2	mg/L	325.2 (1)	04/29/92	MW
8020 - AROMATIC VOLATILE ORGANICS		*5		8020 (2)	05/07/92	KRB
Benzene	150	5	ug/L			
Toluene	10	5	ug/L			
Ethyl Benzene	ND	5	ug/L			
Xylenes	15	5	ug/L			

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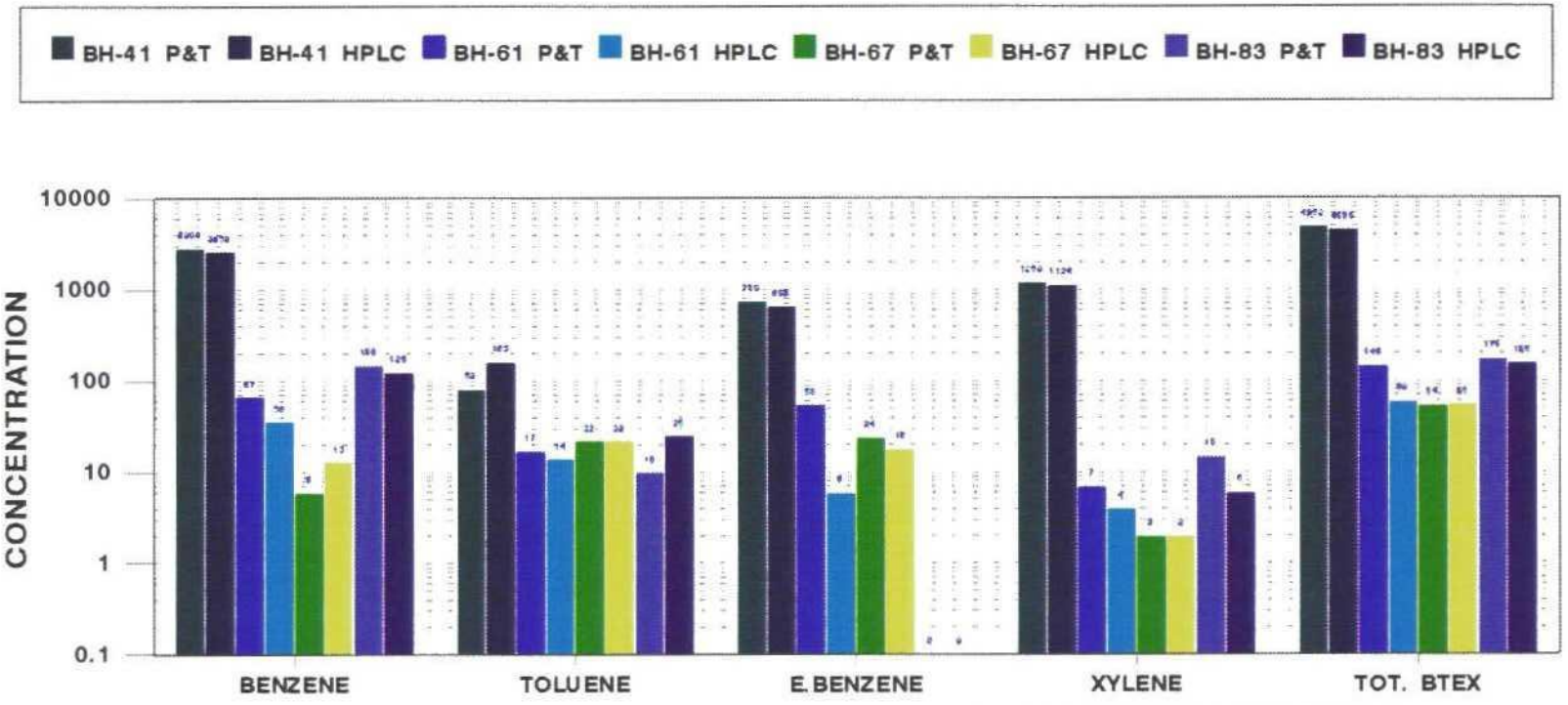
APPENDIX C

APRIL POINT-IN-TIME ANALYSIS TECHNIQUE COMPARISON

APPENDIX C

APRIL 1992 QUARTERLY POINT IN TIME SAMPLING RESULTS
CORE LABS P & T VERSUS MARATHON HPLC ANALYSIS COMPARISON



	BENZENE	TOLUENE	E.BENZENE	XYLENE	TOT. BTEX
BH-41 P&T	2900	82	750	1200	4932
BH-41 HPLC	2639	163	658	1124	4585
BH-61 P&T	67	17	56	7	146
BH-61 HPLC	36	14	6	4	60
BH-67 P&T	6	22	24	2	54
BH-67 HPLC	13	22	18	2	55
BH-83 P&T	150	10	0	15	176
BH-83 HPLC	125	25	0	6	156

BTEX COMPONENTS

HPLC - HIGH PERFORMANCE LIQUID CHROMOTOGRAPHY ANALYSIS
P & T - STANDARD PURGE AND TRAP ANALYSIS
ALL CONCENTRATIONS GIVEN IN PPB

APPENDIX D

APRIL POINT-IN-TIME SAMPLE ACQUISITION TECHNIQUE COMPARISON

APPENDIX D

APRIL QUARTERLY POINT IN TIME SAMPLING RESULTS
COMPARISON OF BAILER VERSUS PUMP SAMPLES

WELL NUMBER	SAMPLING TECHNIQUE	BENZENE CONCENTRATION	TOLUENE CONCENTRATION	ETHYLBENZENE CONCENTRATION	TOTAL XYLENE CONCENTRATION	TOTAL BTEX CONCENTRATION	CHLORIDE CONCENTRATION
BH-61/MW-38	Bailer	105	13.2	94	9	221	142
	Bailer	98.6	4.6	95.3	6	204	
	Bailer	98	16.9	76.2	8	198	
	BAILER AVG.	100.5	11.6	88.2	7.7	207.7	
	Pump	33	21	8.1	6	68	151
	Pump	50	3.1	3.3	5	61	
	Pump	30.4	14.4	6.8	1	53	
	Pump - Dup.	33.4	11.7	6.6	0	52	
	Pump - Dup.	30.7	18.5	5.4	6	60	
	PUMP AVG.	35.6	13.7	6.0	3.6	58.8	
BH-67/MW-44	Bailer	15.3	16.8	12.9	4	49	
	Bailer	22.2	16.3	12.4	3	54	1190
	Bailer	10.7	6.9	12.6	3	33	
	BAILER AVG	16.1	13.3	12.6	3.3	45.3	
	Pump	16.7	16.5	11.4	3	48	
	Pump	11	15.2	13.4	5	44	218
	Pump	16	17.7	14.3	2	50	
	Pump - Dup.	11.6	16.5	15.9	0	44	
	Pump - Dup.	10.9	41.5	35.2	0	88	
	PUMP AVG.	13.2	21.5	18.0	2.0	54.8	

BTEX DATA GIVEN IN PPB
CHLORIDE DATA GIVEN IN PPM

APPENDIX D

APRIL QUARTERLY POINT IN TIME SAMPLING RESULTS
COMPARISON OF BAILER VERSUS PUMP SAMPLES

WELL NUMBER	SAMPLING TECHNIQUE	BENZENE CONCENTRATION	TOLUENE CONCENTRATION	ETHYLBENZENE CONCENTRATION	TOTAL XYLENE CONCENTRATION	TOTAL BTEX CONCENTRATION	CHLORIDE CONCENTRATION
BH-73/MW-50	Bailer	3.6	6.8	ND	4	15	397
	Bailer	5.2	6.7	ND	4	16	
	Bailer	3.9	7.5	ND	14	31	
	BAILER AVG.	4.2	7.0	ND	8.7	20.7	
	Pump	6.9	6.6	ND	0	14	369
	Pump	5.1	7.8	ND	11	24	
	Pump	1.1	17.9	ND	17	36	
	PUMP AVG.	4.4	10.8	ND	9.3	24.7	
BH-83/MW-57	Bailer	12.9	16.1	ND	15	44	89
	Bailer	14.5	8.2	ND	16	39	
	Bailer	11.3	8.6	ND	15	35	
	BAILER AVG	12.9	11.0	ND	15.3	39.3	
	Pump	127	24.8	ND	5.3	167	117
	Pump	122	29.1	ND	9	160	
	Pump	125	24.0	ND	5	164	
	Pump - Dup.	126	23.3	ND	5	154	
	Pump - Dup.	127	23.5	ND	5	156	
	PUMP AVG.	125.4	24.9	ND	5.9	156.2	

BTEX DATA GIVEN IN PPB
CHLORIDE DATA GIVEN IN PPM

APPENDIX D

APRIL QUARTERLY POINT IN TIME SAMPLING RESULTS
COMPARISON OF BAILER VERSUS PUMP SAMPLES

WELL NUMBER	SAMPLING TECHNIQUE	BENZENE CONCENTRATION	TOLUENE CONCENTRATION	ETHYLBENZENE CONCENTRATION	TOTAL XYLENE CONCENTRATION	TOTAL BTEX CONCENTRATION	CHLORIDE CONCENTRATION
BH-86/MW-60	Bailer	3.5	7.2	ND	0	11	9.5
	Bailer	2.0	8.9	ND	1	12	
	Bailer	2.7	8.2	ND	4	11	
	BAILER AVG.	2.7	8.1	ND	0.3	11.3	
	Pump	2.8	5.2	ND	4	12	8.3
	Pump	4.6	7.5	ND	4	16	
	Pump	3.0	6.4	ND	2	12	
	PUMP AVG.	3.5	6.4	ND	3.3	13.3	
BH-90/MW-64	Bailer	245	10.9	81.8	294	632	13
	Bailer	219	32.3	ND	331	582	
	Bailer	235	9.3	ND	311	556	
	BAILER AVG	233	17.5	27.3	312	590	
	Pump	68.5	7.3	18.9	78	172	10.4
	Pump	69.2	5.4	14	67	155	
	Pump	68.6	7.0	ND	77	153	
	Pump - Dup.	65.3	4.8	ND	76	146	
	Pump - Dup.	69.9	7.1	ND	81	158	
	PUMP AVG.	68.3	6.3	6.6	75.8	156.8	

BTEX DATA GIVEN IN PPB
CHLORIDE DATA GIVEN IN PPM

APPENDIX D

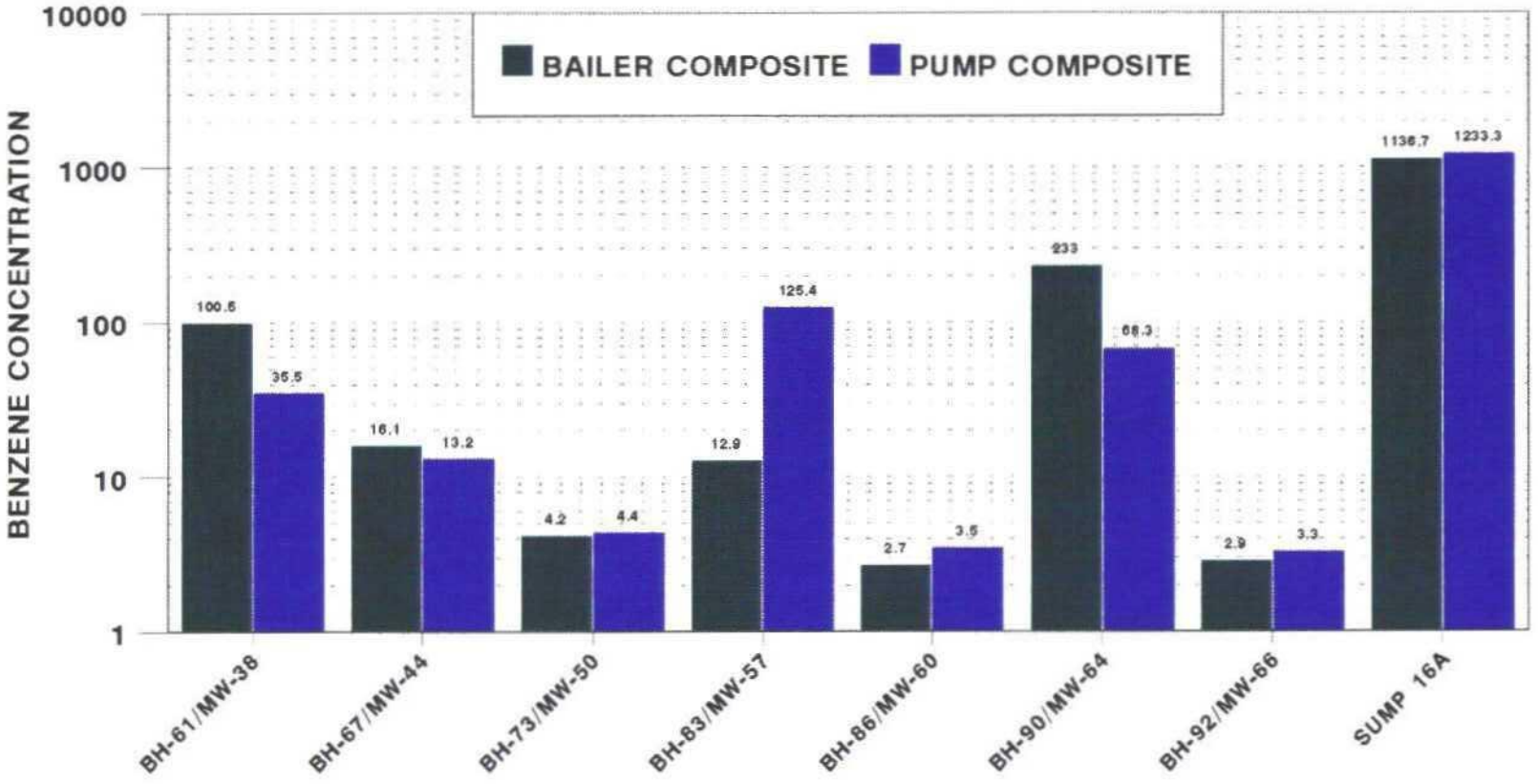
APRIL QUARTERLY POINT IN TIME SAMPLING RESULTS
COMPARISON OF BAILER VERSUS PUMP SAMPLES

WELL NUMBER	SAMPLING TECHNIQUE	BENZENE CONCENTRATION	TOLUENE CONCENTRATION	ETHYLBENZENE CONCENTRATION	TOTAL XYLENE CONCENTRATION	TOTAL BTEX CONCENTRATION	CHLORIDE CONCENTRATION
BH-92/MW-66	Bailer	2.3	6.5	ND	0	9	4.6
	Bailer	3.5	6.8	ND	0	10	
	Bailer	3.0	6.0	ND	0	9	
	BAILER AVG.	2.9	6.4	ND	0	9.3	
	Pump	2.7	5.4	ND	3	12	8.2
	Pump	4.0	6.0	ND	4	14	
	Pump	3.1	5.1	ND	2	11	
	PUMP AVG.	3.3	5.5	ND	3	12.3	
SUMP 16A	Bailer	1110	92.8	ND	3207	4410	522
	Bailer	1150	109	ND	3137	4396	
	Bailer	1150	105	ND	3122	4377	
	BAILER AVG	1136.7	102.3	ND	3155.3	4394.3	
	Pump	1240	119	ND	3052	4411	521
	Pump	1220	119	ND	2887	4226	
	Pump	1240	189	ND	3376	4805	
	PUMP AVG.	1233.3	142.3	ND	3105.0	4480.7	

BTEX DATA GIVEN IN PPB
CHLORIDE DATA GIVEN IN PPM

APPENDIX D

APRIL QUARTERLY POINT IN TIME SAMPLING RESULTS
BAILER VERSUS PUMP BENZENE CONCENTRATION COMPARISON



BAILER COMPOSITE	100.5	16.1	4.2	12.9	2.7	233	2.9	1136.7
PUMP COMPOSITE	35.5	13.2	4.4	125.4	3.5	68.3	3.3	1233.3

WELLS SAMPLED

DATA GIVEN IN PPB

DATA REPRESENT COMPOSITE AVERAGES FOR REPLICATE ANALYSES

APPENDIX E

POINT-IN-TIME RESULTS COMPARISON

APPENDIX E TABLE 1

LOWER QUEEN BENZENE ANALYSES
POINT-IN-TIME SAMPLINGS

(Data in PPB)

Well Number	September 1991^	December 1991^	April 1992#
BH-83	1600	350	12.9*@
BH-83	-	290	125.4*
BH-83	-	-	150.^
BH-84+	40	90	202.*
BH-85+	540	420	40.4*
BH-86	33	<1	2.7*@
BH-86	-	-	3.5
BH-87A+	190	10	5.0*
BH-88+	2200	1400	257.5*
BH-89	<1	<1	4.1*
BH-90	150	130	233.*@
BH-90	-	-	68.3*
BH-91A+	680	150	25.3*
BH-92	<1	<1	2.9*@
BH-92	-	-	3.3*
BH-93	280	320	4.3*
BH-94+	240	1900	1865.*
BH-97	<1	<1	1.7*

\+ Withdrawal Well

^ Analysis by Core Labs

\# Analysis by PTC HPLC method except as noted

* Average of more than one analysis

@ Bailed sample; all others collected by pump

APPENDIX E TABLE 2

SHALLOW WELL BENZENE ANALYSES
POINT-IN-TIME SAMPLINGS

(Data in PPB)

Well Number	September 1991^	December 1991^	April 1992#
BH-14	250	200	NS
BH-33	2300	2300	1780.*@
BH-34	3000	3800	2971.*@
BH-35	3800	Dry	NS
BH-36	3100	3000	3492.*@
BH-38	5100	Dry	NS
BH-39	1700	Dry	NS
BH-41	4300	NS	2639.*
BH-42	4700	Dry	3195.*@
BH-44	1000	1100	NS
BH-45	4	NS	Dry
BH-49	3100	3000	NS
BH-55	<1	NS	Dry
BH-61	15	15	36.*
BH-61	-	-	101.*@
BH-64	200	170	NS
BH-65	<1	<1	NS
BH-67	59	NS	13.*
BH-67	-	-	16.*@
BH-68	<1	<1	NS
BH-70	2600	2000	NS
BH-71	<1	<1	Dry
BH-73	<1	<1	4.*
BH-73	-	-	4.*@
BH-74	800	<1	NS
BH-80	<1	<1	9.*
BH-81	940	400	296.*
BH-82	2200	1000	NS
Sump A11	1400	2900	3033.*
Sump 16A	240	2000	1233.*
Sump 16A	-	-	1137.*@

Note: See footnotes on following page.

^ Analysis by Core Labs

Analysis by PTC HPLC method except as noted

* Average of more than one analysis

@ Bailed sample; all others collected by pump

NS Not sampled

APPENDIX F

RANCHER WATER WELLS, PLANT WATER WELLS AND SPRINGS ANALYSES

APPENDIX F

RANCHER WATER WELL SAMPLE RESULTS
SECOND QUARTER 1992

LOCATION	APRIL	MAY	JUNE	JUNE DUPLICATE	JULY
LYMAN WATER WELL					
BENZENE	ND	ND	ND	ND	ND
TOULENE	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND
XYLENE	ND	ND	2	ND	ND
CHLORIDE	12.6	12.9	12.8	-	-
UPPER INDIAN HILLS SPRING WEST					
BENZENE	ND	ND	ND	-	-
TOULENE	ND	ND	ND	-	-
ETHYLBENZENE	ND	ND	ND	-	-
XYLENE	ND	ND	ND	-	-
CHLORIDE	16.2	11.3	4.6	-	-
BIEBELLE WATER WELL					
BENZENE	ND	-	-	-	-
TOULENE	ND	-	-	-	-
ETHYLBENZENE	ND	-	-	-	-
XYLENE	ND	-	-	-	-
CHLORIDE	13.5	-	-	-	-

BTEX GIVEN IN PPB
CHLORIDE GIVEN IN PPM
ND - BELOW DETECTION LIMIT

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CORE LABORATORIES

LABORATORY TESTS RESULTS
05/01/92

JOB NUMBER: 920669 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL CO.
DATE SAMPLED.....: 04/16/92
TIME SAMPLED.....: 09:27
WORK DESCRIPTION...: #1 Lyman Well

LABORATORY I.D...: 920669-0004
DATE RECEIVED....: 04/21/92
TIME RECEIVED....: 09:32
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	12.6	0.5	mg/L	325.2 (1)	04/22/92	DTJ
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	04/24/92	KRB
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
05/01/92

JOB NUMBER: 920669 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL CO.
DATE SAMPLED.....: 04/16/92
TIME SAMPLED.....: 09:50
WORK DESCRIPTION...: #2 Upper Indian Spring. West

LABORATORY I.D...: 920669-0005
DATE RECEIVED....: 04/21/92
TIME RECEIVED....: 09:32
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	16.2	0.5	mg/L	325.2 (1)	04/22/92	DTJ
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	04/24/92	KRB
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
05/01/92

JOB NUMBER: 920669 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL CO.
DATE SAMPLED.....: 04/16/92
TIME SAMPLED.....: 10:12
WORK DESCRIPTION...: #4 Bieballe Well

LABORATORY I.D...: 920669-0006
DATE RECEIVED....: 04/21/92
TIME RECEIVED....: 09:32
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	13.5	0.5	mg/L	325.2 (1)	04/22/92	DTJ
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	04/24/92	KRB
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
06/12/92

JOB NUMBER: 920864 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.........: MARATHON OIL
DATE SAMPLED.......: 05/13/92
TIME SAMPLED.......: 10:15
WORK DESCRIPTION...: #1 Lyman Water Well

LABORATORY I.D...: 920864-0001
DATE RECEIVED....: 05/15/92
TIME RECEIVED....: 10:05
REMARKS..........:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	12.9	0.5	mg/L	325.2 (1)	06/08/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	05/19/92	KRB
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
06/12/92

JOB NUMBER: 920864 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 05/13/92
TIME SAMPLED.....: 10:40
WORK DESCRIPTION...: #2 Upper Indian Hills Spring - West

LABORATORY I.D...: 920864-0002
DATE RECEIVED....: 05/15/92
TIME RECEIVED....: 10:05
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	11.3	0.5	mg/L	325.2 (1)	06/08/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	05/19/92	KRB
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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Aurora, CO 80012
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Western Atlas International

CORE LABORATORIES

LABORATORY TESTS RESULTS
06/12/92

JOB NUMBER: 920864 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 05/13/92
TIME SAMPLED.....: 13:15
WORK DESCRIPTION...: #7 Plant Water Well - SW-1

LABORATORY I.D...: 920864-0003
DATE RECEIVED....: 05/15/92
TIME RECEIVED....: 10:05
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	18.8	0.5	mg/L	325.2 (1)	06/08/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	05/19/92	KRB
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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a Litton Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
06/12/92

JOB NUMBER: 920864 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 05/13/92
TIME SAMPLED.....: 11:30
WORK DESCRIPTION...: #8 Plant Backup Well SW-2

LABORATORY I.D...: 920864-0004
DATE RECEIVED....: 05/15/92
TIME RECEIVED....: 10:05
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	104	1	mg/L	325.2 (1)	06/11/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	05/19/92	KRB
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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A Baker Hughes Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
06/30/92

JOB NUMBER: 921071 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: WATER
DATE SAMPLED.....: 06/09/92
TIME SAMPLED.....: 13:00
WORK DESCRIPTION...: #1 Lyman Water Well

LABORATORY I.D...: 921071-0001
DATE RECEIVED....: 06/11/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	12.8	0.5	mg/L	325.2 (1)	06/30/92	KDS
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/12/92	RAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	2	1	ug/L			

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Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
06/30/92

JOB NUMBER: 921071 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: WATER
DATE SAMPLED.....: 06/09/92
TIME SAMPLED.....: 13:25
WORK DESCRIPTION...: #2 Upper Indian Hills Spring - West

LABORATORY I.D...: 921071-0002
DATE RECEIVED....: 06/11/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	4.6	0.5	mg/L	325.2 (1)	06/30/92	KDS
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/12/92	RAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
06/30/92

JOB NUMBER: 921071 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: WATER
DATE SAMPLED.....: 06/09/92
TIME SAMPLED.....: 15:05
WORK DESCRIPTION...: #7 Plant Supply Well - SW1

LABORATORY I.D...: 921071-0003
DATE RECEIVED....: 06/11/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
hloride (Unfilt.)	20	1	mg/L	325.2 (1)	06/24/92	KDS
3020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/12/92	RAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
06/30/92

JOB NUMBER: 921071 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: WATER
DATE SAMPLED.....: 06/10/92
TIME SAMPLED.....: 10:55
WORK DESCRIPTION...: #8 Plant backup well - SW 2

LABORATORY I.D...: 921071-0004
DATE RECEIVED....: 06/11/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	28	1	mg/L	325.2 (1)	06/24/92	KDS
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	06/12/92	RAD
Benzene	2	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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A Litton/Teleco Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
07/02/92

JOB NUMBER: 921191 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 06/30/92
TIME SAMPLED.....: 15:50
WORK DESCRIPTION...: #1 Lyman Water Well

LABORATORY I.D...: 921191-0001
DATE RECEIVED....: 07/02/92
TIME RECEIVED....: 09:19
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/02/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

L A B O R A T O R Y T E S T S R E S U L T S
07/02/92

JOB NUMBER: 921191   CUSTOMER: MARATHON OIL COMPANY   ATTN: JEFFREY S. LYNN

CLIENT I.D.........: MARATHON OIL
DATE SAMPLED.......: 06/30/92
TIME SAMPLED.......: 14:50
WORK DESCRIPTION...: #8 Plant backup well - SW2

LABORATORY I.D...: 921191-0002
DATE RECEIVED....: 07/02/92
TIME RECEIVED....: 09:19
REMARKS..........:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/02/92	MAD
Benzene	3	1	ug/L			
Toluene	2	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	2	1	ug/L			

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LABORATORY TESTS RESULTS
07/15/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/08/92
TIME SAMPLED.....: 11:00
WORK DESCRIPTION...: #1 Lyman Water Well

LABORATORY I.D...: 921250-0001
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECH
Chloride (Unfilt.)	N/A	1	mg/L	325.2 (1)	N/A	N/A
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/15/92	MLD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

JUL 15 1992

Environmental & Safety

1300 South Potomac, Suite 130
Aurora, CO 80012
(303) 751-1780

APPENDIX G

STATE ENGINEER'S WATER PRODUCTION REPORTS

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

May 5, 1992

Robert R. Marr
Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Dear Mr. Marr:

The below listing of monitor wells (MW)/boreholes (BH) indicates the meter reading of fluid removed from the Lower Queen as of May 4, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	5/4/92	774721.6	774721.6 GALS.
MW-59/BH-85	10259114	5/4/92	39652.3	39652.3 BBLS.
MW-61A/BH-87A	10239116	5/4/92	574623.3	574623.3 GALS.
*MW-62/BH-88	10239115	5/4/92	473281.3	667212.0 GALS.
MW-65A/BH-91A	10239117	5/4/92	986801.4	986801.4 GALS.
MW-68/BH-94	10239114	5/4/92	623523.5	623523.5 GALS.
	TOTAL			5,292,278.4 GALS.

Cumulative Lower Queen fluid removal as of 5/4/92 is 5,613,746.4 GALS. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

If more information is required, please free to contact me at (915) 687-8312.

Very truly yours,

Jeffrey S. Lynn
Advanced Environmental Representative

JSL/cb

cc: J. L. Benson
D. E. Kenyon
R. F. Unger

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

June 4, 1992

Robert R. Marr
Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of June 1, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	6/1/92	799340.7	799340.7 GALS.
MW-59/BH-85	10259114	6/1/92	40834.5	40834.5 BBLS.
MW-61A/BH-87A	10239116	6/1/92	619649.0	619649.0 GALS.
*MW-62/BH-88	10239115	6/1/92	518144.8	712075.5 GALS.
MW-65A/BH-91A	10239117	6/1/92	1182277.8	1182277.8 GALS.
MW-68/BH-94	10239114	6/1/92	688957.2	688957.2 GALS.
		LOWER QUEEN TOTAL		5,717,349.2 GALS.

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queen fluid removal as of 6/1/92 is 6,038,817.2 GALS. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of June 1, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-1/BH-14	02209213	5/18/92	6712.5	6712.5 GALS.
MW-13/BH-36	02209213	6/01/92	6909.0	196.5 BBLS.
MW-14/BH-37	02209214	6/01/92	22150.2	22150.2 GALS.
MW-21/BH-44	02209212	5/18/92	188.8	188.8 GALS.
MW-35/BH-59	02209212	6/01/92	188.8	0 GALS.
		SHALLOW TOTAL		29,248.0 GALS.

The meter on MW-1/BH-14 (serial number 02209213) was moved to MW-13/BH-36 on May 18, 1992. The total fluid withdrawal from MW-1/BH-14 prior to pump removal was 6712.5 gallons.

The meter on MW-21/BH-44 (serial number 02209212) was also moved to MW-35/BH-59 on May 18, 1992. The total fluid withdrawal from MW-21/BH-44 prior to pump removal was 188.8 gallons.

If more information is required, please free to contact me at (915) 687-8312.

Very truly yours,

Jeffrey S. Lynn
Advanced Environmental Representative

JSL/cb

xc: T. C. Lowry - Midland
D. E. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser - IBGP, Artesia

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

July 10, 1992

Robert R. Marr
Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of July 6, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	7/6/92	979200.0	979200.0 GALS.
MW-59/BH-85	10259114	7/6/92	46094.5	46094.5 BBLS.
MW-61A/BH-87A	10239116	7/6/92	755936.0	755936.0 GALS.
*MW-62/BH-88	10239115	7/6/92	657821.8	851752.5 GALS.
MW-65A/BH-91A	10239117	7/6/92	1493169.4	1493169.4 GALS.
MW-68/BH-94	10239114	7/6/92	744543.9	744543.9 GALS.
		LOWER QUEEN TOTAL		6,760,570.8 GALS.

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queen fluid removal as of 7/6/92 is 7,082,038.8 GALS. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of July 6, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
** MW-13/BH-36	02209213	7/6/92	13627.4	6914.9 GALS.
MW-14/BH-37	02209214	7/6/92	166538.3	166538.3 GALS.
*** MW-35/BH-59	02209212	7/6/92	38017.0	37828.2 GALS.
		SHALLOW TOTAL		211,281.4 GALS.

** The meter reading on MW-13/BH-36 reflects 6712.5 gallons attributed to MW-1/BH-14 prior to removal and reinstallation on MW-13/BH-36.

*** The meter reading on MW-35/BH-59 reflects 188.8 gallons attributed to MW-21/BH-44 prior to removal and reinstallation on MW-35/BH-59.

The cumulative shallow fluid removal as of July 6, 1992 is 218,182.7 GALS. This number reflects the 6901.3 gallons removed from MW-1/BH-14 and MW-21/BH-44 prior to meter removal.

The June 4, 1992 report erroneously identified MW-13/BH-36 as having removed 196.5 BBLS. of water. The correct volume is 196.5 GALS. of water.

If more information is required, please free to contact me at (915) 687-8312.

Very truly yours,

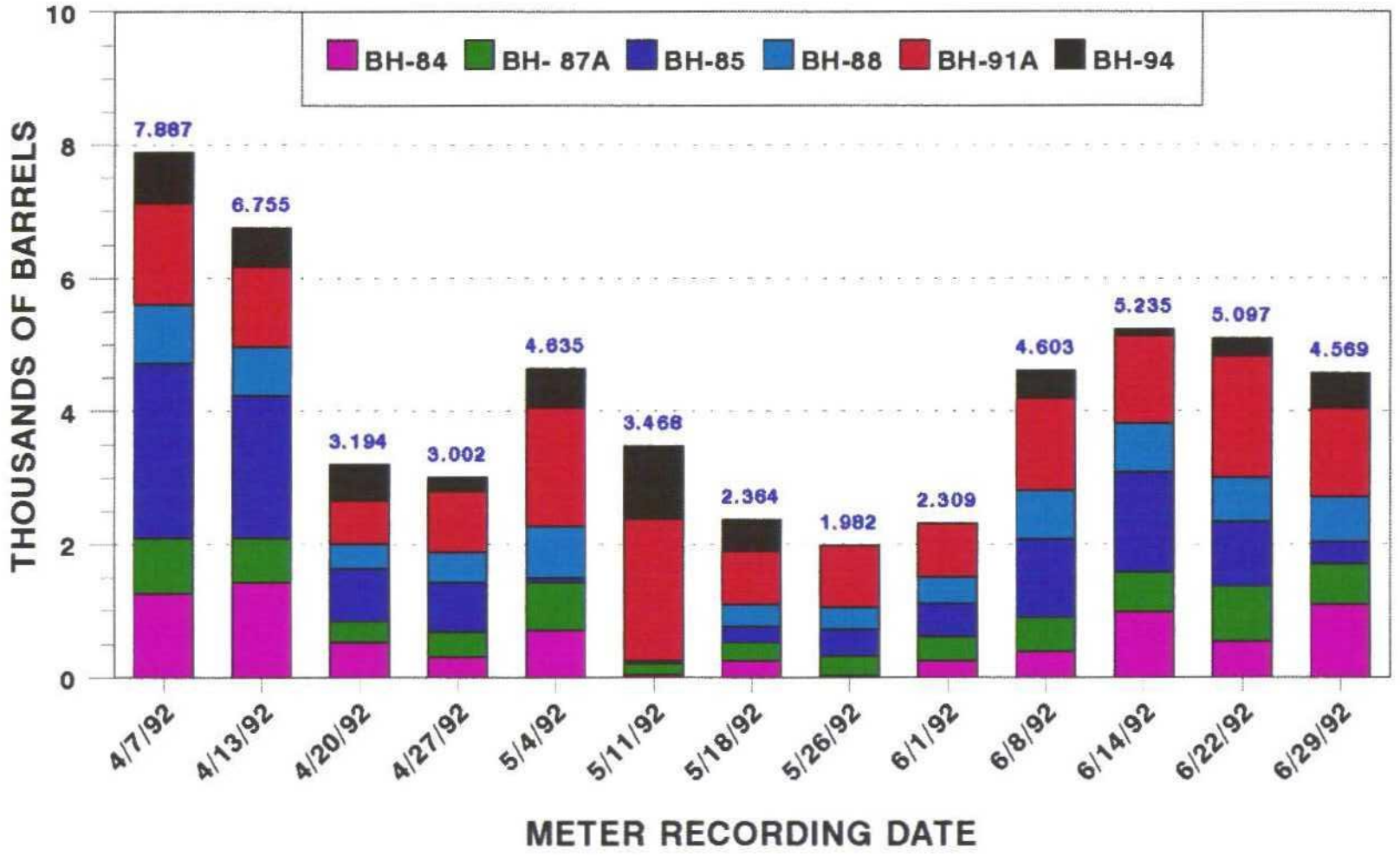
Jeffrey S. Lynn
Advanced Environmental Representative

JSL/cb

xc: T. C. Lowry - Midland
D. E. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser - IBGP, Artesia

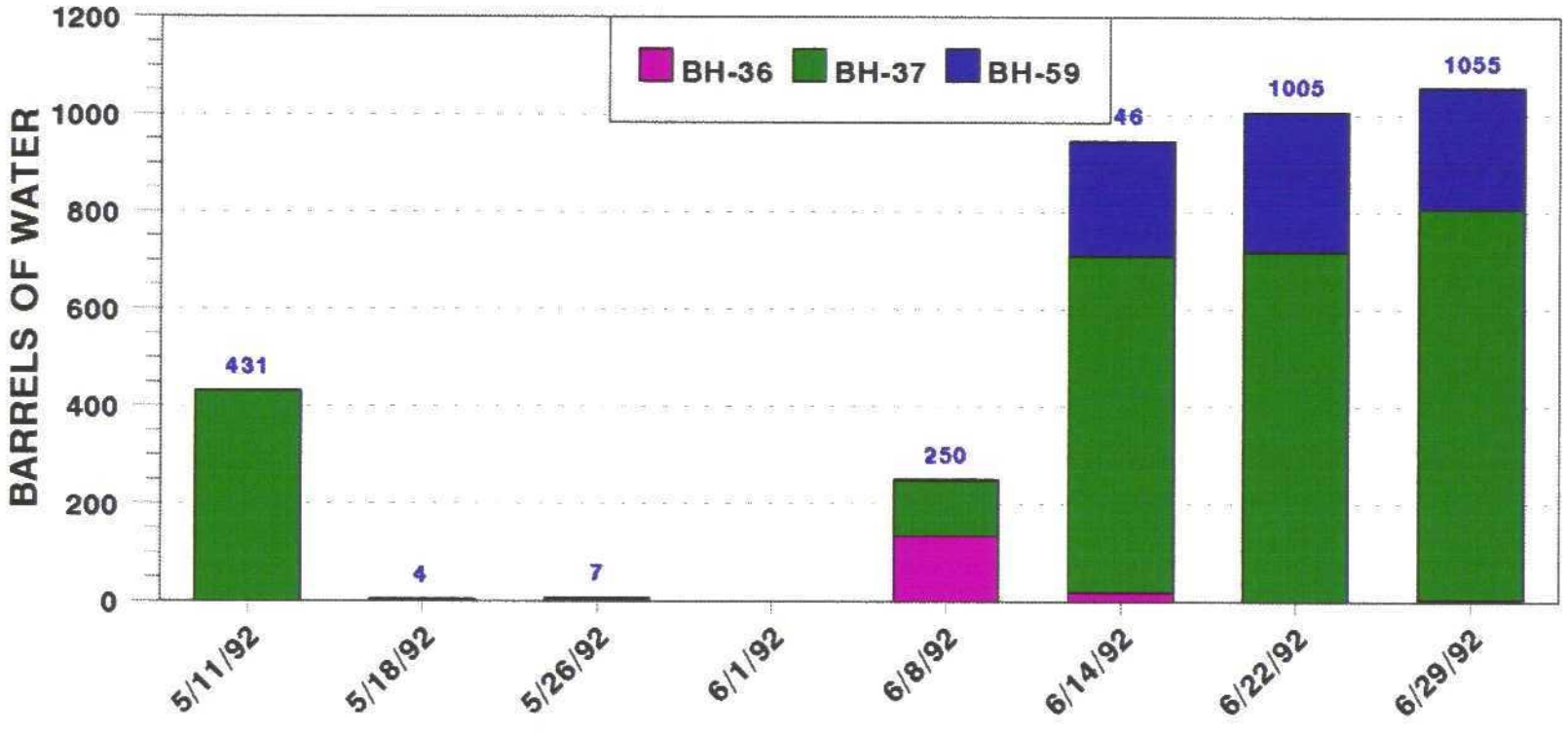
APPENDIX G

WEEKLY LOWER QUEEN WATER WITHDRAWALS
SECOND QUARTER 1992



APPENDIX G

WEEKLY SHALLOW WATER WITHDRAWALS
SECOND QUARTER 1992



BH-59	0	0	0	0	1	236	288	249
BH-37	431	4	2	0	114	691	717	801
BH-36	0	0	5	0	135	19	0	5

METER RECORDING DATE

APPENDIX G

WEEKLY TOTAL WATER WITHDRAWALS
SECOND QUARTER 1992

SHALLOW TOTAL	0	0	0	0	0	0.431	0.004	0.007	0	0.25	0.946	1.005	1.055
LOWER QUEEN TOTAL	7.887	6.755	3.194	3.002	4.635	3.468	2.364	1.982	2.309	4.603	5.235	5.097	4.569

METER RECORDING DATE

APPENDIX H

LOWER QUEEN FLUID LEVEL DATA AND POTENTIOMETRIC MAPS

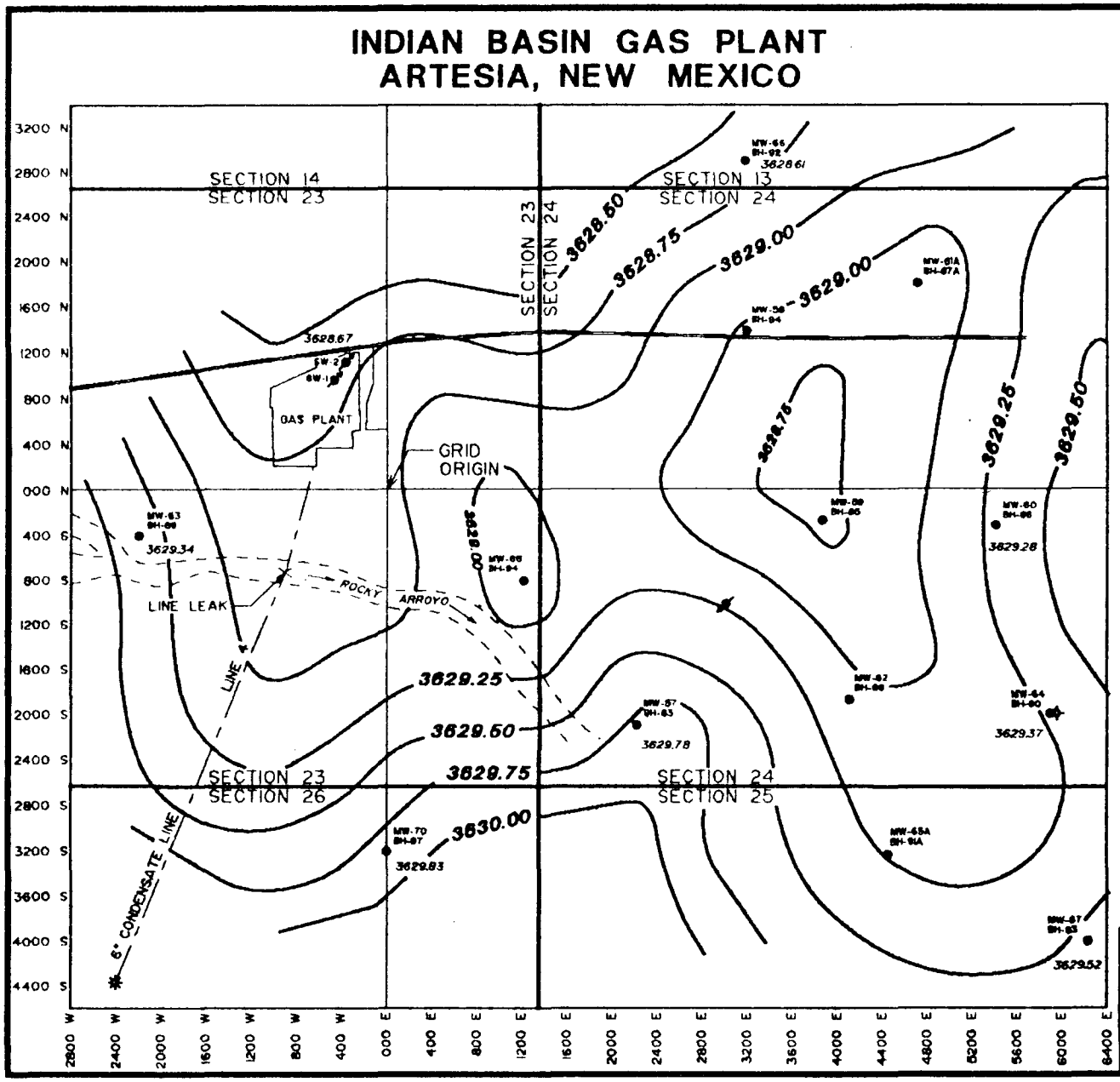
APPENDIX H

LOWER QUEEN FLUID LEVELS

WELL NUMBER	MARCH 1992	APRIL 1992	MAY 1992	JUNE 1992
BH-83	3629.78	3630.11	3639.70	3636.49
BH-86	3629.28	3629.49	3635.18	3633.61
BH-89	3629.34	3629.14	3642.91	3638.95
BH-90	3629.37	3629.57	3636.99	3634.32
BH-92	3628.61	3628.73	3633.73	3632.90
BH-93	3629.52	3629.62	3638.21	3634.79
BH-97	3629.83	3629.95	3632.60	3634.15
SW-2	3628.67	3628.79	3632.37	3632.73
**********	**********	**********	**********	**********
MONTHLY RAINFALL	0.12	0.79	5.66	3.78

FLUID LEVEL MEASUREMENTS IN FEET
RAINFALL MEASUREMENTS IN INCHES

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

LEGEND

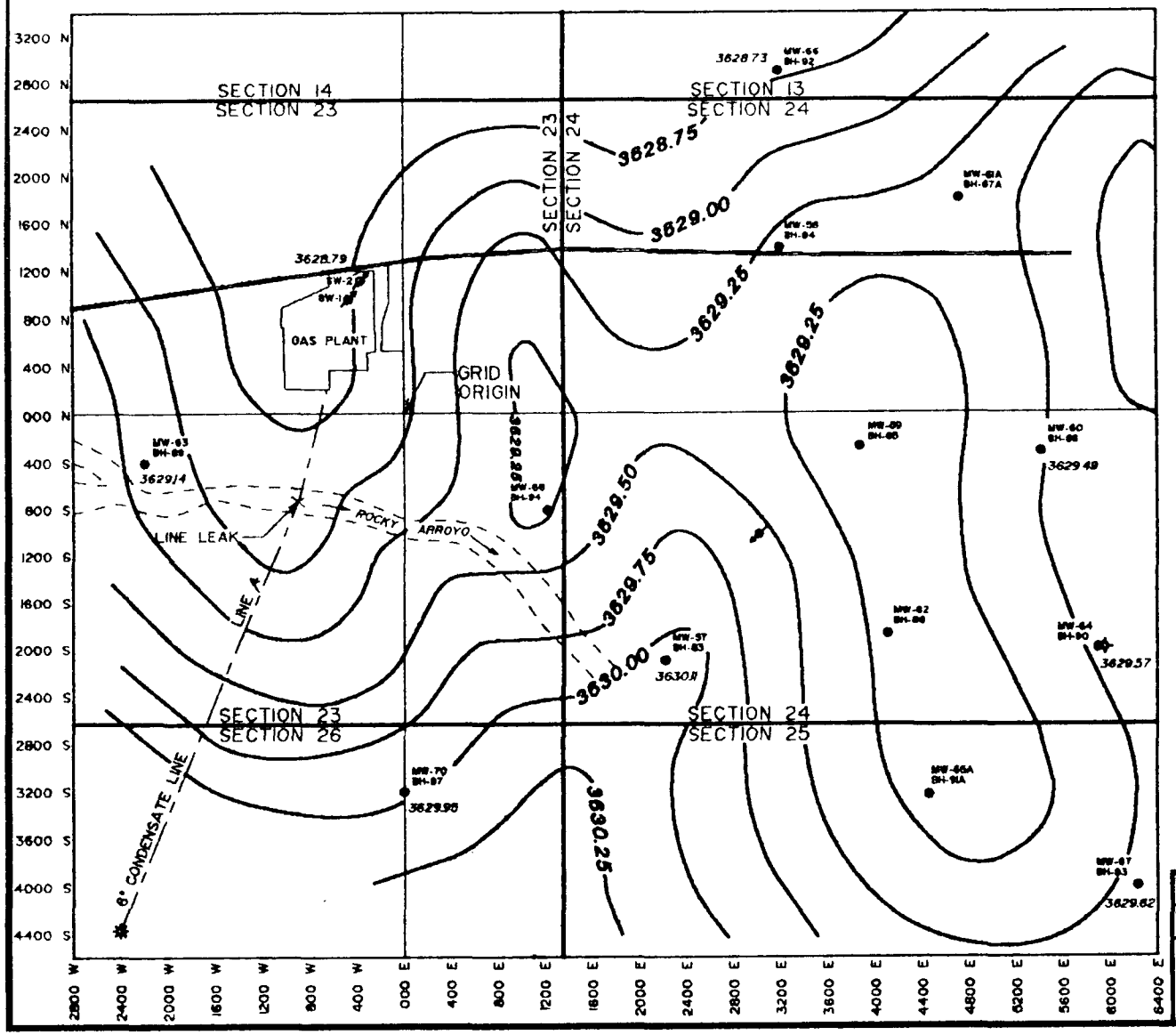
- DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

C.I. 0.25'

IBGASPLT.STY OPER

Figure Title: MARCH 1992 LOWER QUEEN POTENTIOMETRIC SURFACE	MARARTHON OIL COMPANY
Document Title: SECOND QUARTER 1992 INDIAN BASIN TREATMENT PROJECT REPORT	Location: INDIAN BASIN GAS PLANT
APPENDIX H LOWER QUEEN POTENTIOMETRIC SURFACE	DATE: 6/92 — PREPARED BY: JSL; SCALE: — CHECKED BY: ; PROJECT NO. — DRAFTED BY: ; FIGURE NO.

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

LEGEND

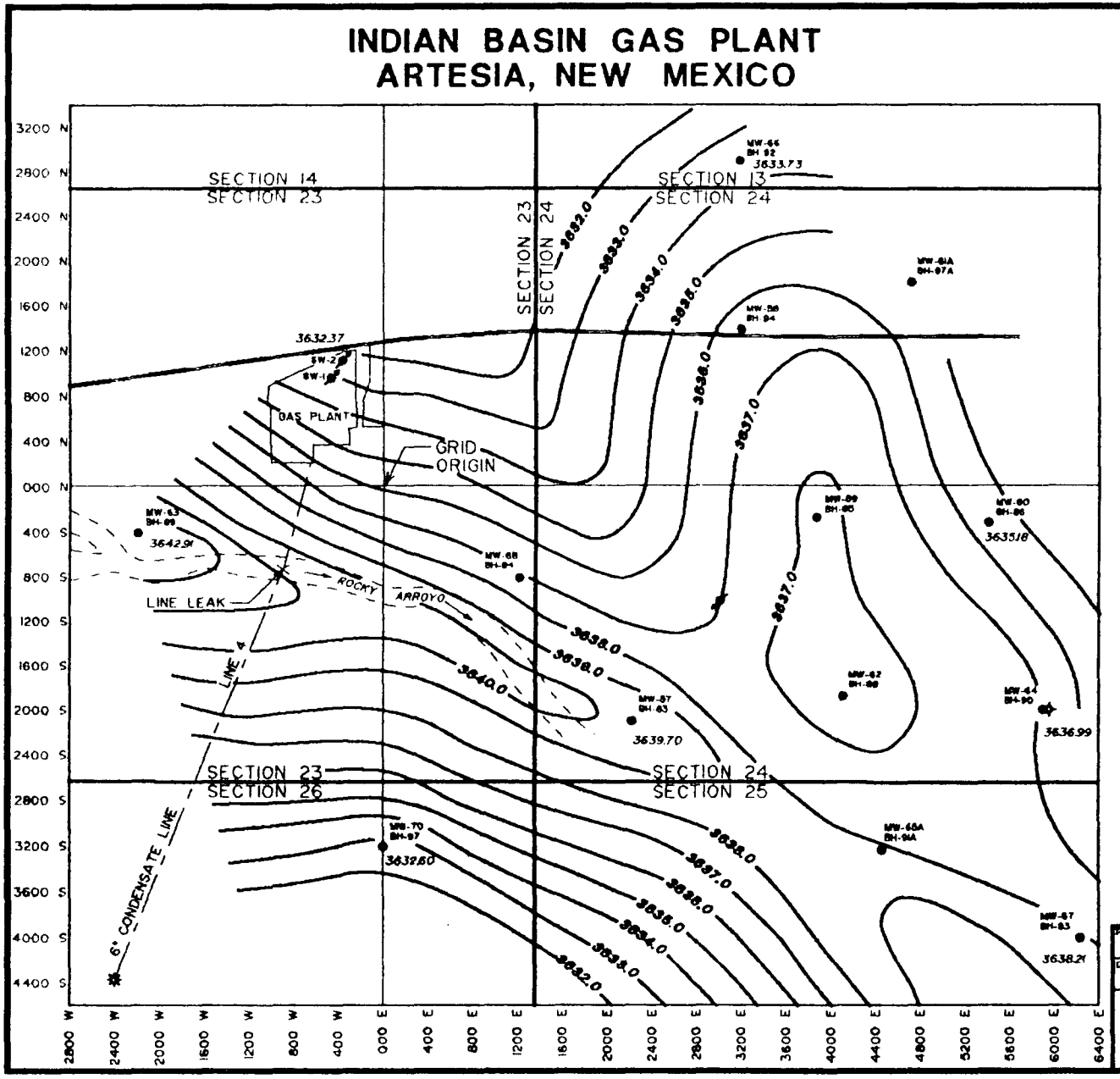
- DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

C.I. 0.25'

IBGASPLT.STY OPER

Figure Title: APRIL 1992 LOWER QUEEN POTENTIOMETRIC SURFACE	MARARTHON OIL COMPANY
Document Title: SECOND QUARTER 1992 INDIAN BASIN TREATMENT PROJECT REPORT	Location: INDIAN BASIN GAS PLANT
APPENDIX H LOWER QUEEN POTENTIOMETRIC SURFACE	DATE: 6/92 · SCALE: · PROJECT NO. · PREPARED BY: J.S.L. · CHECKED BY: · DRAFTED BY: · FIGURE NO.

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

L E G E N D

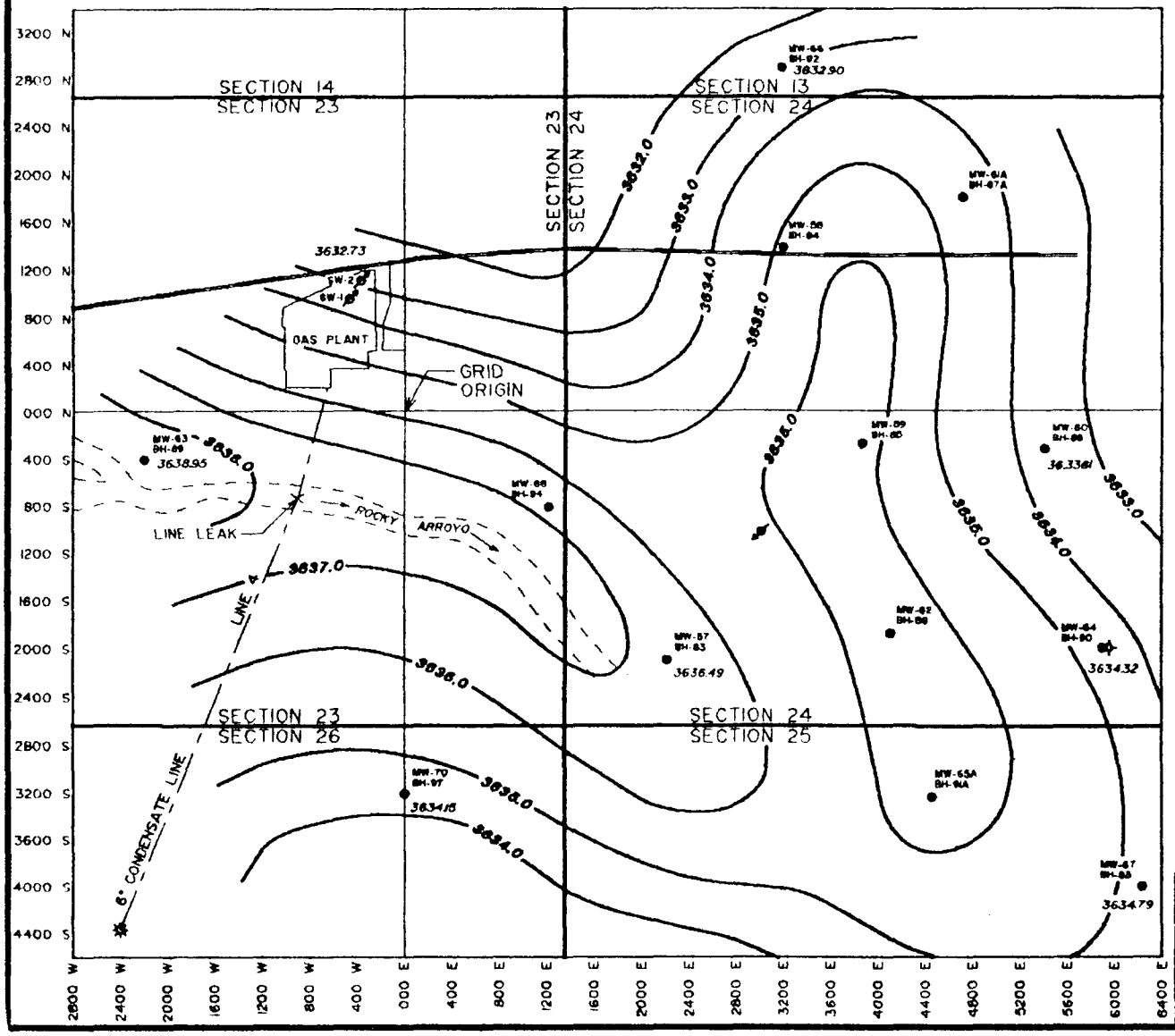
- DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

C.I. 1.0'

I89ASPLT.STY OPER

Figure Title: MAY 1992 LOWER QUEEN POTENTIOMETRIC SURFACE	MARARTHON OIL COMPANY
Document Title: SECOND QUARTER 1992 INDIAN BASIN TREATMENT PROJECT REPORT	Location: INDIAN BASIN GAS PLANT
APPENDIX H LOWER QUEEN POTENTIOMETRIC SURFACE	DATE: 8/92 · SCALE: · PROJECT NO.: · PREPARED BY: J.S.L. · CHECKED BY: · DRAFTED BY: · FIGURE NO.:

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

LEGEND

- DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

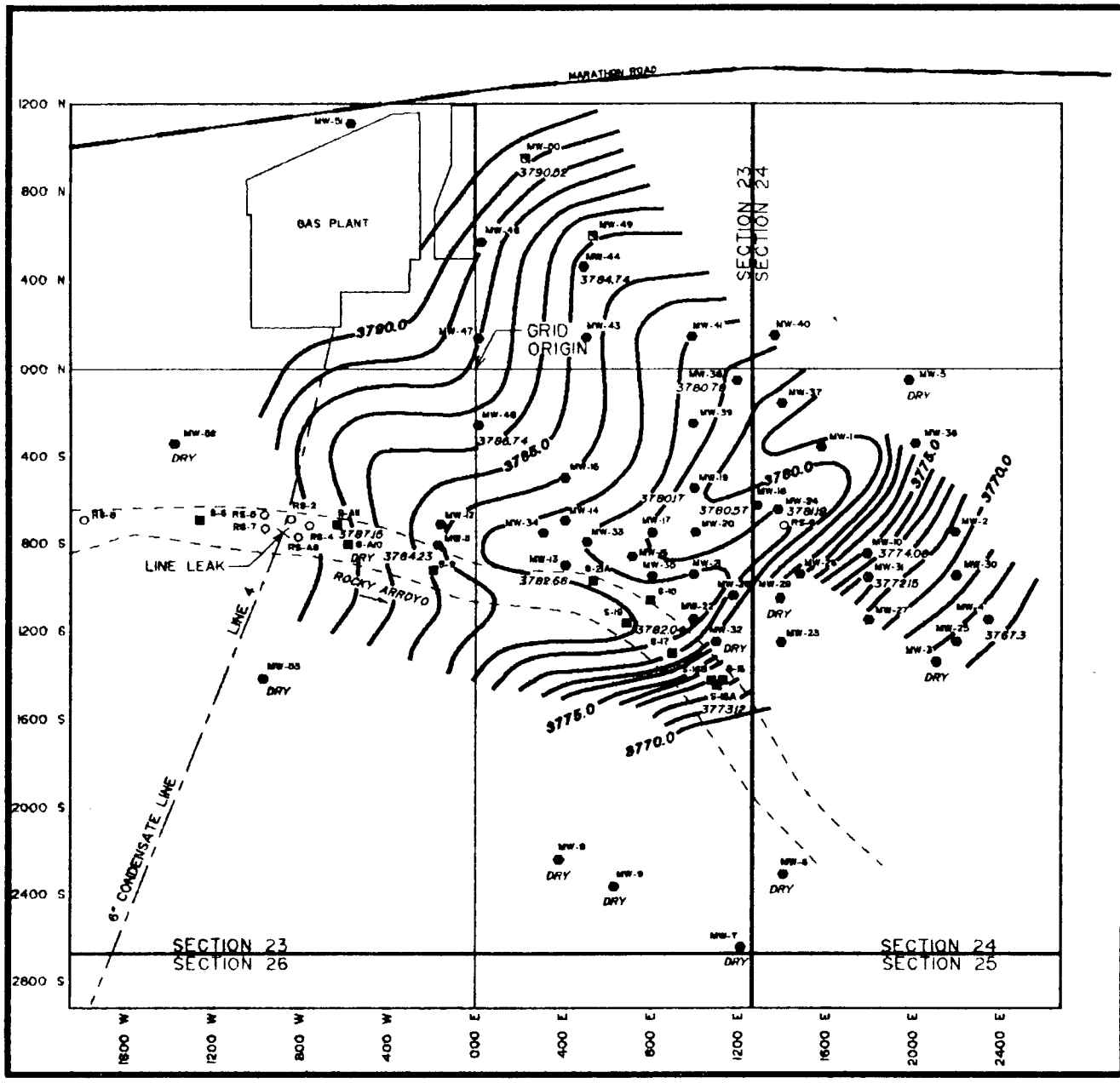
C.I. 1.0'

BGASPLT.STY OPER

Figure Title: JUNE 1992 LOWER QUEEN POTENTIOMETRIC SURFACE	MARARTHON OIL COMPANY
Document Title: SECOND QUARTER 1992 INDIAN BASIN TREATMENT PROJECT REPORT	Location: INDIAN BASIN GAS PLANT
APPENDIX H LOWER QUEEN POTENTIOMETRIC SURFACE	DATE: 7/92 · SCALE: · PROJECT NO. · PREPARED BY: JSL · CHECKED BY: · DRAFTED BY: · FIGURE NO.

