ROSENMAN & COLIN

575 MADISON AVENUE, NEW YORK, NY 10022-2585

TELEPHONE (212) 940-8800
CABLE ROCOKAY NEWYORK
TELECOPIER (212) 940-8776
(212) 935-0679
TELEX 427571 ROSCOL (ITT)
971520 RCFLC NYK (W. U.)

September 17, 1991

SAMUEL I. ROSENMAN (1896-1973)
RALPH F. COLIN (1900-1985)

WASHINGTON OFFICE
1300 19TH STREET, N. W.
WASHINGTON, D. C. 20036
TELEPHONE (202) 463-7177

RICHARD G. LELAND
(212) 940-8700

BY HAND

Dorothy Allen
Project Manager
United States Environmental Protection Agency
Region II
26 Federal Plaza
New York, N.Y. 10278

Re: Anchor Chemical Superfund Site, Hicksville, N.Y.
Administrative Order, Index No. II CERCLA-90208

Dear Ms. Allen:

As per the above-referenced Administrative Order, enclosed please find a "Tank Closure Report," dated August 23, 1991.

Sincerely,

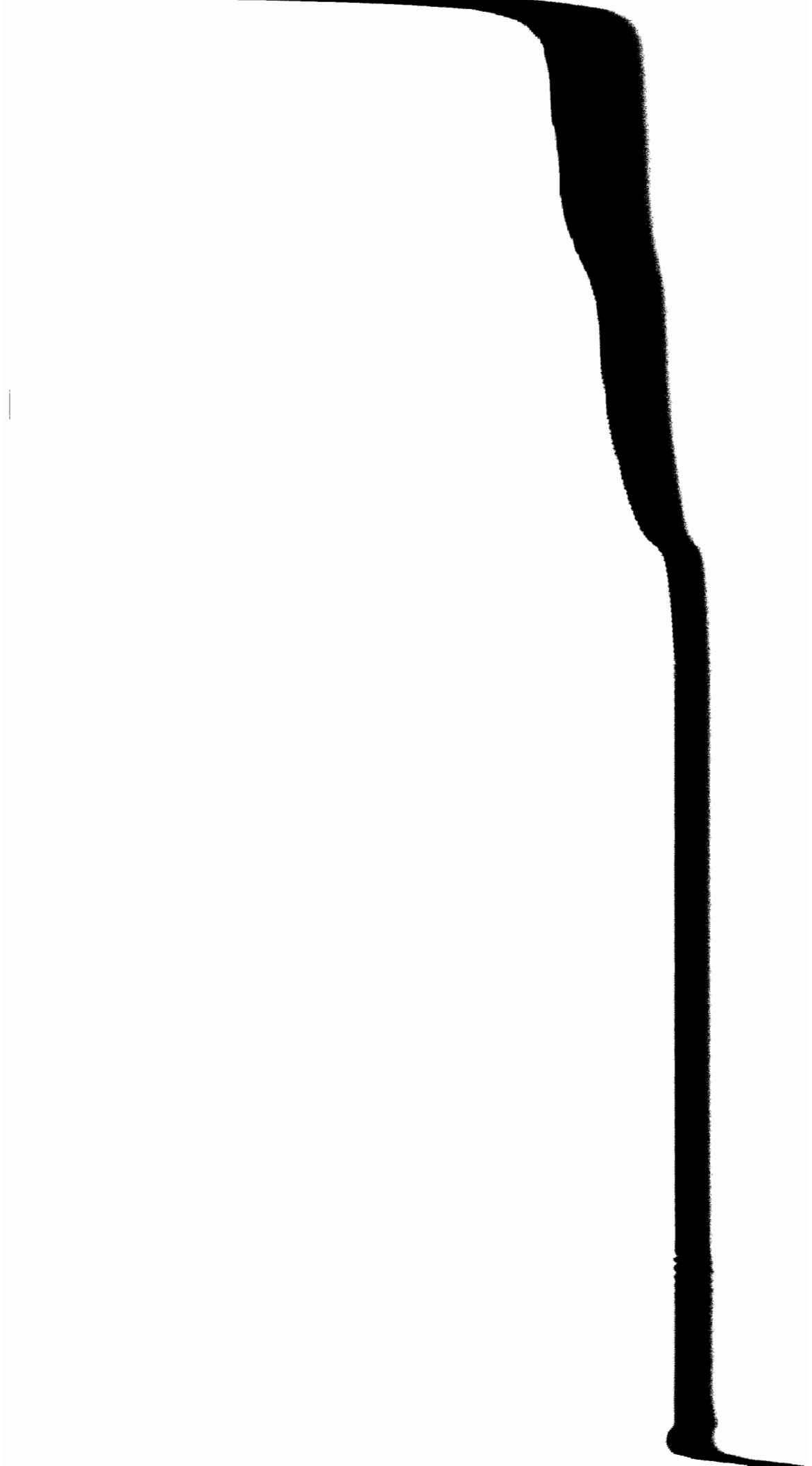
Richard G. Leland (K.C.B.)

Richard G. Leland

Encl.

cc: Spiegel Associates (w/out encl.)

301657



TANK CLOSURE REPORT

Anchor Chemical Site
500 W. John Street
Hicksville, New York

August 23, 1991

Prepared for:

Spiegel Associates
375 North Broadway
Jericho, New York 11753

Prepared by:

ROUX ASSOCIATES, INC.
775 Park Avenue
Huntington, New York 11743

The underground tank inspection (Task 2) at the Anchor Chemical Site was performed in accordance with the Anchor Chemical Remedial Investigation Work Plan. This task consisted of inspecting and sampling (if applicable) 12 underground tanks of unknown status located beneath the concrete floor of the 500 West John Street building.

The underground tank inspection and closure was conducted from June 8 through June 14, 1991 by Enro-Serve, a subsidiary of Stout Environmental. Enro-Serve was contracted to Spiegel Associates to perform the underground tank inspection in accordance with the April 10, 1991 RI Work Plan and Project Operations Plan for the Site. Roux Associates, Inc., observed the underground tank inspection as consultant to Spiegel Associates, while Alliance Technology observed the operation as consultant to the United States Environmental Protection Agency (USEPA).

Prior to initiation of the work, Spiegel Associates hired a construction contractor to install plastic dust barriers within the building to contain any dust or debris created by the work. The building, which is currently occupied by a furniture company, was evacuated for the duration of the underground tank inspection as specified in the Site Health and Safety Plan.

On June 8, 1991 Enro-Serve cut through the building's concrete floor (approximately 4-inches thick) to expose the manways of eight of the underground tanks. All concrete debris was removed from the building and carted away the same day. The following week (June 10-14, 1991), Enro-Serve exposed the remaining four tanks to be inspected and opened the 12 tanks. The Enro-Serve worker who open the tanks wore a full-face respirator on an air line connected to bottled air, and took explosimeter and percent oxygen measurements within each tank immediately after opening the manways.

In the north room (the Combustible Mixing Room [CMR]), Enro-Serve exposed and opened the manways of Tanks 1 through 4. Tanks 1, 2, and 3 were found completely filled with concrete, while Tank 4 was found half filled with concrete (Figure 1). Tank 1 was slightly overfilled with concrete and the manway cover was bulging. All soil that had been removed from above the tanks was piled along the north wall inside the CMR. The soil appeared clean, and all Hnu readings (taken by Alliance) were reportedly zero.

In the south room (the Flammable Mixing Room [FMR]), the concrete slab was removed in about six locations, and the seven tanks to be investigated (Tanks 7, 9, 10, 12, 13, 14, and 17) had been located. Each tank had a manway with the exception of Tank 17. Enro-Serve opened the manways of these tanks and used a Sawsall saw to cut open Tank 17. Four of these tanks (Tanks 9, 12, 13, and 14) were found filled with concrete, and Tanks 7, 10, and 17 were empty and, based on our visual inspection and Hnu readings, appeared clean (Figure 1).

In the warehouse, Tank 16 was located and a manway exposed (Figure 1). When the manway was opened, Enro-Serve's initial explosimeter reading was within the explosive range, but this quickly dropped to background levels. The tank contained about 550 gallons of water. OVM and Hnu readings were zero above and inside the tank prior to sampling the water. Enro-Serve bailed water from the tank using a "sludge judge" (similar to a bailer) and collected samples. The samples collected by Enro-Serve were turned over to Roux Associates, Inc. to label, complete chain-of-custody documentation, pack on ice, and ship to CEIMIC Corporation's laboratory for TCLP analysis. Alliance collected a split sample to be analyzed by the USEPA's laboratory.

After sampling the water, Enro-Serve pumped the water from Tank 16 into eleven 55-gallon drums. All 55-gallon drums were sealed and placed just outside the building on pallets. Each drum lid was labeled as "Hazardous Waste Liquid". The 55-gallon drums were later moved to the northwest corner of the Site and properly stored on pallets on pavement and within a bermed area constructed of sand.

The four empty tanks (Tanks 7, 10, 16, and 17) were cleaned on July 12, 1991. Enro-Serve lowered a man into each tank to clean it. The worker within the confined space cleaning the inside of the tanks was in full Level B attire, in a full-face respirator on an airline (supplied bottled air), and attached to safety ropes. One Enro-Serve worker was outside the tank holding the safety ropes, and another was lowering equipment to the man in the tank. If liquid remained in the bottom of the tank, it was removed with a diaphragm pump. Each of the four tanks was scraped, and the scrapings removed either with a pump or manually (bucket). Oil-Dri absorbent was lowered into the tanks that had moisture in them, and

spread around with a shovel. All the used Oil-Dri was removed from the tanks and drummed.

After scrapping Tank 10, the total vapor readings measured on the OVM and Hnu were approximately 234 ppm and 55 ppm, respectively. CO_2 gas (fire extinguisher), added to the tank to decrease the vapor concentration, brought the OVM reading down to 33 ppm. Enro-Serve then tried to remove all remaining vapors by pumping air into Tank 10 while all workers left the building. The OVM reading then increased to 201 ppm. This prompted Enro-Serve to power-wash Tank 10 with cold water to remove vapors trapped in the tank walls. Rinse water was vacuumed from the tank, Oil-Dri was used to absorb the remaining moisture, and the used Oil-Dri removed from the tank and drummed.

According to the federal underground storage tank (UST) regulations, a tank should be clean and "vapor-free" prior to abandonment. To accomplish this, Enro-Serve used dry ice and CO_2 gas (fire extinguisher) to evacuate the vapors which remained in Tanks 4, 7, 10, and 17. The final OVM and Hnu readings for each empty (and partially empty) tank are given in Table 1.

With the USEPA's approval, Enro-Serve and a concrete contractor filled Tanks 7, 10, 16, and 17, and the remainder of Tank 4 with concrete. The results of the tank inspections are summarized in Table 2.

After the tanks had been filled with concrete, Malcolm Barkan of MIB Consulting (affiliated with Enro-Serve) marked out the locations of six soil borings to be drilled within the building, and prepared a map of these locations.

The sample collected from Tank 16, along with additional sample volume collected from the drums stored at the Site, was shipped to CEIMIC Corp. (laboratory) by Roux Associates. The sample was analyzed for the toxicity characteristic leaching procedure (TCLP) parameters, plus ignitability, reactivity, and corrosivity according to USEPA Methods. Two metals were detected in the sample as follows: arsenic (0.3 ppm), and barium (0.02 ppm). All other analytes were below the applicable detection limit. CEIMIC Corporation's analytical report is given in Appendix A.

Respectfully submitted,

ROUX ASSOCIATES, INC.

Joanne Yeary
Senior Hydrogeologist

Paul Roux
President

301662

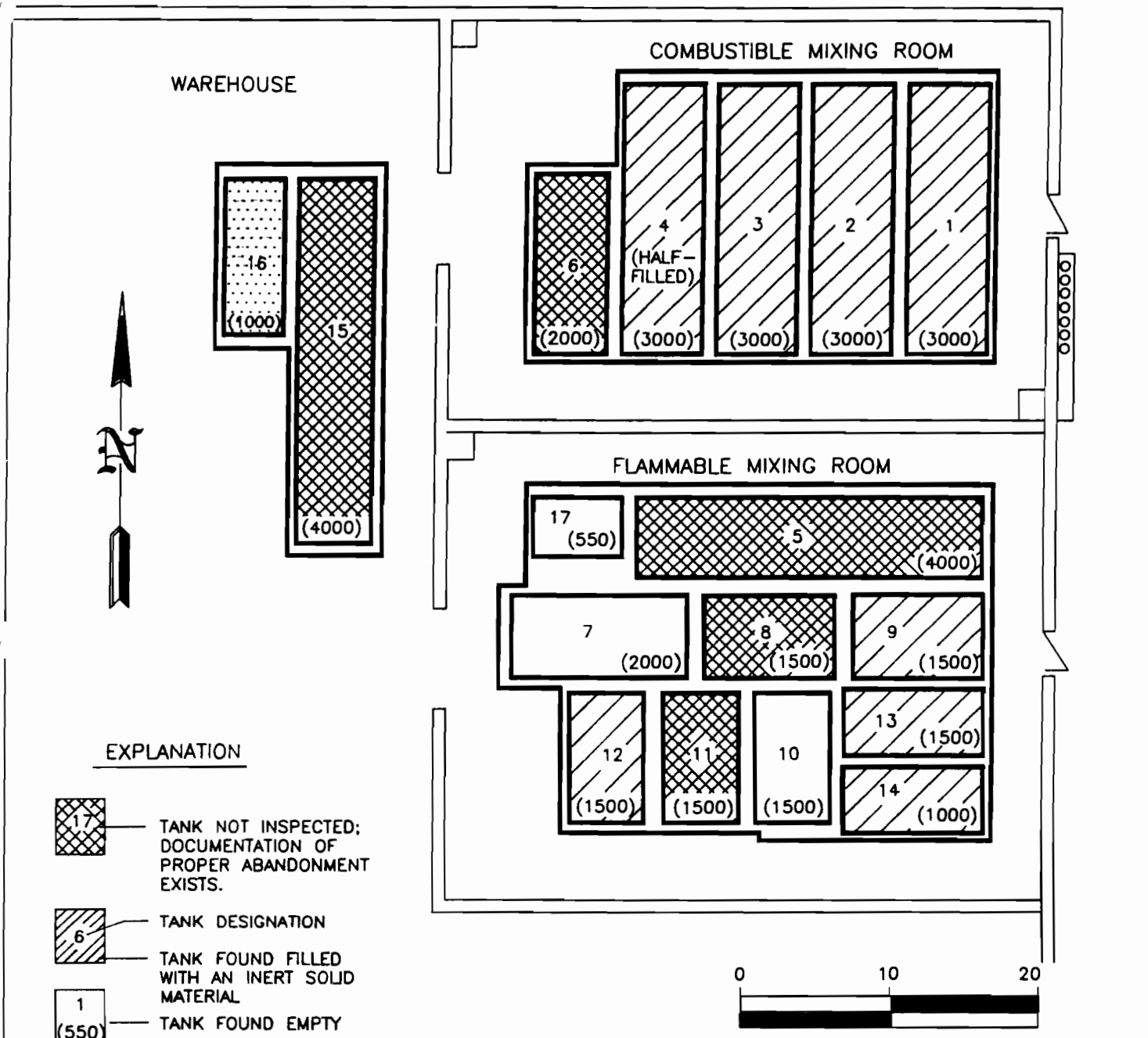
Table 1. Final Photoionization Meter Readings Taken Within the Underground Tanks on June 12, 1991, Anchor Chemical Site, Hicksville, New York.

Tank Designation	OVM Reading (ppm)	Hnu Reading (ppm)
Tank 4	0 to 1.3	6 to 7
Tank 7	0	19
Tank 10	9	5
Tank 16	0	0
Tank 17	4	3.8

Table 2. Summary of Underground Tank Inspections Performed from June 8 Through June 12, 1991, Anchor Chemical Site, Hicksville, New York.

Tank Designation	Tank Contents	Work Performed by Enro-Serve
Tank 1	Concrete	None
Tank 2	Concrete	None
Tank 3	Concrete	None
Tank 4	1/2 Concrete 1/2 Empty	Vapors removed, tank filled with concrete
Tank 7	Empty	Tank scrapped, dried, vapors removed, tank filled with concrete
Tank 9	Concrete	None
Tank 10	Empty	Tank scrapped, power-washed, dried, vapors removed and tank filled with concrete
Tank 12	Concrete	None
Tank 13	Concrete	None
Tank 14	Concrete	None
Tank 16	550 gallons of water	Water sampled and removed, tank scrapped, dried and filled with concrete
Tank 17	Empty	Tank scrapped, dried, vapors removed and tank filled with concrete

FIGURES



EXPLANATION

17 — TANK NOT INSPECTED; DOCUMENTATION OF PROPER ABANDONMENT EXISTS.

6 — TANK DESIGNATION

TANK FOUND FILLED WITH AN INERT SOLID MATERIAL

1 (550) — TANK FOUND EMPTY

TANK CAPACITY, IN GALLONS

16 — TANK FOUND TO CONTAIN WATER; WATER SAMPLED

NOTE: STATUS OF TANKS DURING TASK 2 OF REMEDIAL INVESTIGATION, JUNE 8–14, 1991

Title:

STATUS OF UNDERGROUND STORAGE TANKS AT THE ANCHOR CHEMICAL SITE

HICKSVILLE, NEW YORK

Prepared For: SPIEGEL ASSOCIATES

ROUX ASSOCIATES, INC
Consulting Ground-Water Geologists & Engineers

Compiled by: J.Y.	Date: 7/91	FIGURE
Prepared by: S.W.	Scale: SHOWN	1
Project Mgr: J.Y.	Revision:	
File No: SP603A02		

301667

APPENDIX A

CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

July 17, 1991

Mr. Fred Werfel
Spiegel Associates
375 North Broadway
Jericho, NY 11753

Dear Mr. Werfel:

Enclosed is the data report of results for the analyses of samples which were received at CEIMIC Corporation on June 12, 1991.

Due to difficulty with the herbicide analyses, the samples had to be reextracted out of holding time.

Please call if you have any questions.

Sincerely,

Kin S. Chiu
Organic Laboratory
Manager

KSC/ll

enc.

301670

10 Dean Knauss Drive, Narragansett, R.I. 02882 • (401) 782-8900 • FAX (401) 782-8905

VOLATILE ORGANIC ANALYSES

CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

SURROGATE RECOVERY SUMMARY

Volatile Organics Analysis

Client: Roux Associates

Date Samples Received: 6/12/91

Project No.: 910312

Matrix: Leachate

Surrogate Compound	TCLP Extraction Blank	Samples -01	QC Limits
1,2-Dichloroethane-d4	97 %	96 %	76 - 114
Toluene-d8	99	102	88 - 110
Bromofluorobenzene	97	104	86 - 115

Reported by: KC

301672

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

VOLATILE ORGANICS TARGET ANALYTES

Client: Roux Associates

Client Sample ID: TCLP Extraction Blank Date Sampled: NA

Laboratory ID: VTCLP0618-B1 Date TCLP performed: 6/18/91

Concentration in: ug/L (ppb) Date Leachate Analyzed: 6/24/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
Benzene	ND	5	--	--
Carbon tetrachloride	ND	5	--	--
Chlorobenzene	ND	5	--	--
Chloroform	ND	5	--	--
1,2-Dichloroethane	ND	5	--	--
1,1-Dichloroethylene	ND	5	--	--
Methylethylketone	ND	10	--	--
Tetrachloroethylene	ND	5	--	--
Trichloroethylene	ND	5	--	--
Vinyl chloride	ND	10	--	--
Pyridine	ND	1,000	--	--

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

NA = Not applicable
ND = Not detected

Reported by: AJK Approved by: KC

301673

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

VOLATILE ORGANICS TARGET ANALYTES

Client: Roux Associates

Client Sample ID: Tank 16 — Date Sampled: 6/11/91

Laboratory ID: 910312-01 — Date TCLP performed: 6/18/91

Concentration in: ug/L (ppb) — Date Leachate Analyzed: 6/20/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
Benzene	ND	5	ND	7
Carbon tetrachloride	ND	5	ND	6
Chlorobenzene	ND	5	ND	7
Chloroform	ND	5	ND	6
1,2-Dichloroethane	ND	5	ND	6
1,1-Dichloroethylene	ND	5	ND	5
Methylethylketone	ND	10	ND	12
Tetrachloroethylene	ND	5	ND	6
Trichloroethylene	ND	5	ND	6
Vinyl chloride	ND	10	ND	11
Pyridine	ND	1,000	ND	2,300

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Library Search:

Compound	Retention Time	Estimated Concentration
Unknown	3.92 min.	8
Acetone	4.47	310
Methylene Choride	5.23	200

ND = Not detected

Reported by: AJK — Approved by: KC

301674

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CEIMIC
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"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

VOLATILE ORGANICS TARGET ANALYTES

MATRIX SPIKE ANALYSIS SUMMARY

EPA METHOD 8240

Client: Roux Associates

Client Sample ID: Tank 16 Laboratory ID: 910312-01

Date Analyzed: 6/26/91 Concentration in: ug/L (ppb)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
Benzene	ND	50	37	75%
Carbon tetrachloride	ND	50	44	88
Chlorobenzene	ND	50	37	74
Chloroform	ND	50	43	86
1,2-Dichloroethane	ND	50	40	79
1,1-Dichloroethylene	ND	50	49	98
Methylethylketone	ND	50	41	82
Tetrachloroethylene	ND	50	40	80
Trichloroethylene	ND	50	44	88
Vinyl chloride	ND	50	47	94
Pyridine	ND	2000	870	44

This matrix spike analysis summary applies to the following samples:
Tank 16

ND = Not detected

Reported by: AJK Approved by: KC

301675

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TCLP SEMIVOLATILE ORGANIC ANALYSES

CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

SURROGATE RECOVERY SUMMARY

Semivolatile Organics

Client: Roux Associates

Project No.: 910312

Date Samples Received: 6/20/91

Matrix: TCLP Leachate

Surrogate Compound	TCLP Extraction Blank	Samples -01	-01MS	QC Limits
2-Fluorophenol	69 %	71 %	70 %	21-100
Phenol-d5	54	54	51	10 -94
2,4,6-Tribromophenol	72	65	72	10-123
Nitrobenzene-d5	82	87	87	35-114
2-Fluorobiphenyl	79	90	84	43-116
Terphenyl-d14	105	109	93	33-141

Reported by: GMD.

301677

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CEIMIC
CORPORATION

"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

SEMIVOLATILE ORGANIC ANALYSIS

EPA METHOD 8270

Client: Roux Associates — Date Sampled: NA

Client Sample ID: TCLP Extraction Blank — Date TCLP Performed: 6/17/91

Laboratory ID: STCLP0617-B1 — Date Leachate Prepared: 6/18/91

Concentration in: ug/L (ppb) — Date Extract Analyzed: 6/20/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
2,4-Dinitrotoluene	ND	33	--	--
Hexachlorobenzene	ND	33	--	--
Hexachloro-1,3-butadiene	ND	33	--	--
Hexachloroethane	ND	33	--	--
Nitrobenzene	ND	33	--	--
1,4-Dichlorobenzene	ND	33	--	--
Methylphenols (total)	ND	33	--	--
Pentachlorophenol	ND	160	--	--
2,4,5-Trichlorophenol	ND	160	--	--
2,4,6-Trichlorophenol	ND	33	--	--

ND = Not detected

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Reported by: BMC — Approved by: KC

301678

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

SEMIVOLATILE ORGANIC ANALYSIS

EPA METHOD 8270

Client: Roux Associates
Client Sample ID: Tank 16
Laboratory ID: 910312-01
Concentration in: ug/L (ppb)

Date Sampled: 6/11/91
Date TCLP Performed: 6/17/91
Date Leachate Prepared: 6/18/91
Date Extract Analyzed: 6/20/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
2,4-Dinitrotoluene	ND	33	ND	52
Hexachlorobenzene	ND	33	ND	46
Hexachloro-1,3-butadiene	ND	33	ND	46
Hexachloroethane	ND	33	ND	59
Nitrobenzene	ND	33	ND	38
1,4-Dichlorobenzene	ND	33	ND	52
Methylphenols (total)	ND	33	ND	52
Pentachlorophenol	ND	160	ND	260
2,4,5-Trichlorophenol	ND	160	ND	270
2,4,6-Trichlorophenol	ND	33	ND	53

ND = Not detected

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Reported by: [signature] Approved by: KC

301679

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

SEMIVOLATILE ORGANIC ANALYSIS

MATRIX SPIKE ANALYSIS SUMMARY

EPA METHOD 8270

Client: Roux Associates

Client Sample ID: Tank 16MS Laboratory ID: 910312-01MS

Date Analyzed: 6/20/91 Concentration in: ug/L (ppb)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
2,4-Dinitrotoluene	ND	125	79	63 %
Hexachlorobenzene	ND	125	89	71
Hexachloro-1,3-butadiene	ND	125	90	72
Hexachloroethane	ND	125	70	56
Nitrobenzene	ND	125	109	87
1,4-Dichlorobenzene	ND	125	80	64
Methylphenols (total)	ND	500	319	64
Pentachlorophenol	ND	250	155	62
2,4,5-Trichlorophenol	ND	250	151	60
2,4,6-Trichlorophenol	ND	250	155	62

This matrix spike analysis summary applies to the following samples:

Tank 16

Reported by: GMD Approved by: KC

301680

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TCLP PESTICIDES ANALYSES

CEIMIC
CORPORATION

"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

SURROGATE RECOVERY SUMMARY

Organochlorine Pesticides Analysis

Client: Roux Associates

Date Samples Received: 6/12/91

Project No.: 910312

Client ID	Laboratory ID	Dibutylchlorendate Recovery
Tank 16	910312-01	91 %
QA/QC		
TCLP Extraction Blank	PTCLP-0617-B1	99
Tank 16MS	910312-01MS	86

Reported by: _____

301682

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CEIMIC
CORPORATION

"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

ORGANOCHLORINE PESTICIDES

EPA Method 8080

Client: Roux Associates

Client Sample ID: TCLP Extraction Blank

Laboratory ID: TCLP617-B1

Concentration in: ug/L (ppb)

Date Sampled: 6/21/91

Date TCLP Performed: 6/21/91

Date Leachate Prepared: 6/18/91

Date Extract Analyzed: 6/21/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
gamma-BHC (Lindane)	ND	0.16	ND	0.21
Heptachlor	ND	0.16	ND	0.17
Heptachlor Epoxide	ND	0.16	ND	0.17
Endrin	ND	0.33	ND	0.33
Methoxychlor	ND	0.16	ND	0.19
Toxaphene	ND	3.3	ND	---
Chlordane	ND	0.16	ND	---

ND = Not detected

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Reported by: _____ Approved by: _____

301683

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

ORGANICHLORINE PESTICIDES

MATRIX SPIKE ANALYSIS SUMMARY

EPA METHOD 8080

Client: Roux Associates

Client Sample ID: Tank 16MS

Laboratory ID: 910312-01

Date Analyzed: 6/21/91

Concentration in: ug/L (ppb)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
gamma-BHC (Lindane)	ND	0.2	0.5	77 %
Heptachlor	ND	0.2	0.6	93
Heptachlor Epoxide	ND	0.2	0.6	93
Endrin	ND	0.5	2.2	133
Methoxychlor	ND	1.0	2.7	82
Toxaphene	ND	NA	---	---
Chlordane	ND	NA	---	---

This matrix spike analysis summary applies to the following samples:

Tank 16

Reported by: _____ Approved by: _____

301684

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CEIMIC
CORPORATION

"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

ORGANOCHLORINE PESTICIDES

EPA Method 8080

Client: Roux Associates

Client Sample ID: Tank 16

Laboratory ID: 910312-01

Concentration in: ug/L (ppb)

Date Sampled: 6/21/91

Date TCLP Performed: 6/21/91

Date Leachate Prepared: 6/18/91

Date Extract Analyzed: 6/21/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
gamma-BHC (Lindane)	ND	0.16	ND	0.21
Heptachlor	ND	0.16	ND	0.17
Heptachlor Epoxide	ND	0.16	ND	0.17
Endrin	ND	0.33	ND	0.33
Methoxychlor	ND	0.16	ND	0.19
Toxaphene	ND	3.3	ND	---
Chlordane	ND	0.16	ND	---

ND = Not detected

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Reported by: _____ Approved by: _____

301685

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TCLP HERBICIDES ANALYSES

CEIMIC
CORPORATION

"Analytical Chemistry for Environmental Management"

SURROGATE RECOVERY SUMMARY

Organochlorine Herbicides Analysis

Client: Roux Associates

Date Samples Received: 6/12/91

Project No.: 910312

Client ID	Laboratory ID	DCPAA* Recovery
Tank 16	910312-01	84%
QA/QC		
TCLP Extraction Blank	HTCLP0628-B2	89%
Matrix Spike	910312-01MS	86%
Laboratory Control Spike	H910702-LCS1	86%

DCPAA = Dichlorophenylacetic acid

Reported by: HL

301687

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

ORGANOCHLORINE HERBICIDES

EPA Method 8150

Client: Roux Associates — Date Sampled: NA

Client Sample ID: TCLP Extraction Blank — Date TCLP Performed: 6/28/91

Laboratory ID: HTCLP0628-B1 — Date Leachate Prepared: 7/02/91

Concentration in: ug/L (ppb) — Date Extract Analyzed: 7/09/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
2,4-D	ND	100	--	--
2,4,5-TP (Silvex)	ND	33	--	--

ND = Not detected

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Reported by: HL

Approved by: KC

301688

10 Dean Knauss Drive, Narragansett, R.I. 02882 • (401) 782-8900 • FAX (401) 782-8905

CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

ORGANOCHLORINE HERBICIDES

EPA Method 8150

Client: Roux Associates
Client Sample ID: Tank 16
Laboratory ID: 910312-01
Concentration in: ug/L (ppb)

Date Sampled: 6/11/91
Date TCLP Performed: 6/28/91
Date Leachate Prepared: 7/02/91
Date Extract Analyzed: 7/09/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
2,4-D	ND	100	ND	140
2,4,5-TP (Silvex)	ND	33	ND	50

ND = Not detected

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Reported by: HL

Approved by: KC

301689

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

ORGANOCHLORINE HERBICIDES

MATRIX SPIKE ANALYSIS SUMMARY

EPA Method 8150

Client: Roux Associates

Client Sample ID: Tank 16 Laboratory ID: 910312-01

Date Analyzed: 7/09/91 Concentration in: ug/L (ppb)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
2,4-D	ND	5.0	3.4	69%
2,4,5-TP (Silvex)	ND	1.0	0.7	68

ND = Not detected
This matrix spike analysis summary applies to the following samples:

Reported by: HL Approved by: KC

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CEIMIC
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ORGANOCHLORINE HERBICIDES

LABORATORY CONTROL SPIKE

EPA Method 8150

Client: Roux Associates

Client Sample ID: Laboratory Control Spike

Laboratory ID: H910702-LCS1

Date Sample Received: NA

Date Sample Prepared: 7/02/91

Date Sample Analyzed: 7/09/91

Matrix: Water

Target Analyte	% Recovery
2,4-D	70 %
Silvex	64

NA = Not applicable

Reported by: HL

Approved by: KC

301691

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TCLP METALS ANALYSES

CEIMIC
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"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: Roux Associates

Client Sample ID: Tank 16 — Date Sampled: 6/11/91

Laboratory ID: 910312-01 — Date TCLP performed: 6/17/91

Concentration in: mg/L (ppm) — Date Leachate Analyzed: 6/19/91

	Actual		Adjusted*	
Target Analyte	Sample Result	Method Reporting Limit	Sample Result	Method Reporting Limit
Arsenic	0.3	0.2	0.3	0.2
Barium	0.02	0.01	0.02	0.01
Cadmium	ND	0.01	ND	0.01
Chromium	ND	0.01	ND	0.01
Lead	ND	0.1	ND	0.1
Mercury	ND	0.0008	ND	0.008
Selenium	ND	0.3	ND	0.3
Silver	ND	0.02	ND	0.02

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

Reported by: _____ Approved by: _____

301693

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CEIMIC
CORPORATION
"Analytical Chemistry for Environmental Management"

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

MATRIX SPIKE ANALYSIS SUMMARY

EPA METHOD 1311

Client: Roux Associates

Client Sample ID: 6/11/91 Laboratory ID: 910312-01S

Date Analyzed: 6/19/91 Concentration in: mg/L (ppm)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
Arsenic	0.263	0.500	0.771	102 %
Barium	0.023	0.500	0.546	105
Cadmium	ND	0.500	0.647	129
Chromium	ND	0.500	0.529	106
Lead	ND	0.500	0.552	110
Mercury	ND	0.00100	0.00107	107
Selenium	ND	0.500	0.586	117
Silver	ND	0.500	0.475	95

This matrix spike analysis summary applies to the following samples:

Tank 16

Reported by: _____ Approved by: _____

301694

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CEIMIC
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"Analytical Chemistry for Environmental Management"

QUALITY CONTROL

METHOD BLANK

Client: Roux Associates

Client Sample ID: Method Blank

Date Sample Received: 910312 Laboratory ID: 0618PBW

Date Analysis Completed: 6/19/91 Concentration in: mg/L (ppm)

Target Analyte	Sample Concentration	Method Reporting Limits
Toxicity Characteristics Leaching Procedure (TCLP)		
Arsenic	ND	0.2
Barium	ND	0.01
Cadmium	0.01	0.01
Chromium	ND	0.01
Lead	ND	0.1
Mercury	ND	0.0008
Selenium	ND	0.3
Silver	ND	0.02

ND = Not detected

Reported by: _____ Approved by: _____

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CEIMIC
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"Analytical Chemistry for Environmental Management"

QUALITY CONTROL

METHOD BLANK

Client: Roux Associates

Client Sample ID: Filtration Blank

Date Sample Received: 910312 Laboratory ID: 0617FB

Date Analysis Completed: 6/19/91 Concentration in: mg/L (ppm)

Target Analyte	Sample Concentration	Method Reporting Limits
Toxicity Characteristics Leaching Procedure (TCLP)		
Arsenic	ND	0.2
Barium	0.03	0.01
Cadmium	ND	0.01
Chromium	ND	0.01
Lead	ND	0.1
Mercury	ND	0.0008
Selenium	ND	0.3
Silver	ND	0.02

ND = Not detected

Reported by: _____ Approved by: _____

301696

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CEIMIC
CORPORATION

"Analytical Chemistry for Environmental Management"

QUALITY CONTROL

LABORATORY CONTROL SAMPLE

Client: Roux Associates

Client Sample ID: Laboratory Control Sample

Project No.: 910312 Laboratory ID: 0618LCSW

Date Analysis Completed: 6/19/91 Matrix: Aqueous

Target Analyte	% Recovery	Control Limits
Toxicity Characteristic Leaching Procedure (TCLP)		
Arsenic	140 %	75-125 %
Barium	104	75-125
Cadmium	127	75-125
Chromium	106	75-125
Lead	104	75-125
Mercury	106	75-125
Selenium	112	75-125
Silver	93	75-125

Reported by: _____ Approved by: _____

301697

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INORGANIC ANALYTES

CEIMIC
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"Analytical Chemistry for Environmental Management"

INORGANIC ANALYTES

Client: Roux Associates

Client ID: Tank 16

Date Sample Received: 6/12/91

Laboratory ID: 910312-01

Date Analysis Completed: 6/19/91

Target Analyte	Result	Units	Method Reporting Limit
Flashpoint	No flash	°F	200 °F
pH	7.02	S.U.	--
Reactive Cyanide	ND	mg/L (ppm)	0.5
Reactive Sulfide	ND	mg/L (ppm)	2

ND = Not detected

Reported by: [signature] Approved by: [signature]

301699

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CEIMIC
CORPORATION

"Analytical Chemistry for Environmental Management"

QUALITY CONTROL

METHOD BLANK

Client: Roux Associates

Client ID: Method Blank

Project No.: 910312

Laboratory ID: PBW

Date Analysis Completed: 6/19/91

Target Analyte	Result	Units	Method Reporting Limit
Reactive Cyanide	ND	mg/L (ppm)	0.5
Reactive Sulfide	ND	mg/L (ppm)	2

ND = Not detected

Reported by: [signature]

Approved by: [signature]

301700

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Anson Environmental

Environmental Audits
Hazardous Waste
Asbestos Management
Groundwater Remediation
Storage Tank Management
Impact Statements
Wetland Investigations

256 Main Street
Northport, NY 11768
516-757-7090
(fax) 516-757-1229

April 22, 1992

Dorothy Allen, Project Manager
United States Environmental Protection Agency, Region II
26 Federal Plaza
New York, NY 10278

Re: Administrative Order Index No. II CERCLA-90208
Anchor Chemical Site
500 West John Street, Hicksville, NY

Dear Mrs. Allen:

Enclosed please find a copy of the revised report by the data validator, Environmental Standards Inc. As you requested, we obtained the CLP data package for the water from Tank 16 which was originally analyzed as TCLP. This revised report includes the validation of the CLP raw data for the Tank 16 water.

As this additional validation has confirmed that the water is not hazardous, we will dispose of it as soon as we receive your concurrence.

We trust this is satisfactory for your purposes. If you have any questions, please do not hesitate to call.

Very truly yours,

Dean Anson

Dean Anson II
Co-Facility Coordinator

cc (w/out enclosures):
Richard Leland, Esq.
James Doyle, Esq.
Arthur Sanders
Fred Werfel
Doug Sullivan
Stan Sucharski

301701

Environmental Standards, Inc.

April 16, 1992

Mr. Dean Anson
Anson Environmental
256 Main Street
Northport, NY 11768

Dear Mr. Anson:

Please find enclosed the revised quality assurance review of the data for the samples collected June 11, 1991 and August 10-23, 1991 as part of the Anchor Chemical project. In general, the data quality is good. However, some of the data has been qualified as estimated or rejected due to various quality control results, holding times and/or calibration issues.

Also included is the Section 7 (support documentation) for the TCLP analyses and an addition to Section 8 (case narrative for the TCLP data package). Please add these to the report previously sent to you (dated 11/18/91).

If you have any questions or comments, please feel free to call.

Sincerely,

Rock J. Vitale
Quality Assurance Specialist/Principal

RJV:cs
Enc.

Environmental Standards, Inc.

QUALITY ASSURANCE REVIEW

THE ANCHOR CHEMICAL PROJECT

April 16, 1992

Prepared for:

ANSON ENVIRONMENTAL
256 Main Street
Northport, NY 11768

Prepared by:

ENVIRONMENTAL STANDARDS, INC.
1220 Valley Forge Road
P.O. Box 911
Valley Forge, PA 19481

Environmental Standards, Inc.

QUALITY ASSURANCE REVIEW

THE ANCHOR CHEMICAL PROJECT

April 16, 1992

Prepared for:

ANSON ENVIRONMENTAL
256 Main Street
Northport, NY 11768

Prepared by:

ENVIRONMENTAL STANDARDS, INC.
1220 Valley Forge Road
P.O. Box 911
Valley Forge, PA 19481

TABLE OF CONTENTS

Introduction

This quality assurance review is based upon an examination of all data generated from the samples which were collected June 11, 1991 and August 10-23, 1991 at the Anchor Chemical site. The samples that have undergone a rigorous quality assurance review are listed on Table 1. It should be noted that multiple field blanks and trip blanks were designated "FB" or "TB". For the purposes of this report, the reviewer added the date each field blank (or trip blank) was collected as a suffix after the "FB" (or "TB") designation. This was done to distinguish between these samples.

The validation has been performed in accordance with the following U.S. EPA Region II documents:

> "CLP Organics Data Review and Preliminary Review," SOP No. HW-6, Revision #7
>
> "Evaluation of Metals Data for the Contract Laboratory Program (CLP)," SOP No. HW-2, Revision X

The reported analytical results are presented as a summary of the data in Section 2. Data were examined to determine the usability of the analytical results and also to determine contractual compliance relative to the analytical requirements specified in EPA's Contract Laboratory Program (CLP) protocols (SOW288 and SOW788). Qualifier codes have been placed next to the results so that the data user can quickly assess the qualitative and/or quantitative reliability of any result. Details of this quality assurance review are presented below in the narrative section of this report. This report was prepared to provide a critical review of the laboratory analyses and reported chemical results. Rigorous quality assurance reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most experienced and capable laboratories. The nature and extent of the problems identified in this quality assurance review should not be interpreted to mean that those results that do not have qualifier codes are less than valid.

TABLE 1

SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW

Anson Environmental Sample Number	Organic Laboratory Sample Number	Inorganic Laboratory Sample Number	Analyses Performed
RB-1 (RINSE BLANK)	8103-10	01499-12S	TI,V,S,P
FB821 (FIELD BLANK)	8200-03	01499-15S	TI,V,S,P
FB822 (FIELD BLANK)	8215-04	01499-18S	TI,V,S,P
FB823 (FIELD BLANK)	8224-05	01499-23S	TI,V,S,P
DW#2	8095-01	00499-01S	TI,V,S,P
DW#3	8095-02	00499-02S	TI,V,S,P
DW#4	8095-03	00499-03S	TI,V,S,P
DW#1	8103-01/08	00499-04S	TI,V,S,P
DW#5	8103-02	00499-05S	TI,V,S,P
DW#6	8103-03	00499-06S	TI,V,S,P
DW#7	8103-04	00499-07S	TI,V,S,P
DW#8	8103-05	00499-08S	TI,V,S,P
DW#9	8103-06	00499-09S	TI,V,S,P
DRAIN	8103-07	00499-10S	TI,V,S,P
DW#1MSD (or MS/MSD) (Field Dup of DW#1)	8103-08	00499-11S	TI,S
DW#1 25'-27'	8200-01	00499-13S	TI,V,S,P
DW#1 30'-32'	8200-02	00499-14S	TI,V,S,P
DW#6 35'-37'	8215-01	00499-16S	TI,V,S,P
DW#6 30'-32'	8215-02	00499-17S	TI,V,S,P

TABLE 1 (Cont.)

Anson Environmental Sample Number	Organic Laboratory Sample Number	Inorganic Laboratory Sample Number	Analyses Performed
DW#7 40'-42'	8224-01	00499-19S	TI,V,S,P
DW#7 45'-47'	8224-02	00499-20S	TI,V,S,P
DW#7 55'-57'	8224-03	00499-21S	TI,V,S,P
DW#7A 45'-47' (Field Dup of DW#7 45'-47')	8224-04	00499-22S	TI,V,S,P
TANK 16	910312-01	910312-01	TCLP VOA,SVOA, P,H,M,CH
TANK 16MS Lab Matrix Spike	910312-01MS	910312-01MS	TCLP VOA,SVOA, P,H,M,CH
DW#1MS (Lab Matrix Spike)	NA	00499-11SMS	TI
DW#1Dup (Lab Duplicate)	NA	00499-11SDup	TI
Trip Blank 810	8095-04	NA	V
Trip Blank 811	8103-11	NA	V
Trip Blank 822	8215-03	NA	V
Trip Blank 8231	8224-06	NA	V
Trip Blank 8232	8224-07	NA	V
DW#3MS (Lab Matrix Spike)	8095-02MS	NA	V
DW#3MSD (Lab Matrix Spike Dup)	8095-02MSD	NA	V
DW#1MS (Lab Matrix Spike)	8103-01/08MS	NA	V,S,P
DW#1MSD (Lab Matrix Spike Dup)	8103-01/08MSD	NA	V,S,P
DW#7 40'-42' (Lab Matrix Spike)	8224-01MS	NA	S,P

TABLE 1 (Cont.)

Anson Environmental Sample Number	Organic Laboratory Sample Number	Inorganic Laboratory Sample Number	Analyses Performed
DW#7 40'-42' (Lab Matrix Spike Dup)	8224-01MSD	NA	S,P
RB-1 (Lab Matrix Spike)	8103-10MS	NA	S
RB-1 (Lab Matrix Spike Dup)	8103-10MSD	NA	S

NOTES:

TI - TAL Inorganics
V - TCL Volatile Organics
S - TCL Semivolatile Organics
P - TCL Pesticides/PCBs
TCLP VOA - TCLP Volatile Organics
TCLP SVOA - TCLP Semivolatile Organics
TCLP P - TCLP Pesticides
TCLP H - TCLP Herbicides
TCLP M - TCLP Metals
CH - Characteristics - Flashpoint, pH and Reactivity.

Section 1 Quality Assurance Review

A. Organic TCL Data

The organic analyses of 25 soil samples and 11 aqueous samples (trip blanks, rinse blanks and field blanks) were performed by Intech Biolabs of New Brunswick, New Jersey. These samples were collectively analyzed by CLP protocols (SOW288) for the Target Compound List (TCL) volatile organics, TCL semivolatile organics and TCL pesticides/PCBs. In addition, library searches were performed for up to 30 extraneous chromatographic peaks for the volatile and semivolatile fractions combined. The analytical results are presented in Section 2, Part A.

The findings offered in this report are based upon a review of holding times, blank analysis results, matrix spike and surrogate recoveries, GC/MS tuning, internal standard areas, target compound matching quality, calibrations, quantitation of positive results and overall system performance.

The analytical data were examined to determine data usability in accordance with the U.S. EPA Region II validation checklist SOP No. HW-6 (Revision #7) "CLP Organics Data Review and Preliminary Review." The analytical requirements and required deliverables specified in the CLP Statement of Work (SOW288) were met for this data set with several exceptions. It should be noted that the following items are contractual in nature and do not necessarily affect data usability. Usability is addressed in a subsequent section.

Correctable Deficiencies

1. With very few exceptions, the laboratory did not specify the sample delivery group (SDG) number (for the BNA and pesticide/PCB fractions) or the Anson Environmental sample identification number on Forms I - VIII. Because of this correctable noncompliance, additional review time was necessary to constantly cross-reference sample identification numbers. Other items that were randomly missing on forms included "Lab Name" and "Lab Code."

2. For the GC/MS VOA data, the instrument identification numbers on approximately 25% of the Forms IV - VIII are incorrect. In addition, GC/MS systems "C" and "D" were used based on the raw data but were not specified on the QC summary forms. Similarly, the instrument identification number was not specified (e.g., pages 22, 30, 32, 272, 325, etc.).

3. For the VOA fraction, none of the Form IV's included the laboratory sample identification for the method blanks.

4. None of the Form VI-2's for the BNA fraction included the exact times of the calibration standard injections.

5. The result for total xylenes in sample DW#2 appears to be incorrect. Based on the data provided (pgs. 56-57), the reviewer calculated a concentration of 67,000 µg/Kg for total xylenes (16,000 µg/Kg reported). The data tables have been modified to reflect the reviewer's calculation.

6. For the BNA fraction, the percent moisture results reported on each of the solid sample Form I's are incorrect. The percent moisture reported on each Form I actually represents percent solids. With this assumption, the reviewer was able to reproduce the concentration reported by the laboratory.

7. A confident detection of benzo(a)anthracene was observed in sample DW#4RE at an estimated concentration of 490 µg/Kg. Although a valid mass spectrum was provided (pg. 600), the laboratory did not report this result. This result has been added to the data tables.

8. The Intech laboratory number reported for sample DW#4 (I10895-04) appears to be incorrect in the laboratory Case Narrative. According to the raw data, the laboratory sample number for DW#4 is I10895-03.

9. For the semivolatile Form III (pg. 416), the MSD recovery for N-nitroso-di-n-propylamine and the RPDs for pentachlorophenol and 4-nitrophenol were not flagged "*" as required.

10. For all of the Form IX's, the laboratory did not complete the field for calibration factors appropriately. The peak areas were entered into the field instead of the required calibration factors.

11. The reported results for methoxychlor in sample DW#6 (2.4 µg/Kg) and *gamma*-chlordane in sample DW#8 (59 µg/Kg) are incorrect. According to the reviewer's calculations (below), the results are 24 J µg/Kg and 29 µg/Kg, respectively.

methoxychlor - $$\frac{1352 \times 0.4 \text{ ng} \times 20000 \text{ µl}}{13418 \times 2 \text{ µl} \quad 30.43 \text{ gm} \times 0.558} = 24 \text{ µg/Kg}$$

gamma-chlordane - $$\frac{3482 \times 0.04 \text{ ng} \times 20000 \text{ µl}}{2858 \times 2 \text{ µl} \times 30.9 \text{ gm} \times 0.544} = 29 \text{ µg/Kg}$$

12. The quantitation limits reported for pesticides/PCBs for all soil samples on the Form I's were notably below the Contract Required Quantitation Limits (CRQLs). Laboratories are required to report to the CRQLs. Similarly, pesticide results were reported below the CRQL. The CLP requires that unless positive results are detected at or above the CRQL, the results should be reported as not-detected (with the quantitation limit being the CRQL). The reviewer has flagged all positive pesticide results that are less than the CRQL with a "J" qualifier code on the data tables.

13. The RPD for 4,4'-DDT was not flagged "*" on the Pesticide Form III (pg. 1047) as required.

Noncorrectable Deficiencies

1. According to the BNA Form V (pg. 427), sample DW#3 was injected exactly 12 hours after the associated DFTPP tune injection. The reviewer interprets the CLP protocol to mean that all injections must be performed within the 12-hour tune period. If the reviewer's interpretation is correct, the semivolatile analysis of sample DW#3 in noncompliant.

2. Two of the Calibration Check Compounds (CCC) were in excess of the 25% difference criteria in the semivolatile calibration associated with samples DW#8RE, DW#2RE, DW#3RE, DW#4, DW#1, DW#5RE, DW#1 25'-27', DW#1 30'-32', Field Blank 822 and Field Blank 823. The analyses of these samples are noncompliant with respect to the CLP protocol.

3. A high (26.5%) RSD was calculated for 4,4'-DDT between the calibration factors observed for EVAL A-C on the RTX 1701 column for the 8/26/91 - 8/28/91 sequence. Dieldrin and 4,4'-DDE were quantitated from this column in this sequence. (All other pesticides were quantitated on the RTX5 column.) Samples DW#2, DW#3, DW#4, DW#6, DW#7 and DW#8 are noncompliant with respect to the CLP requirements.

4. For the 8/26/91 - 8/29/91 72-hour pesticide/PCB sequence, a number of pesticides revealed percent differences in excess of 15% (quantitation) and 20% (confirmation) in the INDA and INDB closing standards run on 8/29/91 at 00:43 - 01:33. In addition, a number of pesticides within these closing standards revealed retention times outside the established retention time windows. Since these are closing standards, it is ambiguous whether these issues represent noncompliances. However, these issues do necessitate data qualification.

Comments

1. Based on the information provided on the VOA analyses for samples DW#1 25'-27', DW#1 30'-32' and DW#6 35'-37', it appears that the decision to analyze these samples by the medium-level protocol may not have been warranted. Similarly, the 5-fold dilutions performed for the semivolatile analyses for samples DRAIN, DW#9, DW#5 and possibly DW#7 do not appear to have been warranted. It is possible that the laboratory's screening data justify these actions.

2. Very high recoveries (up to 1900%) were observed for the pesticide surrogate compound dibutylchlorendate (DBC) in the majority of soil samples. These recoveries are likely due to the coelution of a contaminant (e.g., phthalate esters) with the surrogate. Because of this problem, method performance for pesticides/PCBs on a sample-specific basis cannot be assessed. In addition, chromatographic stability (viz., assessment of chromatographic shift) could not be assessed. This is a concern because a number of pesticides were outside the established retention time windows in the closing calibration checks.

With regard to data usability, the principal areas of concern include blank results, holding times, internal standard areas and calibrations. Based upon the data packages reviewed, the following organic data qualifiers are offered. It should be noted that the following data usability issues represent an interpretation of the quality control results obtained for the project samples. Quite often, data qualifications address issues relating to the sample matrix problems. Similarly, the validation guidelines routinely specify areas of the data that require qualification, yet the methods used for analysis do not require any corrective action by the laboratory. Accordingly, the following data usability issues should not necessarily be construed as an indication of laboratory performance.

Organic TCL Data Qualifiers

- Due to the presence of methylene chloride, toluene and bis(2-ethylhexyl)phthalate in field blanks, trip blanks and/or laboratory method blanks, these compounds in the following samples should be considered "not-detected" and have been flagged "U" on the data tables (Section 2, Part A). For results reported at levels less than the CRQL, the result has been replaced with the CRQL with the appropriate "U" qualifier code.

Compound	Applicable Samples
methylene chloride	All positive soil sample results.
toluene	DW#3

Compound	Applicable Samples
bis(2-ethylhexyl)phthalate	DW#1 25'-27', DW#1 30'-32', DW#6 35'-37', DW#6 30'-32', DW#7 45'-47', DW#4, DW#4RE, DW#1, DW#1RE, DW#5, DW#5RE, DW#7, DW#8, DW#8RE, DW#9, DRAIN, DW#1MS/MSD and DW#1MS/MSDRE

Although the results for methylene chloride, toluene and bis(2-ethylhexyl)phthalate in several of the aforementioned samples may appear to be substantial, they actually represent instrument concentrations similar to those observed in the blank(s) subsequently multiplied by large dilution factors.

- All positive soil sample results for acetone are unreliable and have been flagged "R" on the data tables. According to verbal indications from project management, acetone was used as a field equipment decontamination solvent.

- The analyses for 2-nitroaniline in samples Field Blank 821, DW#2, DW#3, DW#6, DW#7, DW#8, DW#9, DRAIN and DW#1MS/MSDRE are unreliable and have been flagged "R" on the data tables. A zero response factor was obtained for 2-nitroaniline in the associated calibration check standard. It is possible that a "normal" response was obtained, but the automated search and quantitation data system procedures "missed" the detection for 2-nitroaniline.

- The analyses for indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene in samples RB-1, DW#1MS/MSD and DW#5 and chloroethane in sample DRAIN are unreliable and the results have been flagged "R" on the data tables. High percent differences (>90%) were obtained for these compounds in the associated calibration check standard.

- The analyses for *delta*-BHC, endosulfan II, 4,4'-DDD, endosulfan sulfate and endrin ketone in samples DW#3, DW#4, DW#5, DW#6, DW#7, DW#8, DW#9 and DRAIN are unreliable and the results have been flagged "R" on the data tables. These pesticides were outside of the established retention time windows in the calibration standards run following these samples. The lack of meaningful DBC shift information (see Comment #2) exacerbated these problems.

- The positive results for *alpha*-BHC, *beta*-BHC, dieldrin, 4,4'-DDE, endrin, methoxychlor, *alpha*-chlordane and *gamma*-chlordane should be used with caution. Although the peaks that these identifications were based on were within the established retention time windows, examination of the chromatograms revealed numerous

chromatographic patterns similar to PCB multi-peak patterns (note that none of the patterns provided a reasonable match to the Aroclor standards provided). Because of the "busyness" of the chromatograms (samples DW#1-DW#9) and the numerous trace-level identifications for an assortment of relatively unrelated organochlorine pesticides, these results should be used cautiously.

- The actual detection limits for aromatic volatile organics in samples Field Blank 821, RB-1, Trip Blank 810 and Trip Blank 811 may be higher than reported and have been flagged "UJ" on the data tables. Similarly, the positive result for toluene in Trip Blank 810 should be considered estimated and has been flagged "J" on the data table. The aforementioned (unpreserved) aqueous blanks were analyzed 1 day in excess of the Federal Register holding time for purgeable aromatics.

- The actual detection limits for volatile organics in soil samples DW#2, DW#3 and DW#4 may be higher than reported and have been flagged "UJ" on the data tables. Qualitatively confident VOA results in these samples should be considered estimated and have been flagged "J" on the data tables. These samples were analyzed 1 day in excess of the U.S. EPA Region II data validation guidelines. (Note that the CLP holding time of 10 days from the date of laboratory sample receipt was met.)

- The actual detection limits for N-nitroso-di-n-propyl-amine and 1,2,4-trichlorobenzene in samples DW#1, DW#1RE, DW#1MS/MSD and DW#1MS/MSDRE may be higher than reported and have been flagged "UJ" on the data tables. Slightly low (36%-40%) recoveries were obtained for the compounds in the matrix spike duplicate of sample DW#1.

- The actual detection limits for the following compounds may be higher than reported and have been flagged "UJ" on the data tables. Similarly, positive samples should be considered estimated and have been flagged "J" on the data tables. High percent differences (>15%) were obtained for the calibration factors for these pesticides in the calibration check standards run after the samples presented below. The percent differences were necessarily in the direction of a low bias.

Compound	Estimated Results	Biased Detection Limits
beta-BHC	DW#9	DW#3, DW#4, DW#5, DW#6, DW#7, DW#8, and DRAIN
heptachlor		DW#3, DW#4, DW#5, DW#6, DW#7, DW#8, DW#9 and DRAIN

Compound	Estimated Results	Biased Detection Limits
heptachlor epoxide		DW#3, DW#4, DW#5, DW#6, DW#7, DW#8, DW#9 and DRAIN
aldrin		DW#3, DW#4, DW#5, DW#6, DW#7, DW#8, DW#9 and DRAIN
4,4'-DDT		DW#3, DW#4, DW#5, DW#6, DW#7, DW#8, DW#9 and DRAIN
alpha-chlordane		DW#3, DW#4, DW#5, DW#6, DW#7, DW#8, DW#9 and DRAIN
gamma-chlordane	DW#7 and DW#8	DW#3, DW#4, DW#5, DW#6, DW#9 and DRAIN
methoxychlor	DW#3, DW#4, DW#6, DW#7, DW#8 and DW#9	DW#5 and DRAIN
dieldrin	DW#3, DW#4, DW#6, DW#7 and DW#8	DW#5, DW#9 and DRAIN
4,4'-DDE	DW#3, DW#4, DW#6, DW#7 and DW#8	DW#5, DW#9 and DRAIN

- The positive results for 4,4'-DDE and dieldrin in samples DW#2, DW#3, DW#4, DW#6, DW#7 and DW#8 should be considered estimated and have been flagged "J" on the data tables. A high RSD was obtained for one of the pesticides (4,4'-DDT) in the initial multi-point calibration. The RSD is indicative of the stability of the calibration curve for quantitating analytes.

- The reported results for acetone in samples Field Blank 821, Field Blank 822 and Field Blank 823, benzoic acid in sample DW#5RE, benzo(k)fluoranthene in samples DW#4RE, DW#8RE and DW#1MS/MSD and indeno(1,2,3-cd)pyrene in samples DW#8RE should be considered estimated and have been flagged "J" on the data tables. High percent differences (>25%) were obtained between the response factors used to quantitate these results and the initial multi-point response factor. For indeno(1,2,3-cd) pyrene in DW#8, a high RSD (35%) was calculated between the response factors obtained from the initial multi-point calibration.

- The actual detection limit for chloroethane in sample DW#7 55'-57'RE may be higher than reported and has been flagged "UJ" on the data table. A high (51.4%) percent difference was obtained for chloroethane in the associated calibration check standard.

- The actual detection limits for late-eluting BNA compounds associated with the internal standards d_{12}-chrysene and d_{12}-perylene in samples DW#8, DW#1MS/MSD and DW#5 and d_{12}-perylene in samples DW#2, DW#1MS/MSDRE, DW#3, DW#2RE, DW#3RE, DW#4, DW#1, DW#5RE, DW#8RE, DW#4RE and DW#1RE may be higher than reported and have been flagged "UJ" on the data tables. Similarly, positive results quantitated using the aforementioned internal standards should be considered estimated and have been flagged "J" on the data tables. Low area counts were observed for d_{12}-chrysene and/or d_{12}-perylene in the aforementioned samples.

- Two field duplicate pairs, samples DW#7 45'-47' and DW#7A 45'-47' and samples DW#1 and DW#1MS/MSD, were analyzed as part of this data set. Reasonably good correlation was observed between the results of the original samples and the field duplicate samples. In addition, generally good correlation was observed for the non-matrix spike compounds between the unspiked, matrix spike and matrix spike duplicate aliquots in the numerous matrix spikes analyzed for this data set.

- Per CLP protocol, all positive results displaying instrument levels less than the CRQL have been flagged "J" on the sample data tables and should be considered estimated.

- Tentatively identified compounds (TICs) have been evaluated and are presented in Section 2. The TICs observed in the samples are mostly saturated hydrocarbons, alkylbenzenes and unknowns. Notable hydrocarbon envelopes were observed for samples DW#1-DW#4.

A complete support documentation for this organic quality assurance review is presented in Section 5 of this report. The Region II organics analysis data validation checklist is presented in Section 3 of this report.

B. Inorganic TAL Data

The inorganic analyses of 21 solid samples and 4 aqueous samples (a rinse blank and 3 field blanks) collected between August 10-23, 1991 were performed by Ceimic Corporation of Narragansett, Rhode Island. Based on the documentation, it appears that the samples were held at Intech Biolabs of East New Brunswick, New Jersey for several weeks before being received

at Ceimic Corporation. These samples were analyzed by CLP protocols for the Target Analyte List (TAL) metals and cyanide as specified in Table 1. The data were submitted in 2 sample delivery groups (SDG's) -- SDG 8103-10 for the 4 aqueous samples and SDG 8095-01 for the 21 solid samples.

The analytical data were examined to determine data usability in accordance with the validation checklist in the U.S. EPA Region II SOP No. HW-2 (SOP Revision X), Feb. 1990, "Evaluation of the Metals Data for the Contract Laboratory Program (CLP)" based on SOW788, Rev. 2/89. The data were also examined with respect to completeness and compliance relative to the specified analytical requirements and data package deliverables as stated in SOW788.

The findings offered in this report are based upon a rigorous review of the sample holding times, blank analysis results, pre- and post-digestion matrix spikes, laboratory duplicate analyses, quantitation of positive results, system performance, instrument sensitivity, initial and continuing calibrations, ICP interference checks, ICP serial dilutions and graphite furnace duplicate burns. The analytical results are presented in Section 2, Part B.

Contractual criteria (CLP) and reporting requirements were met with several exceptions. It should be emphasized that the following items are contractual in nature and do not necessarily affect data usability. Usability is addressed in a subsequent section.

