1.3.1

GOODWIN, PROCTER & HOAR
(A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS)
COUNSELLORS AT LAW
EXCHANGE PLACE
BOSTON, MASSACHUSETTS 02109

TELEPHONE (617) 570-1000
TELECOPIER (617) 523-1231
TELEX 94-0640
CABLE-GOODPROCT, BOSTON

JEFFREY C. BATES
(617) 570-1499

February 25, 1987

Superfund Records Center
SITE: Wells G + H
BREAK: 11.9
OTHER: 548831

SDMS DocID 548831

Ms. Gwen Ruta
HRS-1903
Waste Management Division
U.S. Environmental Protection Agency
J.F.K. Federal Building
Boston, MA 02203

Re: UniFirst Corporation/Woburn, Massachusetts
Request for Information Pertaining
To Wells G & H Superfund Site

Dear Ms. Ruta:

Last week, my client, UniFirst Corporation, responded to the above-referenced Information Request. Today, I received some new laboratory anaylses data sheets from ERT. These materials were not available to UniFirst at the time of UniFirst's response. Accordingly, I am forwarding them to you with this letter.

Sincerely,

Jeffrey C. Bates

JCB/dg

Enclosure

SVS-3486/U

DATA CHART
For Use With

1 LOCATION: 13 OLYMPIA ROAD (Street No. and/or Corner) WOBURN (City) MA (State) (Telephone No.)

2 OWNER: UNIFIRST CORPORATION (Name) 13 OLYMPIA ROAD, WOBURN, MA (Address) (Representative) (Position) (Telephone No.)

3 OPERATOR: SAME AS ABOVE (Name) (Dealer, Mgr. or Other) (Address (if different than Location)) (Telephone No.)

4 REASON FOR TEST: INVESTIGATE SOURCE OF SOIL CONTAMINATION

5 TEST REQUESTED BY: JEFF LAWSON (Name) SENIOR ENGINEER (Position) (Order No.) 696 VIRGINIA ROAD, CONCORD, MA (Billing Address)

6 SPECIAL INSTRUCTIONS: TEST FILL LINE (TANK WAS REMOVED)

7 CONTRACTOR OR COMPANY MAKING TEST MECHANIC(S) NAME: PCA ENGINEERING, INC. DREW LAWRENCE

8 IS A TANK TEST TO BE MADE WITH THIS LINE TEST? ☐ YES ☒ NO

9 MAKE AND TYPE OF PUMP OR DISPENSERS: NONE

10 WEATHER: PARTLY CLOUDY TEMPERATURE IN TANKS ____ °F ____ °C COVER OVER LINES: CONCRETE WALL (Concrete, Black Top, etc.) APPROXIMATE BURIAL DEPTH: 16"

OWNER: Name

LOCATION: State: MASSACHUSETTS; City: WOBURN

DATE OF TEST: Year 87; Mo. 1; Day 13

11 IDENTIFY EACH LINE AS TESTED	12 TIME (MILITARY)	13 LOG OF TEST PROCEDURES, AMBIENT TEMPERATURE, WEATHER, ETC.	14 PRESSURE psi OR kPa BEFORE	14 PRESSURE psi OR kPa AFTER	15 VOLUME READING BEFORE	15 VOLUME READING AFTER	15 VOLUME NET CHANGE	16 TEST RESULTS CONCLUSIONS, REPAIRS AND COMMENTS
FILL LINE	1100	STARTED LINE TEST		20				
	1115		20	20	.077	.077	+0	+0 GALLON/HOUR
	1130		20	20	.077	.077	+0	
	1145		20	20	.077	.077	+0	LINE TESTED 2" FILL, APPROX. 24" IN LENGTH
	1200		20	20	.077	.077	+0	

PCA ENGINEERING, INC.

177 ROYAL AVENUE • P.O. BOX 227 • HAWTHORNE, NEW JERSEY 07507-9227
Telephone 201-427-8540 • Boston 617-659-7793
TELEX: 219715

ENGINEERING • CORROSION CONTROL • TESTING • MATERIALS • DIVING • ENVIRONMENTAL SERVICES

January 20, 1987

ERT
696 Virginia Road
Concord, MA 07142

Att: Mr. J. Lawson, P.G.

Re: Pipeline Tightness Test
Unifirst Corp.
Woburn, Massachusetts
PCA Job No. 1718

Dear Sir:

Please find the attached data sheet containing the results of the pipeline tightness test performed on January 13, 1987 at Unifirst Corporation in Woburn, Massachusetts.

The 2-inch steel pipe under test had been used as a fill line for a recently removed storage tank that had been located inside the warehouse. The remaining section of this line is approximately 2 feet long running through the building foundation. At the time of the survey, the ends were found plugged with concrete.

The concrete plugs were removed and each end capped. The line was filled with water and pressurized. Gauging connected through one of the caps allowed for continuous monitoring of the hydrostatic pressure developed in the pipe. The data enclosed lists the pressure measurements recorded during the test.

The results show this section of piping is tight.

If you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,

PCA ENGINEERING, INC.

Bertram J. Phillips

BERTRAM J. PHILLIPS

BJP:Jaz

Enclosure

2. The Solinst installation log for wells UC7 and UC7A

3. PCA Engineering Inc. tank fill-pipe test logs.

Rec'd 2/20/87

UniFirst Corporation
15 Olympia Avenue
P.O. Box 4017
Woburn, Massachusetts 01888
Telephone (617) 933-5800

February 19, 1987

Ms. Gwen Ruta
HRS-1903
Waste Management Division
U.S. Environmental Protection Agency
J.F.K. Federal Building
Boston, MA 02203

Dear Ms. Ruta:

I am responding to EPA's Request to UniFirst for Information pertaining to the Wells G&H Superfund site in Woburn, Massachusetts. As you can imagine, providing answers that include information about operations and business practices that took place 20 years ago and which involve the activities of personnel who are, in some cases, dead and, in other cases, not available, and to provide accurate and complete responses within 15 days has not been easy. At this time, we are submitting information pertaining to your request that we have been able to assemble since I received your request.

In Question 1 of your Information Request, you asked for documentation pertaining to hydrogeologic investigations and/or environmental assessments conducted at UniFirst's Woburn facility. You specifically asked for documents relating to the activities of Environmental Research and Technology, Inc. (ERT) and Dr. John Cherry. Accordingly, we have enclosed with this response the following documents:

(1) Copy of Jeffrey Lawson's field book (Jeffrey Lawson is ERT's Senior Program Manager);

(2) Solinst installation logs for wells UC7 and UC7A;

(3) PCA Engineering Inc.'s tank fill-pipe test logs;

(4) ERT's HNu pore-gas analysis field logs;

(5) Field sampling notes taken by Jeffrey Lawson at the Woburn facility;

(6) Well and test pit logs taken in 1986 and 1987;

(7) Laboratory analyses data sheets;

(8) Draft environmental assessment prepared by ERAS, Inc. (the final version was not made available to UniFirst).

These documents constitute all documentation of hydrogeologic investigations and/or environmental assessments that has not already been submitted and which does not constitute attorney-client communications or mental impressions, conclusions and legal theories of UniFirst's specially retained experts and counsel (as to which we are, however, giving you the underlying data not generated by EPA or its contractors) that is presently available to UniFirst management.

In your second question, you have asked UniFirst to identify all leaks, spills or releases of any hazardous substance into the environment which may have occurred during the period of UniFirst's operations at the Woburn facility. As you know, ERT conducted an environmental assessment and investigation in 1983 and 1984 under the consent order in EPA Docket No. 83-1006. ERT's reports on its activities under that order, including the Assessment of Groundwater Contamination Potential at Interstate Uniform Corp., Woburn, Massachusetts, November, 1983; the Summary of Monitoring Program, UniFirst Corp., Woburn, Massachusetts, August, 1984; and the Evaluation and Recommendations for Alternatives Concerning Additional Investigation of Groundwater Contamination, September, 1984, you already have in your possession. Those reports described the only releases of which UniFirst management was then and is now aware.

Recently, UniFirst has undertaken additional field investigations into possible sources of ground or groundwater contamination, as described in the scopes of work submitted to EPA by ERT and our attorneys and in field consultation with Mr. David Delaney. These investigations included a pressure

test of the fill-pipe through which product was fed into and out of an above-ground storage tank that was once within the building. The results reported in Document 4 (listed above in response to Question 1) reveal no detectible leaks. In addition, Jeffrey Lawson tested pore-gas samples with an HNu analyzer at numerous sites on the property. We do not believe that the results of these tests, included in Document 5, as noted above, reveal any release or dumping of hazardous substances or waste. Excavation of a diesel tank in December 1986 also exposed a sewer line that reportedly transported wastewater from the 1966-69 drycleaning operations, and no evidence of leakage was detected. A test pit was dug outside the facility near the fill-pipe that was used to fill the indoor storage tank, and no evidence of releases or dumping was detected there either. Well UC8 was then installed inside the loading dock because there reportedly had once been a storm drain in that vicinity. As we have reported to you, tetrachloroethene was discovered in this well.

The discovery of tetrachlorethene in Well UC8 and EPA's Information Request have caused us to recheck our records and re-interview available past and present employees who were involved in or familiar with operations that involved tetrachloroethene at the facility. To date, however, we have been unable to discover any releases other than those previously reported to EPA or to determine that those releases were the source(s) of the tetrachloroethene found in UC8.

In its third inquiry, EPA has asked UniFirst to submit data on any hazardous substances or waste purchased, generated, stored, treated, disposed of, transported, or otherwise handled at the Woburn facility. All of the data presently available to UniFirst management that are responsive to this request may be found in the documents submitted with this letter and under the 1983 consent order.

Very truly yours,

Ronald Croatti
Vice-Chairman

SVS-3371/U

Rec'd 3/9/87

GOODWIN, PROCTER & HOAR
(A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS)
COUNSELLORS AT LAW
EXCHANGE PLACE
BOSTON, MASSACHUSETTS 02109

JEFFREY C. BATES
(617) 570-1499

TELEPHONE (617) 570-1000
TELECOPIER (617) 523-1231
TELEX 94-0640
CABLE-GOODPROCT. BOSTON

February 25, 1987

Ms. Gwen Ruta
HRS-1903
Waste Management Division
U.S. Environmental Protection Agency
J.F.K. Federal Building
Boston, MA 02203

Re: UniFirst Corporation/Woburn, Massachusetts
Request for Information Pertaining
To Wells G & H Superfund Site

Dear Ms. Ruta:

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Sincerely,

Jeffrey C. Bates

JCB/dg

Enclosure

SVS-3486/U

5. Field sampling notes taken by Jeffrey Lawson at the Woburn plant.

ERT

Well No. UC-7

GROUND WATER SAMPLE COLLECTION RECORD

Job No. 0445-003 Date: 1/7/87

Location: Woburn MA Time: S ____

Weather Conds.: CLOUDY 35°F F ____

1. WATER LEVEL DATA: (from ToC)

ToC Elevation (from LS) ____

a. Total Well Length (+ TC) ____ (known, meas.)

Tape Corr. (TC) ____

b. Water Table Elev. (+ TC) ____

Well Dia. ____

c. Length of Water Column ____ (a-b)

2. WELL PURGING DATA:

a. Purge Method SOLINST SYSTEM

b. Required Purge Volume (@ ____ well volumes) ____

c. Field Testing: Equipment Used Orion pH Cole Parmer Cond

Volume Removed	T°C #1	#2	3	4	5	PH 1	2	3	4	5	Spec. Cond. 1	2	3	4	5	Color #3
1	12	12	12	13	11	6.45	6.92	6.60	6.63	7.54	15.64	7.25				CLEAR - (TAN TURBID)
2	12	11.5	12	12	11	6.47	6.82	6.63	6.67	7.59		ND	CAL			#1 CLEAR (VOLUME [illegible])
3	11.5	12	11.5	13	10	6.41	6.86	6.72	6.61	7.54						

3. Sample Collection: Method ____

Container Type	Preservation	Analysis Req.
3 VOA PER SAMPLE PORT	—	GC1 GC

Comments: 5 SAMPLE PORTS

SAMPLES ARE UC 7-1 to 5

UC-7-6 IS A FIELD BLANK

ERT

Well No. UC-7

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D49E-003 Date: 1/9/77

Location: Woburn MA Time: S _____

Weather Conds.: Sunny 35° F F _____

1. WATER LEVEL DATA: (from ToC)

ToC Elevation (from LS) _____

a. Total Well Length (+ TC) _____ (known, meas.)

Tape Corr. (TC) _____

b. Water Table Elev. (+ TC) _____

Well Dia. _____

c. Length of Water Column _____ (a-b)

2. WELL PURGING DATA:

a. Purge Method Solinst

b. Required Purge Volume (@ ____ well volumes) _____

c. Field Testing: Equipment Used _____

Volume Removed	T°C 1	2	3	4	5	PH 1	2	3	4	5	Spec. Cond. µmho/cm 1	2	3	4	5	Color
10 volumes	11.5	12.5	12	13	12.5	6.43	6.81	6.77	6.71	6.91	1225	1150	700	600	1100	CLEAR
																UC-7-5 - [illegible]

3. Sample Collection: Method _____

Container Type	Preservation	Analysis Req.
2 [illegible] vial / sample	—	VOC 601

Comments: _____

12-84

1/8/87

Purging UC-7 - W.L in 2" casing 6.82' BTC

TO DATE THE 5 PORT SYSTEM HAS BEEN COMPLETELY PURGED 8 TIMES WITH THE EXCEPTION OF UC 7-1 WHICH HAS BEEN PURGED 10 TIMES

# of PURGES TODAY: ~~||||~~ ~~||||~~ ~~||||~~

UC-7A - UNABLE TO DETERMINE DEPTH TO WATER in casing

1/9/87

UC-7 PURGES UC-7 CENTER CASING W.L. 6.82'

~~||||~~ ||||

UC-7A - UNABLE TO REACH WATER 3'-5'

I'm Purging UC-7A w/ PERISTALTIC PUMP

PUMPING RATE APPROX 1.5 min / QUART = 6 min / GAL

UC-7A-1	START	TIME	10:30A	FINISH	11:45A
UC-7A-2	"	"	11:47A	"	12:56P
UC-7A-3	"	"	12:58P	"	1:30P
UC-7A-4	"	"		"	
UC-7A-5	"	"		"	

HINU HEAD SPACE DATA on UC-7 1 TO 5

CALIBRATE DATA HINU CAL GAS 14 PPM @ 9.8 SPAN w/ 10.0 EV PROBE 150 PS

SPAN START - 7.82 VALUE - 16 PPM

SPAN FINISH - 9.60 VALUE 14 PPM

UC-7-1	200-300	PPM
UC-7-2	500	PPM
UC-7-3	200	PPM
UC-7-4	15	PPM
UC-7-5	12 (100 DOWN TUBE)	PPM

DALLAS WAIT
ENSECO INCORPORATED

205 ALEWIFE BROOK PKWY
CAMBRIDGE MA 02138

SETTLING TEST

INFLUENT HAS ONLY SLIGHTLY MORE SEDIMENT THAN THE EFFLUENT

IT IS A FLUFFY IRON COLORED FLOCK

WOBURN 1/7/87

	UC 7A	W L	
1	~ 2' of HOSE	~ 9.5	TO TOP OF TUBE OUT SIDE CASING 9.25'
2	~ 2.3 " "	~ 9.5	11' W/ SOLINST ± ~.1' AGAIN 11'
3	~ 2.3'		
4	~ 3' of HOSE	~ 8	
5	~ 4' of HOSE	~ 8	TO TOP OF TUBE

CASING

CHECK BOTH CASINGS NEXT TRIP

TRUCK MILEAGE @ UNIFIRST 26983
15
STARTING 26968
FINAL 27005

12/17/8[illegible]

0.3 0.3 0.2

12/18/56

[illegible] FIRST [illegible] WATER [illegible]

[illegible] .56'

NELL

1 - 4.[illegible] + .5[illegible] = 4.62

2 8.41 + .56 = 8.97

3 + .56 =

2

3

1/16/87 UNIFIRST

~~SA~~ SAMPLES ARE BEing COLLECTED FROM ALL THE FULL BARRELS FOR 624 ANALYSES. BIRINGS WITH MULTIPLE BARRELS WILL BE COMPOSITED BY THE LAB

	BARREL	IN VENTORY	
UC-4	1	BARRELS	ADJACENT TO DUMPSTER
UC-5	1	"	ADJACENT TO LOADING DOCK
UC-6	3	"	
UC-7	16	"	15 SAMPLED
UC-8	1		NO SAMPLE
TOTAL	22	BARRELS	

ERT

S-71-D
Well No.

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D882.280 Date: 2/3/87

Location: UniFirst Woburn Time: S ~1:00 PM

Weather Conds.: Cloudy 7,-°F F 2:40 PM

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) 0

a. Total Well Length (+ TC) 42.70 (known, meas.) Tape Corr. (TC) .51'

b. Water Table Elev. (+ TC) 8.53' (~~8.40~~ 8.02+.51) Well Dia. 1.5"

c. Length of Water Column 34.17 (a-b)

2. WELL PURGING DATA:

a. Purge Method PVC BAILER

b. Required Purge Volume (@ ____ well volumes) 3 gal / vol

c. Field Testing: Equipment Used Orion pH, YSI S-C-T

Volume Removed	T°	PH	Spec. Cond.	Color
3 well volumes	14	6.31	850	gray green/silty

3. Sample Collection: Method

Container Type	Preservation	Analysis Req.

Comments:

ERI

S-71-S
Well No.

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D888-280 Date: 2/3/87

Location: UniFirst Woburn Time: S 2:40 PM

Weather Conds.: cloudy 35°F F 2

1. WATER LEVEL DATA: (from ToC)

a. Total Well Length (+ TC) 14.73 (known, meas.)

b. Water Table Elev. (+ TC) 8.51 (8.00 + 0.51)

c. Length of Water Column 6.22 (a-b)

ToC Elevation (from LS) 0

Tape Corr. (TC) 0.51

Well Dia. 1.5"

2. WELL PURGING DATA:

a. Purge Method ~~teflon~~ PVC Bailer

b. Required Purge Volume (@ 3 well volumes) (0.5 x 3) 1.5 gallons / purge volume ~~[illegible]~~

c. Field Testing: Equipment Used

Volume Removed	T°C	PH	Spec. Cond.	Color
0.5 gallons DRY	11	11.51	2800	gray (fill)
1.0 gallons (DRY)	8	9.07	2000	"
~~1.5 gallons~~				

3. Sample Collection: Method PVC BAILER

Container Type	Preservation	Analysis Req.
3 VOA vials	—	GC/MS

Comments: "AFTER" SAMPLED 2/4/87 AFTER PURGING DRY + WAITING FOR RECOVERY BEFORE + AFTER PURGE SAMPLES COLLECTED

7/12-84

ERT

Well No. UC-7A

GROUND WATER SAMPLE COLLECTION RECORD

Job No. 0880-280 Date: 2/3/87

Location: UniFirst Woburn Time: S ____ F ____

Weather Conds.: Cloudy 35°F

1. WATER LEVEL DATA: (from ToC)

a. Total Well Length (+ TC) ____ (known, meas.)

b. Water Table Elev. (+ TC) ____

c. Length of Water Column ____ (a-b)

ToC Elevation (from LS) ____

Tape Corr. (TC) ____

Well Dia. ____

2. WELL PURGING DATA:

a. Purge Method PERISTALTIC PUMP

b. Required Purge Volume (@ ____ well volumes) 1 - .72 gal, 2 - 600, 3 - .78, 4 - .18, 5 - .084

c. Field Testing: Equipment Used ORION PH, YSI COND

Volume Removed	1	2	3	4	T°C	PH 1	2	3	4	5	Spec. Cond. µmho/cm 1	2	3	4	5	Color
1	12	12	12	14	11	7.82	6.38	8.78	7.03	6.41	1100	700	700	800	2000	
2	12	12	12	13	11	6.91	6.43	8.41	6.86	6.45	1100	600	700	800	2000	ALL CLEAR
2	13	[illegible]	12	13	11	6.96	6.13	7.41	6.73	6.50	1200	1000	700	800	2000	EXCEPT 5
				13					6.64					800		WHICH HAS
																A BROWN TINT

3. Sample Collection: Method PERISTALTIC PUMP

Container Type	Preservation	Analysis Req.
3 VOA VIALS		C24

Comments: BEFORE + AFTER PURGE SAMPLES COLLECTED FROM EACH SUB WELL

UC 7A - 1+2 SAMPLED ON 2/3/87

UC 7A - 3-5 " " 2/4/87

ERT

Well No. VC-7

GROUND WATER SAMPLE COLLECTION RECORD

Job No. 0888-280 Date: 2/3/89

Location: UniFirst Woburn MA Time: S 11:15 AM

Weather Conds.: cloudy 35°F F 2:10 PM

1. WATER LEVEL DATA: (from ToC)

a. Total Well Length (+ TC) _____ (known, meas.)

b. Water Table Elev. (+ TC) _____

c. Length of Water Column _____ (a-b)

ToC Elevation (from LS) _____

Tape Corr. (TC) _____

Well Dia. _____

2. WELL PURGING DATA:

a. Purge Method SoLinST SYSTEM

b. Required Purge Volume (@ ____ well volumes) _____

c. Field Testing: Equipment Used ORION pH YSI S.C.T

Volume Removed	1	2	3	4	T°C	PH 1	2	3	4	5	Spec. Cond. mmh/cm 1	2	3	4	5	Color
1 V	12	12	12	12	11	6.25	7.00	6.73	6.71	6.56	1150	600	700	700	350	CLEAR 1-3
2 V	11	13	13	13	11	6.25	7.05	7.21	[illegible]	6.50	1200	1000	700	700	300	CLEAR
3 V	12	12	13	14	12	6.25	7.01	7.39	[illegible]	6.59	1100	1100	700	700	850	CLEAR

3. Sample Collection: Method FROM - SoLinST TUBE

Container Type	Preservation	Analysis Req.
3 VOA VIALS		601 GC SCAN

Comments:

5 SETS OF SAMPLES 1 EACH FROM VC7 - 1 TO 5

ERT

Well No. UC-4

GROUND WATER SAMPLE COLLECTION RECORD

Job No. P445-003 Date: 2/4/87

Location: Woburn Time: S 1:40

Weather Conds.: partly cloudy 35°F F

1. WATER LEVEL DATA: (from ToC)

a. Total Well Length (+ TC) not measured (known, meas.)

b. Water Table Elev. (+ TC) 9.51 (9.40+0.51)

c. Length of Water Column (a-b)

ToC Elevation (from LS) 0

Tape Corr. (TC) .51

Well Dia. 2"

2. WELL PURGING DATA:

a. Purge Method dedicated bailer

b. Required Purge Volume (@ 1 well volumes)

c. Field Testing: Equipment Used

Volume Removed	T°	PH	Spec. Cond.	Color
1 vol = ± 6 gallons (well dry)	12	10.45	285	murky grey

3. Sample Collection: Method dedicated bailer - TEFLON

Container Type	Preservation	Analysis Req.
VOA vials	none	VOA

Comments: 1 set before purging sampling
1 set after purging sampling

ERT

Well No. VC-5

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D445-003 Date: 2/4/87

Location: UNIFIRST WOBURN MA ADJACENT LOADING DOCK Time: S ____

Weather Conds.: PARTLY CLOUDY 32°F WIND F ____

1. WATER LEVEL DATA: (from ToC)

ToC Elevation (from LS) 0

a. Total Well Length (+ TC) ____ (known, meas.)

Tape Corr. (TC) .51'

b. Water Table Elev. (+ TC) 7.01 (6.50 + 51)

Well Dia. 2"

c. Length of Water Column ____ (a-b)

2. WELL PURGING DATA:

a. Purge Method TEFLON BAILER DEDICATED

b. Required Purge Volume (@ ____ well volumes) ____

c. Field Testing: Equipment Used ____

Volume Removed	T°C	PH	Spec. Cond. mmHo/cm	Color
1 gallon	10	8.72	500	murky brown with
6 gallons	8	6.47	380	oil film
7 gallons	7	6.80	400	SAME

3. Sample Collection: Method TEFLON BAILER

Container Type	Preservation	Analysis Req.
3 VOA VIALS	—	62c

Comments:

WATER IS STILL DRAINING INTO THE WELL WE WILL TRY TO SOAK IT UP BEFORE PURGING - NO BEFORE SAMPLE

After sample: slight (drops) bit of ~~water~~ inflow still getting into well

5/12-84

ERT

Well No. VC-4

GROUND WATER SAMPLE COLLECTION RECORD

Job No. ~~[illegible]~~ 445-003 Date: 7/4/94 ADJ DUMPSTER

Location: WOBURN UNIFIRST

Weather Conds.: PARTLY CLOUDY 32°F WIND Time: S ____ F ____

1. WATER LEVEL DATA: (from ToC)

a. Total Well Length (+ TC) ____ (known, meas.)

b. Water Table Elev. (+ TC) 3.41 + .51

c. Length of Water Column ____ (a-b)

ToC Elevation (from LS) 0

Tape Corr. (TC) .51

Well Dia. 2"

2. WELL PURGING DATA:

a. Purge Method TEFLON BAILER

b. Required Purge Volume (@ ____ well volumes) ____

c. Field Testing: Equipment Used ____

Volume Removed	T°	PH	Spec. Cond. mmHO/cm	Color
1 [illegible] (DRY)	7	7.44	EC 210	TAN - SL. OIL SHEEN
2 ~ 1.5 gal (DRY)	7	6.80	240	TAN

Sample Collection: Method TEFLON BAILER

Container Type	Preservation	Analysis Req.
3 VOA VIAL		620

Comments: WATER LEVELS ARE SUSPECT DUE TO SURFACE WATER DRAINAGE INTO THE WELL — NO BEFORE PURGE SAMPLE

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 1 OF 1
DATE
HOLE NO. UC-4
LINE & STA.
OFFSET
SURF. ELEV.

TO E R T
ADDRESS Concord, Mass.
PROJECT NAME Monitor Well Installation
LOCATION Woburn, Mass.
REPORT SENT TO above
PROJ. NO.
SAMPLES SENT TO Taken at Site
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS
At 6' after Comp. Hours
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	H/S/A	S/S	NVD
Size I.D.	HW	1-3/8"	
Hammer Wt.	Spin	140#	BIT Dia.
Hammer Fall		30"	

	Date	Time
START	11/3/86	a.m. p.m.
COMPLETE	11/3/86	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	D. Green	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		0'-1.2'	D	(Not	Required)			1.2'	3" Asphalt - Light Brown to Tan silty SAND & Gravel Till	1	1.2	10"
									Boulder			
								6'				
		6'-7.2'	D	(Not	Required)			7.2'	Brown to Gray silty SAND & Gravel (Till)	2	1.2	9"
									(Ran Roller Bit to 10')			
		10'-15'	C						Gray to Pink GRANITE	C1	5'	4.5
		15'-18'	C							C2	3'	2.8
		18'-20'	C					20'		C3	2'	2.3
									Bottom of Boring 20'			
									Installed Observation Well at 20'			
									10' of 2" Sch. 40 Screen			
									10' of 2" Sch. 40 Solid			
									One Bag of Ottawa Sand			
									¼ Pail of Bentonite Balls			
									¼ Bag of Cement			
									One 6" Road Box			

GROUND SURFACE TO 2' USED Auger "CASING: THEN HW to 7.2' then R.B. then Cored

Sample Type | Proportions Used trace 0 to 10% | 140 lb Wt. x 30" fall on 2" O.D. Sampler Cohesionless Density | Cohesive Consistency | SUMMARY: Earth Boring 10'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 1 OF 1
DATE
HOLE NO. UC-5
LINE & STA.
OFFSET
SURF. ELEV.

TO E R T
PROJECT NAME Monitor Well Installation
REPORT SENT TO above
SAMPLES SENT TO Taken at Site

ADDRESS Concord, Mass.
LOCATION Woburn, Mass.
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS
At 7' after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	H/S/A	S/S	NVD
Size I.D.	HW	1-3/8"	
Hammer Wt.	Spin	140#	BIT Dia.
Hammer Fall		30"	

	Date	Time
START	11/4/86	a.m. p.m.
COMPLETE	11/4/86	a.m. p.m.
TOTAL HRS.		

BORING FOREMAN D. Green
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		0'-2'	D	(Not	Required)				4" Asphalt - Tan Sand and Gravel, trace silt (Fill)	1	2'	1.5
		2'-3'	D	(Not	Required)			3'		2	1'	1'
									(Ran Roller Bit to 9')			
		9'-11'	C						Pink-Gray GRANITE, very weathered, fractured	C1	2'	2'
		11'-14'	C							C2	3'	2.1
		14'-17.5'	C							C3	3.5	3.9
		17.5'-19.5'	C					19.5'		C4	2'	1.8
									Bottom of Boring 19.5'			
									Installed Observation Well at 19.5'			
									10' of 2" Sch. 40 Screen			
									9' of 2" Sch. 40 Solid			
									One Bag of Ottawa Sand			
									¼ Pail of Bentonite Balls			
									¼ Bag of Cement			
									One 6" Road Box			

GROUND SURFACE TO 3' USED Auger "CASING: THEN HW to 4' then R.B. then Cored

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 9'
Rock Coring 10.5
Samples 2

HOLE NO. UC-5

TOWN PRESS — EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 1 OF 2
DATE
HOLE NO. UC-6
LINE & STA.
OFFSET
SURF. ELEV.

TO E R T
PROJECT NAME Monitor Well Installation
REPORT SENT TO above
SAMPLES SENT TO Taken at Site

ADDRESS Concord, Mass.
LOCATION Woburn, Mass.
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS
At 14' after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	H/S/A	S/S	NVD
Size I.D.	HW	1-3/8"	
Hammer Wt.	300#	300#	BIT
Hammer Fall	24"	30"	Dia.

	Date	Time
START	11/5/86	a.m. p.m.
COMPLETE	11/14/86	a.m. p.m.
TOTAL HRS.		

BORING FOREMAN D. Green
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From – To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		0'-2'	D	No Blows with 300# Weight					Tan coarse SAND & Gravel, trace of silt	1	24"	18"
		2'-4'	D	"	"	"				2	24"	12"
		4'-5'	D	"	"	"		4.5'		3	12"	12"
								5'	Gray silty SAND & Gravel			
								7'	Boulder			
		8'-8.5'	D	"	"	"			Tan & Gray fine to coarse SAND & Gravel, trace of silt (Till)	4	6"	6"
		14'-16'	D	"	"	"				5	24"	3"
		19'-20'	D	"	"	"				6	12"	6"
		24'-24.5'	D	"	"	"				7	6"	4"
								29'				
		29.5'-30'	D	"	"	"		29.5'	Boulder	8	6"	6"
		34'-34.5'	D	"	"	"			Tan & Gray fine to coarse SAND & Gravel, trace of silt (Till)	9	6"	2"
		39'-39.7'	D	"	"	"				10	8"	7"

GROUND SURFACE TO ____ USED ____ "CASING: THEN ____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used	
trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 56'
Rock Coring 2'
Samples 13

HOLE NO. UC-6

TOWN PRESS EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 2 OF 2
DATE
HOLE NO. UC-6
LINE & STA.
OFFSET
SURF. ELEV.

TO
PROJECT NAME
REPORT SENT TO
SAMPLES SENT TO

ADDRESS
LOCATION
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt.			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From – To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec
		44'-44.5'	D	No Blows with					Tan & Gray fine to coarse	11	6"	6"
				300# Weight					SAND & Gravel, trace of			
									silt (Till)			
		49'-49.5'	D	"	"	"				12	6"	2"
		54'-54.5'	D	"	"	"		54.5'		13	6"	3"
		56'-58'	C						Dark Green GRANODIORITE	C1	24"	18"
								58'				
									Bottom of Boring 58'			
									Grouted Hole			
									5 Bags of Cement			
									58' up to 43'			
									Installed Observation			
									Well at 43'			
									10' of 2" Sch. 40 Screen			
									33' of 2" Sch. 40 Solid			
									3 Bags of Ottawa Sand			
									1/4 Pail of Bentonite Balls			
									Finished grouting hole from			
									30' to top of ground			
									Installed 6" Road Box			

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO. UC-6

TOWN PRESS – EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 1 OF 3
DATE
HOLE NO. UC-7
LINE & STA.
OFFSET
SURF. ELEV.

TO E R T
PROJECT NAME Monitor Well Installation
REPORT SENT TO above
SAMPLES SENT TO Taken at Site

ADDRESS Concord, Mass.
LOCATION Woburn, Mass.
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS
At 16' after Comp. Hours
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW-NW		NVD NQWL
Size I.D.	4" 3"		
Hammer Wt.	Spun		BIT
Hammer Fall			Dia.

	Date	Time
START	11/17/86	a.m. p.m.
COMPLETE	11/24/86	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	D. Green	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		Installed 2x2 manhole to be used as gate box							Tan Gray fine to coarse SAND			
								16'				
		17.5'-22'	C	N	V	D			Pink & Gray GRANITE	C1	4.5	4'
		22'-27'	C	N	Q	W L				C2	5'	4.9'
		27'-28'	C	"	"					C3	1'	1'
		28'-33'	C	"	"			28' -	mis-latch	C4	5'	3.5
		33'-35'	C	"	"					C5	2'	2.2
		35'-38'	C	"	"					C6	3'	2.9
		38'-41'	C	"	"					C7	3'	2.8
		41'-46'	C	"	"					C8	5'	5'
								46'				
		46'-48'	C	"	"				GRANODIORITE	C9	2'	2'
		48'-53'	C	"	"					C10	5'	5
		53'-58'	C	"	"					C11	5'	5

GROUND SURFACE TO 15' USED HW "CASING: THEN NW to 17.5' then Cored

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring 17.5
Rock Coring 130.5
Samples -

HOLE NO. UC-7

TOWN PRESS - EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 2 OF 3
DATE
HOLE NO. UC-7
LINE & STA.
OFFSET
SURF. ELEV.

TO
PROJECT NAME
REPORT SENT TO
SAMPLES SENT TO

ADDRESS
LOCATION
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt.			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		58'-63'	C	N Q	W L				GRANODIORITE	12	5'	5'
		63'-68'	C							13	5'	5'
		68'-73'	C							14	5'	5'
		73'-78'	C							15	5'	4.9
		78'-83'	C							16	5'	5'
		83'-88'	C					85.6'		17	5'	5'
		88'-93'	C					90.8'	Pink GRANITE	18	5'	5'
		93'-98'	C						GRANODIORITE	19	5'	4.9
		98'-103'	C							20	5'	5'
		103'-108'	C							21	5'	5'
		108'-113'	C							22	5'	5'
		113'-118'	C							23	5'	5'
		118'-123'	C							24	5'	5'
		123'-128'	C							25	5'	4.9

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO. UC-7

TOWN PRESS - EAST PROV

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 3 OF 3
DATE
HOLE NO. UC-7
LINE & STA.
OFFSET
SURF. ELEV.

TO
PROJECT NAME
REPORT SENT TO
SAMPLES SENT TO

ADDRESS
LOCATION
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt.			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From – To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		128'-133'	C	N O	W L				GRANODIORITE	26	5'	5.1
								131.8'	- Lost Water			
		133'-138'	C							27	5'	4.9
		138'-143'	C							28	5'	5.1
		143'-148'	C							29	5'	5'
								148'				
									Bottom of Boring 148'			
								Note:	Left 15' of NW Casing & Econo Shoe in Hole.			

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO. UC-7

TOWN PRESS – EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 1 OF 3
DATE
HOLE NO. UC-7A
LINE & STA.
OFFSET
SURF. ELEV.

TO E R T
PROJECT NAME Monitor Well Installation
REPORT SENT TO above
SAMPLES SENT TO Taken at Site

ADDRESS Concord, Mass.
LOCATION Woburn, Mass.
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS
At 15' after Comp. Hours
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW-NW		NQWL
Size I.D.	4" 3"		
Hammer Wt.			BIT
Hammer Fall			Dia.

	Date	Time
START	11/25/86	a.m. p.m.
COMPLETE	12/1/86	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	D. Green	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		Installed 2x2 Manhole for Gate Box							Gray fine to coarse SAND & Gravel, trace of silt			
								16.6'				
		18'-22.6'	C						Dark Green GRANODIORITE with bands of Pink Granite	C1	4.6	3.9
		22.6'-27'	C							C2	4.4	4.3
		27'-32'	C							C3	5'	5.1
		32'-33.9'	C							C4	1.9	1.8
		33.9'-38'	C							C5	4.1	4.1
		38'-43'	C							C6	5'	5'
		43'-48'	C							C7	5'	5'
		48'-53'	C							C8	5'	5'
		53'-58'	C							C9	5'	5'
		58'-63'	C							10	5'	5'
		63'-68'	C							11	5'	5'

GROUND SURFACE TO 15' USED HW "CASING: THEN NW to 17.5' then Cored

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring 18'
Rock Coring 129'
Samples -

HOLE NO. UC-7A

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 2 OF 3
DATE
HOLE NO. UC-7A
LINE & STA.
OFFSET
SURF. ELEV.