APPENDIX I

SHALLOW SOIL WATER POTENTIOMETRIC MAPS



INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO

SCALE

0 1000' 2000'

FEET

LEGEND

- MW-9 ● SHALLOW ALLUVIAL GROUNDWATER MONITORING WELL
- RS-4 o 4 INCH PVC RCOVERY SUMP
- S-18 ■ 24 INCH GALVANIZED RECOVEY SUMP

C.I. 1.0'

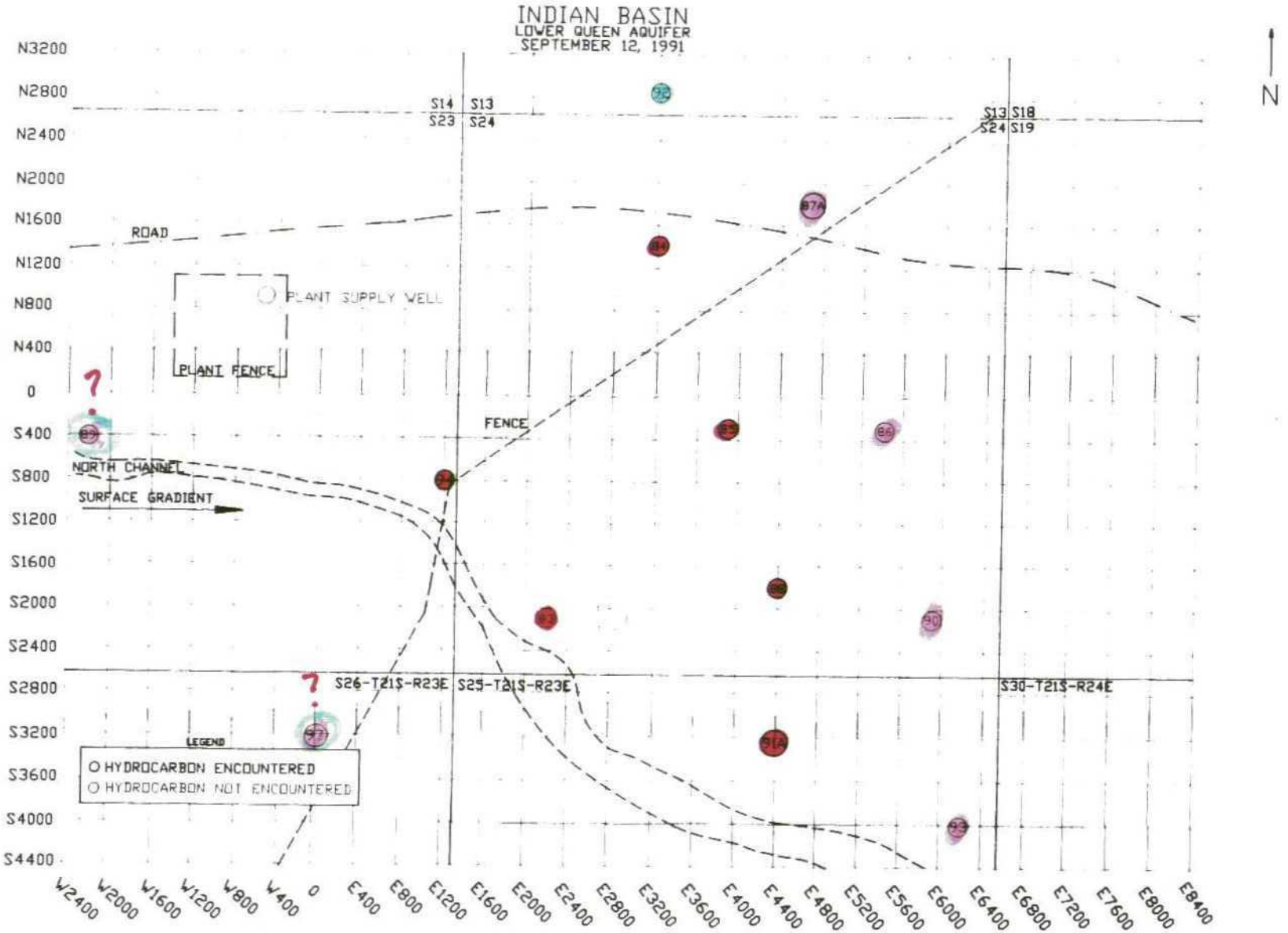
BGASPLT.STY OPER

Figure Title: APRIL 1992 SHALLOW GROUNDWATER POTENTIOMETRIC SURFACE	MARARTHON OIL COMPANY
Document Title: SECOND QUARTER 1992 INDIAN BASIN TREATMENT PROJECT REPORT	Location: INDIAN BASIN GAS PLANT
APPENDIX I SHALLOW GROUND WATER POTENTIOMETRIC SURFACE	DATE: 6/92 · SCALE: · PROJECT NO.: · PREPARED BY: JSL · CHECKED BY: · DRAFTED BY: · FIGURE NO.:

INDIAN BASIN GAS PLANT TREATMENT PROJECT QUARTERLY REPORT

THIRD QUARTER 1992

NOVEMBER 1992


INDIAN BASIN
LOWER QUEEN AQUIFER
SEPTEMBER 12, 1991
N
N3200
N2800
N2400
N2000
N1600
N1200
N800
N400
0
S400
S800
S1200
S1600
S2000
S2400
S2800
S3200
S3600
S4000
S4400
W2400
W2000
W1600
W1200
W800
W400
0
E400
E800
E1200
E1600
E2000
E2400
E2800
E3200
E3600
E4000
E4400
E4800
E5200
E5600
E6000
E6400
E6800
E7200
E7600
E8000
E8400
S14 S13
S23 S24
S13 S18
S24 S19
ROAD
PLANT SUPPLY WELL
PLANT FENCE
FENCE
NORTH CHANNEL
SURFACE GRADIENT
S26-T21S-R23E
S25-T21S-R23E
S30-T21S-R24E
LEGEND
HYDROCARBON ENCOUNTERED
HYDROCARBON NOT ENCOUNTERED

INDIAN BASIN TREATMENT PROJECT QUARTERLY REPORT

THIRD QUARTER 1992

Submitted by
Marathon Oil Company
on behalf of the
Indian Basin Gas Plant Owners

November 5, 1992

INDIAN BASIN GAS PLANT TREATMENT PROJECT QUARTERLY REPORT

TABLE OF CONTENTS

MARATHON OIL COMPANY
INDIAN BASIN TREATMENT PROJECT
QUARTERLY REPORT
OCTOBER 1992

INTRODUCTION

This report summarizes treatment activities which have taken place during the third quarter of 1992 related to environmental problems resulting from a produced liquid gathering line leak discovered in April 1991 near the Indian Basin Gas Plant. Preparation of this report is in accordance with the April 2, 1992 New Mexico Oil Conservation Division (OCD) directive for quarterly reporting on Indian Basin Treatment Project activities.

QUARTERLY REPORT SUMMARY

The overall Indian Basin Treatment Project is fully operational and functioning as designed per Marathon's March 1992 technical submittal to OCD. Combined withdrawals from the Lower Queen and shallow horizons are on going and an air stripper facility is used to remove volatile hydrocarbons. Water discharged from the air stripper continues to be utilized by the plant for process water. Soil venting operations continue to remove volatile hydrocarbons from the soil horizon. Water analyses from rancher wells and nearby surface springs have not exceeded any State or Federal drinking water standards for hydrocarbons or chlorides. Local ranchers are informed of treatment project activities via a quarterly update letter.

QUARTERLY POINT-IN-TIME SAMPLING AND RESULTS

A point-in-time sampling of the Indian Basin treatment project monitor wells was conducted July 7 - 10, 1992. Forty-six wells were sampled by Southwestern Laboratories using EPA sampling protocol. The attached field log in Appendix A was prepared by Southwestern Laboratories from field notes taken during sample acquisition and identifies the fluid levels, purge volumes and other field analysis data of all wells evaluated.

Marathon's Petroleum Technology Center (PTC) Littleton, Colorado, performed BTEX and chloride analyses for the quarterly point-in-time samples. High performance liquid chromatography (HPLC) was used to analyze water samples for BTEX concentrations and a titration method was used for chloride analysis. Replicate BTEX analyses were made for each well sampled. The results from the point-in-time analyses are contained in Appendix B.

Core Laboratories, Aurora, Colorado, performed four BTEX analyses using EPA method 8020 purge and trap gas chromatography as a quality assurance comparison of PTC's HPLC analytical techniques. Core Labs also conducted four chlorides analyses using EPA method 325.2. The following four wells (3 shallow and 1 Lower Queen) were analyzed for BTEX concentrations using both HPLC and purge and trap analytical techniques: BH-41, BH-42, BH-49 and BH-97. A chart comparing the BTEX analytical results from the two analysis

techniques is attached in Appendix C. The results of this comparison indicate that the HPLC analysis technique portray an accurate representation of BTEX concentration when compared with the EPA method 8020 purge and trap analysis technique for the same samples.

Three wells were sampled by the OCD for duplicate analysis (BH-93, BH-86, and BH-87A). The results for the three well comparison are attached in Appendix C.

Appendix D (Tables 1 and 2) compares the results of the September 1991, December 1991, April 1992 and July 1992 point-in-time benzene concentration data for the Lower Queen and shallow wells. Graphs of the benzene, BTEX and chloride concentrations from the various point-in-time samplings for each borehole/monitoring well are also included in Appendix D.

MONTHLY SAMPLING

Monthly water samples of nearby rancher water wells and springs were taken on July 8, July 28, August 19, and September 10. Analytical results from the monthly water samples indicate the water to be within standards for hydrocarbons and chlorides as established by EPA for drinking water. The attached table in Appendix E provides a summary of the monthly analyses performed on the Lyman water well, the closest down gradient water well to the leak site, and a surface water spring in Rocky Arroyo. The

quarterly analysis for the Biebelle water well, the second closest down gradient well, is also reported. All rancher water well and arroyo spring samples were obtained using EPA sampling and handling procedures. Core Labs performed the BTEX and chloride analyses using EPA approved methods. Analytical data from rancher water well samples and surface water springs is provided to the local ranchers each month with letters of explanation. Copies of these letters are provided to the New Mexico Oil Conservation Division (Santa Fe) and the Bureau of Land Management (Roswell) upon distribution to the ranchers.

The plant water supply well and backup well are also sampled and analyzed on a monthly basis. Analytical reports for all the rancher wells, springs and plant wells are also included in Appendix E.

WATER AND CONDENSATE RECOVERY

Water withdrawals from Lower Queen wells and shallow water wells are individually metered and reported to the State Engineer's Office (SEO) on a monthly basis, per SEO directive. The reports filed with the State Engineer's Office for the third quarter of 1992 are attached in Appendix F. Appendix F also contains stacked bar graphs depicting weekly water withdrawals from Lower Queen and shallow soil water wells. A third graph shows the combined weekly water withdrawal from the Lower Queen and shallow zone.

Six Lower Queen wells (BH-84, BH-85, BH-87A, BH-88, BH-91A, and BH-94) were routinely pumped for water withdrawal during the quarter. Monthly water withdrawals for each well are listed in the following table:

LOWER QUEEN MONTHLY WATER WITHDRAWALS

WELL NUMBER	JUL	AUG	SEP	QTR. TOTAL	
BH-84	3,845	3,005	3,764	10,614	BBL.
BH-85	2,967	3,124	3,870	9,961	BBL.
BH-87A	1,833	3,154	6,568	11,555	BBL.
BH-88	2,378	4,565	4,208	11,151	BBL.
BH-91A	4,713	7,033	7,219	18,965	BBL.
BH-94	1,607	3,580	4,622	9,269	BBL.
LQ TOTAL	**16,803**	**24,461**	**30,251**	**71,515**	**BBL.**

Three shallow water wells (BH-36, BH-37, and BH-59) were pumped during the third quarter. Monthly shallow water withdrawals for each well are listed below:

SHALLOW SOIL WATER MONTHLY WITHDRAWALS

WELL NUMBER	JUL	AUG	SEP	[A QTR. TOTAL	
BH-36	813	1,338	195	2,346	BBL.
BH-37	1,535	1,407	1,664	4,606	BBL.
BH-59	15	341	54	410	BBL.
SHALLOW TOTAL	**2,363**	**3,086**	**1,913**	**7,362**	**BBL.**

Fluids from the Lower Queen and shallow withdrawal wells are piped to an air stripper facility for hydrocarbon separation and eventual plant usage. An oil/water separator is used to remove any free product prior to soluble hydrocarbon removal. The free product is transferred to a holding tank which is gauged on a weekly basis. The measured volume of free condensate recovered during the third quarter of 1992 is 13 barrels. The cumulative free product recovery for the second and third quarters is 32 barrels. This brings the cumulative free product recovered to date (not including volumes volatilized by the air stripper and soil vent) to 3319 barrels.

POTENTIOMETRIC MAPPING

Lower Queen fluid levels were measured once a month for all non-pumping wells. The table in Appendix G lists the Lower Queen fluid levels (elevations) obtained during the third quarter of 1992. Cumulative monthly rainfall as measured at the gas plant is also recorded. The cumulative rainfall for the quarter was 3.13 inches. Monthly Lower Queen potentiometric maps, based on these monthly fluid level readings are also attached in Appendix G. The July Lower Queen potentiometric map is indicative of the unusually high rainfall during May, June and July. Lower Queen water levels reflect this significant influx of water through higher fluid levels. The August and September Lower Queen potentiometric maps reflect lower fluid levels due to decreased precipitation.

A shallow water potentiometric map based on data accumulated during the July point-in-time sampling round is attached in Appendix H.

SOIL VENTING ACTIVITIES

The Phase I soil venting program is operational and includes wells: BH-39, BH-40 and BH-44. Venting during the third quarter was discontinuous due to mechanical difficulties with the blower and the generator as well as natural conditions creating high water levels in the vent wells. The shallow water withdrawal wells were selectively located in the vicinity of the soil vent wells to help promote soil venting by lowering the water table, thus more soil would be exposed for hydrocarbon vapor extraction. The occurrence of unusually large rainfalls during May, June and July required these adjustments to the shallow water withdrawal system in order to impact water levels in the vicinity of the venting system. Venting is presently ongoing as water levels are receding and mechanical difficulties have been corrected.

APPENDIX A

JULY POINT-IN-TIME FIELD NOTES

SWL

SOUTHWESTERN LABORATORIES

Materials, environmental and geotechnical consultation, fundamental testing and analytical services
P.O. Box 2150 • 1703 West Industrial • Midland, Texas 79702 • 915/683-3348

August 10, 1992

Mr. Jeff Lynn
Marathon Oil Company
P. O. Box 552
Midland, Texas 79702

Re: Marathon Indian Basin Remediation Project

Dear Mr. Lynn:

The monitoring project was started at 8:00 a.m. on July 7, 1992. From July 7, 1992, to July 9, 1992, a total of forty four (44) wells were checked. A malfunction in the control box was encountered on July 9, 1992, which prevented the sampling of two (2) wells.

The malfunction was corrected with a new control box, and the two (2) remaining wells (Sump 16A and Sump All) were checked and sampled on July 10, 1992,

If you have any questions, please do not hesitate to call.

Sincerely,

Lorri L. Church

Lorri L. Church
Project Manager, Midland EAS

LLC:jjc

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

QUEEN WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.		Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-83	MW-57	177.20	154.07	23.13	7-7-92	N	86.4	21	7.00	820	
BH-84	MW-58	218.71			7-7-92	N	Pump Present		6.48	1508	
BH-85	MW-59	211.29			7-7-92	N	Pump Present		6.81	1129	
BH-86	MW-60	223.08	183.21	39.87	7-7-92	N	148.9	22	6.92	1042	
BH-87A	MW-61A	216.37			7-7-92	N	Pump Present		6.71	1074	
BH-88	MW-62	225.90			7-7-92	N	Pump Present		6.80	1828	
BH-89	MW-63	221.19	189.00	32.19	7-7-92	N	120.2	21.5	6.57	615	
BH-90	MW-64	202.37	166.36	36.01	7-7-92	N	134.5	21	7.11	854	
BH-91A	MW-65A	168.56			7-7-92	N	Pump Present		6.87	730	
BH-92	MW-66	235.18	197.35	37.83	7-7-92	N	141.3	21	6.61	1085	
BH-93	MW-67	165.77	133.24	32.53	7-7-92	N	121.5	21.5	6.84	654	
BH-94	MW-68	203.43				Y	Pump Present		6.95	766	
BH-97	MW-70	225.20	189.00	36.20	7-8-92	N	135.2	21	6.87	553	
SW-1	Plant Well				7-7-92	N					
SW-2	Backup well				7-7-92	N					

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.	Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-24 MW-3	17.40		Dry	7-7-92						
BH-26 MW-4	18.68	17.74	0.94	7-9-92	N	2.6				No recovery in 2 hours
BH-28 MW-5	13.10		Dry	7-7-92						
BH-29 MW-6	13.98		Dry	7-7-92						
BH-55 MW-31	19.93	18.5	1.43	7-9-92	N	5.3(a)	21.9	6.77	2390	
BH-30 MW-7	17.31		Dry	7-7-92						
BH-45 MW-22	17.30	17.07	0.23	7-9-92	N	0.6				No recovery in 2 hours
BH-31 MW-8	17.74		Dry	7-8-92						
BH-32 MW-9	13.65	13.60	0.05	7-8-92	N					Insufficient Sample to Test
BH-33 MW-10	19.08	16.02	3.06	7-9-92	N	11.4	20	6.63	1879	
BH-34 MW-11	24.85	18.00	6.85	7-9-92	N	25.6	22	6.74	1237	
BH-36 MW-13	22.07					Pump Present				
BH-42 MW-19	19.11	12.15	6.96	7-9-92	N	26.0	22	6.33	2103	
BH-47 MW-24	14.09	10.14	3.95	7-9-95	N	11.6(b)				

(a) Bailed dry after 1 gallon. (b) Bailed dry before appropriate purge volume. Insufficient sample for pH conductivity & Temp.

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.		Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-41	MW-18	17.42	11.08	6.34	7-9-92	N	23.7	22	6.54	1380	
BH-53	MW-29	14.76		Dry	7-8-92						
BH-49	MW-26	21.51	16.37	5.14	7-9-92	N	19.2	20	6.69	1617	
BH-56	MW-32	16.77	15.35	1.42	7-9-92	N	4.0				No recovery in 2 hours
BH-44	MW-21	23.31			Inaccessible						Soil vent well
BH-61	MW-38	20.62	12.42	8.20	7-9-92	N	30.6		6.63	1948	
BH-67	MW-44	25.34	17.27	8.07	7-9-92	N	30.1		7.00	2013	
BH-71	MW-48	19.98	17.25	2.73	7-9-92	N	7.6 (a)		6.98	2678	
BH-73	MW-50	37.15	21.24	15.91	7-9-92	N	44.5 (b)		6.85	5663	
BH-75	MW-52	21.44	19.00	2.44	7-9-92	N	6.8 (c)		7.05	809	
BH-77	MW-53	16.02	15.15	0.87	7-8-92	N					Insufficient Sample to bail
BH-80	MW-54	78.15	44.16	33.99	7-8-92	N	126.9 (d)		7.04	2281	
BH-81	MW-55	66.80	21.89	44.91	7-8-92	N	107.7	20.5	6.95	2499	
BH-82	MW-56	43.76	31.73	12.03	7-8-92	N	44.9 (e)	20.5	6.54	2093	
BH-95	MW-69	59.41	24.71	34.7	7-8-92	N	129.6	20.5	6.97	920	
Sump 16A		15.46	4.87	10.59	7-10-92	Film	254.2	21.5	6.34	874	

(a) Bailed dry before appropriate purge volume. (b) Bailed dry after 9 gallons. (c) Bailed dry after 2 gallons.
(d) Pumped dry after approx. 85 gals. (e) Pumped dry after approx. 24 gals.

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.	Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
Sump A11	17.20	10.46	6.74	7-10-92	Heavy film	161.8	20.5	6.45	861	

APPENDIX B

JULY POINT-IN-TIME ANALYTICAL RESULTS

Indian Basin BTEX Analysis Results by HPLC (7/92)

Sample	Date	Notes *	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)	BTEX (ppb)	Chloride (mg/L)
BH-33/MW-10	7/9/92	L.C.	1832	101	482	2183	4598	240
BH-33/MW-10	7/9/92	L.C. DF=x2	926	42	243	1154	2365	
BH-34/MW-11	7/9/92	L.C.	2160	2125	463	dilution required		270
BH-34/MW-11	7/9/92	L.C. DF=x6	410	361	75	820	1666	
BH-34/MW-11	7/9/92	L.C.	2000	1832	409	3693	7934	
BH-34/MW-11	7/9/92	L.C. DF=x3	686	552	129	1290	2657	
BH-34/MW-11 Dup.	7/9/92	L.C.	2274	2440	465	dilution required		
BH-34/MW-11 Dup.	7/9/92	L.C. DF=x6	374	368	80	806	1628	
BH-36/MW-13	7/9/92	M.G. (P)	2440	136	597	2247	5420	269
BH-36/MW-13	7/9/92	M.G. DF=x7 (P)	397	27	92	367	883	
BH-36/MW-13	7/9/92	M.G. DF=x6 (P)	484	27	114	496	1121	
BH-41/MW-18	7/9/92	L.C. DF=x6	544	17	118	40	719	106
BH-41/MW-18	7/9/92	L.C. DF=x3	982	41	275	72	1370	
BH-42/MW-19	7/9/92	L.C. D.F.=x3	954	31	7	232	1224	264
BH-42/MW-19	7/9/92	L.C. DF=x2	1368	61	512	30	1971	
BH-42/MW-19 Dup.	7/9/92	L.C.	2603	52	764	ND	3419	
BH-42/MW-19 Dup.	7/9/92	L.C. DF=x3	922	33	331	15	1301	
BH-47/MW-24	7/9/92	M.G. DF=x6	742	27	52	708	1529	455
BH-47/MW-24	7/9/92	M.G. DF=x6	709	15	55	647	1426	
BH-49/MW-26	7/9/92	J.L.	1993	90	495	1492	4070	183
BH-49/MW-26	7/9/92	J.L. DF=x7	266	11	76	291	644	
BH-49/MW-26	7/9/92	J.L.	1961	100	522	1498	4081	
BH-55/MW-31	7/9/92	L.C. DF=x11	50	32	9	54	145	337
BH-55/MW-31	7/9/92	L.C. D.F.=x6	19	36	11	42	108	
BH-61/MW-38	7/9/92	L.C.	75	34	25	56	190	147
BH-61/MW-38	7/9/92	L.C.	11	33	ND	19	63	
BH-61/MW-38 Dup.	7/9/92	L.C.	24	31	14	26	95	
BH-67/MW-44	7/9/92	M.G.	94	25	8	96	223	263
BH-67/MW-44	7/9/92	M.G.	100	16	102	4	222	
BH-71/MW-48	7/9/92	L.C.	50	18	6	18	92	431

Indian Basin BTEX Analysis Results by HPLC (7/92)

Sample	Date	Notes *	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX	Chloride
BH-71/MW-48	7/9/92	L.C.	43	13	ND	13	69	
BH-73/MW-50	7/9/92	L.C.	5	167	7	3	182	379
BH-73/MW-50	7/9/92	L.C.	3	10	ND	11	24	
BH-73/MW-50 Dup.	7/9/92	L.C.	5	20	ND	3	28	
BH-75/MW-52	7/9/92	L.C.	3	26	4	2	35	3
BH-75/MW-52	7/9/92	L.C.	7	31	ND	5	43	
BH-80/MW-54	7/8/92	L.C.	9	44	23	195	271	80
BH-80/MW-54	7/8/92	L.C.	6	26	12	130	174	
BH-81/MW-55	7/8/92	L.C.	466	36	64	65	631	273
BH-81/MW-55	7/8/92	L.C.	500	16	62	66	644	
BH-82/MW-56		L.C. DF=x6	199	34	228	49	510	248
BH-82/MW-56		L.C.	1034	64	962	25	2085	
BH-83/MW-57	7/7/92	L.C.	940	398	112	876	2326	63
BH-83/MW-57	7/7/92	L.C.	955	422	112	866	2355	
BH-84/MW-58	7/7/92	J.L.	176	58	26	33	293	149
BH-84/MW-58	7/7/92	J.L.	180	18	32	44	274	
BH-85/MW-59	7/7/92	J.L.	276	45	24	121	466	55
BH-85/MW-59	7/7/92	J.L.	260	20	110	232	622	
BH-86/MW-60	7/7/92	L.C.	18	25	3	4	50	10
BH-86/MW-60	7/7/92	L.C.	20	18	ND	10	48	
BH-87A/MW-61A	7/7/92	J.L.	335	4	27	95	461	12
BH-87A/MW-61A	7/7/92	J.L.	382	32	25	92	531	
BH-88/MW-62	7/7/92	M.G.	363	9	184	292	848	236
BH-88/MW-62	7/7/92	M.G.	351	13	157	301	822	
BH-89/MW-63	7/7/92	L.C.	20	28	3	18	69	7
BH-89/MW-63	7/7/92	L.C.	4	21	3	20	48	
BH-90/MW-64	7/7/92	L.C.	116	19	9	40	184	13
BH-90/MW-64	7/7/92	L.C.	113	17	10	35	175	
BH-91A/MW-65A	7/7/92	R.M.G.	418	235	93	551	1297	18
BH-91A/MW-65A	7/7/92	R.M.G.	407	226	90	502	1225	
BH-92/MW-66	7/7/92	L.C.	8	25	5	11	49	8
BH-92/MW-66	7/7/92	L.C.	8	15	7	10	40	

Indian Basin BTEX Analysis Results by HPLC (7/92)

Sample	Date	Notes *	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX	Chloride
BH-93/MW-67	7/7/92	L.C.	103	64	34	201	402	3
BH-93/MW-67	7/7/92	L.C.	103	46	32	192	373	
BH-94/MW-68	7/7/92	M.G. (FP)	171	267	49	746	1233	15
BH-94/MW-68	7/7/92	M.G. (FP)	148	172	ND	581	901	
BH-95/MW-69	7/8/92	L.C.	461	56	1785	239	2541	15
BH-95/MW-69	7/8/92	L.C.	675	53	311	1966	3005	
BH-97/MW-70	7/8/92	L.C.	40	45	70	23	178	9
BH-97/MW-70	7/8/92	L.C. Leaky Bottle	2	22	12	20	56	
BH-97/MW-70 Dup.	7/8/92	L.C.	2	27	3	20	52	
Equip Blank	7/10/92	B.R.	63	253	64	724	1104	
Equip. Blank	7/10/92	B.R.	48	188	57	628	921	
Equip. Blank	7/10/92	B.R.	54	260	58	648	1020	
Equip. Blank (Repe	7/10/92	B.R.	50	204	60	628	942	
Equip. Blank No. 1	7/7/92	L.C.	11	15	ND	25	51	<1
Equip. Blank No. 1	7/8/92	L.C.	6	18	21	5	50	
Equip. Blank No. 2	7/7/92	L.C.	12	25	9	78	124	
Sump 16-A	7/10/92	B.R.	1537	2028	280	3442	7287	82
Sump 16-A	7/10/92	B.R. DF=x6	242	355	51	580	1228	
Sump A-11	7/10/92	B.R.	1240	1694	423	3347	6704	60
Sump A-11	7/10/92	B.R. DF=x6	221	300	74	640	1235	
Sump A-11	7/10/92	B.R.	1209	1710	421	3416	6756	
SW-1 (#7)	7/7/92	J.L.	4	20	ND	7	31	19
SW-1 (#7)	7/7/92	J.L. Bad Lid	31	69	ND	67	167	
SW-2 (#8)	7/7/92	J.L.	7	38	ND	24	69	20
SW-2 (#8)	7/7/92	J.L.	7	24	<1	1	32	
Trip Blank No. 1	7/8/92	L.C.	4	29	ND	3	36	<1
Trip Blank No. 1	7/7/92	L.C.	25	67	ND	66	158	

*** Key to Notes:**

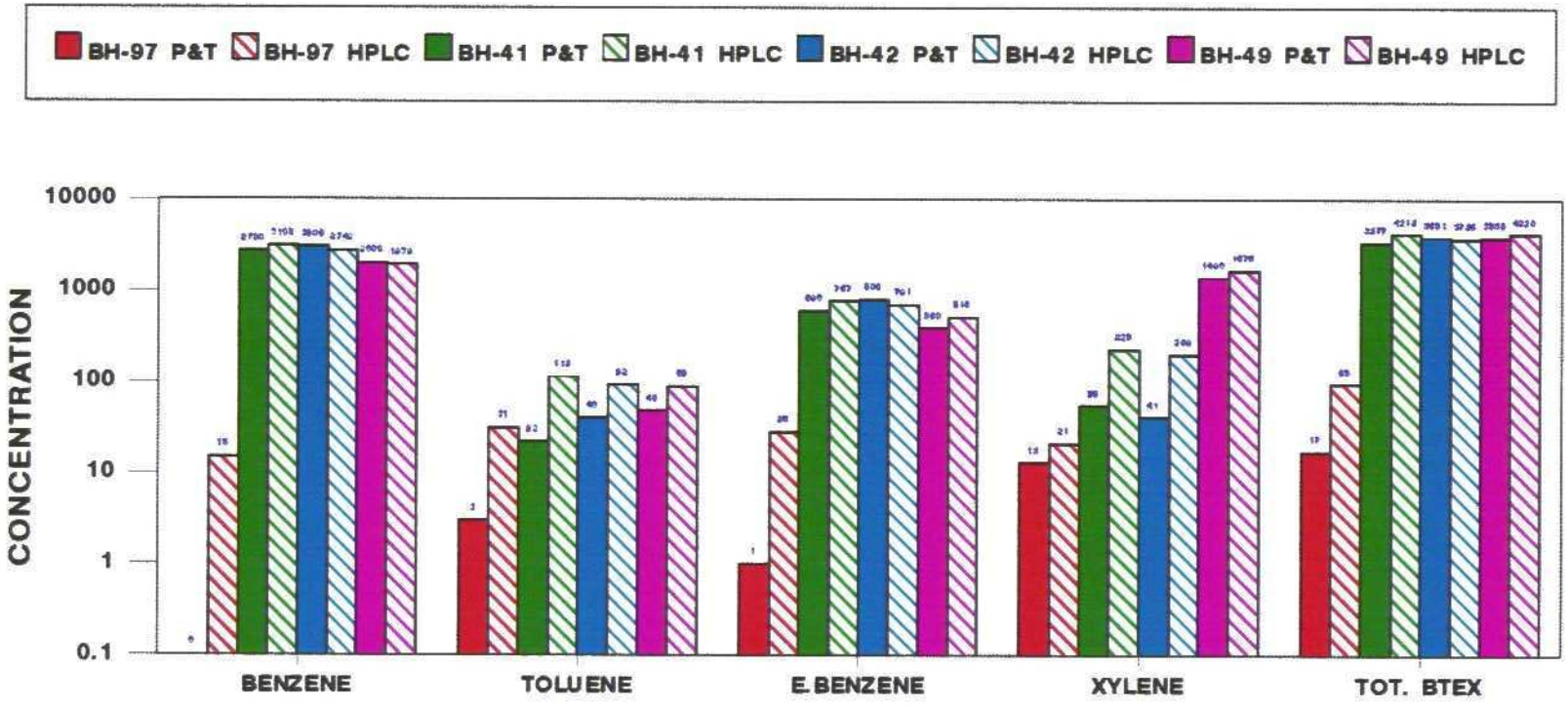
L.C., J.L., M.G., B.R., and R.M.G. are sampler initials
(DF) = dilution factor
(P) = Pump Well

APPENDIX C

JULY POINT-IN-TIME ANALYSIS TECHNIQUE COMPARISON

APPENDIX C

JULY 1992 QUARTERLY POINT IN TIME SAMPLING RESULTS
CORE LABS P & T VERSUS MARATHON HPLC ANALYSIS COMPARISON



	BENZENE	TOLUENE	E.BENZENE	XYLENE	TOT. BTEX
BH-97 P&T	0	3	1	13	17
BH-97 HPLC	15	31	28	21	95
BH-41 P&T	2700	22	600	55	3377
BH-41 HPLC	3105	113	767	228	4213
BH-42 P&T	3000	40	800	41	3881
BH-42 HPLC	2742	92	701	200	3736
BH-49 P&T	2000	48	390	1400	3838
BH-49 HPLC	1939	89	516	1676	4220

BTEX COMPONENTS

HPLC - HIGH PERFORMANCE LIQUID CHROMOTOGRAPHY ANALYSIS
P & T - STANDARD PURGE AND TRAP ANALYSIS
ALL CONCENTRATIONS GIVEN IN PPB

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/11/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/09/92
TIME SAMPLED.....: 10:10
WORK DESCRIPTION...: BH-41/MW-18

LABORATORY I.D...: 921250-0005
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	109	1	mg/L	325.2 (1)	07/29/92	KDS
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/16/92	MAD
Benzene	2700	100	ug/L			
Toluene	22	1	ug/L			
Ethyl Benzene	600	100	ug/L			
Xylenes	55	1	ug/L			

1300 South Potomac, Suite 130
Aurora, CO 80012
(303) 751-1780

Western Atlas International
A Litton Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/11/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/09/92
TIME SAMPLED.....: 09:53
WORK DESCRIPTION...: BH-42/MW-19

LABORATORY I.D...: 921250-0007
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	90	1	mg/L	325.2 (1)	07/29/92	KDS
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/16/92	MAD
Benzene	3000	50	ug/L			
Toluene	40	1	ug/L			
Ethyl Benzene	800	50	ug/L			
Xylenes	41	1	ug/L			

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Aurora, CO 80012
(303) 751-1780

Western Atlas International
A Litton Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/11/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/09/92
TIME SAMPLED.....: 08:40
WORK DESCRIPTION...: BH-49/MW-26

LABORATORY I.D...: 921250-0006
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	164	1	mg/L	325.2 (1)	07/29/92	KDS
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/16/92	MAD
Benzene	2000	100	ug/L			
Toluene	48	1	ug/L			
Ethyl Benzene	390	100	ug/L			
Xylenes	1400	100	ug/L			

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(303) 751-1780

Western Atlas International
A Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/11/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/08/92
TIME SAMPLED.....: 09:30
WORK DESCRIPTION...: BH-97/MW-70

LABORATORY I.D...: 921250-0004
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	9.2	0.5	mg/L	325.2 (1)	08/03/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/17/92	MAD
Benzene	ND	1	ug/L			
Toluene	3	1	ug/L			
Ethyl Benzene	1	1	ug/L			
Xylenes	13	1	ug/L			

1300 South Potomac, Suite 130
Aurora, CO 80012
(303) 751-1780

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

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

September 25, 1992

Jeffrey S. Lynn
Marathon Oil Company
P.O. Box 552
Midland, Texas 79702

RE: **WATER QUALITY SAMPLING**
MARATHON INDIAN BASIN GAS PLANT
EDDY COUNTY, NEW MEXICO

Dear Mr. Lynn:

Enclosed you will find a copy of the New Mexico Oil Conservation Division's (OCD) analytic results of ground water samples that OCD split with Marathon on July 7, 1992. If you have any questions, please contact me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

Enclosure

xc: Mike Williams, OCD Artesia District Office

Environmental & Safety Mid-Continent Region	
Route	Action
CKC	
JDH	
JNK	
RFM	
BAS	✓
JSL	
RMG	
SECY	
FILE	
Return	
TOSS	

SEP 29 1992

Environmental & Safety

STATE OF NEW MEXICO DEPARTMENT OF HEALTH
SCIENTIFIC LABORATORY DIVISION
P.O. Box 4700 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 [505]-841-2500
ORGANIC CHEMISTRY SECTION [505]-841-2570

July 17, 1992

ANALYTICAL REPORT
SLD Accession No. OR-92-1596

Request ID No. 014362

Distribution
( ) User 70320
(■) Submitter 260
(※) SLD Files

To: D. Boyer
NM Oil Consv. Div.
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

From: Organic Chemistry Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

Re: A water, purgeable sample submitted to this laboratory on July 8, 1992

DEMOGRAPHIC DATA

COLLECTION
On: 7-Jul-92 *By:* Ols . . .
At: 13:00 hrs. *In/Near:* Carlsbad

LOCATION
BH-93

ANALYTICAL RESULTS: Aromatic & Halogenated Purgeable [EPA-601/2] Screen (754)

Parameter	Value	Note	MDL	Units
Benzene	69.10		10.00	ppb
Ethylbenzene	19.60		10.00	ppb
p- & m-Xylene	79.20		10.00	ppb
o-Xylene	36.60		10.00	ppb
1,2,4-Trimethylbenzene	38.90		10.00	ppb

See Laboratory Remarks for Additional Information

Notations & Comments:

MDL = Minimal Detectable Level.

A = Approximate Value; N = None Detected above Detection Limit; P = Compound Present, but not quantified; T = Trace (<Detection Limit); U = Compound Identity Not Confirmed.

Evidentiary Seals: Not Sealed[☒]; Intact: No[ ], Yes[ ] & Broken By: _____ Date: _____

Laboratory Remarks:

Twenty late eluting compounds in the C3 substituted benzene region at trace-40 ppb were detected by the photoionization detector, but not identified.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: NM SCIENTIFIC LABORATORY DIVISION Contract: N/A
Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A
Matrix: (soil/water) Water Lab Sample ID: OR-92-1596
Sample wt/vol: 50.0 (g/mL) mL SLD Batch No: 196
Level: (low/med) Low Date Received: 7/8/92
% Moisture: not dec. N/A dec. N/A Date Extracted: N/A

(Continued on page 2.)

Extraction: (SepF/Cont/Sonc) N/A
GPC Cleanup: (Y/N) No pH: _____

Date Analyzed: 7/9/92
Dilution Factor: 10
CONCENTRATION UNITS:
(ug/L or ug/Kg): ug/L

This sample was analyzed for the following compounds using EPA Methods 601 & 602

CAS NO.	COMPOUND	CONC.	QUALIFIER
67-64-1	Acetone	50.0	U
71-43-2	Benzene	69.1	
108-86-1	Bromobenzene	10.0	U
74-97-5	Bromochloromethane	10.0	U
75-27-4	Bromodichloromethane	10.0	U
75-25-2	Bromoform	10.0	U
78-93-3	2-Butanone (MEK)	50.0	U
104-51-8	n-Butylbenzene	10.0	U
135-98-8	sec-Butylbenzene	10.0	U
98-06-6	tert-Butylbenzene	10.0	U
1634-04-4	tert-Butyl methyl ether (MTBE)	50.0	U
56-23-5	Carbon tetrachloride	10.0	U
108-90-7	Chlorobenzene	10.0	U
67-66-3	Chloroform	10.0	U
95-49-8	2-Chlorotoluene	10.0	U
106-43-4	4-Chlorotoluene	10.0	U
96-12-8	1,2-Dibromo-3-chloropropane	10.0	U
124-48-1	Dibromochloromethane	10.0	U
106-93-4	1,2-Dibromoethane	10.0	U
74-95-3	Dibromomethane	10.0	U
95-50-1	1,2-Dichlorobenzene	10.0	U
541-73-1	1,3-Dichlorobenzene	10.0	U
106-46-7	1,4-Dichlorobenzene	10.0	U
75-71-8	Dichlorodifluoromethane	10.0	U
75-34-3	1,1-Dichloroethane	10.0	U
107-06-2	1,2-Dichloroethane	10.0	U
75-35-4	1,1-Dichloroethene	10.0	U
156-59-4	cis-1,2-Dichloroethene	10.0	U
156-60-5	trans-1,2-Dichloroethene	10.0	U
78-87-5	1,2-Dichloropropane	10.0	U
142-28-9	1,3-Dichloropropane	10.0	U
590-20-7	2,2-Dichloropropane	10.0	U
563-58-6	1,1-Dichloropropene	10.0	U
1006-01-5	cis-1,3-Dichloropropene	10.0	U

(Continued on page 3.)

1006-02-6	trans-1,3-Dichloropropene	10.0	U
100-41-4	Ethylbenzene	19.6	
87-68-3	Hexachlorobutadiene	10.0	U
98-82-8	Isopropylbenzene	10.0	U
99-87-6	4-Isopropyltoluene	10.0	U
75-09-2	Methylene chloride	10.0	U
90-12-0	1-Methylnaphthalene	10.0	U
91-57-6	2-Methylnaphthalene	10.0	U
91-20-3	Naphthalene	10.0	U
103-65-1	Propylbenzene	10.0	U
100-42-5	Styrene	10.0	U
630-20-6	1,1,1,2-Tetrachloroethane	10.0	U
79-34-5	1,1,2,2-Tetrachloroethane	10.0	U
127-18-4	Tetrachloroethene	10.0	U
109-99-9	Tetrahydrofuran (THF)	50.0	U
108-88-3	Toluene	10.0	U
87-61-5	1,2,3-Trichlorobenzene	10.0	U
120-82-1	1,2,4-Trichlorobenzene	10.0	U
71-55-6	1,1,1-Trichloroethane	10.0	U
79-00-5	1,1,2-Trichloroethane	10.0	U
79-01-6	Trichloroethene	10.0	U
75-69-4	Trichlorofluoromethane	10.0	U
96-18-4	1,2,3-Trichloropropane	10.0	U
95-63-6	1,2,4-Trimethylbenzene	38.9	
108-67-8	1,3,5-Trimethylbenzene	10.0	U
75-01-4	Vinyl chloride	10.0	U
95-47-6	o-Xylene	36.6	
N/A	p- & m-Xylene	79.2	

Qualifier Definitions:

B - Indicates compound was detected in the Lab Blank as well as in the sample.
D - Indicates value taken from a secondary (diluted) sample analysis.
E - Indicates compound concentration exceeded the range of the standard curve.
J - Indicates an estimated value for tentatively identified compounds, or for compounds detected and identified but present at a concentration less than the quantitation limit.
N - Indicates that more than one peak was used for quantitation.
U - Indicates compound was analyzed for, but not detected above the concentration listed (Quantitation Limit).

(Continued on page 4.)

QUALITY CONTROL SUMMARY FOR VOLATILES SCREEN

METHOD BLANK: A laboratory method blank was analyzed along with this sample to assure the absence of interfering contaminants from lab reagents, instruments, or the general laboratory environment. Unless listed below, no contaminants were detected in this blank above the reported detection limit.

COMPOUND DETECTED	CONCENTRATION (PPB)
No Compounds Detected	

SURROGATE RECOVERIES:

SURROGATE	CONCENTRATION	% RECOVERY
Bromofluorobenzene	25.0 ppb	106.8
2-Bromo-1-chloropropane	25.0 ppb	106.0

SPIKE RECOVERY: The % recoveries for compounds in the batch spike were from 80% to 120% with the exception of the compounds listed below:

COMPOUND	CONCENTRATION	% RECOVERY
1,1,2,2-tetrachloroethane	25.3 ppb	129.1
Naphthalene	25.3 ppb	166.5

Analyst: _____
Gary C. Eden
Analyst, Organic Chemistry

Reviewed By: _____
Richard F. Meyerhein 07/17/92
Supervisor, Organic Chemistry Section

STATE OF NEW MEXICO DEPARTMENT OF HEALTH
SCIENTIFIC LABORATORY DIVISION
P.O. Box 4700 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 [505]-841-2500
ORGANIC CHEMISTRY SECTION [505]-841-2570

JUL 17 1992

ANALYTICAL REPORT
SLD Accession No. OR-92-1595

Request ID No. 014361

Distribution
- User 70320
- Submitter 260
- SLD Files

To: D. Boyer
NM Oil Consv. Div.
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

From: Organic Chemistry Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

Re: A water, purgeable sample submitted to this laboratory on July 8, 1992

DEMOGRAPHIC DATA

COLLECTION

8-Jul-92 By: Ols
12:00 hrs. In/Near: Carlsbad

SECTION

SH-60

ANALYTICAL RESULTS: Aromatic & Halogenated Purgeable (EPA-601 2) Screen (754)

Parameter	Value	Note	MDL	Units
Halogenated Volatiles (42)	0.00	N	1.00	ppb
Benzene	16.60		1.00	ppb
Toluene	0.80	T	1.00	ppb
p- & m-Xylene	0.90	T	1.00	ppb
1,2,4-Trimethylbenzene	0.90	T	1.00	ppb
Naphthalene	1.80		1.00	ppb

See Laboratory Remarks for Additional Information

Notations & Comments:

MDL = Minimal Detectable Level.

A = Approximate Value; N = None Detected above Detection Limit; P = Compound Present, but not quantified;
T = Trace (<Detection Limit); U = Compound Identity Not Confirmed.

Evidentiary Seals: Not Sealed [X]; Intact: No [ ], Yes [ ] & Broken By: _____ Date: _____

Laboratory Remarks:

Thirty-five late eluting compounds in the C3 substituted benzene region at trace levels were detected by the photoionization detector, but not identified.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: NM SCIENTIFIC LABORATORY DIVISION Contract: N/A
Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A
Matrix: (soil/water) Water Lab Sample ID: OR-92-1595
Sample wt/vol: 5.0 (g/mL) mL SLD Batch No: 196
Level: (low/med) Low Date Received: 7/8/92

(Continued on page 2.)

% Moisture: not dec. N/A dec. N/A
Extraction: (SepF/Cont/Sonc) N/A
GPC Cleanup: (Y/N) No pH: _____

Date Extracted: N/A
Date Analyzed: 7/9/92
Dilution Factor: 1
CONCENTRATION UNITS:
(ug/L or ug/Kg): ug/L

This sample was analyzed for the following compounds using EPA Methods 601 & 602

CAS NO.	COMPOUND	CONC.	QUALIFIER
67-64-1	Acetone	5.0	U
71-43-2	Benzene	15.6	
108-86-1	Bromobenzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
78-93-3	2-Butanone (MEK)	5.0	U
104-51-8	n-Butylbenzene	1.0	U
135-98-8	sec-Butylbenzene	1.0	U
98-06-6	tert-Butylbenzene	1.0	U
1634-04-4	tert-Butyl methyl ether (MTBE)	5.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
67-66-3	Chloroform	1.0	U
95-49-8	2-Chlorotoluene	1.0	U
106-43-4	4-Chlorotoluene	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
74-95-3	Dibromomethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-4	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
142-28-9	1,3-Dichloropropane	1.0	U
590-20-7	2,2-Dichloropropane	1.0	U
563-58-6	1,1-Dichloropropene	1.0	U

(Continued on page 3.)

1006-01-5	cis-1,3-Dichloropropene	1.0	U
1006-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
98-82-8	Isopropylbenzene	1.0	U
99-87-6	4-Isopropyltoluene	1.0	U
75-09-2	Methylene chloride	1.0	U
90-12-0	1-Methylnaphthalene	1.0	U
91-57-6	2-Methylnaphthalene	1.0	U
91-20-3	Naphthalene	1.8	
103-65-1	Propylbenzene	1.0	U
100-42-5	Styrene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
109-99-9	Tetrahydrofuran (THF)	5.0	U
108-88-3	Toluene	0.8	J
87-61-5	1,2,3-Trichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
95-63-6	1,2,4-Trimethylbenzene	0.9	J
108-67-8	1,3,5-Trimethylbenzene	1.0	U
75-01-4	Vinyl chloride	1.0	U
95-47-6	o-Xylene	1.0	U
N/A	p- & m-Xylene	0.9	J

Qualifier Definitions:

B - Indicates compound was detected in the Lab Blank as well as in the sample.
D - Indicates value taken from a secondary (diluted) sample analysis.
E - Indicates compound concentration exceeded the range of the standard curve.
J - Indicates an estimated value for tentatively identified compounds, or for compounds detected and identified but present at a concentration less than the quantitation limit.
N - Indicates that more than one peak was used for quantitation.
U - Indicates compound was analyzed for, but not detected above the concentration listed (Quantitation Limit).

(Continued on page 4.)

QUALITY CONTROL SUMMARY FOR VOLATILES SCREEN

METHOD BLANK: A laboratory method blank was analyzed along with this sample to assure the absence of interfering contaminants from lab reagents, instruments, or the general laboratory environment. Unless listed below, no contaminants were detected in this blank above the reported detection limit.

COMPOUND DETECTED	CONCENTRATION (PPB)
No Compounds Detected	

SURROGATE RECOVERIES:

SURROGATE	CONCENTRATION	RECOVERY
Bromofluorobenzene	25.0 ppb	99.2
2-Bromo-1-chloropropane	25.0 ppb	108.7

SPIKE RECOVERY: The % recoveries for compounds in the batch spike were from 80% to 120% with the exception of the compounds listed below:

COMPOUND	CONCENTRATION	% RECOVERY
1,1,2,2-tetrachloroethane	25.3 ppb	129.1
Naphthalene	25.3 ppb	166.5

Analyst: _____
Gary C. Eden
Analyst, Organic Chemistry

Reviewed By: _____
Richard F. Meyernein 07/17/92
Supervisor, Organic Chemistry Section

STATE OF NEW MEXICO DEPARTMENT OF HEALTH

SCIENTIFIC LABORATORY DIVISION

P.O. Box 4700 700 Camino de Salud, NE
Albuquerque, NM 87196-4700 (505)-841-2500
ORGANIC CHEMISTRY SECTION (505)-841-2570

July 17, 1992

Request ID No. 014360

ANALYTICAL REPORT
SLD Accession No. OR-92-1594

Distribution
( ) User 70320
(■) Submitter 260
(✱) SLD Files

To: D. Boyer
NM Oil Consv. Div.
State Land Office Bldg.
P.O. Box 2088
Santa Fe, NM 87504-2088

From: Organic Chemistry Section
Scientific Laboratory Div.
700 Camino de Salud, NE
Albuquerque, NM 87106

Re: A water, purgeable sample submitted to this laboratory on July 8, 1992

DEMOGRAPHIC DATA

COLLECTION
On: 7-Jul-92 *By:* Ols . . .
at: 8:45 hrs. *In/Near:* Carlsbad

LOCATION
MW 61 (BH-87A)

ANALYTICAL RESULTS: Aromatic & Halogenated Purgeable (EPA-601/2) Screen (754)

Parameter	Value	Note	MDL	Units
Halogenated Volatiles (42)	0.00	N	10.00	ppb
Benzene	59.80		10.00	ppb
Ethylbenzene	2.50	T	10.00	ppb
p- & m-Xylene	8.10	T	10.00	ppb
1,2,4-Trimethylbenzene	4.10	T	10.00	ppb
Naphthalene	27.30		10.00	ppb

See Laboratory Remarks for Additional Information

Notations & Comments:

MDL = Minimal Detectable Level.

A = Approximate Value; N = None Detected above Detection Limit; P = Compound Present, but not quantified;
T = Trace (<Detection Limit); U = Compound Identity Not Confirmed.

Evidentiary Seals: Not Sealed [X]; Intact: No [ ], Yes [ ] & Broken By: _____ Date: _____

Laboratory Remarks:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: NM SCIENTIFIC LABORATORY DIVISION Contract: N/A
Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A
Matrix: (soil/water) Water Lab Sample ID: OR-92-1594
Sample wt/vol: 50.0 (g/mL) mL SLD Batch No: 196
Level: (low/med) Low Date Received: 7/8/92
% Moisture: not dec. N/A dec. N/A Date Extracted: N/A
Extraction: (SepF/Cont/Sonc) N/A Date Analyzed: 7/9/92
GPC Cleanup: (Y/N) No pH: _____ Dilution Factor: 10

(Continued on page 2.)

CONCENTRATION UNITS:
(ug/L or ug/Kg): ug/L

This sample was analyzed for the following compounds using EPA Methods 601 & 602

CAS NO.	COMPOUND	CONC.	QUALIFIER
67-64-1	Acetone	50.0	U
71-43-2	Benzene	59.8	
108-86-1	Bromobenzene	10.0	U
74-97-5	Bromochloromethane	10.0	U
75-27-4	Bromodichloromethane	10.0	U
75-25-2	Bromoform	10.0	U
78-93-3	2-Butanone (MEK)	50.0	U
104-51-8	n-Butylbenzene	10.0	U
135-98-8	sec-Butylbenzene	10.0	U
98-06-6	tert-Butylbenzene	10.0	U
1634-04-4	tert-Butyl methyl ether (MTBE)	50.0	U
56-23-5	Carbon tetrachloride	10.0	U
108-90-7	Chlorobenzene	10.0	U
67-66-3	Chloroform	10.0	U
95-49-8	2-Chlorotoluene	10.0	U
106-43-4	4-Chlorotoluene	10.0	U
96-12-8	1,2-Dibromo-3-chloropropane	10.0	U
124-48-1	Dibromochloromethane	10.0	U
106-93-4	1,2-Dibromoethane	10.0	U
74-95-3	Dibromomethane	10.0	U
95-50-1	1,2-Dichlorobenzene	10.0	U
541-73-1	1,3-Dichlorobenzene	10.0	U
106-46-7	1,4-Dichlorobenzene	10.0	U
75-71-8	Dichlorodifluoromethane	10.0	U
75-34-3	1,1-Dichloroethane	10.0	U
107-06-2	1,2-Dichloroethane	10.0	U
75-35-4	1,1-Dichloroethene	10.0	U
156-59-4	cis-1,2-Dichloroethene	10.0	U
156-60-5	trans-1,2-Dichloroethene	10.0	U
78-87-5	1,2-Dichloropropane	10.0	U
142-28-9	1,3-Dichloropropane	10.0	U
590-20-7	2,2-Dichloropropane	10.0	U
563-58-6	1,1-Dichloropropene	10.0	U
1006-01-5	cis-1,3-Dichloropropene	10.0	U
1006-02-6	trans-1,3-Dichloropropene	10.0	U
100-41-4	Ethylbenzene	2.5	J

(Continued on page 3.)

87-68-3	Hexachlorobutadiene	10.0	U
98-82-8	Isopropylbenzene	10.0	U
99-87-6	4-Isopropyltoluene	10.0	U
75-09-2	Methylene chloride	10.0	U
90-12-0	1-Methylnaphthalene	10.0	U
91-57-6	2-Methylnaphthalene	10.0	U
91-20-3	Naphthalene	27.3	
103-65-1	Propylbenzene	10.0	U
100-42-5	Styrene	10.0	U
630-20-6	1,1,1,2-Tetrachloroethane	10.0	U
79-34-5	1,1,2,2-Tetrachloroethane	10.0	U
127-18-4	Tetrachloroethene	10.0	U
109-99-9	Tetrahydrofuran (THF)	50.0	U
108-88-3	Toluene	10.0	U
87-61-5	1,2,3-Trichlorobenzene	10.0	U
120-82-1	1,2,4-Trichlorobenzene	10.0	U
71-55-6	1,1,1-Trichloroethane	10.0	U
79-00-5	1,1,2-Trichloroethane	10.0	U
79-01-6	Trichloroethene	10.0	U
75-69-4	Trichlorofluoromethane	10.0	U
96-18-4	1,2,3-Trichloropropane	10.0	U
95-63-6	1,2,4-Trimethylbenzene	4.1	J
108-67-8	1,3,5-Trimethylbenzene	10.0	U
75-01-4	Vinyl chloride	10.0	U
95-47-6	o-Xylene	10.0	U
N/A	p- & m-Xylene	8.1	J

Qualifier Definitions:

B - Indicates compound was detected in the Lab Blank as well as in the sample.
D - Indicates value taken from a secondary (diluted) sample analysis.
E - Indicates compound concentration exceeded the range of the standard curve.
J - Indicates an estimated value for tentatively identified compounds, or for compounds detected and identified but present at a concentration less than the quantitation limit.
N - Indicates that more than one peak was used for quantitation.
U - Indicates compound was analyzed for, but not detected above the concentration listed (Quantitation Limit).

(Continued on page 4.)