Correctable Deficiencies

1. For both SDGs, the Anson Environmental sample identifications were not utilized on the QC summary forms or in the raw data as required.

2. For SDG 8095-01, the ICP and graphite furnace data for sample DW#1 30'-32' was identified with the Ceimic Corp. sample identification number 8200-04 on pages 111, 192, 235, 274 and 298. The apparently correct Ceimic Corp. sample identification number is 8200-02.

3. For SDG 8095-01, thallium was observed to be present in sample DW#6 at the instrument detection limit, which translates to 0.28 mg/Kg, according to the raw data (pg. 292). Thallium was reported as "not detected" in this sample. (This result has been added to the data tables.) In addition, given this positive result, the post-digestion spike recovery was observed to be 84.2%. Accordingly, the Form I for sample DW#6 should include a "W" flag for thallium.

4. For SDG 8095-01, the positive result (12 mg/Kg) for antimony reported in sample DW#1MSD was observed to have an ICP coefficient of variance of 25.89%. This result was not flagged "M" on the Form I as required.

5. For both SDGs, the times of analysis did not appear in the raw data for the graphite furnace analysis or in the raw data for the mercury and cyanide analyses as required.

Noncorrectable Deficiency

- For both SDGs, continuing calibration verifications (CCVs) and continuing calibration blanks (CCBs) were not performed before samples were analyzed. The CLP protocol requires that a CCV and CCB be performed at the beginning of each analytical sequence.

Comment

- For both SDGs, the ICP analyses included a blank and a standard. The graphite furnace (GF) analyses included a blank and 3 standards. The CLP protocol requires a 2-point initial calibration for ICP analyses and a 4-point initial calibration for GF analyses. Although the protocol requirement is ambiguous about whether the blank is considered one of the "points" during calibration, the laboratory has interpreted this requirement as such.

With regard to data usability, the principal areas of concern include laboratory and field blanks, Contract Required Detection Limit (CRDL) standards, pre- and post-digestion matrix spikes, laboratory duplicates and ICP serial dilutions. Based on a rigorous review of the data provided, the following qualifiers are offered. These data qualifiers should be considered when evaluating the data. It should be noted that the following data usability issues represent an interpretation of the quality control results obtained for the project samples. Quite often, data qualifications address issues relating to the sample matrix problems. Similarly, the validation guidelines routinely specify areas of the data that require qualification, yet the methods used for analysis do not require any corrective action by the laboratory. Accordingly, the following data usability issues should not necessarily be construed as an indication of laboratory performance.

Inorganic TAL Data Qualifiers

- Due to the presence of beryllium, calcium, chromium and sodium in the field blanks, the results for the analytes in the following samples are unreliable and have been flagged "R" on the data tables. The analytical results below are usable to the extent that levels higher than those reported are not present. For all intents and purposes, the reported positive results should now be considered the detection limits.

Analyte	Applicable Samples
beryllium	All positive solid sample results.
calcium	DW#1 25'-27', DW#1 30'-32', DW#6 35'-37', DW#7 40'-42', DW#7 45'-47', DW#7 55'-57' and DW#7A 45'-47'
chromium	DW#1 25'-27', DW#1 30'-32', DW#7 40'-42', DW#7 45'-47', DW#7 55'-57' and DW#7A 45'-47'
sodium	DW#7, DW#1MSD, DW#1 25'-27', DW#1 30'-32', DW#6 35'-37', DW#4, DW#1 and DW#5

- The analyses for mercury and cyanide in all project samples reported as "not-detected" should be considered unreliable and the results have been flagged "R" on the data tables. Similarly, positive results for mercury and cyanide should be considered estimated and have been flagged "J" on the data tables. The preparation and analyses were performed 2-15 days beyond the 14-day (from collection) holding time for cyanide and 6-17 days beyond the 28-day (from collection) holding time for mercury. It should be noted that reasons other than this holding time issue exist to qualify (cyanide) or reject (mercury) data.

- The analyses for silver in all samples are unreliable and the results have been flagged "R" on the data tables. A 0% recovery was obtained for silver in the associated solid matrix spike analysis. In addition, a 45% recovery was obtained for silver in the 2-times the CRDL standard associated with the 4 aqueous samples and all project solid samples.

- All positive results for cadmium in solid samples are unreliable and have been flagged "R" on the data tables. A 200% recovery was observed for cadmium in the 2 times the CRDL standard associated with all project samples.

- The positive result for antimony in sample DW#1MSD should be considered estimated and has been flagged "J" on the data tables. A high coefficient of variance was obtained between the multiple integration (analyses) for antimony in the ICP analysis of sample DW#1MSD.

- The positive results for arsenic in samples DW#7, DRAIN, DW#1 30'-32', DW#1, DW#5, DW#6 30'-32', DW#7 40'-42' and DW#7 45'-47' and for thallium in sample DW#6 should be considered estimated and have been flagged "J" on the data table. Similarly, the actual detection limit for thallium in sample DW#7 45'-47' may be higher

than reported and has been flagged "UJ" on the data tables. Low recoveries (<85%) were obtained for these analytes in the post-digestion spikes of the aforementioned samples.

- The results for the analytes in the following samples should be considered estimated and have been flagged "J" on the data tables unless previously flagged "R". Similarly, the actual detection limits for these analytes in the associated samples may be higher than reported and have been flagged "UJ" on the data tables. In some cases, there are multiple reasons for this qualification. These reasons are defined after the following table.

Constituent	Estimated Sample Results	Biased Detection Limits	Percent Recovery, RPD or PD
arsenic[a]	All positive solid sample results.		123%
antimony[a,b,d,e]	DW#1MSD, DW#2 and DW#8	All other solid sample results	138%, 51.2%, 23.2% and 200% (RPD)
iron[a,e,f]	All positive solid sample results.		121%, 26.1% (RPD) and 11.8% (PD)
chromium[f]	All qualitatively confident positive solid sample results.		15.9% (PD)
manganese[a,e]	All positive solid sample results.		123%, 46% (RPD)
calcium[e,f]	All qualitatively confident positive solid sample results.		45.7% (RPD) and 14.7% (PD)
copper[e]	All qualitatively confident positive solid sample results.		42.6% (RPD)
nickel[a]	All positive solid sample results.		125%
magnesium[e]	All positive solid sample results.		50% (RPD)
vanadium[a,f]	All positive solid sample results.		122% and 13.2% (PD)
sodium[f]	All qualitatively confident positive solid sample results.		13.1% (PD)
aluminum[a,f]	All positive solid sample results.		137% and 13.5% (PD)
zinc[a,c,f]	All positive solid sample results.		143%, 150% and 20.1% (PD)

a - A high recovery was obtained for this constituent in the associated CRDL standard.

b - A low recovery was obtained for this constituent in the associated pre-digestion matrix spike.

c - A high recovery was obtained for this constituent in the associated pre-digestion matrix spike.

d - A low recovery was obtained for this constituent in the associated post-digestion matrix spike.

e - A high RPD was observed for this constituent between the results for the associated laboratory duplicate.

f - A high percent difference was observed for this constituent between the initial ICP result and the serially diluted ICP result (>10% difference with initial result >10 times the IDL).

- Due to interferences with the arsenic analysis of sample DW#6, a 10-fold dilution and reanalysis was necessary. Accordingly, the laboratory raised the detection limit for arsenic in this sample by a factor of 10. This has been indicated by "(10×)" on the data tables.

- Due to the limited sample volume available, the Contract Required Detection Limit (CRDL) could not be achieved in the cyanide analysis of field blanks FB821, FB822 and FB823. The data reviewer has added CRDL multipliers on the sample data table to reflect the higher detection limits. For example, for FB823, the laboratory reported a detection limit of 50 μg/L. A qualifier "(5×)" appears on the data table for cyanide for this field blank.

- Two field duplicates (solids) were submitted for this data set. All positive results for the two pairs were observed to be within the U.S. EPA Region II 100% RPD criterion.

A complete support documentation for this inorganic quality assurance review is presented in Section 6 of this report. The Region II inorganics analyses data validation checklist is presented in Section 4 of this report.

C. TCLP Data

The analyses of 2 liquid samples (TANK 16 and TANK 16MS) were performed by Ceimic Corporation of Narragansett, Rhode Island. The samples and the analyses performed are summarized on Table 1. These analyses were performed in accordance with SW846 (Third Edition) procedures.

The findings offered in this report are based on an examination of the quality assurance forms and organic raw data. The data was evaluated with regard to holding times, internal standards,

instrument calibrations, blank analysis results, surrogate recoveries, matrix spike and matrix spike duplicate recoveries. The analytical results are presented in Section 2, Part C. It should be noted that in accordance with current requirements, the analytical results (non-detects and positive results) were recovery-corrected for matrix spike recoveries $< 100\%$.
Based on an examination of the data packages provided, the reviewer identified several deficiencies, as follows.

Correctable Deficiencies

1. The result page for TCLP pesticides indicates that sample TANK 16 was collected 6/21/91. All other result pages for TANK 16 indicate that the sample was collected 6/11/91. The Chains-of-Custody give dates of sample collection of 6/14/91 and 6/11/91. Originally, the sample was collected on 6/11/91, but the laboratory requested additional sample for analysis. This additional sampling was performed 6/14/91. It should be noted that the laboratory did not specify which analyses were performed on the samples collected on the initial or subsequent sampling events. In addition, the semivolatile preparation date of the TCLP leachate was listed as 6/21/91. However, the extraction date is specified as 6/18/91. The latter date appears as "?" in the data tables.

2. The recovery-corrected reporting limit for mercury reported on the result page for TANK 16 appears to be incorrect. The laboratory's method detection limit is 0.80 μg/L, and a 107% recovery was reported for the matrix spike. However, the laboratory reported a recovery-corrected limit of 8.0 μg/L. The reporting limit on the data tables is 0.80 μg/L for mercury.

3. The raw data for the bromofluorobenzene GC/MS tunings performed on 6/15/91 at 14:18 and on 6/23/92 at 12:15 give instrument numbers of MS2 and MS5, respectively. However, the associated tune summary forms and initial and continuing calibration summary forms indicate a sample instrument number of MS6.

4. Page 176 of the raw data (the quantitation list for the semivolatile analysis of the TCLP method blank) was not included in the organic raw data submitted for review.

5. The laboratory reported an incorrect spiking level for 2,4,5-TP and 2,4,5-T in the matrix spike analysis of sample TANK 16. The spiking level should have been reported to be 1.00 μg/L, not 5.00 μg/L. Good recoveries were obtained for these compounds in the sample.

6. The laboratory apparently performed manuai integrations for the initial and continuing calibrations on the matrix spike analysis for pyridine in the volatile organics analyses. Pyridine did not appear on any quantitation list or summary form for the analyses. The data reviewer could not verify the reported matrix spike results for pyridine.

Noncorrectable Deficiency

- The laboratory analyzed sample TANK 16 and several QC analyses outside the 12-hour tunes for the semivolatile and volatile organics analyses. The table below summarizes the deficiency.

Sample	Analysis	Date and Time of Analysis	Date and Time of Associated Tune
TANK 16	VOA	6/20/91 at 2154	6/20/91 at 0919
TANK 16MS	VOA	6/26/91 at 1020	6/25/91 at 2053
TCLP BLANK	VOA	6/24/91 at 0111	6/23/91 at 1215
TANK 16	BNA	6/20/91 at 0504	6/19/91 at 1401
TANK 16MS	BNA	6/20/91 at 0602	6/19/91 at 1401

Comments

1. Pyridine was reported as a volatile organics target compound in this data package (Case 910312) with a method detection limit of 1,000 μg/L, but was reported as a semivolatile organics target compound in a previous data package associated with this project (Case 910614) with a method detection limit of 33 μg/L.

2. The calibration factors for chlordane reported in the pesticide analysis were calculated from the *alpha*-chlordane peak in the INDB standards, not from the technical chlordane standard, using 0.1 ng injected.

With regard to data usability, principal areas of concern include holding times, laboratory control sample results and blank contamination. Based on the QC information provided, the following TCLP data qualifiers are offered.

TCLP Data Qualifiers

- The analysis for herbicides in the TANK 16 sample is unreliable and the results have been flagged "UR" on the data tables. The sample was prepared 3 days in excess of the 14-day holding time from the apparent date of sample collection.

- The positive result for barium in sample TANK 16 is unreliable and has been flagged "R" on the data tables. A similar concentration of barium was reported by the laboratory in the filtration blank.

- The positive result for arsenic in sample TANK 16 may be biased high and has been flagged "J" on the data tables. A high recovery (145%) was reported in the associated laboratory control sample (LCS) with the laboratory-specified limits of 75%-125%.

- The laboratory performed library searches on extraneous chromatographic peaks for the TCLP volatile analysis. (It is not known if this was also requested for the semivolatile fraction, and no peaks were observed.) Acetone, methylene chloride and one early-eluting peak (3.92 minutes) were identified in the TANK 16 sample. The result for acetone is unreliable and has been flagged "R" on the data table. According to project management, acetone was used as a field equipment decontamination solvent. The reliability of the results for the other two compounds cannot be ascertained; however, these results should be considered estimated and have been flagged "J" on the data tables.

A complete support documentation for this quality assurance review of the TCLP data is presented in Section 7 of this report.

D. Conclusions

This quality assurance review has identified several areas of the data that have required qualification. A notable portion of the organic data was qualified as estimated or rejected due to calibration issues or sample matrix problems. A fair portion of the inorganic data was qualified as estimated or rejected due to sample matrix problems, which appear to be related to the samples themselves, and holding time issues. To confidently use any of the data in the sample set, the data users should understand the limitations and qualifications presented in this report.

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Date: 4/16/92

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SECTION 2

ANALYTICAL RESULTS

A. ORGANIC TCL DATA

ORGANIC ANALYSIS - ANALYTICAL RESULTS -page 1	
Anson Environmental Sample Number	TANK 16
Laboratory Sample Number	910312-01
Remarks	
Units	ug/l
ORGANIC ELEMENTS	
Benzene	7 U
Carbon Tetrachloride	6 U
Chlorobenzene	7 U
Chloroform	6 U
1,2-Dichloroethane	6 U
1,1-Dichloroethylene	5 U
Methylethylketone	12 U
Tetrachloroethylene	6 U
Trichloroethylene	6 U
Vinyl Chloride	11 U
Pyridine	2300 U
Date Sample Collected	6/14/91
Date Leachate Generated	6/18/91
Date Leachate Analyzed	6/20/91

NOTES:

U This compound was analyzed for but was not detected at or above the level indicated.

R Unreliable result - Compound may or may not be present in this sample.

J Quantitation is approximate due to limitations identified during the quality assurance review (data validation).

UJ This compound was not detected, but the quantitation limit is probably higher due to low bias identified during the quality assurance review.

The reported quantitation limits are recovery-corrected.

TENTATIVELY IDENTIFIED COMPOUNDS	
Anson Environmental Sample Number	TANK 16
Laboratory Sample Number	910312-01
Units	ug/l
Unknown	8 J
Acetone	310 R
Methylene Chloride	200 J

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ORGANIC ANALYSIS - ANALYTICAL RESULTS -page 2	
Anson Environmental Sample Number	TANK 16
Laboratory Sample Number	910312-01
Remarks	
Units	ug/L
SEMIVOLATILE ELEMENTS	
2,4-Dinitrotoluene	52 U
Hexachlorobenzene	46 U
Hexachloro-1,3-butadiene	46 U
Hexachloroethane	59 U
Nitrobenzene	38 U
1,4-Dichlorobenzene	52 U
Methylphenols (total)	52 U
Pentachlorophenol	260 U
2,4,5-Trichlorophenol	270 U
2,4,6-Trichlorophenol	53 U
Date Sample Collected	6/14/91
Date Leachate Generated	6/17/91
Date Leachate Extracted	6/18/91
Date Leachate Analyzed	6/20/91

NOTES:

U This compound was analyzed for but was not detected at or above the level indicated.

R Unreliable result - Compound may or may not be present in this sample.

J Quantitation is approximate due to limitations identified during the quality assurance review (data validation).

UJ This compound was not detected, but the quantitation limit is probably higher due to low bias identified during the quality assurance review.

The reported quantitation limits are recovery-corrected.

ORGANIC ANALYSIS - ANALYTICAL RESULTS -page 3	
Anson Environmental Sample Number	TANK 16
Laboratory Sample Number	910312-01
Remarks	
Units	ug/L
ORGANOCHLORINE PESTICIDES	
gamma-BHC	0.21 U
Heptachlor	0.17 U
Heptachlor Epoxide	0.17 U
Endrin	0.33 U
Methoxychlor	2.1 U
Toxaphene	3.3 U
Chlordane	1.7 U
Date Sample Collected	6/14/91
Date Leachate Generated	?
Date Leachate Extracted	6/18/91
Date Extract Analyzed	6/21/91

NOTES:

U This compound was analyzed for but was not detected at or above the level indicated.

R Unreliable result - Compound may or may not be present in this sample.

J Quantitation is approximate due to limitations identified during the quality assurance review (data validation).

UJ This compound was not detected, but the quantitation limit is probably higher due to low bias identified during the quality assurance review.

The reported quantitation limits are recovery-corrected with the exception of toxaphene and chlordane.

ORGANIC ANALYSIS - ANALYTICAL RESULTS -page 4	
Anson Environmental Sample Number	TANK 16
Laboratory Sample Number	910312-01
Remarks	
Units	ug/L
HERBICIDES	
2,4-D	140 UR
2,4,5-TP (Silvex)	50 UR
2,4,5-T	55 UR
Date Sample Collected	6/14/91
Date Leachate Generated	6/28/91
Date Leachate Extracted	7/2/91
Date Extract Analyzed	7/9/91

NOTES:

U This compound was analyzed for but was not detected at or above the level indicated.

R Unreliable result - Compound may or may not be present in this sample.

J Quantitation is approximate due to limitations identified during the quality assurance review (data validation).

UJ This compound was not detected, but the quantitation limit is probably higher due to low bias identified during the quality assurance review.

UR This compound was analyzed for but was not detected; however, the analysis was deemed unreliable.

The reported quantitation limits are recovery-corrected.

ORGANIC ANALYSIS - ANALYTICAL RESULTS -page 5	
Anson Environmental Sample Number	TANK 16
Laboratory Sample Number	910312-01
Remarks	
Units	ug/L
TCLP METALS	
Arsenic	300 J
Barium	20 R
Cadmium	10 U
Chromium	10 U
Lead	100 U
Mercury	0.8 U
Selenium	300 U
Silver	20 U
CHACTERISTICS	
Flashpoint (at 200 F)	No
pH (Standard Units)	7.02
Reactive Cyanide (mg/L)	500 U
Reactive Sulfide (mg/L)	2000 U

NOTES:

U This compound was analyzed for but was not detected at or above the level indicated.

R Unreliable result - Compound may or may not be present in this sample.

J Quantitation is approximate due to limitations identified during the quality assurance review (data validation).

UJ This compound was not detected, but the quantitation limit is probably higher due to low bias identified during the quality assurance review.

The reported quantitation limits are recovery-corrected.

SECTION 7

TCLP DATA SUPPORT DOCUMENTATION

PROJECT NAME: Anchor Chemical

SUPPORT DOCUMENTATION FOR THE REVIEW OF ORGANIC ANALYSIS LAB DATA PACKAGE

TYPE OF ANALYSIS: TCLP
CONTRACT LABORATORY: Ceimic Corp.

REVIEWER: D. Lancaster
REVIEW DATE: 4/10/92

APPLICABLE SAMPLE NO's.: TANK 16
TANK 16MS

THE FOLLOWING TABLE INDICATES AREAS WHICH WERE EXAMINED IN DETAIL, THE IDENTIFIED PROBLEM AREAS, AND SUPPORT DOCUMENTATION ATTACHMENTS:

	AREAS EXAMINED IN DETAIL (CHECK (✓) IF YES OR FOOTNOTE LETTER FOR COMMENTS BELOW)				PROBLEM AREAS IDENTIFIED (CHECK (✓) IF YES OR FOOTNOTE NUMBER FOR COMMENTS BELOW)				SUPPORT DOCUMENTATION ATTACHMENTS (CHECK (✓) IF YES – OR IDENTIFY ATTACHMENT NO.)			
	ALL APPLICABLE ANALYSES	VOA	BN4	PEST/PCB	ALL APPLICABLE ANALYSES	VOA	BN4	PEST/PCB Herbicides	ALL APPLICABLE ANALYSES	VOA	BN4	PEST/PCB
HOLDING TIMES	✓							✓				
BLANK ANALYSIS RESULTS: TARGET COMPOUNDS	✓											
BLANK ANALYSIS RESULTS: TENTATIVE I.D.'s	✓											
SURROGATE SPIKE RESULTS	✓											
MATRIX SPIKE RESULTS	✓							✓				
DUPLICATE ANALYSIS RESULTS	✓											
TARGET COMPOUND MATCHING QUALITY	✓											
TENTATIVELY IDENTIFIED COMPOUNDS	✓											
DFTPP & BFB SPECTRUM TUNE RESULTS	✓					✓	✓					
GC INSTRUMENT PERFORMANCE	✓											
INITIAL CALIBRATIONS	✓					✓						
CONTINUING CALIBRATIONS	✓					✓	✓					
QUANTITATION OF RESULTS	✓											
OTHERS	✓											

COMMENTS:

301735

BLANK ANALYSIS RESULTS FOR TARGET COMPOUNDS

FRACTION	TYPE/ MATRIX	SAMPLE #	SOURCE	CONTAMINANT (CONCENTRATION)

LABORATORY REPORTED FIELD BLANK IS COMPARED WITH THE SAMPLE DATA IN A TABULATION FORM WITHIN THE SAMPLE ANALYTICAL DATA SUMMARY. TICs IN BLANKS ARE LISTED ON A SEPERATE FORM.

COMMENTS :

(1) RESULT REPORTED BY THE LABORATORY AND CONFIRMED BY REVIEWER

(2) RESULT INFERED FROM QUANTITATION LIST, CHROMATOGRAM AND/OR SPECTRUM

WATER VOLATILE SURROGATE RECOVERY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	TANK_16	102	104	96	0	0
02	TCLP_BLANK	99	97	97	0	0
03	TANK_16MS	96	103	97	0	0
04	VBLK01	100	112	112	0	0
05	VBLK03	99	99	97	0	0
06	VBLK02	96	105	90	0	0

	QC LIMITS
S1 (TOL) = Toluene-d8	(88-110)
S2 (BFB) = Bromofluorobenzene	(86-115)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

VOLATILE ORGANICS TARGET ANALYTES

MATRIX SPIKE ANALYSIS SUMMARY

EPA METHOD 8240

Client: Anson Environmental

Client Sample ID: Tank 16MS

Laboratory ID: 910312-01MS

Date Analyzed: 6/26/91

Concentration in: ug/L (ppb)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
Benzene	ND	50	37	75 %
Carbon tetrachloride	ND	50	44	88
Chlorobenzene	ND	50	37	74
Chloroform	ND	50	43	86
1,2-Dichloroethane	ND	50	40	79
1,1-Dichloroethylene	ND	50	49	98
Methylethylketone	ND	50	41	82
Tetrachloroethylene	ND	50	40	80
Trichloroethylene	ND	50	44	88
Vinyl chloride	ND	50	47	94
Pyridine	ND	2,000	870	44

ND = Not detected

This matrix spike analysis summary applies to the following samples:

Tank 16

Reported by:_____ Approved by:_____

VOLATILE METHOD BLANK SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: B0010 Lab Sample ID: V20620-B1

Date Analyzed: 06/20/91 Time Analyzed: 1423

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: MS2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	TANK_16	910312-01	BA009	2154

COMMENTS:

301739

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: F3418 Lab Sample ID: V60624-B2

Date Analyzed: 06/23/91 Time Analyzed: 1659

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: MS6

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	TCLP_BLANK	TCLPBLK-B1	F3430	0111

COMMENTS:

VOLATILE METHOD BLANK SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: BA084 Lab Sample ID: V20625-B2

Date Analyzed: 06/25/91 Time Analyzed: 2241

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: MS2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	TANK_16MS	910312-01MS	BA098	1020

COMMENTS:

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: B9946 BFB Injection Date: 06/17/91

Instrument ID: MS2 BFB Injection Time: 2243

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	25.7
75	30.0 - 60.0% of mass 95	54.4
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	78.7
175	5.0 - 9.0% of mass 174	6.3 (8.0)1
176	Greater than 95.0%, but less than 101.0% of mass 174	77.8 (98.9)1
177	5.0 - 9.0% of mass 176	5.4 (6.9)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD0618	B9948	06/18/91	0101
02	VSTD020	VSTD0618	B9949	06/18/91	0137
03	VSTD100	VSTD0618	B9950	06/18/91	0214
04	VSTD150	VSTD0618	B9951	06/18/91	0251
05	VSTD200	VSTD0618	B9952	06/18/91	0327

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MS2 Calibration Date(s): 06/18/91 06/18/91

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

Min $\overline{RRF}$ for SPCC(#) = 0.300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = B9949 RRF50 = B9948

RRF100= B9950 RRF150= B9951 RRF200= B9952

COMPOUND	RRF20	RRF50	RRF100	RRF150	RRF200	$\overline{RRF}$	% RSD
Chloromethane #	0.375	0.444	0.426	0.423	0.306	0.395	14.1#
Bromomethane	0.804	1.225	1.080	1.041	0.814	0.993	18.3
Vinyl Chloride ✓ *	0.432	0.466	0.489	0.400	0.361	0.430	11.9*
Chloroethane	0.284	0.371	0.394	0.340	0.295	0.337	14.1
Methylene Chloride	0.854	0.826	0.912	0.621	0.781	0.799	13.8
Acetone	0.348	0.234	0.423	0.394	0.420	0.364	21.6
Carbon Disulfide	1.016	1.677	2.268	1.792	1.710	1.693	26.4
1,1-Dichloroethene ✓ *	0.463	0.591	0.330	0.560	0.437	0.476	21.9*
1,1-Dichloroethane #	1.646	2.392	2.346	2.431	1.784	2.120	17.6#
1,2-Dichloroethene (total)	0.804	1.052	1.058	1.046	0.761	0.944	15.7
Chloroform ✓ *	2.688	3.996	3.993	4.058	2.951	3.537	18.7*
1,2-Dichloroethane ✓	3.227	4.277	4.226	4.437	3.390	3.911	14.3
Butanone ✓	0.073	0.074	0.103	0.097	0.099	0.089	16.3
,1,1-Trichloroethane	0.906	0.870	0.912	0.949	0.784	0.884	7.1
Carbon Tetrachloride ✓	0.615	0.739	0.823	0.838	0.721	0.747	12.0
Vinyl Acetate	0.450	0.388	0.483	0.508	0.552	0.476	13.0
Bromodichloromethane	0.898	0.866	0.899	0.978	0.894	0.907	4.6
1,2-Dichloropropane *	0.224	0.211	0.245	0.267	0.250	0.239	9.2
cis-1,3-Dichloropropene	0.358	0.348	0.377	0.416	0.378	0.375	6.9
Trichloroethene ✓	0.382	0.417	0.471	0.486	0.405	0.432	10.3
Dibromochloromethane	0.920	0.932	1.019	1.016	0.940	0.965	5.0
1,1,2-Trichloroethane	0.287	0.286	0.351	0.347	0.349	0.324	10.6
Benzene ✓	0.576	0.534	0.589	0.630	0.585	0.583	5.9
Trans-1,3-Dichloropropene	1.367	1.250	1.482	1.604	1.511	1.443	9.5
Bromoform #	1.053	0.924	1.138	1.106	1.037	1.052	7.8#
4-Methyl-2-Pentanone	0.393	0.319	0.516	0.498	0.544	0.454	20.8
2-Hexanone	0.270	0.217	0.371	0.364	0.384	0.321	23.0
Tetrachloroethene ✓	0.734	0.747	0.733	0.757	0.611	0.716	8.3
1,1,2,2-Tetrachloroethane #	0.641	0.559	0.731	0.733	0.762	0.685	12.2#
Toluene *	0.528	0.574	0.671	0.658	0.549	0.596	10.9*
Chlorobenzene ✓ #	0.821	0.921	1.018	1.053	0.885	0.940	10.2#
Ethylbenzene *	0.370	0.381	0.438	0.441	0.328	0.392	12.2*
Styrene	0.775	0.871	0.971	1.003	0.845	0.893	10.5
Total Xylenes	0.459	0.484	0.548	0.544	0.477	0.502	8.1
Toluene-d8	0.977	0.948	1.082	1.098	0.951	1.011	7.2
BFB	1.114	1.063	1.075	1.061	0.921	1.047	7.0
2-Dichloroethane-d4	2.792	3.836	3.455	3.496	2.758	3.267	14.5

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: B0005 BFB Injection Date: 06/20/91

Instrument ID: MS2 BFB Injection Time: 0919

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	28.1
75	30.0 - 60.0% of mass 95	59.8
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.4
173	Less than 2.0% of mass 174	0.4 (0.4)1
174	Greater than 50.0% of mass 95	90.6
175	5.0 - 9.0% of mass 174	6.8 (7.5)1
176	Greater than 95.0%, but less than 101.0% of mass 174	88.9 (98.1)1
177	5.0 - 9.0% of mass 176	6.0 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD0620	B0007	06/20/91	1050
02	VBLK01	V20620-B1	B0010	06/20/91	1423
03	TANK_16	910312-01	BA009	06/20/91	2154

outside tune

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MS2 Calibration date: 06/20/91 Time: 1050

Lab File ID: B0007 Init. Calib. Date(s): 06/18/91 06/18/91

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0%

COMPOUND		RRF	RRF50	%D	
Chloromethane	#	0.395	0.303	23.3	#
Bromomethane		0.993	0.922	7.2	
Vinyl Chloride	*	0.430	0.410	4.7	*
Chloroethane		0.337	0.419	-24.3	
Methylene Chloride		0.799	0.868	-8.6	
Acetone		0.364	0.277	23.9	
Carbon Disulfide		1.693	1.920	-13.4	
1,1-Dichloroethene	*	0.476	0.381	20.0	*
1,1-Dichloroethane	#	2.120	1.702	19.7	#
1,2-Dichloroethene (total)		0.944	0.843	10.7	
Chloroform	*	3.537	2.863	19.1	*
1,2-Dichloroethane		3.911	3.471	11.2	
2-Butanone		0.089	0.056	37.1	
1,1,1-Trichloroethane		0.884	0.833	5.8	
Carbon Tetrachloride		0.747	0.654	12.4	
Vinyl Acetate		0.476	0.395	17.0	
Bromodichloromethane		0.907	0.962	-6.1	
1,2-Dichloropropane	*	0.239	0.206	13.8	*
cis-1,3-Dichloropropene		0.375	0.386	-2.9	
Trichloroethene		0.432	0.385	10.9	
Dibromochloromethane		0.965	1.012	-4.9	
1,1,2-Trichloroethane		0.324	0.294	9.3	
Benzene		0.583	0.552 ✓	5.3	
Trans-1,3-Dichloropropene		1.443	1.350	6.4	
Bromoform	#	1.052	1.061	-0.9	#
4-Methyl-2-Pentanone		0.454	0.325	28.4	
2-Hexanone		0.321	0.217	32.4	
Tetrachloroethene		0.716	0.693	3.2	
1,1,2,2-Tetrachloroethane	#	0.685	0.598	12.7	#
Toluene	*	0.596	0.544	8.7	*
Chlorobenzene	#	0.940	0.851	9.5	#
Ethylbenzene	*	0.392	0.380	3.1	*
Styrene		0.893	0.855	4.3	
Total Xylenes		0.502	0.470	6.4	
Toluene-d8		1.011	0.862	14.7	
BFB		1.047	0.988	5.6	
1,2-Dichloroethane-d4		3.267	2.842	13.0	

91

301745

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID (Standard): B0007 Date Analyzed: 06/20/91

Instrument ID: MS2 Time Analyzed: 1050

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

		IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
	12 HOUR STD	106000	9.27	403000	11.72	339000	16.75
	UPPER LIMIT	212000		806000		678000	
	LOWER LIMIT	53000		201500		169500	
	EPA SAMPLE NO.						
01	TANK_16	56500	9.27	209000	11.72	180000	16.74
02	VBLK01	90800	9.29	401000	11.72	332000	16.74

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: BA082 BFB Injection Date: 06/25/91

Instrument ID: MS2 BFB Injection Time: 2053

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.6
75	30.0 - 60.0% of mass 95	56.1
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	84.3
175	5.0 - 9.0% of mass 174	6.5 (7.7)1
176	Greater than 95.0%, but less than 101.0% of mass 174	84.4 (100.1)1
177	5.0 - 9.0% of mass 176	5.4 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD0625	BA083	06/25/91	2143
02	VBLK02	V20625-B2	BA084	06/25/91	2241
03	TANK_16MS	910312-01MS	BA098	06/26/91	1020

outside tune

55

FORM V VOA 1/87 Rev.

301747

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MS2 Calibration date: 06/25/91 Time: 2143

Lab File ID: BA083 Init. Calib. Date(s): 06/18/91 06/18/91

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0%

COMPOUND		RRF	RRF50	%D	
Chloromethane	#	0.395	0.369	6.6	#
Bromomethane		0.993	0.729	26.6	
Vinyl Chloride	*	0.430	0.425	1.2	*
Chloroethane		0.337	0.315	6.5	
Methylene Chloride		0.799	0.762	4.6	
Acetone		0.364	0.265	27.2	
Carbon Disulfide		1.693	1.774	-4.8	
1,1-Dichloroethene	*	0.476	0.558	-17.2	*
1,1-Dichloroethane	#	2.120	1.684	20.6	#
1,2-Dichloroethene (total)		0.944	0.844	10.6	
Chloroform	*	3.537	3.496	1.2	*
1,2-Dichloroethane		3.911	3.496	10.6	
2-Butanone		0.089	0.104	-16.8	
1,1,1-Trichloroethane		0.884	0.884	0.0	
Carbon Tetrachloride		0.747	0.797	-6.7	
Vinyl Acetate		0.476	0.305	35.9	
Bromodichloromethane		0.907	0.942	-3.9	
1,2-Dichloropropane	*	0.239	0.257	-7.5	*
cis-1,3-Dichloropropene		0.375	0.395	-5.3	
Trichloroethene		0.432	0.497	-15.0	
Dibromochloromethane		0.965	0.967	-0.2	
1,1,2-Trichloroethane		0.324	0.354	-9.3	
Benzene		0.583	0.675	-15.8	
Trans-1,3-Dichloropropene		1.443	1.432	0.8	
Bromoform	#	1.052	0.943	10.4	#
4-Methyl-2-Pentanone		0.454	0.400	11.9	
2-Hexanone		0.321	0.294	8.4	
Tetrachloroethene		0.716	0.692	3.4	
1,1,2,2-Tetrachloroethane	#	0.685	0.768	-12.1	#
Toluene	*	0.596	0.660	-10.7	*
Chlorobenzene	#	0.940	1.047	-11.4	#
Ethylbenzene	*	0.392	0.423	-7.9	*
Styrene		0.893	0.956	-7.1	
Total Xylenes		0.502	0.535	-6.6	
Toluene-d8		1.011	0.910	10.0	
BFB		1.047	0.922	11.9	
1,2-Dichloroethane-d4		3.267	2.666	18.4	

SA

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID (Standard): BA083 Date Analyzed: 06/25/91

Instrument ID: MS2 Time Analyzed: 2143

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

		IS1(BCM) AREA	#	RT	IS2(DFB) AREA	#	RT	IS3(CBZ) AREA	#	RT
	12 HOUR STD	139000		9.20	587000		11.65	428000		16.72
	UPPER LIMIT	278000			1174000			976000		
	LOWER LIMIT	69500			293500			244000		
	EPA SAMPLE NO.									
01	TANK_16MS	149000		9.22	585000		11.67	514000		16.72
02	VBLK02	157000		9.22	602000		11.67	506000		16.74

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

59

FORM VIII VOA 1/87 Rev.

301749

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: F3245 BFB Injection Date: 06/15/91

Instrument ID: MS6 (raw data says MS 2) BFB Injection Time: 1418

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) PACK

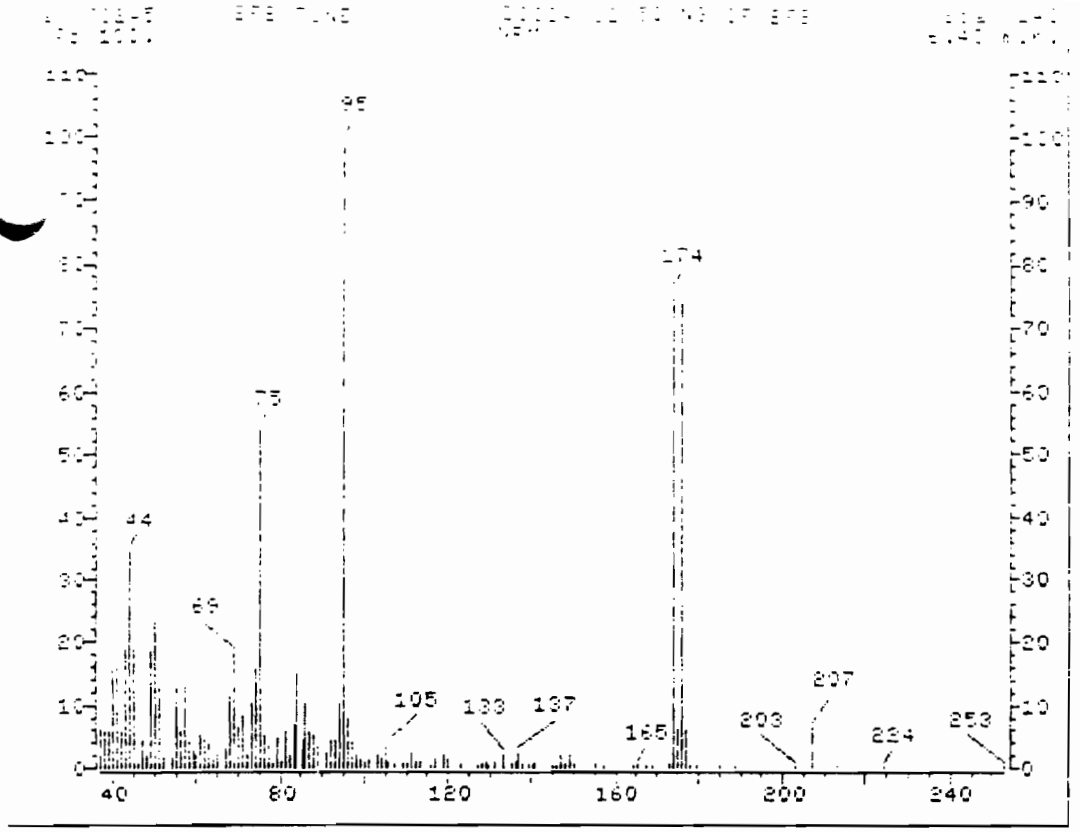
m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	23.1
75	30.0 - 60.0% of mass 95	53.8
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.0
173	Less than 2.0% of mass 174	0.8 (1.1)1
174	Greater than 50.0% of mass 95	76.4
175	5.0 - 9.0% of mass 174	6.0 (7.9)1
176	Greater than 95.0%, but less than 101.0% of mass 174	74.6 (97.6)1
177	5.0 - 9.0% of mass 176	6.2 (8.3)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD0615	F3246	06/15/91	1455
02	VSTD020	VSTD0615	F3247	06/15/91	1646
03	VSTD100	VSTD0615	F3248	06/15/91	1727
04	VSTD150	VSTD0615	F3249	06/15/91	1807
05	VSTD200	VSTD0615	F3250	06/15/91	1847

56



MS data file header from : >F3245::D5

Sample: BFB TUNE DI Operator: VOA4 REG. GRP. 6/15/91 14:18
Misc : ID#MS2 50 NG OF BFB SPH
Sys. #: 2 MS model: 70 SW/HW rev.: IA ALS # : 0 Equip ID:
Method file: MS6A Tuning file: TUNEF No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	220.	220.	0.	0.	0.
Chromatographic times, min. :	12.0	1.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	1.0	0.0	0.0	0.0	0.0

Case# 910312

CB

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	23.14	23.14	Ok
75	30-60% of mass 95	53.85	53.85	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	8.01	8.01	Ok
173	Less than 2% of mass 174	.82	1.07	Ok
174	Greater than 50% of mass 95	76.38	76.38	Ok
175	5-9% of mass 174	6.02	7.88	Ok
176	95-101% of mass 174	74.58	97.64	Ok
177	5-9% of mass 176	6.16	8.26	Ok

Injection Date: 06/15/91
Injection Time: 14:18
Data File: >F3245
Scan: 140

F3245 BFB TUNE DII#MS2 50 NG OF BFB
140 NRM

File: >F3245 Scan #: 140 Retn. time: 6.43

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
37.00	6.271	62.00	4.556	87.00	5.934	113.05	1.012	148.95	1.969
38.00	5.849	63.00	3.965	88.00	5.259	115.95	.591	150.05	.872
39.00	5.849	64.00	1.434	89.00	3.571	117.05	1.519	155.05	.619
40.00	15.214	65.00	1.969	91.00	2.531	118.95	2.193	156.95	.534
41.00	15.664	67.10	3.037	92.00	4.359	119.95	1.462	164.15	.309
42.00	5.849	68.00	11.249	93.00	4.556	122.95	.675	165.05	.675
43.00	18.785	69.00	18.110	94.00	10.264	127.05	.478	165.25	.647
44.00	34.730	70.10	6.412	95.00	100.000	128.05	.816	167.05	.534
45.00	18.532	71.10	8.324	96.00	8.015	129.05	.956	169.05	.450
46.00	.900	72.00	2.025	97.10	4.246	129.75	.478	172.85	.816
47.00	4.612	73.00	10.152	98.10	2.193	130.95	1.209	173.95	76.378
48.00	2.587	74.00	15.748	99.10	1.603	132.95	2.222	174.95	6.018
49.00	18.420	75.00	53.853	100.10	1.209	134.95	.900	175.95	74.578
50.00	23.144	76.00	5.090	101.00	1.406	136.05	.984	176.95	6.159
51.00	12.655	77.00	3.571	103.00	2.081	136.95	2.587	177.95	.506
52.00	1.715	77.90	.844	104.00	1.631	137.95	.759	179.75	.281
54.00	1.940	79.00	4.668	105.00	3.318	139.05	.647	184.95	.450
55.10	12.430	80.00	1.153	105.90	1.265	140.05	.787	188.75	.309
56.10	5.849	81.00	5.737	107.00	.844	140.95	.900	203.15	.422
57.00	13.330	82.00	2.109	109.10	.675	145.05	.478	207.05	6.637
58.10	4.303	83.10	6.834	110.05	.647	145.95	.591	213.05	.506
59.10	2.756	83.90	15.045	111.05	2.362	147.05	2.137	224.25	.422
00	2.250	85.10	4.556	112.05	1.181	148.05	.675	253.05	.422
.00	5.118	86.00	10.067						

111

Case # 910312

301752

CB

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MSE raw data 5005 MS2 Calibration Date(s): 06/15/91 06/15/91

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) PACK

Min RRF for SPCC(#) = 0.300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = F3247 1646 RRF50 = F3248 1755
RRF100= F3248 1717 RRF150= F3249 1307 RRF200= F3250 1317

COMPOUND	RRF20	RRF50	RRF100	RRF150	RRF200	RRF	% RSD
Chloromethane #	0.574	0.655	0.391	0.456	0.723	0.560	24.5#
Bromomethane	1.032	1.089	0.789	0.831	0.916	0.931	13.8
Vinyl Chloride *	0.850	1.059	0.678	0.781	0.851	0.844	16.5*
Chloroethane	0.603	0.692	0.472	0.514	0.563	0.569	14.9
Methylene Chloride	1.322	1.400	0.952	0.982	1.090	1.149	17.6
Acetone	0.310	0.362	0.342	0.340	0.270	0.325	11.0
Carbon Disulfide	2.177	3.237	2.003	2.721	2.879	2.603	19.5
1,1-Dichloroethene *	0.987	1.266	0.804	1.002	0.806	0.973	19.5*
1,1-Dichloroethane #	2.268	2.842	1.944	2.183	1.700	2.187	19.6#
1,2-Dichloroethene (total)	1.160	1.362	0.966	1.116	0.778	1.076	20.3
Chloroform *	2.983	3.567	2.644	2.904	2.140	2.848	18.2*
1,2-Dichloroethane	2.705	2.936	2.441	2.483	1.676	2.448	19.4
-Butanone	0.129	0.135	0.119	0.120	0.069	0.114	23.0
,1,1-Trichloroethane	0.745	0.946	0.710	0.889	0.903	0.839	12.4
Carbon Tetrachloride	0.624	0.916	0.612	0.813	0.828	0.759	17.7
Vinyl Acetate	0.695	0.838	0.724	0.808	0.615	0.736	12.2
Bromodichloromethane	0.847	0.973	0.848	0.943	0.924	0.907	6.3
1,2-Dichloropropane *	0.336	0.419	0.325	0.361	0.378	0.364	10.2*
cis-1,3-Dichloropropene	0.580	0.663	0.580	0.630	0.631	0.617	5.9
Trichloroethene	0.374	0.504	0.359	0.437	0.462	0.427	14.2
Dibromochloromethane	0.778	0.977	0.833	0.912	0.971	0.894	9.7
1,1,2-Trichloroethane	0.342	0.416	0.356	0.382	0.386	0.376	7.6
Benzene	0.723	0.869	0.699	0.815	0.833	0.788	9.3
Trans-1,3-Dichloropropene	0.894	0.966	0.842	0.911	0.908	0.904	4.9
Bromoform #	0.800	0.887	0.860	0.909	1.046	0.900	10.1#
4-Methyl-2-Pentanone	0.394	0.481	0.433	0.472	0.343	0.425	13.5
2-Hexanone	0.303	0.347	0.333	0.354	0.279	0.323	9.8
Tetrachloroethene	0.414	0.583	0.382	0.490	0.453	0.464	16.8
1,1,2,2-Tetrachloroethane #	0.710	0.816	0.766	0.796	0.743	0.766	5.5#
Toluene *	0.600	0.704	0.549	0.658	0.609	0.624	9.5*
Chlorobenzene #	0.791	1.013	0.765	0.893	0.897	0.872	11.3#
Ethylbenzene *	0.393	0.480	0.375	0.442	0.454	0.429	10.2*
Styrene	0.800	1.010	0.771	0.934	1.001	0.903	12.4
Total Xylenes	0.465	0.595	0.430	0.543	0.569	0.520	13.5
Toluene-d8	0.985	0.920	0.882	1.043	0.953	0.957	6.4
BFB	0.863	0.920	0.801	0.885	0.937	0.881	6.1
,2-Dichloroethane-d4	2.411	2.238	2.041	2.062	1.387	2.028	19.1

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: F3414 BFB Injection Date: 06/23/91

Instrument ID: MS6 (raw data says MS5) BFB Injection Time: 1215

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) PACK

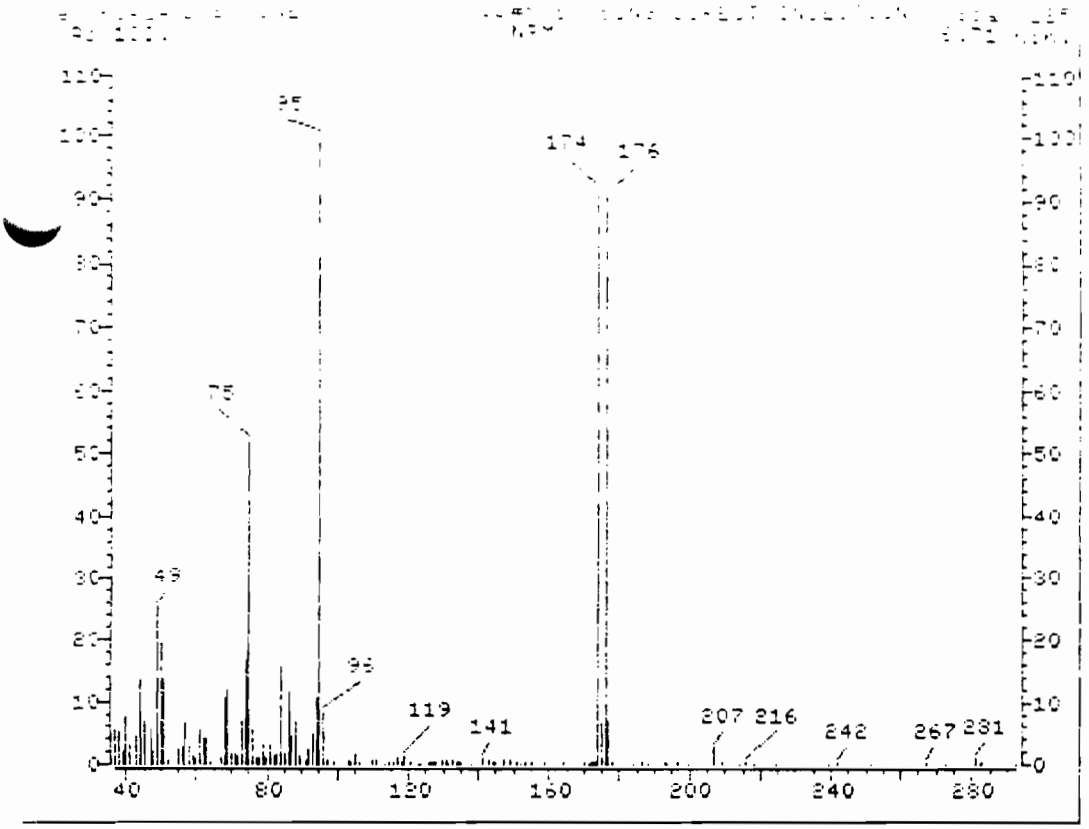
m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.5
75	30.0 - 60.0% of mass 95	51.9
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.3
173	Less than 2.0% of mass 174	0.5 (0.6)1
174	Greater than 50.0% of mass 95	91.6
175	5.0 - 9.0% of mass 174	6.4 (7.0)1
176	Greater than 95.0%, but less than 101.0% of mass 174	90.1 (98.4)1
177	5.0 - 9.0% of mass 176	6.8 (7.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD0623	F3415	06/23/91	1243
02	VBLK03	V60624-B2	F3418	06/23/91	1659
03	TCLP_BLANK	TCLPBLK-B1	F3430	06/24/91	0111

(outside tune)



MS data file header from : >F3414::D1

Sample: BFB TUNE Operator: VOA4 REG. GRP. 6/23/91 12:15
Misc : ID#MS5 50NG DIRECT INJECTION LH
Sys. #: 2 MS model: 70 SW/HW rev.: IA ALS # : 0 Equip ID:
Method file: MS5A Tuning file: TUNEF No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	220.	220.	0.	0.	0.
Chromatographic times, min. :	12.0	1.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	1.0	0.0	0.0	0.0	0.0

Case# 910312

301755

CB

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	19.51	19.51	Ok
75	30-60% of mass 95	51.91	51.91	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	8.27	8.27	Ok
173	Less than 2% of mass 174	.59	.64	Ok
174	Greater than 50% of mass 95	91.63	91.63	Ok
175	5-9% of mass 174	6.45	7.04	Ok
176	95-101% of mass 174	90.20	98.43	Ok
177	5-9% of mass 176	6.73	7.46	Ok

Injection Date: 06/23/91
Injection Time: 12:15
Data File: >F3414
Scan: 125

Case# 910312

: :

>F3414 BFB TUNE IN#MS5 50NG DIRECT INJECTION LH
125 NRM

: : >F3414 Scan #: 125 Retn. time: 6.71

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
37.00	5.479	69.00	11.946	96.10	8.273	132.95	.695	175.95	90.199
38.10	5.063	70.10	1.868	97.10	.772	133.95	.355	176.95	6.729
39.00	2.238	71.10	1.883	99.10	.478	134.35	.278	178.15	.448
40.00	7.547	72.10	1.281	103.00	.818	135.05	.293	184.15	.185
41.00	3.180	73.00	6.976	103.90	.587	138.05	.185	186.25	.309
43.10	4.599	74.00	16.499	105.00	1.837	141.05	1.080	187.95	.185
44.00	13.629	75.10	51.906	105.90	.571	142.85	.648	192.95	.355
45.00	6.822	76.10	5.340	107.60	.154	144.15	.355	193.85	.201
47.00	5.788	77.00	1.235	110.05	.911	144.55	.232	196.75	.293
47.90	2.115	78.00	.957	110.95	.741	144.85	.278	199.35	.216
49.00	25.313	78.90	2.994	113.65	.216	147.05	.664	207.05	2.655
50.00	19.509	79.90	1.111	114.75	.540	149.05	.833	209.05	.401
51.00	13.013	80.90	3.257	115.75	.525	150.95	.525	214.35	.232
51.90	.695	82.00	1.559	117.05	.942	151.75	.247	216.05	.309
55.10	2.562	82.90	1.636	117.95	.432	153.05	.278	218.15	.170
56.00	2.763	84.00	15.651	119.05	1.281	154.75	.417	224.35	.201
57.00	6.498	85.10	1.914	120.75	.587	154.95	.478	239.55	.185
58.00	2.778	86.00	11.699	123.35	.201	158.85	.293	242.05	.355
59.00	1.296	87.00	4.322	123.65	.247	163.95	.262	251.35	.170
60.00	.988	88.00	6.699	126.05	.370	170.15	.370	267.15	.401
61.00	5.402	89.00	1.296	126.95	.293	171.35	.247	272.75	.216
00	3.982	91.10	.756	127.15	.293	171.95	.278	281.15	.957
.00	4.105	92.00	2.500	127.95	.540	172.25	.324	282.15	.247
64.10	.463	93.00	4.954	129.95	.602	173.05	.587	282.95	.293
67.00	1.080	94.00	10.403	130.95	.695	173.95	91.635	292.65	.185
68.00	10.511	95.00	100.000	131.55	.216	174.95	6.452		

113

301756

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 1(o

Instrument ID: MS6 (raw data given MS5) Calibration date: 06/23/91 Time: 1243

Lab File ID: F3415 Init. Calib. Date(s): 06/15/91 06/15/91

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) PACK

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0%

COMPOUND	RRF	RRF50	%D	
Chloromethane	0.560	0.379	32.3	#
Bromomethane	0.931	1.164	-25.0	
Vinyl Chloride	0.844	0.841	0.4	*
Chloroethane	0.569	0.590	-3.7	
Methylene Chloride	1.149	1.210	-5.3	
Acetone	0.325	0.299	8.0	
Carbon Disulfide	2.603	2.476	4.9	
1,1-Dichloroethene	0.973	1.014	-4.2	*
1,1-Dichloroethane	2.187	2.153	1.6	#
1,2-Dichloroethene (total)	1.076	1.140	-5.9	
Chloroform	2.848	2.738	3.9	*
1,2-Dichloroethane	2.448	1.984	19.0	
2-Butanone	0.114	0.110	3.5	
1,1,1-Trichloroethane	0.839	0.638	24.0	
Carbon Tetrachloride	0.759	0.532	29.9	
Vinyl Acetate	0.736	0.598	18.8	
Bromodichloromethane	0.907	0.734	19.1	
1,2-Dichloropropane	0.364	0.337	7.4	*
cis-1,3-Dichloropropene	0.617	0.612	0.8	
Trichloroethene	0.427	0.395	7.5	
Dibromochloromethane	0.894	0.717	19.8	
1,1,2-Trichloroethane	0.376	0.368	2.1	
Benzene	0.788	0.774	1.8	
Trans-1,3-Dichloropropene	0.904	0.604	33.2	
Bromoform	0.900	0.635	29.4	#
4-Methyl-2-Pentanone	0.425	0.322	24.2	
2-Hexanone	0.323	0.250	22.6	
Tetrachloroethene	0.464	0.398	14.2	
1,1,2,2-Tetrachloroethane	0.766	0.695	9.3	#
Toluene	0.624	0.619	0.8	*
Chlorobenzene	0.872	0.844	3.2	#
Ethylbenzene	0.429	0.407	5.1	*
Styrene	0.903	0.887	1.8	
Total Xylenes	0.520	0.504	3.1	
Toluene-d8	0.957	0.911	4.8	
BFB	0.881	0.776	11.9	
1,2-Dichloroethane-d4	2.028	1.779	12.3	

93

301757

SA

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 10

File ID (Standard): F3415 Date Analyzed: 06/23/91

Instrument ID: MS6 Time Analyzed: 1243

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) PACK

		IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
	12 HOUR STD	215000	8.95	813000	18.82	734000	23.67
	UPPER LIMIT	430000		1626000		1468000	
	LOWER LIMIT	107500		406500		367000	
	EPA SAMPLE NO.						
01	TCLP_BLANK	147000	8.92	563000	18.82	491000	23.64
02	VBLK03	208000	8.95	811000	18.82	714000	23.67

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

60

FORM VIII VOA 1/87 Rev.

