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REPORTS

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JULY 1993

ENVIROTECH INC.

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QUARTERLY MONITORING REPORT

2ND QUARTER, 1993

AMOCO PRODUCTION CORPORATION
SAN JUAN GRAVEL A-1E
PRODUCTION TANK PIT AREA

FARMINGTON, NEW MEXICO

Prepared For:
Mr. Buddy Shaw
Environmental Coordinator
Amoco Production Company

July 1993

Project: 92140/C4012

5796 U.S. HIGHWAY 64 - 3014 • FARMINGTON, NEW MEXICO 87401 • PHONE: (505) 632-0615

QUARTERLY MONITORING REPORT
2nd Quarter, 1993
AMOCO PRODUCTION CORPORATION
SAN JUAN GRAVEL A-1E
PRODUCTION TANK PIT AREA
SE/4, NE/4 (H) SECTION 21, T29N, R13W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

PREPARED FOR:
MR. BUDDY SHAW
ENVIRONMENTAL COORDINATOR
AMOCO PRODUCTION COMPANY

PROJECT/PIT NO.: 92140/C4012

JULY 1993

ENVIROTECH, INC.
Environmental Scientist & Engineers
5796 U.S. Highway 64-3014
Farmington, New Mexico

(505) 632-0615

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JULY 1993 PROJECT/PIT NO: 92140/C4012

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SAN JUAN GRAVEL A-1E
PRODUCTION TANK PIT AREA
SE/4, NE/4 (H) SECTION 21, T29N, R13W, NMPM
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO

INTRODUCTION

Amoco Production Company has installed a pump and treat system as part of a Remedial Action Plan (RAP) to abate groundwater contamination from the production equipment and storage system associated with the subject well located south of Farmington, in the Southeast 1/4 of the Northeast 1/4 of Section 21, Township 29N, Range 13W, NMPM, San Juan County, New Mexico (refer to Vicinity Map - Appendix A). Quarterly monitoring of the remediation system has been required by the New Mexico Oil Conservation Division (NMOCD).

This is the first quarterly monitoring report (QMR) that Envirotech, Inc. has produced for this site. The quarterly sampling event was not initiated until approval of the GROUNDWATER MONITORING PLAN, prepared by Envirotech, was given by the New Mexico Oil Conservation Division. A copy of the letter providing this approval is located in Appendix A.

Included in the QMR are groundwater and treatment system analyses, a potentiometric map showing the hydraulic gradient of the groundwater, and a table listing all of the past laboratory analyses that has been conducted.

The QMR also outlines a sampling schedule for the remaining 1993 calendar year (located within the Purpose and Scope of Work section on the following page).

PURPOSE AND SCOPE OF WORK

The purpose and scope of this quarterly monitoring is to collect groundwater samples for benzene, toluene, ethylbenzene, and xylenes (BTEX), Polynuclear Aromatic Hydrocarbons (PAH) analyses [semi-annually on the air stripper effluent and the sump (recovery well-collection system) only], and to gather data on depth to water for development of a potentiometric map to show the hydraulic gradient of the groundwater.

The scope of work consisted of the following:

A. Notification to the New Mexico Oil Conservation Division (NMOCD) at least 72 hours prior to a sampling event.

B. Sampling of the monitor wells, the air stripper effluent, and the sump to verify the status of the groundwater and treated water during the remediation.

C. Documentation of the analytical results from the sampling event.

SAMPLING SCHEDULE

	JAN-MAR, 93	APR-JUN, 93	JUL-SEP, 93	OCT-DEC, 93
MW - 1	X		X	
MW - 2		X		X
MW - 3	X		X	
MW - 4		X		X
MW - 5	X		X	
MW - 6	X	X	X	X
MW - 7	X		X	
EFFLUENT	X		X	
SUMP	X		X	

ANALYTICAL RESULTS

For this quarterly monitoring, monitor wells #'s 2, 4, 5, and 6, were purged by bailing until a minimum of three (3) well volumes had been removed. After purging, water samples were collected in laboratory supplied 40 ml VOA vials and preserved with 5% $HgCl_2$. The water samples were placed on ice and transported to Envirotech's laboratory for BTEX analysis using United States Environmental Protection Agency (USEPA) Method 8020, SW-846. Sampling was preformed in accordance with USEPA SW-846 protocol.