QUALITY CONTROL SUMMARY FOR VOLATILES SCREEN

METHOD BLANK: A laboratory method blank was analyzed along with this sample to assure the absence of interfering contaminants from lab reagents, instruments, or the general laboratory environment. Unless listed below, no contaminants were detected in this blank above the reported detection limit.

COMPOUND DETECTED	CONCENTRATION (PPB)
No Compounds Detected	

SURROGATE RECOVERIES:

SURROGATE	CONCENTRATION	% RECOVERY
Bromofluorobenzene	25.0 ppb	100.0
2-Bromo-1-chloropropane	25.0 ppb	112.4

SPIKE RECOVERY: The % recoveries for compounds in the batch spike were from 80% to 120% with the exception of the compounds listed below:

COMPOUND	CONCENTRATION	RECOVERY
1,1,2,2-tetrachloroethane	25.3 ppb	129.1
Naphthalene	25.3 ppb	166.5

Analyst: _____
Gary C. Eden
Analyst, Organic Chemistry

Reviewed By: _____
Richard F. Meyernain 07/17/92
Supervisor, Organic Chemistry Section

APPENDIX D

POINT-IN-TIME RESULTS COMPARISON

APPENDIX D TABLE 1

LOWER QUEEN BENZENE ANALYSES
POINT-IN-TIME SAMPLINGS

(Data in PPB)

Well Number	September 1991^	December 1991^	April 1992#	July 1992#
BH-83	1600	350	12.9*@	948*
BH-83	-	290	125.4*	-
BH-83	-	-	150.^	-
BH-84+	40	90	202.*	178*
BH-85+	540	420	40.4*	268*
BH-86	33	<1	2.7*@	19*
BH-86	-	-	3.5	16.6~
BH-87A+	190	10	5.0*	359*
BH-87A+	-	-	-	59.8~
BH-88+	2200	1400	257.5*	357*
BH-89	<1	<1	4.1*	12*
BH-90	150	130	233.*@	115*
BH-90	-	-	68.3*	-
BH-91A+	680	150	25.3*	413*
BH-92	<1	<1	2.9*@	8*
BH-92	-	-	3.3*	-
BH-93	280	320	4.3#	103*
BH-93	-	-	-	69.1~
BH-94+	240	1900	1865.*	160*
BH-97	<1	<1	1.7*	15*
BH-97	-	-	-	<1^

+ Withdrawal Well

^ Analysis by Core Labs

Analysis by PTC HPLC method except as noted

* Average of more than one analysis

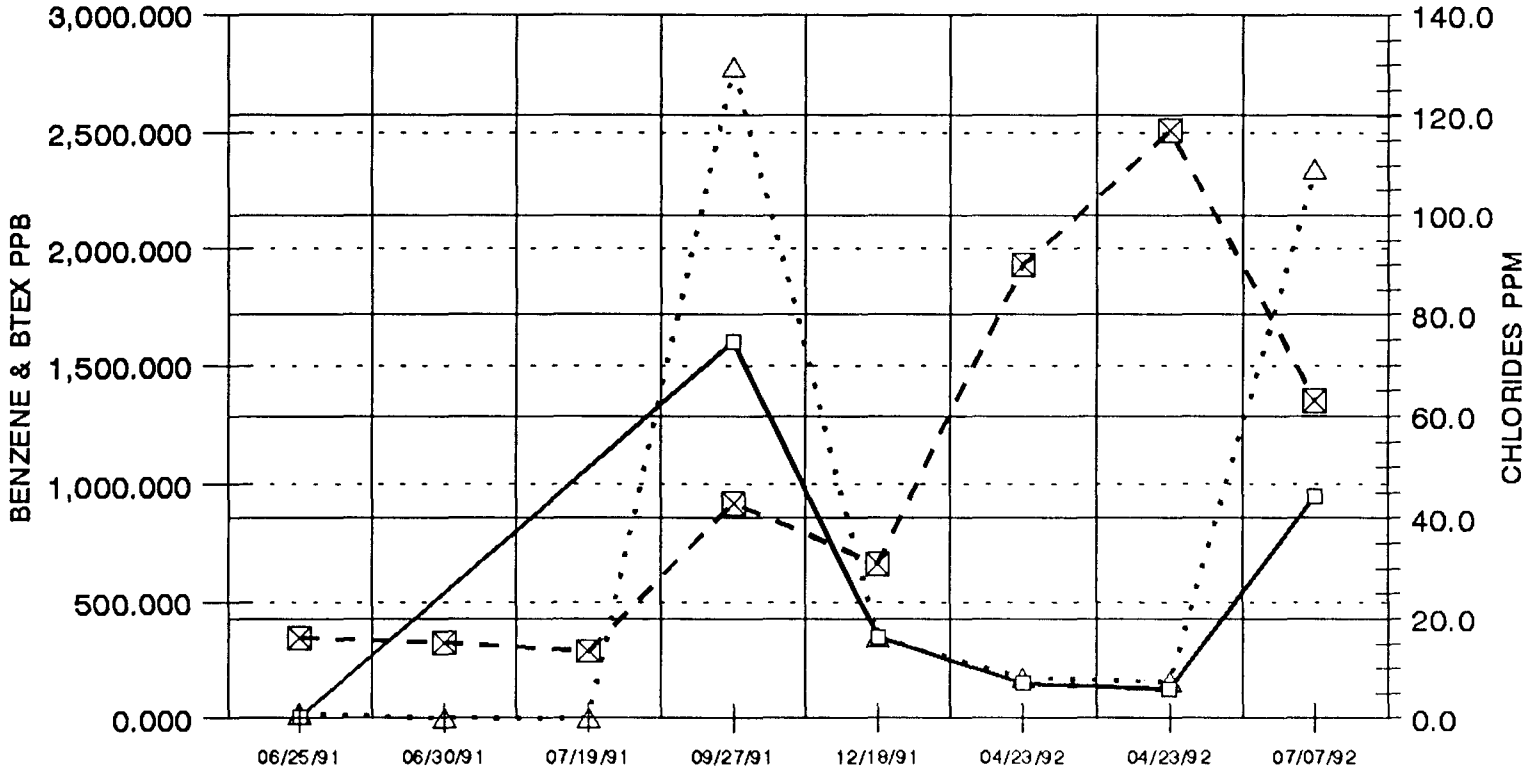
@ Bailed sample; all others collected by pump

~ Analysis by State Dept. of Health

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#57 BH-83



BENZENE	5.000			1,600.000	350.000	150.000	125.400	948.000
BTEX	18.000	1.000	0.000	2,780.000	350.000	175.000	156.200	2,341.000
CHLORIDES	16.2	15.2	13.5	43.0	31.0	90.0	117.0	63.0

DATE SAMPLED

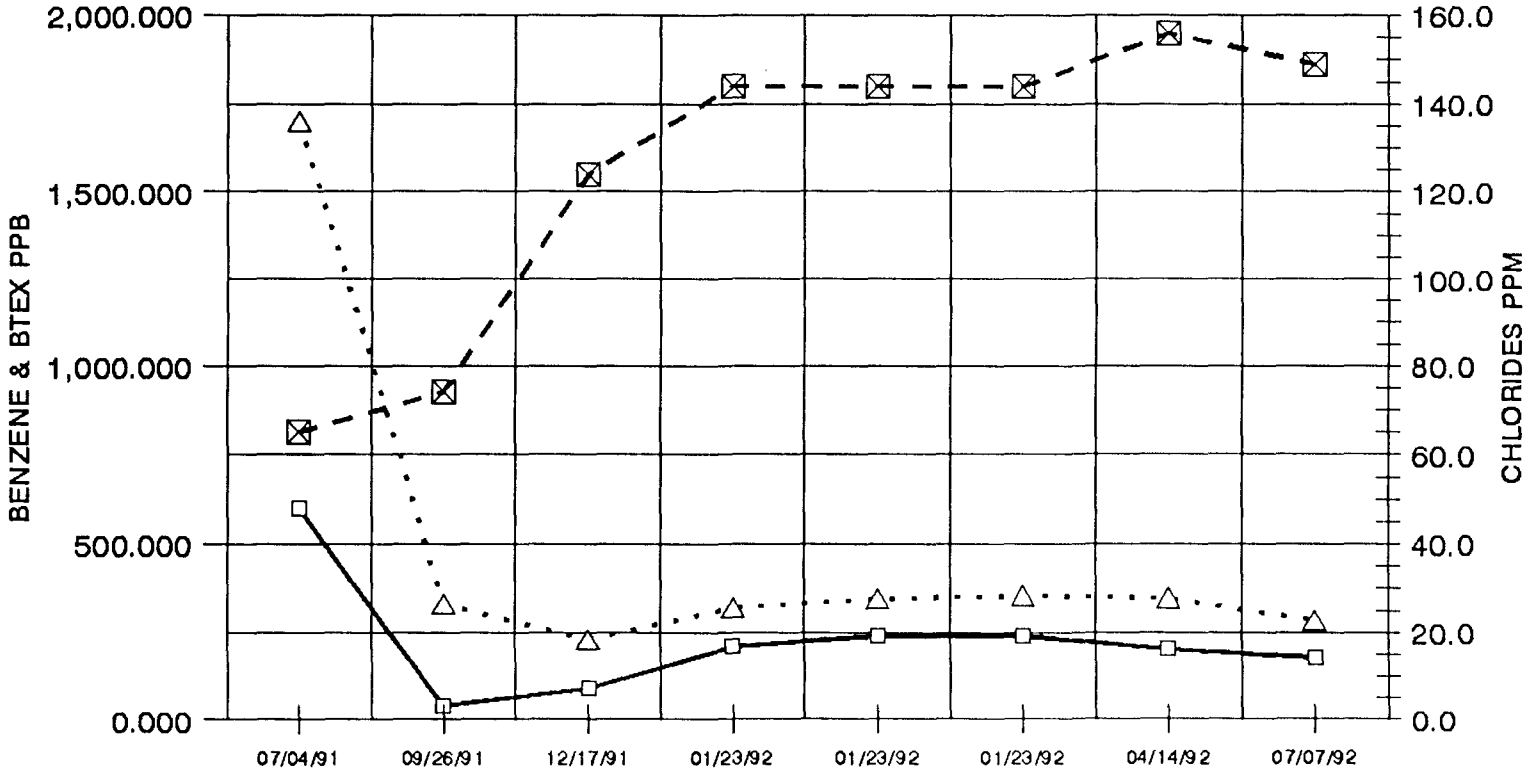
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#58 BH-84



	07/04/91	09/26/91	12/17/91	01/23/92	01/23/92	01/23/92	04/14/92	07/07/92
BENZENE	600.000	40.000	90.000	210.000	240.000	240.000	202.000	178.000
BTEX	1,700.000	330.000	230.000	320.000	345.000	355.000	346.900	284.000
CHLORIDES	65.0	74.0	124.0	144.0	144.0	144.0	156.0	149.0

DATE SAMPLED

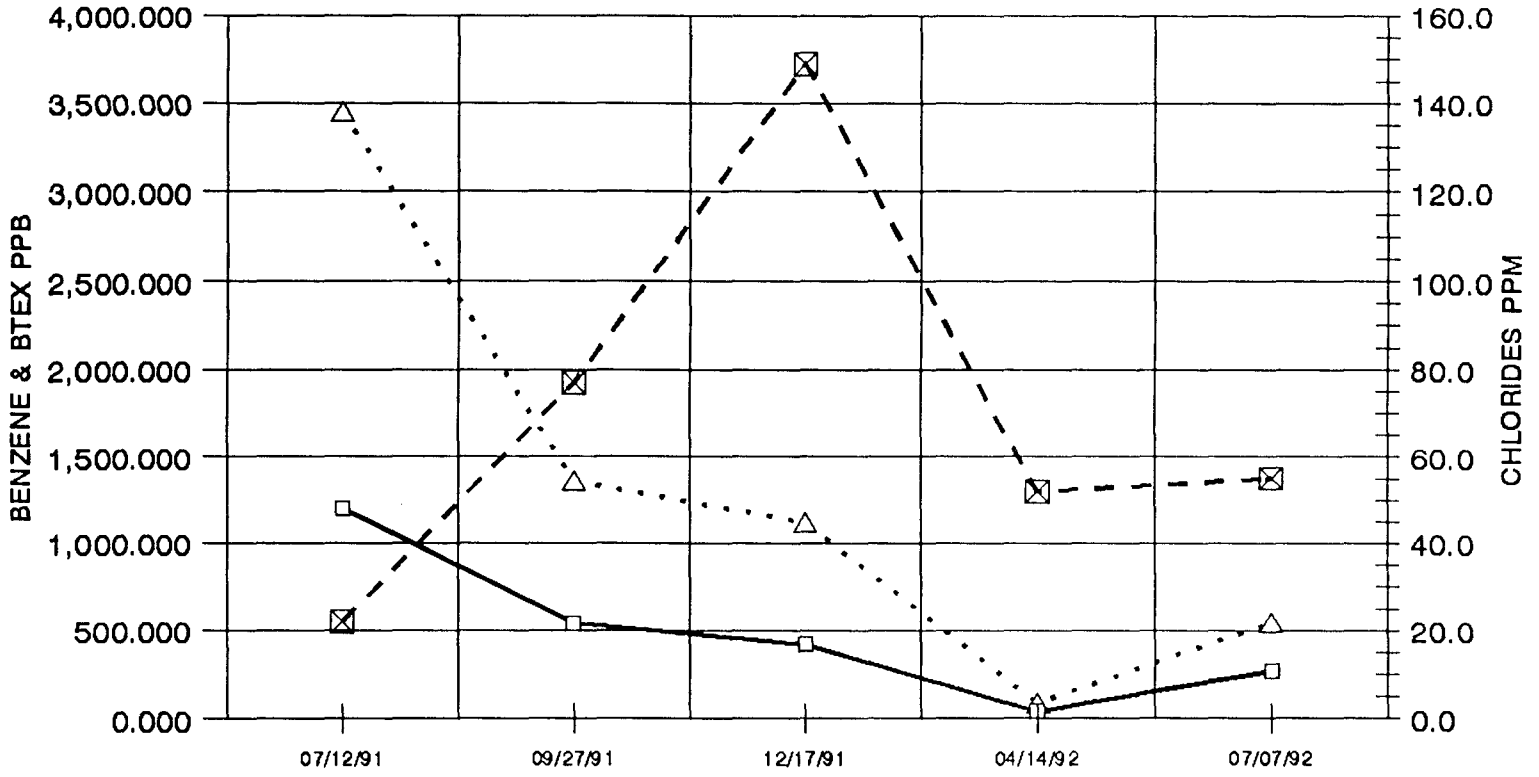
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#59 BH-85



BENZENE	1,200.000	540.000	420.000	40.400	268.000
BTEX	3,450.000	1,360.000	1,120.000	87.400	545.000
CHLORIDES	22.0	77.0	149.0	52.0	55.0

DATE SAMPLED

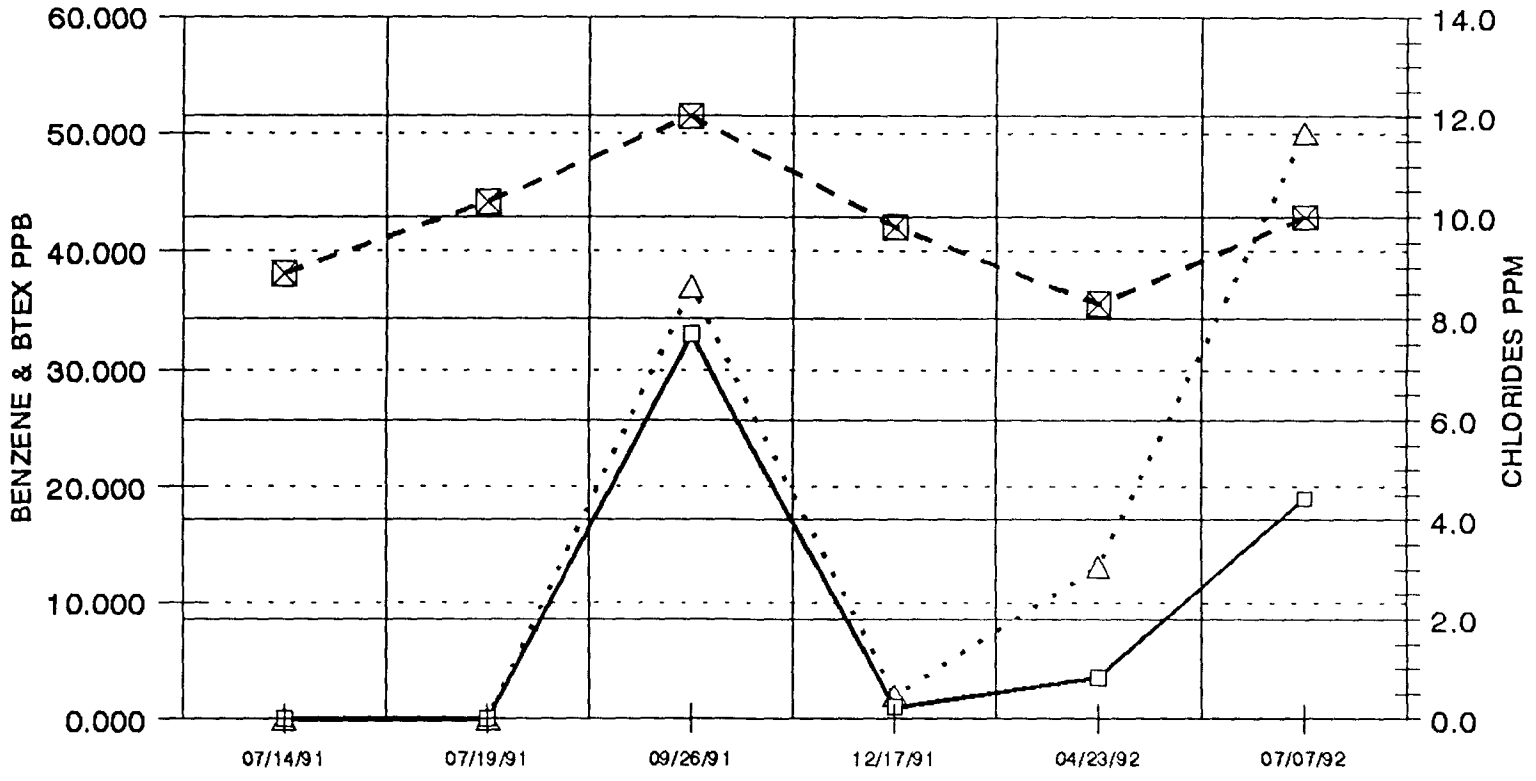
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#60 BH-86



	07/14/91	07/19/91	09/26/91	12/17/91	04/23/92	07/07/92
BENZENE	0.000	0.000	33.000	1.000	3.500	19.000
BTEX	0.000	0.000	37.000	2.000	13.100	50.000
CHLORIDES	8.9	10.3	12.0	9.8	8.3	10.0

DATE SAMPLED

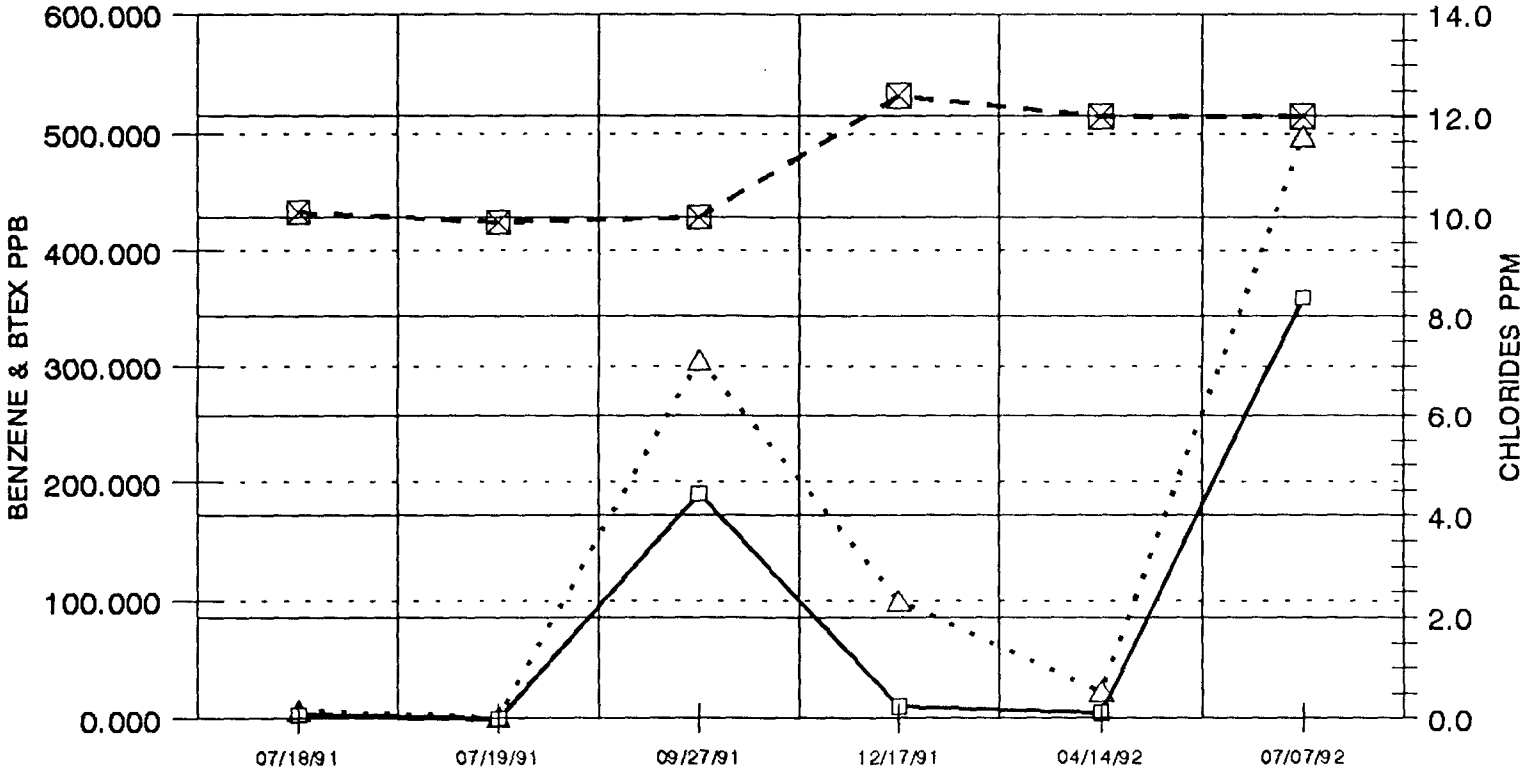
BY R.M. GRAY

PREPARED 3-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#61A BH-87A



	07/18/91	07/19/91	09/27/91	12/17/91	04/14/92	07/07/92
BENZENE	3.000	0.000	190.000	10.000	5.000	359.000
BTEX	7.000	1.000	305.000	100.000	23.000	497.000
CHLORIDES	10.1	9.9	10.0	12.4	12.0	12.0

DATE SAMPLED

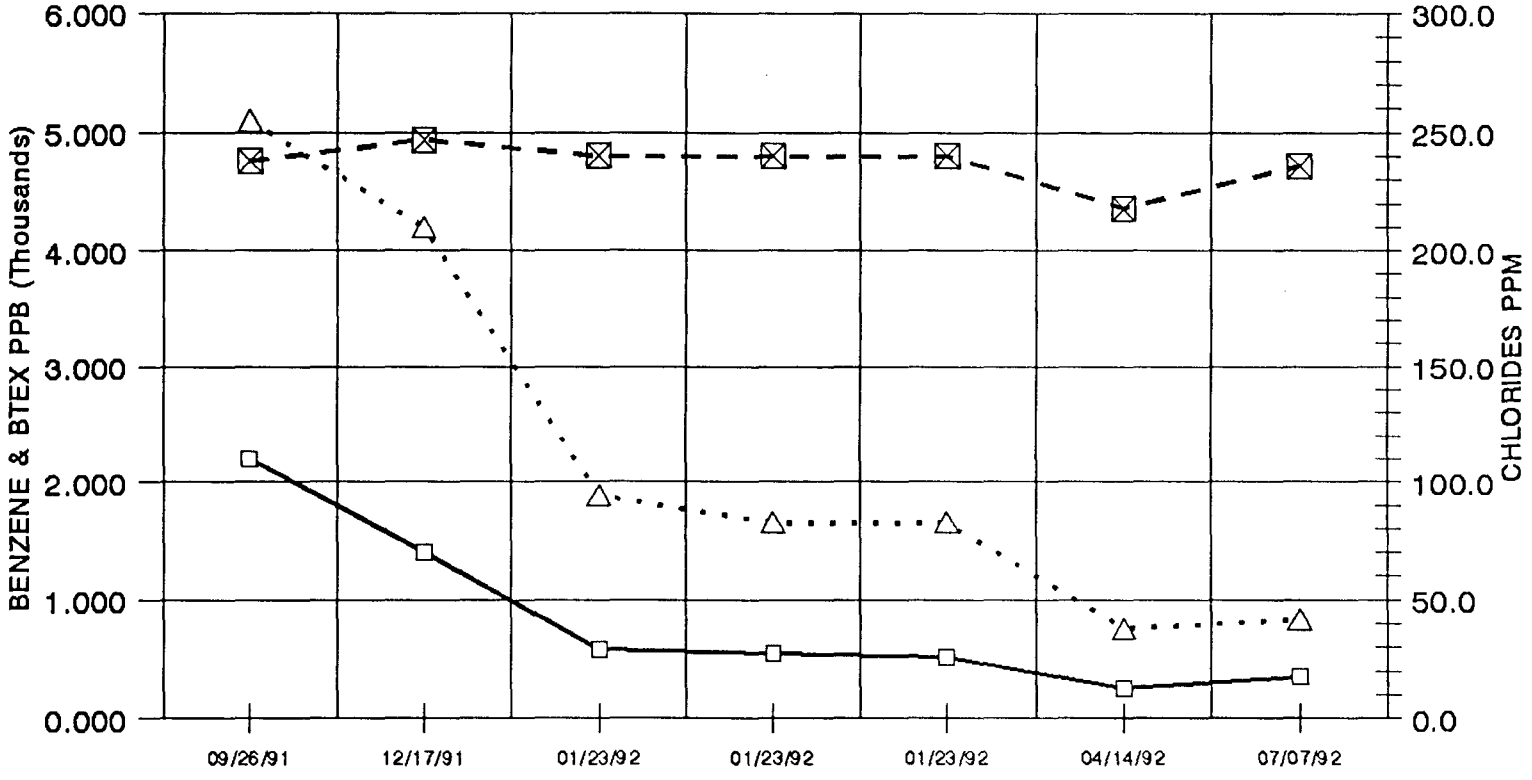
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#62 BH-88



BENZENE	2.200	1.400	0.580	0.550	0.520	0.258	0.357
BTEX	5.100	4.200	1.880	1.650	1.650	0.761	0.836
CHLORIDES	238.0	247.0	240.0	240.0	240.0	218.0	236.0

DATE SAMPLED

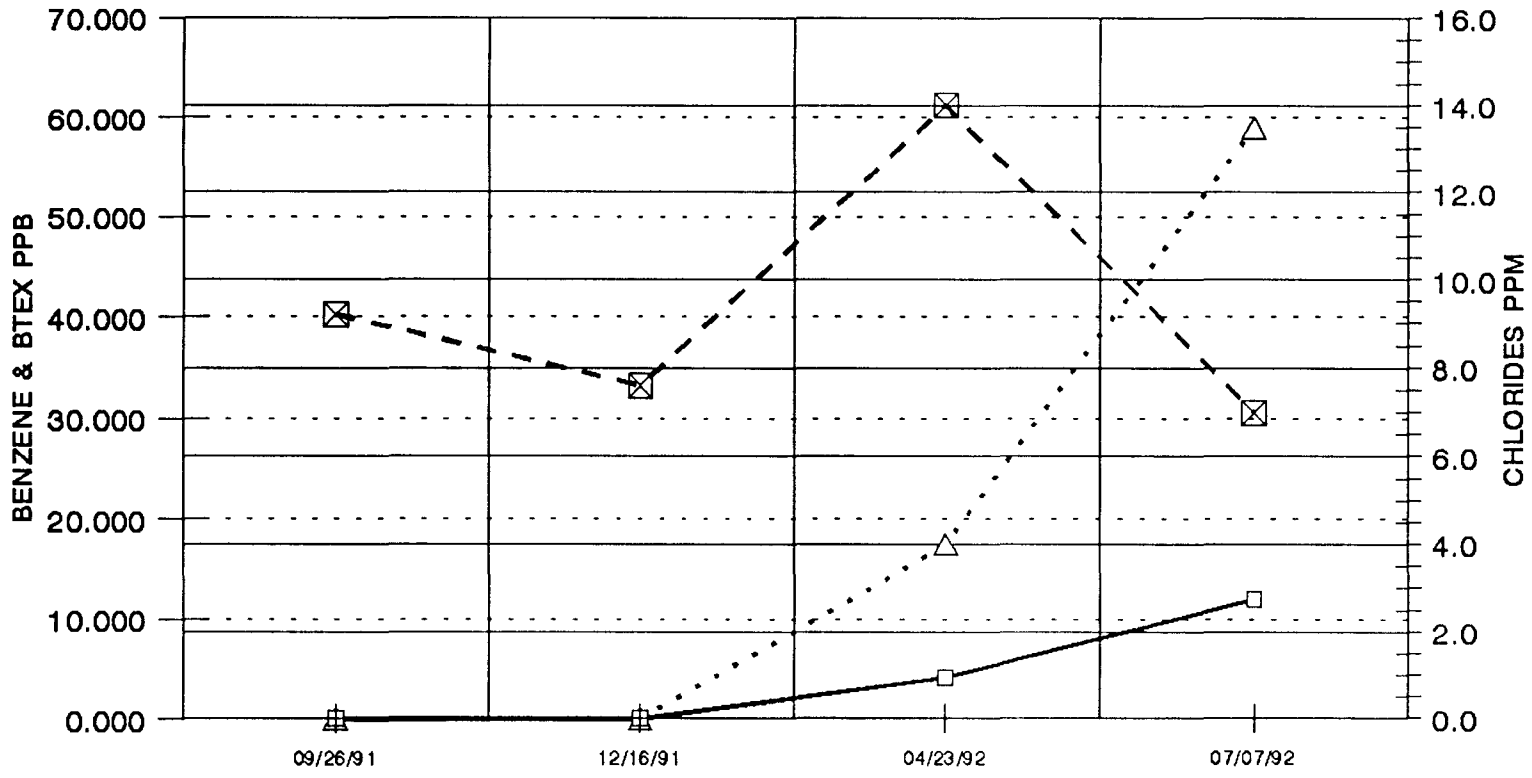
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#63 BH-89



BENZENE	0.000	0.000	4.100	12.000
BTEX	0.000	0.000	17.500	59.000
CHLORIDES	9.2	7.6	14.0	7.0

DATE SAMPLED

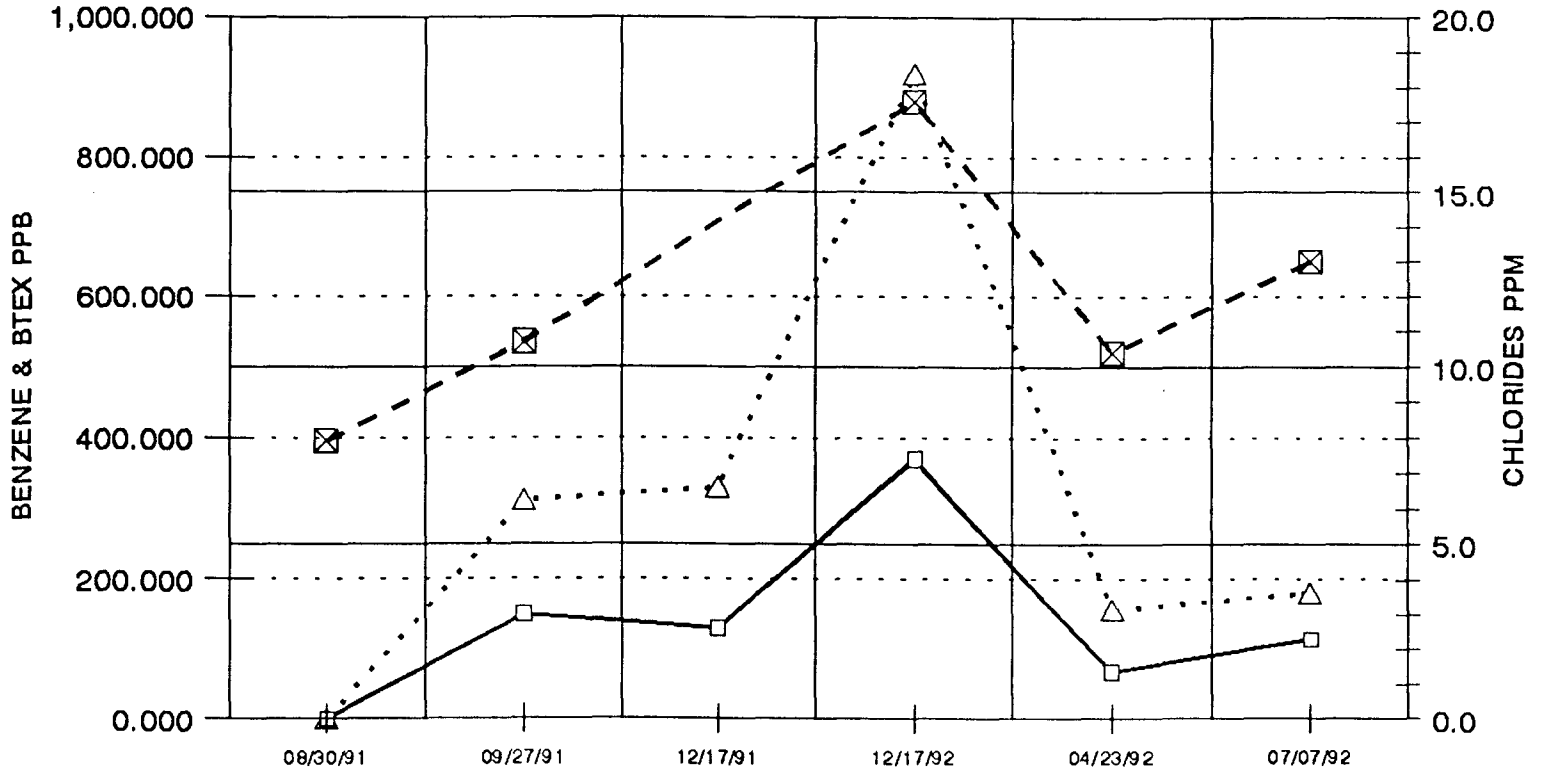
BY R.M. GRAY

PREPARED 3-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#64 BH-90



	08/30/91	09/27/91	12/17/91	12/17/92	04/23/92	07/07/92
BENZENE	0.000	150.000	130.000	370.000	68.300	115.000
BTEX	0.000	312.000	330.000	920.000	156.800	181.000
CHLORIDES	7.9	10.7		17.6	10.4	13.0

DATE SAMPLED

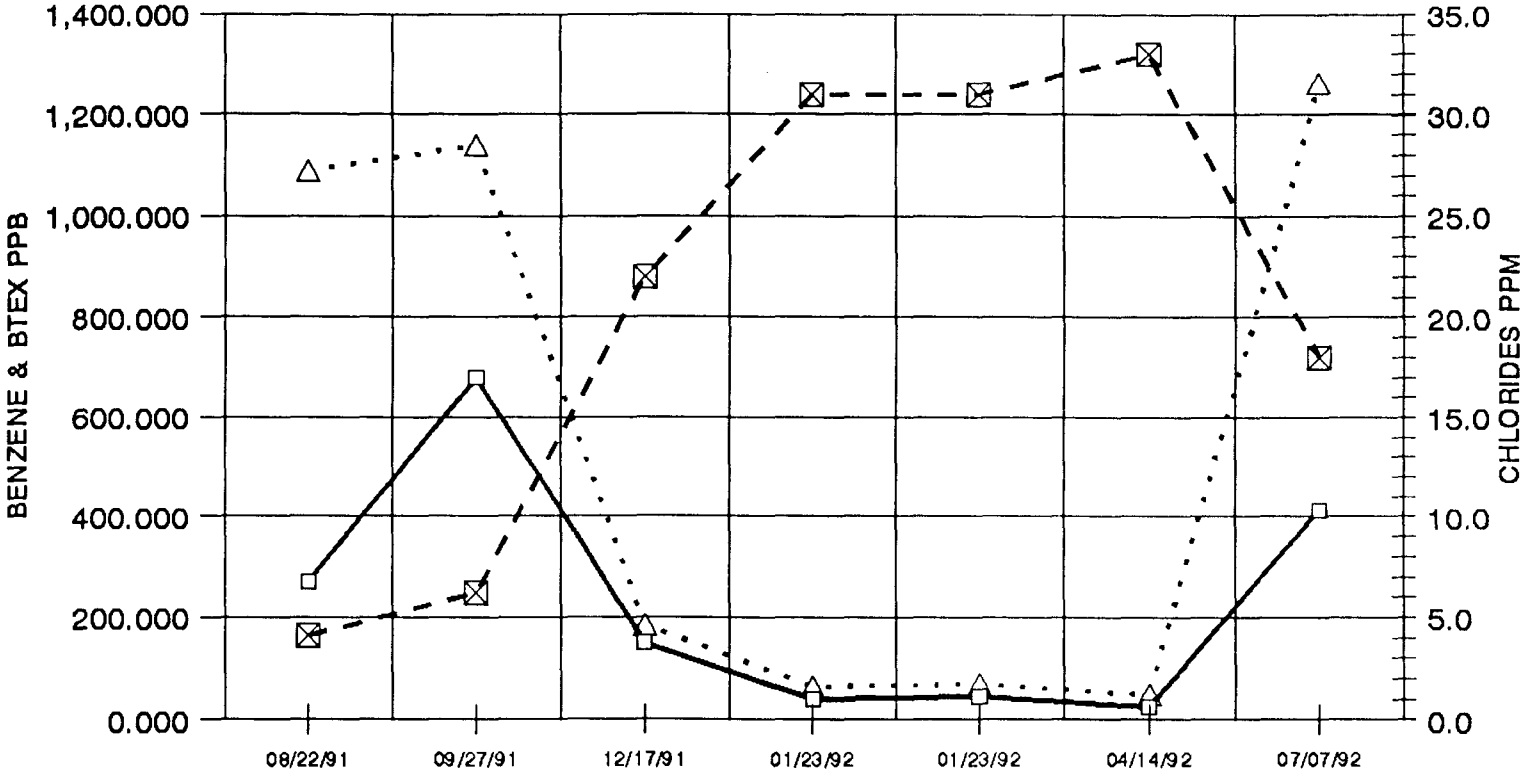
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#65A BH-91A



BENZENE	270.000	680.000	150.000	40.000	46.000	25.300	413.000
BTEX	1,090.000	1,140.000	185.000	65.000	70.000	49.100	1,263.000
CHLORIDES	4.1	6.2	22.0	31.0	31.0	33.0	18.0

DATE SAMPLED

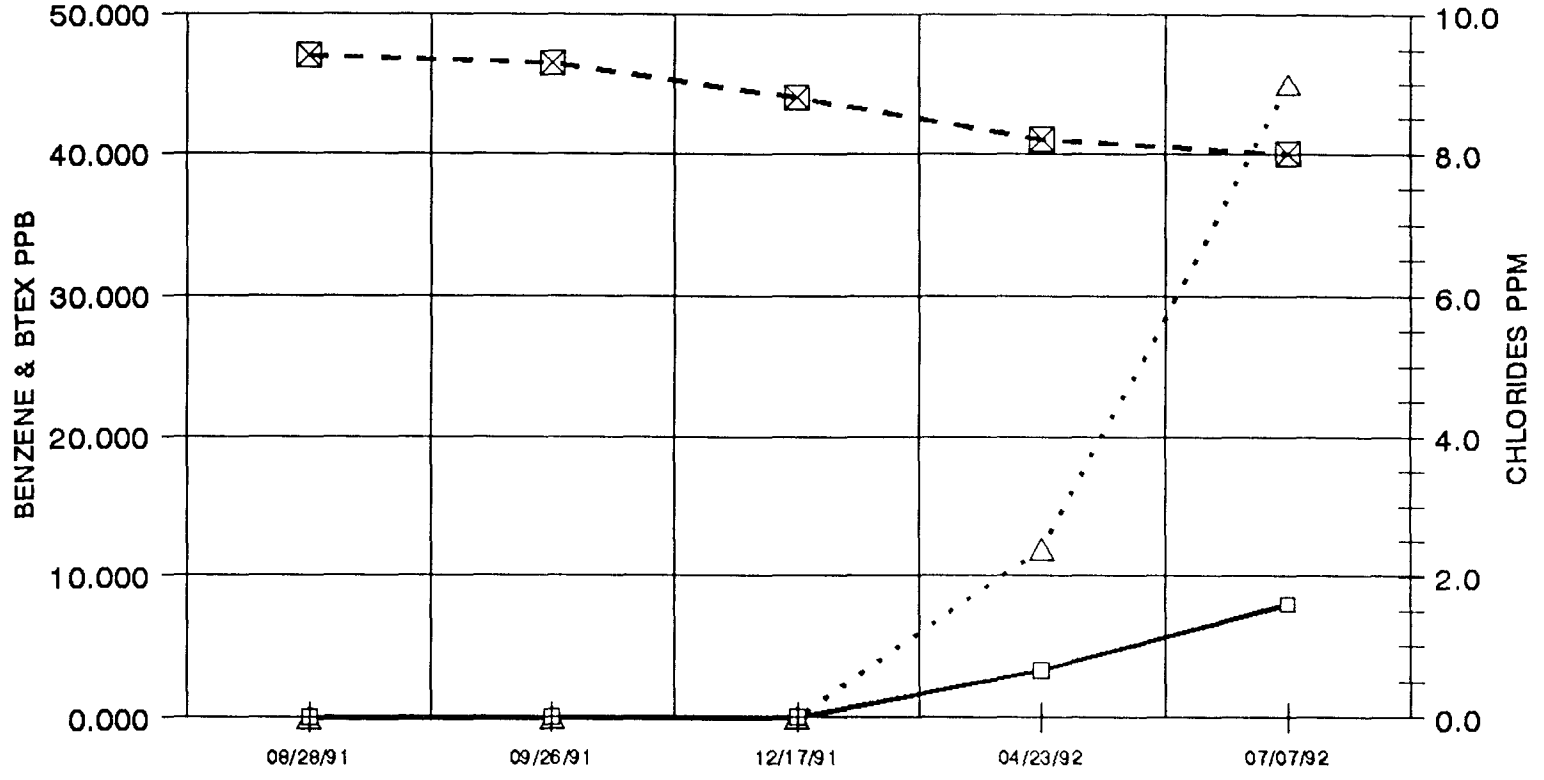
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#66 BH-92



BENZENE	0.000	0.000	0.000	3.300	8.000
BTEX	0.000	0.000	0.000	11.900	45.000
CHLORIDES	9.4	9.3	8.8	8.2	8.0

DATE SAMPLED

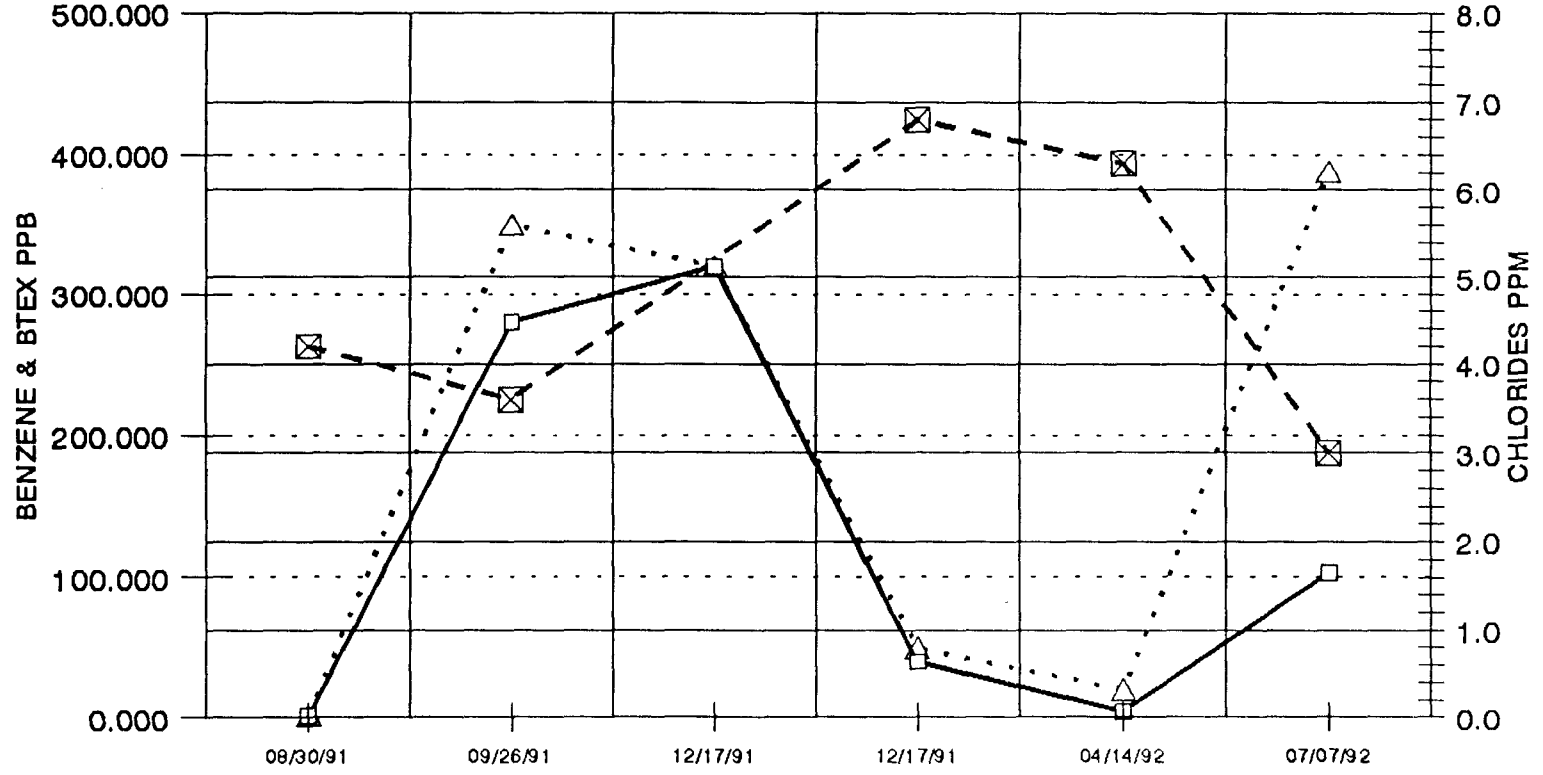
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#67 BH-93



BENZENE	1.000	280.000	320.000	40.000	4.300	103.000
BTEX	1.000	350.000	320.000	50.000	19.800	388.000
CHLORIDES	4.2	3.6		6.8	6.3	3.0

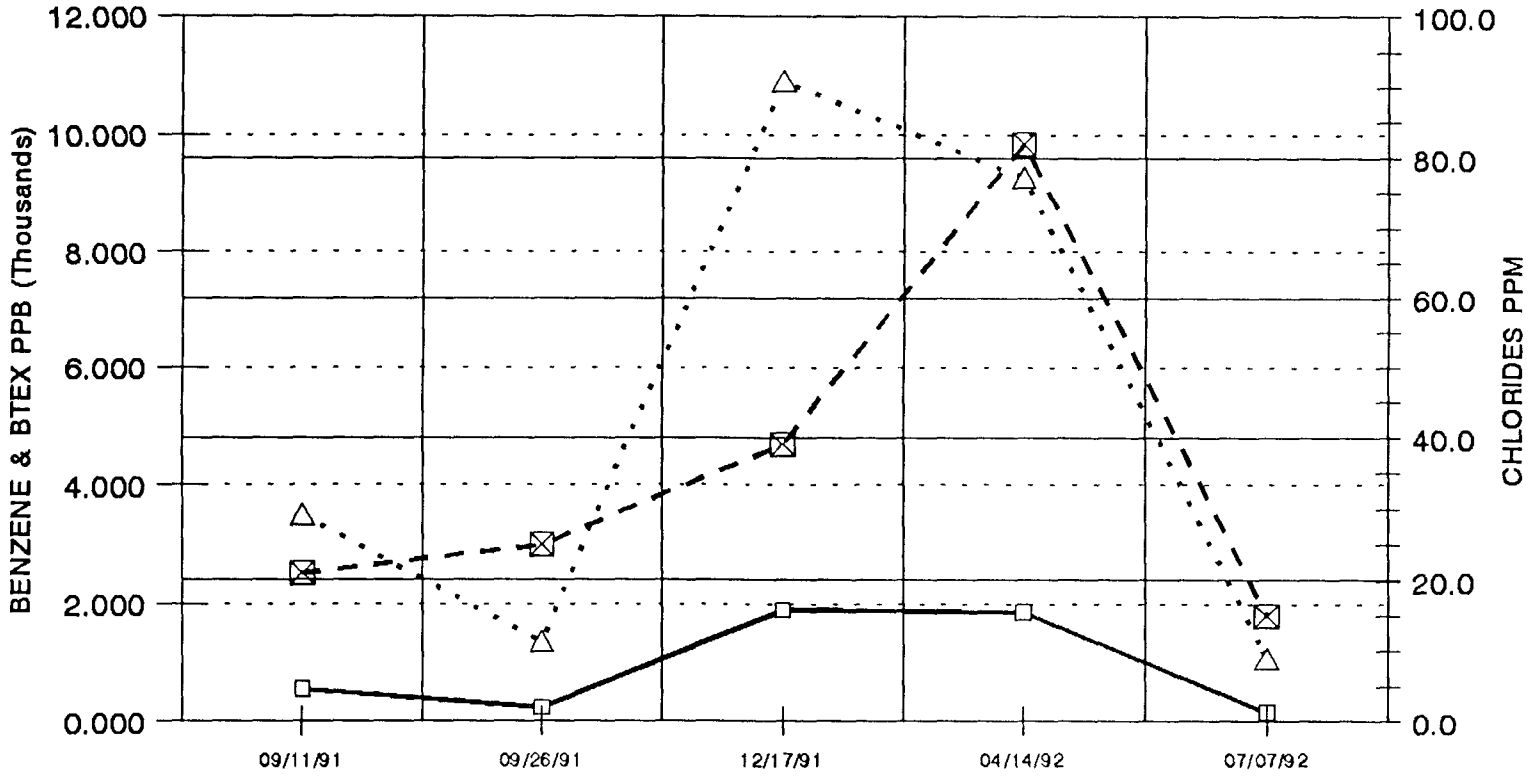
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#68 BH-94



	09/11/91	09/26/91	12/17/91	04/14/92	07/07/92
BENZENE	0.550	0.240	1.900	1.865	0.160
BTEX	3.500	1.360	10.900	9.269	1.069
CHLORIDES	21.0	25.0	39.0	82.0	15.0

DATE SAMPLED

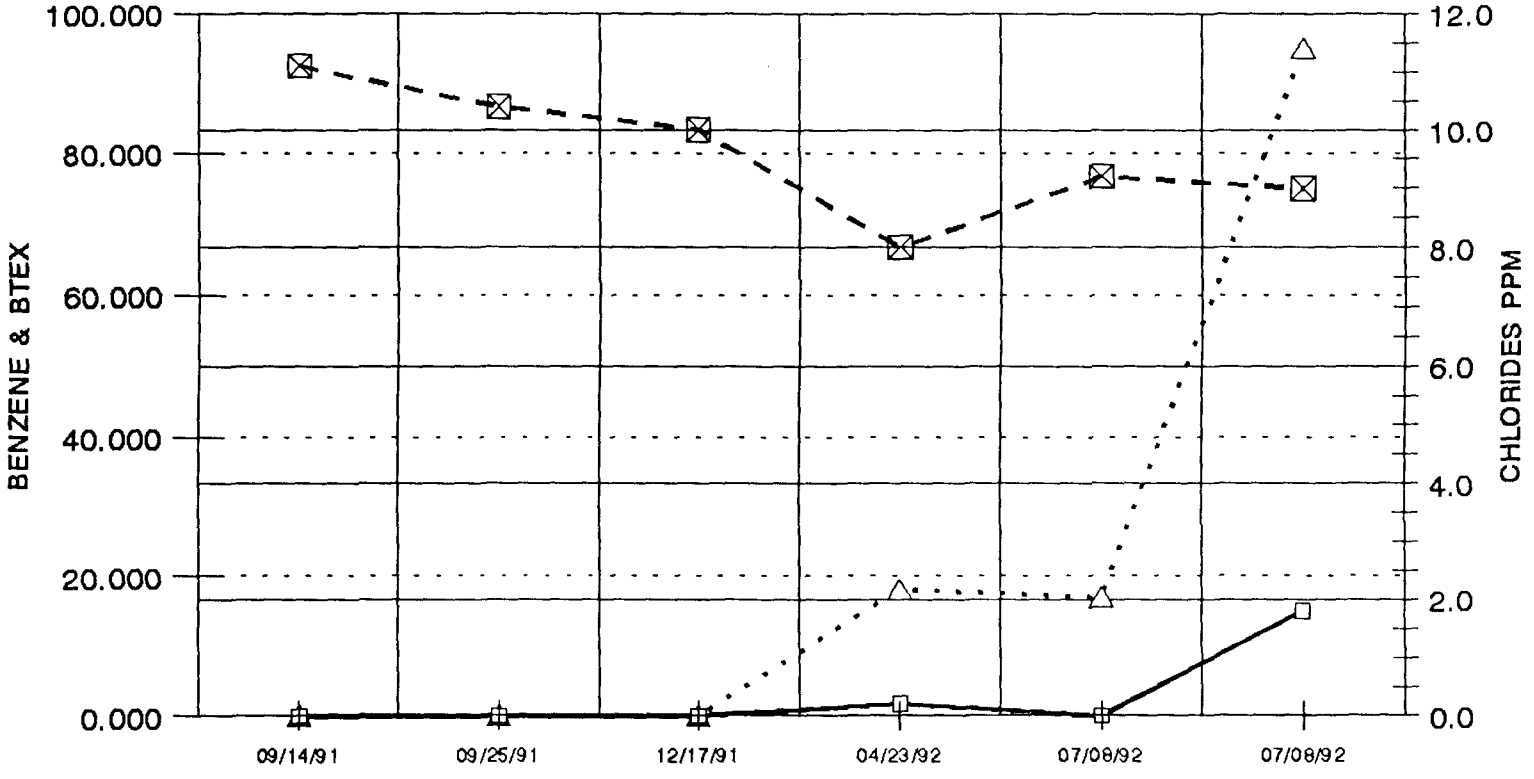
BY R.M. GRAY

PREPARED 9-14-92

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#70 BH-97



BENZENE	0.000	0.000	0.000	1.700	0.000	15.000
BTEX	0.000	0.000	0.000	18.100	17.000	95.000
CHLORIDES	11.1	10.4	10.0	8.0	9.2	9.0

DATE SAMPLED

BY R.M. GRAY

PREPARED 9 14 92

APPENDIX D TABLE 2

SHALLOW WELL BENZENE ANALYSES
POINT-IN-TIME SAMPLINGS

(Data in PPB)

Well Number	September 1991^	December 1991^	April 1992#	July 1992#
BH-14	250	200	NS	NS
BH-33	2300	2300	1780.*@	1842*@
BH-34	3000	3800	3087.*@	2199*@
BH-35	3800	Dry	NS	NS
BH-36	3100	3000	3492.*@	2708*
BH-38	5100	Dry	NS	NS
BH-39	1700	Dry	NS	NS
BH-41	4300	NS	2639.*	3105*
BH-41	-	-	-	2700^
BH-42	4700	Dry	3195.*@	2742*
BH-42	-	-	-	3000^
BH-44	1000	1100	NS	NS
BH-45	4	NS	Dry	NS
BH-47	3400	-	-	4353*
BH-49	3100	3000	NS	1939*@
BH-49	-	-	-	2000^
BH-55	<1	NS	Dry	332*
BH-61	15	15	36.*	37*
BH-61	-	-	101.*@	-
BH-64	200	170	NS	NS
BH-65	<1	<1	NS	NS
BH-67	59	NS	13.*	97*@
BH-67	-	-	16.*@	-
BH-68	<1	<1	NS	NS
BH-70	2600	2000	NS	NS
BH-71	<1	<1	Dry	47*@
BH-73	<1	<1	4.*	4*@
BH-73	-	-	4.*@	-
BH-74	800	<1	NS	NS
BH-75	<1	-	-	5*@
BH-80	<1	<1	9.*	8*
BH-81	940	400	296.*	483*

Well Number	September 1991^	December 1991^	April 1992#	July 1992#
BH-82	2200	1000	NS	1114*
Sump A11	1400	2900	3033.*	1258*
Sump 16A	240	2000	1233.*	1495*
Sump 16A	-	-	1137.*@	-

Note: See footnotes.