301758

2C

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

	EPA SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	OTHER	TOT OUT
01	TANK_16	87	90	108	54	70	66	0	0
02	TCLP_BLANK	82	79	105	54	69	72	0	0
03	TANK_16MS	87	84	93	51	70	72	0	0
04	SBLK01	80	83	102	31	52	69	0	0

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl	(33-141)
S4 (PHL)	= Phenol-d5	(10-94)
S5 (2FP)	= 2-Fluorophenol	(21-100)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

SEMIVOLATILE ORGANIC ANALYSIS

MATRIX SPIKE ANALYSIS SUMMARY

EPA METHOD 8270

Client: Anson Environmental

Client Sample ID: Tank 16MS

Laboratory ID: 910312-01MS

Date Analyzed: 6/20/91

Concentration in: ug/L (ppb)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
2,4-Dinitrotoluene	ND	125	79	63 %
Hexachlorobenzene	ND	125	89	71
Hexachloro-1,3-butadiene	ND	125	90	72
Hexachloroethane	ND	125	70	56
Nitrobenzene	ND	125	109	87
1,4-Dichlorobenzene	ND	125	80	64
Methylphenols (total)	ND	500	319	64
Pentachlorophenol	ND	250	155	62
2,4,5-Trichlorophenol	ND	250	151	60
2,4,6-Trichlorophenol	ND	250	155	62

ND = Not detected

This matrix spike analysis summary applies to the following samples:

Tank 16

Reported by:_____ Approved by:_____

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: A7895 Lab Sample ID: S0618-B1

Date Extracted: 06/18/91 Extraction:(SepF/Cont/Sonc) SEPF

Date Analyzed: 06/20/91 Time Analyzed: 0020

Matrix: (soil/water) WATER Level:(low/med) LOW

Instrument ID: MS1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	TANK_16	910312-01	A7900	06/20/91
02	TCLP_BLANK	STCLP0617-B1	A7896	06/20/91
03	TANK_16MS	910312-01MS	A7901	06/20/91

COMMENTS:

130

5B

SEMIVOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: A7861 DFTPP Injection Date: 06/17/91

Instrument ID: MS1 DFTPP Injection Time: 1914

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	54.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	66.5
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	42.5
197	Less than 1.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.5
275	10.0 - 30.0% of mass 198	16.1
365	Greater than 1.00% of mass 198	1.18
441	Present, but less than mass 443	6.4
442	Greater than 40.0% of mass 198	40.6
443	17.0 - 23.0% of mass 442	8.0 (19.8)2

1-Value is % mass 69 2-Value is % mass 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050	SSTD0617	A7863	06/17/91	2103
02	SSTD020	SSTD0617	A7864	06/17/91	2200
03	SSTD080	SSTD0617	A7865	06/17/91	2258
04	SSTD120	SSTD0617	A7866	06/17/91	2356
05	SSTD160	SSTD0618	A7867	06/18/91	0055

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MS1 Calibration Date(s): 06/17/91 06/18/91

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = A7864 1222 RRF50 = A7863 2103

RRF80 = A7865 1153 RRF120= A7866 2116 RRF160= A7867 2055

COMPOUND	RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Phenol *	1.847	1.720	1.703	1.616	1.583	1.694	6.1*
bis(2-Chloroethyl)Ether	1.556	1.436	1.367	1.205	1.146	1.342	12.5
2-Chlorophenol	1.376	1.324	1.242	1.155	1.107	1.241	9.1
1,3-Dichlorobenzene	1.600	1.585	1.479	1.415	1.301	1.472	8.2
1,4-Dichlorobenzene *	1.679	1.626	1.500	1.426	1.396	1.525	8.1*
Benzyl Alcohol	0.802	0.921	0.917	0.905	0.905	0.890	5.6
1,2-Dichlorobenzene	1.594	1.561	1.503	1.375	1.335	1.474	7.7
2-Methylphenol	1.322	1.285	1.227	1.083	1.028	1.189	10.8
bis(2-Chloroisopropyl)Ether	2.847	2.965	2.918	2.744	2.669	2.829	4.3
4-Methylphenol	1.426	1.316	1.178	1.182	1.241	1.269	8.2
N-Nitroso-Di-n-Propylamine #	1.394	1.507	1.518	1.299	1.160	1.376	10.9#
Hexachloroethane	0.752	0.715	0.658	0.586	0.560	0.654	12.5
Nitrobenzene	0.446	0.468	0.436	0.437	0.396	0.437	6.0
Isophorone	0.941	0.972	0.938	0.947	0.890	0.938	3.2
-Nitrophenol *	0.241	0.250	0.250	0.252	0.255	0.250	2.1*
2,4-Dimethylphenol	0.306	0.350	0.357	0.365	0.372	0.350	7.4
Benzoic Acid		0.204	0.223	0.268	0.272	0.242	13.9
bis(2-Chloroethoxy)Methane	0.557	0.557	0 531	0.517	0.504	0.533	4.5
2,4-Dichlorophenol *	0.355	0.366	0.345	0.326	0.319	0.342	5.7*
1,2,4-Trichlorobenzene	0.395	0.401	0.367	0.359	0.340	0.372	6.8
Naphthalene	1.098	1.057	0.976	0.941	0.888	0.992	8.6
4-Chloroaniline	0.449	0.439	0.410	0.402	0.384	0.417	6.4
Hexachlorobutadiene *	0.244	0.244	0.233	0.227	0.217	0.233	5.0*
4-Chloro-3-Methylphenol *	0.402	0.422	0.411	0.396	0.394	0.405	2.9*
2-Methylnaphthalene	0.774	0.743	0.706	0.675	0.643	0.708	7.4
Hexachlorocyclopentadiene #	0.161	0.216	0.282	0.237	0.228	0.225	19.4#
2,4,6-Trichlorophenol *	0.466	0.496	0.474	0.426	0.416	0.456	7.4*
2,4,5-Trichlorophenol		0.590	0.566	0.517	0.479	0.538	9.2
2-Chloronaphthalene	1.409	1.335	1.340	1.095	1.087	1.253	12.0
2-Nitroaniline		0.672	0.645	0.639	0.628	0.646	2.9
Dimethyl Phthalate	1.771	1.840	1.817	1.694	1.690	1.762	3.9
Acenaphthylene	2.263	2.150	2.081	1.833	1.753	2.016	10.7
2,6-Dinitrotoluene	0.423	0.452	0.443	0.429	0.394	0.428	5.2
3-Nitroaniline		0.505	0.498	0.504	0.458	0.491	4.6
Acenaphthene *	1.428	1.366	1.331	1.174	1.116	1.283	10.3*
2,4-Dinitrophenol #		0.240	0.274	0.329	0.335	0.294	15.5#
4-Nitrophenol #		0.241	0.244	0.229	0.244	0.242	1.0#

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MS1 Calibration Date(s): 06/17/91 06/18/91

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = A7864 RRF50 = A7863
RRF80 = A7865 RRF120= A7866 RRF160= A7867

COMPOUND	RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Dibenzofuran	2.154	2.089	1.971	1.826	1.762	1.960	8.5
2,4-Dinitrotoluene ✓	0.652	0.742	0.716	0.630	0.659	0.680	6.9
Diethylphthalate	2.009	2.100	1.890	1.534	1.361	1.779	17.8
4-Chlorophenyl-phenylether	0.858	0.901	0.827	0.743	0.724	0.811	9.3
Fluorene	1.671	1.636	1.551	1.177	1.090	1.425	19.0
4-Nitroaniline		0.612	0.614	0.585	0.562	0.593	4.2
4,6-Dinitro-2-Methylphenol		0.189	0.195	0.200	0.201	0.196	2.8
N-Nitrosodiphenylamine (1) *	0.543	0.558	0.521	0.458	0.423	0.501	11.5*
4-Bromophenyl-phenylether	0.240	0.251	0.224	0.177	0.162	0.211	18.6
Hexachlorobenzene ✓	0.307	0.334	0.312	0.301	0.299	0.311	4.5
Pentachlorophenol ✓ *	0.141	0.195	0.191	0.194	0.190	0.182	12.7*
Phenanthrene	1.176	1.170	1.113	0.965	0.926	1.070	10.9
Anthracene	1.165	1.192	1.111	0.965	0.920	1.071	11.4
Di-n-Butylphthalate	1.843	1.877	1.705	1.528	1.564	1.703	9.3
uoranthene *	1.455	1.459	1.386	1.253	1.202	1.351	8.7*
yrene	1.373	1.417	1.388	1.404	1.450	1.406	2.1
Butylbenzylphthalate	0.828	0.943	0.898	0.836	0.868	0.875	5.4
3,3'-Dichlorobenzidine	0.385	0.382	0.421	0.383	0.374	0.389	4.7
Benzo(a)Anthracene	1.189	1.417	1.427	1.463	1.568	1.413	9.8
Chrysene	1.324	1.352	1.312	1.397	1.368	1.351	2.5
bis(2-Ethylhexyl)Phthalate	1.245	1.363	1.381	1.374	1.453	1.363	5.5
Di-n-Octyl Phthalate *	2.722	3.113	2.752	2.703	3.062	2.870	7.0*
Benzo(b)Fluoranthene	1.395	1.571	1.482	1.732	1.902	1.616	12.5
Benzo(k)Fluoranthene	1.466	1.601	1.403	1.217	1.273	1.392	11.0
Benzo(a)Pyrene *	1.206	1.317	1.242	1.233	1.283	1.256	3.5*
Indeno(1,2,3-cd)Pyrene	0.743	0.783	0.713	0.659	0.567	0.693	12.1
Dibenz(a,h)Anthracene	0.801	0.872	0.774	0.736	0.649	0.766	10.8
Benzo(g,h,i)Perylene	0.757	0.736	0.660	0.606	0.507	0.653	15.6
Nitrobenzene-d5	0.432	0.448	0.434	0.441	0.422	0.435	2.2
2-Fluorobiphenyl	1.270	1.310	1.185	1.081	1.052	1.180	9.6
Terphenyl-d14	0.880	0.957	0.921	0.922	0.952	0.926	3.3
Phenol-d5	1.947	1.962	1.958	1.872	1.845	1.917	2.8
2-Fluorophenyl	1.048	1.015	1.054	1.038	0.986	1.028	2.7
2,4,6-Tribromophenol	0.300	0.353	0.371	0.373	0.388	0.357	9.6

(1) Cannot be separated from Diphenylamine

144

301764

5B

SEMIVOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID: A7884 DFTPP Injection Date: 06/19/91

Instrument ID: MS1 DFTPP Injection Time: 1401

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	56.4
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	65.0
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	40.1
197	Less than 1.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.5
275	10.0 - 30.0% of mass 198	17.2
365	Greater than 1.00% of mass 198	1.56
441	Present, but less than mass 443	7.3
442	Greater than 40.0% of mass 198	49.3
443	17.0 - 23.0% of mass 442	9.3 (18.8)2

1-Value is % mass 69 2-Value is % mass 442

IS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050	SSTD0619	A7885	06/19/91	1431
02	SBLK01	S0618-B1	A7895	06/20/91	0020
03	TCLP_BLANK	STCLP0617-B1	A7896	06/20/91	0117
04	TANK_16	910312-01	A7900	06/20/91	0504
05	TANK_16MS	910312-01MS	A7901	06/20/91	0602

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MS1 Calibration date: 06/19/91 Time: 1431

Lab File ID: A7885 Init. Calib. Date(s): 06/17/91 06/19/91

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND	RRF	RRF50	%D	
Phenol	1.694	1.916	-13.1	*
bis(2-Chloroethyl)Ether	1.342	1.579	-17.7	
2-Chlorophenol	1.241	1.420	-14.4	
1,3-Dichlorobenzene	1.472	1.650	-12.1	
1,4-Dichlorobenzene	1.525	1.717	-12.6	*
Benzyl Alcohol	0.890	0.948	-6.5	
1,2-Dichlorobenzene	1.474	1.643	-11.5	
2-Methylphenol	1.189	1.394	-17.2	
bis(2-Chloroisopropyl)Ether	2.829	3.066	-8.4	
4-Methylphenol	1.269	1.424	-12.2	
N-Nitroso-Di-n-Propylamine	1.376	1.566	-13.8	#
Hexachloroethane	0.654	0.744	-13.8	
Nitrobenzene	0.437	0.460	-5.3	
Isophorone	0.938	0.988	-5.3	
2-Nitrophenol	0.250	0.254	-1.6	*
2,4-Dimethylphenol	0.350	0.391	-11.7	
Benzoic Acid	0.242	0.206	14.9	
bis(2-Chloroethoxy)Methane	0.533	0.574	-7.7	
2,4-Dichlorophenol	0.342	0.357	-4.4	*
1,2,4-Trichlorobenzene	0.372	0.408	-9.7	
Naphthalene	0.992	1.088	-9.7	
4-Chloroaniline	0.417	0.498	-19.4	
Hexachlorobutadiene	0.233	0.257	-10.3	*
4-Chloro-3-Methylphenol	0.405	0.434	-7.2	*
2-Methylnaphthalene	0.708	0.769	-8.6	
Hexachlorocyclopentadiene	0.225	0.395	-75.6	#
2,4,6-Trichlorophenol	0.456	0.512	-12.3	*
2,4,5-Trichlorophenol	0.538	0.569	-5.8	
2-Chloronaphthalene	1.253	1.415	-12.9	
2-Nitroaniline	0.646	0.655	-1.4	
Dimethyl Phthalate	1.762	1.882	-6.8	
Acenaphthylene	2.016	2.256	-11.9	
2,6-Dinitrotoluene	0.428	0.440	-2.8	
3-Nitroaniline	0.491	0.526	-7.1	
Acenaphthene	1.283	1.416	-10.4	*
2,4-Dinitrophenol	0.294	0.168	42.9	#
4-Nitrophenol	0.242	0.248	-2.5	#

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Instrument ID: MS1 Calibration date: 06/19/91 Time: 1431

Lab File ID: A7885 Init. Calib. Date(s): 06/17/91 06/18/91

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND	RRF	RRF50	%D	
Dibenzofuran	1.960	2.136	-9.0	
2,4-Dinitrotoluene	0.680	0.736	-8.2	
Diethylphthalate	1.779	2.070	-16.4	
4-Chlorophenyl-phenylether	0.811	0.930	-14.7	
Fluorene	1.425	1.666	-16.9	
4-Nitroaniline	0.593	0.591	0.3	
4,6-Dinitro-2-Methylphenol	0.196	0.169	13.8	
N-Nitrosodiphenylamine (1)	0.501	0.566	-13.0	*
4-Bromophenyl-phenylether	0.211	0.264	-25.1	
Hexachlorobenzene	0.311	0.367	-18.0	
Pentachlorophenol	0.182	0.198	-8.8	*
Phenanthrene	1.070	1.211	-13.2	
Anthracene	1.071	1.195	-11.6	
Di-n-Butylphthalate	1.703	1.907	-12.0	
Fluoranthene	1.351	1.511	-11.8	*
Pyrene	1.406	1.413	-0.5	
Butylbenzylphthalate	0.875	0.854	2.4	
3,3'-Dichlorobenzidine	0.389	0.474	-21.8	
Benzo(a)Anthracene	1.413	1.338	5.3	
Chrysene	1.351	1.345	0.4	
bis(2-Ethylhexyl)Phthalate	1.363	1.274	6.5	
Di-n-Octyl Phthalate	2.870	2.724	5.1	*
Benzo(b)Fluoranthene	1.616	1.431	11.4	
Benzo(k)Fluoranthene	1.392	1.411	-1.4	
Benzo(a)Pyrene	1.256	1.334	-6.2	*
Indeno(1,2,3-cd)Pyrene	0.693	0.924	-33.3	
Dibenz(a,h)Anthracene	0.766	0.969	-26.5	
Benzo(g,h,i)Perylene	0.653	0.924	-41.5	
Nitrobenzene-d5	0.435	0.442	-1.6	
2-Fluorobiphenyl	1.180	1.299	-10.1	
Terphenyl-d14	0.926	0.896	3.2	
Phenol-d5	1.917	2.151	-12.2	
2-Fluorophenyl	1.028	1.244	-21.0	
2,4,6-Tribromophenol	0.357	0.417	-16.8	

(1) Cannot be separated from Diphenylamine

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID (Standard): A7885 Date Analyzed: 06/19/91

Instrument ID: MS1 Time Analyzed: 1431

		IS1(DCB) AREA #	RT	IS2(NPT) AREA #	RT	IS3(ANT) AREA #	RT
	12 HOUR STD	9360	9.70	39500	13.35	23900	18.74
	UPPER LIMIT	18720		79000		47800	
	LOWER LIMIT	4680		19750		11950	
	EPA SAMPLE NO.						
01	TANK_16	10900	9.72	42800	13.34	26200	18.75
02	TCLP_BLANK	10200	9.70	40600	13.35	26000	18.74
03	TANK_16MS	10500	9.70	38600	13.34	25000	18.75
04	SBLK01	9070	9.70	35100	13.34	22500	18.75

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON

Lab Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK 16

Lab File ID (Standard): A7885 Date Analyzed: 06/19/91

Instrument ID: MS1 Time Analyzed: 1431

		IS4(PHN) AREA	#	RT	IS5(CRY) AREA	#	RT	IS6(PRY) AREA	#	RT
	12 HOUR STD	53300		23.37	57400		31.67	49200		35.92
	UPPER LIMIT	106600			114800			98400		
	LOWER LIMIT	26650			28700			24600		
	EPA SAMPLE NO.									
01	TANK_16	54100		23.37	43100		31.64	23000	*	35.92
02	TCLP_BLANK	53400		23.39	45100		31.64	24400	*	35.91
03	TANK_16MS	53100		23.37	45400		31.64	25800		35.92
04	SBLK01	46800		23.37	39200		31.64	22300	*	35.91

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

target compounds not quantitated from perylene-d12

WATER PESTICIDE SURROGATE RECOVERY

Lab Name: CEIMIC CORP Contract: _____

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK16

	EPA SAMPLE NO.	S1 (DBC)#	OTHER
01	TANK16	83	0
02	TANK16MS	90	0
03	PBLK01	90	0

ADVISORY QC LIMITS

S1 (DBC) = Dibutlychlorendate (24-154)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3E

WATER PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CEIMIC CORP Contract: _____

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK16

Matrix Spike - EPA Sample No.: TANK16

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
gamma-BHC (Lindane)	0.200	0	0.154	77	56-123
Heptachlor	0.200	0	0.186	93	40-131
Heptachlor Epoxide	0.200	0	0.186	93	40-131
Endrin	0.500	0	0.665	133	56-121
Methoxychlor	1.000	0	0.820	82	38-127

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS:

FORM III PEST-1 8/87 Rev.

4C

PESTICIDE METHOD BLANK SUMMARY

Lab Name: CEIMIC CORP Contract: _____

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK16

Lab Sample ID: PTCLP617-B1 Lab File ID: _____

Matrix:(soil/water) WATER Level:(low/med) LOW

Date Extracted: 06/17/91 Extraction:(SepF/Cont/Sonc) SEPF

Date Analyzed (1): 06/21/91 Date Analyzed (2): _____

Time Analyzed (1): 1801 Time Analyzed (2): _____

Instrument ID (1): GC3 Instrument ID (2): _____

GC Column ID (1): DB-5 GC Column ID (2): _____

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	TANK16	910312-01	06/21/91	
02	TANK16MS	910312-01MS	06/21/91	

COMMENTS:

184

PESTICIDE EVALUATION STANDARDS SUMMARY

Lab Name: CEIMIC CORP Contract: _____

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK15

Instrument ID: GC3 GC Column ID: DB-5

Dates of Analyses: 06/21/91 to 06/22/91

Evaluation Check for Linearity

PESTICIDE	CALIBRATION FACTOR EVAL MIX A	CALIBRATION FACTOR EVAL MIX B	CALIBRATION FACTOR EVAL MIX C	%RSD (</= 10.0%)	
Aldrin	7780000	7690000	7550000	1.5	
Endrin	7320000	7150000	6690000	4.6	
4,4'-DDT	6390000	6180000	5610000	6.7	(1)
DBC	4720000	4580000 ✓	4290000 ✓	4.8	25.7

(1) If > 10.0% RSD, plot a standard curve and determine the ng for each sample in that set from the curve.

Evaluation Check for 4,4'-DDT/Endrin Breakdown (percent breakdown expressed as total degradation)

		DATE ANALYZED	TIME ANALYZED	ENDRIN	4,4'-DDT	COMBINED (2)
01	INITIAL EVAL MIX B	06/21/91	1415	4.1	0.0	

(2) See Form instructions.

PESTICIDE EVALUATION STANDARDS SUMMARY
Evaluation of Retention Time Shift for Dibutylchlorendate

ab Name: CEIMIC CORP Contract: _____

, Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK16

Instrument ID: GC3 GC Column ID: DB-5

Dates of Analyses: 06/21/91 to 06/22/91

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	% D	*
01	EVALA	EVALA	06/21/91	1338	0.0	
02	EVALB	EVALB	06/21/91	1415	0.0	
03	EVALC	EVALC	06/21/91	1453	0.0	
04	INDA	INDA	06/21/91	1531	0.1	
05	INDB	INDB	06/21/91	1608	0.1	
05a	CHLORDANE	CHLORDANE	06/21/91	1646	0.1	
05b	TOXAPHENE	TOXAPHENE	07/13/91	1904	0.0	
06	PBLK01	PTCLP617-B1	06/21/91	1801	0.0	
07	TANK16	910312-01	06/21/91	1839	-0.1	
08	TANK16MS	910312-01MS	06/21/91	1916	-0.1	
09	INDA	INDA	06/21/91	1953	-0.2	
10	INDB	INDB	06/22/91	1636	0.2	

* Values outside of QC limits (2.0% for packed columns, 0.3% for capillary columns)

193

301774

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: CEIMIC CORP Contract: _____

Code: CEIMIC Case No.: 910312 SAS No.: _____ SDG No.: TANK16

Instrument ID: GC3 GC Column ID: DB-5

DATE(S) OF ANALYSIS FROM: 06/21/91 TO: 06/21/91
TIME(S) OF ANALYSIS FROM: 1336 TO: 1608

DATE OF ANALYSIS 06/21/91
TIME OF ANALYSIS 1953
EPA SAMPLE NO. (STANDARD) INDA

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
gamma-BHC	11.83	11.77	11.89	11900000	11.87	12200000	Y	-2.5
Heptachlor	14.49	14.43	14.55	10500000	14.54	10800000	Y	-2.9
Hept. epoxide	17.17	17.11	17.23	8530000	17.23	8780000	Y	-2.9
Endrin	20.17	20.12	20.22	5290000				
Methoxychlor	24.03	23.98	24.08	3710000	24.08	3790000	Y	-2.2
Chlordane	18.57	18.50	18.64	6720000				
Toxaphene	22.73	22.67	22.79	168814				
DBC	15.19			4410000		4511000		

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.
%D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRDL is a form of titation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

FORM IX PEST 8/87 Rev.

9

PESTICIDE/PCB STANDARDS SUMMARY

Lab Name: CEIMIC CORP Contract: _____

Code: CEIMIC Case No.: 910712 SAS No.: _____ SDG No.: TANK16

Instrument ID: GC3 GC Column ID: DB-5

DATE(S) OF ANALYSIS FROM: 06/21/91 TO: 06/21/91
TIME(S) OF ANALYSIS FROM: 1336 TO: 1608
DATE OF ANALYSIS 06/22/91
TIME OF ANALYSIS 1636
EPA SAMPLE NO. (STANDARD) INDB

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
gamma-BHC	11.83	11.77	11.89	11900000				
Heptachlor	14.49	14.43	14.55	10500000				
Hept. epoxide	17.17	17.11	17.23	8530000				
Endrin	20.17	20.12	20.22	5290000	20.13	5930000	Y	-12.1
Methoxychlor	24.03	23.98	24.08	3710000				
Chlordane	18.57	18.50	18.64	6720000	18.54	7220000	Y	-7.4
Toxaphene	22.73	22.67	22.79	168814				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.
%D must be less than or equal to 15.0% for quantitiation, and less than or equal to 20.0% for confirmation.

[illegible]: Determining that no compounds were found above the CRDL is a form of [illegible]titation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

SURROGATE RECOVERY SUMMARY

Organochlorine Herbicides Analysis

Client: Anson Environmental

Date Samples Received: 6/17/91

Project No.: 910312

Client ID	Laboratory ID	DCPAA* Recovery
Tank 16	910312-01	84%
QA/QC		
TCLP Extraction Blank	HTCLP0628-B2	89
Matrix Spike	910312-01MS	86
Laboratory Control Spike	H910702-LCS1	86

DCPAA = Dichlorophenylacetic acid

Reported by: _____

ORGANOCHLORINE HERBICIDES

LABORATORY CONTROL SPIKE

EPA Method 8150

Client: Anson Environmental

Client Sample ID: Laboratory Control Spike

Laboratory ID: H910702-LCS1

Date Sample Received: NA

Date Sample Prepared: 7/02/91

Date Sample Analyzed: 7/09/91

Matrix: Aqueous

Target Analyte	% Recovery
2,4-D	70 %
Silvex	64
2,4,5-T	60

NA = Not applicable

Reported by:_____

Approved by:_____

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

ORGANOCHLORINE HERBICIDES

MATRIX SPIKE ANALYSIS SUMMARY

EPA Method 8150

Client: Anson Environmental

Client Sample ID: Tank 16 Laboratory ID: 910312-01

Date Analyzed: 7/09/91 Concentration in: ug/L (ppb)

Target Analyte	Sample Result	Spike Added	Spiked Sample Result	Percent Recovery
2,4-D	ND	5.0	3.4	69%
2,4,5-TP (Silvex)	ND	5.0	0.7	68
2,4,5-T	ND	5.0	0.6	60

ND = Not detected

Reported by:_____ Approved by:_____

HERBICIDE METHOD BLANK SUMMARY

Lab Name: CEIMIC CORP | Contract: Anson Environmental

Lab Code: CEIMIC Case No. | SAS No.: SDG No.: Tank 16

Lab Sample ID: HTCLP0628-B2 | Matrix: Aqueous

Extraction Date: 6/28/91 | Date Analyzed: 7/09/91

Instrument ID: GC-1 | Time Analyzed: 18:36

GC Column ID: DB-608

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

Client ID	Lab Sample ID	Date Analyzed
Tank 16	910312-01	7/09/91
Tank 16MS	910312-01MS	7/09/91

Reported by: _____ Aprroved by: _____

HERBICIDE STANDARDS SUMMARY

Lab Name: CEIMIC CORP Contract: ANSON ENVIRONMENTAL

Lab Code: CEIMIC Case No.: CAS No.: SDG No.: Tank 16

Instrument ID: GC-1 GC Column ID: DB-608

Dates of Analyses: 7/09/91

HERBICIDE	RESPONSE FACTOR LEVEL 1	RESPONSE FACTOR LEVEL 2	RESPONSE FACTOR LEVEL 3	RESPONSE FACTOR LEVEL 4	RESPONSE FACTOR LEVEL 5	%RSD (</= 10.0%)
DCPAA	381,000	361,000	349,000	332,000	329,000	6
2,4-D	482,000	400,000	386,000	380,000	378,000	11
2,4,5-TP (SILVEX)	2,420,000	2,310,000	2,280,000	2,260,000	2,310,000	3
2,4,5-T	2,480,000	1,700,000	1,800,000	1,820,000	1,890,000	15

HERBICIDE STANDARDS (MASS INJECTED)

HERBICIDE	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
DCPAA	0.125	0.377	0.628	0.879	1.13
2,4-D	0.098	0.295	0.492	0.689	0.800
2,4,5-TP (SILVEX)	0.025	0.075	0.126	0.176	0.226
2,4,5-T	0.025	0.074	0.123	0.172	0.221

Reported by: _____ Approved by: _____

HERBICIDE STANDARD SUMMARY
CONTINUING CALIBRATION

Lab Name: CEIMIC CORP. Contract: Anson Environmental

Lab Code: CEIMIC Case No.: SAS No.: SDG: Tank 16

Instrument ID: GC-1 GC Column ID: DB-608

DATE(S) OF ANALYSIS FROM: 7/09/91 TO: 7/09/91
TIME(S) OF ANALYSIS FROM: 9:24 TO: 11:34
DATE OF ANALYSIS 7/09/91
TIME OF ANALYSIS 21:18
STANDARD: HERBICIDE-3

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
2,4,D	13.22	13.20	13.24	405,000	13.24	450,000	Y	11
2,4,5-TP (SILVEX)	15.86	15.85	15.87	2,310,000	15.88	2,410,000	Y	4
2,4,5-T	18.07	18.05	18.09	2,030,000	18.09	2,050,000	Y	2

Reported by: _____ Approved by: _____

HERBICIDE STANDARD SUMMARY
CONTINUING CALIBRATION

Lab Name: CEIMIC CORP. Contract: Anson Environmental

Lab Code: CEIMIC Case No.: SAS No.: SDG: Tank 16

Instrument ID: GC-1 GC Column ID: DB-608

DATE(S) OF ANALYSIS FROM: 7/09/91 TO: 7/09/91
TIME(S) OF ANALYSIS FROM: 9:24 TO: 11:34
DATE OF ANALYSIS 7/10/91
TIME OF ANALYSIS 11:00
STANDARD: HERBICIDE-3

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
2,4,D	13.22	13.20	13.24	405,000	13.27	475,000	Y	17
2,4,5-TP (SILVEX)	15.86	15.85	15.87	2,310,000	15.92	2,430,000	Y	5
2,4,5-T	18.07	18.05	18.09	2,030,000	18.13	2,160,000	Y	6

Reported by: _____ Approved by: _____

SECTION 8

PROJECT CASE NARRATIVES AND CHAINS-OF-CUSTODY

CASE NARRATIVE

The enclosed data package is in response to Anson Environmental Ceimic Case #910312, SDG Tank 16. Under this SDG, there are 2 TCLP VOA, 2 TCLP SVOA, 2 TCLP Pest, and 2 TCLP Herb analyses for 1 soil sample which was received at CEIMIC on June 12, 1991.

This data package included the analysis of samples for SDG Tank 16.

CLIENT ID	ANALYSIS
Tank 16(MS)	VOA, SV, PEST, HERB

The submitted data covers the analysis of the Volatile (VOA), Semivolatile (SV), Pesticides (Pest), and Herbicides (Herb) fractions and their associated blanks and QA/QC. CEIMIC would like to highlight the following points pertaining to the analyses performed for this case:

(1) INSTRUMENTATION AND COLUMN IDENTIFICATION

The following instruments are used for the analyses:

GC/MS ANALYSIS

A. VOA
- MS2 : HP5970B GC/MS using 75 m x 0.53 mm ID DB-624 megabore column
- MS6 : HP5970B GC/MS using 6' x 2mm ID SP-1000 glass packed column

B. SV
- MS1 : HP 5970B GC/MS using 30 m x 0.25 mm ID DB-5 fused silica capillary column

C. Pest
- GC 3 : HP 5890 DB-5 30 mm x 0.53 mm ID megabore column

D. Herb
- GC 1 : HP5890 DB-608 30 mm x 0.53 mm ID megabore column

(1) SAMPLE INFORMATION

Additional qualifier: "x"

An "x" qualifier is flagged by Formaster software whenever the data is manually edited.

A. VOA Fraction

The VOA reconstructed ion chromatograms are labelled as:

IS1	Bromochloromethane	IS
IS2	Difluorobenzene	IS
IS3	Chlorobenzene-d5	IS
SS1	Dichloroethane-d4	SS
SS2	Toluene-d8	SS
SS3	Bromofluorobenzene	SS

TCLP Blank is out of 12 hours tune time. There is no last QCal time for F3430 (TCLPBlank). There is no last QCal time for (5Level) F3247, F3248, F3249, F3250, except for Ff3246(50ppb).

B. SVOA Fraction

The entire base-neutral and acid fractions were combined and concentrated to a final extract volume of 1 ml prior to GC/MS analysis. The sample concentration in FORM 1B are therefore correct and do not have to be divided by 2.

The SV reconstructed ion chromatograms are labeled as:

S-1	2-Fluorophenol	SS
S-2	Phenol-d5	SS
IS-1	1,4-Dichlorobenzene-d4	IS
S-3	Nitrobenzene-d5	SS
IS-2	Naphthalene-d8	IS
S-4	2-Fluorobiophenyl	SS
IS-3	Acenaphthene-d10	IS
S-5	Tribromophenol	SS
IS-4	Phenanthrene-d10	IS
S-6	Terphenyl-d14	SS
IS-5	Chrysene-d12	IS
IS-6	Perylene-d12	IS

IS = Internal standard
SS = Surrogate standard

The samples Tank 16 and Tank 16MS are out of 12 hour tune time. For samples Tank 16, TCLPBlank, and SBLK01 the internal standard compound Dis-Perylene is out of QC limits.

C. Pest

Visual inspection of the chromatogram for sample Tank 16 was used to determine that toxaphene was not present. A chromatogram of a toxaphene standard analyzed in a later sequence on the same GC3 DB-5 column is included in this data pack and listed in the analytical sequence for reference purposes.

D. Herb

None.

DEVIATIONS FROM THE SOW

None other than specified above.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Miguel Muzzio
Organic Lab Director
March 5, 1992

301787

1C

CHAIN OF CUSTODY

Original chain of Custody goes to Laboratory

3

301788

Proj. #	Project name
11603Y	Anchor Chemical

Samplers (Please print)

Enro-Serve

Date	Time	Comp.	Grab	Sample Identification	Type of container	Number of containers	TCLP (in 4oz Viral)	RCRA Characteristics	Ignitability, reactivity, corrosivity 8.03 Jars	Remarks
6/11	1400		✓	TANK 16			3		3	
					1					

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	Remarks:
Roux)	6/11/1530		6/12/91 1000	Samples cooled to 4°C
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	

CEIMIC Corporation 10 Dean Knauss Drive, Narragansett, RI 02882 (401) 782-8900 FAX (401) 782-8905

CHAIN OF CUSTODY

Original chain of Custody goes to Laboratory

301789

Proj. #	Project name
11603	Anchor Chemical

Samplers (Please print)
Roux—H. Ernst & J. Yeary.

Date	Time	Comp.	Grab	Sample Identification	Type of container	Number of containers	RCRA Toxicity Characteristics	Remarks
6/14	10:30		X	Tank 16			12	

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	Remarks
Joanne Yeary	6/14 3Pm			Chilled to 4°C
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	- Additional Volume
				30 requested by CEIMIC
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	
		[signature]	6/15/91 10:30	

CEIMIC Corporation 10 Dean Knauss Drive, Narragansett, RI 02882 (401) 782-8900 FAX (401) 782-8905

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date December 6, 1994

From Arthur Block
Sr. Regional Representative

Subject **Revised Site Review and Update (SRU) for Anchor Chemicals/Lith Kem-Ko, Hicksville, Nassau County, NY**

To Tom Taccone
ERRD/NYCSB2-W

Attached is a copy of the Revised Site Review and Update (SRU) for the above site, dated **November 16, 1994**, prepared by the New York State Department of Health (NYSDOH) under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry (ATSDR).

The primary purpose of the SRU is to perform a review of current site conditions and recommend further actions for ATSDR to take at the site. An extensive evaluation of available data is not done for the SRU. If extensive evaluation is necessary due to new information, the SRU will suggest that a health consultation or a public health assessment be performed. This document is final and will not be reissued unless new and substantial information/data is submitted that would warrant reevaluation.

Should you have any questions/concerns, please contact my office at extensions 9673/9255.

Attachment

cc:

ATSDR	EPA	NYSDOH
G. Buynoski	G. Pavlou	N. Kim/attach.
B. Williams	B. McCabe	A. Carlson/attach.
G. Ulirsch	V. Pitruzzello/attach.	C. Jones Rafferty/ attach.
DHAC/PERIS	C. Petersen/attach.	
	K. Lynch/attach.	
	D. Santella/attach.	

301790

Site Review And Update

ANCHOR CHEMICALS

HICKSVILLE, NASSAU COUNTY, NEW YORK

CERCLIS NO. NYD001485226

MAY 16, 1994

REVISED

NOVEMBER 16, 1994

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Site Review and Update: A Note of Explanation

The purpose of the Site Review and Update is to discuss the current status of a hazardous waste site and to identify future ATSDR activities planned for the site. The SRU is generally reserved to update activities for those sites for which public health assessments have been previously prepared (it is not intended to be an addendum to a public health assessment). The SRU, in conjunction with the ATSDR Site Ranking Scheme, will be used to determine relative priorities for future ATSDR public health actions.

REVISED SITE REVIEW AND UPDATE

ANCHOR CHEMICALS

HICKSVILLE, NASSAU COUNTY, NEW YORK

CERCLIS NO. NYD001485226

Prepared by:

The New York State Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

SUMMARY OF BACKGROUND AND HISTORY

The Anchor/Lith Kem-Ko Chemical site is at 500 West John Street in the Village of Hicksville, Town of Oyster Bay, in Nassau County. The surrounding area is predominantly industrial, but a 125 acre recreational park and golf course borders the site to the east and north. To the west and south, the site is bordered by commercial properties. The nearest residence is about 0.25 miles to the east. The topography of the site and surrounding area is generally flat with no wetlands. The surrounding area is not used for agricultural purposes.

The 1.5 acre site includes a 25,850 square foot two-story building surrounded by a paved parking lot. Currently, seventeen inactive storage tanks are buried under the northeast corner of the building. All of the tanks have been filled with concrete and permanently decommissioned. Nine dry-wells and one floor drain on-site collect surface water runoff and drain directly to the ground. Prior to connection to public sewer in 1985, the sewage system was connected to an on-site cesspool in front of the building.

The building is serviced by public water and there are no known private drinking water wells in the area. However, groundwater is the source for several public water supply wells within three miles of the site. These wells supply water to 70,000 people in nine municipal districts. The public water supply wells for three municipalities are within 1.25 miles of the site and the nearest public supply well is one-half mile east of the site. The well is tested periodically by Nassau County Department of Health (NCHD) and is not contaminated. It is presently used to supply water for the Hicksville area. Groundwater flows southwest from the site and there are no public drinking water supply wells immediately downgradient of the site. The nearest downgradient public water supply wells are about 2 miles southwest of the site and serve the City of Hempstead.

In 1964, the K.B. Company purchased the site property and constructed the present building. From 1964 to 1978 the site was leased to the Anchor Chemical Company which manufactured, blended, and stored chemicals for the graphic arts industry. Seventeen underground and seven above ground storage tanks (500 to 4,000 gallon capacity) were constructed in 1964 and reported to store chemicals. In 1978, Anchor Chemical Company changed its name to Anchor/Lith Kem-Ko and continued chemical production until 1984, when it ceased operations at the site. The site was placed on the National Priorities List (NPL) in 1983. From 1985 to 1988, Emery Worldwide Freight, a shipping company occupied the building, and from 1988 to 1992, J.D. Brauner manufactured furniture at the site.

is contaminated by the Anchor/Lith Kem-Ko site and people could be exposed in the future if the public water supply wells, south of the site, become contaminated. Possible contamination of these wells is the main public health concern. No community health concerns were identified in the preliminary health assessment. The health assessment identified 1,1,1-trichloroethane, trichloroethene, tetrachloroethene and 1,1-dichloroethene as the groundwater contaminants of concern. In the preliminary health assessment, it was recommended that additional monitoring wells be constructed between the site and the public water supply wells. ATSDR also recommended that sampling of on-site monitoring wells and the Nassau County test wells continue to monitor the levels of VOCs in groundwater. The preliminary health assessment identified the need to confirm the integrity of the on-site monitoring wells.

In 1989, through an Administrative Order of Consent by the United States Environmental Protection Agency (US EPA), the owners agreed to initiate a remedial investigation (RI) of the site. The purpose of the RI was to characterize the site with regard to the extent of possible soil or groundwater contamination which may have occurred from past disposal activities at the site. The sampling data showed that the levels of contaminants in the groundwater in the area of the site have significantly decreased since 1982. This decrease was attributed to migration of contaminants with movement of the groundwater through the area. Some biodegradation of the contaminants may have also occurred. The RI also identified contaminated sediments in the areas of the drywells on-site and recommended that they be excavated. Elevated levels of lead, chromium, volatile organic compounds (VOCs) and several semi-volatile organic compounds were found in sediment samples. Drywell #2 had the highest concentration of contaminants. The floor drain of the mixing room inside the building discharged directly to this drywell.

The NYS DOH, Bureau of Cancer Epidemiology conducted a cancer surveillance program in April 1990 for the Hicksville Census Tract which includes the area of the site. The survey was completed in response to community concerns over the number of cancer cases in Hicksville. The survey concluded that the cancer incidence in the Hicksville Census Tract did not differ from other comparable areas of New York State for the period between 1978 and 1987.

Current Site Conditions

Mike Hughes and Tim Vickerson of the NYS DOH visited the site on March 15, 1994. No areas of on-site surface contamination have occurred. The building and grounds have been maintained; the site is completely fenced and access is controlled. At the time of visit, the gates to the property were open. No physical hazards are evident. The building is being used as a warehouse for

Distribution Systems of America Inc., which distributes advertisement flyers.

New sources of contamination have not existed on-site since Anchor/Lith Kem-Ko ceased operations in 1985 and no hazardous substances have been manufactured, stored or spilled at the site since that time. The area around the building is paved, which covers the contaminated sediments and subsurface soils and there does not appear to be any exposure to contaminants on-site. These observations are consistent with the observations from the previous site visits conducted by the NYS DOH in 1985 and also in 1988 for the preliminary health assessment. The most recent sampling was conducted in 1990 for the RI, and is discussed in the Summary of Background and History section of this site review and update (SRU).

Current Issues

Under current conditions, groundwater, sediments and subsurface soil contamination at the site do not pose a concern to human health. Remedial workers and occupants of the on-site building could be exposed to contaminants in sediments and subsurface soils via inhalation and dermal exposure to contaminants during future remediation activities. It is unlikely that private wells will be constructed near the site in the future. The main public health concern is that groundwater contamination from the site may contaminate the public water supply wells south of the site. However, there has been no known exposure to the public from contaminated drinking water. Under present site conditions, there is little likelihood of human exposure to contaminants on-site. The only known past community health concern is related to the incidence of cancer in Hicksville. NYS DOH conducted a study of cancer incidence in response to these concerns and no statistically significant results were observed. There are no known new community health concerns about this site and there are no new public health concerns.

VOC concentrations in recent on-site monitoring well samples decreased since 1982. Monitoring wells downgradient of the site have contained VOCs, which are believed to be from site. The levels of these compounds exceed NYS DOH drinking water standards. However, other compounds not related to the site have also been found in the monitoring wells and public supply wells. Several other inactive hazardous sites in the area have contaminated groundwater. Contaminated sediments in the drywells at the site continue to be a source of groundwater contamination.

Conclusions

Conclusions of the 1988 preliminary health assessment were valid and the recommendations were followed. The RI initiated in 1989 conducted a comprehensive evaluation of the site and media which may have been contaminated. Analyses of sediments in the drywells and soils conducted during the RI identified VOCs, metals and semi-volatile organic compounds. The recommendation to excavate the contaminated soil in the area of the drywells has been acknowledged by the regulatory agencies. If land use in the area changes, an evaluation of potential future development of the site should be considered.

Currently, the site poses no apparent public health hazard. The NYS DOH's cancer survey for the Hicksville area did not identify an increased incidence of cancer among the population studied. There are no known exposures that have occurred in the past or known to be occurring at present. There are no known community health concerns and past public health concerns have been addressed by remedial measures completed at the site. However, if groundwater remediation does not occur, contaminants from the site could migrate towards downgradient public water supply wells and exposures to contaminants could occur at levels of public health concern.

Recommendations

Under present conditions, monitoring of groundwater both on-site and off-site, especially between the site and public water supply wells, should continue. Analyses should include those VOCs previously identified as well as degradation by-products. The drywells should be excavated as soon as possible, followed by continued groundwater monitoring both on-site and off-site. The possibility of future land use in the area should also be investigated with local municipalities to determine if the potential for residential development exists.

A public health assessment or health consultation is not needed at this time for the site. Past and proposed remedial measures will address contamination in on-site subsurface soil and sediments in the drywells.

The data and information developed in this site review and update for the Anchor/Lith Kem-Ko Chemical site have been evaluated to determine whether follow-up actions may be indicated. No further public health actions are indicated at this time.

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Nassau County Department of Health, Bureau of Public Water Supply, Test Well Analytical Data, September 1982.

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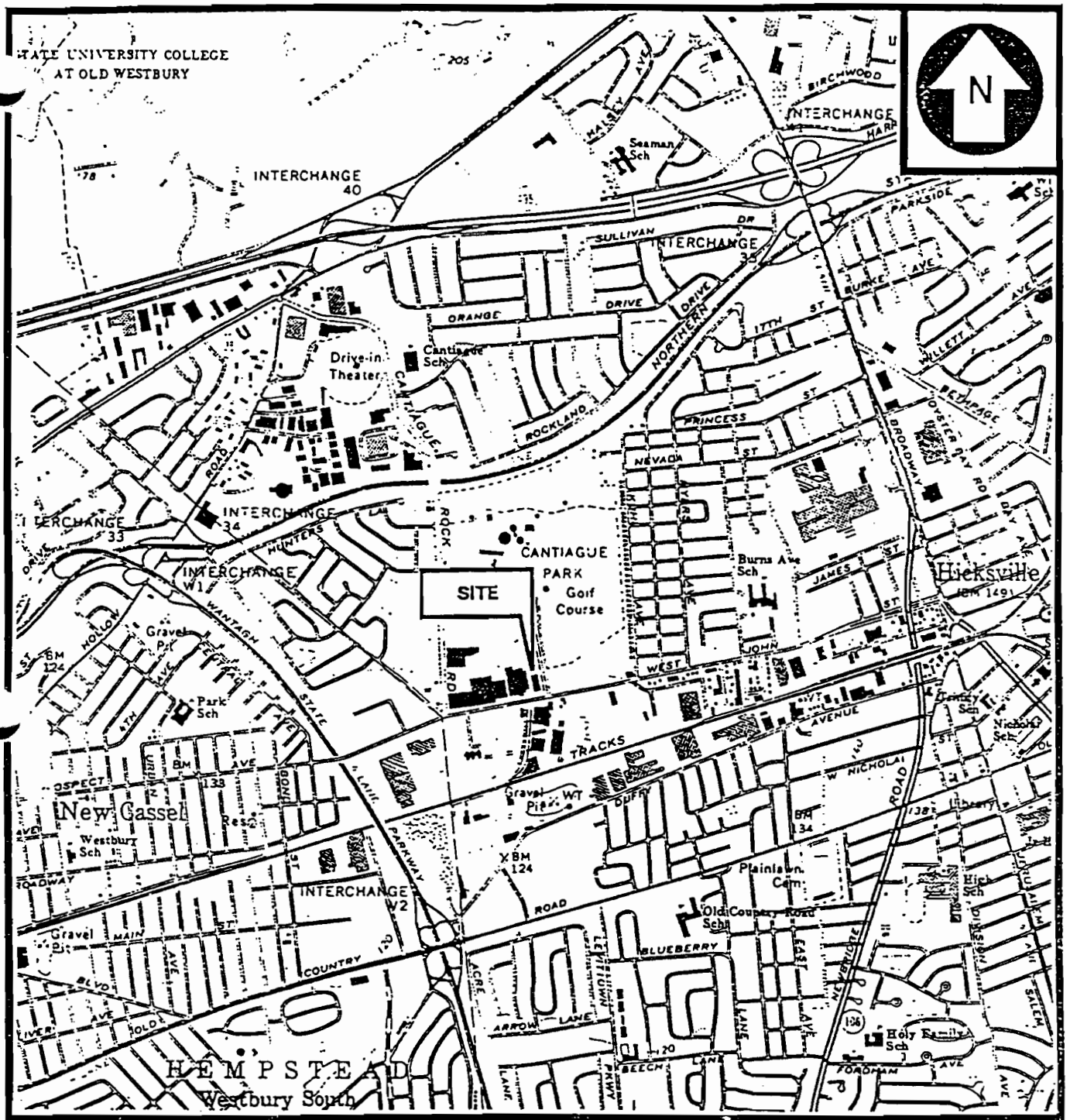
301800

ATTACHMENT 1

FIGURES



BASE MAP IS A PORTION OF THE FOLLOWING USGS 7.5' SERIES QUADRANGLE:
HICKSVILLE, NY, 1967; PHOTOREVISED 1979

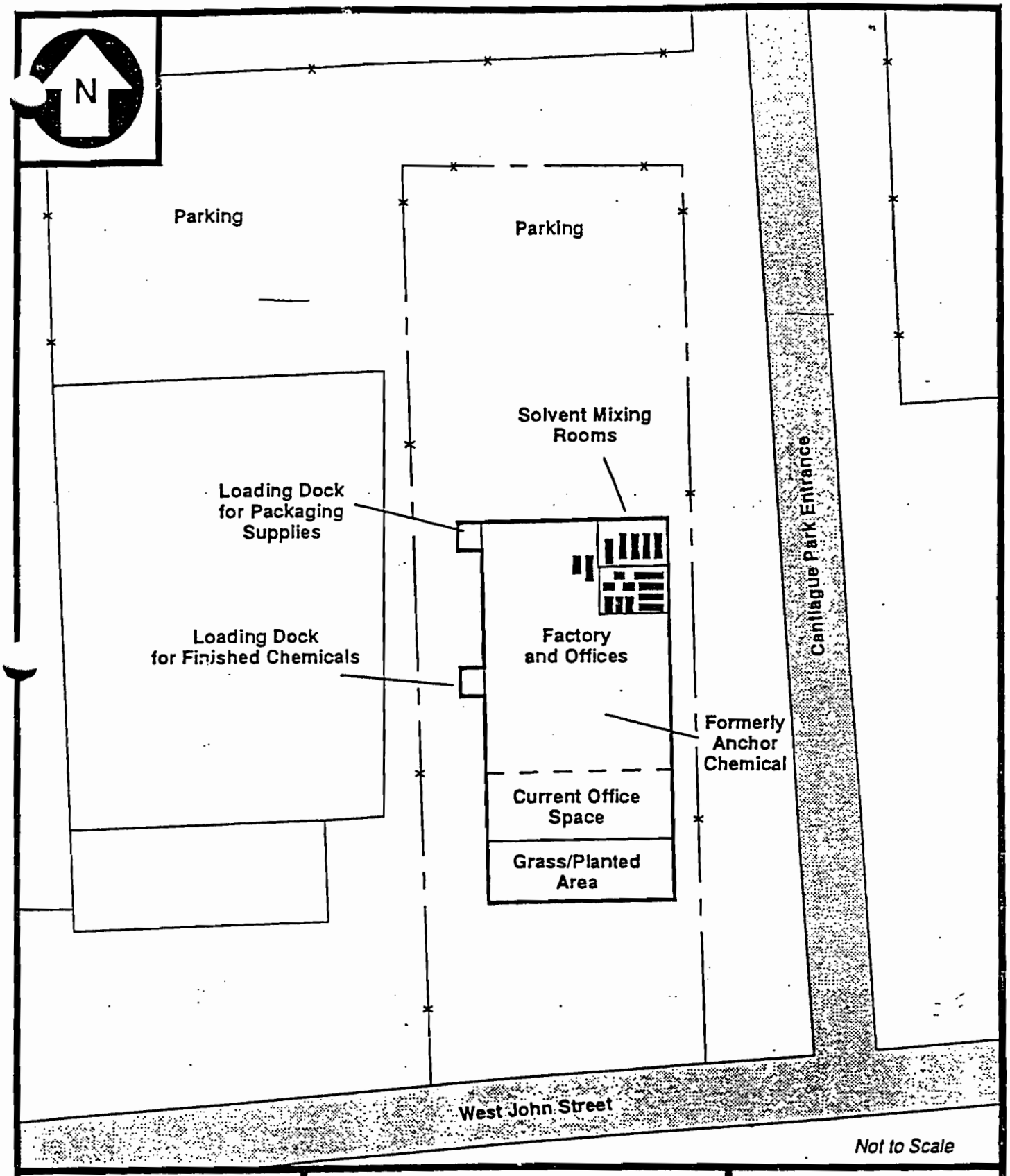
LOCATION MAP

ANCHOR CHEMICAL PROPERTY
HICKSVILLE, NEW YORK

Figure 1

Taken from Final Risk Assessment, TRC Environmental Corp.

301802



SITE SKETCH

ANCHOR CHEMICAL SITE
HICKSVILLE, NEW YORK

Figure 2

Taken from Final Risk Assessment, TRC Environmental Corp.

301603

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VOLUME 1

REMEDIAL INVESTIGATION REPORT

Anchor Chemical Site
Hicksville, New York

March 1995

Prepared for:

K.B. Co.
375 North Broadway
Jericho, New York 11753

Prepared by:

Anson Environmental Ltd.
33 Gerard Street
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Huntington, New York 11743

Table of Contents

Table of Contents (cont)

1.0 INTRODUCTION

The Anchor Chemical Site (Site) is located at 500 West John Street (Longitude 73º 32' 48" W and Latitude 40º 45' 58"N) in the Incorporated Village of Hicksville, Town of Oyster Bay, Nassau County, New York, and is approximately 1.5 acres in size (Figures 1-1 and 1-2). Jerry Spiegel, a predecessor to the current owner of the site, K.B. Co., purchased the Site on September 31, 1964. At the time of purchase, the Site was used for agricultural purposes. The Site contains only one building, which was constructed in 1964 for Anchor Chemical Company (Anchor); its operations consisted of the production and mixing of cleaning solvents for the printing industry. A variety of chemicals, including organic solvents used in the manufacturing process, were stored in seventeen (17) steel underground storage tanks, which Anchor caused to be installed beneath the building (Table 1-1).

In 1981, during the use of the Site by Anchor/Lith Kem Ko, five of the underground tanks failed tightness tests and were suspected of leaking. In January 1983, the Site was placed on the New York State Department of Environmental Conservation (NYSDEC) listing of Inactive Hazardous Waste Disposal Sites. A State designated Phase I report was prepared for

NYSDEC by Woodward Clyde Consultants, Inc., (Woodward Clyde, 1983) (McGill, 1990). Based on that Phase I report, the Site was placed on the National Priorities List (NYSDEC, 1983).

In June 1989, an Administrative Order on Consent was signed by representatives of K.B. Co. and the U.S. Environmental Protection Agency (USEPA) Region II. Based on that Order, a Remedial Investigation (RI) was conducted by K.B. Co., which was represented by Jerry Spiegel Associates, the Managing Agent of the building, and the RI was performed with oversight by the USEPA Region II.

1.1 Purpose of Report

The purpose of the RI was to characterize the Site with regard to the extent of possible soil and/or ground water contamination which may have resulted from past activities at the Site. An RI Work Plan was prepared in April 1991 to characterize the Site, its history, and the tasks that were to be accomplished.

This RI Report identifies and interprets the findings of the RI Work Plan and provides the technical basis for choosing a preferred remedial

alternative.

1.2 Site Background

In the early 1960's, the land currently occupied by Cantiague Park, which is north of the site and directly adjacent on the eastern side of the Site, was deeded to the Town of Oyster Bay, and the adjacent property along West John Street was re-zoned for industrial land use (Kunz, 1990). The remaining property between the Northern State Parkway and West John Street, including the Site, and east of Cantiague Rock Road was developed starting in 1964. Prior to development, this land was utilized as farmland, other agricultural purposes and, at times, was left fallow.

Since the mid 1960's, the surrounding land uses in the Site area have been commercial, industrial and recreational.

1.2.1 Site Description

Land use in the area of the Site is predominantly industrialized and recreational. The Site is bordered to the north and east by Cantiague Park, a 125-acre recreational facility (Figure 1-3). The Site includes one

building of 25,850 square feet located on 1.5 acres of land. The building has offices on the first and second floors of the south side. The remainder of the building is a warehouse, which was subdivided by Anchor to include a chemical blending area. The former blending area is currently used as warehouse space (Figure 1-4).

The Site is enclosed by a fence with two gates located in the front of the building. The entire Site is paved with asphalt and has nine drywells which are used to drain the parking lot. The building was connected to the Nassau County sewer system in the early 1980's. Between its construction in 1964 and its connection to the Nassau County sewer system, the building plumbing system was connected to an on-site cesspool located in the front of the building. Currently, the interior of the building does not have any floor drains. However, a floor drain was previously reported in the mixing room and was reportedly connected to a drywell.

East of the Site is an entrance to Cantiague Park. A moderate size building is located on the east side of the entrance road to the park (even addresses 450-460). This building is occupied by six small firms engaged

in diverse activities, such as, imports; computer services; entertainment; and aerospace. A large recharge basin, surrounded by a chain link fence, is located on the east side of this building. On the north side of the Site is a small parcel of undeveloped land which is part of the property designated as 520 West John Street. North of the small parcel is Cantiague Park.

To the West of the Site, at 520 West John Street, is a building which, until 1992, was leased by Stokvis Multiton Corp., a manufacturer of materials handling equipment. Attached to the west side of that building is 530 West John Street, which is currently occupied by Litton Applied Technology. Litton Applied Technology is engaged in the design of electronic components. To the west of 530 West John Street, separated by a driveway and chain link fence, is an unoccupied building at 550 West John Street. Until 1992 that building was occupied by S. Fishman, a distributor of housewares. Attached to the west side of 550 West John Street, at 600 West John Street is a large building occupied by General Instruments Corporation, a manufacturer of semi-conductor devices. To the north of all of the buildings west of 500 West John Street are parking lots for use by building occupants and visitors. Cantiague Rock Road is located on the west side of 600 West John Street.

On the south side of West John Street, at 499 West John Street, there is a large landfill facility. This facility is also engaged in the manufacture of asphalt and other roadbed materials. Adjacent to the landfill road entrance on West John Street, at 455 West John Street, are the offices of Jaydee Tomfor Transportation, a student bus cornpany. Immediately south, and behind that building, is a large parking lot for school buses. In that parking lot, and about 100 feet south of the building, is a moderate size fuel dispensing island for servicing the school bus fleet.

To the west of 455 West John Street, on the south side of West John Street and southeast of the Site, is 477 West John Street, which is occupied by Reliance Utilities, a heating oil distributor. Behind that building and south on Alpha Plaza is a large parking lot for Reliance Utilities oil delivery trucks. Adjacent to and south of the parking lot is a medium sized building used by Reliance Rite Fuel, a subsidiary of Reliance Utilities and engaged in the same type of business.

Further south on Alpha Plaza, adjoining the Reliance Utilities building, on the east side of the street, at 51 Alpha Plaza is a large building occupied

by Stokvis Multiton Corp., Plant No. 2. This was formerly the warehouse and storage location for the production facilities at 520 West John Street. On the east side of this building is a 30 foot high man-made bank of roadway debris. The debris is part of the landfill operation on West John Street. The Long Island Rail Road (LIRR) mainline is located just south of 51 Alpha Plaza.

On the west side of Alpha Plaza, adjacent to the LIRR, at 90 Alpha Plaza, is a large building occupied by Contract Alterations Builders, Corp. This company is involved in large construction projects. Approximately 100 feet north of that building, on the west side of Alpha Plaza, at 62 Alpha Plaza , is a large building, occupied by Micro Contacts Inc., a manufacturer of electrical products.

The next building north on Alpha Plaza is actually on the corner of West John Street. The rear of the building is occupied by U.S. Fleet Force, its operations consist of the repair of large vehicles. The front of the building, at 485 West John Street, is occupied by LTS Lite-Trol Service Co., Inc. To the west of that building, on the south side of West John Street, at 487 West John Street is a connected building occupied by Konig

Motoring Accessories Warehouse. Approximately 100 feet west of that building and to the south of the Site, is an LIRR siding used for freight and liquid tank car deliveries.

The building to the west of the LIRR siding and southeast of the Site, on the corner of Charlotte Avenue and West John Street at 5 Charlotte Avenue, is occupied by Crown Lift Trucks, which manufactures lift gates for trucks. Also located in that building is California Closet Co. and Eastern Orthopedic and Prosthetics.

To the south of 5 Charlotte Avenue, on the east side of the street, is located Dal-Tile, a ceramic tile warehouse and showroom (address not posted). The building to the south of Dal-Tile, at 25 Charlotte Avenue, is occupied by Coronet-Frosted Foods and Ice Cream Corp. The LIRR mainline borders the south side of 25 Charlotte Avenue.

To the southeast of the Site, south of 600 Charlotte Avenue, on the south side of West John Street and at the west corner of Charlotte Avenue, is located a large overgrown unoccupied parking lot which is surrounded by a chain link fence. The LIRR mainline borders the south side of the parking

lot. (Figure 1-3).

There are no wetlands in the area of the Site (Wulforst, 1987).

1.2.2 Site History

Jerry Spiegel purchased the Site on September 31, 1964. At that time, the Site was undeveloped and was previously used for agricultural purposes. In 1964, the 25,850 square foot building was constructed specifically for Anchor, the tenant. Anchor installed seventeen steel tanks under the floor of the building. Figure 1-6 is a copy of a photograph showing the piping and tanks under the floor before the concrete slab was poured.

The history of occupancy of the site is as follows:

Years	Name of Occupant	Nature of Business
1964 to 1978	Anchor Chemical Company	Blend & package chemical specialties for graphic arts industry
1978 to 1985	Anchor/Lith Kem-Ko	Blend & package chemical specialties for graphic arts industry
1985 to 1988	Emery Worldwide Freight	Shipping company
1989 to 1992	J.D. Brauner	Furniture manufacturer

1992 to 1994	Distributors of America	Distributor of marketing flyers that are included in the local newspapers
1994 to present	Machinery Values	Machinery refurbisher

During the tenancy of Anchor and subsequently as Anchor Lith/Kem-Ko, the building on the Site was used as a manufacturing facility and as a warehouse. The building maintained two solvent mixing rooms; a product packaging room; several container and drum storage areas; two loading docks; a testing laboratory; and offices (Figure 1-4). Documentation of materials used in the facility in 1977 (Appendix M) indicates the following substances were used in the production of the products sold by Anchor:

methylene chloride
1,1,1-trichloroethane
ethylbenzene
petroleum tars (naphthalene antradene)
dyes and organic pigments

The materials documentation identifies the usage of dyes and organic pigments a the site. The dyes and organic pigments could refer to lead chromate inks which were commonly used during this time frame. Lead chromate inks were orange in color while phthalates were used in blue inks.

Seventeen steel underground storage tanks (USTs) ranging in size from 550 gallons (gal) to 4,000 gallons, were installed at the Site by the Franklin Company under contract with Anchor in 1964. Those USTs were located beneath the concrete floor of the former mixing rooms (Figure 1-5). In addition, there were seven above ground storage tanks that ranged in size from 550 to 1500 gallons. Figure 1-6 is a photograph of some of the piping and tank installation. According to the Nassau County Department of Health (NCDH, 1981), the above ground tanks were located in the blending rooms and were reported to contain chemical products listed in Table 1-1.

In 1981 seven USTs were reported to have failed tightness tests and in 1982 NCDH identified the connection of a floor drain to a drywell on the north side of the property. Therefore, ground water monitoring wells were installed at the Site.

The ground water has been monitored at the Site since 1982 when ground water monitoring wells were installed by Lockwood, Kessler & Bartlett (LKB). Between December 1982 and February 1985 LKB conducted the ground water monitoring. Roux Associates conducted the monitoring

between October 1987 and February 1991. The ground water analyses have indicated a general decrease in the concentration of contaminants in the ground water except for a rise in 1,1,1-trichloroethane in Monitoring Well (MW1) (between 1987 and 1989) and Monitoring Well (MW3) (between November 1984 and 1991) (Table 1-2). Also, in MW1 1,1,1-trichloroethane and trichloroethylene both increased between 1983 and 1984 and chloroform concentrations increased between January and July 1984.

This general decrease in the concentration of volatile organic compounds in the ground water between 1982 and 1992 could be due to several factors:

1. There is no longer a source of volatile organic compound contamination on the Site; therefore, the concentration has decreased.

2. The contaminants previously released have undergone dispersion and have decreased in concentration as they flow through the aquifer.

3. A methyl ethyl ketone (MEK) recovery project was carried out at 530 West John Street which is located 300 feet to the west (and cross gradient) of the Site. A "pump and treat" system was used to remediate a spill from July 8 to October 9, 1984. Pumping was from three recovery

wells at 60 to 90 gallons per minute (gpm). This pumping is highly likely to have temporarily altered the natural pathway contaminants would have taken following natural migration from the site. The cessation of pumping would have caused ground water gradients to return to their natural state. It is also possible that any contaminants that left the site could have been intercepted by the MEK recovery system and discharged into the aquifer (LKB,1985).

1.2.3 Previous Investigations

There have been several previous investigations at the Site. In 1977, NCDH sampled liquid in the northernmost drywell (Drywell #1) (LKB, 1985). Laboratory analyses of this liquid indicated the following chemicals and concentrations:

Chemical	Concentration (ppb)
1,1,1-Trichloroethane	2,500
Trichloroethlyene	>15,000
Tetrachloroethylene	>20,000.

Subsequently, Anchor submitted a spill prevention plan to NCDH and all piping lines leading from the building to the drywell were sealed (Roux,

1991).

In May of 1981, Anchor/Lith Kem-Ko, a successor to Anchor, received a notice from the Nassau County Fire Marshal that it was in violation of Nassau County Fire Prevention Ordinance No. 51-81 Article III, which requires that all underground storage tanks (USTs) containing flammable or combustible liquids be registered with the County Fire Marshal. Provisions for registration require that tanks be hydrostatically tested to determine if a leak of flammable or combustible liquid exists. Anchor/Lith Kem-Ko had neither tested its USTs nor registered them with the County Fire Marshal prior to receipt of the Notice of Violation (Office of the Fire Marshal, 1981a, b, c).

NCDH records indicate that 5 out of 14 tanks tested in 1981 failed air over product tests (Table 1-1). These five tanks were:

Tank No.	Contents
5	Naphthol spirits
6	Acetone
8	Mineral spirits*
11	Isopropyl alcohol
15	Textile spirit

*1,1,1-trichloroethane (1,1,1-TCA) reportedly was stored as a sole

component in 1965 and 1975 (LKB, 1985).

According to the Merck Index (1989) naphthol spirits, mineral spirits and textile spirits are composed of petroleum distillates such as aromatic organics, including benzene, toluene, ethylbenzene, o, m & p xylene, n-heptane, n-hexane, cyclohexane and naphthalene.

Per Nassau County Article III, these five tanks were taken out of service and decommissioned (NCDH, 1983b and NCDH, 1983c). Three underground storage tanks which stored 1,1,1-TCA, diethyl glycol and methylene chloride were not tested by Anchor/Lith Kem-Ko in 1981. NCDH requested that these three tanks be tested and, in addition, that Anchor/Lith Kem-Ko provide a ground water clean up plan by December 1, 1982 (NCDH, 1982c). During testing of the remaining three tanks in 1982 and 1983, tank No. 3, which contained methylene chloride, did not pass the hydrostatic test.