The field and laboratory results are summarized as follows:

1. Table 1 summarizes the field sampling and groundwater conditions for this quarterly report.

2. Table 2-4 summarizes the historical and current laboratory analyses for the effluent, sump, and monitor wells.

3. Table 5 summarizes the Clean-up Standards for groundwater for the State of New Mexico.

Surface mounding as recommended in the GROUNDWATER MONITORING PLAN was initiated at the end of June, 1993.

Groundwater elevations were measured on July 6, 1993. The static water levels of the monitor wells were measured with a Solinst Interface Meter, Model 121. Depths are from the top of the well casing to water level.

All analytical results for the laboratory analyses, laboratory QC/QA, and Chain-of-Custody for this quarterly sampling event are presented in Appendix B.

TABLE 1

SUMMARY OF SAMPLING & GROUNDWATER CONDITIONS
AMOCO PRODUCTION COMPANY
SAN JUAN GRAVEL A -1E
PRODUCTION TANK PIT AREA

SAMPLING DATE: JULY 6, 1993

SAMPLING POINT	TOTAL DEPTH (ft.)	GROUND-WATER ELEVATION (ft.)	STATIC WATER LEVEL (ft.)	WELL BORE VOLUME (gals)	WATER CONDITIONS TEMP. (°C)	CONDUCT (µS)	pH	COMMENTS
MW-1	11.10	94.89	5.64	NA	NA	NA	NA	not sampled
MW-2	8.15	94.78	3.53	0.77	20.6	600	7.25	slightly murky, no odor
MW-3	7.90	95.64	2.24	NA	NA	NA	NA	not sampled
MW-4	6.95	97.35	2.27	0.78	21.1	600	7.04	slightly murky
MW-5	10.55	95.57	4.66	0.98	23.3	400	7.57	slightly murky, no odor
MW-6	10.10	95.39	5.02	0.68	21.7	400	7.29	black color, strong odor
MW-7	8.0	96.39	4.45	NA	NA	NA	NA	not sampled
Efflu.	NA	NA	NA	NA	21.7	500	8.03	clear, no odor
Sump	9.8	NA	NA	NA	18.3	600	7.31	clear to slightly murky, no odor

NOTE: NA - INDICATES NO DATA AVAILABLE
µS = micro mhos per centimeter.

TABLE 2
(Part 1 of 2)

HISTORICAL RESULTS OF THE AIR STRIPPER EFFLUENT LABORATORY ANALYSIS
AMOCO PRODUCTION CORPORATION
SAN JUAN GRAVEL A-1E
PRODUCTION TANK PIT AREA

LABORATORY ANALYSES	08/31/92	10/05/92	11/13/92	01/06/93	02/25/93	07/06/93
Benzene, (µg/L)	ND	0.2	1.3	ND	ND	ND
Toluene, (µg/L)	1.0	1.0	10.2	ND	1.0	ND
Ethylbenzene, (µg/L)	ND	ND	2.4	ND	0.6	ND
Total Xylene, (µg/L)	2.1	2.2	51.0	0.4	ND	ND
Polynuclear Aromatic Hydrocarbons, (µg/L)	NA	NA	ND	ND	ND	ND
TPH, (mg/L)	ND	ND	NA	NA	NA	NA

NOTE: **NA - NO DATA AVAILABLE.**
ND - NON DETECTABLE AT THE STATED DETECTION LIMIT (SEE LABORATORY ANALYSES)
µg/L = parts per billion.
mg/L = parts per million.