^ Analysis by Core Labs

Analysis by PTC HPLC method except as noted

* Average of more than one analysis

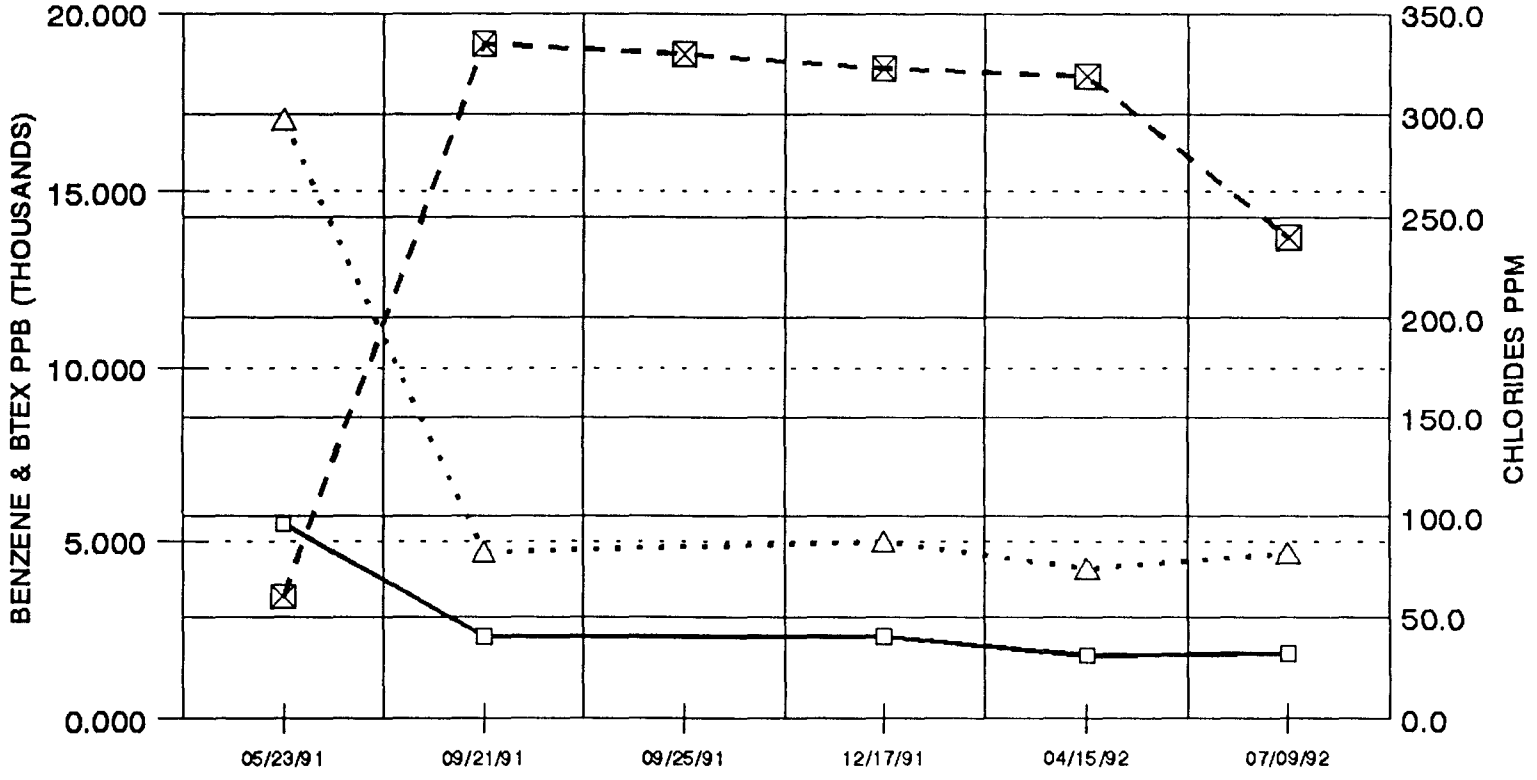
@ Bailed sample; all others collected by pump

NS Not sampled

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#10 BH-33



	05/23/91	09/21/91	09/25/91	12/17/91	04/15/92	07/09/92
BENZENE	5.500	2.300		2.300	1.780	1.842
BTEX	17.000	4.700		5.000	4.232	4.665
CHLORIDES	60.0	335.0	330.0	323.0	319.0	240.0

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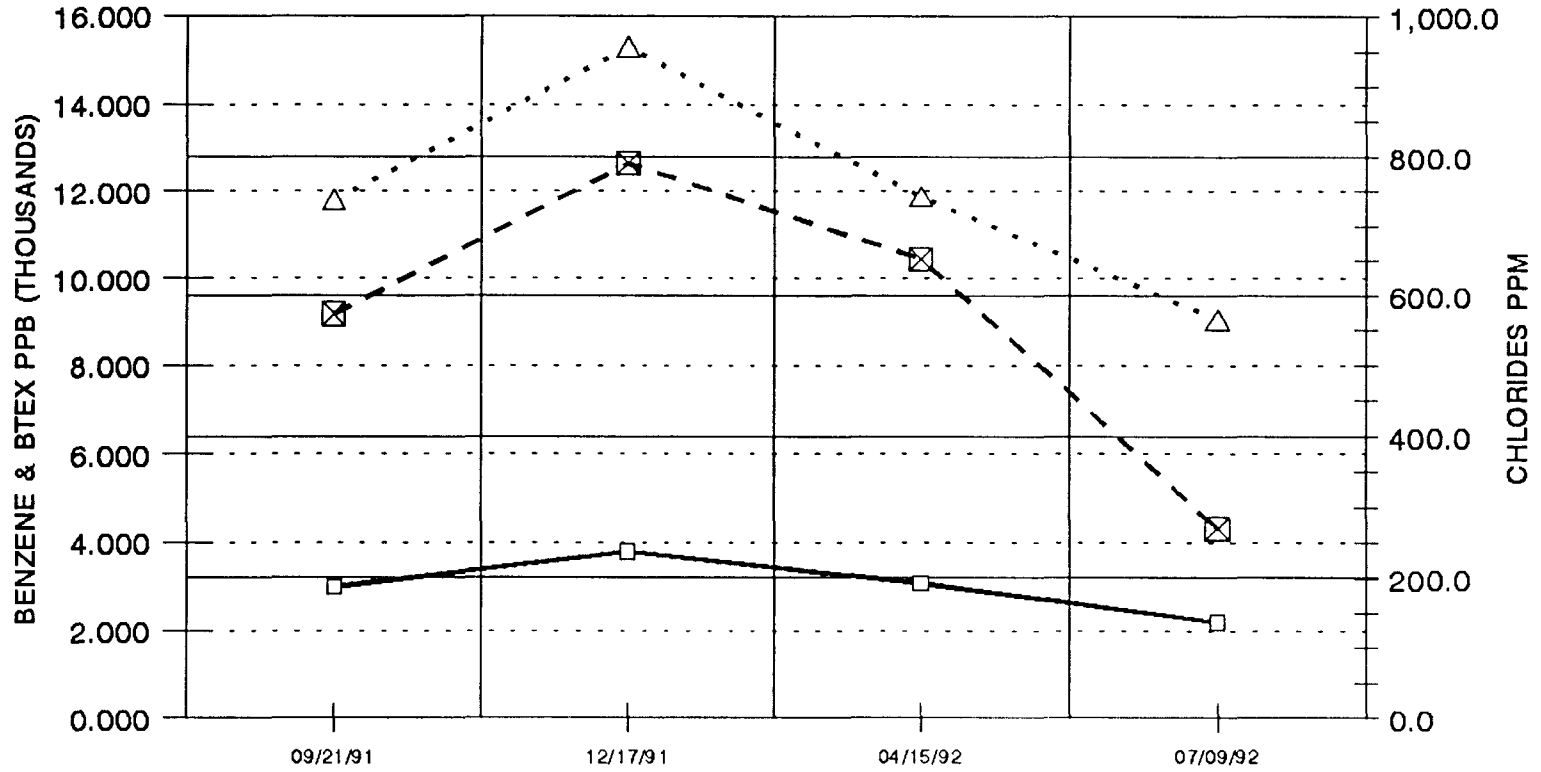
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#11 BH-34



	09/21/91	12/17/91	04/15/92	07/09/92
BENZENE	3.000	3.800	3.087	2.199
BTEX	11.800	15.300	11.881	9.042
CHLORIDES	573.0	790.0	653.0	270.0

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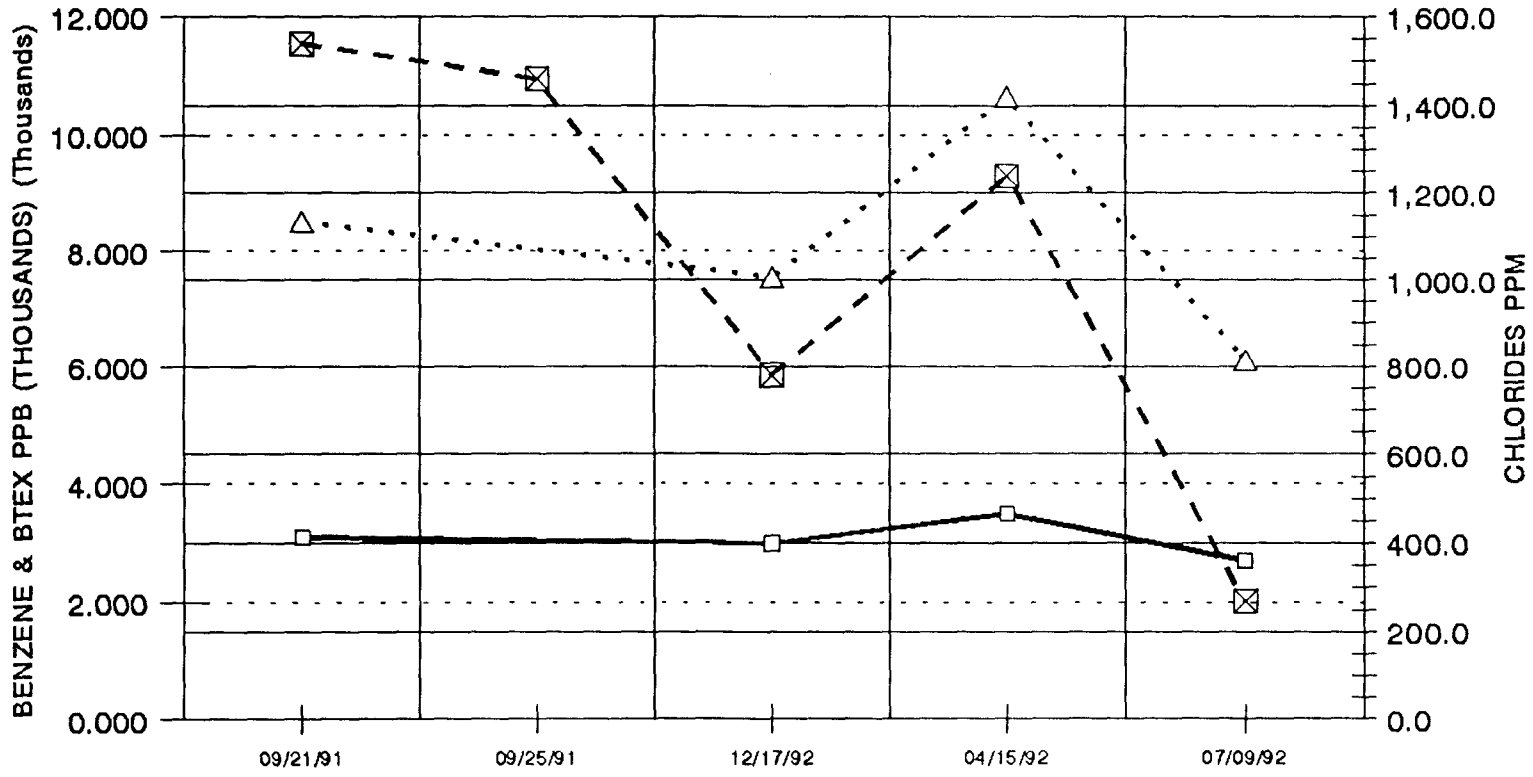
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#13 BH-36



BENZENE	3.100		3.000	3.492	2.708
BTEX	8.500		7.550	10.644	6.109
CHLORIDES	1,540.0	1,460.0	780.0	1,240.0	269.0

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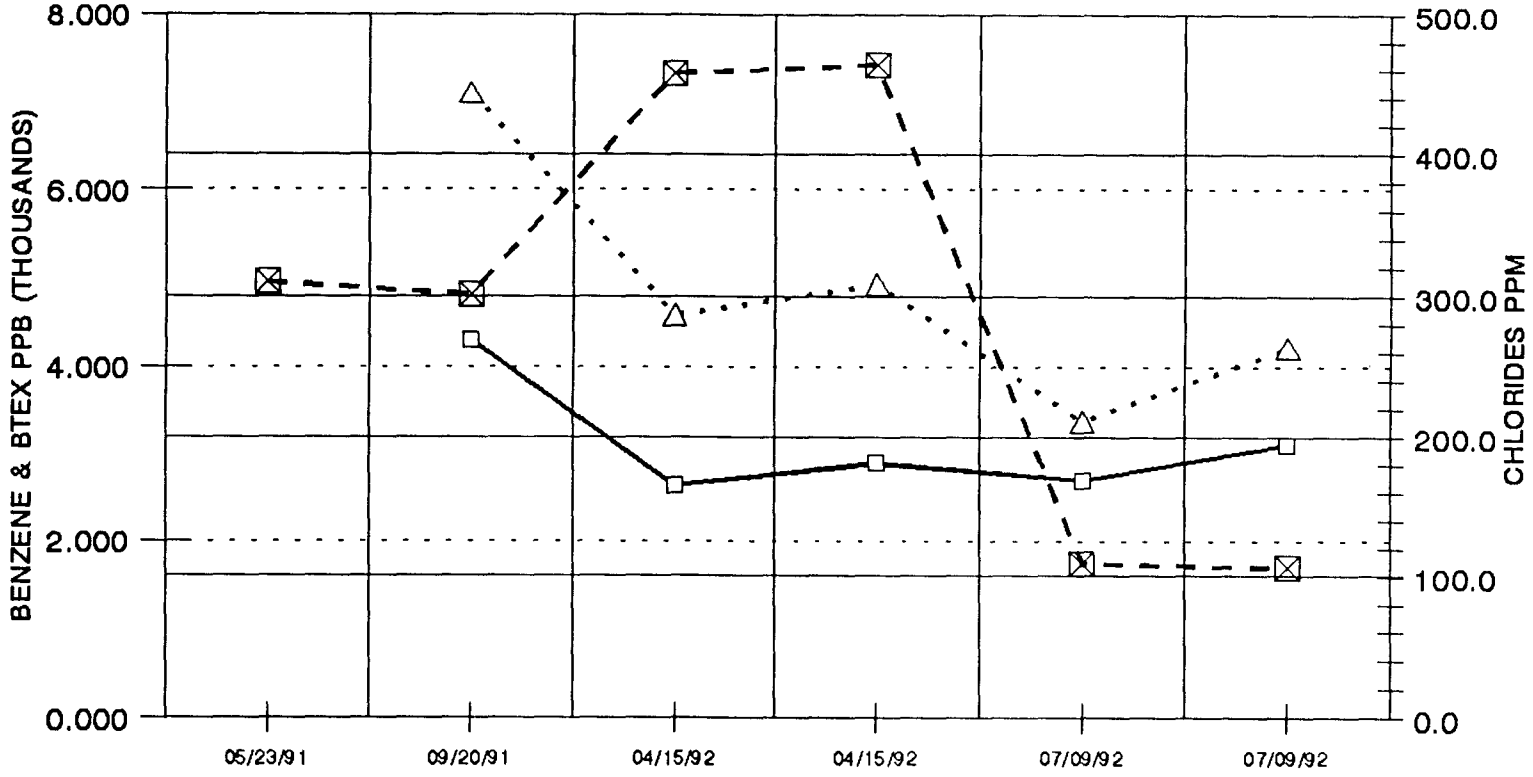
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#18 BH-41



BENZENE		4.300	2.639	2.900	2.700	3.105
BTEX		7.100	4.585	4.932	3.377	4.213
CHLORIDES	310.0	301.0	458.0	464.0	109.0	106.0

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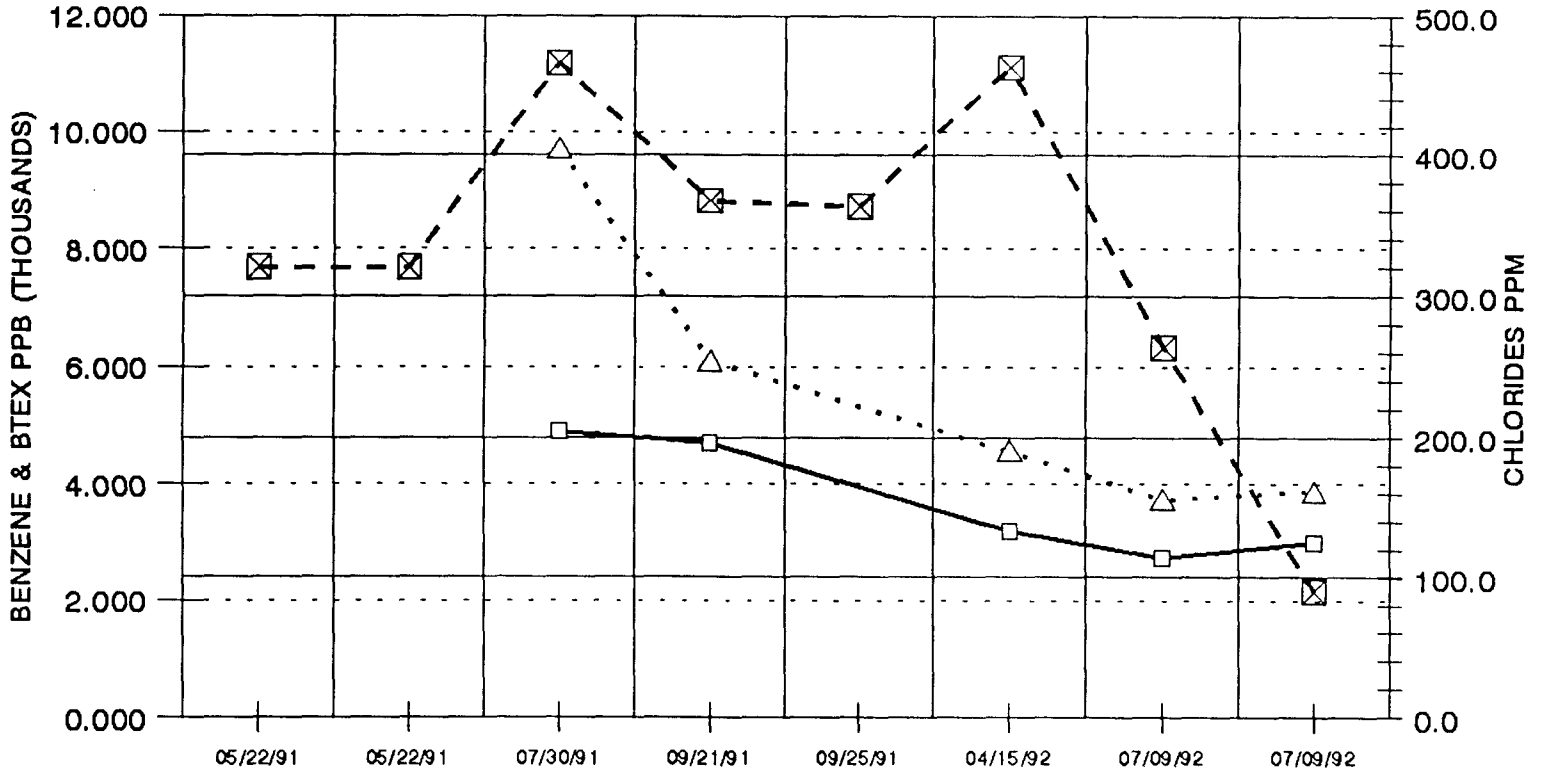
BOREHOLE WATER ANALYSIS DATA

MW#19 BH-42



BENZENE			4.900	4.700		3.195	2.742	3.000
BTEX			9.700	6.100		4.564	3.735	3.881
CHLORIDES	320.0	320.0	466.0	367.0	363.0	463.0	264.0	90.0

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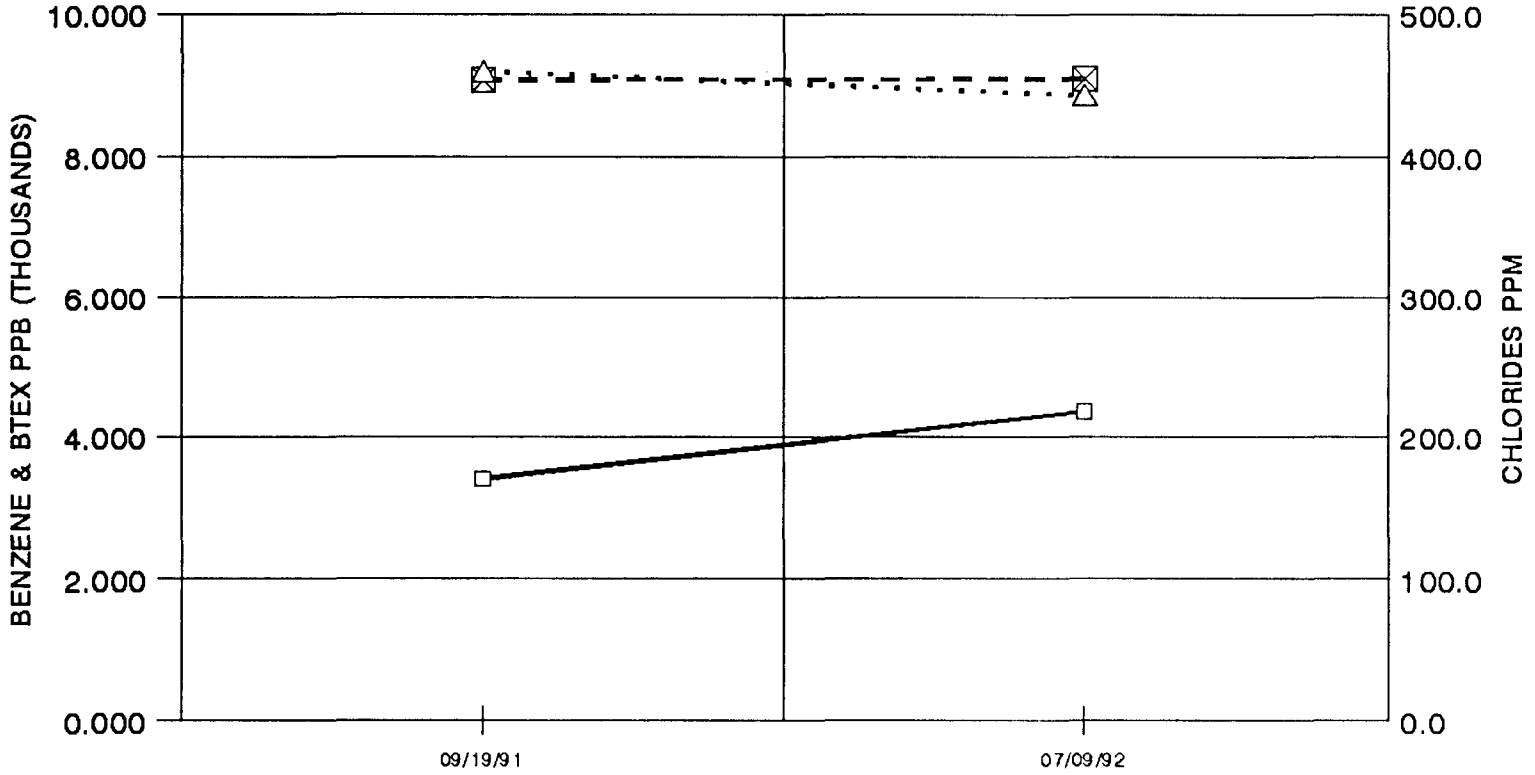
BOREHOLE WATER ANALYSIS DATA

MW#24 BH-47



	09/19/91	07/09/92
BENZENE	3.400	4.353
BTEX	9.200	8.865
CHLORIDES	454.0	455.0

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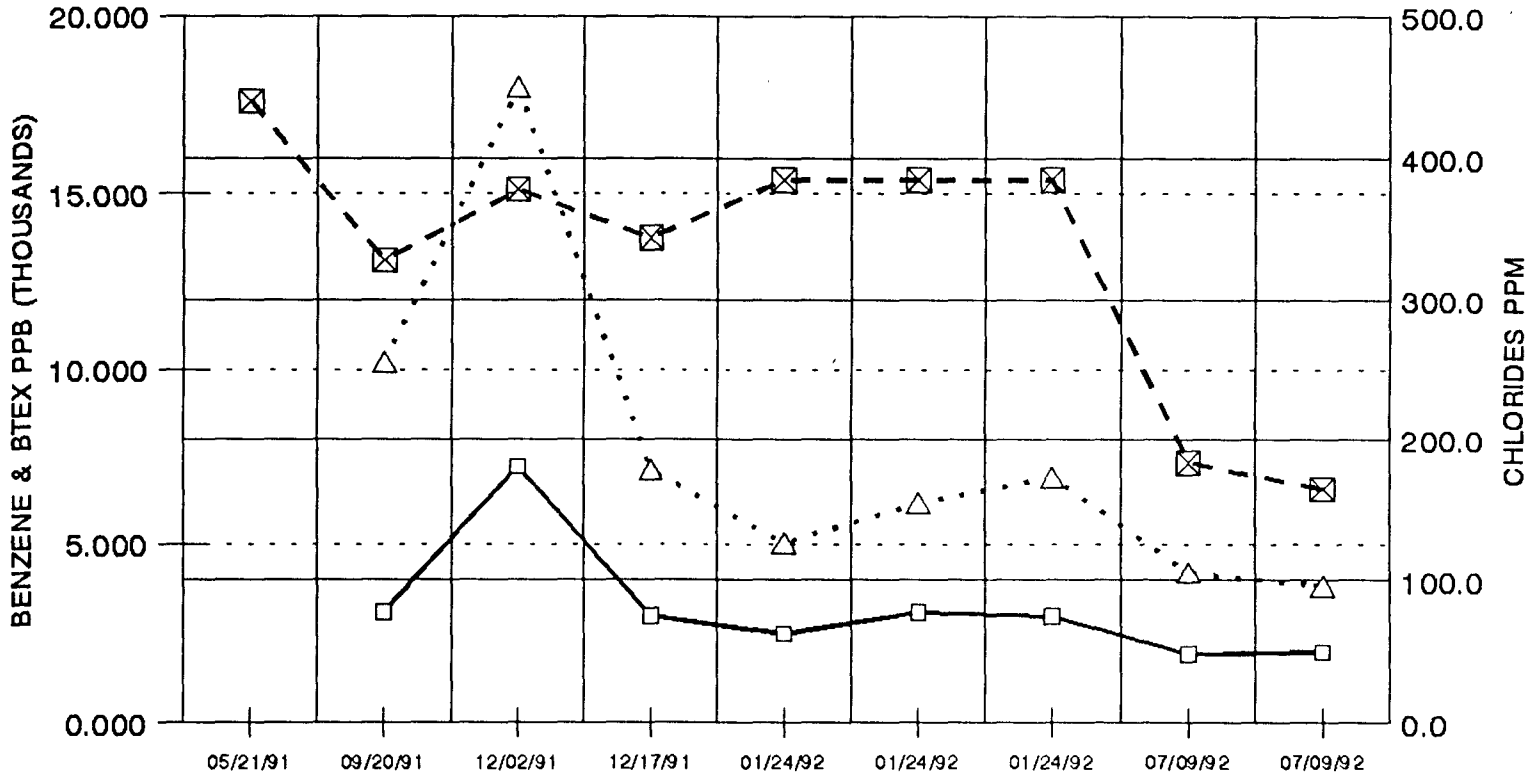
BOREHOLE WATER ANALYSIS DATA

MW#26 BH-49



BENZENE		3.100	7.200	3.000	2.500	3.100	3.000	1.939	2.000
BTEX		10.200	18.000	7.100	5.050	6.150	6.900	4.220	3.838
CHLORIDES	440.0	328.0	378.0	344.0	385.0	385.0	385.0	183.0	164.0

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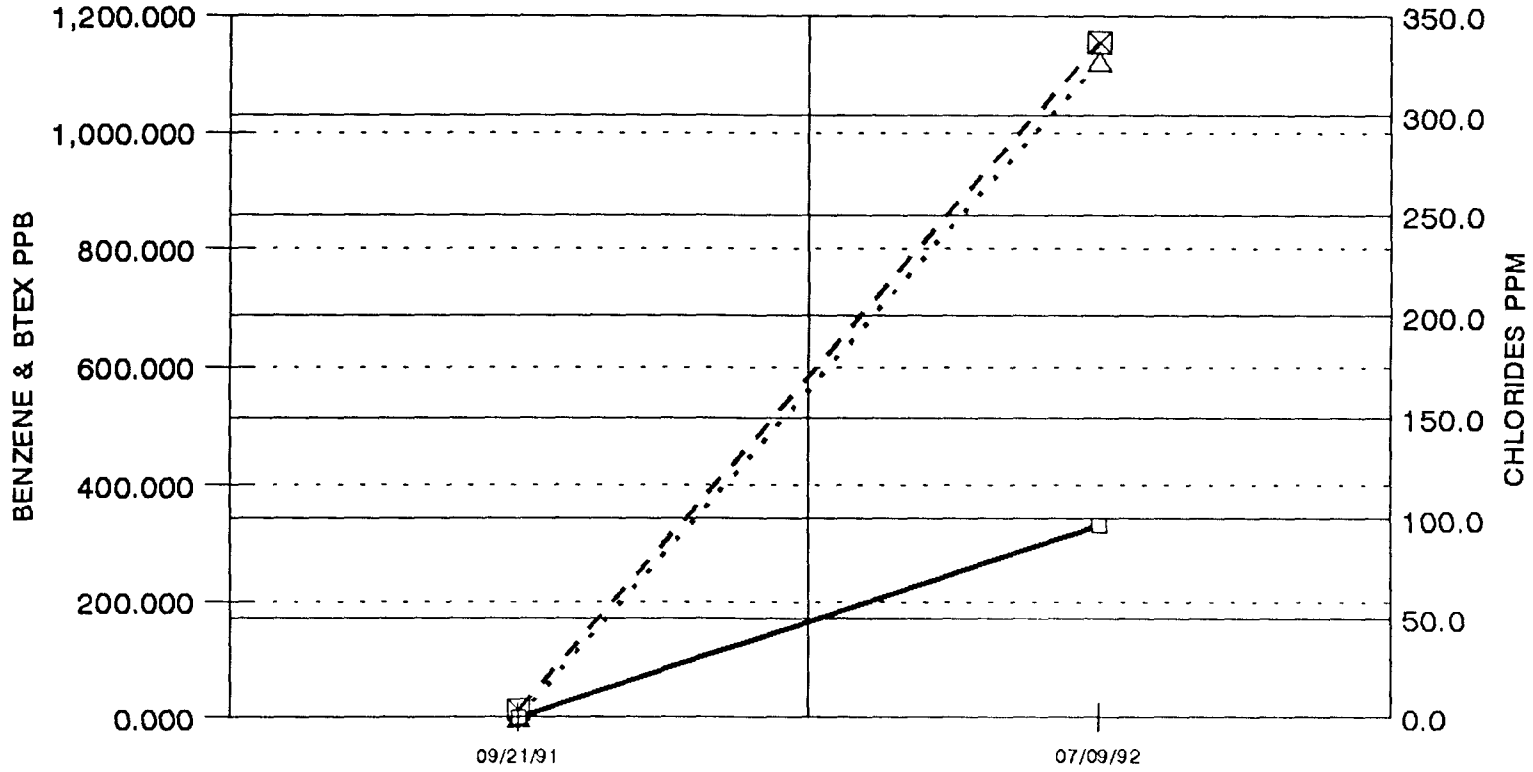
BOREHOLE WATER ANALYSIS DATA

MW#31 BH-55



	09/21/91	07/09/92
BENZENE	0.000	332.000
BTEX	0.000	1,122.000
CHLORIDES	3.8	337.0

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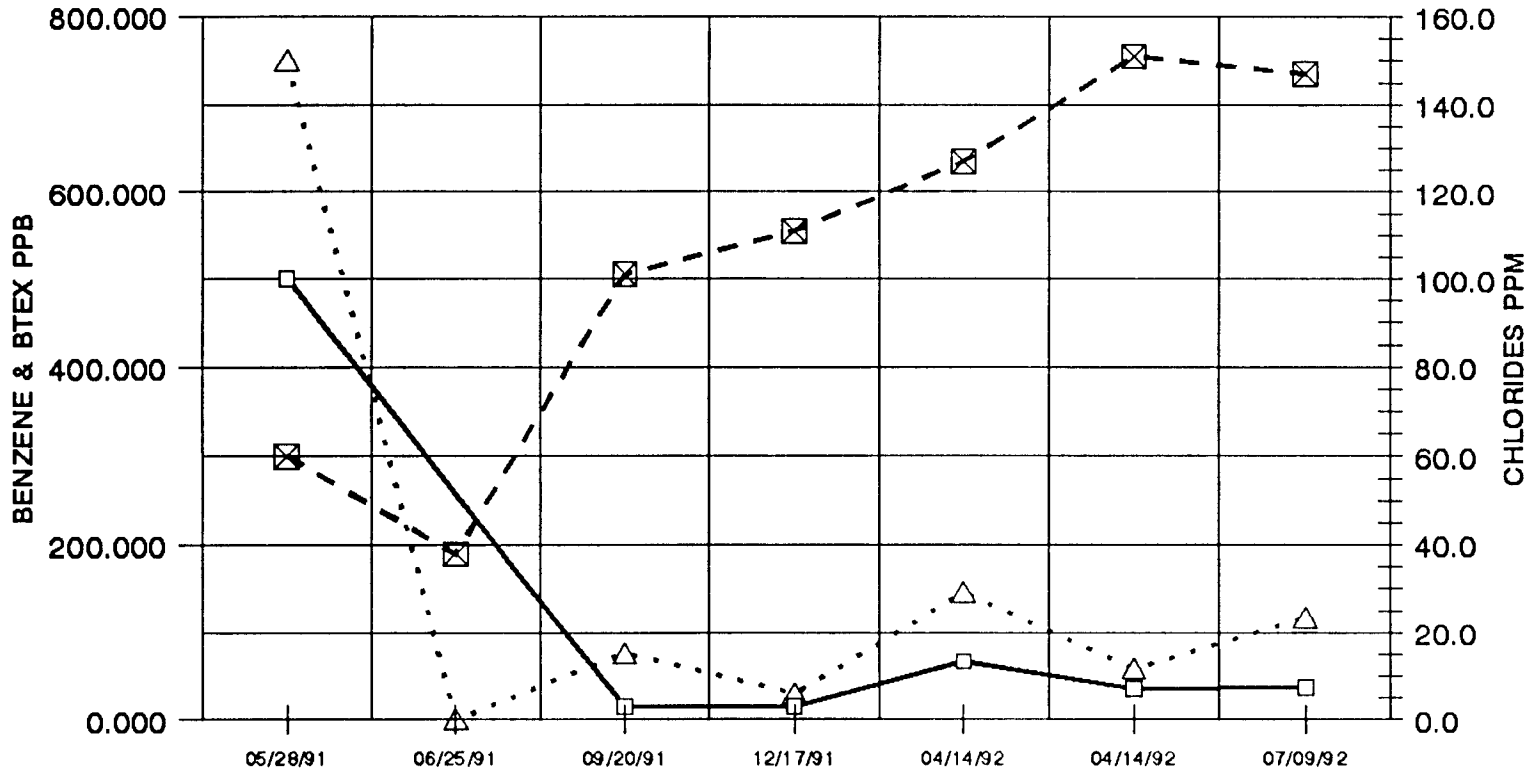
BOREHOLE WATER ANALYSIS DATA

MW#38 BH-61



BENZENE	500.000		15.000	15.000	67.000	35.400	37.000
BTEX	750.000	0.000	77.000	30.000	146.000	58.600	117.000
CHLORIDES	60.0	38.0	101.0	111.0	127.0	151.0	147.0

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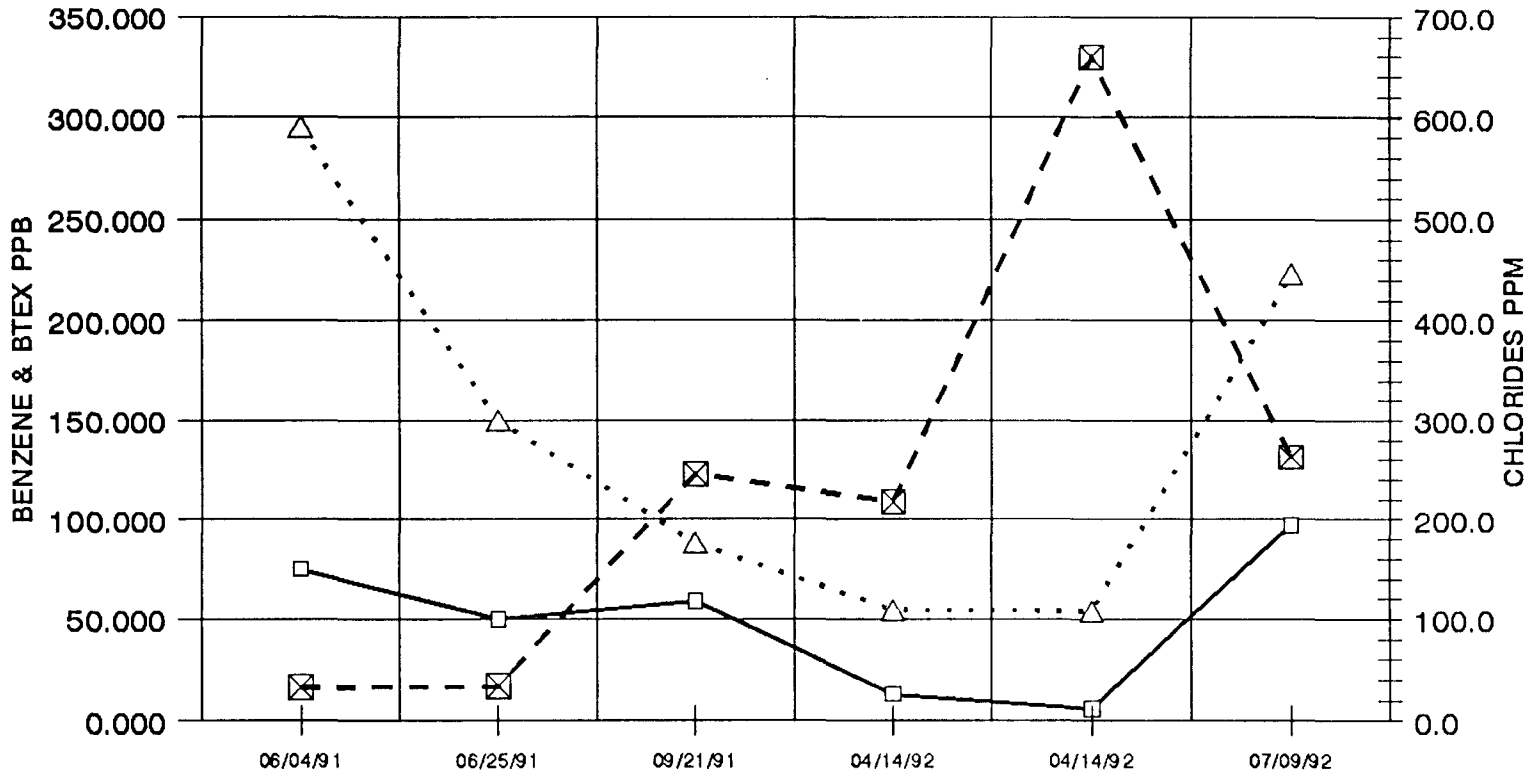
BOREHOLE WATER ANALYSIS DATA

MW#44 BH-67



BENZENE	75.000	50.000	59.000	13.200	6.000	97.000
BTEX	295.000	150.000	88.000	54.700	54.000	223.000
CHLORIDES	33.0	34.0	246.0	218.0	660.0	263.0

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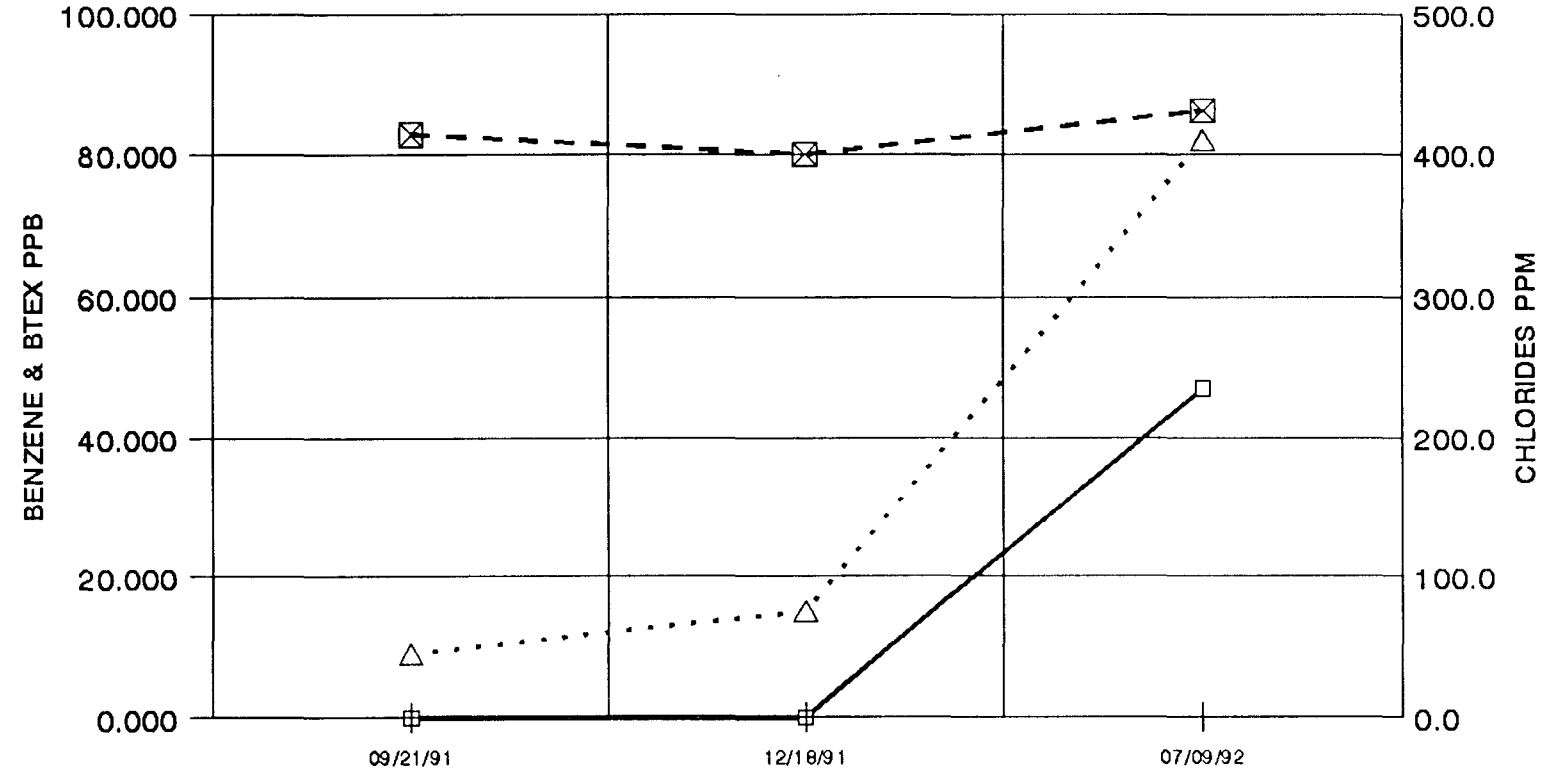
BOREHOLE WATER ANALYSIS DATA

MW#48 BH-71



BENZENE	0.000	0.000	47.000
BTEX	9.000	15.000	82.000
CHLORIDES	414.0	400.0	431.0

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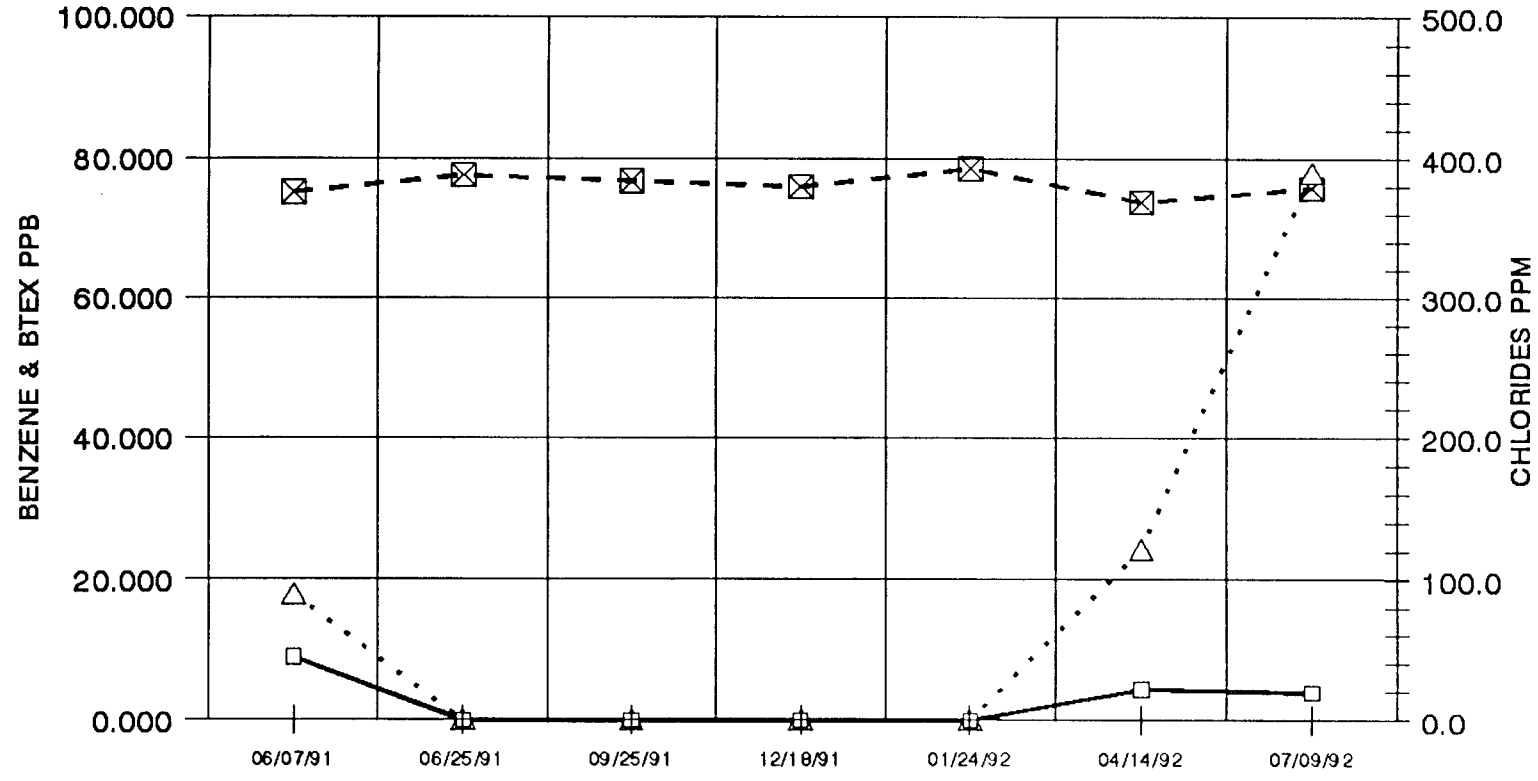
BOREHOLE WATER ANALYSIS DATA

MW#50 BH-73



	06/07/91	06/25/91	09/25/91	12/18/91	01/24/92	04/14/92	07/09/92
BENZENE	9.000	0.000	0.000	0.000	0.000	4.400	4.000
BTEX	18.000	0.000	0.000	0.000	0.000	24.300	78.000
CHLORIDES	376.0	388.0	384.0	380.0	393.0	369.0	379.0

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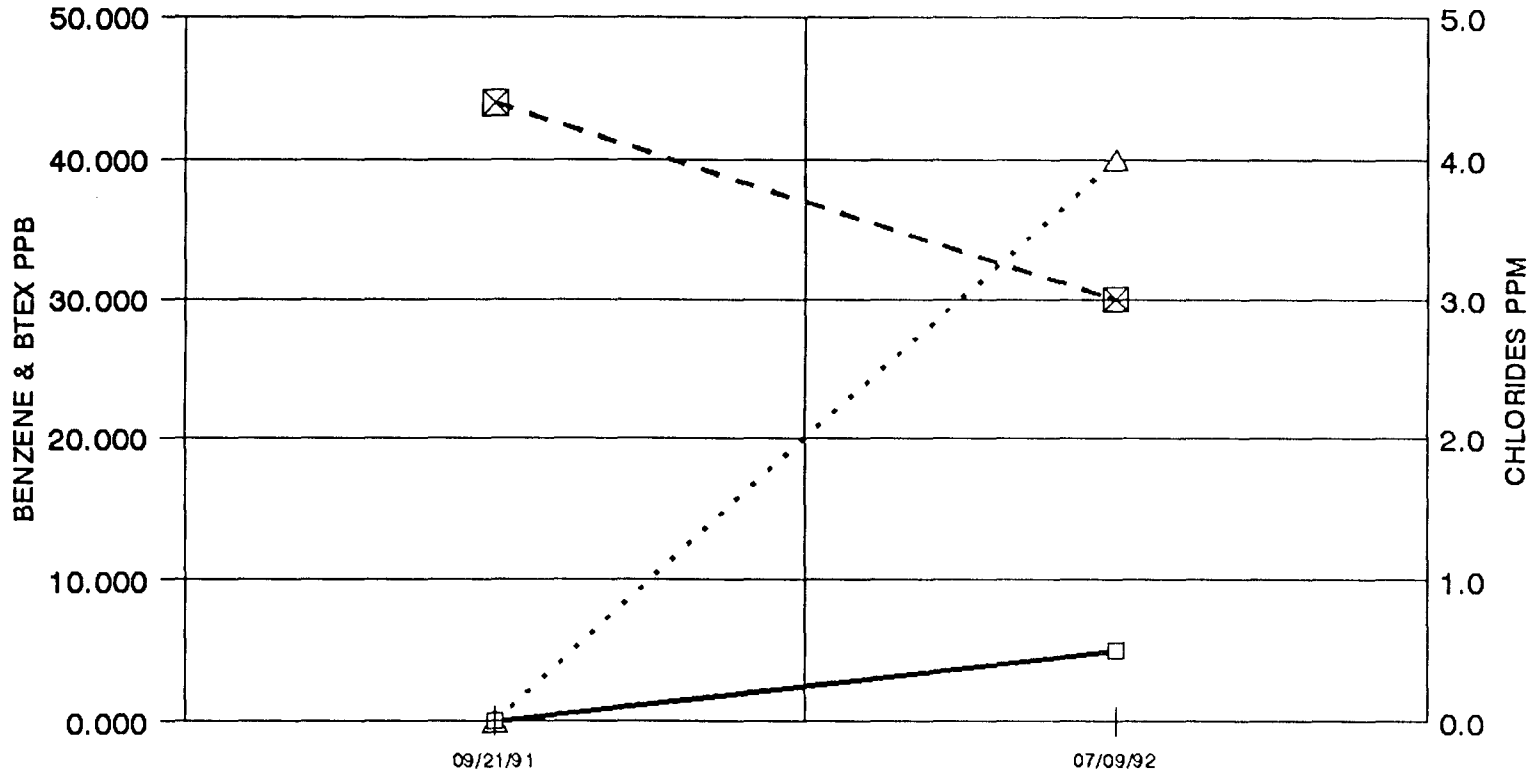
BOREHOLE WATER ANALYSIS DATA

MW#52 BH-75



BENZENE	0.000	5.000
BTEX	0.000	40.000
CHLORIDES	4.4	3.0

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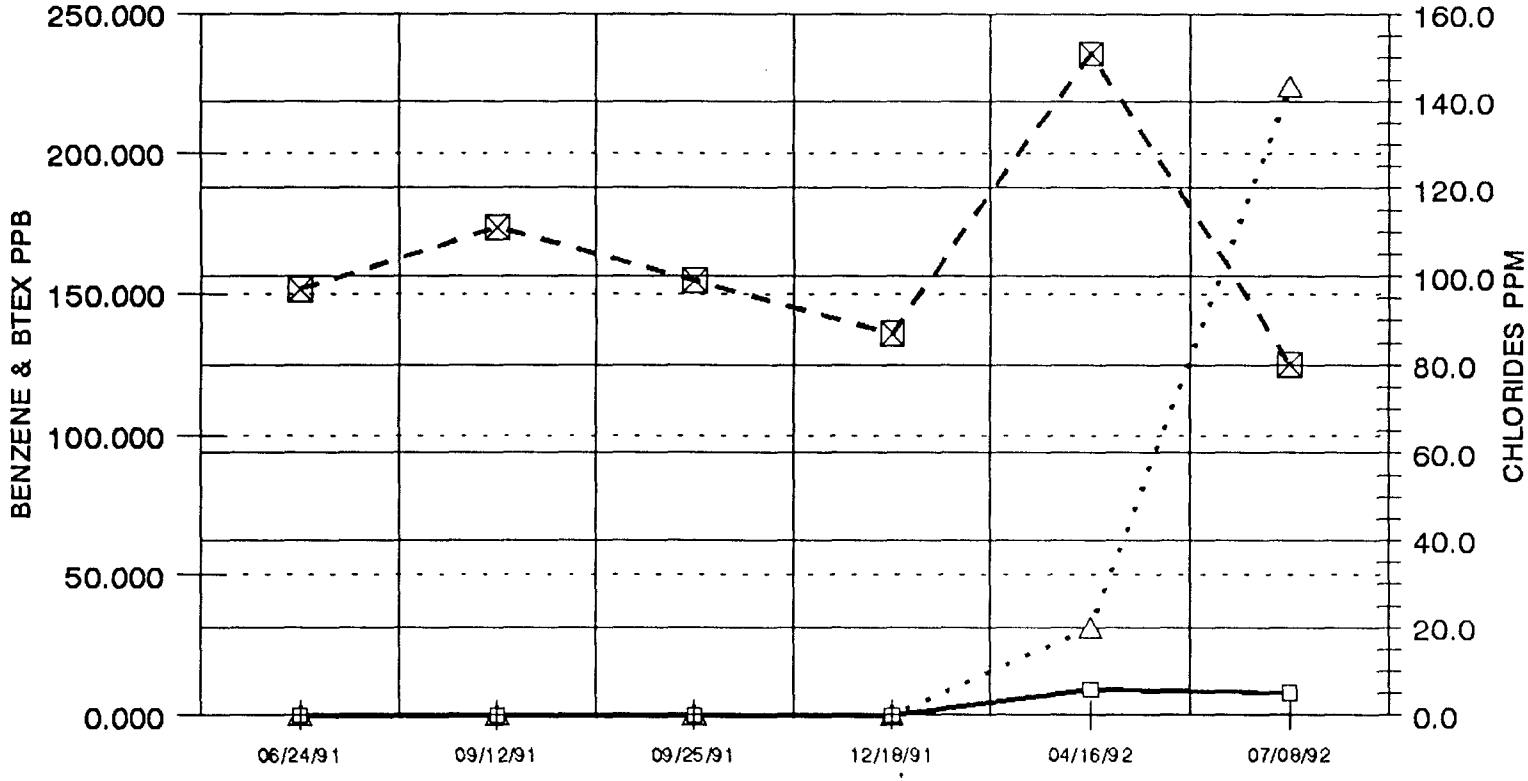
BOREHOLE WATER ANALYSIS DATA

MW#54 BH-80



	06/24/91	09/12/91	09/25/91	12/18/91	04/16/92	07/08/92
BENZENE	0.000	0.000	0.000	0.000	9.100	8.000
BTEX	0.000	0.000	0.000	0.000	31.000	224.000
CHLORIDES	97.0	111.0	99.0	87.0	151.0	80.0

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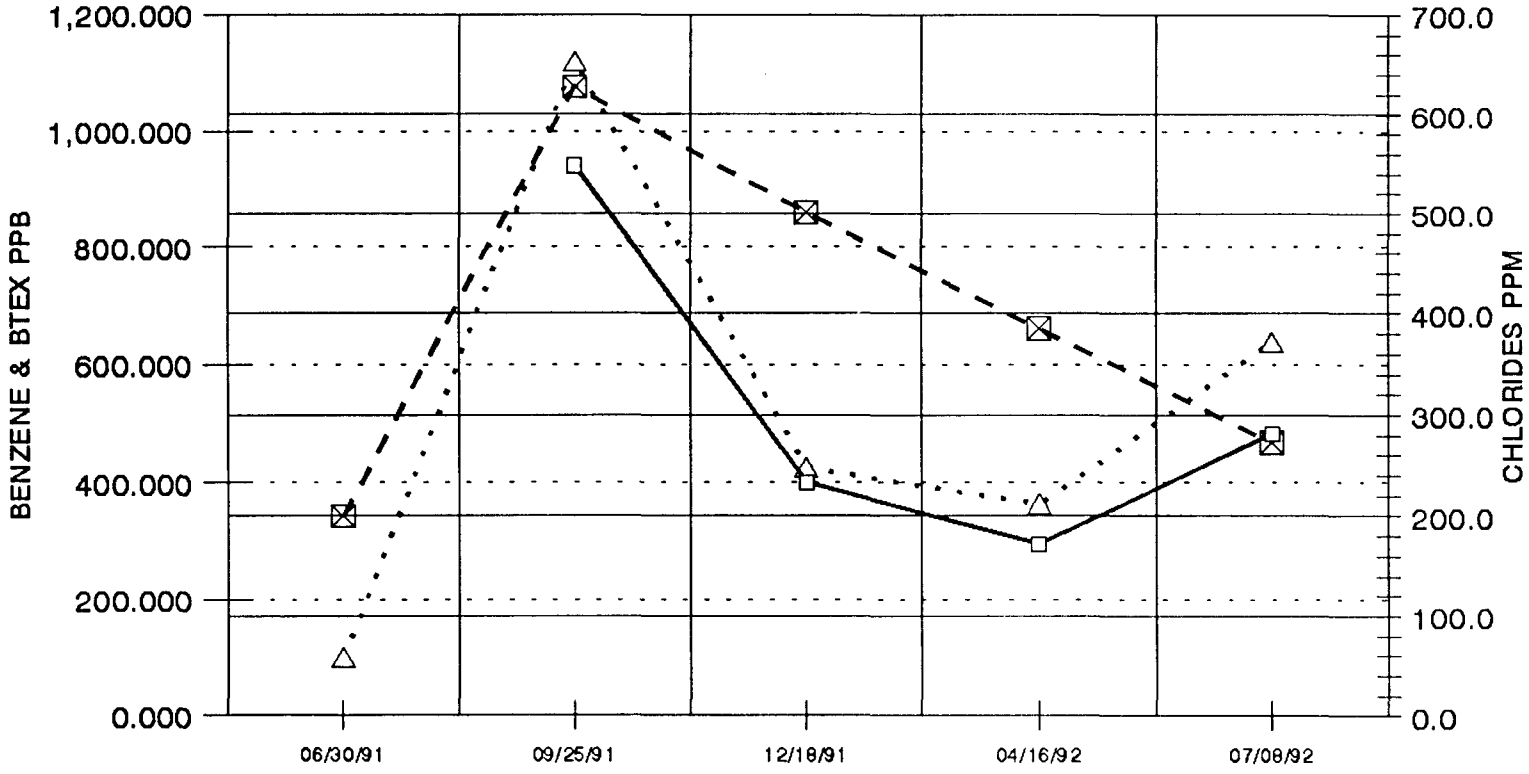
BOREHOLE WATER ANALYSIS DATA