In 1982, NCDH informed Anchor/Lith Kem-Ko of a possible violation of New York's Environmental Conservation Laws, Article 17, concerning point discharges of chemicals and requested the submission of plans for an investigation of possible contamination of soil and ground water (NCDH, 1982a). LKB was retained by Anchor/Lith Kem-Ko to conduct the

investigation.

As part of that investigation, three ground water monitoring wells were installed by LKB in September 1982. Soil samples collected and analyzed by the NCDH exhibited concentrations up to 490 parts per billion (ppb) methylene chloride and 22 ppb 1,1,1-TCA (NCDH, 1982b). Ground water samples collected by NCDH and LKB exhibited concentrations of: 1,1,1-TCA (24,000 ppb); tetrachloroethylene (1,100 ppb); dichloroethane (350 ppb); methylene chloride (41 ppb); and trichloroethylene (55 ppb). Chlorodibromomethane was detected in Monitoring Well 3 at concentrations up to 170 ppb (LKB, 1985 and NCDH, 1982b). Ground water analytical data are summarized in Table 1-2.

Based on water level measurements from the three on-site monitoring wells, LKB estimated the rate of horizontal ground water movement at the Site to be 0.45 feet per day (LKB, 1985) in their 1985 report. The ground water direction was determined to be from the north-northeast toward the south-southwest (LKB, 1985). At the time, these data were consistent with EPA's calculation of direction of ground water flow at 530 West John Street (LKB, 1985).

Jerry Spiegel Associates, K.B.Co.'s property management agent, retained Roux Associates, Inc. (Roux) in October 1987 to conduct additional ground water sampling at the Site. Between October 1987 and early 1991 sampling of ground water from the three existing monitoring wells indicated that the concentration of volatile organic compounds had declined from approximately 30,000 ppb in 1982, to 9 ppb in 1991. (Table 1-2).

Based upon the decline in concentration of the volatile organic compounds in ground water, there are no anticipated "hot spots" which should require unusual precautions for the outdoor investigative tasks of the RI.

In 1991, Anson Environmental Ltd. (AEL) and Blasland Bouck Engineers, P.C. (BBEPC) were retained by Jerry Spiegel Associates to implement the RI. The RI report was prepared by AEL.

Table 1-1 Underground Storage Tank Data, Anchor Chemical, Hicksville, New York.

Tank Number	Capacity (gallons)	Construction	Product(s)	Date Installed	Date Tested	Test Results	Abandoned/ Decommissioned
1	3,000	steel	Napthol Spirits (1)	1964	1981	passed	
2	3,000	steel	Mineral Spirits (2) Aromatic 100 (3)	1964	1981	passed	
3	3,000	steel	Methylene Chloride	1964	1982	failed	
4	3,000	steel	Textile Spirits (Hexane)	1964	1981	passed	
5	4,000	steel	Napthol Spirits	1964	1981	failed	1983
6	2,000	steel	Acetone Solvatone	1964	1981	failed	1983
7	2,000	steel	Cellosolve (2-Ethoxyethanol)	1964	1981	passed	
8	1,500	steel	1,1,1-Trichloroethane Mineral Spirits	1964	1981	failed	1983
9	1,500	steel	Diethyl Glycol	1964	1983	passed	
10	1,500	steel	Mineral Spirits 66 Cellosolve	1964	1981	passed	
11	1,500	steel	Isopropyl alcohol	1964	1981	failed	1983
12	1,500	steel	1,1,1-Trichloroethane	1964	1983	passed	
13	1,500	steel	Ethyl acetate Isopropanol	1964	1981	passed	
14	1,000	steel	Butyl cellosolve (2-Butoxyethanol)	1964	1981	passed	
15	4,000	steel	Textile Spirits	1964	1981	failed	1983
16	1,000	steel	VM&P Naptha (2)	1964	1981	passed	
17	550	steel	Acetone	1964	1981	passed	

(1) Hydrocarbon mixture; also called petroleum naphtha
(2) Mix of hydrocarbons of the methane series, also called VM&P Naptha
(3) Mix of aromatic hydrocarbons, C8-C10

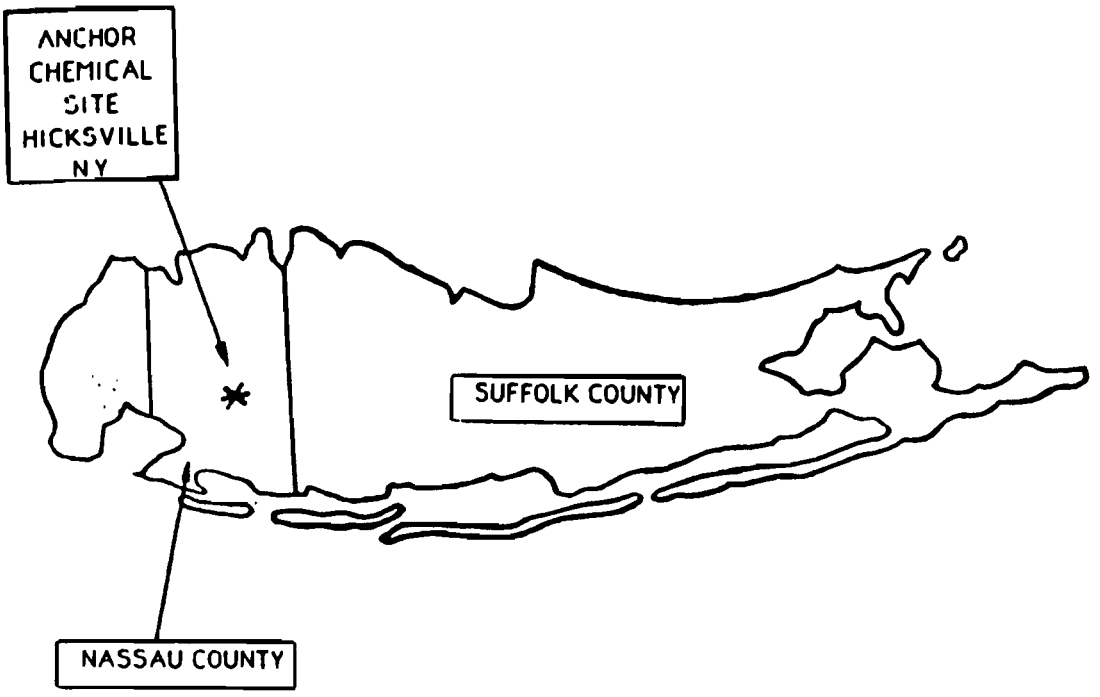
Table 1-2 Volatile Organic Compounds Detected at Quantifiable Concentrations in Groundwater at the Anchor Chemical Site (concentrations in µg/L) (Roux 1991) (Anson updated 1993).

Date sampled	12/14/82	6/15/83	1/30/84	7/10/84	11/1/84	2/28/85	10/27/87	6/22/89	2/1/91	4/23/92	11/9/92
Sampled by:	LKB	LKB	LKB	LKB	LKB	LKB	ROUX	ROUX	ROUX	ANSON **	ANSON **
Parameter											
Well No. 1											
Methylene Chloride	9	<5	<5	<5	<2	<2	-	-	-	-	-
1,1-Dichloroethane	12	<5	6	<5	4	<2	-	4	-	-	-
1,1,1-Trichloroethane	800	180	1000	400	85	26	21.2	59	<1	-	-
Trichloroethylene	19	2	3	<1	<1	<1	-	-	-	-	-
Tetrachloroethylene	48	5	2	<1	<1	<1	-	-	-	-	-
Chloroform	<1	<1	<1	10	<1	<1	-	-	-	-	-
Acetone	-	-	-	-	-	-	-	-	-	-	150J
Chloromethane	-	-	-	-	-	-	-	-	-	-	2J
Well No. 2											
1,1-Dichloroethane	-	-	-	-	-	-	-	<1	-	-	-
1,1,1-Trichloroethane	6	<1	3	<1	<1	<1	1.5	<2	<1	-	-
Xylene	*	*	*	*	*	*	1.5	-	-	-	-
Well No. 3							†	-	-	-	-
Methylene Chloride	<5	<5	<1	<5	<2	<2		-	-	-	-
1,1-Dichloroethylene	800	250	*	*	*	*		-	-	-	-
1,1-Dichloroethane	350	58	5	<5	<2	<2		<2	-	-	-
1,1,1-Trichloroethane	24000	7000	80	60	7	4		8	9	8	2J
Trichloroethylene	55	18	<1	<1	<1	<1		-	-	-	-
Tetrachloroethylene	1100	410	3	<1	<1	<1		-	-	-	-
Chlorodibromomethane	170	9	<1	<1	<1	<1		-	-	-	-
1,2-Dichloroethylene	100	17	<5	<5	<2	<2		-	-	-	-
Chloroform	12	2	<1	<1	<1	<1		-	-	-	-
1,2-Dichloroethane	31	<5	<5	<5	<2	<2		-	-	-	-
Benzene	*	3	<1	<1	<1	<1		-	-	-	-
Toluene	*	2	<2	<2	<2	<2		-	-	-	-
Acetone	*	110	<20	<10	<10	<10					

* Not Analyzed For
\- No Data Available
† Not Sampled

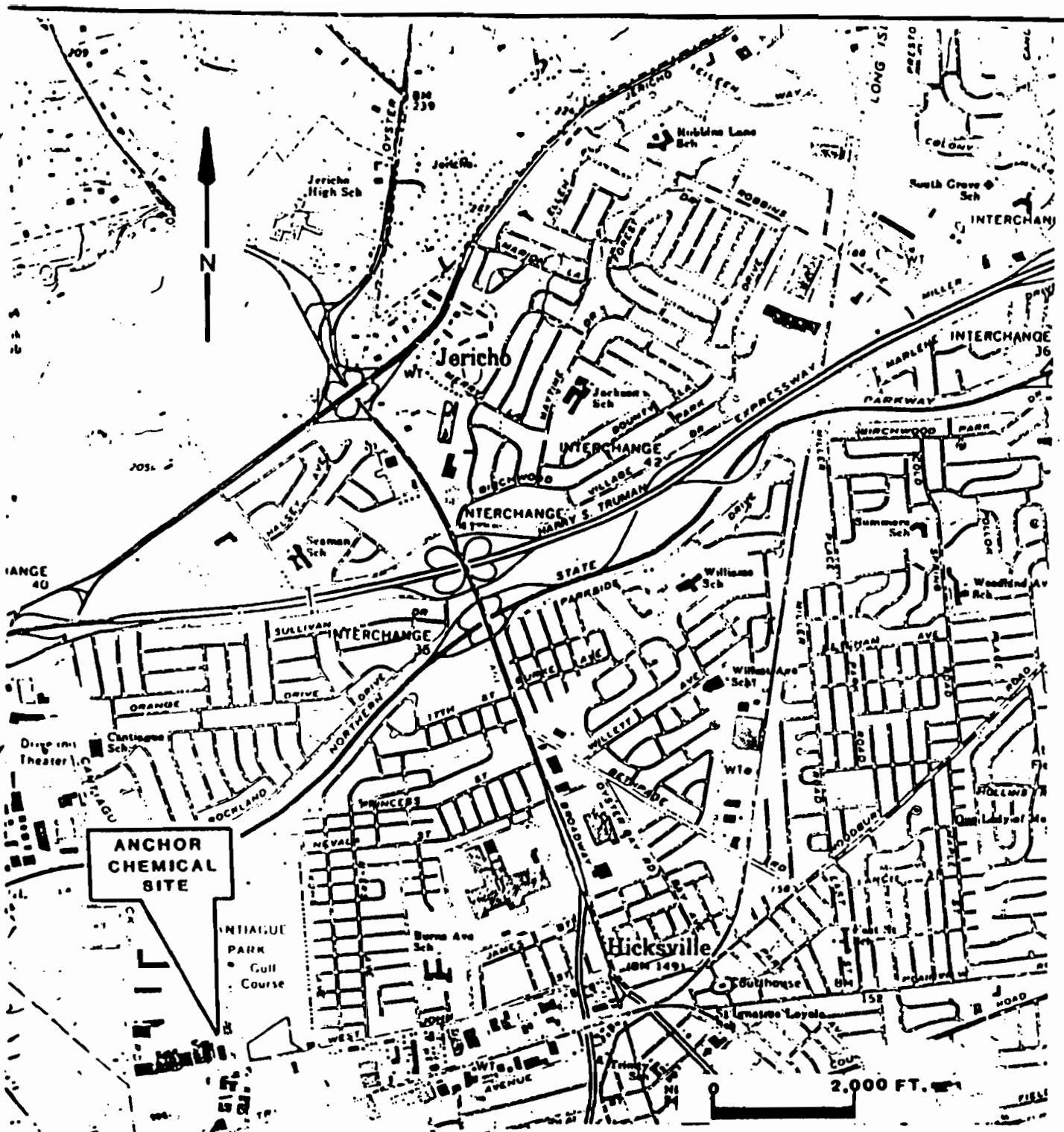
** - Data for Well No. 1 are for MW1S
J - Estimate by laboratory

LONG ISLAND, NEW YORK



TITLE: LOCATION OF ANCHOR CHEMICAL SITE 500 WEST JOHN STREET HICKSVILLE, NEW YORK 11801	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 1-1

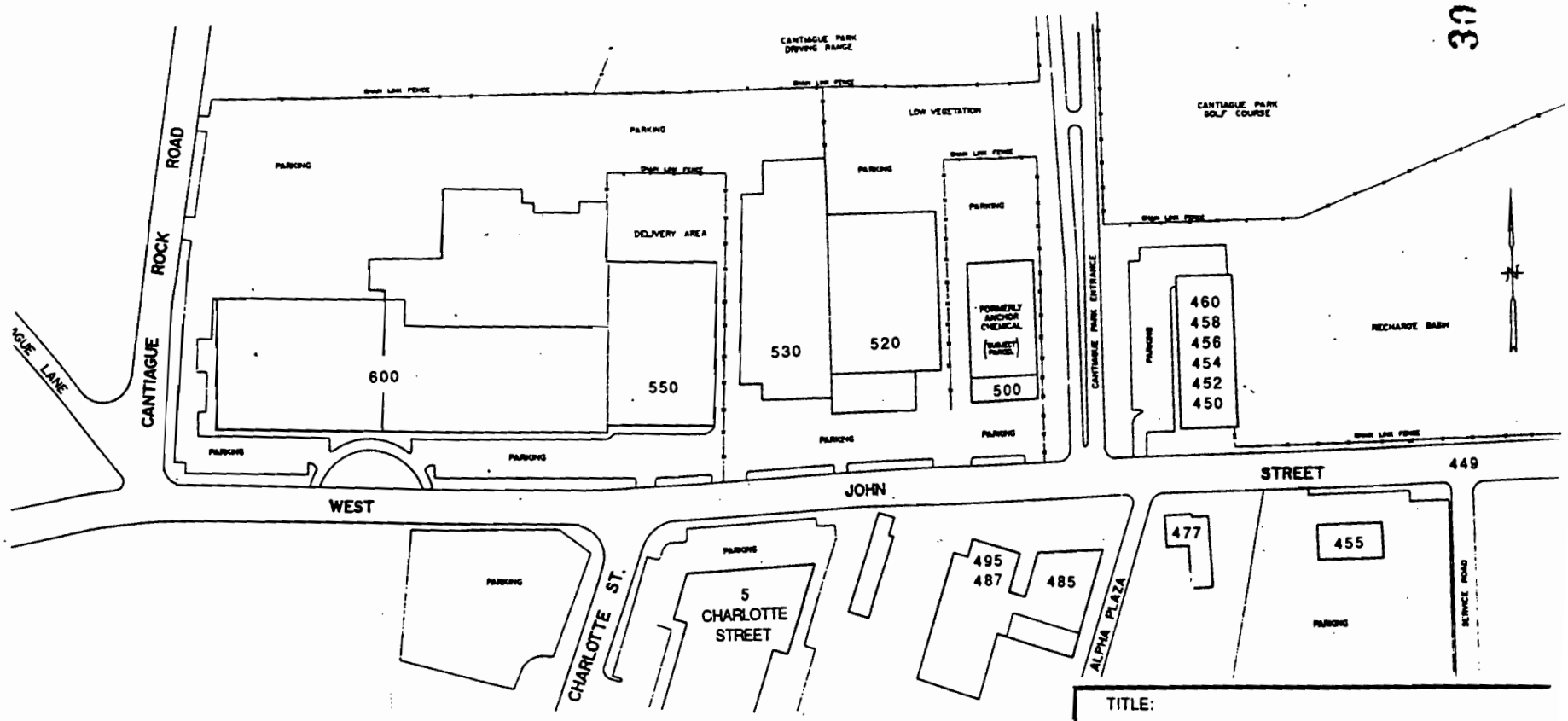
301826



REFERENCE: USGS HICKSVILLE QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE: LOCATION OF ANCHOR CHEMICAL SITE	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 1 - 2

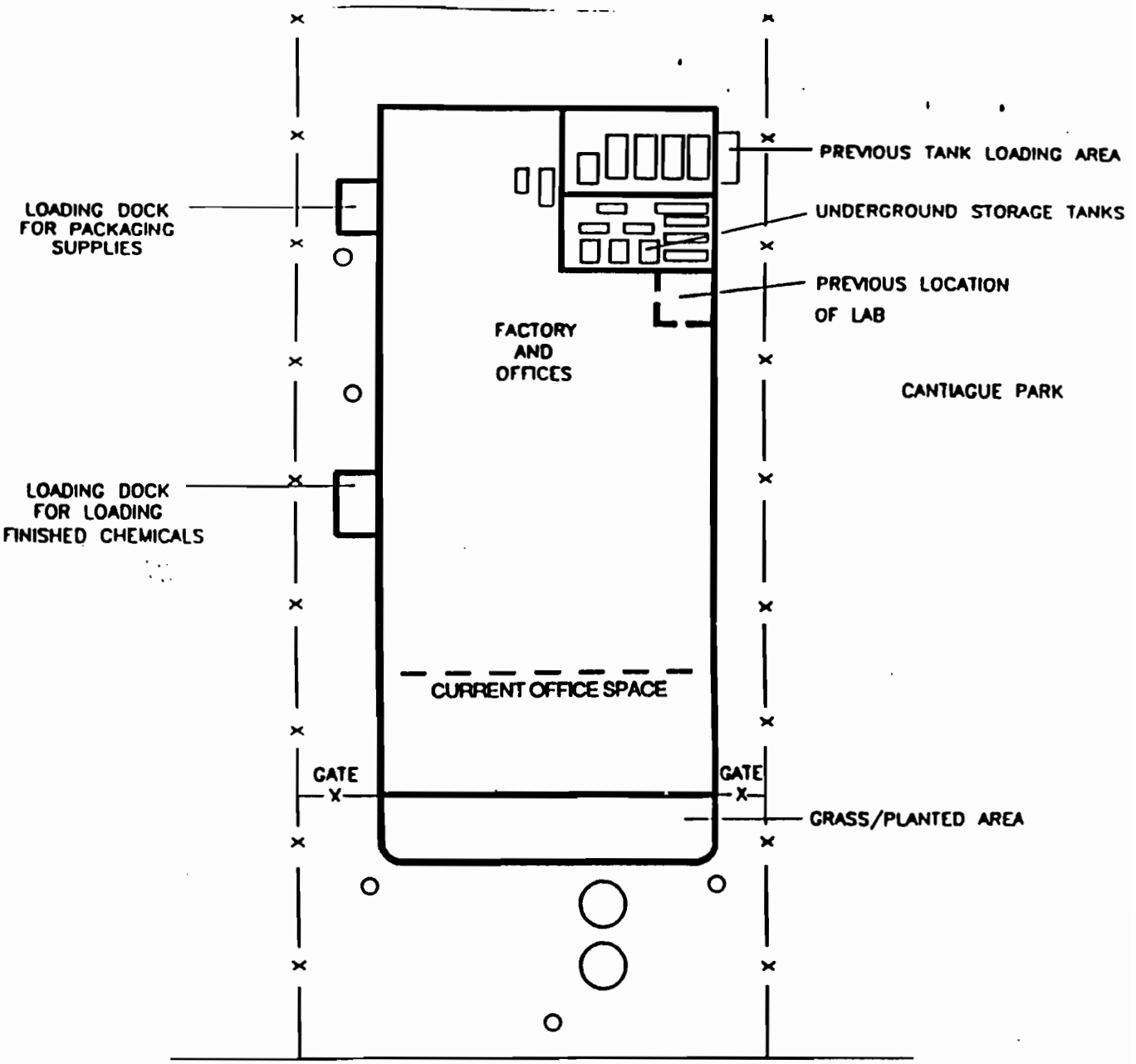
301827



TITLE:

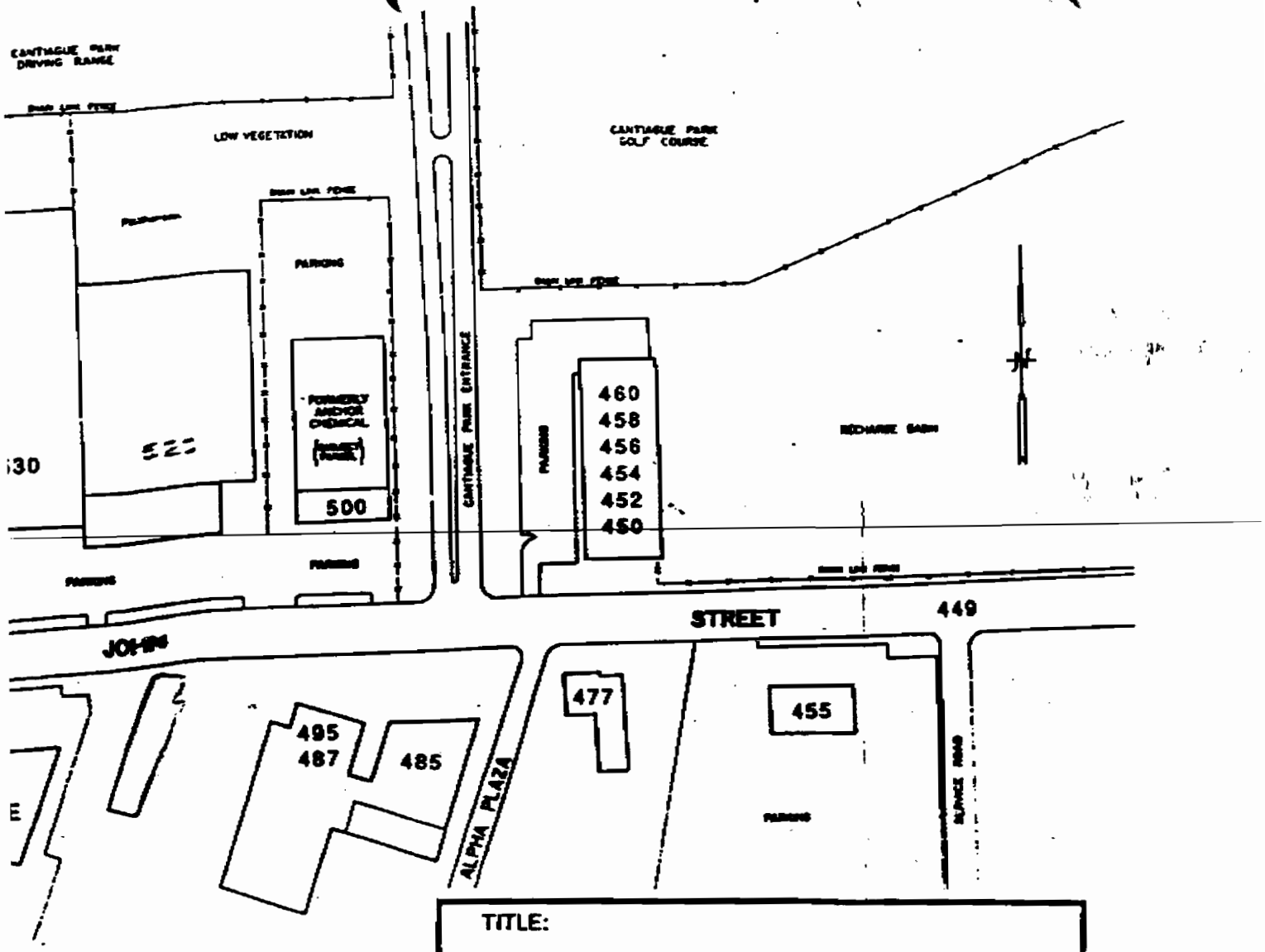
BUILDINGS IDENTIFIED IN THE VICINTY OF THE SITE

ANSON ENVIRONMENTAL LTD.	FIGURE NO. 1 - 3



FROM: Roux, 1991.

TITLE: FACILITY USE AT ANCHOR CHEMICAL SITE 301829	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 1 - 4



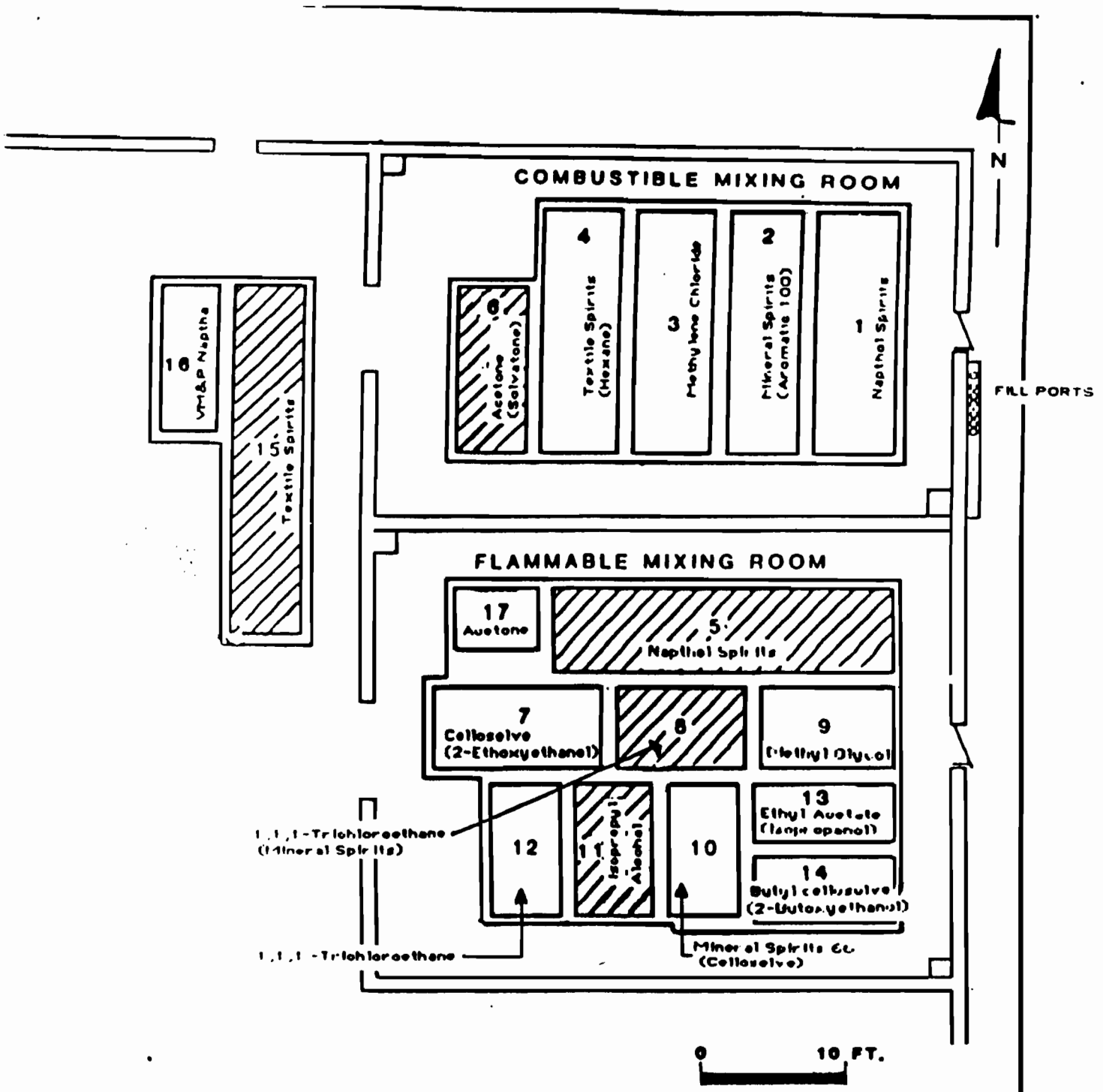
TITLE:

BUILDINGS IDENTIFIED IN THE VICINTY OF THE SITE

ANSON ENVIRONMENTAL LTD.

FIGURE NO. 1 - 5

301830



EXPLANATION

TANK FILLED WITH AN INERT SOLID MATERIAL

FROM: Roux, 1991.

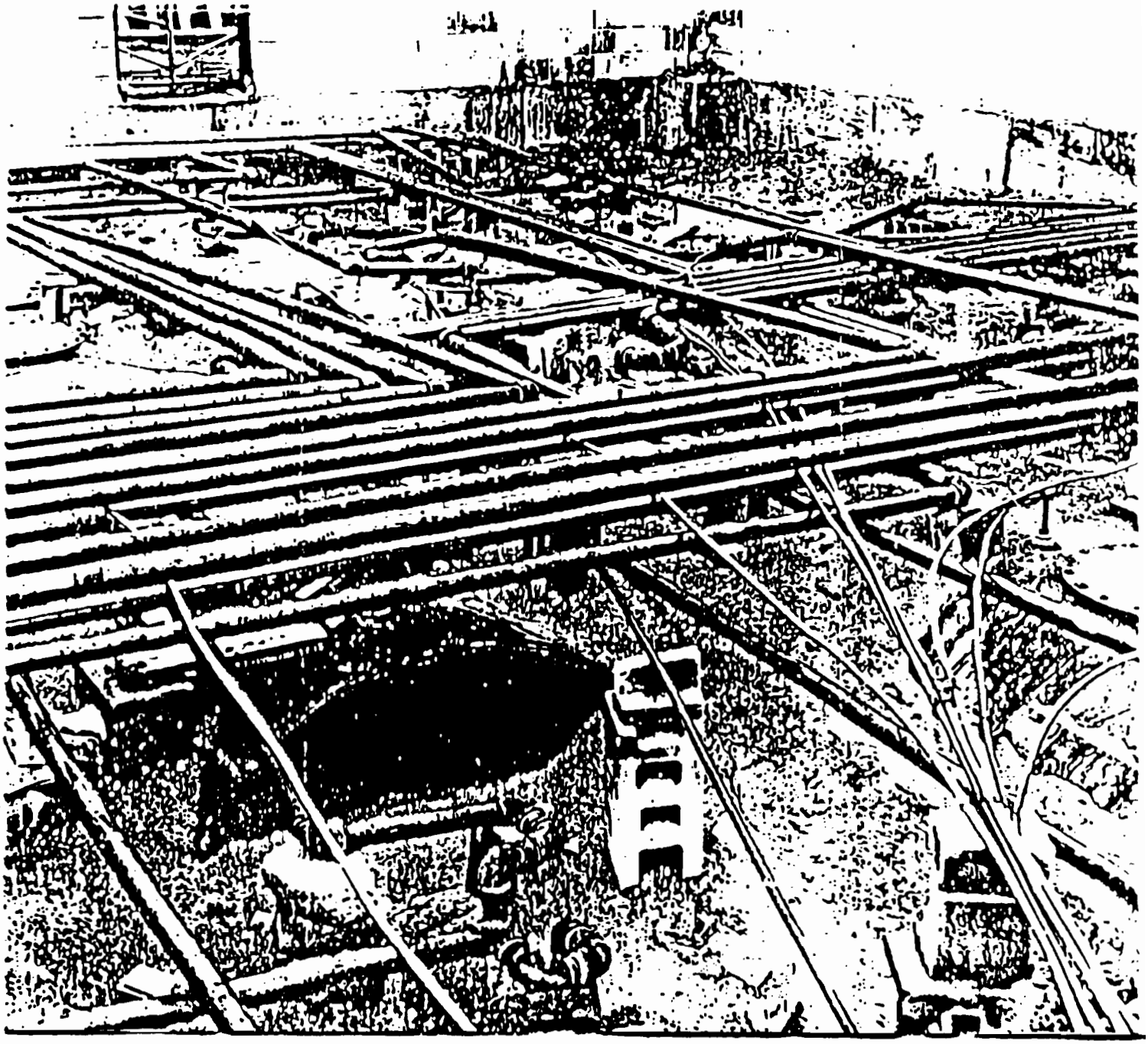
TITLE:

ARRANGEMENT OF UNDERGROUND STORAGE TANKS AT ANCHOR CHEMICAL SITE

ANSON ENVIRONMENTAL LTD.

FIGURE NO. 1-5

301831



Photograph of Piping Under 500 West John Street	
Anson Environmental Ltd.	Figure 1-6

2.0 Study Area Investigation

Figure 2-1 contains a map of the Site and area surrounding the Site.

2.1 Surface Features

The surface features of the site consist of urban land which is topographically flat. This classification includes areas where at least 85 percent of the surface is covered with asphalt, concrete or other impervious building materials. These areas are mostly parking lots, shopping centers, industrial parks or institutional sites. Most of these areas are nearly level or gently sloping. They are mostly adjacent to local main transportation thoroughfares.

The entire Site is paved or covered by the building, except for a small lawn area in front of the building adjacent to the sidewalk. The building fronts on West John Street, a major east-west thoroughfare in Hicksville. The back of the building (north side) abuts an unpaved portion of 520 West John Street and the east side abuts the access road to Cantiague Park.

2.2 Geology

The site area is located on the outwash plain deposits approximately five miles south of the Ronkonkoma Recessional Moraine. These deposits consist of a well sorted and stratified sand and gravel of fluvio-glacial origin (Isbister, 1966) and constitute the sediments of the Upper Glacial Aquifer.

Figure 2-2 is a generalized geological cross-section (D-D') trending north to south across Long Island which shows a southward sloping wedge of unconsolidated deposits unconformably overlying a crystalline bedrock of metamorphic and igneous rock. Figure 2-3 illustrates the location of this cross section on Long Island.

As illustrated in Figure 2-2, there are three main hydraulically connected aquifers underlying Long Island: the Upper Glacial, Magothy and Lloyd Aquifers. The unconsolidated deposits of the aquifers are late Cretaceous, Pleistocene and Recent in age. The total thickness of the unconsolidated deposits under the site area is approximately 1,000 feet (Isbister, 1966).

2.2.1 Upper Cretaceous Series

Raritan Formation

The Raritan formation of Late Cretaceous age is the deepest formation of unconsolidated deposits in the Site area. It rests directly on the crystalline bedrock and is unconformably overlain by the Magothy formation. The Raritan formation occurs beneath the entire area of Long Island but does not outcrop. Formation thickness ranges from 300 to 600 feet and is approximately 415 feet thick below the site area. The formation is divided into a lower unit (the Lloyd sand member) and an upper unit (Raritan clay).

The Raritan clay member functions as an aquiclude (confining unit), separating the Lloyd sand member from the overlying Magothy. In the vicinity of the Site, Raritan clay is approximately 175 feet thick.

Recent Deposits

The Recent deposits, not including soil and artificial fill, occur beneath

bays, in marshlands, on barrier beaches and in stream valleys. Recent deposits are the uppermost, stratigraphically the youngest sediments and are immediately underlain by outwash. The Recent deposits reach a maximum thickness of about 40 feet.

2.3 Soils

The sedimentary soils encountered during drilling at the Site typically consisted of fine to medium and coarse grained quartz sands containing various amounts of gravel (Appendix A, Soil Logs). The majority of the soils recovered during drilling would be unsorted to very poorly sorted when considering grain size distribution.

Many of the soil samples recovered contained hematite, a naturally occurring form of iron oxide. Soil samples where iron oxide is present generally exhibit a reddish coloration. This coloration was most apparent at the depths of 35 to 37 feet across the Site. This form of iron oxide is commonly identified in Long Island soils.

2.4 Hydrogeology

The Aquifer system underlying Nassau County is composed of three main water bearing units: the Upper Glacial Aquifer; the Magothy Aquifer; and the Lloyd Aquifer. Of main concern in this study is the uppermost aquifer, the Upper Glacial, an unconfined aquifer which is a direct receptor of surface or near surface contamination. The Upper Glacial Aquifer consists mainly of sand and gravel deposits with some cobbles in an unstratified mixture. In the study area, the Upper Glacial Aquifer is about 50 to 100 feet thick, according to Dvirka and Bartilucci, (1986), and the United States Geological Survey (USGS).

The Pleistocene and Upper Cretaceous deposits, comprising sediments of the Magothy Aquifer, are poorly defined within the Hicksville area (Kilburne and Krulikas, 1980). The confining units that separate the Upper Glacial and Magothy Aquifers, are discontinuous in the Hicksville area. These confining units include the Gardiners Clay and the "20 foot Clay" (Kilburne and Krulikas, 1980). This lack of separation, or discontinuity of confining units, allows the two aquifers to be in direct contact; however, the hydraulic communication between the two aquifers is limited due to

the anisotropic character of the two aquifers. There is also a small difference in head pressure from the Upper Glacial to the Magothy Aquifer. Furthermore, the horizontal stratification of the Pleistocene and Cretaceous sediments of the Magothy Aquifer creates a greater horizontal, rather than vertical movement of ground water. However, some vertical recharge of the underlying aquifers does occur.

The NCDH estimates the thickness of the Upper Glacial Aquifer to be approximately 50 to 100 feet in this area of the site (Dvirka and Bartilucci, 1986). During the installation of water supply well number N9463 (638 feet deep), approximately 2,500 feet east of the Site along West John Street, the NCDH encountered unstratified sand and gravel deposits with no clay layers until 155 feet. This lithology was confirmed upon the installation of the eight monitoring wells installed as part of the RI at the Site.

2.5 Direction of Ground Water Flow

According to the Nassau County Department of Public Works (NCDPW) ground water elevation maps, regional ground water flow in the Site area

is toward the southwest. This flow direction was confirmed by the NCDH (Dvirka and Bartilucci, 1986) study conducted in 1984 to 1985 (Figure 2-4). Two measurements (March and October 1992) of ground water in the on-site monitoring wells each indicate that the ground water under the Site flows toward the southwest. The ground water in the four deeper wells also moves toward the southwest.

The difference in water levels between individual monitoring sessions, indicate that the direction of ground water flow is consistent with the regional flow system, which occurs north-northeast to south-southwest. This finding is also consistent with the ground water flow movement defined from 17 monitoring wells located at 530 West John Street, the site of a 1982 MEK spill and with LKB findings in 1982.

The data also suggests the presence of a slight east to west flow pattern between monitoring wells 2 and 3. This is probably due to the presence of a recharge basin approximately 300 feet east of the Site. Recharge basins enhance the migration of precipitation into the water table. This process creates a local ground water mound beneath the basin. Since ground water flows from areas of high head to low head, ground water

will move from the mound to surrounding areas of lower head. In the vicinity of the Site, this results is an east to west ground water flow component (LKB,1985). The direction of ground water flow has remained consistent since the studies done by Woodward & Clyde and LKB in the early 1980s. Any pumping of nearby supply wells has not effected the general direction of ground water flow to date.

Regional reports of ground water direction indicate that the ground water flows to the south or southwest (Franke and McClymonds, 1972; Donaldson and Koszalka, 1983; Woodward & Clyde Consultant,1983)

2.6 Environmental Investigations in the Site Area

In the Site area, several years ago, NCDH had several complaints of ground water contamination with volatile organic compounds. These complaints have been traced to the following properties which have been designated as Inactive Hazardous Waste Disposal Sites by the NYSDEC. All of those sites are within one (1) mile of the Site, and the ground water flowing from under these sites can adversely impact the ground water down gradient of the Site (Figure 2-5).

Name & Address	Classification	Site Number
1. General Instruments Corporation 600 West John Street Hicksville, NY	Class 2	130020
2. Mattiace PetroChemicals 530 West John Street Hicksville, NY	Class 2	130024
3. AGO Associates 499 West John Street Hicksville, NY	Class 2a	130029
4. Air Techniques Inc. 70 Cantiague Rock Road Hicksville, NY	Class 2	130040
5. Alsy Manufacturing Inc. 270 Duffy Avenue Hicksville, NY	Class 2	130027
6. Depew Manufacturing 359 Duffy Avenue Hicksville, NY	Class 2a	130038
7. Magnusonics Devices 290 Duffy Avenue Hicksville, NY	Class 2	130031

According to NYSDEC records, each of these sites are suspected of causing ground water contamination in the vicinity of the Site. Environmental investigations are currently underway at these sites and are at various

stages of progress.

An industrial profile prepared by NCDH in 1986 identified numerous users of volatile organic compounds in the area of the site. These include the following companies which are also shown on Figure 2-6.

Company & Address	Organic Compounds Used	Quantities Used,Stored & Disposed Since1977
Model Communication 307 West John Street	trichloroethylene	10 gal/yr
Nestor Systems Inc. 489 West John Street	trichloroethylene	10 gal/yr
Universal Shellac & Supply 495 West John Street	trichloroethylene	325 gal/yr
General Instrument Corp. 600 West John Street	trichloroethylene	3,600 gal/yr
Amperes Electronic Corp. 230 Duffy Avenue	benzene 1,1,1-trichloroethane	20 gal/yr 5,375 gal/yr
Four Star Association Inc. 260 Duffy Avenue	methylene chloride	55 gal/yr
MHI Knitware Ltd. 270 Duffy Avenue	1,1,1-trichloroethane	55 gal/yr
Magnusonic Devices Inc. 290 Duffy Avenue	1,1,1-trichloroethane	600 gal/yr

Company & Address	Organic Compounds Used	Quantities Used,Stored & Disposed Since1977
Depew Mfg. Corp. 359 Duffy Avenue	benzene toluene	unknown unknown
Dyna Magnetic 200 Frank Road	trichloroethylene	200 gal/yr
Micro Contacts Inc. 62 Alpha Plaza	1,1,1-trichloroethane	1,920 gal/yr
Metco 325 Duffy Avenue	trichloroethylene tetrachlorethylene methylene chloride trichlorotrifluoroethane	various amounts ranging from 50 to 400 gal/yr

2.7 Drinking Water Supply Wells Survey

The area immediately surrounding the Site is served by the Hicksville Water District. The area to the west is served by the Westbury Water District. The locations of the public water supply and monitoring wells within two miles of the site are shown in Figure 2-7.

Conversations with Mr. Don Myott (1991), NCDH-Public Water Supply Division, and representatives of the Hicksville Water District confirm that there are no known private residential wells within two miles of the Site. This information is confirmed by a listing of all wells in Nassau County which is provided in Appendix I. This listing includes the location,

affliation and status of each well. In Figure 2-8, a map of the residential wells within a two mile radius of the site is provided. There are no known private residential wells within the 2 mile radius of the site.

There is only one public water supply well (N9463) located in the Hicksville area near West John Street. Since most of the contaminated wells are located in the southern and western regions, downgradient of the supply well, it would appear that contamination of ground water in Hicksville does not pose a serious threat to well N9463.

There are, however, two wells, N8956 and N8957, located southwest of Hicksville in the Bowling Green Water District, which may be down gradient to a portion of the contaminated aquifer segment. Sampling of those wells in 1986 did not detect any organic compounds. There are several clay layers described in the lithologic logs for the deeper Hicksville Water District wells which could impede the migration of contaminants; however, the areal extent and stratigraphic continuity of the clay is unknown.

The characteristics of the ground water quality in the surrounding vicinity

of the site have been defined by compiling NCDH water quality data from monitoring, process and public water supply wells, located within a one mile radius of the facility. In general, the data indicates that organic chemical contamination is widespread.

The compounds (tetrachloroethene and 1,1,1-trichloroethane) and others such as chloroform, benzene and toluene are commonly found in many industrial cleaning solvents and are frequently detected in ground water in industrial areas (Stover, 1982).

Two instances of ground water contamination are known along West John Street. Water samples collected by NCDH in 1981, from monitoring wells located on the premises of General Instruments Corp., 600 West John Street (approximately 500 feet west of the Anchor Chemical Site), contained a variety of organic chemicals. In the parking lot of Interstate Cigar Co., located at 530 West John Street (approximately 300 feet west of the Anchor Chemical Site), a spill of 3,700 gallons of MEK occurred in January of 1982. Water samples collected from a monitoring well installed at the Cigar Co. site in 1982 indicated the presence of MEK in large quantities, as well as tetrachloroethane and trichloroethene in the

low ppb range. In 1984, the U. S. Environmental Protection Agency conducted a MEK recovery project there. However, recent conversations with NCDH personnel indicate that the program was unsuccessful. Concentrations of MEK in the ground water that had decreased as a result of the on-site clean-up action have begun to occur again (LKB, 1985).

2.7.1 Upgradient Water Supply Wells

Well N9463

This well is 638 feet deep. The soil lithology includes sand, grit and gravel to 155 feet. Several clay layers, varying in thickness from one to 15 feet, were also encountered below 155 feet. This well is located nearly directly to the southeast of the Site. This well is screened within the Magothy Aquifer.

Well N1195

Well N1195 was installed on August 18, 1976 to a depth of 37 feet. The well is screened within the Upper Glacial Aquifer and is located northwest of the Site on the corner of Cantiague Road and Barry Drive.

NCDPW tests this well on an annual basis. Those laboratory results are included in Appendix B.

The following compounds [in parts per billion (ppb)] have been detected in the ground water in the following quantities in well N1195:

Compound	11/88	12/89	10/90
1,1,1- trichloroethane	ND	1.40	ND
methylene chloride	ND	0.70	ND
benzene	5.00	ND	ND
total volatile organics	5.00	2.10	
copper			0.02
iron			7.94
manganese			0.22
zinc			0.09
barium			0.08

2.7.2 Downgradient Water Supply and Monitoring Wells

There are no drinking water supply wells downgradient of the Site. There are several monitoring wells located downgradient of the Site.

Monitoring Well N8880

Well N8880 is located to the south-southwest of the Site on the corner of Montana Street and Burns Avenue. It was installed in 1980 to a depth of

247 feet and is screened in the Magothy Aquifer.

The lithologic log for N8880 which is 247 feet deep and is located southwest of the Site, describes sand, grit and gravel for the first 62 feet. A significant clay layer exists between 70 and 98 feet below the surface. Smaller layers of clay are also described for this well, but are reported to be less than two feet thick. The areal extent of these clay layers is unknown and they do not demonstrate clear stratigraphic continuity in wells N8880 and N9463.

This well is tested annually by the NCDPW. The laboratory results are included in Appendix B.

In summary, the total organic compounds have been detected in the ground water in the following quantities (in ppb):

Compound	3/20/84
total volatile organics	175

Monitoring Well N9917

Well N9917 is located southeast of the site at the corner of Apex Lane and Acre Lane in Hicksville. The well was installed on October 1, 1981 to a depth of 73 feet. The well is screened within the Upper Glacial Aquifer and is tested annually by NCDPW. Again, these laboratory results are included in Appendix B.

The following compounds have been detected in the ground water in the following quantities in well N9917 (in ppb):

Compound	3/85	6/88	7/89	6/90	7/91
tetrachlorethylene	1.30	ND	ND	ND	ND
benzene	ND	3.30	ND	ND	ND
total volatile organics	1.30	3.30	0.0	0.0	0.0
chromium				0.16	ND
iron				5.48	7.52
manganese				2.08	3.52
silver				0.01	ND
zinc				0.04	0.06
barium				0.16	0.23
lead				ND	ND

*ND-not detected

Monitoring Wells WH-1 to WH-6

The monitoring wells WH-1 to WH-6 installed as part of the Dvirka and Bartilucci study (1986) were screened within the Upper Glacial Aquifer (see Figure 2-9). These wells are downgradient of the Site.

The sediments encountered during drilling were unstratified deposits of sand and gravel. The USGS estimated the thickness of the Upper Glacial Aquifer to be between 50 and 100 feet in this area.

The regional ground water flow pattern of the Upper Glacial Aquifer in western Hicksville is toward the south and southwest. Static ground water level measurements from wells installed as part of the Dvirka and Bartilucci investigation generally follow this trend. One exception is WH-3 (Figure 2-9) which appears to be on a local ground water mound. Water levels in this well are reported to be ten feet above the other wells in the area. There is no recharge basin or reported injection well in the area or any other known reason for the high values. This reported static water level may be the result of a survey error and is discarded in the definition of the local flow regime. Wells WH-1 through WH-6 were sampled in 1984

and 1985. These wells have not been sampled by Nassau County since 1985.

Well WH-1

Well WH-1 is located south of Duffy Avenue to the west of Henrietta Street, which is southwest of the Site. It was installed as part of the Dvirka and Bartilucci study in 1985 to a depth of 60 feet and is located in the Upper Glacial Aquifer.

The following compounds have been detected in the ground water in the following quantities (in ppb):

Compound	10/84	12/84	4/85	12/85
xylene(o,m,p)	12.0	ND	ND	ND
benzene	ND	ND	4.0	ND
total volatile organics	12.0	0.0	4.0	0.0

*ND-not detected

Well WH-2

Well WH-2 is located at the westernmost end of Border Street, south of

Duffy Avenue nearly directly south of the Site. The well is installed to a depth of 63 feet and is located in the Upper Glacial Aquifer.

The following compounds have been detected in the ground water in the following quantities (in ppb) in WH-2:

Compound	12/84	4/85	12/85
1,1,1-trichloroethane	4	8	16
total volatile organics	4	8	16

Well WH-3

Well WH-3 is located at the southwest corner of Border Street and Mc-Alister Street, southeast of the Site. The well was installed in 1984 to a depth of 64 feet and is located in the Upper Glacial Aquifer.

The following compounds have been detected in the ground water in the following quantities (in ppb) in well WH-3:

Compound	12/84	4/85	12/85
1,1,2-trichlorotrifluoroethane		150	520
chloroform		1	1
1,1,1-trichloroethane	40	460	5400
trichloroethylene	5	64	900
tetrachloroethylene	17	13	23
total volatile organics	62	688	6844

Well WH-4

Well WH-4 is located south of Duffy Avenue at the corner of Nikolai Street. It was installed in 1984 to a depth of 66 feet and is located in the Upper Glacial Aquifer.

The following compounds have been detected in the ground water in the following quantities (in ppb) in well WH-4:

Compound	10/84	12/84	4/85	12/85
chloroform	ND	1	ND	ND
1,1,1-trichloroethane	ND	2	1	ND
trichloroethylene	ND	1	ND	ND
total volatile organics		4	1	

Well WH-5

Well WH-5 is located at the southeast corner of Duffy Avenue and Loretta Lane and is southeast of the Site. The well was installed in 1984 to a depth of 72 feet and is located in the Upper Glacial Aquifer.

The following compounds have been detected in the ground water in the following quantities (in ppb) in well WH-5:

Compound	12/84	4/85	12/85
c&t-1,2-dichloroethylene	36		
1,1 dichloroethane	25		
1,1,1-trichloroethane	29	4	11
trichloroethylene	23	2	9
tetrachloroethylene	160	110	620
total volatile organics	273	116	640

This well has not been sampled since 1985.

Well WH-6

Well WH-6 is located south of Old Country Road near the intersection of Acre Lane and Arcadia Street, nearly directly south of the Site. The well

was installed in 1984 to a depth of 64 feet and is located in the Upper Glacial Aquifer.

In summary, the following compounds have been detected in the ground water in the following quantities (in ppb) in well WH-6:

Compound	10/84	12/84	4/85	12/85
trichlorofluoroethane	ND	ND	2	1
1,1,2-trichlorotrifluorethane	11	ND	ND	8
c&t-1,2-dichloroethylene	25	23	ND	25
1,1-dichloroethane	ND	44	ND	27
1,1,1-trichloroethane	55	43	21	170
trichloroethylene	96	73	35	80
tetrachloroethylene	8	8	7	9
xylene	15	ND	ND	ND
dichlorobenzene	7	ND	ND	ND
total volatile organics	217	193	64	319

This well has not been sampled since 1985.

A summary of the laboratory analytical data for wells WH-1 to WH-6 are included in Appendix C.

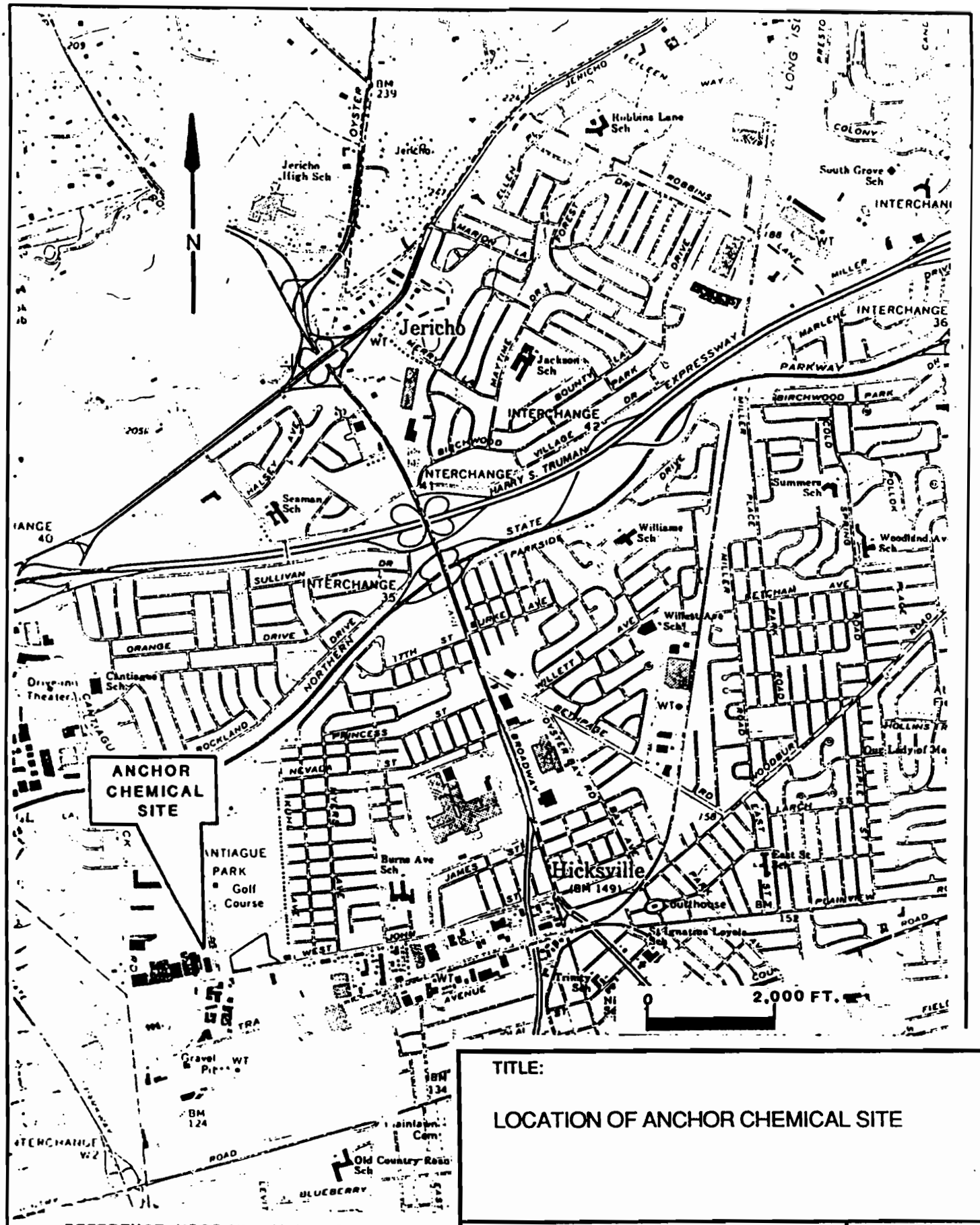
Other NCDPW Monitoring Wells

NCDPW maintains an information network of the ground water monitoring wells in the West Hicksville area.

The two wells closest to the Site are in the Upper Glacial Aquifer and designated as follows:

County ID	NYS ID	Location
0-9	N-01195	Cantiague Road and Barry Drive
0-10A	N-09917	Apex Lane and Acre Lane

These wells are sampled annually for compounds on the Target Compound List (TCL). The analytical results of the ground water sampling are attached in Appendix B. Well N-01195 is located northeast and up gradient of the Site and did not contain volatile organic compounds above the analytical detection limits. Well N-09917 is located southwest and downgradient of the Site, just south of Old Country Road. The latest sampling conducted on October 15, 1990 did not detect volatile organic compounds.



REFERENCE: USGS HICKSVILLE QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

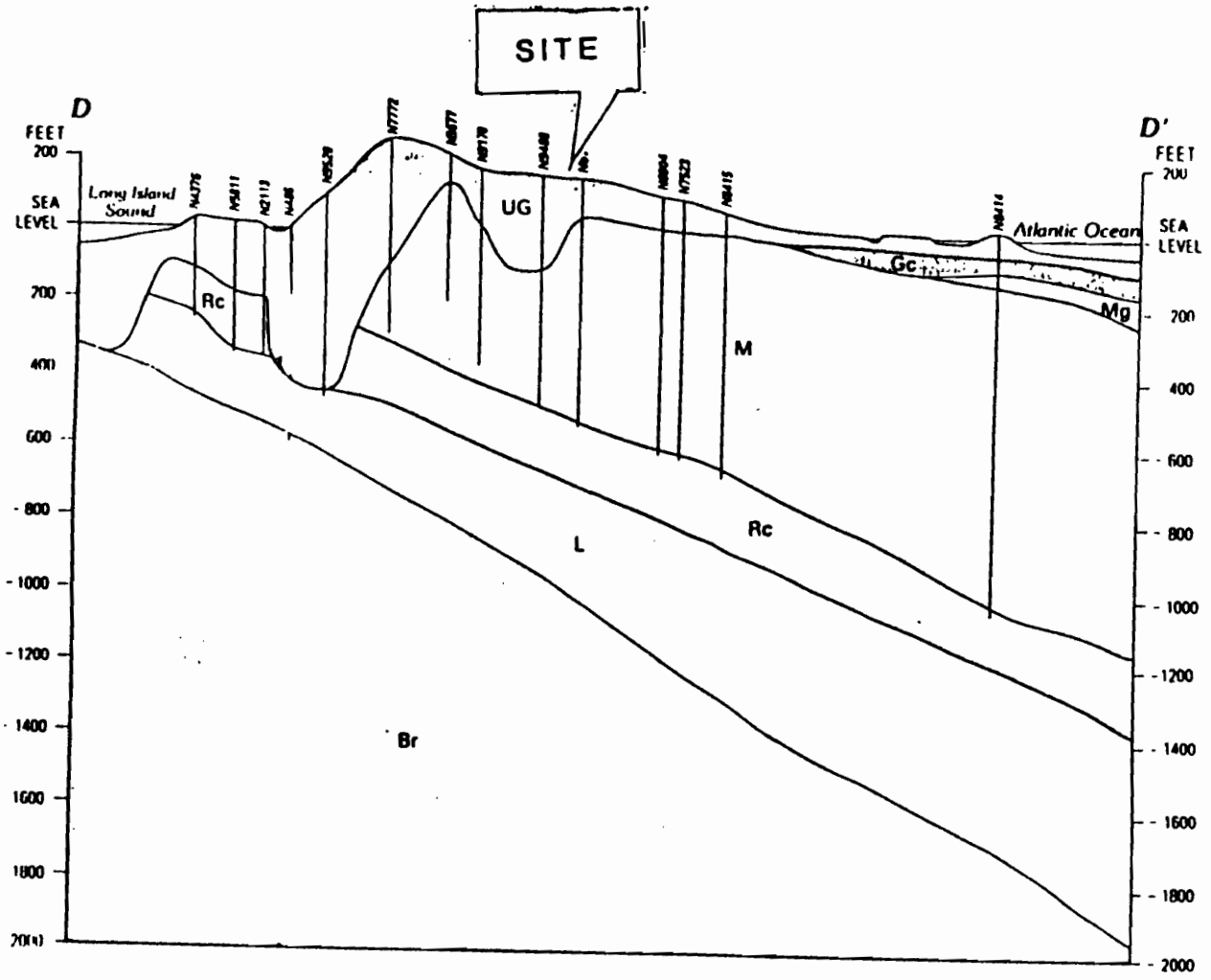
TITLE:

LOCATION OF ANCHOR CHEMICAL SITE

ANSON ENVIRONMENTAL LTD.

FIGURE NO.
2-1

301857



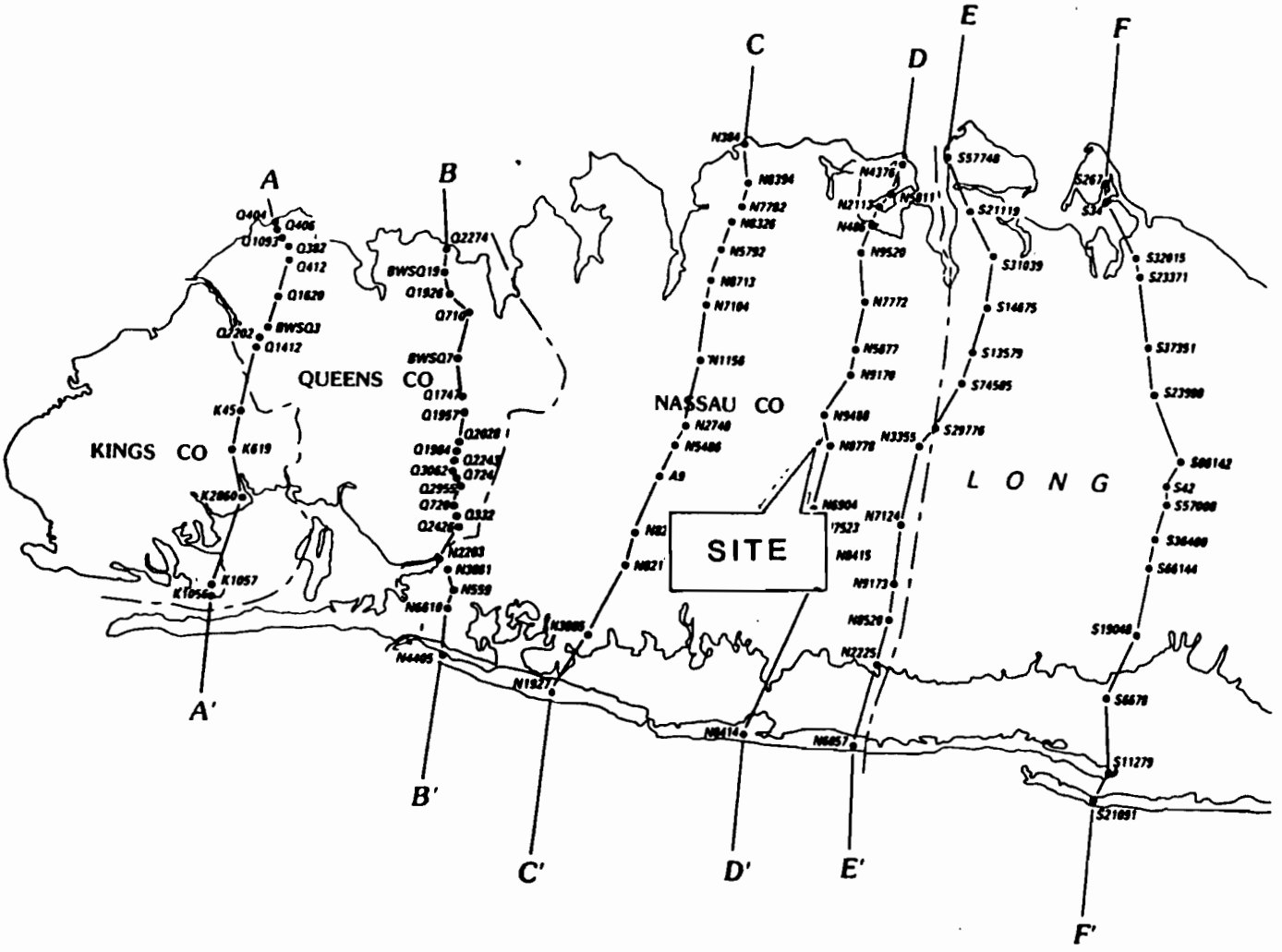
LEGEND

UG - Upper Glacial Aquifer
Gc - Gardiners Clay
Mg - Monmouth Greensand
M - Magothy Aquifer
Rc - Raritan Confining Unit
L - Lloyd Aquifer
Br - Bed rock

TITLE: GEOLOGICAL CROSS SECTION	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 2-2

FROM: D. A. Smolensky, H.T. Buxton, and P.K. Shernoff, 1989, Hydrogeologic Framework of Long Island, New York, USGS Hydrologic Investigations, Atlas HA-709.

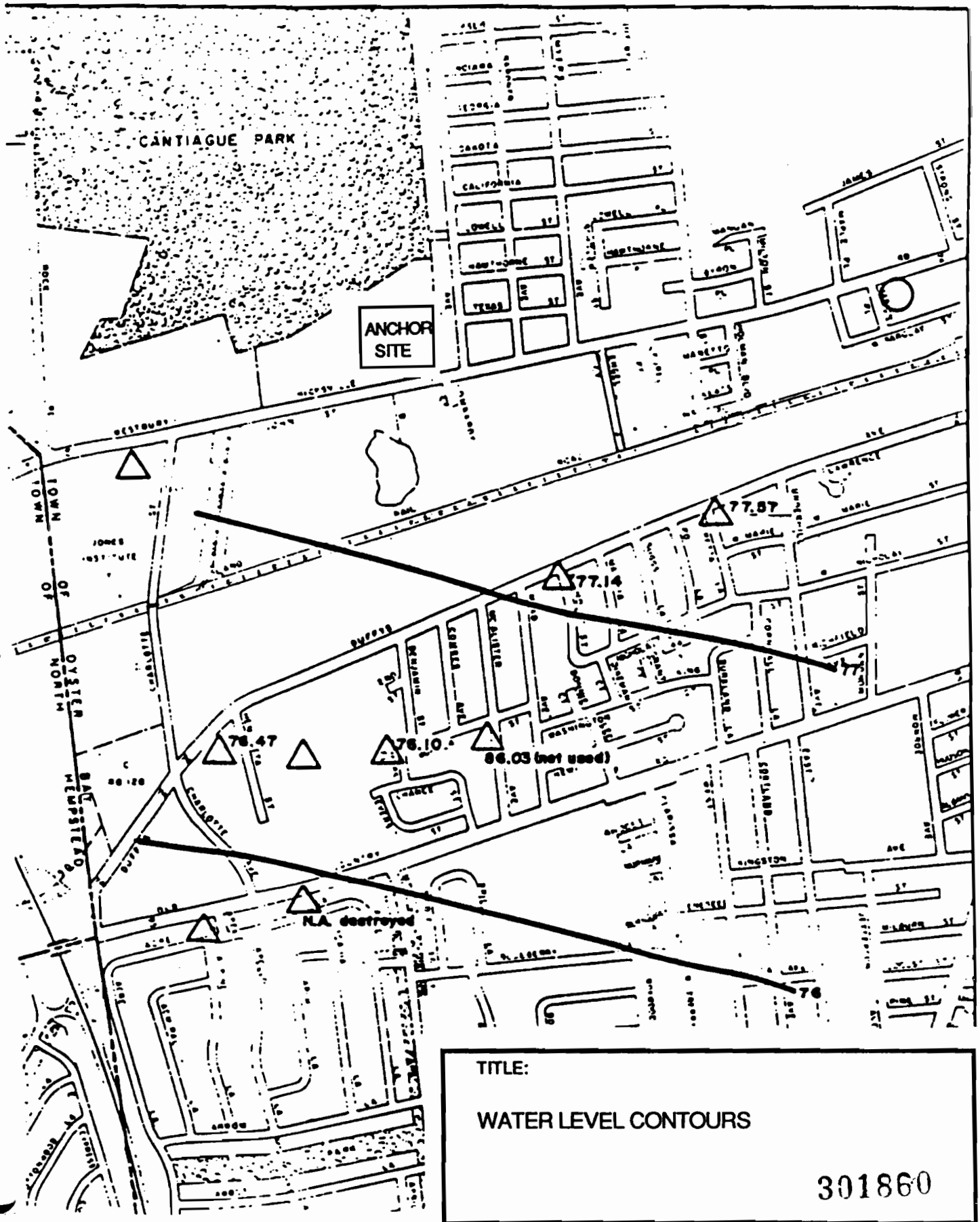
301858



TITLE: LOCATION OF GEOLOGICAL CROSS SECTION	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 2-3

FROM: D. A. Smolensky, H.T. Buxton, and P.K. Shernoff, 1989, Hydrogeologic Framework of Long Island, New York, USGS Hydrologic Investigations, Atlas HA-709.

301859



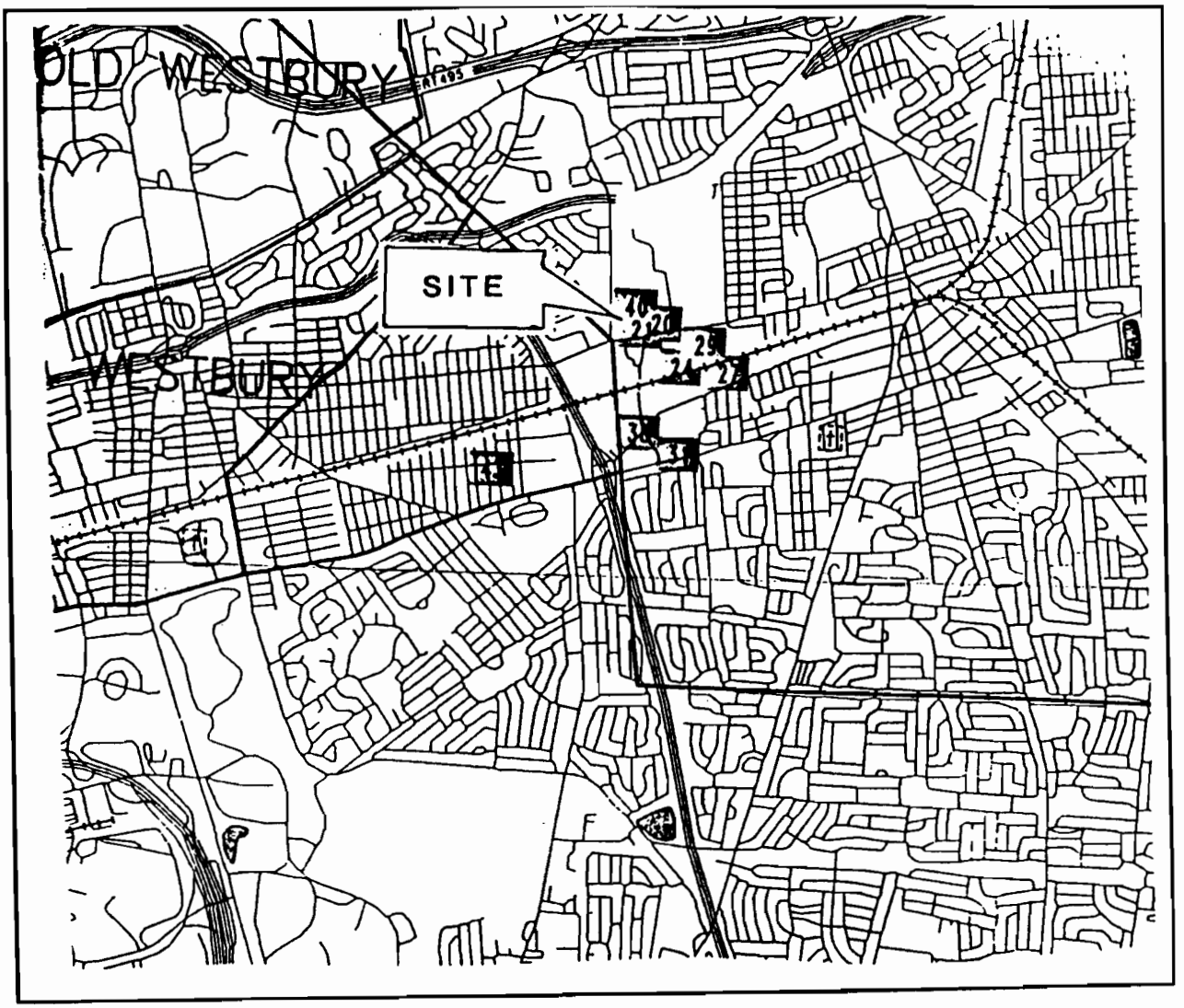
TITLE:

WATER LEVEL CONTOURS

301860

ANSON ENVIRONMENTAL LTD.	FIGURE NO. 2-4

FROM: Dvirka and Bartilucci, 1986.



LEGEND

20 General Instruments Corp.
21 Anchor Chemical (SITE)
24 Mattiace Petrochemicals
27 Alsy Manufacturing, Inc.
29 AGO Associates
31 Magnusonics Devices
38 Depew Manufacturing
40 Air Techniques, Inc.
43 New Cassel Industrial Area

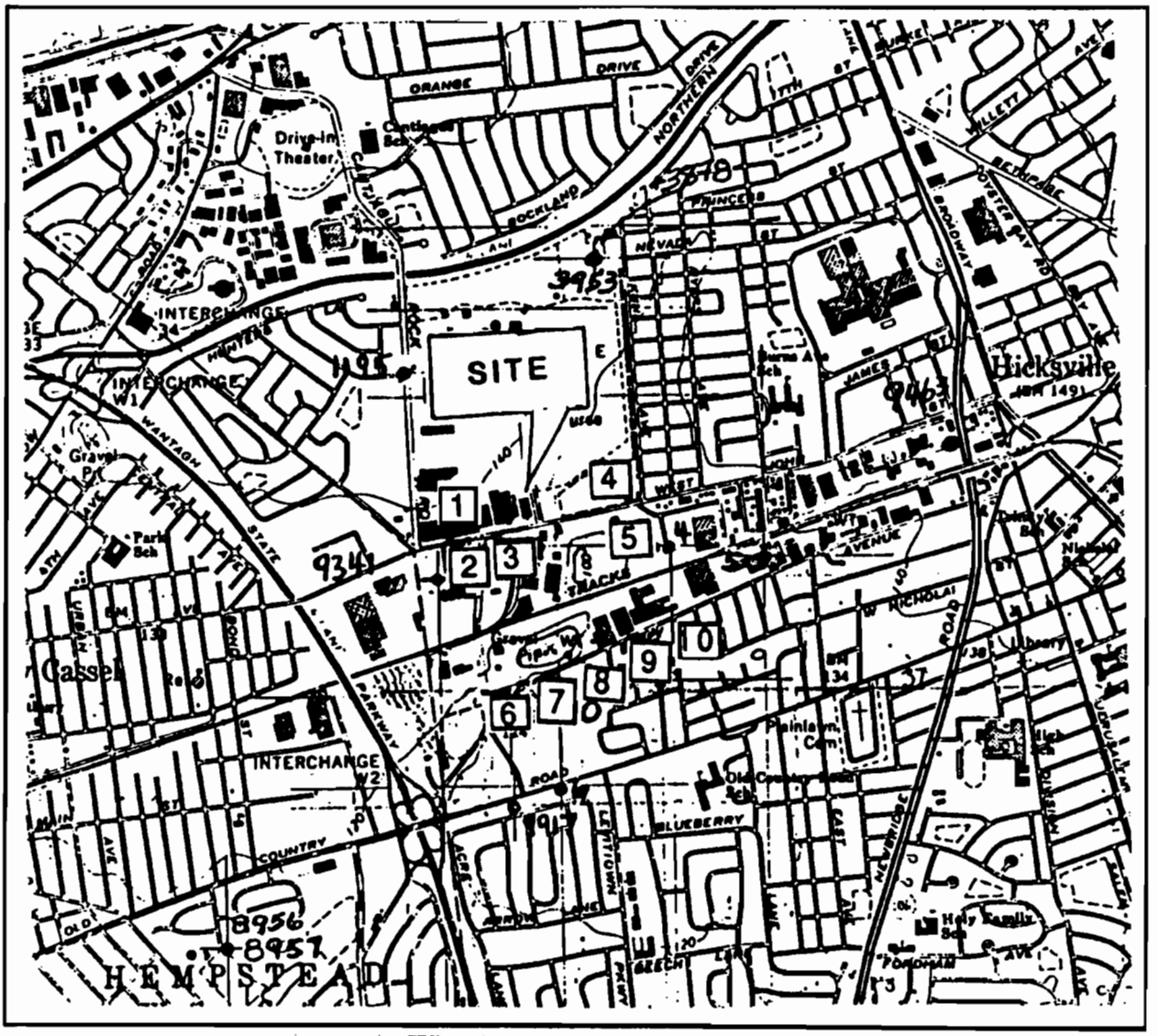
FROM: NYSDEC.

TITLE:

INACTIVE HAZARDOUS WASTE SITES
IN VICINITY OF ANCHOR CHEMICAL

301861

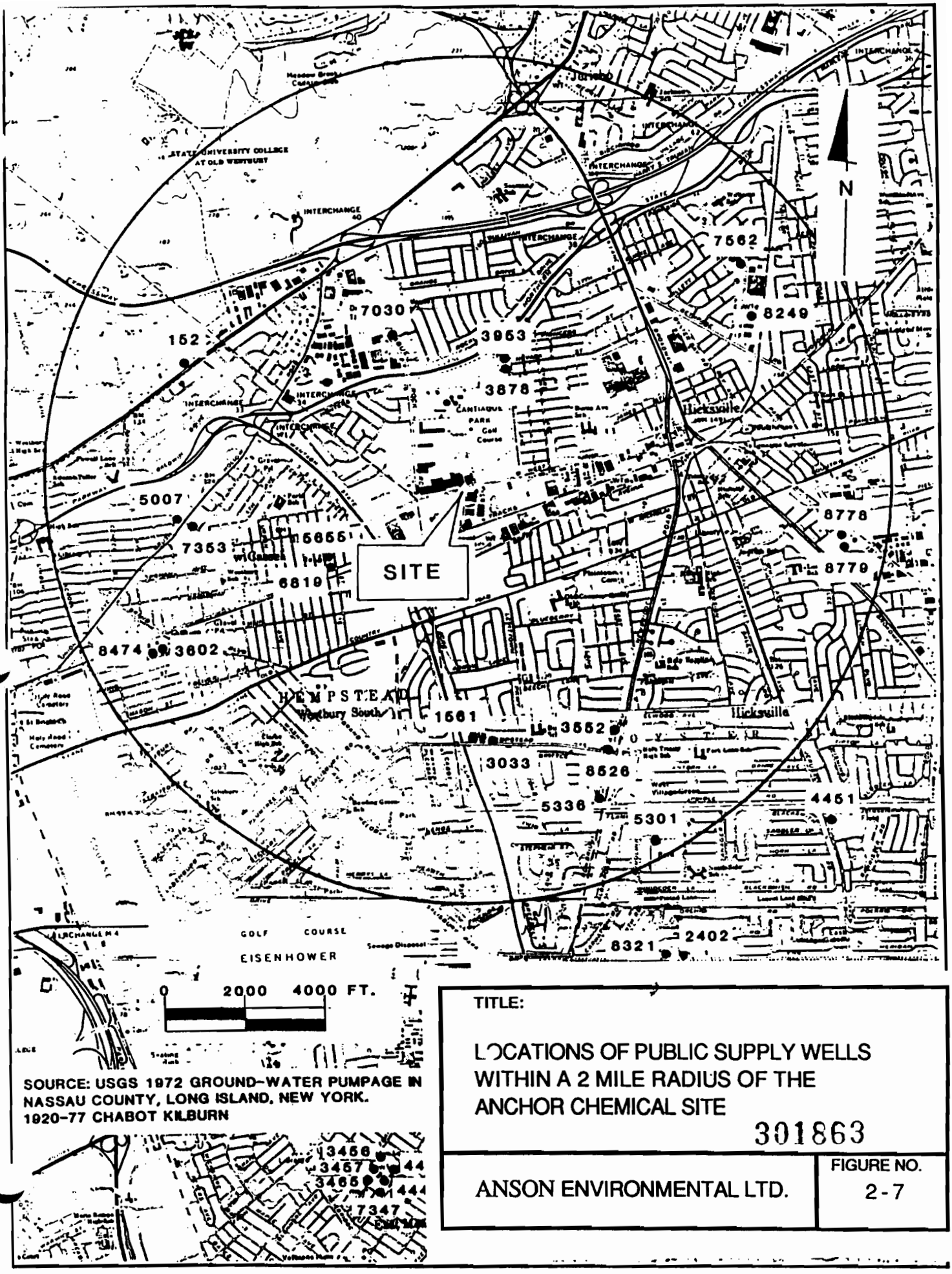
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 2-5



LEGEND

1. General Instruments Corp.
2. Universal Shellac & Supply
3. Nestor Systems Inc.
4. Model Communication
5. Micro Contracts Inc.
6. Depew Manufacturing Corp.
7. Metco
8. MHI Knitware Ltd.
9. Four Star Association Inc.
10. Amperes Electronic Corp.

TITLE:	
COMPANIES IDENTIFIED AS USING VOCs IN VICINITY OF ANCHOR CHEMICAL 301862	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 2-6



SOURCE: USGS 1972 GROUND-WATER PUMPAGE IN NASSAU COUNTY, LONG ISLAND, NEW YORK. 1920-77 CHABOT KILBURN

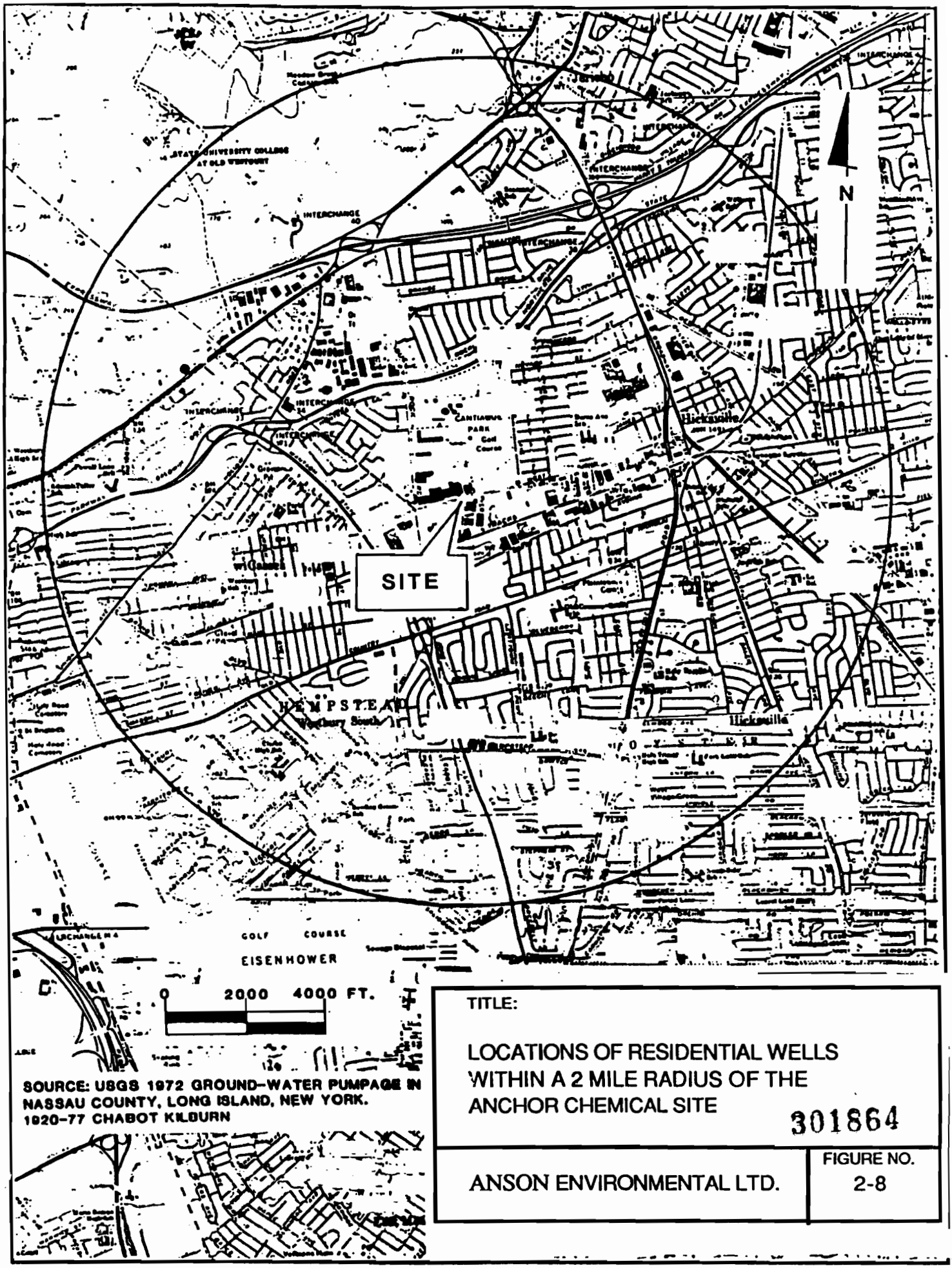
TITLE:

LOCATIONS OF PUBLIC SUPPLY WELLS WITHIN A 2 MILE RADIUS OF THE ANCHOR CHEMICAL SITE

301863

ANSON ENVIRONMENTAL LTD.

FIGURE NO. 2-7



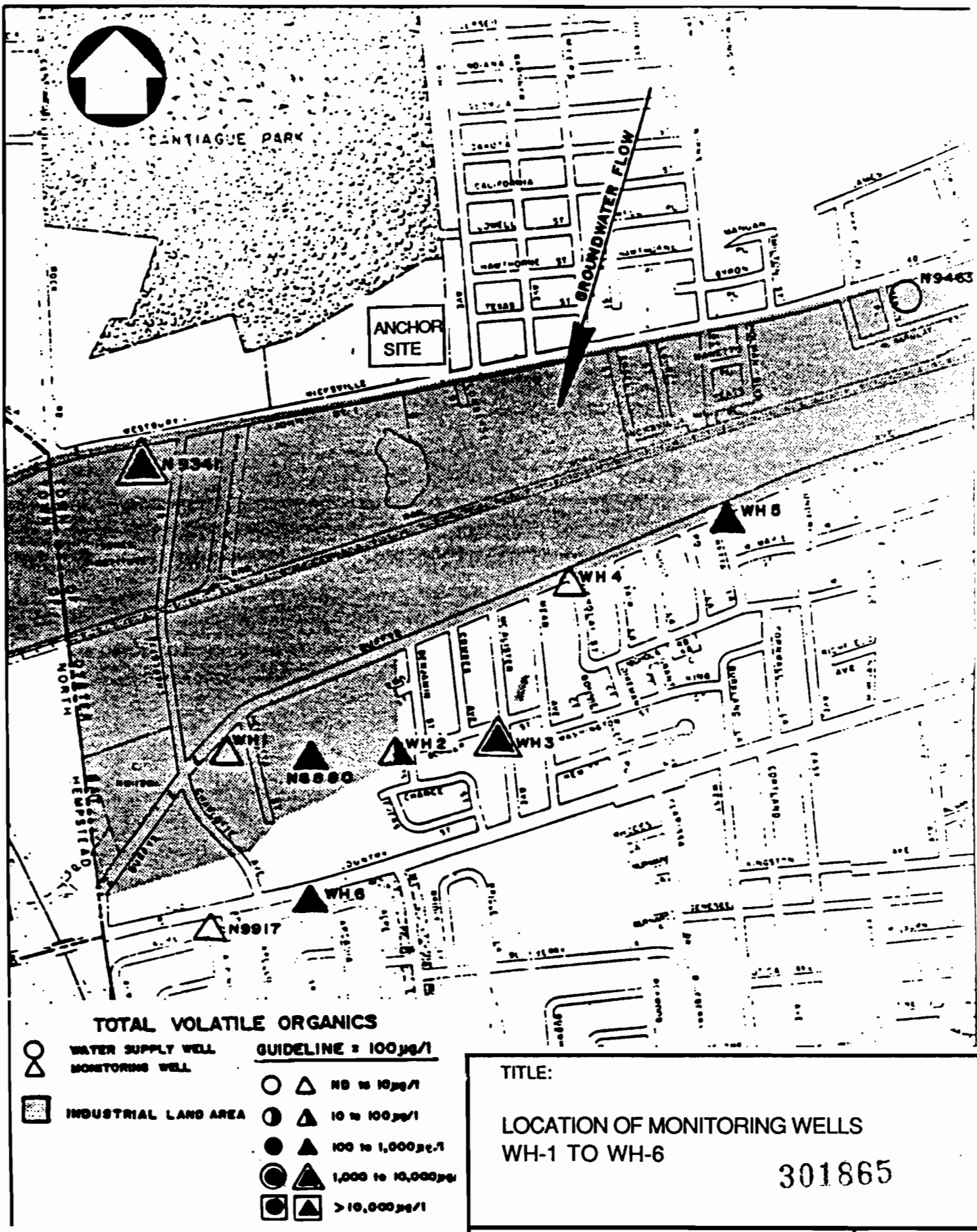
SOURCE: USGS 1972 GROUND-WATER PUMPAGE IN NASSAU COUNTY, LONG ISLAND, NEW YORK. 1920-77 CHABOT KILBURN

TITLE:

LOCATIONS OF RESIDENTIAL WELLS WITHIN A 2 MILE RADIUS OF THE ANCHOR CHEMICAL SITE

301864

ANSON ENVIRONMENTAL LTD.	FIGURE NO. 2-8



TITLE:

LOCATION OF MONITORING WELLS
WH-1 TO WH-6

301865

ANSON ENVIRONMENTAL LTD.

FIGURE NO. 2-9

FROM: Dvirka and Bartilucci, 1986.

3.0 Physical Characteristics of the Study Area

The study area is shown in Figure 3-1.

The Site is completely fenced except for the front (south) parking area and lawn, and access is restricted via gates at the front west and front east sides of the building. There are overhead electrical lines at the front southeast corner of the Site, and the sewer and water lines are under the front of the Site. Other below-grade utilities include drywells, PVC drain lines, and unused, former cesspools. The PVC drain lines are located on the west and north sides of the building.

3.1 Surface Features

Albert W. Tay, L.S., a New York State registered land surveyor, performed a topographic survey at the Site (Figure 3-2), the purpose of which was to determine the exact elevation of all monitoring wells, drywells, drains and the building. The survey was compiled on April 21, 1992 and was performed in level D personnel protective gear.

The soils in the area of the Site consist of loam to sandy loam soils which are generally well drained, and have slopes of less than 3 percent. The entire surface of the Site, except a small front lawn area, is paved, so that all precipitation which occurs will drain as run-off. The run-off is collected in drywells on the Site. These drywells are not connected to a sewage system, but instead drain directly into the soils.

The average depth to water in this area is approximately 50 feet to 60 feet below land surface, (75 feet to 85 feet above mean sea level). County water table maps (Koszalka, 1975) indicate that the general direction of ground water flow in the area is from north-northeast to south-southwest.

3.2 Contaminant Source Investigation

An investigation was undertaken to identify the potential sources of contaminants at the Site. The areas of investigation included drywells, drain, cesspools and underground storage tanks. The twelve on-site drywells and drain on Site collect the surface runoff from the Site (9 drywells and 3 overflows). Prior to 1985, the two cesspools were

connected to the sanitary system of the building. In 1982 these cesspools were taken out of service and filled with sand and gravel when the building was connected to the Nassau County sewers. There are seventeen underground storage tanks beneath the building in the area of the former solvent mixing rooms (Figure 3-3). These tanks were used to store raw materials which were blended to create products for the printing industry. The contents of the underground storage tanks are listed in Table 3-1.

In addition, there were seven above ground storage tanks located in the blending rooms. The above ground storage tanks were not on-site at the time of this investigation. It is believed that these tanks were removed when Anchor/Lith Kem-Ko vacated the Site in 1985.

In November 1991, one soil boring was installed in each of the drywells, drain and the cesspools. Soil samples were collected from the surface of the sediment in all the drywells, drain and cesspools. In four drywells, soil samples were collected at five foot intervals from the bottom of the drywell to the ground water interface.

The tanks beneath the floor of the building were opened and observed to

determine if there was any liquids in them. Tank 16 was the only tank that contained liquid. This liquid was removed and disposed of properly. Six soil borings were then installed inside the building in the vicinity of the abandoned tanks (Figure 3-3B). Soil samples were collected at five foot intervals from the ground surface to the ground water interface.

In addition to the three ground water monitoring wells installed on the Site by LKB in 1982, eight new monitoring wells were installed on Site as part of the Remedial Investigation. Of the new wells, four are deep wells and four are shallow. Two ground water samples were collected from each of the wells and submitted for laboratory analysis. One ground water sampling round was conducted on April 22 and 23, 1992 and the other was conducted on November 9 and 10, 1992.

All soil and ground water samples were submitted for laboratory analysis for the Target Compound List.

3.3 Geological Investigation

Well Construction

There were three existing 2-inch diameter wells on Site. These wells were installed by LKB in 1982 and appear to be constructed of PVC. No additional data regarding the construction of those wells are available. A search of the field notes and reports did not reveal the actual well development date in 1982.

According to the April 10, 1991 Anchor Chemical Site Project Operations Plan (POP) prepared by Roux Associates, the three existing wells were to be developed to determine if development water could be brought down to less than 50 nephelometric turbidity units (NTU); thereby meeting NYSDEC requirements for the decision as to whether these wells could be used during the field investigation. If the 50 NTU could not be attained, then the wells would have to be replaced.

Development of the wells on April 22, 1992, determined that the 50 NTU level could be satisfied. Therefore, those wells were used for the first

two rounds of ground water sampling.

Between November 19, 1991 and March 10, 1992, eight new monitoring wells were installed, in accordance with the POP and Work Plan, at the Site. The locations of all eleven monitoring wells are shown on Figure 3-2. The monitoring wells were installed in clusters by Marine Pollution Control a/k/a Miller Environmental Group of Calverton, New York and the installation was overseen by hydrogeologists from AEL and BBEPC.

Four of the new monitoring wells (MW-4, MW-5S, MW-6S and MW-7S) were shallow and screened in the Upper Glacial Aquifer at 70 to 80 feet below land surface. These shallow wells were installed with the well screens ten feet below the water table as specified in the Work Plan. The four deep wells (MW-1D, MW-5D, MW-6D and MW-7D) were screened deeper in the Upper Glacial Aquifer at 100 to 120 feet below land surface. The three original wells, MW-1S, MW-2 and MW-3, were shallow wells. As a result, well clusters which consist of a shallow well and a deeper well are located at MW-1S and MW-1D, MW-6S and MW-6D, MW-5S and MW-5D, and MW-7S and MW-7D. During the installation of wells, no clayey layers were detected in the Upper Glacial Formation beneath the Site. Typical

well construction details for the new monitoring wells are provided in Figure 3-4. Well construction diagrams for the new wells are provided in Appendix D.

The new wells were installed using the hollow-stem auger method. Ten-inch diameter boreholes were drilled and 4-inch diameter flush-joint, schedule 10, threaded stainless steel casing (type 304) with a ten-foot long stainless steel screen with a .20 slot screen size was used for well installation. When the screen was in place, a clean, Morie No. 2 graded silica sand was used to pack the annular space around the screen. When the well screen was properly packed, two feet of fine sand was placed immediately over the sand pack and a five-foot thick layer of certified 100 percent bentonite high solids grout was placed on top of the fine sand. The bentonite layer seals the annular space while the remainder of the annular space is grouted to the surface with a 5 percent bentonite and 95 percent cement/bentonite slurry to the ground surface. The cement/bentonite slurry was tremied.

All new wells were finished flush with grade, had locking caps installed and protective meter boxes cemented in-place. USEPA guidelines were

followed while installing and constructing all of the new wells. Drill cuttings were collected during well installation and were placed in 55-gallon drums. These cuttings were stored on Site until RCRA disposal requirements were satisfied. Each of the 55-gallon drums was labelled as to its contents, well number and date of collection.

At well clusters, the deep well was installed first, except at MW-1 where MW-1S was already in-place. During the installation of the deep well, formation samples were collected at 5-foot intervals using split-spoon core barrels that were advanced ahead of the augers with a rig-operated hammer. The exception was well number MW-7D which was logged continuously. All soil samples were described by AEL and BBEPC hydrogeologists; Appendix A contains copies of the sample core boring logs prepared in the field.

Portions of the soil sample from each sampling interval were retained for possible laboratory analyses for the Target Compound List (TCL). Selection of soil samples for analyses was made by screening the head space in partially-filled sample jars using an organic vapor analyzer (HNu and/or OVM). The two samples containing the highest concentrations of

organic vapors from each well boring were submitted for analysis for TCL. A more detailed explanation of the sample selection process is described in Section 4.2). Intech Biolabs of East Brunswick, New Jersey, analyzed samples for volatile organic compounds, semi-volatile organic compounds, pesticides and polychlorinated biphenyls (PCBs). CEIMIC Laboratories, Inc. of Narrangansett, Rhode Island performed the inorganic, phenol and cyanide analyses for the TCL. Validated laboratory data summary sheets are included in Appendix E and the summary validated data reports are included in Volume 3 of this report.

All down-hole drilling equipment (augers, drilling rods, etc.) and those parts of the drilling rig exposed to drill cuttings were steam-cleaned before use and between each boring. Split-spoon samplers and all other sampling equipment were decontaminated following the decontamination procedures listed in Table 3-2. Decontamination liquids were placed in 55 gallon drums and were labelled and stored on Site until proper disposal techniques were identified.

Upon completion of the well installation, the newly-installed wells were developed by surging and pumping to remove fine sediment from around the

screen zone and to ensure good hydraulic connection between the well and the aquifer. This was done in compliance with the Work Plan, Section 4.3 Task 3. The development was accomplished using either a stainless steel submersible pump or a teflon Geogard pulse pump. Development continued until the water was less than 50 NTU. Ground water samples were collected on two occasions using USEPA and NYSDEC approved sampling protocols. Three to five volumes of water were purged from each well prior to collecting samples for laboratory analysis.

Development water, from the initial development procedure, and the purge water collected prior to the first round of ground water samples, were placed in drums.

The well development dates, purge dates and sampling dates are included in the revised Table 3-3. The drums were labelled as to the date and monitoring well number. Once the initial round of laboratory data were available and it was determined that the water samples were not contaminated, the development water was discharged into drywell number 2 as specified in the POP. This discharge of the development water was approved by both the USEPA and the NYSDEC. The exception was

development water from MW7D and MW7S which was pumped by Long Island Cesspool Sewer and Drain into a truck from E & B Industrial Cleaning on June 1, 1993. A total of 1400 gallons of liquid was removed.

3.4 Hydrology and Water Supply

The direction of shallow ground water flow beneath the Site (at or near the water table) is from the northeast to the southwest. The ground water flow was derived from three rounds of water level measurements collected from the eleven well installed on-site. This information confirms the description of the hydrologic conditions for 530 West John Street, which is 300 feet to the west of 500 West John Street and the 1985 findings on-site (LKB, 1985).

The ground water supplies the domestic, public and commercial needs of the population of Nassau County. The two most commonly tapped aquifers for water supply purposes are the Upper Glacial and the Magothy. In Hicksville, the Upper Glacial Aquifer is not used as a source of potable water. The Magothy is the source of municipal potable drinking water, industrial process flow, cooling water and water for fire protection

purposes. The Magothy is totally dependent upon downward percolating rainfall and recharge from the overlying Upper Glacial deposits for its subsurface replenishment.

Two water companies supply water pumped from municipal wells to the homes and businesses in the vicinity of the Site. The Hicksville Water District supplies the Site, as well as areas to the north, and the Bowling Green Water District supplies the remaining areas to the south of the Site. Each well field consists of one or more public supply wells.

The nearest municipal well field is located 2,500 feet east of the Site (Hicksville Waster District well N9436). This well, like all of the local public supply wells in the Site area, is advanced to, and completed within, the Magothy Aquifer. Again, there are no reported private wells near the site (Myott, 1991).

3.5 Underground Storage Tank Investigation

Seventeen steel underground storage tanks ranging in size from 550 to 4,000 gallons were located under the floor in the vicinity of the former

solvent blending rooms. In May of 1981, the Nassau County Fire Marshal (NCFM) notified Anchor/Lith Kem-Ko that it was in violation of Nassau County Fire Prevention Ordinance No. 51-81 Article III for failure to register and test the tanks.

NCDH records indicate that five of the 14 tanks tested in 1981 failed the fitness tests. Therefore, in June of ~~1981~~ 1983, those five tanks (tanks 5, 6, 8, 11 and 15) were taken out of service and decommissioned. The chemical compounds reported to have been stored in those tanks were:

Tank No.	Contents
5	Naphthol spirits
6	Acetone
8	Mineral spirits*
11	Isopropyl alcohol
15	Textile spirits

*1,1,1-trichloroethane (1,1,1-TCA) reportedly was stored in 1965 and 1975 in Tank 8. It was stored in Tank 12 as well.

According to the County Fire Marshal, those tanks were abandoned in-place and filled with concrete slurry in accordance with applicable Nassau County regulations in 1983 (Nassau County Fire Commissioner, 1984).

301678

NCDH records indicate that the decommissioning of the twelve (12) remaining underground storage tanks (Nos. 1 to 4, 7, 9, 10, 12 to 14, 16 and 17) by Barlo Equipment Corporation, was halted in August 1985 (NCDH, 1985) (Lesser, 1990).

Task 2 of the RI consisted of inspecting and sampling the remaining twelve (12) tanks whose status was unknown. Between June 8 and June 14, 1991, Roux and Enro-Serve performed an inspection of these tanks by cutting through the concrete floor in order to expose the manways of the twelve tanks. The table below summarizes the findings of that inspection. The Roux Associates report of its findings is presented in Appendix F.

Tank Designation	Tank Contents	Work Performed
Tank 1	Concrete	None
Tank 2	Concrete	None
Tank 3	Concrete	None
Tank 4	1/2 Concrete 1/2 Empty	Vapors removed and tank filled with concrete
Tank 7	Empty	Vapors removed and tank filled with concrete.

To determine the status of the twelve remaining tanks, the concrete floor was cut to gain access to a tank nozzle or manhole or an opening was cut in the tank so that the tanks could be inspected and sampled if they contained liquids or sludges. The inspecting, sampling, emptying and

decommissioning of the tanks were carried out.

During the tank inspections, all piping to and from the tanks was cut off and capped at wall and floor entry points.

The former contents of the tanks are described in Section 3.2. After the tanks were inspected, sampled, emptied and decommissioned, six soil borings were drilled inside the building to sample soil below the underground tanks (Figure 3-3).

Tank decommission/abandonment documents for the remaining twelve tanks were not available from any of the sources.

3.6 Site Climate

The following climatological data were assembled from the files for Nassau County recorded in Mineola, New York. Average temperatures are 33 degrees Fahrenheit (F) and 72 degrees F for winter and summer, respectively. The tempering influence of the Atlantic Ocean and Long Island Sound keep the mean annual temperature (51 degrees F) for the

Island several degrees higher than the average for all of New York State. Average temperatures increase from west to east, and because of the effect of the Atlantic Ocean, the temperatures at the south shore are slightly lower than the corresponding longitude of the north shore temperatures. The maximum and minimum temperatures of record are 103 degrees F (39 degrees C) and -14 degrees F (-26 degrees C), respectively (Soil Conservation Service, USDA, 1974).

The prevailing wind direction is northwest during most of the year, except during the summer months, when south and southwest winds predominate (Franke and McClymonds, 1972). During the spring the windspeed is highest, averaging 14 miles per hour (Wulforst, 1987).

The 30-year annual average precipitation recorded at Mineola, Long Island, New York (ref; Northeast Regional Climate Center, Ithaca, N.Y.) is 43.69 inches. Approximately half of the precipitation falls between April and September. The annual rainfall for 1991 was 44 inches.

3.7 Demography and Land Use

Information on the current industrial profile of West Hicksville indicates that the area is heavily industrialized with a wide variety of industrial categories, including chemical, electronics and electrical equipment. The residential area in West Hicksville, south of Old Country Road and south of the Site, is considered to be of intermediate density, with approximately five to ten dwelling units per acre.

Industrial and commercial firms are concentrated generally along West John Street and Duffy Avenue, which run east and west though central Hicksville and adjacent to the Long Island Rail Road. The area is served primarily by the Hicksville Water District. It is part of Nassau County Sewer District #3 and has been sewered since the 1980s.

The area has been developed for about 30 years, and has exhibited no recent growth. The population of Hicksville, including the northern and western sections, decreased from 49,820 in 1970 to 41,727 in 1984 (Dvirka and Bartilucci, 1986).

3.8 Field Quality Assurance/Quality Control Protocol

Dedicated teflon bailers were used to collect ground water samples. These bailers were suspended from polypropylene line which was discarded after each sampling event. Gloves and other personnel protective equipment were also discarded after sampling each ground water monitoring well.

Samples collected for volatile organic analysis were quickly capped and placed in a cooler. The laboratory-supplied 40-milliliter vials had teflon septa. Ground water samples analyzed for metals and volatile organic compounds were preserved in the field following USEPA Contract Laboratory Program protocol.

For each day of sampling, field blanks were submitted for laboratory analysis along with the field samples. Trip blanks accompanied each cooler and were provided by the laboratory and consisted of two 40-milliliter vials filled with analyte-free water. Documentation for the deionized water and trip blank water was provided by the laboratory. Trip blanks accompanied field samples and were handled in the same manner as

field samples, except trip blanks were not opened in the field and were only opened by laboratory personnel during analysis.

Table 3-1

Summary of Fate of Underground Storage Tanks

Tank No.	Capacity (gallons)	Construction	Action in 1983	Contents in March 1991	Action in July 1991
1	3000	steel		filled with concrete	none
2	3000	steel		filled with concrete	none
3	3000	steel		filled with concrete	none
4	3000	steel		1/2 filled with concrete	vapors removed, filled with concrete
5	4000	steel	decommissioned		
6	2000	steel	decommissioned		
7	2000	steel		empty	scraped, vapors removed, filled with concrete
8	1500	steel	decommissioned		
9	1500	steel		filled with concrete	none
10	1500	steel		empty	scraped, vapors removed, filled with concrete
11	1500	steel	decommissioned		
12	1500	steel		filled with concrete	none
13	1500	steel		filled with concrete	none
14	1000	steel		filled with concrete	none
15	4000	steel	decommissioned		
16	1000	steel		550 gallons of water	sampled and removed,scraped, filled with concrete
17	550	steel		empty	scraped, vapors removed, filled with concrete

Work performed by Roux Associates

From "Tank Closure Report," August 23, 1991

Table 3-2

Sampling Equipment Decontamination Procedures

Step 1 - wash and scrub with low phosphate detergent

Step 2 - rinse with tap water

Step 3 - rinse with ultrapure grade of 10 percent nitric acid*

Step 4 - rinse with analyte-free deionized water

Step 5 - rinse with reagent grade acetone

Step 6 - rinse with analyte-free deionized water

Step 7 - air dry

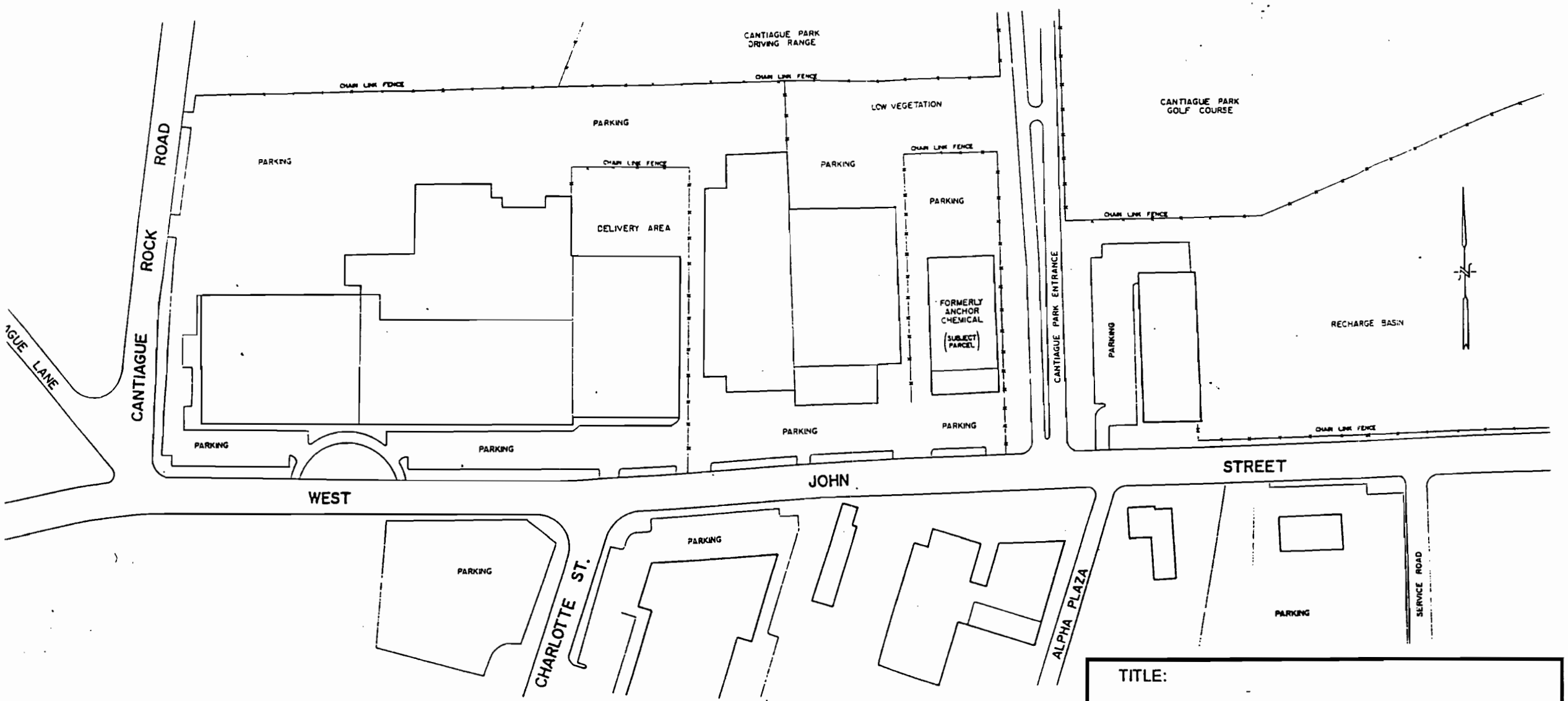
Step 8 - wrap in clean aluminum foil until use

* one percent nitric acid was used when carbon steel split spoons were used to prevent leaching of metals from the split spoons (as specified in the POP).

301886

Anchor Chemical Site
500 West John Street, Hicksville, NY
Table 3-3-Well Development Data

Well #	Installation Date	Development Date	Purge Dates	1st Round Sampling Date	2nd Round Sampling Date
1D	11/19/91	3/31/92	4/23/92,11/9/92	4/23/92	11/9/92
1S	12/18/82	unknown(LKB)	4/23/92, 11/10/92	4/23/92	11/10/92
2	12/18/82	unknown(LKB)	4/23/92, 11/10/92	4/23/92	11/10/92
3	12/18/82	unknown (LKB)	4/23/92, 11/10/92	4/23/92	11/10/92
4	11/24/91	12/3/91	4/22/92,11/10/92	4/22/92	11/10/92
5D	3/10/92	3/22/92	4/22/92,11/10/92	4/22/92	11/10/92
5S	3/13/92	3/22/92	4/22/92,11/9/92	4/22/92	11/9/92
6D	3/25/92	3/30/92	4/23/92,11/9/92	4/23/92	11/9/92
6S	11/25/91	12/3/91	4/23/92,11/9/92	4/23/92	11/9/92
7D	3/18/92	3/22/92	4/22/92,11/10/92	4/22/92	11/10/92
7S	3/22/92	3/22/92	4/22/92,11/9/92	4/22/92	11/9/92

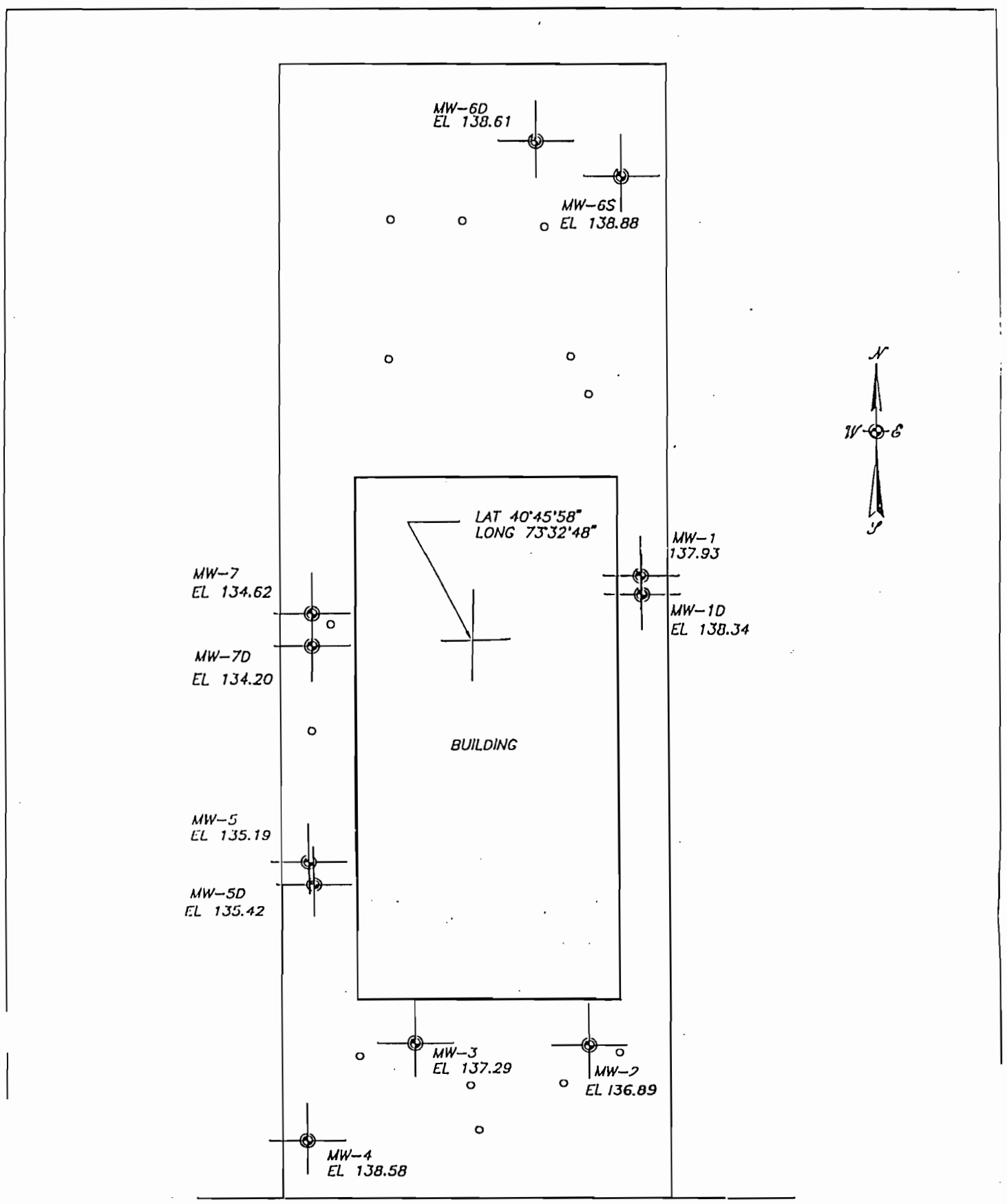


TITLE:

ANCHOR CHEMICAL STUDY AREA

ANSON ENVIRONMENTAL LTD.	FIGURE NO. 3-1

301888



WEST JOHN STREET

Albert W. Tay

ALBERT W. TAY
LICENSED LAND SURVEYOR
P.O. BOX 312, PLAINVIEW, NY 11803
TEL (516) 433-3725 FAX (516) 433-0409

92233

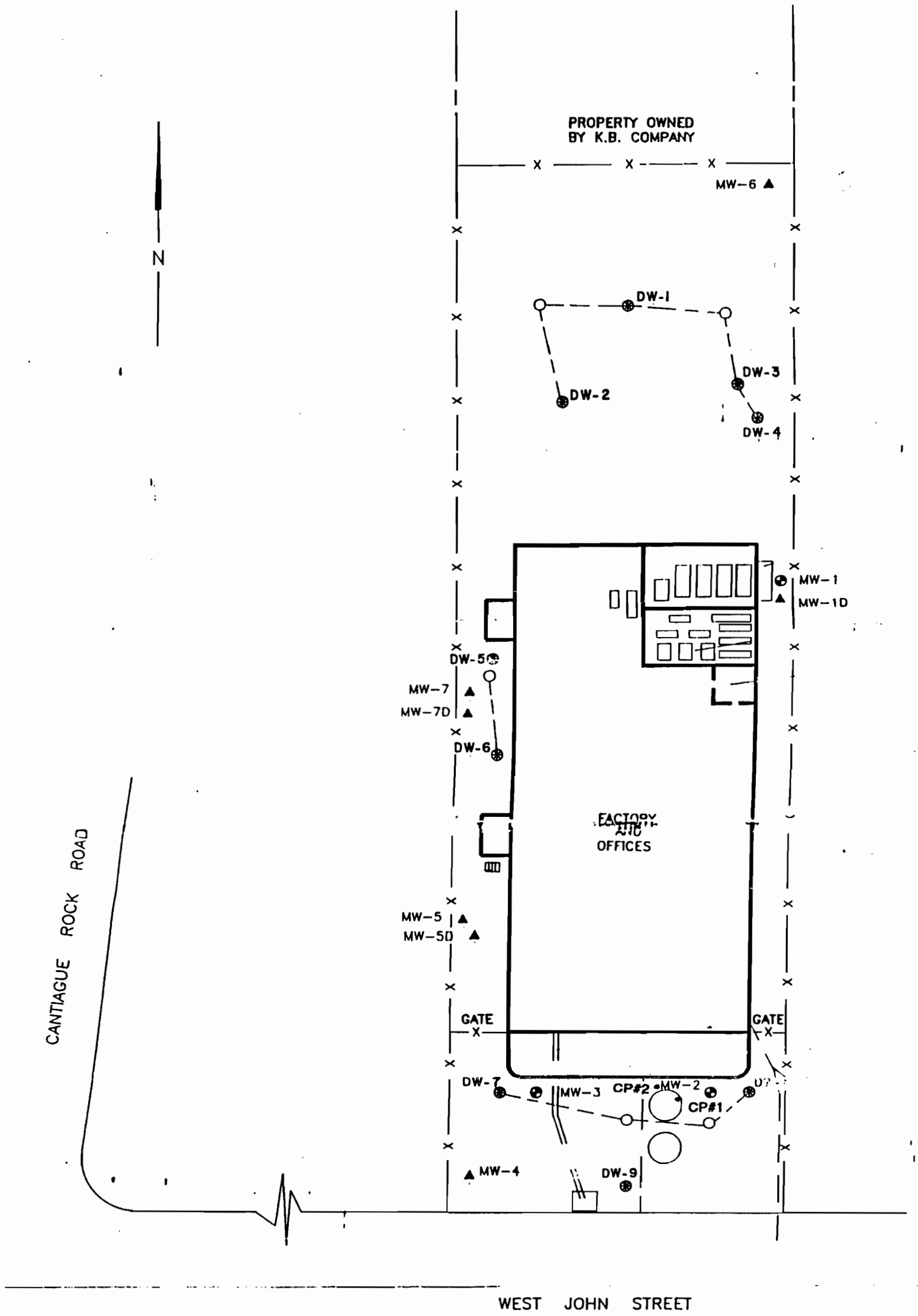
TITLE: WELL LOCATION SURVEY	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 3-2

N.C.T.M. SECT II BLK 499 LOT 87

SURVEYED APRIL 21, 1992

40 20 0 40
SCALE 1" = 40'

301889

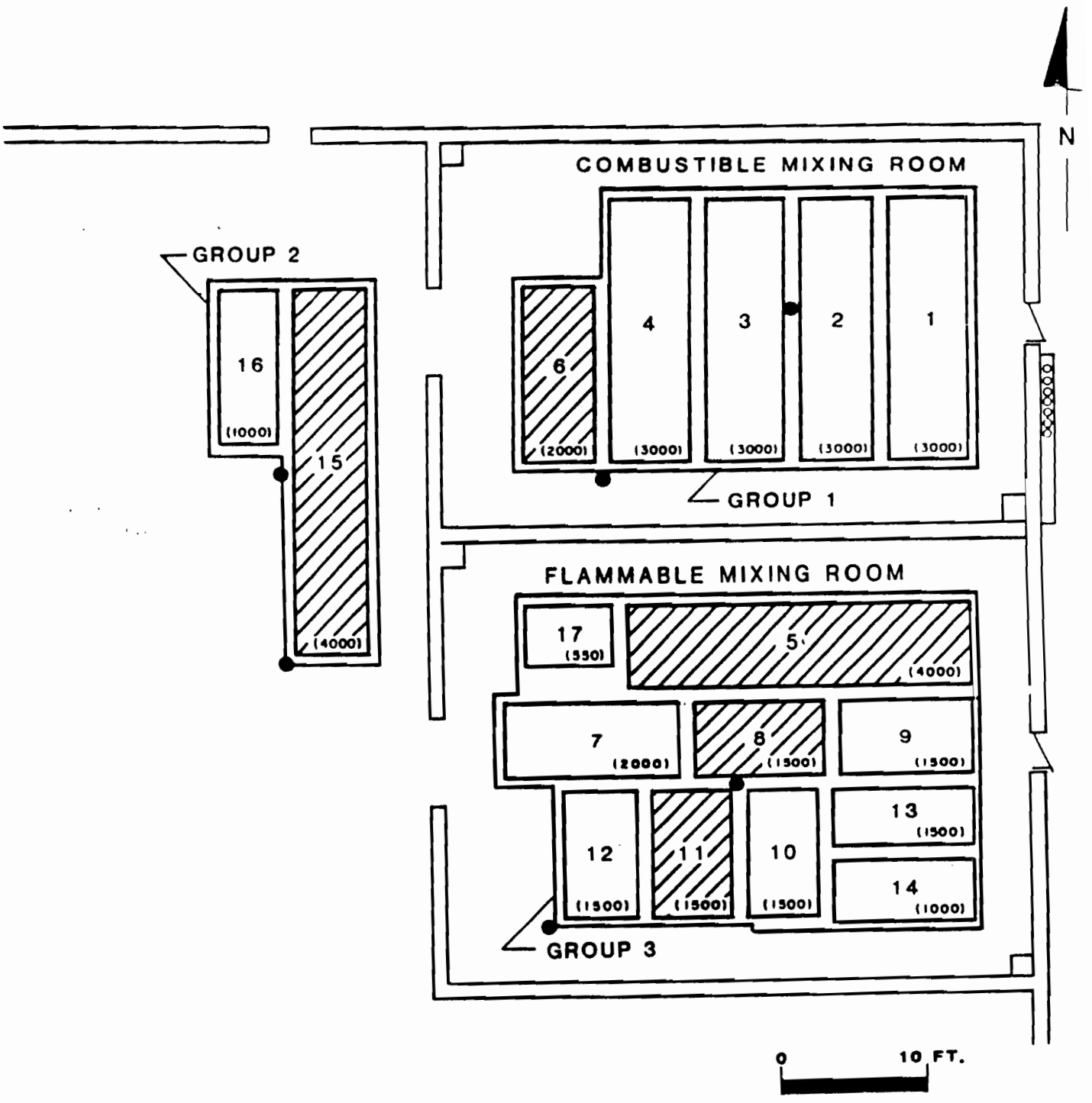


EXPLANATION

- DRYWELL SAMPLING LOCATIONS
- LOCATION OF UNUSED CESSPOOLS
- CESSPOOL SAMPLING LOCATIONS

Figure 3-5 Drywell and Cesspool Sampling Locations

Anson Environmental



EXPLANATION

● PROBABLE BORING LOCATION (MAY BE MOVED BASED ON ACCESS)

(2000) TANK FILLED WITH AN INERT SOLID MATERIAL

TANK CAPACITY IN GALLONS

TITLE:

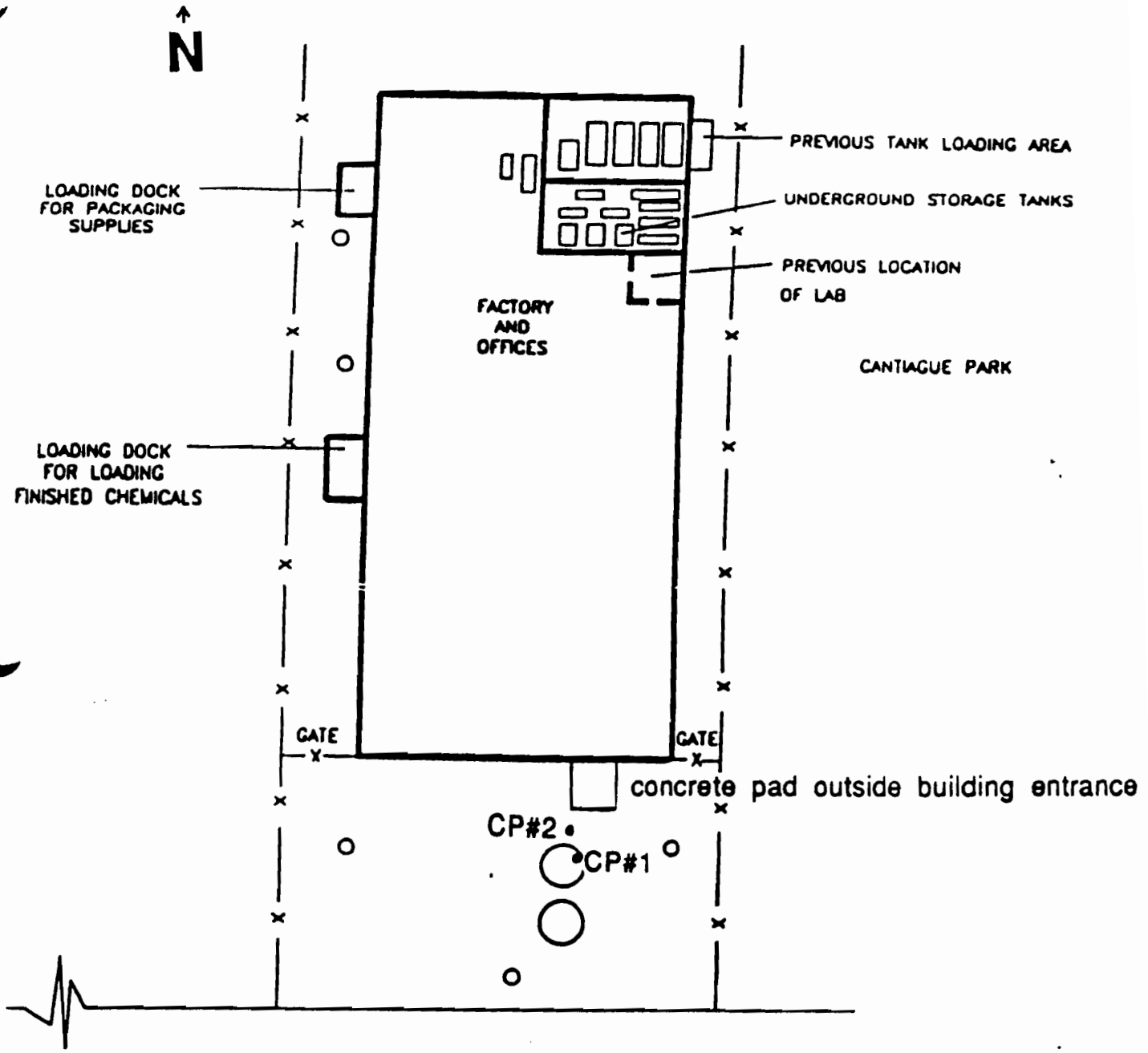
ARRANGEMENT OF UNDERGROUND STORAGE TANKS AT ANCHOR CHEMICAL SITE

301891

FROM: Roux, 1991.

ANSON ENVIRONMENTAL LTD.

FIGURE NO. 3-3



500 West John Street

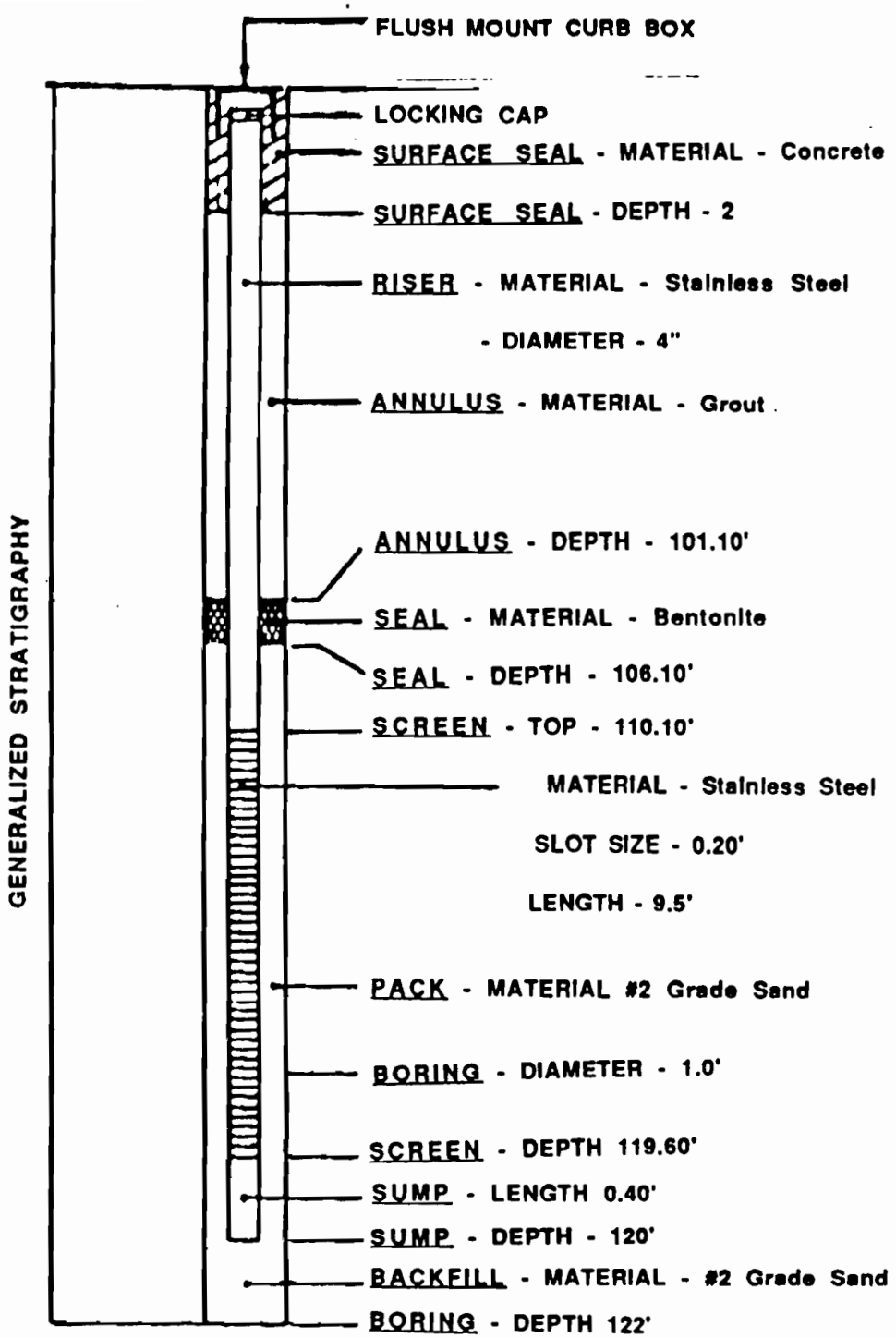
Cesspool Sampling Locations

CP#1 29' west of east side of bldg
22' south of southern side of bldg

CP#2 31' west of east side of bldg
19' south of southern side of bldg

Figure 3-3 B

Anson Environmental



TITLE: WELL CONSTRUCTION DETAILS 301893	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 3-4

4.0 Data Analysis and Results

This section of the RI report contains the laboratory analyses and evaluation of the data collected during the RI investigation at the Site. This section is divided into the following subsections:

4.1 Drywell, Drain and Cesspool Sampling

4.2 Tank Investigation and Soil Borings Inside the Building

4.3 Monitoring Well Installation and Sampling Analyses-2 Rounds

4.4 In-Situ Specific Capacity Tests

4.5 Topographic Survey and Water Level Contours

Copies of the summaries of the validated data reports are contained in Appendix E of this report.

To assess the impacts posed to the subsurface environment (soil and ground water) at the Anchor Site, a list of potential Applicable or Relevant and Appropriate Requirements or ARARs were developed for organic and inorganic compounds detected at the Site. Tables 4.0 (A-D) contain the most stringent enforceable, regulated soil cleanup objectives

and ground water concentrations developed by the NYSEDC, NYSDOH or USEPA.

4.1 Drywell, Drain and Cesspool Sample Analyses

As described in Section 3 of this report, nine drywells, one drain (actually a concrete-bottom catch basin) and two abandoned cesspools were sampled (see Figure 3-2 for locations on Site). The drywell and drain samples were collected from the sediment in the bottom of the structures. The results of this sampling are discussed by category of compound and sampling location.

ESIvalidated laboratory data for samples collected from Drywells 1, 5 and the drain did not have any volatile compounds above the method detection limits.

Drywells 2, 4, 6, 7, 8 and 9 had volatile organic compounds identified above the method detection limit. The compounds present in Drywell 2 are listed in Table 41. Drywells 4, 6 and 8 contained concentrations of toluene at 64 µg/Kg (estimated), 5 µg/Kg (estimated) and 280 µg/Kg,

respectively. Drywells 7 and 9 had carbon disulfide at 5 µg/Kg (estimated) and 21 µg/Kg, respectively.

Drywells 2, 4, 5, 8, 9 and the drain had semivolatile organic compounds present above the method detection limit. Phenanthrene was detected in Drywell 2 (370 and 370 µg/Kg), Drywell 4 (260 and 310 µg/Kg), Drywell 8 (1,800 and 1,500 µg/Kg), Drywell 9 (260 µg/Kg) and the drain (190 µg/Kg). Semivolatile compounds present in each of the drywells are identified in Table 4-2 and inorganic analytes present are identified in Table 4-3.

The only semivolatile organic compound present in Drywell 5 was benzoic acid (53 and 73 µg/Kg). The laboratory analyzed the sample from Drywell 5 twice for quality assurance/quality control purposes.

All of the drywells and the drain contained bis(2-ethylhexyl)phthalate above method detection limits.

The presence of bis(2-ethylhexyl)phthlates could be explained in at least two ways:

(1) it is a common laboratory/field contaminant or

(2) it is used as a pigment in blue inks.

According to Laboratory Resources Inc., the parent organization of Intech Biolabs Laboratories, Inc., bis(2-ethylhexyl)phthalate is, in this case, considered a laboratory contaminant (see Appendix K). Hydrocarbon-contaminated soils are particularly suspectible to the presence of phthalic acid esters in the laboratory analysis process. However, because there are records that indicate that phthlates were used on-Site, it is considered a Site contaminant.

The following metals were identified in all of the nine drywells and the drain: aluminum, arsenic, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, vanadium and zinc.

No aroclors (PCBs) were detected above the method detection limits in any of the drywell samples.

Pesticides were detected in Drywells 2, 3. 4, 6, 7, 8 and 9 (see Table 4-4). Drywells 1 and 5 and the drain did not have any pesticides detected above the method detection limits. The sediment/soil in Drywell 2 contained

the following five pesticides above the method detection limit: alpha BHC; dieldrin; 4,4'-DDE; endrin; and methoxychlor.

The two cesspools, which were abandoned and filled with sand in 1982, were sampled below the fill material. The second round of sampling was performed on September 20, 1993. Samples were collected at 11 to 13 feet (cesspool 1) and 12 to 14 feet (cesspool 2). Field and trip blanks were submitted for analysis.

The only volatile organic compound detected was methylene chloride in cesspool 1 at an estimated level of 10 µg/Kg, which was determined by the data validator (ESI) to be considered nondetected. The data validator also stated that the bis(2ethylhexyl)phthlate at levels of 190 and 140 µg/Kg respectively should be considered a laboratory/field contaminant. Given the treatment of this compound as a Site contaminant, the ARAR for bis(2-ethylhexyl)phthlate in soil is 50 mg/Kg or 50,000 µg/Kg.

The pesticide, dieldrin, was detected at 3.4 and 7.5 µg/Kg in cesspools 1 and 2 respectively and methoxychlor was detected in cesspool 2 at an

estimated level of 14 µg/Kg. There were no aroclors (PCBs) detected in either sample.

The concentrations of inorganic analytes detected in the cesspool samples are displayed in Table 4-3. The levels detected are generally below those of the drywell sediment samples and do not, in and of themselves, represent contamination. The compounds of primary interest, lead and chromium, were detected at levels of 1.9 mg/Kg in both cesspools for lead and 4.3 and 3.5 mg/Kg for chromium. The site background level in monitoring well 6D installation was 2.1 mg/Kg for lead and 3.4 mg/Kg for chromium. The NYSDEC RSCOs are 30 mg/Kg for lead and 10 mg/Kg for chromium. These samples are well below the ARAR.

In general, the levels of compounds detected in the surface sediment of the drywells and drain were higher than the soil collected during the installation of the monitoring well MW 6D whose soil sample was collected at 60-62 feet below the ground surface considered to be site background. The three tables included (Tables 5-1, 5-4, 5-4a) summarize the comparison of drywell sediment to soil collected from the groundwater interface of an upgradient monitoring well, MW 6D.

4.2 Tank Investigation and Soil Borings Inside the Building

The tank investigation portion of this RI investigation determined that tank number 16 had approximately 700 gallons of liquid in it. Roux Associates and Enroserv, who performed this portion of the RI field work, pumped the liquid into thirteen 55-gallon drums. AEL collected a representative sample of this liquid for analysis via Toxicity Characteristic Leaching Procedure (TCLP). The data were validated by Environmental Standards, Inc. of Valley Forge, Pennsylvania.

The liquid was determined to be nonhazardous and the data are summarized and compared to TCLP standards in Table 4-5. The drums were stored onSite until EPA and NYSDEC approved the disposal at Nassau County WPCP, Bay Park Plant, East Rockaway, New York. This disposal was performed in accordance with Resource Conservation and Recovery Act (RCRA) requirements. The nonhazardous waste manifest is included in Appendix J.

As part of the tank investigation, six soil borings were then drilled

through the concrete floor from inside the building in the vicinity of the underground storage tanks (Figure 3-3B). The soil cuttings were used to backfill that excavation and excess soils were placed in drums, labelled, sampled for TCLP characteristics and disposed of in accordance with RCRA requirements (see Appendix J).

Split spoon samples were collected at five foot intervals to the groundwater interface which was at 60-62 feet below ground surface.

Two soil samples from four of the indoor borings (IB) were subrnitted for laboratory analysis. Because of the soil conditions encountered in IB 2 and IB 3, three samples were submitted.

The sample selection process can be described briefly as the following: as each split spoon was removed from the ground, the split spoon was opened by the hydrogeologist and oversight contractor. As part of the sample selection process, each sample was examined visually to identify anomalous or unusual features (e.g. color or texture) that might warrant its submission for laboratory analysis.

Soils encountered under the building were predominantly tan and orange in color and consisted of fine to coarse sands and gravels. No clay was encountered. The water table was typically reached at approximately 60 feet below grade (floor level).

The sample was probed and scanned using two organic vapor meters, one supplied by AEL and the other supplied by the oversight contractor. The readings were recorded and the sample was put into the appropriate glassware for analysis for the Target Compound List. The jar which was to be submitted for analysis for metals was covered with a piece of aluminum foil and capped. This jar was set aside for head space analysis which took place in the field.

After the completion of the indoor boring, the samples were scanned with the OVM or HNu to conduct the headspace analysis. The head space analysis consisted of removing the lid from the 8 oz. jars which had been filled previously and sealed with aluminum foil. The foil was punctured and the tip of the OVM or HNu was immediately placed in the punctured hole. The readings were taken and recorded. In the cases where the head space readings did not show significant levels above background, the

groundwater interface samples were chosen for laboratory analysis.

Generally, the two samples with the highest head space readings were chosen for laboratory analysis unless there were other, fieldrelated circumstances (color or texture), which required an additional sample to be submitted to the laboratory (see Table 4-6) as in the cases of IB 2 and IB 3.

In summary, the sample selection process did not rely on only one selection criterion (e.g. OVM or HNu readings). In every case, the oversight contractor was consulted prior to selecting the samples for laboratory analysis.

Accordingly, the following samples were submitted for laboratory analysis:

Boring 1	10-12 feet	15-17 feet	
Boring 2	5-7 feet	10-12 feet	15-17 feet
Boring 3	25-27 feet	30-32 feet	35-39 feet
Boring 4	10-12 feet	15-17 feet	
Boring 5	15-17 feet	35-37 feet	
Boring 6	30-32 feet	40-42 feet	

The sample taken from IB 2 at 5 to 7 feet had an elevated OVM reading when the split spoon was initially opened. This sample was chosen for laboratory analysis even though the Project Operations Plan called for sampling below the bottom of the underground storage tanks which would be at depths approximately 10 feet below grade.

Laboratory analyses indicate that all aroclors, pesticides, volatile and semivolatile organic compounds [except bis(2-ethylhexyl)phthalate], in the TCL were below detection limits for all soil samples at all depths. The bis(2-ethylhexyl)phthalate was not detected in IB 2 (all depths) and IB 5 (15-17 feet) and IB 6 (30-32 feet). It was considered as nondetect by the data validator in IB 3 (all depths) and IB 4 (all depths). Bis(2-ethylhexyl)phthlate was estimated to be present in IB 1 at 130 µg/Kg (10-12 feet) and 210 µg/Kg (15-17 feet), in IB 5 (35-37 feet) at 130 µg/Kg and detected in IB 6 (40-42 feet) at 400 µg/Kg. The recommended soil cleanup objective for bis (2-ethylhexyl)phthlate is 50 mg/Kg or 50,000 µg/Kg. These levels of bis (2-ethylhexyl)phthlate detected at the site do not exceed the ARARs which are the State cleanup objectives.

Concentrations of the semivolatile compound, 2-butoxyethanol, were identified in laboratory analyses of IB 1 [10 to 12 feet (30 µg/Kg estimated) and 15 to 17 feet (60 µg/Kg estimated)] and IB 2 [5 to 7 feet (100 µg/Kg estimated), 10 to 12 feet (200 µg/Kg estimated as a volatile) (6400 µg/Kg estimated as a semi-volatile)] and 15 to 17 feet [(100 µg/Kg estimated as a volatile) (2100 µg/Kg estimated as a semi-volatile)]. These borings were installed in the vicinity of Tank 14, which was used to store 2-butoxyethanol (also known as butyl cellusolve).

There is no published standard for acceptable levels (ARAR) for 2-butoxyethanol in soil. The most applicable ARAR (general NYSDEC RSCO guideline) is the presence of total concentration ofvolatiles of less than 10 mg/Kg and a concentration of less than 50 mg/Kg for individual semivolatiles. The presence of 2-butoxyethanol detected at these concentrations meet these general ARARs.

In addition, the laboratory analysis of soil sampling conducted near Tank 14 and outside the building in February 1995 will address the 2-butoxyethanol and 1,4 dioxane issue as well as the TCL volatile organic and semivolatile organic compounds. A description of the sampling

techniques and laboratory results will be published in April 1995 and will serve as a supplement to this report.

The inorganics detected in the soil samples collected in November 1991 are summarized in Table 4-7. These levels are compared to concentrations of inorganics found in soil samples collected during the installation of MW 6D and are compared to the ARARs [the NYSDEC Recommended Soil Cleanup Objectives (RSCO)]. The NYSDEC Recomended Soil Cleanup Objectives (RSCO) for the inorganic analytes, except mercury, do not identify specific concentrations because metals are ubiquitous and their concentrations vary widely from site to site. Therefore, the RSCOs for these metals provide for determination of background conditions for each site. At the direction of the EPA, for Anchor, the background levels are based on soil samples collected at 60-62 feet below grade. This sample was collected during the installation of MW 6D. These background concentrations for metals are probably lower than would have been expected if soil samples were collected at shallower depths.

The only inorganic which exceeds the ARAR in every indoor boring sample is iron. The only samples which exceed Site background for chromium is

IB 1 10-12 feet (11.6 mg/Kg vs. 3.7 mg/Kg) and IB 3 30-39 feet (69.6 mg/Kg vs. 3.7 mg/Kg) and IB 5 15-17f feet (4.6 mg/Kg vs 3.7 mg/Kg) and IB 6 40-42 feet (3.8 mg/Kg vs 3.7 mg/Kg). It should be noted that the NYSDEC RSCO for chromium is 10 mg/Kg. Lead exceeds the background level of 2.1 mg/Kg in IB 2 10-12 feet at a level of 2.3 mg/Kg. The NYSDEC RSCO (site background) for lead is 30 mg/Kg. Soil samples from MW 6D are considered background for the Site.

4.3 Monitoring Well Installation and Sampling and Analyses 2 Rounds

As part of this RI, eight ground water monitoring wells were installed at the Site: MW ID, MW 6S; MW 6D; MW 4; MW 5S; MW 5D; MW 7D and MW 7S. These new wells, as well as the two existing monitoring wells in the front of the building (MW 2 and MW 3) and the one well located on the east side of the building (MW 1S) were sampled in April 1992 (Sampling Round 1) and November 1992 (Sampling Round 2).

Methylene chloride was detected in all of the ground water samples. Although this compound was stored in Tank 3, it is also a common drying

agent utilized by Intech Biolabs Laboratories in the performance of organic compound analyses. This compound was detected in the rinseate blanks as well as in the ground water samples which suggests that the source of the methylene chloride was a laboratory contaminant, according to the data validator.

Acetone was also detected in all the ground water samples. Since the data validator noted that it was present in blanks at similar concentrations to those in ground water, the validator disregarded the identification of acetone in the ground water samples.

The only volatile organic compound identified was 1,1,1-trichloroethane; there were 8 µg/L detected in MW 3 and an estimated 3 µg/L was detected in MW 4 in the November 1992 sampling event. This chemical compound was stored in Tanks 8 and 12. The NYSDEC ARAR for 1,1,1-trichloroethane is 5 µg/l.

The semivolatile organic compound, bis(2-ethylhexyl)phthalate, was detected. The levels ranged from estimated levels 58 µg/l in monitoring wells1D, 6S and 6D to 1965 µg/l in wells 7S, 5S, 5D and 4 in April. The

ARAR, 10NYCRR Subpart 5.1 MCL, is 50 µg/l. Within the semi-volatile components analysis, unknown oxygenated compounds were detected in all the new wells, but not in MW 2 or MW 3 in the first round of sampling. All the sampling points for the second round of ground water samples contained estimated quantities of unknown semi-volatile organic compounds. Individual components were detected in the following estimated quantities in the April 1992 ground water sampling event.

Chemical Compound	MW 3	MW 5S	MW 5D	ARAR
1,4-Dioxane	110 µg/l			5 µg/l
Benzothiazole		10 µg/l		5 µg/l
Phthalate ester		10 µg/l		5 µg/l
Hexanoic acid, 2ethyl			26 µg/l	5 µg/l
Hexadecanoic acid			16 µg/l	5 µg/l

The compound 1,4-dioxane is a solvent for cellulose acetate, resins, oils, spiritsol dyes and many other organic as well as inorganic compounds. It is possible that 1,4-dioxane was used on-site by Anchor. This compound, 1,4-dioxane, was not detected in any monitoring well in the November 1992 sampling.

The additional soil and groundwater sampling which was conducted in February 1995 includes specific analysis instructions for the presence of

1,4-dioxane. The results of this sampling event will be published in April 1995 in the supplement to this RI report.

No aroclors or pesticides were detected in the ground water in the April 1992 sampling. In MW 1S, heptachlor epoxide was detected in a concentration of .076 µg/l in the November ground water sampling. This was the only pesticide present. No aroclors were detected in the November 1992 sampling.

Elevated levels of chromium and lead were detected in the ground water in the April and November 1992 sample rounds. The concentrations detected in both samplings are summarized below:

	1992 Chromium (in mg/l)		1992 Lead (in mg/l)	
Monitoring Well	April	November	April	November
Shallow Wells				
MW1S	11*	353	22.0R	87.0*
MW2	317*	1440	74.7*	240*
MW3	227*	1150	30.2*	71.5*
MW4	14*	15.5*	15.6R	10.2*
MW5S	137*	131	44.4*	33.6*
MW6S background	**13***	**54.4**	**18.2R**	**29.4***
MW7S	33*	19.6*	27.9*	27.0*
Deep Wells				
MW1D	132*	19.7*	29.4	17.2*
MW5D	48*	101	31.4*	40.4*
MW6D background	**33***	**45.6**	**10.5R**	**25.2***
MW7D	18*	47.2	27.9*	25.8*

*estimated value per data validation
R = unreliable resultthis compound may or may not be present

Because data validation rejected the analytical result for lead in ground water for the April 1992 sample round, the analytical result for the November 1992 sample round will be used to represent the background concentration of lead in ground water for the site.

Elevated levels of lead and chromium in the ground water in monitoring wells 1S, 1D, 2, 3, 4, and 5S were identified in the November 1992 sampling. These levels may be due to the presence of these metals in the drywells in close proximity to the following wells:

Monitoring Well	Drywell	Concentration (mg/Kg) Chromium	Lead
MW 1S and MW 1D	DW 4	31.7	154
MW 2	DW 8	198	1620
MW 3 and MW 4	DW 7	54.2	157
MW 5S	Drain	71.0	216
	DW 6	240	1120
	DW 2	463	1210
	DW 3	101	607

The concentrations in each of these drywells or drain exceed site background levels of 3.4 parts per million (mg/Kg) for chromium and 2.1 mg/Kg for lead. Site background was derived from soil sampling at MW 6D

6062 feet (see Table 4-3).

The second round of ground water sampling, performed in November 1992, was analyzed at lower detection limits at the request of the USEPA.

Methylene chloride and acetone were again detected in the samples. Methylene chloride should be disregarded for the reasons stated above.

Acetone was detected in MW 1D, MW 1S, MW 3 and MW 5D. The data validator recommended disregarding the findings in all but MW 1S. Approximately 150 µg/l (estimated) were identified in MW 1S. This well is located upgradient of the underground storage tank area. Therefore, it is unlikely that the acetone stored in Tanks 6 and 17 contaminated the ground water. No acetone was detected in Indoor Borings 5 and 6, which are the closest to MW 1S and to Tanks 6 and 17.

The following volatile organic compounds were detected in the following

estimated quantities:

Compound (µg/l)	MW 3	MW 4	MW 5D	MW 5S	MCL
1,1 dichloroethane				2	5
total 1,2dichloroethene				3	5
1,1,1trichloroethane	2	2	2	2	5

From the first round of ground water sampling to the second, the concentrations of 1,1,1trichloroethane were reduced from 8 µg/l to an estimated 2 µg/l in MW 3 and from 3 µg/l to an estimated 2 µg/l in MW 4.

With the exception of acetone and 1,1,1trichloroethane in the April sampling, the ARAR, New York State Environmental Conservation Law MCL of 5µg/l was not exceeded for the volatile organic compounds identified above.

An estimated 3 µg/l of 4-methylphenol was detected in the semivolatile organic compound category in MW 1S. Diethylphthalate was detected in a range of 110 µg/l in the samples and the field blanks; in addition, di-n-butylphthalate, butylbenzylphthalate and bis(2-ethylhexyl)phthalate were also detected in the 12 µg/l range.

There were no PCBs detected in the second round of ground water analysis. One pesticide, heptaclor epoxide, was detected in MW IS at .076 µg/l. This pesticide should not be detected in GA class ground water according to NYS Environmental Conservation Law.

4.4 Insitu Specific Capacity Tests

Pursuant to the April 10, 1991 POP developed by Roux, five 4-inch diameter monitoring wells at the Site were tested to determine the permeability or hydraulic conductivity, specific capacity and transmissivity of the Upper Glacial Aquifer directly beneath the Site. The monitoring wells tested included: MW 6S; MW 7D; MW 7S; MW 4 and MW 1D. The tests were performed after the wells were developed and before they were purged for sampling. Analysis utilized the following formula as developed by Walton, 1962:

Q/s = T/[264 log (Tt/2693r S)65.5]

where: Q/s = specific capacity in gallons per minute per foot (gpm/ft)
Q = discharge in gallons per minute (gpm)
s = drawdown in feet (ft)
T = coefficient of transmissivity in gpd/ft
S = coefficient of storage

r = nominal radius of well in feet (ft)
t = time after pumping started in minutes

The calculated hydraulic conductivities, specific capacities and transmissivities for the screened aquifer interval for each of the monitoring wells tested at the site are provided in the Table 4-10.

Described briefly, the Specific Capacity tests involved the removal of ground water, via a submersible pump, at a known and predetermined pumpage rate (10 gallons per minute). An electronic transducer was placed in the test monitoring well and its depth below the static water table was measured. The test consisted of three individual steps, each encompassing ten minutes: Step 0, the static water level was measured; Step 1, the pump was turned on and the transducer measured the subsequent changes in the vertical elevation of the water table from the transducer, within the monitoring well; Step 2, the pumped was turned off and the transducer provided the same measurements as in Step 1. All measurements of elevation changes were collected in a linear manner while time measurements were collected as a logarithmic function. The collection of data points in a logarithmic manner allows for the compilation of a greater number of points during the initial phases of

drawdown (Step 2) and recovery (Step 3) than when static or near static water table conditions are attained. These data are presented graphically in Appendix G.

Data collected from the individual wells tested are presented in Table 410. This table illustrates the representative values previously outlined and indicate the drawdown and recovery over time, exhibited by each monitoring well tested. The raw data collected from the field tests are included within Appendix H.

The specific capacity tests represent the hydraulic conductivity at the site. These data indicate the yield per unit of drawdown per time period. Dividing the yield of a well by the drawdown gives the specific capacity of the well. This yield and drawdown must be measured at the same time.

The specific capacity generally varies with the length of the pumping. For instance, as the length of pumping time and discharge from the well increase, the specific capacity decreases (Driscoll, 1986).

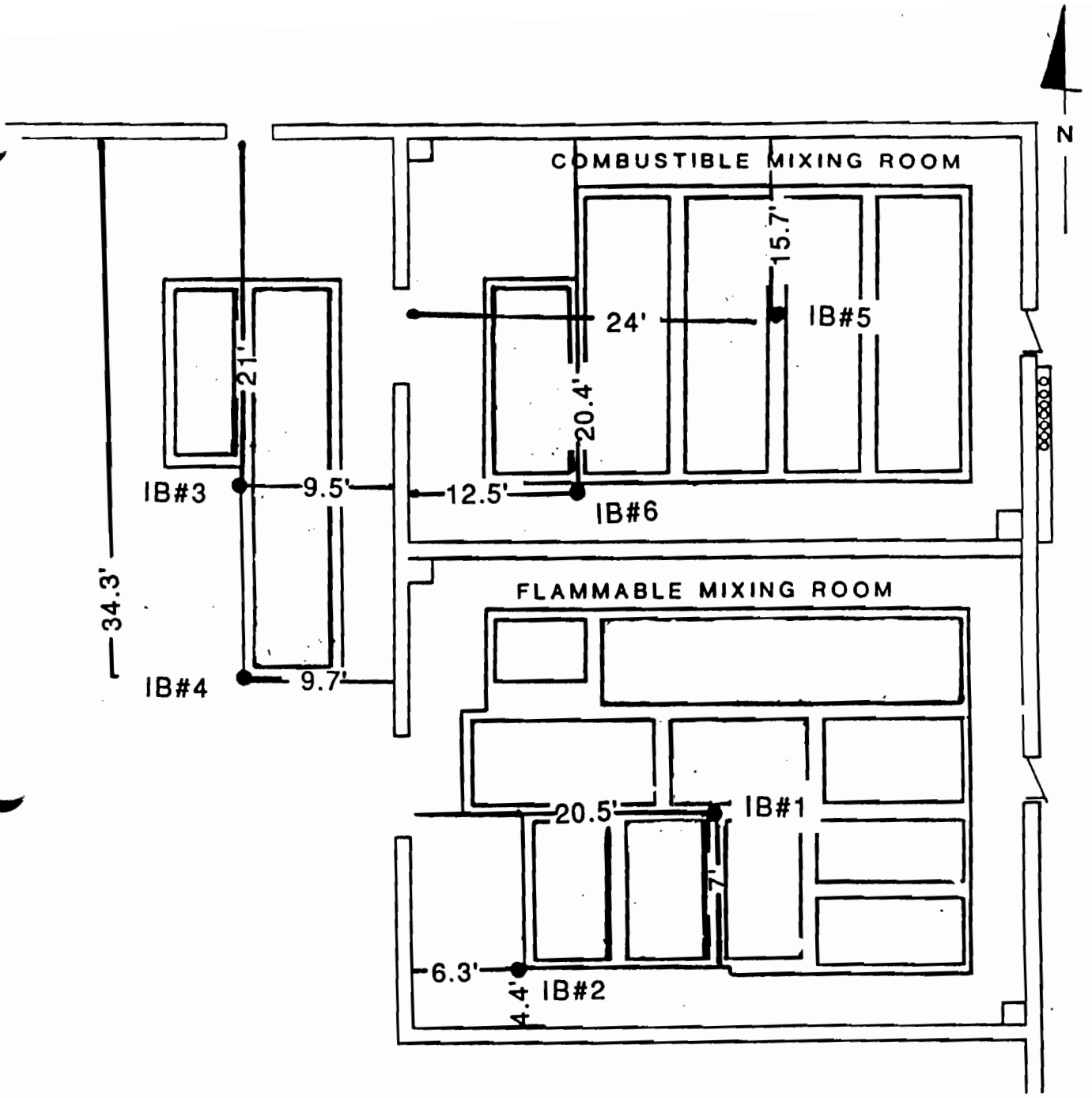
In an unconfined aquifer like the Upper Glacial Aquifer at the AnchorLith

Kem/Ko site, the calculation of the specific capacity is important should a "pump and treat" ground water remediation system be necessary. These data would be used to calculate the area of the cone of depression and the drawdown curve which identify the distance ground water is affected from a pumped well (Figure 4-12).

4.5 Topographic Survey and Water Level Contours

The survey measurements for each well were used in conjunction with depthtowater measurements to determine the water table elevations beneath the Site (See Table 4-11).

Utilizing the water table elevations from November 1992, a ground water contour map was constructed to determine the direction of ground water flow. The direction of horizontal ground water flow in November 1992 is perpendicular to the drawn contour lines, or toward the southwest. (Figure 4-3).

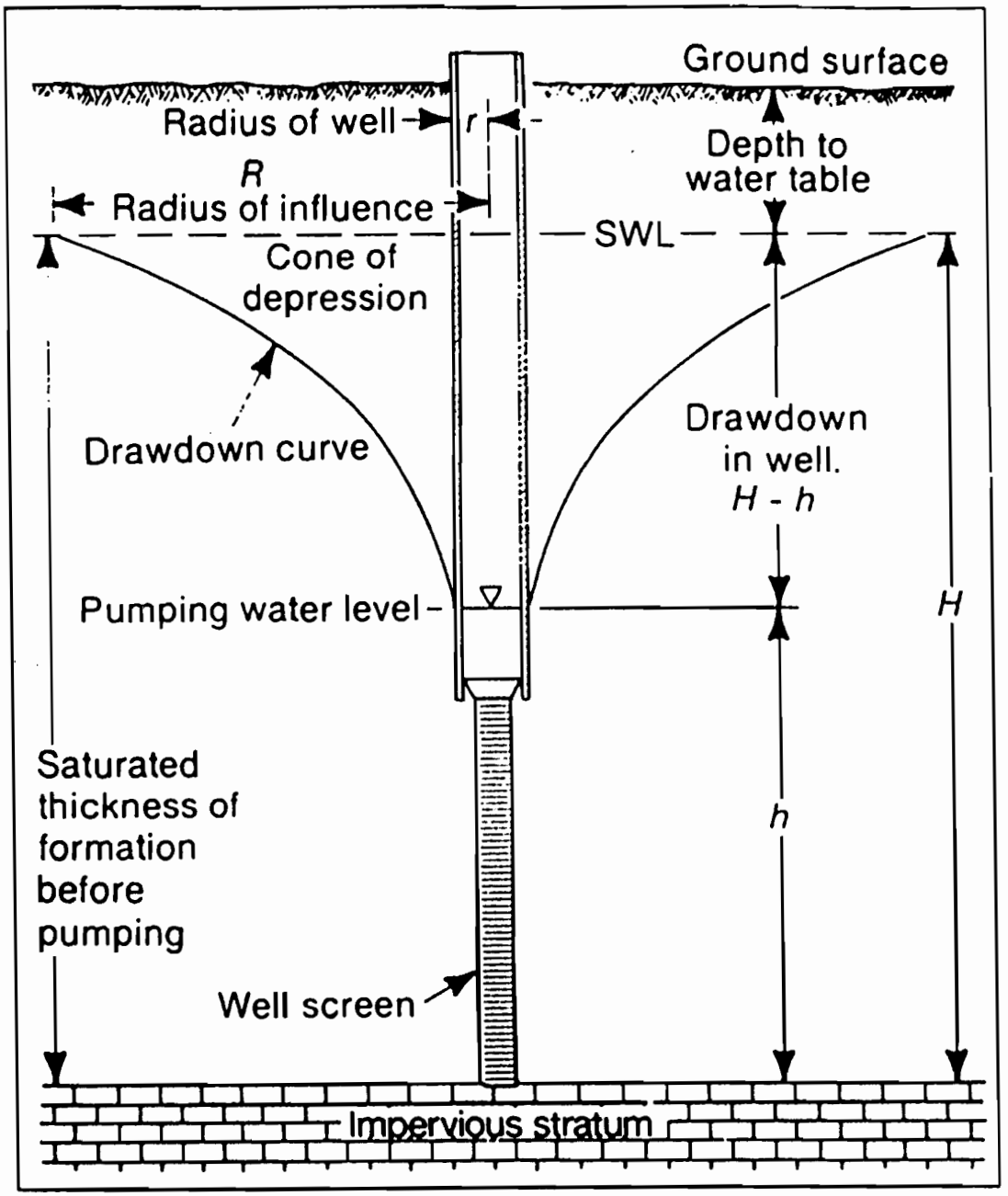


EXPLANATION

● BORING LOCATION

FROM: Roux, 1991.

TITLE: LOCATION OF INDOOR BORINGS 301918	
ANSON ENVIRONMENTAL LTD.	FIGURE NO. 4 - 1



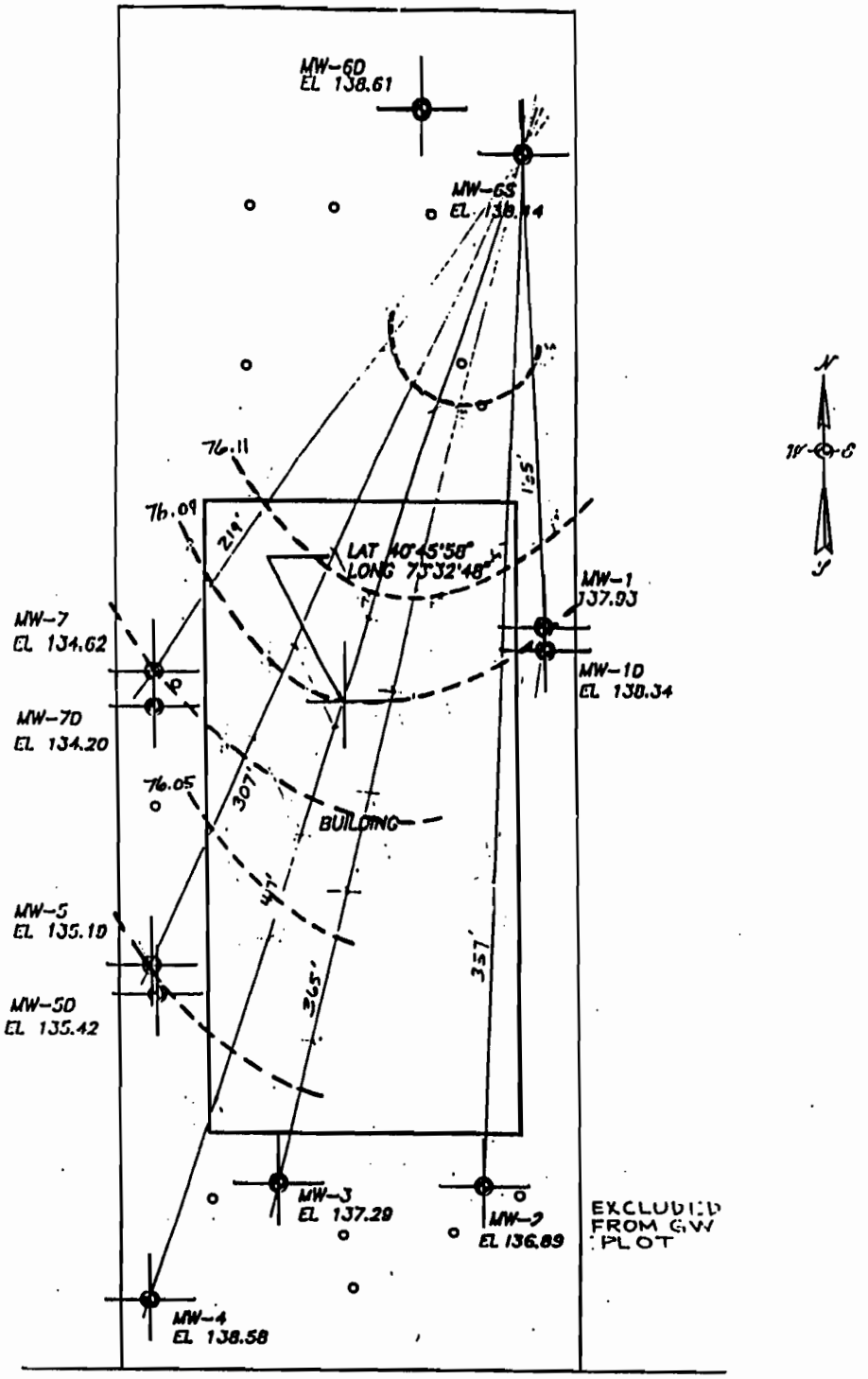
TITLE:

Well in an unconfined Aquifer showing the meaning of the various terms used in the Equilibrium Equation.

ANSON ENVIRONMENTAL LTD.	FIGURE NO. 4 - 2

From : Groundwater and Wells. F.G. Driscoll 1986 published by Johnson Division, Saint Paul, MN

301919



TITLE:

DIRECTION OF GROUND WATER FLOW

301920

ANSON ENVIRONMENTAL LTD.	FIGURE NO. 4-3

Anchor Chemical Site
500 West John Street, Hicksville

Table 4.0 (A)
ORGANICS

ARARs (Soil in mg/Kg)

Analyte	NYSDEC RSCO**
Chloromethane	
Bromomethane	
Vinyl Chloride	0.2
Chloroethane	
Methylene Chloride	0.1
Acetone	0.2
Carbon Disulfide	2.7
1,1-Dichloroethene	0.4
1,1-Dichloroethane	0.2
1,2-Dichloroethene	0.3
Chloroform	0.3
1,2-Dichloroethane	0.1
2-Butanone	0.3
1,1,1-Trichloroethane	0.8
Carbon Tetrachloride	0.6
Vinyl Acetate	
Bromodichloromethane	
1,2-Dichloropropane	
cis-1,3-dichloropropene	
Trichloroethene	0.7
Dibromochloromethane	n/a
1,1,2-Trichloroethane	
Benzene	0.06
trans-1,3-Dichloropropene	0.3
Bromoform	
4-methyl-2-pentanone	1
2-Hexanone	
Tetrachloroethene	1.4
1,1,2,2-tetrachloroethane	0.6
Toluene	1.5
Chlorobenzene	1.7
Ethylbenzene	5.5
Styrene	
Xylene	1.2

Anchor Chemical Site
500 West John Street, Hicksville

Table 4.0 (B)
ORGANICS

ARARs (Groundwater in µg/l)

Analyte	EPA 40CFR141 MCL	10NYCRR Subpart 5.1 MCl	6NYCRR 703 Std	NYSDEC contained-in guidance"
Chloromethane		5	5	
Bromomethane		5	5	
Vinyl Chloride	2	2	2	2
Chloroethane		5	5	
Methylene Chloride		5	5	5
Acetone		50	50	35000
Carbon Disulfide		50	50	35000
1,1-Dichloroethene	7	5	5	5
1,1-Dichloroethane		5	5	5
1,2-Dichloroethene		5	5	5
Chloroform		100	100	7
1,2-Dichloroethane	5	5	5	5
2-Butanone		50	50	
1,1,1-Trichloroethane	200	5	5	5
Carbon Tetrachloride	5	5	5	5
Vinyl Acetate		50	50	350000
Bromodichloromethane	100	100	100	50
1,2-Dichloropropane		5	5	5
cis-1,3-dichloropropene		5	5	5
Trichloroethene		5	5	5
Dibromochloromethane	100	100	100	5
1,1,2-Trichloroethane		5	5	5
Benzene	5	5	ND	0.7
trans-1,3-Dichloropropene		5	5	5
Bromoform	100	100	100	50
4-methyl-2-pentanone		5	5	
2-Hexanone		5	5	50
Tetrachloroethene		5	5	5
1,1,2,2-tetrachloroethane		5	5	5
Toluene		5	5	5
Chlorobenzene		5	5	5
Ethylbenzene		5	5	5
Styrene		5	5	5
Xylene		5	5	5

Anchor Chemical Site
500 West John Street, Hicksville

Table 4.0(C)
INORGANICS

ARARs (Groundwater in µg/l)

Analyte	EPA 40CFR141 MCL	10NYCRR Subpart 5.1 MCI	6NYCRR 703 Std	NYSDEC contained-in guidance*
Aluminum				
Antimony				3
Arsenic	50	50	25	10
Barium	1000	1000	1000	
Beryllium				3
Cadmium	10	10	10	5
Calcium				
Chromium	50	50	50	50
Cobalt				
Copper		1000	1000	<200
Cyanide				
Iron		300	300	300
Lead	50	50	25	25
Magnesium				35000
Manganese		300	300	3000
Mercury	2	2	2	2
Nickel				700
Potassium				
Selenium	10	10	10	10
Silver	50	50	50	
Sodium				
Thallium				4
Vanadium		5000	5000	250
Zinc				<300

Anchor Chemical Site
500 West John Street
Hicksville, New York

Table 4-1- Volatile and Semi-Volatile Organic Compounds
Drywell Sediment- Drywell #2 (August 1991)

		NYSDEC	RSCO***
VOLATILE COMPOUNDS	**µg/Kg**	**mg/Kg**	**µg/Kg**
1,1-Dichloroethane	1,600*	0.2	200
1,1,1-Trichloroethane	3,300*	0.8	800
Toluene	4,000*	1.5	1,500
Ethylbenzene	4,000*	5.5	5,500
Total Xylenes	67,000*	1.2	1,200
SEMI-VOLATILE COMPOUND	**µg/Kg**	**mg/Kg**	**µg/Kg**
Naphthalene	9,000/9,500**	13	13,000
2-Methylnaphthalene	4,100/3,900**	36.4	36,400
Phenanthrene	370/370**	50	50,000

*=estimated
** analyzed twice for laboratory control purposes
***RSCO=NYS Recommended Soil Cleanup Objectives

Anchor Chemical Site
500 West John Street
Hicksville, New York

Table 4-2- Semi-Volatile Organic Compounds in the Drywells and Drain-August 1991 (in µg/Kg)

	DRYWELL									NYSDEC RSCO**
	1	2	3	4	5	6	7	8	9	DRAIN	µg/Kg
SEMI-VOLATILE COMPOUND											
Benzoic Acid					53*						2,700
Naphthalene		9000									13,000
2-Methylnaphthalene		4100									36,400
Phenanthrene		370*		260*				1000*	260*	190*	5,000
Anthracene								390*			5,000
di-n-Butylphthlate		2400*			63*					480*	8,100
Fluoranthene		300*		700*				3700	440*	410*	5,000
Pyrene				790*	34*			3700	340	320	5,000
Butylbenzylphthlate		5100	1100*		64*	5100			370*	300*	5,000
Benzo(a)anthracene				490*				1600*		216	224
Chrysene				520*				1900*	250*	230*	400
Benzo(b)fluoranthene				100*				2900*			1,100
Benzo(k)fluoranthene				560*				1700*			1,100
Benzo(a)pyrene				580*				1400*			61
Ideno)1,2,3-cd)pyrene								1500*			3,200

*estimated in drywell specified
**RSCO=NYS Recommended Soil Cleanup Objectives

Anchor Chemical Site
500 West John Street
Hickaville, New York

Table 4-3- Inorganic Analytes in the Drywells and Drain-August 1991 and Cesspool -September 1993

		DRYWELL									DRAIN	CP#1	CP#2	Rec. Soil Cleanup Obj (ppm)	SB = 6D
		1	2	3	4	5	6	7	8	9					
INORGANIC ANALYTE															
aluminum	*	2630	7830	4850	2030	1580	9910	3310	11100	2860	1410	759	1120	SB	811
antimony			9.6*						9.5*					SB	-
arsenic	*	1.2	3.7	3	6.4	0.79		1.6	3.6	1.2	1.5	0.88	0.81	7.5 or SB	0.8
barium		18.2	90.2	44	34.4	9.7	82.1	15.3	56	23.3	20	3.5	3.7	300 or SB	-
calcium	*	9700	16300	22900	7100	1300	9210	8130	22800	4220	3650	4150	1030	SB	-
chromium		36.1*	463*	101*	31.7*	17.4	240*	54.2*	198*	37.4*	71.0*	4.3	3.5	10 or SB	3.4
cobalt		4.2	8.7	7.5			11.2	3.1	11.3	5.4	3.4	0.59		30 or SB	-
copper	*	17.7	266	49.4	18.2	5.3	80.2	27	130	41.7	44.4	2.7	2.7	25 or SB	-
iron	*	6410	19500	11500	6630	3810	2040	7260	22700	10900	15600	3630	3440	2,000 or SB	1960
lead		124	1210	607	154	81.3	1120	157	1620	122	216	1.9	1.9	SB	2.1
magnesium	*	5200	9350	10900	3460	950	6870	3750	14100	2810	1150	2640	574	SB	28.5
manganese	*	54.6	152	94.1	55.9	53.3	120	62.8	162	189	135	26.5	6.7	SB	25.4
mercury			0.21*											0.1	-
nickel	*	8.3	21.5	12.6	7.2	4.7	18.9	9.3	20.4	11.3	17.4			13 or SB	-
potassium		327	459	332	207	221	615	186	548	260	215	101	101	SB	-
sodium		262	948*	474*			993*		1240*	447*	494*	35.7	53.7	SB	-
thallium			0.33				0.28*							SB	-
vanadium		22.6	79.1*	41.1*	20.5*	5.3*	71.2*	18.6*	81*	28.4*	17.0*	2.3	3.5	150 or SB	-
zinc		81.3	1770*	236*	103*	24.6*	512*	78.5*	675*	138*	254*	4.2	4.2	20 or SB	-
cyanide			430*					2.9*						SB	-

*estimated in all wells or in well specified

Anchor Chemical Site
500 West John Street
Hicksville, New York

Table 4-4-Pesticides in the Drywells and Drain-August 1991 (in µg/Kg)

	DRYWELL										
	1	2	3	4	5	6	7	8	9	DRAIN	RSCO**
PESTICIDE											
alpha-BHC		183									0.11
beta-BHC									8.2*		0.2
Aldrin	5.1*										0.041
Dieldrin		106*	87*	16*		18*	19*	42*			0.044
4.4'-DDE		146*	41*	50*		75*	10*	48*			2.1
Endrin		36						12*			0.1
Methoxychlor		22*	39*	126*		24*	7.5*	52*	14*		<10
alpha-Chlordane	7.7*										0.54
gamma-Chlordane	6.2*						3.4*	29*			0.54

*estimated in all wells or in well specified

**RSCO=NYS Recommended Soil Cleanup Objectives

Note: Drywell #5 and the Drain did not contain pesticides above the method detection limit for that compound

Anchor Chemical Site
500 West John Street, Hicksville, New York

Table 4-5 Analysis of Contents of Tank 16 Water

Compound	mg/L	TCLP limits mg/L
Volatile Organics		
benzene	BDL	0.5
carbon tetrachloride	BDL	0.5
chlorobenzene	BDL	100
chloroform	BDL	6
1,2 dichloroethane	BDL	0.5
1,1 dichloroethylene	BDL	0.7
methylethylketone	BDL	200
tetrachloroethylene	BDL	0.7
trichloroethylene	BDL	0.5
Semi-Volatiles		
pyridine	BDL	5
2,4 dinitrotoluene	BDL	0.13
hexachlorobenzene	BDL	0.13
hexachloro butadiene	BDL	0.5
hexachloroethane	BDL	3
nitrobenzene	BDL	2
1,4-dichlorobenzene	BDL	7.5
methylphenols (total)	BDL	200
pentachlorophenol	BDL	100
2,4,5-trichlorophenol	BDL	400
2,4,6-trichlorophenol	BDL	2
Organochlorine Pesticides		
gamma-BHC	BDL	0.4
heptachlor	BDL	0.008
heptachlor epoxide	BDL	0.008
endrin	BDL	0.02
methoxychlor	BDL	10
Herbicides		
2,4-D	BDL	10
2,4,5-TP (Silvex)	BDL	1
TCLP metals		
arsenic	BDL	5
barium	0.02	100
cadmium	BDL	1
chromium	BDL	5
lead	BDL	5
mercury	BDL	0.2
selenium	BDL	1
silver	BDL	5

Anchor Chemical Site
500 West John Street, Hicksville, New York

Table 4-6 Indoor Borings
OVM readings and samples selected

Boring depth	IB #1	IB #2	IB #3	IB #4	IB #5	IB #6
5 ft -7 ft	0	70			10.2	12
10 ft -12 ft	8.6*	29*	1	6*	4	0.4
15 ft - 17 ft	32.4*	*		5*	6.1*	0.4
20 ft -22 ft	2.3	1.6	0	3.8	2	0.8
25 ft- 27 ft	0	1.4	6*	3	4.9	2.4
30 ft- 32 ft	1.6	0.5	17*	1	2	7.2*
35 ft - 37 ft	0.1		10*		6.1*	4
40 ft - 42 ft	0		1.2		1.6	3.2*
45 ft - 47 ft	0		0		1.6	2.1
50 ft - 52 ft	0		0		1	1.2
55 ft - 57 ft	0.9		0		1	1.2
60 ft - 62 ft	2.3		0		1	0.8

* = sample selected

Anchor Chemical Site
500 West John Street
Hicksville, New York

Table 4-7 - Inorganics in Indoor Soil Boring Samples (in ppb)

	Samples collected November 1991													Upgradient		
	IB#1 10-12'	IB#1 15-17'	IB#2 10-12'	IB#2 15-17'	IB#3 25-27'	IB#3 30-34'	IB#3 35-39'	IB#4 10-12'	IB#4 15-17'	IB#5 15-17'	IB#5 35-37'	IB#6 30-32'	IB#6 40-42'	MW 6S 74-76'	MW 6D 60-62'	1992 NYSDEC MCL
Inorganic Analytes																
aluminum	1610	1200	1600	784	1550*	2130*	1520*	945*	849*	883	1360	1110	1180	515	811	NS
arsenic	1.5	1.9	1	0.89	0.86	0.45	0.8	0.57			0.57	0.75	1.7	0.1	0.8	25
barium	7.3*	6.5*	6.5*	3.1	5	12.3	7.6	3.9	3.1	2.6	4.4	3.7	1.8			1000
cadmium	1.2*	.83*					0.92	0.92								10
calcium	911	160	134													NS
chromium	11.6*					6*	9.6*			4.6	3.8	2.4	3.8	3.7	3.4	50
iron	5640	5350	4300	2950	2110	6360	9140	8410	3160	3910	3490	2240	3300	1360	1960	300
lead	2	1.2	2.3	1.3						0.74	1.2	0.85	1	1.3	2.1	25
magnesium	285	243	305	148	127*	473*	152*	179*	154*	192	148	112	118	34.6	20.5	35000
manganese	66.9	54.3	53	28.2	26.9	93.3	47.9	49.8	33.2	35	38.2	64.3	47.4	14.8	25.4	300
mercury																2
nickel						1.5										5
potassium	163	207	207	91.5		228										NS
sodium	174	132	132													NS
vanadium	8	3.4	3.4	2.4	2	6	6.1	3.4	1.9							14
zinc	7.6	6.5	8.7	6.3		8.9*	12.9*	5.8*	4.1*				8.4*			300
cyanide																100

* = estimated
NS = no standard
MCL = maximum contaminant level (ug/L)

Anchor Chemical Site
500 West John Street
Hicksville, New York

Table 4-8- Inorganics in Groundwater-Round 1-April 1992 (ppb)

Inorganic Analyte	MW 1D	MW 1S	MW 2	MW 3	MW 4	MW 5D	MW 5S	MW 6D	MW 6S	MW 7D	MW 7S	1992 NYSDEC MCL
aluminum	3020*		5600*	2260*	258*	1670*	1780*					NS
arsenic												25
barium	37*	10*	38*	68*	27*	54*	11*	7*	35*	53*		1000
cadmium											4	10
calcium	19000	9200	5880	11500	9290	23600	25200	12400	19300	16300	6820	NS
chromium	132*	11*	317*	227*	14*	48*	137*	33*	13*	18*	33*	50
copper			74*	115*		59*	108*			37*		200
iron	3990	490	7990	4510	615	1920	3470	458	707	754	489	300
lead	29.4		74.7*	30.2*		31.4*	44.4*			27.9*	27.9*	25
magnesium	2180	1120	1310	1800	1500	558	1580	1670	2450	1720	651	35000
manganese	32	25*	95*	74	53*	23*	52*	92*	43*	35*	26*	300
mercury				.2*								2
nickel	38	14	17	50		28*	92	22		22	21	5
potassium	3010		2340	2590		61500		5010	2680	2540	4820	NS
sodium	41200	19700*	19300*	25400	3600*	38700	2920*	12700*	14000*	16100*	4850*	NS
vanadium	6		13									14
zinc	45	50			76	66	67		48	61	45	300
cyanide												100

*estimated
MCL = maximum contaminant level (ug/L)
NS = no standard

Anchor Chemical Site
500 West John Street
Hicksville, New York

Table 4-9 - Inorganics In Groundwater-Round 2 - November, 1992 (ppb)

Inorganic Analyte		MW 1D	MW 1S	MW 2	MW 3	MW 4	MW 5D	MW 5S	MW 6D	MW 6S	MW 7D	MW 7S	MW6D 74-76' (mg/Kg)	1992 NYSDEC MCL
aluminum	*	314	35100	53100	34300	1690	3320	1710	353	803	675	890	515	NS
arsenic			7.2*	9.2	6.4								0.85	25
barium	*	39.8	110	230	169	56	79.5	46.6	45.1	75.7		63.8	2.2U	1000
cadmium														10
calcium	*	6980	25400	9750	16100	9490	50500	20700	13900	24200	6360	9080	33.7U	NS
chromium		19.7*	353	1440	1150	15.5*	101	131	45.6	54.4	47.2	19.6*	3.7	50
cobalt			10.5	16.1	20.3									5
copper	*	36.2	169	123	179	26	112	102	33	79.8	36.9	75.1	2.0 U	200
iron	*	558	28300	40900	31300	1830	2450	3420	634	1370	1520	1230	1360	300
lead	*	17.2	87	240	71.5	10.2	40.4	33.6	25.2	29.4	25.8	27	1.3	25
magnesium	*	827	2890	2750	3070	1530	2610	1870	1970	2760	645	1010	34.6	35000
manganese		8.2	226	436	482	64.6	68.8	44.4	20.9	58.4	22.7	14.3	14.8	300
mercury			0.09	0.17	0.06			0.06						2
nickel			97.4	51.9	64		23.8	63.2	20.9		8.2			5
potassium	*	2540	4510	5860	4920	1930	3500	2150	2270	4620	1010	7050		NS
sodium		21700	39600	52500	24600	6820	27000	2090	11100	10600	2170	4160		NS
vanadium			41.9	72.4	53.2								2.4 U	14
zinc	*	67.7	229		73.6	94.4	342	173	94.2	97	154	70.7	1.7 U	300
cyanide														100

*estimated in all wells or in well specified

MCL = maximum contaminant level (ug/L)

NS = no standard

Anchor Chemical Site
500 West John Street
Hicksville, New York

Table 4-10 Specific Capacity Tests

Monitoring Well Identification	Test Date	Screened Interval (ft. below grade)	Hydraulic Conductivity (k) (gpd/ft)	Specific Capacity (Q/s) (gpm/ft)	Range of Transmissivity (T) (gpd/ft)
MW 6S	4/21/92	70.0 to 79.6	1,462	14.29	13,973 to 19,402
MW 7D	4/22/92	110.1 to 119.6	2,330	20.8	21,351 to 29,004
MW 7S	4/22/92	70.1 to 79.6	1,716	18.5	16,323 to 19,402
MW 4	4/22/92	71.0 to 80.6	1,991	18.8	19,117 to 26,148
MW 1D	4/21/92	110.1 to 119.6	1,758	16.7	16,630 to 22,914

Notes:

K determined in gpd/ft by converting cm/sec to m/s, then dividing by a conversion factor of 4.72 x 10.

Q/s (specific capacity): rate of discharge divided by drawdown in feet

T (range of transmissivity): first number in column incorporates a coefficient of storage equal to 0.2, generally considered representative of unconfined aquifers.
The second number represents a coefficient of storage equal to 0.01.
This value was utilized due to the short duration and low pumpage rate of the tests.

Anchor Chemical Site
500 West John Street, Hicksville, New York

Table 4-11

WELL NUMBER	CASE ELEVATION (FEET)	DEPTH TO WATER (FEET)	HEAD (CALC.) (FEET)
MW-1	137.93	61.84	76.09
MW-2	136.89	60.82	76.07
MW-3	137.29	61.3	75.99
MW-4	138.58	62.6	75.98
MW-5	135.19	59.17	76.02
MW-6S	138.44	62.24	76.2
MW-7	134.62	58.55	76.07

Depth to water readings taken 8/13/93

301934

5.0 Contaminant Fate and Transport

This section of the RI report evaluates the fate and transport of the chemical compounds discovered on-Site during the RI investigation and prior investigations and the potential routes of migration of those compounds.

The potential sources of chemical compounds identified on-Site are: the underground storage tanks six of which are reported to have leaked; the twelve drywells; one drain and two abandoned cesspools. The cesspools were originally used for sanitary waste purposes at the Site before the building's sanitary system was connected to sewers in 1982. Both of the cesspools were backfilled according to NCDH specifications in 1982.

5.1 Potential Routes of Migration

The potential routes of contaminant migration include movement through the vadose zone (unsaturated soils) and the saturated zone. In theory, the chemical compounds in the vadose zone could migrate to the ground water (saturated zone) and subsequently flow down gradient of the Site. The

physical nature of the soils (including porosity and permeability), the nature of the chemical compounds and microbes in the soils influence the migration through and persistence in both of these zones.

The soil samples collected in the vadose zone throughout the Site consisted of coarse, medium and fine sands with little gravel. The presence of hematite, a naturally occurring form of iron oxide which is commonly found in Long Island soils, was clearly visible at the depth of 35-37 feet below the surface of the Site. The quartz sand was predominantly tan with thin layers of orange/red staining throughout the Site. No clay layers were encountered in the soil borings or monitoring well installations to a depth of 120 feet below the land surface at the Site. Therefore, there is an unconfined aquifer to a depth of at least 120 feet below land surface. Other hydrogeologic investigations in the vicinity of the Site have identified clay layers that do not demonstrate stratigraphic continuity (Dvirka and Bartilucci, 1986). These findings are supported by the drilling logs for wells N8880 and N9463.

Chemical compounds can migrate through the types of soils found on-Site and can reach the aquifers below if a liquid is present to drive them

downward. Vertical and horizontal migration can occur in the ground water until an aquiclude (e.g. clay layer) is encountered and further migration is prevented.

Liquids, such as rainwater, are present to move the chemical compounds present in the vadose zone under the drywells, drain and cesspools on-Site. These chemical compounds can migrate through the vadose zone to the ground water. Once in solution, these chemical compounds can diffuse both horizontally and vertically to a depth of at least 120 feet before being inhibited by aquicludes.

Site specific geohydrological information gathered in the vadose zone during field activities indicates the that permeability ranges from 1,462 to 2,330 gpd/ft. (Permeability refers to the ease with which water moves through a geological formation.) From a study of the Magnusonics site on Duffy Avenue (approximately 0.25 miles south of the Anchor site), the porosity of 32 percent is typical of medium to coarse grained sands with varying amounts of gravel (Galli, 1990). The soil types found at Magnusonics are typical of those found at the Anchor Site.

5.1.1 Soils In the Vicinity of the Underground Storage Tanks

The soils beneath the underground storage tanks were sampled in six boring locations. The analytical results, as discussed in Section 4.2, indicated that contamination with 2-butoxyethanol (a component of Cellusolve, which was stored on Site) exists in the soil in the vicinity of the underground tanks. This semi-volatile compound is the only chemical compound identified in the soil near the underground storage tanks. None of the volatile organic compounds used on-Site by Anchor Chemical were analytically identified in these soil samples.

Liquids, such as rain water, are not present to drive chemical compounds under the floor of the building in the areas where the indoor borings were installed. The chemical compounds present in those soils, in all likelihood, will not migrate through the vadose zone. The semi-volatile contaminant, 2-butoxyethanol, has a low vapor pressure and tends to adhere to soils in the absence of rain water percolation and is not expected to migrate through the soil under the present conditions on Site.

Therefore, at this time, the soils under the building in the vicinity of the

tanks are not a potential source of ground water contamination.

In order to further confirm this finding, we conducted additional soil sampling in February, 1995. Samples were collected in the vicinity of Tank 14 and through an angled boring under the building to a depth of 17 feet below Tank 14. The results of this sampling effort will be described in the supplement to this RI report which is due to be published in April 1995.

5.1.2 Drywells, Cesspools and Drain Sediments

The on-Site drywells and drain are used to remove surface water runoff from the parking lot and building roof. The chemical compounds identified in the drywells and drain are listed in Section 4.1 of this report.

Drywell 1

Chemical contamination is limited to the surface sediment in this drywell as illustrated by the data in Table 5-4. The vertical extent of contamination is unknown at this time.

Drywell 2

The volatile and semi-volatile organic compounds plus lead and chromium that are present in Drywell 2 are listed in Table 5-1, along with the various depths where they were encountered.

The highest concentrations of volatile organic compounds [toluene (4000 µg/Kg), ethylbenzene (4800 µg/Kg), xylenes (67,000 µg/Kg), naphthalene (9800 and 9500 µg/Kg), 1,1-dichloroethane (1600 µg/Kg) and 1,1,1-trichloroethane (3300 µg/Kg)] were detected in Drywell 2. All of these compounds were used on Site by Anchor Chemical and this drywell may have been connected to a floor drain in the mixing room.

As was demonstrated by the concentrations of various compounds at various depths in Drywell 2, the maximum depth of the volatile organic compounds is 27 feet. The percolation of these chemical compounds to 27 feet indicate that this discharge to the ground surface could have taken place ten to fifteen years before the sampling in 1991. An exception is bis (2methylhexyl) phthalate which is present in the ground water. OVM

readings for the samples taken at five foot intervals down to the ground water interface did not indicate contamination by volatile organic compounds.

Drywells 3, 4, 5, 8, 9 and Drain

Table 5-4a summarizes the chemical compounds identified in Drywells 3, 4, 5, 8, 9 and Drain. The vertical extent of these chemical compounds is unknown at this time.

Drywell 6

The data for Drywell 6 are also found in Table 5-4. The vertical extent of contamination is unknown at this time.

Drywell 7

The data for Drywell 7 are also found in Table 5-4. The vertical extent of contamination is unknown at this time.

A comparison of the chemical compounds identified in the drywells located on the north side of the building would suggest that the floor drain identified by NCDH in its 1977 report was connected to Drywell 2. This evaluation is drawn because of the chemical composition of the soils in drywells 1, 2 and 3 located on the northern side.

5.1.3 Ground Water

As discussed in Section 1.2.3, ground water samples have been collected sporatically from Monitoring Wells 1S (MW 1S), 2 and 3 since December 1982. Between that time and the second round of ground water sampling in November 1992, the total concentrations of volatile organic compounds have declined from 888 to zero µg/l in MW 1S; from 6 µg/l to zero µg/l (MW 2); and from 26,618 µg/l to 3 µg/l (MW 3). In the February 1991 sampling, MW 1S and MW 2 contained total volatile organics at or below the detection limits. MW 3 contained 9 µg/l of 1,1,1-trichloroethane.

Background conditions in the upgradient wells MW 1 and MW 6, shallow and deep, are presented in Table 5-5.

Down Gradient Wells

The data for the down gradient wells are found in Table 5-6.

5.2 Contaminant Persistence

The physiochemical and chemical transformation properties determine the persistence of chemical compounds in the vadose and saturated zones. These properties were divided into two groups by Moore and Ramamoothy (1984) and Palmer (1991): "physiochemical properties (solubility, vapor pressure, partition coefficient, sorption/desorption and volatilization) and chemical transformation (oxidation-reduction behavior, hydrolysis, halogenation/dehalogenation, and photochemical breakdown)."

In addition to the chemical processes that influence the persistence of chemical compounds in the soils of the vadose zone, this persistence is determined by whether chemical compounds naturally occur in soils. Certain chemical compounds, such as metals, naturally occur in soils.

Therefore, metals will persist even after cessation of all activities on-Site, although, their concentrations may change.

5.2.1 Contaminant Persistence in the Vadose Zone

The concentrations of metals occurring in the soil sampled during the installation of groundwater monitoring well 6D at 60-62 feet represents the background soil levels. The levels are as follows as measured in mg/Kg:

Aluminum	811
Arsenic	0.80
Barium	2.7 U
Beryllium	0.77 U
Cadmium	ND
Chromium	3.4
Copper	2.3 U
Iron	1960
Lead	2.1
Magnesium	28.5
Manganese	25.4
Vanadium	2.3 U
Zinc	2.4 U

According to Environmental Standards (data validator):
U= this analyte should be considered "not-detected" since it was detected in a blank at a similar level.

Soils Under the Building

During the decommissioning of the underground storage tanks for the POP, no leaking tanks were identified on-Site. In addition, subsequent collection of soil samples beneath the tanks did not identify any elevated levels of chemical compounds. Since the underground tanks, have been decommissioned, they will not be a future source of chemical compounds.

Drywells, Drain and Cesspool Sediments

Elevated concentrations of contaminants in the drywell sediments and drain will be excavated and moved off-site. A removal action will be implemented at a future date and will be scheduled with the concurrence of the EPA.

The laboratory data for the cesspools demonstrates that there is no contamination present below the cesspools.

The second round of sampling indicates that there is no contamination present in the vicinity of the former cesspools. The cesspools do not

represent a source of contamination as they were properly abandoned in 1982 following Nassau County protocol. They have not been used since 1982 when the facility was connected to the sanitary sewer system of Nassau County Department of Public Works.

5.2.2 Contaminant Persistence In the Saturated Zone

The laboratory analyses of ground water samples collected from the Site showed that the concentrations of volatile organic compounds have continued to decline. In addition, the soil samples collected from the saturated zone did not identify any volatile organic compounds. These data indicate that the groundwater samples collected at the site represent levels comparable to the background and are illustrated on the revised Table 4-9.

Since no hazardous materials have been used on Site since Anchor Chemical vacated the building, the volatile organic compounds present in the ground water should continue to decline.

5.3 Contaminant Migration

Vadose Zone

In the vadose zone, all of the identified pesticides are considered immobile and have a persistence of greater than 12 months (Shields, 1985).

Of the semi-volatile compounds identified in the drywells all but benzoic acid and di-n-butylphthlate are considered to be insoluble in water and unlikely to move out of the vadose zone into the saturated zone below (Merck, 1992).

Volatile organic compounds present in the drywells and drain migrate through the vadose zone at different rates due to their solubilities in water. In addition, the volatile organic compounds have differing susceptibilities to biodegradation (see Table 5-9). Methylene chloride, 1,1-dichloroethane and toluene are "degraded by selectively adapted and enriched culture", while ethylbenzene is "readily degraded by selectively

adapted and enriched culture" (Bleam and Zitrides, 1992).

Saturated Zone

In LKB's 1985 report, LKB estimated the rate of horizontal ground water flow at the Site, based on water levels measured in the three on Site wells, to be 0.45 feet per day (LKB, 1985).

Based on the decline in levels of volatile organic compounds in the ground water, there are no expected hot spots which would require unusual precautions for the outdoor investigative tasks of the RI.

As was discussed before, the concentration of volatile organic compounds in the ground water under the Site has continued to decrease since 1982. The diminution may be attributed to both dilution by the movement of the ground water and by microbial action. According to Bleam and Zitrides (1992), the volatile organic compounds found in the ground water between 1982 and the present are susceptible to biodegradation.

Table 5-1 Concentration of Analytes found in Drywell #2 at Various Depths (µg/Kg)

Analyte	Surface	15-17 feet	25-27 feet	Site Background*	RSCO**
1,1-dichloroethane	1600	ND	ND	ND	0.2
1,1,1-trichloroethane	3300	ND	ND	ND	0.8
toluene	4800	2300	ND	ND	1.5
ethylbenzene	4800	4800	ND	ND	5.5
total xylenes	67000	82000	ND	ND	1.2
naphthalene	9800/9500	290	ND	ND	13
2-methylnaphthalene	4100/3900	150	ND	ND	36.4
phenanthrene	370/320	58	ND	ND	50
di-n-butylphthlate	2400/2500	100	ND	ND	8.1
fluoranthene	300	69	ND	ND	50
butylbenzylphthalate	5100/5200	410	ND	ND	50
bis(2-ethylhexyl)phthalate	25000/27000	ND	ND	36	50
pyrene	ND	66	ND	ND	50
4-chloro-3-methylphenol	ND	ND	570	ND	0.24 or MDL
chromium**	463	392	32.9	3.4	10 or SB
lead**	1210	130	4.6	2.1	SB
aroclor 1254	ND	230	ND	ND	NS

* from MW #6D soil sample collected at 60-62 feet below grade

**RSCO=NYS Recommended Soil Cleanup Objectives

ND=None Detect

Table 5-4 Concentration of Analytes found in Drywells #1, 6 & 7 at Various Depths (µg/Kg)

Analyte						
Drywell #1	**Surface**	**25-27 feet**	**30-32 feet**	**Background***		**RSCO****
bis(2-ethylhexyl)phthalate	9700/11000	ND	ND	36		50000
chromium**	36.1	ND	ND	3.4		10,000 or SB
lead**	124	1.8	2.5	2.1		SB
Drywell #6	**Surface**	**30-32 feet**	**35-37 feet**	**Background***		
toluene	5	ND	ND	ND		1500
butylbenzylphthalate	5100	ND	ND	ND		50000
bis(2-ethylhexyl)phthalate	26000	ND	ND	36		50000
Dieldrin	18	ND	ND	ND		440
4,4'-DDE	75	ND	ND	ND		2100
Methoxychlor	24	ND	ND	ND		<10000
chromium**	240	7.6	6.7	3.4		10000 or SB
lead**	1120	6.7	1.8	2.1		30000 or SB
Drywell #7	**Surface**	**40-42 feet**	**45-47 feet**	**55-57 feet**	**Background***	
carbon disulfide	5	ND	ND	ND	ND	2700
bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	36	50000
Dieldrin	19	ND	ND	ND	ND	440
4, 4'-DDE	10	ND	ND	ND	ND	2100
Methoxychlor	7.5	ND	ND	ND	ND	<10000
gamma-Chlordane	3.4	ND	ND	ND	ND	540
chromium**	54.2	ND	ND	ND	3.4	10000 or SB
lead**	157	1.0	0.78	0.84	2.1	30000 or SB

* from MW #6D soil sample taken at 60-62 feet below grade

**RSCO=NYS Recommended Soil Cleanup Objectives

ND = None Detect

Table 5-4a Concentration of Analytes found in Drywells #3,4,5,8,9 and Drain

Analyte (mg/kg)	DW 3	DW 4	DW 5	DW 8	DW 9	DRAIN	MW #6 (60-62')	ppm Rec. Soil Cleanup Obj.
carbon disulfide	ND	ND	ND	ND	21	ND	ND	2.7
toluene	ND	64	ND	200	ND	ND	ND	1.5
benzoic acid	ND	ND	53/73	ND	ND	ND	ND	2.7
phenanthrene	ND	260/310	ND	1800/1500	260	190	ND	50
anthracene	ND	ND	ND	390	ND	ND	ND	50
di-n-butylphthalate	ND	ND	63/72	ND	ND	480	ND	8.1
fluoranthene	300	700/810	ND	3700/3400	440	410	ND	50
butylbenzylphthalate	1100/1100	ND	64/48	ND	370	300	ND	50
bis(2-ethylhexyl)phthalate	26000/21000	ND	ND	ND	ND	ND	36	50
pyrene	ND	790/860	/34	3700/4500	340	320	ND	50
benzo(b)fluoranthene	ND	1000/1000	ND	2900/2700	ND	ND	ND	1.1
chrysene	ND	520/590	ND	1900/2000	250	230	ND	0.4
benzo(a)anthracene	ND	/490	ND	1600/	ND	ND	ND	0.224 or MDL
benzo(k)fluoranthene	ND	560/500	ND	1700/1700	ND	ND	ND	1.1
benzo(a)pyrene	ND	580/590	ND	1400/1100	ND	ND	ND	.061 or MDL
indeno(1,2,3-cd)pyrene	ND	ND	ND	/1500	ND	ND	ND	3.2
beta-BHC	ND	ND	ND	ND	8.2	ND	ND	0.2
dieldrin	87	16	ND	42	ND	ND	ND	0.044
4.4'-DDE	41	50	ND	48	ND	ND	ND	2.1
methoxychlor	39	126	ND	52	14	ND	ND	<10
gamma-chlordane	ND	ND	ND	29	ND	ND	ND	0.54
chromium (mg/kg)	101	31.7	17.4	198	37.4	71	3.4	10 or SB
lead (mg/kg)	607	154	81.3	1620	122	216	2.1	SB

ND=Non Detect
MDL=Minimum Detection Level
SB=Site Background

Table 5-5 Background Conditions in Upgradient Monitoring Wells 1 and 6, Shallow and Deep

Analyte	MW 1S		MW 1D		MW 6S		MW 6D		1992 NYSDEC
	1st Round	2nd Round	1st Round	2nd Round	1st Round	2nd Round	1st Round	2nd Round	MCL
bis(2-ethylhexyl)phthalate	ND	ND	8	65	6	ND	5	ND	50
chromium	11	353	132	19.7	13	54.4	33	45.6	50
lead	22	87	29.4	17.2	18.2	29.4	10.5	25.2	25

units are in µg/Kg
ND = Non Detect

Table 5-6 Concentrations in Downgradient Monitoring Wells 2, 3, 4, 5S, 5D, 7S and 7D

Analyte	MW 2		MW 3		MW 4		MW 5S		1992 NYSDEC MCL
	1st Round	2nd Round	1st Round	2nd Round	1st Round	2nd Round	1st Round	2nd Round	
bis(2-ethylhexyl)phthalate	ND	ND/ND	ND	ND/ND	19	66/57	65	53	50µg/L
chromium	317	1440	227	1150	14	15.5	137	131	50µg/L
lead	74.7	240	30.2	71.5	ND	10.2	44.4	33.6	25µg/L
	MW 5D		MW 7S		MW 7D				
	1st Round	2nd Round	1st Round	2nd Round	1st Round	2nd Round			
bis(2-ethylhexyl)phthalate	30	ND	17	100/160	17	62			50
chromium	48	101	33	19.6	18	47.2			50
lead	31.4	40.4	27.9	27	27.9	25.8			25

units are in µg/Kg - ppb
ND = Non Detect
1st Round = 4/92
2nd Round = 11/92

6.0 Summary and Conclusions

The previous sections of the RI report have detailed the background of the Site, described its past uses, the findings of previous environmental investigations and inspections by NCDH and the findings of the current remedial investigation.

The Site was previously leased to Anchor Chemical (1964 to 1985) to manufacture chemical compounds used by the printing industry. To store liquid chemical compounds used in this manufacturing, seventeen underground steel storage tanks were installed under the floor of the mixing rooms and adjacent areas and seven above ground storage tanks were placed inside the building. Five of the underground tanks failed fitness tests in 1981. Therefore, these tanks were taken out of service and ground water monitoring wells installed in 1981 by LKB to determine if the ground water had been affected. Elevated levels of volatile organic compounds (VOCs) were detected in the ground water from December 1982 until June 1984, when the concentrations decreased significantly. Between June 1984 and June 1989, the concentrations of VOCs continued to decrease and in February 1991 the VOCs were below the laboratory

detection limit except for 1,1,1-trichloroethane.

The RI tasks were designed to provide reliable data about the current quality of the soil and ground water at the Site and to determine whether or not suspected sources of contamination at the Site, specifically from past leaks from the five underground storage tanks and discharges to drywells represent a continuing source of volatile organic contamination to the ground water (Roux 1991).

6.1 Summary

Underground Storage Tanks

Sections of the building floor were removed to gain access to the tanks underneath. Five tanks were not investigated by Roux Associates and Enroserv as there was documentation that they had been previously cleaned and filled with concrete. Tank #16 under the floor contained liquid which was pumped out and stored for disposal based on RCRA requirements. The remaining eleven tanks were opened and found to be either empty and dry or in various stages of abandonment with three tanks being filled with concrete, one half full of concrete. During the tank

investigation, the tanks not previously filled with concrete were inspected and filled with a concrete slurry.

As part of the tank inspection, six borings were installed in close proximity without damaging the tanks or related piping. In these six borings, soil samples were collected at five foot intervals from the floor surface to the ground water interface (approximately 60 feet below grade). The Project Operations Plan called for laboratory analysis of two soil samples collected from elevations below the tanks at each boring location, there were two deviations from the Plan. In boring IB 2 a third sample from the 5 to 7 feet level was submitted. An additional soil sample was also collected from IB 3 because of the physical appearance of the soil in that sarnple.

In these indoor borings, laboratory analyses for the TCL did not identify any VOCs, pesticides, or aroclors. Two semi-volatile organic compounds were detected above the method detection limit which were bis(2-ethylhexyl)phthalate and 2-butoxyethanol. Records compiled by Anchor indicated that inks used on Site may have contained phthlates in their pigments. Bis(2-ethylhexyl)phthlate may have been one of those

phthlates. Anchor's records indicate that 2-butoxyethanol was stored in a least one of the tanks under the floor of the building.

Additional soil sampling in the vicinity of Tank 14, including an angle boring under to building to a depth of 17 feet under Tank 14, was conducted in February 1995. The results of the sampling will be submitted to the EPA in the April supplement to this RI.

Drywells, Cesspools and Drain

Analysis of the surface sediments in four drywells (2, 4, 6 and 8) exceeded ARARs for the following analytes listed in Tables 4-1, 4-2, 4-3 and 4-4.

Pesticides were identified in all drywells (except the drain) with levels which exceed the ARARs.

Soils under Drywell 2 exceed ARARs to 27 feet below the ground surface. This is the deepest sample collected and at this level, the concentrations of the chemical compounds decrease significantly for most compounds. The volatile organic compounds decreased in concentration from the

samples collected at 15-17 feet to the samples collected at 25-27 feet.

The following table summarizes the findings.

Compound (mg/Kg)	15-17 feet	25-27 feet
Methylene chloride	3850 U	1200 U
Acetone	7700 U	1400 U
Toluene	2300 J	ND
Ethylbenzene	4800	ND
Total xylenes	82,000	ND

U=Data validator considered to be "non-detect" as compound was identified in the blanks.
J=Estimated

ND=Not detected

Lead and chromium also show decreases in concentration at the deeper sample depth. Lead was detected at an estimated 130 mg/Kg at 15-17 feet and an estimated 4.6 mg/Kg at the 25-27 feet depth. Chromium was detected at and estimated 392 mg/Kg at the 15-17 feet depth and an estimated 32.9 mg/Kg at the 25-27 feet depth. The analytes are above site-specific ARARs at 25 to 27 feet below grade.

The chemical compounds detected in drywell 2 were all used on Site by Anchor Chemical. The NCDH reported a floor drain in the mixing room which was connected to a drywell on the north side of the Site. Although NCDH did not indicate which drywell it was, chemical composition of the

soils indicate that it was drywell 2.

EPA is requiring that the elevated concentrations of contaminants in the drywell sediments and drain will be excavated and moved off-Site. A removal action will be implemented at a future date and will be scheduled with the concurrence of the EPA.

Soil samples collected from the former cesspool locations did not exceed any ARARs. Thus, no further action is required.

Ground Water Monitoring Well Installation and Sampling

Three ground water monitoring wells were installed in 1982 by LKB. Eight new ground water monitoring wells were installed as part of this RI. Four of the new wells were screened between 75 and 85 feet below the ground surface (shallow wells). The other four wells were screened at 110 to 120 feet deep (deep wells).

Two soil samples were collected during the installation of each of the new wells and were analyzed for TCL. During the installation of MW5D three samples were collected and analyzed. The additional sample was

collected because elevated readings were detected using the volatile organic analyzing field equipment (OVM).

The laboratory analyses of the seventeen soil samples did not identify any chemical compounds that exceeded ARARs. Therefore, no remedial measures are recommended.

Two rounds of ground water samples were collected from each of the eleven ground water monitoring wells located on Site. The details of sample analyses are discussed below. No significant contamination was discovered in either the up or down gradient wells; only 1,1,1-trichloroethane, lead and chromium exceeded the ARARs for ground water.

6.1.1 Nature and Extent of Contamination

Drywells and Drain

The soil/sediments in the drywells on Site have elevated levels of pesticides, except drywell 5 and the drain. The source of these pesticides could be past agricultural uses of the Site and current over-spraying of pesticides at Cantiague Park.

Drywells also have lead concentrations above ARARs. These levels are probably related to leaded gasoline used in vehicles that frequented the Site or lead could have been in inks and dyes used on the Site during Anchor's tenancy. These lead levels are expected to decrease as lead has not been used on Site since 1985 when Anchor left the Site.

Drywell 2 has concentrations that exceed ARARs for volatile organic compounds, semi-volatile organics, lead and aroclor 1254 to approximately 27 feet below the ground surface. With the exception of aroclor 1254, the other chemical compounds were used on the Site by Anchor. Except for the aroclor, all of these chemical compounds were used on Site by Anchor Chemical. The data substantiates a connection between the floor drain and drywell 2 as noted by NCDH.

Ground Water

Two rounds of ground water samples were collected from the eleven monitoring wells on Site and were analyzed for the Target Compound List. These analyses identified 1,1,1-trichloroethane in downgradient wells MW2 and MW3. Concentrations were 8 µg/l and 3 µg/l (estimated)

respectively and the ARAR for this compound is 5 µg/l. During Round 2 of sampling, 1,1,1-trichloroethane was detected in MW 3 (2 µg/l), MW 4 (2 µg/l) MW 5S and MW 5D (both 2 µg/l). These wells are down gradient wells. In the up gradient wells 1,1,1-trichloroethane was at or below the laboratory method detection limit. No ground water remediation is recommended because the ARAR for 1,1,1-trichloroethane is 5 µg/l. Samples collected from up gradient well MW 1S indicated the presence of chloromethane which was not present in down gradient wells. The concentration did not exceed the ARAR.

6.1.2 Fate and Transport

The apparent limit of impacted soils on-Site is within the vicinity of drywell 2 and is confined to a depth of approximately twenty-seven feet below grade. This area is located entirely within the vadose zone, as the water table and saturated zone occur at approximately sixty feet below grade. Moreover, EPA has directed that drywell 2 be cleaned out and sediment be disposed of properly off site.

As discussed in Section 5 of this Report, the impacted soils will naturally

biodegrade the volatile organic compounds, through the activities of indigenous microbes into non-hazardous organic compounds. The following Site specific conditions support this conclusion:

(1) no further addition of contaminants to drywell 2 and it will be cleaned out under EPA supervision;

(2) the soil matrix on-Site (coarse, medium, fine sands with little gravel) will result in continued adsorption and attenuation of contaminants to soil particles; and

(3) the limited amount of impacted soils in the vicinity of the drywell.

6.2 Conclusions

Since the termination of Anchor's operations in1985, no hazardous materials have been used, stored of disposed of on Site. Ground water sampling has demonstrated that the levels of volatile organic compounds in the ground water have been significantly reduced.

The current concentrations of volatile organic compounds in the ground water do not violate ARARs. Therefore, no ground water remediation is

recommended.

The compounds identified in the surface sediments of the drywells and drain on-Site could be remediated by excavating the sediments. The extent of this excavation has not been determined in this investigation. Once this excavation is completed, the majority of the source of soil contamination on-Site will have been removed.

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VOLUME 2

REMEDIAL INVESTIGATION REPORT

Appendix A - D

Anchor Chemical Site
Hicksville, New York

March 1995

Prepared for:

K.B. Co.
375 North Broadway
Jericho, New York 11753

Prepared by:

Anson Environmental Ltd.
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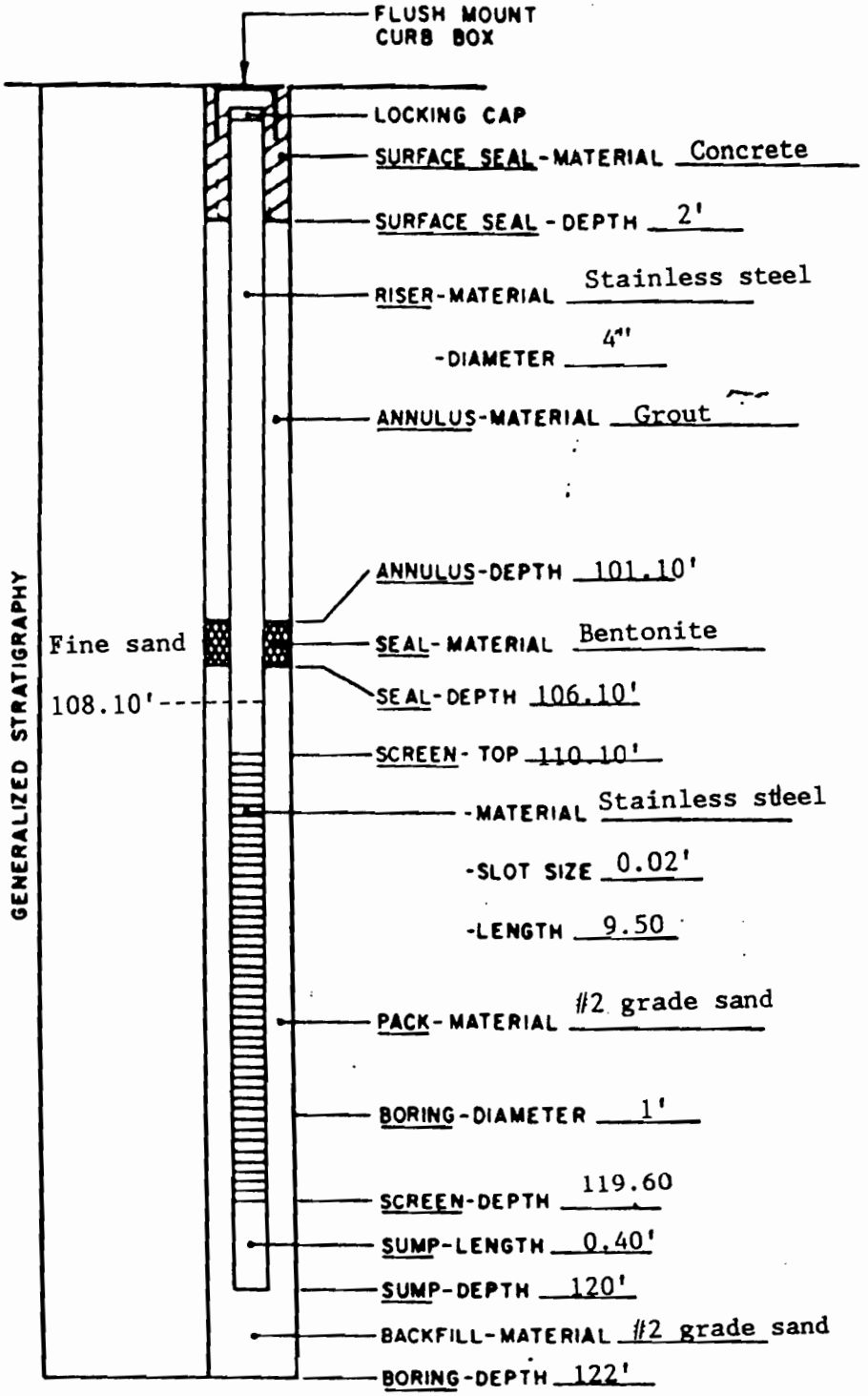
APPENDIX A

Boring Logs

MONITORING WELL CONSTRUCTION DETAILS

Well No MW-1D
PROJECT Anchor-Chem
PROJECT NO 269.01
BY: J.A. Schaefer
DATE 3-30-92



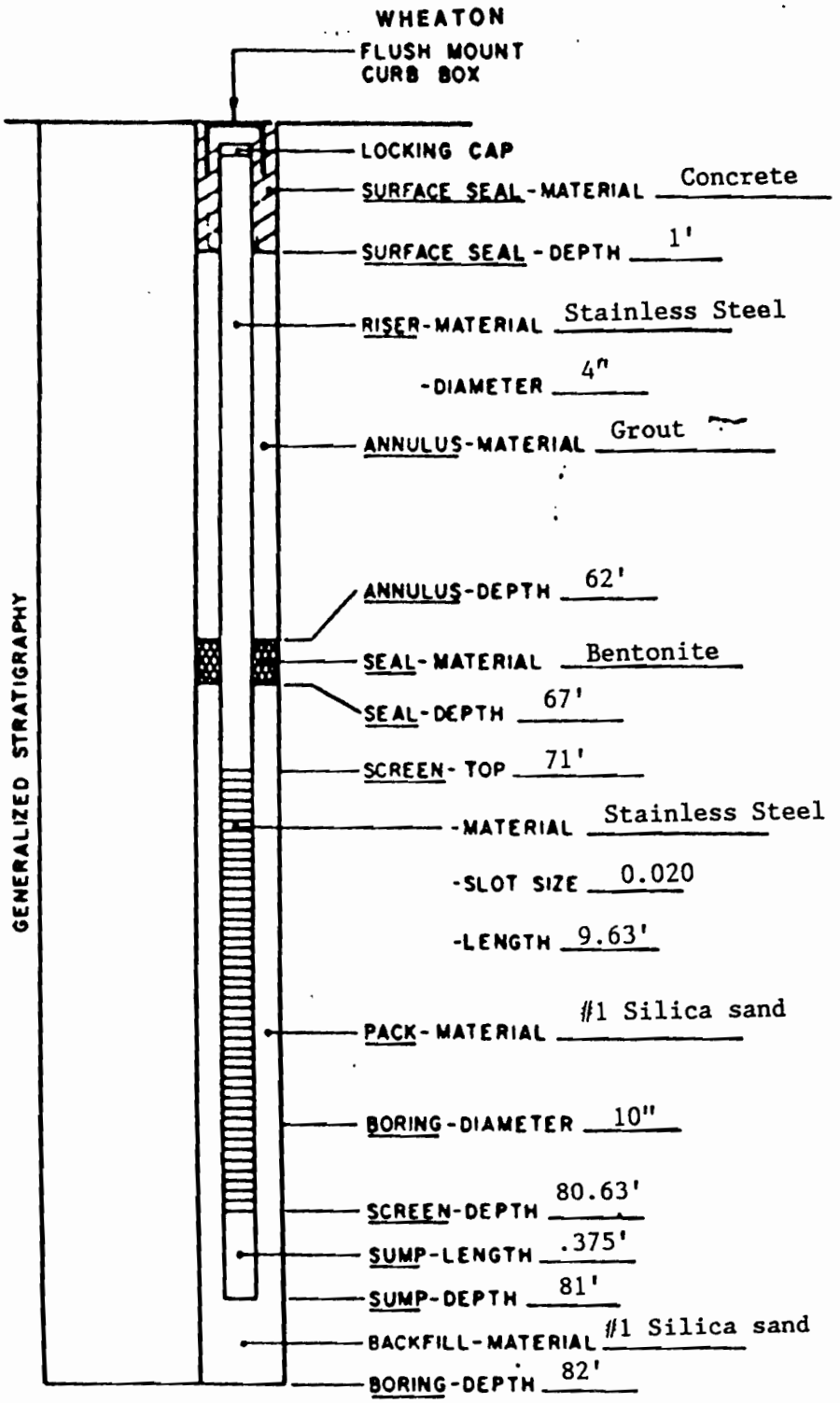
WATER LEVEL UPON COMPLETION _____
DRILLER M.P.C
METHOD Hollow Stem Auger
RIG TYPE Truck mounted
SAMPLING METHOD Split spoon
DEVELOPMENT DATE 3-31-92
DEVELOPMENT METHOD Waterra Hydrolift

301970

SUBSURFACE FIELD LOG

SHEET ____ OF ____

MONITORING WELL CONSTRUCTION DETAILS



WELL NO. MW-4

PROJECT Anchor Chemica

PROJECT NO 269.01

BY J.A. Schaefer

DATE 12-4-91

WATER LEVEL UPON COMPLETION ____

DRILLER MPC (Don Klaus)

METHOD Hollow Stem Auger

RIG TYPE Truck Mounted

SAMPLING METHOD Split Spoon

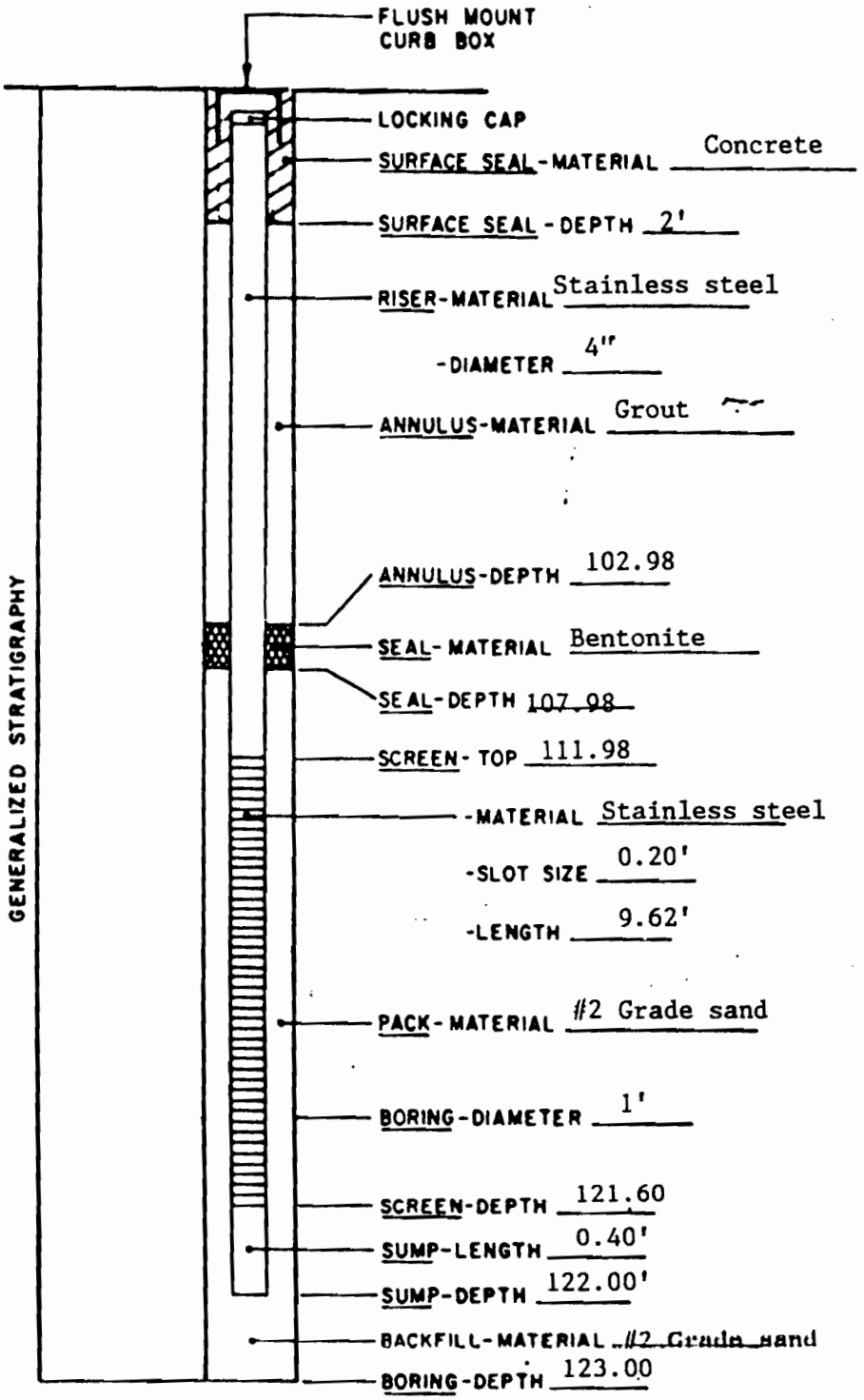
DEVELOPMENT DATE 12/3/91

DEVELOPMENT METHOD Waterra Hydro-lift

301971

MONITORING WELL CONSTRUCTION DETAILS

Well No MW-5D
PROJECT Anchor-Chem
PROJECT NO 269.01.01
BY: J.A. Schaefer
DATE 3-17-92



WATER LEVEL UPON COMPLETION _____
DRILLER M.P.C
METHOD Hollow Stem Auger
RIG TYPE Truck Mounted
SAMPLING METHOD Split spoon
DEVELOPMENT DATE _____
DEVELOPMENT METHOD _____

301972

SUBSURFACE FIELD LOG

MONITORING WELL CONSTRUCTION DETAILS

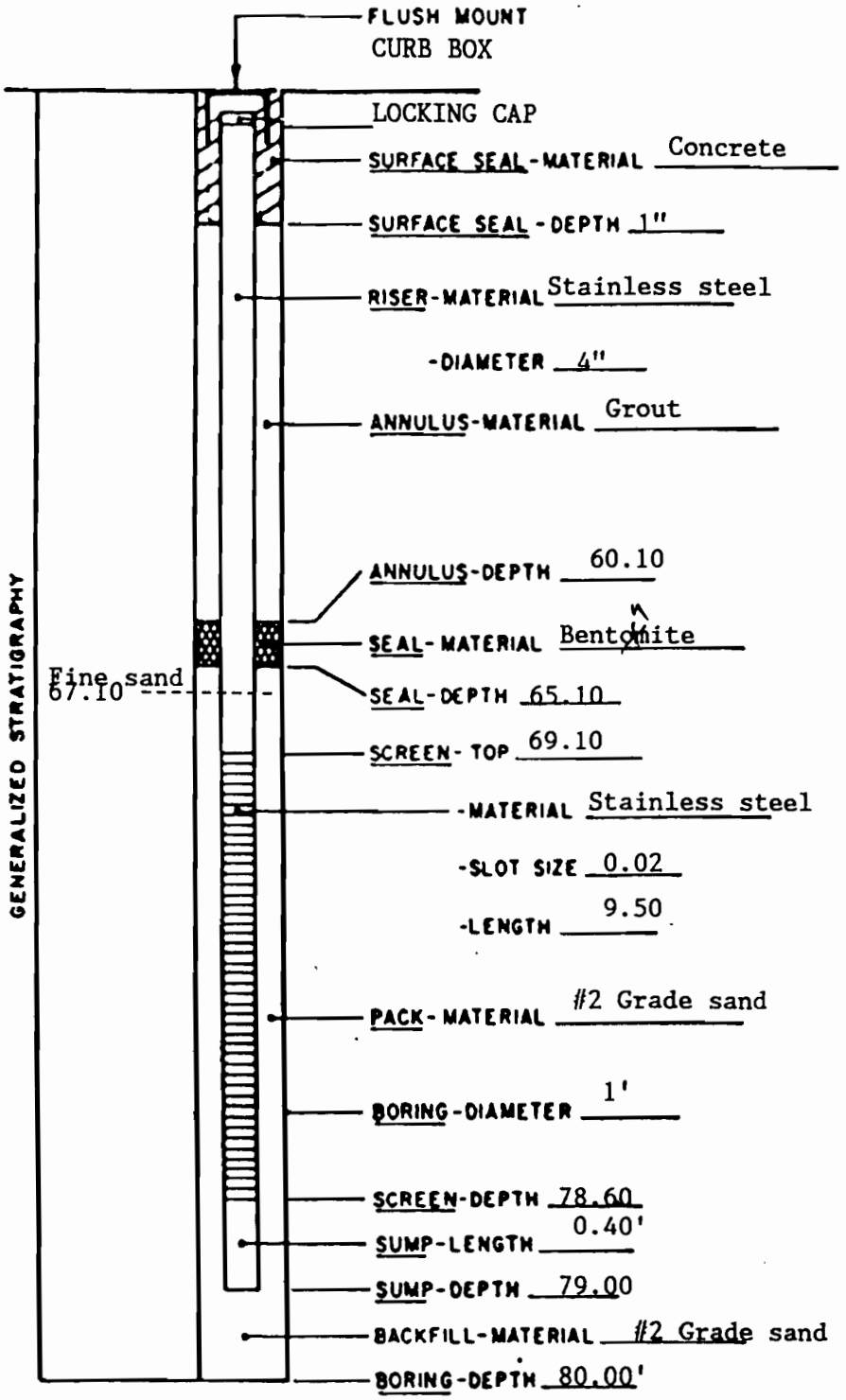
Well No MW-5S

PROJECT Anchor-Chem

PROJECT NO 269.01

BY J.A. Schaefer

DATE 3-13-93



WATER LEVEL UPON COMPLETION 57.40

DRILLER M.P.C

METHOD Hollow Stem Auger

RIG TYPE Truck Mounted

SAMPLING METHOD Split spoon

DEVELOPMENT DATE 3/22/92

DEVELOPMENT METHOD Waterra Hydrolift

301973

SUBSURFACE FIELD LOG

SHEET ____ OF ____

MONITORING WELL CONSTRUCTION DETAILS

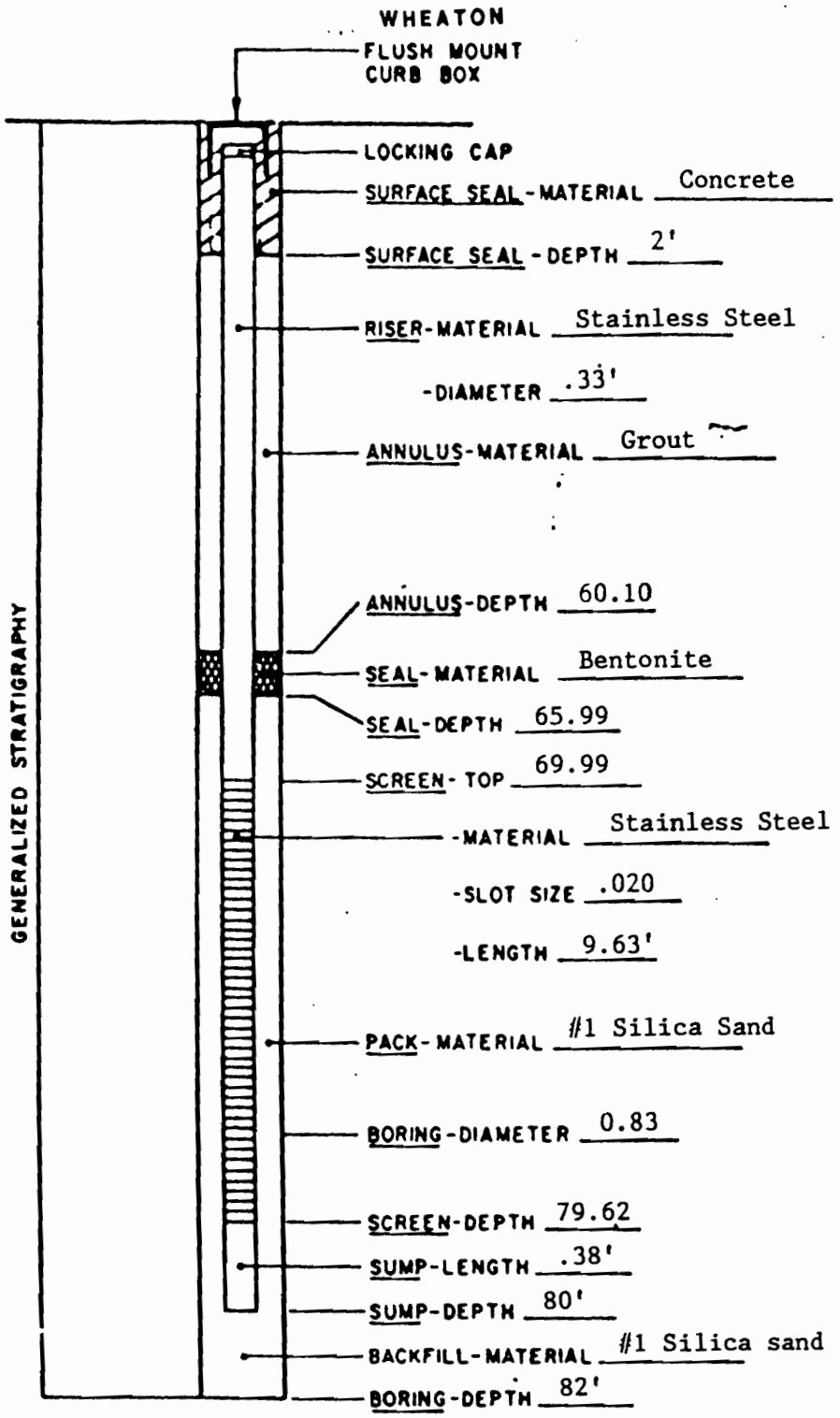
WELL NO. MW-6S

PROJECT Anchor Chem.

PROJECT NO 269.01

BY J.A. Schaefer

DATE 12/4/91



LOCKING CAP

SURFACE SEAL - MATERIAL Concrete

SURFACE SEAL - DEPTH 2'

RISER - MATERIAL Stainless Steel

- DIAMETER .33'

ANNULUS - MATERIAL Grout

ANNULUS - DEPTH 60.10

SEAL - MATERIAL Bentonite

SEAL - DEPTH 65.99

SCREEN - TOP 69.99

- MATERIAL Stainless Steel

- SLOT SIZE .020

- LENGTH 9.63'

PACK - MATERIAL #1 Silica Sand

BORING - DIAMETER 0.83

SCREEN - DEPTH 79.62

SUMP - LENGTH .38'

SUMP - DEPTH 80'

BACKFILL - MATERIAL #1 Silica sand

BORING - DEPTH 82'

WATER LEVEL UPON COMPLETION ____

DRILLER MPC (Marc)

METHOD Hollow Stem Auger

RIG TYPE Truck Mounted

SAMPLING METHOD Split spoon

DEVELOPMENT DATE 12/3/91

DEVELOPMENT METHOD Waterra Hydro lift pump

301974

SUBSURFACE FIELD LOG

SHEET 1 OF 1

MONITORING WELL CONSTRUCTION DETAILS

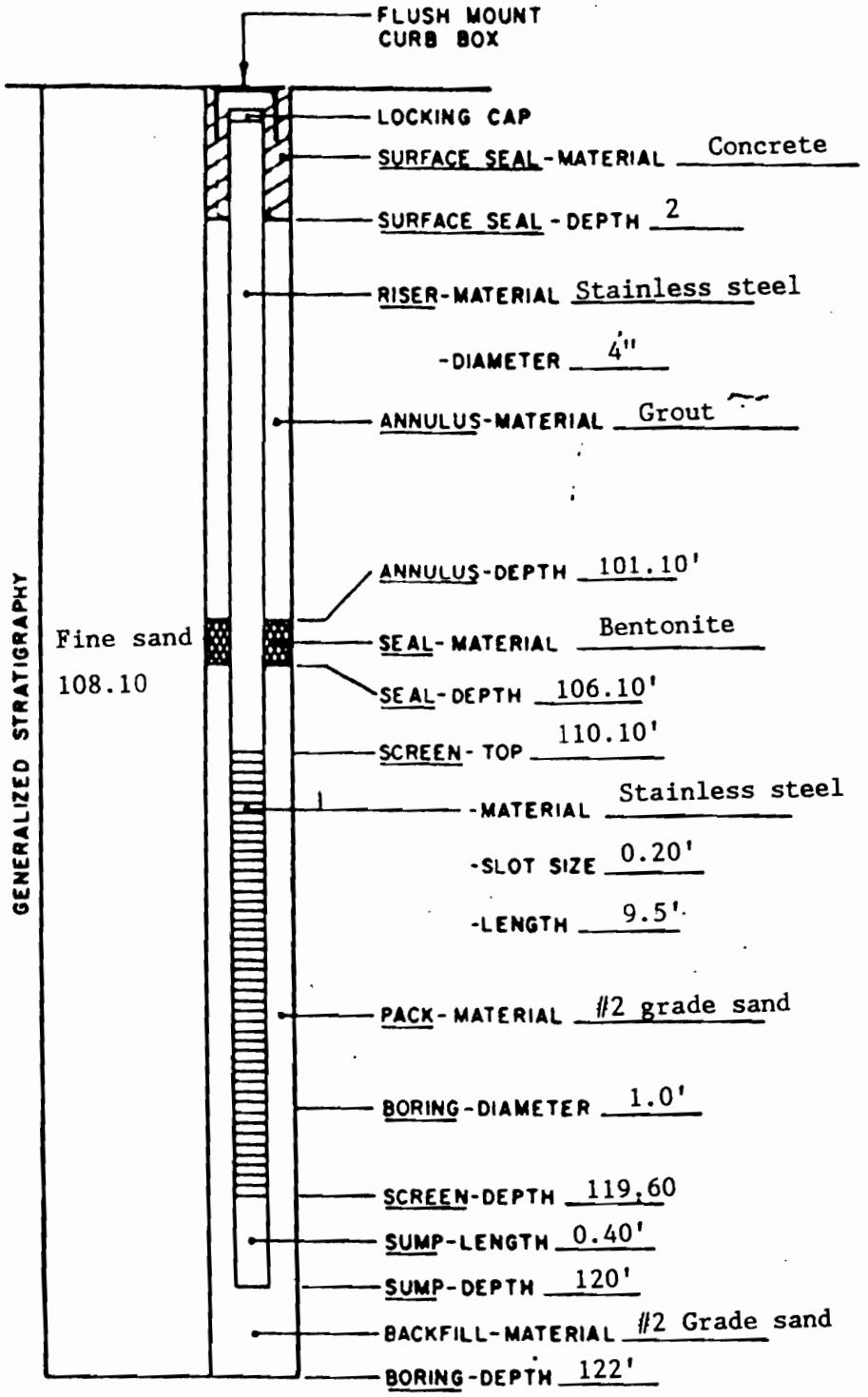
Well No MW-6D

PROJECT Anchor-Chem

PROJECT NO 269.01

BY: J.A. Schaefer

DATE 3-25-92



WATER LEVEL UPON COMPLETION _____

DRILLER M.P.C.

METHOD Hollow Stem Auger

RIG TYPE Truck mounted

SAMPLING METHOD _____

DEVELOPMENT DATE 3-30-92

DEVELOPMENT METHOD Waterra Hydrolift

301975

MONITORING WELL CONSTRUCTION DETAILS

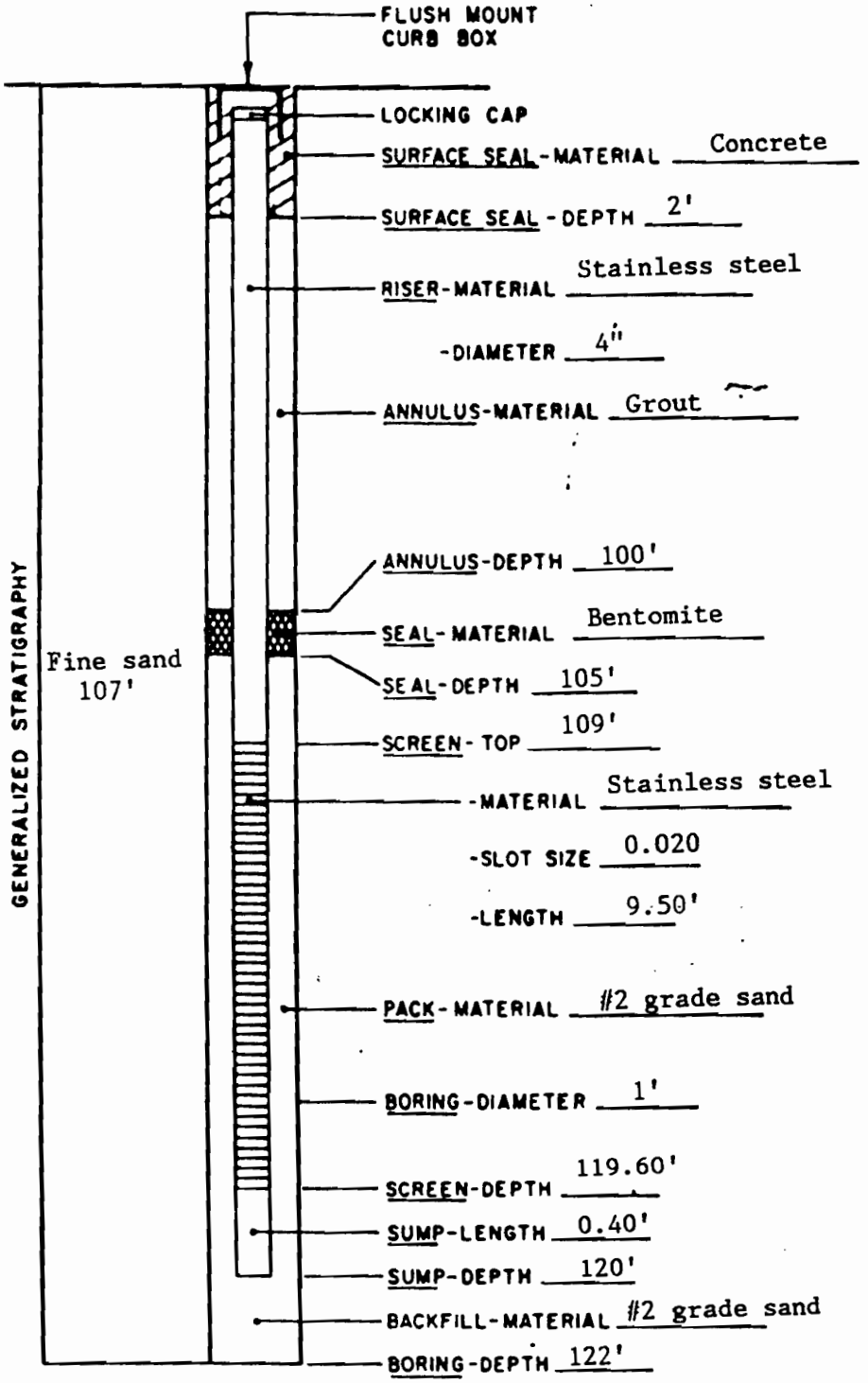
Well No MW-7D

PROJECT Anchor-Chem

PROJECT NO 269.01

BY: J. Schaefer

DATE 3-18-92



WATER LEVEL UPON COMPLETION _____

DRILLER M.P.C

METHOD Hollow Stem Auger

RIG TYPE Truck mounted

SAMPLING METHOD _____

DEVELOPMENT DATE _____

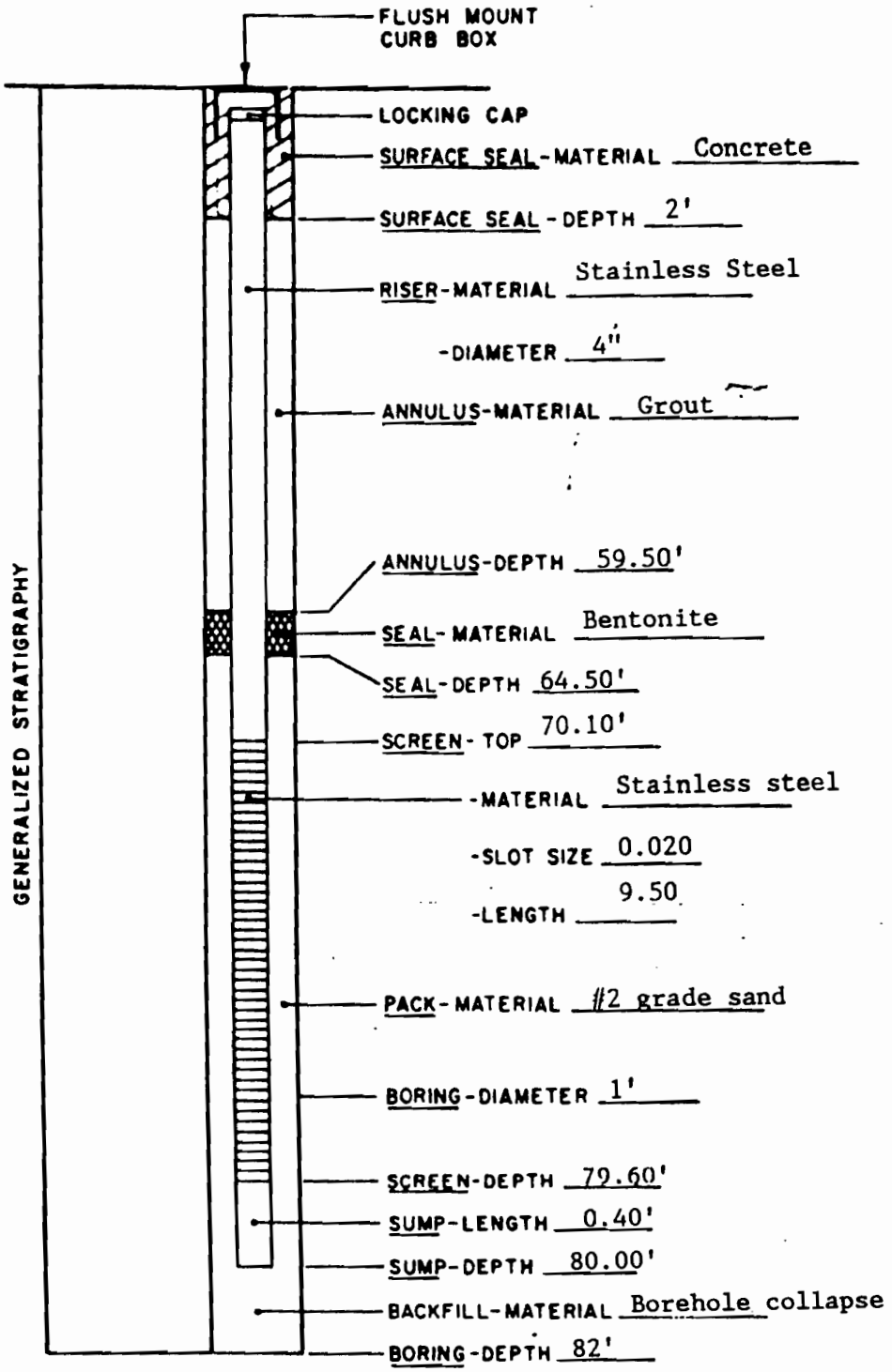
DEVELOPMENT METHOD _____

301976

SUBSURFACE FIELD LOG
MONITORING WELL CONSTRUCTION DETAILS

SHEET 1 OF 1

Well No MW-7S
PROJECT Anchor-Chem
PROJECT NO 269.01
BY: J. Schaefer
DATE 3/22/92



WATER LEVEL UPON COMPLETION _____
DRILLER M.P.C.
METHOD Hollow Stem Auger
RIG TYPE Truck mounted
SAMPLING METHOD _____
DEVELOPMENT DATE _____
DEVELOPMENT METHOD _____

301977

59663

APPENDIX B

Laboratory Results for Public Water Supply Wells

DEPARTMENT OF PUBLIC WORKS
Division of Sanitation and Water Supply
Nassau County, New York

*** GROUNDWATER MONITORING WELL NETWORK ***

- WELL IDENTIFICATION INFORMATION -

County well No: O-10A Water PurveyorHicksville WD Latd: 404524
NYS Well No : N-09917 Street Locat: Apex La & Acre La ,Hicksville Long: 733253

- HISTORICAL WELL INFORMATION -

Date Installed.....: 10/01/81	Meas Pnt El: 124.79	Bot Well El: 48.64	Aquifer: Up. Glacial
Well Diameter (in).: 4.00	Top Scrn El: 53.84	Max Water El: 84.46	Date Max: 06/07/79
Measuring Point....: Top of Coupl	Bot Scrn El: 48.64	Min Water El: 68.18	Date Min: 11/21/66

- SAMPLING INFORMATION -

Date Sampled.....:	01/29/85	03/27/85	06/09/88	07/10/89	06/07/90	07/15/91
Sampled By.....:	JV	JV	JV/BM	JD/AG/MS	JK/JD	P.M. & A.G.
Water Elevation.....:	79.03	78.12	69.78	9999.99	76.64	76.35
Sounding Elevation.....:	49.29	55.53	9999.99	9999.99	49.79	48.21
Purging Method.....:	SUBM PUMP	SUBM PUMP	SUBM PUMP	SUBM PUMP	SUBM PUMP	SUBM PUMP
Rate Pumped (gpm).....:	1.00	1.00	2.00	6.00	2.00	3.00
Time Pumped (min).....:	60	60	30	15	30	30
Volume Evacuated (gal)..:	60	60	60	90	60	90
Laboratory Used.....:	NCDPW	NCDPW	NCDPW	NCDPW	NCDPW	NCDPW
Date Analyzed.....:	02/04/85	03/28/85	06/10/88	07/10/89	06/07/90	07/15/91

- CHEMICAL EXAMINATION ** VOLATILE ORGANIC CHEMICALS -

COMPOUND NAME	RESULTS (ug/l)					
Trichlorofluoromethane..:	NA	NA	NA	BDL	BDL	BDL
Methylene Chloride.....:	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane.....:	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethylene....:	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,2-dichloroethene:	0.10	BDL	BDL	BDL	BDL	BDL
cis-1,2-dichloroethene and 2,2-dichloropropane.....:	NA	NA	NA	NA	NA	BDL
Chloroform.....:	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorethane.....:	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane...:	BDL	BDL	BDL	BDL	BDL	BDL
Carbon Tetrachloride....:	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane....:	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethylene.....:	1.00	BDL	BDL	BDL	BDL	BDL
Dibromochloromethane....:	BDL	BDL	BDL	BDL	BDL	BDL
Bromoform.....:	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene.....:	1.50	1.30	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	NA	NA	NA	NA	BDL	BDL
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	BDL	BDL
Chlorobenzene.....:	BDL	BDL	BDL	BDL	BDL	BDL
Benzene.....:	NA	NA	3.30	BDL	BDL	BDL
Toluene.....:	NA	NA	BDL	BDL	BDL	BDL
Ethylbenzene.....:	NA	NA	BDL	BDL	BDL	BDL
Para Xylene.....:	NA	NA	BDL	BDL	BDL	BDL
Meta Xylene.....:	NA	NA	BDL	BDL	BDL	BDL
Ortho Xylene.....:	NA	NA	BDL	BDL	BDL	BDL
Total Xylenes.....:	NA	NA	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene.....:	NA	NA	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene.....:	NA	NA	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene.....:	NA	NA	BDL	BDL	BDL	BDL
Total Volatile Organics.:	2.60	1.30	3.30	BDL	BDL	BDL

301979

- WELL IDENTIFICATION INFORMATION -

Cnty well No: O-10A Water Purvyr: Hicksville WD Latd: 404524
NYS Well No : N-09917 Street Locat: Apex La & Acre La Long: 733253

- SAMPLING INFORMATION - (continued)

Date Sampled.....:	06/09/88	07/10/89	06/07/90	07/15/91
Sampled By.....:	JV/BM	JD/AG/MS	JK/JD	P.M. & A.G.
Laboratory Used.....:	NCDPW	NCDPW	NCDPW	NCDPW
Date Analyzed.....:	06/10/88	07/10/89	06/07/90	07/15/91

- CHEMICAL EXAMINATION - Results in mg/l

SUBSTANCE TESTED				
Aluminum.....:	NA	NA	NA	NA
Antimony.....:	NA	NA	NA	NA
Cadmium.....:	NA	NA	BDL	BDL
Chromium.....:	NA	NA	0.16	BDL
Hexavalent Chromium.....:	NA	NA	NA	NA
Copper.....:	NA	NA	BDL	BDL
Iron.....:	NA	NA	5.48	7.52
Lead.....:	NA	NA	BDL	BDL
Manganese.....:	NA	NA	2.08	3.52
Mercury.....:	NA	NA	BDL	BDL
Nickel.....:	NA	NA	NA	NA
Silver.....:	NA	NA	0.01	BDL
Tin.....:	NA	NA	NA	NA
Zinc.....:	NA	NA	0.04	0.06
Barium.....:	NA	NA	0.16	0.23
Calcium.....:	NA	NA	NA	NA
Magnesium.....:	NA	NA	NA	NA
Potasium.....:	NA	NA	NA	NA
Sodium.....:	NA	NA	37.10	33.90
pH.....:	NA	6.00	6.01	5.91
Chemical Oxygen Demand..:	NA	NA	NA	NA
BOD.....:	NA	NA	NA	NA
Orthophosphate as P.....:	NA	NA	NA	NA
Phosphate, Total as P...:	NA	NA	NA	NA
Oil and Grease.....:	NA	NA	NA	NA
Cyanide.....:	NA	NA	NA	NA
Flouride.....:	NA	NA	BDL	BDL
Chlorine Residual.....:	NA	NA	NA	NA
Chloride.....:	NA	NA	85.00	162.00
Free Ammonia as N.....:	NA	NA	BDL	BDL
Nitrogen, Total Organic.:	NA	NA	NA	NA
Nitrite as N.....:	0.020	BDL	0.013	BDL
Nitrate as N.....:	0.30	0.68	0.73	0.15
Sulfates, Dissolved.....:	NA	NA	18.50	BDL
Total Alkalinity.....:	NA	NA	NA	NA
Suspended Solids.....:	NA	NA	NA	NA
Dissolved Solids.....:	NA	NA	259	587
Total Solids.....:	NA	NA	NA	NA
Specific Conductance....: (umhos/cm)	NA	284.0	421.0	634.0

301980

DEPARTMENT OF PUBLIC WORKS
Division of Sanitation and Water Supply
Nassau County, New York

*** GROUNDWATER MONITORING WELL NETWORK ***

- WELL IDENTIFICATION INFORMATION -

County well No: O-9 Water Purveyor: Hicksville WD Latd: 0
NYS Well No : N-01195 Street Locat: Cantiague Rd & Barry Dr ,Hicksville Long: 0

- HISTORICAL WELL INFORMATION -

Date Installed.....: 08/18/76 Meas Pnt El: 148.30 Bot Well El: 31.95 Aquifer: Up. Glacial
Well Diameter (in).: 4.00 Top Scrn El: 37.05 Max Water El: 88.78 Date Max: 05/28/80
Measuring Point....: Top of Pipe Bot Scrn El: 31.95 Min Water El: 73.84 Date Min: 03/20/89

- SAMPLING INFORMATION -

Date Sampled.....:	04/27/87	11/18/88	12/08/89	10/15/90
Sampled By.....:	JK	JV/BE	AG/JD	PM/JD
Water Elevation.....:	78.04	73.85	79.92	81.72
Sounding Elevation.....:	9999.99	33.16	9999.99	33.20
Purging Method.....:	SUBM PUMP	SUBM PUMP	SUBM PUMP	SUBM PUMP
Rate Pumped (gpm).....:	4.00	1.00	1.00	1.00
Time Pumped (min).....:	60	150	100	95
Volume Evacuated (gal)..:	240	150	100	95
Laboratory Used.....:	NCDPW	NCDPW	NCDPW	NCDPW
Date Analyzed.....:	04/30/87	11/22/88	12/08/89	10/15/90

- CHEMICAL EXAMINATION ** VOLATILE ORGANIC CHEMICALS -

COMPOUND NAME	RESULTS (ug/l)			
Trichlorofluoromethane..:	NA	BDL	BDL	BDL
Methylene Chloride.....:	BDL	BDL	0.70	BDL
1,1-Dichloroethane.....:	BDL	BDL	BDL	BDL
1,1-Dichloroethylene....:	BDL	BDL	BDL	BDL
trans-1,2-dichloroethene:	BDL	BDL	BDL	BDL
cis-1,2-dichloroethene and				
2,2-dichloropropane.....:	NA	NA	NA	BDL
Chloroform.....:	BDL	BDL	BDL	BDL
1,2-Dichlorethane.....:	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane...:	BDL	BDL	1.40	BDL
Carbon Tetrachloride....:	BDL	BDL	BDL	BDL
Bromodichloromethane....:	NA	BDL	BDL	BDL
Trichloroethylene.....:	BDL	BDL	BDL	BDL
Dibromochloromethane....:	NA	BDL	BDL	BDL
Bromoform.....:	BDL	BDL	BDL	BDL
Tetrachloroethylene.....:	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	NA	NA	BDL	BDL
1,1,2,2-Tetrachloroethane	NA	NA	BDL	BDL
Chlorobenzene.....:	BDL	BDL	BDL	BDL
Benzene.....:	BDL	5.00	BDL	BDL
Toluene.....:	BDL	BDL	BDL	BDL
Ethylbenzene.....:	BDL	BDL	BDL	BDL
Para Xylene.....:	BDL	BDL	BDL	BDL
Meta Xylene.....:	BDL	BDL	BDL	BDL
Ortho Xylene.....:	BDL	BDL	BDL	BDL
Total Xylenes.....:	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene.....:	NA	BDL	BDL	BDL
1,3-Dichlorobenzene.....:	NA	BDL	BDL	BDL
1,4-Dichlorobenzene.....:	NA	BDL	BDL	BDL
Total Volatile Organics.:	BDL	5.00	2.10	BDL

301981

- WELL IDENTIFICATION INFORMATION -

Cnty well No: O-9 Water Purvyr: Hicksville WD Latd: 0
NYS Well No : N-01195 Street Locat: Cantiague Rd & Barry Dr Long: 0

- SAMPLING INFORMATION -
(continued)

Date Sampled.....:	11/18/88	12/08/89	10/15/90
Sampled By.....:	JV/BE	AG/JD	PM/JD
Laboratory Used.....:	NCDPW	NCDPW	NCDPW
Date Analyzed.....:	11/22/88	12/08/89	10/15/90

- CHEMICAL EXAMINATION -
Results in mg/l

SUBSTANCE TESTED			
Aluminum.....:	NA	NA	NA
Antimony.....:	NA	NA	NA
Cadmium.....:	NA	NA	BDL
Chromium.....:	NA	NA	BDL
Hexavalent Chromium.....:	NA	NA	NA
Copper.....:	NA	NA	0.02
Iron.....:	NA	NA	7.94
Lead.....:	NA	NA	BDL
Manganese.....:	NA	NA	0.22
Mercury.....:	NA	NA	BDL
Nickel.....:	NA	NA	NA
Silver.....:	NA	NA	BDL
Tin.....:	NA	NA	NA
Zinc.....:	NA	NA	0.09
Barium.....:	NA	NA	0.08
Calcium.....:	NA	NA	NA
Magnesium.....:	NA	NA	NA
Potasium.....:	NA	NA	NA
Sodium.....:	NA	NA	15.60
pH.....:	NA	6.48	6.03
Chemical Oxygen Demand..:	NA	NA	NA
BOD.....:	NA	NA	NA
Orthophosphate as P.....:	NA	NA	NA
Phosphate, Total as P...:	NA	NA	NA
Oil and Grease.....:	NA	NA	NA
Cyanide.....:	NA	NA	NA
Flouride.....:	NA	NA	BDL
Chlorine Residual.....:	NA	NA	NA
Chloride.....:	NA	NA	32.50
Free Ammonia as N.....:	NA	NA	BDL
Nitrogen, Total Organic.:	NA	NA	NA
Nitrite as N.....:	0.020	0.057	BDL
Nitrate as N.....:	6.61	1.48	4.00
Sulfates, Dissolved.....:	NA	NA	29.90
Total Alkalinity.....:	NA	NA	NA
Suspended Solids.....:	NA	NA	NA
Dissolved Solids.....:	NA	NA	205
Total Solids.....:	NA	NA	NA
Specific Conductance....: (umhos/cm)	NA	368.0	301.0

301982

DEPARTMENT OF PUBLIC WORKS
Division of Sanitation and Water Supply
Nassau County, New York

*** GROUNDWATER MONITORING WELL NETWORK ***

- WELL IDENTIFICATION INFORMATION -

County well No: P-23 Water Purveyor: Hicksville WD Latd: 404624
NYS Well No : N-09922 Street Locat: Montana St & Burns Ave. ,Hicksville Long: 733216

- HISTORICAL WELL INFORMATION -

Date Installed.....: 01/20/82	Meas Pnt El: 145.21	Bot Well El: 59.71	Aquifer: Up. Glacial
Well Diameter (in).: 4.00	Top Scrn El: 68.31	Max Water El: 83.85	Date Max: 03/06/91
Measuring Point....: top of coupl	Bot Scrn El: 63.01	Min Water El: 75.12	Date Min: 03/21/89

- SAMPLING INFORMATION -

Date Sampled.....:	04/24/87	07/20/88	07/07/89	06/19/90	07/15/91
Sampled By.....:	JV	JV/BM	JD/AG/MS	JK/JD	P.M. & A.G.
Water Elevation.....:	79.79	9999.99	78.67	82.01	83.89
Sounding Elevation.....:	64.03	63.83	61.96	62.57	62.21
Purging Method.....:	SUBM PUMP	CENTRIFUGAL	SUBM PUMP	SUBM PUMP	SUBM PUMP
Rate Pumped (gpm).....:	6.00	8.00	6.00	6.00	5.00
Time Pumped (min).....:	30	10	10	10	10
Volume Evacuated (gal)..:	180	80	60	60	50
Laboratory Used.....:	NCDPW	NCDPW	NCDPW	NCDPW	NCDPW
Date Analyzed.....:	04/24/87	07/21/88	07/07/89	06/19/90	07/15/91

- CHEMICAL EXAMINATION ** VOLATILE ORGANIC CHEMICALS -

COMPOUND NAME	RESULTS (ug/l)				
Trichlorofluoromethane..:	NA	BDL	BDL	BDL	BDL
Methylene Chloride.....:	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane.....:	BDL	1.10	0.80	1.40	BDL
1,1-Dichloroethylene....:	BDL	BDL	BDL	BDL	BDL
trans-1,2-dichloroethene:	BDL	BDL	BDL	BDL	BDL
cis-1,2-dichloroethene and					
2,2-dichloropropane.....:	NA	NA	NA	1.20	BDL
Chloroform.....:	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorethane.....:	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane...:	BDL	BDL	BDL	BDL	BDL
Carbon Tetrachloride....:	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane....:	NA	BDL	BDL	BDL	BDL
Trichloroethylene.....:	BDL	BDL	BDL	BDL	BDL
Dibromochloromethane....:	NA	BDL	BDL	BDL	BDL
Bromoform.....:	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene.....:	14.80	33.80	33.20	65.50	44.10
1,1,1,2-Tetrachloroethane	NA	NA	NA	BDL	BDL
1,1,2,2-Tetrachloroethane	NA	NA	NA	BDL	BDL
Chlorobenzene.....:	BDL	BDL	BDL	BDL	BDL
Benzene.....:	BDL	BDL	BDL	BDL	BDL
Toluene.....:	BDL	BDL	BDL	BDL	BDL
Ethylbenzene.....:	BDL	BDL	BDL	BDL	BDL
Para Xylene.....:	BDL	BDL	BDL	BDL	BDL
Meta Xylene.....:	BDL	BDL	BDL	BDL	BDL
Ortho Xylene.....:	BDL	BDL	BDL	BDL	BDL
Total Xylenes.....:	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene.....:	1.50	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene.....:	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene.....:	BDL	BDL	BDL	BDL	BDL
Total Volatile Organics.:	16.30	34.90	34.00	68.10	44.10

301983

- WELL IDENTIFICATION INFORMATION -

Cnty well No: P-23 Water Purvyr: Hicksville WD Latd: 404624
NYS Well No : N-09922 Street Locat: Montana St & Burns Ave. Long: 733216

- SAMPLING INFORMATION -
(continued)

Date Sampled.....:	07/20/88	07/07/89	06/19/90	07/15/91
Sampled By.....:	JV/BM	JD/AG/MS	JK/JD	P.M. & A.G.
Laboratory Used.....:	NCDPW	NCDPW	NCDPW	NCDPW
Date Analyzed.....:	07/21/88	07/07/89	06/19/90	07/15/91

- CHEMICAL EXAMINATION -
Results in mg/l

SUBSTANCE TESTED				
Aluminum.....:	NA	NA	NA	NA
Antimony.....:	NA	NA	NA	NA
Cadmium.....:	NA	NA	BDL	BDL
Chromium.....:	NA	NA	BDL	BDL
Hexavalent Chromium.....:	NA	NA	NA	NA
Copper.....:	NA	NA	0.01	0.02
Iron.....:	NA	NA	0.04	0.06
Lead.....:	NA	NA	BDL	BDL
Manganese.....:	NA	NA	0.35	0.27
Mercury.....:	NA	NA	BDL	BDL
Nickel.....:	NA	NA	NA	NA
Silver.....:	NA	NA	0.04	BDL
Tin.....:	NA	NA	NA	NA
Zinc.....:	NA	NA	0.11	0.10
Barium.....:	NA	NA	0.04	0.04
Calcium.....:	NA	NA	NA	NA
Magnesium.....:	NA	NA	NA	NA
Potasium.....:	NA	NA	NA	NA
Sodium.....:	NA	NA	13.30	11.30
pH.....:	NA	4.80	4.83	4.80
Chemical Oxygen Demand..:	NA	NA	NA	NA
BOD.....:	NA	NA	NA	NA
Orthophosphate as P.....:	NA	NA	NA	NA
Phosphate, Total as P...:	NA	NA	NA	NA
Oil and Grease.....:	NA	NA	NA	NA
Cyanide.....:	NA	NA	NA	NA
Flouride.....:	NA	NA	0.38	0.52
Chlorine Residual.....:	NA	NA	NA	NA
Chloride.....:	NA	NA	17.50	12.50
Free Ammonia as N.....:	NA	NA	BDL	BDL
Nitrogen, Total Organic.:	NA	NA	NA	NA
Nitrite as N.....:	0.010	BDL	BDL	BDL
Nitrate as N.....:	14.80	9.81	9.05	10.96
Sulfates, Dissolved.....:	NA	NA	60.90	72.40
Total Alkalinity.....:	NA	NA	NA	NA
Suspended Solids.....:	NA	NA	NA	NA
Dissolved Solids.....:	NA	NA	227	217
Total Solids.....:	NA	NA	NA	NA
Specific Conductance....: (umhos/cm)	NA	321.0	300.0	291.0

301934

TABLE 3-11

ANALYTICAL RESULTS
WEST HICKSVILLE - GROUNDWATER QUALITY

Well Number	N8800	N9341	N9463	N9917
Well Depth (feet)*	247	265	638	73
Sample Date	3/20/84	5/10/85	1/9/85	3/1/85
Trichlorofluoromethane	< 1	1	< 1	< 1
Methlyene Chloride)				
1,1,2-Trichlorotrifluoroethane)	6	21	< 6	< 7
1,1-Dichloroethylene)				
c & t-1,2-Dichloroethylene	< 4	440	NA	< 7
t-1,2-Dichloroethylene	< 4	NA	NA	NA
1,1-Dichloroethane	< 5	66	NA	NA
c-1,2-Dichloroethylene	< 4	NA	NA	NA
Chloroform	< 1	2	< 1	< 1
1,1,1-Trichloroethane	16	16	< 1	1
Carbon Tetrachloride	< 1	2	< 1	< 1
Trichloroethylene	150	1600	< 1	1
Bromodichloromethane	< 1	<10	< 2	< 1
c-1,3-Dichloropropene)				
Dibromochloromethane)	< 1	NA	< 3	NA
1,1,2-Trichloroethane)				
c-1,3-Dichloropropene)				
Dibromochloromethane)	NA	<10	NA	< 1
1,1,2-Trichloroethane	NA	< 1	NA	< 3
1,2-Dibromoethane	< 1	<10	< 5	< 2
Tetrachloroethylene	3	260	< 2	< 1
Bromoform	< 1	1	< 2	< 1
Benzene	< 3	< 3	< 3	< 5
Toluene	< 3	< 4	<15	< 3
Chlorobenzene	< 3	< 4	<15	< 3
Ethylbenzene	< 3	57	< 4	< 3
Xylene (o,m,p)	< 3	95	< 4	< 3
Dichlorobenzene (o,m,p)	< 6	130	<20	<10
Total	175	2,691	0	0

APPENDIX C

Summary of Laboratory Data
Hicksville Wells

TABLE 3-11 ANALYTICAL RESULTS - WEST HICKSVILLE - GROUNDWATER QUALITY

WELL NUMBER	WH-4	WH-5	WH-5	WH-5	WH-6	WH-6	WH-6	WH-6
WELL DEPTH	66	72	72	72	64	64	64	64
SAMPLE DATE	12/17/85	12/5/84	4/2/85	12/17/85	10/19/84	12/5/84	4/2/85	12/18/85
Trichlorofluoroethane	NA	<1	<1	NA	<3	2	1	NA
Methylene Chloride								
1,1,2-Trichlorotrifluoroethane	<3	<10	<4	<8	11	<10	<4	8
1,1-Dichloroethylene								
c & t-1,2-Dichloroethylene	<18	34	<20	<18	25	29	<20	25
t-1,2-Dichloroethylene								
1,1-Dichloroethane	<14	25	NA	<14	NR	44	NA	27
c-1,2-Dichloroethylene								
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1	29	4	11	55	48	21	170
Carbon Tetrachloride	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethylene	<1	28	2	9	94	78	85	80
Bromodichloromethane	<1	<1	<1	<1	<3	<1	<1	<1
c-1,3-Dichloropropene								
Dibromochloromethane		<2			<2	<2		
1,1,2-Trichloroethane								
c-1,3 Dichloropropene								
Dibromochloromethane	<1		<1	<1			<1	<1
1,1,2-Trichloroethane	<1		<2	<1			<2	<1
1,2-Dibromoethane	NA	<40	NR	NA	<10	<4	<2	NA
Tetrachloroethylene	<1	140	110	420	8	8	7	9
Bromoform	<2	<3	<1	<2	<4	<3	<1	<2
Benzene	<4	<3	<3	<4	<3	<3	<3	<4
Toluene	<4	<3	<4	<4	<3	<3	<4	<4
Chlorobenzene	<4	<3	<3	<4	<3	<3	<3	<4
Ethylbenzene	<4	<3	<3	<4	<3	<3	<3	<4
Xylene (o,m,p)	<12	<3	<3	<12	15	<3	<3	<12
Dichlorobenzene (o,m,p)	<10	<5	<4	<10	7	<5	<4	<10
Total	0	278	116	440	217	193	64	319

NA-Not Analyzed NR-No Result Due To Technical Reasons ?-No Mention On Lab Reports

TABLE 3-11

ANALYTICAL RESULTS - WEST HICKSVILLE - GROUNDWATER QUALITY

WELL NUMBER	WH-1	WH-1	WH-1	WH-1	WH-2	WH-2	WH-2	WH-3	WH-3	WH-3	WH-4	WH-4	WH-4
WELL DEPTH	60	60	60	60	63	63	62	64	64	64	66	66	66
SAMPLE DATE	10/16/84	12/5/84	4/1/85	12/18/85	12/5/84	4/1/85	12/18/85	12/5/84	4/1/85	12/18/85	10/19/84	12/5/84	4/1/85
Trichlorofluoroethane	<2	<1	<1	NA	<1	<1	NA	<1	<1	NA	<2	<1	<1
Methylene Chloride)													
1,1,2-Trichlorotrifluoroethane)	<4	<10	<4	<8	<10	<4	<8	<10	150	520	<10	<10	<4
1,1-Dichloroethylene)													
c & t-1,2-Dichloroethylene	<10	<15	<20	<14	<15		<18	<15	<20	<14	<10	<15	<20
t-1,2-Dichloroethylene						<5							
1,1-Dichloroethane	<15	<15	NA	<14	<15	NA	<16	<15	NA	<14	<15	<15	<10
c-1,2-Dichloroethylene						<20							
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	1	1	<1	1	<1
1,1,1-Trichloroethane	<1	<1	<1	<1	4	8	16	40	460	5400	<1	2	1
Carbon Tetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1
Trichloroethylene	<1	<1	<1	<1	<1	<1	<1	5	64	900	<1	1	<1
Bromodichloroethane	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1
c-1,3-Dichloropropene)													
Dibromochloroethane)		<2			<2			<2			<2	<2	
1,1,2-Trichloroethane)													
c-1,3 Dichloropropene)													
Dibromochloroethane)	<2		<1	<1		<1	<1		<1	<1			<1
1,1,2-Trichlroroethane	7		<2	<1		<2	<1		<2	<1			<2
1,2-Dibromoethane	<10	<6	<2	NA	<6	<2	NA	<6	<2	NA	<10	<6	<2
Tetrachloroethylene	<1	<1	<1	<1	<1	<1	<1	17	19	28	<1	<1	<1
Bromoform	<6	<2	<1	<2	<2	<1	<2	<2	<1	<2	<6	<2	<1
Benzene	<2	<2	4	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2
Toluene	<2	<2	<4	<6	<2	<4	<4	<2	<4	<6	<2	<2	<4
Chlorobenzene	<2	<2	<2	<2	<2	<2	<6	<2	<2	<2	<2	<2	<2
Ethylbenzene	<2	<2	<2	<6	<2	<2	<6	<2	<2	<6	<2	<2	<2
Xylene (o,m,p)	12	<2	<2	<6	<2	<2	<12	<2	<2	<6	<2	<2	<2
Dichlorobenzene (o,m,p)	<6	<5	<4	<9	<5	<4	<10	<5	<4	<9	<6	<5	<4
Total	12	0	4	0	4	8	16	62	698	6844	0	4	1

301988

NA-Not Analyzed NR-No Result Due To Technical Reasons ?-No Mention On Lab Reports

APPENDIX D

Well Construction Diagrams

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/4/92

BORING NO: IB-1

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Marl

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split-spoon

WEATHER: Rainy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	5 - 7'	.1	3,3,3,3	0	Light brown very loose fine sand and gravel
*2	10 - 12'	.5	75/3"	8.6	Light brown poorly sorted fine sand and gravel; dry with Fe stained bands.
*3	15 - 17'	1.2	50,22,17,17	32.4	15-15.4' Brown fine sand; well sorted with a light odor. 15.4 - 16.2 poorly sorted medium to coarse sand with some gravel.
4	20 - 22'	1	32, -,12,24	2.3	Poorly sorted fine to coarse sand with some gravel; light pungent odor.
5	25 - 27'	1.8	10,19,26,29	0	Poorly sorted fine to coarse sand with some gravel; light pungent odor.
6	30 - 32'	2	19,25,26,20	1.6	Poorly sorted fine to coarse sand with gravel. Brown fine sand at upper 3" of spoon.

Remarks:

* - Retained sample for BNA, Metals, Pest, PCBs, VOA's and CN laboratory analysis.

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/4/92

BORING NO: IB-1

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Marl

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split-spoon

WEATHER: Rainy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
7	35 - 37'	2	8,21,20,25	.1	Poorly sorted fine to coarse sand with gravel. Brown fine sand at upper 3" of spoon.
8	40 - 42'	2	19,25,25,30	0	Poorly sorted fine to coarse sand with gravel. Brown fine sand at upper 3" of spoon.
9	45 - 47'	1.9	8,13,11,13	0	Light brown fine sand (lower half) grading to medium to coarse brown sand at upper half of spoon; moist
10	50 - 52'	2	3,11,15,18	0	Light brown fine sand (lower half) grading to medium to coarse brown sand at upper half of spoon; moist
11	55 - 57'	2	12,23,36,20	.9	Light brown very fine sand; well sorted
12	60 - 62'	2	34,30,44,40	2.3	Brown medium sand with some coarse sand; wet at 60'

Remarks:

The watertable was encountered at approximately 60 feet below land surface.

301991

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/5/92

BORING NO: IB-2

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C, Marl

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split-spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
**1	5 - 7'	1.2	8,9,13,15	70	Loose poorly sorted sand and gravel
*2	10 - 12	2	13,26,31,30	29	Loose poorly sorted sand and gravel OVM response over sample was 100+ ppm (overrange); light "sweet" odor; no staining; dry; trace coarse gravel
*3	15 - 17'	1.5	7,14,17,33	5.1	Loose poorly sorted sand and gravel OVM response over sample was 100+ ppm (overrange); light "sweet" odor; no staining; dry; trace coarse gravel
4	20 - 22'	1.6	6,12,17,20	1.6	Loose poorly sorted sand and gravel OVM response over sample was 100+ ppm (overrange); light "sweet" odor; no staining; dry; trace coarse gravel but with thin lenses of interbedded light brown fine sand.
5	25 - 27'	1.8	10,20,23,22	1.4	Loose poorly sorted sand and gravel OVM response over sample was 100+ ppm (overrange); light "sweet" odor; no staining; dry; trace coarse gravel but with thin lenses of interbedded light brown fine sand.
6	30 - 32'	1.9	7,15,27,23	.5	Light brown medium sand with thin bands of very fine sand. Coarse sand and gravel at lower 4" of spoon (Fe stained; no odor).

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/5/92

BORING NO: IB-2

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C, Marl

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split-spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
7	35 - 37'	1.5	13,17,15,13	9	Light brown medium sand with thin bands of very fine sand. Coarse sand and gravel at lower 4" of spoon (Fe stained; no odor).
8	40 - 42	1.6	4,8,12,12	.7	Light brown medium sand with thin bands of very fine sand. Coarse sand and gravel at lower 4" of spoon (Fe stained; no odor).
9	45 - 47'	1.8	8,10,11,12	.1	Light brown fine sand; well sorted with Fe concentrations at 45.3'
10	50 - 52'	2	5,11,14,35	.3	Light brown medium sand with some fine sand; trace gravel, cobbles at 51.5'
11	55 - 57'	2	5,20,28,27	.1	Light brown very fine sand; well sorted; moist
12	60 - 62'	2	5,20,22,58	.5	Light brown well sorted medium sand with some fine sand; wet

Remarks:

Alliance took matrix spix from sample number 10.

The water table was encountered at approximately 60 feet below land surface.

301993

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 12/8/91

BORING NO: IB-5

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 4 1/4"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split Spoon

WEATHER: Clear skies and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0-2			0	Dark brown poorly sorted sand and gravel (fill).
2	5-7	2	26,6,3,3	10.2	Brown fine sand with cobbles throughout; poor recovery (Fill).
3	10-12	1.5	19,22,24,21	4	Light brown medium to coarse sand with a thin layer of coarse sand and gravel (moist).
4	15-17	1.5	24,17,22,29	6.1	Brown poorly sorted medium to coarse sand with some gravel.
5	20-22	.1	200,1,1	20	Poor sorted sand.
6	23-25	1.3	165,38,30,26	4.9	23-23.5' Brown fine to medium sand with some gravel silt layer at 23.5-23.8' medium sand with some coarse sand.

Remarks: Sample #1 obtained from drill cuttings.

2891323Z

301994

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 12/8/91

BORING NO: IB-5S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 4 1/4"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split Spoon

WEATHER: Clear skies and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
7	30-32	1.6	8,24,35,48	2	Light brown pooly sorted medium sand and gravel; with some fine sand; moist no odor.
8	35-37	1.5	13,23,26,20	6.1	Thin lenses of coarse sand interbedded with medium sand. Moist layer of coarse sand at tip of spoon.
9	40-42	1.5	13,36,23,31	1.6	Same as above.
10	45-47	1.5	15,38,58,50	1.6	Well sorted medium sand.
11	50-52	1.5	10,24,34,24	1	Same as above.
12	55-57	1.5	18,56,17,18	1	Light brown fine to medium sand; no odor; trace gravel; moist.

Remarks: Sample #'s 4 and 8 retained for VOA, Pest/PCB, Phenol, Cn, Metals and BNA analysis. Sample time #4 = 1110 and #8 = 1420.

2891323Z

301995

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-9-92

BORING NO: BDW-2

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split spoon

WEATHER: Partly cloudy; 50's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	16-18'	.5	1,1,2,3	244	Dark brown wet silt with some fine to coarse sand. Sewage odor (oil sheen).
2	20-22'	1.2	2,3,3,4	61	Light brown poorly sorted fine to coarse sand; trace of stained soil; moist.
3	25-27'	.9	3,3,4,5	230	Light brown poorly sorted fine to coarse sand; trace of stained soil; moist.
4	30-32'	1.2	1,4,10,14	38	Light brown poorly sorted fine to coarse sand with some cobble chips.
5	35-37'	1.5	4,9,10,14	70	Light brown poorly sorted fine to coarse sand with some cobble chips.
6	40-42'	1.6	6,10,10,14	23	Light brown fine sand with some gravel.
7	45-47'	1.6	8,11,14,16	24	Buff, well sorted fine sand, trace medium sand.

Remarks: Retained samples 1 and 3 for VOC, Pest/PCB, Metals, BNA's, phenols and cyanide laboratory analysis.

301996

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-9-92

BORING NO: BDW-2

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split spoon

WEATHER: Partly cloudy; 50's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
8	50-52'	1.7	5,10,14,15	6.2	Buff well sorted fine sand, trace medium sand.
9	55-57'	1.5	8,14,19,25	3.4	Buff (white) well sorted fine sand.
10	60-62'	1.5	10,14,19,27	14	Light brown fine sand with trace of coarse sand;wet.

Remarks:

301997

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 12/8/91

BORING NO: IB-5S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 4 1/4"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split Spoon

WEATHER: Clear skies and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
13	6-62	1.5	15,34,55,64	1	Well sorted medium sand. Saturated no odor.

Remarks: Water-table was encountered approximately 60' below land surface.

2891323Z

301998

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 12/7/91

BORING NO: IB-6

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 4 1/4"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split Spoon

WEATHER: Partly cloudy and cold

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0-2			0	Brown fine sand with some gravel.
2	5-7	1.6	3,3,5,7	1.2/1.2	Light brown fine to coarse sand with some gravel; trace cobbles (Fill).
3	10-12	1.6	60,30,30,47	.4	Brown fine sand with some meduim sand and gravel.
4	15-17	1.6	not taken	.4	Poorly sorted fine to meduim sand; no odor; dry with some gravel.
5	20-22	1.6	22,14,17,17	.8	Light brown poorly sorted sand and gravel; no odor.
6	25-27	1.5	20,20,23,32	2.4	Light brown medium sand with thin bands of coarse sand and gravel (Fe stained).

Remarks:

2891323Z

301999

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 12/7/91

BORING NO: IB-6

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 4 1/4"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split Spoon

WEATHER: Partly cloudy and cold

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
7	30-32	1.5	31,40,25,21	7.2	Same as above.
8	35-37	1.6	49,28,38,43	4	Brown medium sand with some coarse sand and a trace of gravel. Biotite/~~muscovite~~ rich cobble at tip.
9	40-42	1.6	60,15,17,30	3.2	Light brown fine sand with thin band of coarse sand and gravel at 40.8'.
10	45-47	1.5	14,16,31,32	2.1	Light brown well sorted fine sand; trace cobbles.
11	50-52	1.2	25,13,14,21	1.2	Same as above.

Remarks: Sample numbers 7 and 9 were retained for VOA, Metals, Phenols, Cyanid, Pesticides and BNA laboratory analyses.
Sample time #7 = 1437
Sample time #9 = 1640

2891323Z

302000

(X)

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 12/7/91

BORING NO: IB-6

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 4 1/4"

BOTTOM OF BORING (BOB): 62'

SAMPLER TYPE: Split Spoon

WEATHER: Partly cloudy and cold

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
12	55-57	1.6	34.20,10,20	1.2	Brown medium sand with some Fe stained coarse sand (banding); moist; no odor.
13	60-62	1.6	16,31,30,26	.8	Brown fine to medium sand; trave gravel. Wet at 60'.

Remarks: The water-table was encountered approximately 60' below landsurface.

2891323Z

302001

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/5/92

BORING NO: DW-5

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C., Marl

DRILL TYPE: AW drill rod

BOREHOLE DIAMETER: 3"

BOTTOM OF BORING (BOB): 2'

SAMPLER TYPE: Split-spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0 - 2'	2	4/12	0	0 - 1.3 Brown poorly sorted fine sand and coarse sand. 1.3 - 2' Light brown (orange) poorly sorted fine to coarse sand with some gravel; no odor; dry

Remarks:

Retained sample for CN/Mercury laboratory analysis at 1710.

302002

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/5/92

BORING NO: DW-6

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Marl

DRILL TYPE: AW drill rod

BOREHOLE DIAMETER: 3"

BOTTOM OF BORING (BOB): 2'

SAMPLER TYPE: Split-spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0 - 2'	1.5	2/12"		0-.5 Brown medium sand with some leaf litter .2-1 Light brown fine to medium sand with some gravel 1 - 1.5 Light orange brown fine sand with some gravel 1.5-2 Orange SAAB Dry

Remarks:

Retained sample for CN/Mercury laboratory analysis.

302003

1/7/92
692323.C

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/5/92

BORING NO: DW-7

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C, Marl

DRILL TYPE: AW drill rod

BOREHOLE DIAMETER: 3"

BOTTOM OF BORING (BOB): 2'

SAMPLER TYPE: Split-spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0 - 2'	1	1,2,2,3	0	0-.3 Dark brown silt with some leaf litter no odor .3-1 Poorly sorted medium to coarse sand and gravel; wet

Remarks:

Retained sample for mercury and CN laboratory analysis. Sample time was 1600.

302004

1/7/92
792323.C

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/5/92

BORING NO: DW-9

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C, Marl

DRILL TYPE: AW drill rod

BOREHOLE DIAMETER: 3"

BOTTOM OF BORING (BOB): 2'

SAMPLER TYPE: Split-spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0 - 2'	1	5,6,5,6	0	0-.6 Dark stained silty sand (oil sheen) with a strong "tar" odor; saturated. .6-1 Brown coarse sand and gravel.

Remarks:

Retained sample for CN/Mercury laboratory analysis at 1606.

302005

1/7/92
892323.C

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 1/5/92

BORING NO: Catch Basin

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C., Marl

DRILL TYPE: AW drill rod

BOREHOLE DIAMETER: 3"

BOTTOM OF BORING (BOB): 2'

SAMPLER TYPE: Split-spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0 - 2'	2	2,4,5,6	0	0-.2 Brown medium sand with some leaf litter .2-1 Light brown fine to medium sand with some gravel 1 - 1.5 Light orange brown fine sand with some gravel 1.5-2 Orange SAAB Dry

Remarks:

Retained sample for CN/----- laboratory analysis at 1700.

302006

1/7/92
592323.C

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/24/91

BORING NO: MW-4S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 82'

SAMPLER TYPE: Split Spoon

WEATHER: Rain and cool; 40's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0-2	1.2	11,27,17,40	0	Gray brown silty sand with some brown sand and gravel (Road fill).
2	5-7	1.6	7,17,23,20	0	Same as above.
3	10-12	2	10,12,13,17	0	Cobble chips (quartz); loose medium sand with some coarse sand and gravel.
4	15-17	1.6	4,11,17,19	0	Orange brown poorly sorted coarse sand and gravel; moist; trace cobbles.
5	20-22		No Recovery, lead auger pushing down large cobble.		
6	25-27	1.25	5,7,9,21	0	Light brown coarse sand with some gravel; trace medium sand.

Remarks:

2891323Z

302007

(A)

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/24/91

BORING NO: MW-4S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 82'

SAMPLER TYPE: Split Spoon

WEATHER: Rain and cool; 40's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
7	30-32	1	6,10,12,15	0	Same as above.
8	35-37	1	5,11,14,15	0	35-35.5' Light brown poorly sorted medium to coarse sand. 35.5-36' Coarse sand rich with iron and mica chips; cobbles throughout; moist; no odor.
9	40-42		Split spoon refusal; no blow counts recorded.		
10	45-47	.5	5,10,11,19	0	Light brown meduim sand with some fine sand; trace gravel and silt; dry; friable.
11	50-52	.5	4,7,8,15	.5	Light brown well sorted fine to medium sand.

Remarks: Sample #13 retained for PCBs, BNA, Phenols, Cn and Metals laboratory analyses. Ground water was encountered approximately 60 feet below land surface.

2891323Z

302008

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/24/91

BORING NO: MW-4S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 82'

SAMPLER TYPE: Split Spoon

WEATHER: Rain and cool; 40's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
12	55-57	.33	3,6,11,20	.33	Light brown well sorted fine sand with some medium sand; no odor.
13	60-62	1.6	3,16,13,22	0	Light brown medium sand with some coarse sand; no odor.
14	65-67	.60	3,5,8,11	0	Poorly sorted fine to coarse sand with some gravel.
15	70-72	1.25	3,7,9,9	0	Light brown well sorted fine sand; trace medium sand.

Remarks: Sample #13 retained for PCBs; BNA, Phenols, Cn and Metals laboratory analyses. Ground water was encountered approximately 60 feet below landsurface.

2891323Z

302009

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/24/91

BORING NO: MW-4S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 8"

BOTTOM OF BORING (BOB): 82'

SAMPLER TYPE: Split Spoon

WEATHER: Rain and cool; 40's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
16	75-77	1.33	3,5,6,11	0	Same as above.
17	80-82	0.66	4,6,8,12	0	Well sorted fine sand with some medium sand; light brown in color.

Remarks: Sample #16 retained for BNA, VOA's, Metals, Pest., PCBs, phenols and Cn analyses.

2891323Z

302010

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-10-92

BORING NO: MW-5D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Foggy and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0-2			0	Brown fine sand with some medium sand, loose, no odor.
2	5-7	1.5	4,3,3,3	11	Brown fine sand with some medium sand, loose, no odor. Dark brown silt at tip. Fuel odor with some staining.
3	10-12	1.5	7,10,4,13	5.5	Light brown fine to coarse sand; no odor.
4	15-17	.8	5,12,18,25	0	Light brown fine to coarse sand; no odor.
5	20-22'	.1	6,9,14,19	0	Light brown fine to coarse sand; no odor.
6	25-27'	.1	12,6,5,6	0	Light brown medium sand. Light "sweet" odor from cuttings.
7	30-32'	1.5	4,7,14,24	0	Light brown with some Fe staining, poorly sorted fine to coarse sand with some gravel; no odor.

Remarks:

302011

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-10-92

BORING NO: MW-5D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Foggy and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
8	35-37'	1.8	8,13,19,29	0	Light brown with some Fe staining, poorly sorted fine to coarse sand with some gravel; no odor. Fe staining in spoon tip.
9	40-42'	1.5	4,14,24,30	0	Light brown fine to medium sand with some gravel.
10	45-47'	1.5	10,13,20,30	0	"Buff" light brown, well sorted fine sand.
11	50-52'	1.8	8,12,12,17	0	"Buff" light brown, well sorted fine sand.
12	55-57'	1.8	8,16,32,50	0.1	Light brown fine to medium sand.
13	60-62'	1.8	6,10,12,25	1	Light brown fine to medium sand. Wet.
14	65-67'	0.1	2,4,7,14	0	Light brown fine to medium sand.
15	70-72'	1.5	1,3,4,4	.3	Light brown fine to medium sand. Approximately 3' of sand in auger. Driller sand bailed to remove sand.

Remarks:

992748F

302012

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-10-92

BORING NO: MW-5D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Foggy and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
16	75-77'	.05	33,25,25,25	.3	Light brown fine sand. Poor recovery.
17	80-82	1	5,7,12,26	0	Light brown poorly sorted fine to coarse sand.
18	85-87	.5	6,6,10,12	.5	Light brown poorly sorted fine to coarse sand.
19	90-92	1	4,4,6,10	.3	Light brown well sorted fine sand.
20	95-97	1.5	7,12,15,16	.3	Light brown well sorted fine sand.
21	100-102	1.2	7,14,23,26	0	Light brown fine sand. (Micapons)
22	105-107	1.1	3,7,12,19	.7	Light brown fine sand with some coarse sand.
23	110-112	0.1	3,16,16,29	.5	Light brown fine sand with some coarse sand.
24	115-117	1.3	4,11,16,22	0	Light brown fine sand with some medium sand and trace coarse sand; orange brown clay in spoon tip (trace).

Remarks:

302013

992748F

SURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-10-92

BORING NO: MW-5D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Foggy and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
25	120-122	.3	4,6,6,8	0	Light brown fine sand with some medium sand and trace coarse sand; orange brown clay in spoon tip (trace).

Remarks:

302014

(X)

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/25/91 - 11/26/91

BORING NO: MW-6S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 85'

SAMPLER TYPE: Split Spoon

WEATHER: Sunny and cold

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	2-3	1.6	6,13,21,25	4.3	2-3.1 Poorly sorted loose sand and gravel with some fine sand and silt. 3.1-3.66 Dark brown fine sand with some silt; trace asphalt chips.
2	5-7	1.6	6,27,26,28	.9	Same as above.
3	10-12	1.6	6,14,15,18	0	Light brown poorly sorted fine to meduim sand with some coarse sand and gravel; Fe stained soil at lower half of spoon.
4	15-17	0.16	9,18,21,16	0	Cobble caught in spoon tip. Poor recovery light brown sorted poorly sand and gravel.

Remarks:

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/25/91 - 11/26/91

BORING NO: MW-6S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 85'

SAMPLER TYPE: Split Spoon

WEATHER: Sunny and cold

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
6	20-22	.16	9,21,27,30	6.2	Light brown poorly sorted sand and gravel.
7	25-27	1.6	3,8,12,14	0	Light brown fine to medium sand with gravel. Fe banding throughout sample.
8	30-32	1.5	3,8,8,8	0	Light brown poorly sorted meduim to coarse sand with some fine sand and a trace of gravel.
9	35-37	1.6	3,7,14,20	0	35-35.3 Light brown well sorted fine sand. 35.3-36.66 Poorly sorted medium to coarse sand with thin layer of gravel (Fe stained).
10	40-42	1	5,9,10,10	2.4	Light brown fine to medium sand, trace gravel and cobbles.

Remarks:

2891323Z

302016

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/24/91

BORING NO: MW-6S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 85'

SAMPLER TYPE: Split Spoon

WEATHER: Sunny and cold

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
11	45-47	1.6	3,4,8,17	0	Light brown, well sorted, angular medium sand with trace amounts of gravel. Fe banding and rock chips throughout.
12	50-52	1.6	3,5,7,12	0	Fine brown well sorted fine sand.
13	55-57	1.6	5,16,21,26	0	Same as above.
14	60-62	1.3	3,7,12,15		Light brown well sorted medium sand with some fine sand and trace gravel.
15	65-67	.25	3,7,10,16	0	Medium tan fine sand.

Remarks:

2891323Z

302017

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/24/91

BORING NO: MW-6S

RECORDED BY: J.A. Schaefer

DRILLER: Marine Pollution Control

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 85'

SAMPLER TYPE: Split Spoon

WEATHER: Sunny and cold

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
17	70-72	0.33	3,4,11,16		Poorly sorted, light brown fine to medium sand with some gravel.
18	74-77	1.6	4,10,16,16		Same as above.

Drilled down to 85' below landsurface. Placed monitoring well MW-6S at approximately 81' below landsurface.

Remarks: Retained sample #18 for Pest/PCBs, BNAs, Metals, Phenols, Cn and VOAs laboratory analyses (sample time 1300).

2891323Z

302018

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/19/91

BORING NO: B-1D

RECORDED BY: J.A. Schaefer

DRILLER: Don Klaus (MPC)

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split Spoon

WEATHER: Clear skies and sunny

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	HNU (ppm)	SAMPLE DESCRIPTION
	0-.15	-	-		Asphalt
	.15-1	-	-		Poorly sorted sand and gravel.
1	1.5-3.5	1	5,10,20,28	1	Poorly sorted fine to coarse sand with some gravel; moist; no odor.
2	5-7	.65	7,17,19,36	1	Light brown fine to medium sand; dry.
3	10-12	.9	7,17,27,28	11	Light brown fine sand with some medium to coarse sand and gravel. Cobble chips throughout.
4	15-17	1.6	5,11,19,26	2.5	15-16' Same as above. 16-16.6' Fe stained poorly sorted sand and gravel; moist; no odor.

Remarks: HNU background levels ranged from 4 to 6 ppm throughout the day.

2891323Z

302019

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/19/91

BORING NO: B-1D

RECORDED BY: J.A. Schaefer

DRILLER: Don Klaus (MPC)

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split Spoon

WEATHER: Clear skies and sunny

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	HNU (ppm)	SAMPLE DESCRIPTION
5	20-22	1.6	7,12,17,23	1.5	20-20.66' Poorly sorted, light brown sand and gravel. 20.66-21.83' Fe stained coarse sand and gravel; trace cobbles.
6	25-27	- 0.16	5,7,11,22 7,11,14,0	28	Rock caught in spoon tip. Fine to medium sand; rock caught in tip of spoon.
7	30-32	1.25	5,11,15,21	1	Light brown fine sand and medium coarse sand.
8	35-37	-			No recovery.
9	36-38	1.25	5,7,11,15	1	Loose, poorly sorted medium to coarse sand with some gravel; moist; Fe stained.

Remarks:

2891323Z

302020

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/191

BORING NO: B-1D

RECORDED BY: J.A. Schaefer

DRILLER: Don Klaus (MPC)

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split Spoon

WEATHER: Clear skies and sunny

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
10	40-42	.16	5,11,13,17	3.7	Same as above.
11	45-47	0.25	5,11,17,26	1.8	Brown well sorted medium sand; moist; no odor.
12	50-52	1.5	5,9,13,20	1.4	Light brown medium to coarse sand with some gravel; moist; no odor.
13	57-59	0.75	Not recorded	1.1	Light brown medium sand with some coarse sand; trace gravel; moist; no odor.
14	59-61	0.25	4,7,7,10		Light brown medium sand with some gravel; no odor.

Remarks: The water table was encountered approximately 59.75' below land surface. Sample number 14 and 15 composited for laboratory BNA, PEST/PCB, Metals, PCBs and phenols analyses (sample time 1525).

2891323Z

302021

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/20/91

BORING NO: B-1D

RECORDED BY: J.A. Schaefer

DRILLER: Don Klaus (MPC)

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split Spoon

WEATHER: Cloudy and cool

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
15	61-63	0.75	4,6,10,13		Same as above.
16	65-67	1	6,8,13,24	0	Light brown fine sand with some medium sand; trace gravel.
17	70-72	1.1	4,6,8,9	0	Same as above with some silt.
18	75-77	-	5,6,7,2	0	Heaved sand in augers (2') going back down with spoon to clean out heaved sand.
19	75-77	0.6	6,8,9,17	0	Light brown fine sand with some medium sand and silt; trace coarse sand.

Remarks:

2891323Z

302022

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/20/91

BORING NO: B-1D

RECORDED BY: J.A. Schaefer

DRILLER: Don Klaus (MPC)

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split Spoon

WEATHER: Cloudy and cool; occasional showers.

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
20	80-82	1.5	9,14,14,23	0	Light brown well sorted fine to medium sand; wet.
21	85-87	1.5	7,9,13,18	0	85-86.25 same as above 86.25-86.6 Orange silte with a trace of fine sand. 86.66-86.75 fine sand.
22	90-92	0.3	7,19,23,29	0	Light brown fine sand with some medium sand; trace gravel.
23	95-97	1.5	5,7,19,27	0	Light brown fine sand with some medium to coarse sand.

Remarks: Sand bailed heaved sand prior to sampling from 75' through 120' below land surface.

2891323Z

302023

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 11/20/91

BORING NO: B-1D

RECORDED BY: J.A. Schaefer

DRILLER: Don Klaus (MPC)

DRILL TYPE: Hollow Stem Auger

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split Spoon

WEATHER: Cloudly and cool; occasional showers.

SAMPLE NO.	DEPTH FROM-TO	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
24	100-102	1.6	8,11,12,19	0	Light brown poorly sorted fine to medium sand with some coarse sand.
25	105-107	.25	4,8,10,15	0	Same as above.
26	110-112	.83	5,11,17,24	0	Poorly sorted fine to coarse sand; trace gravel.
27	115-117	1.6	4,11,14,22	0	Same as above with a trace of coarse gravel.
28	120-122	1.6	1,9,11,14	0	Tan fine sand with some medium sand.

Remarks: Sample #28 retained for VOA, BNA, Pest, PCBs and Metals laboratory analysis (sample time 1324). Boring grouted up to land surface (1500 lbs of portland cement used).

2891323Z

302024

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Windy and cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
1	0-2'			0	Light brown poorly sorted sand.
2	2-4'	.5	7,13,14,16	0	Light brown poorly sorted sand.
3	4-6'	1	7,8,9,9	0	Coarse sand and gravel at spoon tip. Light brown fine sand from 4-4.8'.
4	6-8'	1.1	12,12,15,15	0	Light brown fine sand with some medium sand; trace gravel.
5	8-10'	1.1	7,9,11,12	0	Light brown fine sand with some medium sand; trace gravel.
6	10-12'	1	9,9,10,11	0	Light brown medium sand with some gravel.
7	12-14'	1	7,9,10,11	0	Light brown medium sand with some gravel.
8	14-16	1.5	8,10,13,16	0	Orange (Fe) brown coarse sand with some gravel.

Remarks:

302025

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Windy and cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
9	16-18'	1.8	9,10,13,14	0	Light brown medium to coarse sand and gravel; fe stained (reddish orange).
10	18-20'	.3	NT	0	Orange brown medium sand with a trace of gravel.
11	20-22'	1	4,6,6,10	0	Orange brown medium sand with a trace of gravel.
12	22-24'	.5	6,9,14,19	0	Orange brown medium sand with a trace of gravel.
13	24-26'	.8	5,7,7,9	0	Orange brown medium sand with a trace of gravel.
14	26-28'	1.2	76,7,12,19	0	Orange brown medium sand with a trace of gravel.
15	28-30'	1.2	4,5,7,9	0	Light brown poorly sorted fine to coarse sand, with some gravel.

Remarks: NT = Not taken.

302026

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Windy and cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
16	30-32	1.2	10,12,15,17	0	Light brown poorly sorted fine to coarse sand with some gravel.
17	32-34	1.5	7,9,13,17	0	Light brown poorly sorted fine to coarse sand with some gravel.
18	34-36	1.2	5,7,7,8	0	Light brown poorly sorted fine to coarse sand with some gravel.
19	36-38	1.5	6,6,6,6	0	Light brown medium sand with a trace of gravel.
20	38-40	1.5	10,12,17,14	0	Orange brown fine sand with some medium sand. Coarse sand and gravel in spoon tip.
21	40-42	1.2	5.7,8,12	0	Light brown fine sand with a trace of gravel.
22	42-44'	1.8	7,9,12,14	0	Light brown fine sand with a trace of gravel.

Remarks:

302027

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Windy and cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
23	44-46'	1.5	6,7,7,8	0	Light brown fine sand with a trace of gravel.
24	46-48'	1.8	8,9,10,11	0	Light brown fine sand with a trace of gravel.
25	48-50'	1.2	4,8,12,14	0	Light brown fine to medium sand grading to fine sand.
26	50-52'	1.3	14,16,17,18	0	Light brown fine to medium sand grading to fine sand.
27	52-54'	1.4	6,9,14,16	0	Light brown fine to medium sand grading to fine sand.
28	54-56'	1.5	NT	0	Light brown fine to medium sand grading to fine sand. Moist at tip.
29	56-58'	2	14,18,24,26	0	Light brown medium to coarse sand.

Remarks: Retained sample #29 for metals, CN, Pest, PCB, phenol, BNA and VOC laboratory analysis.

302028

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Windy and Cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
30	58-60'	2	7,9,12,13	0	Light brown medium to coarse sand.
31	60-62'	1.5	10,12,12,13	0	Light brown coarse sand.
32	62-64'	1.2	10,12,22,24	0	Light brown coarse sand.
33	64-66'	2	7,9,9,12	0	Light brown coarse sand with some medium sand (wet).
34	66-68'	2	6,7,10,4	0	Light brown coarse sand with some medium sand (wet).
35	68-70'	2	12,13,16,20	0	Light brown medium to coarse sand.
36	70-72'	2	9,10,14,16	0	Light brown medium to coarse sand.
37	72-74'	2	12,15,18,20	0	Light brown medium to coarse sand.

Remarks:

302029

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split Spoon

WEATHER: Windy and cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
38	74-76'	1.5	9,10,12,17	0	Light brown medium to coarse sand.
39	76-78'	1.8	5,7,9,15	0	Light brown medium to coarse sand; wet.
40	78-80'	1.2	7,9,9,12	0	Light brown medium to coarse sand; wet.
41	80-82'	1.8	6,7,12,18	0	Light brown coarse sand with some fine sand.
42	82-84'	.5	6,7,7,10	0	Light brown coarse sand with some fine sand.
43	84-86'	.3	6,8,10,12	0	Light brown poorly sorted fine to coarse sand.
44	86-88'	2	5,6,7,9	0	Light brown poorly sorted fine to coarse sand.
45	88-90'	1.5	7,9,10,13	0	Light brown fine to coarse sand.
46	90-92'	1	2,2,3,4	0	Light brown to medium sand.

Remarks: Retained sample #38 for TOC analysis. Sample time: 1500.

302030

992748F

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Windy and cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
47	92-94'	2	10,15,19,27	0	Light brown to medium sand.
48	94-96'	2	10,14,16,18	0	Light brown to medium sand.
49	96-98'	.8	7,8,15,17	0	Light brown fine sand with some silt.
50	98-100'	2	9.10,11,13	0	Light brown fine sand. Fe staining (thin bands)
51	100-102'	1.5	8,12,14,15	0	Light brown fine sand.
52	102-104'	2	6,7,8,9	0	Light brown coarse sand and gravel.
53	104-106'	1.2	9,9,12,12	0	Light brown coarse sand and gravel.
54	106-108'	1.3	7,7,8,9	0	Light brown coarse sand and gravel.
55	108-110'	1.5	6,7,7,8	0	Poorly sorted fine sand grading to gravel.

Remarks:

302031

SUBSURFACE LOG

PROJECT: Anchor Chemical

PROJECT NO: 269.01

DATE: 3-18-92

BORING NO: MW-7D

RECORDED BY: J.A. Schaefer

DRILLER: M.P.C. Mark

DRILL TYPE: Hollow Stem

BOREHOLE DIAMETER: 10"

BOTTOM OF BORING (BOB): 122'

SAMPLER TYPE: Split spoon

WEATHER: Windy and cold; 20's

SAMPLE NO.	DEPTH FROM-TO FEET	RECOV. (ft)	NO. OF BLOWS Per 6"	OVM (ppm)	SAMPLE DESCRIPTION
56	112-114'	.6	6,6,7,8	0	Fine light brown sand with some gravel mix.
57	114-116'	2	7,9,12,13	0	Light brown coarse sand and gravel.
58	116-118'	2	5,5,7,9	0	Well sorted fine sand.
59	118-120'	2	6,6,9,10	0	"Buff" coarse sand with some gravel.

Remarks: Sample #57 retained for BNA, Pest, PCB, VOC, Metals and phenols analysis at 1230.

302032

992748F