TABLE 2
AIR STRIPPER EFFLUENT LABORATORY ANALYSES
CONTINUED
(PART 2 OF 2)

LABORATORY ANALYSES	08/31/92	10/05/92	11/13/92	01/06/93	02/25/93
Lab pH	7.90	7.92	8.00	8.20	8.00
Lab Conductivity, μhms/cm @ 25°C	569	752	883	903	937
Lab Resistivity, ohms-m	17.6	13.3	11.3	NA	NA
Total Dissolved Solids (180°C), mg/L	436	488	576	586	652
Total Dissolved Solids (calc), mg/L	372	470	552	554	604
Total Alkalinity as $CaCO_3$, mg/L	159	188	199	236	241
Total Hardness as $CaCO_3$, mg/L	219	303	349	371	394
Sodium Adsorption Ratio	1.31	1.11	1.17	1.17	NA

LABORATORY ANALYSES	08/31/92		10/05/92		11/13/92		01/06/93		02/25/93	
	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meg/L	mg/L	meq/L
Bicarbonate as HCO_3	195	3.19	230	3.77	243	3.98	290	3.98	290	4.82
Carbonate as CO_3	< .1	<.01	< .1	<.01	< .1	< .01	0	0.00	0	0.00
Chloride	14.9	.42	29.1	.82	47.2	1.33	30	0.84	30	1.21
Sulfate	142	2.96	165	3.44	201	4.2	200	4.08	200	4.46
Calcium	38.7	1.93	103	5.15	113	5.65	110	5.26	110	6.14
Magnesium	29.7	2.44	11.1	.91	16.3	1.34	26	2.16	t 26	1.74
Potassium	6.65	.17	3.5	.09	3.55	.09	3.2	.08	3.2	.08
Sodium	44.4	1.93	44.5	1.94	50.4	2.19	52	52	52	2.37
Major Cations	NA	6.47	NA	8.09	NA	9.27	NA	9.75	NA	10.34
Major Anions	NA	6.57	NA	8.03	NA	9.51	NA	9.64	NA	10.50
Cation/Anion Difference	NA	.74%	NA	.42%	NA	1.27%	NA	0.58%	NA	0.81%

NOTE: NA - INDICATES NO DATA AVAILABLE.
mg/L = parts per million.
meq/L = milliequivalent per Liter.
μmhos/cm = micro mhos per centimeter.
ohms-m = reciprocal of micro mhos per centimeter.

TABLE 3

HISTORICAL RESULTS OF THE SUMP LABORATORY ANALYSIS
AMOCO PRODUCTION CORPORATION
SAN JUAN GRAVEL A-1E
PRODUCTION TANK PIT AREA

LABORATORY ANALYSES	08/03/92	11/19/92	07/06/93
Benzene, (µg/L)	ND	4.2	ND
Toluene, (µg/L)	ND	1.6	ND
Ethylbenzene, (µg/L)	0.6	3.7	ND
Total Xylene, (µg/L)	1.3	4.7	ND
Polynuclear Aromatic Hydrocarbons, (µg/L)	NA	NA	ND
TPH, (mg/L)	ND	ND	NA

NOTE: **NA - NO DATA AVAILABLE.**
ND - NON DETECTABLE AT THE STATED DETECTION LIMIT (SEE LABORATORY ANALYSES).
µg/L = parts per billion.
mg/L = parts per million.

TABLE 4

HISTORICAL RESULTS OF MONITOR WELLS LABORATORY ANALYSIS
AMOCO PRODUCTION CORPORATION
SAN JUAN GRAVEL A-1E
PRODUCTION TANK PIT AREA

Monitor Well	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
# 1	06-01-92	ND	ND	ND	ND
	10-08-92	0.5	0.7	ND	0.6
	11-16-92	ND	ND	ND	0.4
# 2	06-01-92	ND	1.1	0.4	1.1
	11-16-92	ND	ND	ND	0.8
	04-04-93	ND	ND	ND	1.1
	07-06-93	2.0	ND	ND	8.0
# 3	06-01-92	ND	ND	ND	0.9
	10-08-92	ND	ND	ND	ND
	11-16-92	ND	ND	ND	0.9
# 4	06-01-92	ND	ND	ND	ND
	11-16-92	ND	ND	ND	1.3
	04-04-93	ND	ND	ND	ND
	07-06-93	ND	ND	ND	ND
# 5	06-01-92	ND	54.0	ND	64.4
	10-08-92	0.3	1.2	ND	1.4
	11-16-92	ND	ND	ND	ND
	04-04-93	ND	ND	1.5	0.9
	07-06-93	ND	ND	ND	ND
# 6	06-01-92	540	235	294	3060
	11-16-92	6.2	58	159	783
	04-04-93	230	62	159	784
	07-06-93	54	2.9	36.1	233
# 7	06-02-92	0.2	2.9	ND	1.2
	10-08-92	1.6	3.4	ND	4.0
	11-16-92	0.7	3.4	2.1	7.0