MW#55 BH-81



BENZENE		940.000	400.000	295.500	483.000
BTEX	100.000	1,120.000	425.000	363.400	638.000
CHLORIDES	200.0	628.0	501.0	385.0	273.0

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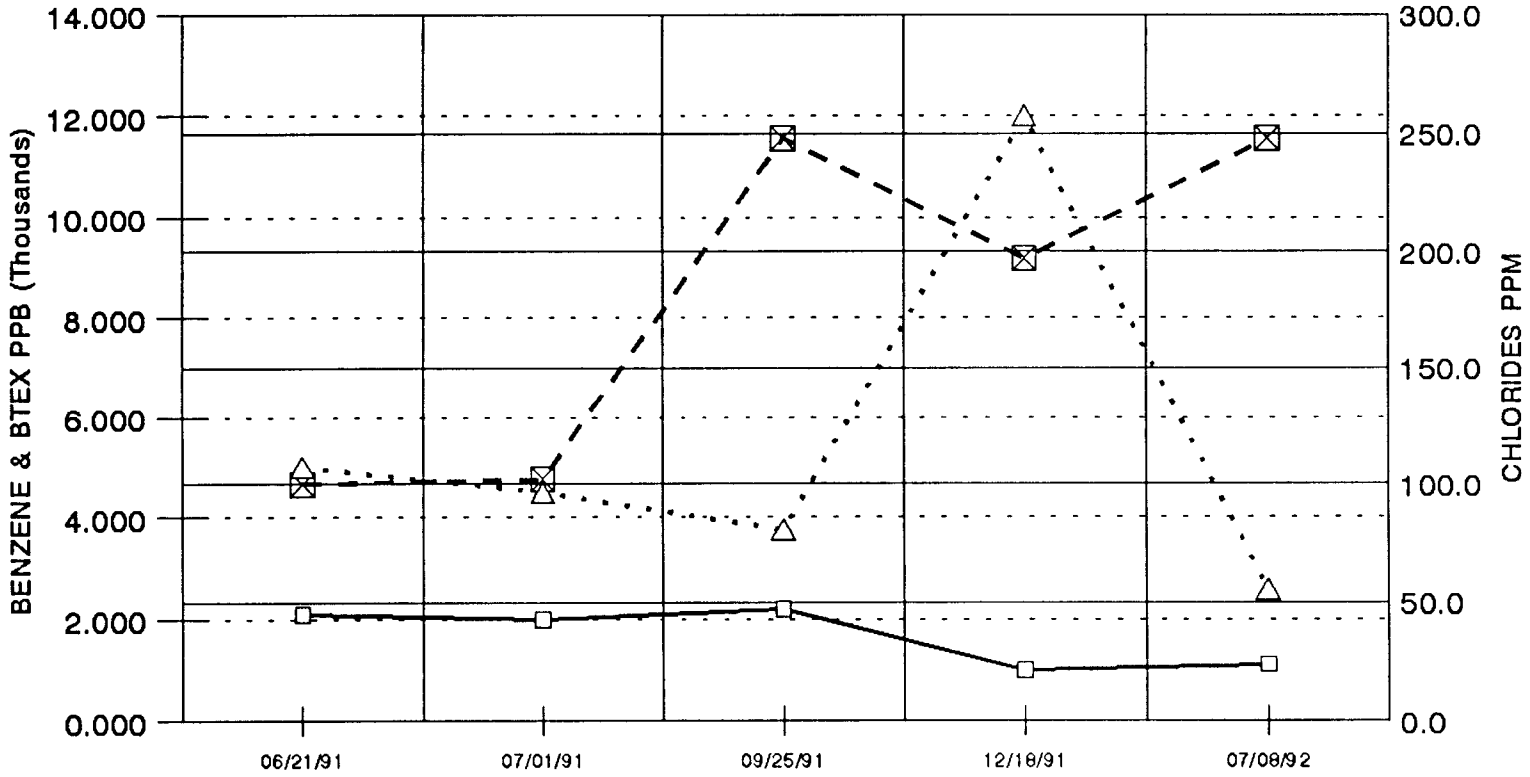
BOREHOLE WATER ANALYSIS DATA

MW#56 BH-82



BENZENE	2.100	2.000	2.200	1.000	1.114
BTEX	5.000	4.500	3.750	12.000	2.573
CHLORIDES	100.0	102.0	248.0	197.0	248.0

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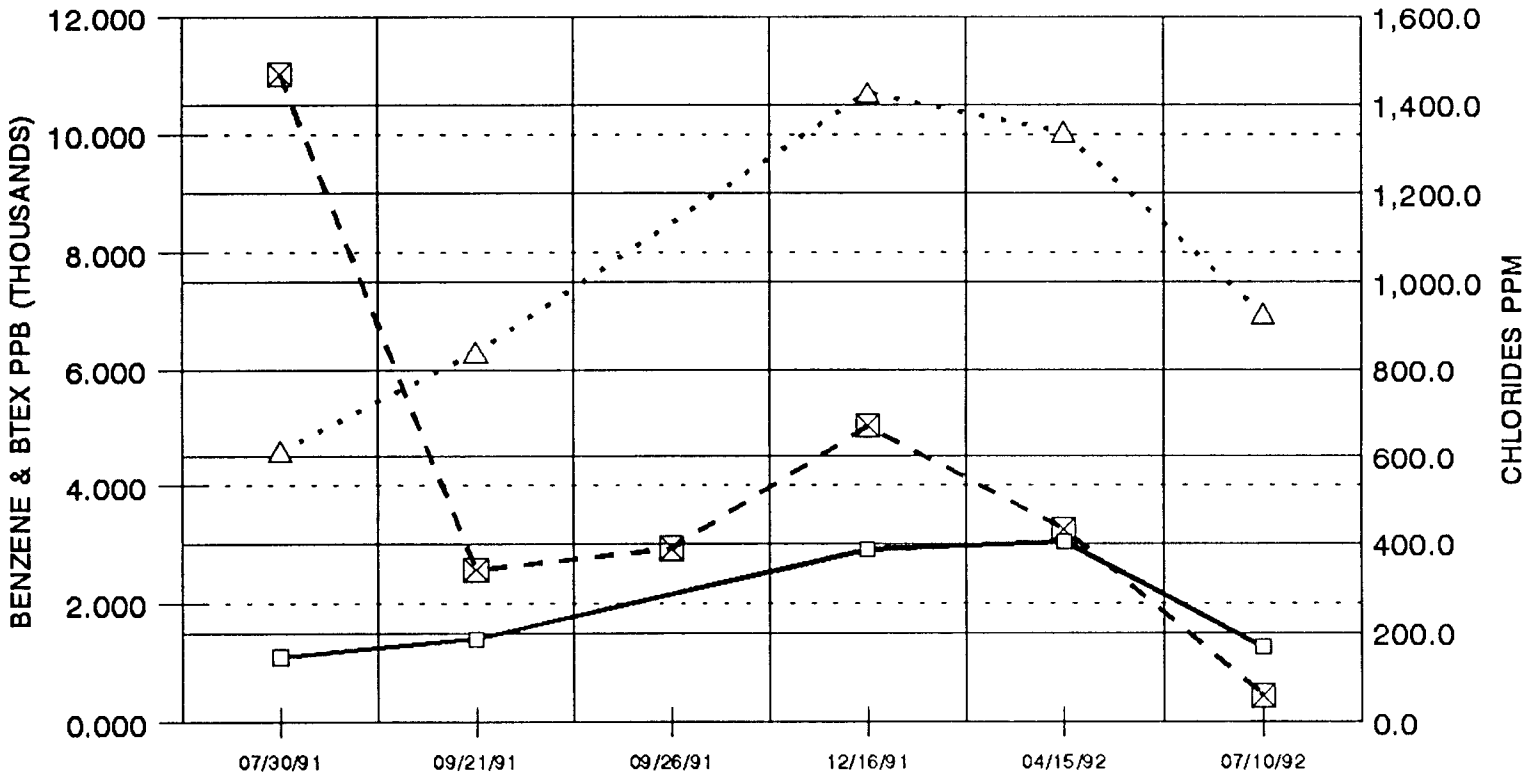
BOREHOLE WATER ANALYSIS DATA

SUMP 11A



BENZENE	1.100	1.400		2.900	3.033	1.258
BTEX	4.600	6.300		10.700	10.033	6.956
CHLORIDES	1,470.0	342.0	390.0	670.0	433.0	60.0

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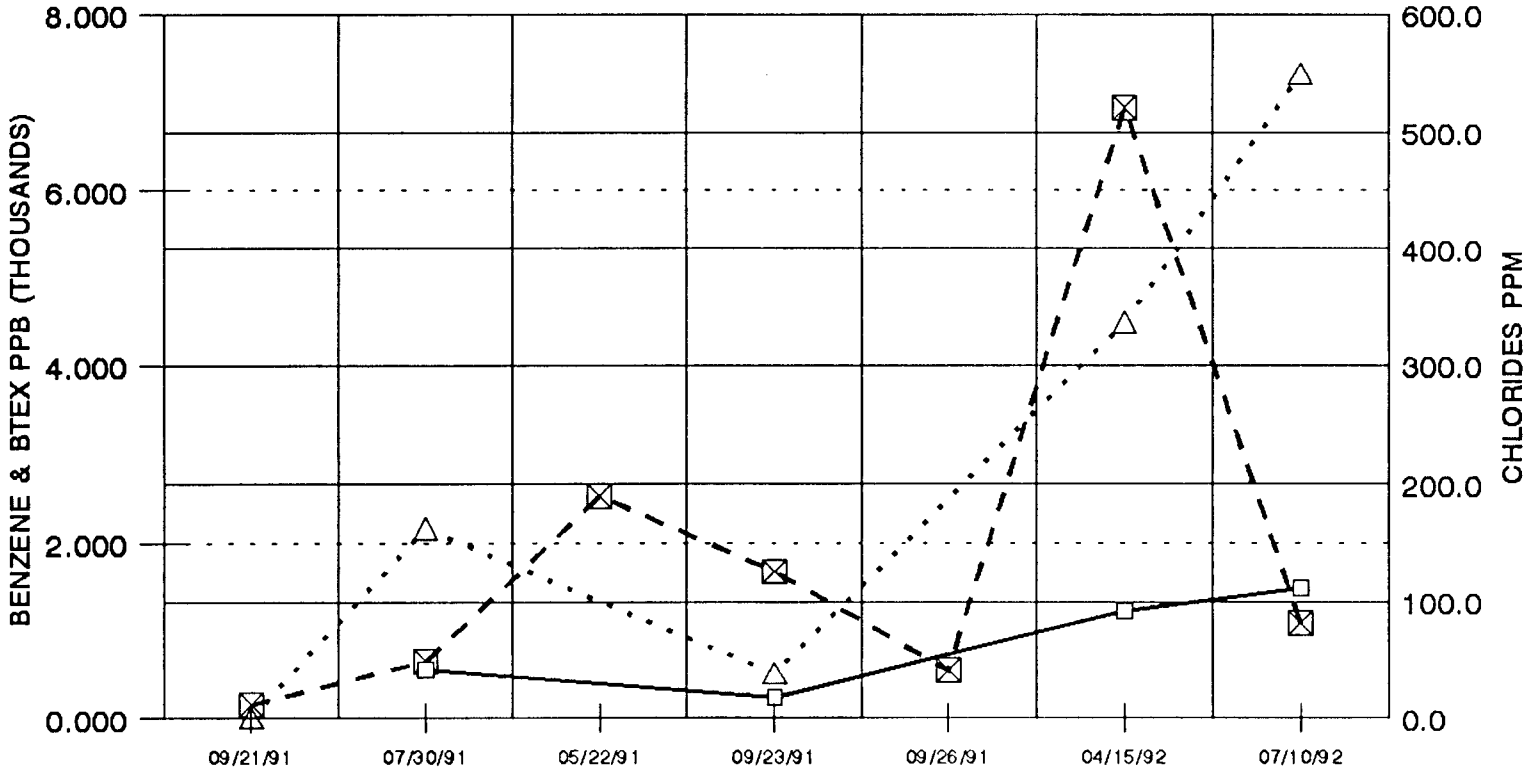
BOREHOLE WATER ANALYSIS DATA

SUMP 16A



BENZENE		0.560		0.240		1.233	1.495
BTEX	0.002	2.170		0.515		4.481	7.328
CHLORIDES	11.7	49.0	190.0	126.0	41.0	521.0	82.0

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APPENDIX E

RANCHER WATER WELLS, PLANT WATER WELLS AND SPRINGS ANALYSES

APPENDIX E

RANCHER WATER WELL SAMPLE RESULTS
THIRD QUARTER 1992

LOCATION	JULY	JULY DUPLICATE	AUGUST	SEPTEMBER
LYMAN WATER WELL				
BENZENE	ND	ND	ND	ND
TOULENE	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND
XYLENE	ND	ND	ND	ND
CHLORIDE	14.6	13.2	13.8	13.8
UPPER INDIAN HILLS SPRING WEST				
BENZENE	ND	-	ND	ND
TOULENE	ND	-	ND	ND
ETHYLBENZENE	ND	-	ND	ND
XYLENE	ND	-	ND	ND
CHLORIDE	8.5	-	9.0	14.3
BIEBELLE WATER WELL				
BENZENE	ND	-	-	-
TOULENE	ND	-	-	-
ETHYLBENZENE	ND	-	-	-
XYLENE	ND	-	-	-
CHLORIDE	7.8	-	-	-

BTEX GIVEN IN PPB
CHLORIDE GIVEN IN PPM
ND - BELOW DETECTION LIMIT

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LABORATORY TESTS RESULTS
08/11/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/08/92
TIME SAMPLED.....: 11:00
WORK DESCRIPTION...: #1 Lyman Water Well

LABORATORY I.D...: 921250-0001
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	14.6	0.5	mg/L	325.2 (1)	08/03/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/17/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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LABORATORY TESTS RESULTS
08/11/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/08/92
TIME SAMPLED.....: 11:30
WORK DESCRIPTION...: #2 Upper Indian Hills Spring West

LABORATORY I.D...: 921250-0002
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	8.5	0.5	mg/L	325.2 (1)	08/03/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/17/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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LABORATORY TESTS RESULTS
08/11/92

JOB NUMBER: 921250 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/08/92
TIME SAMPLED.....: 11:48
WORK DESCRIPTION...: #4 Biebelle Water Well

LABORATORY I.D...: 921250-0003
DATE RECEIVED....: 07/14/92
TIME RECEIVED....: 09:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	7.8	0.5	mg/L	325.2 (1)	08/03/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/17/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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LABORATORY TESTS RESULTS
08/23/92

JOB NUMBER: 921360 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 07/28/92
TIME SAMPLED.....: 14:35
WORK DESCRIPTION...: #1 Lyman Water Well

LABORATORY I.D...: 921360-0001
DATE RECEIVED....: 07/30/92
TIME RECEIVED....: 09:30
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	13.2	1	mg/L	325.2 (1)	08/20/92	KDS
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	07/31/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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L A B O R A T O R Y   T E S T S   R E S U L T S
09/02/92

JOB NUMBER: 921595 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.........: MARATHON
DATE SAMPLED.......: 08/19/92
TIME SAMPLED.......: 15:15
WORK DESCRIPTION...: 1 Lyman Water Well

LABORATORY I.D...: 921595-0001
DATE RECEIVED....: 08/21/92
TIME RECEIVED....: 17:01
REMARKS..........:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	13.8	0.5	mg/L	325.2 (1)	08/31/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/26/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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LABORATORY TESTS RESULTS
09/02/92

JOB NUMBER: 921595 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON
DATE SAMPLED.....: 08/19/92
TIME SAMPLED.....: 15:32
WORK DESCRIPTION...: 2 Upper Indian Hills Spring West

LABORATORY I.D...: 921595-0002
DATE RECEIVED....: 08/21/92
TIME RECEIVED....: 17:01
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	9.0	0.5	mg/L	325.2 (1)	08/31/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/26/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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LABORATORY TESTS RESULTS
09/02/92

JOB NUMBER: 921595 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON
DATE SAMPLED.....: 08/19/92
TIME SAMPLED.....: 14:50
WORK DESCRIPTION...: 7 Plant Supply Well

LABORATORY I.D...: 921595-0003
DATE RECEIVED....: 08/21/92
TIME RECEIVED....: 17:01
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	20	1	mg/L	325.2 (1)	08/27/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/26/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
09/02/92

JOB NUMBER: 921595 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON
DATE SAMPLED.....: 08/19/92
TIME SAMPLED.....: 14:30
WORK DESCRIPTION...: 8 Plant backup Well

LABORATORY I.D...: 921595-0004
DATE RECEIVED....: 08/21/92
TIME RECEIVED....: 17:01
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	172	1	mg/L	325.2 (1)	08/27/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	08/26/92	MAD
Benzene	3	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	1	1	ug/L			
Xylenes	ND	1	ug/L			

1300 South Potomac, Suite 130
Aurora, CO 80012
(303) 751-1780

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/07/92

JOB NUMBER: 921734 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: LAKEWOOD,NM
DATE SAMPLED.....: 09/10/92
TIME SAMPLED.....: 10:01
WORK DESCRIPTION...: 1 Lyman Well

LABORATORY I.D...: 921734-0001
DATE RECEIVED....: 09/17/92
TIME RECEIVED....: 09:30
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
hloride (Unfilt.)	13.8	0.5	mg/L	325.2 (1)	10/01/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	09/18/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/07/92

JOB NUMBER: 921734 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: LAKEWOOD,NM
DATE SAMPLED.....: 09/10/92
TIME SAMPLED.....: 09:30
WORK DESCRIPTION...: 2 Upper Indian Hills Spring West

LABORATORY I.D...: 921734-0002
DATE RECEIVED....: 09/17/92
TIME RECEIVED....: 09:30
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	14.3	0.5	mg/L	325.2 (1)	10/01/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	09/18/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/07/92

JOB NUMBER: 921734 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: LAKEWOOD,NM
DATE SAMPLED.....: 09/10/92
TIME SAMPLED.....: 11:57
WORK DESCRIPTION...: 7 Plant Water Supply Well

LABORATORY I.D...: 921734-0003
DATE RECEIVED....: 09/17/92
TIME RECEIVED....: 09:30
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	21	1	mg/L	325.2 (1)	09/30/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	09/18/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/07/92

JOB NUMBER: 921734 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: LAKEWOOD,NM
DATE SAMPLED.....: 09/10/92
TIME SAMPLED.....: 11:00
WORK DESCRIPTION...: 8 Plant backup well

LABORATORY I.D...: 921734-0004
DATE RECEIVED....: 09/17/92
TIME RECEIVED....: 09:30
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	183	1	mg/L	325.2 (1)	09/30/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	09/18/92	MAD
Benzene	13	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	3	1	ug/L			
Xylenes	ND	1	ug/L			

1300 South Potomac, Suite 130
Aurora, CO 80012
(303) 751-1780

APPENDIX F

STATE ENGINEER'S WATER PRODUCTION REPORTS

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

July 10, 1992

Robert R. Marr
Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of July 6, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	7/6/92	979200.0	979200.0 GALS.
MW-59/BH-85	10259114	7/6/92	46094.5	46094.5 BBLS.
MW-61A/BH-87A	10239116	7/6/92	755936.0	755936.0 GALS.
*MW-62/BH-88	10239115	7/6/92	657821.8	851752.5 GALS.
MW-65A/BH-91A	10239117	7/6/92	1493169.4	1493169.4 GALS.
MW-68/BH-94	10239114	7/6/92	744543.9	744543.9 GALS.
		LOWER QUEEN TOTAL		6,760,570.8 GALS.

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queen fluid removal as of 7/6/92 is 7,082,038.8 GALS. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of July 6, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
** MW-13/BH-36	02209213	7/6/92	13627.4	6914.9 GALS.
MW-14/BH-37	02209214	7/6/92	166538.3	166538.3 GALS.
*** MW-35/BH-59	02209212	7/6/92	38017.0	37828.2 GALS.
		SHALLOW TOTAL		211,281.4 GALS.

** The meter reading on MW-13/BH-36 reflects 6712.5 gallons attributed to MW-1/BH-14 prior to removal and reinstallation on MW-13/BH-36.

*** The meter reading on MW-35/BH-59 reflects 188.8 gallons attributed to MW-21/BH-44 prior to removal and reinstallation on MW-35/BH-59.

The cumulative shallow fluid removal as of July 6, 1992 is 218,182.7 GALS. This number reflects the 6901.3 gallons removed from MW-1/BH-14 and MW-21/BH-44 prior to meter removal.

The June 4, 1992 report erroneously identified MW-13/BH-36 as having removed 196.5 BBLS. of water. The correct volume is 196.5 GALS. of water.

If more information is required, please free to contact me at (915) 687-8312.

Very truly yours,

Jeffrey S. Lynn
Advanced Environmental Representative

JSL/cb

xc: T. C. Lowry - Midland
D. E. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser - IBGP, Artesia

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

August 10, 1992

Robert R. Marr
Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of August 3, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	8/3/92	1128454.8	1128454.8 GALS.
MW-59/BH-85	10259114	8/3/92	48561.2	48561.2 BBLS.
MW-61A/BH-87A	10239116	8/3/92	827163.2	827163.2 GALS
*MW-62/BH-88	10239115	8/3/92	777270.0	971200.7 GALS.
MW-65A/BH-91A	10239117	8/3/92	1693484.0	1693484.0 GALS.
MW-68/BH-94	10239114	8/3/92	791085.7	791085.7 GALS.
		LOWER QUEEN TOTAL		7,450,958.8 GALS.

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queen fluid removal as of 8/3/92 is 7,772,426.8 GALS. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of August 3, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
** MW-13/BH-36	02209213	8/3/92	75600.0	68887.5 GALS.
MW-14/BH-37	02209214	8/3/92	186038.9	186038.9 GALS.
*** MW-35/BH-59	02209212	8/3/92	37760.9	37828.2 GALS.
		SHALLOW TOTAL		292,754.6 GALS.

** The meter reading on MW-13/BH-36 reflects 6712.5 gallons attributed to MW-1/BH-14 prior to meter removal and reinstallation on MW-13/BH-36.

*** The meter reading on MW-35/BH-59 is below the July reading of 38017.0. This well has been shut-in this past month and the volume of water removed should be identical to last month. The meter reading on MW-35/BH-59 also reflects 188.8 gallons attributed to MW-21/BH-44 prior to meter removal and reinstallation on MW-35/BH-59.

The cumulative shallow fluid removal as of August 3, 1992 is 299,655.9 GALS. This number reflects the 6901.3 gallons removed from MW-1/BH-14 and MW-21/BH-44 prior to meter removal.

If more information is required, please free to contact me at (915) 687-8312.

Very truly yours,

Jeffrey S. Lynn
Advanced Environmental Representative

JSL/nrt

xc: T. C. Lowry - Midland
D. E. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser - IBGP, Artesia

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

September 9, 1992

Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Attention: Robert R. Marr

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (NW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of September 8, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	9/8/92	1271510.1	1271510.1 Gals
MW-59/BH-85	10259114	9/8/92	52290.0	52290.0 Bbls
MW-61A/BH-87A	10239116	9/8/92	1017505.0	1017505.0 Gals
*MW-62/BH-88	10239115	9/8/92	977623.0	1171553.7 Gals
MW-65A/BH-91A	10239117	9/8/92	2070112.0	2070112.0 Gals
MW-68/BH-94	10239114	9/8/92	987929.0	987929.0 Gals
LOWER QUEEN TOTAL				8,714,789.8 Gals

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queeen fluid removal as of 9/8/92 is 9,036,257.8 Gals. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of September 8, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
** MW-13/BH-36	02209213	9/8/92	112157.9	105445.4 Gals.
MW-14/BH-37	02209214	9/8/92	267630.0	267630.0 Gals.
*** MW-35/BH-59	02209212	9/8/92	52593.3	52660.6 Gals.
			SHALLOW TOTAL	425,736.0 Gals.

** The meter reading on MW-13/BH-36 reflects 6712.5 gallons attributed to MW-1/BH-14 prior to removal and reinstallation on MW-13/BH-36.

*** The meter on MW-35/BH-59 has been repaired. As indicated in the August 1992 monthly satement the August meter reading of 37760.9 was below the July reading of 38017.0. The difference between the two readings is 256.1 gallons. This amount has been added to the total water withdrawal volume. The meter reading on MW-35/BH-59 also reflects 188.8 gallons attributed to MW-21/BH-44 prior to meter removal and reinstallation on MW-35/BH-59.

The cumulative shallow fluid removal as of September 8, 1992 is 432,637.3 Gals. This number reflects the 6901.3 gallons removed from MW-1/BH-14 and MW-21/BH-44 prior to meter removal.

If more information is required, please feel free to contact me at (915) 687-8312.

Very truly yours,

Jeffrey S. Lynn

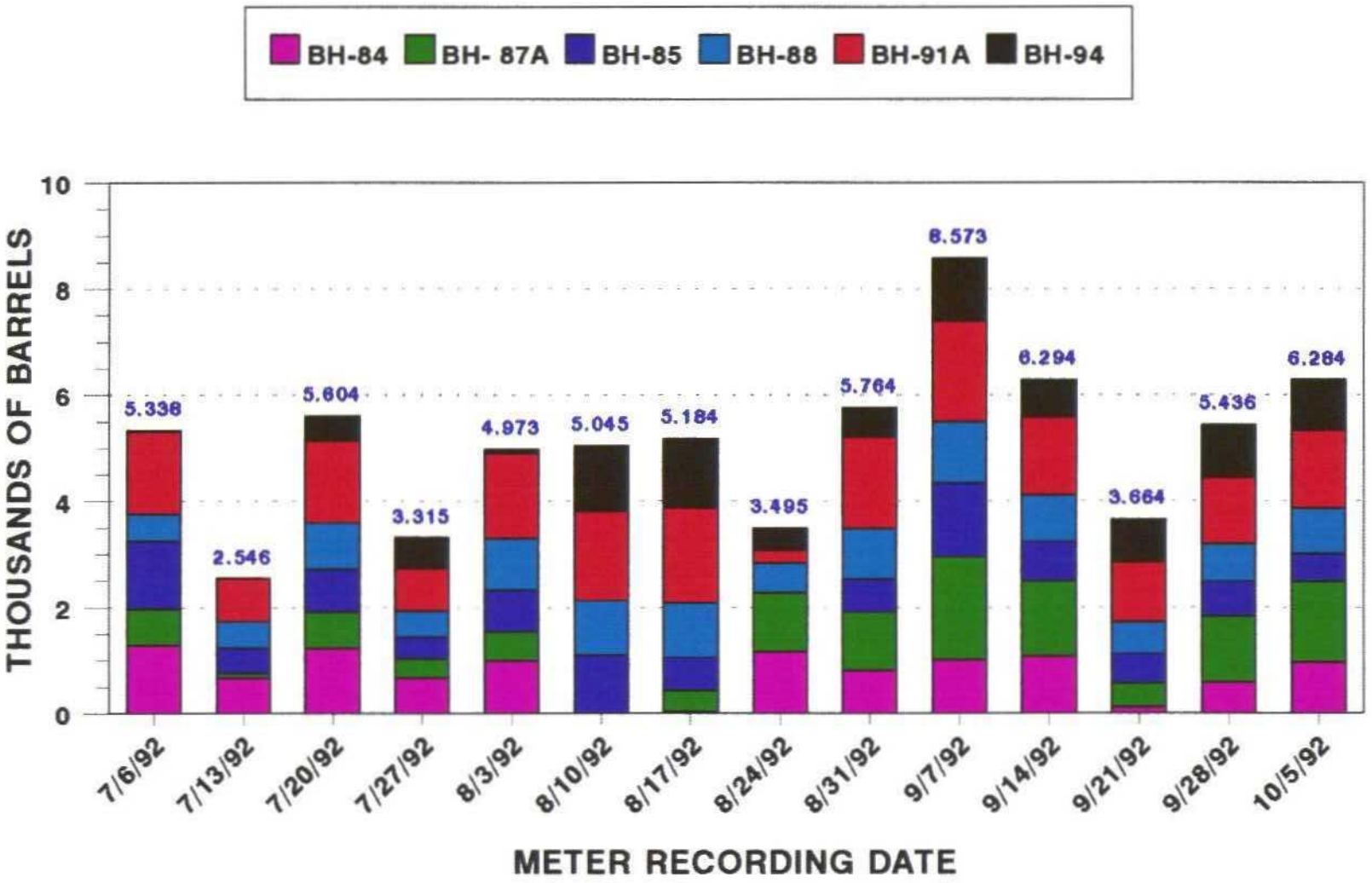
Jeffrey S. Lynn
Advanced Environmental Representative

JSL020/nrt

xc: T. C. Lowry - Midland
D. F. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser- IBGP, Artesia

APPENDIX F

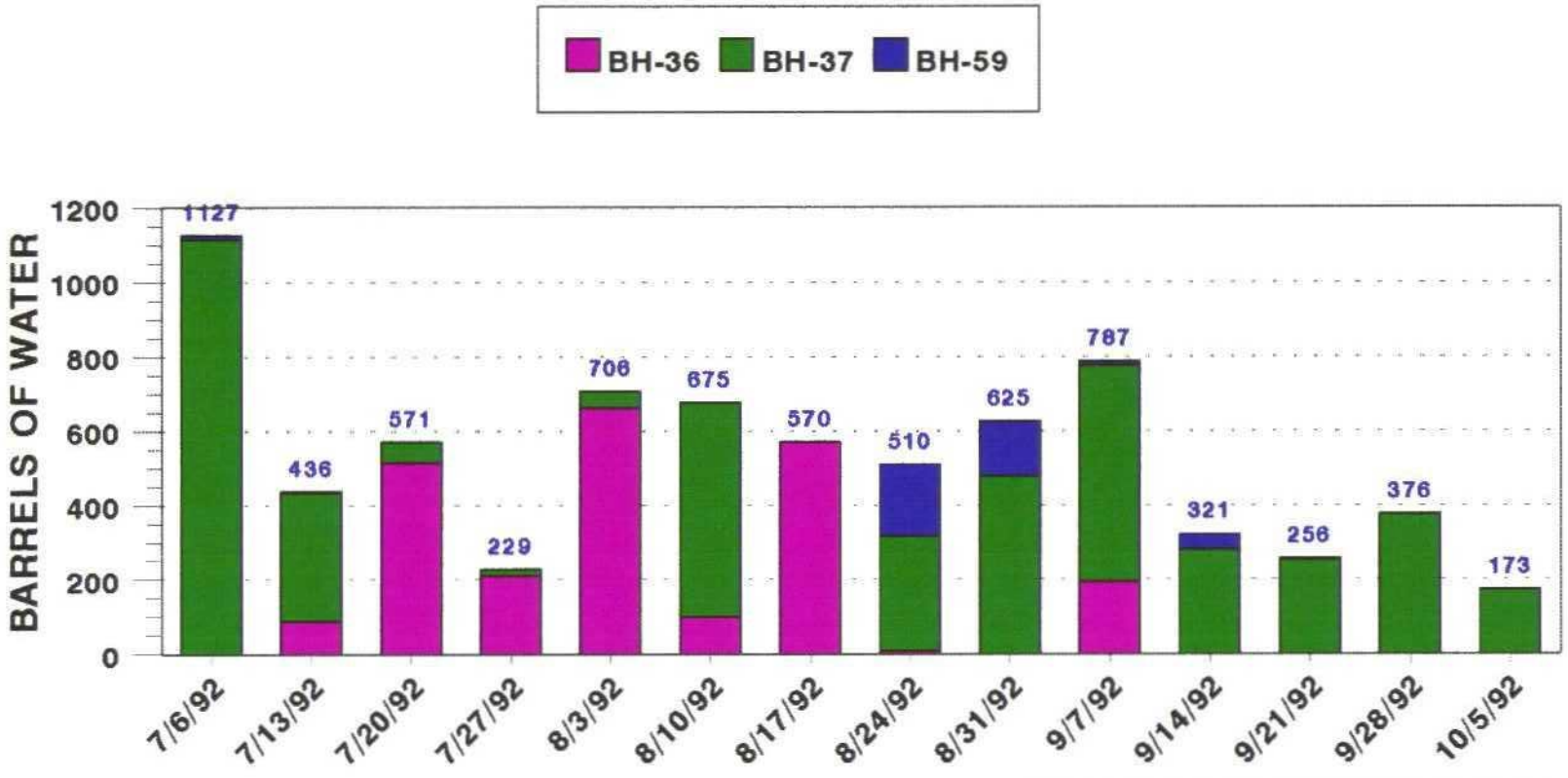
WEEKLY LOWER QUEEN WATER WITHDRAWALS
THIRD QUARTER 1992



LQPROWA2

APPENDIX F

WEEKLY SHALLOW WATER WITHDRAWALS
THIRD QUARTER 1992



BH-59	13	2	0	0	0	0	0	194	147	12	40	2	0	0
BH-37	1114	346	56	19	44	576	0	309	478	580	281	254	376	173
BH-36	0	88	515	210	662	99	570	7	0	195	0	0	0	0

METER RECORDING DATE

SHPROWA2

APPENDIX F

WEEKLY TOTAL WATER WITHDRAWALS
THIRD QUARTER 1992

SHALLOW TOTAL	1.127	0.436	0.571	0.229	0.706	0.675	0.57	0.51	0.625	0.786	0.321	0.256	0.376	0.173
LOWER QUEEN TOTAL	5.337	2.546	5.604	3.315	4.973	5.045	5.284	3.495	5.764	8.573	6.294	3.665	5.436	6.284

METER RECORDING DATE

IBPROWAT

APPENDIX G

LOWER QUEEN FLUID LEVEL DATA AND POTENTIOMETRIC MAPS

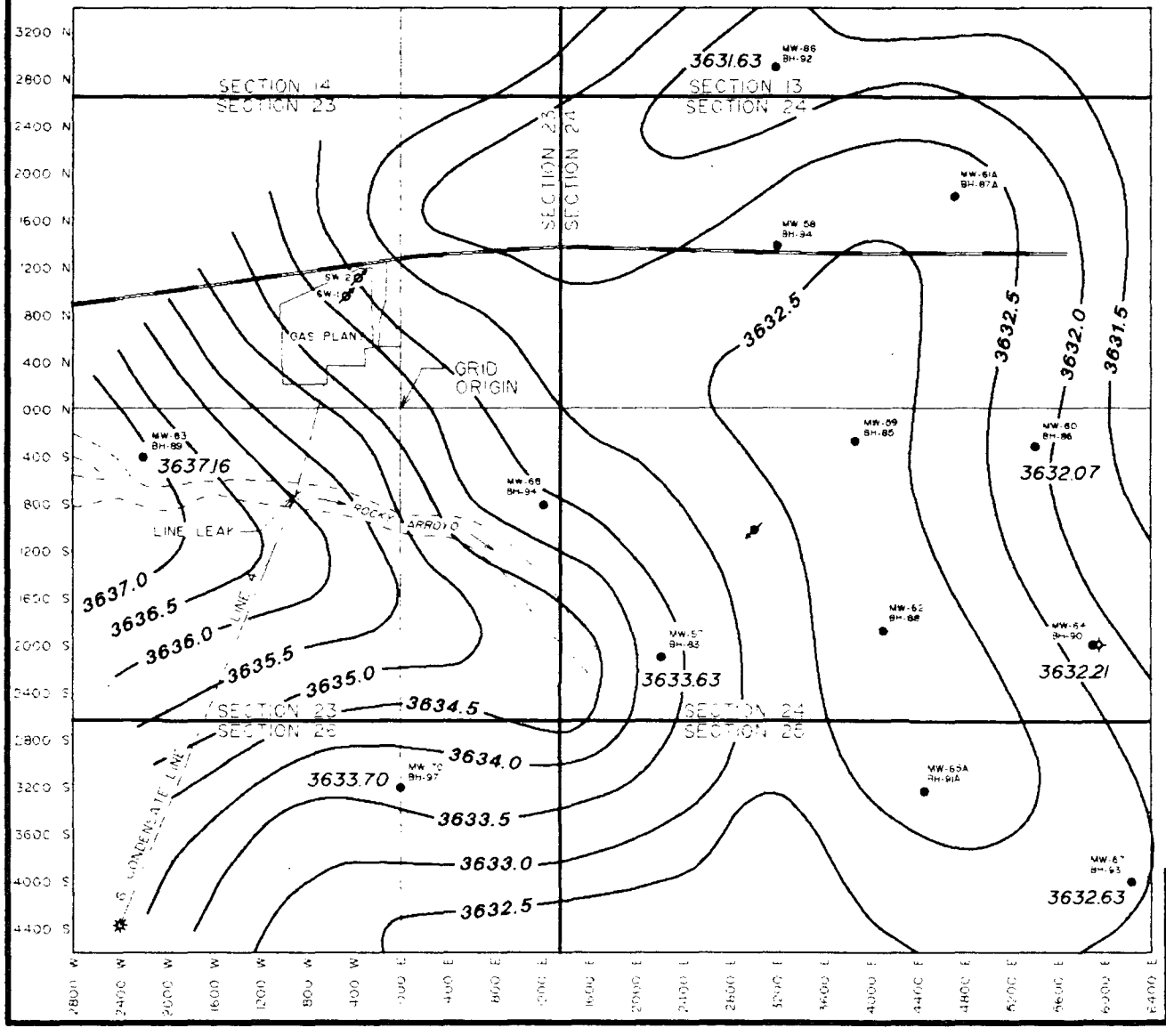
APPENDIX G

LOWER QUEEN FLUID LEVELS
THIRD QUARTER 1992

WELL NUMBER	JULY 1992	AUGUST 1992	SEPTMEBER 1992
BH-83	3633.63	3632.46	3632.03
BH-86	3632.07	3631.67	3631.34
BH-89	3637.16	3633.43	3632.51
BH-90	3632.21	3631.75	3631.4
BH-92	3631.63	3631.21	3630.81
BH-93	3632.63	3631.98	3631.63
BH-97	3633.70	3633.03	3632.55
SW-2	-------	3631.80	3631.22
**********	**********	**********	**********
MONTHLY RAINFALL	2.15	0.80	0.18

FLUID LEVEL MEASUREMENTS IN FEET
RAINFALL MEASUREMENTS IN INCHES

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

LEGEND

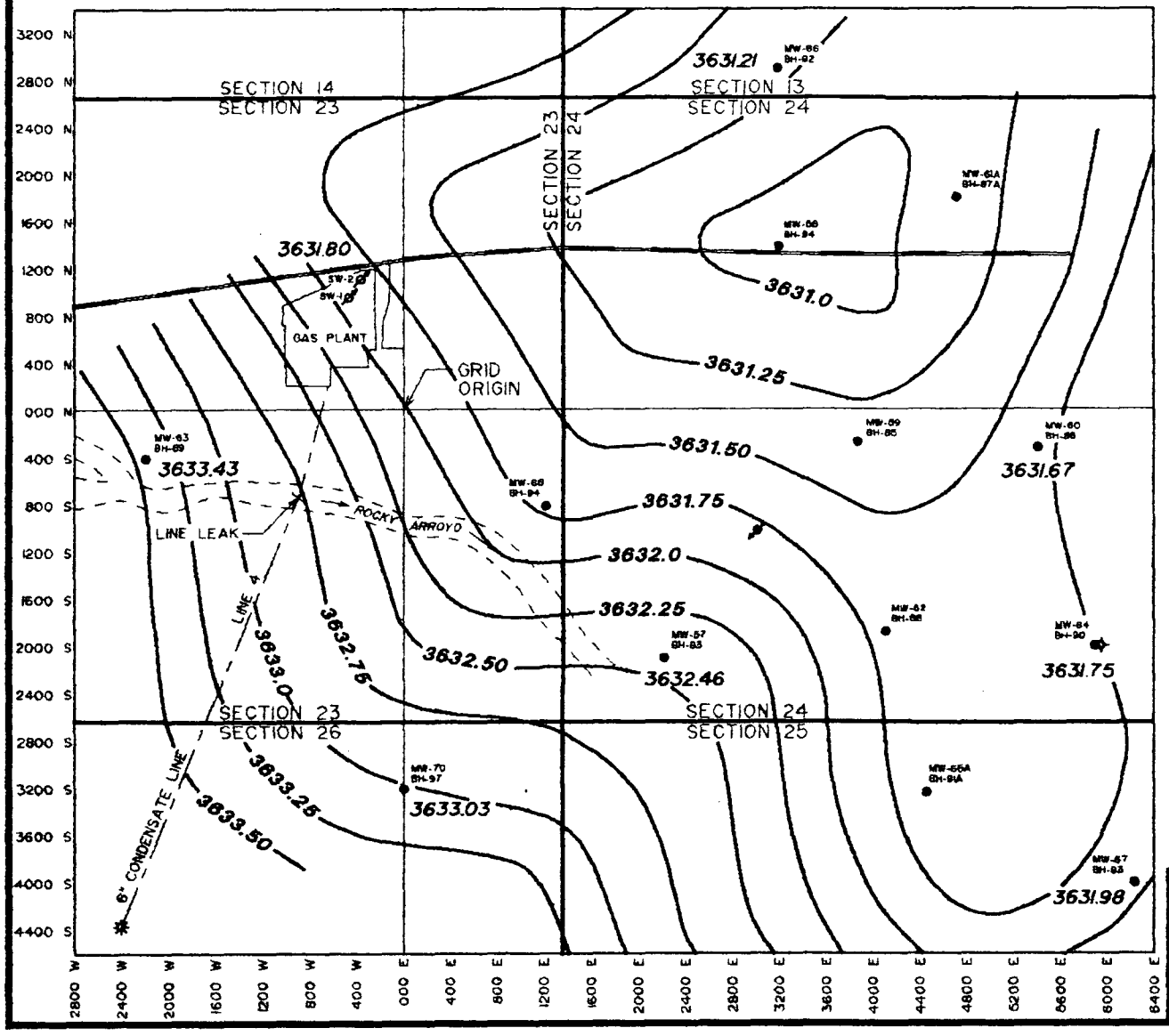
- MW-64 BH-90 — DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- SW-1 — WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

C.I. = 0.5'

IBGASPLT.STY OPER

Figure Title	MARARTHON OIL COMPANY
Document Title:	Location: INDIAN BASIN GAS PLANT
JULY LQ FLUID LEVELS POTENTIOMETRIC SURFACE	DATE 10/92 · PREPARED BY: JSL · SCALE · CHECKED BY: · DRAFTED BY: · PROJECT NO · FIGURE NO

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

L E G E N D

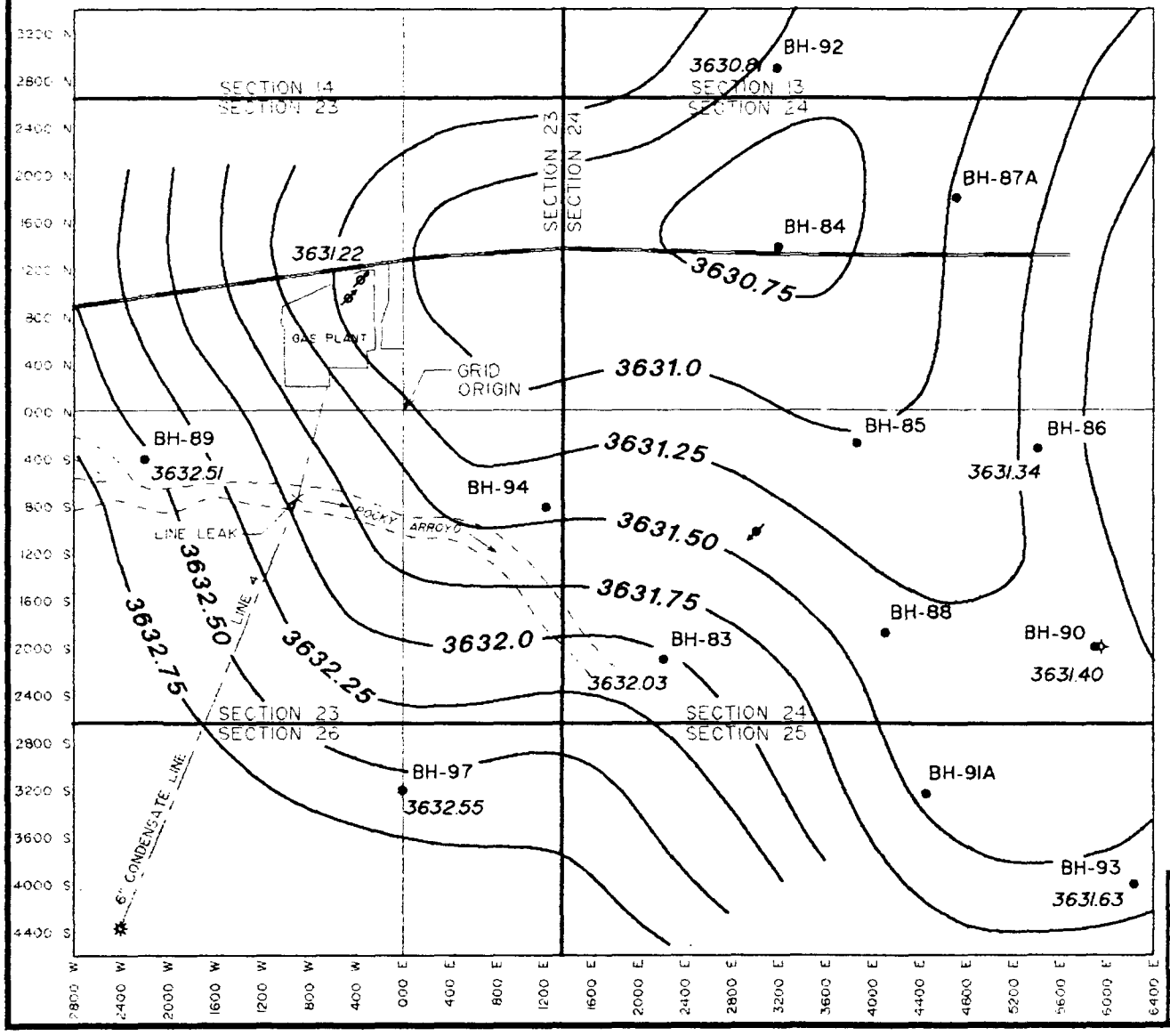
- MW-64 SH-90 — DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- SW-1 — WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

C.I. = 0.25'

BGASPLT.STY OPER

Figure Title:	MARARTHON OIL COMPANY
Document Title:	Location: INDIAN BASIN GAS PLANT
AUGUST LQ FLUID LEVELS POTENTIOMETRIC SURFACE	DATE: 10/92 — PREPARED BY: JSL; SCALE: — CHECKED BY: ; PROJECT NO: — DRAFTED BY: ; FIGURE NO.

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

L E G E N D

- DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

C.I. = 0.25'

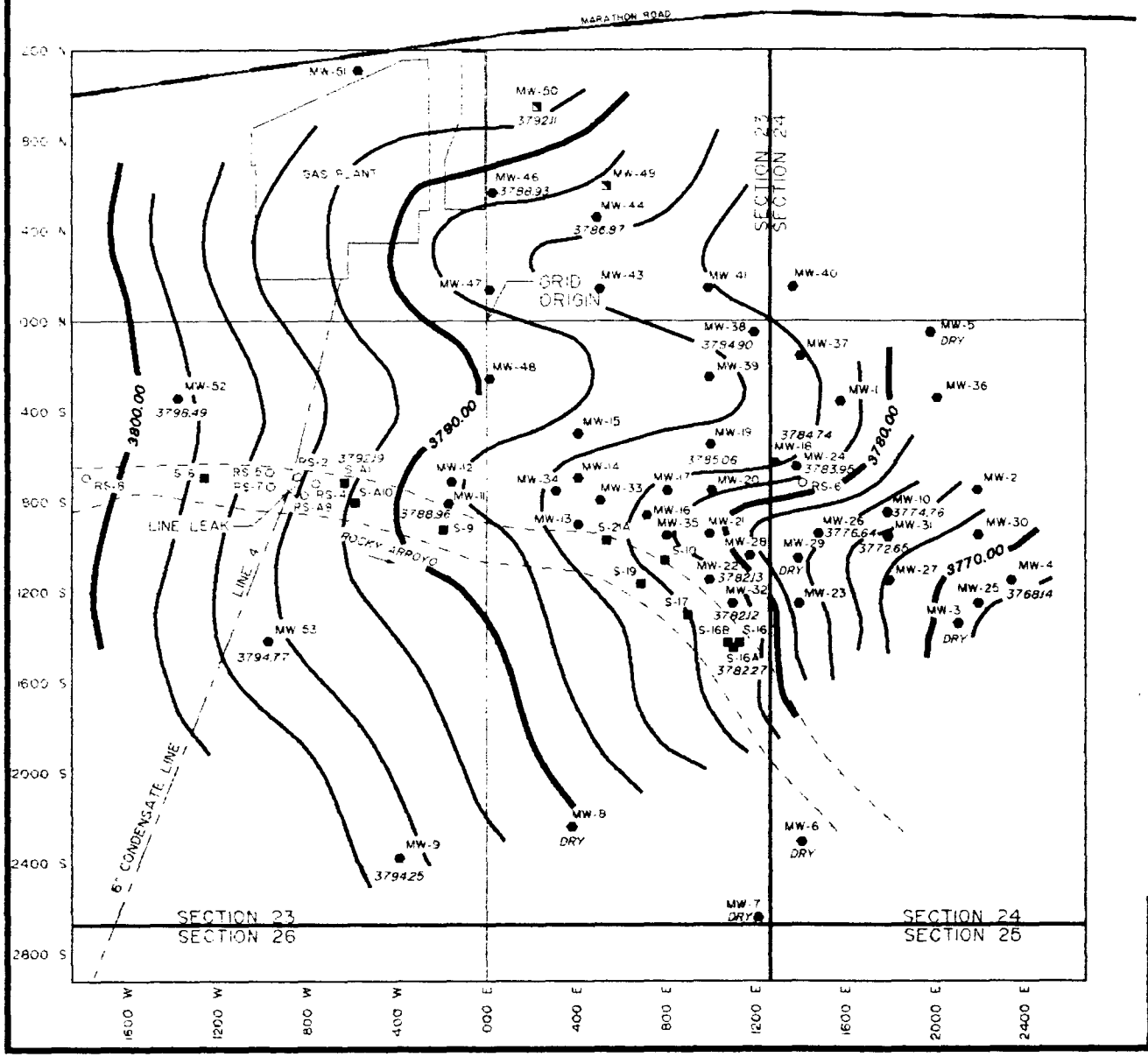
IBGASPLT.STY OPER

Figure Title: SEPTEMBER LQ FLUID LEVELS POTENTIOMETRIC SURFACE	MARARTHON OIL COMPANY
Document Title:	Location: INDIAN BASIN GAS PLANT
	DATE: 9/27/92
	SCALE
	PROJECT NO.
	PREPARED BY: JSL
	CHECKED BY:
	DRAFTED BY:
	FIGURE NO.

APPENDIX H

SHALLOW SOIL WATER POTENTIOMETRIC MAPS

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

L E G E N D

- MW-9 ⬢ SHALLOW ALLUVIAL GROUNDWATER MONITORING WELL
- RS-4 ○ 4 INCH PVC RCOVERY SUMP
- S-19 ■ 24 INCH GALVANIZED RECOVEY SUMP

C.I. 2.0'

!BGASPLT.STY OPER

Figure Title:	MARARTHON OIL COMPANY	
Document Title:	Location: INDIAN BASIN GAS PLANT	
JULY 1992 SHALLOW GROUND WATER POTENTIOMETRIC MAP	DATE: 10/92	PREPARED BY: JSL
	SCALE	CHECKED BY:
	PROJECT NO	DRAFTED BY:
		FIGURE NO:

INDIAN BASIN GAS PLANT TREATMENT PROJECT QUARTERLY REPORT

FOURTH QUARTER 1992

FEBRUARY 1993

INDIAN BASIN TREATMENT PROJECT QUARTERLY REPORT

FOURTH QUARTER 1992

Submitted by
Marathon Oil Company
on behalf of the
Indian Basin Gas Plant Owners

February 3, 1993

INDIAN BASIN GAS PLANT TREATMENT PROJECT QUARTERLY REPORT

TABLE OF CONTENTS

MARATHON OIL COMPANY
INDIAN BASIN TREATMENT PROJECT
QUARTERLY REPORT - FEBRUARY 1993

INTRODUCTION

This report summarizes treatment activities which have taken place during the fourth quarter of 1992 related to environmental problems resulting from a produced liquid gathering line leak discovered in April 1991 near the Indian Basin Gas Plant. Preparation of this report is in accordance with the April 2, 1992 New Mexico Oil Conservation Division (OCD) directive for quarterly reporting on Indian Basin Treatment Project activities.

QUARTERLY REPORT SUMMARY

The overall Treatment Project is fully operational and functioning as designed per Marathon's March 1992 technical submittal to OCD. Water withdrawal from the Lower Queen horizon is on-going with an air stripper used to remove volatile hydrocarbons. In response to cold weather freezing of the shallow well pumps, shallow water withdrawals have been temporarily halted; Lower Queen withdrawals are unaffected. Water discharged from the air stripper continues to be utilized by the plant for process water. Soil venting operations continue to remove volatile hydrocarbons from the soil horizon. Water analyses from rancher wells and nearby surface springs have not exceeded any State or Federal drinking water standards for hydrocarbons or chlorides. Local ranchers are kept informed of treatment project activities via a quarterly update letter.

QUARTERLY POINT-IN-TIME SAMPLING AND RESULTS

A point-in-time sampling of the Indian Basin treatment project monitor wells was conducted October 13 - 15, 1992. Forty-six wells were sampled by Southwestern Laboratories using EPA sampling protocol. The attached field log in Appendix A was prepared by Southwestern Laboratories from field notes taken during sample acquisition and identifies the fluid levels, purge volumes and other field analysis data of all wells evaluated.

Marathon's Petroleum Technology Center (PTC) in Littleton, Colorado, performed BTEX and chloride analyses for the quarterly point-in-time samples. High performance liquid chromatography (HPLC) was used to analyze water samples for BTEX concentrations and a titration method was used for chloride analysis. The results from the point-in-time analyses are contained in Appendix B.

Core Laboratories, Aurora, Colorado, performed four BTEX analyses using EPA method 8020 purge and trap gas chromatography as a quality assurance comparison of PTC's HPLC analytical techniques. Core Labs also conducted four chlorides analyses using EPA method 325.2. The following four wells (3 shallow and 1 Lower Queen) were analyzed for BTEX concentrations using both HPLC and purge and trap analytical techniques: BH-33, BH-41, BH-67 and BH-90. A chart comparing the BTEX analytical results for the two analysis techniques is attached in Appendix C. The results of this

comparison indicate that the HPLC analysis technique portrays an accurate representation of BTEX concentration when compared with the EPA method 8020 purge and trap analysis technique for the same samples.

Appendix D (Tables 1 and 2) compares the results of the September 1991, December 1991, April 1992, July 1992 and October 1992 point-in-time benzene concentration data for the Lower Queen and shallow wells. Graphs depicting benzene concentrations over time for each routinely sampled borehole/monitoring well are also included in Appendix D.

MONTHLY SAMPLING

Monthly water samples of nearby rancher water wells and springs were taken on October 12, November 11, and December 10. Analytical results from the monthly water samples indicate the water to be within standards for hydrocarbons and chlorides as established by EPA for drinking water. The attached table in Appendix E provides a summary of the monthly analyses performed on the Lyman water well, the closest down gradient water well to the leak site, and a surface water spring in Rocky Arroyo. The quarterly analysis for the Biebelle water well, the second closest down gradient well, is also reported. All rancher water well and arroyo spring samples were obtained using EPA sampling and handling procedures. Core Labs performed the BTEX and chloride analyses using EPA approved methods. Analytical data from rancher water

well samples and surface water springs is provided to the local ranchers each month with letters of explanation. Copies of these letters are also provided to the New Mexico Oil Conservation Division (Santa Fe) and the Bureau of Land Management (Roswell) upon distribution to the ranchers.

The plant water supply well and backup well are also sampled and analyzed on a monthly basis. Analytical reports for all the rancher wells, springs and plant wells are included in Appendix E.

WATER AND CONDENSATE RECOVERY

Water withdrawals from the Lower Queen and shallow water wells are individually metered and reported to the State Engineer's Office (SEO) on a monthly basis, per SEO directive. The reports filed with the SEO for the fourth quarter of 1992 are attached in Appendix F. Appendix F also contains stacked bar graphs depicting weekly water withdrawals from Lower Queen and shallow soil water wells. A third graph shows the combined weekly water withdrawals from the Lower Queen and shallow zone.

Six Lower Queen wells (BH-84, BH-85, BH-87A, BH-88, BH-91A, and BH-94) were routinely pumped for water withdrawal during the quarter. Monthly water withdrawals for each well are listed in the following table:

LOWER QUEEN MONTHLY WATER WITHDRAWALS

WELL NUMBER	OCT	NOV	DEC	QTR. TOTAL
BH-84	5,425	4,891	6,956	17,272 BBL.
BH-85	1,970	2,413	2,916	7,299 BBL.
BH-87A	7,093	5,379	6,839	19,311 BBL.
BH-88	3,658	1,790	3,035	8,483 BBL.
BH-91A	6,875	6,289	8,967	22,131 BBL.
BH-94	5,474	5,059	7,413	17,946 BBL.
LQ TOTAL	**30,495**	**25,821**	**36,126**	**92,442 BBL.**

Three shallow water wells (BH-36, BH-37, and BH-59) were pumped during the fourth quarter. In December, the shallow withdrawal wells were temporarily shut-in due to cold weather freezing the pneumatic pumps. Shallow withdrawals will resume as warmer weather allows. Monthly shallow water withdrawals for each well are listed below:

SHALLOW SOIL WATER MONTHLY WITHDRAWALS

WELL NUMBER	OCT	NOV	DEC	QTR. TOTAL
BH-36	181	68	0	249 BBL.
BH-37	258	0	0	258 BBL.
BH-59	36	1,009	0	1,045 BBL.
SHALLOW TOTAL	**475**	**1,077**	**0**	**1,552 BBL.**

Fluids from the Lower Queen and shallow withdrawal wells are piped to an air stripper facility for hydrocarbon separation and

eventual plant usage. An oil/water separator is used to remove any free product prior to soluble hydrocarbon removal. The free product is transferred to a holding tank which is gauged on a weekly basis. The measured volume of free condensate recovered during the fourth quarter of 1992 is 6 barrels. The cumulative free product recovery for the second through fourth quarters of 1992 is 38 barrels. This brings the cumulative free product recovered to date (not including volumes volatilized by the air stripper and soil vent) to 3325 barrels.