TO
PROJECT NAME
REPORT SENT TO
SAMPLES SENT TO

ADDRESS
LOCATION
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt.			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		
BORING FOREMAN		
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		68'-73'	C							12	5'	5'
		73'-78'	C							13	5'	5'
		78'-83'	C							14	5'	5'
		83'-88'	C							15	5'	4.9
		88'-93'	C							16	5'	5'
		93'-98'	C							17	5'	5'
		98'-103'	C							18	5'	5'
								100.3'				
								101.5'	Pink GRANITE			
		103'-107.4'	C						Pink & Gray GRANODIORITE	19	4.4	4.2
		107.4'-108'	C							20	0.6	0.6
		108'-113'	C							21	5'	5'
								113'				
		113'-118'	C						Green GRANODIORITE	22	5'	4.9
		118'-123'	C							23	5'	5'
		123'-128'	C							24	5'	4.9

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density.
0-10 Loose
10-30 Med. Dense
30-50 Dense
50 + Very Dense

Cohesive Consistency
0-4 Soft 30 + Hard
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff

SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO. UC-7A

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 3 OF 3
DATE
HOLE NO. UC-7A
LINE & STA.
OFFSET
SURF. ELEV.

TO
PROJECT NAME
REPORT SENT TO
SAMPLES SENT TO

ADDRESS
LOCATION
PROJ. NO.
OUR JOB NO. 87-433

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt.			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
		128'-133'	C							25	5'	5'
								133'	Lost Water			
		133'-138'	C							26	5'	5'
		138'-143'	C						mis-latch also sand in seam	27	5'	3.7
		143'-147'	C							28	4'	4.2
								147'				
									Bottom of Boring 147'			
								Note:	Left 15' of NW Casing & Econo Shoe in Hole.			

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO. UC-7A

TOWN PRESS — EAST PROV.

Project [illegible] Site [illegible]

BORING UC4 Sh 2 of 2

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
							roller bit to 10.0	
							Barriers To Bedrock	
							continue roller bit until cuttings become consistently pinkish gray and rig vibration become steady, if wx and highly fractured top of rock present it is not distinguishable from boulders by color of cuttings or rig vibration	
	9						Bedrock ~8.0?	
	9						Scale change	
			RQD					
	10							
		NX-1	70%	10.0-15.0	4.5		10.0 – 11.0 gray and pink coarse grained granite	
	15						11.0 – [illegible] green [illegible] (Salem)	
		NX-2	30%	15.0-18.0	2.8		joints 45°-60° from axis of core, some vertical fracturing	
		NX-3	80%	18.0-20.0	2.35		calcite mineralization in fractures	
							moderately fractured slightly wx	
							16.0 – 19.0 increased fracture frequency – joint faces coated w/ calcite, iron oxide, MnO? chlorite slightly wx	
	14						20.0	
							Bottom of Boring	
	15							

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Project [illegible] Site Woburn **BORING** UC4 Sh 1 of 2

Date Started 11/3/86 Completed 11/4/86 Ground Elevation

Total Depth 20.0 Location Logged by J T Lawson

Casing I.D. HSA/4in/NW Contractor Guild Drilling Co

Remarks

Elev. Feet	Depth Feet	Sample Type & Number	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Sample Description	Equipment Installed
		SS 1		0.0-1.2	10"		0.0-0.2 Bituminous Concrete 0.2-1.2 light brown-tan silty sand & Gravel TILL HNU 10-15 units boulder @ 1.2, spin NW casing roller bit to 5.0, spoon bounces roller bit 5.0 to 6.0	
	1							
	2						spin casing to 6.0	
	3						- sample drill water taken from mud tub, split w/ EPA - tool blank prepared by running DI water through decontaminated BOULDERS reassembled split spoon	
	4							
	5						10' 2" ID PVC Sch 40 threaded jt - w/ O ring, .01 Screen tip at 20.0', packing to 6', flush valve box, bentonite pellets 6'-3' cement/bentonite 3'-0	
	6	SS 2		6.0-7.2	9"		light brown-tan SILT & SAND trace gravel TILL split sample w/ EPA	

UC4

1911 (1-81)

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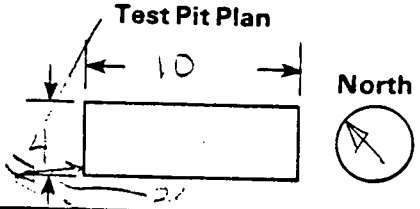
Project UNIFIRST Site WOBURN **TEST PIT** 1 Sh ___ of ___
Date 12/4/86 Location ___ Ground Elevation ___
Total Depth 3.0 Contractor [illegible]
Equipment Used [illegible] PC 220LC Logged by [illegible]
Remarks ___

Elev. Feet	Depth Feet	Sample Type & No.	Sample Depth Range	Soil & Rock Description & Comments
				Northeast Corner
				0.0-0.2 Bituminous Concrete Pavement
	1			0.2 - 1.5 Tan to yellow-tan crs-f SAND & GRAVEL trace silt, lightly stained on surface in contact with bit-com. light "perc." odor below lower pavement
	2			
	3			
	4			1.5- 1.7 Bituminous Concrete Pavement
				1.7 - 2.0 3/4-1 in crushed stone
				2.0-3.0 Tan to Yellow-tan crs-f SAND & GRAVEL trace silt
				3.0 ft large > 3 ft pink granite [illegible] machine refusal
				ambient HNU Readings — HS jar
				0.0'-1.5': 0-5 — <50
				1.7'-2.0': <10 — <100
				>2.0': 5-8 — <50

Test Pit Plan



Groundwater

Date	Time (Hours After Completion)	Depth (Feet)
12/4/86		Dry

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Project UniFirst Site Woburn **BORING** UC6 Sh 1 of 4

Date Started 11/5/86 Completed 11/14/86 Ground Elevation

Total Depth Location Logged by J. T. Lawson

Casing I.D. HSA / 4in / NW Contractor Guild Drilling Co.

Remarks

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Sample Description	Equipment Installed
		SS-1		0.0-2.0	1.5		0.0 - 0.2 Top soil 0.2 - 1.1 Coarse sand & gravel trace silt	
	1						1.1 - 2.0 fine sand trace silt HNU No Response in sample or hole	
	2	SS-2		2.0 7.0 4.0	1.0		2.0 - 4.5 coarse to fine sand and gravel trace silt, stone plugged spoon HNU No Response in sample or hole	
	3							
	4	SS-3		4.0 to 5.0	1.0		4.5 - Gray silty sand & gravel Till HNU No Response in sample or hole 5.0 - 6.0 Boulder	
	5							
	6							

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Project UniFirst Site Woburn **BORING** UC6 Sh 2 of 4

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
							Boulders	
	8	SS-4		8.0 to 8.5	0.5		Tan and gray c-f sand and gravel trace silt HNU No Response Boulders Refusal	
	14							
		SS-5		14.0 - 16.0			greenish tan silty sand and gravel, till	
	20	SS-6		19.0 - 20.0			HNU no response from spoon ~50 units in jar headspace gray silty sand & gravel, till	
	25	SS7		24.0 - 24.5	0.4		HNU slight response ~1-2 in spoon ~40 in jar headspace gray fine SAND some gravel trace silt till	
	30	SS8		29.5 30.0	0.5		300# hammer refusal gray silt to coarse sand trace gravel till 300# hammer refusal HNU ~5-10 in open casing 29.0-29.4 boulder	

1912 (1/81)

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Project Unifrax Site Wilbur **BORING** UC6 Sh 3 of 4

Elev. Feet	Depth Feet	Sample Type & Number	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Sample Description	Equipment Installed
	30							
	35	SS9		34.0 34.5	0.2		gray till same as above [illegible]	
	40	SS10		39.0 39.5	0.5		gray silt to coarse sand little gravel trace clay, Till	
	45	SS11		44.0 44.5	0.5		BOULDERS same as above HNU response 100 units	EPA HNU span 9.8
	50	SS12		49.0 49.5	0.2		same as above HNU ~150 clay on roller bit from <54.0 smooth bit action, clay on rods	
	55	SS13 NXL	20% RQD	54.0 54.5 56.0 58.0	0.4 1.4		Gray clay and silt HNU ~25 trace gravel 54.5-56.0 Roller bit smoothly 54.5 Top of Rock 56.0-58.0 Granodiorite vertical jt. 56.6-56.8	
	60						58.0 Bottom of Boring	
							Screen 9.65' Riserpiping 9.85	

Collect another hydraulic Oil

3.01.4

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UC6

Project [illegible] Site [illegible] **BORING** [illegible] Sh [illegible] of

Elev. Feet	Depth Feet	Sample: Type & Number	Sample: Blows per 6 In.	Sample: Depth Range	Sample: Rec.	Graphic Log	Sample Description	Equipment Installed
							11/14/86 cold [illegible] clear.	
							top of bentonite pellets 30.5	
							2.3 stickup	
							32.2	
							tremie grout w/ 9:1	
							cement: bentonite grout	
							grout falls to 13.0 ft after	
							HW casing pulled	
							finish w/ neat cement to surface,	
							install gate box	
							▽ 12.2 ft below ground surface	
							well top @ 42.95	
							Bail down to ~ .5' water in well	
							recovers ~ 4 ft w/in 30 min, bail down	
							Need: Lab gloves	
							Kimwipes	
							DI Water	
							11/14/86 UC5 9.48	
							.56 10.04 ▽	below road box
							18.22	
							.56	
							18.78 total depth	
							UC4 6.39	
							.56	
							6.95 ▽	below road box
							19.29	
							.56	
							19.85 total depth	

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Project Un. First Site Woburn **BORING** UC7 Sh 1 of 5

Date Started 11/17/86 Completed 11/24/86 Ground Elevation

Total Depth 143.0 Location Logged by J. T. Lawson

Casing I.D. 3¾ ID HSA; HW; NW Contractor Guild Drilling

Remarks

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In. (HNU Jar Headspace)	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
11/10/86		S1	HNU ~700	0.4			0.0 - 0.4 Bituminous Concrete Pavement	
							0.4 - yellow-tan crs-f SAND & GRAVEL tr. silt, FILL trace brown sand, silt & clay agglomerations slightly plastic	
	1						S1 & S2 grab samples from manhole excavation, split w/ EPA	
11/10/86	2	S2	HNU ~400	2.2			bottom of manhole @ 2.2 no HNU response in the open pit	
		S1	12/29 34/42	2.3 [illegible] 4.3	1.8		rim to base 2.3 ft.	
	3		HNU no response				SS1 tan & gray crs-fine SAND & GRAVEL FILL grade to [illegible] occurring S&G	
		SS2	HNU ~20	4.3 to 5.8	1.1		same as above spoon refusal	
	4							
	5							
	6	SS3	HNU ~10	6.0-6.4	0.4		same as above spoon refusal	

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Project Un-First Site Woburn **BORING** Sh 2 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
							auger refusal @ 7.0 ft. spoon refusal boulders, spin HW casing to 9.8'	
	8							
	10	SS4	HNu ~5	10.0 - 12.0	1.1		tan med. - f. SAND some f. gravel cobbles. spin casing to 15.0	
	15	SS5	HNu 1-2	15.0 - 16.0	0.7		16.0 spoon refusal gray-brown crs. - f. SAND & GRAVEL, bedrock fragments, wet → bedrock @ 16.0	
4.5 .5 / 2.25 / 2.25			RQD				NW spun to 17.5'	
		Nx1	50%	17.5 - 22.0	[illegible]			Dedham Granodiorite
5.0 .62 / 3.1 / 3.0	17						~19.5-20.0 Sand Seam, tools advance rapidly & slight wash color change; change to split tubes	
	20						Pink & gray coarse grained granite ~20.0 Mixed gray granodiorite & granite	
2 min/ft		NQ1	62%	22.0 - 27.0	4.9		19.5 Open FeO stained fractures ~30° from core axis	
	25						joint surfaces are planar to wavy FeO stained & $CaCO_3$ coated	
				Salem Gabbrodiorite			Switch to wireline, split inner tube	
							22.0-27.0 Mixed Granite/Granodiorite 22.2-23.2 jt 10° from core axis FeO, CaCO 24 wx jt. 60°	

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Project Uni First Site Woburn

BORING

Sh 3 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
	25		RQD					
		NQ2	40%	27.0 28.0	1.0		NQ 2 Same as above 27.4 fracturing 50° from core axis FeO staining	
	30	NQ3	0%	28.0-33.0	3.5		NQ 3 mislatch - core left in barrel fractured granodiorite 29.5 - 30.2 Quartz vein subvertical retrieved 0.65 ft. of NQ3	
		NQ4	40%	33.0-35.0	2.2			
	35	NQ5	0%	35.0-38.0	2.8		NQ 4 pink granite & granodiorite fractures 35° from core axis, FeO, CaCO3 coated planar - core lifter failed, replaced	
	40	NQ6	35%	38.0-41.0	2.9		NQ 5 same as above jts. ~10° from core axis	
		NQ7	68%	41.0-46.0	5.0		NQ 6 decreasing granodiorite, jts 50° from core axis FeO, CaCO3 coated planar core lifter slipping	
	45						NQ 7 frax. gradient 41.0 - 43.0, 45.0 - 46.0 45.0 - 46.0 CaCO3 filled jts, 30° from core increasing granodiorite	
		NQ8	30%	46.0-48.0	2.0		NQ 8 granodiorite & pink granite frax 30° from axis CaCO3 coated planar - wavy	
	50	NQ9	68%	48.0-53.0	5.0		NQ 9 granodiorite, frax 30° from core face planar wavy CaCO3 42.2 - 42.8 CaCO3 filled frax ~10° from core axis	
	55	NQ 10	58%	53.0-58.0	5.0		NQ 10 granodiorite, intersecting jt sets 45° & 70° from core axis, CaCO3 filled jts. some jts. no CaCO3	
	60	NQ 11	38%	58.0 63.0	5.0		NQ 11 granodiorite 60.0 ∩ jts 10°, jts 10°-50° from core axis jts planar coated	
	65	NQ 12	67%	63.0 68.0	5.0		NQ 12 granodiorite, jts 40°-50° to core axis, coated planar 67.8 ∩ jts,	

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Project [illegible] Site [illegible]

BORING

Sh 4 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Sample Description	Equipment Installed
			RQD					
	70	NQ 13	74%	68-73	5.0		granodiorite jts planar, coated [illegible]	
→	75	NQ 14	16%	73-78	4.9		granodiorite, n jt sets 10-20° to core axis slickensides & coating	
→	80	NQ 15	16%	78-83	5.0		granodiorite, vertical jt 82 83 n jt sets, coated sks	
	85	NQ 16	50%	83-88	5.0		85.6 change to med. grained pink granite jts 10°-90° coated sks	drill speed slows marked by [illegible] granite
	90	NQ 17	50%	88-93	5.0		90.8 change to granodiorite 89.4-90.0 close spaced 80°-40° jts 91.5-92.3 10° jt coated slightly wavy	
	95	NQ 18	61%	93-98	4.9		granodiorite jts 80°-15° from core axis sks, $CaCO_3$ coating	
	100	NQ 19	86%	98-103	5.0		granodiorite jts 85°-25° from core axis coated planar	
	105	NQ 20	100%	103-108			granodiorite ~5% pink K spar 107.6 n jts 30° & 40° from core axis planar, [illegible]	

[illegible] 106.9

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Project UniFirst Site Woburn **BORING** UCD Sh 5 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 in.	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
			(RQD)					
	110	NQ 21	88%	108-113	5.0		increasing pink Kspar ~10% 108.6-109.2 fjts 50° from core axis	
	115	NQ 22	84%	113-118	5.0	→	Same as above 114.3-114.4 frax. zone 50° to core axis FeO staining jts. 90° from core axis coated, planar-rough 115.9-116.8	
	120	NQ 23	94%	118-123	5.0		Same as above jts 60-90° from core axis planar, ~rough, coated, FeO staining 120.41-121.6 qtz vein, minor py, lots of $CaCO_3$	
	125	NQ 24	94%	123-128	4.9		Same as above jts 60°-80° from core axis, rough FeO 123.0-124.9 flow fabric 127 $CaCO_3$ filled vug	
	130	NQ 25	76%	128-133	5.1		131.8 lost water, regain ~1/2 flow by 133.0	
	135	NQ 26	88%	133-138	4.9	→	increasing pink Kspar 131.7-132.9 fractured zone, FeO, $CaCO_3$	
	140	NQ 27	32%	138-143	5.1		mixed granodiorite & pink granite → no water return 137.5-138 frax. zone FeO other jts 70°-90° from core axis	
	145	NQ 28	94%	143-148	5.0	→	no water return mixed granodiorite & pink granite jts 40°-90° from core axis FeO, $CaCO_3$; 140.3 granodiorite; 140.6-142.0 fracture zone	
		End of Boring						

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rock generally has flow fabric and/or filled network of jts

granodiorite, calcite veining chloritized greenish when wet jts 70°-90° to axis core

1012 (1/81)

Project Ur First Site Woburn **BORING** UC7A Sh 1 of 5
Date Started 11/25/86 Completed 12/1/86 Ground Elevation
Total Depth 137.0 Location Logged by J. T. Lawson
Casing I.D. 3¾ ID HSA; Contractor Guild Drilling
Remarks

Elev. Feet	Depth Feet	Sample Type & Number	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Sample Description	Equipment Installed
							0.0-0.4 Bituminous Concrete Pavement	
	1						0.4-2.3 Yellow-tan crs-f sand & gravel tr. silt Fill trace brown sand, silt & clay agglomerations, slightly plastic	
							2 ft ø manhole installed	
	2							
			jar head-space HNu (max.)				Auger to 7.0	
	7	SS1	~1-2	7.0-9.0	1.5'		Gray crs-fine SAND & GRAVEL tr silt Till 8.9-9.0 wet in ss shoe	
							▽ 8.9 -> probably artificially high from drilling UC7	
	9	SS2	~2	9.0-11.0	1.8'		Tan med-f. SAND tr f. gravel wet ~med. compact, lot < dense than SS1	
	11	SS3	~7-8	11.0-13.0	1.4'		Same as above Spin HW Casing to 13.0'	
	13	SS4	~8	13.0-15.0	0.8'		same as above Spin HW to 15.0	
							HNu responses rapidly dissipate w/in 15 sec. to background	

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Project Unifirst Site Woburn **BORING** UCASh 2 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Sample Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
		SS5		15.0-16.7	0.9		spoon starts bouncing @ ~16.5' same as above, pink granite rock fragment at 16.5'	
	16						hammer HW to 15.5 then to 16.0 spin NW to 17.8	
							Top of Rock 16.5	
	17		RQD				roller bit to 19.0 barrel drops to 17.7 ~19.5 ft soft seam, quick advance ~0.2	
	20	NQ 1	37%	18.0-22.6	3.9		granodiorite (Salem Granodiorite) ~5% pink Kspar frac. zones 18.6-19.1, 19.4-19.7 20.3-20.8, jts 20°-90° to core axis	
	25	NQ 2	50%	22.6 to 27.0	4.3		same as above jts 10°-20° to axis	
	30	NQ 3	72%	27.0 to 32.0	5.1		same as above above wx zones 30.3-30.4, 31.5-31.6	
		NQ 4	63%	32.0-33.9	1.8		granodiorite 32.6-32.9 crushed zone jts 20° core axis	
	35	NQ 5	30%	33.9-38.0	4.1		granodiorite w/ bands of pink granite jts 10° to core axis, planar FeO & CaCO3 coated	
	40	NQ 6	74%	38.0 to 43.0	5.0		pink crs & fine grained granites (Dedham Granodiorite) 41.5 granodiorite - fractured - RQD 0% jts 40°-90° to core axis planar FeO, CaCO3	
	45	NQ 7	70%	43.0 to 48.0	5.0		granodiorite bands of pink granite jts 55°-90° to core axis CaCO3	

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Project UniFirst Site Woburn **BORING** UCFA Sh 3 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
			RQD					
	50	NQ 8	80%	48.0 to 53.0	5.0		granodiorite, 48.4-49.1 pink granite jts 20°-80° to core axis planar to wavy $CaCO_3$	
	55	NQ 9	40%	53.0 to 58.0	5.0		granodiorite, 56.5-58.4 frax. zone jts 0°-80° to core axis, $CaCO_3$	
	60	NQ 10	46%	58.0 to 63.0	5.0		61.3-63.0 frax. zone jts 40°-60° to core axis, $CaCO_3$	
★	65	NQ 11	46%	63.0 to 68.0	5.0		jts 0°-90° to core axis, $CaCO_3$ 64.0-64.3 vertical jt, 64.6-64.7 crushed zone	
	70	NQ 12	60%	68.0 to 73.0	5.0		68.3 jt 35° to core axis, sks, $CaCO_3$ jts planar to wavy 71.0-71.4 vertical jt. 72.0-72.4 jts 30° to core axis	
	75	NQ 13	16%	73.0 to 78.0	5.0		jts 10°-90° to core axis, sks, planar-wavy $CaCO_3$	
	80	NQ 14	30%	78.0 to 83.0	5.0		core barrel jambs, pull string jts 45°-90° to core axis	
	85	NQ 15	20%	83.0 to 88.0	4.9		jts. 10°-90° to core axis planar, some sks, $CaCO_3$ 84.5- frax. frequent leave 1.4 ft downhole	

5 3.5
.46
5 2.3
16%
.8

19
51.79
.79

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Project UniFirst Site Woburn **BORING U7A** Sh 4 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Sample Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
			RQD					
	90	NQ 16	56%	88.0 to 93.0	5.0		To recover core dropped from NQ 15, spinned barrel over dropped core	
	95	NQ 17	40%	93.0 to 98.0	5.0		90.0 - 91.0 fine grained pink granite 91.0 - 92.0 granodiorite 92.0 - f.gr. pink granite - jts 40° to core axis closely spaced, crumbled during removal from shoe	
drill slows	100	NQ 18	94%	98.0 to 103.0	5.0		94.4 granodiorite jts 35° - 80° planar to wavy coated	
	105	NQ 19	95%	103.0 to 107.4	4.2		100.3 - 101.5 pink med. gr. granite jts 50°-90° to core axis planar-wavy $CaCO_3$	
		NQ 20	100%	107.4-108.0	0.6		Pink & gray granodiorite; bit worn stop run - Pull string & replace bit	
	110	NQ 21	78%	108.0 to 113.0	5.0		111.9 - 112.8 ∩ jts 10° & 20° to core axis planar FeO, $CaCO_3$	
	115	NQ 22	88%	113.0 to 118.0	4.9		~113.0 change to greenish granodiorite with pink K spar phenocrysts 117.5 - 118.0 open jt 0° to core axis	
	120	NQ 23	82%	118.0 to 123.0	5.0		jts, planar-wavy FeO, $CaCO_3$ 0°-90° to core axis strong fabric, filled jts	
	125	NQ 24	72%	123.0 to 128.0	4.9		Same as above, qtz & $CaCO_3$ vein 124.0 crushed zone 125.7 - 125.8 jt 0° 120.0 - 121.4; jts 0°-90° to core axis Pink K spar increases to ~70-80% 124.3 - 124.6 close spaced jts 60°-90° to core axis, close spaced qtz & $CaCO_3$ filled fractures	

1012 (1/81)

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43

Project Uni First Site Woburn **BORING** UC7A Sh 5 of 5

Elev. Feet	Depth Feet	Sample Type & Number	Blows per 6 In.	Depth Range	Rec.	Graphic Log	Sample Description	Equipment Installed
	125		RQD					
	130	NQ 25	86%	128.0 to 133.0	5.0		Same as above, jts 70°-90° to core axis FeO, CaCO3 coating; vert jt healed	132.6-132.9
	135	NQ 26	82%	133.0 to 138.0	5.0		Same as above, 133.2 - 139.8 ~1 jts 10° to core axis 137.0 - 137.1 open FeO wx jt; 137.5 - 137.9 close spaced frax, crushed upon removal from shoe; lose water ~137	
	140	NQ 27	44%	138.0 to 143.0	3.7		no water return; core slips, dry block attempt — sand blows into barrel & jambs it — mislatch barrel pushed up into rod & jambed w/ sand, brown. pull string; core removed from outer barrel	
	145	NQ 28	75%	143.0 to 147.0	4.2		138.5 - 139.1 close spaced frax 139.6 - 140.1 " 141.6 - 141.0 "	
	150						switch to std. barrel to reduce problems w/ sand blocking 146.3 greenish granodiorite jts. 45°-90° to core axis planar - wavy CaCO3 sand lightly blown up into barrel 147.0 End of Boring	

1012 (1/81)

ERT
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4. HNu pore-gas analysis field logs.

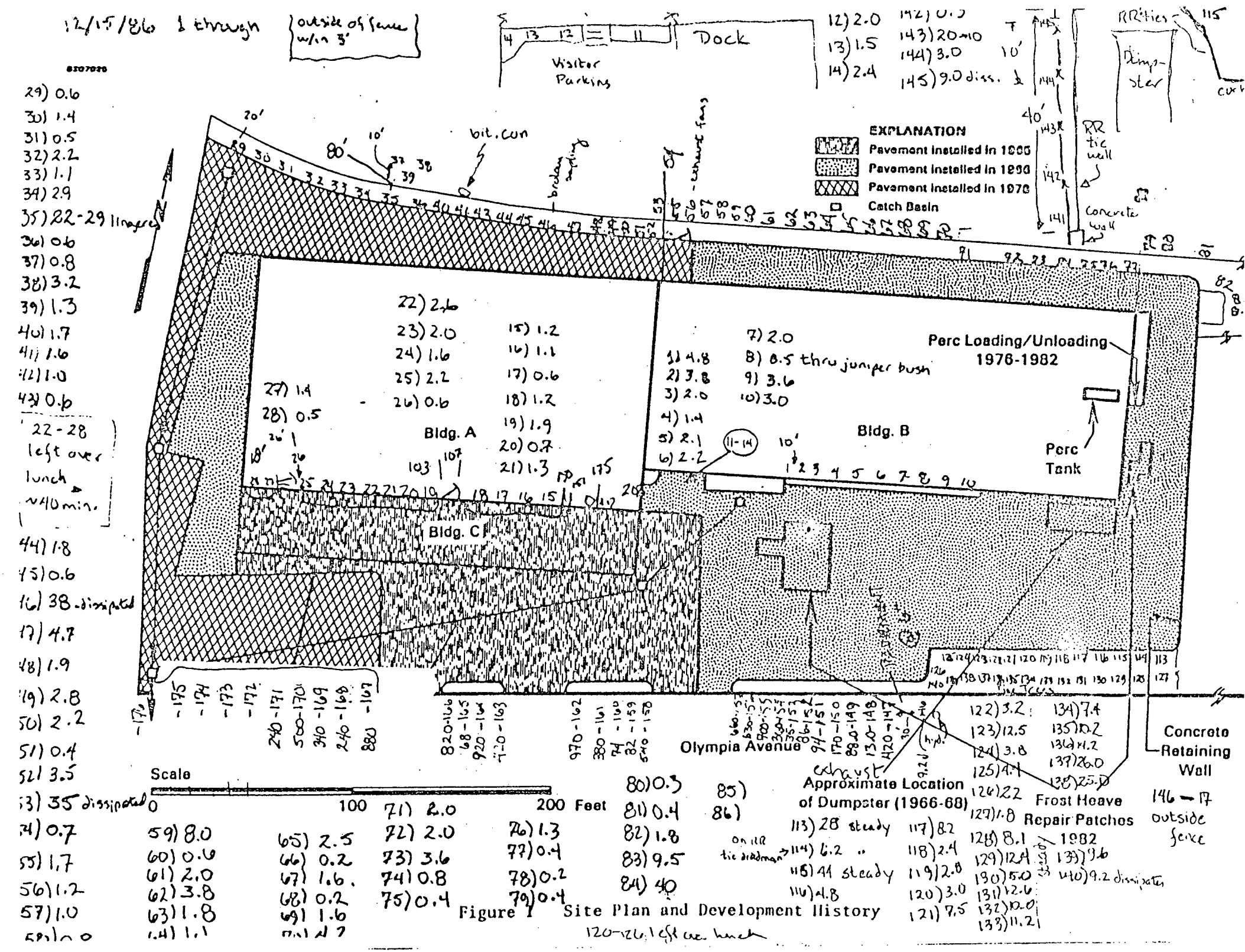
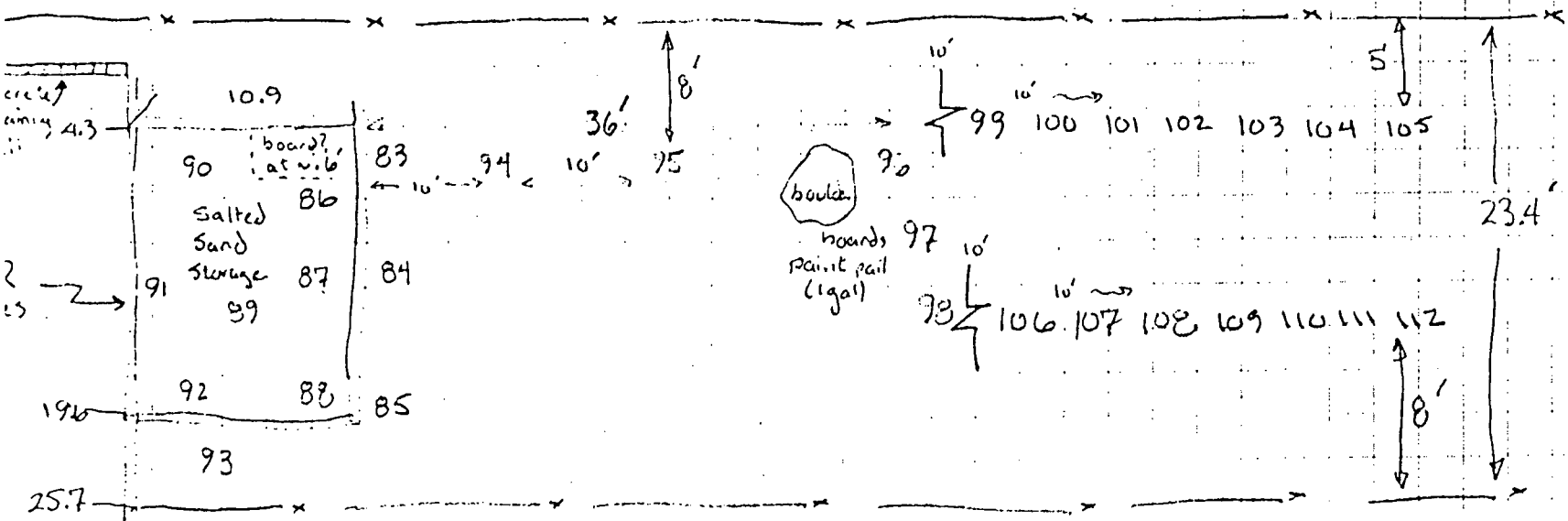


Figure 1 Site Plan and Development History

7/14/86 85 through



85) 4.5
86) 2.3
87) 12 dissipates; 16 5min later
88) 3.9
89) 1.8
90) 2.5
91) 1.6
92) 2.2
93) 1.2
94) 3.6
95) 9.2 steady
96) 3.2
97) 14.4 steady
98) 2.2

99) 0.6
100) 2.1
101) 8.8 dissipates
102) 2.4
103) 7.0 dissipates
104) 1.2
105) 8.2 slow rise & dissipates
106) 6.4
107) 1.3
108) 1.4
109) 1.8
110) 3.3
111) 0.8
112) 2.2

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

Date | Dwg. | Project | Proposal

Rec'd. 4/20/87

UniFirst Corporation
15 Olympia Avenue
P.O. Box 4017
Woburn, Massachusetts 01888
Telephone (617) 933-5800

February 19, 1987

Ms. Gwen Ruta
HRS-1903
Waste Management Division
U.S. Environmental Protection Agency
J.F.K. Federal Building
Boston, MA 02203

Dear Ms. Ruta:

I am responding to EPA's Request to UniFirst for Information pertaining to the Wells G&H Superfund site in Woburn, Massachusetts. As you can imagine, providing answers that include information about operations and business practices that took place 20 years ago and which involve the activities of personnel who are, in some cases, dead and, in other cases, not available, and to provide accurate and complete responses within 15 days has not been easy. At this time, we are submitting information pertaining to your request that we have been able to assemble since I received your request.

In Question 1 of your Information Request, you asked for documentation pertaining to hydrogeologic investigations and/or environmental assessments conducted at UniFirst's Woburn facility. You specifically asked for documents relating to the activities of Environmental Research and Technology, Inc. (ERT) and Dr. John Cherry. Accordingly, we have enclosed with this response the following documents:

(1) Copy of Jeffrey Lawson's field book (Jeffrey Lawson is ERT's Senior Program Manager);

(2) Solinst installation logs for wells UC7 and UC7A;

(3) PCA Engineering Inc.'s tank fill-pipe test logs;

(4) ERT's HNu pore-gas analysis field logs;

(5) Field sampling notes taken by Jeffrey Lawson at the Woburn facility;

(6) Well and test pit logs taken in 1986 and 1987;

(7) Laboratory analyses data sheets;

(8) Draft environmental assessment prepared by ERAS, Inc. (the final version was not made available to UniFirst).

These documents constitute all documentation of hydrogeologic investigations and/or environmental assessments that has not already been submitted and which does not constitute attorney-client communications or mental impressions, conclusions and legal theories of UniFirst's specially retained experts and counsel (as to which we are, however, giving you the underlying data not generated by EPA or its contractors) that is presently available to UniFirst management.

In your second question, you have asked UniFirst to identify all leaks, spills or releases of any hazardous substance into the environment which may have occurred during the period of UniFirst's operations at the Woburn facility. As you know, ERT conducted an environmental assessment and investigation in 1983 and 1984 under the consent order in EPA Docket No. 83-1006. ERT's reports on its activities under that order, including the Assessment of Groundwater Contamination Potential at Interstate Uniform Corp., Woburn, Massachusetts, November, 1983; the Summary of Monitoring Program, UniFirst Corp., Woburn, Massachusetts, August, 1984; and the Evaluation and Recommendations for Alternatives Concerning Additional Investigation of Groundwater Contamination, September, 1984, you already have in your possession. Those reports described the only releases of which UniFirst management was then and is now aware.

Recently, UniFirst has undertaken additional field investigations into possible sources of ground or groundwater contamination, as described in the scopes of work submitted to EPA by ERT and our attorneys and in field consultation with Mr. David Delaney. These investigations included a pressure

test of the fill-pipe through which product was fed into and out of an above-ground storage tank that was once within the building. The results reported in Document 4 (listed above in response to Question 1) reveal no detectible leaks. In addition, Jeffrey Lawson tested pore-gas samples with an HNu analyzer at numerous sites on the property. We do not believe that the results of these tests, included in Document 5, as noted above, reveal any release or dumping of hazardous substances or waste. Excavation of a diesel tank in December 1986 also exposed a sewer line that reportedly transported wastewater from the 1966-69 drycleaning operations, and no evidence of leakage was detected. A test pit was dug outside the facility near the fill-pipe that was used to fill the indoor storage tank, and no evidence of releases or dumping was detected there either. Well UC8 was then installed inside the loading dock because there reportedly had once been a storm drain in that vicinity. As we have reported to you, tetrachloroethene was discovered in this well.

Note!

The discovery of tetrachlorethene in Well UC8 and EPA's Information Request have caused us to recheck our records and re-interview available past and present employees who were involved in or familiar with operations that involved tetrachloroethene at the facility. To date, however, we have been unable to discover any releases other than those previously reported to EPA or to determine that those releases were the source(s) of the tetrachloroethene found in UC8.

In its third inquiry, EPA has asked UniFirst to submit data on any hazardous substances or waste purchased, generated, stored, treated, disposed of, transported, or otherwise handled at the Woburn facility. All of the data presently available to UniFirst management that are responsive to this request may be found in the documents submitted with this letter and under the 1983 consent order.

Very truly yours,

Ronald Croatti

Ronald Croatti
Vice-Chairman

SVS-3371/U

5. Field sampling notes taken by Jeffrey Lawson at the Woburn plant.

ERT

Well No. UC-7

GROUND WATER SAMPLE COLLECTION RECORD

Job No. 0495-003 Date: 1/7/87

Location: Woburn MA Time: S ____

Weather Conds.: CLOUDY 35°F F ____

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) ____

a. Total Well Length (+ TC) ____ (known, meas.) Tape Corr. (TC) ____

b. Water Table Elev. (+ TC) ____ Well Dia. ____

c. Length of Water Column ____ (a-b)

2. WELL PURGING DATA:

a. Purge Method Solinst SYSTEM

b. Required Purge Volume (@ ____ well volumes) ____

c. Field Testing: Equipment Used Orion pH Cole Parmer Cond

Volume Removed	#1	#2	3	4	5	T°C 1	PH 2	3	4	5	Spec. Cond. µmho/cm 1	2	3	4	5	Color #3
1	12	12	12	13	11	6.45	6.92	6.60	6.63	7.54	15.64	7.25				CLEAR - (TAN TURBID)
2	12	11.5	12	12	11	6.47	6.87	6.63	6.67	7.59		NO	CAL			#1 CLEAR (OLIVE TURBID)
3	11.5	12	11.5	13	10	6.41	6.86	6.72	6.61	7.54						

3. Sample Collection: Method ____

Container Type	Preservation	Analysis Req.
3 VOA PER SAMPLE PORT	—	601 GC

Comments: 5 SAMPLE PORTS

SAMPLES ARE UC 7-1 to 5

UC-7-6 IS A FIELD BLANK

/12-84

ERT

Well No. UC-7

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D495-003 Date: 1/9/77

Location: Woburn MA Time: S ____

Weather Conds.: Sunny 35° F F ____

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) ____

a. Total Well Length (+ TC) ____ (known, meas.) Tape Corr. (TC) ____

b. Water Table Elev. (+ TC) ____ Well Dia. ____

c. Length of Water Column ____ (a-b)

2. WELL PURGING DATA:

a. Purge Method Solinst

b. Required Purge Volume (@ ____ well volumes) ____

c. Field Testing: Equipment Used ____

Volume Removed	T°C 1	2	3	4	5	PH 1	2	3	4	5	Spec. Cond. µmho/cm 1	2	3	4	5	Color
10 volumes	11.5	12.5	12	13	12.5	6.43	6.81	6.77	6.71	6.91	1225	1150	700	600	1100	CLEAR
																UC-7-5-TURBID

3. Sample Collection: Method ____

Container Type	Preservation	Analysis Req.
2 VOA vial / sample	—	VOC 601

Comments: ____

1/8/87

Purging UC-7 - WL in 2" casing 0.52' BTC

TO DATE THE SPRT SYSTEM HAS BEEN COMPLETELY PURGED 8 TIMES WITH THE EXCEPTION of UC 7-1 WHICH HAS BEEN PURGED 10 TIMES

# of Purges TODAY: ~~||||~~ ~~||||~~ ~~||||~~

UC-7A - UNABLE TO DETERMINE DEPTH TO WATER in casing

1/9/87

UC-7 Purges ~~||||~~ ||||

UC-7 CENTER CASING W.L. 8.2'
UC-7A - UNABLE TO REACH WATER 3'-5'

In Purging UC-7A w/ PERISTALTIC Pump
Pumping RATE APROX 1.5 min / QUART = 6 min / GAL

UC-7A-1	START	TIME	10:30A	FINISH	11:45A
UC-7A-2	"	"	11:47A	"	12:56P
UC-7A-3	"	"	12:58P	"	1:30P
UC-7A-4	"	"		"	
UC-7A-5	"	"		"	

HNU HEAD SPACE DATA on UC-7 1 TO 5

CALIBRATE DATA HNU CAL GAS 14 PPM @ 9.8 SPAN w/ 10.2 EV PROBE 150 ASI

SPAN START - 782 VALUE - 16 PPM

SPAN FINISH - 9.60 VALUE 14 PPM

UC-7-1 200-300 PPM
UC-7-2 500 PPM
UC-7-3 200 PPM
UC-7-4 15 PPM
UC-7-5 12 (100 DOWN TUBE) PPM

DALLAS WAIT

ENSECO INCORPORATED

205 ALEWIFE BROOK PKWY
CAMBRIDGE MA 02138

SETTLING TEST

INFLUENT HAS ONLY SLIGHTLY MORE SEDIMENT THAN THE EFFLUENT

IT IS A FLUFFY IRON COLORED FLOCK

Woburn 1/7/89

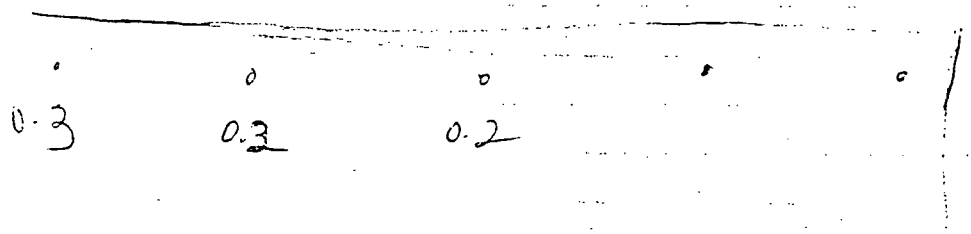
	W.L. 7A	W.L.	
1	~ 2' of HOSE	~ 9.5'	TO TOP OF TUBE OUT SIDE CASING 9.25'
2	~ 2.3' " "	~ 9.5	11' W/ SLIMST + ~.1' AGAIN 11'
3	~ 2.3'		
4	~ 3' of HOSE	~ 8	
5	~ 4' of HOSE	~ 8'	TO TOP OF TUBE

CASING

CHECK BOTH CASINGS NEXT TRIP

TRUCK MILEAGE @ UNIFIRST 26983
15
STARTING 26968
FINAL 27005

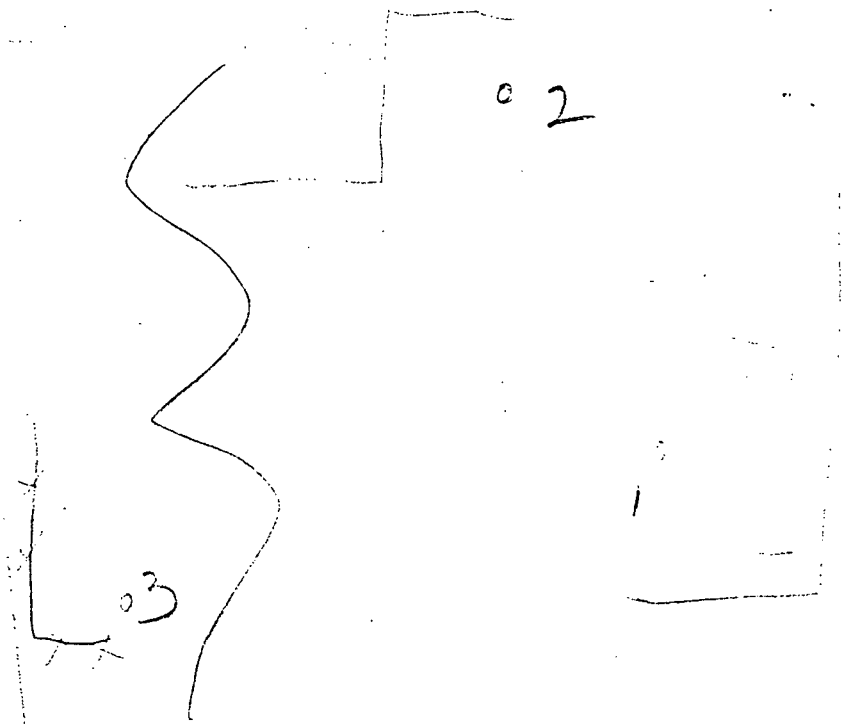
12/17/86



12/18/86

UNIFIRST WASH WATER LEVEL

TAPE CORR. .56'



WELL #

1 - 4.0 + .56 = 4.62

2 8.41 + .56 = 8.97

3 + .56 =

1/16/87 UNIFIRST

~~TH~~ SAMPLES ARE BEing COLLECTED FROM ALL THE FULL BARRELS FOR C24 ANALYSES. BORINGS WITH MULTIPLE BARRELS WILL BE COMPOSITED BY THE LAB

	BARREL INVENTORY		
VC-4	1	BARRELS	ADJACENT TO DUMPSTER
VC-5	1	"	ADJACENT TO LOADING DOCK
VC-6	3	"	
VC-7	16	"	15 SAMPLED
VC-8	1		NO SAMPLE
TOTAL	22	BARRELS	

Well No. _____

GROUND WATER SAMPLE COLLECTION RECORD

Job No. 0888-280 Date: 2/3/87

Location: UniFirst Woburn Time: S ~1:00 PM

Weather Conds.: CLOUDY 35°F F 2:40 PM

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) 0

a. Total Well Length (+ TC) 42.70 (known, meas.) Tape Corr. (TC) .51'

b. Water Table Elev. (+ TC) 8.53' (~~5.40~~ 8.02+.51) Well Dia. 1.5"

c. Length of Water Column 34.17 (a-b)

2. WELL PURGING DATA:

a. Purge Method PVC BAILER

b. Required Purge Volume (@ ____ well volumes) 3 gal / vol

c. Field Testing: Equipment Used Orion pH, YSI S-C-T

Volume Removed	T°	PH	Spec. Cond.	Color
3 well volumes	14	6.31	850	gray green/silty

3. Sample Collection: Method _____

Container Type	Preservation	Analysis Req.

Comments: _____

1035/12-84

Well No. _____

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D888280 Date: 2/3/87

Location: UniFirst Woburn Time: S 2:40 PM

Weather Conds.: cloudy 35°F F 1

1. WATER LEVEL DATA: (from ToC)

ToC Elevation (from LS) 0

a. Total Well Length (+ TC) 14.73 (known, meas.)

Tape Corr. (TC) 0.51

b. Water Table Elev. (+ TC) 8.51 (8.00 + 0.51)

Well Dia. 1.5"

c. Length of Water Column 6.22 (a-b)

2. WELL PURGING DATA:

a. Purge Method ~~teflon~~ PVC Bailer

b. Required Purge Volume (@ 3 well volumes) (0.5 x 3) 1.5 gallons / purge volume ~~[illegible]~~

c. Field Testing: Equipment Used

Volume Removed	T°C	PH	Spec. Cond.	Color
0.5 gallons DRY	11	11.51	2800	gray (till)
1.0 gallons (DRY)	8	9.67	2000	"
~~1.5 gallons~~				

3. Sample Collection: Method PVC BAILER

Container Type	Preservation	Analysis Req.
3 VOA VIALS	—	624

Comments: 'AFTER' SAMPLED 2/4/87 AFTER Purging DRY + WAITING FOR RECOVERY

BEFORE + AFTER Purge SAMPLES COLLECTED

005/12-84

ERT

Well No. UC-7A

GROUND WATER SAMPLE COLLECTION RECORD

Job No. 0880-280 Date: 2/3/87

Location: UniFirst Woburn Time: S ____

Weather Conds.: Cloudy 35°F F ____

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) ____

a. Total Well Length (+ TC) ____ (known, meas.) Tape Corr. (TC) ____

b. Water Table Elev. (+ TC) ____ Well Dia. ____

c. Length of Water Column ____ (a-b)

2. WELL PURGING DATA:

a. Purge Method PERISTALTIC PUMP

b. Required Purge Volume (@ ____ well volumes) 1 - .72 gal, 2 - 600, 3 - .78, 4 - .18, 5 - .084

c. Field Testing: Equipment Used ORION PH, YSI COND

Volume Removed	1	2	3	4	5	T°C	PH 1	2	3	4	5	Spec. Cond. umho/cm 1	2	3	4	5	Color
1	12	12	12	14		11	7.82	6.38	8.98	7.03	6.41	1100	700	700	800	2000	
2	12	12	12	13		11	6.91	6.43	8.91	6.86	6.45	1100	600	700	800	2000	ALL CLEAR
3	13	12	12	13		11	6.96	6.13	7.91	6.73	6.50	1200	1000	700	800	2000	EXCEPT 5
				13						6.64					800		WHICH HAS
																	A BROWN TINT

3. Sample Collection: Method PERISTALTIC PUMP

Container Type	Preservation	Analysis Req.
3 VOA VIALS		624

Comments: BEFORE + AFTER PURGE SAMPLES COLLECTED FROM EACH SUB WELL

UC 7A - 1+2 SAMPLED ON 2/3/87

UC 7A - 3-5 " " 2/4/87

1005/12-84

ERT

Well No. UC-7

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D885-280 Date: 2/3/89

Location: UniFirst Woburn MA Time: S 11:15 AM

Weather Conds.: Cloudy 35°F F 2:10 PM

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) _____

a. Total Well Length (+ TC) _____ (known, meas.) Tape Corr. (TC) _____

b. Water Table Elev. (+ TC) _____ Well Dia. _____

c. Length of Water Column _____ (a-b)

2. WELL PURGING DATA:

a. Purge Method SOLINST SYSTEM

b. Required Purge Volume (@ ____ well volumes) _____

c. Field Testing: Equipment Used ORION pH YSI S.C.T

Volume Removed	1	2	3	4	T°C 5	PH 1	2	3	4	5	Spec. Cond. mmho/cm 1	2	3	4	5	Color
1 V	12	12	12	12	11	6.25	7.01	6.73	6.71	6.56	1150	600	700	700	350	CLEAR 1-3
2 o l	11	13	13	13	11	6.28	7.05	7.21	6.12	6.50	1200	1000	700	700	300	CLEAR
3 v m l	12	12	13	14	12	6.25	7.01	7.39	6.40	6.59	1100	1100	700	700	850	CLEAR

3. Sample Collection: Method FROM - SOLINST TUBE

Container Type	Preservation	Analysis Req.
3 VOA VIALS		601 GC Scan

Comments: 5 SETS OF SAMPLES 1 EACH FROM UC7 - 1 TO 5

7/12-84

ERT

Well No. UC-6

GROUND WATER SAMPLE COLLECTION RECORD

Job No. P495-003 Date: 2/4/87

Location: Woburn Time: S 1:40

Weather Conds.: partly cloudy 35°F F

1. WATER LEVEL DATA: (from ToC)

a. Total Well Length (+ TC) not measured (known, meas.)

b. Water Table Elev. (+ TC) 9.51 (9.40+0.51)

c. Length of Water Column _____ (a-b)

ToC Elevation (from LS) 0

Tape Corr. (TC) .51

Well Dia. 2"

2. WELL PURGING DATA:

a. Purge Method dedicated bailer

b. Required Purge Volume (@ 1 well volumes)

c. Field Testing: Equipment Used

Volume Removed	T°	PH	Spec. Cond.	Color
1 vol = ± 6 gallons	12	10.55	285	murky grey
(well dry)				

3. Sample Collection: Method dedicated bailer - TEFLON

Container Type	Preservation	Analysis Req.
VOA vials	none	GC

Comments: 1 set before purging samples
1 set after purging samples

ERT/12-84

ERT

Well No. VC-5

GROUND WATER SAMPLE COLLECTION RECORD

Job No. D445-003 Date: 2/4/87 ADJACENT LOADING DOCK

Location: UNIFIRST WOBURN MA Time: S ____

Weather Conds.: PARTLY CLOUDY 32°F WIND F ____

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) 0

a. Total Well Length (+ TC) ____ (known, meas.) Tape Corr. (TC) .51'

b. Water Table Elev. (+ TC) 7.01 (6.50 + .51) Well Dia. 2"

c. Length of Water Column ____ (a-b)

2. WELL PURGING DATA:

a. Purge Method TEFLON BAILER DEDICATED

b. Required Purge Volume (@ ____ well volumes) ____

c. Field Testing: Equipment Used ____

Volume Removed	T°C	PH	Spec. Cond. mmHg/cm	Color
1 gallon	10	8.72	500	murky brown with oil film
6 gallons	8	6.47	380	SAME
7 gallons	7	6.80	400	

3. Sample Collection: Method TEFLON BAILER

Container Type	Preservation	Analysis Req.
3 VOA VIALS	—	62L

Comments:

WATER IS STILL DRAINING INTO THE WELL WE WILL TRY TO SOAK IT UP BEFORE PURGING - NO BEFORE SAMPLE

After sample: slight (drops) bit of ~~water~~ inflow still getting into well

1695/12-84

ERT

Well No. UC-4

GROUND WATER SAMPLE COLLECTION RECORD

Job No. ~~[illegible]~~ 445-003 Date: 7/4/94 ADJ DUMPSTER

Location: WOBURN UNIFIRST Time: S _____

Weather Conds.: PARTLY CLOUDY 32°F WIND F _____

1. WATER LEVEL DATA: (from ToC) ToC Elevation (from LS) 0

a. Total Well Length (+ TC) _____ (known, meas.) Tape Corr. (TC) .51

b. Water Table Elev. (+ TC) 3.41 + .51 Well Dia. 2"

c. Length of Water Column _____ (a-b)

2. WELL PURGING DATA:

a. Purge Method TEFLON BAILER

b. Required Purge Volume (@ ____ well volumes) _____

c. Field Testing: Equipment Used _____

Volume Removed	T°	PH	Spec. Cond. mmHO/cm	Color
1 ~ [illegible] (DRY)	7	7.44	210	TAN - SL. OIL SHEEN
2 ~ 1.5 gal (DRY)	7	6.80	240	TAN

3. Sample Collection: Method TEFLON BAILER

Container Type	Preservation	Analysis Req.
3 VOA VIAL		624

Comments: WATER LEVELS ARE SUSPECT DUE TO SURFACE WATER DRAINAGE INTO THE WELL — NO BEFORE PURGE SAMPLE

1996/12-84

6. Well and Test Pit Logs taken in 1986 and 1987.

Project [illegible] Site [illegible]

BORING

Sh [illegible] of 2

Elev. Feet	Depth Feet	Sample Type & Number	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Sample Description	Equipment Installed
		SS5	50 [illegible]	[illegible] to [illegible]	0.8		[illegible]	
	8	SS6	200	[illegible] to 3.0	0.5		gray-green [illegible] sand silt [illegible] HNU ~2	some
							[illegible] pebbles	
	9	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
							8.3 Top of Rock	
			RQD					
	10	NQ1	16%	8.3 to 12.8	2.7		8.3-10.3 black-green fine grained granodiorite highly frax. jts. 10°-80° to core axis coated $CaCO_3$, light FeO → Salem Gabbrodiorite	
							NQ1 10.3 - pink-gray granite unfrax. → Dedham Granodiorite	
							boring caves @ 11.0 overnight - ream it	1/8/86
		NQ2	92%	12.8 to 16.8	3.8		NQ2 pink granite becomes coarse grained jts 90°-80° to core axis FeO stained	
							boring continues to cave - ream	13.8-16.8
							NQ3 difficulty pulling rods, hole caving	
		NQ3	85%	16.8 to 20.8	4.1		same as above	
							20.8 End of boring	
		7' HW casing 0.5' hard shoe					boring caves, push obstruction to 18.0	
		bottom of casing @ 7.7'					during installation of road box "solvent type" odor noted from standing water between casing and floor ~200 HNU response at water surface	

road box installed @ surface

ERT
ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

1912 (1/81)

BORING UC8 Sh 1 of 2

Project UniFirst Site Woburn Ground Elevation
Date Started 1/6/87 Completed 1/9/87 Logged by J. T. Lawson
Total Depth 20.8 Location
Casing I.D. HW Contractor Guild
Remarks

Elev. Feet	Depth Feet	Sample Type & Number	Sample Blows per 6 In.	Sample Depth Range	Sample Rec.	Graphic Log	Sample Description	Equipment Installed
		HNU	background 5.7				0.0-0.45 Concrete Floor 12in. thinwall bit HNU no response - took ~15 min to remove concrete plug	
	1	SS1	2/1.5'	0.7 to 2.2	0.2		soil settles to 0.7 during removal of plug Brown f-m SAND tr silt HNU No Response	
	2	SS2	1/1.5'	2.2 to 3.7	0.1		Pebble in shoe wet - thin-wall drilling water trapped above pavement	
	3	SS3	14/9/5	3.7 to 5.2			3.7 - 3.9 Bituminous Concrete Pavement 3.9-4.2 1/4 in crushed stone 4.2-6.4 Brown Sand & Gravel HNU response ~250	
	4							
	5	SS4		5.2 to 6.7	1.2		drive 4in/HW to 5.2 pull drop spoon to 4.8 sample 6.4- black f. SAND 5.7-6.4 HNU ~30 6.4-6.7 HNU ~5	
	6		7/6/15					
	7							

Bit. Con in wash HNU ~50

UC8

ERT ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

1911 (1/81)

7. Laboratory Analyses Data Sheets

ALPHA ANALYTICAL LABORATORIES
200 Homer Avenue
Ashland Technolgy Center
Ashland, MA 01721
(617) 881-3503

CERTIFICATE OF ANALYSIS

Client: Environmental Research and and Technology, Inc.

Job Number: 870034

Address: 696 Virginia Road

Invoice Number: 1749

Concord, MA 01742

Date In: 01/16/87

Att: Larry Hogan

Date Reported: 01/27/87

Sample Description: Four water samples

ERT Project #0495-003

REFERENCES:

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1982.

2. Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water. EPA 600/4-82-057. 1982.

3. Analysis of PCB's in Transformer Fluid and Waste Oil. EPA 600/4-81-045. 1981.

4. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WACF. 15th Edition. 1980.

Authorized by: Scott McLean

Scott McLean--Laboratory Director

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870034.1

Analysis Requested: Volatile Organics (624) **Date Received:** 01/16/87

Date Reported: 01/26/87

Client Ident: UC-4 Barrels (during purge)
Sample Location:
Sample Description: Water
Sample Container: VOA vials **# of Containers:** 2
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	15.6	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Tetrachloroethylene	17.6	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Volatile Aromatics	ND	ug/L	1*	GC/MS	1	8240	-----	01/23/87

1* A list of volatile halocarbons and volatile aromatics analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870034.2

Analysis Requested: Volatile Organics (624) **Date Received:** 01/16/87

Date Reported: 01/26/87

Client Ident: UC-5 Barrels
Sample Location:
Sample Description: Water
Sample Container: VOA vials **# of Containers:** 2
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1-Dichloroethylene	3.4	ug/L	1*	GC/MS	1	8240	-----	01/23/87
1,1-Dichloroethane	7.2	ug/L	1*	GC/MS	1	8240	-----	01/23/87
1,2-Dichloroethylene	1.9	ug/L	1*	GC/MS	1	8240	-----	01/23/87
1,1,1-Trichloroethane	242	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Trichloroethylene	3.0	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Tetrachloroethylene	432	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Volatile Aromatics	ND	ug/L	1*	GC/MS	1	8240	-----	01/23/87

1* A list of volatile halocarbons and volatile aromatics analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870034.3

Analysis Requested: Volatile Organics (624) **Date Received:** 01/16/87

Date Reported: 01/26/87

Client Ident: UC-6 Barrels (composite)
Sample Location:
Sample Description: Water
Sample Container: VOA vials **# of Containers:** 6
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	5.3	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Tetrachloroethylene	76.1	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Volatile Aromatics	ND	ug/L	1*	GC/MS	1	8240	-----	01/23/87

1* A list of volatile halocarbons and volatile aromatics analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870034.4

Analysis Requested: Volatile Organics (624) **Date Received:** 01/16/87

Date Reported: 01/26/87

Client Ident: UC-7 Barrels (composite)
Sample Location:
Sample Description: Water
Sample Container: VOA vials **# of Containers:** 15
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1-Dichloroethylene	5.7	ug/L	1*	GC/MS	1	8240	-----	01/23/87
1,1-Dichloroethane	13.4	ug/L	1*	GC/MS	1	8240	-----	01/23/87
1,2-Dichloroethylene	69.6	ug/L	1*	GC/MS	1	8240	-----	01/23/87
1,1,1-Trichloroethane	135	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Trichloroethylene	18.4	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Tetrachloroethylene	1,184	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Volatile Aromatics								
Toluene	9.5	ug/L	1*	GC/MS	1	8240	-----	01/23/87
Xylenes	2.3	ug/L	1*	GC/MS	1	8240	-----	01/23/87

1* A list of volatile halocarbons and volatile aromatics analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

VOLATILE ORGANICS BY GC/MS

Parameter	Method Detection Limit
Chloromethane	nd
Bromomethane	nd
Vinyl chloride	nd
Chloroethane	nd
Methylene chloride	2.8 ug/L
Trichlorofluoromethane	nd
1,1-Dichloroethene	2.8 ug/L
1,1-Dichloroethane	4.7 ug/L
trans-1,2-Dichloroethene	1.6 ug/L
Chloroform	1.6 ug/L
1,2-Dichloroethane	2.8 ug/L
1,1,1-Trichloroethane	3.8 ug/L
Carbon tetrachloride	2.8 ug/L
Bromodichloromethane	2.2 ug/L
1,2-Dichloropropane	6.0 ug/L
trans-1,3-Dichloropropene	5.0 ug/L
Trichloroethene	1.9 ug/L
Benzene	4.4 ug/L
Dibromochloromethane	3.1 ug/L
1,1,2-Trichloroethane	5.0 ug/L
cis-1,3-Dichloropropene	nd
2-Chloroethylvinyl ether	nd
Bromoform	4.7 ug/L
1,1,2,2-Tetrachloroethane	6.9 ug/L
Tetrachloroethene	4.1 ug/L
Toluene	6.0 ug/L
Chlorobenzene	6.0 ug/L
Ethyl benzene	7.2 ug/L
1,3-Dichlorobenzene	nd
1,2-Dichlorobenzene	nd
1,4-Dichlorobenzene	nd
Xylenes	1.0 ug/L

NOTE: Detection limits in soil and sediment are 50X higher.

ERCO
205 Alewife Brook Parkway, Cambridge, Massachusetts 02138 (617) 661-3111 Telex 650-256-7697 (MCI)

A DIVISION OF
ENSECO
INCORPORATED

January 27, 1987

Mr. Joe Mastone
ERT
33 Industrial Way
Wilmington, MA 01887

Dear Joe:

Enclosed are the analytical results for seven water samples we received on January 7, 1987, under Job No. D495-003 (ERCO Project No. 8801-3130).

If you have any questions about the data, please do not hesitate to contact me.

Sincerely,

Dallas Wait

A. Dallas Wait, Ph.D.
Director of Programs

ADW:km
Encl.

Regional and international offices:

- 2400 West Loop South, Suite 300, Houston, Texas 77027 (713) 960-9411
- 123 Grove Avenue, Suite 118, Cedarhurst, New York 11516 (516) 295-1162
- c/o Bectech Trading Co., Ltd., P.O. Box 101-41, Taipei, Taiwan (R.O.C.) Tel. 5013908

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT

CLIENT ID: VC-7-1 (dup)

ERCO ID: 87-000209

SAMPLE RECEIVED: 01/07/87

ANALYSIS COMPLETED: 01/21/87

RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	11	1
13V	1,1-Dichloroethane	31	1
30V	1,2-trans-Dichloroethylene	100	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	240	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	82	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	15,000	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Reported by: JL
Checked by: MR

Dilution factor: 1

ND = Not detected above the minimum reporting limit.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: VC-7-2
ERCO ID: 87-000210
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	730	1
30V	1,2-trans-Dichloroethylene	480	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	3,200	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	ND	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	22,000	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Reported by: JL
Checked by: MR

Dilution factor: 100

ND = Not detected above the minimum reporting limit.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: VC-7-3
ERCO ID: 87-000211
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	810	1
30V	1,2-trans-Dichloroethylene	ND	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	270	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	10,000	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Reported by: JL
Checked by: MR

Dilution factor: 100

ND = Not detected above the minimum reporting limit.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: VC-7-4
ERCO ID: 87-000212
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	ND	1
30V	1,2-trans-Dichloroethylene	ND	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	ND	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene ----------	1,300	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Dilution factor: 100

ND = Not detected above the minimum reporting limit.

Reported by: JL
Checked by: [illegible]

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: VC-7-5
ERCO ID: 87-000213
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	30	1
30V	1,2-trans-Dichloroethylene	26	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	7.4	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	180	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Dilution factor: 5

ND = Not detected above the minimum reporting limit.

Reported by: JL
Checked by: MOR

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: VC-7-6 FIELD BLANK
ERCO ID: 87-000214
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	ND	1
30V	1,2-trans-Dichloroethylene	ND	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	ND	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	ND	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Dilution factor: 1

ND = Not detected above the minimum reporting limit.

Reported by: JL
Checked by: MR

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: Trip Blank
ERCO ID: 87-000224
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	ND	1
30V	1,2-trans-Dichloroethylene	ND	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	ND	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	ND	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Reported by: JL
Checked by: WR

Dilution factor: 1

ND = Not detected above the minimum reporting limit.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: Procedural Blank - Water
ERCO ID: AR912
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	ND	1
30V	1,2-trans-Dichloroethylene	ND	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	ND	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	ND	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Reported by: JL
Checked by: [illegible]

Dilution factor: 1

ND = Not detected above the minimum reporting limit.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: Blank Spike
ERCO ID: AR923
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/21/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result[a]	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	ND	1
30V	1,2-trans-Dichloroethylene	24 (120%)	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	19 (95%)	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	18 (90%)	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Reported by: JL
Checked by: [illegible]

Dilution factor: 1

ND = Not detected above the minimum reporting limit.

[a]Percent recovery, in parentheses, is based on a spike concentration of 20 ppb.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: ERT
CLIENT ID: Blank Spike Duplicate
ERCO ID: AR939
SAMPLE RECEIVED: 01/07/87
ANALYSIS COMPLETED: 01/22/87
RESULTS IN: µg/l (ppb)

VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 601

- Data Report -

	Compound	Result[a]	Minimum reporting limit
45V	Chloromethane	ND	5
46V	Bromomethane	ND	5
88V	Vinyl chloride	ND	2
16V	Chloroethane	ND	5
44V	Methylene chloride	ND	5
29V	1,1-Dichloroethylene	ND	1
13V	1,1-Dichloroethane	ND	1
30V	1,2-trans-Dichloroethylene	23 (115%)	1
23V	Chloroform	ND	1
10V	1,2-Dichloroethane	ND	1
11V	1,1,1-Trichloroethane	ND	1
6V	Carbon tetrachloride	ND	1
48V	Bromodichloromethane	ND	1
32V	1,2-Dichloropropane	ND	2
33V	trans-1,3-Dichloropropylene	ND	2
87V	Trichloroethylene	21 (105%)	1
51V	Dibromochloromethane	ND	1
33V	cis-1,3-Dichloropropylene	ND	2
14V	1,1,2-Trichloroethane	ND	2
47V	Bromoform	ND	5
15V	1,1,2,2-Tetrachloroethane	ND	2
85V	Tetrachloroethylene	22 (110%)	1
7V	Chlorobenzene	ND	5
19V	2-Chloroethyl vinyl ether	ND	10

Multiply minimum reporting limit by dilution factor to obtain true minimum limit.

Reported by: JL
Checked by: [illegible]

Dilution factor: 1

ND = Not detected above the minimum reporting limit.

[a]Percent recovery, in parentheses, is based on a spike concentration of 20 ppb.

RESULTS

Client : UNIFIRST
Charge # : 0005-241

Analysis: TCE
Matrix : WATER
Method : HEADSPACE/GC/FID

ERT #	FIELD ID	ANALYSIS DATE	CIS -1,2-DICHLORO-ETHENE	1,1,1-TRICHLORO-ETHANE	TRI CHLORO ETHENE	TETRA-CHLORO-ETHENE
40727	UC6	08-Dec-86	BDL~	BDL	BDL	0.092
40728	SHIP BLANK	08-Dec-86	BDL	BDL	BDL	BDL
40729	FIELD BLANK	08-Dec-86	BDL	BDL	BDL	BDL
40730	UC5	08-Dec-86	0.016	0.973	0.012	2.175
40730	* UC5	08-Dec-86	0.016	1.087	0.014	2.576
40730	** UC5	08-Dec-86	0.016	1.030	0.013	2.376
40731	UC4	08-Dec-86	0.002	0.004	0.000	1.532
40742	UC7A-2	08-Dec-86	0.128	0.221	0.073	10.892
40742	* UC7A-2	08-Dec-86	0.128	0.202	0.072	10.498
40742	** UC7A-2	08-Dec-86	0.128	0.212	0.073	10.695
40743	UC7A-1	08-Dec-86	0.131	0.197	0.074	9.682
40744	UC7	08-Dec-86	0.161	0.589	0.098	19.437 → will be diluted & rerun
40745	FIELD BLANK	08-Dec-86	BDL	BDL	BDL	BDL
40746	SHIP BLANK	08-Dec-86	BDL	BDL	BDL	BDL

~ BDL=Below Detection Limit of 10 ppb

* Analyzed in duplicate

** Mean of duplicates

RESULTS

Client : UNIFIRST
Charge # : 0005-241

Analysis: TCE
Matrix : SOIL
Method : HEADSPACE/GC/FID

ERT #	FIELD ID	ANALYSIS DATE	CIS -1,2-DICHLORO-ETHENE	TRI-CHLORO-ETHENE	1,1,1-TRICHLORO-ETHENE	TETRA-CHLORO-ETHENE
39789	UC4 SS1	05-Nov-86	BDL*	BDL	BDL	80.6 ug/g
39790	UC4 SS2	05-Nov-86	BDL	BDL	BDL	BDL
39802	UC5 SS1	05-Nov-86	BDL	BDL	BDL	BDL
39803	UC5 SS2	05-Nov-86	BDL	BDL	BDL	BDL
39805	UC5 SAND	05-Nov-86	BDL	BDL	BDL	BDL
39834	UC6 SS3	05-Nov-86	BDL	BDL	BDL	BDL
39835	Auger Soil	05-Nov-86	BDL	BDL	BDL	BDL
**39786	Packing Sand	03-Nov-86	BDL	BDL	BDL	BDL

* BDL = Below Detection Limit of 0.5 ug/g

** This sample was analyzed as a soil only for the screen. After the initial screening, the sand packed in water was analyzed using the water method assuming that any volatiles in the sand would extract into the water

ERT

RESULTS

Client : UNIFIRST
Charge # : 0005-241

Analysis: TCE
Matrix : WATER
Method : HEADSPACE/GC/FID

ERT #	FIELD ID	ANALYSIS DATE	CIS -1,2-DICHLORO-ETHENE	1,1,1-TRICHLORO-ETHENE	TRI-CHLORO-ETHENE	TETRA-CHLORO-ETHENE
39787	Tool Blank	10-Nov-86	BDL	BDL	BDL	BDL
39788	Drill Blank	10-Nov-86	BDL	BDL	BDL	BDL
39804	UC5 SAND	10-Nov-86	BDL	BDL	BDL	BDL
39806	Wash Water	10-Nov-86	BDL	BDL	BDL	BDL
39807	DI Rinse Rise	10-Nov-86	BDL	BDL	BDL	BDL
39837	Hands	10-Nov-86	BDL	BDL	BDL	BDL
39965	Casing 4in	10-Nov-86	BDL	BDL	BDL	BDL
39967	ADR	10-Nov-86	BDL	BDL	BDL	BDL
39968	NW Casing	10-Nov-86	BDL	BDL	BDL	BDL
39969	Tap Water	10-Nov-86	BDL	BDL	BDL	BDL
39970	UC6 Drill	10-Nov-86	BDL	BDL	BDL	BDL
40049	Field Blank	24-Nov-86	BDL	BDL	BDL	BDL
40050	UC4	24-Nov-86	BDL	BDL	BDL	BDL
* 40050	UC4	24-Nov-86	BDL	BDL	BDL	BDL
40051	UC5	24-Nov-86	BDL	BDL	240 ppb	55 ppb
40052	UC6	24-Nov-86	BDL	BDL	BDL	640 ppb
40053	Ship Blank	24-Nov-86	BDL	BDL	BDL	BDL
40208	UC6 Well Rise	24-Nov-86	BDL	BDL	BDL	BDL
40209	Ship Blank	24-Nov-86	BDL	BDL	BDL	BDL
40210	UC6	24-Nov-86	BDL	BDL	BDL	BDL
* 40210	UC6	24-Nov-86	BDL	BDL	BDL	BDL
40211	Field Blank	24-Nov-86	BDL	BDL	BDL	BDL

~ BDL=Below Detection Limit of 10 ppb

* Analyzed in duplicate

** Mean of duplicates

ERT

ALPHA ANALYTICAL LABORATORIES
200 Homer Avenue
Ashland Technology Center
Ashland, Massachusetts 01721
(617) 881-3503

CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Job Number: 870016

Address: 696 Virginia Road

Invoice Number: 1717

Concord, MA 01742

Date In: 1/9/87

Attn: Larry Hogan

Date Reported: 1/14/87

Sample Description: Two water samples

ERT Project #0495

REFERENCES:

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1982.

2. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WACF. 15th Edition. 1980.

3. Analysis of PCB's in Transformer Fluid and Waste Oil. EPA 600/4-81-045. 1985.

Authorized by: Scott McLean

Scott McLean--Laboratory Director

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870016.1

Analysis Requested: Volatile Halocarbons (601) **Date Received:** 1/9/87

Date Reported: 1/14/87

Client Ident: UC7A-1 ->Peristaltic Pump
Sample Location:
Sample Description: Water
Sample Container: VOA vial **# of Containers:** 2
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,2-Dichloroethylene	105	ug/L	100	GC	1	8010	-----	01/12/87
1,1,1-Trichloroethane	535	ug/L	100	GC	1	8010	-----	01/12/87
Trichloroethylene	108	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	35,500	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870016.2

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC7-Riser
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	125	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	1,250	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

PURGEABLE HALOCARBONS--
Method 601 and 8010

PARAMETER

Bromodichloromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chlorobenzene
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Chloromethane
Dibromochloromethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane
Vinyl chloride

Method Detection Limit = 100 ug/L

ALPHA ANALYTICAL LABORATORIES
200 Homer Avenue
Ashland Technology Center
Ashland, Massachusetts 01721
(617) 881-3503

CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Address: 696 Virginia Road

Concord, MA 01742

Attn: Larry Hogan

Job Number: 870015

Invoice Number: 1718

Date In: 1/9/87

Date Reported: 1/14/87

Sample Description: Two water samples

ERT Project #D495-003

REFERENCES:

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1982.

2. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WACF. 15th Edition. 1980.

3. Analysis of PCB's in Transformer Fluid and Waste Oil. EPA 600/4-81-045. 1985.

Authorized by: Scott McLean

Scott McLean--Laboratory Director

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.1

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: Shipping Blank
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 3

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons	ND	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.2

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC 8
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,2-Dichloroethylene	14,300	ug/L	100	GC	1	8010	-----	01/12/87
1,1,1-Trichloroethane	580	ug/L	100	GC	1	8010	-----	01/12/87
Trichloroethylene	2,250	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	62,510	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870015.3

Analysis Requested: Volatile Halocarbons (601) **Date Received:** 1/9/87

Date Reported: 1/14/87

Client Ident: UC 7-1
Sample Location:
Sample Description: Water
Sample Container: VOA vial **# of Containers:** 2
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,2-Dichloroethylene	160	ug/L	100	GC	1	8010	-----	01/12/87
1,1,1-Trichloroethane	450	ug/L	100	GC	1	8010	-----	01/12/87
Trichloroethylene	125	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	16,740	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.3D

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC 7-1 Duplicate
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	384	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	15,000	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.4

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC 7-2
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,2-Dichloroethylene	250	ug/L	100	GC	1	8010	-----	01/12/87
1,1,1-Trichloroethane	2,250	ug/L	100	GC	1	8010	-----	01/12/87
Trichloroethylene	140	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	40,150	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.5

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC 7-3
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1-Dichloroethylene	136	ug/L	100	GC	1	8010	-----	01/12/87
1,1-Dichloroethane	660	ug/L	100	GC	1	8010	-----	01/12/87
Trichloroethylene	550	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	11,010	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.6

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC 7-4
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	150	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	2,000	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.7

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC 7-5
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	160	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	2,050	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.7D

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: UC 7-5 Duplicate
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	141	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	2,630	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870015.8

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/9/87

Date Reported: 1/14/87

Client Ident: Field Blank
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1,1-Trichloroethane	106	ug/L	100	GC	1	8010	-----	01/12/87
Tetrachloroethylene	4,280	ug/L	100	GC	1	8010	-----	01/12/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

PURGEABLE HALOCARBONS--
Method 601 and 8010

PARAMETER

Bromodichloromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chlorobenzene
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Chloromethane
Dibromochloromethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane
Vinyl chloride

Method Detection Limit = 100 ug/L

JAN 22 1987

ALPHA ANALYTICAL LABORATORIES
200 Homer Avenue
Ashland Technology Center
Ashland, Massachusetts 01721
(617) 881-3503

CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Job Number: 870031

Address: 696 Virginia Road

Invoice Number: 1723

Concord, MA 01742

Date In: 1/14/87

Attn: Larry Hogan

Date Reported: 1/16/87

Sample Description: Seven water samples

ERT Project #0495-003

REFERENCES:

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1982.

2. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WACF. 15th Edition. 1980.

3. Analysis of PCB's in Transformer Fluid and Waste Oil. EPA 600/4-81-045. 1985.

Authorized by: Scott McLean

Scott McLean--Laboratory Director

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870031.1

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/14/87

Date Reported: 1/16/87

Client Ident: UC7-1
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
Tetrachloroethylene	11,390	ug/L	200	GC	1	8010	-----	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870031.2

Analysis Requested: Volatile Halocarbons (601) **Date Received:** 1/14/87

Date Reported: 1/16/87

Client Ident: UC7-2
Sample Location:
Sample Description: Water
Sample Container: VOA vial **# of Containers:** 2
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1-Dichloroethane	550	ug/L	200	GC	1	8010	-----	01/15/87
1,2-Dichloroethylene	300	ug/L	200	GC	1	8010	-----	01/15/87
1,1,1-Trichloroethane	2,980	ug/L	200	GC	1	8010	-----	01/15/87
Tetrachloroethylene	59,400	ug/L	200	GC	1	8010	-----	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870031.3

Analysis Requested: Volatile Halocarbons (601) **Date Received:** 1/14/87

Date Reported: 1/16/87

Client Ident: UC7-3
Sample Location:
Sample Description: Water
Sample Container: VOA vial **# of Containers:** 2
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1-Dichloroethane	680	ug/L	200	GC	1	8010	-----	01/15/87
Trichloroethylene	580	ug/L	200	GC	1	8010	-----	01/15/87
Tetrachloroethylene	16,670	ug/L	200	GC	1	8010	-----	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870031.3D

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/14/87

Date Reported: 1/16/87

Client Ident: UC7-3 Duplicate
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,1-Dichloroethane	890	ug/L	200	GC	1	8010	-----	01/15/87
1,2-Dichloroethylene	250	ug/L	200	GC	1	8010	-----	01/15/87
Trichloroethylene	700	ug/L	200	GC	1	8010	-----	01/15/87
Tetrachloroethylene	19,380	ug/L	200	GC	1	8010	-----	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870031.4

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/14/87

Date Reported: 1/16/87

Client Ident: UC7-4
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
Tetrachloroethylene	1,680	ug/L	200	GC	1	8010	-----	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870031.5

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/14/87

Date Reported: 1/16/87

Client Ident: UC7-5
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
Tetrachloroethylene	1,090	ug/L	200	GC	1	8010	------	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc.

Sample Number: 870031.6

Analysis Requested: Volatile Halocarbons (601)

Date Received: 1/14/87

Date Reported: 1/16/87

Client Ident: UC7-Riser
Sample Location:
Sample Description: Water
Sample Container: VOA vial
Field Prep: None

# of Containers: 2

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
1,2-Dichloroethylene	14.4	ug/L	10	GC	1	8010	-----	01/15/87
Tetrachloroethylene	32.0	ug/L	10	GC	1	8010	-----	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Client: Environmental Research and Technology, Inc. **Sample Number:** 870031.7

Analysis Requested: Volatile Halocarbons (601) **Date Received:** 1/14/87

Date Reported: 1/16/87

Client Ident: Field Blank
Sample Location:
Sample Description: Water
Sample Container: VOA vial **# of Containers:** 2
Field Prep: None

PARAMETER	RESULT	UNITS	MDL*	INST	REF**	METHOD	EXTRACT	ANALYSIS
Volatile Halocarbons								
Tetrachloroethylene	21.9	ug/L	5	GC	1	8010	-----	01/15/87

A list of volatile halocarbons analyzed for and their detection limits accompanies this report.

* MDL--Method Detection Limits (same units as the Results).
** REF--Reference as cited on the cover (first) page of this report.

PURGEABLE HALOCARBONS--
Method 601 and 8010

PARAMETER

Bromodichloromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chlorobenzene
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Chloromethane
Dibromochloromethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane
Vinyl chloride

Method Detection Limit

870031.1, .2, .3, .4, & .5 = 200 ug/L
870031.6 = 10 ug/L
870031.7 = 5 ug/L

J. Cleary

4. HNu pore-gas analysis field logs.

HNU - PPM
readings

— Higher readings may be due to free product & not soil contamination
>10ppm on HNU in a screen.

— Soil sampling for chemical analysis showed no soil contamination

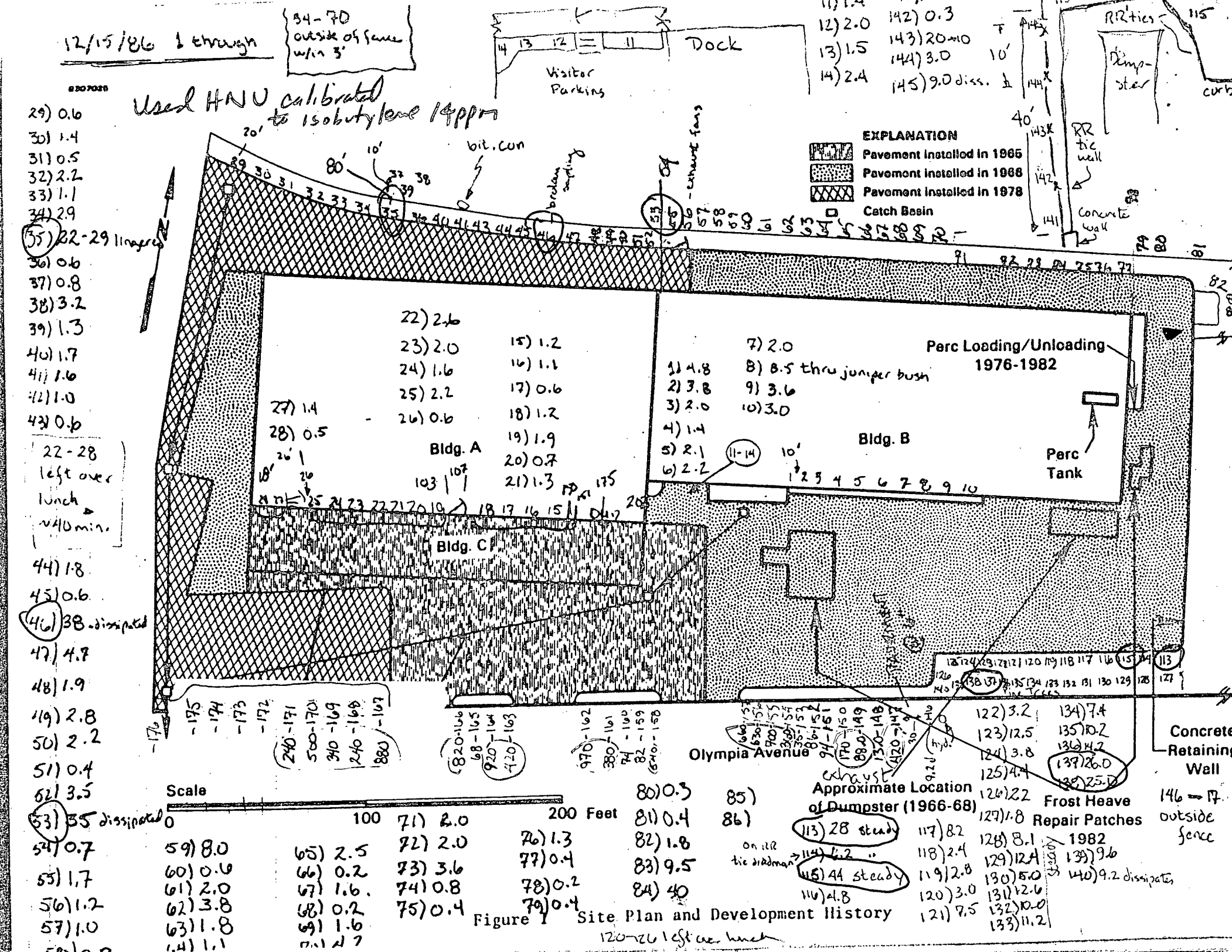
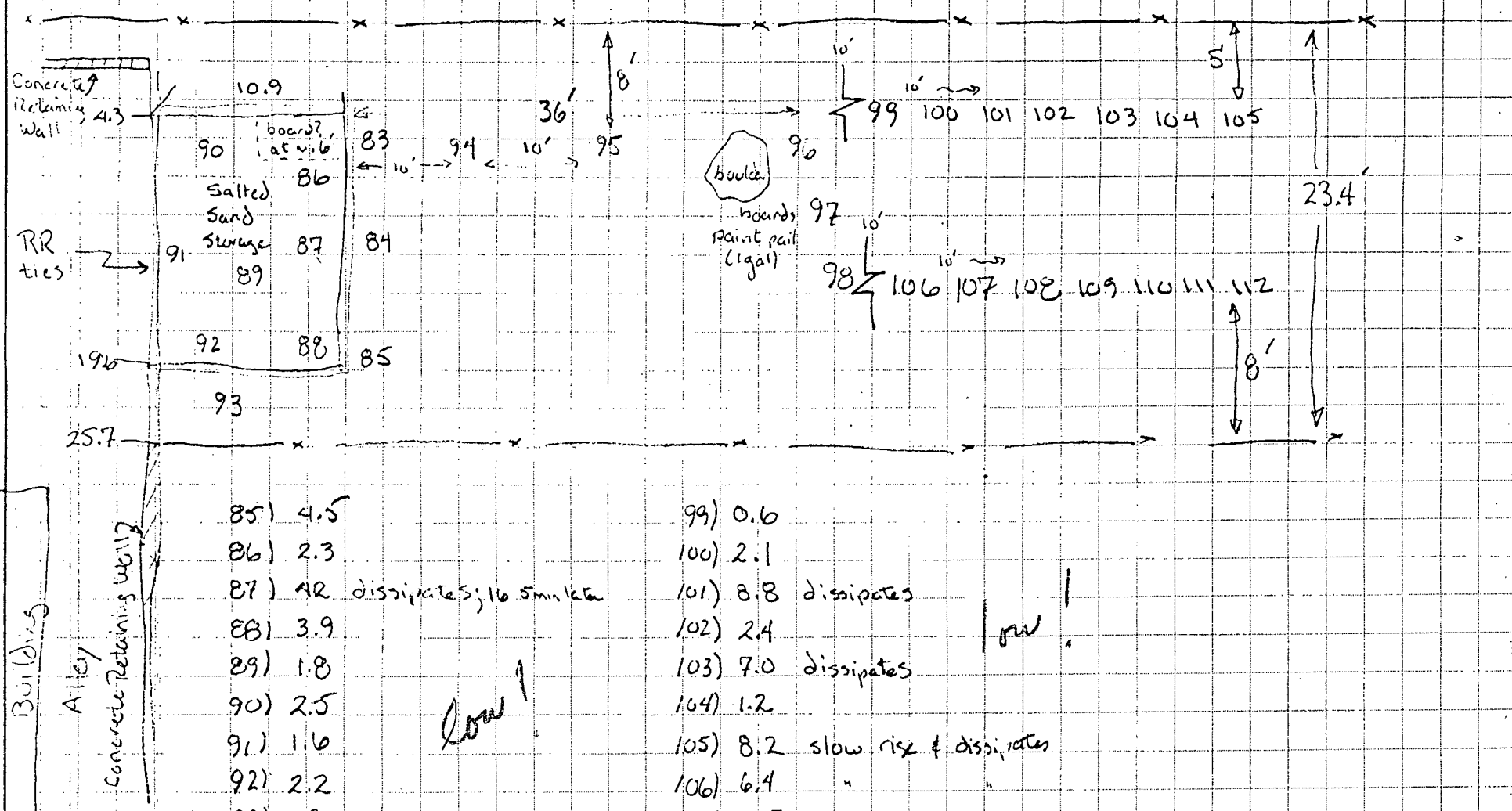


Figure 1 Site Plan and Development History

12/16/86 85 through



85) 4.5
86) 2.3
87) 4.2 dissipates; 16.5 min later
88) 3.9
89) 1.8
90) 2.5
91) 1.6
92) 2.2
93) 1.2
94) 3.6
95) 9.2 steady
96) 3.2
97) 14.4 steady
98) 2.2

low!

99) 0.6
100) 2.1
101) 8.8 dissipates
102) 2.4
103) 7.0 dissipates
104) 1.2
105) 8.2 slow rise & dissipates
106) 6.4 " "
107) 1.3
108) 1.4
109) 1.8
110) 3.3
111) 0.8
112) 2.2

low!

File
Date
Dwg.
Project
Proposal

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

File 8.1

ROUTING AND TRANSMITTAL SLIP

Date 5/22

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. JOE CLEARY		
2.		
3.		
4.		
5.		

EBASCO SERVICES INC.
RECEIVED
MAY 6 1987

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

This is the Umfirst Workplan for all the wells you saw on their property. They now have installed 2 more upgradient — these are not drawn in on the last page

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
	Phone No.

5041-102

★U.S.GPO:1986-0-491-247/20047

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

GOODWIN, PROCTER & HOAR
(A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS)
COUNSELLORS AT LAW
EXCHANGE PLACE
BOSTON, MASSACHUSETTS 02109

JEFFREY C. BATES
(617) 570-1499

TELEPHONE (617) 570-1000
TELECOPIER (617) 523-1231
TELEX 94-0640
CABLE-GOODPROCT, BOSTON

October 30, 1986

Attorney Lisa Evans
Office of Regional Counsel
U.S. Environmental Protection
Agency - Region 1
J.F. Kennedy Federal
Building, Room 2203
Boston, MA 02203

Dear Lisa:

Enclosed is a copy of a scope of work I have patched together to describe the work John Cherry, Ed Bouwer, and Jeff Lawson expect to carry out beginning next week at the UniFirst property in Woburn. I spoke with John Cherry and Jeff Lawson late this afternoon and confirmed that Jeff will be sending you directly copies of the standard operating procedures to be followed with respect to sampling, analyses, QA/QC, worker safety, etc.

I also confirmed with Jeff and John that both will be on site and available to talk with EPA representatives Monday morning, November 3. Jeff expects to arrive shortly before 8:00 a.m., and John will be arriving from Canada at about 10:00 a.m. Chris Davis will be on site commencing at about 8:30 a.m.

Please do not hesitate to contact me or Chris Davis if you have questions or requests. Consistent with the need I explained to you to proceed in accordance with the schedule laid out in the enclosed scope of work, please be assured that we will do our very best to cooperate with you.

Sincerely,

Jeffrey C. Bates

JCB/dq
Enclosure
cc: Dr. John A. Cherry
Jeffrey T. Lawson, P.G.
Edward J. Bouwer, Ph.D.
Christopher P. Davis, Esq.
Nancer Ballard, Esq.

SCOPE OF WORK

I. Task 1: Install Well to Investigate Up-Gradient Septic Systems as Potential Source.

Four residential dwellings are located within 600 feet to the east of and up-gradient from Wells S71. It is believed that some or all of these dwellings had on-site sewage disposal systems such as leaching fields or cesspools. Among other consumer products, several popular septic system treatment compounds that were available to homeowners and may have been used at these dwellings contained tetrachloroethene ("perc") and/or 1,1,1-trichloroethane. To investigate this potential source, a shallow well will be located at the eastern-most accessible location along UniFirst's southern property line, (UC1 on Figure 1, attached).

now UC-4 shallow well

Continuous split-spoon samples will be taken from the surface to refusal. All reasonable attempts will be made to reach the top of bedrock. The soil samples will be screened in the field for volatile organic compound content by an informal headspace analysis that will be performed with an HNU or OVA. Selected soil samples from the unsaturated zone will be prepared for laboratory analysis. This well will be screened at the top of rock and be constructed of two-inch, inside-diameter, threaded joint PVC.

This well currently is scheduled to be installed during the week of November 3, 1986, with installation scheduled to commence on November 3, 1986.

II. Task 2: Install Well at Fill Pipe.

Depending on results obtained from Task 1, a shallow well might be installed outside the southeast corner of the UniFirst building, where the fill pipe to the former indoor perc storage tank is located (UC2 on Figure 1). A boring would be drilled adjacent to the building in the fill pipe area. Continuous split-spoon samples would be taken from the surface to refusal. All reasonable attempts would be made to reach the top of bedrock. Soil samples would be screened in the field for volatile organic compound content by an informal headspace analysis that would be performed with an HNU or OVA. Selected soil samples from the unsaturated zone would be prepared for laboratory analysis. A well would be installed in this boring. It would be screened at the top of rock and would be constructed of two-inch, inside-diameter, threaded joint PVC.

UC-5 one shallow well

Should it be undertaken, this task currently is scheduled to be carried out during the week of November 3, 1986.

III. Task 3: Install Well on the Westerly Side of the Front of the Site, along Olympia Avenue.

Depending on the results from Tasks 1 and 2, a third shallow well might be installed on the westerly side of the front of the site, along Olympia Avenue (UC3 on Figure 1). Along with the shallow well at UC1, this well would bracket Well S71. As described above, continuous split-spoon samples would be taken from the surface to refusal. All reasonable attempts would be made to reach the top of bedrock. Soil samples would be screened in the field for volatile organic compound content by an informal headspace analysis that would be performed with an HNU or OVA. Selected soil samples from the unsaturated zone would be prepared for laboratory analysis. The well would be screened at the top of rock and be constructed of two-inch, inside-diameter, threaded joint PVC.

This well also would be installed during the week of November 3, 1986, should this task be undertaken.

IV. Task 4: Install Multi-Level Groundwater Sampling Well.

Depending on the results of the previous tasks, a five-level groundwater sampling well might be installed adjacent to wells S71 (UC4 on Figure 1). This well would be constructed in two, three-inch diameter bedrock borings, one boring for groundwater sampling and one boring for water level measurements. The borings would be cased with three-inch inside-diameter steel casing through the unconsolidated deposits and socketed into bedrock. The bedrock would be cored to a depth of approximately 100 feet below the surface of the bedrock with a standard rock-coring rig.

In the borings, multi-level sampling and elevation measuring equipment would be installed by Solinst, Canada Ltd. of Burlington, Ontario. This equipment would be installed such that there would be five equally spaced ports through the length of the bald bedrock bore. Each sampling port would be separated by a packer to prevent verticle flow of groundwater between the sampling ports.

This task would be performed during the week of November 17, 1986, should it be undertaken.

IV. Task 5: Removal of Underground Fuel Tanks.

As part of UniFirst's general site maintenance activities, the gasoline and diesel fuel tanks that are located at the southeast corner of the property will be removed. The excavation required for tank removal will expose the unconsolidated deposits that underlie most of the southwest parking area and adjacent grassy areas along the front of the

lot. The excavation will be visually inspected and screened with an HNU or similar portable organic vapor detector. Should evidence of volatile organic compounds be encountered, samples of the soil will be taken and analyzed.

This work currently is scheduled to be carried out sometime during the first half of December, 1986.

VI. Task 6: Install Bedrock Wells at UC1, UC2 and UC3. — not done

Depending on the results of the previous tasks, three bedrock wells might be installed at locations UC1, UC2 and UC3. The air-rotary drilling technique would be used to install these bedrock wells. An eight-inch hole would be drilled through the soil to a level approximately one foot below the top of rock. Six-inch inside-diameter casing would be installed and grouted in place. The six-inch wells might be drilled to a depth of approximately 20 feet below the top of rock. The wells would be completed by installation of a standard, domestic-supply well submersible pump in the open bedrock bore.

If undertaken, this task would be expected to be commenced during the week of December 15, 1986.

VII. Task 7: Make Hydraulic Measurements.

not done

Depending upon the results of the previous tasks, permeability tests might be run in the newly installed wells and, with EPA permission, wells S70, S71 and S81. Simple rising-head tests would be performed in the two-inch PVC wells by bailing or pumping them down and measuring recovery. The six-inch bedrock wells would be pumped together and individually while water-level measurements were recorded in the bedrock wells and the wells that are screened in the unconsolidated deposits. Disposal of groundwater pumped from these wells could require special handling, and current plans provide for the taking of one tanker-load (5,000 gallons) to CECOS' facility in Connecticut.

If undertaken, this task would be commenced during the week of January 5, 1987.

VIII. Sampling and Analyses.

Selected soil samples from borings and the tank excavation would be analyzed for volatile organic compounds by EPA SW-846 sample introduction method 5020 or 5030 and analysis method 8024. In addition, the organic carbon content would be determined.

The new wells and, with EPA's permission, S71 and S81 would be sampled twice within one month to provide groundwater quality data. The wells would be purged prior to sampling until pH, specific conductance and temperature stabilized. The groundwater samples would be analyzed for dissolved oxygen, dissolved organic carbon, nitrate, sulphate, iron, manganese, sulfide and volatile organic compounds detected by a modification of EPA method 624. This analytical method would be modified to allow separation of the cis and trans isomers of 1,2-dichloroethene. In addition, a shipping and field blank and one duplicate sample would be analyzed during each sampling round.

All samples and analytical work would be conducted by ERT, under the supervision of Dr. John Cherry, Dr. Edward Bouwer and Mr. Jeffrey Lawson. Applicable sampling, analytical, QA/QC and worker safety procedures will be provided under separate cover by ERT.

VS-5145/m
10/29/86

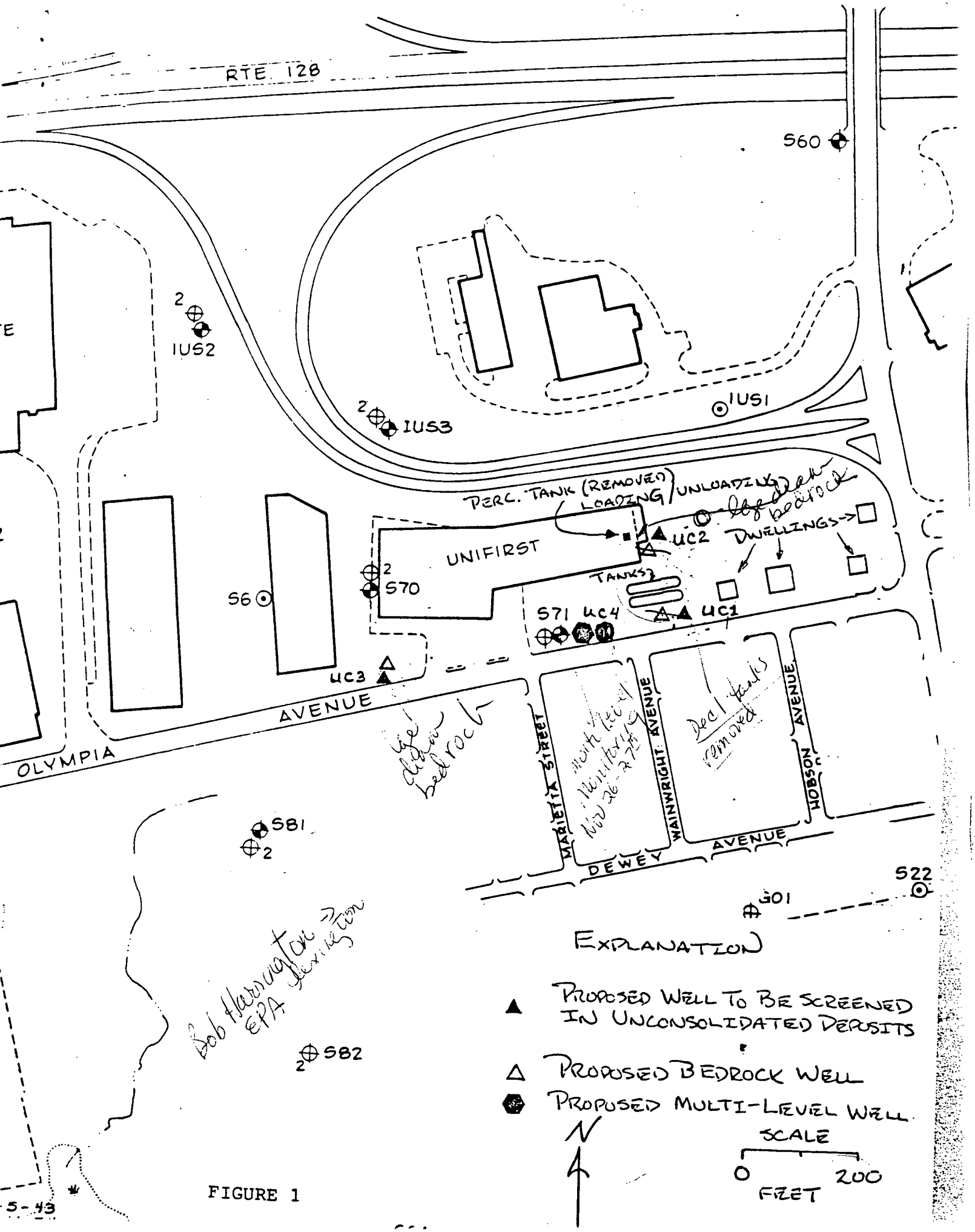
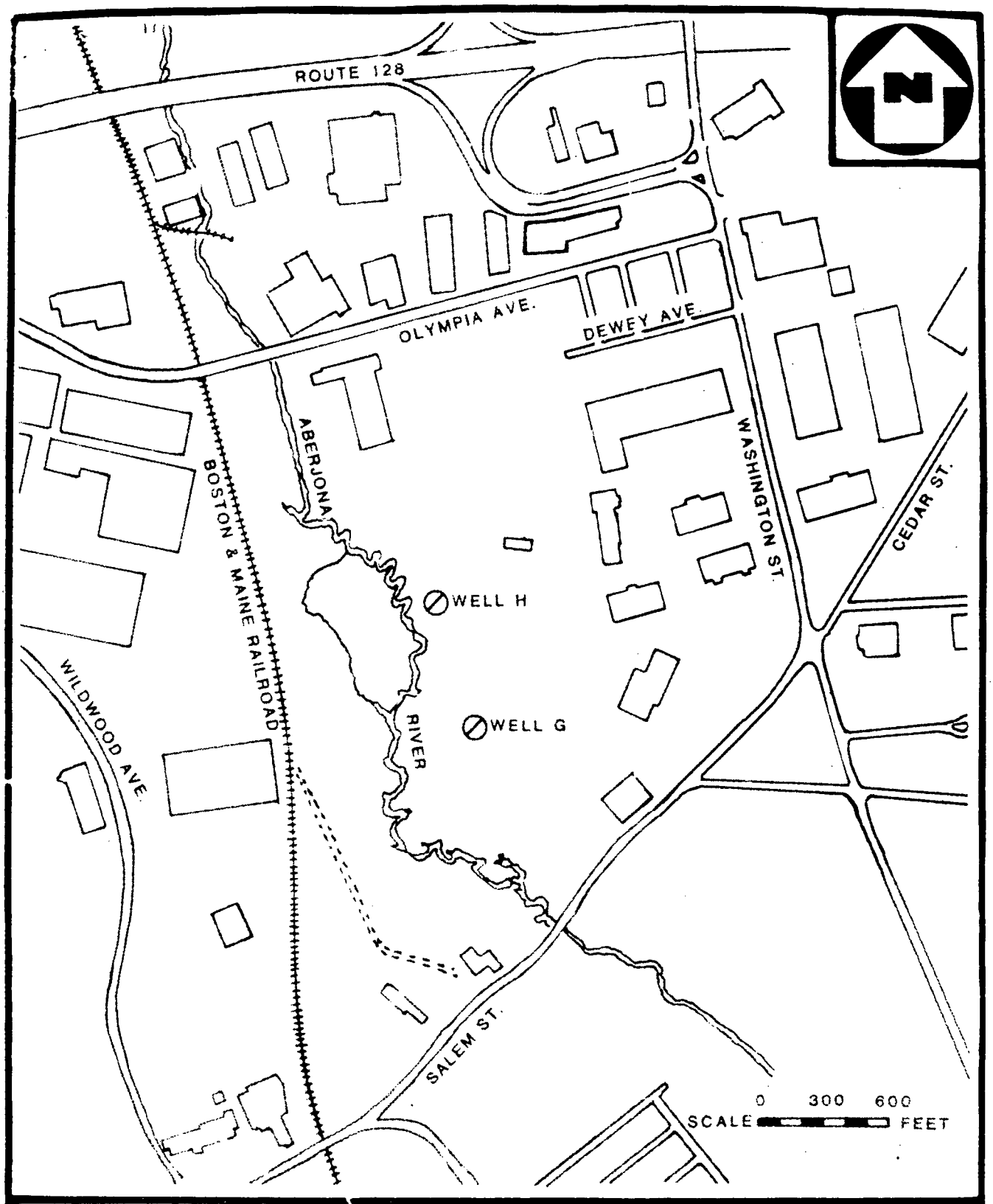

RTE. 128
S60
IUS2
IUS3
IUS1
PERC. TANK (REMOVED)
LOADING/UNLOADING
UC2
DWELLINGS
UNIFIRST
TANKS
S70
S6
S71
UC4
UC1
UC3
OLYMPIA AVENUE
MARIETTA STREET
WAINWRIGHT AVENUE
HOBSON AVENUE
DEWEY AVENUE
S81
S82
G01
S22
EXPLANATION
PROPOSED WELL TO BE SCREENED IN UNCONSOLIDATED DEPOSITS
PROPOSED BEDROCK WELL
PROPOSED MULTI-LEVEL WELL
N
SCALE
0
200
FEET

FIGURE 1



SITE MAP
WELLS G AND H
WOBURN, MA

1986

NUS CORPORATION
A Halliburton Company

KI Pt 2

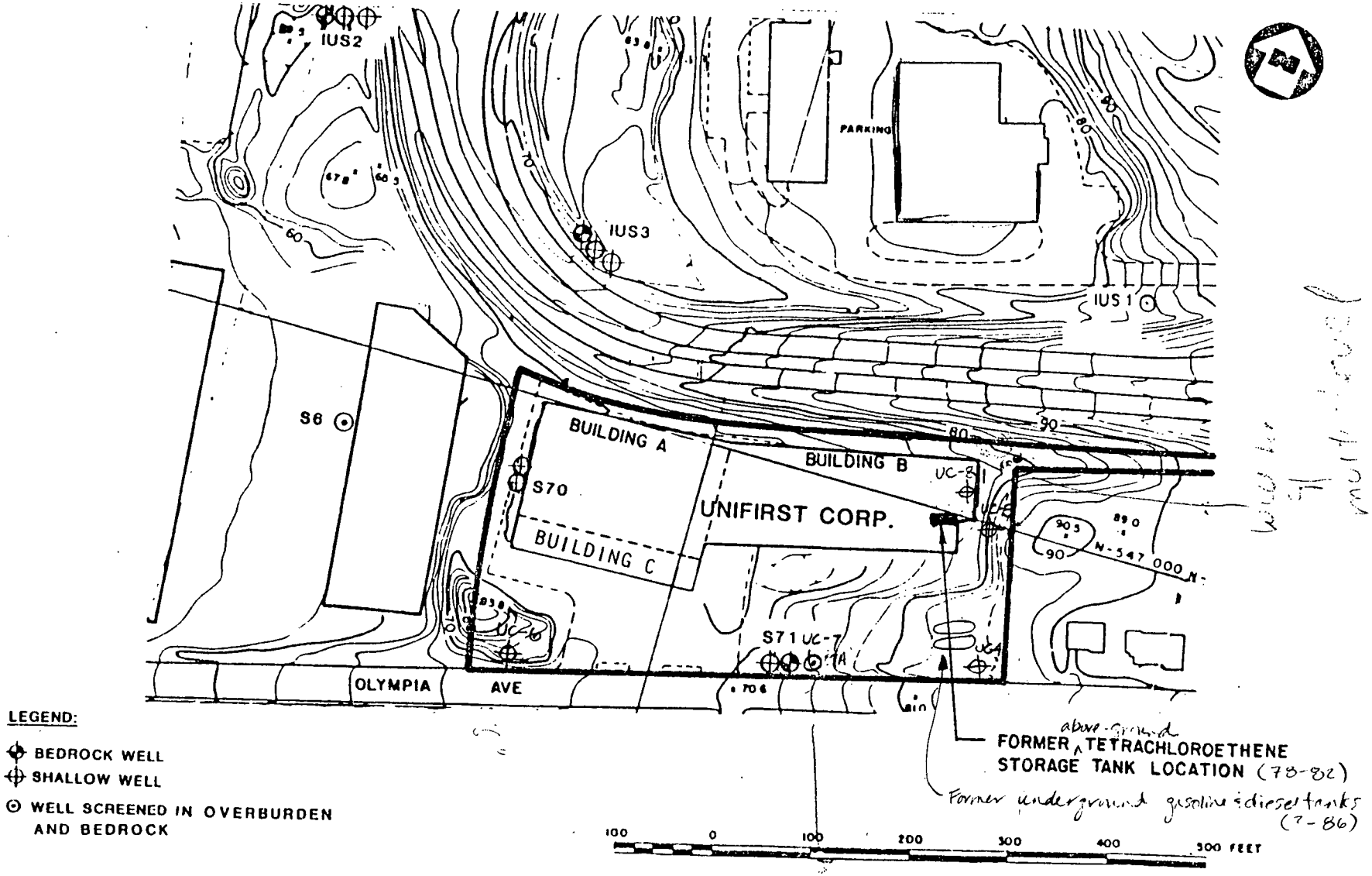


Figure 4. Site plan for Unifirst Corporation.[1]

8-21-87

TO DO

Letter to Barbara on Unifirst

1. Recent work @ Unifirst was removal
   - Soil Gas
   - Soil Sampling
   - GW Sampling

   > Indicated no soil contamination

   bedrock problem from spill of free product

2. Plan for off-site deep wells.
   - We need this information for FS
     include oversight & split in WP & FOP

3. Plan for on-site 6 new wells
   Rec'd this information Aug 18th

We recommend the following:

1- Ebasco oversee work during our field program schedule.

2- The FSD oversee before & after our field operation schedule.