NOTE: ND - NON DETECTABLE AT STATED DETECTION LIMIT (SEE LABORATORY ANALYSES).
µg/L = parts per billion.

Clean Up Standards:

The current maximum allowable concentrations for groundwater contamination as outlined by the State of New Mexico Water Quality Control Commission (August 18, 1991) are summarized and reported in Table 5.

TABLE 5

HYDROCARBON SOIL & GROUNDWATER CONTAMINATION STANDARDS
STATE OF NEW MEXICO
RANKING FOR THE SITE > 19

Parameter	Max. Allowable Limits Groundwater (µg/l)
Benzene	10
Toluene	750
Ethylbenzene	750
Total Xylene	620
Polynuclear aromatic Hydrocarbons	
total Naphthalene	30
Benzo(a)pyrene	0.7

Notes: 1) µg/l - equivalent to parts per billion.

DISCUSSION

Surface Mounding

As mentioned earlier, surface mounding was initiated at the end of June, 1993. The static water level appears to have stabilized once the rate of flow into the air stripper was increased. The normal flow rate into the air stripper was at approximately 2 - 4 gallons per minute (gpm). After initiating the surfacing mounding (flow rate at 2 - 4 gpm), the flow rate into the air stripper was increased to approximately 6 - 8 gpm.

With daily monitoring of the flow rates mentioned above (on a temporary basis), the remediation system should increase in terms of effectiveness. However; at this time, there is insufficient historical data to draw a firm conclusion.

Groundwater Gradient

The potentiometric map (refer to Appendix A) indicates that the groundwater flow direction for the area of the contaminated plume leads directly into the sump and the intercept gallery. Since the surface mounding and the in-flow to the air stripper appears to be at equilibrium, the area of the suspected hydrocarbon contamination within the vadose zone should theoretically be remediated (i.e. maintaining optimal soil moisture in the vadose zone enhancing microbial activity of hydrocarbon degrading bacteria).

System Effectiveness

Based upon the laboratory analyses, the system appears to be remediating the site. With upgradient infiltration of treated groundwater and downgradient intercept of the hydrocarbon contaminated groundwater, the system is theoretically closed.

Monitor well #6, which is located within the area of the suspected hydrocarbon contaminated plume, is the only water sample with Benzene above the regulatory standards at this time. The previous laboratory analysis for monitor well # 6 indicates reports a higher level of Benzene and total Zylenes. Because of the dramatic drop in these levels, it appears that the system is effectively remediating the site. Once the Benzene and/or total BTEX for monitor well #6 has dropped below the regulatory standards for at least 3 consecutive quarters, a final follow-up site assessment will be conducted within the suspected hydrocarbon plume area to verify that contamination within the vadose zone is also below the regulatory standards.

LIMITATIONS AND CLOSURE

The scope of Envirotech's services was limited to sampling of the designated monitor wells, the air stripper effluent, and the sump (recovery well-collection system), and measurement of the water level in those wells. All work has been performed in accordance with generally accepted professional practices in geotechnical/ environmental engineering and hydrogeology.

The Quarterly Monitoring Report has been prepared for the exclusive use of Amoco Production Company as it pertains to their San Juan Gravel A -1E facility located on the SE/4 of the NE/4 of Section 21, Township 29N, Range 13W, NMPM, San Juan County, New Mexico.

I certify that I am personally familiar with the investigative work at the site, the site conditions, and the reported information as described and this document.

Respectfully Submitted,
ENVIROTECH, INC.

Nelson Velez
Geologist

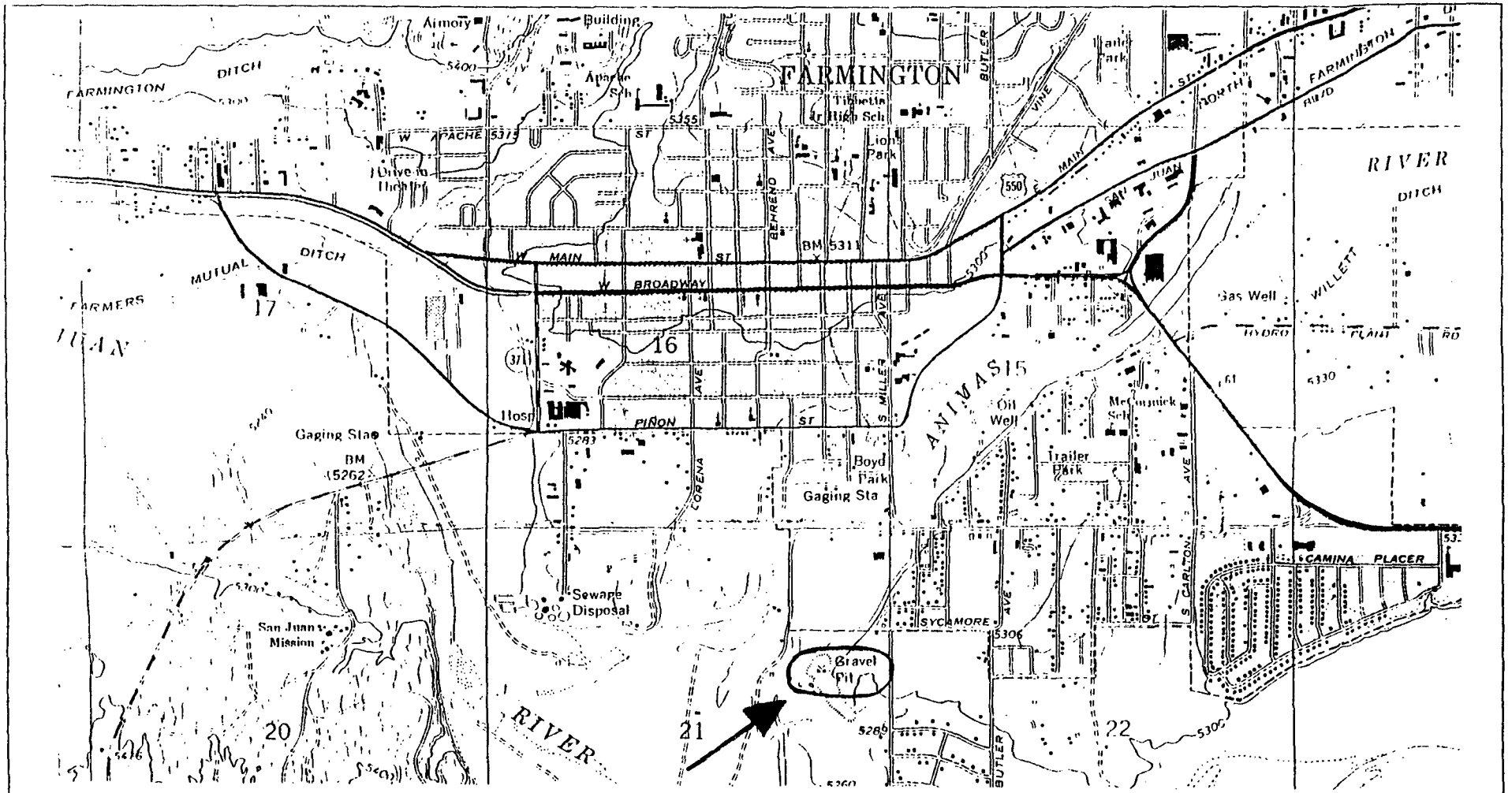
Reviewed By:

Michael K. Lane, P.E.
Geological Engineer

Appendix

NV/NV

SJG2QM93.RPT



REFERENCE: USGS FARMINGTON SOUTH QUADRANGLE, SAN JUAN COUNTY, NM 7.5" SERIES

AMOCO PRODUCTION COMPANY
SAN JUAN GRAVEL A-1E
SEC 21, TWP 29N, RNG 13W
SAN JUAN COUNTY, NEW MEXICO
PRODUCTION TANK PIT AREA

REMEDIATION PLAN PROJECT NO: 92140/94012

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, MEW MEXICO 87401
PHONE: (505) 632-0615

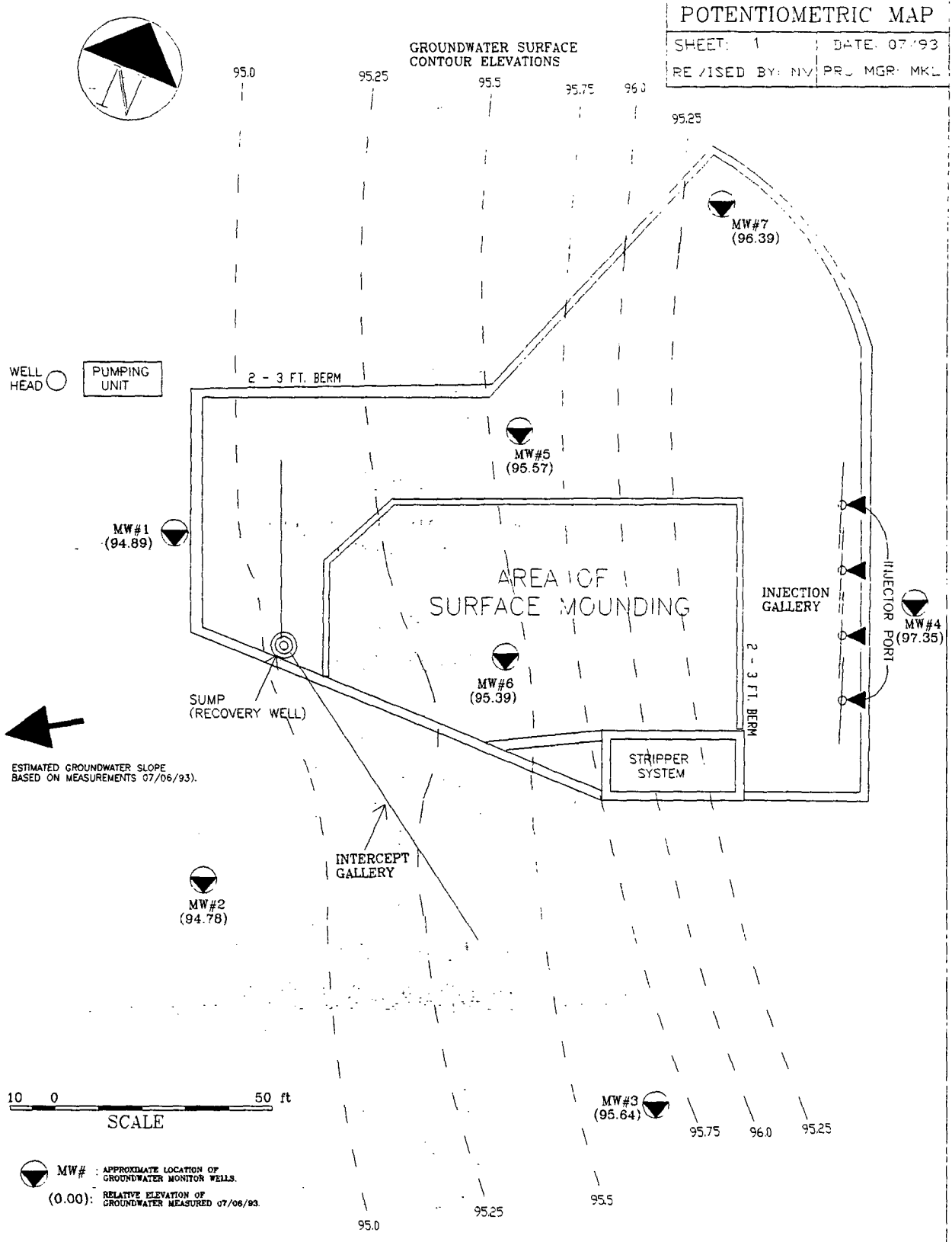
GROUNDWATER REMEDIATION
COLLECTION SYSTEM
VICINITY MAP

SHEET: 1	DRAWN: 5/92
DRWN BY: MKL	PRJ MGR: MKL

GROUNDWATER REMEDIATION
COLLECTION SYSTEM

POTENTIOMETRIC MAP

SHEET: 1 | DATE: 07/93
REVISED BY: NV | PROJ MGR: MKL



AMOCO PRODUCTION COMPANY
SAN JUAN GRAVEL A-1E
SEC 21, TWP 29N, RNG 13W
SAN JUAN COUNTY, NEW MEXICO
PRODUCTION TANK PIT AREA
QUARTERLY MONITORING REPORT PROJECT NO:92140/C4012

ENVIROTECH INC.
ENVIRONMENTAL SCIENTISTS & ENGINEERS
5796 U.S. HIGHWAY 64-3014
FARMINGTON, MEW MEXICO 87401
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STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

May 24, 1993

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-344

Mr. B.D. Shaw
Amoco Production Company
200 Amoco Court
Farmington, New Mexico 87401

RE: GROUND WATER MONITORING PLAN
AMOCO SAN JUAN GRAVEL A-1E WELL SITE
FARMINGTON, NEW MEXICO

Dear Mr. Shaw:

The New Mexico Oil Conservation Division (OCD) has completed a review of Amoco's March 1993 "GROUNDWATER PLAN, AMOCO PRODUCTION COMPANY, SAN JUAN GRAVEL A-1E PRODUCTION TANK PIT AREA, SE/4, NE/4 (H) SECTION 21, T29N, R13W, NMPM, FARMINGTON, SAN JUAN COUNTY, NEW MEXICO" which was submitted to OCD on April 6, 1993 by Amoco's consultant Envirotech, Inc. The plan contains the results of Amoco's investigation of the extent of ground water contamination related to the San Juan Gravel A-1E well site and monitoring of effluent from the ground water remediation system.

The recommendations contained in the above referenced document **are hereby approved with the following conditions:**

1. Effluent from the air stripper will be sampled for polynuclear aromatic hydrocarbons on a semiannual basis.

2. Ground water from the recovery well will be sampled and analyzed:

   a. Quarterly for concentrations of benzene, toluene, ethylbenzene and xylenes, and;

   b. Semiannually for polynuclear aromatic hydrocarbons.

3. The quarterly reports will include:

   a. A potentiometric map showing the hydraulic gradient of the ground water.

   b. Tables listing the results of all past and present sampling events for each well and the air stripper effluent .

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

5. Amoco will notify OCD at least 72 hours in advance of sampling events such that OCD may have the opportunity to witness the activities and/or split samples

Please be advised that OCD approval will not limit Amoco to the proposed work plan should the remediation system fail to adequately contain and remediate petroleum contaminated ground water related to Amoco activities. In addition, OCD approval does not relieve Amoco of liability for compliance with any other federal, state, city and county laws and/or regulations.

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

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Aztec Office

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	Effluent	Date Reported:	07-13-93
Laboratory Number:	5578	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	Cool	Date Analyzed:	07-12-93
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	86 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	Effluent	Date Reported:	07-12-93
Laboratory Number:	5579	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	HgCl and Cool	Date Analyzed:	07-07-93
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.5
Ethylbenzene	ND	0.3
p,m-Xylene	ND	0.4
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	83 %
Bromofluorobenzene	81 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	Sump	Date Reported:	07-13-93
Laboratory Number:	5576	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	Cool	Date Analyzed:	07-12-93
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	91 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	Sump	Date Reported:	07-12-93
Laboratory Number:	5577	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	HgCl and Cool	Date Analyzed:	07-07-93
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.5
Ethylbenzene	ND	0.3
p,m-Xylene	ND	0.4
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	86 %
Bromofluorobenzene	97 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 2	Date Reported:	07-12-93
Laboratory Number:	5580	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	HgCl and Cool	Date Analyzed:	07-07-93
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	2.0	0.3
Toluene	ND	0.5
Ethylbenzene	ND	0.3
p,m-Xylene	ND	0.4
o-Xylene	8.0	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	81 %
Bromofluorobenzene	82 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 4	Date Reported:	07-12-93
Laboratory Number:	5581	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	HgCl and Cool	Date Analyzed:	07-07-93
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.5
Ethylbenzene	ND	0.3
p,m-Xylene	ND	0.4
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	93 %
Bromofluorobenzene	85 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 5	Date Reported:	07-12-93
Laboratory Number:	5582	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	HgCl and Cool	Date Analyzed:	07-07-93
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.5
Ethylbenzene	ND	0.3
p,m-Xylene	ND	0.4
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	85 %
Bromofluorobenzene	84 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW # 6	Date Reported:	07-12-93
Laboratory Number:	5583	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Preservative:	HgCl and Cool	Date Analyzed:	07-07-93
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	54	0.3
Toluene	2.9	0.5
Ethylbenzene	36.1	0.3
p,m-Xylene	126	0.4
o-Xylene	107	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	98 %
Bromofluorobenzene	99 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: SJ GVL A 1E Production Pit C4012

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	NA	Project #:	NA
Sample ID:	Laboratory Blank	Date Reported:	07-12-93
Laboratory Number:	0707PM.BLK	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	NA	Date Analyzed:	07-07-93
Condition:	NA	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.3
Toluene	ND	0.5
Ethylbenzene	ND	0.3
p,m-Xylene	ND	0.4
o-Xylene	ND	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	96 %
Bromofluorobenzene	89 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments:

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** QUALITY ASSURANCE EPA METHOD 8020
MATRIX SPIKE - AROMATIC VOLATILE ORGANICS

Client:	NA	Project #:	NA
Sample ID:	Sample Spike	Date Reported:	07-12-93
Laboratory Number:	5589-S-BTEX.	Date Sampled:	07-06-93
Sample Matrix:	Water	Date Received:	07-06-93
Analysis Requested:	BTEX	Date Analyzed:	07-07-93
Condition:	NA		

Parameter	Sample Result (ug/L)	Spike Added (ug/L)	Spiked Sample Result (ug/L)	Det. Limit (ug/L)	Percent Recovery	SW-846 % Rec. Accept. Range
Benzene	228.9	20.0	232.5	0.3	93	39-150
Toluene	2.6	20.0	19.6	0.5	87	46-148
Ethylbenzene	3.3	20.0	18.9	0.3	81	32-160
p,m-Xylene	3.2	20.0	20.2	0.4	87	46-148
o-Xylene	0.7	20.0	21.7	0.3	105	46-148

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Review

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CHAIN OF CUSTODY RECORD

C4012

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
AMOCO 92140	PROD. PIT SJ GUL A 1E	
Sampler: (Signature) Nelson Velez	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8020)	PAH (8100)					Remarks
SUMP	7/6/93	0910	5576	WATER	1		✓					
SUMP	7/6/93	0915	5577	WATER	2	✓						
EFFLUENT	7/6/93	0930	5578	WATER	1		✓					
EFFLUENT	7/6/93	0925	5579	WATER	2	✓						
MW #2	7/6/93	0945	5580	WATER	2	✓						
MW # 4	7/6/93	1025	5581	WATER	2	✓						
MW # 5	7/6/93	1025	5582	WATER	2	✓						
MW #6	7/6/93	1015	5583	WATER	2	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	7/6/93	1425 ~~1425~~ NV 7/6/93	[signature]	7-6-93 ~~1500~~	1500
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
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