POTENTIOMETRIC MAPPING

Lower Queen fluid levels were measured once a month for all non-pumping wells. The table in Appendix G lists the Lower Queen fluid levels (elevations) obtained during the fourth quarter of 1992. Cumulative monthly rainfall as measured at the gas plant is also recorded. The cumulative rainfall for the quarter was 0.92 inches. Monthly Lower Queen potentiometric maps, based on these monthly fluid level readings are also attached in Appendix G. The Lower Queen potentiometric maps reflect lower fluid levels due to decreased precipitation.

A shallow water potentiometric map based on data accumulated during the October point-in-time sampling round is attached in Appendix H.

SOIL VENTING ACTIVITIES

The Phase I soil venting program is fully operational and includes wells: BH-39, BH-40 and BH-44. Venting during the fourth quarter was continuous. Shallow water withdrawal wells, selectively located in the vicinity of the soil vent wells, help promote soil venting by lowering the water table and exposing more soil to hydrocarbon vapor extraction. Water levels in the area of the soil vent wells have dropped from the high levels encountered during the previous two quarters benefiting the ongoing venting program. Additionally, the mechanical difficulties associated with the soil venting program described in the previous quarterly report have been corrected.

APPENDIX A

OCTOBER POINT-IN-TIME FIELD NOTES

SwL **SOUTHWESTERN LABORATORIES**

Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 West Industrial • P. O. Box 2150 • Midland, Texas 79702
Fax 915/686-0492 915/683-3349

October 27, 1992

Mr. Jeff Lynn
Marathon Oil Company
P. O. Box 552
Midland, Texas 79702

Re: Marathon Indian Basin Remediation Project

Dear Mr. Lynn:

The quarterly monitoring project was started at 7:00 am on October 13, 1992. During a three (3) day period, a total of forty-six (46) wells were checked. The monitoring project was completed on October 15, 1992, at 1:00 pm.

Due to a malfunction in the portable pH and Conductivity meter, analysis were not performed on location. Samples were put on ice and analyzed for pH and Conductivity as soon as possible.

If you have any questions, please do not hesitate to call.

Sincerely,

Lorri L. Church

Lorri L. Church
Project Manager, Midland EAS

LLC:jjc

xc: D. E. Krueger
11/10/92

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

QUEEN WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.		Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °F	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-83	MW-57	177.20	156.01	21.19	10-13-92	N	41.5	70	7.02	780	
BH-84	MW-58	218.71	--	--	10-13-92	N	Pump Present	--	6.97	1555	
BH-85	MW-59	211.29	--	--	10-13-92	N	Pump Present	--	6.96	1126	
BH-86	MW-60	223.08	184.18	38.90	10-13-92	N	76.2	72	7.13	1024	
BH-87A	MW-61A	216.37	--	--	10-13-92	N	Pump Present	--	7.18	1034	
BH-88	MW-62	225.90	--	--	10-13-92	N	Pump Present	--	6.83	1716	
BH-89	MW-63	221.19	194.24	26.95	10-13-92	N	52.8	71	7.12	597	
BH-90	MW-64	202.37	167.45	34.92	10-13-92	N	68.4	68	7.15	936	
BH-91A	MW-65A	168.56	--	--	10-13-92	N	Pump Present	--	6.97	800	
BH-92	MW-66	235.18	198.40	36.78	10-13-92	N	72	69	7.19	1026	
BH-93	MW-67	165.77	134.53	31.24	10-13-92	N	61.2	70	7.04	669	
BH-94	MW-68	203.43	--	--	10-13-92	N	Pump Present	--	7.04	741	
BH-97	MW-70	225.20	190.61	34.59	10-14-92	N	67.3	68	7.26	595	
SW-1	Plant Well	255.00	--	--	10-13-92	N	Pump Present	--	7.32	799	
SW-2	Backup well	292.00	178.02	113.98	10-13-92	N	None	--	--	--	

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.	Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °F	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-24 MW-3	17.40	--	Dry	10-14-92	--	--	--	--	--	
BH-26 MW-4	18.68	18.54	0.14	10-14-92	N	0.1	--	--	--	QNS to Purge
BH-28 MW-5	13.10	--	Dry	10-13-92	--	--	--	--	--	
BH-29 MW-6	13.98	--	Dry	10-13-92	--	--	--	--	--	
BH-55 MW-31	19.93	19.00	0.93	10-15-92	N	1.8	--	QNS	QNS	(a)
BH-30 MW-7	17.31	--	Dry	10-13-92	--	--	--	--	--	
BH-45 MW-22	17.30	17.29	0.01	10-14-92	N	--	--	--	--	QNS to Purge
BH-31 MW-8	17.74	--	Dry	10-14-92	--	--	--	--	--	
BH-32 MW-9	13.65	--	Dry	10-14-92	--	--	--	--	--	
BH-33 MW-10	19.08	16.97	2.11	10-14-92	N	4.1	--	6.76	2381	
BH-34 MW-11	24.85	22.47	2.38	10-15-92	Y	4.7	--	6.70	1523	0.25" Free Product
BH-36 MW-13	22.07	--	--	--		Pump Present	--	--	--	Pump Inoperative
BH-42 MW-19	19.11	17.16	1.95	10-15-92	Film	3.8	--	6.63	2596	
BH-47 MW-24	14.09	12.92	1.17	10-15-92	N	0.6	--	--	--	(b)

(a) Bailed dry after 0.2 gallons. (b) Bailed dry after 0.2 gallons, no recovery in 2 hours.

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.		Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °F	pH	Conductivity µmhos/cm @ 25° C	Remarks
BH-41	MW-18	17.42	15.89	1.53	10-14-92	N	3.0	--	6.73	2424	
BH-53	MW-29	14.76	--	Dry	10-14-92	--	--	--	--	--	
BH-49	MW-26	21.51	19.66	1.85	10-15-92	Film	3.6	--	6.87	1791	
BH-56	MW-32	16.77	--	Dry	10-14-92	--	--	--	--	--	
BH-44	MW-21	23.31	--	--	10-14-92	--	Pump Inaccesible	--	--	--	
BH-61	MW-38	20.62	17.66	2.96	10-14-92	N	5.8	--	6.80	1834	
BH-67	MW-44	25.34	20.28	5.06	10-14-92	N	9.9	--	7.02	2059	
BH-71	MW-48	19.98	18.87	1.11	10-15-92	N	0.5	--	--	--	(a)
BH-73	MW-50	37.15	23.77	13.38	10-15-92	N	6.6	--	6.91	5491	
BH-75	MW-52	21.44	--	Dry	10-13-92	--	--	--	--	--	
BH-77	MW-53	16.02	--	Dry	10-14-92	--	--	--	--	--	
BH-80	MW-54	78.15	44.66	33.49	10-13-92	N	65.6	69	7.28	1630	(b)
BH-81	MW-55	66.80	24.47	42.33	10-14-92	--	82.9	70	6.93	2939	
BH-82	MW-56	43.76	34.68	9.08	10-15-92	Y	17.8	--	6.76	1995	2.50" Free Product
BH-95	MW-69	59.41	31.37	28.04	10-14-92	Y	54.9	70	6.99	1059	0.25" Free Product
Sump A-11		17.20	14.91	2.29	10-14-92	Film	55	69	6.95	1287	

(a) Bailed dry after 0.25 gallons, no recovery in 2 hours. (b) Pumped dry after approx. 32 gallons.

SOUTHWESTERN LABORATORIES, INC.

FIELD LOG

SHALLOW WELLS

Indian Basin Gas Plant

Artesia, N.M.

Well I.D.	Reported Total Depth (ft.)	FTC Water Level (ft.)	Water Column (ft.)	Sample Date	Free Product (Y/N)	Purge Volume (gal.)	Temperature °C	pH	Conductivity µmhos/cm @ 25° C	Remarks
Sump 16A	15.46	12.00	3.46	10-14-92	Film	83	70	7.02	1641	

APPENDIX B

OCTOBER POINT-IN-TIME ANALYTICAL RESULTS

Indian Basin BTEX Analysis Results by HPLC (10/92)

Sample	Date	Time	Notes *	Benzene	Toluene	o-Xylene	Ethylbenzene	m,p-Xylene	Xylenes	BTEX	Chloride
BH-33/MW-10	10/14/92	15:35	R.M.G.	1664.8	144.3	26.1	435.8	732.9	759	3003.9	312
BH-33/MW-10	10/14/92	15:35	R.M.G., DF=x3	556.1	44	21.7	173.8	293	314.7	1088.6	
BH-34/MW-11	10/15/92	9:20	R.M.G.	2754.8	1896.2	851.2	ND	4344.6	5195.8	9846.8	239
BH-34/MW-11	10/15/92	9:20	R.M.G., DF=x6	490.4	352.3	154.4	ND	816.3	970.7	1813.4	
BH-41/MW-18	10/14/92	12:40	R.M.G.	3083.1	115.3	33.8	869.9	153.3	187.1	4255.4	408
BH-41/MW-18	10/14/92	12:40	R.M.G., DF=x6	653.8	48.1	18.1	200.2	50.7	68.8	970.9	
BH-42/MW-19	10/15/92	8:45	A.J.	2360.4	68.6	30.8	711.2	ND	30.8	3171	420
BH-42/MW-19	10/15/92	8:45	A.J.	2756	72.6	34.9	757.8	ND	34.9	3621.3	420
BH-42/MW-19	10/15/92	8:45	A.J., DF=x5	606.4	52	27.9	192.8	31.3	59.2	910.4	
BH-42/MW-19	10/15/92	8:45	A.J., DF=x4	763	68.9	24.3	146.7	142.1	166.4	1145	
BH-49/MW-26	10/15/92	9:20	L.C.	1859.7	58.8	55	567.1	1719.3	1774.3	4259.9	222
BH-49/MW-26	10/15/92	9:20	L.C., DF=x3	664	40	22.9	183.9	588.9	611.8	1499.7	
BH-55/MW-31	10/15/92	10:23	L.C.	9.1	31.8	3.2	10	15.1	18.3	69.2	296
BH-61/MW-38	10/14/92	11:57	R.M.G.	166	18.4	24.4	241.5	ND	24.4	450.3	128
BH-67/MW-44	10/14/92	14:45	R.M.G.	40.6	34.3	14.7	96	9.6	24.3	195.2	356
BH-73/MW-50	10/15/92	9:05	W.	8.5	9.5	ND	2.9	2	2	22.9	370
BH-80/MW-54	10/13/92	10:15	L.C.	61.6	7.2	2.5	194.5	627.8	630.3	893.6	55
BH-81/MW-55	10/14/92	11:45	L.C.	214.7	56.2	24.1	91.9	2.3	26.4	389.2	292
BH-82/MW-56	10/15/92	10:30	L.C.	1026	46.9	35.1	ND	803.7	838.8	1911.7	183
BH-83/MW-57	10/13/92	17:07	L.C.	15.1	32.9	38.9	ND	38.7	77.6	125.6	67
BH-84/MW-58	10/13/92	8:35	J.L., PW	190	48.9	12.9	25.7	44.2	57.1	321.7	155
BH-85/MW-59	10/13/92	9:35	J.L., PW	98.8	37.1	12.9	43.6	33.1	46	225.5	69
BH-86/MW-60	10/13/92	11:40	L.C.	31.7	109.1	8.3	35.5	48.8	57.1	233.4	14
BH-86/MW-60	10/13/92	11:40	L.C.	22.6	39.4	9.3	ND	20.9	30.2	92.2	14
BH-87A/MW-61A	10/13/92	8:10	J.L., PW	470.1	17.4	24.5	ND	2326.7	2351.2	2838.7	13
BH-88/MW-62	10/13/92	13:30	J.L., PW	212.3	18.5	38.1	416	1653.7	1691.8	2338.6	285
BH-89/MW-63	10/13/92	15:03	L.C.	4.3	6.9	7.4	17.1	25.8	33.2	61.5	1
BH-90/MW-64	10/13/92	12:58	L.C.	37.1	60.6	43.6	ND	52.7	96.3	194	12
BH-91A/MW-65A	10/13/92	16:04	J.L.	10.6	ND	43.4	ND	23.9	67.3	77.9	35
BH-92/MW-66	10/13/92	8:40	L.C.	12.1	36.2	15.4	ND	18.2	33.6	81.9	8
BH-93/MW-67	10/13/92	16:10	L.C.	2.6	8.9	59.6	ND	13.2	72.8	84.3	9
BH-94/MW-68	10/13/92	15:33	J.L.	2205.3	3326.9	574.3	ND	4146.8	4721.1	10253.3	30

Indian Basin BTEX Analysis Results by HPLC (10/92)

Sample	Date	Time	Notes *	Benzene	Toluene	o-Xylene	Ethylbenzene	m,p-Xylene	Xylenes	BTEX	Chloride
BH-94/MW-68	10/13/92	15:33	J.L., DF=x6	368.5	586.2	100.2	ND	800.8	901	1855.7	
BH-95/MW-69	10/14/92	10:10	L.C.	1598.1	70.9	421.9	ND	2456.9	2878.8	4547.8	43
BH-97/MW-70	10/14/92	8:36	L.C.	10.7	40.3	23.6	62.7	36.3	59.9	173.6	17
Equip. Blank1	10/13/92	9:35	L.C.	3.2	9.4	ND	4.2	10.3	10.3	27.1	
Equip. Blank 1	10/14/92	9:25	L.C.	10	32.8	9.5	ND	16.6	26.1	68.9	
Equip. Blank 2	10/14/92	15:02	L.C.	44.5	92.3	66	ND	291.7	357.7	494.5	
Equip. Blank 2	10/13/92	17:40	L.C.	23.8	22.5	7.6	ND	13.3	20.9	67.2	
Lab Blank				2.8	2.7	ND	7.1	4	4	16.6	
Sump 16A	10/14/92	13:33	L.C.	632.2	87.1	309.1	ND	1512	1821.1	2540.4	225
Sump A-11 Dup	10/14/92	14:35	L.C.	2742.5	2047.7	676.5	ND	2731.9	3408.4	8198.6	124
Sump A-11 Dup	10/14/92	14:35	L.C., DF=x6	467.4	366	121.5	ND	522.9	644.4	1477.8	
Sump A11	10/14/92	14:35	L.C.	2673.3	2235.3	685.9	ND	2681.8	3367.7	8276.3	124
Sump A11	10/14/92	14:35	L.C., DF=x4	706.6	572.4	227.8	ND	822.1	1049.9	2328.9	
SW-1	10/13/92	10:50	J.L.	15.7	14.9	3.8	ND	6.4	10.2	40.8	25
SW-2	10/13/92	10:23	J.L.	69.4	36.9	34.3	25	26.7	61	192.3	252
Trip. Blank	10/14/92	8:21	L.C.	ND	3.5	86.8	ND	46.6	133.4	136.9	
Trip. Blank 1	10/13/92	9:30	L.C.	9.5	12.8	5.8	ND	11.5	17.3	39.6	

*** Notes:**

L.C. is L. Church
J.L. is J. Lynn
R.M.G. is R.M. Gray
A.J. is A. Johnston
W. is Wilson
PW is "Pump Well
DF is "Dilution Factor"

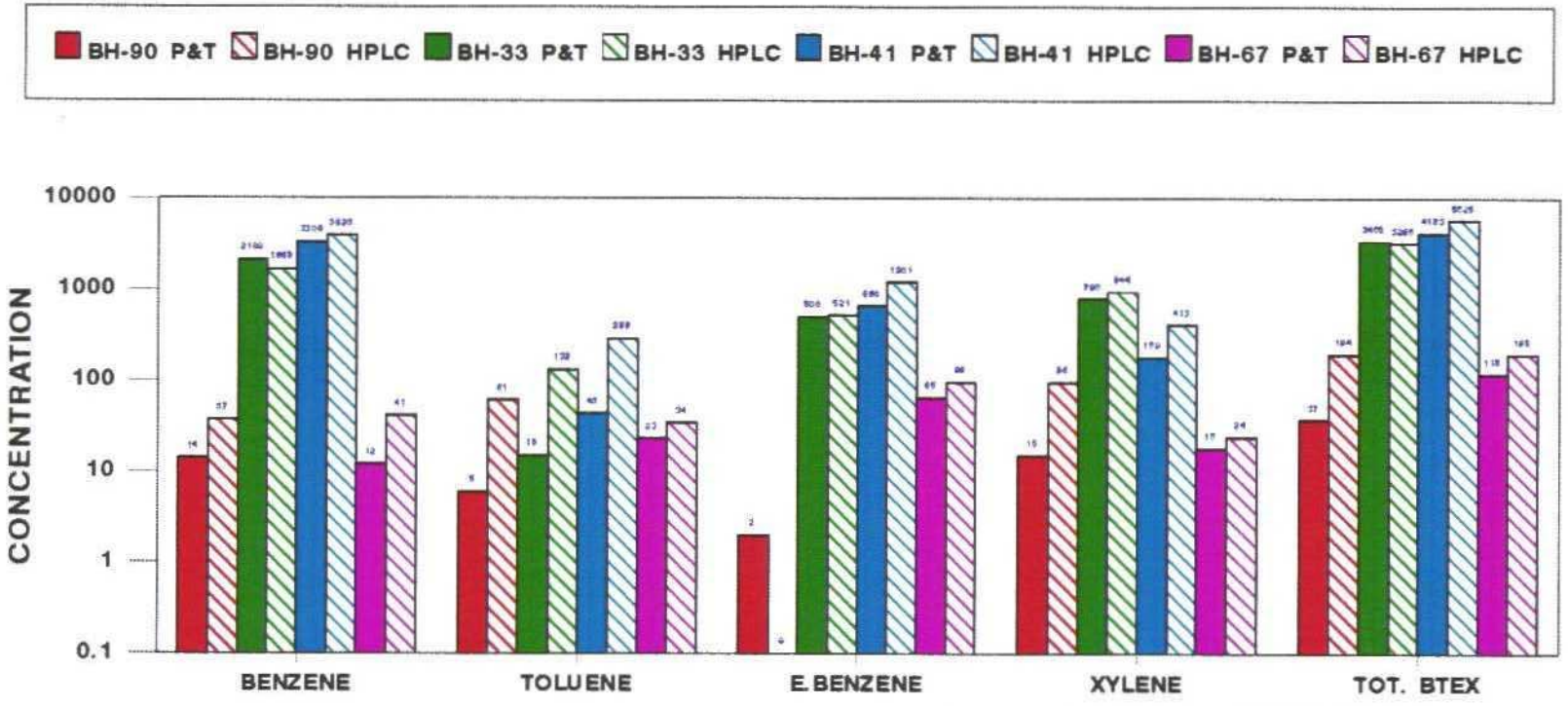
APPENDIX C

OCTOBER POINT-IN-TIME ANALYSIS TECHNIQUE COMPARISON

INDIAN BASIN TREATMENT PROJECT

OCTOBER 1992 QUARTERLY POINT IN TIME SAMPLING RESULTS

CORE LABS P & T VERSUS MARATHON HPLC ANALYSIS COMPARISON



	BENZENE	TOLUENE	E.BENZENE	XYLENE	TOT. BTEX
BH-90 P&T	14	6	2	15	37
BH-90 HPLC	37	61	0	96	194
BH-33 P&T	2100	15	500	790	3405
BH-33 HPLC	1668	132	521	944	3266
BH-41 P&T	3300	43	660	180	4183
BH-41 HPLC	3923	289	1201	413	5825
BH-67 P&T	12	23	65	18	118
BH-67 HPLC	41	34	96	24	196

BTEX COMPONENTS

HPLC - HIGH PERFORMANCE LIQUID CHROMOTOGRAPHY ANALYSIS
P & T - STANDARD PURGE AND TRAP ANALYSIS
ALL CONCENTRATIONS GIVEN IN PPB

APPENDIX D

ANALYTICAL RESULTS COMPARISON OVER TIME

APPENDIX D TABLE 1

LOWER QUEEN BENZENE ANALYSES
POINT-IN-TIME SAMPLINGS

(Data in PPB)

Well Number	September 1991^	December 1991^	April 1992#	July 1992#	October 1992#
BH-83	1600	350	12.9*@	948*	15.1
BH-83	-	290	125.4*	-	-
BH-83	-	-	150.^	-	-
BH-84+	40	90	202.*	178*	190
BH-85+	540	420	40.4*	268*	98.8
BH-86	33	<1	2.7*@	19*	31.7
BH-86	-	-	3.5	16.6~	-
BH-87A+	190	10	5.0*	359*	470.1
BH-87A+	-	-	-	59.8~	-
BH-88+	2200	1400	257.5*	357*	212.3
BH-89	<1	<1	4.1*	12*	4.3
BH-90	150	130	233.*@	115*	37.1
BH-90	-	-	68.3*	-	14.^
BH-91A+	680	150	25.3*	413*	10.6
BH-92	<1	<1	2.9*@	8*	12.1
BH-92	-	-	3.3*	-	-
BH-93	280	320	4.3#	103*	2.6
BH-93	-	-	-	69.1~	-
BH-94+	240	1900	1865.*	160*	2208.2*
BH-97	<1	<1	1.7*	15*	10.7
BH-97	-	-	-	<1^	

\+ Withdrawal Well

^ Analysis by Core Labs

\# Analysis by PTC HPLC method except as noted

* Average of more than one analysis

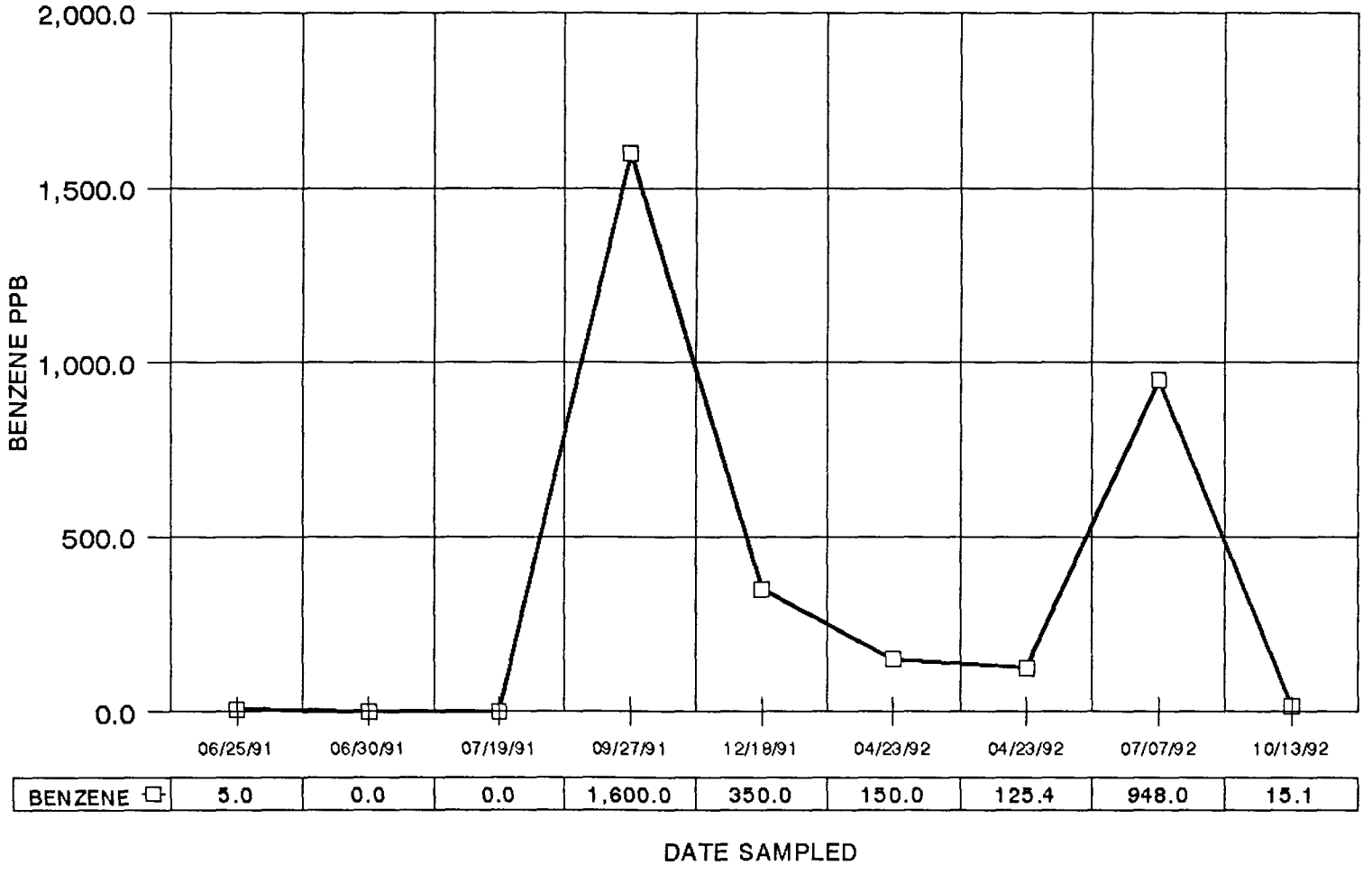
@ Bailed sample; all others collected by pump

~ Analysis by State Dept. of Health

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#57 BH-83



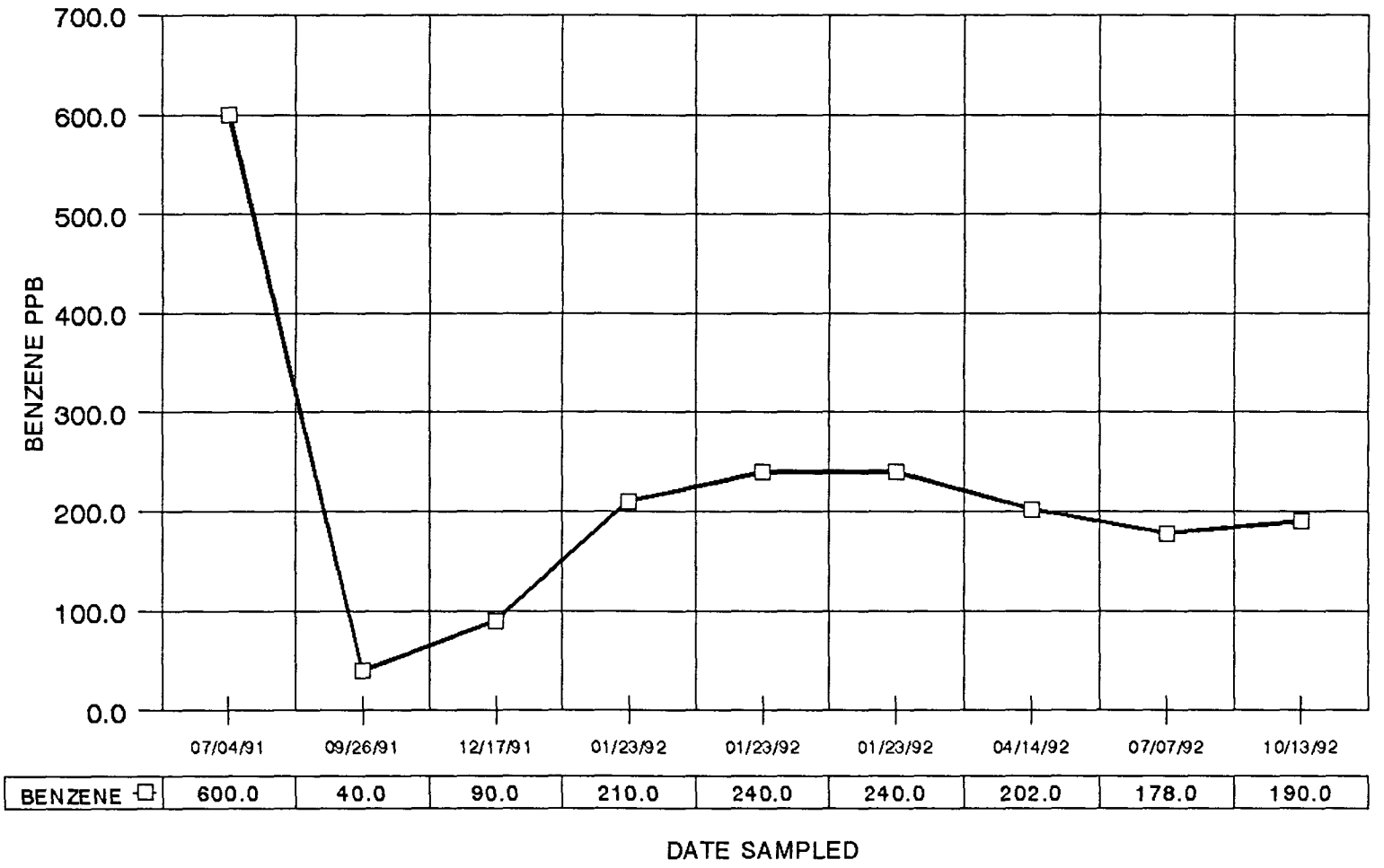
BY R.M. GRAY

PREPARED 1/5/93

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#58 BH-84



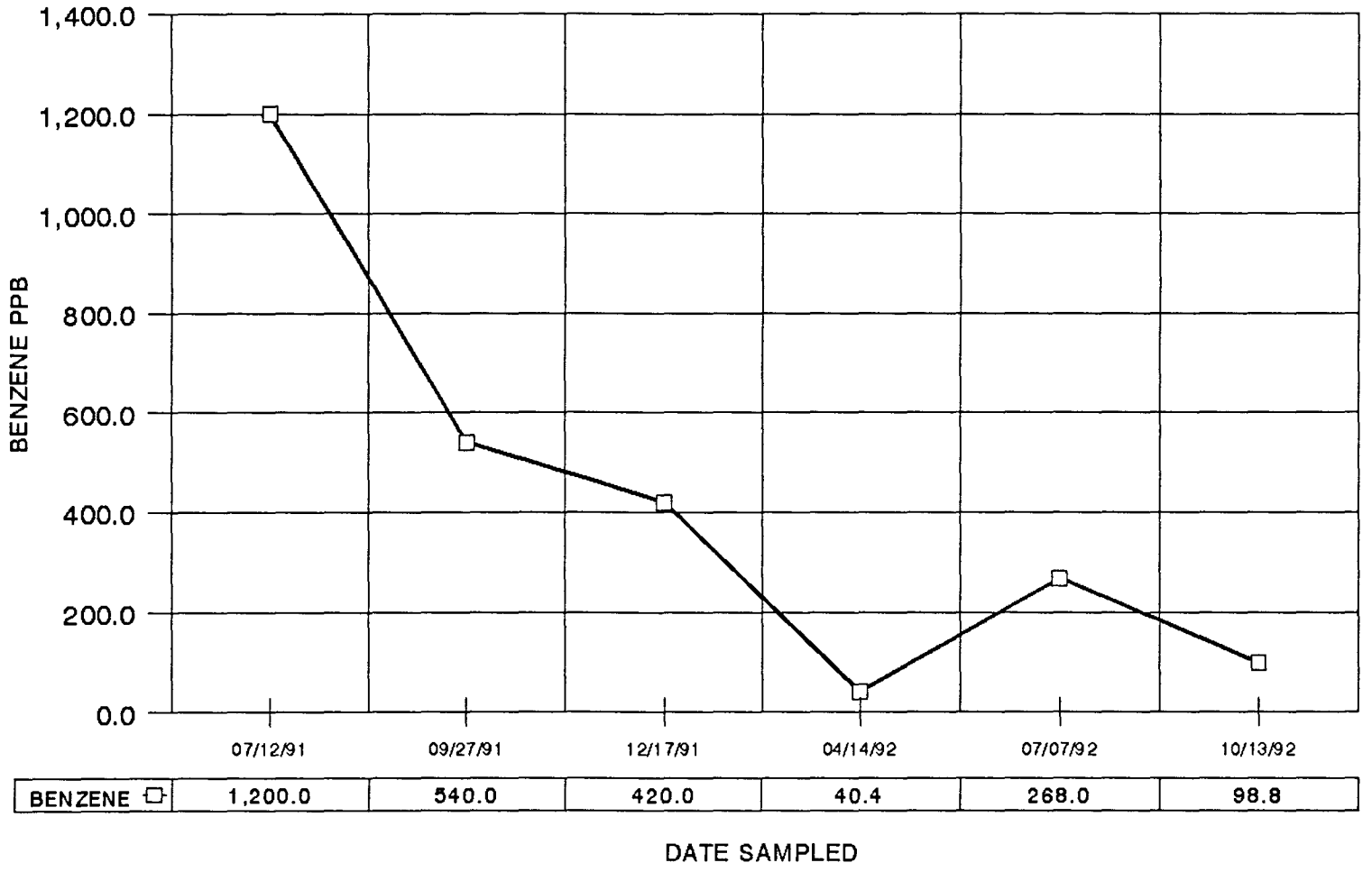
BY R.M. GRAY

PREPARED 1/5/93

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#59 BH-85



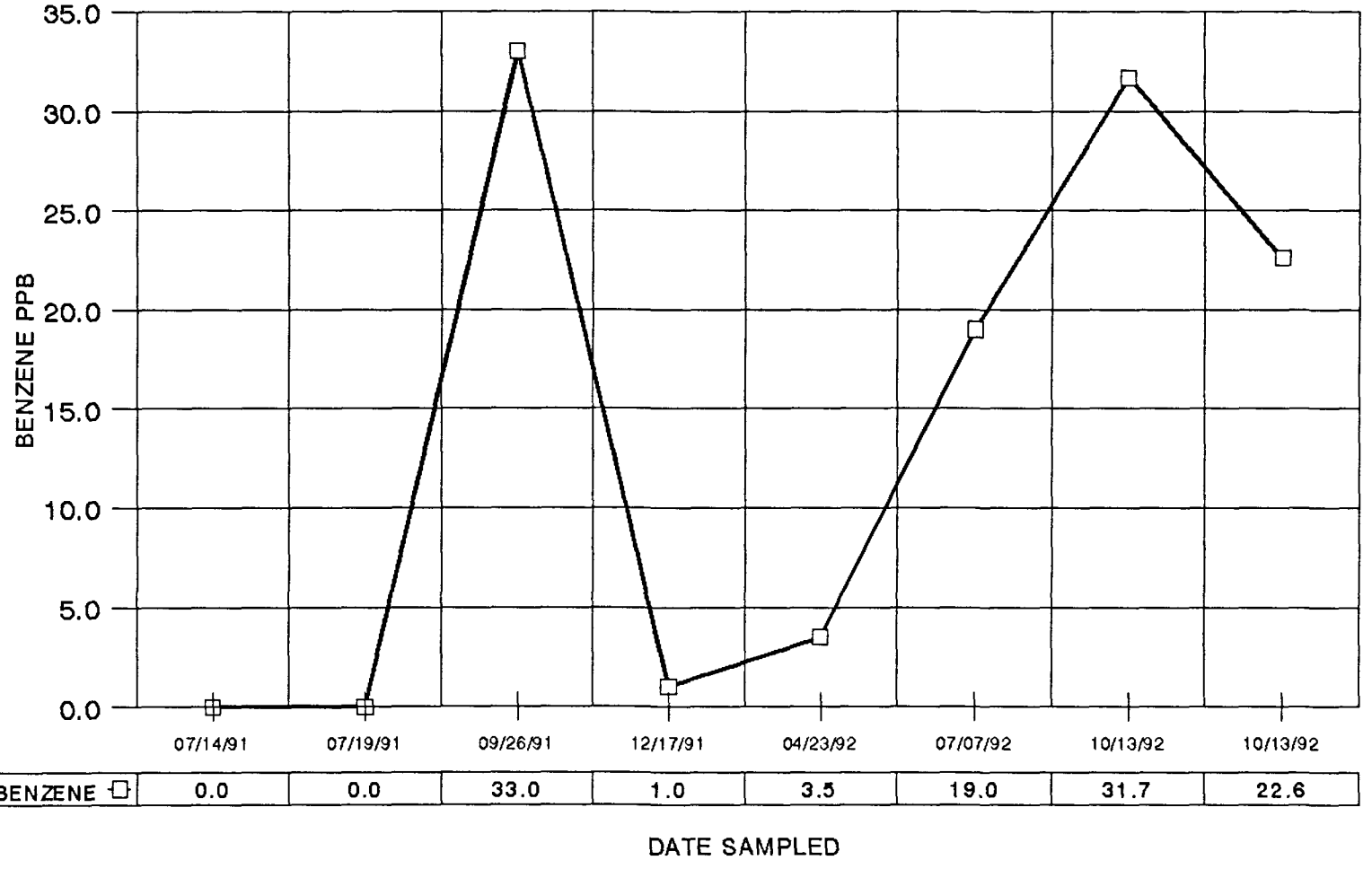
BY R.M. GRAY

PREPARED 1/5/93

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#60 BH-86



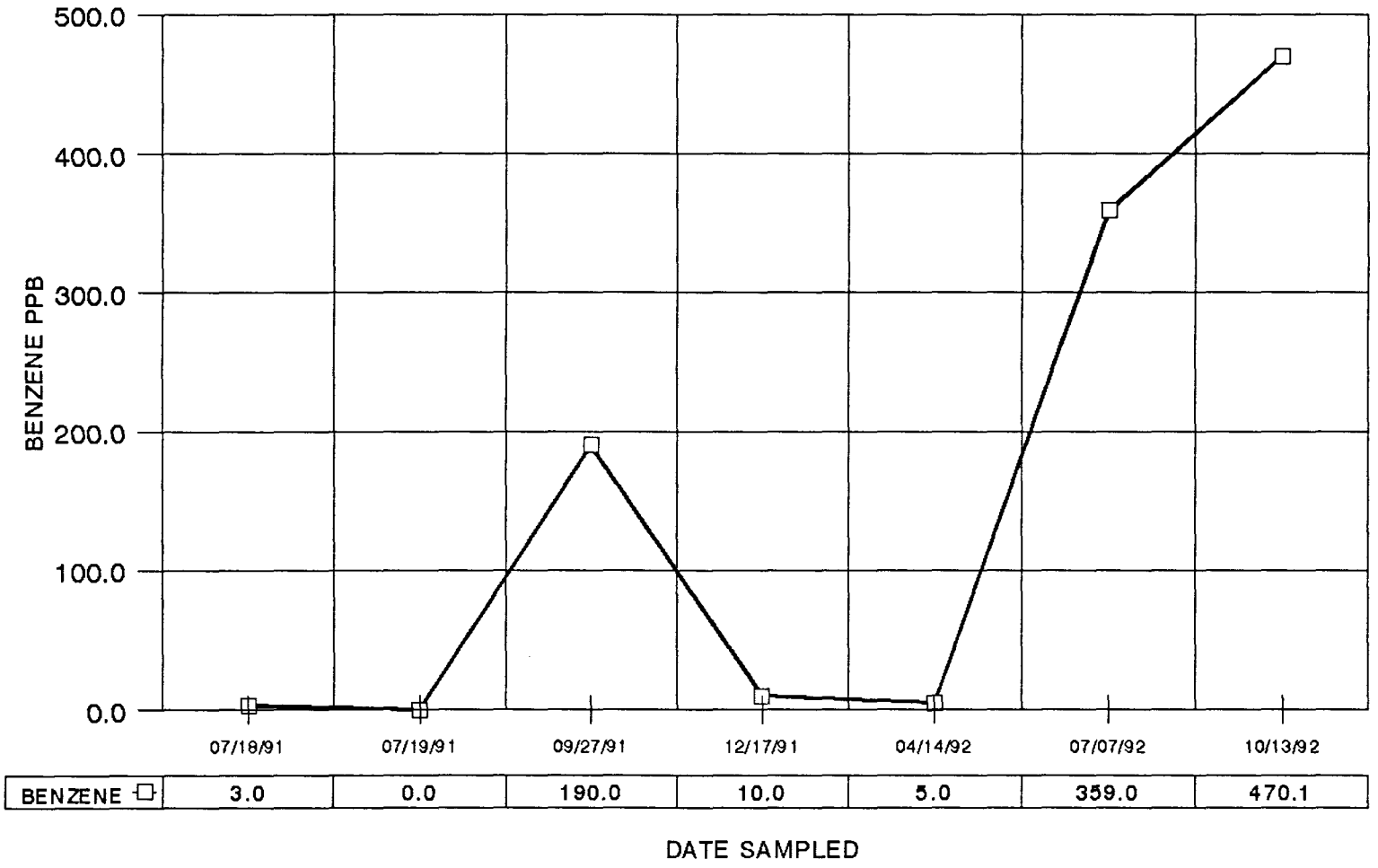
BY R.M. GRAY

PREPARED 1/5/93

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#61A BH-87A



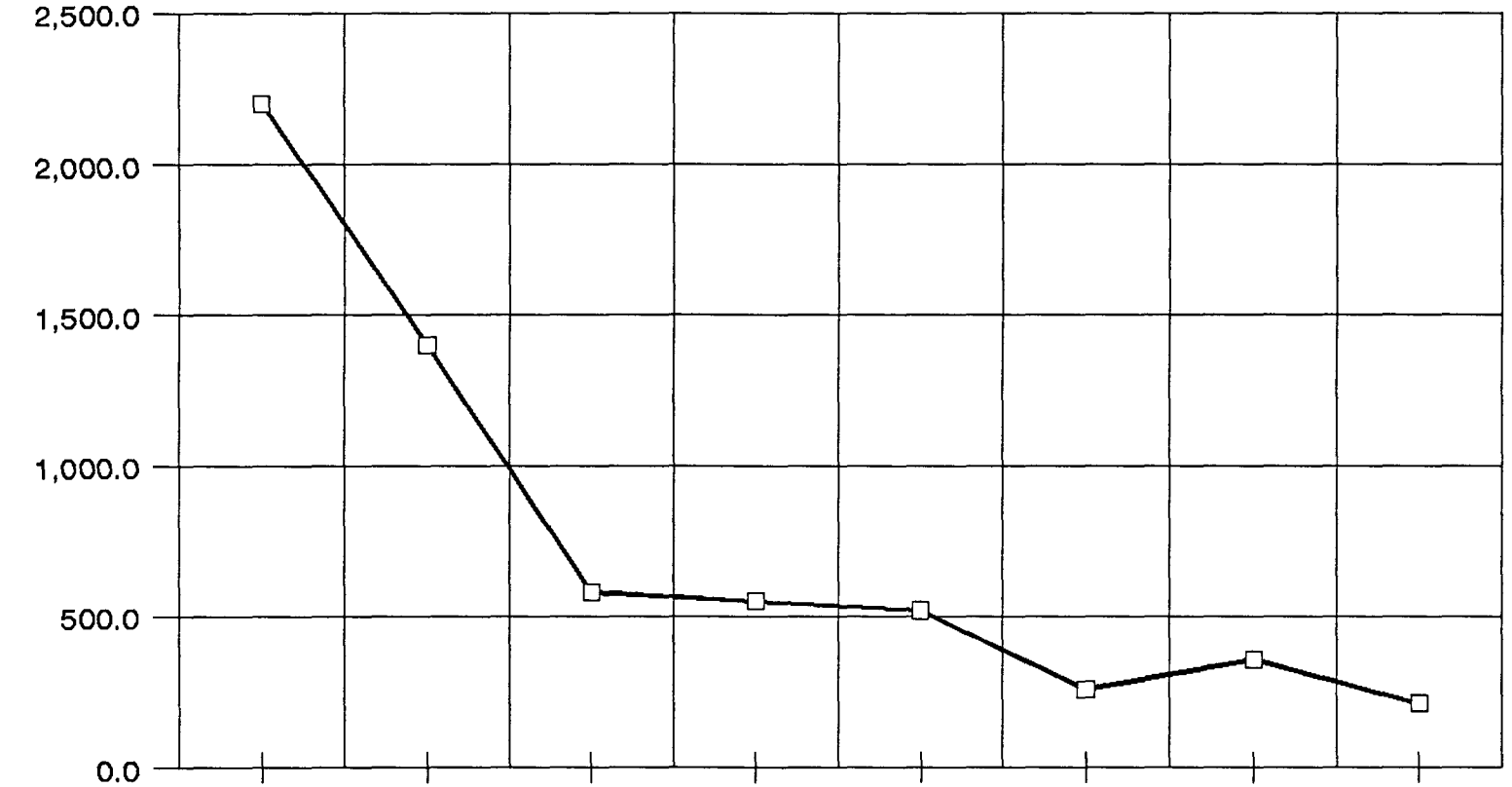
BY R.M. GRAY

PREPARED 1/5/93

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#62 BH-88



	09/26/91	12/17/91	01/23/92	01/23/92	01/23/92	04/14/92	07/07/92	10/13/92
BENZENE	2,200.0	1,400.0	580.0	550.0	520.0	257.5	357.0	212.3

DATE SAMPLED

BY R.M. GRAY

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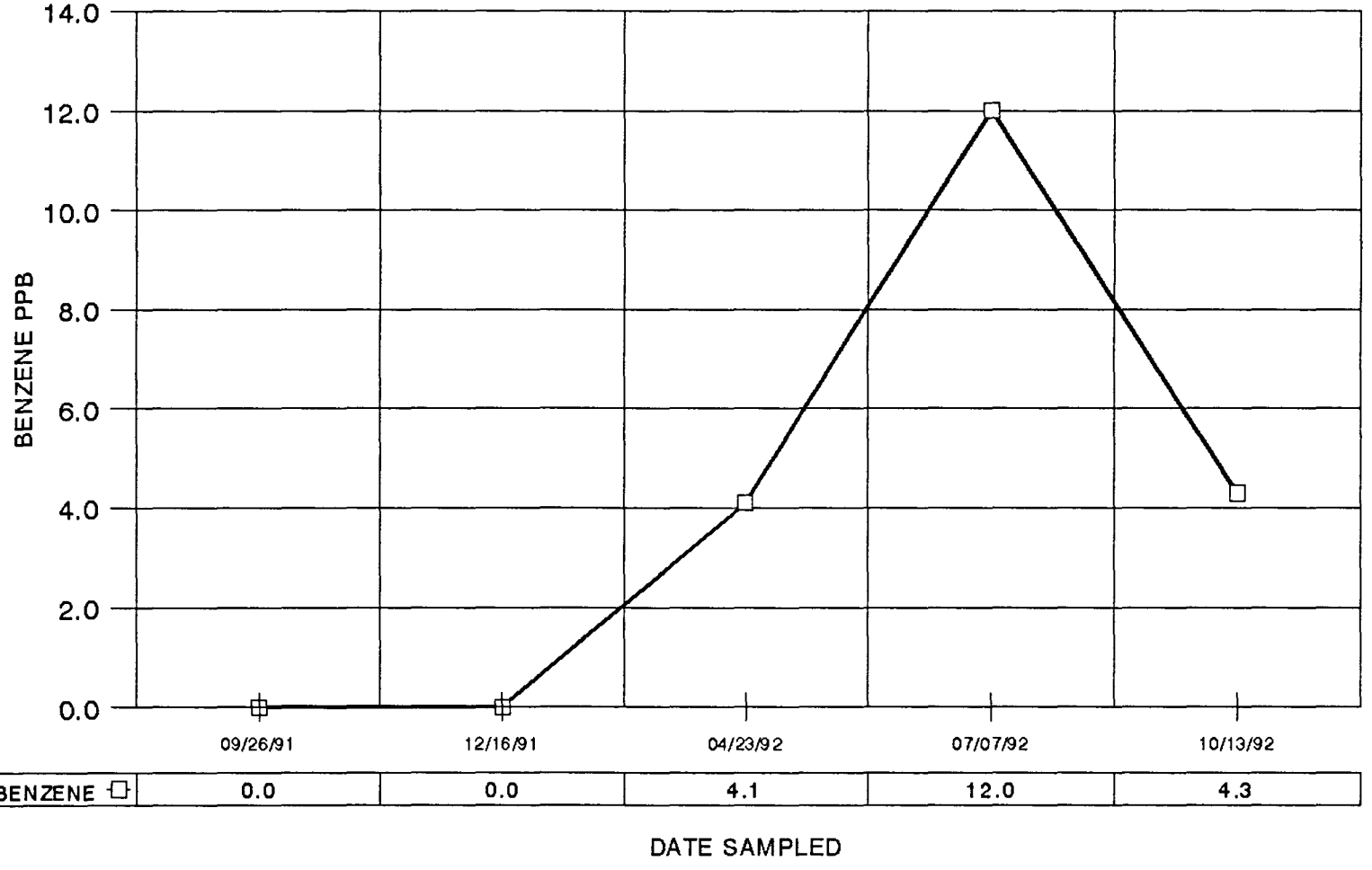
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#63 BH-89



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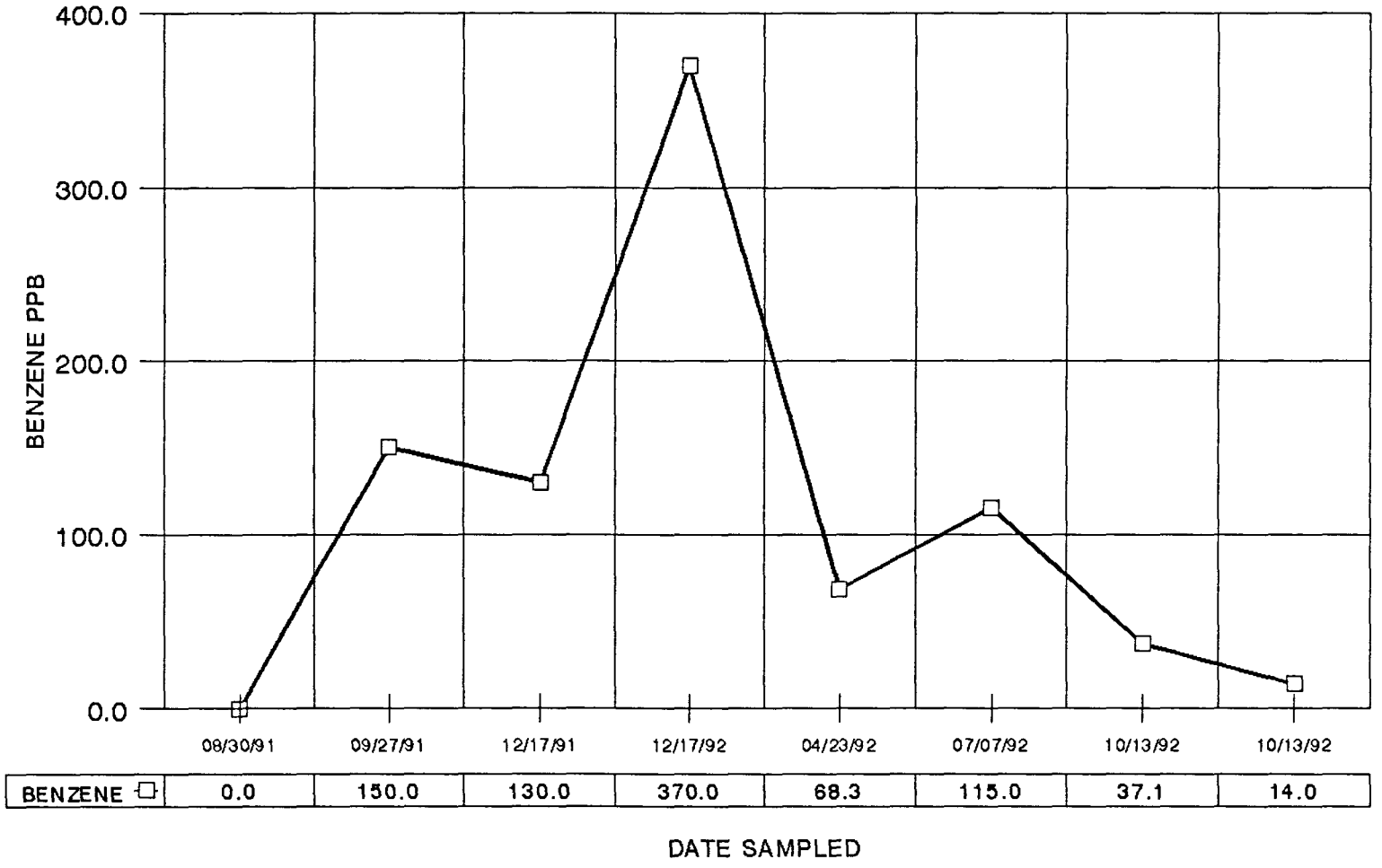
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#64 BH-90



BENZENE	0.0	150.0	130.0	370.0	68.3	115.0	37.1	14.0

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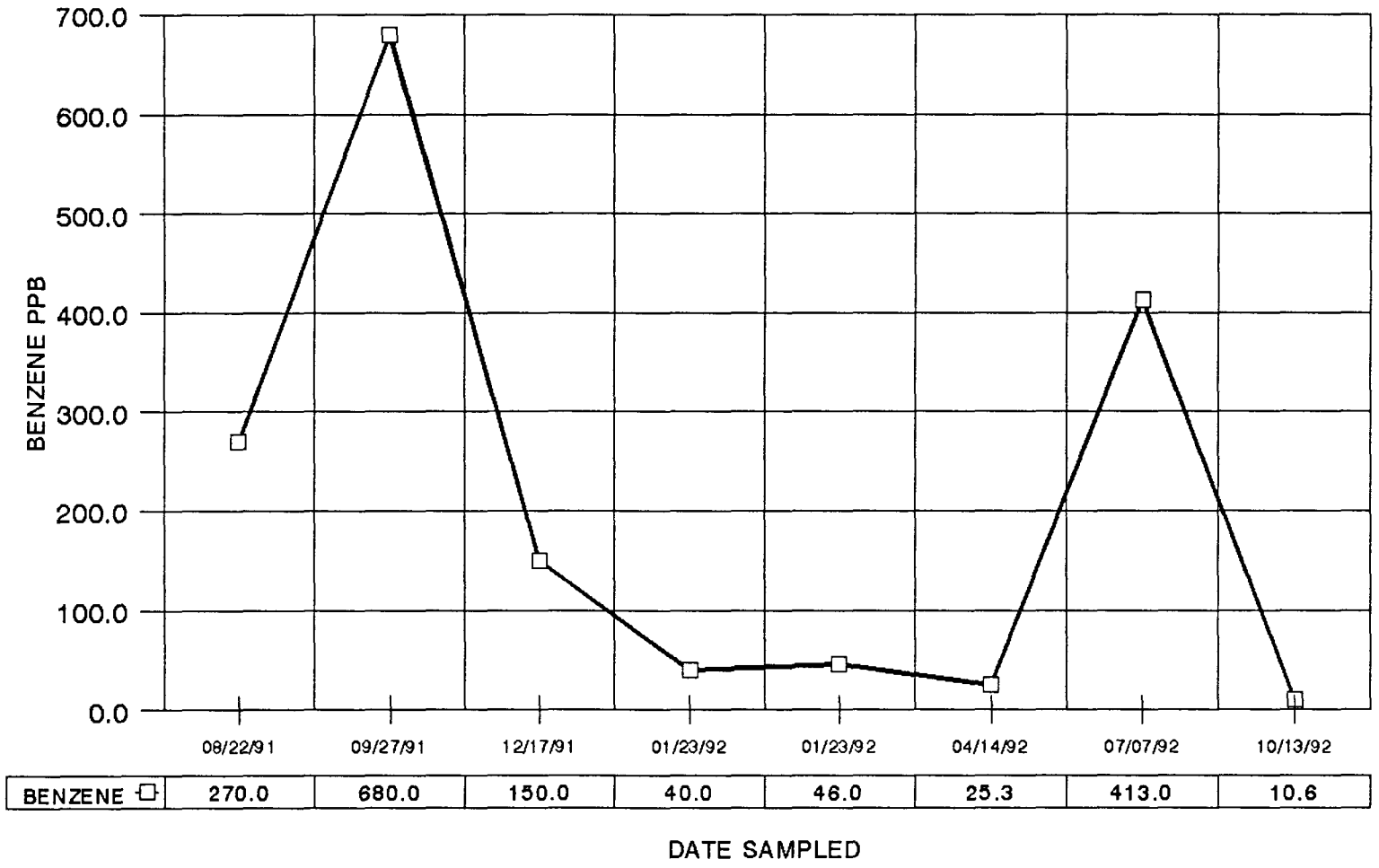
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#65A BH-91A



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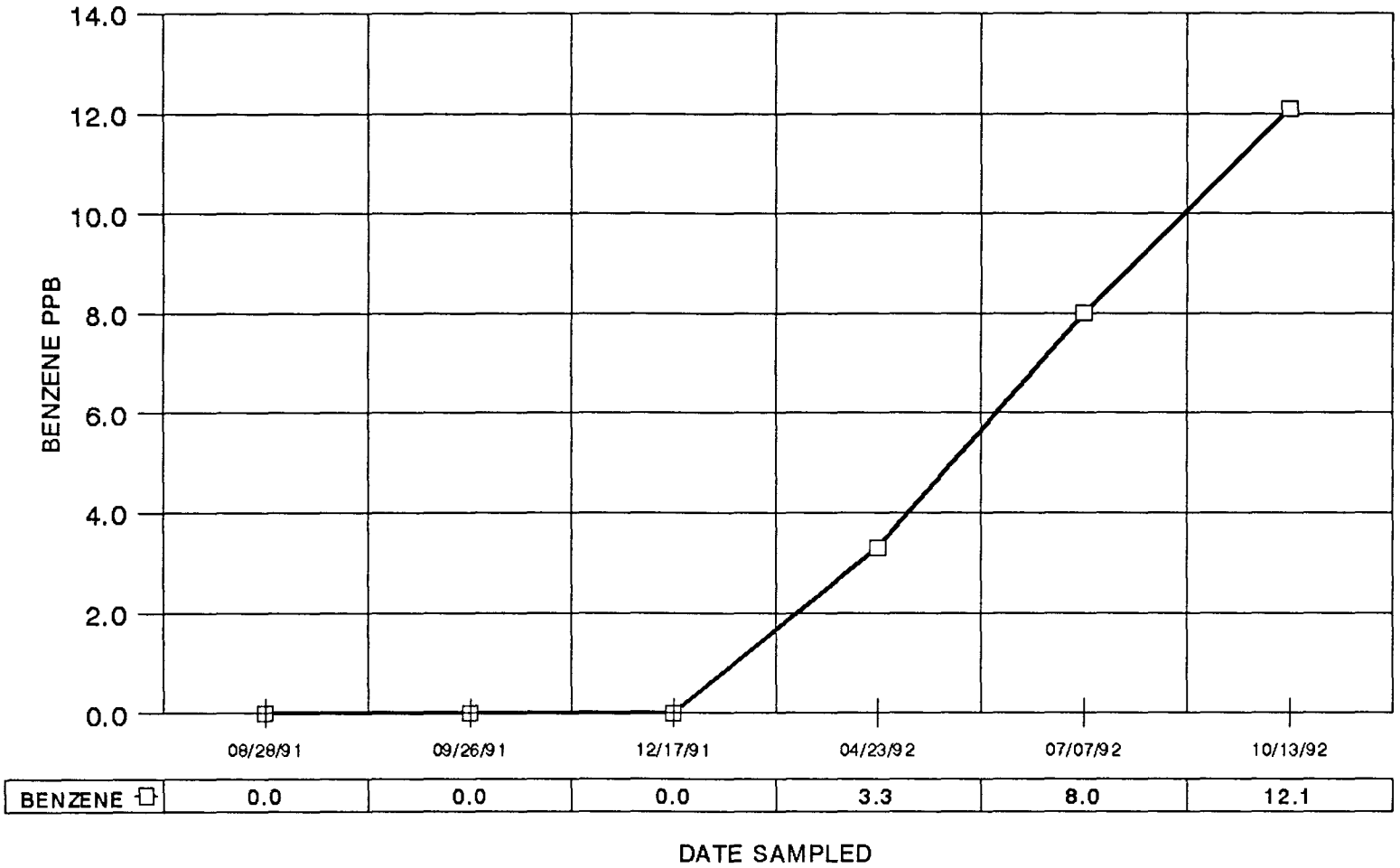
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#66 BH-92



BY R.M. GRAY

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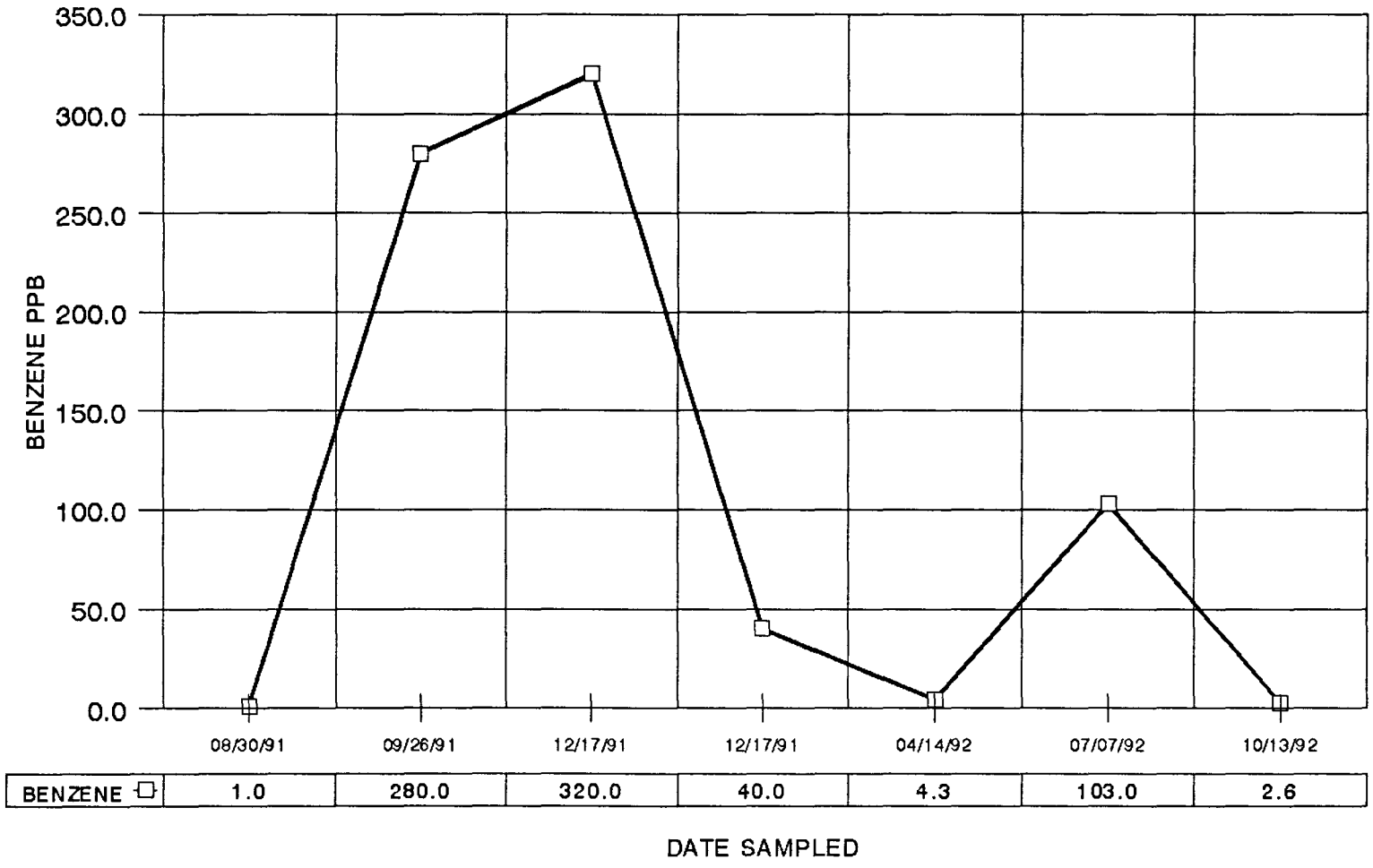
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#67 BH-93



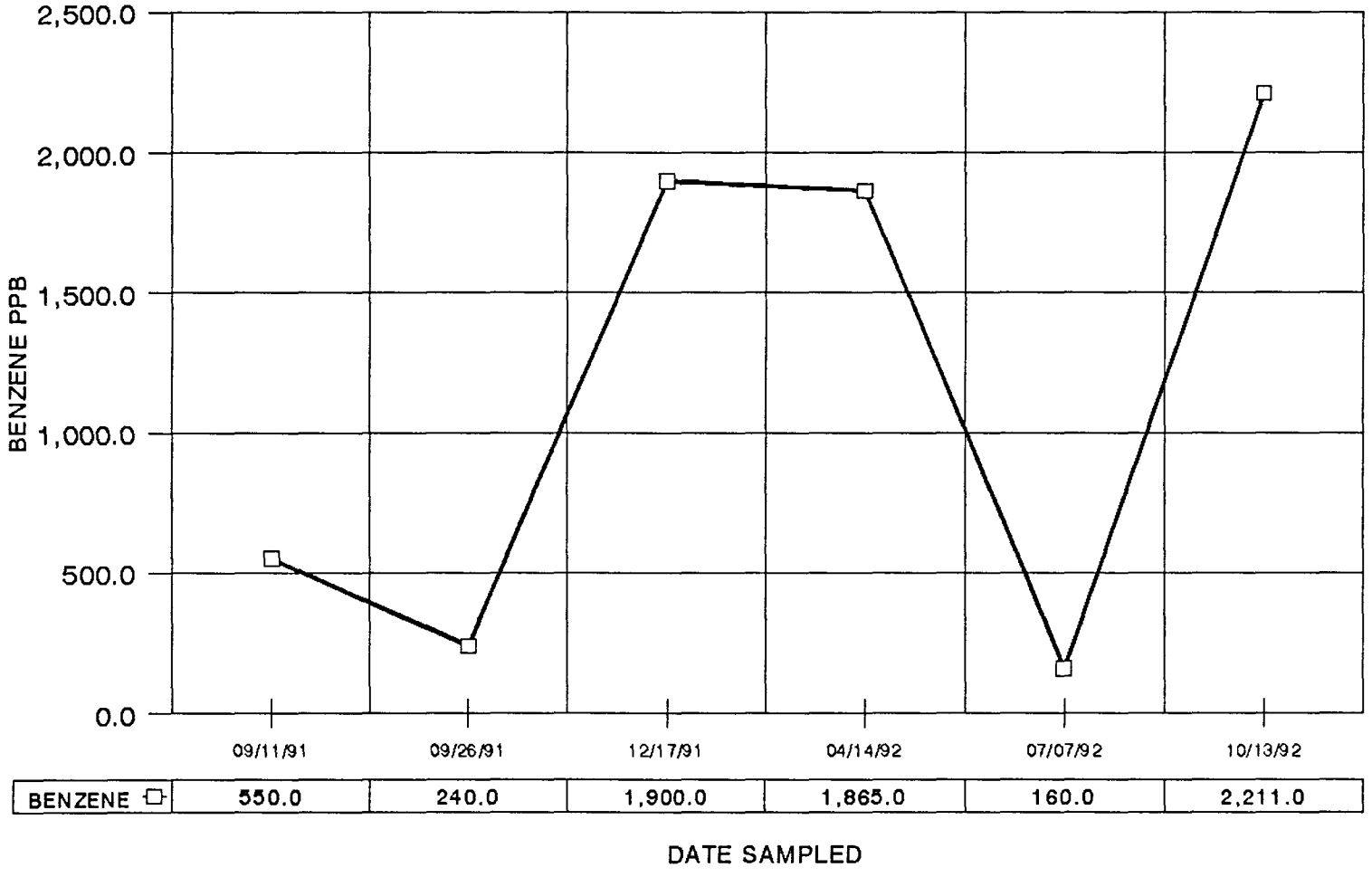
BY R.M. GRAY

PREPARED 1/5/93

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#68 BH-94



BY R.M. GRAY

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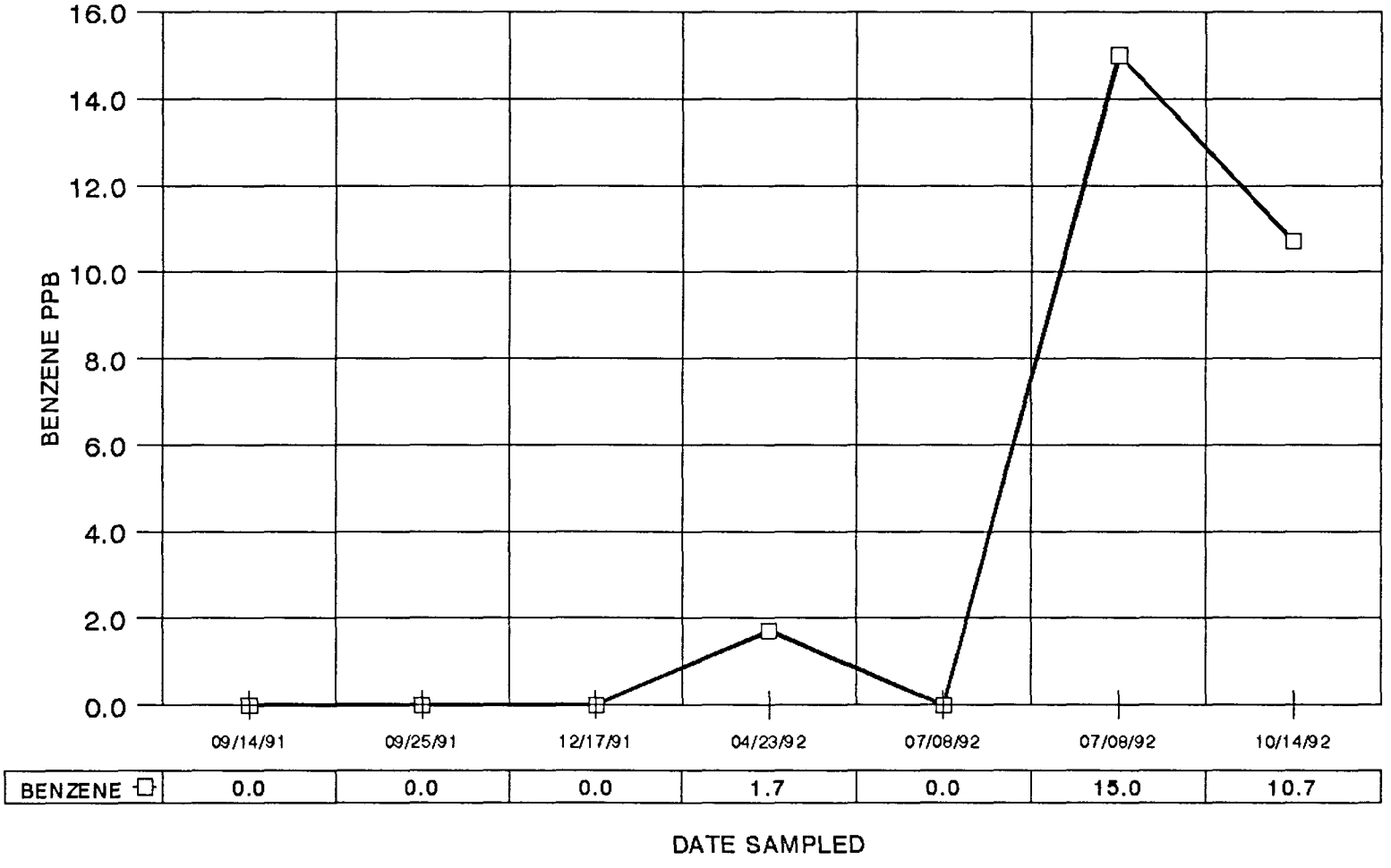
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#70 BH-97



BY R.M. GRAY

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APPENDIX D TABLE 2

SHALLOW WELL BENZENE ANALYSES
POINT-IN-TIME SAMPLINGS

(Data in PPB)

Well Number	September 1991^	December 1991^	April 1992#	July 1992#	October 1992#
BH-14	250	200	NS	NS	NS
BH-33	2300	2300	1780.*@	1842.*@	1668.@
BH-33	--	--	--	--	2100.@^
BH-34	3000	3800	3087.*@	2199.*@	2942.@
BH-35	3800	Dry	NS	NS	NS
BH-36	3100	3000	3492.*@	2708.*	NS
BH-38	5100	Dry	NS	NS	NS
BH-39	1700	Dry	NS	NS	NS
BH-41	4300	NS	2639.*	3105.*	3923.@
BH-41	-	-	-	2700.^	3300.@^
BH-42	4700	Dry	3195.*@	2742.*	3032.
BH-42	-	-	-	3000.^	--
BH-44	1000	1100	NS	NS	NS
BH-45	4	NS	Dry	NS	Dry
BH-47	3400	-	-	4353.*	Dry
BH-49	3100	3000	NS	1939.*@	1992.@
BH-49	-	-	-	2000.^	--
BH-55	<1	NS	Dry	332.*	9.@
BH-61	15	15	36.*	37.*	166.@
BH-61	-	-	101.*@	--	--
BH-64	200	170	NS	NS	NS
BH-65	<1	<1	NS	NS	NS
BH-67	59	NS	13.*	97.*@	41.@
BH-67	-	-	16.*@	--	12.@^
BH-68	<1	<1	NS	NS	NS
BH-70	2600	2000	NS	NS	NS
BH-71	<1	<1	Dry	47.*@	Dry
BH-73	<1	<1	4.*	4.*@	8.@
BH-73	-	-	4.*@	--	--
BH-74	800	<1	NS	NS	NS
BH-75	<1	-	-	5.*@	Dry
BH-80	<1	<1	9.*	8.*	62.

Well Number	September 1991^	December 1991^	April 1992#	July 1992#	October 1992#
BH-81	940	400	296.*	483.*	215.
BH-82	2200	1000	NS	1114.*	1026.
BH-95	2400	2100	--	568.	1598.
Sump A11	1400	2900	3033.*	1258.*	2815.
Sump 16A	240	2000	1233.*	1495.*	632.
Sump 16A	-	-	1137.*@	-	-

Note: See footnotes.

^ Analysis by Core Labs

Analysis by PTC HPLC method except as noted

* Average of more than one analysis

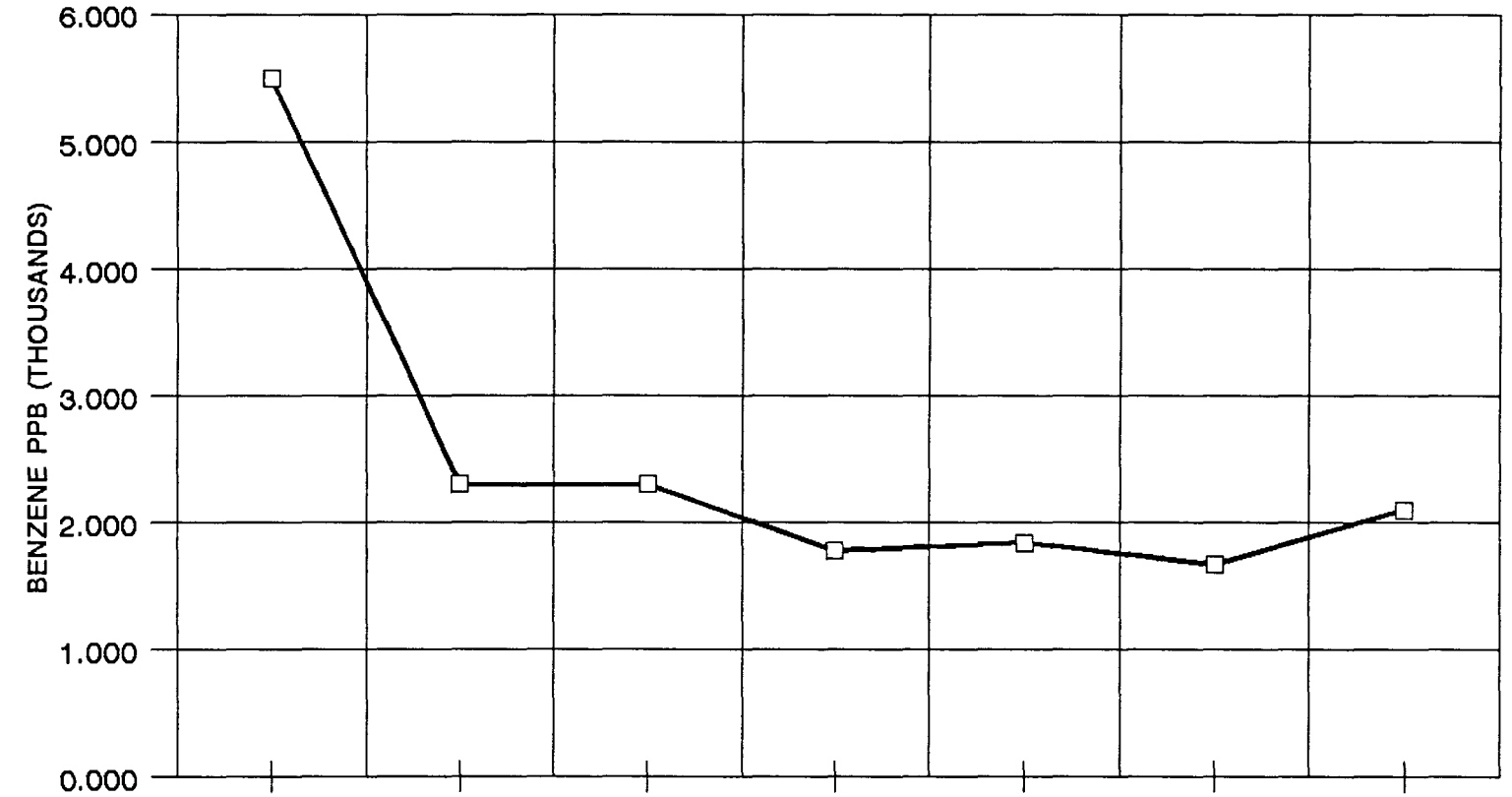
@ Bailed sample; all others collected by pump

NS Not sampled

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#10 BH-33



BY R.M. GRAY

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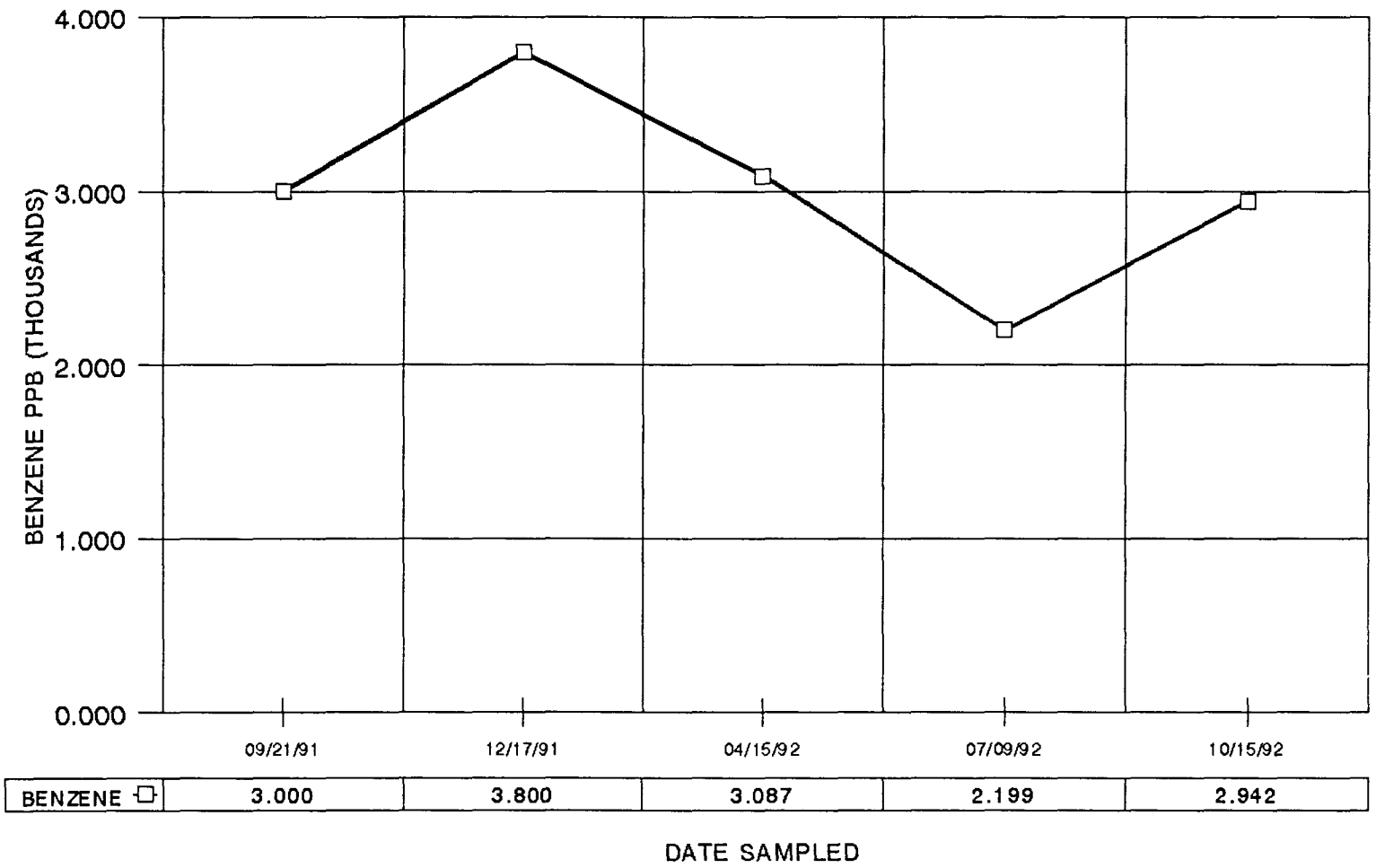
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#11 BH-34



BENZENE	3.000	3.800	3.087	2.199	2.942

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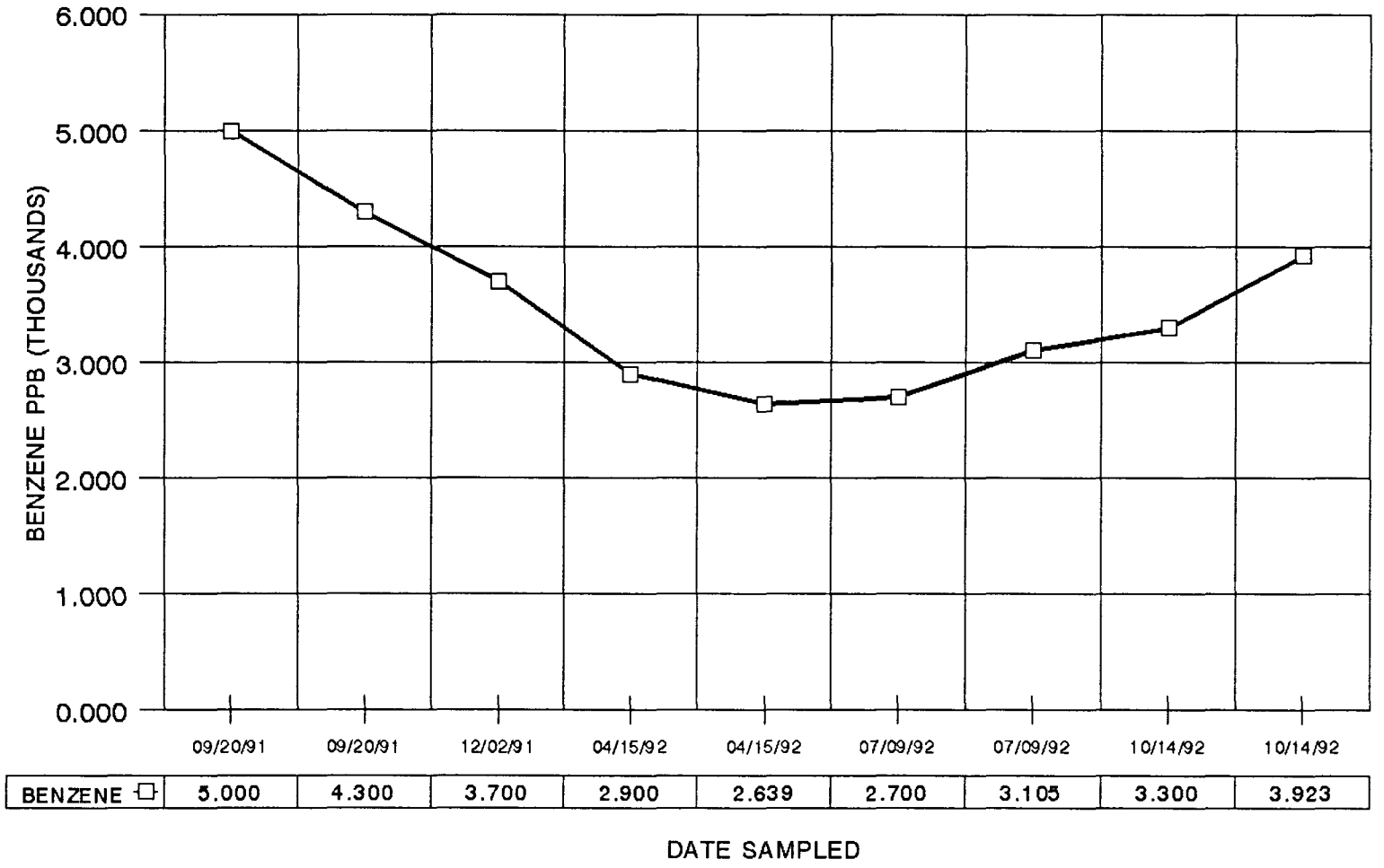
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#18 BH-41



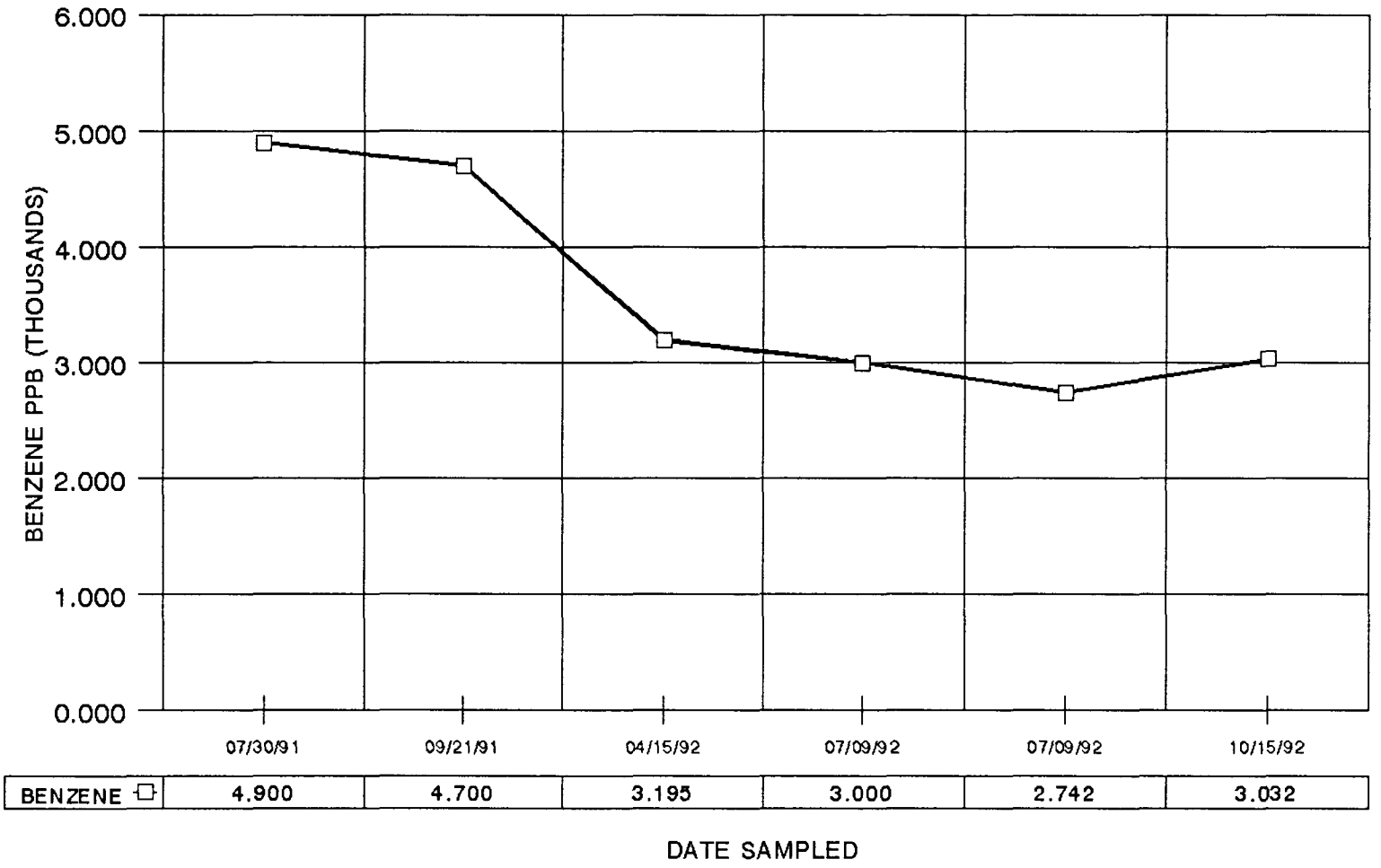
BY R.M. GRAY

PREPARED 1/5/93

INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#19 BH-42



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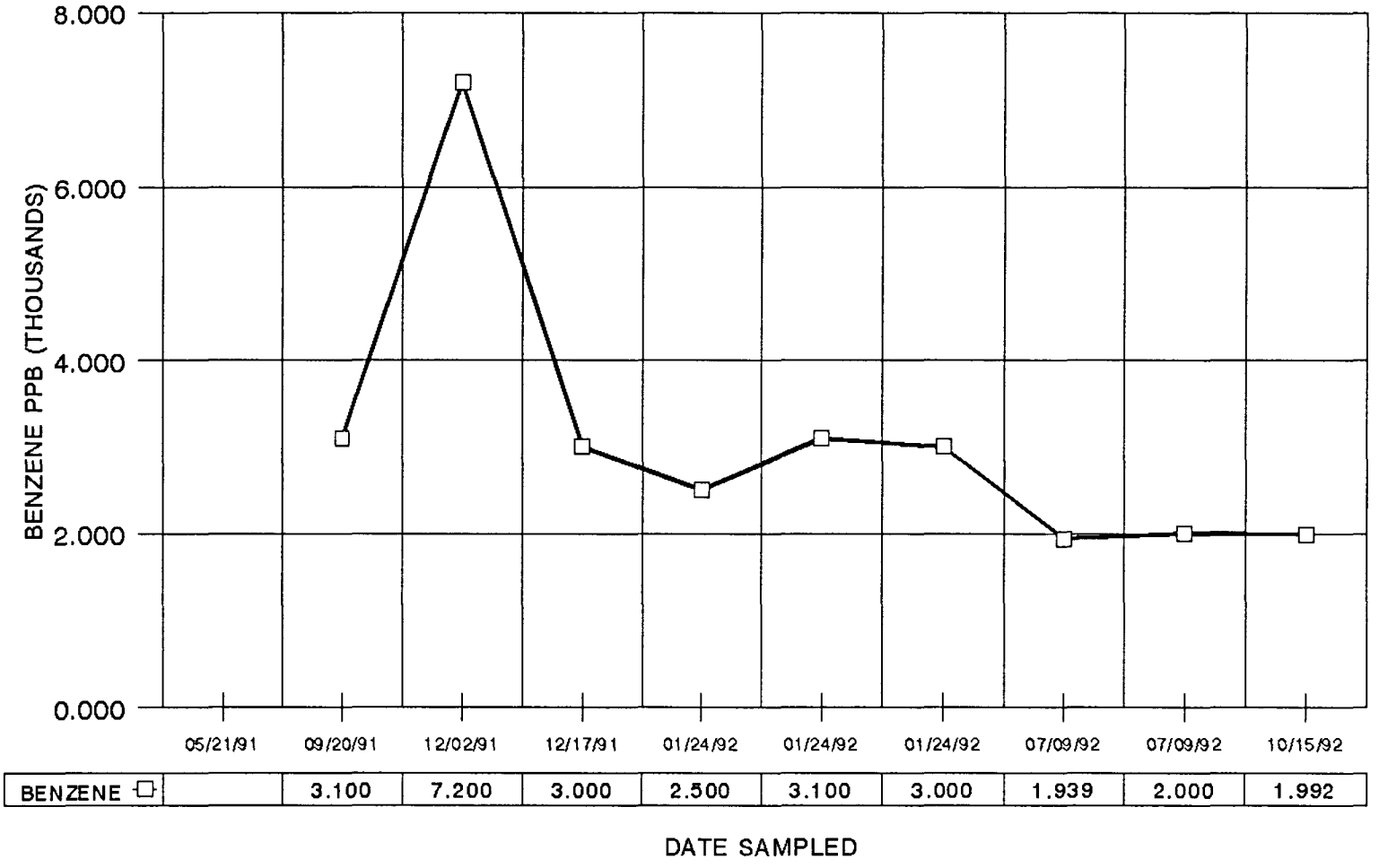
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#26 BH-49



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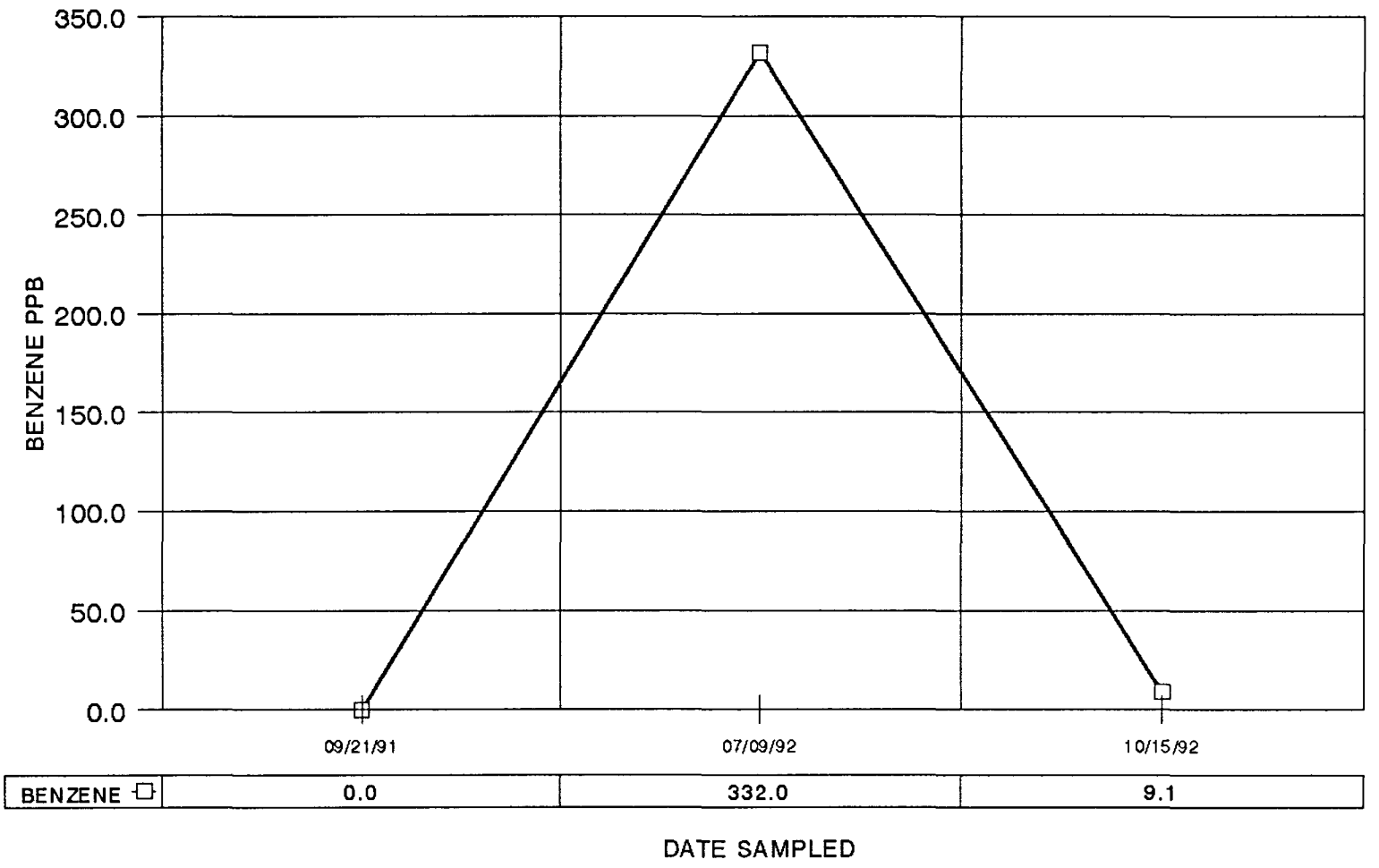
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#31 BH-55



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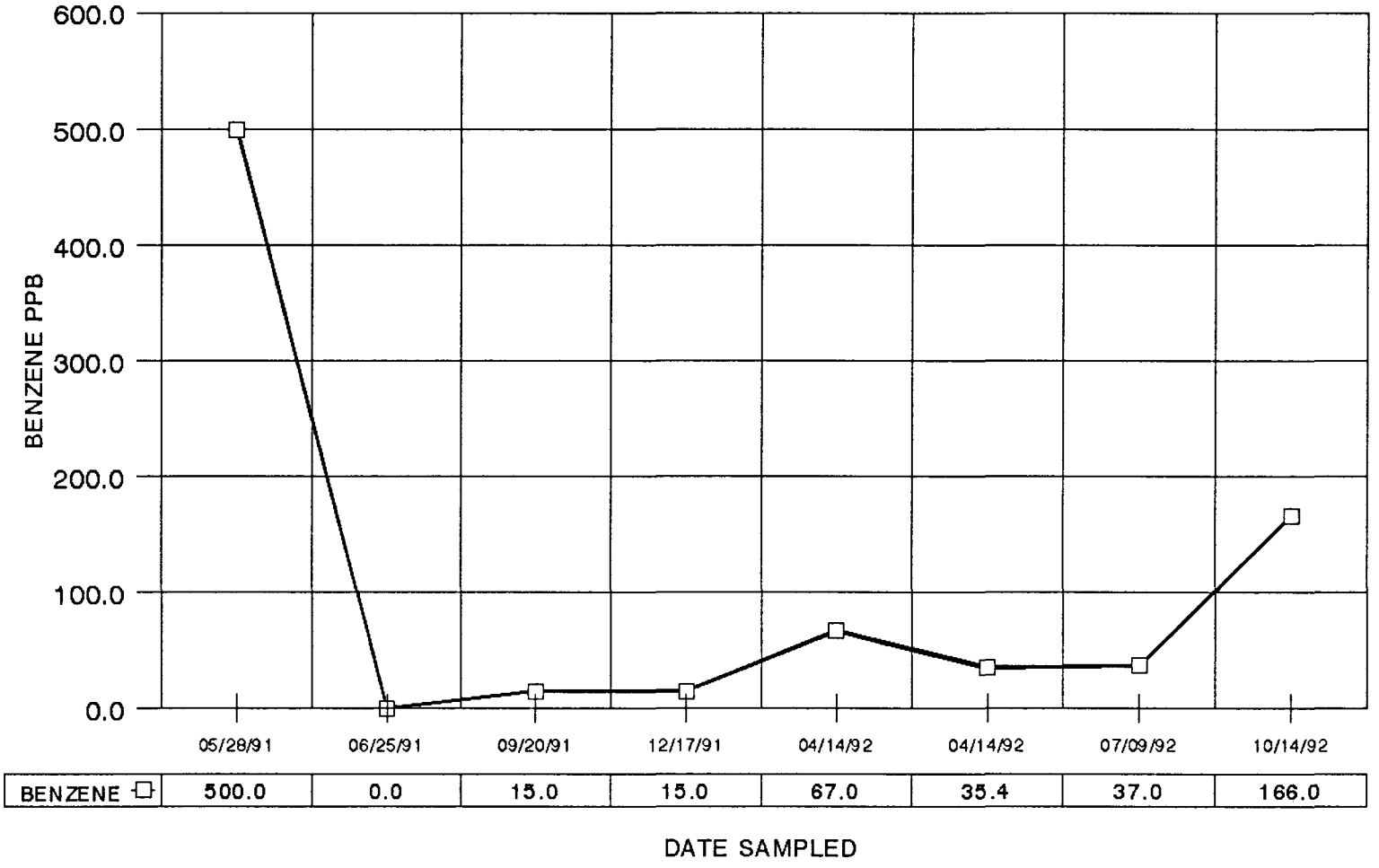
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#38 BH-61



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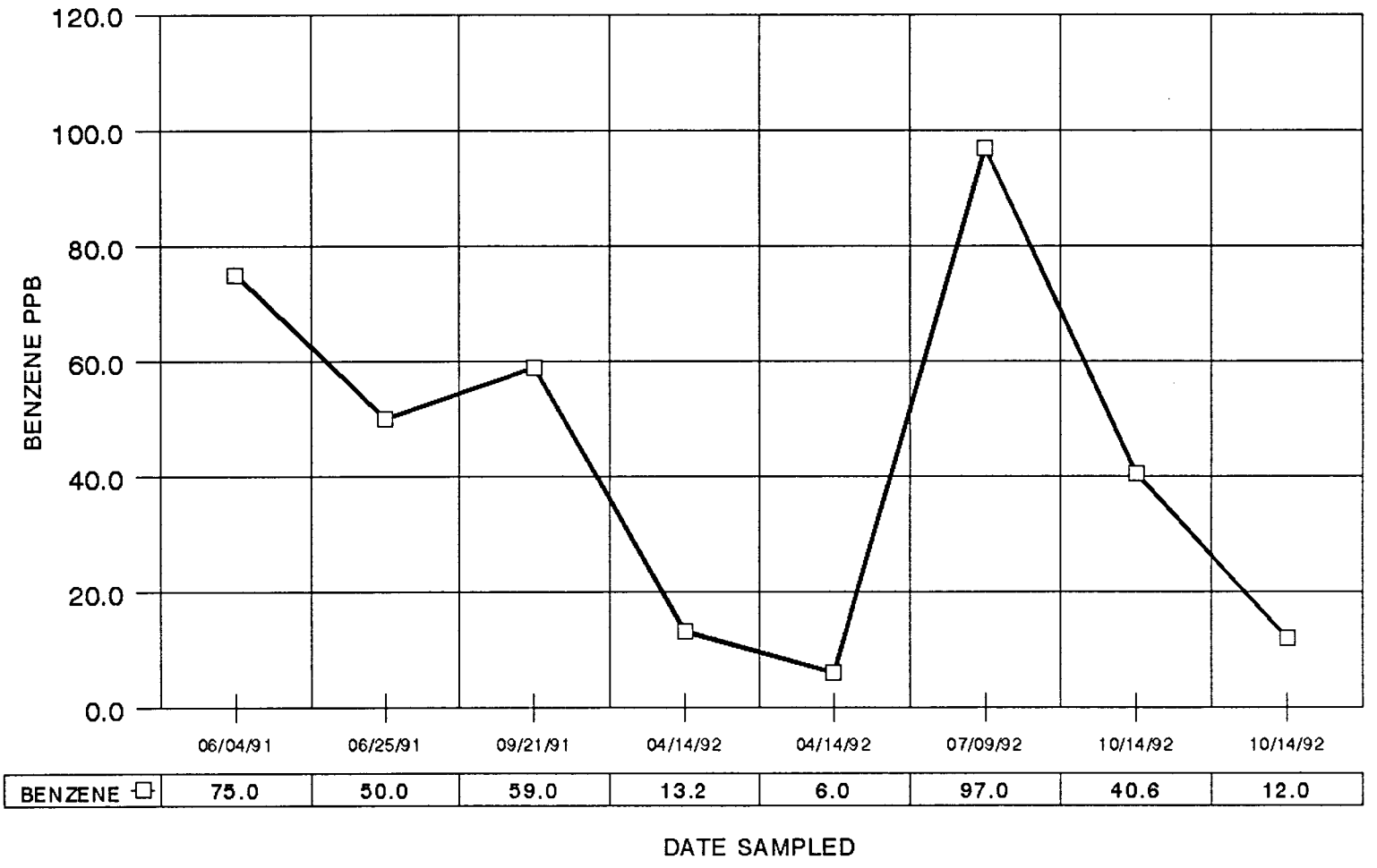
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#44 BH-67



BENZENE	75.0	50.0	59.0	13.2	6.0	97.0	40.6	12.0

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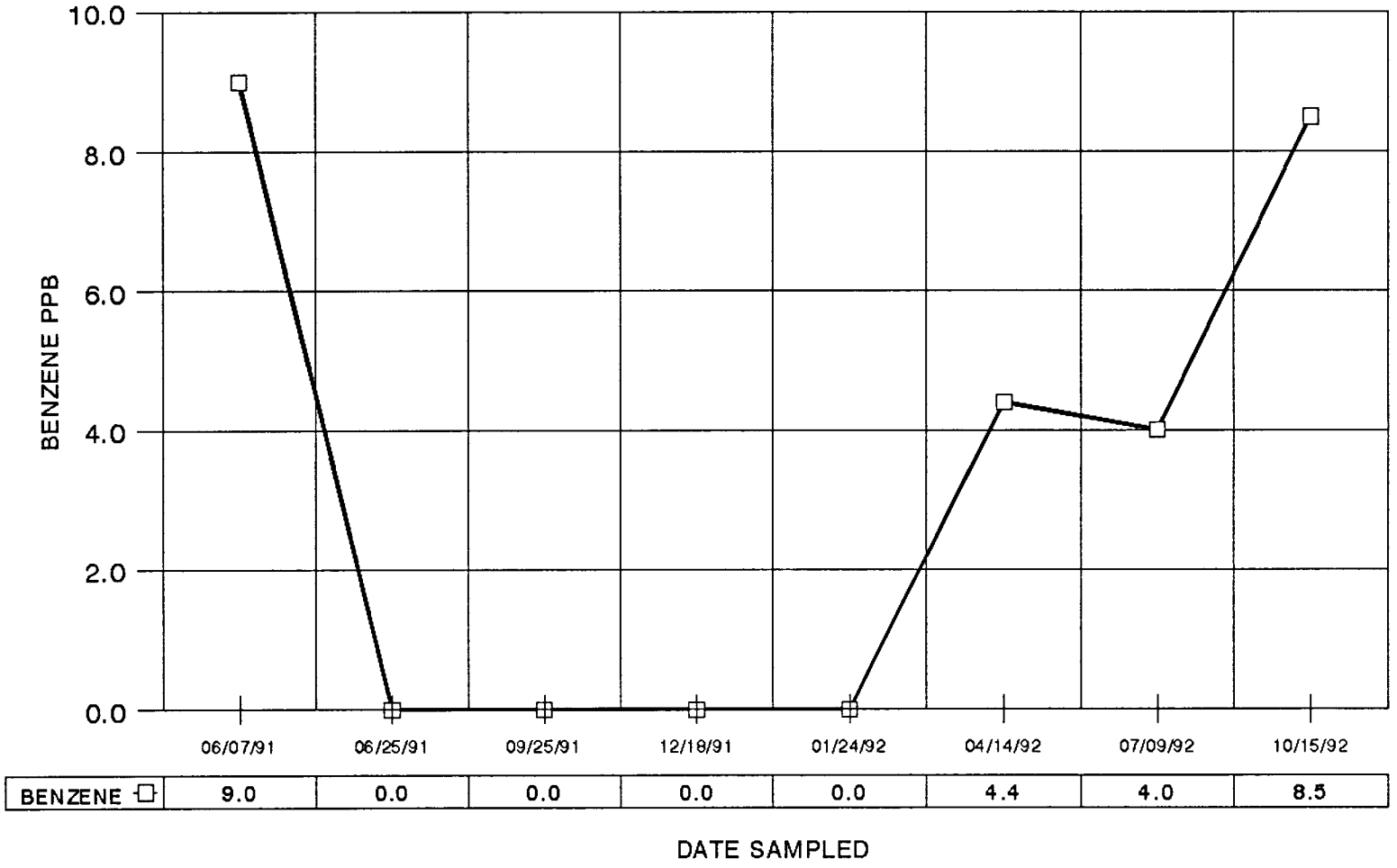
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#50 BH-73



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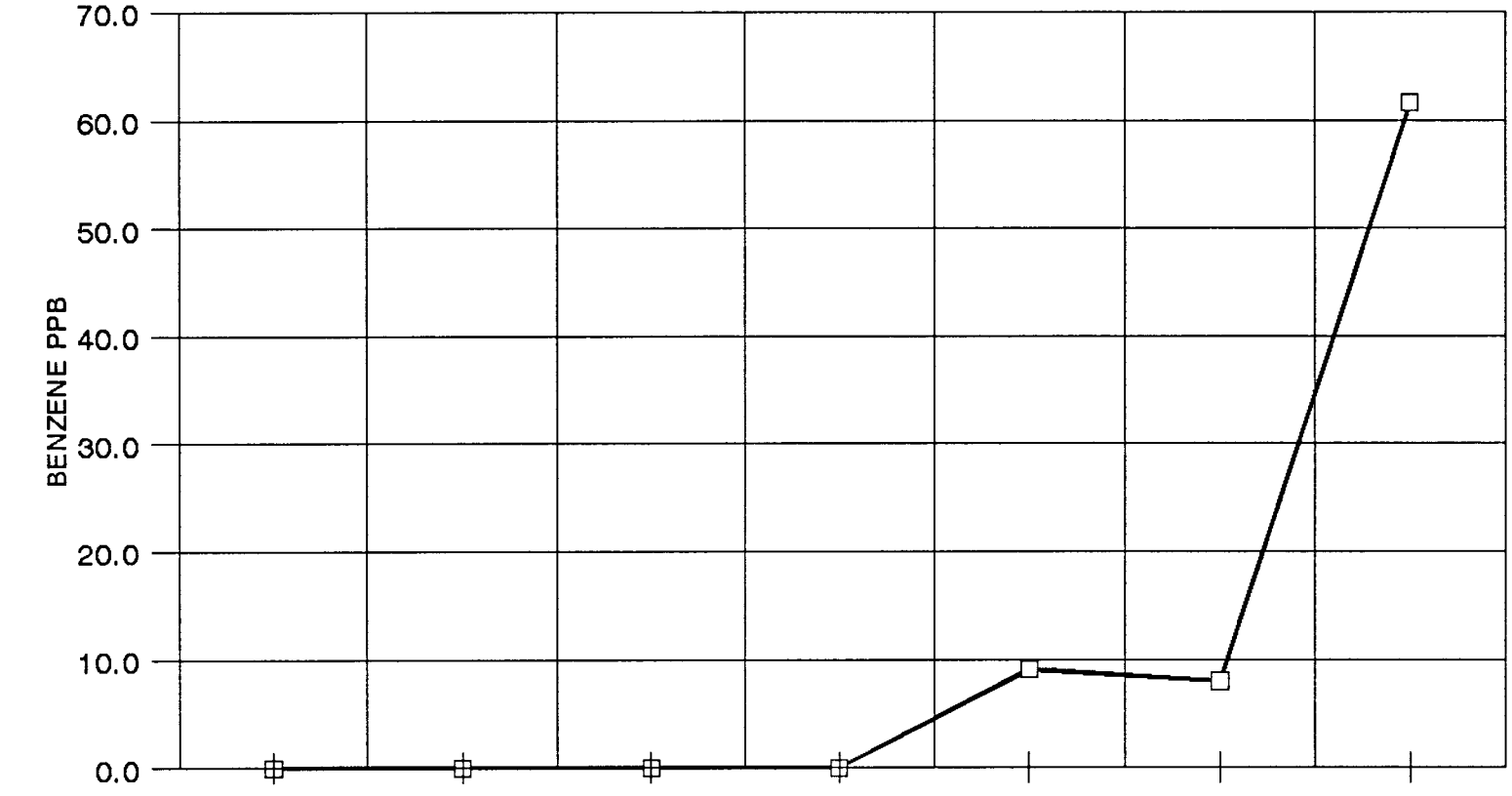
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#54 BH-80



	06/24/91	09/12/91	09/25/91	12/18/91	04/16/92	07/08/92	10/13/92
BENZENE	0.0	0.0	0.0	0.0	9.1	8.0	61.6

DATE SAMPLED

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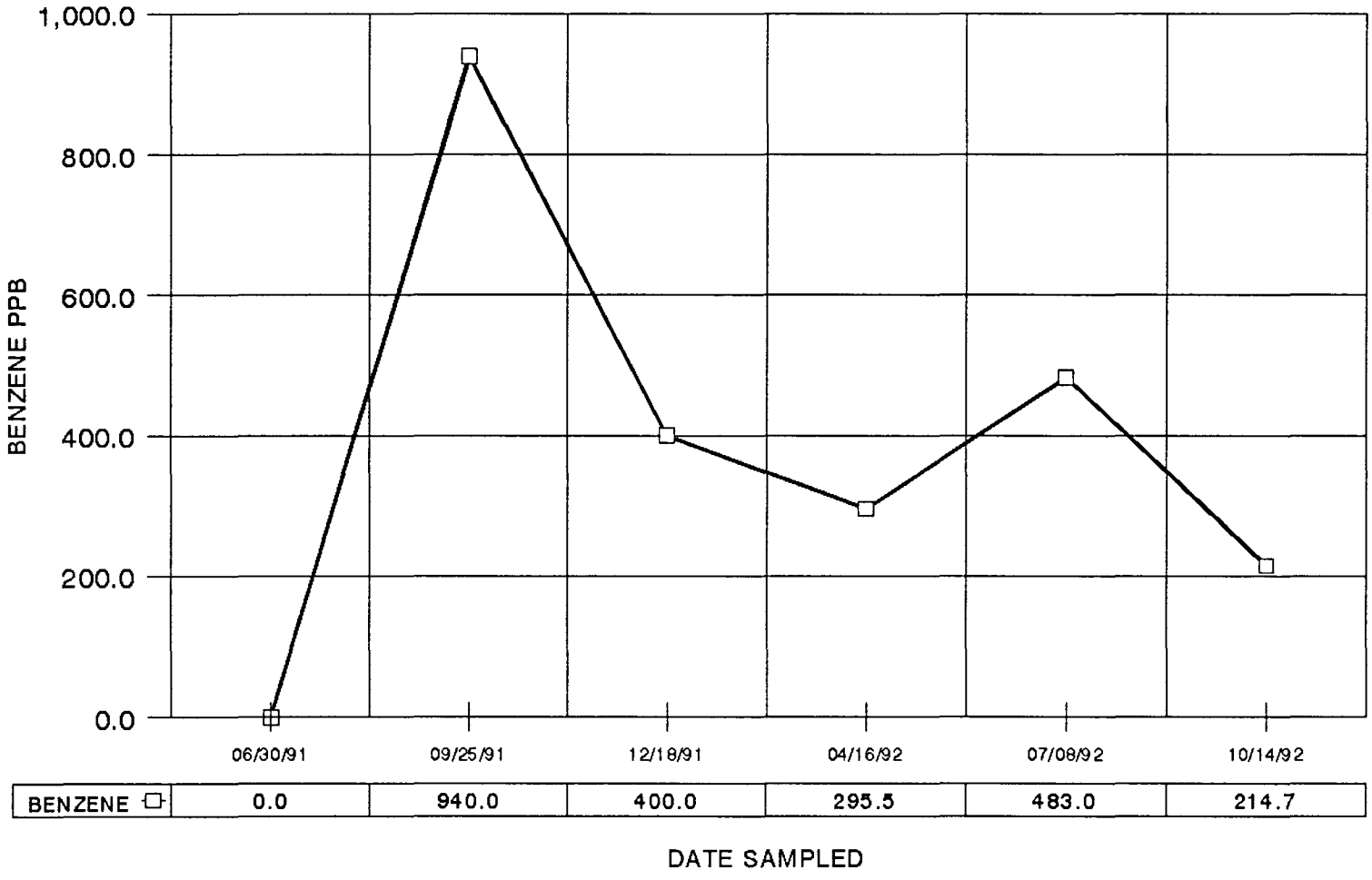
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#55 BH-81



	06/30/91	09/25/91	12/18/91	04/16/92	07/08/92	10/14/92
BENZENE	0.0	940.0	400.0	295.5	483.0	214.7

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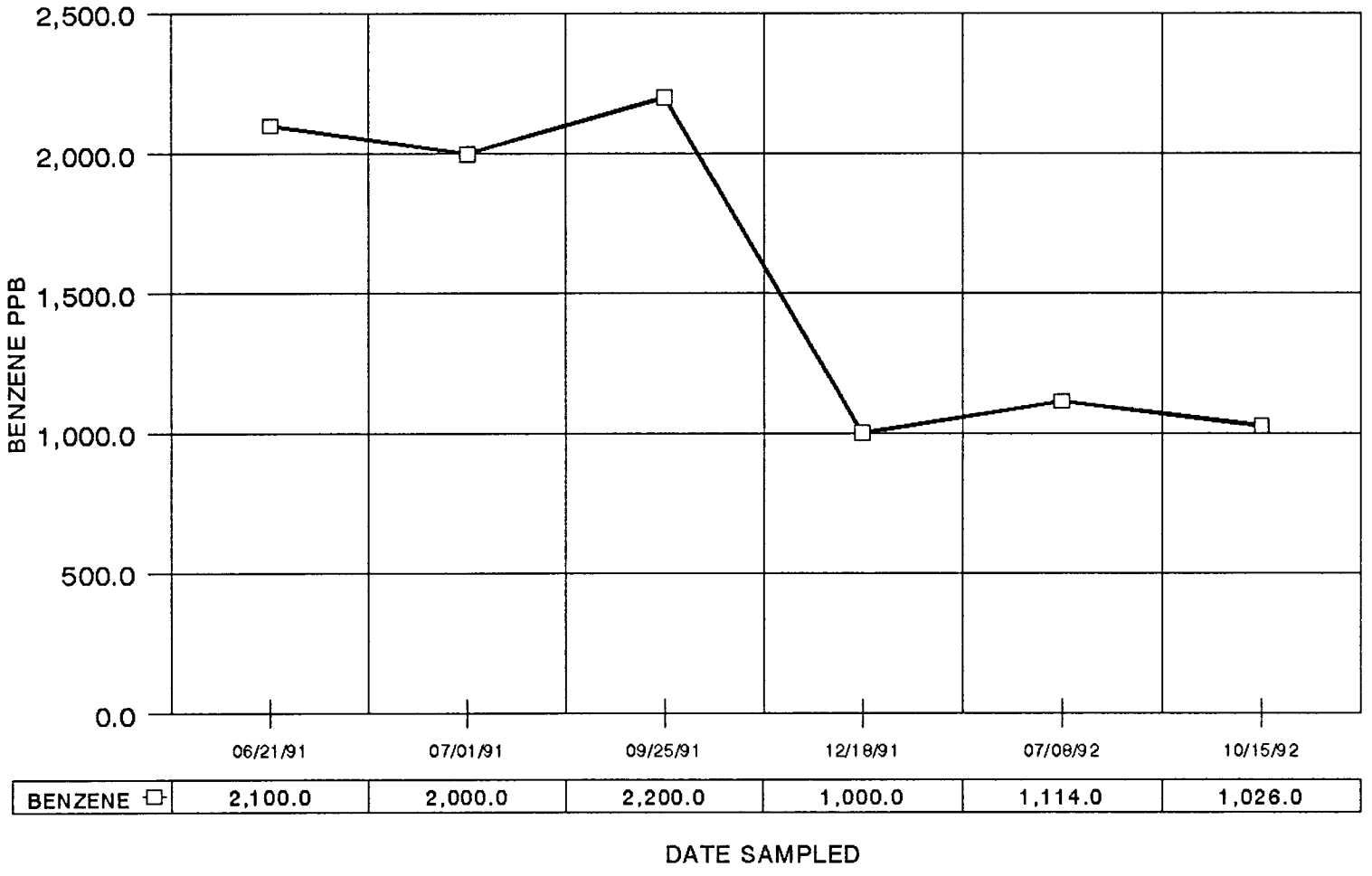
INDIAN BASIN TREATMENT PROJECT

BOREHOLE WATER ANALYSIS DATA

MW#56 BH-82



BENZENE	06/21/91	07/01/91	09/25/91	12/18/91	07/08/92	10/15/92
	2,100.0	2,000.0	2,200.0	1,000.0	1,114.0	1,026.0

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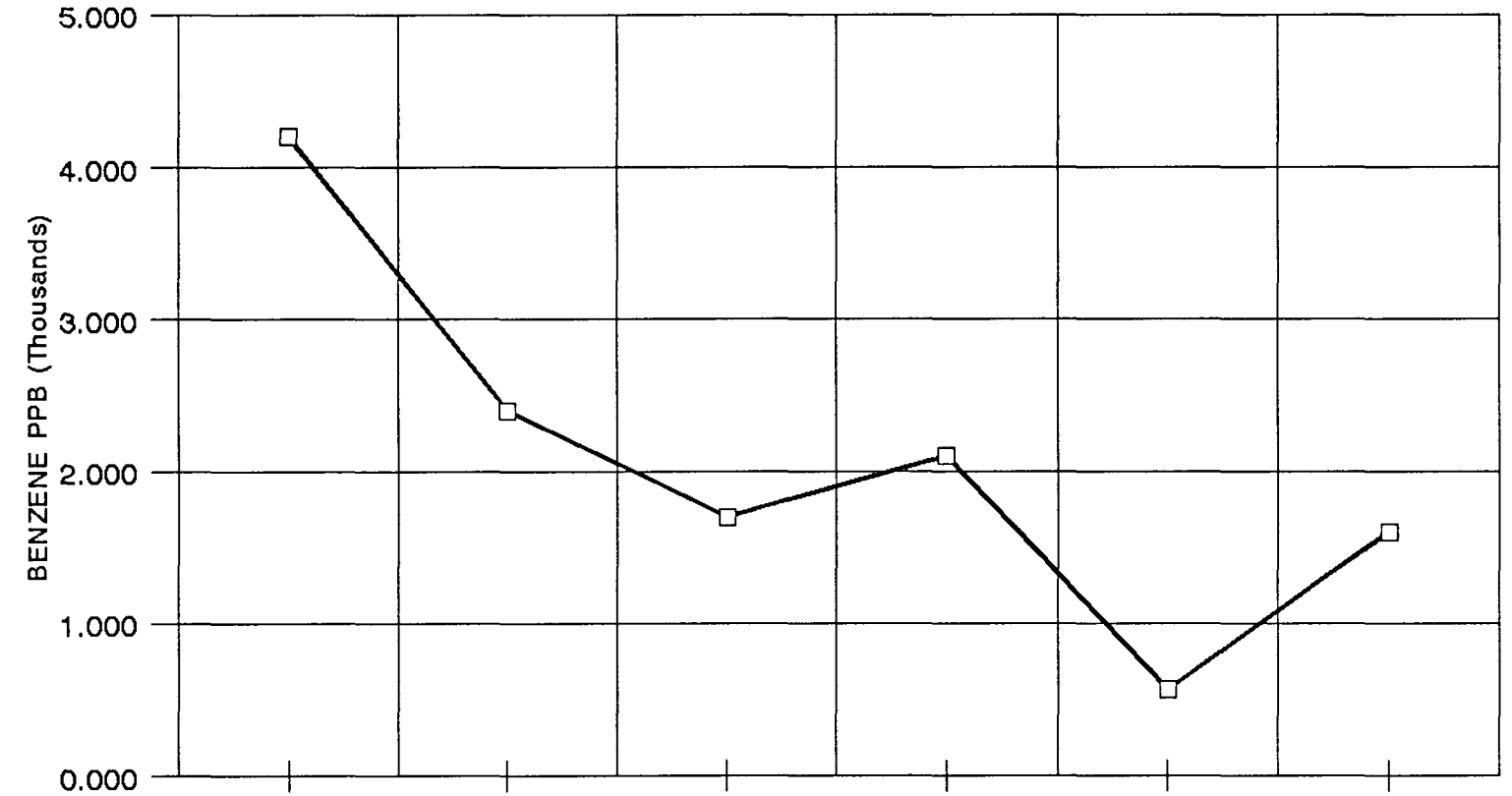
BOREHOLE WATER ANALYSIS DATA

MW#69 BH-95



BENZENE	4.200	2.400	1.700	2.100	0.568	1.598

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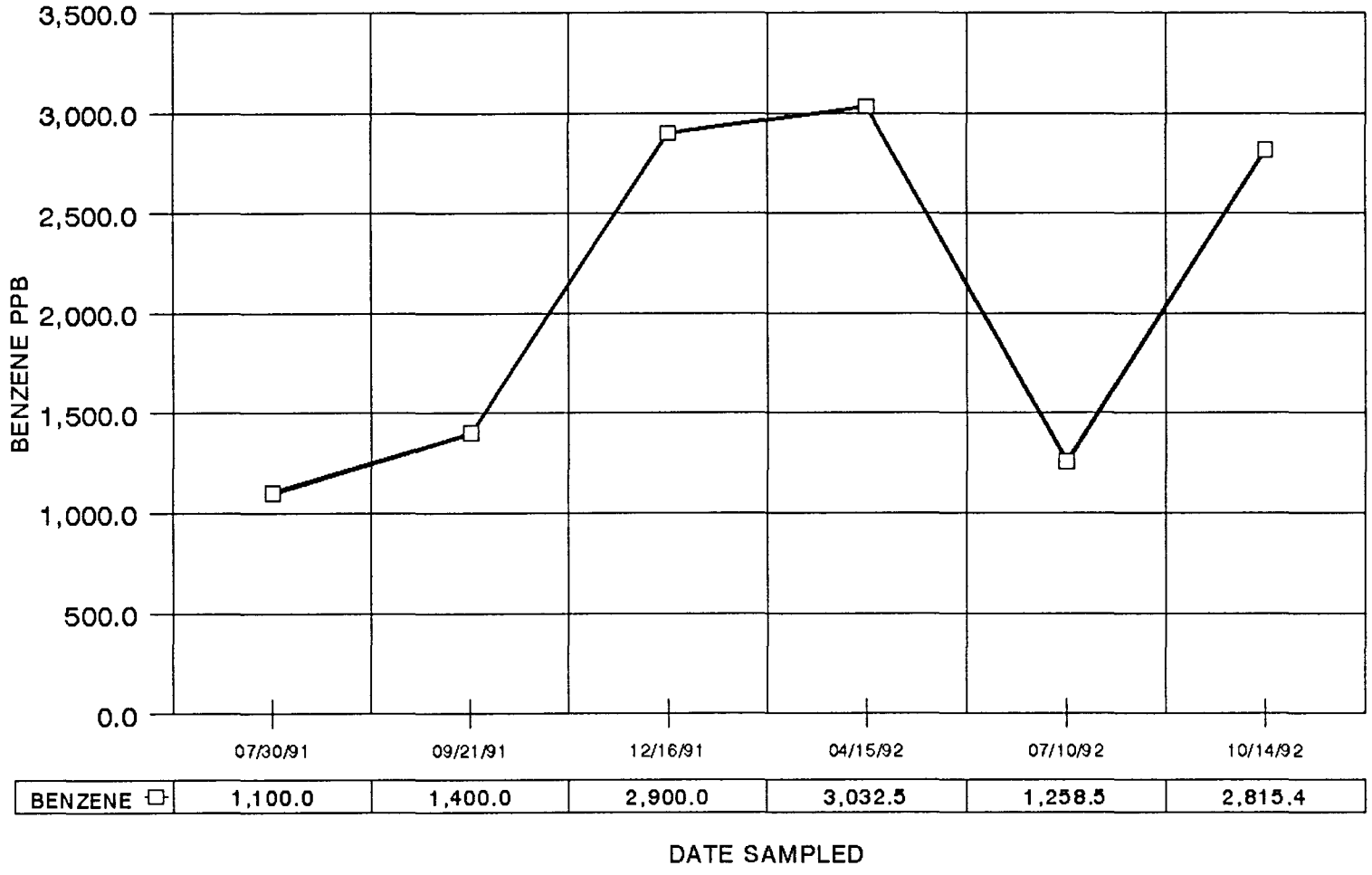
BOREHOLE WATER ANALYSIS DATA

SUMP 11A



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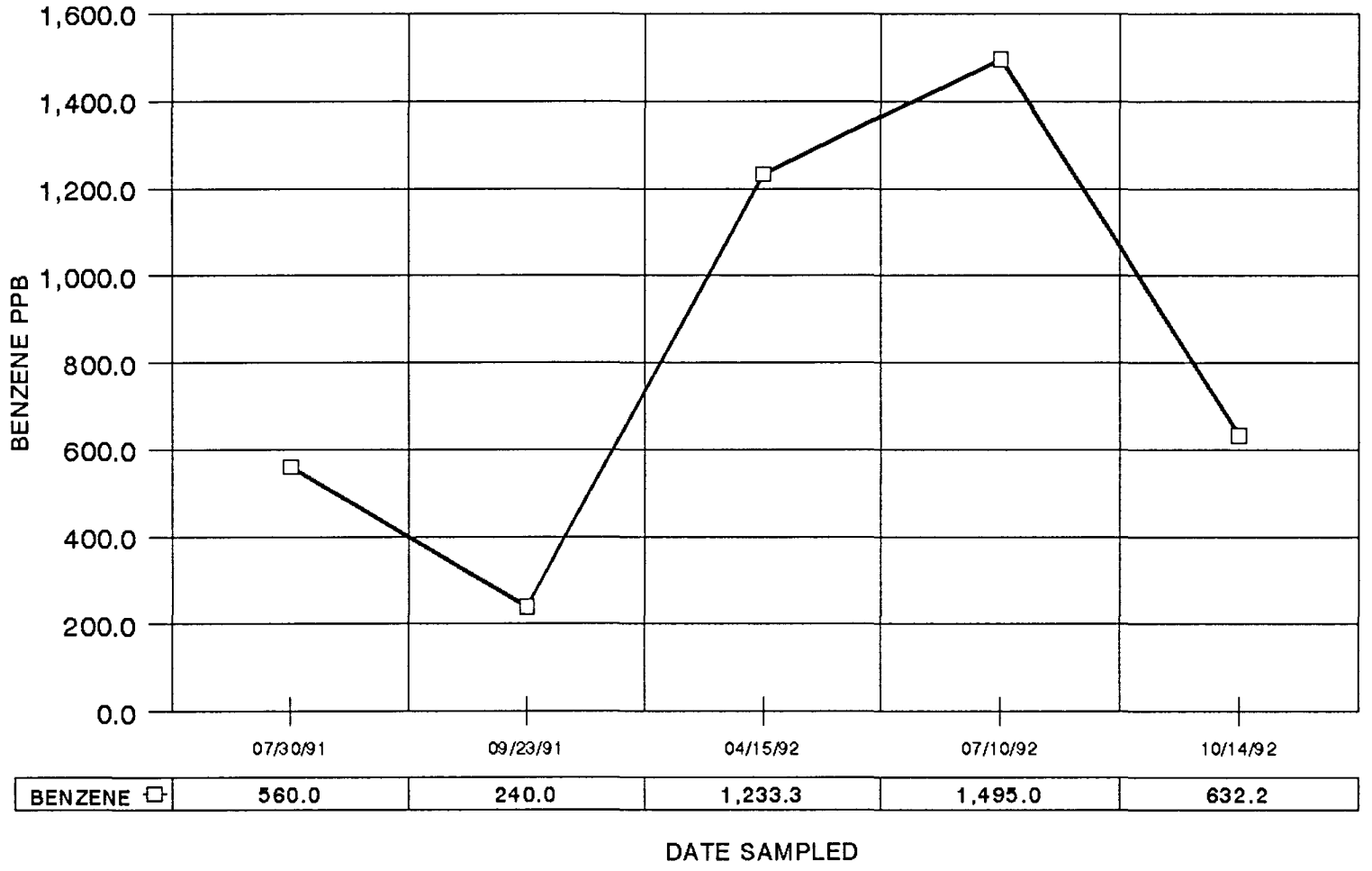
BOREHOLE WATER ANALYSIS DATA

SUMP 16A



BY R.M. GRAY

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APPENDIX E

RANCHER WATER WELLS, PLANT WATER WELLS AND SPRINGS ANALYSES

INDIAN BASIN TREATMENT PROJECT

RANCHER WATER WELL SAMPLE RESULTS
FOURTH QUARTER 1992

LOCATION	OCTOBER	NOVEMBER	DECEMBER
LYMAN WATER WELL			
BENZENE	ND	ND	ND
TOULENE	ND	ND	ND
ETHYLBENZENE	ND	ND	ND
XYLENE	ND	ND	ND
CHLORIDE	15.5	13.2	13.9
UPPER INDIAN HILLS SPRING WEST			
BENZENE	ND	ND	ND
TOULENE	ND	ND	ND
ETHYLBENZENE	ND	ND	ND
XYLENE	ND	ND	ND
CHLORIDE	13.5	10.6	11.3
BIEBELLE WATER WELL			
BENZENE	ND	-	-
TOULENE	ND	-	-
ETHYLBENZENE	ND	-	-
XYLENE	ND	-	-
CHLORIDE	10.1	-	-

BTEX GIVEN IN PPB
CHLORIDE GIVEN IN PPM
ND - BELOW DETECTION LIMIT

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CORE LABORATORIES

LABORATORY TESTS RESULTS
11/10/92

JOB NUMBER: 921917 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: INDIAN BASIN GAS PLANT
DATE SAMPLED.....: 10/12/92
TIME SAMPLED.....: 17:10
WORK DESCRIPTION...: 1 Lyman Water Well

LABORATORY I.D...: 921917-0001
DATE RECEIVED....: 10/20/92
TIME RECEIVED....: 10:20
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	15.5	0.5	mg/L	325.2 (1)	11/02/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	10/23/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
11/10/92

JOB NUMBER: 921917 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: INDIAN BASIN GAS PLANT
DATE SAMPLED.....: 10/12/92
TIME SAMPLED.....: 17:33
WORK DESCRIPTION...: 2 Upper Indian Hills Spring

LABORATORY I.D...: 921917-0002
DATE RECEIVED....: 10/20/92
TIME RECEIVED....: 10:20
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	13.5	0.5	mg/L	325.2 (1)	11/02/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	10/23/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
11/10/92

JOB NUMBER: 921917 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.........: INDIAN BASIN GAS PLANT
DATE SAMPLED.......: 10/12/92
TIME SAMPLED.......: 17:55
WORK DESCRIPTION...: 4 Biebelle Water Well

LABORATORY I.D...: 921917-0003
DATE RECEIVED....: 10/20/92
TIME RECEIVED....: 10:20
REMARKS..........:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	10.1	0.5	mg/L	325.2 (1)	11/02/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	10/23/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
12/07/92

JOB NUMBER: 922080 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 11/11/92
TIME SAMPLED.....: 12:05
WORK DESCRIPTION...: 1 Lyman Water Well

LABORATORY I.D...: 922080-0004
DATE RECEIVED....: 11/13/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	13.2	0.5	mg/L	325.2 (1)	12/01/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	11/19/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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LABORATORY TESTS RESULTS
12/07/92

JOB NUMBER: 922080 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 11/11/92
TIME SAMPLED.....: 11:40
WORK DESCRIPTION...: 2 Upper Indian Hills Spring West

LABORATORY I.D...: 922080-0005
DATE RECEIVED....: 11/13/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	10.6	0.5	mg/L	325.2 (1)	12/01/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	11/19/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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LABORATORY TESTS RESULTS
12/07/92

JOB NUMBER: 922080 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 11/11/92
TIME SAMPLED.....: 12:31
WORK DESCRIPTION...: 7 Plant Water Supply Well

LABORATORY I.D...: 922080-0006
DATE RECEIVED....: 11/13/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	21	1	mg/L	325.2 (1)	12/01/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	11/19/92	MAD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

1300 South Potomac, Suite 130
Aurora, CO 80012
(303) 751-1780

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
12/07/92

JOB NUMBER: 922080 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON OIL
DATE SAMPLED.....: 11/11/92
TIME SAMPLED.....: 08:08
WORK DESCRIPTION...: 8 Plant backup well

LABORATORY I.D...: 922080-0007
DATE RECEIVED....: 11/13/92
TIME RECEIVED....: 10:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	28	1	mg/L	325.2 (1)	12/01/92	KJA
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	11/19/92	MAD
Benzene	57	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	7	1	ug/L			
Xylenes	3	1	ug/L			

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Aurora, CO 80012
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Western Atlas International

CORE LABORATORIES

LABORATORY TESTS RESULTS
01/07/93

JOB NUMBER: 922227 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.........: MARATHON, MIDLAND
DATE SAMPLED.......: 12/10/92
TIME SAMPLED.......: 10:10
WORK DESCRIPTION...: #1 Lyman Water Well

LABORATORY I.D...: 922227-0001
DATE RECEIVED....: 12/14/92
TIME RECEIVED....: 08:45
REMARKS..........:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	13.9	0.5	mg/L	325.2 (1)	12/31/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	12/16/92	MLD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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Aurora, CO 80014
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CORE LABORATORIES

LABORATORY TESTS RESULTS
01/07/93

JOB NUMBER: 922227 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON, MIDLAND
DATE SAMPLED.....: 12/10/92
TIME SAMPLED.....: 10:36
WORK DESCRIPTION...: #2 Upper Indian Hills Spring West

LABORATORY I.D...: 922227-0002
DATE RECEIVED....: 12/14/92
TIME RECEIVED....: 08:45
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	11.3	0.5	mg/L	325.2 (1)	12/31/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	12/16/92	MLD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
01/07/93

JOB NUMBER: 922227 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.....: MARATHON, MIDLAND
DATE SAMPLED.....: 12/10/92
TIME SAMPLED.....: 09:38
WORK DESCRIPTION...: #7 Plant Supply Well - SW-1

LABORATORY I.D...: 922227-0003
DATE RECEIVED....: 12/14/92
TIME RECEIVED....: 08:45
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	20.0	0.5	mg/L	325.2 (1)	12/31/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	12/16/92	MLD
Benzene	ND	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	ND	1	ug/L			
Xylenes	ND	1	ug/L			

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Aurora, CO 80014
(303) 751-1780

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
01/07/93

JOB NUMBER: 922227 CUSTOMER: MARATHON OIL COMPANY ATTN: JEFFREY S. LYNN

CLIENT I.D.........: MARATHON, MIDLAND
DATE SAMPLED.......: 12/10/92
TIME SAMPLED.......: 09:10
WORK DESCRIPTION...: #8 Plant backup well - SW-2

LABORATORY I.D...: 922227-0004
DATE RECEIVED....: 12/14/92
TIME RECEIVED....: 08:45
REMARKS..........:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Chloride (Unfilt.)	338	4	mg/L	325.2 (1)	12/28/92	PJM
8020 - AROMATIC VOLATILE ORGANICS		*1		8020 (2)	12/16/92	MLD
Benzene	44	1	ug/L			
Toluene	ND	1	ug/L			
Ethyl Benzene	5	1	ug/L			
Xylenes	1	1	ug/L			

10703 East Bethany Drive
Aurora, CO 80014
(303) 751-1780

APPENDIX F

STATE ENGINEER'S WATER PRODUCTION REPORTS

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

November 4, 1992

Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Attention: Robert R. Marr

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (NW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of November 2, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	11/2/92	1614809.0	1614809.0 Gals
MW-59/BH-85	10259114	11/2/92	56746.0	56746.0 Bbls
MW-61A/BH-87A	10239116	11/2/92	1509952.0	1509952.0 Gals
*MW-62/BH-88	10239115	11/2/92	1258615.0	1452545.7 Gals
MW-65A/BH-91A	10239117	11/2/92	2582635.0	2582635.0 Gals
MW-68/BH-94	10239114	11/2/92	1362631.0	1362631.0 Gals
LOWER QUEEN TOTAL				10,905,904.7 Gals

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queeen fluid removal as of 11/2/92 is 11,227,372.7 Gals. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of November 2, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
** MW-13/BH-36	02209213	11/2/92	119771.6	113059.1 Gals.
MW-14/BH-37	02209214	11/2/92	323965.0	323965.0 Gals.
*** MW-35/BH-59	02209212	11/2/92	55862.4	55795.1 Gals.
		SHALLOW TOTAL		492,819.2 Gals.

** The meter reading on MW-13/BH-36 reflects 6712.5 gallons attributed to MW-1/BH-14 prior to removal and reinstallation on MW-13/BH-36.

*** The meter on MW-35/BH-59 has been repaired. As indicated in the August 1992 monthly satement the August meter reading of 37760.9 was below the July reading of 38017.0. The difference between the two readings is 256.1 gallons. This amount has been added to the total water withdrawal volume. The meter reading on MW-35/BH-59 also reflects 188.8 gallons attributed to MW-21/BH-44 prior to meter removal and reinstallation on MW-35/BH-59.

The cumulative shallow fluid removal as of November 2, 1992 is 499,720.5 gals. This number reflects the 6901.3 gallons removed from MW-1/BH-14 and MW-21/BH-44 prior to meter removal.

If more information is required, please feel free to contact me at (915) 687-8312.

Very truly yours,

Jeffrey S. Lynn
Advanced Environmental Representative

JSL035/nrt

xc: T. C. Lowry - Midland
D. F. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser- IBGP, Artesia

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

December 7, 1992

Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Attention: Robert R. Marr

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (NW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of December 7, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	12/7/92	1865266.2	1865266.2 Gals
MW-59/BH-85	10259114	12/7/92	59853.0	59853.0 Bbls
MW-61A/BH-87A	10239116	12/7/92	1779830.4	1779830.4 Gals
*MW-62/BH-88	10239115	12/7/92	1333371.7	1527302.4 Gals
MW-65A/BH-91A	10239117	12/7/92	2904668.7	2904668.7 Gals
MW-68/BH-94	10239114	12/7/92	1623269.8	1623269.8 Gals
LOWER QUEEN TOTAL				12,214,163.5 Gals

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queeen fluid removal as of 12/7/92 is 12,535,631.5 Gals. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of December 7, 1992.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
** MW-13/BH-36	02209213	12/7/92	122623.9	115911.4 Gals.
*** MW-14/BH-37	02209214	12/7/92	323788.1	323977.1 Gals.
****MW-35/BH-59	02209212	12/7/92	98236.2	98303.5 Gals.
		SHALLOW TOTAL		538,192.0 Gals.

** The meter reading on MW-13/BH-36 reflects 6712.5 gallons attributed to MW-1/BH-14 prior to removal and reinstallation on MW-13/BH-36.

*** The meter on MW-14/BH-37 is below the November reading of 323965.0. This well has been shut in the majority of the month and has only produced 12.1 gallons. The meter will be repaired. The difference between the two monthly readings is <176.9> gallons. The water removed volume reflects the known 12.1 gallons removed in November.

**** The meter on MW-35/BH-59 has been repaired. As indicated in the August 1992 monthly statement the August meter reading of 37760.9 was below the July reading of 38017.0. The difference between the two readings is 256.1 gallons. This amount has been added to the total water withdrawal volume. The meter reading on MW-35/BH-59 also reflects 188.8 gallons attributed to MW-21/BH-44 prior to meter removal and reinstallation on MW-35/BH-59.

The cumulative shallow fluid removal as of December 7, 1992 is 545,093.3 gals. This number reflects the 6901.3 gallons removed from MW-1/BH-14 and MW-21/BH-44 prior to meter removal.

If more information is required, please feel free to contact me at (915) 687-8312.

Very truly yours,

Jeffrey S. Lynn
Advanced Environmental Representative

JSL039/nrt

xc: T. C. Lowry - Midland
D. F. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser- IBGP, Artesia

Mid-Continent Region
Production United States

Marathon Oil Company

P.O. Box 552
Midland, Texas 79702
Telephone 915/682-1626

January 5, 1993

Roswell Basin Watermaster
State Engineer Office
1900 West Second Street
Roswell, New Mexico 88201

Attention: Robert R. Marr

Re: Indian Basin Treatment Project

Dear Mr. Marr:

The below list of monitor wells (NW)/boreholes (BH) indicates the meter readings for fluid removed from the Lower Queen as of January 4, 1993.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
MW-58/BH-84	10239118	01/4/93	2112320.0	2112320.0 Gals
MW-59/BH-85	10259114	01/4/93	62073.5	62073.5 Bbls
MW-61A/BH-87A	10239116	01/4/93	2023050.0	2023050.0 Gals
*MW-62/BH-88	10239115	01/4/93	1460824.0	1654754.7 Gals
MW-65A/BH-91A	10239117	01/4/93	3223348.0	3223348.0 Gals
MW-68/BH-94	10239114	01/4/93	1886436.0	1886436.0 Gals
LOWER QUEEN TOTAL				13,506,995.7 Gals

* The volume of water removed from BH-88 reflects an additional 193,930.7 gallons which was metered prior to the installation of an automatic sampling device on 1/25/92.

Cumulative Lower Queeen fluid removal as of 01/4/93 is 13,828,463.7 Gals. This number reflects the 321,468 gallons removed prior to installation of the present meters in December, 1991.

The below list of monitor wells (MW)/boreholes (BH) indicates the meter readings for fluid removed from shallow wells under permit RA-8015 as of December 11, 1992 when meters and pumps were removed from these wells due to pump freeze potential. The meters and pumps will be reinstalled upon the arrival of warmer weather.

LOCATION	SERIAL NUMBER	DATE READ	METER READING	WATER REMOVED
** MW-13/BH-36	02209213	12/11/92	122623.9	115911.4 Gals.
*** MW-14/BH-37	02209214	12/11/92	323788.1	323977.1 Gals.
****MW-35/BH-59	02209212	12/11/92	98236.2	98303.5 Gals.
		SHALLOW TOTAL		538,192.0 Gals.

** The meter reading on MW-13/BH-36 reflects 6712.5 gallons attributed to MW-1/BH-14 prior to removal and reinstallation on MW-13/BH-36.

*** The meter on MW-14/BH-37 has been repaired. As indicated in the December 1992 monthly statement the December meter reading of 323788.1 was below the November reading of 323965.0. The difference between the two readings is 176.9 gallons while the actual withdrawal was 12.1 gallons. The 12.1 gallons has been added to the total water removed volume.

**** The meter on MW-35/BH-59 has been repaired. As indicated in the August 1992 monthly statement the August meter reading of 37760.9 was below the July reading of 38017.0. The difference between the two readings is 256.1 gallons. This amount has been added to the total water withdrawal volume. The meter reading on MW-35/BH-59 also reflects 188.8 gallons attributed to MW-21/BH-44 prior to meter removal and reinstallation on MW-35/BH-59.

The cumulative shallow fluid removal as of December 11, 1992 is 545,093.3 gals. This number reflects the 6901.3 gallons removed from MW-1/BH-14 and MW-21/BH-44 prior to meter removal.

If more information is required, please feel free to contact me at (915) 687-8312.

Very truly yours,

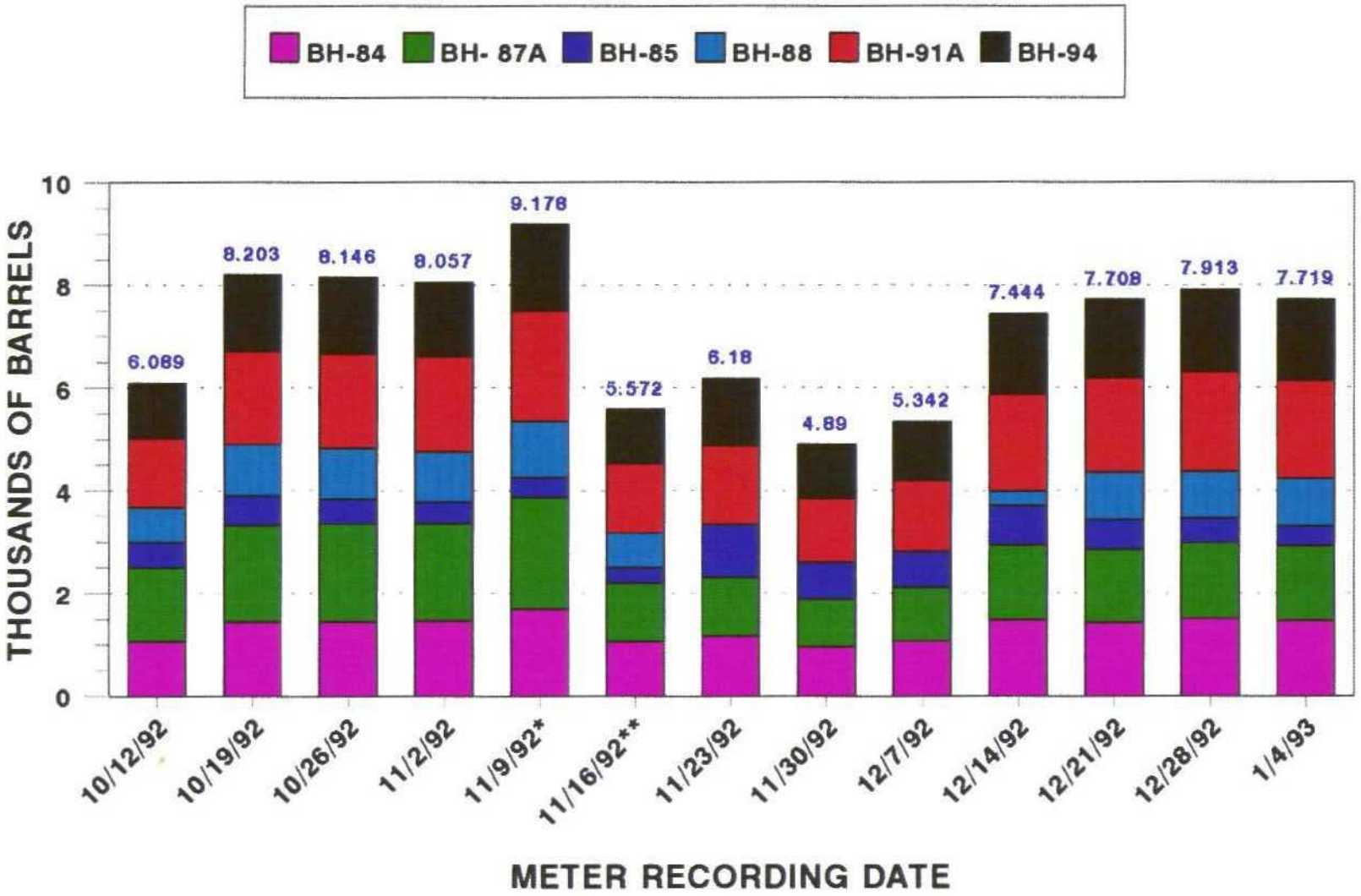
Jeffrey S. Lynn
Advanced Environmental Representative

JSL039/nrt

xc: T. C. Lowry - Midland
D. E. Kenyon - PTC, Littleton
R. F. Unger - Midland
R. A. Biernbaum - Midland
C. M. Schweser- IBGP, Artesia

INDIAN BASIN TREATMENT PROJECT

WEEKLY LOWER QUEEN WATER WITHDRAWALS
FOURTH QUARTER 1992



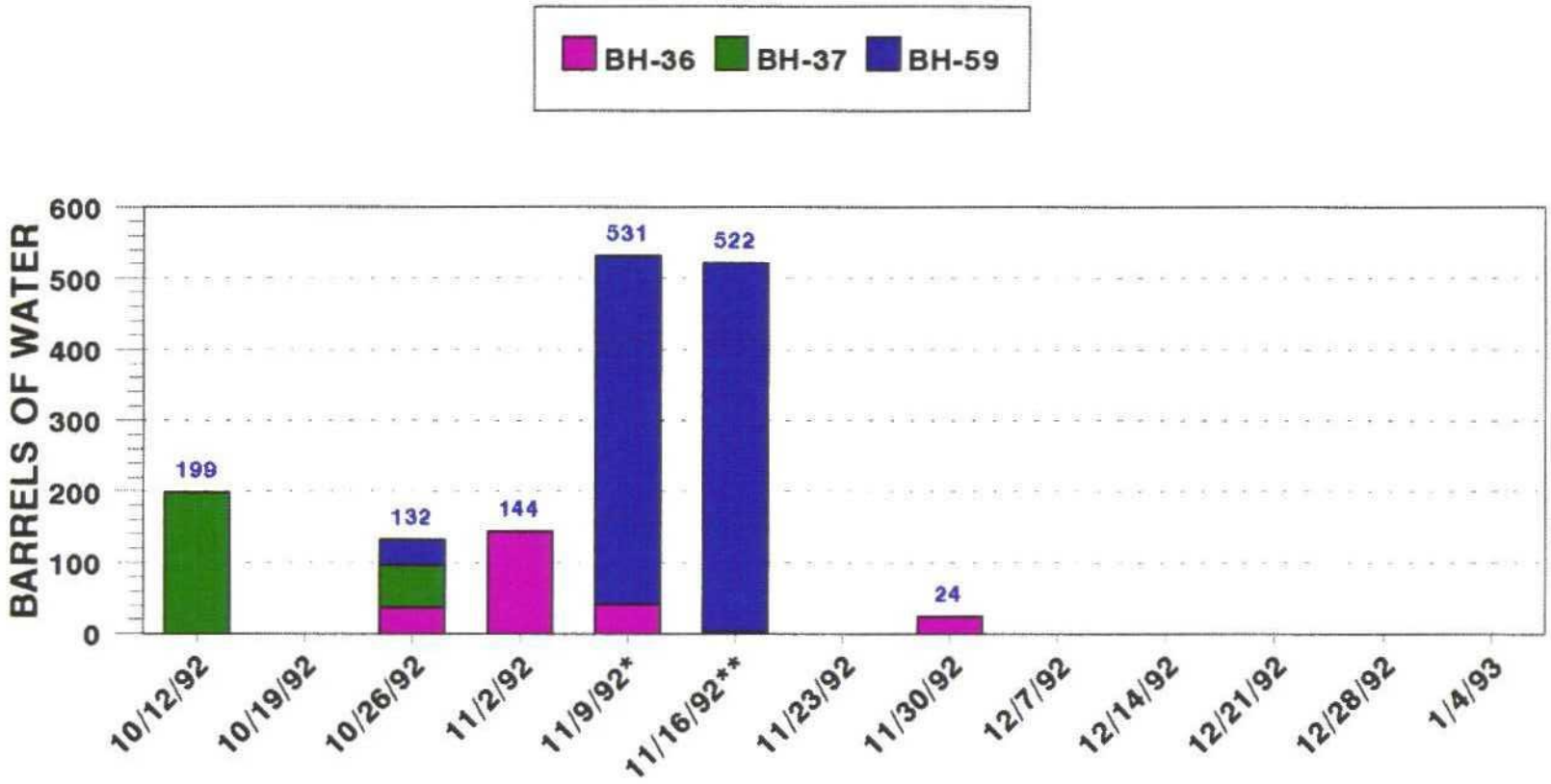
LQPROWA2

* Eight Withdrawal Days

** Six Withdrawal Days

INDIAN BASIN TREATMENT PROJECT

WEEKLY SHALLOW WATER WITHDRAWALS
FOURTH QUARTER 1992



BH-59	0	0	36	0	489	520	0	0	0	0	0	0	0
BH-37	199	0	59	0	0	0	0	0	0	0	0	0	0
BH-36	0	0	37	144	42	2	0	24	0	0	0	0	0

METER RECORDING DATE

SHPROWA2

* Eight Withdrawal Days

** Six Withdrawal Days

INDIAN BASIN TREATMENT PROJECT

WEEKLY TOTAL WATER WITHDRAWALS
FOURTH QUARTER 1992

SHALLOW TOTAL	0.199	0	0.132	0.144	0.531	0.522	0	0.024	0	0	0	0	0
LOWER QUEEN TOTAL	6.089	8.203	8.146	8.057	9.178	5.572	6.18	4.89	5.342	7.444	7.708	7.913	7.719

METER RECORDING DATE

IBPROWAT

* Eight Withdrawal Days

** Six Withdrawal Days

APPENDIX G

LOWER QUEEN FLUID LEVEL DATA AND POTENTIOMETRIC MAPS

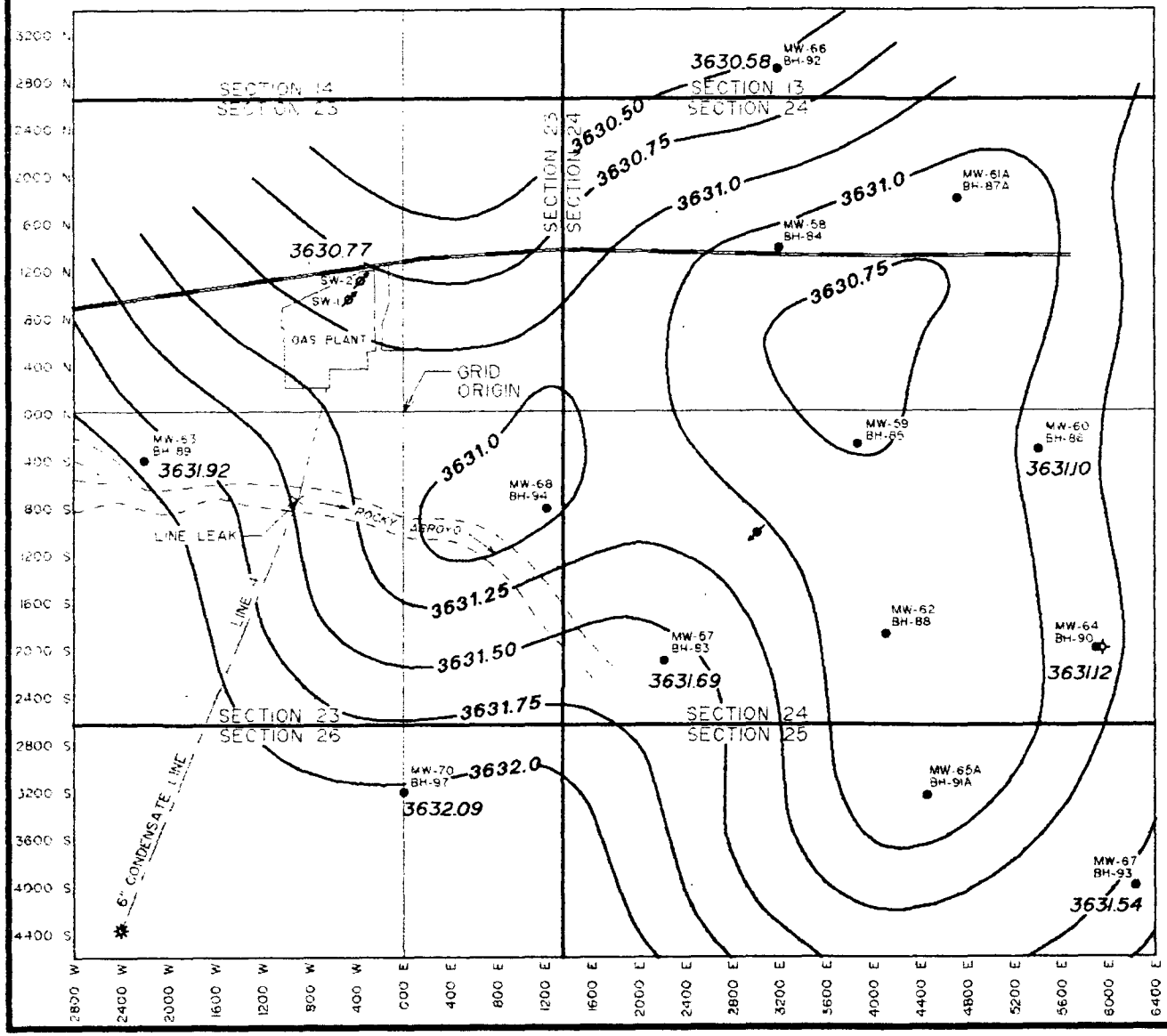
IBGP TREATMENT PROJECT

LOWER QUEEN FLUID LEVELS
FOURTH QUARTER 1992

WELL NUMBER	OCTOBER 1992	NOVEMBER 1992	DECEMBER 1992
BH-83	3631.69	3631.39	3631.15
BH-86	3631.10	3630.84	3630.61
BH-89	3631.92	3631.26	3630.84
BH-90	3631.12	3630.94	3630.72
BH-92	3630.58	3630.22	3630.00
BH-93	3631.54	3631.11	3630.87
BH-97	3632.09	3631.71	3631.40
SW-2	3630.77	3630.48	3629.73
**********	**********	**********	**********
MONTHLY RAINFALL	0.21	0.33	0.38

FLUID LEVEL MEASUREMENTS IN FEET
RAINFALL MEASUREMENTS IN INCHES
January 6, 1993

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

L E G E N D

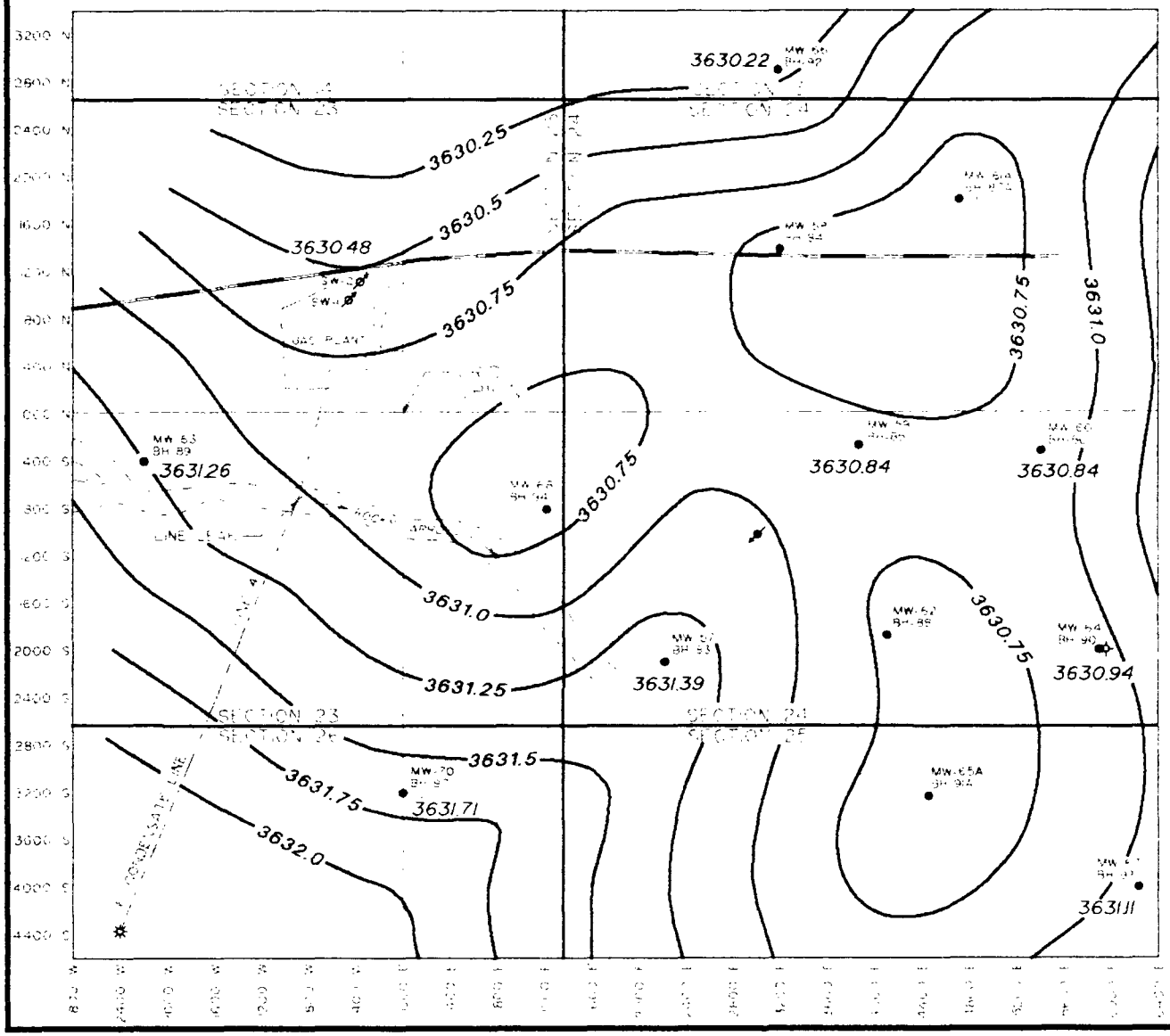
- MW-64 BH-90 — DEEP BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- SW-1 — WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION / DISPOSAL WELL
- GAS WELL

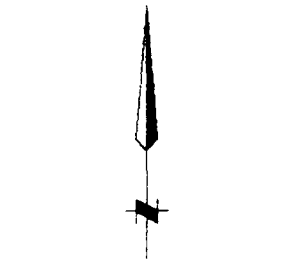
C.I. = 0.25'

IBGASPLT.STY OPER

Figure Title:	MARARTHON OIL COMPANY
Document Title:	Location: INDIAN BASIN GAS PLANT
OCTOBER 1992 LOWER QUEEN POTENTIOMETRIC SURFACE	DATE: 10/28 PREPARED BY: JSL
	SCALE: CHECKED BY:
	PROJECT NO: DRAFTED BY: FIGURE NO.

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO





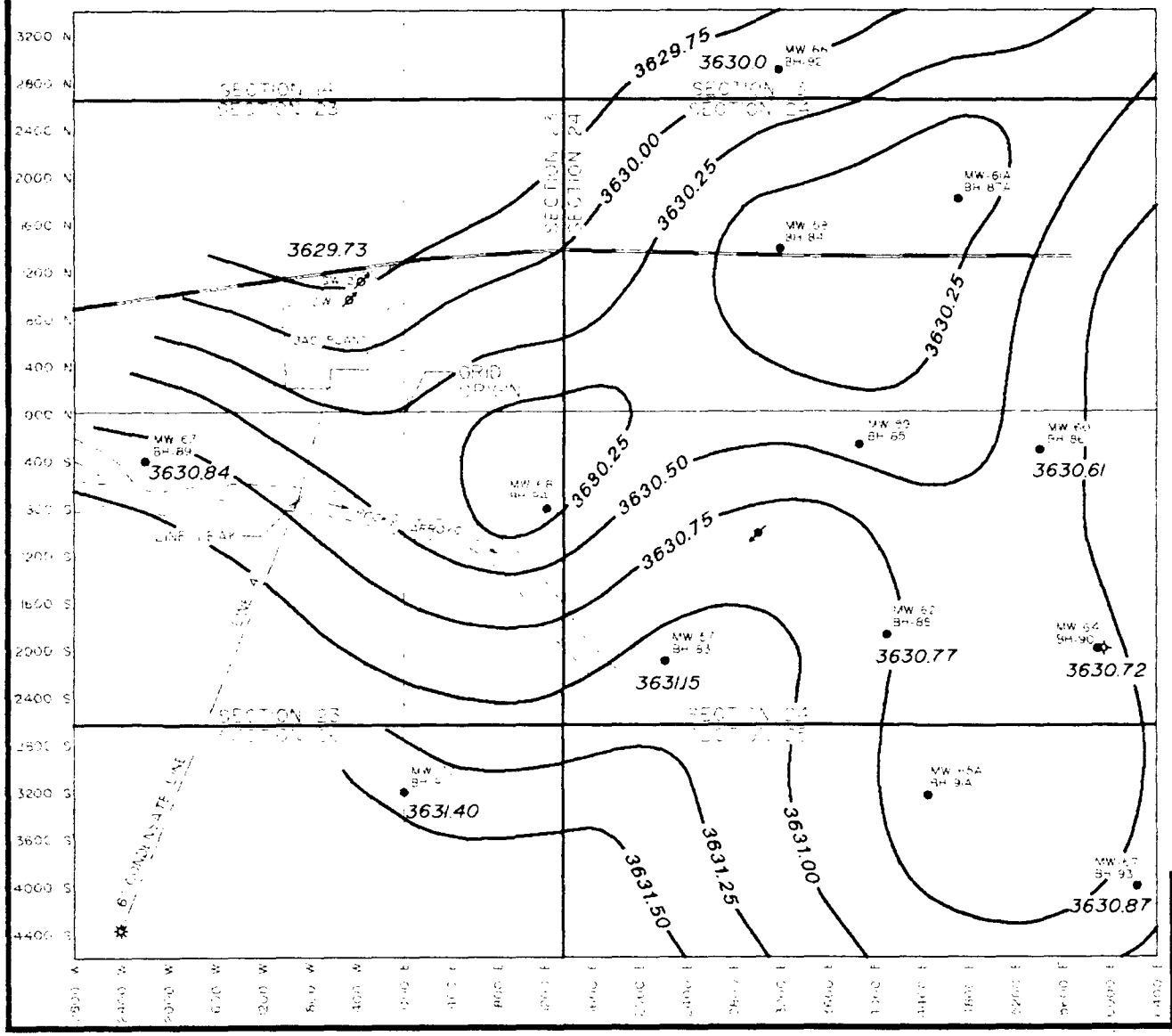
LEGEND

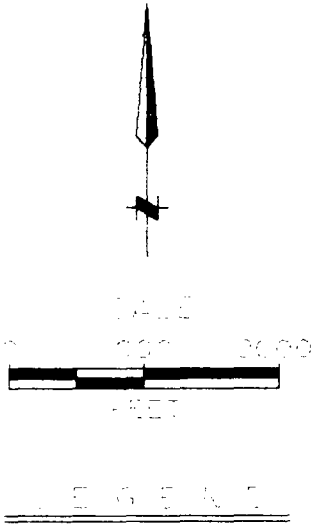
- MW-64 BH 88 — NEW BEDROCK (LOWER QUEEN) WELL AND SOIL BORING LOCATION
- WATER SUPPLY WELL (DEEP BEDROCK, LOWER QUEEN)
- DRY GAS EXPLORATION HOLE, PLUGGED AND ABANDONED
- INJECTION DISPOSAL WELL
- GAS WELL

C.I. = 0.25'

Figure Title	MARARTHON OIL COMPANY
Document Title	Location: INDIAN BASIN GAS PLANT
NOVEMBER 1992 LOWER QUEEN POTENTIOMETRIC SURFACE	DATE: 1993 — PREPARED BY: J.S.
	SCALE — CHECKED BY
	PROJECT NO — FIGURE NO

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO





DEEP BEDROCK LOWER QUEEN WELL AND SOIL BORING LOCATION

WATER SUPPLY WELL DEEP BEDROCK-LOWER QUEEN

DRY GAS EXPLORATION HOLE PLUGGED AND ABANDONED

INJECTION DISPOSAL WELL

GAS WELL

C.I. = 0.25'

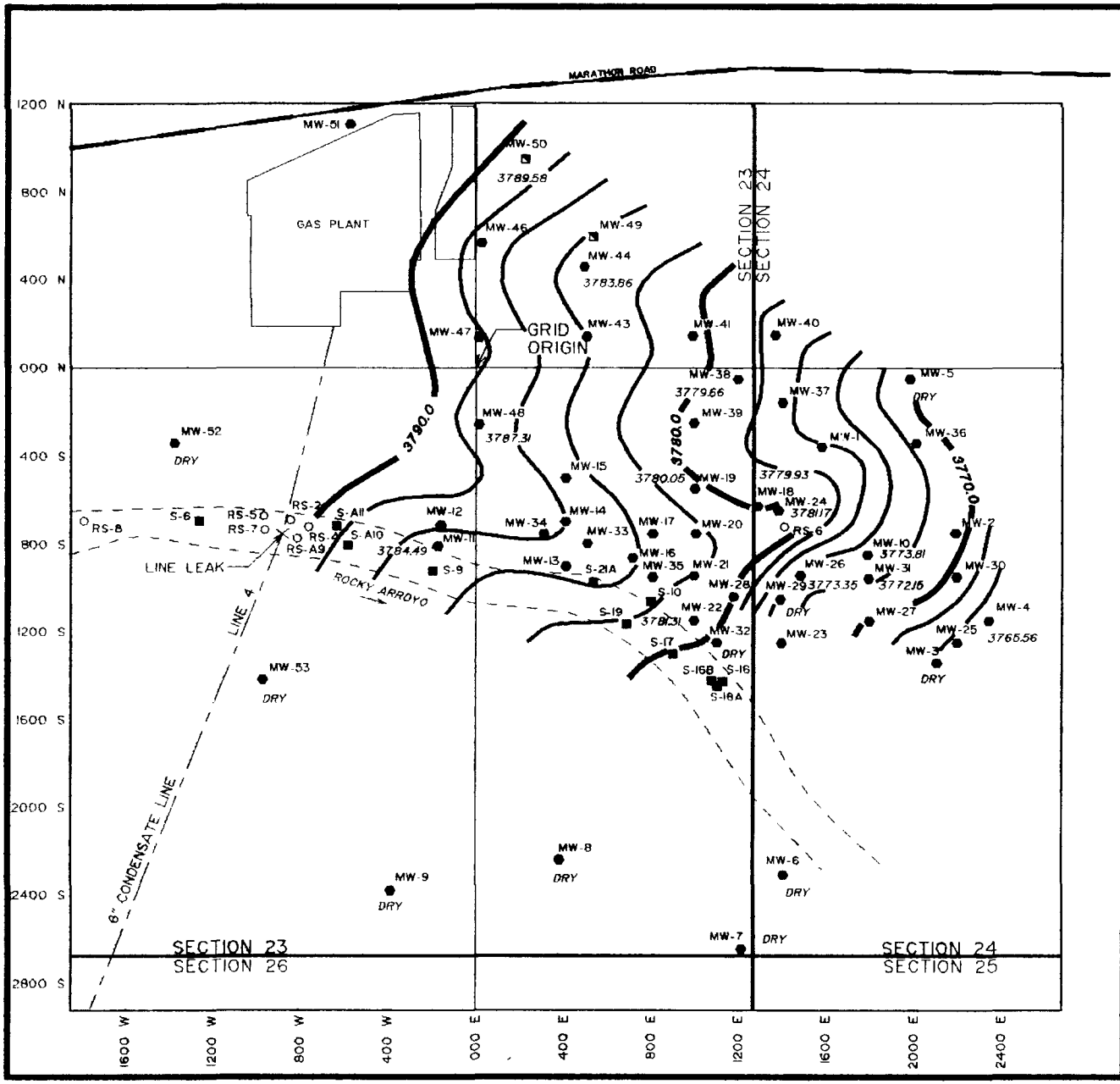
IBGASPLT.STY 6PEP

Figure Title:	MARARTHON OIL COMPANY
Document Title:	Location: INDIAN BASIN GAS PLANT
DECEMBER 1992 LOWER QUEEN POTENTIOMETRIC SURFACE	DATE: 93 PREPARED BY: JS SCALE: CHECKED BY: PROJECT NO: DRAFTED BY: FIGURE NO.

APPENDIX H

SHALLOW SOIL WATER POTENTIOMETRIC MAP

INDIAN BASIN GAS PLANT
ARTESIA, NEW MEXICO



SCALE

0 1000' 2000'

FEET

LEGEND

MW-9 ● SHALLOW ALLUVIAL GROUNDWATER MONITORING WELL

RS-4 ○ 4 INCH PVC RCOVERY SUMP

S-16 ■ 24 INCH GALVANIZED RECOVEY SUMP

C.I. 2.0'

IBGASPLT.STY OPER

Figure Title:	MARARTHON OIL COMPANY	
Document Title:	Location: INDIAN BASIN GAS PLANT	
OCTOBER 1992 SHALLOW GROUND WATER POTENTIOMETRIC MAP	DATE: 1/93	PREPARED BY: JSL
	SCALE:	CHECKED BY:
	PROJECT NO:	DRAFTED BY:
		FIGURE NO: