

FINAL

**REMEDIAL INVESTIGATION/FEASIBILITY STUDY
IROQUOIS GAS/WESTWOOD PHARMACEUTICALS SITE #915141**

APPENDICES

VOLUME III

February 1994

**Prepared by:
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Sterling, Virginia**

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Iroquois Gas/Westwood Squibb
Appendices
Volume III

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Appendix A
SOILS INVESTIGATION AND WELL CONSTRUCTION DATA REPORT

INTRODUCTION

This data report summarizes the soils investigation and well construction work performed at the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). The work was performed by GeoTrans, Inc. for Westwood Squibb Inc. from April 2 through April 30, 1992. Included in this report are discussions on field activities, laboratory activities, and a copy of the soil-boring logs and well construction diagrams. The location of the site is shown in Figure A-1.

FIELD ACTIVITIES

The field activities described here include drilling, sample collection and decontamination procedures, well development, and elevation control. The drilling, sample collection, and decontamination procedures are further subdivided into discussions on soil borings, fill monitor wells and piezometers, and sand monitor wells and piezometers. Drilling and well installation services were provided by Buffalo Drilling Inc. of Buffalo, New York. Surveying services were provided by Krehbiel Associates of Buffalo, New York.

Drilling, Sample Collection, and Decontamination

A total of 26 borings were drilled, nine were completed as monitor wells, six were completed as piezometers, and 11 remained as soil borings. The locations of the borings are shown in Figure A-2. The primary purpose of monitor wells was to provide access for the groundwater sampling program. The primary purpose of the piezometers was to allow water-level measurements at different points in the aquifers. The primary purpose of the soil borings was to determine the horizontal and vertical extent of soil contamination in the subsurface.

Soil samples for chemical analysis were collected using a 24-inch long, three-inch diameter, stainless steel, split-spoon sampler. Soil samples for lithologic description were collected with a 24-inch long, two-inch diameter, steel split-spoon sampler. At locations where surface soil samples were collected, any ground covering such as asphalt or road gravel was scraped off prior to sampling.

The drills, rig, all augers, split-spoon samplers, and other drilling equipment were decontaminated by a steam spray washer prior to drilling at each location. Split-spoon samplers were decontaminated after each sample by a wash and scrub with non-phosphate detergent, a tap water rinse, deionized water rinse, ten percent methanol solution rinse, final deionized water rinse, and air drying.

Soil Borings. Eleven soil borings were augered in the fill material in the northern, eastern, and western portions of the site. Augering was conducted using nominal four-inch I.D. hollow-stem augers.

In general, soil samples were obtained continuously to the top of the native silty clay using the split-spoon method. However, borings at locations SB2, SB3, and SB5 were terminated prior to encountering the native silty clay because of misidentification of the compacted clayey fill material present. The lithology of the compacted fill material was similar to that anticipated for the native silty clay.

All samples were visually examined for evidence of contamination, and organic vapor readings were recorded for each split-spoon sample. Selected soil samples were collected and sent to an analytical laboratory for analysis. The depth of the selected samples, and the parameters analyzed, are described below in the Chemical Analysis section on page A-6.

Monitor Wells and Piezometers. Nine monitor wells were added to the five existing wells onsite. Of the nine new wells, five were drilled and screened in the fill material, and four were drilled and screened in the lower sand layer. Six piezometers were also added. Four of these were drilled and screened in the fill material, and two were drilled and screened in the lower sand layer. A summary of well construction information is presented in Table A-1.

Soil samples were obtained continuously to the top of the native silty clay. All samples were visually examined for evidence of contamination, and organic vapor readings were recorded for each split-spoon sample. Selected soil samples were collected and sent to an analytical laboratory for analysis. The depth of the selected samples and the parameters analyzed are described below in the Chemical Analysis section on page A-6.

Fill Monitor Wells and Piezometers. The following procedures were used to install the monitor wells and piezometers in the fill material:

1. 4¼-inch I.D. hollow-stem augers were used to advance the borehole to the top of the silty clay layer while collecting continuous split-spoon samples.
2. New, two-inch I.D., stainless steel (Type 304) riser and ten-slot (0.010-inch diameter) stainless steel screen was installed in the borehole.
3. A sand pack using Morie No. 0 rounded sand was poured to a depth of two ft above the top of the well screen as the augers were withdrawn.
4. A bentonite pellet seal was installed above the sand pack to provide approximately a two-ft seal. The bentonite seal was allowed to hydrate a minimum of one hour prior to placement of the grout.
5. The remaining annular space was then grouted either by directly pouring the grout in the annulus or by lateral grout displacement using a positive pressure tremie pipe into the annulus.
6. All wells and piezometers were completed with approximately two ft of protective surface casing stickup, three bumper posts, a three-ft diameter cement pad, and a locking well cap.
7. All reusable tools and materials were decontaminated prior to use at the next well.

A schematic diagram of a typical fill well or piezometer is presented in Figure A-3.

At piezometers PF3 and PF6, minor deviations from the above procedure were necessary due to special conditions or objectives. In piezometer PF3,

a 0.5-ft bentonite seal was installed due to the shallow depth of this piezometer. For piezometer PF6, this installation was drilled using 4½-inch I.D. hollow-stem augers for sampling, then reamed with 8½-inch I.D. hollow-stem augers for piezometer installation. This installation was finished as a four-inch I.D. piezometer to allow sufficient annulus to install a data logger and pressure transducer for long term water-level monitoring.

Lower Sand Monitor Wells and Piezometers. The following procedures were used to install the monitor wells and piezometers in the lower sand layer and to prevent cross contamination in the lower sand layer:

1. 4½ inch I.D. hollow-stem augers were used to advance the borehole approximately two ft below the top of the silty clay layer. Split-spoon samples were collected continuously.
2. The borehole was then reamed with 8½-inch I.D., hollow-stem augers.
3. The 8½-inch I.D. augers were removed, and a predetermined volume of grout was placed in the reamed borehole. The grout volume was calculated to fill the annulus between the borehole wall and a ten-inch I.D. steel casing.
4. Ten-inch I.D. steel casing with a drillable cement shoe was driven approximately three ft below the top of the silty clay layer.
5. The grout was allowed to set for a minimum of 24 hours.
6. 4½-inch I.D. hollow-stem augers were then used to drill through the cement shoe to final depth. The final depth was the top of bedrock as determined by either split-spoon refusal (100 blows per two inches) or by drilling action at an anticipated depth. Split-spoon samples were collected at five-ft. intervals to the top of bedrock.
7. The installations were completed in a similar manner to that of the fill wells except at MWS2, MWS3, and PS2. At these locations, a bentonite slurry was tremied into place instead of using bentonite pellets.

A schematic diagram of a lower sand well or piezometer is presented in Figure A-4.

At installations PS1 and MWS1, deviations from the above procedure were necessary due to special conditions or objectives. Piezometer PS1 was installed as a four-inch installation to allow sufficient annulus to install a data logger and pressure transducer for long term water-level monitoring. After the ten-inch surface casing was installed and the 4¼-inch I.D. hollow-stem augers drilled to depth, the augers were removed and temporary, six-inch, flush-threaded casing was spun to depth. Four-inch diameter riser and screen were installed inside the temporary six-inch casing. The piezometer was then completed in a similar manner to the other wells and piezometers.

At well MWS1, the installation was completed with a five-ft screen interval instead of a ten-ft screen due to the limited thickness of the lower sand layer at that location.

Well Development

Each new well and piezometer was developed by surging and discharging water from the well. Surging was conducted by moving a capped, 1½-inch I.D. PVC pipe up and down in approximately two-ft intervals across the screened zone. This was typically done several times across the screened zone.

Discharge water was removed by either a pump or a bailer. The pumps used were either a peristaltic pump or a Brainard Kilman hand pump. Field measurements of pH, temperature, and specific conductance were recorded during well development. Well development was considered complete when the field parameters were consistent to within ten percent for three consecutive well volumes. Noticeable turbidity reduction was generally observed in the wells and piezometers by the end of well development. Table A-2 presents well development and final field parameter measurements.

All reusable tools and materials were decontaminated with the steam spray washer prior to use at the next well.

Elevation and Horizontal Control

An elevation and horizontal survey was conducted after completion of the new wells and piezometers. The survey was performed by a licensed surveyor with a vertical accuracy to the nearest 0.01 ft, and a horizontal

accuracy less than 0.06 times the square root of the horizontal distance from the reference datum (in miles). Measurements of the new and existing monitor wells and piezometers were referenced to the 1929 National Geodetic Vertical Datum (NGVD).

LABORATORY ANALYSIS

Chemical Analysis

Chemical analytical results from the soil investigation are presented in this section. Analytical laboratory services were provided by General Testing Corporation of Rochester, New York. A total of 48 samples were collected with the associated QA/QC samples. The depth and location of individual soil samples are presented in Table A-3. The sample-depth-selection rationale was to satisfy a number of data users and objectives. These included:

1. Characterize the horizontal and vertical extent, nature, and levels of soil and nonaqueous phase liquid contamination.
2. Provide further identification of locations where hazardous substances are present.
3. Further determine types, quantities, and extent of buried waste.
4. Collect sufficient data to prepare a baseline risk assessment.
5. Propose remedial action objectives for each contaminated media.

The analytical methods employed were consistent with the New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) December, 1989. Samples were analyzed for volatile organic compounds (VOCs), base neutral analytes (BNAs), acid extractable organics (AEOs), Target Analyte List metals (TALs), and total organic carbon (TOC). A list of the analytes is presented in Table A-4. The method employed for VOC analysis was ASPDEC89-I, ASPDEC89-II for BNAs and AEOs, EPA 7000 Series for TAL metals, and the Modified Walkley-Black titration method for TOC.

The results of these organic and inorganic analyses are presented in Tables A-5 and A-6, respectively. The sample identification numbers in these tables indicates the location of each sample and the top of the depth interval sampled. Sample identification SB6-10 indicates the soil sample was collected at soil boring six from a depth of ten to 12 ft.

Geotechnical Analysis

Geotechnical testing results from the soil investigation are presented in this section. Geotechnical testing was provided by Buffalo Drilling of Buffalo, New York. Three samples were collected for grain size analysis and three samples were collected for vertical permeability. The geotechnical method employed for grain-size analysis was ASTM D422-63. The method employed on the shelby tube samples for vertical permeability was in accordance with procedures described in the US Army Corps of Engineers Manual EM 1110-2-1906.

The results of the grain size analysis and the shelby tube samples are presented in Tables A-7 and A-8, respectively. Samples were selected based on representativeness of the various sediments encountered, and on the lack of visual contamination.

BORING LOGS

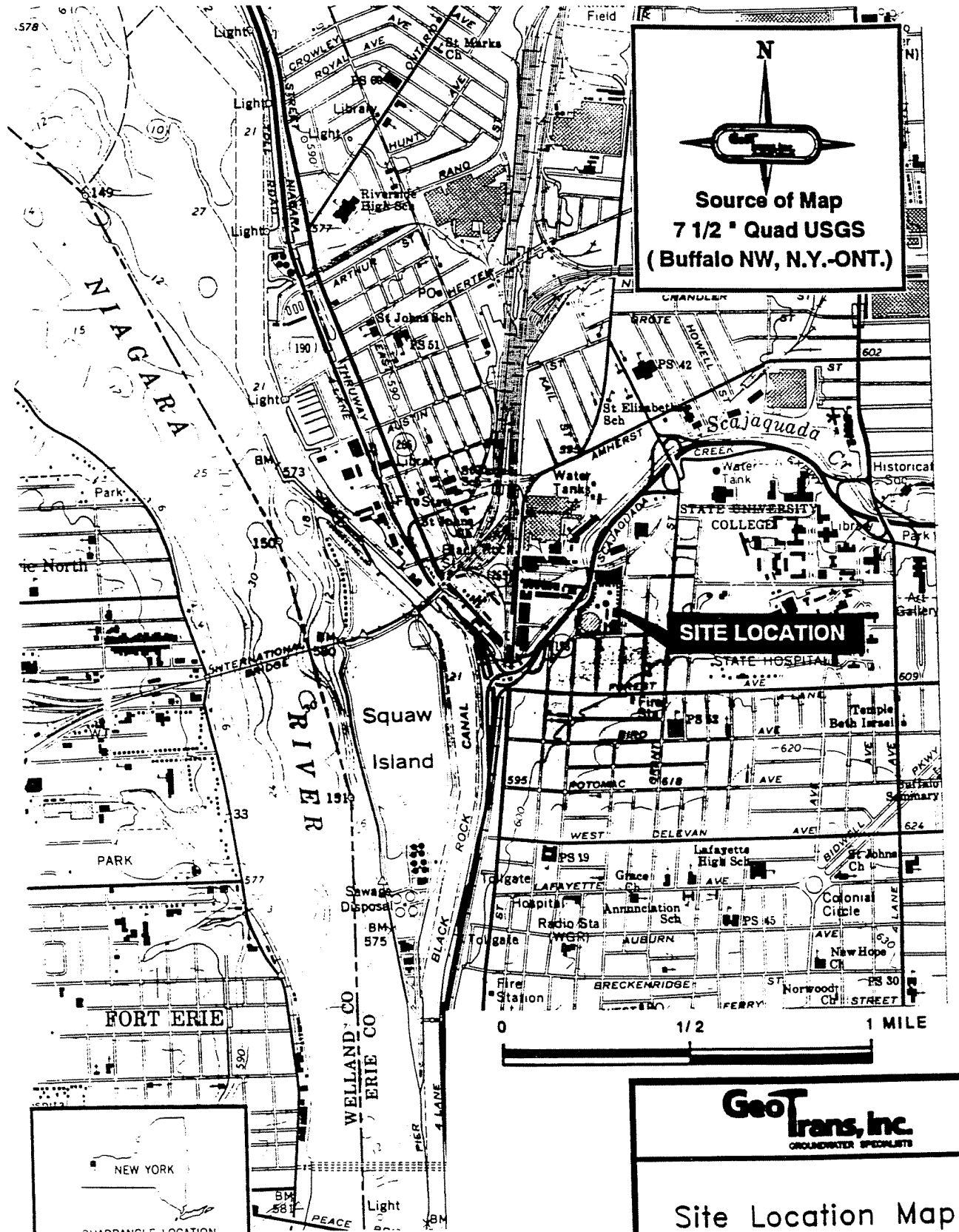
Attached are the final boring logs for the soil borings, monitor wells, and piezometers installed at the site. Also attached are well construction diagrams for the newly installed wells and piezometers.

PREVIOUS BORING LOGS

Attached are the final boring logs for the "B Series" monitor wells (Termini, 1987) previously installed at the site. Also attached are well construction diagrams for the "B Series" wells.

REFERENCE

Termini, C.R., 1987. Subsurface evaluation of the Dart Street former fuel gas plant site, Buffalo, New York.

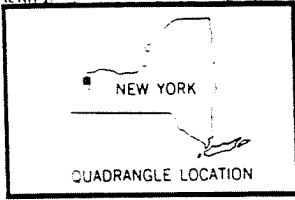


N

Source of Map
7 1/2 " Quad USGS
(Buffalo NW, N.Y.-ONT.)

SITE LOCATION

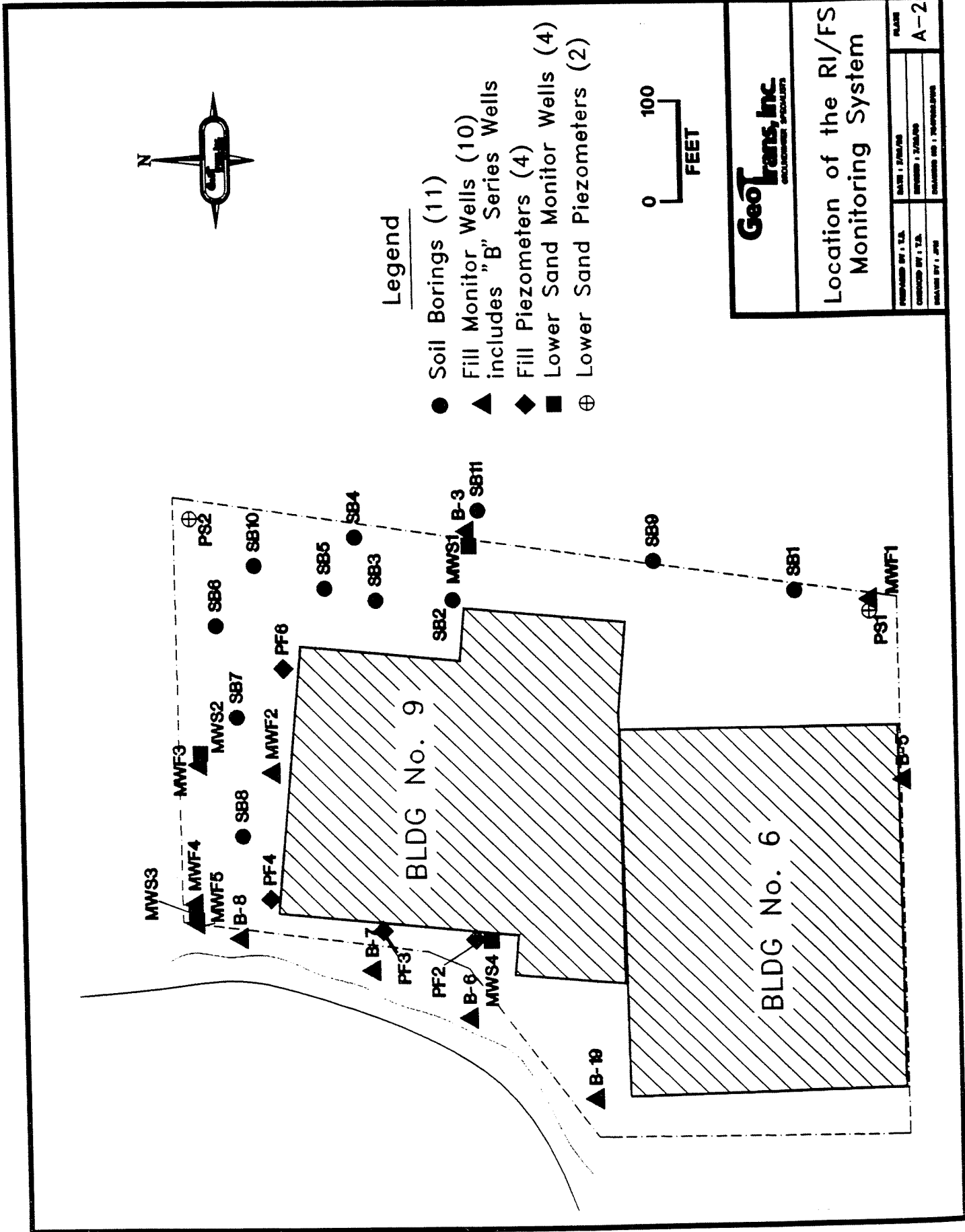
0 1/2 1 MILE



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Site Location Map

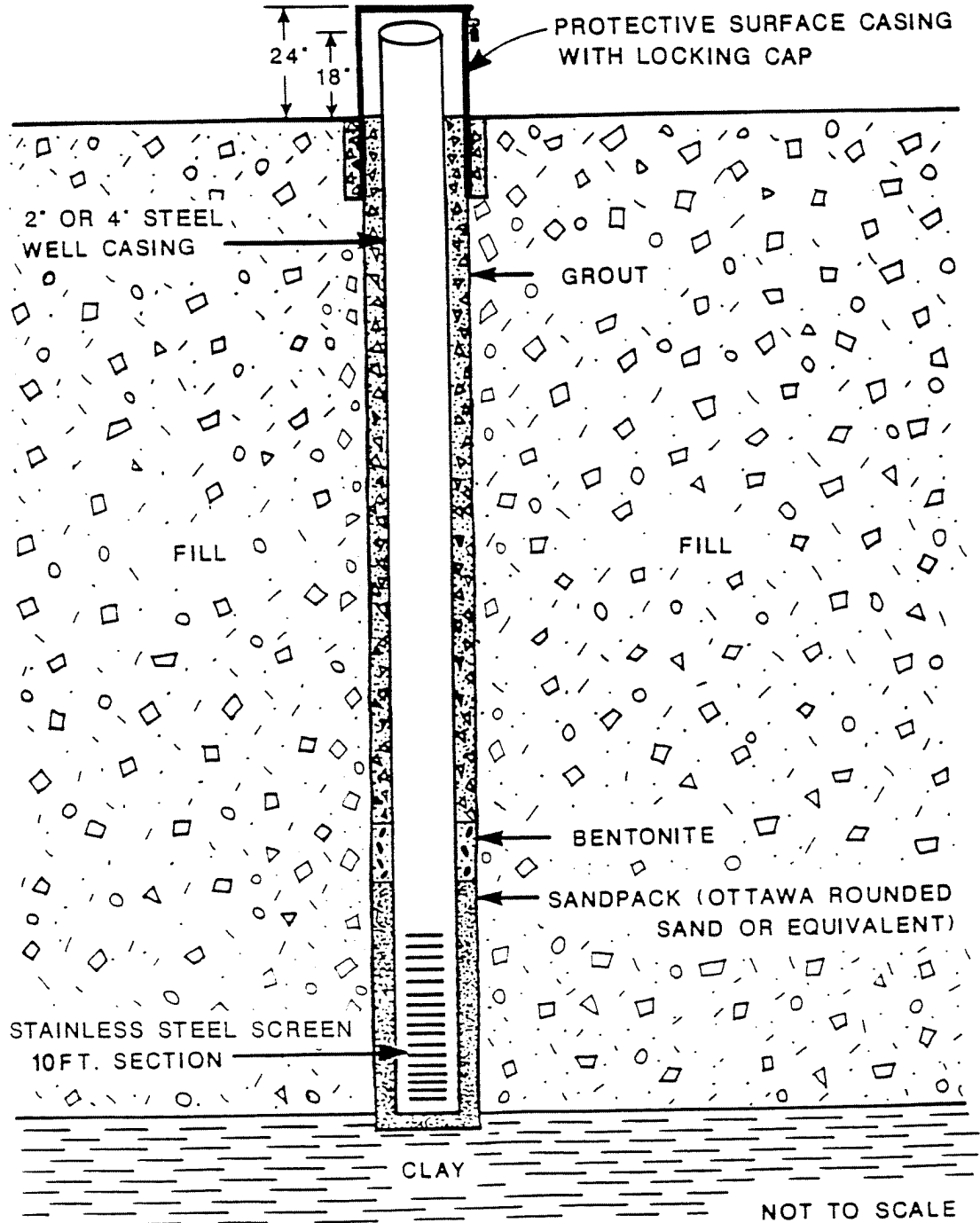
PREPARED BY : T.S.	DATE : 7/25/90	FIGURE A-1
CHECKED BY : T.S.	REVISED : 7/25/90	
DRAWN BY : JPS	DRAWING NO : 01A/700-02/00/1	



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**Location of the RI/FS
 Monitoring System**

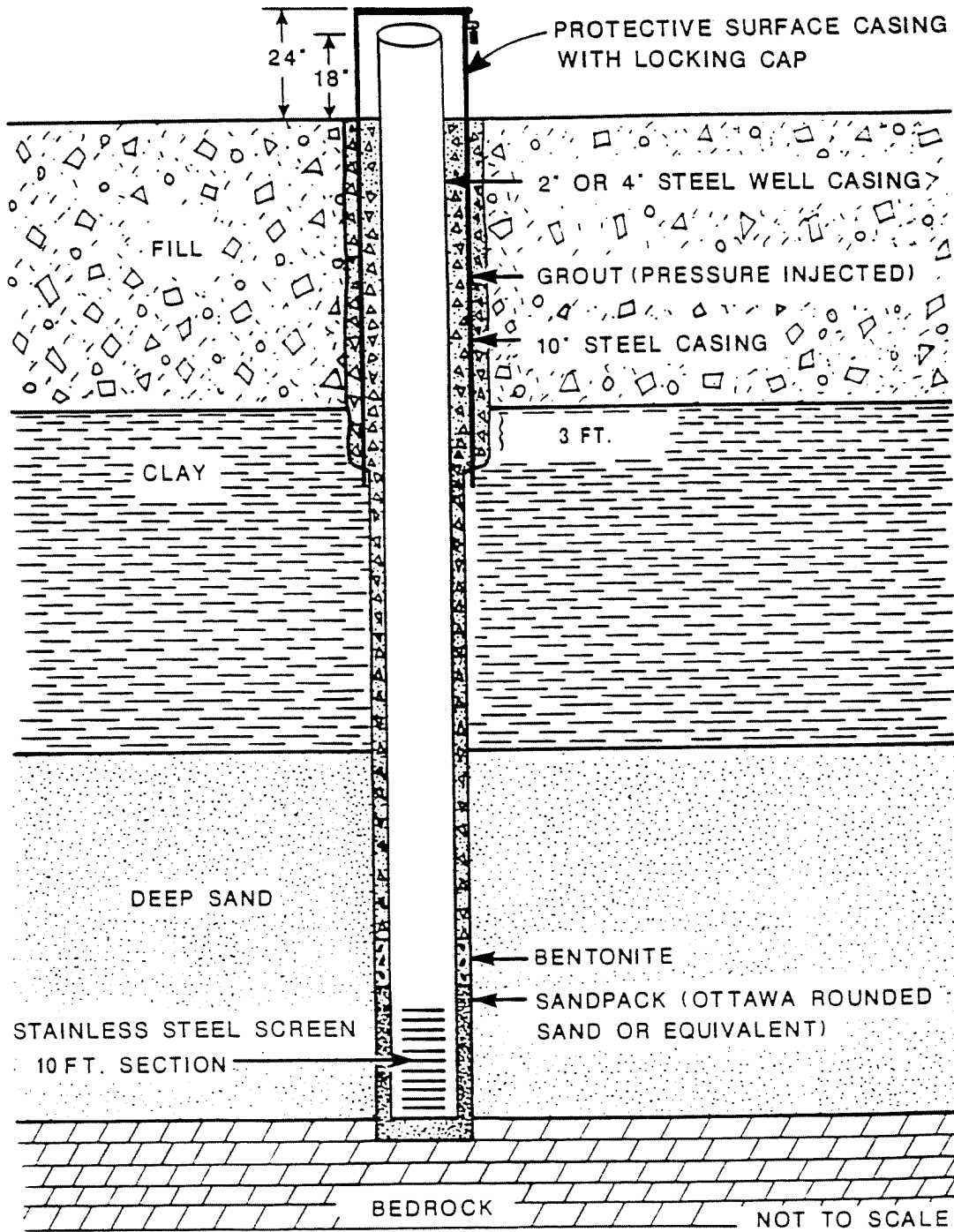
PREPARED BY: J. T.S.	DATE: 2/28/98	PLATE
CONDUCTED BY: J. T.S.	REVISION: 1/2/98	A-2
DRAWN BY: J. J.W.	ISSUED BY: J. T.S./J.J.W.	



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Schematic of typical fill well/ piezometer

PREPARED BY : T.L.	DATE : 7/22/88	FIGURE A-3
CHECKED BY : T.L.	REVISION : 7/27/88	
DRAWN BY : JPM	DRAWING NO : 6/A/7947-048/0A/3	



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Schematic of deep sand well/ piezometer

PREPARED BY : T.S.	DATE : 7/22/99	FIGURE A-4
CHECKED BY : T.S.	REVISED : 7/27/99	
DRAWN BY : JPM	DRAWING NO : S/A/7647-042/0A/3	

Table A-1. Monitor Well and Piezometer construction information.

MW/Piez ID	Elev. of Measured Reference Point	Ground Surface Elevation	Northing	Easting	Depth to Top of Bentonite Seal	Depth to Top of Sand Pack	Depth to Top of Screen Interval	Depth to Bottom of Screen Interval	Depth to Bottom of Borehole	Casing Diameter and Material	Depth to Bottom of Surface Casing	Geologic Unit Screen Interval
NEW WELLS												
MWF1	592.94	591.4	1087719.01	417322.96	4.0	6.0	8.3	18.3	18.3	2" SS	-	Fill
MWF2	592.74	590.5	1088321.46	417156.76	12.2	14.0	16.0	26.0	28.0	2" SS	-	Fill
MWF3	593.11	591.0	1088394.99	417184.59	10.0	12.0	14.0	24.0	24.2	2" SS	-	Fill
MWF4	592.88	590.3	1088401.40	417025.55	10.0	12.0	13.0	18.0	18.0	2" SS	-	Fill
MWF5	591.71	589.8	1088400.13	417006.44	20.1	22.1	23.1	28.1	28.1	2" SS	-	Fill
MWS1	591.40	589.1	1088121.04	417381.99	63.3	65.3	67.3	72.3	72.3	2" SS	20	Sand & Grav
MWS2	593.29	591.0	1088393.79	417176.16	18.0	73.0	74.5	84.5	84.5	2" SS	34	Sand & Grav
MWS3	592.51	590.1	1088401.53	417017.14	64.0	71.5	73.5	83.5	83.5	2" SS	34	Sand & Grav
MWS4	593.71	591.2	1088106.49	416986.62	68.0	70.0	72.0	82.0	82.0	2" SS	19	Sand & Grav
PF2	593.51	591.3	1088121.99	416988.59	2.5	3.0	5.0	15.0	15.0	2" SS	-	Fill
PF3	593.04	591.1	1088214.32	416997.69	10.1	12.0	14.2	24.2	24.3	2" SS	-	Fill
PF4	592.25	590.7	1088328.22	417030.38	14.2	16.2	18.2	28.2	28.2	2" SS	-	Fill
PF6	593.55	591.2	1088309.27	417260.70	10.7	13.0	15.0	25.0	26.0	4" SS	-	Fill
PS1	593.55	591.3	1087719.70	417311.31	26.0	33.0	35.0	45.0	49.0	4" SS	18	Sand & Grav
PS2	594.23	591.5	1088400.13	417411.11	74.0	76.0	79.2	89.2	89.2	2" SS	19	Sand & Grav
B SERIES WELLS												
B3	591.39	588.7	1088123.07	417398.69	12.0	13.0	18.0	23.0	31.0	2" PVC	-	Silt & Clay
B5	593.12	590.2	1087688.76	417141.92	3.0	4.0	4.5	9.5	11.0	2" PVC	-	Silt & Clay
B6	593.03	590.0	1088128.22	416909.78	11.5	13.0	19.0	24.0	28.0	2" PVC	-	Silt & Clay/Fill
B7	592.49	590.3	1088224.83	416957.81	11.0	12.0	23.0	28.0	34.0	2" PVC	-	Silt & Clay/Fill
B8	593.03	590.3	1088356.88	416891.10	11.0	12.0	23.0	28.0	28.0	2" PVC	-	Silt & Clay/Fill
B19	592.5	589.4	1088004.04	416827.18	9.0	10.0	17.0	22.0	22.0	1.5" PVC	-	Silt & Clay/Fill

Note:
 (1) All Measurements in Feet
 (2) Elevation of Measured Reference Point is the Top of the Fixed Section of the Protective Casing Next to the Lock Hesp
 (3) Elevation Values Expressed in Feet With Respect to the 1929 National Geodetic Vertical Datum (NGVD)
 (4) "Depth To..." Measurements Made From Ground Surface
 (5) PVC-Polyvinyl Chloride
 (6) "B" Wells Installed By Termini Associates
 (7) SS - Stainless Steel
 (8) Construction Information Provided By Termini, 1987

Table A-2. Well development final measured parameters.

Well/Piez ID	WD Method	Total Volume Purged (gals)	Temp. (°F)	pH	Cond. (μohms/cm)	Comments
MWF1	Bailer	13.5	52.5	7.4	2200	Repeatedly Bailed to Within 6" of Dry
MWF2	-	-	-	-	-	DNAPL Present, No Well Development Done
MWF3	Bailer/ Per. Pump	65	49.6	7.7	570	
MWF4	Bailer/ Per. Pump	53	51.4	7.8	740	
MWF5	Bailer/ Per. Pump	190	51.1	8.0	760	
MWS1	BK Pump	250	54.3	7.1	1540	
MWS2	BK Pump	250	52.0	7.2	1640	
MWS3	BK Pump	500	52.2	7.5	1700	
MWS4	BK Pump	250	52.4	7.4	1780	
PF2	Bailer	~ 6	51.6	6.7	1540	Bailed Dry, Very Slow to Recovery
PF3	Bailer	31	53.6	7.0	1650	Noticeable Odor Present, Oily Sheen on Water Surface
PF4	Bailer	24	52.7	6.8	1100	Noticeable Odor Present, Oily Sheen on Water Surface
PF6	Bailer	20	52.0	6.3	1700	Stopped WD Due to Floating Oil Layer Present
PS1	BK Pump	75	55.4	7.1	1730	
PS2	BK Pump	140	53.6	7.0	1690	

- Note:
- (1) Wells Were Purged, Pumped, or Bailed
 - (2) Per. Pump is a Peristaltic Pump
 - (3) BK Pump is a Brainard Kilman PVC Hand Pump
 - (4) WD is Well Development

Table A-3. Soil sample depth.

Boring	Sample Depth*	Field Sample ID	Chemical Table ID	Comment QA/QC Notation
S1	4-6	SB1-4	SB1-4	C-of-C Reference SB1/4-6
	10-12	SB1-10	SB1-10	C-of-C Reference SB1/10-12
S2	6-8	SS2-6	SB2-6	
	10-12	SS21-10	SB2-10	State Split
S3	4-6	SB3-4	SB3-4	C-of-C Reference SB3/4-6
	10-12	SB3-10	SB3-10	C-of-C Reference SB3/10-12
S4	0-2	SS4-0	SB4-0	
	18-20	SS4-18	SB4-18	
	18-20	SS4-20	-	Duplicate of S4-18
S5	4-6	SS5-4	SB5-4	
	10-12	SS5-10	SB5-10	
S6	4-6	SS6-4	SB6-4	
	10-12	SS6-10	SB6-10	
S7	0-2	SS7-0	SB7-0	
	4-6	SS7-4	SB7-4	
	4-6	SS7-6	-	Duplicate of S7-4
S8	4-6	SS8-4	SB8-4	
S9	16-18	SB9-16	SB9-16	Added Sample
S10	12-14	SB0-12	SB10-12	Added Sample
MWS1	2-4	SS1-2	MWS1-2	C-of-C Reference SS1-2
	10-12	SS1-10	MWS2-10	C-of-C Reference SS1-10
MWS2	2-4	MS2-2	MWS2-2	C-of-C Reference MWS2/2-4
	10-12	MS2-10	MWS1-10	C-of-C Reference MWS2/10-12
MWS3	8-10	MS3-8	MWS3-8	
	12-14	MS3-12	MWS3-12	MS/MSD-1 Obtained, State Split
	32-34	MS3-32	MWS3-32	
MWS4	4-6	MS4-4	MWS4-4	C-of-C Reference MWS4/4-6
	10-12	MS4-10	MWS4-10	C-of-C Reference MWS4/10-12
PS1	0-2	PS1-0	PS1-0	
	0-2	PS1-2	-	Duplicate of PS1-0
	10-12	PS1-10	PS1-10	
PS2	4-6	PS2-4	PS2-4	C-of-C Reference PS2/4-6
	10-12	PS2-10	PS2-10	C-of-C Reference PS2/10-12

Table A-3. Soil Sample depth (continued).

Boring	Sample Depth ^a	Field Sample ID	Chemical Table ID	Comment QA/QC Notation
PF1	0-2	PF1-0	PF1-0	
	2-4	PF1-2	PF1-2	Not A Duplicate
PF2	0-3'	PF2-0	PF2-0	0-3' Surface Sample. This well is paired with MWS4.
PF3	0-2	PF3-0	PF3-0	
	22-24	PF3-22	PF3-22	State Split
PF4	28-30	PF4-28	PF4-28	
PF6	0-3'	PF6-0	PF6-0	0-3' Surface Sample. MS/MSD-2 also collected.
	4-6	PF6-4	PF6-4	
MWF1	0-3'	MF1-0	MWF1-0	0-3' Surface Sample
	0-3'	MF1-2	-	Duplicate of MF1-0, 0-3' Sample
MWF2	4-6	MF2-4	MWF2-4	
	4-6	MF2-6	-	Duplicate of MWF2-4
	22-24	MF2-22	MWF2-22	Split With State of Contaminated Interval
	26-28	MF2-26	MWF2-26	
MWF4	0-3'	MF4-0	MWF4-0	0-3' Surface Sample

- Note:
- (1) ^aDepth Measurements Made In Feet Below Ground Surface (bgs) Unless Otherwise Noted
 - (2) C-of-C Refers to the Chain of Custody
 - (3) All Samples Analyzed For VOA, Semi VOA, TAL, TCN, TOC

Table A-4. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	Miscellaneous (1)	
Acetone Benzene Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes	4 Chloro-3 methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitro-phenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide	Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Ideno(1,2,3-c,d)pyrene Isophorone 2-Methylnaphthalene Naphthalene 2-Nitroaniline 3-Nitroaniline 4-Nitroaniline Nitrobenzene N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Phenanthrene Pyrene 1,2,4-Trichlorobenzene	Total Organic Carbon

Table A-5
SOIL ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification											
	SB1-4	SB1-10	SB2-6	SB2-10	SB3-4	SB3-10	SB4-0	SB5-4	SB5-10	SB6-4	SB6-10	SB7-0
Volatile Organic Compounds												
(m+p)Xylene	<6	5 J	12000	190000	<7	69000	3 J	<6	11000	4 J	<7	<6
1,1,1-Trichloroethane	<6	<7	<9000	<81000	<7	11000 J	<8	<6	<840	<7	<7	<6
1,2-Dichloroethane	<6	<7	<9000	<81000	<7	<31000	<8	<6	<840	<7	<7	<6
Cis-1,2-Dichloroethene	<6	<7	<9000	<81000	2 J	<31000	4 J	<6	<840	4 J	<7	<6
2-Butanone	<6	<7	<9000	<81000	<7	<31000	<8	<6	<840	<7	<7	<6
Acetone	42	<7	<9000	<81000	<7	<31000	<8	54	<840	<7	<7	<6
Benzene	3 J	12	2300 J	55000 J	1 J	16000 J	<8	<6	1200	1 J	<7	<6
Carbon Disulfide	<6	15	<9000	<81000	<7	<31000	<8	<6	<840	<7	<7	<6
Chlorobenzene	<6	<7	<9000	<81000	<7	<31000	<8	<6	<840	<7	<7	<6
Chloroform	<6	<7	<9000	<81000	<7	<31000	3 J	<6	<840	3 J	<7	<6
Ethylbenzene	<6	7	23000	220000	<7	55000	<8	<6	17000	<7	<7	<6
Methylene Chloride	<6	<7	<9000	<81000	<7	<31000	16 J	<6	<840	42 J	2 J	2 J
Styrene	<6	<7	<9000	<81000	<7	<31000	<8	<6	<840	<7	<7	<6
Tetrachloroethene	<6	<7	<9000	<81000	<7	<31000	4 J	<6	<840	4 J	<7	<6
Toluene	<6	6 J	4300 J	<81000	<7	14000 J	<8	<6	280 J	5 J	<7	<6
Trichloroethene	<6	9	<9000	<81000	2 J	<31000	6 J	<6	<840	8 J	<7	<6
o-Xylene	<6	5 J	10000	91000	<7	34000	<8	<6	7300	<7	<7	<6

J = Estimated value, analyte detected below contract required detection level.
 Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS).
 The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.
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Table A-5 (Continued)
SOIL ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification											
	SB7-4	SB8-4	SB10-12	PF1-2	PF3-22	PF4-28	PF6-4	PS1-0	PS1-10	PS2-4	PS2-10	MWF1-0
Volatile Organic Compounds												
(m+p)Xylene	5 J	2900	2400	2300 J	5300 J	10	1900	<6	<7	<6	<6	<6
1,1,1-Trichloroethane	<6	<760	<770	<710	<8500	<6	<6	<6	<7	<6	<6	<6
1,2-Dichloroethane	<6	330 J	<770	<710	<8500	<6	<6	<6	<7	<6	<6	<6
Cis-1,2-Dichloroethene	<6	<760	<770	<710	<8500	<6	<6	2 J	<7	<6	<6	<6
2-Butanone	<6	<760	1100 J	<710	<8500	<6	<6	<6	<7	<6	<6	<6
Acetone	<6	<760	<770	<710	<8500	<6	<6	180	180	42	<6	<6
Benzene	120	20000	<770	820 J	1900 J	12	3600	<6	<7	3 J	2 J	<6
Carbon Disulfide	<6	<760	<770	<710	<8500	<6	<6	<6	<7	<6	<6	<6
Chlorobenzene	<6	<760	<770	180 J	<8500	<6	<6	<6	<7	<6	<6	<6
Chloroform	<6	<760	<770	<710	<8500	<6	<6	2 J	<7	<6	<6	1 J
Ethylbenzene	5 J	17000	2400	2100 J	13000	15	4400	<6	<7	<6	2 J	<6
Methylene Chloride	<6	<760	<770	<710	<8500	<6	<6	<6	<7	<6	<6	<6
Styrene	<6	1200	<770	350 J	<8500	<6	540	<6	<7	<6	<6	<6
Tetrachloroethene	<6	<760	<770	<710	<8500	<6	<6	<6	<7	<6	<6	<6
Toluene	6 J	7200	<770	720 J	<8500	5	1900	1 J	<7	<6	<6	<6
Trichloroethene	<6	<760	<770	<710	<8500	<6	<6	4 J	<7	<6	<6	3 J
o-Xylene	3 J	5400	1400	3000 J	5000 J	7	2100	<6	<7	<6	<6	<6

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Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS).
The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.
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Table A-5 (Continued)
SOIL ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification										
	MWF2-4	MWF2-22	MWF4-0	MWS1-10	MWS2-2	MWS2-10	MWS3-8	MWS3-12	MWS3-32	MWS4-4	MS4-10
Volatile Organic Compounds											
(m+p)Xylene	26000 J	210000	<5	12 J	760 J	760 J	2 J	1900 J	2 J	<33	<7
1,1,1-Trichloroethane	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
1,2-Dichloroethane	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
Cis-1,2-Dichloroethane	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
2-Butanone	22000 J	57000 J	<5	<30	<830	<780	<6	<8100	<6	<33	5 J
Acetone	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	1100 J	1100 J
Benzene	36000	90000	<5	<30	1000	3800	4 J	<8100	<6	<33	<7
Carbon Disulfide	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
Chlorobenzene	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
Chloroform	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
Ethylbenzene	87000	480000	<5	11 J	1400	840	<6	5400 J	2 J	<33	<7
Methylene Chloride	11000 J	29000 J	<5	<30	<830	<780	<6	<8100	<6	<33	<7
Styrene	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
Tetrachloroethene	<31000	<90000	<5	<30	<830	<780	<6	<8100	<6	<33	<7
Toluene	6900 J	150000	<5	<30	630 J	160 J	<6	<8100	<6	<33	<7
Trichloroethene	<31000	<90000	1 J	<30	<830	<780	<6	<8100	<6	<33	<7
o-Xylene	22000 J	170000	<5	10 J	400 J	460 J	<6	2500 J	<6	<33	<7

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Table A-5
SOIL ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification										Total Organic Carbon (%)			
	SB1-4	SB1-10	SB2-6	SB2-10	SB3-4	SB3-10	SB4-0	SB4-18	SB5-4	SB5-10		SB6-4	SB6-10	SB7-0
SEMIVOLATILE ORGANIC COMPOUND														
1,2-Dichlorobenzene	<770	<920	<140000	<160000	<880	<24000	<1100	<770	<800	<130000	<870	<860	<760	<780
2,4-Dinitrotoluene	<770	<920	16000	<160000	<880	<24000	<1100	<770	<800	<130000	<870	<860	<760	<780
2-Methylnaphthalene	1000	3100	490000	1400000	<880	150000	960	<770	<800	1100000	<870	<860	250	430
4-Chloroaniline	<770	110	<140000	<160000	<880	<24000	<1100	<770	<800	<130000	<870	<860	<760	<780
4-Nitrophenol	<3700	<4500	<690000	<770000	<4300	<120000	<5200	<3700	<3900	<640000	<4200	<4200	<3700	<3800
Acenaphthene	1300	530	360000	1200000	<880	98000	250	<770	<800	750000	<870	<860	<760	120
Acenaphthylene	<770	690	710000	1000000	<880	16000	1800	<770	<800	68000	<870	<860	1900	2400
Anthracene	1700	1000	520000	570000	<880	68000	1700	<770	<800	420000	110	<860	8400	1400
Benzoic Acid	<3700	<4500	<690000	<770000	<4300	<120000	<5200	<3700	<3900	<640000	<4200	<4200	<3700	<3800
Benzo(a)anthracene	2700	1700	350000	280000	150	43000	9900	<770	<800	250000	460	100	9000	4800
Benzo(a)pyrene	2100	1200	270000	230000	120	35000	7500	<770	<800	210000	560	<860	5600	7300
Benzo(b)fluoranthene	2100	1500	160000	130000	140	14000	7600	<770	<800	90000	720	<860	5400	4500
Benzo(g,h,i)perylene	<770	1100	110000	110000	<880	16000	9800	<770	<800	84000	<870	<860	3400	3700
Benzo(k)fluoranthene	1800	850	170000	130000	130	22000	6300	<770	<800	130000	700	<860	12000	4600
Bis(2-ethylhexyl)phthalate	<770	<920	<140000	<160000	<880	<24000	<1100	<770	<800	<130000	<870	<860	<760	<780
Butyl benzyl phthalate	2500	1600	<140000	<160000	170	41000	11000	<770	<800	<130000	690	100	9900	4900
Chrysene	<770	<920	<140000	<160000	<880	<24000	<1100	<770	<800	<130000	<870	<860	<760	<780
Di-n-Butylphthalate	<770	<920	<140000	<160000	<880	<24000	<1100	<770	<800	<130000	690	100	9900	4900
Dibenz(a,h)anthracene	<770	<920	<140000	<160000	<880	<24000	<1100	<770	<800	<130000	690	100	9900	4900
Dibenzofuran	<770	<920	<140000	<160000	<880	<24000	<1100	<770	<800	<130000	690	100	9900	4900
Fluoranthene	850	450	58000	74000	<880	8600	340	<770	<800	21000	<870	<860	300	320
Fluorene	4700	3700	750000	750000	340	83000	9000	<770	<800	38000	<870	<860	83	100
Indeno(1,2,3-cd)pyrene	1000	1300	570000	560000	<880	54000	460	<770	<800	490000	1100	190	6000	4200
Naphthalene	1600	990	81000	77000	<880	12000	7300	<770	<800	440000	<870	<860	370	400
Phenanthrene	2400	6900	900000	2600000	<880	320000	1100	<770	<800	64000	<870	<860	2500	2800
Pyrene	5200	4300	1100000	1300000	260	170000	5700	<770	<800	1900000	<870	<860	260	660
	7200	6300	900000	820000	280	110000	20000	<770	<800	1000000	640	<860	4400	4000
										660000	1300	230	12000	8300
	0.73	0.73	6.3	1.8	0.66	0.45	0.94	0.18	0.06	1.5	0.63	0.09	0.26	0.73

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 Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS).
 The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.
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Table A-5 (Continued)
SOIL ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification											PS2-4	PS2-10	
	SB8-4	SB10-12	PF1-0	PF1-2	PF2-0	PF3-0	PF3-22	PF4-28	PF6-0	PF6-4	PS1-0			PS1-10
SEMIVOLATILE ORGANIC COMPOUND														
1,2-Dichlorobenzene	<800	<820	<790	<1200000	<710	<780	<270000	120 J	<780	<1000	<780	<870	<830	<840
2,4-Dinitrotoluene	120 J	<820	<790	<1200000	<710	<780	<270000	<730	<780	<1000	<780	<870	<830	<840
2-Methylnaphthalene	<800	7300	120 J	<1200000	<710	<780	2600000	320 J	<780	1800	350 J	<870	<830	<840
4-Chloroaniline	<3900	<820	<790	<1200000	<710	110 J	<270000	<730	<780	<1000	<780	<870	<830	<840
4-Nitrophenol	1500	<4100	<3800	<5600000	<3500	<3800	1300000 J	<3700	<3800	<5000	<3800	<4200	<4000	<4100
Acenaphthylene	2500	2400	<790	<1200000	<710	<780	2000000	220 J	<780	9600	980	<870	<830	<840
Acenaphthene	3000	1600	150 J	<1200000	<710	<780	1500000	<780	<780	13000	11000	<870	<830	<840
Anthracene	<3900	<4100	<3800	<5600000	<3500	<3800	12000000	76 J	<780	8300	3300 J	90 J	<830	<840
Benzoic Acid	3400	930	960	14000 J	80 J	<780	<1300000	<3700	<3800	<5000	<3800	<4200	<4000	<4100
Benzo(a)anthracene	2800	740 J	1500	21000 J	<710	<780	5700000	<730	3900	23000	22000 J	<870	<830	<840
Benzo(e)pyrene	<800	390 J	1200	14000 J	270 J	<780	4100000	<730	3900 J	28000 J	30000 J	<870	<830	<840
Benzo(b)fluoranthene	1200	320 J	880	<1200000	<710	<780	3900000 J	<730	3700 J	12000 J	36000 J	<870	<830	<840
Benzo(g,h,i)Perylene	2000	340 J	1300	<1200000	<710	<780	2600000 J	<730	1300 J	11000 J	41000 J	<870	<830	<840
Benzo(k)fluoranthene	<800	<820	<790	<1200000	<710	<780	3900000 J	<730	<780	9700 J	60000 J	<870	<830	<840
Bis(2-ethylhexyl)phthalate	<800	<820	<790	<1200000	<710	<780	<270000	<730	<780	<1000	<780	<870	<830	<840
Butyl benzyl phthalate	3700	900	1100	23000 J	130 J	<780	6000000	<730	4100	23000	29000 J	<870	<830	<840
Chrysene	<800	<820	<780	<1200000	<710	<780	<270000	<730	120 J	<1000	<780	<870	<830	<840
Di-n-Butylphthalate	370 J	<820	92 J	<1200000	<710	<780	1900000 J	<730	<780	6000 J	2900	<870	<830	<840
Dibenz(a,h)anthracene	300 J	110 J	<790	<1200000	<710	<780	250000	<730	770 J	1600	<780	<870	<830	<840
Dibenzofuran	5300	1600	1200	13000 J	170 J	<780	1000000	140 J	6100	13000	3300 J	<870	<830	91 J
Fluoranthene	3200	1100	<790	<1200000	<710	<780	11000000	120 J	1100	9100	<780	<870	<830	<840
Fluorene	960	<820	800	<1200000	<710	<780	1900000 J	<730	2300 J	8700 J	28000 J	<870	<830	<840
Indeno(1,2,3-cd)pyrene	11000	<820	<790	<1200000	<710	<780	33000000	650 J	880	7100	940	<870	<830	<840
Naphthalene	7000	5400	560 J	<1200000	98 J	<780	21000000	470 J	6000	15000	2000 J	92 J	<830	480 J
Phenanthrene	6900	3100	1200	97000 J	150 J	<780	15000000	200 J	10000	66000	27000 J	<870	<830	140 J
Pyrene														
Total Organic Carbon (%)	0.23	<0.5	0.96	14	0.2	0.16	4.2	0.38	0.64	2.3	0.26	0.2	0.35	0.38

J = Estimated value, analyte detected below contract required detection limits.
Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS).
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Table A-5 (Continued)
SOIL ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification										MWSS-32	MWSS-12	MWSS-8	MWSS-10	MWSS-2	MWSS-1-10	MWSS-2	MWSS-10	MWSS-8	MWSS-12	MWSS-32	MWS4-4	MWS4-10
	MWF1-0	MWF2-4	MWF2-22	MWF2-26	MWF4-0	MWS1-2	MWS1-10	MWS2-2	MWS2-10	MWS3-8													
SEMIVOLATILE ORGANIC COMPOUND																							
1,2-Dichlorobenzene	<760	<120000	<330000	<850	<710	<1700	<800	<880	<820	<810	<4300	<840	<880	<880									
2,4-Dinitrotoluene	<760	<120000	<330000	<850	<710	<1700	<800	<880	<820	<810	<4300	<840	<880										
2-Methylnaphthalene	<760	630000	4900000	<850	<710	910	2500	3800	350 J	<810	58000	<840	130 J										
4-Chloroaniline	<760	<120000	<330000	<850	<710	<1700	<800	<880	<820	<810	<4300	<840	<880										
4-Nitrophenol	<3800	<620000	<1700000	<4300	<3500	<8400	<3900	<4300	<4000	<3900	<21000	<4200	<4300										
Acenaphthene	<760	320000	2300000	<850	<710	980	2700	1500	400 J	<810	55000	<840	<880										
Acenaphthylene	<760	31000 J	440000	<850	110 J	2700	190 J	4800	180 J	<810	8100	<840	150 J										
Anthracene	210 J	200000	1500000	<850	92 J	6300	1200	3000	580 J	<810	31000	<840	<880										
Benzoic Acid	<3800	<620000	<1700000	<4300	<3500	110 J	290 J	<4300	<4000	<3900	<21000	<4200	<4300										
Benzo(a)anthracene	720 J	100000 J	780000	<850	450 J	7800	650 J	17000	990	97 J	29000	<840	820 J										
Benzo(a)pyrene	650 J	94000 J	580000	<850	460 J	8100	540 J	22000	830	<810	29000	<840	170 J										
Benzo(b)fluoranthene	870 J	37000 J	240000 J	<850	370 J	5900 J	240 J	14000	870	85 J	15000	<840	760 J										
Benzo(g,h)perylene	<760	<120000	<330000	<850	<710	3700 J	250 J	11000	390 J	<810	8200	<840	330 J										
Benzo(k)fluoranthene	610 J	48000 J	310000 J	<850	380 J	4100 J	290 J	11000	700 J	<810	16000	<840	830 J										
Bis(2-ethylhexyl)phthalate	<760	<120000	<330000	<850	<710	<1700	<800	<880	<820	<810	<4300	<840	<880										
Butyl benzyl phthalate	<760	<120000	<330000	<850	<710	<1700	<800	<880	50 J	<810	<4300	<840	<880										
Chrysene	760	99000 J	730000	<850	520 J	7300	650 J	17000	1100	<810	26000	<840	840 J										
Di-n-Butylphthalate	<760	<120000	<330000	<850	97 J	<1700	<800	<880	<820	<810	<4300	<840	<880										
Dibenz(a,h)anthracene	<760	<120000	<330000	<850	<710	<1700	<800	<880	140 J	<810	2700 J	<840	<880										
Dibenzofuran	1400	220000	1600000	<850	<710	380 J	130 J	380 J	250 J	<810	8800	<840	<880										
Fluoranthene	1400	220000	1400000	<850	750	11000	1400	12000	2500	250 J	28000	<840	200 J										
Fluorene	<760	180000	1400000	<850	<710	3300	1200	1900	530 J	<810	45000	<840	<880										
Indeno(1,2,3-cd)pyrene	150 J	<120000	<330000	<850	230 J	3000 J	190 J	7300 J	380 J	<810	6800	<840	350 J										
Naphthalene	<760	1100000	5800000	93 J	<710	1700	5000	9800	3400	<810	61000	<840	280 J										
Phenanthrene	830	640000	3100000	120 J	470 J	13000	4300	6300	2700	<810	46000	160 J	860 J										
Pyrene	1400	350000	2000000	<850	1200	18000	2100	55000	2200	190 J	51000	<840	1300										
Total Organic Carbon (%)	0.81	1.2	7.7	0.19	0.15	1.3	1.9	2.9	0.76	0.59	1.2	0.43	0.66	0.68									

J = Estimated value, analyte detected below contract required detection limits.
Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS).
The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.
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Table A-6
SOIL INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification									
	SB1-4	SB1-10	SB2-6	SB2-10	SB3-4	SB3-10	SB4-0	SB4-18		
Aluminum	8220	22200	2520	7320	17200	20000	21100	15100		
Antimony	R	R	R	<35.6	R	R	<35.6	R		
Arsenic	2.8	5.2	4.8	14	5.1	3.7	14.7	4		
Barium	58.5 J	170 J	16.8 J	152 J	135 J	114 J	159 J	99.1 J		
Beryllium	0.35	1.1	0.25	0.53	0.81	0.76	3.2	0.59		
Cadmium	<3.8	<3.8	<3.8	<3.8	<3.8	0.81 J	<3.8	<3.8		
Calcium	81700	63400	4910	6060	31400	59100	106000	70000		
Chromium	<3	28.9 J	<3	17 J	23.6 J	24.3 J	45.2 J	20.5 J		
Cobalt	5.2	13.7	3.5	7.8	11.1	11.3	11.5	10		
Copper	10.9	26.6	15.7	110	50.4	18.7	57.2	16.5		
Iron	12100 J	29100 J	6420 J	13200 J	26800 J	25700 J	57000 J	22100 J		
Lead	13.8 J	18.8 J	78.4 J	631 J	99.7 J	18.9 J	352 J	9.8 J		
Magnesium	16200	14600	735	1280	9610	22900	22700	23800		
Manganese	256 J	598 J	45.1 J	162 J	413 J	503 J	2290 J	474 J		
Mercury	<0.1	<0.1	0.2	0.23	<0.1	0.4	0.19	<0.1		
Nickel	12.7	30.8	13.8	21.8	24.7	25.6	27	22.4		
Potassium	1810 J	5550 J	207 J	882 J	3030 J	4170 J	2560 J	3610 J		
Selenium	<2.8	<2.8	1 J	20.5 J	<2.8	<2.8	6 J	<2.8		
Sodium	145	325	208	280	175	147	681	247		
Thallium	<2.2	<2.2	1.6	<2.2	<2.2	<2.2	0.47	0.26 J		
Vanadium	15.1	37.7	7.8	28.5	34.5	27.1	43.8	21.3		
Zinc	45.5 J	81.2 J	113 J	173 J	101 J	69.2 J	361 J	60.8 J		
Cyanide	<10	<10	<10	<10	<10	2.8 J	10.2 J	<10		

J = Estimated value, analyte detected below contract required detection limits or qualified by data validation.

R = Value rejected by data validation.

Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS). The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.

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Table A-6 (continued)
SOIL INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification							
	SB5-4	SB5-10	SB6-4	SB6-10	SB7-0	SB7-4	SB8-4	SB9-16
Aluminum	8060	16200	10300 J	20600 J	5760 J	18300 J	10500 J	27000
Antimony	R	R	R	R	R	R	R	R
Arsenic	2.7	9.5	16.7 J	3.1 J	1.8 J	4.7 J	3.2 J	22.6 J
Barium	45.9 J	111 J	119 J	89.3 J	49.9 J	105 J	86.8 J	152
Beryllium	0.31	0.83	1	0.54	0.3	0.79	0.56	1
Cadmium	<3.8	<3.8	0.75	<3.8	<3.8	0.6	0.39	0.52 J
Calcium	62300	35200	<77.3	<77.3	73600 J	69400 J	84800 J	2550 J
Chromium	<3	22.7 J	26.5	17.1	<3	24.1	18.1	35 J
Cobalt	4.2	11.9	10	7.1	<17.4	8.1	6.6	14.7 J
Copper	9.1	25.9	36.1 J	16.4 J	9.3 J	24.8 J	25.2 J	19
Iron	11800 J	20500 J	20800 J	31900 J	9910 J	20500 J	19200 J	33800
Lead	10.2 J	43.8 J	112 J	9.9 J	9.9 J	44.6 J	30.3 J	11.5
Magnesium	27800	12500	4370 J	36000 J	30200 J	24700 J	32000 J	8680
Manganese	385 J	432 J	193	443	338	547	557	420 J
Mercury	<0.1	<0.1	2.6	<0.1	<0.1	<0.1	0.12	<0.1
Nickel	9.5	27.5	25.5	16.5	8.6	20.4	16.1	33.9
Potassium	2110 J	3010 J	1240 J	4170 J	1360 J	2490 J	2280 J	5480 J
Selenium	0.47 J	<2.8	1.7 J	R	R	1.8 J	R	1.3 J
Sodium	160	229	190	164	169	216	180	360 J
Thallium	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	0.19 J	<2.2
Vanadium	15	28.7	28.6 J	35.7 J	14.2 J	26.4 J	24 J	46.1
Zinc	70.2 J	72.9 J	103	73.2	69.3	92.6	90.9	66.5 J
Cyanide	<10	<10	<10	<10	<10	2.4 J	11.6 J	<10

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R = Value rejected by data validation.

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Table A-6 (continued)
SOIL INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification									
	SB10-12	PF1-0	PF1-2	PF2-0	PF3-0	PF3-22	PF4-28	PF6-0		
Aluminum	28800	19800 J	13900 J	2180 J	7050 J	21000 J	11300 J	9210 J		
Antimony	<35.6	R	R	3.6 J	R	R	3.6 J	R		
Arsenic	19.9 J	6.1 J	8.2 J	<3	5.5 J	3.7 J	<3	<3		
Barium	163	149 J	122 J	5.7	82.4 J	125 J	78 J	78.9 J		
Beryllium	1.2	1.2	1	0.31	0.61	0.93	0.43	0.71		
Cadmium	0.68 J	0.65	32.8	0.63	0.92	0.75	<3.8	0.97		
Calcium	5170 J	53800 J	28500 J	206000	54500 J	14300 J	95500	68700		
Chromium	37 J	42.9	29.8	4.2 J	20	32.4	12.8 J	16.8 J		
Cobalt	14.7 J	11.8	13.1	<17.4	6.5	12.1	5.8	9.6		
Copper	32.3	26.4 J	86 J	<4.5	38.7 J	42.6 J	11.6 J	35.4 J		
Iron	33800	32300 J	36300 J	638 J	15900 J	31300 J	1560 J	19300 J		
Lead	16.7	56 J	238 J	139 J	57.8 J	865 J	9.6 J	96.5 J		
Magnesium	8000	16800 J	14500 J	102000	17700 J	10300 J	3850	10100		
Manganese	561 J	722	731	536	474	246	383	488		
Mercury	<0.1	<0.1	0.38	<0.1	<0.1	0.37	<0.1	<0.1		
Nickel	38.4	28.6	41.4	4.9	24	28.9	13.3	20.3		
Potassium	5360 J	4090 J	2510 J	1100 J	1290 J	3100 J	2610 J	2000 J		
Selenium	1.7 J	1.6 J	1.4 J	<2.8	R	R	0.49 J	<2.8		
Sodium	164 J	259	209	67.2	166	1820	133	120		
Thallium	<2.2	<2.2	<2.2	0.22	<2.2	0.24 J	<2.2	<2.2		
Vanadium	49.3	34.2 J	24.4 J	<36.6	14.6 J	32.5 J	13.3	15.5		
Zinc	90.3 J	116	5630	35.1 J	144	146	<5.3	131 J		
Cyanide	<10	<10	270 J	<10	<10	<10	<10	<10		

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Table A-6 (continued).
SOIL INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification							
	PF6-4	PS1-0	PS1-10	PS2-4	PS2-10	MWF1-0	MWF2-4	MWF2-22
Aluminum	32300 J	15200 J	27200 J	34000 J	30800	9400 J	25900 J	53200 J
Antimony	R	R	R	<35.6	R	4.8 J	R	R
Arsenic	<3	7.8 J	10.5 J	3.6	2.9	<3	<3	<3
Barium	227 J	219 J	175 J	96.3 J	175 J	56.9 J	153 J	249 J
Beryllium	1.6	1.3	1.3	1.2	1.2	0.4	1.3	2
Cadmium	0.75	0.76	0.45	<3.8	<3.8	0.93	<3.8	1.5
Calcium	6820	40400 J	42600 J	61500	55200	93100	58200	16200
Chromium	41.6 J	27.4	38.5	43.3 J	39 J	13.9 J	32.8 J	57.2 J
Cobalt	20.3	9.1	17.6	16.6	15.9	5.7	16.1	25.6
Copper	77.8 J	22.1 J	24.2 J	26.3	25.3	24.2 J	23 J	39.3 J
Iron	46300 J	26300 J	33900 J	36800 J	36100 J	14700 J	34400 J	54700 J
Lead	514 J	55.3 J	13.1 J	10.7 J	11.3 J	92.6 J	195 J	93.7 J
Magnesium	9870	11700 J	15600 J	19200	20600	43900	16300	16400
Manganese	385	808	576	602 J	639 J	394	710	528
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	122 J	<0.1
Nickel	45.1	20.8	35.5	38.5	38.6	14.9	34.1	56.5
Potassium	7200 J	3110 J	5590 J	8070 J	7870 J	1980 J	6420 J	8140 J
Selenium	<2.8	0.34 J	R	<2.8	<2.8	<2.8	<2.8	<2.8
Sodium	207	194	273	278	409	95.9	215	221
Thallium	<2.2	<2.2	<2.2	0.3	<2.2	<2.2	<2.2	<2.2
Vanadium	53.5	30 J	40.2 J	47.3	43.9	12.4	39.5	66.2
Zinc	121 J	107	76.3	81.8 J	80.3 J	115 J	77.6 J	212 J
Cyanide	<10	<10	<10	<10	<10	<10	7.6	<10

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R = Value rejected by data validation.

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Table A-6 (continued).
SOIL INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification									
	MWF2-26	MWF4-0	MWS1-2	MWS1-10	MWS2-2	MWS2-10	MWS3-8	MWS3-12		
Aluminum	26500 J	3690 J	6060 J	13600 J	24500 J	18400 J	14900 J	12700 J		
Antimony	R	R	R	R	R	<35.6	R	R		
Arsenic	<3	<3	8 J	0.61 J	4.8	5	9.6 J	4.7 J		
Barium	96.3 J	14 J	62.9 J	146 J	171 J	144 J	120 J	122 J		
Beryllium	1.3	0.22	0.79	1.2	1.1	0.7	0.81	0.83		
Cadmium	0.77	0.46	1.6	0.51	<3.8	<3.8	0.62	0.74		
Calcium	54300	183000	3170 J	91100 J	54300 J	27100	24200 J	73800 J		
Chromium	36.9 J	5 J	<3	35.2	32.4 J	24.2 J	26.2	24.9		
Cobalt	17.7	2.3	8	13.3	15.3	9.8	9.7	9.3		
Copper	23.8 J	24.3 J	59.4 J	37.5 J	25.1	42.6	30.1 J	19.9 J		
Iron	36300 J	733 J	31500 J	22200 J	33200 J	22900 J	22600 J	19200 J		
Lead	14 J	52.4 J	76.1 J	18.3 J	14.1 J	481 J	56.1 J	18 J		
Magnesium	15900	92300	1130 J	32700 J	19700 J	12000	10300 J	23500 J		
Manganese	582	440	453	648	646 J	339 J	507	532		
Mercury	<0.1	<0.1	0.15	<0.1	<0.1	0.88	<0.1	<0.1		
Nickel	36.9	8	21.1	33.5	36.1	20.3	21.2	21.9		
Potassium	7420 J	1190 J	1010 J	2940 J	5660 J	2820 J	2280 J	2400 J		
Selenium	<2.8	<2.8	0.47 J	R	0.52 J	<2.8	0.42 J	49.8 J		
Sodium	190	79.2	272	342	204	152	137	178		
Thallium	<2.2	0.28	<2.2	<2.2	0.3	0.23	<2.2	<2.2		
Vanadium	40.4	<36.6	18.8 J	26.5 J	38.6	31.3	29.9 J	25.3 J		
Zinc	92.8 J	<5.3	343	115	85.3 J	188 J	96.4	71.3		
Cyanide	<10	<10	<10	<10	3.5 J	1.7 J	<10	<10		

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R = Value rejected by data validation.

Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS). The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.

Table A-6 (continued).
SOIL INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification			
	MWS3-32	MWS4-4	MWS4-10	
Aluminum	16300 J	6340	25000	
Antimony	R	R	R	R
Arsenic	<3	8.4	3.9	
Barium	115 J	2070 J	158 J	J
Beryllium	0.8	0.69	1.1	
Cadmium	0.71	<3.8	<3.8	
Calcium	76100	13500	42200	
Chromium	20.2 J	<3	38.4 J	J
Cobalt	11	9.5	15.7	
Copper	19 J	51	23.1	
Iron	23500 J	18200 J	41300 J	J
Lead	9 J	64.9 J	16.5 J	J
Magnesium	29800	1020	12700	
Manganese	524	975 J	786 J	J
Mercury	<0.1	<0.1	<0.1	
Nickel	22.3	13.4	34.9	
Potassium	4560 J	424 J	4870 J	J
Selenium	3.4 J	1.2 J	<2.8	
Sodium	202	149	127	
Thallium	<2.2	<2.2	<2.2	
Vanadium	21.6	12.2	52.3	
Zinc	70.6 J	273 J	75.6 J	J
Cyanide	<10	187 J	<10	

J = Estimated value, analyte detected below contract required detection limits or qualified by data validation.

R = Value rejected by data validation.

Sample identifications are from the numbered soil borings (SB), near-surface fill wells or piezometers (MWF or PF), and lower sand wells or piezometers (MWS or PS). The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.

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Table A-7. Results of grain-size analysis.

Installation	Depth of Sample (ft)	Depth of Screened Interval	Gradation Analysis			Sample Description
			Grav (%)	Sand (%)	Silt/Clay (%)	
MWS-2	79.0-81.0	74.5-84.5	1.2	92.4	6.4	f/c Sand, tr. Silt, tr. Gravel
MWS-3	78.5-80.5	73.5-83.5	46.8	41.8	11.4	Gravel and f/c Sand, tr. Silt, tr. Clay
MWS-4	74.0-76.0	72.0-82.0	28.5	60.3	11.2	f/c Sand, some Gravel, tr. Silt, tr. Clay

Note: (1) f/c is fine to coarse
(2) tr. is trace

Table A-8. Results of Shelby tube analysis.

Installation	Depth of Sample (ft)	Depth of Screened Interval	Perm. (ft/day)	Sample Description
MWS-2	44.0-46.0	74.5-84.5	1.4×10^{-4}	Clay, s. Silt, little f/c Sand
MWS-3	48.5-50.5	73.5-83.5	5.4×10^{-5}	Clay and Silt, little f/c Gravel, tr. f/c Sand
PS-1	34.0-36.0	35.0-45.0	1.2×10^{-3}	Clay, s. Silt, tr. f. Gravel, tr. f. Sand

Note: (1) s. is Sand
 (2) f/c is Fine to Coarse
 (3) tr. is Trace
 (4) f. is Fine

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation - 590'
 Water Level & Date DRY

Boring Number SB-1
 Date Started 4-7-92
 Date Completed 4-7-92
 Drilling Method 4.25" HSA W/DIETRICK D50
 Page Number 1 of 2
 Logged By A. BRYDA

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
	0-2	S1	1.5	16-42- 29-20 (71)	Gravel fill material.	Air Mont: (HNu, CGI) of sample (BG, 0%)
2	2-4	S2	0.5	9-41 100/3"	Same as above.	(BG, 0%)
4	4-6	S3	1.8	5-12- 7-8 (19)	0-10" <u>Silty Clay</u> , (CL-ML), pale yellow brown (10 YR 6/2), wet, some gravel. 10-20" Gravel fill, grayish black (N2), moist, slightly oily.	(BG, 0%) Chemical sample from S3 Sample ID SB1 4-6. Slight odor to the gravel fill.
6	6-8	S4	1.8	1-3 4-4 (7)	<u>Fat Clay w/ Gravel</u> and construction debris, (CH), olive brown and gray (N5).	(BG, 0%)
8						

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-7-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-7-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>- 590'</u>	Page Number	<u>2</u> of <u>2</u>
Water Level & Date	<u>DRY</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-	8-10	S5	1.0	3-2- 3-4 (5)	Same as S4, moderate yellow brown (10 YR 5/4), moist.	(BG,0%)
- 10	10-12	S6	1.0	3-8- 4-8 (12)	Similar to above, S5.	(BG,0%) Chemical sample SBI 10-12.
-	12-14	S7	0.5	50/2"	Construction debris, thin blk watery covering on red overlying brick.	(BG,0%) At 12' "soupy" cutting returns. At 13' rough drilling, hitting some kind of obstruction.
- 14	14-16	S8	0.5	100/3"	Gravelly Silty Clay, (CL-ML), gray black (N2), wet, loose.	(BG,0%) Slight oily sheen to wet sediments. At 15' could not get past an obstruction. End boring total depth 15.5'. Borehole aband- oned w/bentonite grout. Poured thru the augers prior to removing the augers.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-8-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-8-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>- 590'</u>	Page Number	<u>1</u> of <u>2</u>
Water Level & Date	<u>11 ft. bgs on 4-8-92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-	0-2	S1	1.0	9-14 -30 (44)	Construction fill and gravel, moist.	Air Mont:(HNu,CGI) of sample: (BG, 0%)
-	2-4	S2	1.6	13-85- 42-27 (127)	0-6" <u>Gravelly Clay</u> , (CL-ML), medium gray (N6), moist. Possibly construc- tion fill. 6-10" Red brick fragments. 10-19" Similar to 0-6" but black, (N1). Possibly asphalt-like fill.	(BG)
-	4-6	S3	0	7-16- 14-11 (30)	No recovery in the spoon. A wood fragment blocked the split spoon shoe.	Note: the first chem. sample will be from 6-8'.
-	6-8	S4	0.2	8-5 8-6 (13)	<u>Clayey Gravel</u> , (GP-GC), slightly oily covered, wet.	(BG, 0%) Chemical sample S2-6. Sample obtained at 13:35 but was noted on the bottle as 14:00. Insufficient sample volume. Will repush the same interval. Second spoon was driven from 7 to 9'.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-8-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-8-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>100</u>	Page Number	<u>2</u> of <u>2</u>
Water Level & Date	<u>11 ft. bgs on 4-8-92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	0.4	4-6- 5-7 (11)	Same as S4, wet.	Air Mont:(HNU,CGI) of sample: (15 ppm, 0.2%) Sample (BG) Borehole
10	10-12	S6	1.5	3-5- 6-6 (11)	0-6" <u>Lean Clay</u> , (CL), dry, pale yellow brown (10 YR 4/2), stiff. 6-18" Same as S4, wet.	(20 ppm, 0%) Sample (BG) Borehole Chemical sample S2-10. State split sample for VOA, semi-VOA, and metals. From water line on drill rods, water at 11 ft.
12	14-14	S7	1.0	3-5- 4-8 (9)	<u>Gravelly Clay</u> , (CL-ML), oil covered, grayish black, (N2), moist, some peat.	(1 ppm, 0%) switch to 1.5" spoons
14	14-16	S8	0.4	4-5- 7-7 (12)	<u>Peat</u> , (PT), moderate brown (5 YR 4/4), dry, "oil rind" outside the sediments.	(BG,0%). Outside of the sample is oil soaked but the inside is not, possibly due to the inside of the split spoon is going thru an oily layer. Terminate boring at 16'. Bore- hole abandoned with bentonite grout.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-7-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-7-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>- 590'</u>	Page Number	<u>1</u> of <u>3</u>
Water Level & Date	<u></u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
	0-2	S1	1.0	18-30 -31 (61)	Asphalt and gravel fill.	Air Mont: (HNU, CGI) of sample: (BG, 0%)
2	2-4	S2	1.0	16-16- 12-11 (28)	0-6" Same fill. 6-12" <u>Clay with Gravel</u> , (CL), pale yellow brown (10 YR 6/2), dry, slight plastic.	(BG, 0%) Using a 2.5" ID stainless steel split spoon.
4	4-6	S3	1.8	4-4- 4-6 (8)	0-8" Same as S2 6-12", dry. 8-12" Silty clay and gravelly fill, moist. 12-20" Same as 0-8" above, dry.	(BG, 0%) Chemical analysis of sample SB3 4-6.
6	6-8	S4	1.5	18-18- 19-15 (37)	0-12" Covered construction debris. 12-18" <u>Clay with gravel</u> , (CL), pale yellow brown, (10 YR 6/2), dry with oil staining in the clay.	(5 ppm, 0%) of sample (3 ppm) in borehole Oily odor present.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-7-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-7-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>- 590'</u>	Page Number	<u>2</u> of <u>3</u>
Water Level & Date	<u></u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-	8-10	S5	1.5	8-19- 22-27 (41)	Same as above S4 12-18". Oil staining in the clay matrix.	(20 ppm, 0%) of sample (2 ppm, 0%) in borehole Oily odor present.
- 10	10-12	S6	1.7	4-7- 13-14 (20)	Same as above.	(5 ppm, 0%) of sample (1 ppm) in borehole Chemical sample taken SB3 10-12.
- 12	12-14	S7	1.8	7-9- 12-14 (21)	Same as above, slightly more fat.	(5 ppm, 0%) of sample (BG, 0%) in borehole
- 14	14-16	S8	1.5	3-5- 8-10 (13)	0-12" Same as S7. 12-16" <u>Clay with fine Gravel, (CL)</u> 16-18" Same as 0-12".	(5 ppm, 0%) of sample (BG, 0%) in borehole Switch to 1.5" split spoon.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>- 590'</u>	Page Number	<u>1</u> of <u>3</u>
Water Level & Date	<u></u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.5	41-52 -56 (108)	Gravel fill and construction fill.	Air Mont:(HNU,CGI) of sample: (BG,0%) Chemical sample taken from below the asphalt to 2', 0.5 to 2.0'. Sample S4-0. Split spoon from 0.5 to 2.0'.	
-	2	2-4	S2	1.5	11-19- 26-62 (45)	Clayey gravel fill, black (N1), and orange brown (10 YR 6/6), dry.	(BG, 0%)
-	4	4-6	S3	1.5	6-3- 3-4 (6)	<u>Fat Clay</u> , (CH), pale yellow brown (10 YR 6/2), moist, intermixed with <u>Clayey Gravel</u> , (GC), gray (N2), moist to wet. Probable fill material.	(BG,0%)
-	6	6-8	S4	1.5	3-8- 13-16 (21)	0-12" <u>Fat Clay</u> , (CH), pale yellow brown, (10 YR 6/2), dry, stiff. 12-18' Same as <u>Clayey Gravel</u> , (GC), above.	(BG,0%)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>~ 590'</u>	Page Number	<u>2</u> of <u>3</u>
Water Level & Date	<u></u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.5	2-4- 10-16 (14)	Fat Clay w/ Gravel (CH), pale yellow brown (10 YR 6/2), with light olive gray (5 Y 5/2), moist with some gravel, bottom 6" is less fat, clay.	
10	10-12	S6	1.5	3-6- 8-9 (14)	Similar to above, but with charcoal fragments in the plastic clay.	
12	12-14	S7	1.8	8-9- 12-17 (21)	0-14" Same as above, moist. 14-20" Clay, (CL), black (N1), with wood fragments, moist to wet.	
14	14-16	S8	1.5	7-16- 27-35 (43)	Lean Clay, (CL), pale yellow brown (10 YR 6/2), clay matrix is dry, secondary fractures in the clay have a white silty infilling, some of these are wet, very stiff.	(BG,0%) This is possible native soil.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>- 590 FT.</u>	Page Number	<u>3</u> of <u>3</u>
Water Level & Date	<u></u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample		SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.			
18	16-18	S9	1.8	13-24- 37-46 (61) Same as S8, <u>Lean Clay</u> , (CL), with white silty infilling, dry, trace sandstone pebble sand gravel, root holes present.	
20	18-20	S10	1.8	14-24- 39-45 (63) Similar to above. <u>Silty Clay</u> , (CL-ML), pale yellow brown (10 YR 6/2), dry, very dense, trace gravel.	Chemical sample S418. S420 is the duplicate of S418. Boring terminated at 20'. Borehole abandoned by pouring grout through the augers prior to removal

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-5</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-8-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-8-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/DIETRICK D5</u>
Elevation	<u>- 590'</u>	Page Number	<u>1</u> of <u>3</u>
Water Level & Date		Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-	0-2	S1	0.9	9-16 -8 (24)	Gravel fill.	Air Mont:(HNU,CG) of sample (BG, 0%) Only an 18' sample was drilled due to the first 6" being asphalt.
2	2-4	S2	0.8	6-11- 19-18 (30)	0-8" <u>Lean Clay</u> , (CL), pale yellow brown (10 YR 6/2), dry, very stiff to hard plastic, trace gravel. 8-10" <u>Clayey Gravel</u> , (GP-GC), dark gray (N3), loose.	(BG, 0%)
4	4-6	S3	1.5	5-5- 4-10 (9)	0-6" <u>Sandy Lean Clay</u> , (CL), pale yellow brown (10 YR 6/2), moist, stiff. Fine grained trace gravel at 6". 6-18" same as S2 0-8" <u>Lean Clay</u> , (CL), dry.	(BG, 0%) Chemical sample S5-4.
6	6-8	S4	1.5	5-11- 10-13 (21)	0-5" Same as S3 6-18", moist. 5-12" Boulder debris w/clay, debris is "red brick" colored. 12-18" <u>Lean Clay w/ Gravel</u> , (CL), med gray (N4), moist, very stiff.	(10 ppm, 0%) Oily odor.

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation - 590'
 Water Level & Date _____

Boring Number SB-5
 Date Started 4-8-92
 Date Completed 4-8-92
 Drilling Method 4.25 HSA W/DIETRICK D5
 Page Number 2 of 3
 Logged By A. BRYDA

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.8	5-11- 15-17 (26)	0-18" <u>Lean Clay</u> , (CL), same as above dry. 18-22" <u>Lean Clay with Gravel</u> , (CL), oil stained, moist.	(20 ppm, 0%) Sample (1 ppm, 0%) Borehole Oily odor present.
10	10-12	S6	2.0	5-5- 5-7 (10)	0-6" <u>Lean Clay</u> , (CL), pale yellow brown (10 YR 6/2), dry. 6-9" <u>Gravel w/ Clay</u> , (GP-GC), light gray (N7), oily film present. 6-16" Same as 0-6", dry. 16-18" Same as 6-9", oily film present. 18-24" <u>Lean Clay w/ Gravel</u> , (CL), dark gray (N8), moist, some oily film present.	Chemical sample SB5-10.
12	12-14	S7	1.5	3-3- 5-5 (8)	<u>Gravelly Fat Clay</u> , (CH), pale brown (5 YR 5/2), moist, firm.	(1 ppm, 0%) Sample (1 ppm) Borehole Switched to 1.5" split spoons from 2.5" ID. Slight oily odor.
14	14-16	S8	1.5	2-4- 4-5 (8)	<u>Fat Clay w/ Gravel</u> , (CH), pale brown (5 YR 5/2), moist firm.	(BG, 0%) Sample (1 ppm) Borehole

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-6</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D5</u>
Elevation	<u>- 590'</u>	Page Number	<u>1</u> of <u>4</u>
Water Level & Date	<u>- 6' BGS on 4-9-92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.0	26-29- 35-39 (64)	Gravel fill.	Air Mont: (HNu, CGI, Dust) of sample (BG)	
-	2	2-4	S2	1.8	8-11- 19-29 (30)	0-12" <u>Lean Clay w/Gravel</u> , (CL), pale yellow brown (10 YR 6/2), dry, stiff, root holes. 12-18" Charcoal wood fragments and clay, black (N1), dry. 18-21" Same as 0-12".	(BG)
-	4	4-6	S3	1.5	8-8- 8-5 (16)	Construction debris and clayey gravel. Clayey gravel is grayish black (N2), moist with some clay light olive gray (5 Y 5/2).	(BG) Chemical sample is SB-4
-	6	6-8	S4	1.8	3-6- 9-11 (15)	0-6" Same as above. 6-18" <u>Lean Clay</u> , (CL), pale yellow brown same as S2 0-12". 18-20" Same as 0-6".	(BG) - water table - 6 ft. - from water line on drill rods.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-6</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D5</u>
Elevation	<u>- 590'</u>	Page Number	<u>2</u> of <u>4</u>
Water Level & Date	<u>- 6' BGS on 4-9-92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.0	5-8- 9-11 (17)	Same as above, more plastic, dry.	(BG)
10	10-12	S6	1.5	9-6- 9-10 (15)	Same as above, slightly higher sand content, moist to wet.	Chemical sample S6-10.
12	12-14	S7	1.0	4-4- 6-6 (10)	0-6" Same, moist. 6-9" Black wood fragments, moist. 9-12" <u>Clayey gravel</u> , (GC), pale yellow brown (10 YR 6/2), and black (N1), moist.	(1 ppm) Switch to 1.5" split spoons. water table - 6 ft. from water line on drill rods.
14	14-16	S8	1.0	3-5- 8-9 (13)	Same as above.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-6</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D5</u>
Elevation	<u>- 590'</u>	Page Number	<u>3</u> of <u>4</u>
Water Level & Date	<u>- 6' BGS on 4-9-92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.0	4-4- 5-6 (9)	Same w/ 8-10" clayey sand seam, grayish black (N2), wet, sand is fine to medium.	(BG)
18	18-20	S10	1.5	2-3- 7-7 (10)	0-6" <u>Clayey Sand</u> , (SC), olive gray (5 Y 3/2), to pale yellow brown (10 YR 6/2), moist to wet, loose, and sand is fine to medium grained. 6-14" <u>Peat</u> (PT). 14-18" Same as 0-6".	(BG)
20	20-22	S11	1.8	4-7- 14-14 (21)	<u>Silty Clay</u> , (CL-ML), dark yellow brown (10 YR 4/2), dry, very stiff.	(BG) Possibly native material.
22	22-24	S12	1.9	10-20- 36-22 (56) (56)	<u>Silty Clay</u> , (CL-ML), pale yellow brown (10 YR 6/2), dry, very dense. Clay has numerous white possibly calcite infillings which some are moist. Trace gravel throughout.	(BG)

GEOLOGIC LOG

Project <u>IG/WS</u>	Boring Number <u>SB-6</u>
Location <u>Buffalo, New York</u>	Date Started <u>4-9-92</u>
Client <u>Westwood Squibb</u>	Date Completed <u>4-9-92</u>
Driller <u>Buffalo Drilling Inc.</u>	Drilling Method <u>4.25" HSA W/ DIETRICK D5</u>
Elevation <u>- 590'</u>	Page Number <u>4</u> of <u>4</u>
Water Level & Date <u>- 6' BGS on 4-9-92</u>	Logged By <u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
24	24-26	S13	1.9	19-16- 25-30 (41)	Same as S12.	<p>(BG)</p> <p>Terminate borehole at 26 ft. Borehole abandoned w/ bentonite grout poured through the augers before removing the augers.</p>

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-7</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-13-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" ID HSA W/ CME 55</u>
Elevation	<u>- 590</u>	Page Number	<u>1</u> of <u>4</u>
Water Level & Date	<u></u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.8	5-12- 15-15 (27)	Fill, <u>clayey silt w/ some gravels,</u> (ML), trace wood debris, trace brick dusky yellowish brown (10 YR 4/2), moist to slightly moist, very stiff.	Air Mont:(HNU,CGI) of sample. (BG) Chemical sample S7-0.	
-	2	2-4	S2	0.3	11-11- 15-10 (26)	Fill, <u>silty lean clay,</u> (CL), some gravels, pale brown (5 YR 5/2), slightly moist, very stiff.	(BG)
-	4	4-6	S3	1.5	10-13- 17-22 (30)	Fill, same as 2-4'. Visual contamination throughout spoon, more odorous near shoe with black stained horizons.	(5 ppm above known background (akb)). Chemical sample S7-4. Duplicate collected S7-6, collected concurrently w/ S7-4. Both samples from same spoon. No archive.
-	6	6-8	S4	0.5	10-5- 5-6 (10)	Fill, same as 2-4', strong odors present.	(20 ppm akb)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-7</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-13-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/ CME 55</u>
Elevation	<u>- 590</u>	Page Number	<u>2</u> of <u>4</u>
Water Level & Date	<u></u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.0	5-5- 6-5 (11)	Lean clay, (CL), fill, trace wood chips, trace gravel, pale brown (5 YR 5/2), slightly moist, stiff. Zones of black staining, obvious odor, streaked zones of orange-brown odored, viscous liquid.	(100 ppm) fresh surface
10	10-12	S6	0.9	3-4- 4-6 (8)	Fill, same as 8-10 with occasional smell, brick fragments (orange).	
12	12-14	S7	0.7	4-4 4-5 (8)	Same as 8-10.	
14	14-16	S8	1.2	3-4- 4-5 (8)	Same as 8-10.	

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-7</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-13-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ CME 55</u>
Elevation	<u>590</u>	Page Number	<u>3</u> of <u>4</u>
Water Level & Date	<u></u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.5	2-4- 5-5 (9)	<u>Fat Clay</u> , (CH), grading down to lean clay with sharp contact below to clayey sands, little gravel, (CL-ML) fine grained, saturated, firm-stiff.	-
18	18-20	S10	1.8	5-7- 7-7 (14)	<u>Fat Clay</u> , (CH), massive, dark yellowish brown (10 YR 4/2), soft to firm. Sharp contact below to clayey sand, (GC), fine grained, saturated with black stained liquid/product.	(5 ppm) of sample. (2-5 ppm) inside augers (BG) in breathing zone.
20	20-22	S11	2.0	4-5- 5-6 (10)	<u>Peat</u> , (PT), decaying cellulose material, laminated parallel to ground surface/platy. Dusky yellowish brown (10 YR 2/2), moist, sulfide odor, uniform material throughout.	(20 ppm, 1%) of sample. CGI >100% inside auger. After 1 hr. CGI = 40% inside augers.
22	22-24	S12	0.8	5-6- 8-8 (14)	Same as 20-22, <u>Peat</u> , (PT), less platy, more prismatic, washed, saturated, uniform throughout. Some zones of product staining near shoe. Dark yellowish orange product on moderate yellowish brown (10 YR 5/4) matrix.	(180 ppm, 0%) of sample CGI 30% inside augers.

GEOLOGIC LOG

Project <u>IG/WS</u>	Boring Number <u>SB-7</u>
Location <u>Buffalo, New York</u>	Date Started <u>4-13-92</u>
Client <u>Westwood Squibb</u>	Date Completed <u>4-13-92</u>
Driller <u>Buffalo Drilling Inc.</u>	Drilling Method <u>4.25 HSA W/ CME 55</u>
Elevation <u>- 590</u>	Page Number <u>4</u> of <u>4</u>
Water Level & Date _____	Logged By <u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type & No.	Rec. (ft)			
24	24-26	S13	1.2	3-3- 3-5 (6)	<u>Lean Clay</u> , (CL), with trace organic cellulose material, and silt, dusky yellowish brown (10 YR 2/2), very moist to wet, firm.	(40 ppm) CGI 2-4% inside augers.
26	26-28	S14	1.5	1-2- 3-6 (5)	<u>Clayey Silt</u> , (ML), some organics (tree limbs, cellulose, peat), dark yellowish brown (10 YR 4/2), grading down to a <u>Lean Clay</u> , (CL), dark yellow brown (10 YR 4/2), moist.	(2 ppm)
28	28-30	S15	1.5	6-10- 14-21 (24)	Same as in shoe of 26-28' spoon, <u>Silty Lean Clay</u> , (CL), dark yellowish brown (10 YR 4/2), moist, very stiff to hard, massive, homogeneous. One rounded cobble, occasional to trace fine gravels.	(2 ppm)
30	30-32	S16	1.5	21-21- 18-24 (39)	Same as 28-30'. Native till.	(3 ppm)
						Terminated boring at 32 ft. BGS. Borehole abandoned w/ bentonite grout poured through augers prior to removal

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-8</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-14-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>- 590</u>	Page Number	<u>1</u> of <u>3</u>
Water Level & Date	<u>- 10 ft. BGS</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.5	14-15- 17-20 (32)	<u>Clayey Sand and Gravel</u> , (SC), fine grained, pale brown (5 YR 5/2), slightly moist, dense, grading down to <u>Silty Lean Clay</u> , (CL), some gravel, moderate brown (5 YR 4/4), slightly moist, stiff.	Air Mont:(HNu,CGI) of of sample (BG)	
-	2	2-4	S2	1.5	18-25- 100/4"	Same as lower part of 0-2' with slightly more clay content, less silt, large cobbles. Zone of compressed platy material, black, resembling mica.	(0.5 ppm above known background (akb)). Slight odor in shoe.
-	4	4-6	S3	1.7	10-12- 12-12 (24)	<u>Clayey Sand and Gravel</u> , (SC), trace debris (bricks, black), trace organics grading down to <u>Silty Lean Clay</u> , (CL), some gravel, moderate brown (5 YR 3/4), slightly moist, very stiff.	(5 ppm akb) Chemical sample S8-4. Slight creosole odor.
-	6	6-8	S4	0.9	4-3- 6-7 (9)	<u>Silty Clay</u> , (CL-ML), trace gravel some fibrous wood zones, moderate brown (5 YR 3/4), saturated, very stiff. Completely saturated with irridescent sheen.	(160 ppm) Creosole odor very strong. Contaminated soil throughout spoon.
-	8						

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-8</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-14-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>- 590</u>	Page Number	<u>2</u> of <u>3</u>
Water Level & Date	<u>- 10' BGS</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.6	3-5- 6-9 (11)	Same as 6-8' with discrete zones of clayey sands, fine grained, trace fibrous wood throughout.	(160 ppm) Sample contaminated w/ black and yellow brown product, especially in sand zones.
10	10-12	S6	1.4	7-12- 12-16 (24)	<u>Lean Clay</u> , (CL), trace gravel moderate brown (5 YR 4/4), very moist, very stiff, heavily contaminated zone from 1.0'-1.2' above shoe where clay is less stiff with a slightly higher silt content.	(750 ppm) Noticeable visual contamination. Spoon exterior wet.
12	12-14	S7	1.3	7-13- 14-15 (27)	Same as 10'-12' with a sandy zone of contamination in the center of recovery (0.2' wide).	(60 ppm) Visual contamination.
14	14-16	S8	1.7	6-20- 11-11 (31)	Same as 10-12', grading down to a <u>Clayey Sand</u> , (SC), fine to medium grained, trace gravel, trace wood/cellulose material, occasional cobbles (rounded), saturated with product in shoe, olive gray (5 Y 4/1), very stiff and dense.	(60 ppm) Visual contamination.
16						

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-8</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-14-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>- 590</u>	Page Number	<u>3</u> of <u>3</u>
Water Level & Date	<u>- 10' BGS</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.5	5-6- 7-9 (13)	<u>Lean Clay, (CL)</u> , little gravel, dark yellowish brown (10 YR 4/2), moist (spoon exterior/interior saturated) very stiff clay zones, 2 small seams of clayey gravels with some fine sand, saturated with product.	(55 ppm) Visible contamination present.
18	18-20	S10	1.0	5-7- 7-9 (14)	<u>Lean Clay, (CL)</u> , dark yellowish brown (10 YR 4/2), wet, very stiff with 4 seams of clayey gravel, some sand, trace wood/cellulose, each seam saturated with product. Product not present through massive clay zones.	(60 ppm) Product dripping out of spoon.
20	20-22	S11	1.0	4-6- 6-5 (12)	<u>Clayey Gravel, (GC)</u> , some sand, trace wood/cellulose. Saturated with dark reddish brown to black product. Loose matrix, no cohesion between aggregates.	(70 ppm) Boring terminated at 22 ft. Spoon augering ended at 20' BGS. Abandoned with bentonite grout poured through the augers before removing the augers.

GEOLOGIC LOG

Project	IG/WS	Boring Number	SB-9
Location	Buffalo, New York	Date Started	4-21-92
Client	Westwood Squibb	Date Completed	4-21-92
Driller	Buffalo Drilling Inc.	Drilling Method	4.25 HSA W/ DIETRICK D50
Elevation	- 590	Page Number	1 of 3
Water Level & Date	- 8 ft. bgs on 4/12/92	Logged By	T. ROGERS

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.6	13-30- 52-23 (82)	0-6" Topsoil, grass. Gravel, fill 13".	Air Mont:(HNu,CGI) of sample:	
-	2	2-4	S2	1.5	13-18- 18-18 (36)	Lean Clay, (CL), light yellow brown (10 YR 6/2), very dry, light inter- bedded minor gravel - 14". Clay Gravel, (GP-GC), dark gray (N3) loose, some silt and clay.	(BG)
-	4	4-6	S3	1.3	4-5- 7-7 (12)	Sandy Lean Clay, (CL), light brown (5 YR 5/6) to red brown (10 R 4/6), moist, tight, very plastic, top 13". Sandy Gravel, (GM), black (N1), to dark gray (N3).	(4 ppm) bottom 3"
-	6	6-8	S4	1.9	3-3- 4-7 (7)	0-6" Sandy Lean Clay, (CL), light brown (5 YR 5/6) to red (5 R 4/6), plastic. 6-9" Fill, sandy gravel, yellow green (5 GY 7/4). 9-23" Lean Clay, (CL), light brown (5 YR 5/6) to red (5 R 4/6), silt, tight clay, very stiff.	(25 ppm) Strong odor, visible sheen, visible contami- nation present.

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation ~ 590
 Water Level & Date ~ 8 ft. bgs on 4/21/92

Boring Number SB-9
 Date Started 4-21-92
 Date Completed 4-21-92
 Drilling Method 4.25 HSA W/ DIETRICK D50
 Page Number 2 of 3
 Logged By T. ROGERS

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.7	7-7- 10-4 (17)	0-3" <u>Lean Clay</u> , (CL), medium brown (5 YR 4/4) to red (5 R 4/6), wet, oil stained. 3-20" Fill, cinder, ash, white yellow (5 Y 8/4) to green (5 G 5/6). Gravel.	(25 ppm) Contamination present. Oily odor present. Ash fill with odor, contamination present.
10	10-12	S6	2.0	3-3- 5-9 (8)	0-16" Fill, same as above, ash and cinder. 16-22" <u>Silty Clay</u> , (CL), brown red (10 R 4/6), very tight. 22-24" <u>Well Graded Sand w/ Gravel</u> , (SW), black (N1), to dark gray (N3).	Wet conditions effect- ing the HNu. (BG) visible contami- nation.
12	12-14	S7	1.6	5-5- 7-18 (12)	0-13" Fill, cinder ash. 13-19" <u>Silty Clay</u> , (CL), medium brown (5 YR 4/4) to red (5 R 4/6), dry, stiff.	HNu down because of rain. Visible contami- nation.
14	14-16	S8	1.4	8-21- 25-36 (46)	0-3" Fill, cinder ash 3-14" <u>Silty Clay</u> , (CL), medium brown (5 YR 4/4) to yellow (5 Y 7/6), dry, very stiff. 14-17" <u>Silty Sand</u> , (ML), medium brown (5 YR 4/4) to light red (5 R 4/6).	Visible contamination HNu effected by the rain.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-9</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-21-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-21-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>~ 590</u>	Page Number	<u>3</u> of <u>3</u>
Water Level & Date	<u>~ 8 ft. bgs on 4/21/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.9	12-26- 37- 50/3" (63)	Fat Clay, (CH), with gravel, pale brown (5 YR 5/2), to yellow brown (10 YR 5/4), moist, firm, very stiff	(BG) Boring terminated at 18 ft. Abandoned with grout poured through the augers before removing the augers.
-						
18						
-						
-						
-						
-						
-						
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GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-10</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-22-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-22-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>- 590</u>	Page Number	<u>1</u> of <u>2</u>
Water Level & Date	<u></u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-	0-2	S1	1.2	16-59- 50/2"	0-5" Topsoil, grass. 5-10" Fill, gravel.	Air Mont:(HNu,CGI) of sample: (BG)
-	2	2-4	1.7	12-12- 13-23 (25)	0-15" Fill, cinder ash, yellow (5 Y 7/6) to gray (N5), to black (N1), friable. 15-20" <u>Sandy Silt with Gravel</u> , (GM), orange (10 R 6/6) to medium brown (5 YR 3/4).	(BG)
-	4	4-6	1.2	18-9- 8-9 (17)	0-7" <u>Gravel with some Sand</u> , (GP), medium gray (N6), to orange (10 R 6/6). 7-14" <u>Silty Clay</u> , (CL), with clear (calcite ?) crystals, medium brown (5 YR 4/4), to orange (10 R 6/6), to gray (N5). 14-15" <u>Gravel</u> , (GP), light gray (N7) to pale yellow brown (10 YR 6/2).	(BG)
-	6	6-8	1.7	6-9- 7-4 (16)	0-8" <u>Silty Clay</u> , (CL), medium brown (5 YR 4/4) to light red brown (10 R 5/4), moderately stiff. 8-20" Fill, cinder, ash, with gravel at base, white (N7), to moderate reddish orange (10 R 6/6).	(BG)

GEOLOGIC LOG

Project	IG/WS	Boring Number	SB-11
Location	Buffalo, New York	Date Started	5-05-92
Client	Westwood Squibb	Date Completed	5-05-92
Driller	Buffalo Drilling Inc.	Drilling Method	TRIPOD/SNATCH BLOCK
Elevation	- 590 FT.	Page Number	1 of 2
Water Level & Date		Logged By	J. TOTH

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.5	4-4- 6-7 (10)	0-6" Top soil and grass vegetation. 6-1.5' <u>Silty Sand</u> , (SM), little gravel, little slag/cinders, grayish black (N2), damp, loose. 1.5-2' <u>Silty Clay</u> , (CL), lean, little gravel, moderate brown (5 YR 3/4), moist, stiff, fill.	Air Mont: (HNU, CGI) of sample: (0.4 ppm above known background (akb)) -	
-	2	2-4	S2	0.5	6-6- 7-8 (13)	<u>Silty Clay</u> , (CL), lean, little gravel, moderate brown (5 YR 3/4), moist, stiff, fill.	(75 ppm) of sample. No distinctive odor. -
-	4	4-6	S3	1.2	10-9- 10-12 (19)	<u>Silty Clay</u> , (CL), lean, some gravel, trace wood, cinders/slag, brick, pale brown (5 YR 5/2), moist, stiff, fill.	(32 ppm) of sample. No distinctive odor. -
-	6	6-8	S4	1.5	8-9- 6-5 (15)	6-6.5' Same as 4-6'. 6.5-8' Sharp contact to <u>Clayey Gravel</u> , (GC), and fly ash, some sand well graded, medium light gray (N6), wet, loose, fill.	(7 ppm) of sample. (12 ppm) of sample. Slight petroleum odor. -

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>SB-11</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>5-05-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>5-05-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>TRIPOD/SNATCH BLOCK</u>
Elevation	<u>~ 590 FT.</u>	Page Number	<u>2</u> of <u>2</u>
Water Level & Date	<u></u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.0	4-5- 5-5 (10)	8-8.5' Same as 6.5-8'. 8.5-10' <u>Silty Gravel</u> , (GM), some sand, well graded, trace fly ash, light gray (N7), with brownish/burnt orange product, saturated, loose.	(85 ppm) of sample. Contamination present, 0.5' thick, from 9.4- 9.9' bgs, saturated w/ product. Silty clay in shoe. Till.
10	10-12	S6	0.4	4-4- 4-4 (8)	10-11' Gravel wash same as 8.5-10'. 11-12' <u>Silty Clay</u> , (CL), lean, trace gravel, moderate brown (5 YR 4/4) w/ small streaked zones/lenses of light olive gray (5 Y 6/1) staining, moist very stiff.	Spoon retrieved satu- rated with water and product (burnt orange to black product plus sheen). Gravel wash same as 8.5-10.0' bgs. 11-12' no obvious contamination. Till.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-10-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>589.13</u>	Page Number	<u>1</u> of <u>6</u>
Water Level & Date	<u>579.8 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-	0-2	S1	1.7	12-15- 23-18 (38)	Sand and gravel fill, brown (5 YR 4/4) and gray (N5), moist.	Air Mont:(HNu,CGI) of sample: HNu effected by the high humidity, CGI 0%.
2	2-4	S2	1.7	4-7- 12-8 (19)	Gravel fill, cinders with plastic clay bands, brown (5 YR 4/4), and gray (N5).	Strong odor with sheen. CGI 0%.
4	4-6	S3	1.7	4-9- 11-8 (20)	Gravel fill with slag material, brown (5 YR 4/4), and gray (N5), moist.	Strong odor with sheen. CGI 0%.
6	6-8	S4	1.5	12-16- 12-15 (28)	<u>Silty Clay</u> , (CL), with pieces of coal and rock fragments, brown (5 YR 4/4), moist.	CGI 0%.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-10-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>589.12</u>	Page Number	<u>2</u> of <u>6</u>
Water Level & Date	<u>579.8 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.8	7-22- 40-42 (62)	Same as above, but clay more homogenous.	Air Mont:(HNU,CGI) of sample: HNU effected by the high humidity, CGI 0%.
10	10-12	S6	1.7	18-20- 22-40 (42)	Clay, (CL), moderate brown (5 YR 3/4), with gray streaks, few rock pebbles, moist, till.	
12	12-14	S7	1.9	3-12- 18-22 (30)	Same as above.	
14	14-16	S8	1.9	17-28- 36-37 (64)	Same as above.	

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-9-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-10-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>589.13</u>	Page Number	<u>3</u> of <u>6</u>
Water Level & Date	<u>579.8 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.8	15-29- 44-50 (73)	Same as above.	Air Mont: (HNU, CGI) of sample: (BG, 0%)
18	18-20	S10	1.8	3-40- 39-37 (79)	Same as above.	(BG, 0%)
					Moved over 5' and augered with 8.25" to set 10" steel casing at 20'. Moved to avoid possibly hitting a nearby water line.	Pulled auger plug from augers at 20'. Clay was contaminated, very strong odor, HNU=20 ppm next to plug. Air breathing space was 5-7 ppm; after 20 min was BG level. Did not start grouting inside augers until a fan and level B equip. could be obtained due to possi- bility of strong con- tamination on augers when they are removed after grouting. Set 10" surface casing to 20'. -

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-27-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-28-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>589.13</u>	Page Number	<u>4</u> of <u>6</u>
Water Level & Date	<u>579.8 FT. ABOVE MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
20	20-22	S11	1.2	65-6- 10-12 (16)	20-20.5' <u>Gravel</u> , (GW), and sand with rock fragments, dark greenish gray (5 GY 4/1), saturated, loose. 20.5-22' <u>Silty Clay</u> , (CL), lean, trace gravel, dark yellowish brown (10 YR 4/2), moist, stiff.	(0.2 ppm above known background (akb)) (7 ppm akb)
25	25-27	S12	2.0	10-8- 10-12 (18)	<u>Silty Clay</u> , (CL), trace sub-rounded gravel, pale brown (5 YR 5/2), moist stiff, massive, homogeneous.	(2.5 ppm akb)
30	30-32	S13	2.0	4-4 -6 (10)	Same as 25-27' but not as lean. Firm consistency.	(1.2 ppm akb) Spoon driven 18", clay expanded to 24" inside spoon.
35	35-37	S14	2.0	2-2 -4 (6)	Same as 30-32' with some zones of light olive gray staining (5 Y 6/1). Not as firm as 30-32', more fat.	(0.5 ppm akb)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-27-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-28-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>589.13</u>	Page Number	<u>5</u> of <u>6</u>
Water Level & Date	<u>579.8 FT. ABOVE MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
40	40-42	S15	2.0	2-3 -3 (6)	Same as 35-37'.	(0.2 ppm akb)
45	45-47	S16	2.0	5-6 -7 (13)	Same as 30-32', but with more gravel (little gravel), lack of gray stained zones.	(BG)
50	50-52	S17	2.0	5-5 -6 (11)	Same as 30-32', but with occasional light olive gray zones of staining.	(BG) Lack of standing water 4/28/92 a.m. inside HSA
55	55-57	S18	2.0	7-5 -8 (13)	Same as 25-27'.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-27-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-28-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>589.13'</u>	Page Number	<u>6</u> of <u>6</u>
Water Level & Date	<u>579.8 FT. ABOVE MSL, 5/18/92</u>	Logged By	<u>TOTH</u>

Depth BGS (ft)	Sample		SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss	
	Int- erval	Type &No.				
60	60-62	S19	1.5	12-14- -20 (34)	60-60.5' Same as 55-57'. 60.5' Sharp contact to a <u>Clayey Sand</u> (SC), and silt, little to trace gravel, fine grained, pale brown (5 YR 5/2), moist, stiff, with two small seams of loose fine grained sand, no clay, no gravel, moist.	(BG)
65	65-67	S20	2.0	WOR-5 -8 (13)	65-65.5' Same as 30-32'. 65.5' Sharp contact to <u>Clayey Sand</u> , (SC), and silt, fine grained, pale brown (5 YR 5/2), wet, firm, grading down to <u>Clayey Sand</u> , (SC), some gravel, little silt, medium grained, brownish gray (5 YR 4/1), compact, wet, subrounded to subangular lime- stone gravels.	(BG)
70	70-72	S21	0.4	29- 100/2"	<u>Sandy Gravel</u> , (GM), little silt, fine to coarse grained, occasional cobble, pale yellowish brown (10 YR 5/2), saturated, compact. (6" auger wash).	(BG) Center plug pulled dripping wet.
75	75-77	S22	0.2	100/2"	Same as 70-72' with more cobbles/ rock fragments. Bedrock at 72.3'.	Total depth 72.3'. Well Screen 67.3-72.3'. Sand Pack 65.3-72.3'. Bentonite Seal 63.3- 65.3'. Grout Sand 0-63.3'.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-8-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.03</u>	Page Number	<u>1</u> of <u>7</u>
Water Level & Date	<u>578.0 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.2	8-10- 11-15 (21)	Silty clay fill with rock fragments and pieces of brick, brown (5 YR 2/2), moist.	Air Mont:(HNu,CGI) of sample: (0, 0%)	
-	2	2-4	S2	1.2	9-8- 11-16 (19)	Silty Clay, (CL), brown (5 YR 2/2), moist, dark stains, black band with gravel at 2.5-3.1', glass, wood, and rock fragments, also cinders in this zone.	(1 ppm, 0%) Strong odor.
-	4	4-6	S3	1.2	11-12- 7-10 (19)	Silty Clay, (CL), same as above with dark contaminated zones.	(1 ppm, 0%) Strong creosole-type odor.
-	6	6-8	S4	1.2	7-2- 11-14 (13)	Silty Clay, (CL), same as above.	(1 ppm, 0%) Strong odor.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-8-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.03</u>	Page Number	<u>2</u> of <u>7</u>
Water Level & Date	<u>578.0 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.3	8-8- 10-12 (18)		Air Mont:(HNu,CGI) of sample: (1 ppm, 0%)
10	10-12	S6		7-6- 8-15 (14)	Same as above with several dark bands of rock fragments and carbonaceous material.	2' of water in hole at 10'. Strong odor.
12	12-14	S7	0.5	2-2- 3-2 (5)	<u>Lean Clay</u> , (CL), possibly fill, dark gray (N4), very wet.	(1 ppm, 0%)
14	14-16	S8	0.5	3-3- 9-3 (12)	Clay fill, with pieces of brick and rock fragments.	(1 ppm, 0%)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-8-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.03</u>	Page Number	<u>3</u> of <u>7</u>
Water Level & Date	<u>578.0 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	0.7	3-4- 4-6 (8)	Same as above.	(1 ppm, 0%)
18	18-20	S10	0.7	3-2- 2-3 (4)	Fill, wood chips or peat, yellowish brown (10 YR 5/4), wet, soft.	(1 ppm, 0%)
20	20-22	S11	0.5	2-2- 2-2 (4)	Top 3" same as above. Base 3" <u>Lean Clay</u> , (CL), and rock fragments, dark, wet, staining.	(1 ppm, 0%) Strong odor.
22	22-24	S12	1.3	WOH	<u>Silty Clay</u> , (CL-ML), dark gray (N4), rock fragments, stains.	(2 ppm, 0%) Strong odor.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-8-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-9-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.03</u>	Page Number	<u>4</u> of <u>7</u>
Water Level & Date	<u>578.0 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
24	24-26	S13	1.3	1-10- 16-20 (26)	<u>Lean Clay</u> , (CL), brown (5 YR 4/4), moist, dense, light gray streaks	(BG, 0%)
26	26-28	S14	1.6	25-18- 30-34 (48)	Same as above.	(BG, 0%)
28	28-30	S15	1.8	21-25- 30-32 (55)	Same as above.	(BG, 0%)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-23-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u></u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.03</u>	Page Number	<u>5</u> of <u>7</u>
Water Level & Date	<u>578.0 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
35	34-36	S16	2.0	3-3- 4-4 (7)	Fat Clay, (CH), light medium gray (N6), to pale yellow brown (10 YR 6/2), moist, soft, firm. Some varves.	Set 10 inch surface casing to 34 feet.
40	35-41	S17	2.0	WOH-1 -2-3 (3)	Fat Clay, (CH), same as above, some sand and trace gravel.	
45	44-46	SH-1			Apparently the same as above. Logged from the bottom and top of the Shelby tube.	
50	49-51	S18	2.0	7-7- 12-13 (19)	Similar, more lean, slightly moist, pronounced varves.	First gear on the rig transmission went down.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-24-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-24-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ CME 55</u>
Elevation	<u>591.03</u>	Page Number	<u>6</u> of <u>7</u>
Water Level & Date	<u>578.0 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
55	54-56	S19	2.0	WOR from 30' up	<u>Fat Clay, (CH), pale yellow brown (10 YR 6/2), with some medium light gray (N6), moist, soft, plastic.</u>	Rods dropped the final 30'.
60	59-61	S20	2.0	10-11- 14-13 (25)	Same as S18, varved, moist, sand is firm.	
65	64-66	S21	1.0	14-20- 22-26 (42)	<u>Silty Clay with Sand and Gravel, (CL-ML), greensih gray (5 G 6/1), to grayish yellow (5 GY 7/2), moist to dry, hard, sand is fine to medium grained, gravel appears to be limestone.</u>	Gravel from this spoon is the same as the drive way stone.
70	69-71	S22	1.0	8-13- 26-29 (39)	0-6" <u>Silty Sand, (SC-SM), light olive gray (5 Y 6/1), wet, sand is fine grained.</u> 6-12" <u>Clayey Sand with Gravel, (SC), light olive gray (5 Y 6/1), wet, dense limestone gravel.</u>	Gravel same as drive way stone.

GEOLOGIC LOG

Project <u>IG/WS</u>	Boring Number <u>MWS-2</u>
Location <u>Buffalo, New York</u>	Date Started <u>4-24-92</u>
Client <u>Westwood Squibb</u>	Date Completed <u>4-24-92</u>
Driller <u>Buffalo Drilling Inc.</u>	Drilling Method <u>4.25 HSA W/ CME 55</u>
Elevation <u>591.03</u>	Page Number <u>7</u> of <u>7</u>
Water Level & Date <u>578.0 ft. above MSL, 5/18/92</u>	Logged By <u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
75	74-76	S23	2.0	14-22- 18-22 (40)	<u>Poorly Graded Sand with Gravel</u> , (SP-SC), light olive gray, (5 Y 6/1) dry to moist, dense.	No archive sample. Slow drilling at 78'.
80	79-81	S24	2+	90- 100/5"	<u>Poorly Graded Sand</u> , (SP-SM), light olive gray (5 Y 6/1), wet, dense, sand is medium to coarse grained. Sand is composed of limestone fragments with some quartz grains.	Blow counts are not representative, spoon was pushed full. Rough drilling at 79'. Smother drilling at 80'
85	84-86	S25	2.0	100/2"	Same, fill up in the spoon from the previous interval.	No archive sample, same as S24. Washed out the augers with the roller bit. Top of rock is 84' as determined by drilling action. Total depth 86'. Well screen 74.5-84.5'. Sand 73-84.5'. Bentonite seal 18-73' (plus some cave in). Grout sand 0-18'.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-23-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>590.11</u>	Page Number	<u>1</u> of <u>8</u>
Water Level & Date	<u>580.1' above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.5	16-50 -50 (100)	Fill, gravel construction debris, "Graystone", dry to slightly moist.	Air Mont:(HNu,CGI) of sample: (BG, 0%).	
-	2	2-4	S2	1.2	17-18- 25-12 (43)	Fill, gravel construction debris, same as above, dry.	(BG)
-	4	4-6	S3	0.9	16-25- 11-10 (36)	Fill, gravel construction debris, wet.	(BG)
-	6	6-8	S4	0.5	6-29- 38-22 (67)	<u>Lean Clay with Gravel</u> , (CL), pale yellow brown (10 YR 6/2), dry, hard.	(BG)

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation 590.11
 Water Level & Date 580.1 ft. above MSL, 5/18/92

Boring Number MWS-3
 Date Started 4-13-92
 Date Completed 4-23-92
 Drilling Method 4.25 HSA W/ DIETRICK D50
 Page Number 2 of 8
 Logged By A. BRYDA

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.5	9-12- 15-10 (27)	Same as S4, less gravel, slightly moist to dry.	(BG) Chemical sample MS3-8. Also MS/MSD-1. No archive sample, insufficient sample volume.
10	10-12	S6	1.5	5-5- 8-5 (13)	Same, bottom 6" is moist to wet.	Note: on 4/14 water level was ~ 10' bgs overnight. Odor from the split spoon and borehole. (15 ppm) Sample. (0.5 ppm) Borehole.
12	12-14	S7	1.5	6-8- 13-13 (21)	Similar to above, oily staining, oily odor present in two distinct bands of wood fragments at 4-6" and 12-14".	Chemical sample MS3-12. State split sample will take a third chemical sample below visual contamination. Begin using engineering control of 1500 cfs fan
14	14-16	S8	0.9	14-14- 18-18 (32)	Lean Clay, (CL), pale yellow brown (10 YR 6/2), dry, hard, trace gravel	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-23-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>590.11</u>	Page Number	<u>3</u> of <u>8</u>
Water Level & Date	<u>580.1 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.5	17-10- 13-10 (23)	0-4" Same, moist. 4-10" Wood chips and fragments, moist to wet.	(0.5 ppm)
18	18-20	S10	1.5	9-10- 11-12 (21)	Clayey Sand, (SC), pale olive (10 Y 6/2), moist to wet, medium, grained, some gravel and construction debris.	(BG) slight odor.
20	20-22	S11	0.8	36-41- 40 50/4" (81)	Similar to S10, more clay. Sandy Lean Clay, (CL), pale olive (10 Y 6/2), wet, hard, with gravel.	(BG) Water at 15', as noted on the drill rods. Water level is rising.
22	22-24	S12	0.6	31-27- 16-10 (43)	0-3" Same as S11, wet. 3-7" Slightly cemented fine to medium grained sand, gray black (N2) dry.	(5 ppm) for 0-3" (BG) for 3-7".

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-23-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>590.11</u>	Page Number	<u>4</u> of <u>8</u>
Water Level & Date	<u>580.1 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
24	24-26	S13	0.5	15-18- 22-10 (40)	Similar to S12 with gravel, wet.	(BG)
26	26-28	S14	1.8	5-20- 18-18 (38)	0-4" <u>Gravelly Clay</u> , (CL), similar to above, oily sheen present, slight odor, wet. 4-16" Same as S13. 16-22" Wood fragments, strong odor, moist to wet (highest HNu readings).	(5-20 ppm).
28	28-30	S15	1.5	6-8- 7-15 (15)	0-12" <u>Fat Clay</u> , (CH), light gray (N7), dry to moist, stiff, some gravel present. Slight organic odor 12-18" <u>Fat Clay</u> , (CH), moderate brown (5 YR 4/4), dry to moist, stiff, slight organic odor.	(BG)
30	30-32	S16	1.8	5-7- 8-8 (15)	Same as S15 12-18" dry to moist.	(BG) Slight odor, however, the outside of the spoon sample has a gray mud covering probably from the water present in the borehole.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-13-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-23-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>590.11</u>	Page Number	<u>5</u> of <u>8</u>
Water Level & Date	<u>580.1 ft. above MSL, 5/18/92</u>		Logged By <u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
32	32-34	S17	1.8	8-14- 14-14 (28)	Same, dry to moist.	Chemical sample MS3-32. (BG)
34	34-36	S18	2.0	8-10- 10-8 (20)	0-12" <u>Sandy Fat Clay</u> , (CH), pale yellow brown (10 YR 6/2), wet, stiff 12-24" Same as S17.	(BG) Will ream out borehole with 8.25" HSA to 34', then push 10" steel casing to 35' (+1 to 35 feet bgs).

GEOLOGIC LOG

Project	IG/WS	Boring Number	MWS-3
Location	Buffalo, New York	Date Started	4-21-92 LOWER SAND DRILL
Client	Westwood Squibb	Date Completed	4-23-92
Driller	Buffalo Drilling Inc.	Drilling Method	4.25 HSA W/ DIETRICK D50
Elevation	590.11	Page Number	6 of 8
Water Level & Date	580.1 ft. above MSL, 5/18/92	Logged By	A. BRYDA

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
35					For last sample see previous boring log.	
40	38.5- 40.5	S19	2.0	5-6- 6-7 (12)	<u>Silty Clay</u> , (CL-ML), pale yellow brown (10 YR 6/2), moist, stiff, very plastic, some sand, a thin sandy clay seam at 20-22".	(BG)
45	43.5- 45.5	S20	2.0	4-5- 6-9 (11)	<u>Silty Clay</u> , (CL-ML), same as above, some trace gravel, moist.	
50	48.5- 50.5	SH1	2.0			Shelby Tube.

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation 590.11
 Water Level & Date 580.1 ft. above MSL, 5/18/92

Boring Number MWS-3
 Date Started 4-21-92
 Date Completed 4-23-92
 Drilling Method 4.25 HSA W/ DIETRICK D50
 Page Number 7 of 8
 Logged By A. BRYDA

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
55	53.5- 55.5	S21	2.0	5-8- 16-12 (24)	Similar to above, moist, pronounced varved intervals - 1-2" thick.	
60	58.5- 60.5	S22	2.0	17-17 24-27 (41)	Similar to above, more stiff and drier, less moist.	
65	63.5- 65.5	S23	1.5	9-10 -8 (18)	Same as S20, with a dry sandy clay seam - 1" thick at 2-3" from the top of the spoon, light gray color. is fine to medium grained, light gray, wet.	Switched to driving 18" spoons.
70	68.5- 72.5	S24	1.5	7-10 -10 (20)	Similar to above, <u>Fat Clay with Sand</u> (CH), pale yellow brown (10 YR 6/2), moist to wet, stiff, varved. Sand is fine to medium grained, light gray, wet.	

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-21-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-23-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>590.11</u>	Page Number	<u>8</u> of <u>8</u>
Water Level & Date	<u>580.1 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample		SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss	
	Int- erval	Type &No.				
75	73.5- 75.5	S25	1.0	14-17 -20 (37)	Clayey Gravel with Sand, (GC-GM), pale yellow brown (10 YR 6/2), moist to wet, dense.	- 74' begin rough drilling. "Wash up" into the augers - 20' of running medium to coarse sand.
80	78.5- 80.5	S26	1.0	29- 100/6 (109)	Poorly Graded Gravel, (GP), medium gray (N5), wet, very dense. The gravel is medium to very coarse. Some small boulders, subangular to angular. Material is probably limestone and dolomite with some shale and quartz.	Grain size sample, no archive. At - 80' rough drilling. At 82' less rough. At 82.5' rough to very rough drilling. 15 minutes to drill from 81-83.0'.
85	83.0- 85.0	S27	1.0	100/0"	0-6" Same as above. 6-12" Weathered bedrock. Gray limestone or dolomite with white silty infilling, possibly calcite.	Total depth is 84'. Screen Interval 73.5- 83.5'. Sand Pack 71.5-83.5'. Bentonite Seal 64.0- 71.5'. Grout Seal 0-64'.

GEOLOGIC LOG

Project	IG/WS	Boring Number	MWS-4
Location	Buffalo, New York	Date Started	4-6-92
Client	Westwood Squibb	Date Completed	4-20-92
Driller	Buffalo Drilling Inc.	Drilling Method	4.25 HSA W/ DIETRICK D50
Elevation	591.19	Page Number	1 of 7
Water Level & Date	577.6 ft. above MSL, 5/18/92	Logged By	J. MOFFIT

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.5	7-5- 9-7 (14)	Fill, coarse sand, moderate brown (5 YR 3/4), moist. Wet at 2'. Rock and wood fragments present.	Air Mont:(Hnu,CGI) of sample: (3 ppm, 0%).	
-	2	2-4	S2	1.2	11-14- 15-18 (29)	Sand, (SP), moderate brown (5 YR 3/4), moist to wet, coarse gr. 3.5-4' Lean Clay, (CL).	(BG, 0%)
-	4	4-6	S3	1.3	12-12- 16-20 (28)	Cinders, dark gray (N3), to black (N1), coarse grained.	(BG, 0%)
-	6	6-8	S4	1.3	8-8 -9 (17)	Silty Clay, (CL-ML), moderate brown (5 YR 3/4), moist to wet, very coarse grained. Cinders and rock fragments present. Cinders present in lower half foot of the spoon.	(BG, 0%)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-6-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.19</u>	Page Number	<u>2</u> of <u>7</u>
Water Level & Date	<u>577.6' above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.6	4-3- 4-5 (7)	<u>Silty Clay, (CL-ML), dark gray (N3), moist to wet, coarse cinder bands and rock fragments, very dense.</u>	Air Mont:(HNu,CGI) of sample: (2 ppm, 0%)
10	10-12	S6	1.3	2-3- 6-5 (9)	<u>Silty Clay, (CL-ML), dark gray (N3), moist to wet, dense, very plastic, rock fragments present.</u>	(2 ppm, 0%) Slight odor present.
12	12-14	S7	1.2	4-10- 12-18 (22)	<u>Silty Clay, (CL-ML), moderate brown (5 YR 3/4), with dark gray streaks (N3), dense, plastic, stiff.</u>	(BG, 0%)
14	14-16	S8	1.6	7-9- 10-11 (19)	<u>Silty Clay, (CL-ML), moderate brown (5 YR 3/4), with dark streaks, plastic, stiff, rock fragments present.</u>	(BG, 0%)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-6-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.19</u>	Page Number	<u>3</u> of <u>7</u>
Water Level & Date	<u>577.6 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.8	7-13- 20-34 (33)	Silty Clay, (CL-ML), medium brown (5 YR 4/4), with dark gray streaks, plastic, stiff, rock fragments present.	(BG, 0%)
18	18-20	S10	1.8	15-27- 33-46 (60)	Silty Clay, (CL-ML), medium brown (5 YR 4/4), with gray steaks, plastic, rock fragments present.	(BG, 0%) Set 10 inch surface casing to 19 ft.
20	20-22	S11	1.8	6-20- 25-50 (45)	Silty Clay, (CL-ML), moderate brown (5 YR 4/4), with gray streaks, plastic, rock fragments present.	(BG, 0%)
22	22-24	S12	1.9	16-32- 42-43 (74)	Silty Clay, (CL), same as above.	(BG, 0%)

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation 591.19
 Water Level & Date 577.6 ft. above MSL, 5/18/92

Boring Number MWS-4
 Date Started 4-6-92
 Date Completed 4-20-92
 Drilling Method 4.25" HSA W/DIETRICK D55
 Page Number 4 of 7
 Logged By A. BRYDA

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
24	24-26	S13	1.8	13-23- 28-29 (51)	Same as above but increase in 5% of silt towards base of sample, moderate brown (5 YR 3/4).	(BG, 0%)
26	26-28	S14	1.8	12-17- 16-20 (33)	Clay, (CL), increasing in silt, moderate brown (5 YR 3/4).	(BG, 0%) Note: all clays from 14-30'+ appear to be glacial till.
28	28-30	S15	1.8	9-9- 12-15 (21)	Same as above.	
30	30-32	S16		5-7- 8-8 (15)	Same as above.	

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-6-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D55</u>
Elevation	<u>591.19</u>	Page Number	<u>5</u> of <u>7</u>
Water Level & Date	<u>577.6 ft. above MSL, 4/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
30						
35						Continue drilling through the surface casing with 4.25" HSA.
40	39-41	S18	1.6	8-10- 15-15 (25)	Silty Clay, (CL-ML), pale yellow brown (10 YR 6/2), dry to moist, very stiff, plastic, sandy seam from 12-14".	(BG)
45	44-46	S19	2.0	6-7- 10-13 (17)	Same as above, dry to moist with gravel.	(BG)
50	49-51	S20	2.0	WOR-2- 10-11 (12)	Same. Dry to moist.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-6-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>591.19</u>	Page Number	<u>6</u> of <u>7</u>
Water Level & Date	<u>577.6 ft. above MSL, 5/18/92</u>		Logged By

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
55	54-56	S21	2.0	WOR-4 11-12 (15)	Same, moist.	
60	59-61	S22	2.0	6-8- 17-26 (25)	0-18" <u>Sandy Silty Clay</u> , (CL-ML), pale yellow brown (10 YR 6/2), dry to moist, stiff. Varved, alternating predominantly sand/clay/ sand/clay. Sand is fine to medium grained, trace gravel. 18-24" Similar, light olive gray (5 Y 5/2), moist, more sand and more gravel.	(BG)
65	64-66	S23	1.0	14-45- 26-20 (71)	0-6" <u>Clayey Gravel with Sand</u> , (GC), light olive gray (5 Y 6/1), wet, very dense. 6-12" <u>Well Graded Gravel</u> , (GW), predominant color is brownish gray (5 YR 4/1), wet gravel appears to be predominantly limestone.	Water on the rods to - 45' bgs. Stop for the day at 66' - 8:00 4/16 - 2' of run up inside the augers from - 62' to 64". At - 66' rough drilling action. At - 68' soft drilling.
70	69-71	S24	1.0	27- 100/5"	Same as S23, <u>Clayey Gravel with Sand</u> , (GC), and <u>Well Graded Gravel</u> , (GW).	

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWS-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-6-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA</u>
Elevation	<u>591.19</u>	Page Number	<u>7</u> of <u>7</u>
Water Level & Date	<u>577.6 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
75	74-76	S25	1.0	36-69- 64-55 (133)	Same as above, <u>Clayey Gravel</u> , (GC), some large gravel.	At 69' drillers add - 30 gals of water to stabilize the bottom of the borehole to prevent runup. At 70' rough drilling. Grain size analysis sample MS4 69-76. Note: From 74-76' sample a gravel is similar to road bed gravel. At 80' very rough drilling. Total depth 82'. Pulled rods, augers open to 75'. "Washed" borehole open to 82 ft. Screen Interval 72-82'. Sand Pack 70-82'. Bentonite Seal 68-70'. Grout Seal 0-68'.
80	79-81	S26	1.0	77- 100/4	Same, slightly less clay.	
	82-84	S27	0	50/.5	No recovery.	

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWF1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4/17/92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4/17/92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA</u>
Elevation	<u>591.41</u>	Page Number	<u>1</u> of <u>1</u>
Water Level & Date	<u>580.7 ft. above MSL, 5/18/92</u>		Logged By <u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
					See PS-1 Boring Log for lithologic log.	Air Mont: (HNu, CGI) of sample.
-						
-						
-						
-						
-						
-						
-						
-						

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation 590.47
 Water Level & Date 582.0 ft. above MSL, 5/18/92

Boring Number MWF-2
 Date Started 4-16-92
 Date Completed 4-17-92
 Drilling Method 6.25" HSA W/DIETRICK D55
 Page Number 1 of 4
 Logged By J. TOTH

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.4	5-18- 14-14 (32)	Gravel fill material, well graded, some sand, sand is medium to coarse grained, dark yellowish brown (10 YR 4/2), very moist.	Air Mont:(HNU,CGI) of sample. Humidity effecting the HNU.	
-	2	2-4	S2	1.2	11-21- 31-10 (52)	Same as 0-2' with brick, concrete greater than 50%. Black stained grains in shoe.	Coal tar odor.
-	4	4-6	S3	1.4	4-11- 8-8 (19)	Silty lean clay fill, little gravel moderate brown (5 YR 3/4), moist, vein of porosity (secondary). Burnt orange product, stiff. Gravel lens and sand, trace clay, loose, saturated with product.	Chemical sample MF 2-4. Duplicate sample MF2-6. Visual contamination present.
-	6	6-8	S4	1.7	4-7- 7-9 (14)	Same as above, clay fill. Lens of silty sand, some gravel, trace clay, little wood, black glossy product.	Visual contamination present.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWF-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-16-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-17-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6.25" HSA W/DIETRICK D55</u>
Elevation	<u>590.47</u>	Page Number	<u>2</u> of <u>4</u>
Water Level & Date	<u>582.0 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.3	5-5- 7-9 (12)	Same as 6-8' less stiff (firm) grading to stiff at 10'. Lens of silty sand and gravel, fine to coarse grained, trace wood, saturated with iridescent product, burnt orange with some purple color.	HNu effected by the high humidity.
10	10-12	S6	1.1	3-5- 7-9 (12)	<u>Silty Lean Clay</u> , (CL-ML), fill, trace gravel, dark yellowish brown (10 YR 4/2), moist, stiff to very stiff, massive, (homogeneous throughout recovery).	Slight petroleum odor.
12	12-14	S7	1.5	2-4- 3-4 (7)	<u>Silty Clay</u> , (CL-ML), fill and some gravel, dark yellowish brown (10 YR 4/2), moist, soft/firm consistency (more fat than 10-12'). Product visible in secondary porosity (burnt orange oily contamination).	
14	14-16	S8	1.2	6-10- 12-12 (22)	Same as 12-14' with more gravel. Lens of silty gravel, trace clay, saturated with burnt orange oily product.	End split spoon at 16' on 4-16-92. End 6" HSA at 18' on 4-16-92.

GEOLOGIC LOG

Project <u>IG/WS</u>	Boring Number <u>MWF-2</u>
Location <u>Buffalo, New York</u>	Date Started <u>4-16-92</u>
Client <u>Westwood Squibb</u>	Date Completed <u>4-17-92</u>
Driller <u>Buffalo Drilling Inc.</u>	Drilling Method <u>4.25" HSA</u>
Elevation <u>590.47</u>	Page Number <u>3</u> of <u>4</u>
Water Level & Date <u>582.0 ft. above MSL, 5/18/92</u>	Logged By <u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	0.9	4-5- 7-9 (12)	Silty Lean Clay, (CL-ML), little gravel, trace wood, trace rock fragments, trace brick, brownish gray (5 YR 4/1), moist, stiff. Contamination in secondary porosity (burnt orange color), very odorous.	(80 ppm) Sample. (40 ppm) Borehole. Split spoon exterior covered with product.
18	18-20	S10	2.0	3-7- 7-14 (14)	Peat and Cellulose/Wood, 100% organic (particles/sizes like particle board), grains/fibers very moist with product, coal tar and organic decomposition odor.	(80 ppm) Sample. CGI 52% in borehole.
20	20-22	S11	1.5	6-7- 7-7 (14)	Same as 18-20' Peat and Cellulose/Wood. Clayey Sand and Silt, (SC), black (N1), grading to olive black (5 Y 2/1), very moist, firm, fine grained, some wood, trace shells (gastropods, bivalves).	(250 ppm) CGI 13% in borehole. (15 ppm)
22	22-24	S12	2.0	3-3- 4-4 (7)	Peat/Cellulose Wood Fibers, very loose, saturated with burnt orange brown colored product, iridescent. Clayey Sand, (SC), olive gray (5 Y 4/1), fine grained, little plant material (root/grass), little wood, moist, firm. Same as 22.0-22.6'.	(250 ppm) (15 ppm) (230 ppm) Chemical samp MF2-22, dupli. MF2-22.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>MWF-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-16-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-17-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6" HSA W/DIETRICK D55</u>
Elevation	<u>590.47</u>	Page Number	<u>4</u> of <u>4</u>
Water Level & Date	<u>582.0 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample		SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.			
24	24-26	S13	2.0	5-5-7-8 (12) Silty Clay, (CL-ML), trace gravel, medium gray (N5), stiffing downward from firm, massive, homogeneous, occasional secondary permeability with black stained products.	HNu effected by high humidity.
26	26-28	S14	2.0	10-11-13-14 (24) Silty Lean Clay, (CL-ML), occasional gravel, grayish brown (5 YR 3/2), moist, stiff and grading down to very stiff, massive, homogeneous.	(2 ppm above known background (akb) Chemical sample MF2-26. (3 ppm akb) End boring at 26' bgs. End spooning at 28' bgs Screened Interval 16-26'. Sand Pack 14-16'. Bentonite Seal 12-14'. Cement Grout 0-12'. (3 ppm akb)

GEOLOGIC LOG

Project	IG/WS	Boring Number	PS-1
Location	Buffalo, New York	Date Started	4-14-92
Client	Westwood Squibb	Date Completed	4-24-92
Driller	Buffalo Drilling Inc.	Drilling Method	4.25 HSA W/ DIETRICK D50
Elevation	591.31	Page Number	1 of 5
Water Level & Date	578.8 ft. above MSL, 5/18/92	Logged By	A. BRYDA

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.3	9-14 23-19 (37)	0-4" Top Soil. 4-8" Asphalt fill. 8-15" <u>Lean Clay with Gravel</u> , (CL), very stiff. Some black organic silt possibly fly ash.	(BG) Chemical sample PS1-0. Duplicate sample PS1-2.	
-	2	2-4	S2	1.5	5-8- 13-13 (21)	<u>Silty Clay</u> , (CL-ML), pale yellow brown (10 YR 6/2), dry, stiff, slightly plastic, trace gravel in a couple of discontinuous bands.	(BG)
-	4	4-6	S3	1.5	10-14- 14-18 (28)	Similar to S2, more gravel and more plastic, dry.	(BG)
-	6	6-8	S4	1.5	7-10- 8-11 (18)	Similar to S3, less gravel. Bottom 6" were moist to wet.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-14-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-24-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.31</u>	Page Number	<u>2</u> of <u>5</u>
Water Level & Date	<u>578.8 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample		SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No. (ft)			
8	8-10	S5	1.0	7-8- 8-11 (16)	Same as above, slightly more plastic except for 6-9" which is dusky yellow brown (10 YR 2/2). (BG)
10	10-12	S6	1.5	5-7- 15-13 (22)	Same as S5, slightly moist. (BG)
12	12-14	S7	1.0	4-10- 100/4"	Same, more plastic, trace gravel, slightly moist, wood fragment in the toe of the split spoon. (BG)
14	14-16	S8	1.5	19-23- 25-22 (48)	Silty Clay, (CL-ML), pale yellow brown (10 YR 6/2), dry, hard, slightly plastic, calcite silt infilling of secondary fractures, trace gravel. (BG) Native till.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-14-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-24-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.31</u>	Page Number	<u>3</u> of <u>5</u>
Water Level & Date	<u>578.8 ft. above MSL, 5/18/92</u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.5	7-14- 18-19 (32)	Same, dry, some trace gravel.	(BG) Set 10 inch surface casing to 18'. Note: No water in this borehole.
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GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-22-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-24-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.31</u>	Page Number	<u>4</u> of <u>5</u>
Water Level & Date	<u>578.8 ft. above MSL, 5/18/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
24	24-26	S10	1.4	7-13- 13-16 (26)	Silty Clay, (CL-ML), medium red (5 R 4/6), to moderate brown (5 YR 4/4), dry, moderately stiff.	(BG)
29	29-31	S11	2.0	8-10- 12-14 (22)	Same as above, minor pebbles.	(BG)
34	34-36	SH-1	2.2	Shelby Tube	Silty Clay, (CL-ML), medium brown (5 YR 4/4), to red (5 R 4/6), dry, very stiff, with minor pebbles medium gray (N5), to dark green (5 G 3/2), well rounded. Description of soil based on exposed bottom of Shelby Tube.	
39	39-41	S12	0.8	100/3"	Silty Sand (SM), silt is light brown (5 YR 5/6), to tan. Sand is medium brown (5 YR 4/4), to medium gray (N5), to green (5 G 5/6). Shale is dark gray to green with white calcite cement.	(BG) Spoon is wet.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-22-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-24-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.31</u>	Page Number	<u>5</u> of <u>5</u>
Water Level & Date	<u>578.8 ft. above MSL, 5/18/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
44	44-46	S13	0.1	100/1"	Same as above, no sand or silt, dark gray (N3), shale with white calcite cement.	(BG)
47	47-51	S14	0.2	100/1"	Dark gray (N3), to dark green (5 G 3/2), shale, friable, platy, crystalline. White calcite cement. Bedrock.	(BG)
						Total depth 49'. Screen Interval 35-45'. Sand Pack 33-45'. Bentonite Seal 26-33'. Cement Grout 0-26'. Set 4" stainless steel well at PS-1.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-24-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-30-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.48</u>	Page Number	<u>1</u> of <u>6</u>
Water Level & Date	<u>577.5 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.2	4-12- 16-9 (28)	0-6" <u>Clay</u> , (CL), brownish black (5 YR 2/1). 6-9" fill with coarse sand and cinders, moist.	Air Mont:(HNu,CGI) of sample: (BG, 0%)	
-	2	2-4	S2	1.2	7-14- 18-28 (32)	<u>Silty Clay</u> , (CL-ML), dark reddish brown (10 R 3/4), moist, dense, plastic, a few rock pebbles and gray streaks.	(BG, 0%)
-	4	4-6	S3	1.2	16-30- 40-50 (70)	<u>Clay</u> , (CL), similar to above, very dense with white gray streaks along vertical fractures, appears to be calcite crystals, a few rock pebbles	(BG, 0%)
-	6	6-8	S4	1.3	14-28- 42-53 (70)	Same as above.	(BG, 0%)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-24-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-30-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.48</u>	Page Number	<u>2</u> of <u>6</u>
Water Level & Date	<u>577.5 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample		SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.			
8	8-10	S5			
10	10-12	S6			
12	12-14	S7			
14	14-16	S8			

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-24-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4/30/92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.48</u>	Page Number	<u>3</u> of <u>6</u>
Water Level & Date	<u>577.5 ft. above MSL, 5/18/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
15	15-19	S9	1.8	15-24- 30-43 (54)	Silty Clay, (CL-ML), medium brown (5 YR 4/4), to medium red (5 R 4/6), to yellow (5 Y 7/6), moist, moderately stiff, with minor pebbles rounded 3/4", dark green (5 G 3/2), to gray (N5), with light gray (N7), streaks.	(BG)
19	19-24	S10	2.0	16-26- 30-36 (56)	Silty Clay, (CL-ML), same as above, and medium to fine grained sand lens vertical fractures, white to light gray (N7), moist, with calcite content.	(BG) Set 10 inch surface casing to 19 ft.
24	24-29	S11	2.0	20-27- 34-37 (61)	Silty Clay, (CL-ML), same as above, color change to light brown (5 YR 5/6), to medium brown (5 YR 4/4).	(BG) Sample wet along outside of core beside spoon.
29	29-34	S12	2.0	7-7- 11-12 (18)	Clay, (OH), medium brown (5 YR 4/4), to dark brown (5 YR 2/2), to red (5 R 4/6), medium moist, very sticky moderate stiff, medium to high plasticity.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-24-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-30-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.48</u>	Page Number	<u>4</u> of <u>6</u>
Water Level & Date	<u>577.5 ft. above MSL, 5/18/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
34	34-39	S13	2.0	WH-WH- WH-6	Same as above plus <u>Organic Clay</u> , (OH), color in bottom 8" medium red (5 R 4/6), less brown, more moisture low plasticity.	(BG)
39	39-44	S14	2.0	WH-WH- 6-7	Same clay as above, <u>Organic Clay</u> , (OH), medium red (5 R 4/6), to medium gray (N5), low moisture, very plastic, banding (6").	(BG)
44	44-49	S15	2.0	WH-WH- 8-10	Same as above, <u>Organic Clay</u> , (OH).	(BG)
49	49-54	S16	2.0	WH-11- 7-13 (18)	<u>Organic Clay</u> , (OH), same as above.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-24-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-30-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.48</u>	Page Number	<u>5</u> of <u>6</u>
Water Level & Date	<u>577.5 ft. above MSL, 5/18/92</u>		Logged By <u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
54	54-59	S17	2.0	WH-WH- 8-14	Organic Clay, (OH), same as above.	(BG)
59	59-64	S18	2.0	WH-WH- 7-7	Organic Clay, (OH), same as above.	(BG)
64	64-69	S19	2.0	18-38- 40-101 (78)	Silty Sand with Rock Fragments, (SM) dark yellow brown (10 YR 4/2), very moist, dense, with subangular gravel	(BG)
69	69-74	S20	1.2	30-55- 90-62 (145)	Silty Sand with Rock Fragments, (SM) same as above, but sand is grading coarser.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PS-2</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-24-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-30-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25 HSA W/ DIETRICK D50</u>
Elevation	<u>591.48</u>	Page Number	<u>6</u> of <u>6</u>
Water Level & Date	<u>577.5 ft. above MSL, 5/18/92</u>	Logged By	<u>J. MOFFITT</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
74	74-79	S21	1.3	28-48- 35-70 (83)	Coarse Sand and Gravel.	
79	79-84	S22	0.8	58- 107/3"	Same as above.	
84	84-89	S23	0.1	108/1"	Weathered dolomite/limestone, light gray, moist, soft.	
						Split spoon refusal at 89.1'. Auger refusal at 89.2'. Total depth 89.2'. Screen Interval 79.2- 89.2'. Sand Pack 76-89.2'. Bentonite Seal 74-76'. Cement Grout 0-74'.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-10-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-10-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" AUGUGS W/DIETR. D5</u>
Elevation	<u>-590 ft.</u>	Page Number	<u>1</u> of <u>3</u>
Water Level & Date	<u></u>	Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-	0-2	S1	1.8	20-16- 20-45 (36)	0-12" Gravel fill. 12-20" <u>Silty Clay with Gravel</u> , (CL- ML), grayish brown (5 YR 3/2), dry, dense.	Air Mont: (HNu, CGI) of sample. (BG) Chemical sample PF1-0.
2	2-4	S2	1.5	13-22- 33-27 (55)	0-12" Same as S1 12-20" with more gravel. 12-18" <u>Lean Clay with Gravel</u> , (CL), black (N1), medium, dry, with wood fragments. Still in the fill.	(2 ppm) of sample. (5 ppm) in borehole. Chemical sample PF1-2.
4	4-6	S3	1.5	7-14- 21-25 (35)	<u>Silty Clay with Gravel</u> , (CL-ML), moderate brown (5 YR 4/4), dry, hard Small pebbles in the clay matrix and some thin calcite and gravel seams. All dry.	(BG)
6	6-8	S4	1.5	6-8- 13-18 (21)	Same as S3, less gravel, dry.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-1</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-10-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-10-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" AUGUGS W/DIETR. D5</u>
Elevation	<u>- 590 ft.</u>	Page Number	<u>2</u> of <u>3</u>
Water Level & Date		Logged By	<u>A. BRYDA</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.8	13-18- 21-29 (39)	Same as S4, trace gravel, dry.	(BG)
10	10-12	S6	1.8	7-11- 20-25 (31)	Same as above, dry.	(BG)
12	12-14	S7	1.8	11-16- 21-26 (37)	Same, slightly moist, more plastic.	(BG) Slower drilling, tight unit.
14	14-16	S8	2.0	11-15- 20-22 (35)	Same, slightly moist, more plastic.	(BG)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-14-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-15-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6" HSA</u>
Elevation	<u>591.05'</u>	Page Number	<u>1</u> of <u>5</u>
Water Level & Date	<u>575.8 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.4	18-15- 14-22 (29)	Silty Sand, (SM), fill, mod. brown (5 YR 3/4), fine to medium grained, and gravel (parking lot stone), slightly moist, loose.	Air Mont:(HNu,CGI) of sample. (BG) Chemical sample PF3-0.	
-	2	2-4	S2	0.8	10-12- 14-13 (26)	Silty Clay, (CL-ML), fill, grayish brown (5 YR 3/2), some gravel, trace organics, occasional cobble, slightly moist, very stiff.	(0.5 ppm above known background (akb)) Slight petroleum odor.
-	4	4-6	S3	1.5	3-9- 14-16 (23)	Same as S2. Sharp contact below to silty sand, olive black (5 Y 2/1), little gravel, trace organics, trace cinders, fine to medium grained, moist, loose, trace clay.	(0.8 ppm akb) Slight petroleum odor.
-	6	6-8	S4	1.6	10-40- 65-47 (105)	Silty sand fill matrix <20% in between gravel, cobbles, cinders, slag, organics, fine to medium grained, brownish black (5 YR 2/1), moist, compact, zone of highest contamination (mostly loose sand), trace clay.	(140 ppm) Sample. Coal tar odor. Visual contamination present.

GEOLOGIC LOG

Project <u>IG/WS</u>	Boring Number <u>PF-3</u>
Location <u>Buffalo, New York</u>	Date Started <u>4-14-92</u>
Client <u>Westwood Squibb</u>	Date Completed <u>4-15-92</u>
Driller <u>Buffalo Drilling Inc.</u>	Drilling Method <u>6" HSA</u>
Elevation <u>591.05'</u>	Page Number <u>2</u> of <u>5</u>
Water Level & Date <u>575.8 ft. above MSL, 5/18/92</u>	Logged By <u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.3	10-20- 13-10 (33)	Same as 6-8' with additional rubber, brick, lack of slag. Contaminated sandy zone which is saturated with oily black product. Exterior of spoon wet.	(90 ppm akb) of sample Visible contamination present.
10	10-12	S6	1.4	5-24- 15-14 (39)	<u>Silty Clay</u> , (CL-ML), fill, olive gray (5 Y 4/1), some gravels, little cobbles, brick fragments, wet, very stiff with sharp contact below to 0.4' lens of silty sand, and gravel, trace clay, saturated with some contamination, very loose, moderate reddish brown (10 R 4/6), with glossy brownish black staining.	(45 ppm) of sample
12	12-14	S7	0.5	15-25- 12-10 (37)	<u>Silty Clay</u> , (CL-ML), fill, moderate brown (5 YR 4/4), moist, very stiff. Entire spoon saturated with an oily irridescent film. Tar substance inside clay seams.	(65 ppm) of sample (60 pp akb) in borehole Visible contamination present.
14	14-16	S8	0.9	9-6- 6-8 (12)	<u>Silty Clay and Gravel</u> , (CL-ML), fill moderate brown (5 YR 4/4), saturated very stiff, black staining on gravels and sand. Clay not massive (more varved).	(90 ppm) Visible contamination present.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-14-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-15-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6" HSA</u>
Elevation	<u>591.05'</u>	Page Number	<u>3</u> of <u>5</u>
Water Level & Date	<u>575.8 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.8	4-6- 9-12 (15)	Silty Clay, (CL-ML), fill, pale brown (5 YR 5/2), little gravel, occasional brick fragments, cinders, moist, very stiff.	(5 ppm above known background (akb)) No visible contamination in lower 1.5' of recovery.
18	18-20	S10	1.8	5-8- 10-12 (18)	Same as 16-18. Sharp contact to silty sand lens, fine to medium grained, wet, loose.	(6 ppm) Tar substance coating the grains.
20	20-22	S11	1.6	5-8- 9-7 (17)	Clayey Sand, (SC), fill, some gravel trace wood, trace cinders, grayish black (N2), with yellowish gray (5 Y 8/1), zones of (ash?), compact to dense in some areas.	(35 ppm) Contamination with tar throughout.
22	22-24	S12	1.8	5-5- 5-7 (10)	Silty Clay, (CL-ML), fill, pale brown (5 YR 5/2), stiff, overlying clayey sand, trace gravels, trace glass, few wood chips, fine grained, black (N1), moist, compact.	(25 ppm) Chemical sample PF3-22. Split given to state. Noticeable contamination.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-14-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-15-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6" HSA</u>
Elevation	<u>591.05'</u>	Page Number	<u>4</u> of <u>5</u>
Water Level & Date	<u>575.8 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type & No.	Rec. (ft)			
26	24-26	S13	2.0	5-6- 6-8 (12)	<u>Clayey Sand and Silt</u> , (SC), dusky yellowish brown (10 YR 2/2), little organics (wood, peat, roots), little gravel, fine grained, moist. Fossil layer of snail shells (gastropods and brachipods), 0.2' lens. Below lens, <u>Clayey Silty</u> (ML) of same description as upper part of spoon. Stream deposits.	(12 ppm)
26	26-28	S14	1.5	1-1- 3-4 (4)	<u>Silty Sand</u> , (SM), olive gray (5 Y 4/1), some wood (trees/roots), little "shells", little clay, saturated, loose.	(25 ppm) (CGI 3%) inside augers. Water level - 10' bgs. Strong organic decomposition odor.
28	28-30	S15	1.1	10-11- 16-17 (27)	<u>Lean Clay</u> , (CL), medium gray (N5), moist, stiff, trace gravels. Homogeneous throughout spoon.	(15 ppm) (CGI 1%) inside augers. Strong decomposition odor.
30	30-32	S16	1.4	12-18- 23-27 (41)	<u>Silty Clay</u> , (CL-ML), medium gray (N5), trace gravel, moist, stiff. Continuation of 28-30' grading down to <u>Silty Clay</u> , (CL-ML), moderate brown (5 YR 3/4), trace gravel, moist, very stiff.	(5 ppm) (BG)
						End boring at 30' bgs. End spooning at 32' bgs

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-3</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-14-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-15-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6' HSA</u>
Elevation	<u>590.05'</u>	Page Number	<u>5</u> of <u>5</u>
Water Level & Date	<u>575.8 ft. above MSL, 5/18/92</u>		Logged By <u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
						Piezometer constructed in a second auger hole, 5' away. 2" stainless steel. Total depth 24.3'. Screen Interval 14.3- 24.3'. Sand Pack 12-24.3'. Bentonite Seal 10.1-12' Cement Grout 0-10.1'.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-15-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-16-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6.25 " HSA</u>
Elevation	<u>590.65</u>	Page Number	<u>1</u> of <u>4</u>
Water Level & Date	<u>571.6 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.5	8-12- 15-17 (27)	Silty sand fill, dark yellow brown (10 YR 4/2), little gravel, trace clay, saturated, loose, medium grained. Grading down to clayey sand and gravel fill, dusky yellow brown (10 YR 2/2), wet, stiff.	Air Mont:(HNu,CGI) of sample: (BG)	
-	2	2-4	S2	1.7	5-10- 30-80 (40)	Same clayey sand fill continued. Sharp contact to silty sand and gravel fill, trace clay, occasional cobble, moist, compact. Brownish black stained grains.	(BG)
-	4	4-6	S3	0	12-15- 10-15 (25)	Brick block wedged in spoon shoe. No recovery.	-
-	8	6-8	S4	1.5	10-28- 39-24 (67)	Brick and concrete rubble, moderate reddish brown (10 R 4/6), with black stained grains, wet. <u>Silty Sand</u> , (SM), black (N1), stained, little clay, fine to medium grained, moist, very dense.	(BG) inside auger at 6' (28 ppm) of sample. Coal tar odor.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-15-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-16-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6.25 " HSA</u>
Elevation	<u>590.65</u>	Page Number	<u>2</u> of <u>4</u>
Water Level & Date	<u>571.6 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.0	5-8- 12-15 (20)	Silty Clay, (CL-ML), fill, mod brown (5 YR 3/4), moist (spoon saturated, dripping), very stiff. One lens of sand/gravel with brick and concrete debris, saturated, loose, black staining.	(25 ppm) of sample. (5 ppm) inside augers Contamination present.
10	10-12	S6	1.5	2-3- 5-9 (8)	Silty Clay, (CL-ML), fill, mod brown (5 YR 3/4), with some gravel (stained black in stiff clay matrix) moist (spoon saturated). Brick lens (crushed) with fat clay. Silty Sand, (SM), fill, black (N1), little gravel, no clay, trace coal, moist, loose.	(15 ppm) (10 ppm) Odorous.
12	12-14	S7	1.4	12-7- 7-7 (14)	Same as 10-11'. Slightly less lean, more fat. Fill.	(4 ppm above known background (akb)) Very slight odor/coal tar.
14	14-16	S8	1.7	6-7- 4-4 (11)	Continuation of 12-14'. Zone of gravelly sand fill, light brown (5 YR 5/6), medium to coarse grained, moist, very loose. Subrounded gravels, cinders, trace black stained grains. Continuation of 12-14', very moist.	(4 ppm akb) (0.5 ppm akb) (0.5 ppm akb) (6 ppm akb) Slight to moderate coal tar odor.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-15-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-16-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6.25" HSA</u>
Elevation	<u>590.65</u>	Page Number	<u>3</u> of <u>4</u>
Water Level & Date	<u>571.6 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.8	2-4- 7-7 (11)	<u>Silty Clay, (CL-ML), fill, mod brown (5 YR 4/4), trace gravel, with black stained veins in no preferred orientation, moist, soft. Clayey gravels and sand fill, light brown (5 YR 5/6), saturated with product, glassy black with iridescent sheen, little wood (tree or root). Same as 16-16.5'.</u>	(25 ppm) adjacent to product. Spoon retrieved w/ iridescent product on exterior.
18	18-20	S10	1.2	4-5- 7-9 (12)	<u>Silty Clay, (CL-ML), fill, pale brown (5 YR 5/2), trace gravel, homogeneous, massive, lack of black stained veins, firm grading down to stiff. Bottom 3" of spoon - lens of wood fiber, coal tar stained.</u>	(3 ppm) (12 ppm)
20	20-22	S11	1.2	2-4- 6-8 (10)	<u>Clayey Gravels, (GC), fill, some wood (tree and roots), some construction debris (glass, fiberboard, rubber). <20% matrix soil (clay).</u>	(65 ppm) of sample Completely saturated w/ black iridescent coal tar product, spoon covered with product. Very odorous.
22	22-24	S12	1.6	2-3- 5-9 (8)	<u>Clayey Sand, (SC), and wood, some silt, trace gravel, olive black to glossy black staining throughout. Completely saturated with product. (No grains unstained, original color 100% masked throughout spoon), compact, fine grained.</u>	(110 ppm) of sample

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-4</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-15-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-16-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>6.25" HSA</u>
Elevation	<u>590.65</u>	Page Number	<u>4</u> of <u>4</u>
Water Level & Date	<u>571.6 ft. above MSL, 5/18/92</u>	Logged By	<u>J. TOTH</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
24	24-26	S13	1.8	3-5- 5-7 (10)	Clayey Sand and Silt, (SC), dark yellowish brown (10 YR 4/2), little organics (plant roots), occasional subrounded gravels, trace shells (gastropods, brachiopods), very moist (spoon saturated w/ product from above in column). No product between grains, stratified (X-beds?)	(25 ppm)
26	26-28	S14	2.0	6-6- 6-6 (12)	Continuation of 24-26'. Zone of <u>Well Graded Gravels</u> , (GW), fossils, sand medium to very coarse, saturated, some burnt orange product (iridescent) visible. Sharp contact to <u>Fat Clay</u> , (CH), medium light gray (N6), trace gravel moist, soft to firm.	(60 ppm) Organic decomposition odor. (40 ppm)
28	28-30	S15	1.8	4-5- 8-8 (13)	Continuation of 27.5-28' grading down to same material but more lean, <u>Silty Clay</u> , (CL-ML), stiff at 29'. Sharp gradational contact over 0.1' in color to grayish red (10 R 4/2), of same <u>Lean Clay</u> , (CL).	(0.5 akb) Chemical sample PF4-28. (0.5 ppm akb)
						Terminate augering at 28'. Terminate spooning at 30' in native till under fill and alluvium. Screen Interval 18.2-28.2'. Sand Pack 16.2-28.2'. Bent. Seal 14.2-16.2'. Cement Grout 0-14.2'.

GEOLOGIC LOG

Project <u>IG/WS</u>	Boring Number <u>PF-6</u>
Location <u>Buffalo, New York</u>	Date Started <u>4-20-92</u>
Client <u>Westwood Squibb</u>	Date Completed <u>4-20-92</u>
Driller <u>Buffalo Drilling Inc.</u>	Drilling Method <u>4.25 HSA W/ DIETRICK D50</u>
Elevation <u>591.22</u>	Page Number <u>1</u> of <u>4</u>
Water Level & Date <u>581.6 ft. above MSL, 5/18/92</u>	Logged By <u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss	
	Int- erval	Type &No.	Rec. (ft)				
-	0-2	S1	1.0	3-4- 5-7 (9)	<u>Sand</u> , (SM), dark brown (5 YR 2/2) to medium brown (5 YR 3/4), very moist, medium to fine sand grading down from fine to coarse to bottom 1'.	Air Mont: (HNU, CGI) of sample: (0.4 ppm) background	
-	2	2-4	S2	1.7	14-10- 9-9 (19)	Subrounded coarse to medium fill. 4" coarse fill at top grading to medium fill, subangular 16", light gray (N7), to black (N1).	(5 ppm)
-	4	4-6	S3	1.2	5-8- 8-8 (16)	Gravel fill with medium size rocks at top 7", wet, with dark gray (N3), to black (N1), bottom 8" contaminated. Visible sheen/odor. Bottom 5" <u>Organic Clay</u> , (OH), light brown (5 YR 5/6), to medium brown (5 YR 4/4), tight.	(120 ppm) Contamination in gravel above clay.
-	6	6-8	S4	1.7	9-11- 12-13 (23)	<u>Lean Clay</u> , (CL), medium brown (5 YR 4/4), to light gray (N7) slightly moist, very tight, fine to very fine clay with minor medium to fine fill at bottom 2", oily sheen present.	(25 ppm) Coal tar odor.

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-6</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-20-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/ DIETR. D50</u>
Elevation	<u>591.22</u>	Page Number	<u>2</u> of <u>4</u>
Water Level & Date	<u>581.6 ft. above MSL, 5/18/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
8	8-10	S5	1.2	4-7- 9-9 (16)	<u>Organic Clay, (OH)</u> , medium brown (5 YR 4/4), to red brown (10 R 4/6), clays with gray organic silts, very plastic clays, tight w/ net moisture, small lens of organic silts with contamination throughout.	(40 ppm)
10	10-12	S6	1.0	3-3- 4-4 (7)	<u>Silty Clay with Sand, (CL)</u> , dry to moist. Bottom 4" <u>Silty Clay, (CL-ML)</u> , with lens of organic silt. Top 8" <u>Organic Clay, (OH)</u> , medium brown (5 YR 4/4) to brown red (10 R 4/6), dry, stiff, tight.	(BG)
12	12-14	S7	1.0	3-5- 5-9 (10)	0-8" <u>Organic Clay, (OH)</u> , medium brown (5 YR 4/4), to brownish red (10 R 4/6), very tight. 8-12" <u>Silty Clay with Sand, (CL-ML)</u> .	(140 ppm, 21%) Visible contamination. 1" lens in the middle of bottom 4" very contaminated.
14	14-16	S8	1.2	4-4- 4-5 (8)	0-4" <u>Silty Clay, (CL)</u> , medium gray (N5), to red tan (10 R 6/2), subangular grains. 4-14" <u>Organic Clay, (OH)</u> , medium red (5 R 4/6), to tan, very light moist to dry, medium plasticity.	(50 ppm) Contamination present in top 4".

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-6</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-20-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>591.22</u>	Page Number	<u>3</u> of <u>4</u>
Water Level & Date	<u>581.6 ft. above MSL, 5/18/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
16	16-18	S9	1.5	4-3- 4-5 (7)	<u>Organic Clays</u> , (OH), medium brown red (10 R 4/6), to gray (N5), with some mottled. Thin lens of silty clay throughout (usually contaminated). 14-18" Wood shavings medium gray (N5), to black (N1).	(60 ppm) Contamination present. (200 ppm)
18	18-20	S10	1.8	2-3- 3-6 (6)	0-6" <u>Silty Clay</u> , (CL-ML), dark gray (N3), to dark brown (5 YR 2/2), very wet with minor rounded pebbles. Wood shavings bottom 16", shavings usually 1/4" long, very mottled, moist, friable.	(250 ppm) Contamination present.
20	20-22	S11	1.5	3-3- 4-3 (7)	<u>Silty Clay</u> , (CL-ML), dark gray (N3), to black (N1), moist, moderately plastic, bottom 3". Wood shavings 12" same as above. Wet above shavings 3" silty clay.	(150 ppm) Contamination present.
22	22-24	S12	1.7	3-5- 5-7 (10)	0-5" Wood shavings with sand and gravel, medium gray (N5), to dark brown (5 YR 2/2). 5-9" Interbedded silty clay and wood shavings next 4", medium gray (N5), medium plastic. 9-21" <u>Organic Clay</u> , (OH), medium gray (N5), to light gray (N7) dry, medium to tight clay.	(100 ppm) (1 ppm)

GEOLOGIC LOG

Project	<u>IG/WS</u>	Boring Number	<u>PF-6</u>
Location	<u>Buffalo, New York</u>	Date Started	<u>4-20-92</u>
Client	<u>Westwood Squibb</u>	Date Completed	<u>4-20-92</u>
Driller	<u>Buffalo Drilling Inc.</u>	Drilling Method	<u>4.25" HSA W/DIETRICK D50</u>
Elevation	<u>591.22</u>	Page Number	<u>4</u> of <u>4</u>
Water Level & Date	<u>581.6 ft. above MSL, 5/18/92</u>	Logged By	<u>T. ROGERS</u>

Depth BGS (ft)	Sample		SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Dril Rate, & Fluid Loss	
	Int- erval	Type &No.				
24	24-26	S13	1.8	7-9- 15-20 (24)	0-5" Silty Clay interbedded w/ wood shavings. 5-22" <u>Silty Lean Clay, (CL)</u> , grayish brown (5 YR 3/2), moist, stiff and transition to very stiff. Gray lens bands, massive, homogeneous, 17".	(90 ppm) (0 ppm)
26	26-28	S14	1.3	12-17- 22-30 (39)	<u>Silty Lean Clay, (CL)</u> , brown gray (5 YR 3/2), stiff and uniform plasticity to bottom. Gray lens (banding) in core, very homogeneous.	(1 ppm)
					Note sampled with the 4.25" Augers and reamed to set the well with 8.25" augers.	
					Total Depth 26'. Screen Interval 15-25'. Sand Pack 13-25'. Bentonite Seal 10.7-13'. Cement Grout 0-10.7'. Set a 4" stainless steel well at PF6.	

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by J. Toth

Boring/Piezometer No. MWF1
 TOC Elevation 592.94 ft
 Location Buffalo, New York
 Date 4/17/92

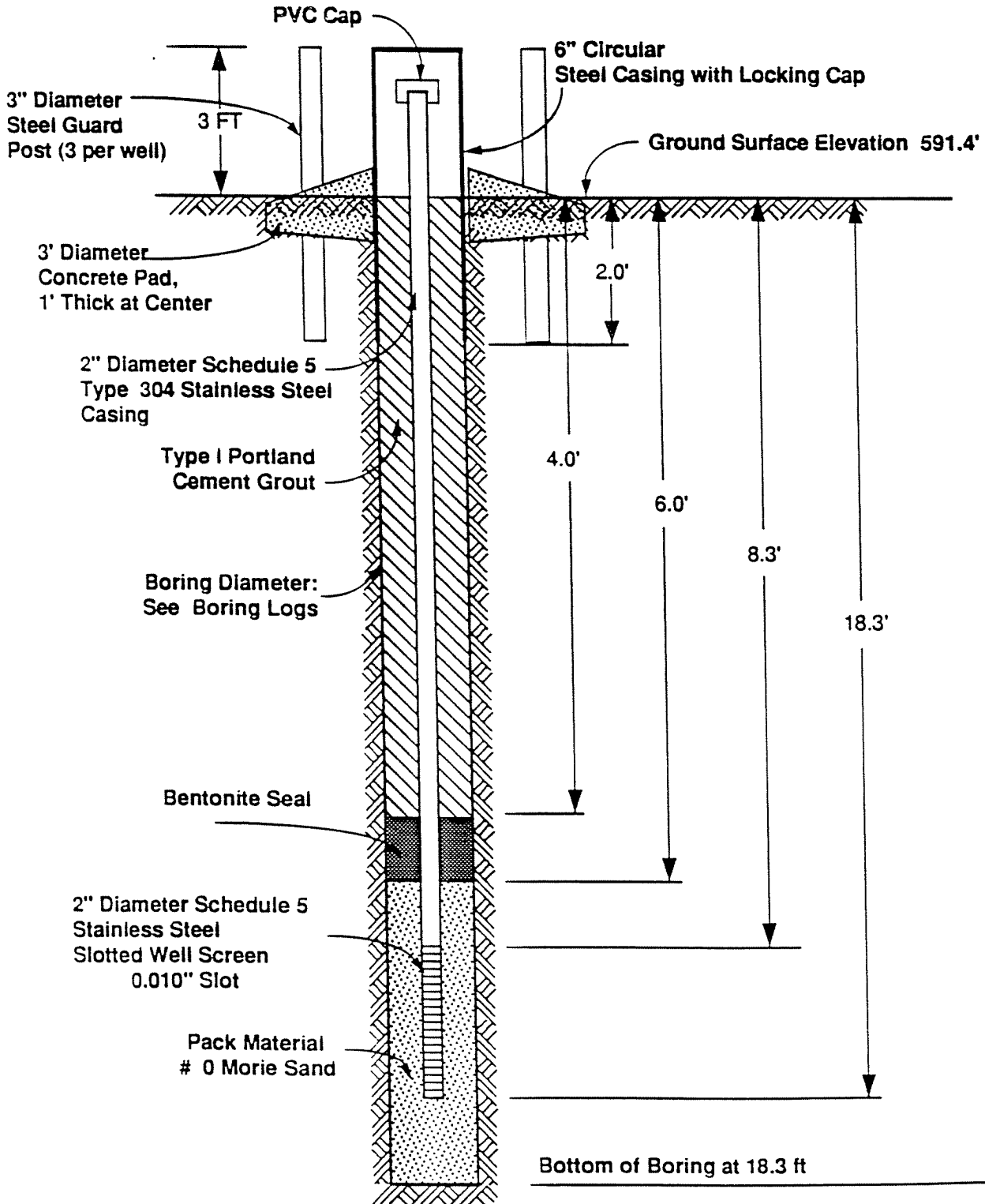


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name <u>IG/WS RI/FS</u>	Boring/Piezometer No. <u>MWF2</u>
Project No. <u>7647-011</u>	TOC Elevation <u>592.74 ft</u>
Drilling Contractor <u>Buffalo Drilling</u>	Location <u>Buffalo, New York</u>
Recorded by <u>J. Toth</u>	Date <u>4/17/92</u>

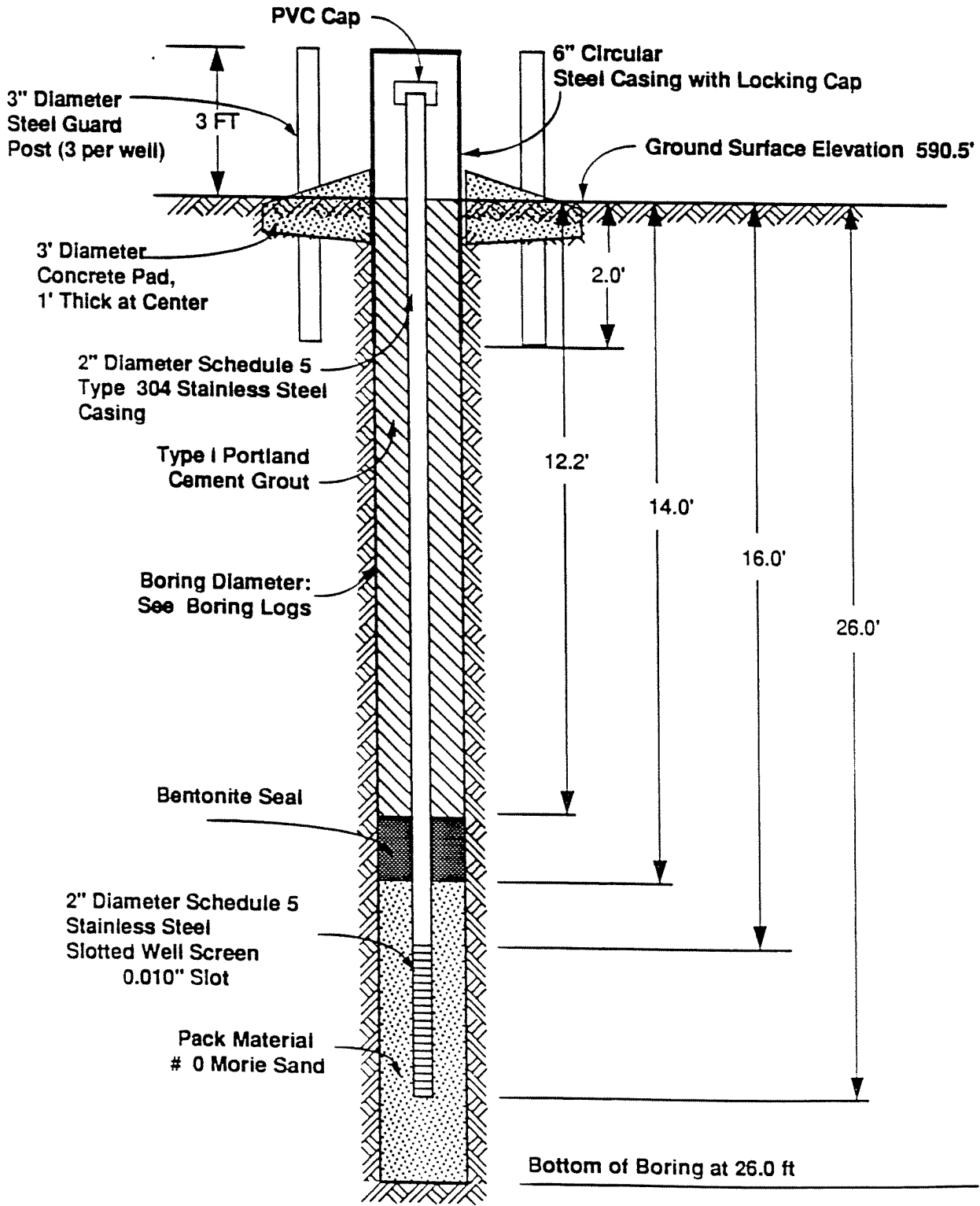


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IGWS R/FS
Project No. 7647-011
Drilling Contractor Buffalo Drilling
Recorded by T. Rogers

Boring/Piezometer No. MWF3
TOC Elevation 593.11 ft
Location Buffalo, New York
Date 4/20/92

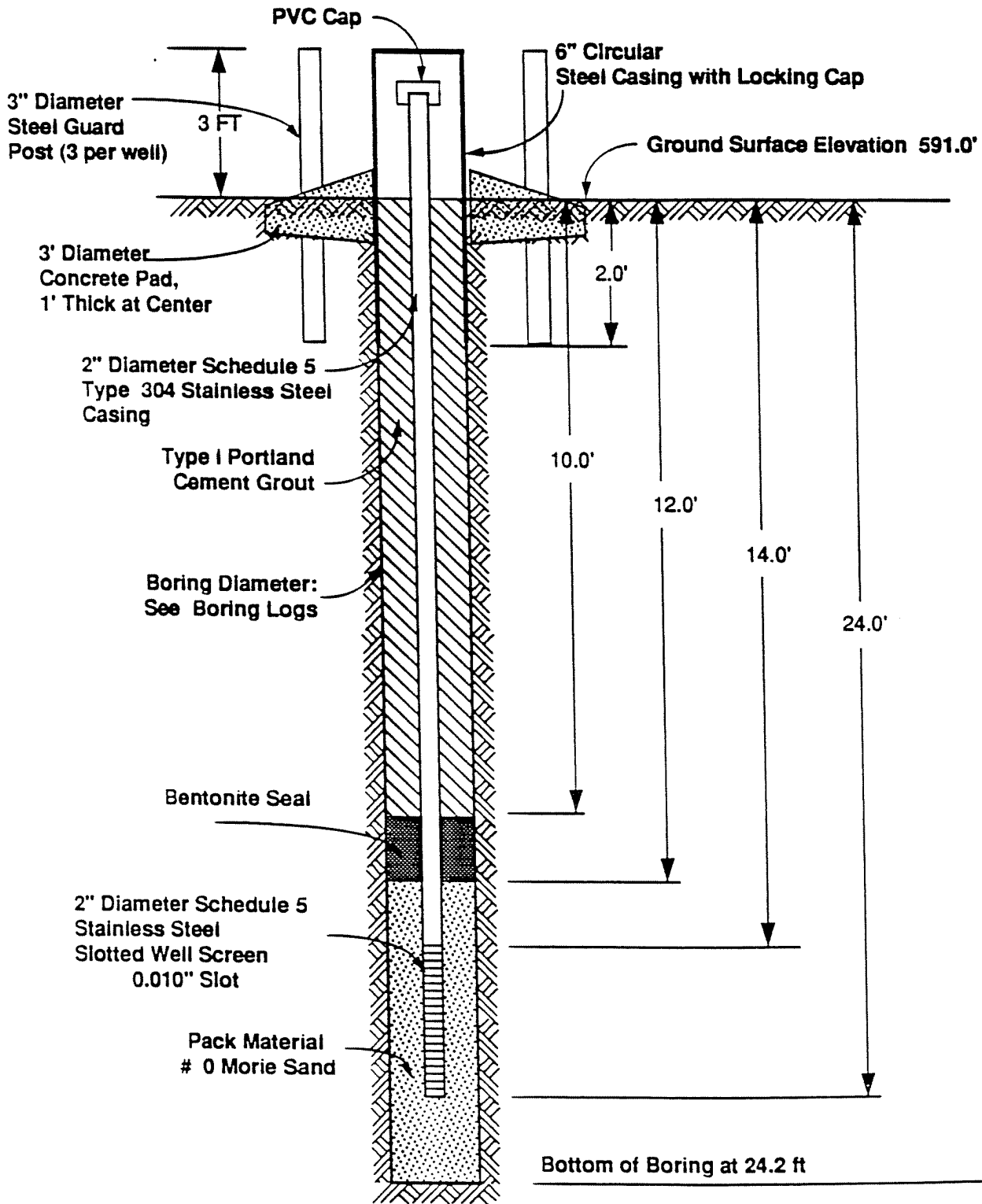


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
Project No. 7647-011
Drilling Contractor Buffalo Drilling
Recorded by A. Bryda

Boring/Piezometer No. MWF4
TOC Elevation 592.69 ft
Location Buffalo, New York
Date 4/23/92

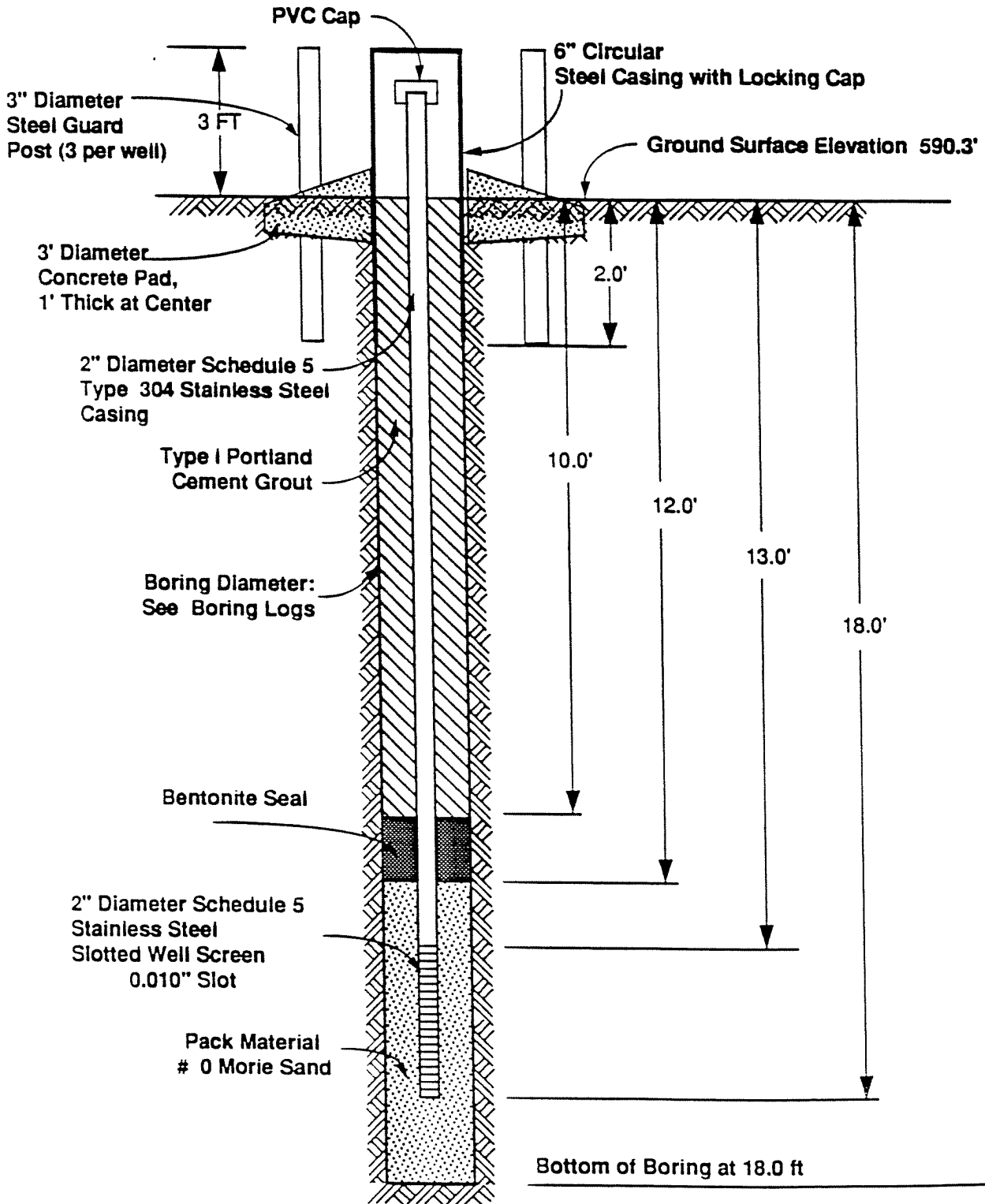


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by A. Bryda

Boring/Piezometer No. MWF5
 TOC Elevation 591.71 ft
 Location Buffalo, New York
 Date 4/23/92

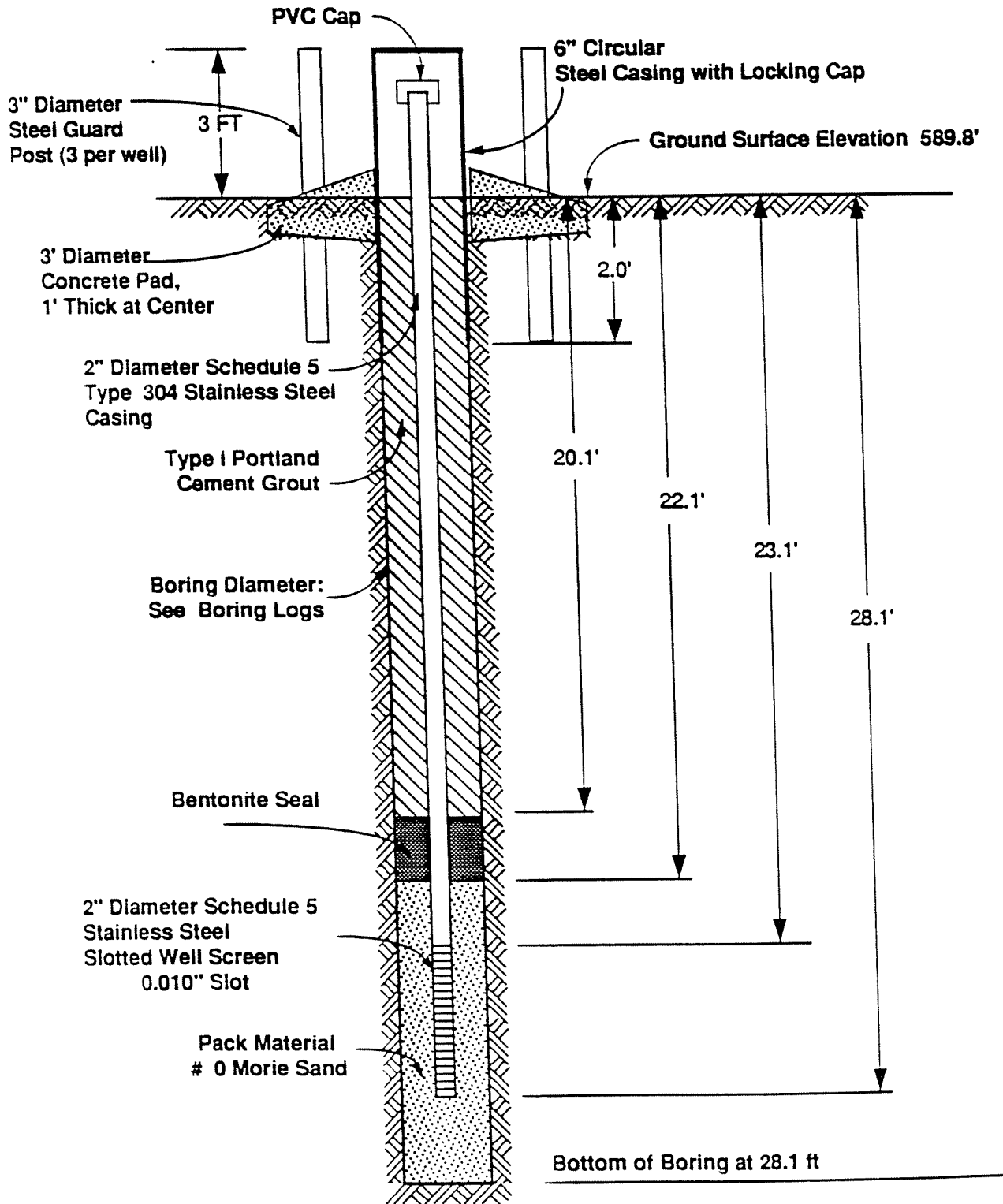


Figure Not to Scale

Piezometer Construction Diagram

Project Name IG/WS R/FS
Project No. 7647-011
Drilling Contractor Buffalo Drilling
Recorded by J. Toth

Boring/Piezometer No.: PF2
TOC Elevation 593.51 ft
Location Buffalo, New York
Date 4/21/92

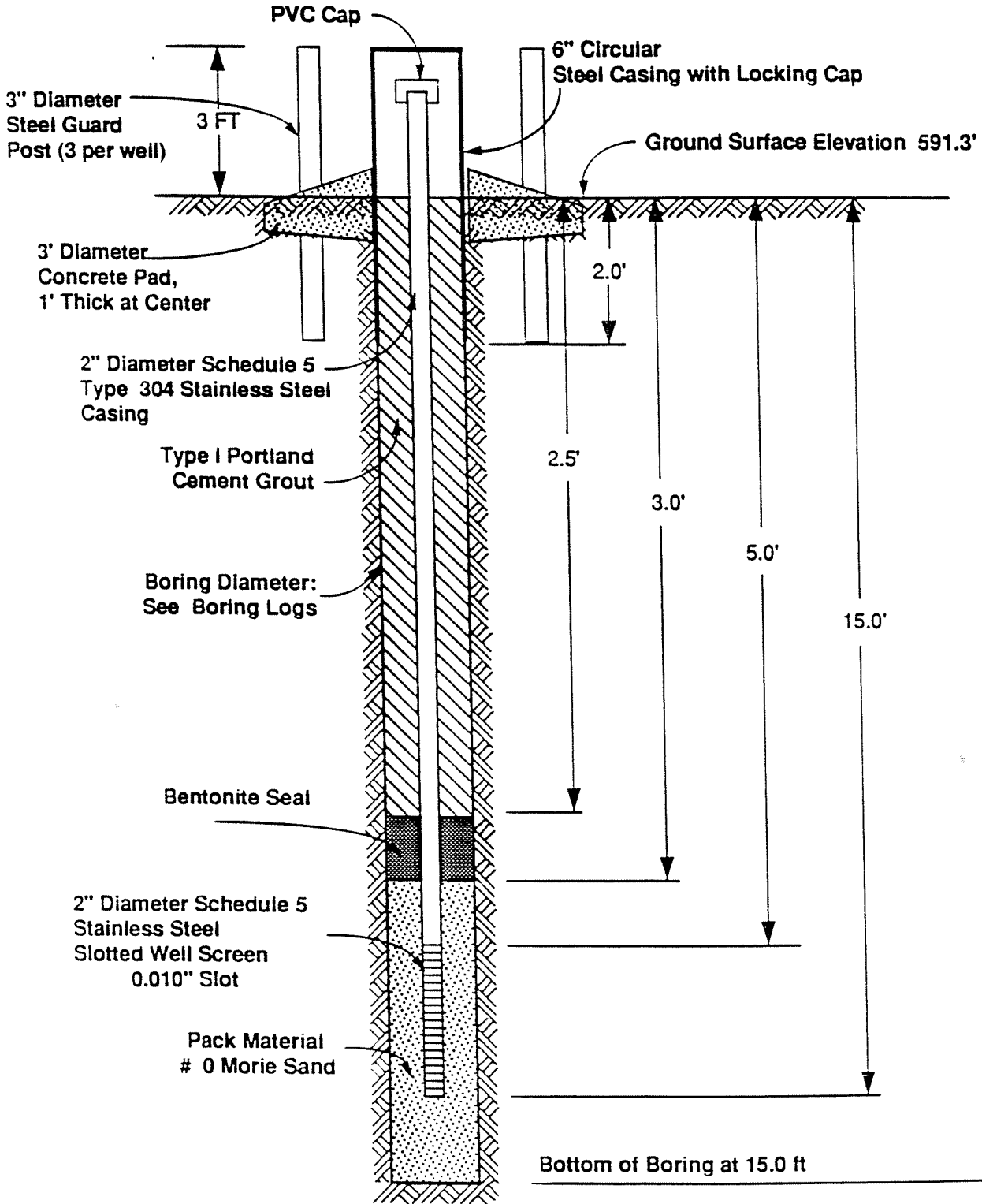


Figure Not to Scale

Piezometer Construction Diagram

Project Name IGWS R/FS
Project No. 7647-011
Drilling Contractor Buffalo Drilling
Recorded by J. Toth

Boring/Piezometer No. PF3
TOC Elevation 593.04 ft
Location Buffalo, New York
Date 4/15/92

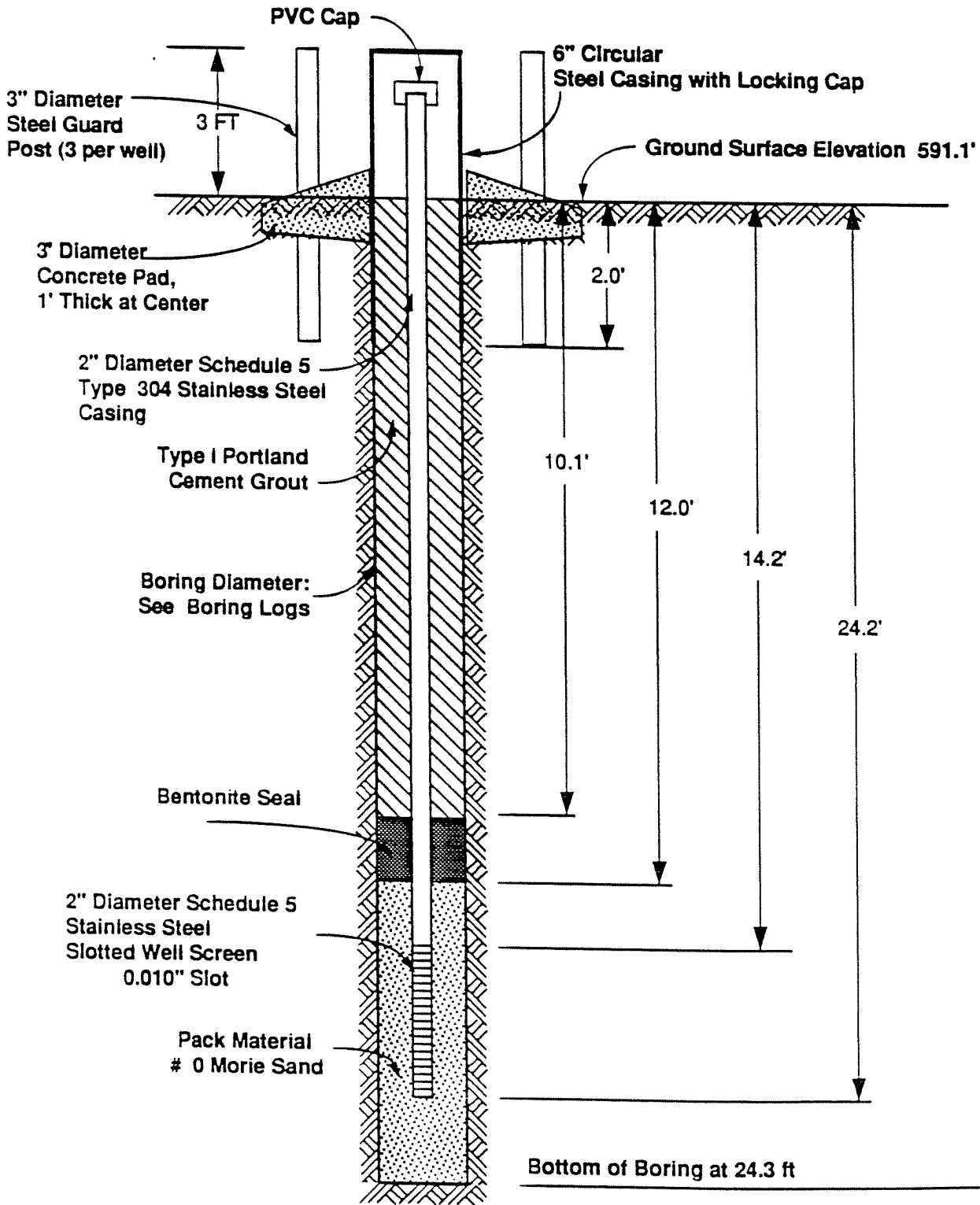


Figure Not to Scale

Piezometer Construction Diagram

Project Name IG/WS R/FS
Project No. 7647-011
Drilling Contractor Buffalo Drilling
Recorded by J. Toth

Boring/Piezometer No. PF4
TOC Elevation 592.25 ft
Location Buffalo, New York
Date 4/16/92

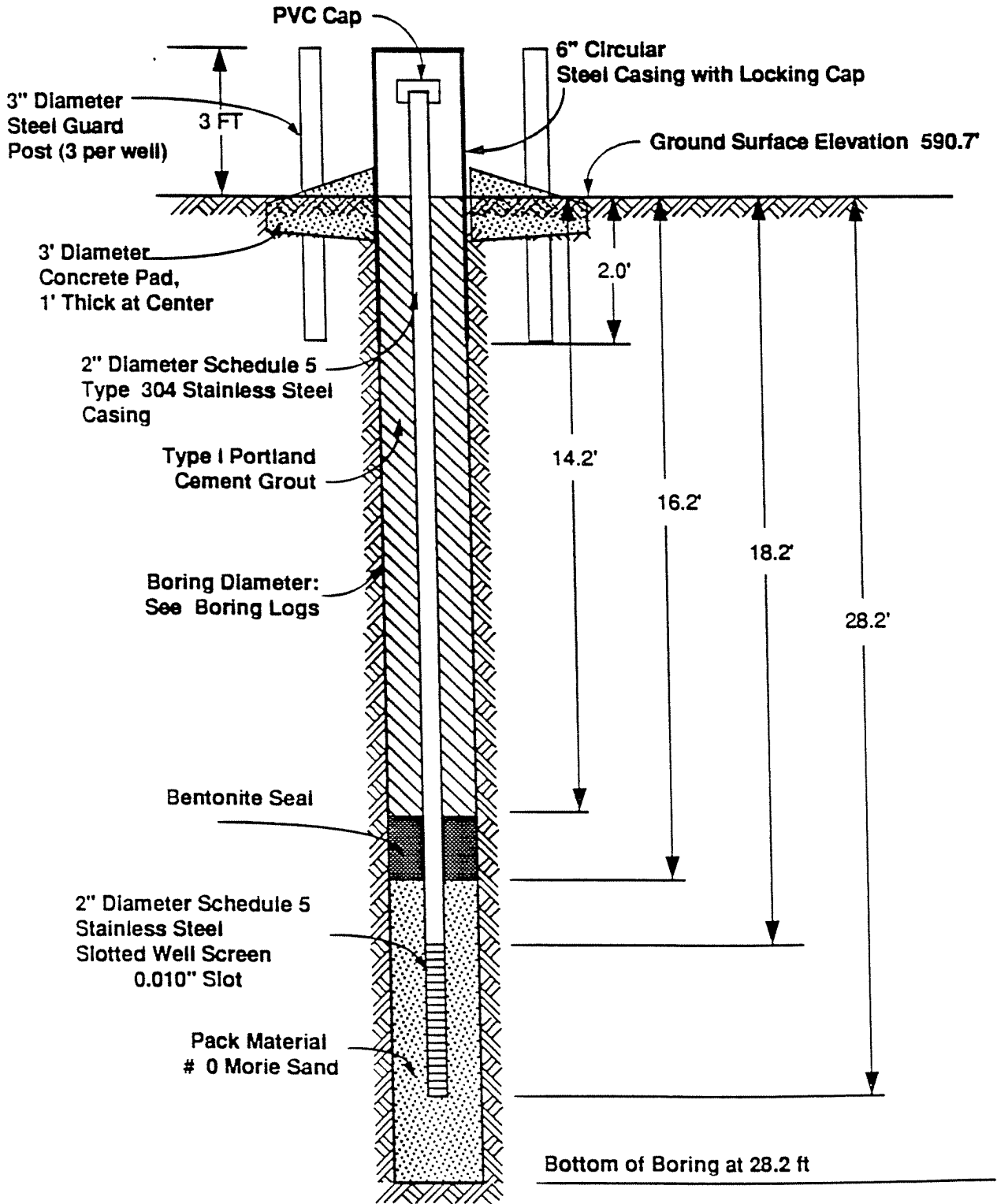


Figure Not to Scale

Piezometer Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by T. Rogers

Boring/Piezometer No. PF6
 TOC Elevation 593.55 ft
 Location Buffalo, New York
 Date 4/20/92

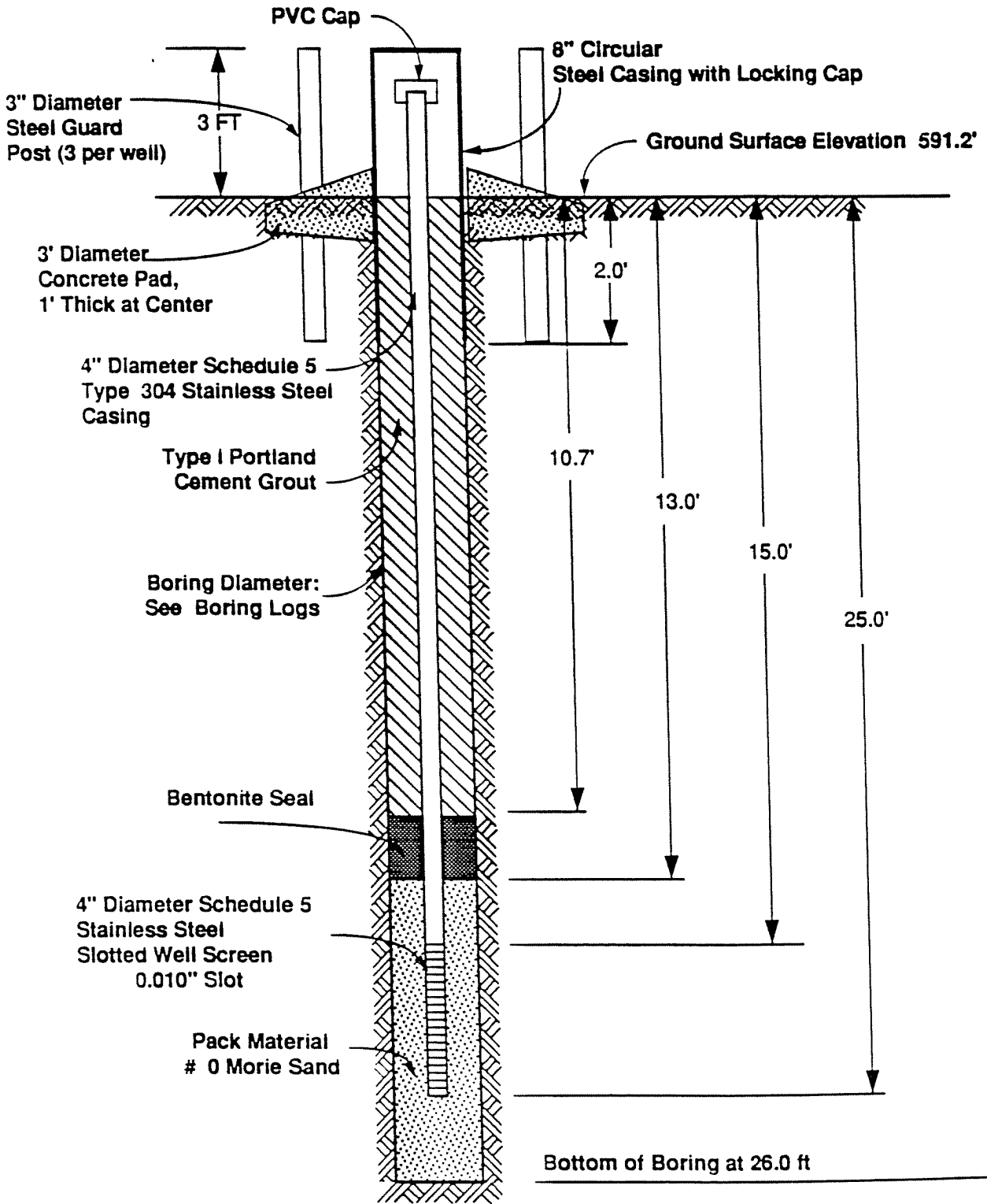


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS R1/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by J. Toth

Boring/Piezometer No. MWS1
 TOC Elevation 591.40 ft
 Location Buffalo, New York
 Date 4/28/92

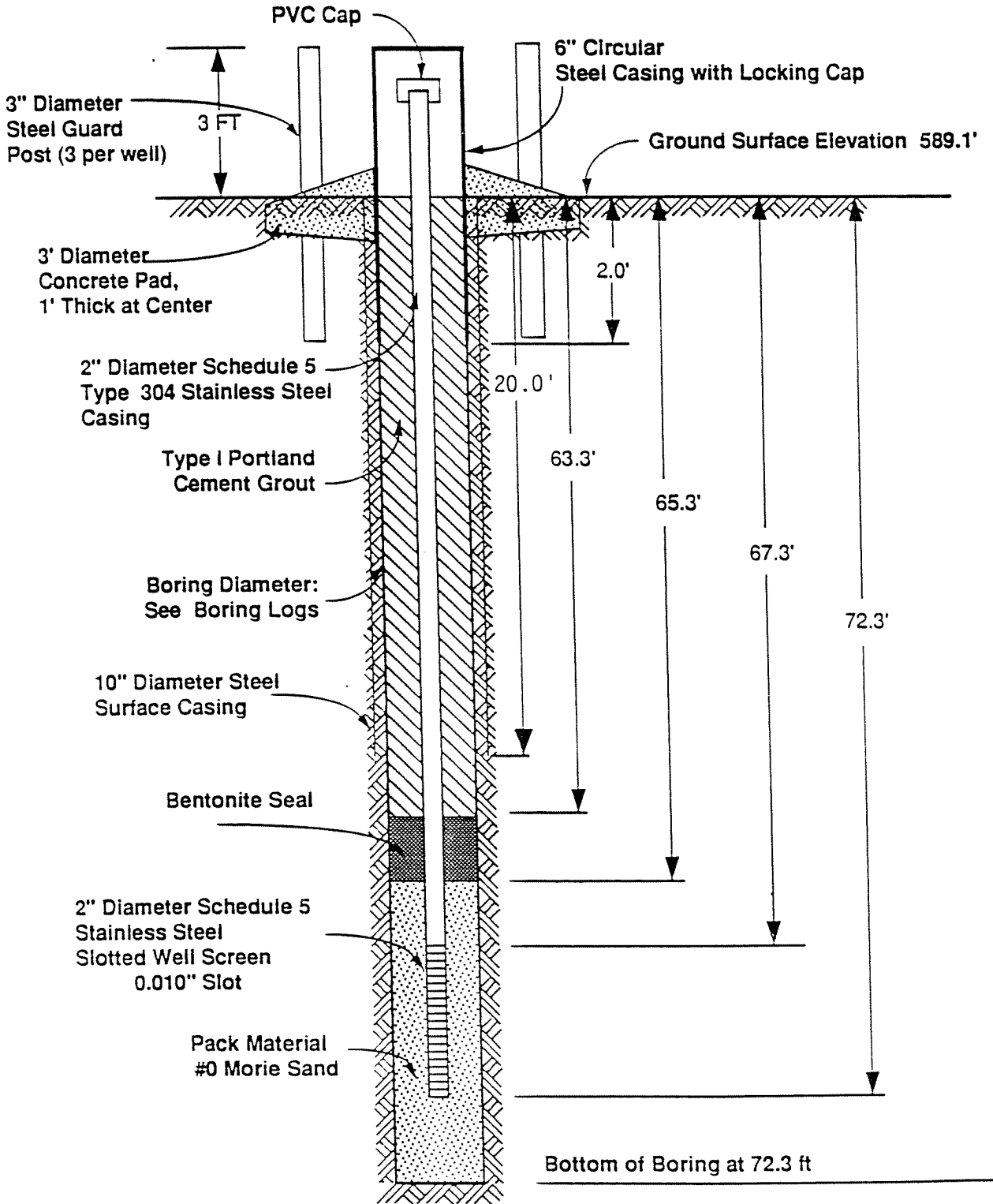


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by A. Bryda

Boring/Piezometer No. MWS2
 TOC Elevation 593.29 ft
 Location Buffalo, New York
 Date 4/24/92

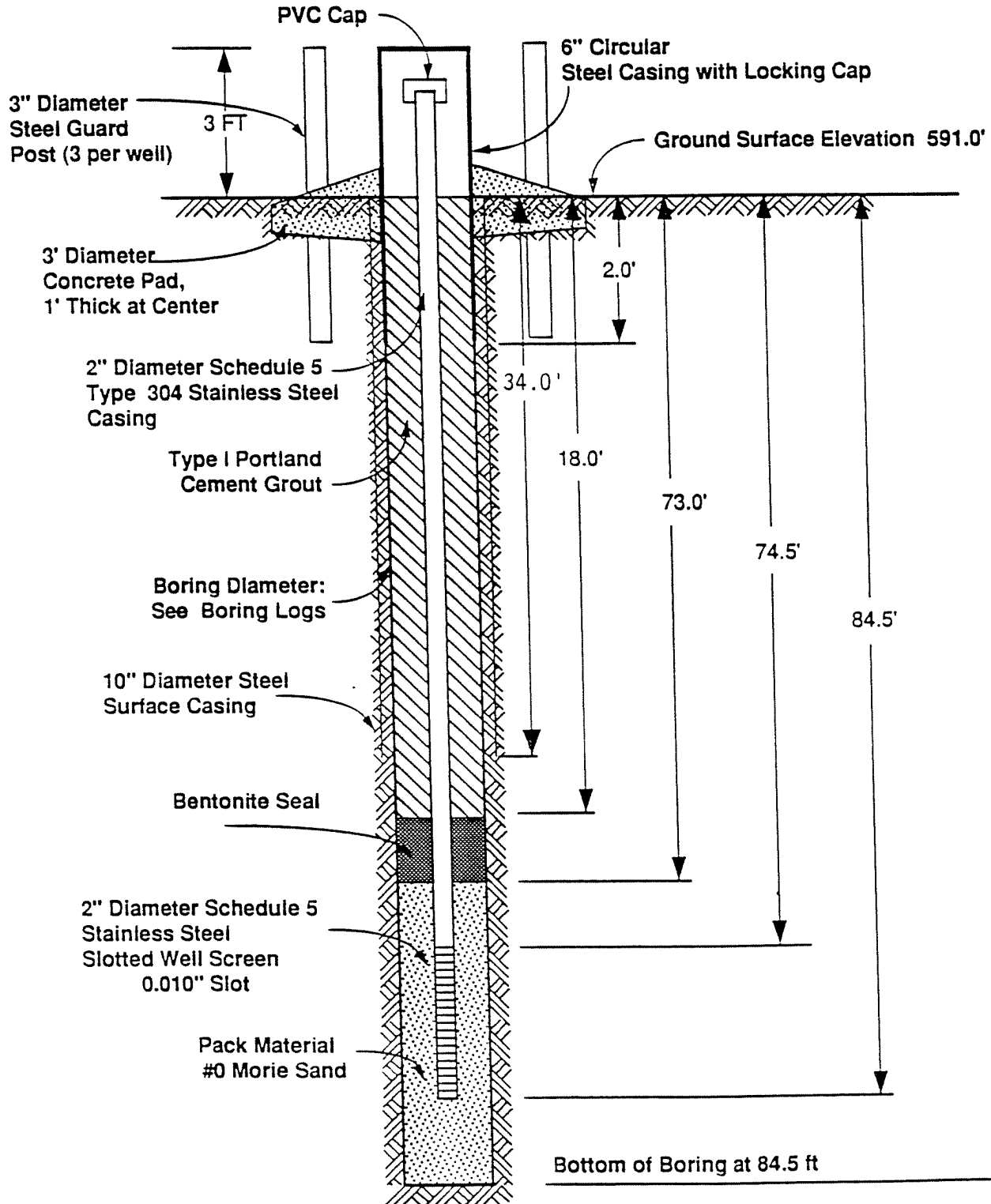


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by A. Bryda

Boring/Piezometer No. MWS3
 TOC Elevation 592.51 ft
 Location Buffalo, New York
 Date 4/23/92

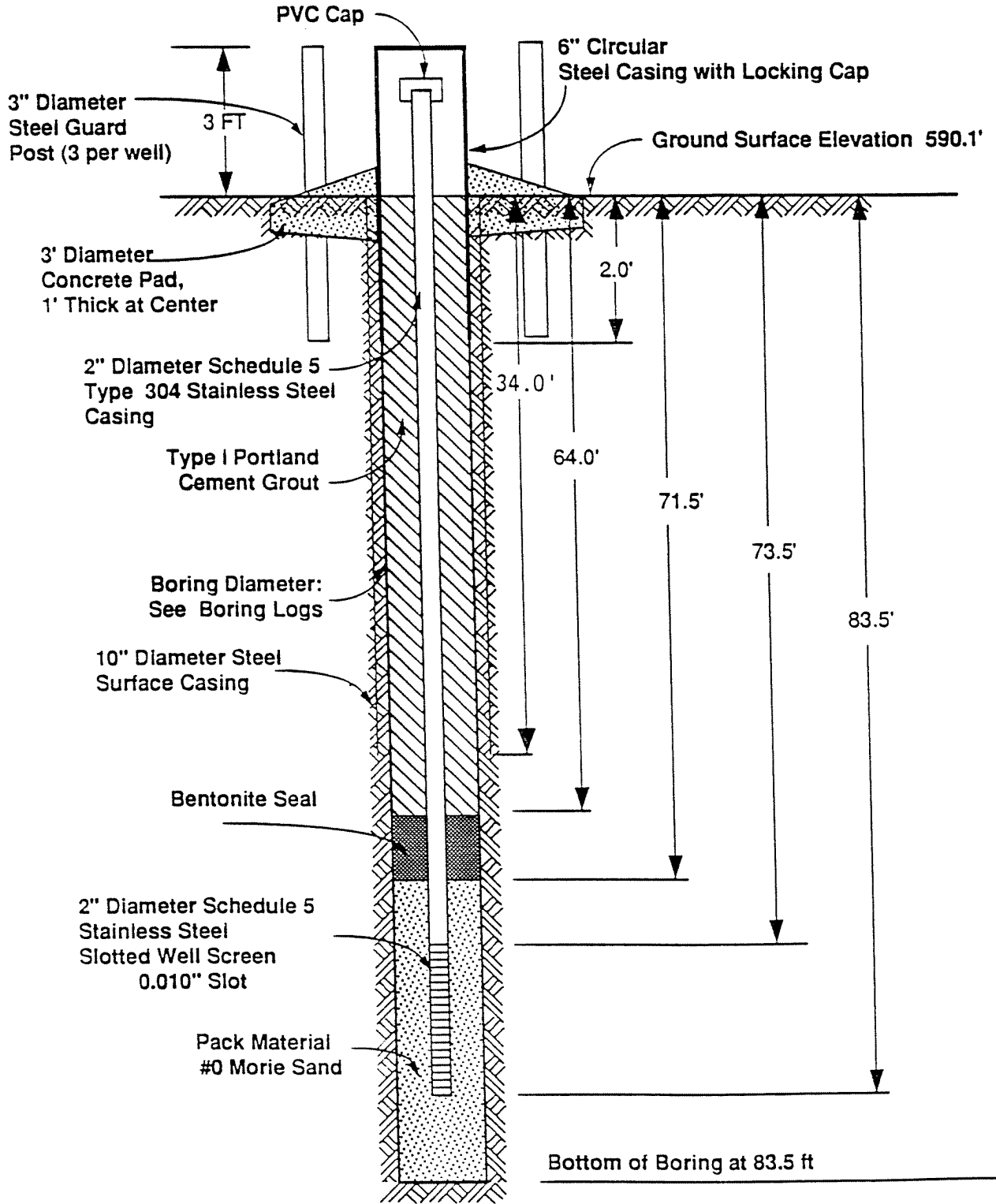


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by A. Bryda

Boring/Piezometer No. MWS4
 TOC Elevation 593.71 ft
 Location Buffalo, New York
 Date 4/20/92

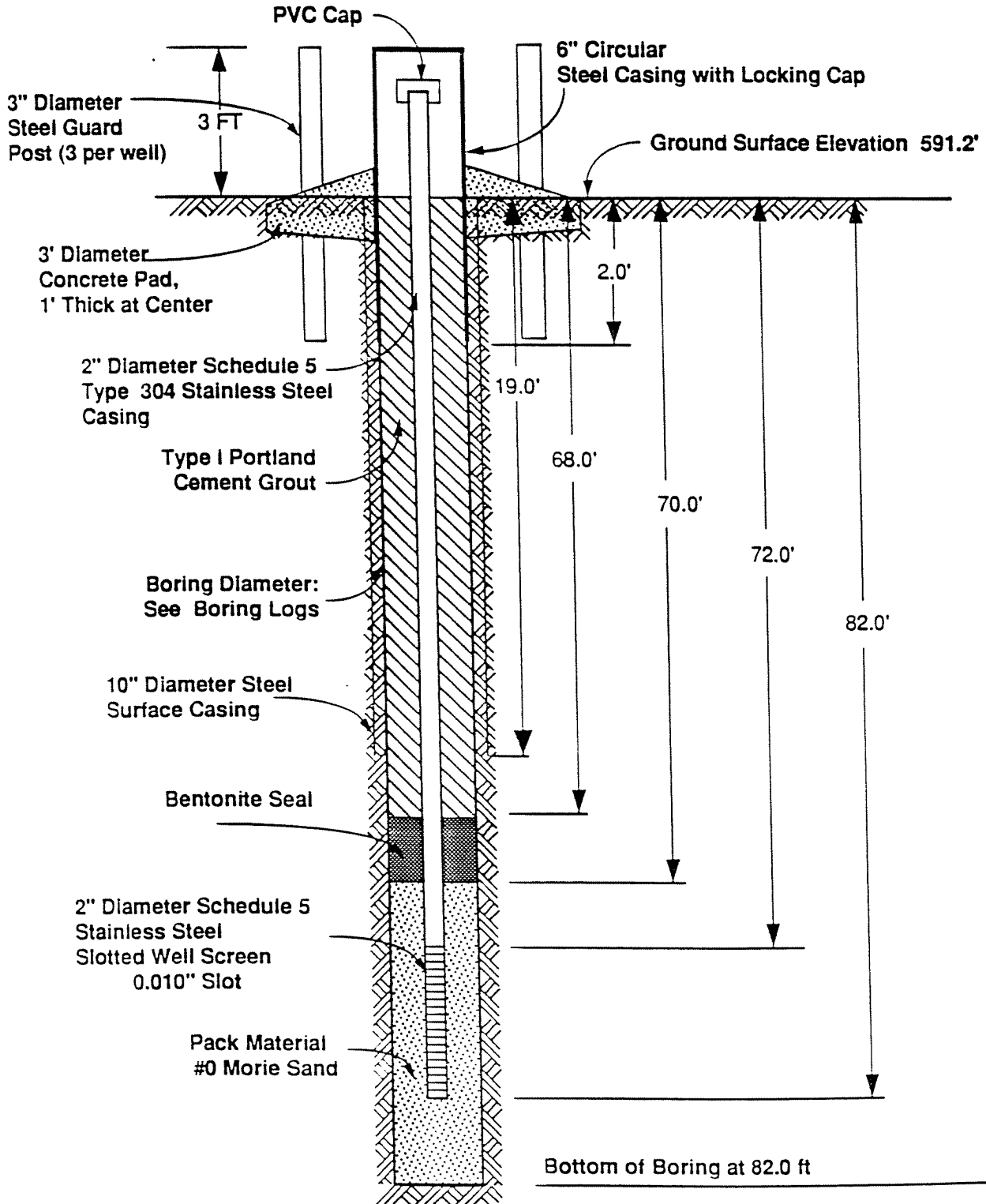


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by T. Rogers

Boring/Piezometer No. PS1
 TOC Elevation 593.55 ft
 Location Buffalo, New York
 Date 4/24/92

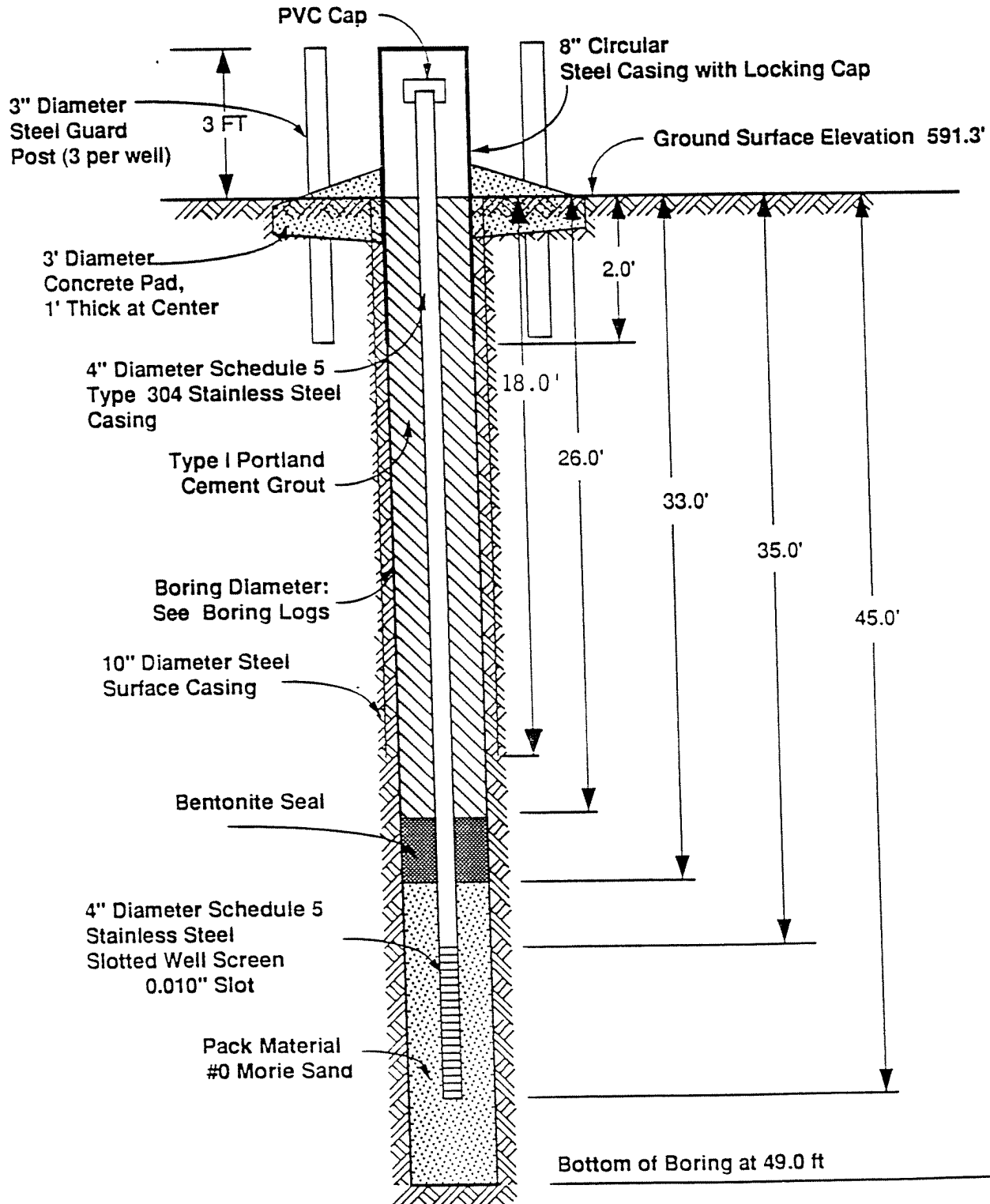


Figure Not to Scale

Monitoring Well Construction Diagram

Project Name IG/WS RI/FS
 Project No. 7647-011
 Drilling Contractor Buffalo Drilling
 Recorded by J. Moffitt

Boring/Piezometer No. PS2
 TOC Elevation 594.23 ft
 Location Buffalo, New York
 Date 4/30/92

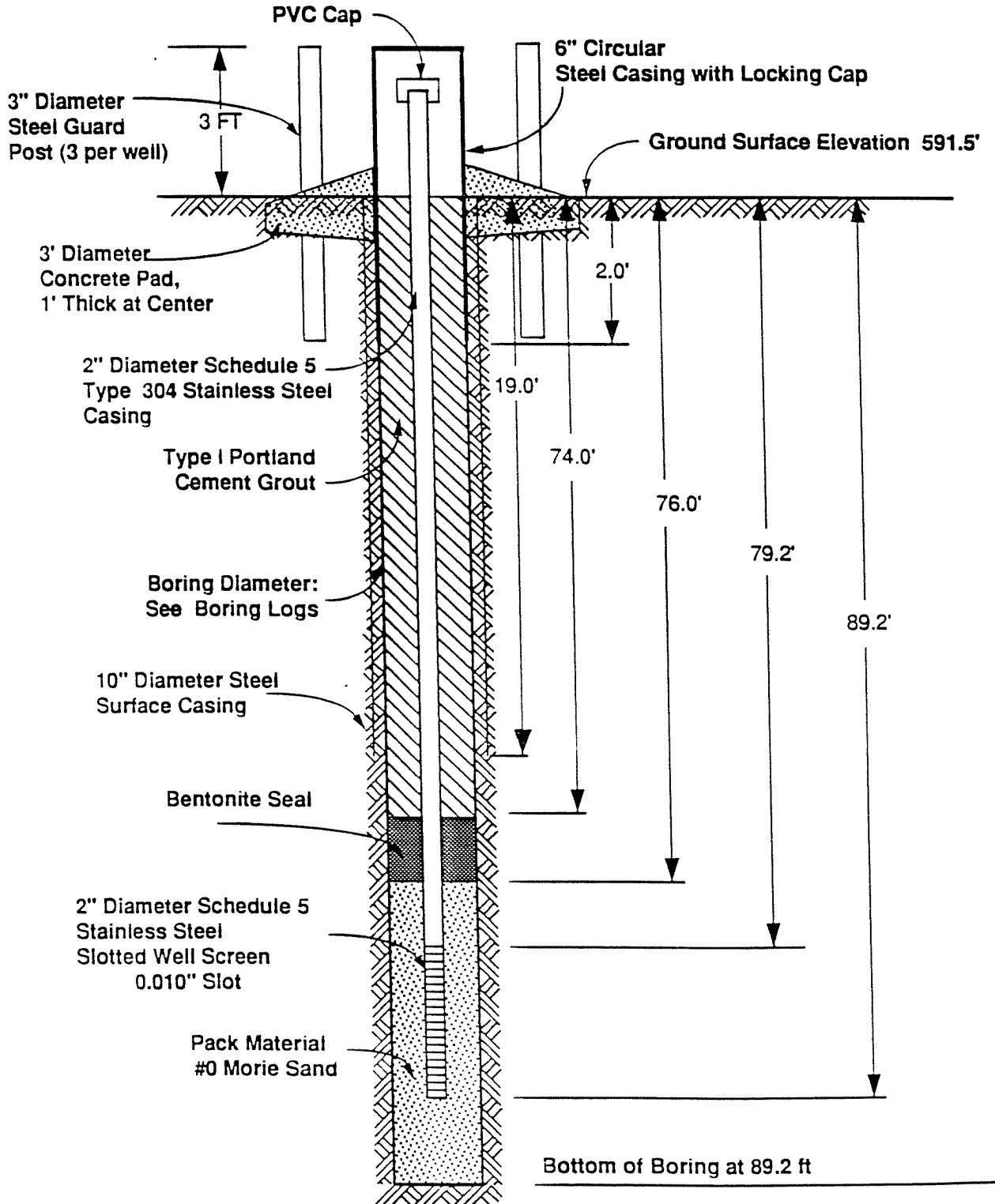


Figure Not to Scale

"B Series" Boring Logs and Monitor Well Schematics
Termini Associates, 1987, Subsurface Evaluation of the
Dart Street Former Fuel Gas Plant Site, Buffalo, New York

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.

1965 Sheridan Drive
Kenmore, New York 14223

Client Westwood Pharmaceuticals

Project Evaluation of potential industrial waste site

File No. 85-226 Boring No. B-3

Driller Darryl Altrogge
Type of Drill Rig CME 55
Sampling Method ASTM D1586
Size and Type of Bit 6 in. ID augers

Surface Elevation 99.76 ft.
Datum manhole NW corner Bldg. # 6
Location refer to boring location plan
Date Started 1/2/86 Completed 1/3/86

Overburden Samples: Disturbed 8 Undist. _____
Total Depth of Hole 31.0 ft.
Depth Drilled into Rock 0 ft.

Top of Rock Elevation _____
Bottom of Hole Elevation 68.76
Ground Water Depth refer to Table I labeled Summary of Water Level Readings

Depth (ft)	Flows per 5 ft.		Sample No.	N	% Rec (ROD)	SOIL AND ROCK DESCRIPTION	REMARKS
1	76		S-1	100 ⁺	100	0.5' Crushed Stone (Fill) 0.5' Concrete Slab	S-1: 0-0.5'
5	9	15	S-2	24	50	Black/Yellow, dense Rubble, moist (Fill)	S-2: 2-3.5'
	86						
5	80	3"	S-3	100 ⁺	75	Grey, v. dense Gravel and Sand, moist (Fill) 1.8' Concrete Slab	S-3: 4-4.2'
10	1	3	S-4	7	60	Brown/Grey, med. stiff, Clay, some Sand little Gravel, little oil, plastic, wet (Fill)	S-4: 6-8'
	4	5					
10	7	12	S-5	31	30	Grey/black, dense, Gravel and Sand, little Clay, wet, oil soaked (Fill)	S-5: 8-10'
	19	19					
15	7	12	S-6	36	75	Brown, hard, SILT and Clay, little f/c Sand, moist, slight plasticity (ML-CL)	S-6: 10-12'
	24	23					
15	8	12	S-7	34	50	...grade: tr. gravel, tr. of oil, wet	S-7: 12-14' note 1
	22	24					
15	10	17	S-8	42	100	same as S-6	S-8: 14-16'
	25	25					
15	10	15	S-9	53	75	same as S-6	S-9: 16-18'
	28	35					
20	12	17	S-10	39	100	same as S-6	S-10: 18-20'
	22	20					

Notes 1.) possible zone of migration

Sheet No 1 of 2

2.) Well installed (refer to Appendix I, labeled Monitoring Well Schematics)

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.
 1965 Sheridan Drive
 Kenmore, New York 14223

Client Westwood Pharmaceuticals
 Project Evaluation of potential industrial waste site
 File No. 85-226 Boring No. B-3

Depth (ft)	Blows per 5 ft		Sample No.	N	% Rec (ROD)	SOIL AND ROCK DESCRIPTION	REMARKS
21	6	12	S-11	39	100	same as S-6	S-11: 20-22'
	17	21					
22	10	17	S-12	39	100	Red/brown, hard SILT, some Clay, little Gravel, plastic, wet (ML-CL)	S-12: 22-24'
	22	19					
25	7	12	S-13	37	100	same as S-12	S-13: 24-26'
	15	19					
30	6	6	S-14	11	75	Red/brown, stiff, CLAY, some Silt, plastic, wet (ML-CL)	S-14: 29-31'
	5	6					
35						Bottom of hole 31.0 ft.	

Notes

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.

1965 Sheridan Drive
Kenmore, New York 14223

Client Westwood Pharmaceuticals
 Project Evaluation of potential industrial waste site
 File No. 85-226 Boring No. B-5

Driller Darryl Altrogge
 Type of Drill Rig CME 55
 Sampling Method ASTM D1586
 Size and Type of Bit 6 in. ID augers

Surface Elevation 99.12
 Datum manhole NW corner of Bldg. # 6
 Location refer to boring location plan
 Date Started 12/31/85 Completed 12/31/85

Overburden Samples: Disturbed 4 Undist. _____
 Total Depth of Hole 11.0 ft.
 Depth Drilled into Rock 0 ft.

Top of Rock Elevation -
 Bottom of Hole Elevation 88.12
 Ground Water Depth refer to table I labeled Summary

of Water Level Readings

Depth (ft)	Blows per 5 ft	Sample No	N	% Rec (ROD)	SOIL AND ROCK DESCRIPTION	REMARKS
1						
	4	S-1	12	75	Brown, stiff, Clay and Silt, little f. Sand, tr. Gravel, moderate plasticity, moist (Fill)	S-1: 2-4'
	6					
	4	S-2	9	80	same as S-1	S-2: 4-6'
5	5					
	8	S-3	29	100	Brown, v. stiff, SILT, some Clay, little Sand, slight plasticity, moist (ML-CL)	S-3: 6-8'
	13					
	7	S-4	27	100	...grade: and Clay, moderate plasticity	S-4: 9-11'
10	15					
					Bottom of hole 11.0 ft.	
15						
20						

Notes 1.) Well installed (refer to Appendix I labeled Monitoring Well Schematics) Sheet No 1 of 1

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.

1965 Sheridan Drive
Kenmore, New York 14223

Client Westwood Pharmaceuticals

Project Evaluation of potential industrial waste site

File No. 85-226 Boring No. B-6

Driller Darryl Altrogge
Type of Drill Rig CME 55
Sampling Method ASTM D1586
Size and Type of Bit 6 in. ID augers

Surface Elevation 99.31
Datum manhole NW corner Bldg. # 6
Location refer to boring location plan
Date Started 1/6/86 Completed 1/6/86

Overburden Samples: Disturbed 12 Undist. _____
Total Depth of Hole 28.0 ft.
Depth Drilled into Rock 0 ft.

Top of Rock Elevation -
Bottom of Hole Elevation 71.31
Ground Water Depth refer to table I labeled Summary of Water Level Readings

Depth (ft.)	Blows per 5 ft.		Sample No	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
1	7	8	S-1	19	75	Brown, v. stiff, Silt, some Clay, little Sand, tr. Coal fragments, moderate plasticity, moist (Fill) ...grade to oil soaked	S-1: 0-3'*
	8	11					
	11	10					
5	8	7	S-2	15	10	same as S-1	S-2: 3-4'
	7	22				...grade: little gravel, hard	
5	18	18	S-3	36	75	Black, dense Coal fragments, tr. sandstone fragments, dry (Random Fill)	S-3: 4-7'*
	32	19					
10	6	6	S-4	8	<5	Grey, loose Concrete fragments, dry (Random Fill)	S-4: 7-9'
	2	2					
	5	20					
10	18	12	S-5	30	60	Brown, v. stiff, Silt, some Clay, little Sand, plastic, lense of Greenish blue Silt, lense of Gravel and Sand, moist to wet (Fill)	S-5: 9-12'*
	10	15					
	4	5	S-6	16	20	Brown, med. stiff Silt and Clay, little f. Sand, plastic, wet (Fill)	S-6: 12-14'
15	11	17					
	7	7					
	11	8	S-7	19	30	Brown/black, v. stiff, Silt, some Gravel sized Coal fragments and Sandstone fragments, wet (Fill)	S-7: 14-17'*
15	14	13					
	5	2	S-8	7	30	Brown, med. stiff, Clay and Silt, some oil soaked nodules, tr. Gravel, plastic, wet (Fill)	S-8: 17-19'
	5	9					
20	14	14					

Notes 1.) Well installed (refer to Appendix I labeled Monitoring Well Schematics) Sheet No 1 of 1
2.) petroleum odor
3.) *implies soil sample taken with 3 inch diameter by three foot long split spoon sampler.

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.

1965 Sheridan Drive
Kenmore, New York 14223

Client Westwood Pharmaceuticals

Project Evaluation of potential industrial waste site

File No. 85-226 Boring No. B-7

Driller Darryl Altrogge
Type of Drill Rig CME 55
Sampling Method ASTM D1586
Size and Type of Bit 6 in. ID augers

Surface Elevation 99.37 ft.
Datum manhole NW corner of Bldg. # 6
Location refer to boring location plan
Date Started 1/5/86 Completed 1/5/86

Overburden Samples: Disturbed 13 Undist. _____
Total Depth of Hole 34.0 ft.
Depth Drilled into Rock 0 ft.

Top of Rock Elevation -
Bottom of Hole Elevation 80.04'
Ground Water Depth no water at completion

Depth (ft)	Blows per 5 ft		Sample No	N	% Rec (ROD)	SOIL AND ROCK DESCRIPTION	REMARKS
1	5	9	S-1	32	70	Dark brown, dense, f/c Sand, some Silt, little Gravel, tr. Coal fragments, moist (Fill)	S-1: 0-3'*
	19	13					
	13	13	S-2	8	20	Brown, stiff, Silt and Clay, little Gravel, tr. Coal fragments, plastic, wet (Fill)	S-2: 3-5'
	4	4					
5	4	13	S-3	38	60	Black, dense Coal fragments, tr. Sandstone fragments, moist (Random Fill)	S-3: 5-8'*
	10	11					
	14	24	S-4	53	30	Brown, v. dense, gravel sized Concrete fragments, some f/c Sand, dry (Random Fill)	S-4: 9-12'*
	33	47					
10	17	45	S-5	15	50	...grade: some Silt, tr. Coal fragments	S-5: 12-14'
	30	23					
	25	22	S-6	16	50	Brown, med. dense Gravel, some Clay, little f/c Sand, saturated (Fill)	S-6: 14-17'*
	7	8					
15	7	5	S-7	11	10	...grade: oil soaked	S-7: 17-19'
	5	10					
	11	5	S-8	6	50	Black, med. dense, Silt and Clay, little Slag, plastic, moist (Fill)	S-8: 19-21'*
	5	6					
20	5	4					note 1
	4	2					

Notes 1.) petroleum odor Sheet No 1 of 1
2.) Well installed (refer to Appendix I, labeled Monitoring Well Schematics)
3.) *implies soil sample taken with 3 inch diameter by 3 foot long split spoon sampler.

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.

1965 Sheridan Drive
Kenmore, New York 14223

Client Westwood Pharmaceuticals

Project Evaluation of potential industrial waste site

File No. 85-226 Boring No. B-8

Driller Darryl Altrogge
Type of Drill Rig CME 55
Sampling Method ASTM D1586
Size and Type of Bit 6 in. ID augers

Surface Elevation 100.04
Datum manhole NW corner of Bldg. # 6
Location refer to boring location plan
Date Started 1/7/86 Completed 1/7/86

Overburden Samples: Disturbed 10 Undist. _____
Total Depth of Hole 29.0 ft.
Depth Drilled into Rock 0 ft.

Top of Rock Elevation -
Bottom of Hole Elevation 71.04'
Ground Water Depth refer to Table I labeled Summary

of Water Level Readings

Depth (ft)	Blows per 5 ft	Sample No	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS	
1					Crushed Stone	augered without sampling	
5	3 9 12	6 12 11	S-1	21	50	Brown/black, v. stiff, Silt, some Clay, little f. Sand, tr. Concrete fragments, plastic, wet (Fill)	S-1: 4-7' *
	5 3	3 3	S-2	6	10	Red, loose, gravel sized Brick fragments, wet (Random Fill)	S-2: 7-9
10	5 22 32	16 16 23	S-3	38	30	Black/brown, hard, Silt, some Clay, little Gravel, tr. Brick, tr. Sandstone, plastic, saturated (Random Fill)	S-3: 9-12' * note 1
	6 3	3 1	S-4	6	<5	Grey, loose, gravel sized Concrete fragments, moist (Random Fill)	S-4: 12-14'
15	5 6 15	6 10 27	S-5	16	50	Brown, v. stiff, Clay, some Silt, little Sand, tr. Wood fragments, plastic, moist (Fill)	S-5: 14-17' *
	6 9	7 7	S-6	16	50	same as S-5	S-6: 17-19'
20	3	20					

Notes

- 1.) petroleum odor
- 2.) Well installed (refer to Appendix I, labeled Monitoring Well Schematics)
- 3.) Lense of oil at Gravel/Clay interface
- 4.) *implies soil sample taken with 3 inch diameter by 3 foot long split spoon sampler.

Sheet No 1 of 1

FIELD BORING LOG

BUFFALO DRILLING COMPANY, INC.

955 Niagara Street
Buffalo, New York 14213

Client Westwood Pharmaceuticals

Project Evaluation of potential industrial waste site

File No. 85-226 Boring No. B-19A

Driller Darryl Altrogge

Surface Elevation approx 75.5 ft

Type of Drill Rig CME 55

Datum _____

Sampling Method ASTM D 1586

Location refer to boring location plan

Size and Type of Bit 3-3/4 in. ID augers

Date Started 6/9/86 Completed 6/9/86

Overburden Samples: Disturbed 7 Undist. _____

Top of Rock Elevation _____

Total Depth of Hole 23.0 ft.

Bottom of Hole Elevation _____

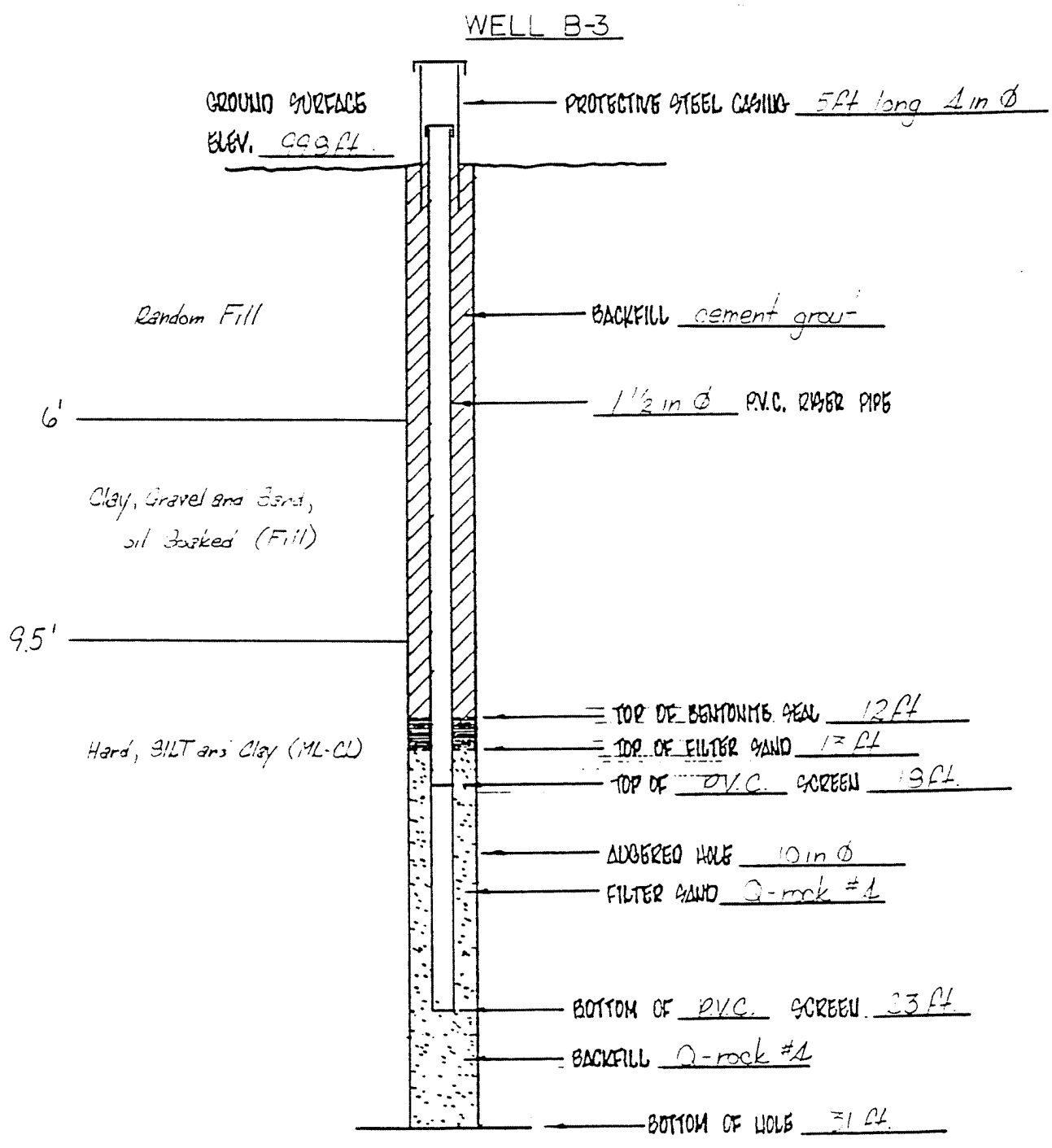
Depth Drilled into Rock 0 ft.

Ground Water Depth 10.0 ft. at completion

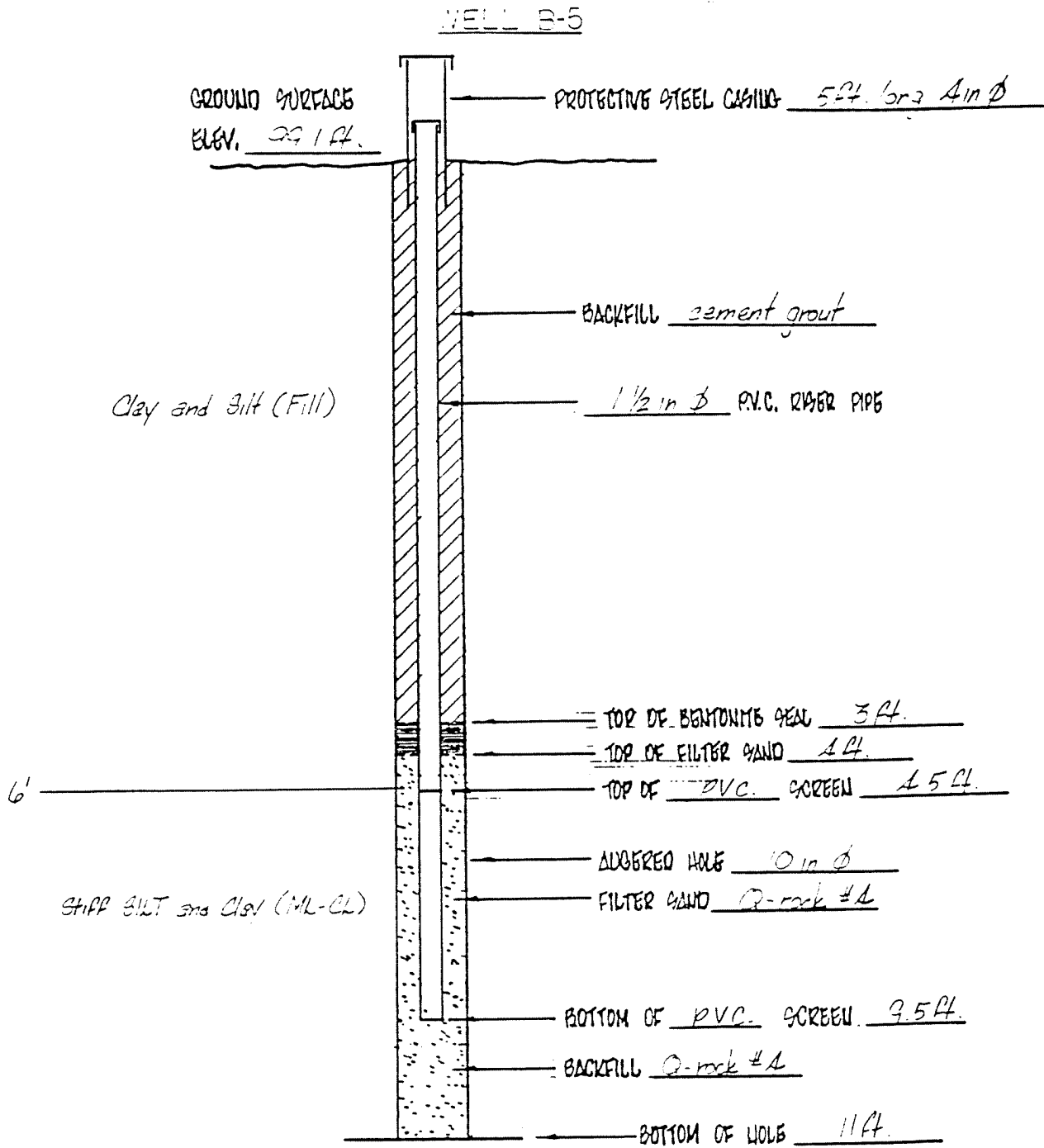
Depth (ft)	Blows per 5 ft.	Sample No	N	% Rec (RQD)	SOIL AND ROCK DESCRIPTION	REMARKS
1					Brown, dense, f/c Sand, some Gravel, some Silt, trace Brick, trace Slag, moist (Fill)	(refer to note 2) augered to 9.0 ft. no samples taken
5						
	9	7				
10	9	10	S-1	16	0	S-1: 9-11' no recovery
	4	4			Red/brown, stiff, CLAY, some Silt, plastic, wet (CL-ML)	S-2: 11-13'
	5	7	S-2	9		
	7	7			...grade: v. stiff	S-3: 13-15'
	11	10	S-3	18		
15	4	7			same as S-3	S-4: 15-17'
	12	13	S-4	19		
	8	14			Red/brown, hard, SILT, some Clay, little f/c Sand, tr. Gravel, non-plastic, wet (Till)	S-5: 17-19'
	19	17	S-5	33		
20	7	14	S-6	35	100	S-6: 19-21'

- Notes
- 1.) Boring B-19A drilled to replace B-19 which was destroyed during construction of the adjacent building foundation system.
 - 2.) Fill description presented as determined by boring B-19.
 - 3.) Well installed (refer to Appendix D labeled Monitoring Well Schematics).

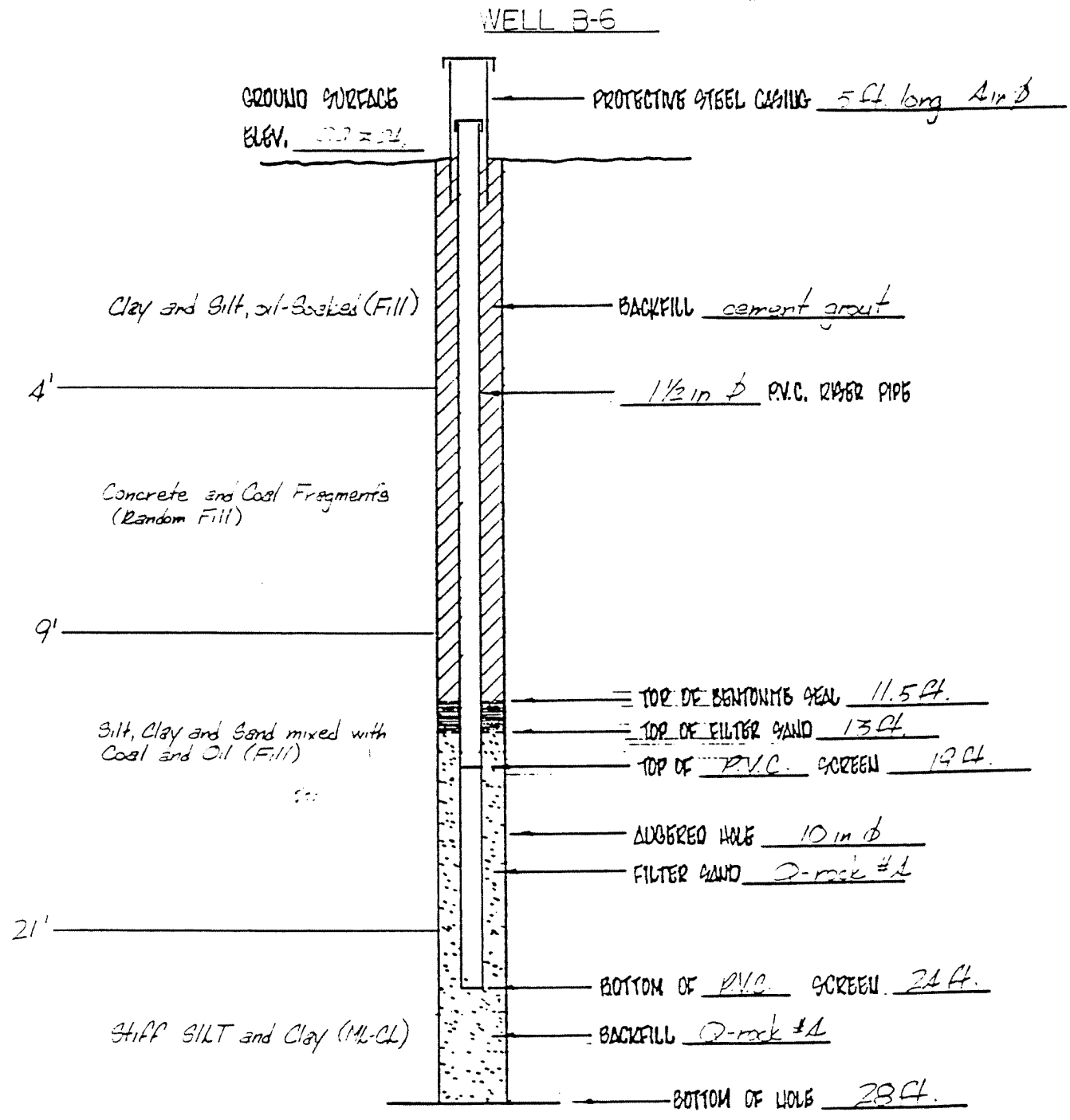
SUMMARY OF SUBSURFACE CONDITIONS



SUMMARY OF SUBSURFACE CONDITIONS

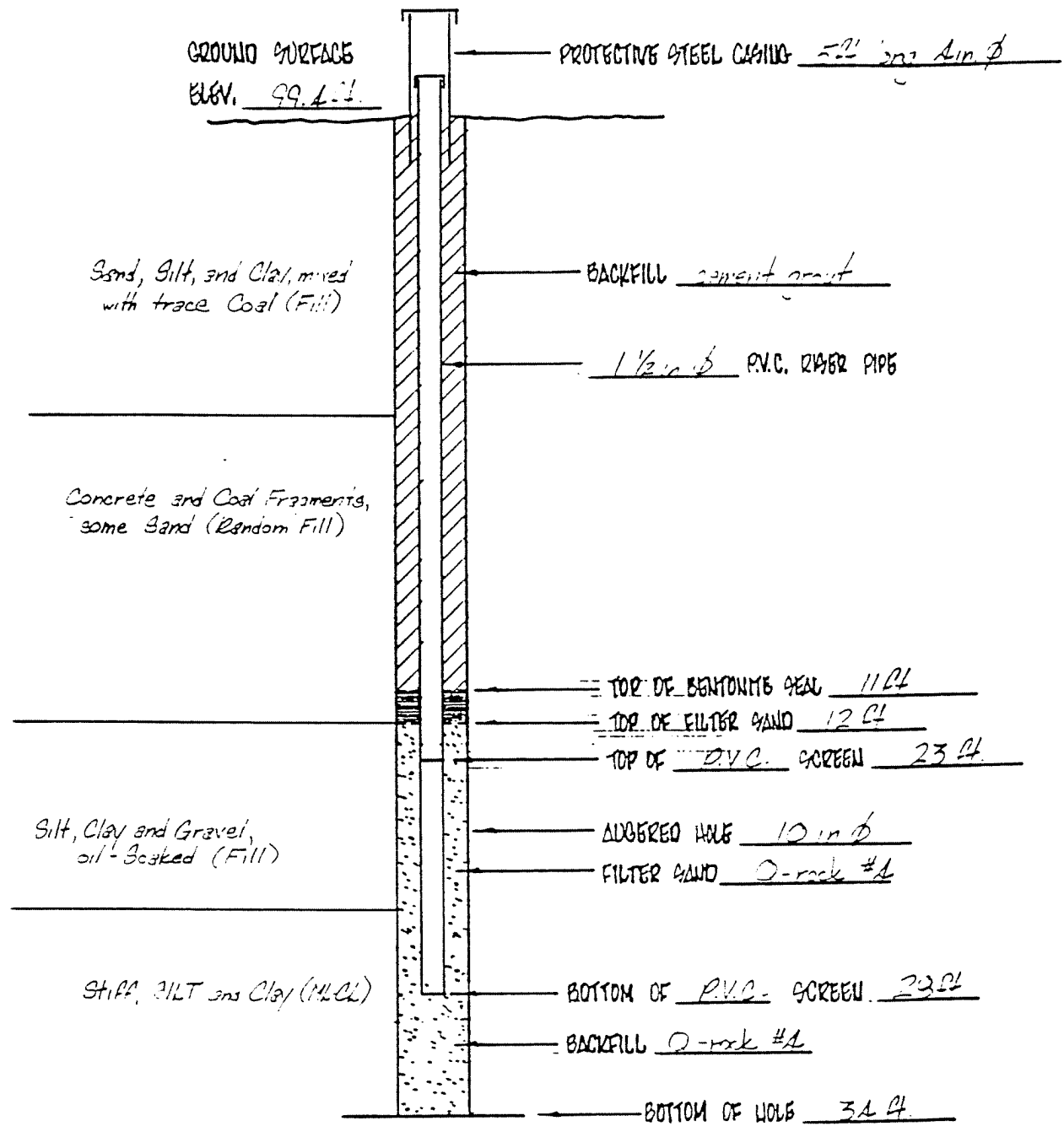


SUMMARY OF SUBSURFACE CONDITIONS

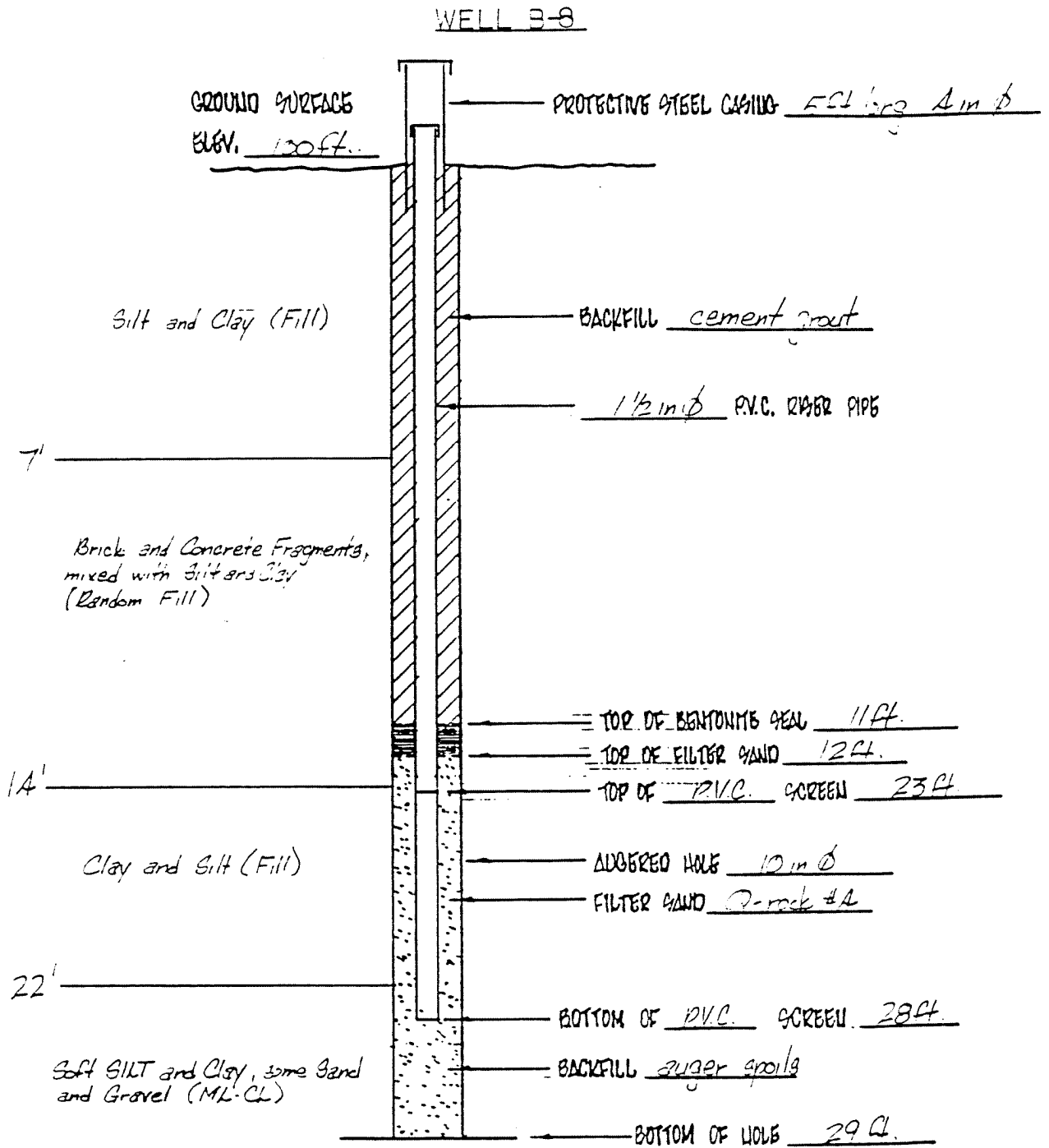


WELL B-7

SUMMARY OF SUBSURFACE CONDITIONS



SUMMARY OF SUBSURFACE CONDITIONS



APPENDIX B

Appendix B

UTILITY BEDDING/FOUNDATION INVESTIGATION EXCAVATIONS

This data report summarizes the procedures used as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141) to assess utility trenches and foundation construction as possible contaminant migration pathways. Five test pits were excavated from April 28 through April 30, 1992. Locations for the test pits are shown in Figure B-1.

Test pits TP-1 and TP-1A consisted of two interconnected trenches excavated for the purpose of determining the influence, if any, that foundation construction may have had on contaminant migration pathways. Test pits TP-2 through TP-5 were excavated to determine the influence, if any, that underground utility bedding materials may have had on contaminant migration pathways. Test pit TP-3 exposed a fabric-encased, gravel "french drain" used for pit drainage during Building 9 foundation construction. Test Pits TP-3 and TP-5 exposed water main bedding materials. Test Pit TP-4 exposed storm drain bedding gravel.

The excavations were conducted by Buffalo Drilling, utilizing a Ford Backhoe, model 550 with a 30-inch wide bucket. Table B-1 shows the specific dimensions of each test pit. Geologic logs of the test pit excavations are attached.

During test pit operations, the exposed materials (that surrounded utilities and foundations) were inspected for visual contamination. One soil sample per excavation immediately adjacent to, or below, the bottom of the foundation or utility bedding material was collected for chemical analyses. In test pit TP-1, the soil sample was collected with a stainless steel spatula at the contact directly beneath the foundation gravel, in the random fill. Test pit TP-2 did not unearth the seep reported in that area, therefore, no sample was collected. Test pit TP-3 yielded two soil samples, one directly below the clean french drain, and the other directly below the water main; both collected with a stainless steel spatula from the random fill below the bedding material. The soil sample from test pit #4 was collected from random fill excavated with the backhoe bucket adjacent to the storm drain next to the gravel backfill envelope. The soil

sample from test pit TP-5 was also collected from the backhoe bucket from the random fill that encased the water main. The stainless steel spatula was thoroughly cleaned prior to its use to prevent cross contamination between soil samples. The decontamination procedure consisted of: (1) wash and scrub with non-phosphate detergent; (2) deionized water rinse; (3) 10% methanol rinse; (4) deionized water rinse; and (5) wrap in aluminum foil for transport.

Samples were analyzed for volatile organic compounds (VOCs), base neutrals (BNAs), acid extractable organics (AEOs), target analyte metals (TAL) plus cyanide, and total organic carbon (TOC). A list of the individual analytes is presented in Table B-2. The results of the organic and inorganic chemical sampling are presented in Tables B-3 and B-4, respectively. The analytical testing services were provided by General Testing Corporation Inc., of Rochester, New York.

Attached are test pit logs from the excavations at the site.

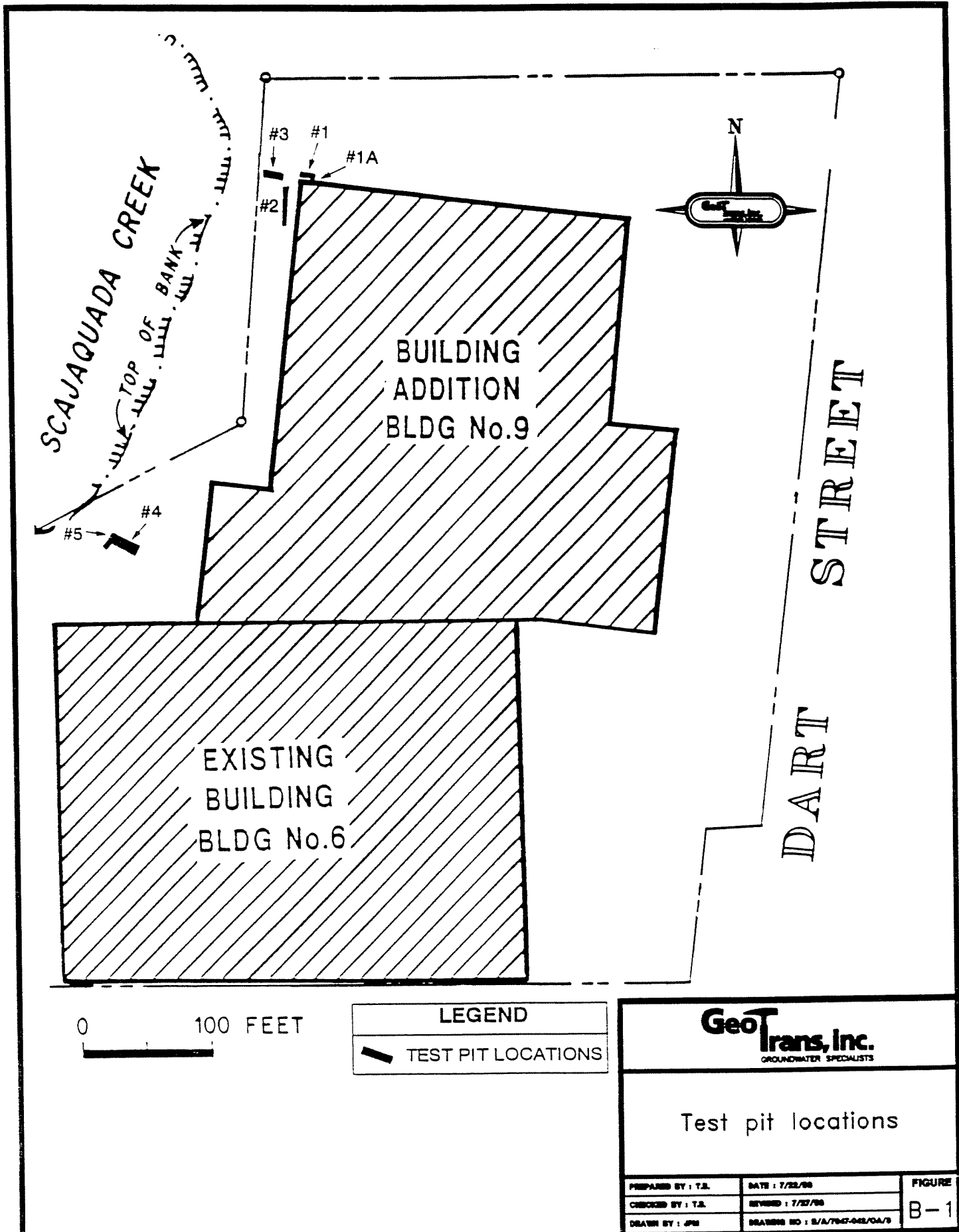


Table B-1. Test pit information.

Test Pit No.	Area of Investigation	Dimensions	Sample ID
1	Bldg 9 Foundation	30"W x 6'L x 5'D	None
1A	Bldg 9 Foundation	30"W x 5'L x 5'D	TP1-4
2	Construction Seep	30"W x 33'L x 5'D	None
3	Construction Seep	3-5'W x 15'L x 6'D	TP3-4
	Water Main	3-5'W x 15'L x 6'D	TP3-5
4	Storm Sewer	5'W x 10'L x 11'D	TP4-9
5	Water Main	4'W x 12'L x 6'D	TP5-6

Table B-2. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	Miscellaneous (1)
Acetone Benzene Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes	4 Chloro-3 methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitro-phenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide	Total Organic Carbon

Table B-3
TEST PIT ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification					
	TP1-4	TP3-4	TP3-5	TP4-9	TP5-6	
VOLITILE ORGANIC COMPOUND						
Chloroform	2 J	<6	<7	<6	<6	
Trichloroethene	2 J	2 J	<7	<6	<6	
SEMIVOLATILE ORGANIC COMPOUND						
2-Methylnaphthalene	340 J	730 J	<880	<800	<830	
Acenaphthene	<880	120 J	<880	<800	<830	
Acenaphthylene	960	1200	190 J	<800	<830	
Anthracene	680 J	650 J	220 J	<800	<830	
Benzo(a)anthracene	3000	1800	660 J	<800	270 J	
Benzo(a)pyrene	3900	2400	580 J	<800	250 J	
Benzo(b)fluoranthene	3500	2000	570 J	<800	250 J	
Benzo(g,h,i)perylene	2600	1500	440 J	<800	230 J	
Benzo(k)fluoranthene	3000	1600	460 J	<800	300 J	
Bis(2-Ethylhexyl)Phthalate	130 J	150 J	170 J	<800	400 J	
Chrysene	3200	2300	660 J	<800	330 J	
Di-n-Butylphthalate	<880	<800	110 J	<800	<830	
Dibenz(a,h)anthracene	740 J	470 J	<880	<800	<830	
Dibenzofuran	88 J	100 J	<880	<800	<830	
Fluoranthene	3200	2500	1300	<800	500 J	
Fluorene	<880	260 J	110 J	<800	<830	
Indeno(1,2,3-cd)pyrene	2100	1200	370 J	<800	200 J	
Naphthalene	290 J	500 J	<880	<800	<830	
Phenanthrene	1400	2600	790 J	<800	260 J	
Pyrene	5100	3600	1100	<800	480 J	
Total Organic Carbon (%)	0.775	0.804	1.48	<0.5	0.762	

J = Estimated value, analyte detected below detection limits.

Sample identifications are from the numbered test pits (TP). The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.

tporg.wq1

Table B-4
TEST PIT INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification					
	TP1-4	TP3-4	TP3-5	TP4-9	TP5-6	
Aluminum	7330 J	9830 J	15800 J	14100 J	22700 J	
Antimony	R	R	<35.6	R	R	
Arsenic	12.3 J	16 J	<3	14.8 J	21.4 J	
Barium	94.8 J	173 J	105 J	104 J	187 J	
Beryllium	1.5	1.3	0.69	0.72	1	
Cadmium	<3.8	2.7	<3.8	<3.8	<3.8	
Calcium	6590 J	62300 J	58800 J	77900 J	70000 J	
Chromium	11 J	18.8 J	20.2 J	20.4 J	26.6 J	
Cobalt	5.3	7.6	8.3	9.6	14.6	
Copper	31.2	234	46.6	20.1	24.5	
Iron	11700	25600	18500	19800	28100	
Lead	83.9	552	79.9	13.9	12	
Magnesium	1690 J	11300 J	19800 J	19100 J	19400 J	
Manganese	101 J	383 J	511 J	448 J	552 J	
Mercury	0.69 J	3.9 J	<0.1	<0.1	<0.1	
Nickel	18	23.5	21.4	20.8	31.7	
Potassium	889 J	1360 J	2420 J	3230 J	5160 J	
Selenium	1.1 J	1.7 J	1.4 J	<2.8	0.59 J	
Sodium	222	839	<107.9	174	192	
Vanadium	18.4	19.7	22.9	23.6	27.9	
Zinc	270 J	676 J	152 J	85 J	64.1 J	
Cyanide	<10	2 J	<10	<10	1.4 J	

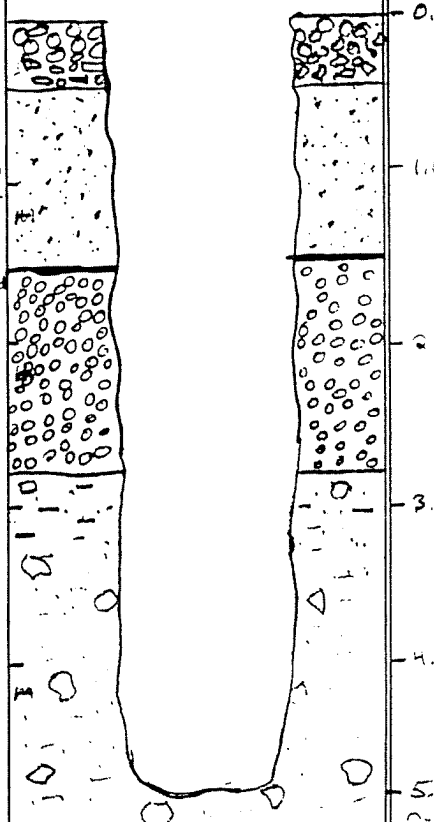
J = Estimated value, analyte detected below contract required detection limits.

R = Value rejected by data validation.

Sample identifications are from the numbered test pits (TP). The second half of the sample identification refers to the top of the two-foot interval the sample was obtained from.

GEOLOGIC LOG

Project <u>IG/WS</u>	Boring Number <u>Test Pit 1</u>
Location <u>Buffalo, New York</u>	Date Started <u>4-29-92</u>
Client <u>Westwood Squibb</u>	Date Completed <u>4-29-92</u>
Driller <u>Buffalo Drilling Inc.</u>	Drilling Method <u>Backhoe Trench</u>
Elevation _____	Page Number <u>1</u> of <u>1</u>
Water Level & Date _____	Logged By <u>TOTH</u>

Depth BGS (ft)	Sample			SPT Result (#)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type & No.	Rec. (ft)			
				HNu (ppm)	Location Parallel to the north face of Bldg 9, striking E-W, Trench 4.5 ft from Bldg 9, 30" wide, 6 ft long from 2'-8" east of the NW corner of Bldg 9, 5 ft deep.	Air Mont: (HNU, CGI, Dust) Well Construction: ft Total Depth ft Screen Interval ft Sand Pack ft Bentonite Seal ft Grout Seal 10 Slot Screen (0.010in) in Stainless Steel Type 304 X-Section E-W ← 30" →
0				BG	Rounded to subrounded coarse pebbles overlying subangular limestone gravel fill.	
1.0		E-2		BG	Poorly graded sand (SP) little fine gravel, fine to medium grained moderate yellowish brown (10YR 5/4) Damp to moist, loose, clean, no clay Construction Sand Fill no contam. present.	
2.0		E-1		BG	Fabric permeable construction liner subgrade construction gravel, poorly graded angular to subangular, fine to medium grained limestone gravel, clean, no soil matrix, moist coating, pristine condition, no contamination present	
3.0		E-3		BG	Silty clay fill (CL) some gravel little sand, trace lumber, wood, metal, cinders, slag, glass. Fine to very fine grained sand and gravel, moist to damp, firm to stiff, dark yellowish brown (10YR 5/2) fill	
4.0				BG	No Obvious contamination HNU = BG throughout the trench	
5.0						

GEOLOGIC LOG

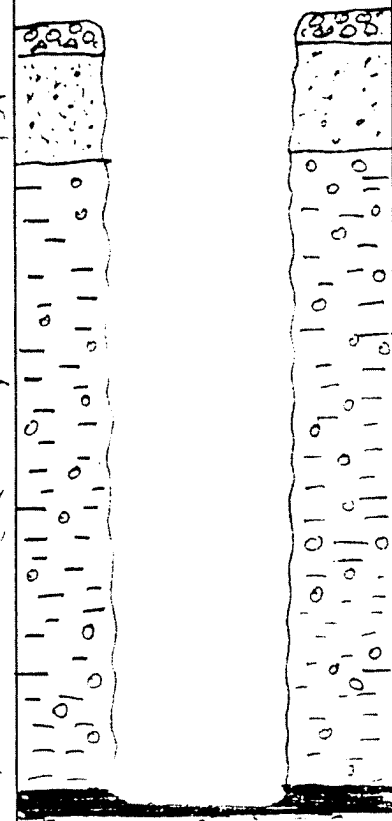
Project	IG/WS	Boring Number	Test Pit 1-A
Location	Buffalo, New York	Date Started	4-29-92
Client	Westwood Squibb	Date Completed	4-29-92
Driller	Buffalo Drilling Inc.	Drilling Method	Backhoe Trench
Elevation		Page Number	1 of 1
Water Level & Date		Logged By	TOTIT

Depth BGS (ft)	Sample			Result (ppm)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
				HNU (ppm)	<p><u>Location:</u> Perpendicular to the North face of Bldg 9, striking N-S, Trench 8 ft from the NW corner of Bldg 9 at the Terminal end of TP-1. (Forms an L with TP-1) Extend from the Bldg 9 foundation 1 out 7 ft.</p>	<p>Air Mont: (HNU, CGI, Dust) Well Construction: ft Total Depth ft Screen Interval ft Sand Pack ft Bentonite Seal ft Grout Seal 10 Slot Screen (0.010in) in Stainless Steel Type 304 X Section N-S 4.0 ft from edge 9 ← 30" →</p>
0				BG	<p>Rounded to subrounded coarse pebbles overlying subangular limestone gravel - <u>ELL</u></p>	
1				BG	<p><u>concrete footing</u> Extending all laterally and 10" vertically from the side of Bldg 9</p> <p>Fabric permeable construction liner - clean</p>	
2				BG	<p>Subgrade construction gravel poorly graded, angular to sub- angular, fine to medium grained limestone gravel, clean, no soil matrix, moist, pristine condition, no contamination present.</p>	
3				BG	<p>Thickness of gravel varies with distance from Bldg 9. At the face, gravel > 5.0 ft BAS (limit of excavation to avoid slumping). At 4.0 ft away, x-section drawn → At 6.0 ft away, thickness of only 3 inches of gravel under the liner.</p>	
4		TP1A E-4		BG	<p>Silty clay (CC) some gravel, little sand, trace lumber, iron cinders, slag, glass, brick, fine to very fine sand and gravel, moist, some yellowish brown (10YR 8/2), firm. <u>ELL</u> NO obvious visual contamination</p>	
5				BG	<p>Lab sample collected from top of silty clay layer from a seam of gravel (GW) and sand, some slag (porous), well graded, grayish black (N2), moist, compact.</p>	

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation _____
 Water Level & Date _____

Boring Number Test Pit #2
 Date Started 4-29-92
 Date Completed 4-29-92
 Drilling Method Backhoe Trench
 Page Number 1 of 1
 Logged By TOTH

Depth BGS (ft)	Sample			SPT Result (#)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type & No.	Rec. (ft)			
0				HNU (CGM)	Location Parallel to the west face of Bldg #9, striking N-S, Trench 8 ft from oldy 9, extending 33' from 8 ft to 41 ft from the NW corner of Bldg 9. No weep line or French drain encountered during excavation No Lab sample collected	Air Mont: (HNU, CGI, Dust) Well Construction: ft Total Depth ft Screen Interval ft Sand Pack ft Bentonite Seal ft Grout Seal 10 Slot Screen (0.010in) in Stainless Steel Type 304 X-Section N-S <div style="text-align: center;">← 30" →</div> 
-1		E-2		REG	limestone gravel fill Construction <u>sand fill</u> (SP) Poorly graded, little fine gravel, fine to medium grained, moderate yellowish brown (10 YR 8/4) damp to moist, loose clean, no visible contamination	
-2		E-3		REG	<u>Silty Clay Fill</u> (CL) some fine grained sand, little to trace gravel dark yellowish brown (10YR 8/2) moist, stiff to firm, with irregular lenses (~40% in total volume) of sandy, gravelly soil with one or more of the following: boulders, cobbles, construction rubble (cement, brick, block, lumber, metal...), glass, trash, rubber (fill) in a loose to compact matrix, moist. No contamination noted above 5.0 ft BGS.	
-4		E-1		20	Zone of sandy gravel (SW) well graded some slag/cinders, grayish black (N1) very moist, loose, coal tar odor. Located 26'-36' south of NW corner Bldg #9	

GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation _____
 Water Level & Date _____

Boring Number Test Pit # 3
 Date Started 4-30-92
 Date Completed 4-30-92
 Drilling Method Backhoe
 Page Number 1 of 1
 Logged By TOTH

Depth BGS (ft)	Sample			Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Interval	Type & No.	Rec. (ft)			
				HNU (ppm) Not Used due to humid conditions	<p>Location: Perpendicular to the west face extension line of Bldg 9 with a line parallel to, and 2 ft north, of the North face of Bldg 9. 15 ft long by 3-5 ft wide extending from 11 ft west of the NW Bldg 9 corner to 26' west, and 5' north.</p> <p><u>Limestone gravel fill</u></p> <p>Construction Sand Fill (SP) poorly graded, little fine gravel, fine to medium grained, moderate yellowish brown (10YR 5/4), moist, loose, very clean, no obvious contamination</p> <p><u>Silty Clay Fill (CL)</u> little gravel, little fine sand, dark yell-brown (10YR 5/4) moist, firm to stiff, with irregular lenses/pockets of coarser grained material, composed of one or more of the following: sand, gravel, cobbles, boulders, construction debris (wood, brick, block, cement, lumber) glass, trash, rubber, metal... (FILL)</p> <p>No obvious visual/olfactory contamination</p> <p><u>French Drain</u> Burlap/nylon liner material surrounding a clean limestone gravel encased, 4" plastic pipe, surrounded by <u>clayey sand (SC)</u> little gravel, trace slag/cinders, trace glass, fine-med. grained, grayish brown, (5YR 5/4) moist, compact to loose, very clean (FILL)</p> <p><u>Water main</u> 10" steel pipe, no permeable bedding material/foundation surrounded with <u>clayey silt formation</u></p> <p><u>Fill (ML)</u> some gravel, little cobbles, little fine sand, dark yell-brown (10YR 4/2) very moist, soft to firm</p>	<p>Air Mont: (HNU, CGI, Dust)</p> <p>Well Construction: ft Total Depth ft Screen Interval ft Sand Pack ft Bentonite Seal ft Grout Seal 10 Slot Screen (0.010in) in Stainless Steel Type 304</p>
		TP3-4 Lab Sample	E-1	No obvious contamination		
		TP3-5 Lab Sample	E-2	No obvious contamination		

GeoTrans Inc.

Earthworms present
 No obvious visual/olfactory contamination
 At 2.5 ft east of the pipe, at 5'-1" BGS, and extending > 4' laterally eastward, coal tar contaminated sand and gravel lens, moist, grayish black (N2), loose, was exposed. Cont zone separated from french drain and water main by yellow-brown silty clay (uncontaminated)

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GEOLOGIC LOG

Project	IG/WS	Boring Number	TP-4
Location	Buffalo, New York	Date Started	4-30-92
Client	Westwood Squibb	Date Completed	4-30-92
Driller	Buffalo Drilling Inc.	Drilling Method	Backhoe
Elevation		Page Number	1 of 1
Water Level & Date		Logged By	TOFH

Depth BGS (ft)	Sample			SPT Rec. (ft) (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-				HNU (ppm) Not Operational	Location: Along the axis of the 24" storm sewer from 39'-58" from the collection manhole at the south west face of bldg 9.	Air Mont: (HNU, CGI, Dust) Well Construction: ft Total Depth ft Screen Interval ft Sand Pack ft Bentonite Seal ft Grout Seal 10 Slot Screen (0.010in) in Stainless Steel Type 304
0		E-1			Limestone gravel fill	
2		E-2			crushed limestone gravel backfill, very clean, moist, no soil, moderately graded. No signs of contamination	
4		E-3			crushed limestone backfill, well- graded from fine pebbles to small cobbles, NO soil matrix. Film of silt/sand/clay on individual gravels NO obvious signs of contamination	
6		E-4			Host soil (pre-fill): Silty Sand (Sm) little sub rounded gravel, trace clay, moist, mod. brown (5YR 4/4), compact, fine grained sand, NO obvious signs of contamin.	
8		E-5			Crushed limestone backfill "poa gravel" very clean (pristine condition) no soil.	
10	TP4-9 Lab sample	E-6			Silty clay (cl) little gravel, moderate brown (5YR 4/4) with light brown (5YR 5/6) and med. lt. gray (N6) streaked zones, moist, firm to stiff, no obvious signs of contamination. Lab sample collected from host soil (pre-fill) at 9'-10' BGS via backhoe bucket.	
12						X-section TP-4 (NW-SE)

GeoTrans Inc.

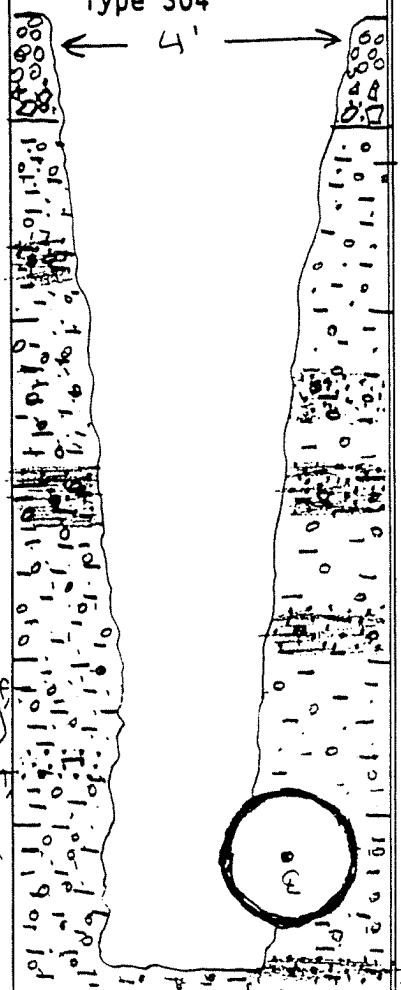
Entire Trench free from standing water. No obvious signs of contamination throughout the trench. All gravel unconsolidated/loose. Severe caving occurred during excavation.

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GEOLOGIC LOG

Project IG/WS
 Location Buffalo, New York
 Client Westwood Squibb
 Driller Buffalo Drilling Inc.
 Elevation _____
 Water Level & Date _____

Boring Number TP-5
 Date Started 4-30-92
 Date Completed 4-30-92
 Drilling Method Backhoe
 Page Number 1 of 1
 Logged By TOTIT

Depth BGS (ft)	Sample			SPT Result (N)	Description: Name & USCS Group Symbol, Color, Moisture Content, Rel. Density or Consistency, & Mineralogy	Remarks: incl Air, Mont, Depth of Casing, Drill Rate, & Fluid Loss
	Int- erval	Type &No.	Rec. (ft)			
-				HNU (ppm) Not Operational	Location: 1 to the terminal end of Test Pit 4 (55' from the storm sewer manhole adjacent to the south west face of building 9.) Extending 12' to the SW along the axis of the 10" water mand.	Air Mont: (HNU, CGI, Dust) Well Construction: ft Total Depth ft Screen Interval ft Sand Pack ft Bentonite Seal ft Grout Seal 10 Slot Screen (0.010in) in Stainless Steel Type 304
-		E-1			<u>Limestone gravel fill</u>	
-					<u>Silty Clay (cl) with lenses/ seams of Silty Sand (sm)</u> (Description below)	
-	TPS-6 Lab Sample	E-2			<u>Silty Clay (cl) lean, trace gravel, lt. brown (5YR 5/6) moist, firm to stiff with seams/lenses of silty sand (sm)</u> little gravel, trace clay, fine grained, moderate brown (5YR 4/4), loose, moist Entirely free of signs of contamination No permeable bedding material or fill around 10" steel water mand	

GeoTrans Inc.

No signs of contamination throughout
the entire trench

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X-section

APPENDIX C

Appendix C
WATER-LEVEL DATA REPORT

This data report summarizes the procedures used to obtain water-level measurements as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). The schedule for obtaining water-level measurements was designed to account for temporal variations in groundwater levels. This was done to assess the effect of short term fluctuations in groundwater levels. After the installation of the current monitor well network, manual measurements were made in 23 wells and piezometers weekly for 12 weeks. The weekly measurements occurred between May 4 and July 20, 1992. Measurements were obtained monthly for the next nine months for a total period of one year through April 29, 1993. Automated water-level measurements were also obtained in two piezometers for a period of one year. Well and piezometer locations are shown on Figure C-1.

Manual water-level measurements were obtained with an oil-water interface probe in the fill installations where dense nonaqueous phase liquid (DNAPL) is known to be present. Water-level measurements were obtained with a water-level probe in the lower sand installations. An oil-water interface probe was used to record the water level and measure the height and thickness of any encountered DNAPL. A water-level probe was used in the lower sand installations to avoid potential introduction of contaminants from the oil-water interface probe used in the fill installations.

Water-level measurements were made from all monitor wells and piezometers prior to the beginning of purging and sampling. Manual water-level measurements were obtained using the following procedure:

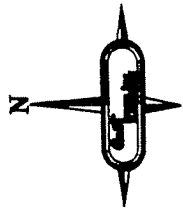
1. All sampling team members wore clean and new disposable gloves to protect themselves from exposure to potentially contaminated groundwater, and to minimize the potential for cross-contamination between wells.
2. The lock from the locking well cap was removed. The measured reference point (MRP) was the top of the protective casing

below the locking cap. The elevation of that reference point was established by a survey to ± 0.01 ft.

3. Personnel would stand upwind, remove the well cap, and allow the well to vent.
4. A cleaned, water-level or oil-water interface probe was lowered to the fluid surface. The water-level probe produced an audible signal upon contact with the water surface. The interface probe produced an audible signal upon contact with a water surface or a different audible signal upon contact with a floating, nonaqueous phase liquid surface.
5. The monitor well number, well radius, and MRPs were recorded.
6. The distance from the MRP to the water surface was recorded to the nearest 0.01 ft.
7. The static water elevation was recorded. This was the elevation of the MRP minus the depth-to-water surface.
8. The probe was lowered to the bottom of the well or to the top of a DNAPL surface (a different audible signal sounded if the oil-water interface probe contacted a DNAPL). The distance from the MRP to the DNAPL or the bottom of the well was recorded.
9. The probe was decontaminated as it was brought to the surface. The decontamination procedure was as follows:
 - a. A clean paper towel was saturated with ten percent methanol in water solution. All decontamination solvents were reagent grade. Water used to make the solution was from a clean potable supply.
 - b. The probe and cable were wiped down, discarding and replacing the towel as it become soiled.
 - c. The rewound spool of the probe was rinsed with deionized water, using a hand sprayer. The probe was then ready for use at the next well.

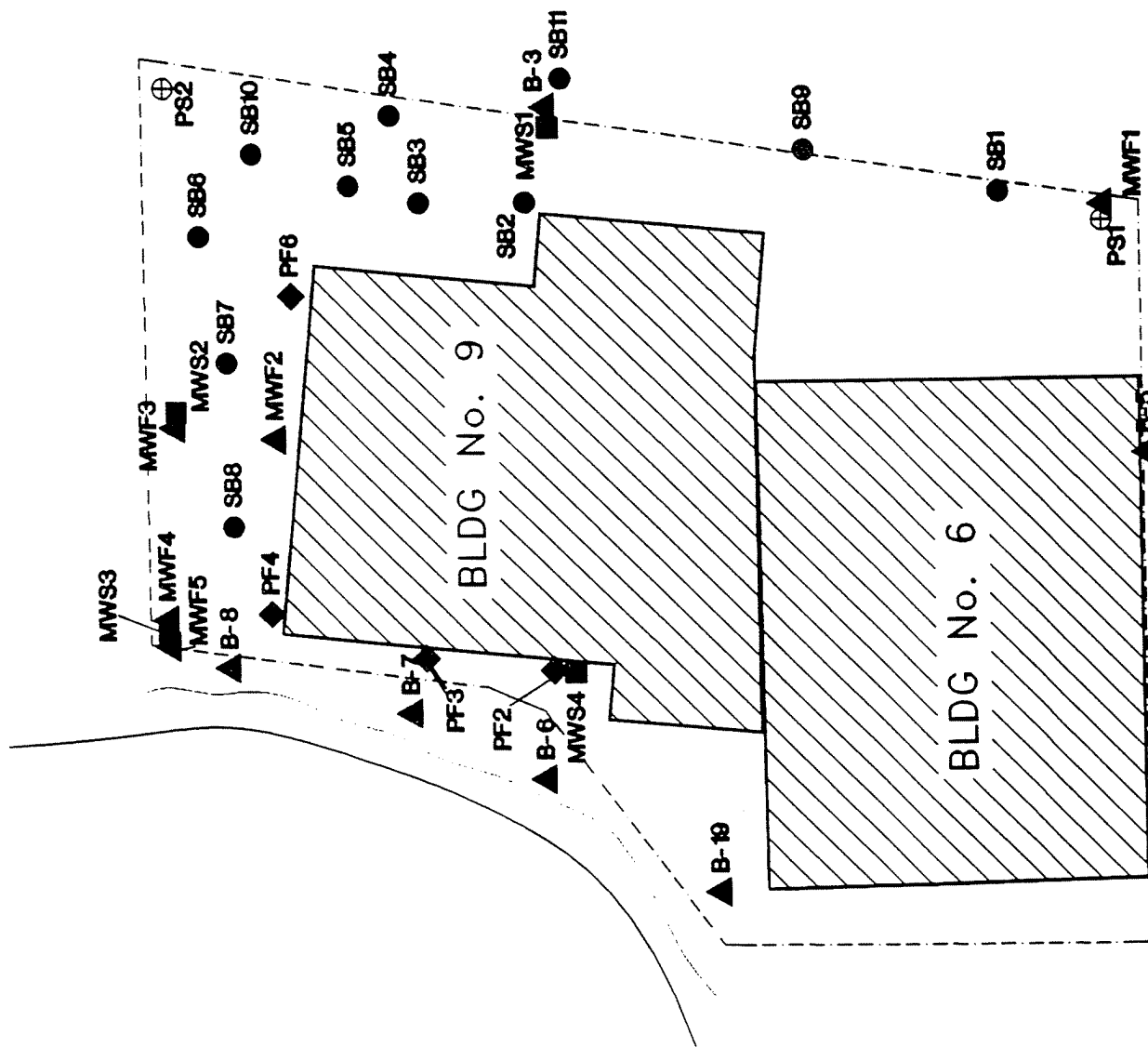
The depth-to-water and water-level elevation measurements are shown in Table C-1. Also recorded were two elevations of Scajaquada Creek. Measurements were made directly from surveyed points to the water surface at the northern and southern property borders by lowering a graduated tape measure from the surveyed mark to the top of the waterline.

In an effort to determine continuous long term water-level trends and to compare the aquifer responses between the near surface fill layer and the lower sand layer, a data logger and a pressure transducer were installed in a piezometer in each geologic unit. Water-level measurements were recorded twice daily in the lower sand piezometer PS1, and in the near surface fill material piezometer PF6. An Instruments Northwest Aquistar data logger and a 15 psi pressure transducer were installed on May 22, 1992 to record the water-level measurements. Table C-2 presents the recorded data through May 3, 1993. Figures C-2 and C-3 present the hydrographs of piezometers PF6 and PS1, respectively. Water-level data was accidentally lost from both piezometers from June 30 to August 17, 1992, during data retrieval. Water-level data was also lost from piezometer PS1 from September 23 to October 10, 1992, for similar reasons.



Legend

- Soil Borings (11)
- ▲ Fill Monitor Wells (10)
includes "B" Series Wells
- ◆ Fill Piezometers (4)
- Lower Sand Monitor Wells (4)
- ⊕ Lower Sand Piezometers (2)

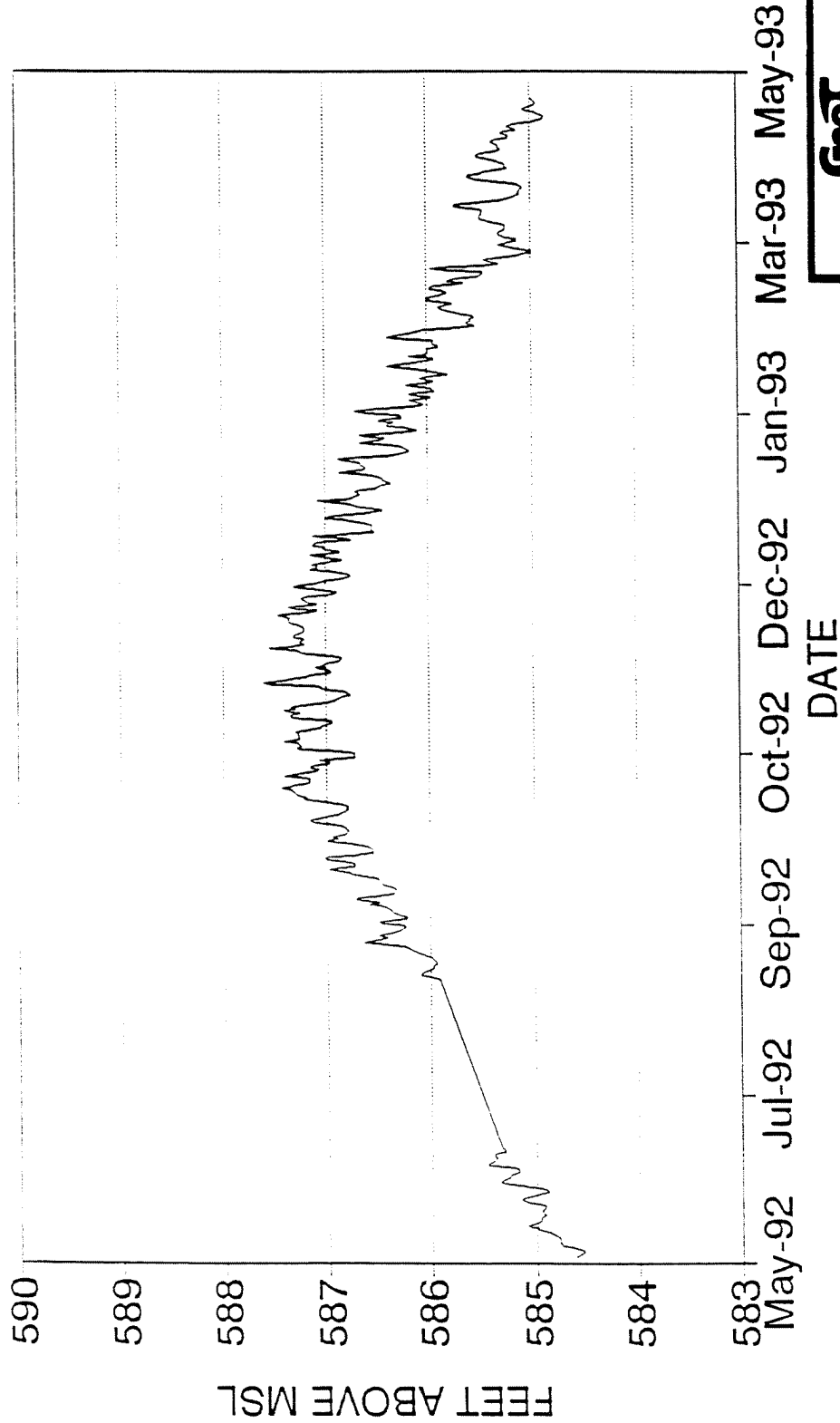


**Location of the RI/FS
Monitoring System**

PREPARED BY: T.A.	DATE: 7/25/99	PLANT
CHECKED BY: T.A.	REVISION: 1/2/00/99	C-1
DRAWN BY: J.P.	ISSUED BY: J.P.	

PF6 HYDROGRAPH

IG/WS RI/FS

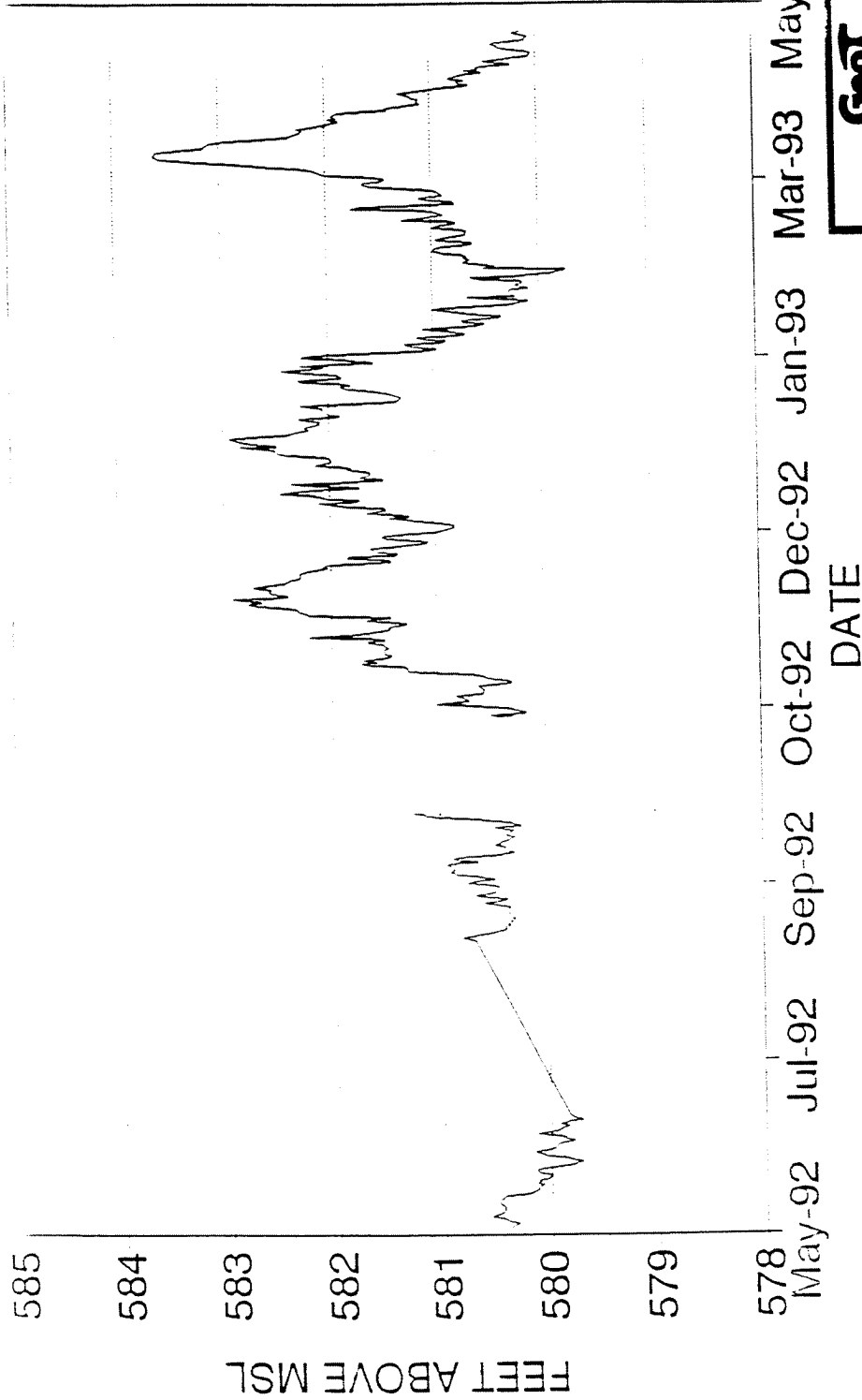


Continuous water-level elevation for PF6

PREPARED BY: J.S.A.	DATE: 7/20/93	PROJECT:
CHECKED BY: J.S.A.	REVISED: 7/20/93	
DRAWN BY: J.P.S.	RELEASED TO: PHOTOLOGUE	FIGURE: C-2

PS1 HYDROGRAPH

IG/WS RI/FS



Continuous water-level
elevation for PS1

PREPARED BY: T.A.	DATE: 7/26/93	FIGURE
CHECKED BY: T.S.	REVISED: 1/7/93/93	
DRAWN BY: J.M.	DRAWING NO: 7903/93/01/93	
		C-3

Table C-1
 IROQUOIS GAS/ESTWOOD PHARMACEUTICALS SITE RIUFS
 WATER-LEVEL ELEVATIONS (IN FT ABOVE MSL)

Station Location	MRP Elevation	Ground Surface Elevation		Water-Level Elevation																				
		5/4/02	5/11/02	5/18/02	5/27/02	6/03/02	6/03/02	6/15/02	6/22/02	6/29/02	7/6/02	7/14/02	8/17/02	9/23/02	10/20/02	11/18/02	12/22/02	1/22/03	2/24/03	3/25/03	4/29/03			
Fill Locations																								
MWF1	592.94	591.41	580.06	578.45	581.69	579.45	582.54	584.22	584.76	585.08	585.61	585.81	587.26	587.37	584.71	585.53	586.11	585.04	586.35	585.07	585.51	586.11	586.33	
MWF2	592.74	590.47	583.78	583.51	584.21	584.97	584.63	584.69	584.88	585.06	585.30	585.69	585.60	585.37	585.51	585.35	585.39	585.35	585.33	585.39	584.75	585.39	584.73	584.73
MWF3	592.11	591.02	587.41	587.11	587.20	587.63	587.49	586.88	586.19	587.33	587.40	587.70	587.98	588.02	587.20	587.55	587.23	587.73	587.33	587.50	585.13	587.23	587.56	587.56
MWF4	592.69	580.25	578.86	578.55	579.03	578.85	578.75	578.48	578.23	578.53	578.61	578.60	578.77	578.61	578.40	578.37	578.41	578.26	578.15	578.25	577.66	578.41	578.92	578.92
MWF5	591.71	589.84	576.76	576.88	576.80	576.78	576.90	576.64	576.42	576.77	576.93	576.95	577.28	577.06	577.08	576.93	576.97	576.54	576.66	576.70	575.34	576.97	576.83	576.83
PF2	591.51	591.27	580.49	578.43	580.00	579.81	579.81	579.78	579.73	579.72	579.75	580.82	581.10	581.64	580.36	582.84	580.06	581.88	582.60	582.74	579.80	580.06	580.06	579.77
PF3	593.04	591.05	577.92	577.87	577.82	577.82	577.80	577.78	577.74	577.73	577.75	577.77	577.82	577.78	577.73	577.72	577.75	577.75	577.76	577.79	577.58	577.75	577.80	577.80
PF4	592.25	590.65	573.07	573.22	573.22	571.29	573.23	573.25	572.98	573.26	573.24	573.31	573.69	573.58	573.44	573.51	573.46	573.28	573.56	573.57	573.35	573.46	571.38	571.38
PF6	593.55	591.22	584.53	583.21	584.03	584.63	584.76	584.89	584.92	585.12	585.33	585.44	585.66	585.50	585.91	586.66	586.94	587.01	585.44	585.56	585.81	586.94	584.88	584.88
B3	591.39	588.74	581.65	582.24	581.63	581.63	581.89	581.67	581.42	581.80	581.95	582.24	582.54	582.52	582.02	582.70	582.35	582.36	582.33	582.45	581.03	582.35	581.53	581.53
B5	593.12	590.16	584.01	583.97	582.11	582.11	581.69	581.69	581.76	581.83	581.99	581.97	582.05	582.11	582.31	582.19	582.31	582.46	582.73	582.86	582.90	582.31	583.10	583.10
B6	593.03	589.98	572.72	572.72	572.82	572.82	572.72	572.82	572.34	572.98	572.77	572.81	573.33	572.99	573.04	573.02	572.82	572.82	572.95	573.09	573.22	573.06	572.80	572.80
B7	592.49	590.30	572.86	572.81	572.81	572.81	572.88	572.82	572.48	572.85	572.82	572.87	573.21	573.13	573.08	573.10	573.05	572.98	572.82	573.04	573.28	573.05	572.88	572.88
B8	593.03	590.27	572.85	572.90	572.90	572.91	572.82	572.91	572.52	573.04	572.81	572.87	573.37	573.09	573.08	573.05	572.81	573.00	572.86	573.30	573.06	573.06	572.84	572.84
B19	592.50	589.40	581.93	581.90	581.99	582.00	582.00	582.03	581.94	582.01	582.04	582.08	582.23	582.24	582.18	582.17	582.06	581.99	582.06	582.18	581.57	582.06	581.98	581.98
NCREEK	575.12	573.70	570.65	570.60	570.60	570.65	570.65	570.65	570.11	570.88	570.48	570.71	571.21	571.14	571.86	570.75	570.79	570.58	570.82	570.86	571.05	570.79	570.82	570.82
SCREEK	573.70	570.65	570.60	570.60	570.65	570.65	570.65	570.11	570.88	570.48	570.71	571.21	571.14	571.86	570.75	570.79	570.58	570.82	570.86	571.05	570.79	570.82	570.82	570.82
Lower Sand Locations																								
MWS1	591.40	589.13	578.00	580.11	579.78	579.59	579.60	579.52	579.32	579.44	579.47	579.49	579.71	580.31	579.81	580.41	579.75	580.53	580.68	580.49	579.61	579.75	579.63	579.63
MWS2	593.29	591.03	580.42	580.26	580.70	580.70	579.95	579.88	579.68	579.82	579.92	579.84	580.08	580.69	580.17	580.81	580.75	580.87	581.05	580.96	580.01	580.75	579.92	579.92
MWS3	592.51	590.11	580.19	580.12	579.92	579.88	579.82	579.82	579.64	579.76	579.77	579.79	580.02	580.64	580.13	580.74	580.78	580.78	580.98	580.72	579.93	580.29	580.03	580.03
MWS4	593.71	591.19	580.34	580.06	579.86	579.86	579.83	579.76	579.56	579.69	579.69	579.71	579.94	580.56	580.04	579.39	580.02	580.69	580.89	579.27	579.83	580.02	579.84	579.84
PS1	593.55	591.31	580.04	580.92	580.48	580.13	580.36	580.11	579.84	580.03	580.16	580.18	580.54	581.37	580.58	581.34	580.46	582.02	582.21	581.89	580.53	580.46	581.16	581.16
PS2	594.23	591.48	580.72	580.48	580.23	580.00	579.79	579.91	579.71	579.86	579.85	579.86	580.09	580.70	580.20	580.84	580.17	580.88	581.07	580.82	580.04	580.17	579.92	579.92

MRP IS THE MEASURED REFERENCE POINT (USUALLY THE TOP OF LOWER PROTECTIVE CASING)
 MRP FOR THE SCREEK LOCATION IS A NAIL IN A TREE OVERHANGING THE CREEK AT THE NORTHERN PROPERTY BOUNDARY
 MRP FOR THE SCREEK LOCATION IS A MARK ON THE LEDGE OF A HEAD WALL AT THE SOUTHERN CREEK BOUNDARY

"-" MEASUREMENT NOT OBTAINED OR RECORDED
 fmr\k.xls

Table C-2
 PS1 AND PF8 CONTINUOUS WATER LEVEL DATA
 WATER LEVELS RECORDED FROM MAY 28 TO MAY 3, 1993

Time	PF8		PS1	
	TRANS	WATER	TRANS	WATER
	READING	ELEVATION	READING	ELEVATION
28-May-92 06:00	19.06	584.83	17.24	580.39
28-May-92 18:00	19.01	584.58	17.24	580.39
29-May-92 06:00	18.96	584.53	17.17	580.32
29-May-92 18:00	18.96	584.55	17.26	580.41
30-May-92 06:00	19.03	584.60	17.27	580.42
30-May-92 18:00	19.06	584.66	17.33	580.48
31-May-92 06:00	19.18	584.75	17.41	580.56
31-May-92 18:00	18.19	584.78	17.38	580.53
01-Jun-92 06:00	19.20	584.77	17.34	580.48
01-Jun-92 18:00	19.20	584.77	17.31	580.46
02-Jun-92 06:00	19.20	584.77	17.29	580.44
02-Jun-92 18:00	19.21	584.78	17.31	580.46
03-Jun-92 06:00	19.23	584.80	17.29	580.44
03-Jun-92 18:00	19.27	584.84	17.35	580.50
04-Jun-92 06:00	19.33	584.80	17.34	580.48
04-Jun-92 18:00	19.40	584.87	17.38	580.51
05-Jun-92 06:00	19.42	584.98	17.30	580.45
05-Jun-92 18:00	19.48	585.05	17.30	580.45
06-Jun-92 06:00	19.52	585.09	17.27	580.42
06-Jun-92 18:00	19.47	585.04	17.13	580.28
07-Jun-92 06:00	19.43	585.00	17.03	580.18
07-Jun-92 18:00	19.40	584.97	17.02	580.17
08-Jun-92 06:00	19.38	584.95	16.97	580.12
08-Jun-92 18:00	19.38	584.95	16.98	580.13
09-Jun-92 06:00	19.34	584.91	16.92	580.07
09-Jun-92 18:00	19.37	584.94	16.99	580.14
10-Jun-92 06:00	19.37	584.94	16.94	580.09
10-Jun-92 18:00	19.39	584.98	16.97	580.12
11-Jun-92 06:00	19.36	584.93	16.87	580.02
11-Jun-92 18:00	19.35	584.92	16.87	580.02
12-Jun-92 06:00	19.34	584.91	16.84	579.99
12-Jun-92 18:00	19.42	584.99	16.96	580.11
13-Jun-92 06:00	19.49	585.06	16.97	580.12
13-Jun-92 18:00	19.56	585.13	16.99	580.14
14-Jun-92 06:00	19.58	585.15	16.92	580.07
14-Jun-92 18:00	19.56	585.13	16.84	579.99
15-Jun-92 06:00	19.45	585.02	16.84	579.79
15-Jun-92 18:00	19.37	584.94	16.61	579.76
16-Jun-92 06:00	19.31	584.88	16.57	579.72
16-Jun-92 18:00	19.33	584.90	16.68	579.81
17-Jun-92 06:00	19.39	584.98	16.73	579.88
17-Jun-92 18:00	19.51	585.08	16.90	580.05
18-Jun-92 06:00	19.58	585.15	16.91	580.06
18-Jun-92 18:00	19.70	585.27	16.97	580.12
19-Jun-92 06:00	19.78	585.35	17.00	580.15
19-Jun-92 18:00	19.78	585.35	16.90	580.05
20-Jun-92 06:00	19.74	585.31	16.83	579.98
20-Jun-92 18:00	19.70	585.27	16.78	579.93
21-Jun-92 06:00	19.89	585.28	16.77	579.92
21-Jun-92 18:00	19.84	585.21	16.70	579.85
22-Jun-92 06:00	19.80	585.17	16.63	579.78
22-Jun-92 18:00	19.80	585.17	16.71	579.86
23-Jun-92 06:00	19.82	585.19	16.71	579.86
23-Jun-92 18:00	19.72	585.29	16.85	580.00
24-Jun-92 06:00	19.88	585.45	16.98	580.13
24-Jun-92 18:00	19.90	585.47	16.87	580.02
25-Jun-92 06:00	19.87	585.44	16.78	579.93
25-Jun-92 18:00	19.85	585.42	16.76	579.91
26-Jun-92 06:00	19.81	585.38	16.69	579.84
26-Jun-92 18:00	19.85	585.42	16.76	579.91
27-Jun-92 06:00	19.85	585.42	16.70	579.85
27-Jun-92 18:00	19.82	585.39	16.68	579.81
28-Jun-92 06:00	19.74	585.31	16.57	579.72
28-Jun-92 18:00	19.74	585.31	16.62	579.77
29-Jun-92 06:00	19.77	585.34	16.68	579.81
17-Aug-92 18:00	20.45	585.91	16.36	580.68
18-Aug-92 06:00	20.51	585.97	16.41	580.73
18-Aug-92 18:00	20.58	586.04	16.48	580.80
19-Aug-92 06:00	20.64	586.10	16.41	580.73
19-Aug-92 18:00	20.63	586.09	16.32	580.64
20-Aug-92 06:00	20.57	586.03	16.20	580.52
20-Aug-92 18:00	20.54	586.00	16.17	580.49
21-Aug-92 06:00	20.52	585.98	16.08	580.40
21-Aug-92 18:00	20.51	585.97	16.09	580.41
22-Aug-92 06:00	20.49	585.95	16.04	580.36
22-Aug-92 18:00	20.49	585.95	16.06	580.38
23-Aug-92 06:00	20.50	585.96	16.02	580.34
23-Aug-92 18:00	20.52	585.98	16.03	580.35
24-Aug-92 06:00	20.53	585.99	16.09	580.31
24-Aug-92 18:00	20.57	586.03	16.02	580.34
25-Aug-92 06:00	20.62	586.08	16.03	580.35
25-Aug-92 18:00	20.65	586.11	16.04	580.36
26-Aug-92 06:00	20.70	586.16	16.06	580.38
26-Aug-92 18:00	20.73	586.19	16.07	580.39
27-Aug-92 06:00	20.79	586.25	16.04	580.36
27-Aug-92 18:00	20.90	586.36	16.11	580.43
28-Aug-92 06:00	21.06	586.52	16.23	580.55
28-Aug-92 18:00	21.19	586.65	16.30	580.62
29-Aug-92 06:00	21.09	586.55	16.12	580.44
29-Aug-92 18:00	20.37	586.43	16.07	580.39

LOST END OF JUNE TO MID OF AUGUST DATA

30-Aug-92	06:00	20.96	586.42	16.22	580.54
30-Aug-92	18:00	21.05	586.51	16.36	580.68
31-Aug-92	06:00	21.01	586.47	16.31	580.63
31-Aug-92	18:00	20.91	586.37	16.18	580.50
01-Sep-92	06:00	20.84	586.30	16.16	580.48
01-Sep-92	18:00	20.81	586.27	16.16	580.48
02-Sep-92	06:00	20.78	586.24	16.15	580.47
02-Sep-92	18:00	20.86	586.32	16.29	580.61
03-Sep-92	06:00	21.02	586.48	16.45	580.77
03-Sep-92	18:00	21.03	586.49	16.36	580.68
04-Sep-92	06:00	20.87	586.33	16.19	580.51
04-Sep-92	18:00	20.78	586.24	16.25	580.57
05-Sep-92	06:00	20.78	586.22	16.35	580.67
05-Sep-92	18:00	20.82	586.28	16.51	580.83
06-Sep-92	06:00	20.87	586.33	16.57	580.88
06-Sep-92	18:00	20.90	586.36	16.58	580.91
07-Sep-92	06:00	20.91	586.37	16.58	580.88
07-Sep-92	18:00	20.95	586.41	16.58	580.90
08-Sep-92	06:00	21.04	586.50	16.63	580.95
08-Sep-92	18:00	21.14	586.60	16.59	580.91
09-Sep-92	06:00	21.03	586.49	16.34	580.68
09-Sep-92	18:00	21.06	586.55	16.48	580.80
10-Sep-92	06:00	21.26	586.72	16.58	580.90
10-Sep-92	18:00	21.25	586.71	16.42	580.74
11-Sep-92	06:00	21.09	586.55	16.18	580.50
11-Sep-92	18:00	20.97	586.43	16.07	580.38
12-Sep-92	06:00	20.90	586.36	16.00	580.32
12-Sep-92	18:00	20.89	586.35	16.08	580.40
13-Sep-92	06:00	20.87	586.33	16.08	580.40
13-Sep-92	18:00	20.93	586.39	16.19	580.51
14-Sep-92	06:00	20.87	586.43	16.12	580.44
14-Sep-92	18:00	21.01	586.47	16.12	580.44
15-Sep-92	06:00	21.02	586.48	16.06	580.38
15-Sep-92	18:00	21.04	586.50	16.04	580.38
16-Sep-92	06:00	21.05	586.51	15.99	580.31
16-Sep-92	18:00	21.13	586.59	16.06	580.38
17-Sep-92	06:00	21.23	586.69	16.07	580.38
17-Sep-92	18:00	21.29	586.75	16.04	580.38
18-Sep-92	06:00	21.34	586.80	16.00	580.32
18-Sep-92	18:00	21.53	586.99	16.19	580.51
19-Sep-92	06:00	21.42	586.88	15.93	580.25
19-Sep-92	18:00	21.28	586.74	15.99	580.31
20-Sep-92	06:00	21.26	586.72	16.02	580.34
20-Sep-92	18:00	21.28	586.74	16.19	580.51
21-Sep-92	06:00	21.36	586.84	16.32	580.64
21-Sep-92	18:00	21.47	586.93	16.50	580.82
22-Sep-92	06:00	21.57	587.03	16.81	581.13
22-Sep-92	18:00	21.53	586.99	16.82	581.14
23-Sep-92	06:00	21.28	586.74	16.92	581.24
23-Sep-92	18:00	21.115	586.66		
24-Sep-92	06:00	21.017	586.56		Data loss in PS-1 until 10-Oct-92.
24-Sep-92	18:00	21.017	586.56		
25-Sep-92	06:00	21.05	586.59		
25-Sep-92	18:00	21.128	586.67		
26-Sep-92	06:00	21.18	586.72		
26-Sep-92	18:00	21.31	586.85		
27-Sep-92	06:00	21.461	587.00		
27-Sep-92	18:00	21.44	586.98		
28-Sep-92	06:00	21.353	586.89		
28-Sep-92	18:00	21.407	586.95		
29-Sep-92	06:00	21.31	586.85		
29-Sep-92	18:00	21.268	586.81		
30-Sep-92	06:00	21.245	586.79		
30-Sep-92	18:00	21.277	586.82		
01-Oct-92	06:00	21.277	586.82		
01-Oct-92	18:00	21.331	586.87		
02-Oct-92	06:00	21.451	586.99		
02-Oct-92	18:00	21.58	587.12		
03-Oct-92	06:00	21.624	587.16		
03-Oct-92	18:00	21.613	587.15		
04-Oct-92	06:00	21.494	587.03		
04-Oct-92	18:00	21.418	586.96		
05-Oct-92	06:00	21.342	586.88		
05-Oct-92	18:00	21.288	586.83		
06-Oct-92	06:00	21.245	586.79		
06-Oct-92	18:00	21.266	586.81		
07-Oct-92	06:00	21.245	586.79		
07-Oct-92	18:00	21.31	586.85		
08-Oct-92	06:00	21.375	586.92		
08-Oct-92	18:00	21.472	587.01		
09-Oct-92	06:00	21.57	587.11		
09-Oct-92	18:00	21.689	587.23		
10-Oct-92	06:00	21.656	587.20		
10-Oct-92	18:00	21.732	587.27		
11-Oct-92	06:00	21.765	587.31		
11-Oct-92	18:00	21.786	587.33		
12-Oct-92	06:00	21.786	587.33		
12-Oct-92	18:00	21.894	587.43		
13-Oct-92	06:00	21.819	587.38		
13-Oct-92	18:00	21.775	587.32		
14-Oct-92	06:00	21.635	587.18		
14-Oct-92	18:00	21.624	587.16		
15-Oct-92	06:00	21.624	587.16		
15-Oct-92	18:00	21.624	587.16		
16-Oct-92	06:00	21.732	587.27		
16-Oct-92	18:00	21.862	587.40		
17-Oct-92	06:00	21.656	587.20		
17-Oct-92	18:00	21.559	587.10		
18-Oct-92	06:00	21.537	587.08		
18-Oct-92	18:00	21.602	587.14		

19-Oct-92	06:00	21.613	567.15		
19-Oct-92	18:00	21.494	567.03		
20-Oct-92	06:00	21.429	566.97		
20-Oct-92	18:00	21.515	566.97	15.463	560.46
21-Oct-92	06:00	21.624	567.07	15.517	560.52
21-Oct-92	18:00	21.418	566.87	15.214	560.21
22-Oct-92	06:00	21.277	566.73	15.181	560.18
22-Oct-92	18:00	21.277	566.73	15.254	560.35
23-Oct-92	06:00	21.342	566.79	15.517	560.52
23-Oct-92	18:00	21.537	566.99	15.82	560.82
24-Oct-92	06:00	21.819	567.27	16.028	561.03
24-Oct-92	18:00	21.84	567.29	15.909	560.81
25-Oct-92	06:00	21.786	567.24	15.712	560.71
25-Oct-92	18:00	21.808	567.26	15.744	560.74
26-Oct-92	06:00	21.84	567.29	15.798	560.80
26-Oct-92	18:00	21.959	567.41	15.831	560.83
27-Oct-92	06:00	21.83	567.26	15.803	560.80
27-Oct-92	18:00	21.808	567.26	15.562	560.56
28-Oct-92	06:00	21.819	567.27	15.571	560.57
28-Oct-92	18:00	21.851	567.27	15.603	560.60
29-Oct-92	06:00	21.873	567.29	15.625	560.63
29-Oct-92	18:00	21.786	567.21	15.463	560.46
30-Oct-92	06:00	21.7	567.12	15.322	560.32
30-Oct-92	18:00	21.635	567.06	15.322	560.32
31-Oct-92	06:00	21.613	567.03	15.43	560.43
31-Oct-92	18:00	21.57	566.99	15.528	560.53
01-Nov-92	06:00	21.515	566.94	15.562	560.56
01-Nov-92	18:00	21.526	566.95	15.69	560.69
02-Nov-92	06:00	21.635	567.06	15.828	560.83
02-Nov-92	18:00	21.916	567.34	16.286	561.29
03-Nov-92	06:00	21.927	567.35	16.275	561.28
03-Nov-92	18:00	21.83	567.25	16.318	561.32
04-Nov-92	06:00	21.927	567.35	16.632	561.63
04-Nov-92	18:00	21.981	567.40	16.719	561.72
05-Nov-92	06:00	21.873	567.29	16.578	561.56
05-Nov-92	18:00	21.927	567.35	16.708	561.71
06-Nov-92	06:00	21.864	567.30	16.632	561.63
06-Nov-92	18:00	21.721	567.14	16.47	561.47
07-Nov-92	06:00	21.56	567.00	16.437	561.44
07-Nov-92	18:00	21.526	566.95	16.502	561.50
08-Nov-92	06:00	21.472	566.89	16.502	561.50
08-Nov-92	18:00	21.429	566.85	16.502	561.50
09-Nov-92	06:00	21.353	566.77	16.459	561.46
09-Nov-92	18:00	21.364	566.78	16.502	561.50
10-Nov-92	06:00	21.407	566.83	16.524	561.52
10-Nov-92	18:00	21.515	566.94	16.664	561.66
11-Nov-92	06:00	21.613	567.03	16.664	561.66
11-Nov-92	18:00	21.624	567.04	16.513	561.51
12-Nov-92	06:00	21.689	567.11	16.654	561.65
12-Nov-92	18:00	22.111	567.53	17.206	562.21
13-Nov-92	06:00	22.176	567.60	16.649	561.65
13-Nov-92	18:00	22.014	567.43	16.675	561.68
14-Nov-92	06:00	21.873	567.29	16.48	561.48
14-Nov-92	18:00	21.785	567.19	16.448	561.45
15-Nov-92	06:00	21.721	567.14	16.459	561.46
15-Nov-92	18:00	21.635	567.06	16.372	561.37
16-Nov-92	06:00	21.526	566.95	16.296	561.30
16-Nov-92	18:00	21.537	566.96	16.502	561.50
17-Nov-92	06:00	21.635	567.06	16.675	561.66
17-Nov-92	18:00	21.678	567.10	16.578	561.56
18-Nov-92	06:00	21.591	567.01	16.448	561.45
18-Nov-92	18:00	21.515	567.01	16.415	562.21
19-Nov-92	06:00	21.44	566.93	16.448	562.24
19-Nov-92	18:00	21.386	566.86	16.502	562.29
20-Nov-92	06:00	21.353	566.84	16.545	562.34
20-Nov-92	18:00	21.44	566.93	16.729	562.52
21-Nov-92	06:00	21.57	567.06	16.892	562.68
21-Nov-92	18:00	21.743	567.23	16.989	562.78
22-Nov-92	06:00	21.765	567.26	16.859	562.65
22-Nov-92	18:00	21.83	567.32	16.924	562.71
23-Nov-92	06:00	22.046	567.54	17.13	562.92
23-Nov-92	18:00	21.905	567.40	16.784	562.57
24-Nov-92	06:00	21.786	567.28	16.61	562.40
24-Nov-92	18:00	21.721	567.21	16.686	562.48
25-Nov-92	06:00	21.765	567.26	16.794	562.56
25-Nov-92	18:00	21.71	567.20	16.762	562.55
26-Nov-92	06:00	21.818	567.31	16.935	562.73
26-Nov-92	18:00	21.83	567.32	16.881	562.67
27-Nov-92	06:00	21.797	567.29	16.762	562.55
27-Nov-92	18:00	21.743	567.23	16.643	562.43
28-Nov-92	06:00	21.721	567.21	16.61	562.40
28-Nov-92	18:00	21.721	567.21	16.567	562.36
29-Nov-92	06:00	21.721	567.21	16.513	562.30
29-Nov-92	18:00	21.743	567.23	16.491	562.28
30-Nov-92	06:00	21.775	567.27	16.491	562.28
30-Nov-92	18:00	21.851	567.34	16.491	562.28
01-Dec-92	06:00	21.873	567.36	16.361	562.15
01-Dec-92	18:00	21.851	567.34	16.242	562.03
02-Dec-92	06:00	21.894	567.38	16.275	562.07
02-Dec-92	18:00	21.981	567.47	16.242	562.03
03-Dec-92	06:00	21.916	567.41	15.982	561.77
03-Dec-92	18:00	21.678	567.17	15.647	561.44
04-Dec-92	06:00	21.602	567.09	15.722	561.51
04-Dec-92	18:00	21.786	567.28	16.047	561.84
05-Dec-92	06:00	21.873	567.36	16.036	561.83
05-Dec-92	18:00	21.732	567.22	15.614	561.40
06-Dec-92	06:00	21.602	567.09	15.582	561.37
06-Dec-92	18:00	21.656	567.15	15.777	561.57
07-Dec-92	06:00	21.754	567.24	15.842	561.63
07-Dec-92	18:00	21.732	567.22	15.657	561.45

08-Dec-92	06:00	21.856	587.15	15.485	581.29
08-Dec-92	18:00	21.505	587.00	15.354	581.14
09-Dec-92	06:00	21.407	586.90	15.289	581.08
09-Dec-92	18:00	21.396	586.88	15.378	581.17
10-Dec-92	06:00	21.57	587.08	15.679	581.47
10-Dec-92	18:00	21.732	587.22	15.733	581.52
11-Dec-92	06:00	21.83	587.32	15.679	581.47
11-Dec-92	18:00	21.754	587.24	15.452	581.24
12-Dec-92	06:00	21.824	587.11	15.235	581.03
12-Dec-92	18:00	21.515	587.01	15.118	580.91
13-Dec-92	06:00	21.398	586.88	15.04	580.83
13-Dec-92	18:00	21.288	586.78	15.04	580.83
14-Dec-92	06:00	21.256	586.75	15.118	580.91
14-Dec-92	18:00	21.31	586.80	15.268	581.06
15-Dec-92	06:00	21.375	586.87	15.398	581.19
15-Dec-92	18:00	21.494	586.98	15.508	581.30
16-Dec-92	06:00	21.656	587.15	15.657	581.45
16-Dec-92	18:00	21.802	587.08	15.463	581.25
17-Dec-92	06:00	21.58	587.07	15.868	581.46
17-Dec-92	18:00	21.645	587.14	15.863	581.65
18-Dec-92	06:00	21.483	586.97	15.89	581.48
18-Dec-92	18:00	21.353	586.84	15.701	581.49
19-Dec-92	06:00	21.429	586.82	18.038	581.83
19-Dec-92	18:00	21.526	587.02	16.156	581.85
20-Dec-92	06:00	21.856	587.15	16.318	582.11
20-Dec-92	18:00	21.528	587.02	16.004	581.79
21-Dec-92	06:00	21.364	586.85	15.928	581.72
21-Dec-92	18:00	21.407	586.90	18.221	582.01
22-Dec-92	06:00	21.537	587.03	16.318	582.11
22-Dec-92	18:00	21.431	587.00	16.134	582.21
23-Dec-92	06:00	21.57	587.12	16.383	582.46
23-Dec-92	18:00	21.548	587.10	16.177	582.26
24-Dec-92	06:00	21.451	587.00	15.917	582.00
24-Dec-92	18:00	21.201	586.75	15.647	581.73
25-Dec-92	06:00	21.277	586.83	16.004	582.08
25-Dec-92	18:00	21.559	587.11	16.286	582.37
26-Dec-92	06:00	21.375	586.83	15.896	581.98
26-Dec-92	18:00	21.18	586.73	15.56	581.64
27-Dec-92	06:00	20.974	586.52	15.43	581.51
27-Dec-92	18:00	21.007	586.56	15.647	581.73
28-Dec-92	06:00	21.007	586.56	15.583	581.67
28-Dec-92	18:00	20.985	586.54	15.528	581.61
29-Dec-92	06:00	20.985	586.54	15.538	581.62
29-Dec-92	18:00	21.126	586.68	15.744	581.82
30-Dec-92	06:00	21.201	586.75	15.712	581.78
30-Dec-92	18:00	21.288	586.84	15.842	581.92
31-Dec-92	06:00	21.44	586.99	16.058	582.14
31-Dec-92	18:00	21.396	586.95	15.971	582.05
01-Jan-93	06:00	21.234	586.78	15.896	581.98
01-Jan-93	18:00	21.072	586.62	15.896	581.98
02-Jan-93	06:00	20.974	586.52	15.917	582.00
02-Jan-93	18:00	20.896	586.45	15.971	582.05
03-Jan-93	06:00	20.985	586.54	16.275	582.36
03-Jan-93	18:00	21.115	586.67	16.383	582.46
04-Jan-93	06:00	21.245	586.80	16.426	582.51
04-Jan-93	18:00	21.353	586.90	16.513	582.59
05-Jan-93	06:00	21.528	587.08	16.751	582.83
05-Jan-93	18:00	21.256	586.81	16.415	582.50
06-Jan-93	06:00	21.189	586.72	16.643	582.72
06-Jan-93	18:00	21.137	586.68	16.773	582.85
07-Jan-93	06:00	21.115	586.67	16.794	582.86
07-Jan-93	18:00	21.147	586.70	16.858	582.94
08-Jan-93	06:00	21.158	586.71	16.782	582.84
08-Jan-93	18:00	21.093	586.64	16.524	582.60
09-Jan-93	06:00	20.974	586.52	16.318	582.40
09-Jan-93	18:00	20.877	586.43	16.188	582.25
10-Jan-93	06:00	20.812	586.36	16.112	582.19
10-Jan-93	18:00	20.833	586.38	16.156	582.24
11-Jan-93	06:00	20.877	586.43	16.134	582.21
11-Jan-93	18:00	20.877	586.43	16.036	582.12
12-Jan-93	06:00	20.908	586.46	16.004	582.08
12-Jan-93	18:00	20.985	586.54	16.004	582.08
13-Jan-93	06:00	21.147	586.70	16.177	582.26
13-Jan-93	18:00	21.31	586.86	16.199	582.28
14-Jan-93	06:00	21.201	586.75	15.885	581.97
14-Jan-93	18:00	21.082	586.63	15.82	581.90
15-Jan-93	06:00	21.05	586.60	15.939	582.02
15-Jan-93	18:00	21.093	586.64	15.971	582.05
16-Jan-93	06:00	21.104	586.65	15.982	582.06
16-Jan-93	18:00	21.189	586.72	16.058	582.14
17-Jan-93	06:00	21.288	586.84	16.188	582.27
17-Jan-93	18:00	21.321	586.87	15.939	582.02
18-Jan-93	06:00	21.093	586.64	15.494	581.56
18-Jan-93	18:00	20.844	586.38	15.289	581.37
19-Jan-93	06:00	20.736	586.29	15.248	581.33
19-Jan-93	18:00	20.649	586.20	15.224	581.30
20-Jan-93	06:00	20.628	586.18	15.278	581.36
20-Jan-93	18:00	20.649	586.20	15.333	581.41
21-Jan-93	06:00	20.736	586.29	15.506	581.59
21-Jan-93	18:00	20.942	586.49	15.712	581.79
22-Jan-93	06:00	21.104	586.65	15.798	581.88
22-Jan-93	18:00	21.158	586.56	15.82	581.89
23-Jan-93	06:00	21.072	586.47	15.722	581.79
23-Jan-93	18:00	21.017	586.42	15.642	581.91
24-Jan-93	06:00	21.158	586.56	16.177	582.25
24-Jan-93	18:00	21.268	586.67	16.221	582.29
25-Jan-93	06:00	21.007	586.41	15.82	581.89
25-Jan-93	18:00	20.844	586.24	15.809	581.88
26-Jan-93	06:00	20.714	586.11	15.852	581.92
26-Jan-93	18:00	20.833	586.23	16.275	582.35

Pressure Transducer reading off by 1.59 feet
in PF-6 when compared to hand measurement on
22-Dec-92. Drift apparently corrected itself
according to 22-Jan-93 hand measurement.

27-Jan-93	06:00	21.007	566.41	16.361	582.43
27-Jan-93	18:00	20.985	566.39	16.112	582.18
28-Jan-93	06:00	20.82	566.32	15.871	582.04
28-Jan-93	18:00	21.082	566.46	16.198	582.27
29-Jan-93	06:00	21.05	566.45	15.852	581.92
29-Jan-93	18:00	20.855	566.29	15.517	581.59
30-Jan-93	06:00	20.855	566.28	15.722	581.79
30-Jan-93	18:00	20.898	566.30	15.777	581.85
30-Jan-93	06:00	21.18	566.58	16.186	582.28
30-Jan-93	18:00	21.298	566.70	16.08	582.15
01-Feb-93	06:00	21.082	566.46	15.419	581.48
01-Feb-93	18:00	20.844	566.24	15.051	581.12
02-Feb-93	06:00	20.871	566.07	14.91	580.98
02-Feb-93	18:00	20.838	566.04	15.029	581.10
03-Feb-93	06:00	20.703	566.10	15.158	581.23
03-Feb-93	18:00	20.788	566.17	15.203	581.27
04-Feb-93	06:00	20.882	566.08	14.878	580.95
04-Feb-93	18:00	20.573	565.97	14.813	580.88
05-Feb-93	06:00	20.88	566.08	15.019	581.08
05-Feb-93	18:00	20.779	566.18	15.084	581.15
06-Feb-93	06:00	20.88	566.06	14.705	580.78
06-Feb-93	18:00	20.53	565.93	14.829	580.70
07-Feb-93	06:00	20.563	565.96	14.802	580.87
07-Feb-93	18:00	20.725	566.13	15.028	581.10
08-Feb-93	06:00	20.801	566.20	14.856	580.93
08-Feb-93	18:00	20.849	566.05	14.521	580.58
09-Feb-93	06:00	20.552	565.95	14.445	580.52
09-Feb-93	18:00	20.585	566.00	14.84	580.71
10-Feb-93	06:00	20.88	566.06	14.881	580.73
10-Feb-93	18:00	20.828	566.03	14.521	580.58
11-Feb-93	06:00	20.508	565.91	14.328	580.40
11-Feb-93	18:00	20.411	565.81	14.293	580.38
12-Feb-93	06:00	20.53	565.93	14.585	580.88
12-Feb-93	18:00	20.714	566.11	14.791	580.88
13-Feb-93	06:00	20.898	566.30	14.932	581.00
13-Feb-93	18:00	20.985	566.39	14.791	580.86
14-Feb-93	06:00	20.887	566.29	14.458	580.53
14-Feb-93	18:00	20.788	566.17	14.239	580.31
15-Feb-93	06:00	20.88	566.06	14.131	580.20
15-Feb-93	18:00	20.552	565.95	14.033	580.10
16-Feb-93	06:00	20.541	565.94	14.228	580.30
16-Feb-93	18:00	20.798	566.17	14.807	580.88
17-Feb-93	06:00	20.649	566.05	14.183	580.23
17-Feb-93	18:00	20.584	565.98	14.185	580.26
18-Feb-93	06:00	20.585	566.00	14.217	580.29
18-Feb-93	18:00	20.584	565.98	14.174	580.24
19-Feb-93	06:00	20.488	565.90	14.033	580.10
19-Feb-93	18:00	20.488	565.90	14.142	580.21
20-Feb-93	06:00	20.541	565.94	14.183	580.23
20-Feb-93	18:00	20.541	565.94	14.077	580.15
21-Feb-93	06:00	20.552	565.95	14.109	580.18
21-Feb-93	18:00	20.788	566.17	14.488	580.54
22-Feb-93	06:00	20.985	566.38	14.564	580.83
22-Feb-93	18:00	20.952	566.35	14.196	580.27
23-Feb-93	06:00	20.855	566.26	14.012	580.08
23-Feb-93	18:00	20.788	566.17	13.828	579.90
24-Feb-93	06:00	20.617	566.02	13.665	579.74
24-Feb-93	18:00	20.454	565.81	13.546	580.53
25-Feb-93	06:00	20.27	565.63	13.438	580.42
25-Feb-93	18:00	20.194	565.55	13.546	580.53
26-Feb-93	06:00	20.259	565.62	13.741	580.72
26-Feb-93	18:00	20.259	565.62	13.719	580.70
27-Feb-93	06:00	20.218	565.58	13.665	580.65
27-Feb-93	18:00	20.227	565.58	13.73	580.71
28-Feb-93	06:00	20.184	565.54	13.696	580.68
28-Feb-93	18:00	20.205	565.57	13.752	580.73
01-Mar-93	06:00	20.292	565.65	13.925	580.91
01-Mar-93	18:00	20.433	565.79	14.012	580.98
02-Mar-93	06:00	20.498	565.86	14.001	580.98
02-Mar-93	18:00	20.541	565.90	13.914	580.89
03-Mar-93	06:00	20.498	565.86	13.752	580.73
03-Mar-93	18:00	20.444	565.80	13.643	580.62
04-Mar-93	06:00	20.4	565.78	13.685	580.65
04-Mar-93	18:00	20.541	565.90	13.947	580.93
05-Mar-93	06:00	20.638	566.00	13.979	580.96
05-Mar-93	18:00	20.638	566.00	13.892	580.87
06-Mar-93	06:00	20.584	565.94	13.752	580.73
06-Mar-93	18:00	20.519	565.88	13.708	580.69
07-Mar-93	06:00	20.454	565.81	13.687	580.67
07-Mar-93	18:00	20.508	565.87	13.848	580.83
08-Mar-93	06:00	20.806	565.97	14.012	580.99
08-Mar-93	18:00	20.617	565.98	13.979	580.96
09-Mar-93	06:00	20.552	565.91	13.949	580.83
09-Mar-93	18:00	20.422	565.78	13.795	580.78
10-Mar-93	06:00	20.303	565.66	13.892	580.87
10-Mar-93	18:00	20.454	565.81	14.293	581.27
11-Mar-93	06:00	20.422	565.78	14.12	581.10
11-Mar-93	18:00	20.292	565.65	14.001	580.98
12-Mar-93	06:00	20.151	565.51	13.925	580.91
12-Mar-93	18:00	20.097	565.48	14.012	580.99
13-Mar-93	06:00	20.119	565.48	14.228	581.21
13-Mar-93	18:00	20.433	565.79	14.791	581.77
14-Mar-93	06:00	20.595	565.96	14.694	581.67
14-Mar-93	18:00	20.389	565.75	14.087	581.07
15-Mar-93	06:00	20.119	565.48	13.806	580.79
15-Mar-93	18:00	19.967	565.33	13.828	580.81
16-Mar-93	06:00	20.01	565.37	14.033	581.01
16-Mar-93	18:00	20.065	565.43	14.152	581.13
17-Mar-93	06:00	20.097	565.46	14.12	581.10
17-Mar-93	18:00	19.945	565.31	13.925	580.91

Pressure Transducer reading off by 0.78 feet in PS-1 when compared to hand measurement on 24 Feb 93. Drift corrected on subsequent measurements.

18-Mar-93	06:00	19.794	585.15	13.936	580.92
18-Mar-93	18:00	19.864	585.02	14.012	580.99
19-Mar-93	06:00	19.821	584.98	14.163	581.14
19-Mar-93	18:00	19.707	585.07	14.456	581.44
20-Mar-93	06:00	19.783	585.14	14.598	581.58
20-Mar-93	18:00	19.87	585.23	14.883	581.88
21-Mar-93	06:00	19.956	585.32	14.881	581.64
21-Mar-93	18:00	19.902	585.26	14.521	581.50
21-Mar-93	06:00	19.848	585.21	14.488	581.43
21-Mar-93	18:00	19.772	585.13	14.488	581.47
23-Mar-93	06:00	19.783	585.14	14.715	581.70
23-Mar-93	18:00	19.88	585.24	15.019	582.00
24-Mar-93	06:00	19.967	585.33	15.116	582.10
24-Mar-93	18:00	19.956	585.32	15.149	582.13
25-Mar-93	06:00	19.913	585.27	15.289	582.27
25-Mar-93	18:00	19.902	585.26	15.517	582.50
26-Mar-93	06:00	19.891	585.25	15.744	582.72
26-Mar-93	18:00	19.88	585.24	16.015	583.00
27-Mar-93	06:00	19.891	585.25	16.231	583.21
27-Mar-93	18:00	19.978	585.34	16.437	583.42
28-Mar-93	06:00	20.032	585.39	16.589	583.57
28-Mar-93	18:00	20.073	585.44	16.832	583.61
29-Mar-93	06:00	20.129	585.49	16.843	583.62
29-Mar-93	18:00	20.129	585.48	16.81	583.59
30-Mar-93	06:00	20.119	585.48	16.502	583.48
30-Mar-93	18:00	20.108	585.47	16.329	583.31
31-Mar-93	06:00	20.097	585.46	16.186	583.17
31-Mar-93	18:00	20.14	585.50	16.158	583.14
01-Apr-93	06:00	20.227	585.59	16.143	583.13
01-Apr-93	18:00	20.368	585.73	16.091	583.07
02-Apr-93	06:00	20.379	585.74	15.961	582.94
02-Apr-93	18:00	20.249	585.61	15.744	582.72
03-Apr-93	06:00	20.088	585.45	15.517	582.50
03-Apr-93	18:00	19.943	585.31	15.376	582.36
04-Apr-93	06:00	19.87	585.23	15.333	582.31
04-Apr-93	18:00	19.783	585.14	15.246	582.23
05-Apr-93	06:00	19.74	585.10	15.224	582.20
05-Apr-93	18:00	19.761	585.12	15.289	582.27
06-Apr-93	06:00	19.751	585.11	15.149	582.13
06-Apr-93	18:00	19.751	585.11	15.105	582.09
07-Apr-93	06:00	19.718	585.08	14.986	581.97
07-Apr-93	18:00	19.729	585.08	14.973	581.96
08-Apr-93	06:00	19.761	585.12	14.9	581.88
08-Apr-93	18:00	19.902	585.26	14.986	581.97
09-Apr-93	06:00	20	585.28	14.91	581.89
09-Apr-93	18:00	20.131	585.51	14.954	581.93
10-Apr-93	06:00	20.249	585.61	14.869	581.87
10-Apr-93	18:00	20.238	585.60	14.618	581.60
11-Apr-93	06:00	20.129	585.48	14.434	581.41
11-Apr-93	18:00	20.087	585.46	14.456	581.44
12-Apr-93	06:00	20.054	585.41	14.326	581.31
12-Apr-93	18:00	19.935	585.30	14.207	581.19
13-Apr-93	06:00	19.87	585.23	14.12	581.10
13-Apr-93	18:00	19.891	585.25	14.152	581.13
14-Apr-93	06:00	19.891	585.25	14.131	581.11
14-Apr-93	18:00	19.935	585.30	14.207	581.19
15-Apr-93	06:00	19.978	585.34	14.207	581.19
15-Apr-93	18:00	20.087	585.46	14.336	581.32
16-Apr-93	06:00	20.182	585.52	14.239	581.22
16-Apr-93	18:00	20.182	585.52	14.066	581.05
17-Apr-93	06:00	20.108	585.47	13.968	580.95
17-Apr-93	18:00	20.032	585.39	13.806	580.79
18-Apr-93	06:00	19.943	585.31	13.663	580.65
18-Apr-93	18:00	19.935	585.30	13.752	580.73
19-Apr-93	06:00	19.967	585.33	13.773	580.75
19-Apr-93	18:00	19.943	585.31	13.708	580.69
20-Apr-93	06:00	19.978	585.34	13.849	580.83
20-Apr-93	18:00	20.021	585.38	13.784	580.76
21-Apr-93	06:00	19.978	585.34	13.663	580.65
21-Apr-93	18:00	19.87	585.23	13.546	580.53
22-Apr-93	06:00	19.859	585.22	13.687	580.67
22-Apr-93	18:00	19.902	585.22	13.817	580.55
23-Apr-93	06:00	19.967	585.29	13.838	580.57
23-Apr-93	18:00	19.935	585.26	13.876	580.41
24-Apr-93	06:00	19.815	585.14	13.514	580.24
24-Apr-93	18:00	19.848	585.17	13.719	580.43
25-Apr-93	06:00	19.913	585.23	13.773	580.50
25-Apr-93	18:00	19.88	585.20	13.589	580.32
26-Apr-93	06:00	19.794	585.11	13.47	580.20
26-Apr-93	18:00	19.686	585.01	13.351	580.08
27-Apr-93	06:00	19.556	584.88	13.319	580.05
27-Apr-93	18:00	19.545	584.87	13.384	580.12
28-Apr-93	06:00	19.545	584.87	13.514	580.24
28-Apr-93	18:00	19.599	584.92	13.633	580.36
29-Apr-93	06:00	19.631	584.95	13.633	580.36
29-Apr-93	18:00	19.707	585.03	13.698	580.43
30-Apr-93	06:00	19.751	585.07	13.654	580.38
30-Apr-93	18:00	19.729	585.05	13.524	580.25
01-May-93	06:00	19.675	585.00	13.373	580.10
01-May-93	18:00	19.642	584.96	13.373	580.10
02-May-93	06:00	19.621	584.94	13.351	580.08
02-May-93	18:00	19.653	584.97	13.492	580.22
03-May-93	06:00	19.664	584.98	13.427	580.16

APPENDIX D

Appendix D-1
FIRST QUARTERLY GROUNDWATER SAMPLING DATA REPORT
May, 1992

This data report summarizes the first of four quarterly groundwater sampling events as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Sampling was performed by GeoTrans personnel between May 20 and May 27, 1992 with analytical services provided by General Testing Corporation Inc.

Twelve of the 16 monitor wells onsite were sampled. Three of six existing, and all five of the new, monitor wells completed in the fill material were sampled. The three existing wells were B3, B7, and B19. The five new wells were MWF1 through MWF5. The four new wells completed in the lower sand layer were also sampled, these wells were MWS1 through MWS4. All well locations are shown in Figure D-1. Existing wells B5, B6, and B8 were not sampled for water quality due to slow recharge in B5 and presence of dense nonaqueous phase liquid (DNAPL) in B6 and B8. However, a groundwater sample from well MWF2 that had DNAPL present was collected.

Prior to sampling, three well volumes were purged from each well. The well volume was calculated based on the following equation:

$$\text{Well Volume} = (\text{well depth} - \text{depth to water}) \times (\text{well radius})^2 \\ \times 3.14 \times 7.48 \text{ gal/ft}^3$$

Note: The units for well radius, depth to water, and well depth are in ft.

After each well volume was purged, a sample of water was collected and measured for the field parameters pH, specific conductance, and temperature. Groundwater samples for the laboratory were collected after the field parameters had stabilized over a minimum of three consecutive well volumes to within \pm ten percent of each field parameter. The final field parameters, recorded prior to sampling, are shown in Table D-1.

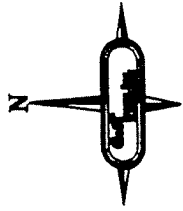
The well sampling and purge order was based on anticipated contaminant concentration and proceeded from the anticipated lowest concentration to the highest concentration. Wells were purged and sampled using dedicated sampling equipment. A variable rate, electric, submersible pump was employed in the lower sand wells. A reduced flow rate of approximately 100 ml/min was used during collection of volatile compounds to reduce agitation and collect a representative sample.

A stainless steel bailer was employed for purging and sampling in all fill wells except for wells B19 and MWF2. A 1½-inch teflon bailer was used in well B19 because the well diameter was smaller than other fill wells onsite. The sample removal method for MWF2 involved extending tubing from a peristaltic pump into the water column overlying a DNAPL layer and pumping at a low rate until all nonvolatile compound sample bottles were filled. Volatile compound samples were collected with a new disposable teflon bailer.

For all wells except MWF2, the sample collection order was as follows. Volatile organic compounds (VOCs) were sampled first, followed by filtered Target Analyte List (TAL) metals and cyanide, semivolatile organic compounds, pesticides/PCBs, and total organic carbon (TOC). The samples were collected in their respective containers except for the TAL metals. These were collected by filling a clean, one-liter glass jar with sample water, then pump the sample water through a 0.45 micron, positive pressure, in-line filter into the appropriately preserved sample container using a peristaltic sampling pump.

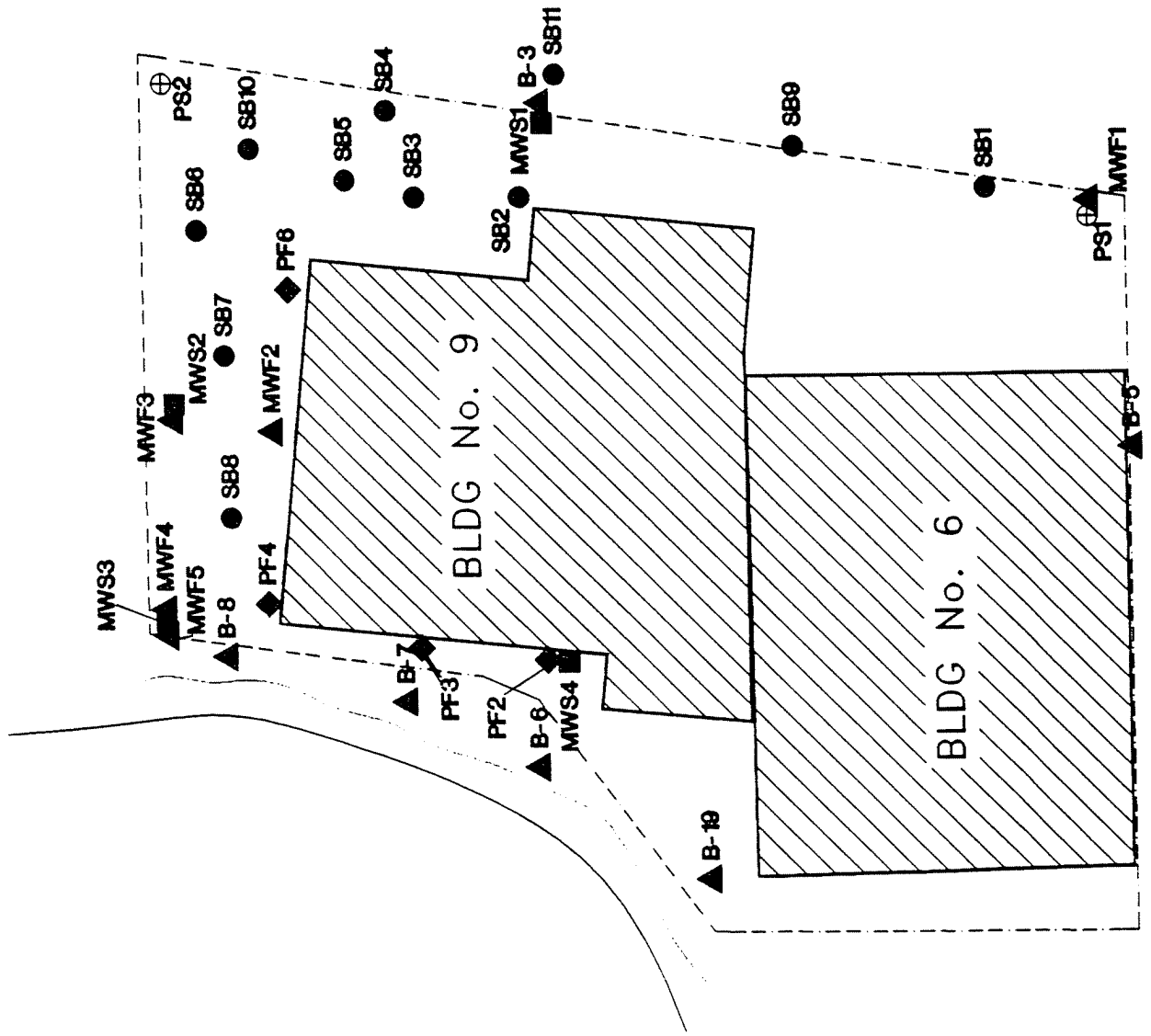
Upon collection, all samples were placed immediately on ice in coolers to ensure preservation. All excess well water removed while purging and sampling was placed in storage tanks onsite for disposal.

A list of the individual analytes is presented in Table D-2. The results of the organic and inorganic chemical analysis are presented in Tables D-3 and D-4, respectively.



Legend

- Soil Borings (11)
- ▲ Fill Monitor Wells (10)
includes "B" Series Wells
- ◆ Fill Piezometers (4)
- Lower Sand Monitor Wells (4)
- ⊕ Lower Sand Piezometers (2)



GeoTrans, Inc.
GROUNDWATER SPECIALISTS

Location of the RI/FS
Monitoring System

PREPARED BY: T.A.	DATE: 1/7/93	PLAN
CHECKED BY: T.A.	REVISION: 1/7/93	D-1
SCALE BY: J.P.S.	PROJECT NO: 76-0022-000	

Table D-1. First quarter final field parameters.

Well	pH	Conductivity (μ ohms/cm)	Temperature (°F)
MWF1	7.6	1500	52.5
MWF2	6.6	2050	-
MWF3	7.4	560	-
MWF4	7.7	620	51.6
MWF5	9.1	700	-
MWS1	7.3	1580	59.0
MWS2	7.3	1600	55.8
MWS3	7.4	1680	54.1
MWS4	7.4	1620	54.5
B3	7.50	1740	52.5
B7	7.02	2400	-
B19	7.50	1300	56.3

Note: (-) Indicates parameters not measured or equipment malfunction.

Table D-2. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	Pesticides and PCBs (28)
<p>Acetone Benzene Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes</p>	<p>4 Chloro-3 methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitrophenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol</p>	<p>Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane</p>	<p>Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide</p>	<p>alpha-BHC beta-BHC delta-BHC gamma-BHC (Lindane) Heptachlor Aldrin Heptachlor epoxide Endosulfan I Dieldrin 4,4'-DDE Endrin Endosulfan II 4,4'-DDD Endosulfan sulfate 4,4'-DDT Methoxychlor Endrin ketone Endrin aldehyde alpha-Chlordane gamma-Chlordane Toxaphene PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 PCB-1260</p>
Miscellaneous (1)				Total Organic Carbon

Table D-3.
GROUNDWATER ORGANIC RESULTS FOR MAY, 1992

Analysis (ug/l)	Well Identification											
	B3	B7	B19	MWP1	MWP2	MWP3	MWP4	MWP5	MWS1	MWS2	MWS3	MWS4
Volatile Organic Compounds												
(m+p) Xylenes	<5	300 J	<5	<5	1500 J	4 J	380 J	43 J	<5	<5	<5	<5
Acetone	<10	<500	<10	6 J	<1000	<10	<50	14	5	<10	<10	<10
Benzene	1 J	510 J	<5	<5	3700 J	1 J	220 J	35 J	<5	<5	<5	<5
Ethylbenzene	<5	580 J	<5	<5	390 J	1 J	<25	<5	<5	<5	<5	<5
Toluene	<5	120 J	<5	<5	1900 J	<5	<25	12 J	<5	<5	<5	<5
o-Xylene	<5	170 J	<5	<5	750 J	3 J	310 J	50 J	<5	<5	<5	<5
Semivolatile Organic Compounds												
2,4-Dimethylphenol	<10	<10	<10	<10	35 J	2 J	1 J	<10	<10	<10	<10	<10
2-Methylnaphthalene	<10	240	<10	<10	1500	11	450	50	<10	<10	<10	<10
2-Methylphenol	<10	<10	<10	<10	12	1 J	<10	<10	<10	<10	<10	<10
4-Methylphenol	<10	<10	<10	<10	36	<10	<10	<10	<10	<10	<10	<10
Acenaphthene	6 J	84	<10	1 J	540	16	130	140	<10	<10	<10	<10
Acenaphthylene	<10	62	<10	<10	79	15	9 J	54	<10	<10	<10	<10
Anthracene	<10	16	<10	<10	240	20	7 J	75	<10	<10	<10	<10
Benzo(a)anthracene	<10	2 J	<10	<10	130	38	<10	53	<10	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10	<10	120 J	18 J	<10	42 J	<10	<10	<10	<10
Benzo(b)fluoranthene	<10	<10	<10	<10	52 J	31 J	<10	22 J	<10	<10	<10	<10
Benzo(g,h,i)perylene	<10	<10	<10	<10	110 J	19 J	<10	<10	<10	<10	<10	<10
Benzo(k)fluoranthene	<10	<10	<10	<10	70 J	37 J	<10	20 J	<10	<10	<10	<10
Chrysene	<10	2 J	<10	<10	120	37	<10	47	<10	<10	<10	<10
Dibenzofuran	<10	5 J	<10	<10	35	11	5 J	7 J	<10	<10	<10	<10
Fluoranthene	<10	9 J	<10	<10	240	77	2 J	81	<10	<10	<10	<10
Fluorene	<10	66	<10	<10	290	21	43	100	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	<10	<10	<10	<10	60 J	17 J	<10	15 J	<10	<10	<10	<10
Naphthalene	<10	2100	<10	<10	6700	58	2400	19	<10	<10	<10	<10
Phenanthrene	<10	78	<10	<10	890	81	35	140	<10	<10	<10	<10
Phenol	<10	<10	<10	<10	30	<10	10	<10	<10	<10	<10	<10
Pyrene	1 J	16	<10	1 J	440	90	3 J	160	<10	<10	<10	<10
Total Organic Carbon (8)	5.9	22	8.1	11	48	10	11	19	1.6	1.7	1.6	1.9

J = Estimated values, analyte detected below contract required detection limits.

Table D-4
GROUNDWATER INORGANIC RESULTS

Analysis (ug/l)	Well Identification							
	B3	B7	B19	MWF1	MWF2	MWF3	MWF4	MWF5
Aluminum	<64.5	<64.5	<64.5	<64.5	<64.5	379	<64.5	119
Arsenic	6.6	3.2	3.3	<3	<3	<3	3.6	3.1
Barium	<1	148	15.9 J	37.5 J	401	575 J	126 J	87.9
Calcium	376000 J	396000	152000 J	200000 J	289000	86600 J	93000 J	74400
Cobalt	<16.6	<16.6	<16.6	<16.6	21.3	<16.6	<16.6	<16.6
Iron	2720 J	243	220 J	<11.4	33000	8530 J	2760 J	<11.4
Lead	<19.1	<19.1	<19.1	<19.1	<19.1	7.9	<19.1	<19.1
Magnesium	586000 J	87700	267000 J	294000 J	120000	21500 J	32100 J	37900
Manganese	546	596 J	197	124	2380 J	275	271	307 J
Nickel	<7.8	<7.8	<7.8	<7.8	118	<7.8	<7.8	<7.8
Potassium	13600	6400	<241	11400	12900	<241	<241	9260
Sodium	142000 J	46200	52600 J	65900 J	33700	13700 J	13400 J	24700
Zinc	<3.9	<3.9	23	<3.9	<3.9	8.3	4.3	<3.9
Cyanide	64.7	280	275	<20	159	26.3	44.2	26.4

J = Estimated value, analyte detected below contract required detection limits.

Table D-4 (continued)
GROUNDWATER INORGANIC RESULTS

Analysis (ug/l)	Well Identification			
	MWS1	MWS2	MWS3	MWS4
Aluminum	<64.5	<64.5	<64.5	<64.5
Arsenic	12.3	<3	11.3	10.8
Barium	<1	13.5 J	21.1 J	22.1 J
Calcium	580000 J	652000 J	642000 J	641000 J
Cobalt	<16.6	<16.6	<16.6	<16.6
Iron	1410 J	1350 J	688 J	1310 J
Lead	<19.1	<19.1	<19.1	<19.1
Magnesium	57800 J	37200 J	35200 J	37600 J
Manganese	38.5	25.5	30	32.6
Nickel	<7.8	<7.8	<7.8	<7.8
Potassium	<241	<241	<241	<241
Sodium	24500 J	31400 J	44300 J	33700 J
Zinc	<3.9	4.5	7.7	30
Cyanide	<20	<20	<20	<20

J = Estimated value, analyte detected below contract required detection limits.

Appendix D-2
SECOND QUARTERLY GROUNDWATER SAMPLING DATA REPORT
August, 1992

This data report summarizes the second of four quarterly groundwater sampling events as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Sampling was performed by GeoTrans personnel on August 17 and 18, 1992. Analytical services were provided by General Testing Corporation Inc. (Rochester, NY).

Twelve of the 16 monitor wells onsite were sampled. Four of six "B" wells and four of five "MWF" wells completed in the fill material were sampled. The four "B" wells were B3, B6, B7, and B19. The four "MWF" wells were MWF1, MWF3, MWF4, and MWF5. The four "MWS" wells completed in the lower sand layer (MWS1 through MWS4) were also sampled. All well locations are shown in Figure D2-1.

Well B5 was not sampled due to slow recharge. Well B8 was not sampled due to the presence of dense nonaqueous phase liquid (DNAPL). A groundwater sample from well B6 was collected even though the presence of a thin layer of DNAPL was detected. This sample was collected to compare the dissolved constituents in B6 with the dissolved constituents observed in well MWF2, which also has DNAPL present in the well. Well MWF2 was sampled during the first quarter sampling round.

Prior to sampling, a minimum of three well volumes were purged from each well. The well volume was calculated based on the following equation:

$$\text{Well Volume} = (\text{well depth} - \text{depth to water}) \times (\text{well radius})^2 \\ \times 3.14 \times 7.48 \text{ gal/ft}^3$$

Note: The units for well radius, depth to water, and well depth are in ft.

After each well volume was purged, a sample of water was collected and measured in the field for pH, specific conductance, and temperature. Groundwater samples for the laboratory were collected after the field

parameters had stabilized over a minimum of three consecutive well volumes to within \pm ten percent of each parameter. The final field parameters, recorded prior to sampling, are shown in Table D2-1.

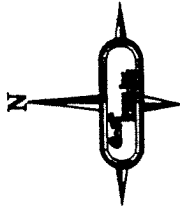
The well sampling and purge order was based on anticipated contaminant concentration and proceeded from the lowest to highest concentration. Wells were purged and sampled using dedicated sampling equipment.

A stainless steel bailer was employed for purging and sampling in all fill wells, except wells B6, B19. A 1½-inch teflon bailer was used in well B19 because the well diameter was smaller than other fill wells onsite. A disposable teflon bailer was employed for purging and sampling well B6. For well B6, the bailer was lowered into the water column overlying the approximate 0.05 ft thick DNAPL layer. The bailer was removed slowly so as not to emulsify the DNAPL in the water column.

For all wells, volatile organic compounds (VOCs) were sampled first followed by filtered (TAL) metals and cyanide, and semivolatile organic compounds. The samples were collected in their respective containers except for the TAL metals. This sample was collected by filling a clean, one-liter glass jar with sample water, then pumping the sample water through a 0.45 micron, positive pressure, in-line filter into the appropriately preserved sample container using a peristaltic sampling pump.

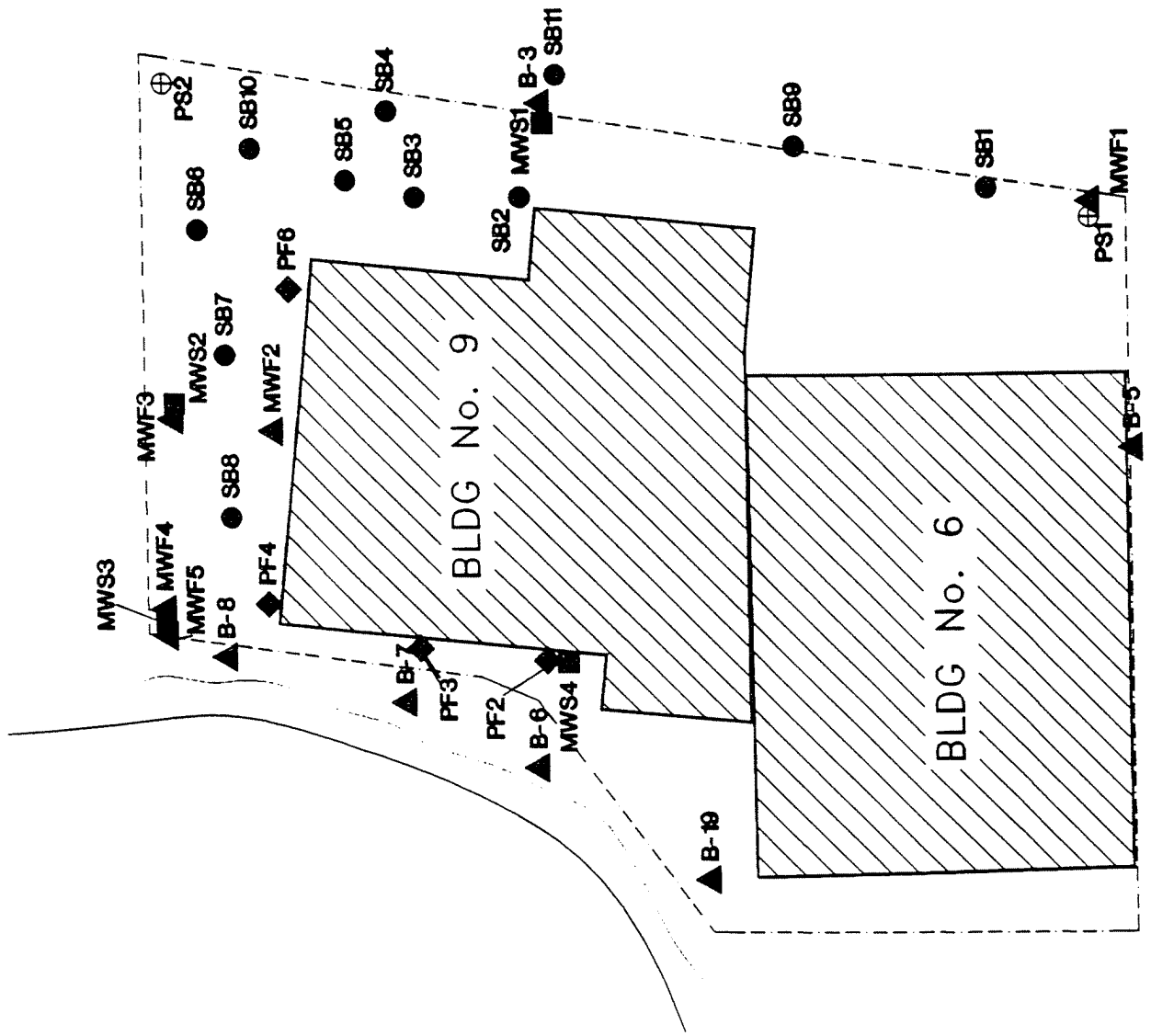
Upon collection, all samples were placed immediately on ice in coolers to ensure preservation. All excess well water removed while purging and sampling was placed in storage tanks onsite for disposal.

A list of the individual analytes is presented in Table D2-2. The results of the organic and inorganic chemical analysis are presented in Tables D2-3 and D2-4, respectively.



Legend

- Soil Borings (11)
- ▲ Fill Monitor Wells (10)
includes "B" Series Wells
- ◆ Fill Piezometers (4)
- Lower Sand Monitor Wells (4)
- ⊕ Lower Sand Piezometers (2)



GeoTrans, Inc.
GROUNDWATER SPECIALISTS

Location of the RI/FS
Monitoring System

PREPARED BY: T.A.	DATE: 1/7/92/MS	PLATE
CHECKED BY: T.A.	REVISED: 1/7/92/MS	D2-1
DRAWN BY: J.C.P.	RELEASED TO: TRANSCORP	

Table D2-1. Final field parameters for second quarter sampling.

Well	pH	Conductivity (μ ohms/cm)	Temperature (°F)
MWF1	7.3	2750	58.3
MWF3	7.0	620	59.2
MWF4	7.1	620	57.6
MWF5	7.4	610	57.1
MWS1	8.3	2400	56.5
MWS2	7.3	2300	54.7
MWS3	7.3	2400	54.1
MWS4	7.3	2500	56.5
B3	7.1	3400	56.7
B6	6.7	1760	56.3
B7	6.4	2200	56.1
B19	7.0	2000	57.4

Table D2-2. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	Pesticides and PCBs (28)
Acetone Benzene Bromodichloromethane Bromoforn Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene	4 Chloro-3 methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitrophenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide	alpha-BHC beta-BHC delta-BHC gamma-BHC (Lindane) Heptachlor Aldrin Heptachlor epoxide Endosulfan I Dieldrin 4,4'-DDE Endrin Endosulfan II 4,4'-DDD Endosulfan sulfate 4,4'-DDT Methoxychlor Endrin ketone Endrin aldehyde alpha-Chlordane gamma-Chlordane Toxaphene PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 PCB-1260
Miscellaneous (1)				Total Organic Carbon

Table D2-3.
GROUNDWATER ORGANIC RESULTS FOR AUGUST, 1992

Analysis (ug/l)	Well Identification						MWFP3	MWFP4	MWFP5
	B3	B6	B7	B19	MWFP1	MWFP2			
Volatile Organic Compounds									
(m,p) Xylenes	<10	7 J	400	<5	<5	<5	400	100	
Acetone	<10	<100	<100	<10	<10	<10	<100	<50	
Benzene	<10	14	300	<5	<5	<5	310	46	
Ethylbenzene	<10	58	710	<5	<5	<5	46 J	62	
Toluene	<10	<5	170	<5	<5	<5	24 J	20 J	
o-Xylene	<10	15	220	<5	<5	<5	260	62	
Semivolatile Organic Compounds									
1,2,4-Trichlorobenzene	<10	<100	10 UJ	<10	<10	<10	<10	<10	
2,4-Dichlorophenol	<10	<100	10 UJ	<10	<10	<10	<10	<10	
2,4-Dimethylphenol	<10	<100	10 UJ	<10	<10	<10	3 J	20	
2-Methylnaphthalene	<10	210	580 J	<10	<10	2 J	550	61	
2-Methylphenol	<10	<100	<10	<10	<10	<10	<10	<10	
2-Nitrophenol	<10	<100	10 UJ	<10	<10	<10	<10	<10	
4-Chloro-3-methylphenol	<10	<100	10 UJ	<10	<10	<10	<10	<10	
4-Chloroaniline	<10	<100	10 UJ	<10	<10	<10	<10	<10	
4-Methylphenol	<10	<100	<10	<10	<10	<10	<10	<10	
Acenaphthene	1 J	830	84	<10	<10	12 J	120	100	
Acenaphthylene	<10	81 J	47	<10	<10	<10	9 J	29	
Anthracene	<10	580	13	<10	<10	<10	9 J	48	
Benzo(a)anthracene	<10	410	3 J	<10	<10	<10	<10	25	
Benzo(a)pyrene	<10	310	2 J	<10	<10	<10	<10	19 J	
Benzo(b)fluoranthene	<10	160	2 J	<10	<10	<10	<10	11 J	
Benzo(g,h,i)perylene	<10	79 J	10 UJ	<10	<10	<10	<10	7	
Benzo(k)fluoranthene	<10	200	3 J	<10	<10	<10	<10	11 J	
Benzoic acid	<50	<500	50 UJ	<50	<50	<50	<50	<50	
Chrysaene	<10	380	2 J	<10	<10	<10	<10	23	
Di-n-Butylphthalate	<10	<100	<10	1 J	<10	<10	<10	<10	
Di-n-octyl phthalate	<10	<100	10 UJ	<10	<10	<10	<10	<10	
Dibenz(a,h)anthracene	<10	38 J	10 UJ	<10	<10	<10	<10	<10	
Dibenzofuran	<10	53 J	5 J	<10	<10	<10	<10	<10	
Fluoranthene	<10	640	4 J	<10	<10	1 J	6 J	6 J	
Fluorene	<10	560	69	<10	<10	4 J	42	72	
Hexachlorobutadiene	<10	<100	10 UJ	<10	<10	<10	<10	<10	
Indeno(1,2,3-cd)pyrene	<10	67 J	10 UJ	<10	<10	<10	<10	5 J	
Isophorone	<10	<100	10 UJ	<10	<10	<10	<10	<10	
Naphthalene	<10	460	2900	<10	3 J	18	2400	19	
Nitrobenzene	<10	<100	10 UJ	<10	<10	<10	<10	<10	
Phenanthrene	<10	1500	79	<10	<10	4 J	50	140	
Phenol	<10	<100	<10	<10	<10	<10	<10	18	
Pyrene	<10	1000	12	<10	<10	1 J	3 J	66	
bis(-2-Chloroethoxy)Methane	<10	<100	10 UJ	<10	<10	<10	<10	<10	

J = Estimated values, analyte detected below contract required detection limits.

UJ = Reported results and nondetects were flagged as estimates due to low internal standard recovery.

-/- = Sample not analyzed.

Table D2-4
GROUNDWATER INORGANIC RESULTS FOR AUGUST, 1992

Analysis (ug/l)	Well Identification									
	B3	B6	B7	B19	MWF1	MWF3	MWF4	MWF5		
Aluminum	<49.4	<49.4	<49.4	<49.4	<49.4	<49.4	<49.4	<49.4	<49.4	<49.4
Antimony	182	101	126	73.8	154	<39.3	44.8 J	<50		
Arsenic	6 UJ	6 UJ	6 UJ	6 UJ	11.6 J	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
Barium	<0.6	98.4	132	<7.6	<0.6	538	138	74.8		
Calcium	384000 J	361000 J	415000 J	148000 J	471000 J	97100 J	94800 J	77800 J		
Chromium	4.1 J	2.6 J	22.6 J	1.5 UJ	3 J	4.1 J	1.5 UJ	1.5 UJ		
Cobalt	<10.9	<10.9	<10.9	<10.9	<10.9	<10.9	<10.9	<10.9		
Copper	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5		
Iron	1800 J	299 J	205 J	95.8 J	1430 J	12900 J	4100 J	98.2 J		
Lead	<20	<2	<2	<2	<20	<2	<2	<2		
Magnesium	574000 J	56200 J	91100 J	248000 J	404000 J	25000 J	30400 J	39900 J		
Manganese	606 J	848 J	491 J	70.2 J	235 J	311 J	337 J	584 J		
Nickel	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5		
Potassium	8210 J	7710 J	5670	<3170	8940 J	<3690	<2160	7020 J		
Selenium	<14	1.5 J	<1.4	1.5 J	<14	<1.4	<1.4	<1.4		
Silver	23 J	8 J	11 J	8 J	23 J	4.4 UJ	4.4 UJ	4.4 UJ		
Sodium	166000 J	47500 J	45600 J	57200 J	108000 J	15500 J	13700 J	26300 J		
Vanadium	98.1	<22.2	<29.1	<38.9	51.5	15.6 UJ	15.6 UJ	15.6 UJ		
Zinc	<3.4	<3.4	<3.4	8.2 J	<3.4	<3.4	9.5	3.8		
Cyanide	53	433	379	266	<10	<10	36.4	28.1		

J = Estimated value, analyte detected below contract required detection limits.

UJ = Reported results and nondetects were flagged as estimated due to low internal standard recovery.

Table D2-4 (continued)
GROUNDWATER INORGANIC RESULTS FOR AUGUST, 1992

Analysis (ug/l)	Well Identification			
	MWS1	MWS2	MWS3	MWS4
Aluminum	<49.4	<49.4	<49.4	<49.4
Antimony	155	162	168	150
Arsenic	6.8 J	6 UJ	8.1 J	9 J
Barium	<0.6	<0.6	<0.6	<0.6
Calcium	572000 J	600000 J	655000 J	610000 J
Chromium	1.5 UJ	1.5 UJ	2.4 J	5.9 J
Cobalt	<10.9	<10.9	<10.9	<10.9
Copper	<2.5	<2.5	2.5	<2.5
Iron	972 J	1700 J	697 J	1300 J
Lead	<20	<20	<20	<20
Magnesium	53000 J	34200 J	34400 J	32700 J
Manganese	35 J	25.6 J	21 J	22.9 J
Nickel	<5.5	<5.5	<5.5	<5.5
Potassium	9810 J	<684	<581	412 J
Selenium	<14	<14	<14	<14
Silver	17 J	20 J	23 J	20 J
Sodium	32000 J	31800 J	39700 J	36100 J
Vanadium	<30.7	<28.6	15.6 UJ	15.6 UJ
Zinc	<3.4	<3.4	6.6	9
Cyanide	<10	<10	<10	<10

J = Estimated value, analyte detected below contract required detection limits.

UJ = Reported results and nondetects were flagged as estimated due to low internal standards.

Appendix D-3
THIRD QUARTERLY GROUNDWATER SAMPLING DATA REPORT
November, 1992

This data report summarizes the third of four quarterly groundwater sampling events as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Sampling was performed by GeoTrans personnel on November 18, 1992 with analytical services provided by General Testing Corporation Inc.

Seven of the 12 monitor wells completed in the fill wells onsite were sampled. Three of six "B" wells and four of the "MWF" monitor wells were sampled. The three "B" wells sampled were B3, B7, and B19. The four "MWF" wells were MWF1, MWF3, MWF4, and MWF5. Wells B5, B6, B8, and MWF2 were not sampled due to slow recharge in B5 and presence of dense nonaqueous phase liquid (DNAPL) in B6, B8, and MWF2. All well locations are shown in Figure D3-1. The four "MWS" wells completed in the lower sand layer were not sampled. Wells MWS1 through MWS4 were not sampled because no contaminants linked to manufactured gas plant contaminants were observed during the two previous sampling rounds.

Prior to sampling the fill wells, a minimum of three well volumes were purged from each well. The well volume was calculated based on the following equation:

$$\text{Well Volume} = (\text{well depth} - \text{depth to water}) \times (\text{well radius})^2 \\ \times 3.14 \times 7.48 \text{ gal/ft}^3$$

Note: The units for well radius, depth to water, and well depth are in ft.

After each well volume was purged except for well B3, a sample of water was collected and measured for the field parameters pH, specific conductance, and temperature. Laboratory samples were collected after the individual field parameters had stabilized to within \pm ten percent for three

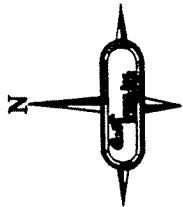
consecutive well volumes. The final field parameters, recorded prior to sampling, are shown in Table D3-1.

For well B3, a groundwater sample was collected after a single set of field parameter measurements were recorded. The measurements were recorded after three well volumes had been purged. Field parameters were only recorded once because the measurement probes were being used at another well during purging of well B3 and an obstruction at depth in well B3 significantly reduced the rate of recharge into the well.

The well sampling and purge order was based on anticipated contaminant concentration and proceeded from the lowest to highest concentration. Wells were purged and sampled using dedicated sampling equipment. A stainless steel bailer was employed for purging and sampling in all fill wells except for well B19. A 1½-inch teflon bailer was used in well B19 because the well diameter was smaller than other fill wells onsite.

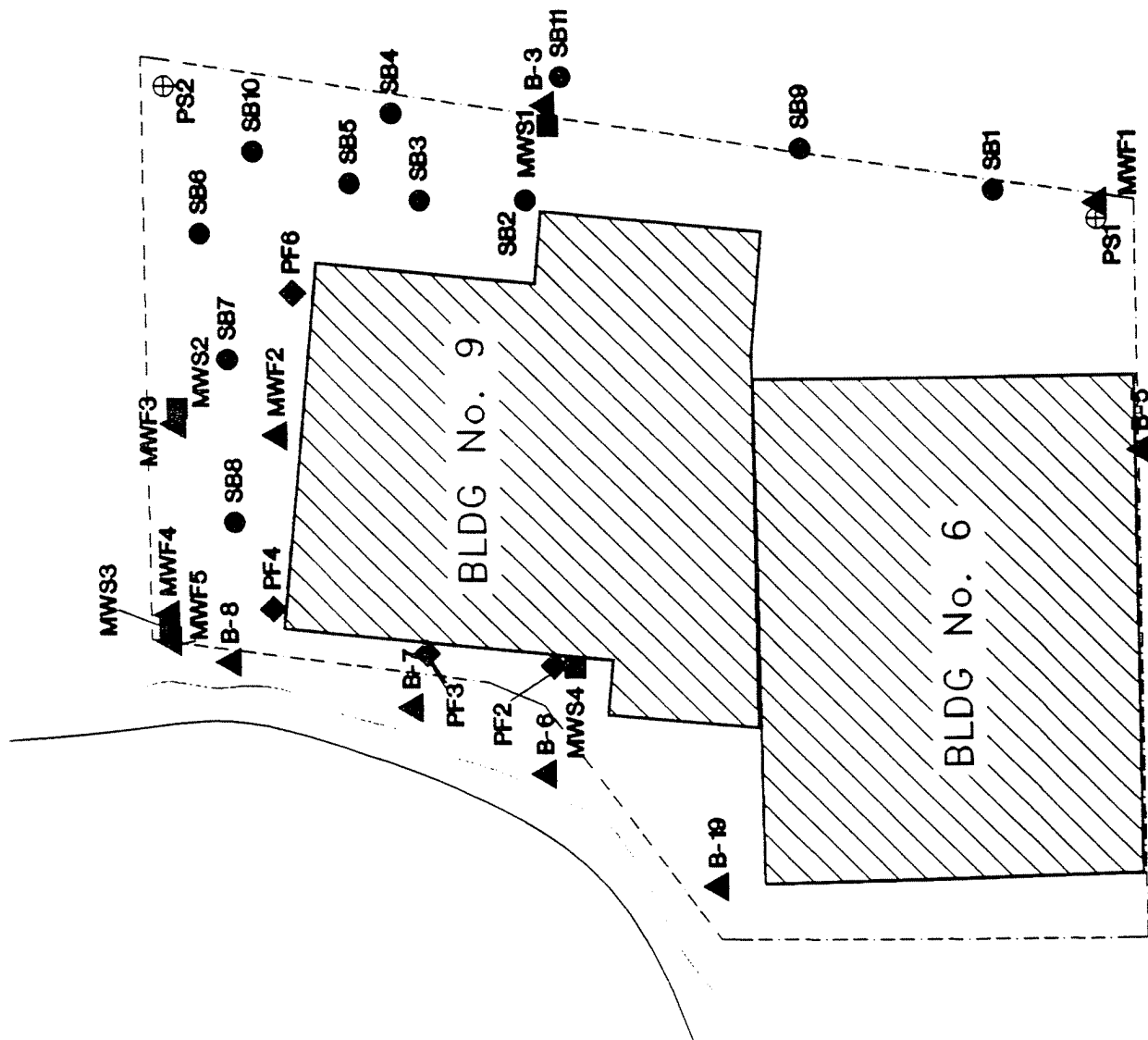
Collected samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds, and (TAL) metals plus cyanide. The samples were collected in their respective containers except for the TAL metals. These were collected by filling a clean, one-liter glass jar with sample water, then pumping the sample water through a 0.45 micron, positive pressure, in-line filter into the appropriately preserved sample container using a peristaltic sampling pump. Upon collection, all samples were placed immediately on ice in coolers to ensure preservation. All excess well water removed while purging and sampling was placed in storage tanks onsite for disposal.

A list of the individual analytes is presented in Table D3-2. The results of the organic and inorganic chemical analysis are presented in Tables D3-3 and D3-4, respectively.



Legend

- Soil Borings (11)
- ▲ Fill Monitor Wells (10)
includes "B" Series Wells
- ◆ Fill Piezometers (4)
- Lower Sand Monitor Wells (4)
- ⊕ Lower Sand Piezometers (2)



GeoTrans, Inc.
CONSULTANTS

Location of the RI/FS
Monitoring System

PREPARED BY: T.A.	DATE: 7/22/98	SCALE
CHECKED BY: T.A.	REVISION: 1/25/99	D3-1
DRAWN BY: J.P.	DRAWING NO.: 1947052-000	

Table D3-1. Final field parameters for third quarter sampling.

Well	pH	Conductivity (μ ohms/cm)	Temperature (°F)
MWF1	7.5	2200	45.3
MWF3	6.8	840	46.2
MWF4	7.6	755	46.9
MWF5	7.7	670	44.6
B3	7.1	4190	43.07
B7	6.8	2250	44.8
B19	7.0	2600	46.6

Table D3-2. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	
Acetone Benzene Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes	4 Chloro-3 methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitrophenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane	Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Ideno(1,2,3-cd)pyrene Isophorone 2-Methylnaphthalene Naphthalene 2-Nitroaniline 3-Nitroaniline 4-Nitroaniline Nitrobenzene N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Phenanthrene Pyrene 1,2,4-Trichlorobenzene	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide

Table D3-J.
GROUNDWATER ORGANIC RESULTS FOR NOVEMBER, 1992

Analysis (ug/l)	Well Identification									
	B3	B7	B19	MWF1	MWFJ	MWF4	MWF5			
Volatile Organic Compounds										
(m+p) Xylenes	<5	330	<5	<5	2 J	290	170			
Acetone	<5	36 J	<10	<10	2 J	<100	<50			
Benzene	<5	240	<5	<5	2 J	180	59			
Ethylbenzene	<5	540	<5	<5	5	11 J	240			
Toluene	<5	140	<5	<5	5	11 J	63			
o-Xylene	<5	180	<5	<5	2 J	200	100			
Styrene	<5	<25	<5	<5	5	<25	16 J			
Semivolatile Organic Compounds										
1,2,4-Trichlorobenzene	<10	<10	<10	<10	<10	<10	<10			
2,4-Dichlorophenol	<10	<10	<10	<10	<10	<10	<10			
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10	<10			
2-Methylnaphthalene	<10	140	<10	<10	3 J	360	100			
2-Methylphenol	<10	<10	<10	<10	<10	<10	<10			
2-Nitrophenol	<10	2 J	<10	<10	<10	<10	<10			
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10			
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10			
4-Methylphenol	<10	14	<10	<10	<10	<10	<10			
Acenaphthene	6 J	85	<10	<10	16	130	110			
Acenaphthylene	<10	36	<10	<10	3 J	16	60			
Anthracene	<10	10 J	<10	<10	4 J	10	78			
Benzo(a)anthracene	<10	2 J	<10	<10	6 J	<10	53			
Benzo(a)pyrene	<10	2 J	<10	<10	4 J	<10	31			
Benzo(b)fluoranthene	<10	2 J	<10	<10	5 J	<10	27			
Benzo(g,h,i)perylene	<10	<10	<10	<10	2 J	<10	7 J			
Benzo(k)fluoranthene	<10	<10	<10	<10	2 J	<10	9 J			
Benzoic acid	<50	<50	<50	<50	<50	<50	<50			
Chrysene	<10	2 J	<10	<10	5 J	<10	48			
Di-n-Butylphthalate	<10	<10	<10	<10	<10	<10	<10			
Di-n-octyl phthalate	<10	<10	<10	<10	<10	<10	<10			
Dibenz(a,h)anthracene	<10	<10	<10	<10	<10	<10	<10			
Dibenzofuran	<10	2 J	<10	<10	1 J	4 J	4 J			
Diethylphthalate	<10	<10	<10	<10	<10	<10	<10			
Fluoranthene	<10	10 J	<10	<10	12	3 J	80			
Fluorene	<10	63	<10	<10	8 J	56	96			
Hexachlorobutadiene	<10	<10	<10	<10	<10	<10	<10			
Indeno(1,2,3-cd)pyrene	<10	<10	<10	<10	<10	<10	6 J			
Isophorone	<10	<10	<10	<10	<10	<10	<10			
Naphthalene	<10	1300	<10	<10	46	2200	630			
Nitrobenzene	<10	<10	<10	<10	<10	<10	<10			
Phenanthrene	<10	65	<10	<10	18	51	270			
Phenol	<10	<10	<10	<10	<10	<10	8 J			
Pyrene	<10	11	<10	<10	11	3 J	110			
Bis(2-Chloroethoxy)Methane	<10	<10	<10	<10	<10	<10	<10			
Bis(2-Ethylhexyl) Phthalate	3 J	4 J	<10	<10	<10	<10	<10			

J = Estimated values, analyte detected below contract required detection limits.

Table D3-4
GROUNDWATER INORGANIC RESULTS FOR NOVEMBER, 1992

Analysis (ug/l)	Well Identification					MWF5	
	B3	B7	B19	MWF1	MWF3		MWF4
Aluminum	<41.1	50.8	<41.1	<41.1	<41.1	<41.1	198
Antimony	154	94.7	66.8	80.2	42.3	<35.5	<35.5
Arsenic	5.7 U	2.4 U	2.3 U	3.2 U	1.8 U	2.5 U	8 U
Barium	<1.1	107	9.5	35.3	545	130	98.8
Calcium	383000	339000	150000	137000	97400	86700	61000
Chromium	6.4 U	15.3 U	<2.0	<2.0	<2.0	8.5 U	85
Cobalt	<13.5	<13.5	<13.5	<13.5	<13.5	<13.5	<13.5
Copper	<8.9	<8.9	<8.9	<8.9	<8.9	<8.9	12.1
Iron	2600	301	168	900	15600	2040	2880
Lead	<13 UJ	<1.3 UJ	<13 UJ	<13 UJ	<1.3 UJ	<1.3 UJ	1.9 J
Magnesium	617000	69000	271000	242000	21200	35600	35800
Manganese	686	437	55.8	312	322	265	393
Nickel	<27	<22.6	22.6	125	<22.6	<22.6	46.3
Potassium	6010	5710	4010	6190	5070	2370	4240
Selenium	<15 UJ	<1.5	1.5 J	<1.5	<1.5	<1.5	<1.5
Silver	17	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1
Sodium	138000	48700	59800	58600	13100	14300	27600
Vanadium	140	54	46.6	38.2	<20.0	<20.0	<20.0
Zinc	5.7	<3.4	3.5	9.5	<3.4	5.9	6.4
Cyanide	65.8 J	203 J	278 J	<10 UJ	<10 UJ	47.2 J	31.6 J

J = Estimated value, analyte detected below contract required detection limits.

U = Concentration found at less than five times concentration found in associated sample blank.

UJ = Reported results and nondetects were flagged as estimates due to low internal standard recovery.

Appendix D-4
FOURTH QUARTERLY GROUNDWATER SAMPLING DATA REPORT
February, 1993

This data report summarizes the fourth of four quarterly groundwater sampling events as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Sampling was performed by GeoTrans personnel on February 24 and 25, 1993 with analytical services provided by General Testing Corporation Inc.

Seven of the 12 monitor wells completed in the fill wells onsite were sampled. Three of six "B" wells and four of the "MWF" monitor wells were sampled. The three "B" wells sampled were B3, B7, and B19. The four "MWF" wells were MWF1, MWF3, MWF4, and MWF5. Wells B5, B6, B8, and MWF2 were not sampled due to slow recharge in B5 and presence of dense nonaqueous phase liquid (DNAPL) in B6, B8, and MWF2. All well locations are shown in Figure D4-1. The four "MWS" wells completed in the lower sand layer were not sampled because no contaminants linked to manufactured gas plants were observed during two previous sampling rounds.

Prior to sampling the fill wells, a minimum of three well volumes were purged from each well. The well volume was calculated based on the following equation:

$$\text{Well Volume} = (\text{well depth} - \text{depth to water}) \times (\text{well radius})^2 \\ \times 3.14 \times 7.48 \text{ gal/ft}^3$$

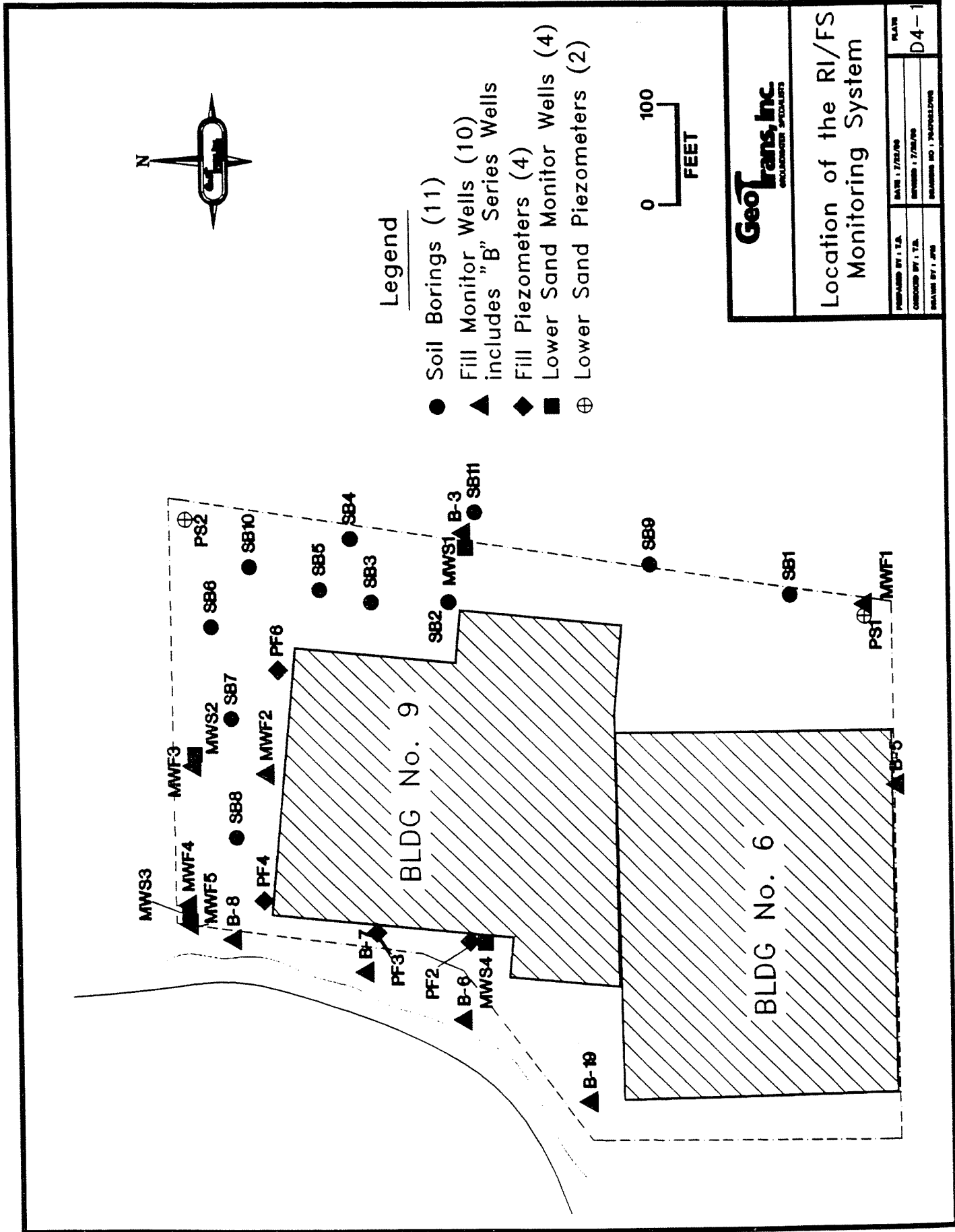
Note: The units for well radius, depth to water, and well depth are in ft.

After each well volume was purged, a sample of water was collected and measured for the field parameters pH, specific conductance, and temperature. Laboratory samples were collected after the individual field parameters had stabilized to within \pm ten percent for three consecutive well volumes. The final field parameters, recorded prior to sampling, are shown in Table D4-1.

The well sampling and purge order was based on anticipated contaminant concentration and proceeded from the lowest to highest concentration. Wells were purged and sampled using dedicated sampling equipment. A stainless steel bailer was employed for purging and sampling in all fill wells except for well B19. A 1½-inch teflon bailer was used in well B19 because the well diameter was smaller than other fill wells onsite.

Collected samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds, and (TAL) metals plus cyanide. The samples were collected in their respective containers except for the TAL metals. These were collected by filling a clean, one-liter glass jar with sample water, then pumping the sample water through a 0.45 micron, positive pressure, in-line filter into the appropriately preserved sample container using a peristaltic sampling pump. Upon collection, all samples were placed immediately on ice in coolers to ensure preservation. All excess well water removed while purging and sampling was placed in storage tanks onsite for disposal.

A list of the individual analytes is presented in Table D4-2. The results of the organic and inorganic chemical analysis are presented in Tables D4-3 and D4-4, respectively.



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Monitoring System

PREPARED BY: T.A.	DATE: 1/25/90	PLATE
CHECKED BY: T.A.	REVISION: 1/25/90	D4-1
DRAWN BY: J.P.H.	ISSUANCE NO.: 74190321098	

Table D4-1. Final field parameters for fourth quarter sampling.

Well	pH	Conductivity (μ ohms/cm)	Temperature (°F)
MWF1	7.2	1347	38.2
MWF3	6.6	655	45.1
MWF4	7.9	552	50.8
MWF5	8.3	496	48.8
B3	6.7	3130	46.0
B7	5.8	1910	52.4
B19	6.6	1920	52.2

Table D4-2. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	
<p>Acetone Benzene Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes</p>	<p>4 Chloro-3 methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitrophenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol</p>	<p>Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane</p>	<p>Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Ideno(1,2,3-cd)pyrene Isophorone 2-Methylnaphthalene Naphthalene 2-Nitroaniline 3-Nitroaniline 4-Nitroaniline Nitrobenzene N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Phenanthrene Pyrene 1,2,4-Trichlorobenzene</p>	<p>Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide</p>

Table D4-3.
GROUNDWATER ORGANIC RESULTS FOR FEBRUARY, 1993

Analysis (ug/l)	Well Identification						
	B3	B7	B19	HWF1	HWF3	HWF4	HWF5
Volatile Organic Compounds							
(mvp) Xylenes	<5	300	<5	<5	3 J	180	110
Acetone	<10	<10	<10	<10	<10	<50	<10
Benzene	<5	310	<5	<5	2 J	180	63
Ethylbenzene	<5	640	<5	<5	<5	140	140
Toluene	<5	100	<5	<5	<5	16 J	21
o-Xylene	<5	170	<5	<5	3 J	130	76
Styrene	<5	<5	<5	<5	<5	<25	<5
Semi-volatile Organic Compounds							
1,2,4-Trichlorobenzene	<10	<10	<10	<10	<10	<10	<10
2,4-Dichlorophenol	<10	<10	<10	<10	<10	<10	<10
2,4-Dimethylphenol	<10	<10	<10	<10	2 J	5 J	<10
2-Methylnaphthalene	<10	300	<10	<10	12	450	120
2-Methylphenol	<10	<10	<10	<10	1 J	<10	<10
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10	<10
4-Chloroaniline	<10	<10	<10	<10	<10	<10	<10
4-Methylphenol	<10	<10	<10	<10	<10	<10	<10
Acenaphthene	5 J	86	<10	<10	23	120	56
Acenaphthylene	<10	29	<10	<10	15	11	36
Anthracene	<10	10	<10	<10	23	13	13
Benzo(a)anthracene	<10	3 J	<10	<10	43	<10	2 J
Benzo(a)pyrene	<10	2 J	<10	<10	40	<10	<10
Benzo(b)fluoranthene	<10	3 J	<10	<10	66	<10	<10
Benzo(g,h,i)perylene	<10	<10	<10	<10	17	<10	<10
Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10
Benzoic acid	<50	<50	<50	<50	<50	<50	<50
Carbazole	<10	2 J	<10	<10	15	3 J	2 J
Chrysene	<10	2 J	<10	<10	37	<10	1 J
Di-n-Butylphthalate	<10	<10	<10	<10	1 J	2 J	1 J
Di-n-octyl phthalate	<10	<10	<10	<10	<10	<10	<10
Dibenz(a,h)anthracene	<10	<10	<10	<10	6 J	<10	<10
Dibenzofuran	<10	5 J	<10	<10	11	7 J	3 J
Diethylphthalate	<10	2 J	<10	<10	<10	1 J	<10
Fluoranthene	<10	10	<10	<10	84	4 J	6 J
Fluorene	<10	65	<10	<10	23	45	37
Hexachlorobutadiene	<10	<10	<10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	<10	<10	<10	<10	17	<10	<10
Isophorone	<10	<10	<10	<10	<10	<10	<10
Naphthalene	<10	1500	<10	<10	57	1300	490
Mitrobenzene	<10	<10	<10	<10	<10	<10	<10
Phenanthrene	<10	79	<10	<10	88	59	57
Phenol	<10	<10	<10	<10	<10	<10	6 J
Pyrene	<10	14	<10	<10	72	<10	8 J
Bis(2-Chloroethoxy)Methane	<10	<10	<10	<10	<10	<10	<10
Bis(2-Ethylhexyl) Phthalate	<10	6 J	<10	2 J	4 J	2 J	2 J

J = Estimated values, analyte detected below contract required detection limits.

Table D4-4
GROUNDWATER INORGANIC RESULTS FOR FEBRUARY, 1993

Analysis (ug/l)	Well Identification					MWF5
	B3	B7	B19	MWF1	MWF3	
Aluminum	64.5	125	<48.9	136	83.3	125
Antimony	<40.1	<40.1	<40.1	<40.1	<40.1	<40.1
Arsenic	4.3	2.6	2.5	3.7	12.5	3.3
Barium	8.2	145	16	39.6	675	65.9
Calcium	391000	356000	152000	124000	136000	76800
Chromium	<1.9	2.7	<1.9	<1.9	<1.9	<1.9
Cobalt	<8.8	<8.8	<8.8	<8.8	<8.8	<8.8
Copper	<6.5	<6.5	<6.5	<6.5	<6.5	14.4
Iron	2110	350	63.9 U	94.3	23800	1890
Lead	<8.0	<0.8	<0.8 UJ	<0.8	1.7 J	<0.8
Magnesium	554000	79600	264000	208000	542000	41000
Manganese	566	464	63.3	344	427	590
Nickel	11.9 U	16.7 U	<11.4	34 U	15.6 U	<11.4
Potassium	8880	6240	4600	5420	8130	5480
Selenium	2.0 UJ	2.1	2.0 UJ	<2.0	<2.0	2.0 UJ
Silver	16	5	6	<3.8	<3.8	<3.8
Sodium	142000	68600	58100	67600	27100	25000
Vanadium	<13.6	<13.6	<13.6	<13.6	<13.6	<13.6
Zinc	<2.8	3.7	3.6	14.5	4.6	<2.8
Cyanide	105	285	237	<3.7	43.3	27.3

J = Estimated value, analyte detected below contract required detection limits.

U = Concentration found at less than five times concentration found in associated blank.

UJ = Reported results and nondetects were flagged as estimates due to low internal standard recovery.

Appendix E
IN-SITU HYDRAULIC CONDUCTIVITY REPORT

INTRODUCTION

This data report summarizes the procedures used to obtain in-situ hydraulic conductivity values as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). On May 5 through 7, 1992, and on May 12, 1993, GeoTrans, Inc. personnel conducted in-situ hydraulic conductivity tests in 17 monitor wells and piezometers onsite. The well and piezometer locations are shown on Figure E-1.

PROCEDURES

In general, two falling head slug tests were performed in each well or piezometer. The tests were conducted by the rapid addition of a fixed volume of water into the well. Changes in water levels were recorded digitally by the use of a pressure transducer and a data logger over time. A five or 15 psi pressure transducer, manufactured by Instruments Northwest Inc. (INW) was submerged below the static water level to an optimum depth of approximately five ft in each well and secured in place. The pressure transducer was connected to an INW Aquistar Data Logger Model DL1-A to record the water-level changes over time at a predetermined data acquisition cycle.

The static water level in the well was measured prior to the initiation of the test using a hand held water-level meter. Each test was begun by activating the data recording system followed by the rapid (in theory instantaneous) addition of a slug of water. Each test ended when the water level recovered to at least 90 percent of the pretest water level or two hours elapsed. The acquired data were then downloaded onto a floppy disk for analysis at a later date.

The pressure transducer was decontaminated between each location by wiping the outside of the cable and transducer with a ten percent methanol and water solution followed by a deionized water rinse.

Several onsite wells and piezometers were not tested or were unsuccessfully tested due to slow test response, greater than two hours, or due to the presence of dense nonaqueous phase liquids (DNAPL). Test response greater than two hours deterred successful testing in wells B3 and MWF1 and in piezometer PF2. DNAPL was present in installations B8, MWF2, and PF6. No test was conducted in the 1992 testing period due to the potentially damaging effect of DNAPL on the slug testing equipment. However, because of the importance of wells B8 and MWF2, these wells were tested in 1993.

ANALYTICAL METHODS

The analytical solution developed by Cooper et al., (1967), was used to analyze the field data. This method is incorporated in the commercially available computer software package for aquifer test analysis, AQTESOLV (Version 1.1) written by Geraghty & Miller, Inc. The program automates the process of curve matching that relates the change in water level over time to well geometry, calculating aquifer transmissivity. Transmissivity (T) is the rate at which groundwater is transmitted through a unit width of an aquifer under a unit hydraulic gradient. Hydraulic conductivity (K) is then calculated by dividing transmissivity by the aquifer thickness (b). The well screen length is used to represent aquifer thickness.

The use of this method is limited by assumptions that 1) the well is screened in a homogeneous and isotropic aquifer of uniform thickness, 2) the well is screened throughout the entire aquifer, 3) the aquifer is confined, 4) well storage is negligible, 5) water is released instantaneously from storage with decline of hydraulic head, and 6) the water slug volume is injected into the well instantaneously. Even though the Cooper et al. solution was developed for confined aquifers, the solution also is widely used for wells in unconfined aquifer settings. It has been GeoTrans' experience that this solution calculates hydraulic conductivities in good agreement with other solutions used for unconfined aquifer settings. In view of all the above limiting assumptions, it is best to consider the calculated hydraulic conductivities as approximate values.

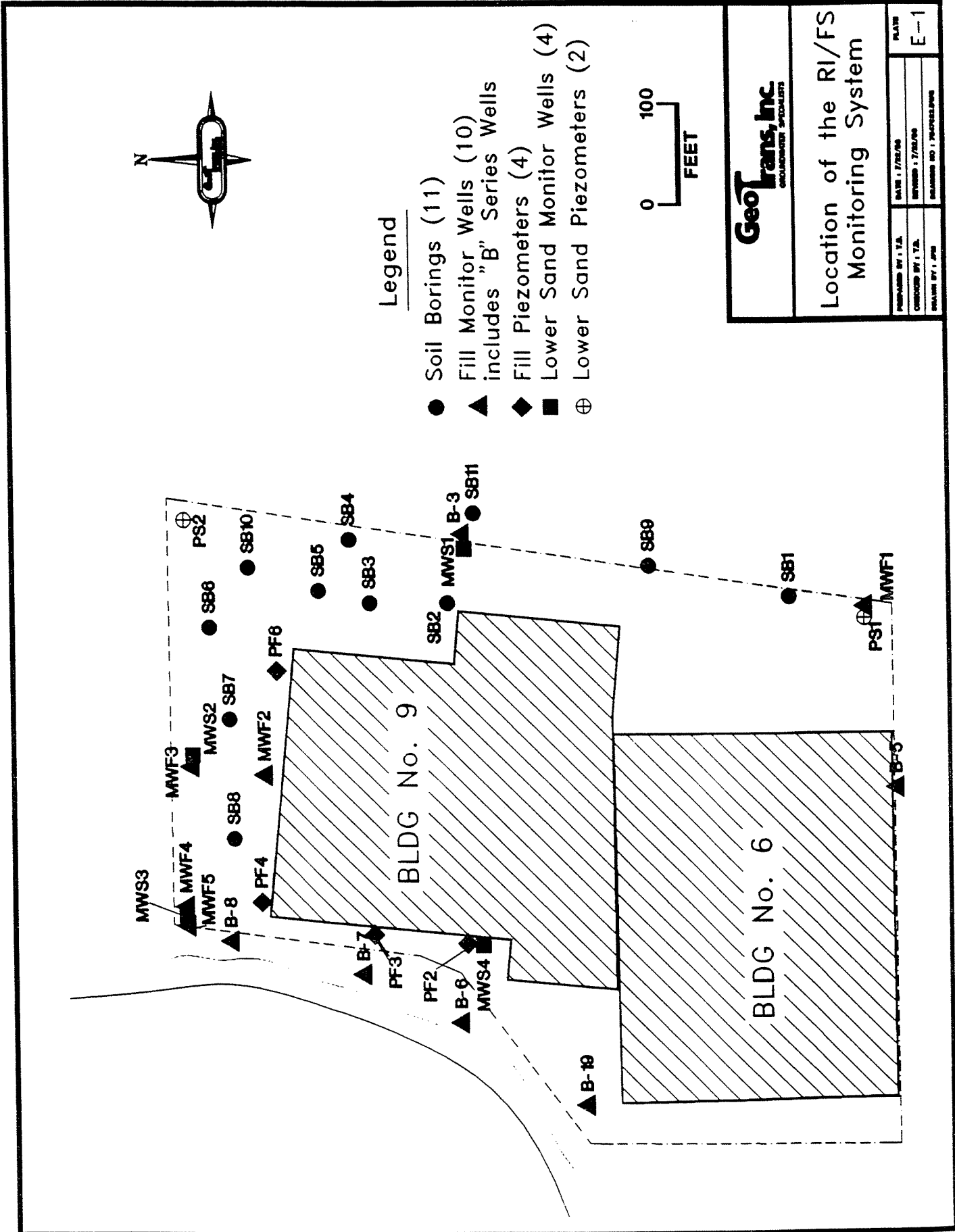
For monitor well B8, a subset of the recorded data was used during the analysis of each slug test. Due to the length of time to release the water slug into the well and the quick recovery to initial conditions, the final 50 percent of the observed water-level data was used for the aquifer parameter calculations.

RESULTS

The results of the in-situ hydraulic conductivity tests for the installations at the site are presented in Tables E-1 and E-2. Individual test results and the average result of multiple tests are included. Table E-1 presents the hydraulic conductivity results in the fill wells and piezometers. Table E-2 presents the hydraulic conductivity results in the lower sand layer wells and piezometers. Individual slug test graphical output of the Cooper et al. solution is attached to this data report.

REFERENCES

- Cooper, H.H., J. D. Bredehoeft, and S. S. Papadopoulos, 1967. Response of a finite-diameter well to an instantaneous charge of water. Water Resources Research, vol. 3, no. 1, pp 263-269.



GeoTrans, Inc.
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Location of the RI/FS
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PREPARED BY: J.A.	DATE: 1/28/98	PLANT
CHECKED BY: J.A.	REVISED: 1/28/98	E-1
DRAWN BY: J.A.	ISSUED NO: 1	

Table E-1. Fill well hydraulic conductivity tests results (in ft/day).

Well	Test 1	Test 2	Average
B6	30.6	42.6	36.6
B7	3.9	3.9	3.9
B8	43.0	42.6	42.8
B19	0.6	0.4	0.5
MWF2	0.07	0.11	0.09
MWF3	7.3	7.0	7.2
MWF4	0.6	0.8	0.7
MWF5	9.3	10.0	9.7
PF3	2.5	2.8	2.7
PF4	1.0	1.3	1.2

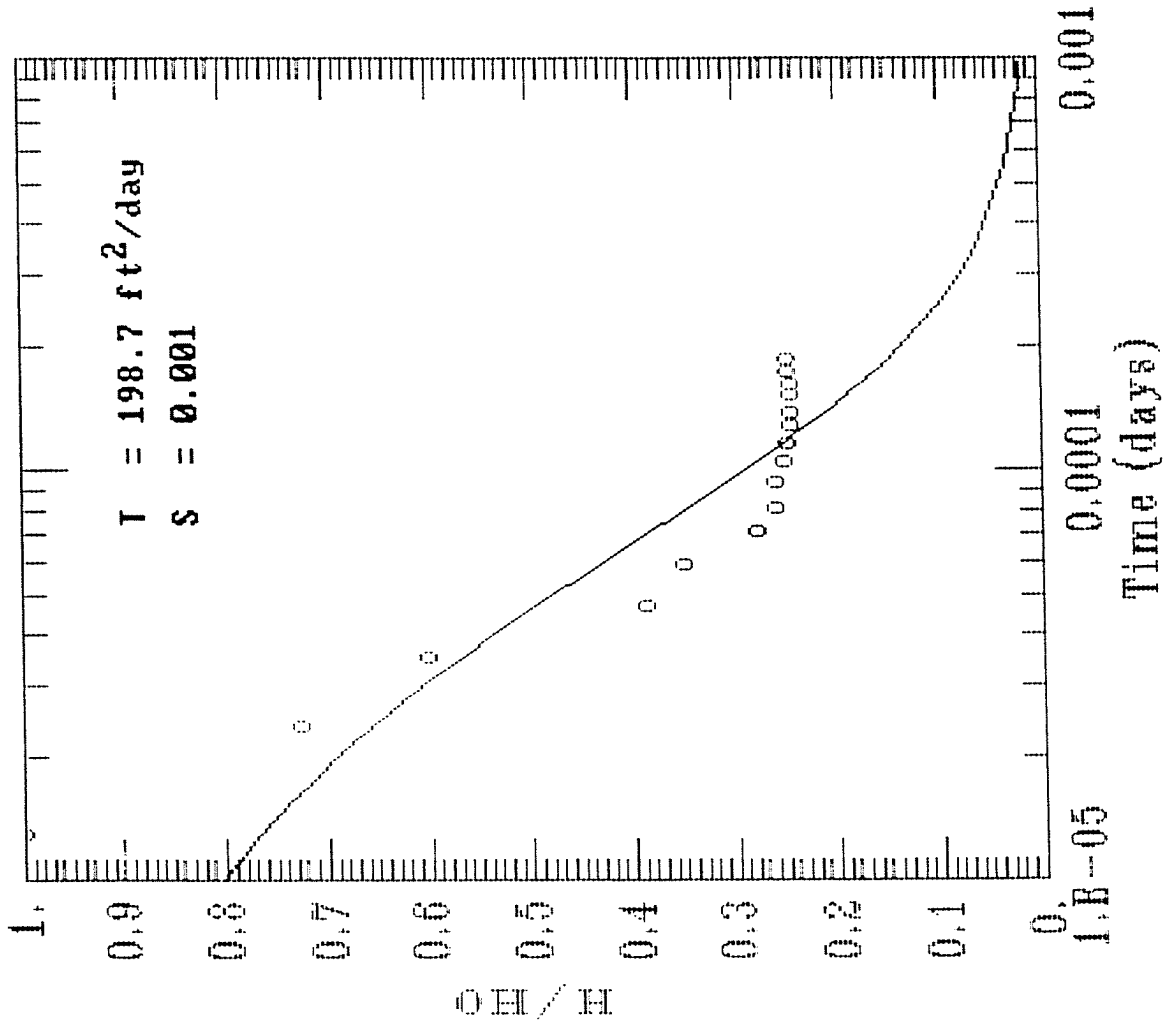
- Notes: 1. Tests analyzed using Cooper et al. Assumes saturated thickness equals screen length.
2. Well radius for all wells was 0.08 ft except B19, which was 0.06 ft.
3. Borehole radius for all wells was 0.25 ft except PF4, which was 0.42 ft.
4. Screen length for all wells was five ft except MWF2, MWF3, PF3, and PF4, which were 10 ft.

Table E-2. Sand well hydraulic conductivity test results (in ft/day).

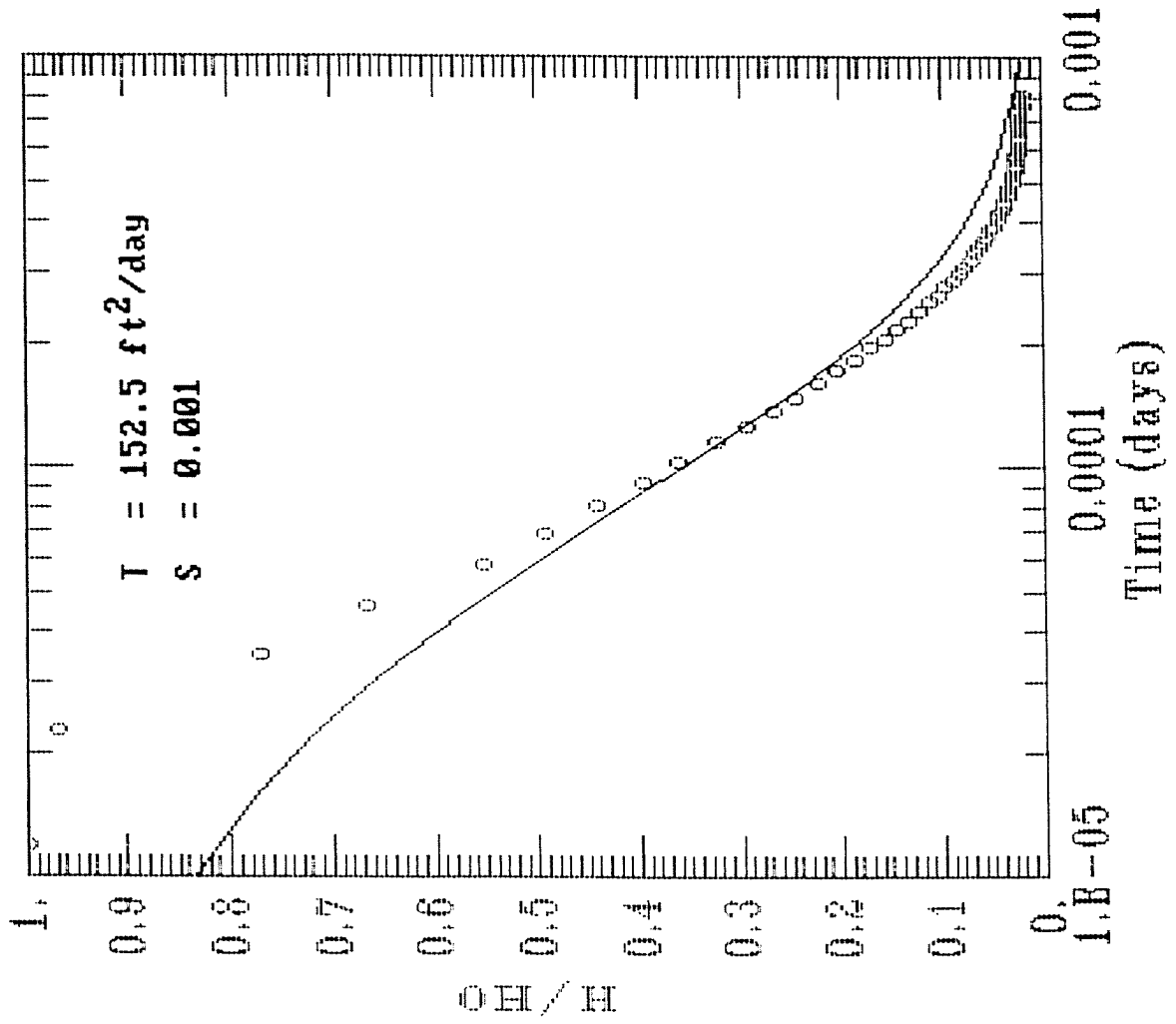
Well	Slug Test Analysis			
	Test 1	Test 2	Test 3	AVG
MWS1	32.0	35.0	-	33.5
MWS2	65.4	58.3	-	61.9
MWS3	18.1	15.8	-	17.0
MWS4	23.1	19.9	18.1	21.5
PS1	3.6	3.5	-	3.6
PS2	-	71.3	54.8	63.1

- Notes: 1) Test analyzed using Cooper et al. solution. Assumes saturated thickness equals screen length.
 2) "-" Test Not Run, Test Data Not Analyzed, or No Test Data Collected.
 3) Screen length was 10 ft for all wells except MWS1 which was 5 ft.
 4) Well radius was 0.08 ft for all wells except PS1 which was 0.25 ft.
 5) Borehole radius was 0.25 ft for all wells except PS1 which was 0.5 ft.

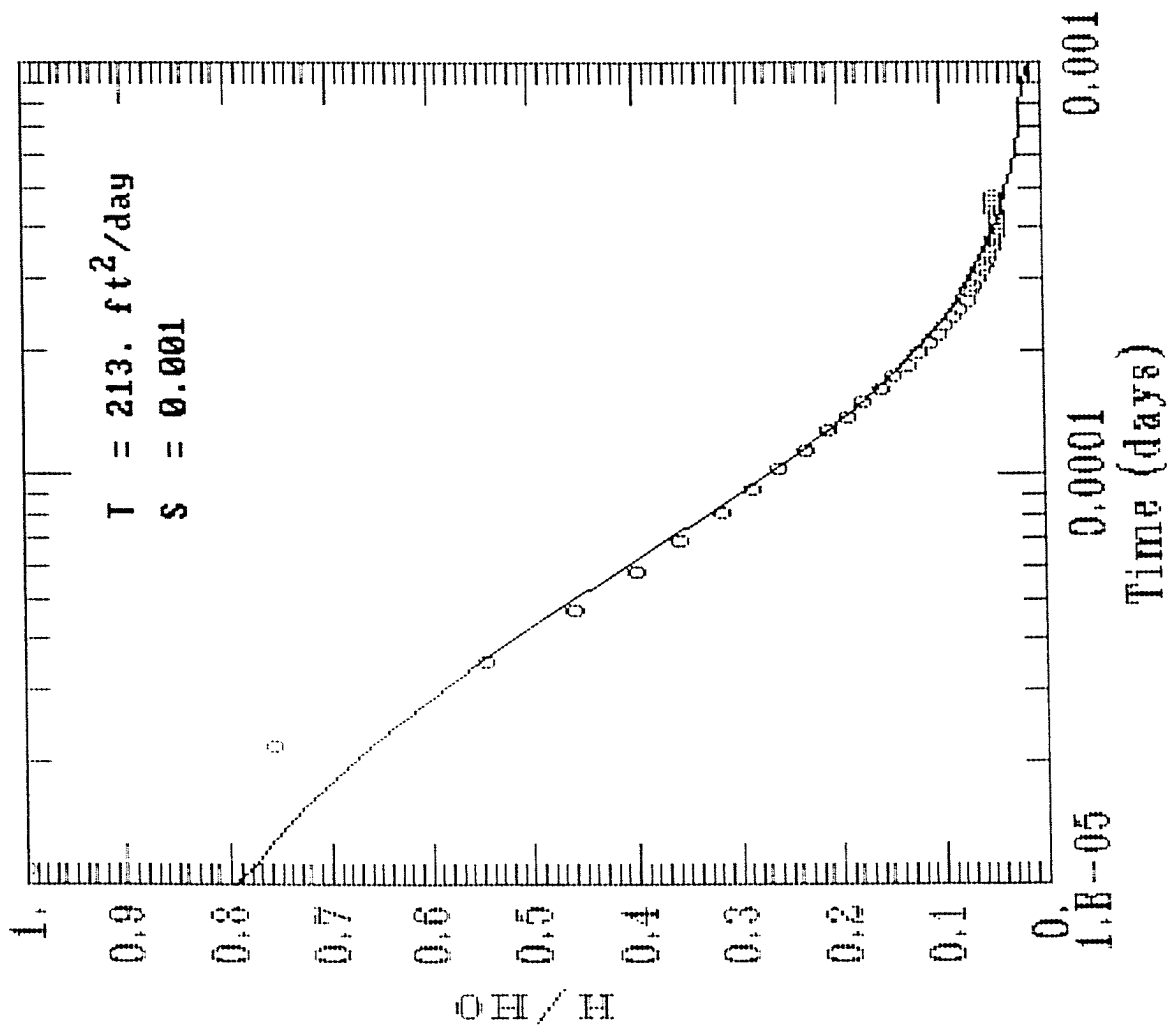
WPI B5 SLUG TEST #1/1



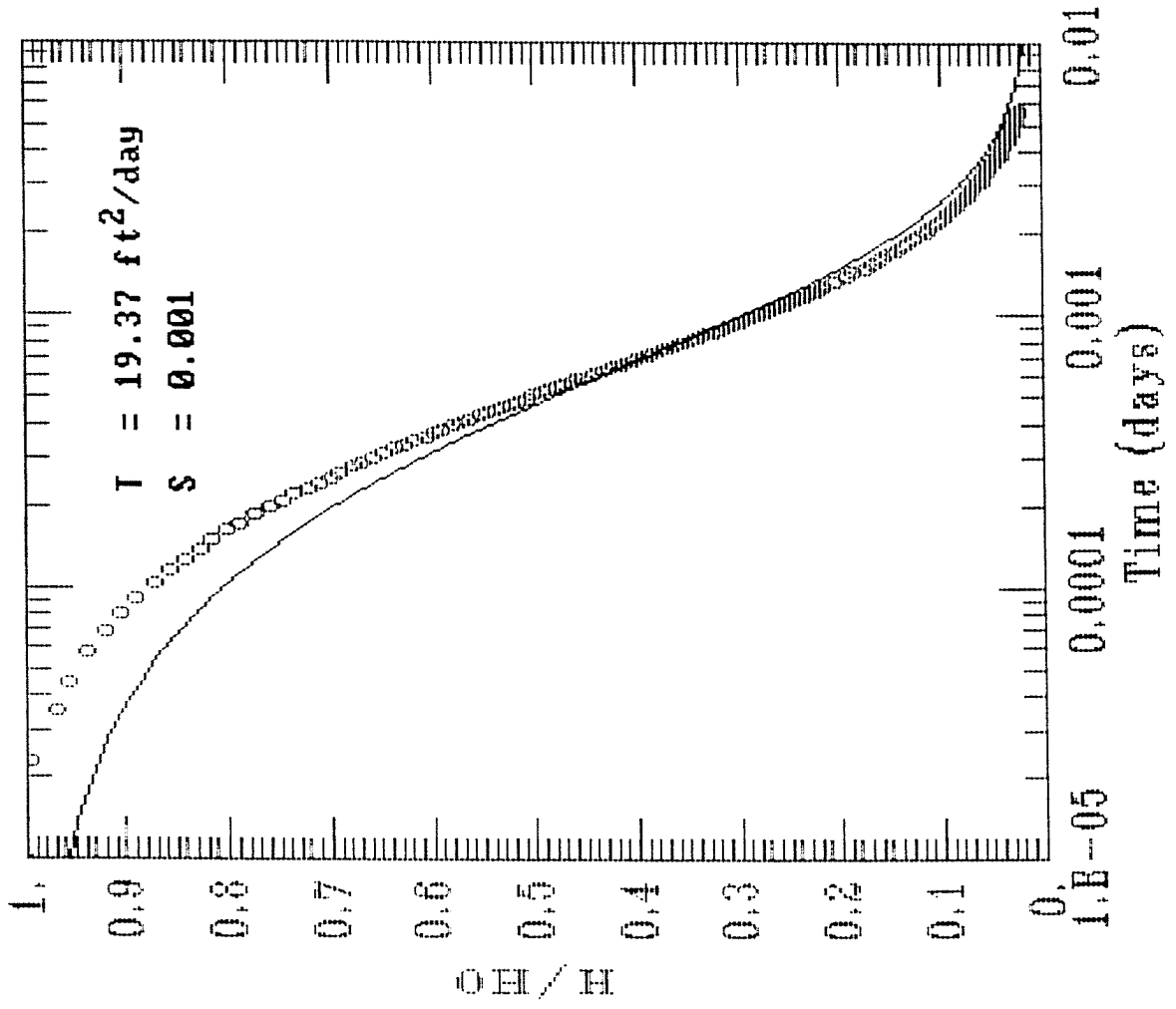
WPI B-6 SLUG TEST #1/2



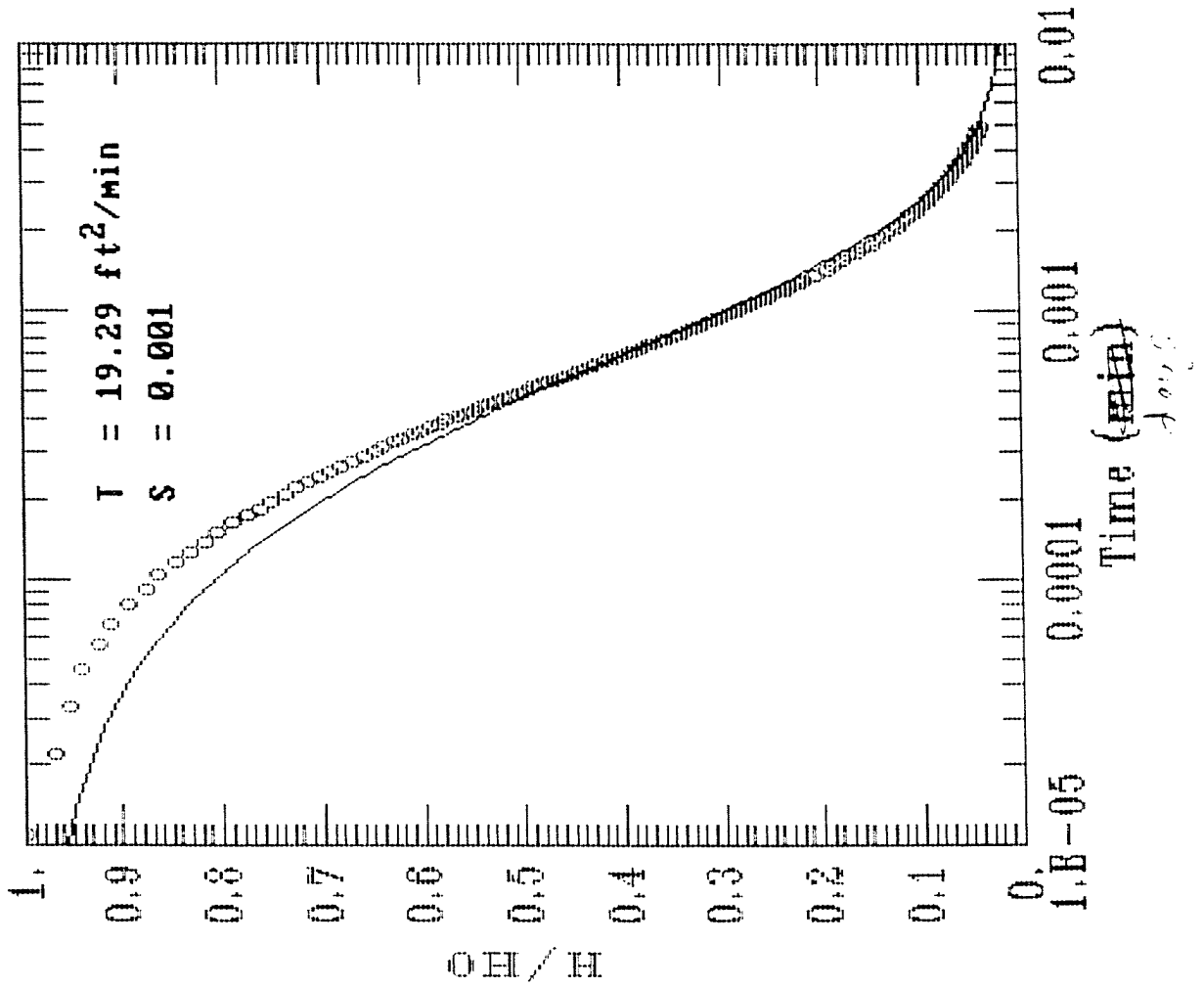
WPI B-6 SLUG TEST #2/2



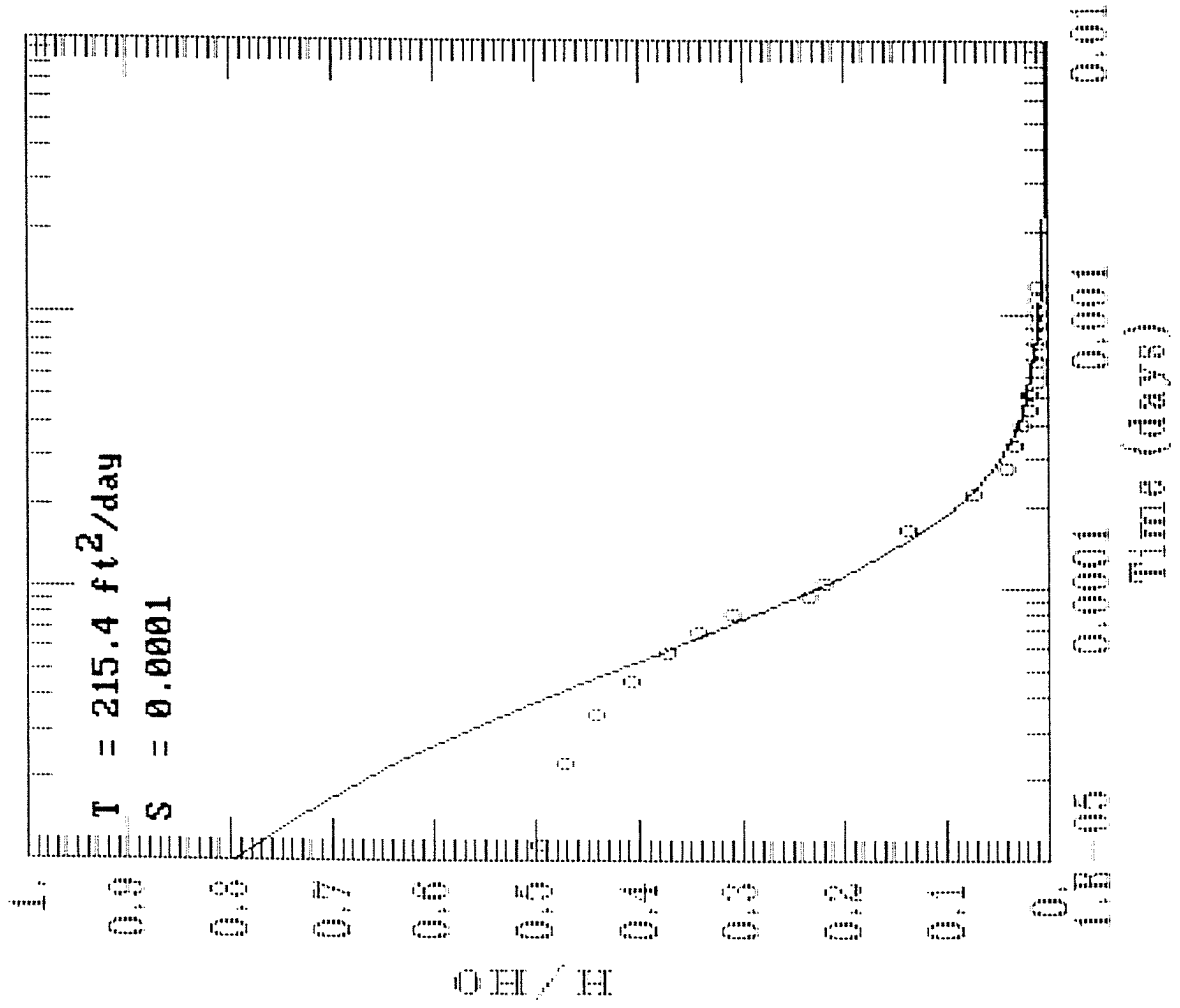
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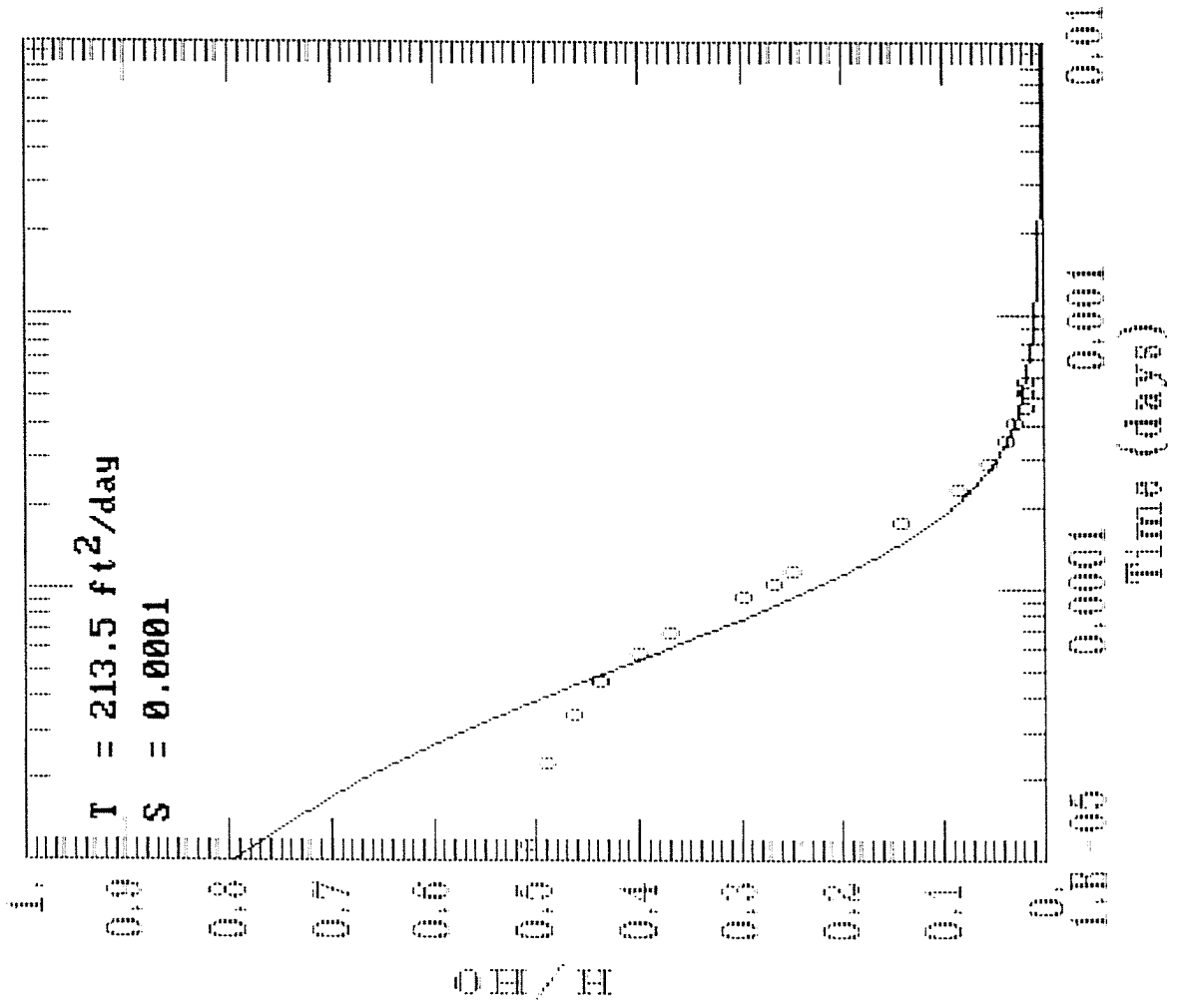
WPI B-7 SLUG TEST #2/2



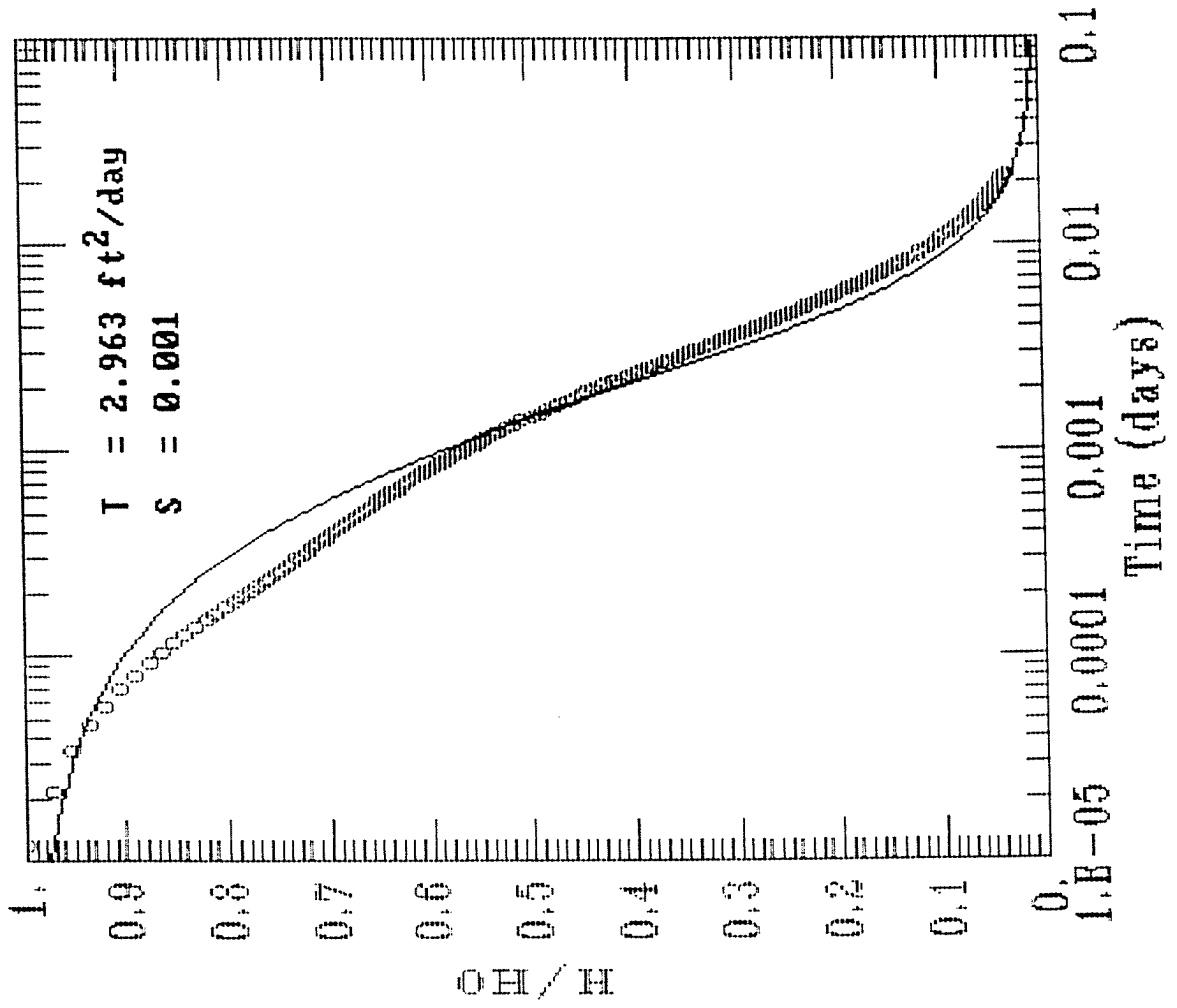
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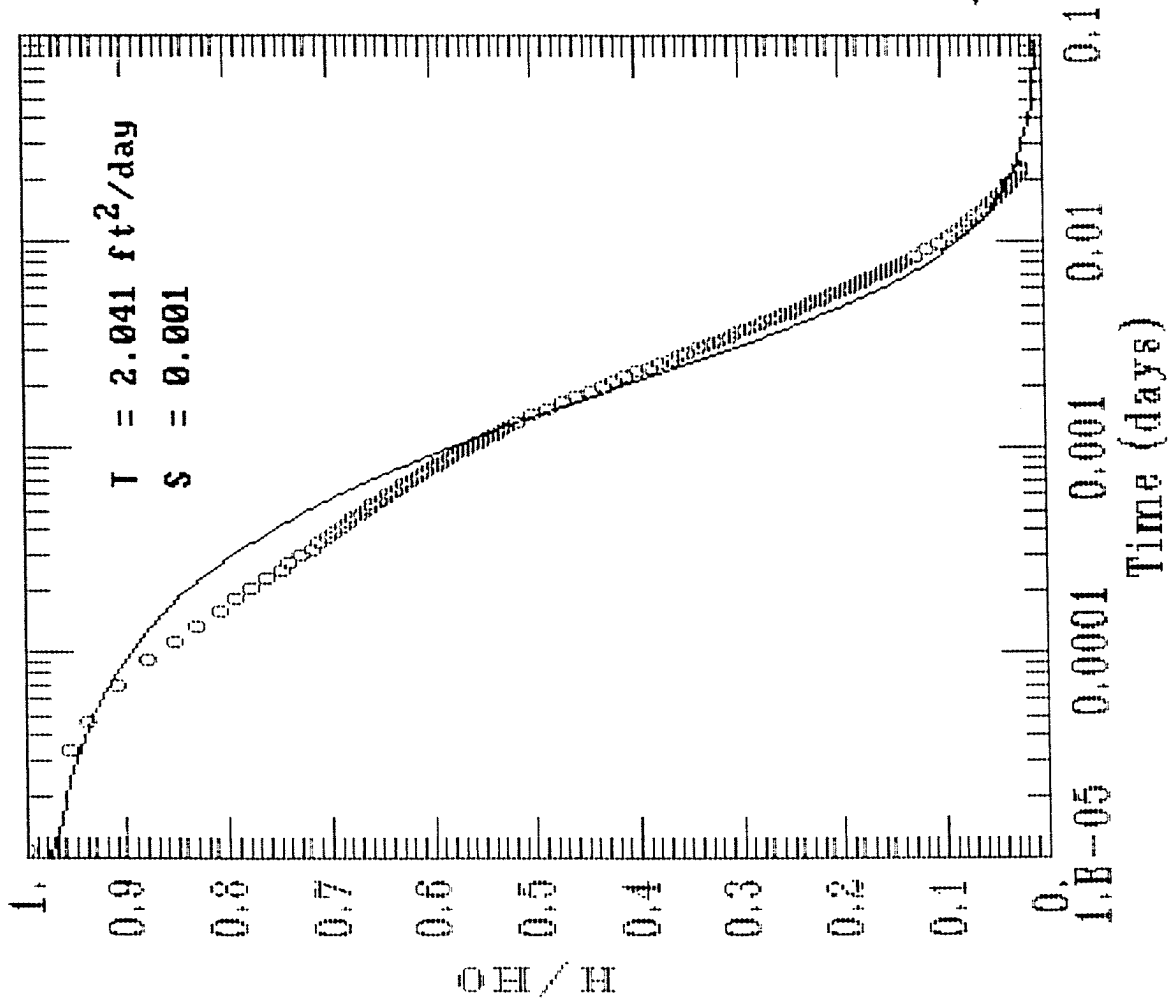
WPI B8 SLUG TEST #2/2



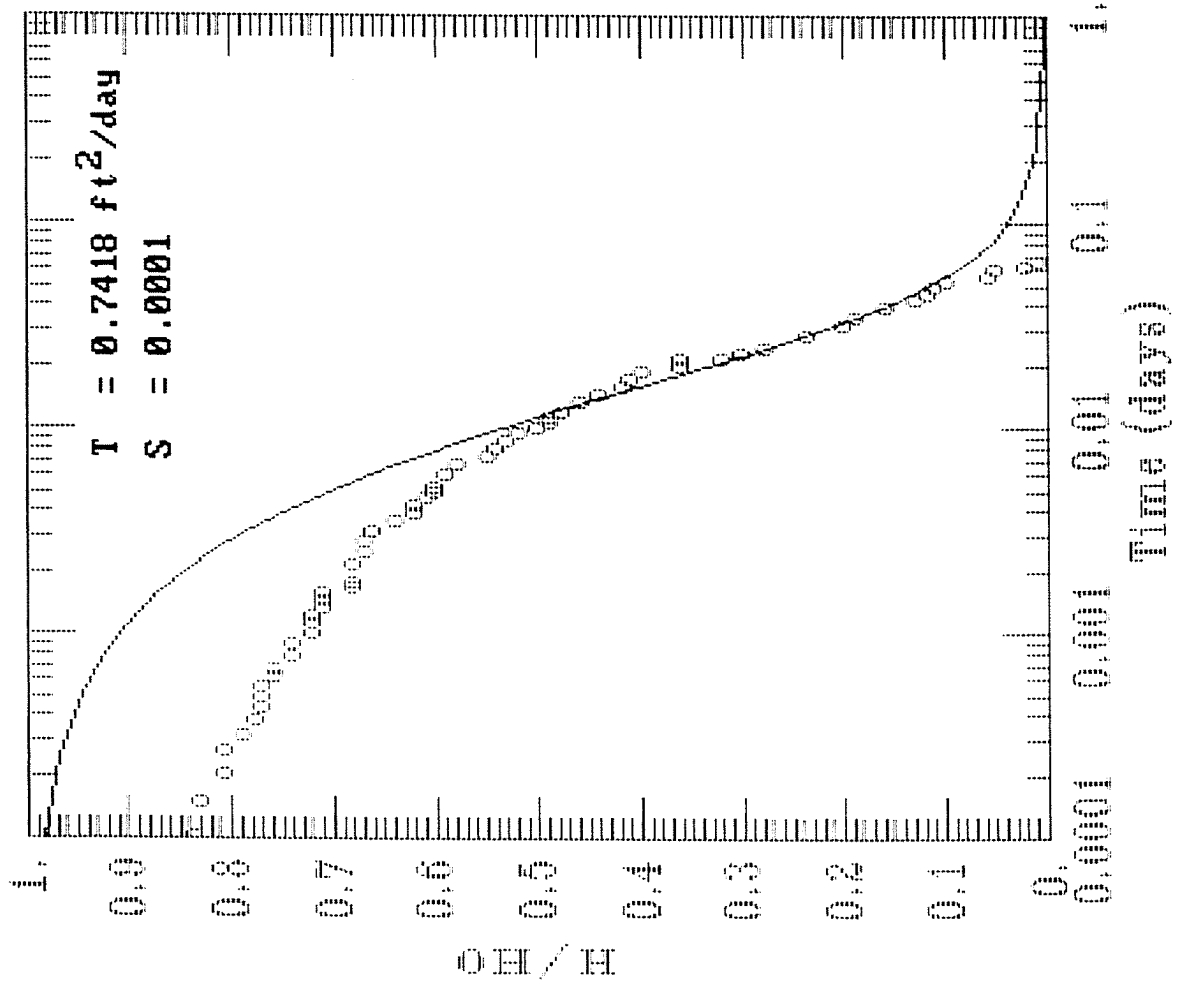
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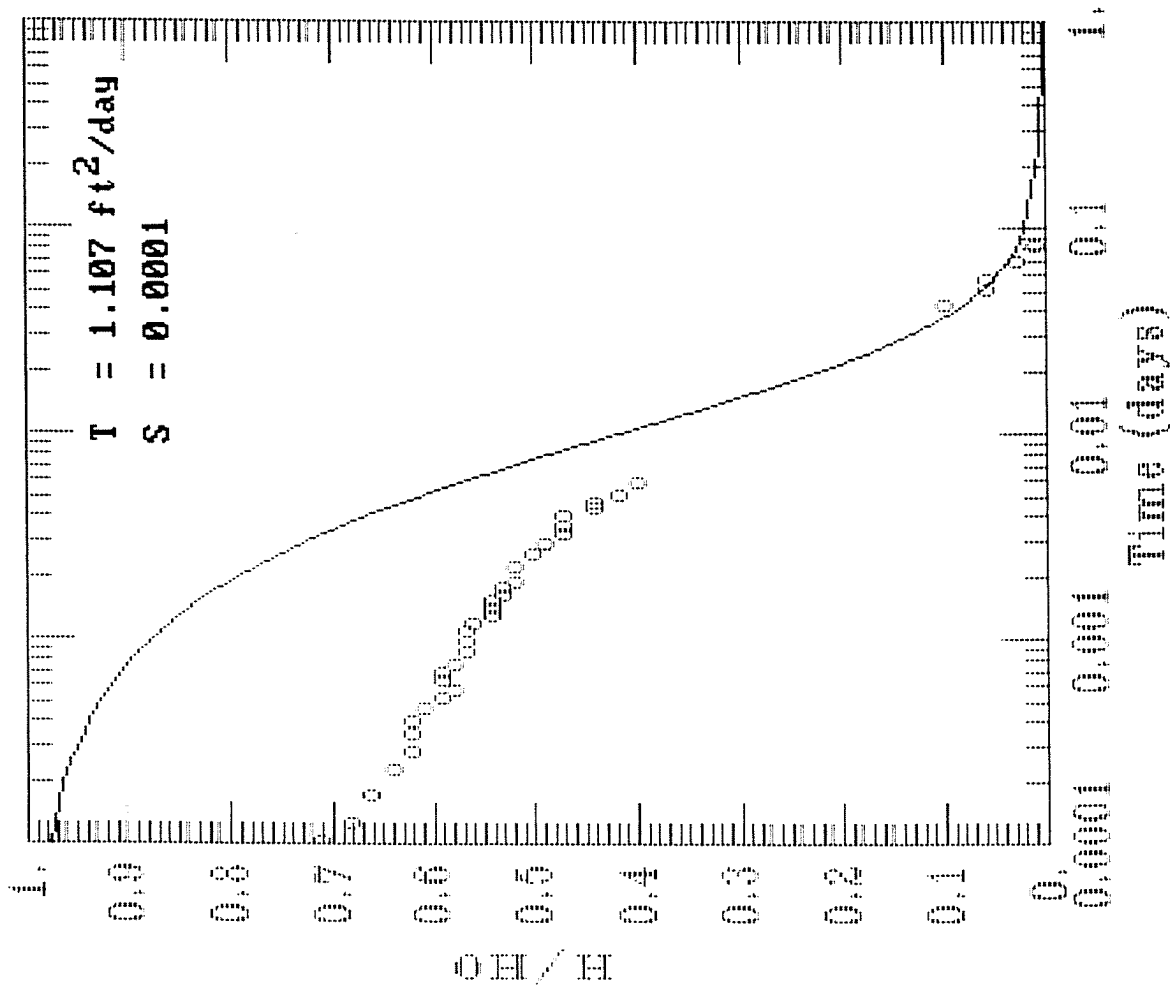
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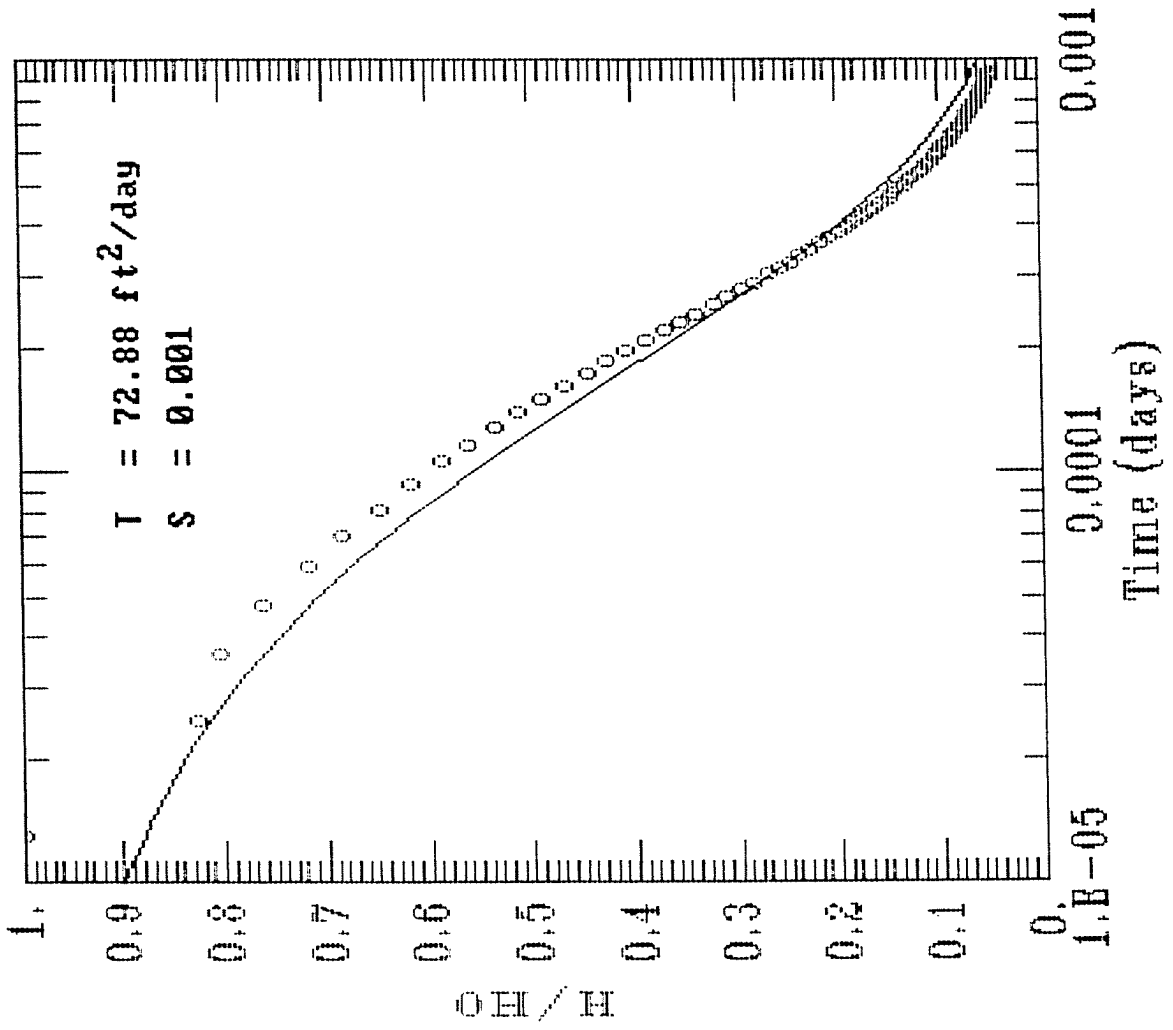
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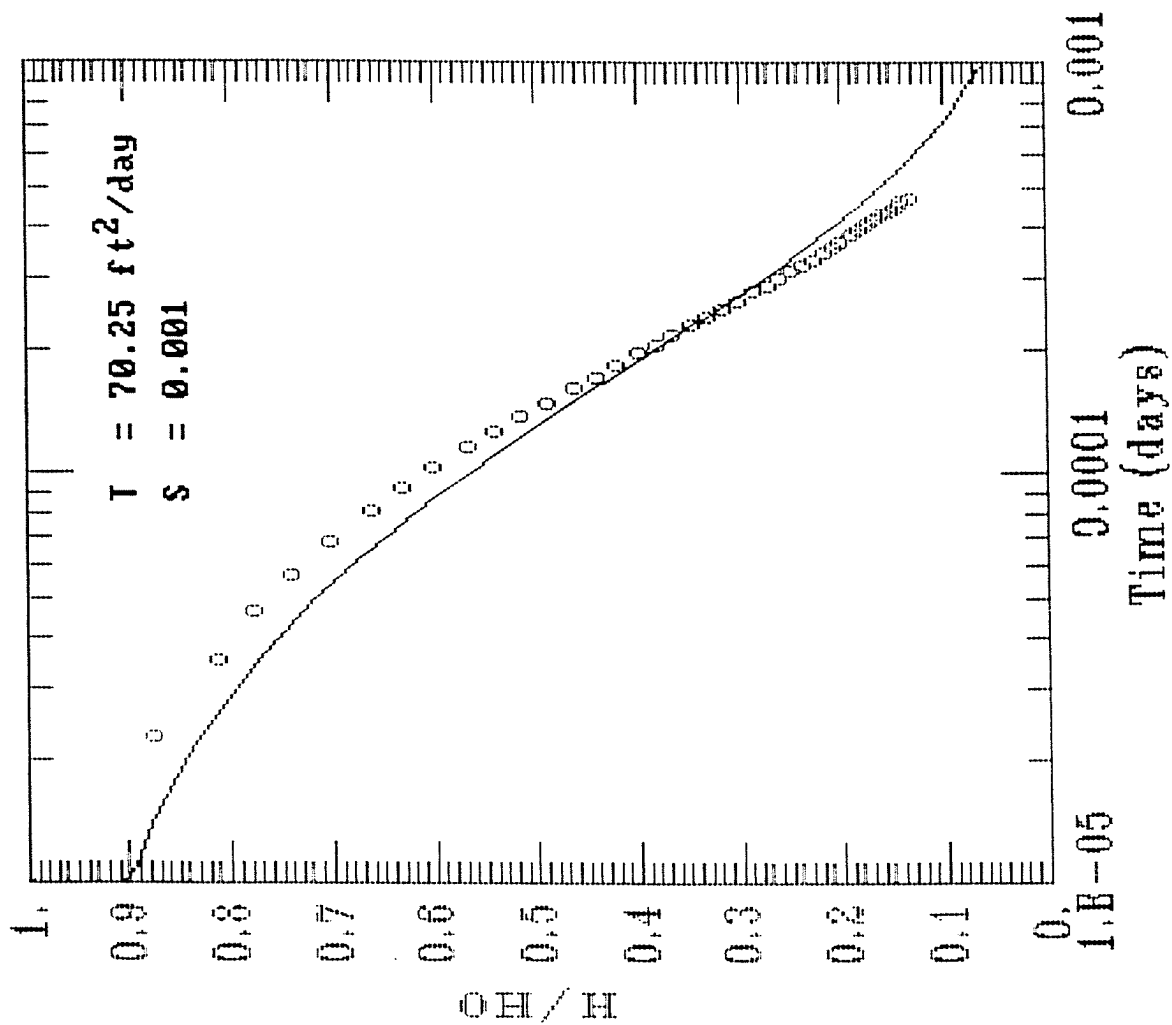
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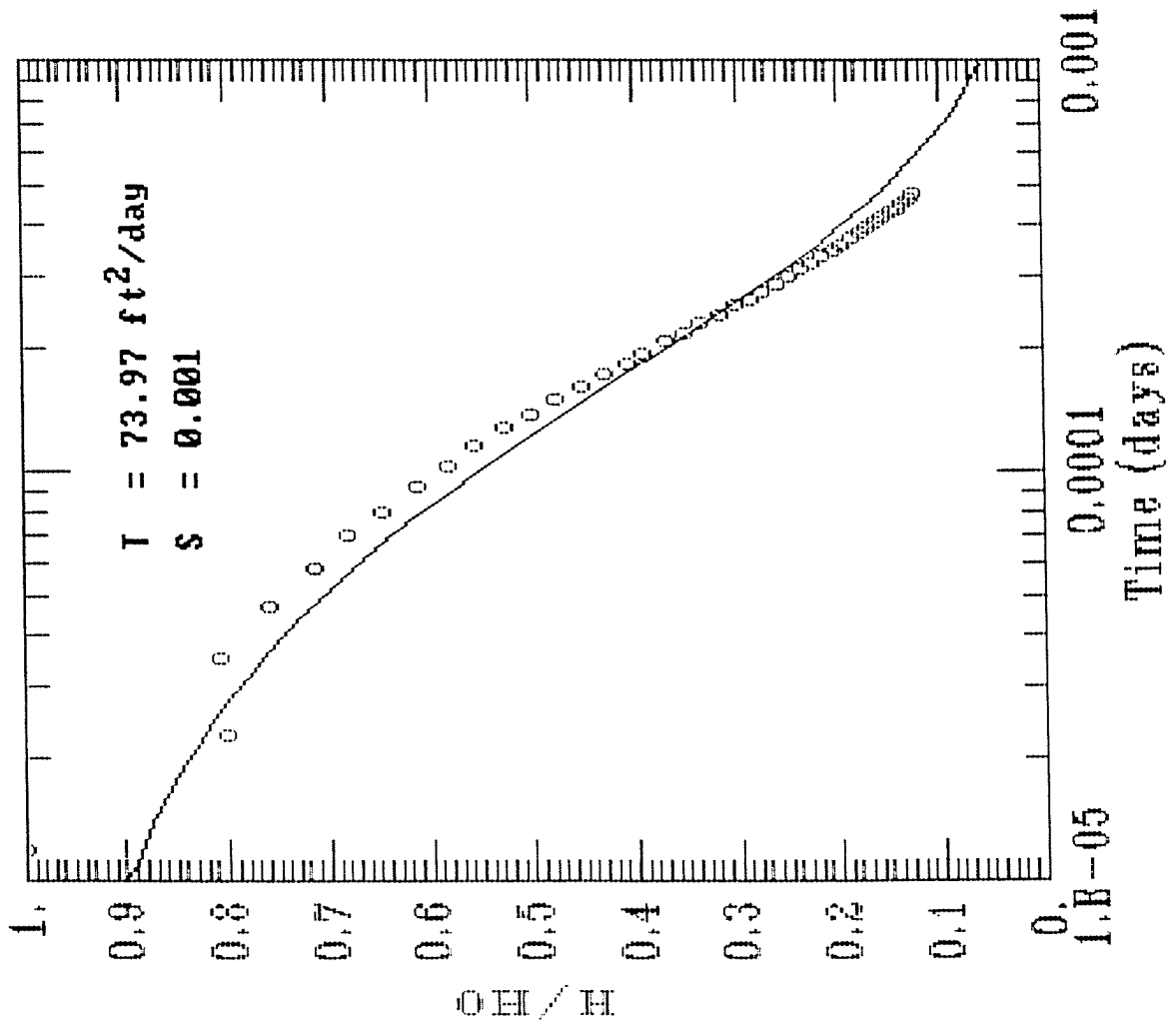
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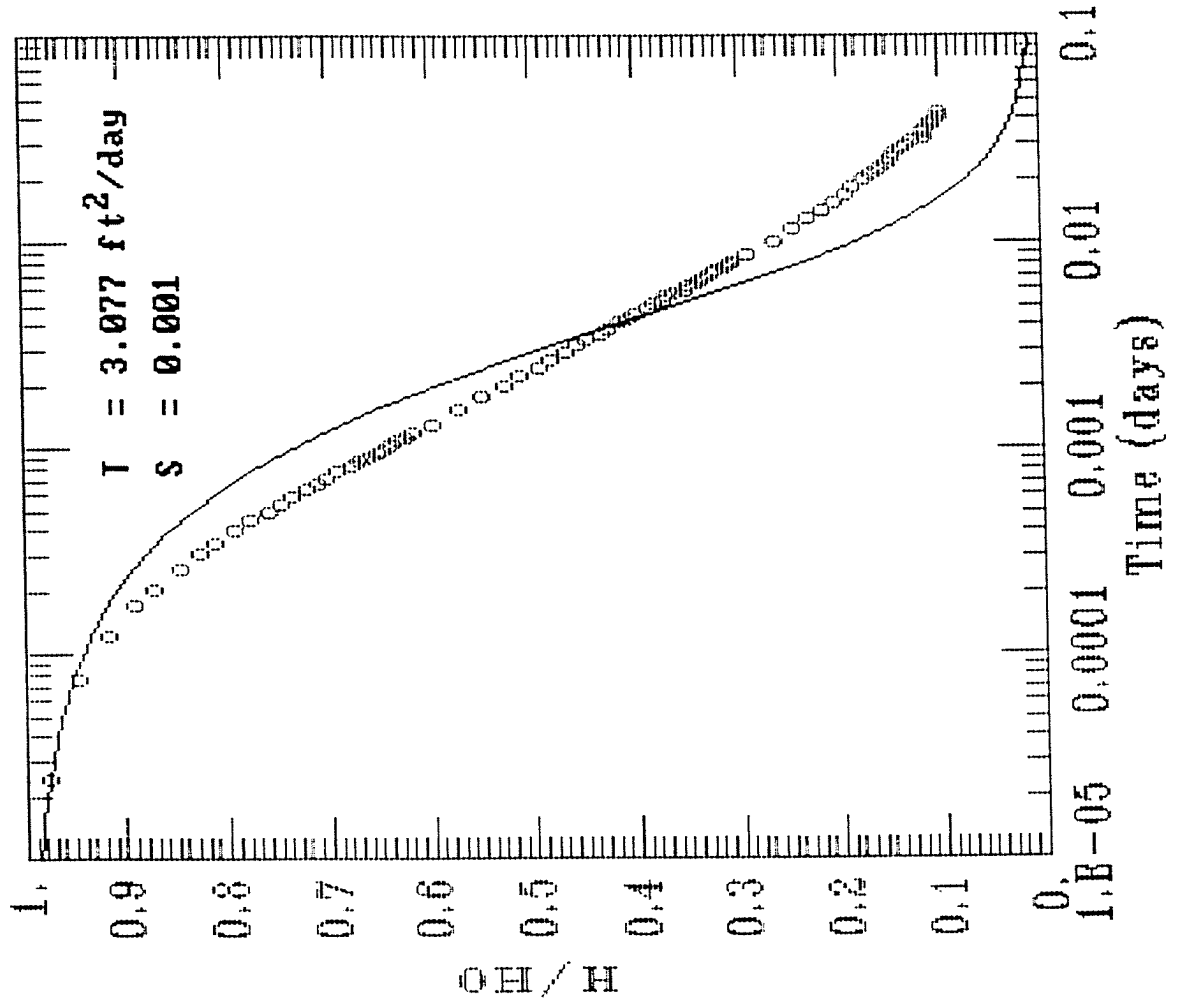
WPI MWFS SLUG TEST #2/3



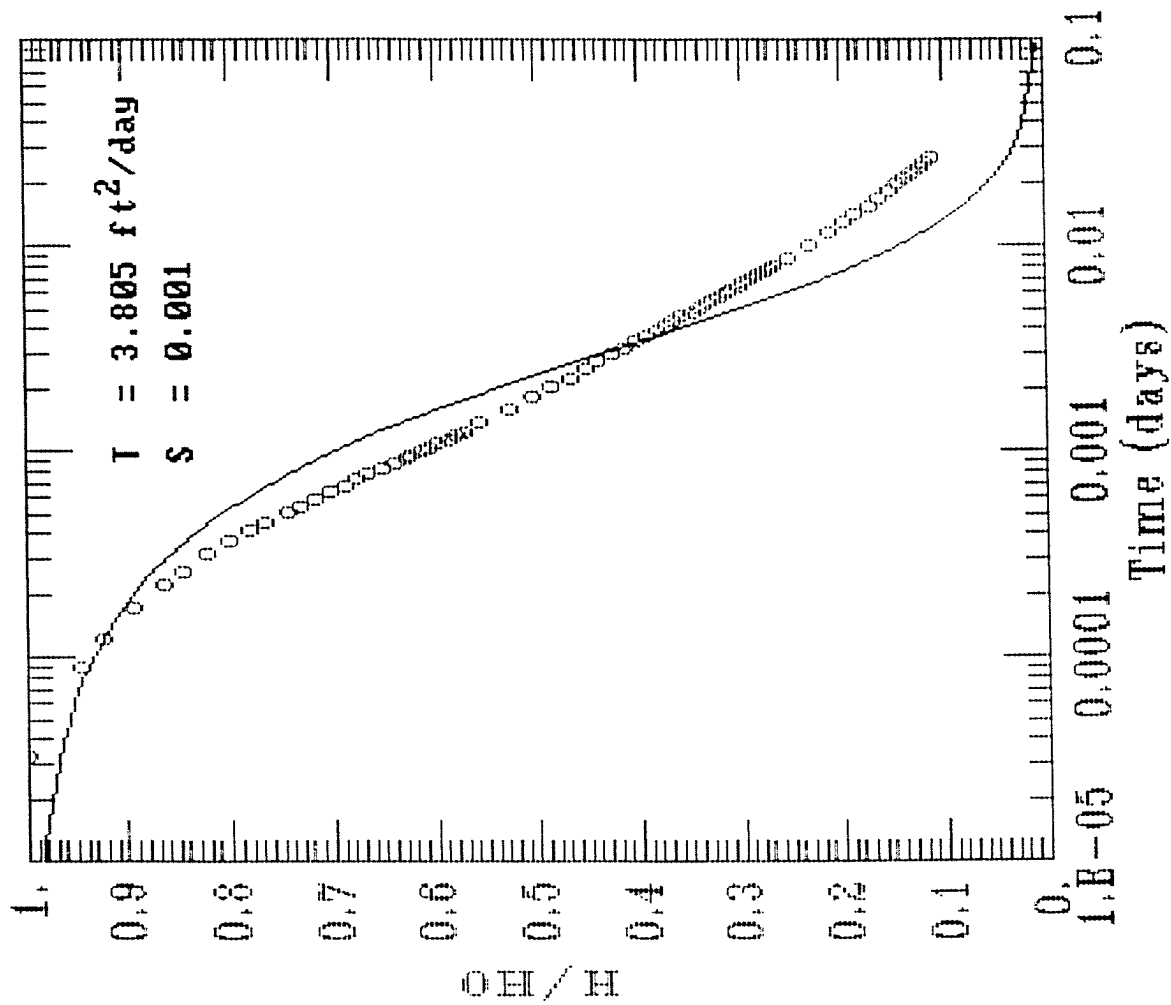
WPI MWF3 SLUG TEST #3/3



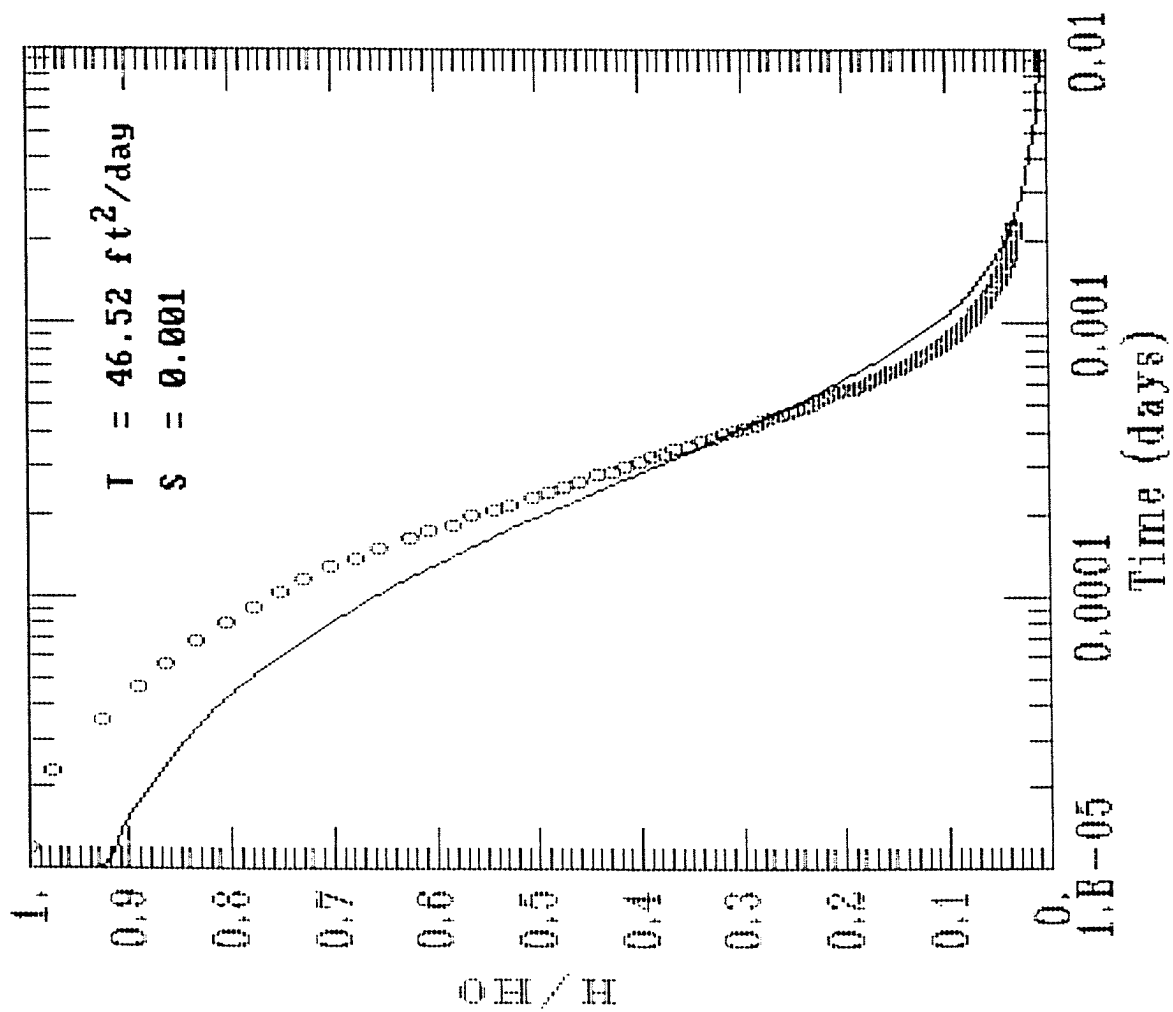
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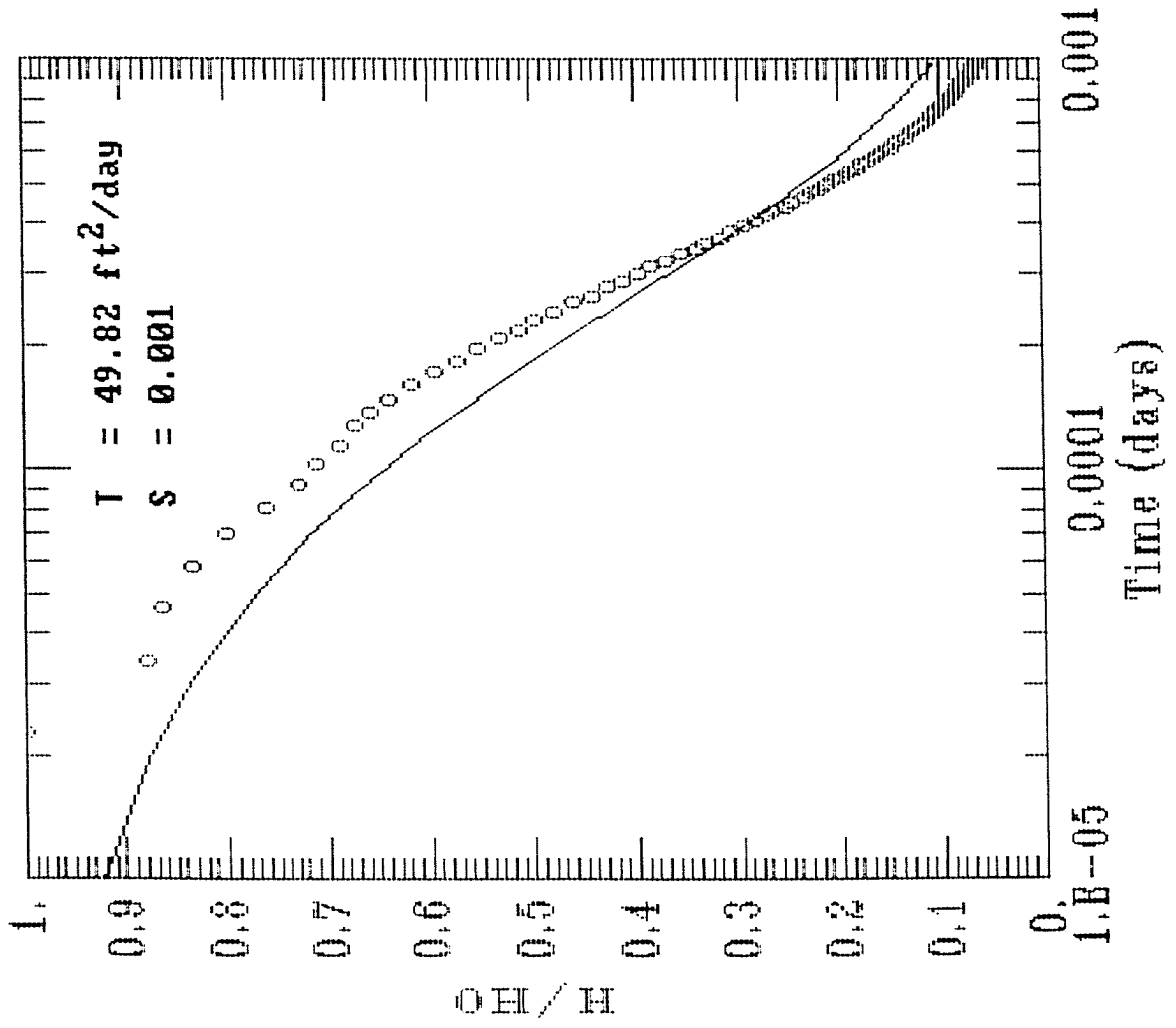
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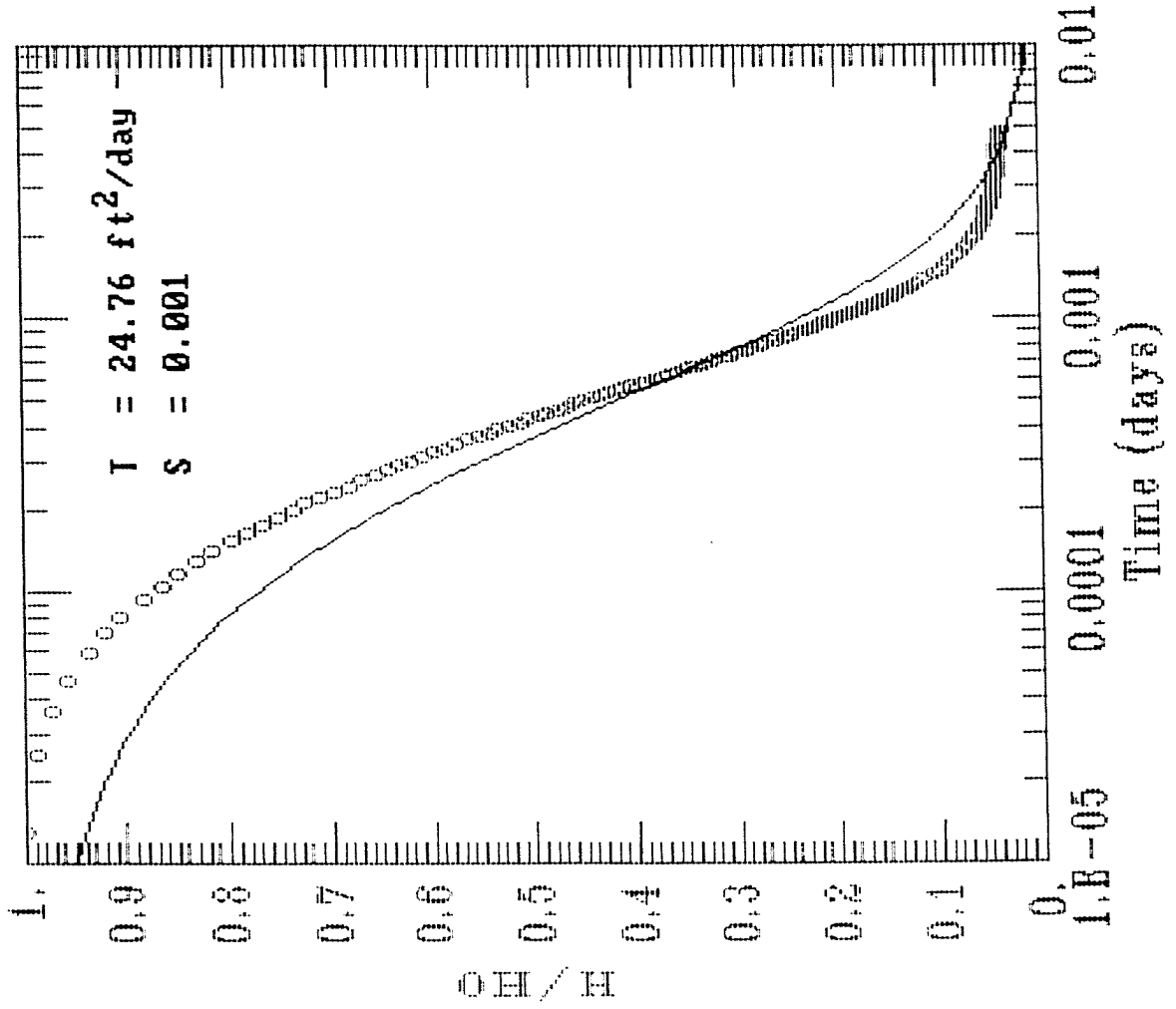
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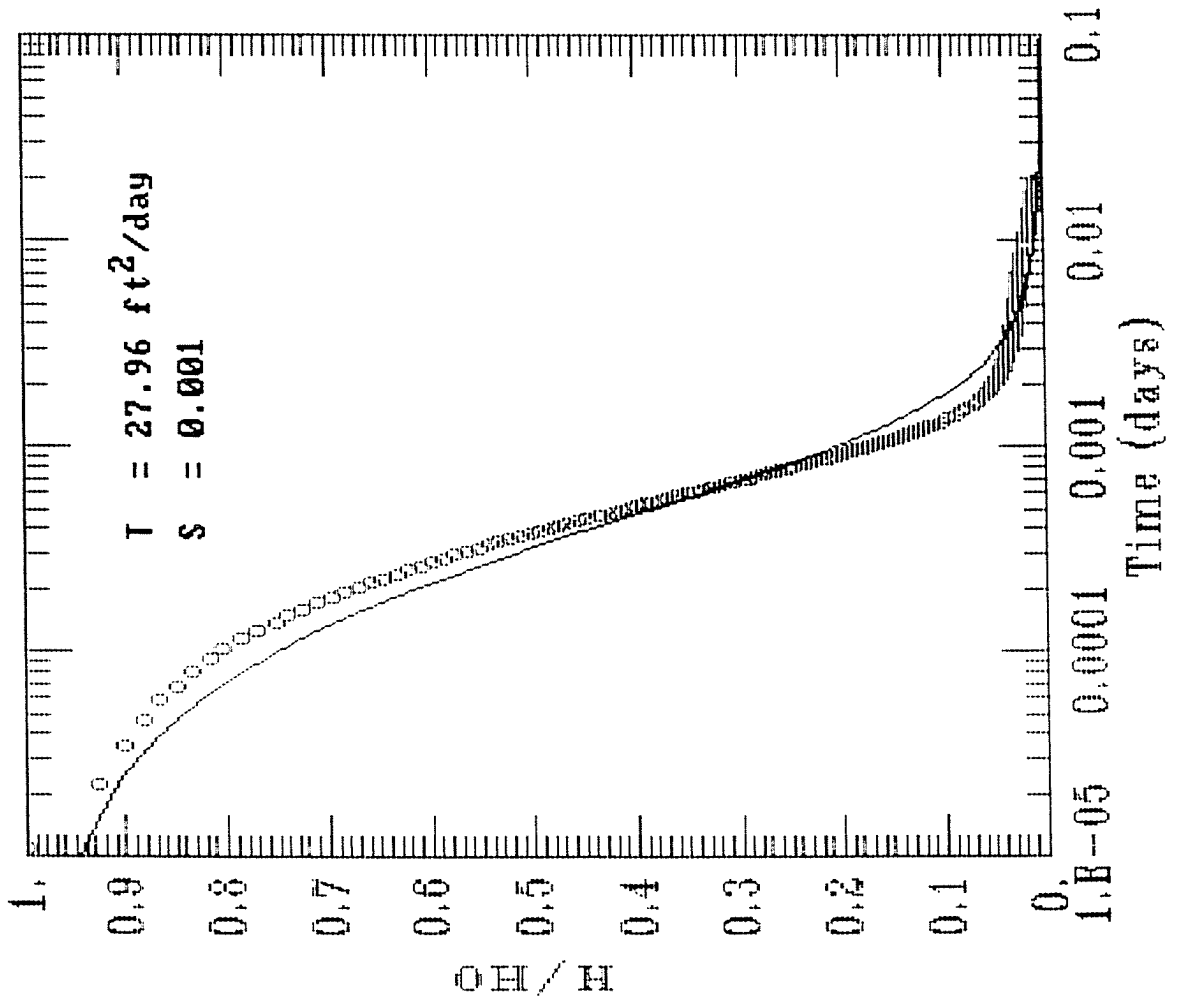
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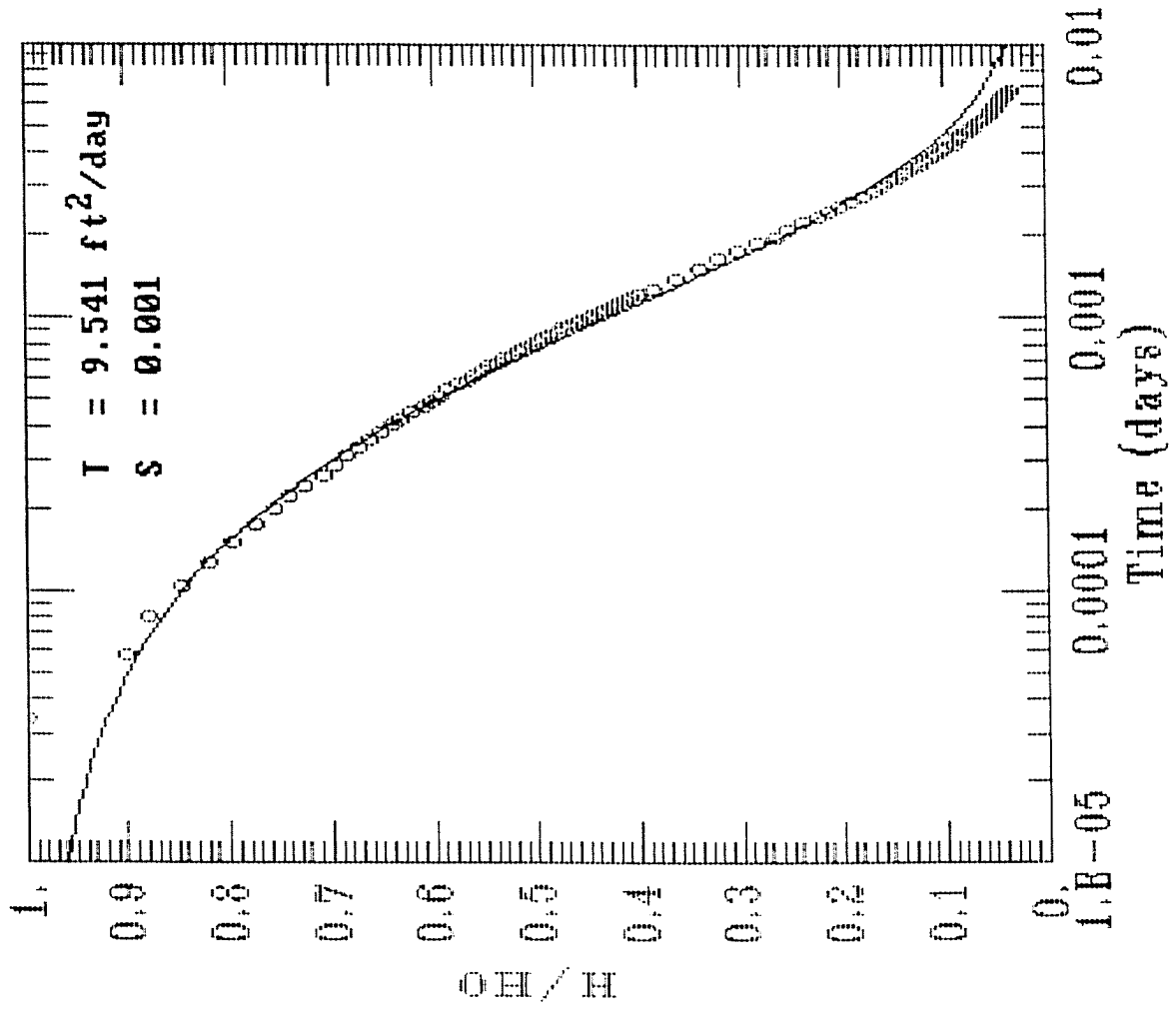
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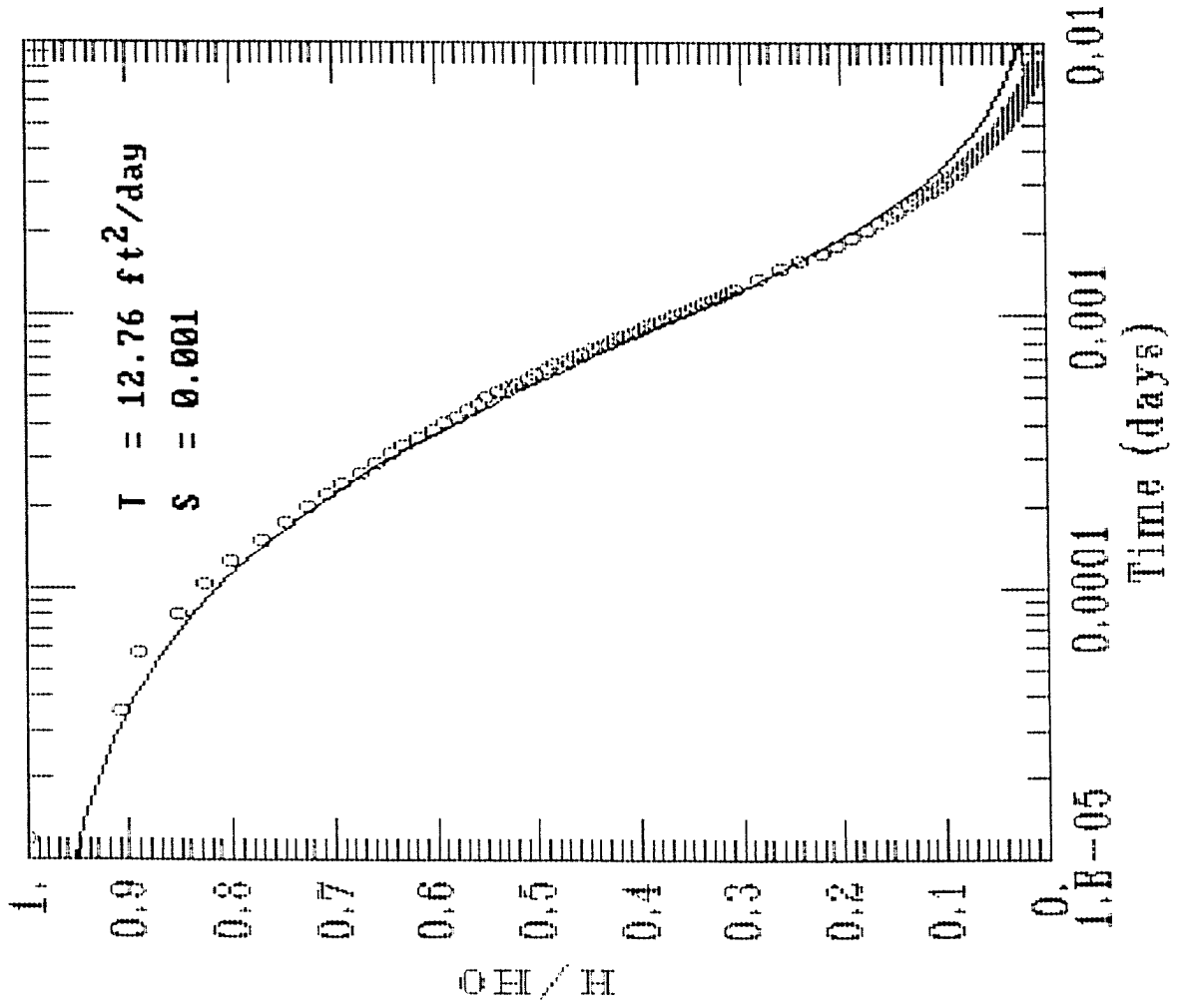
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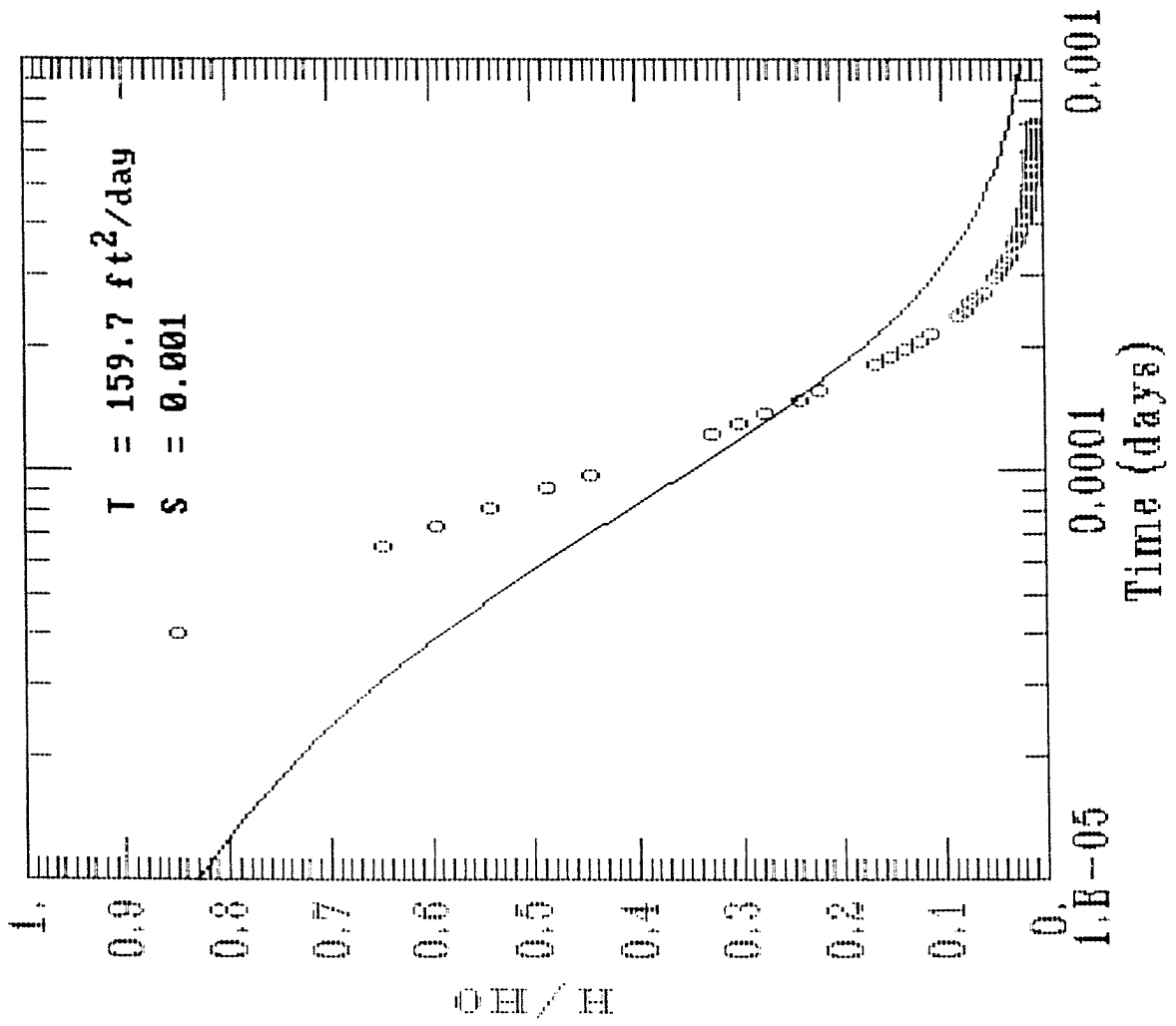
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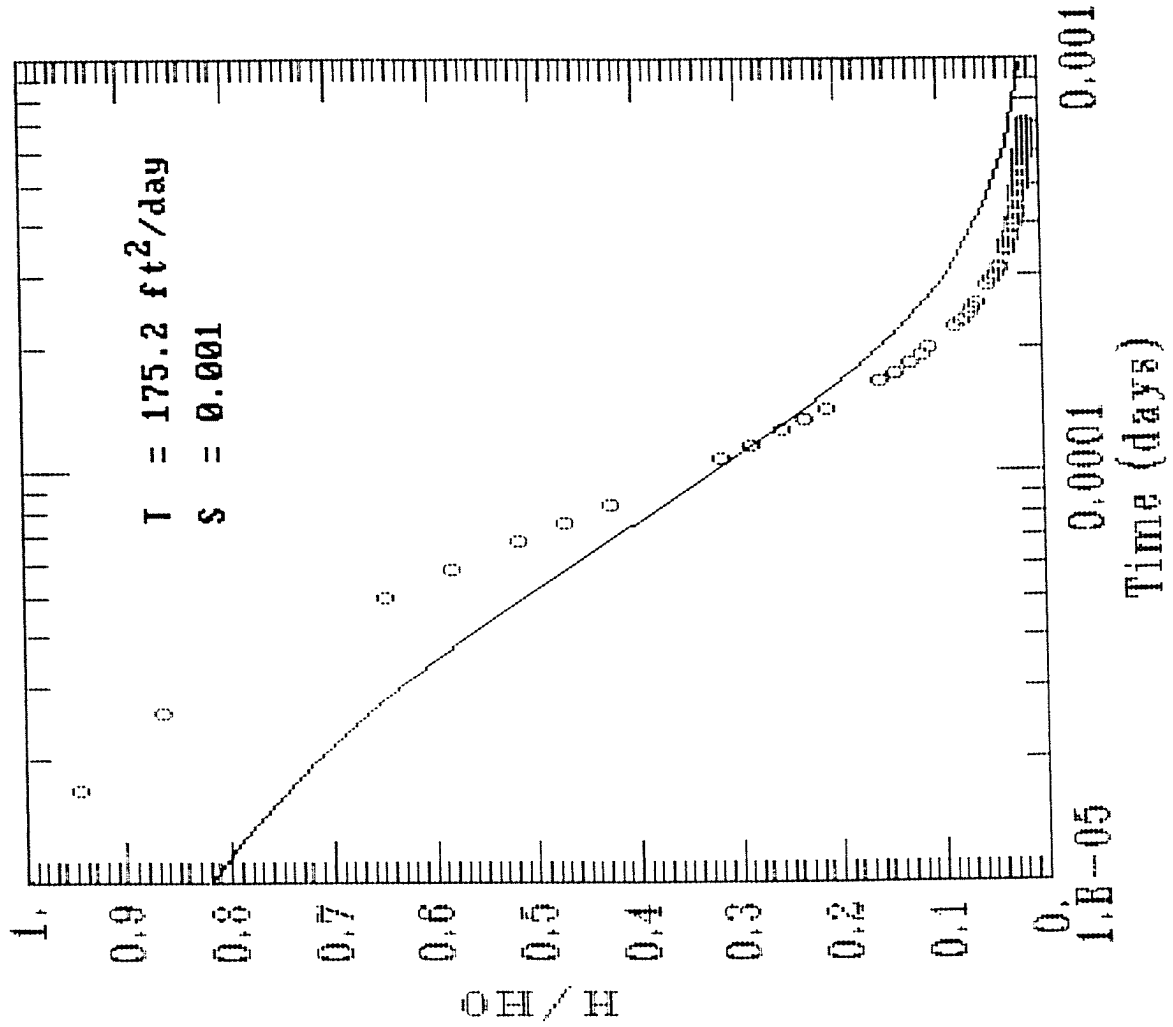
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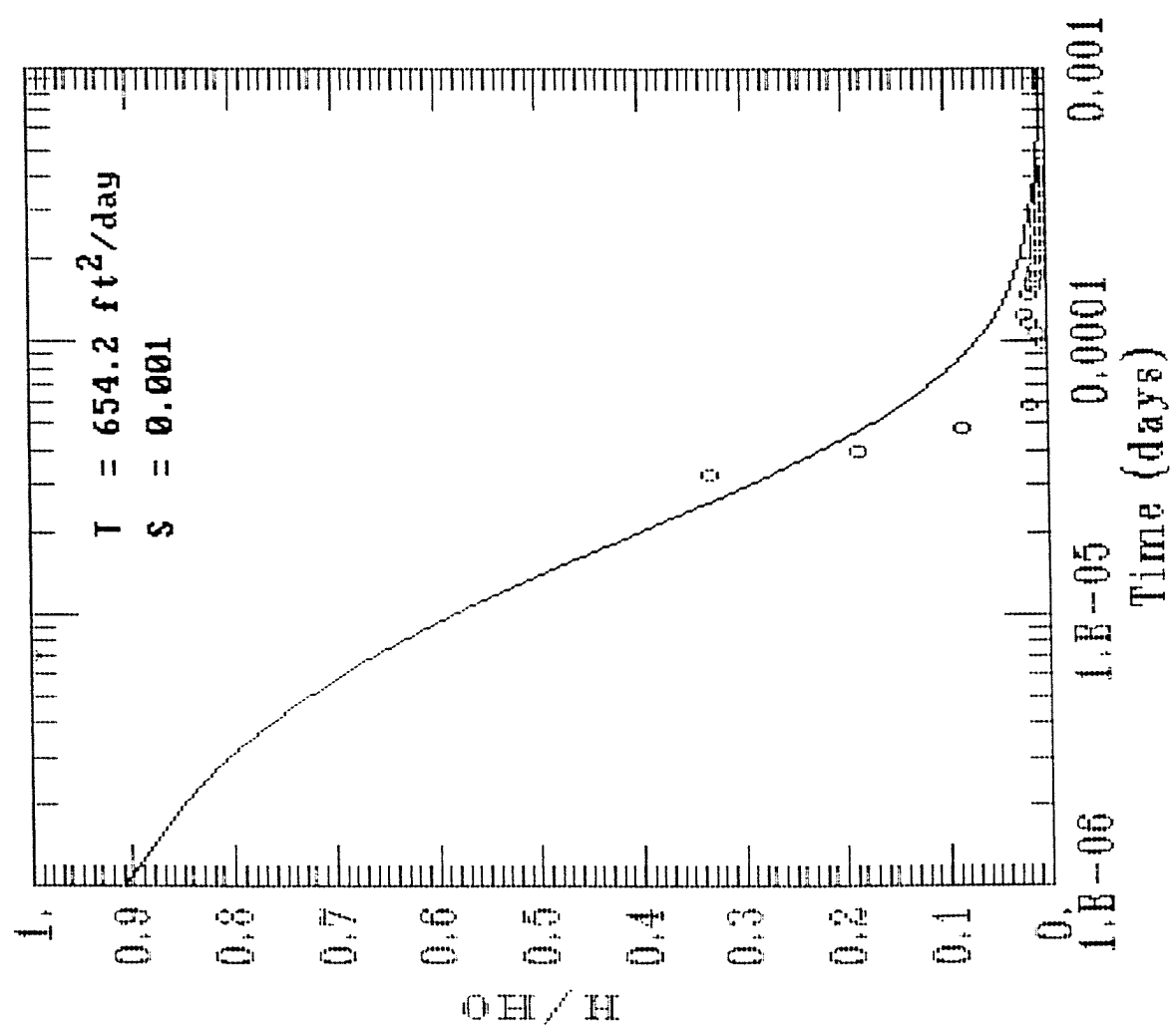
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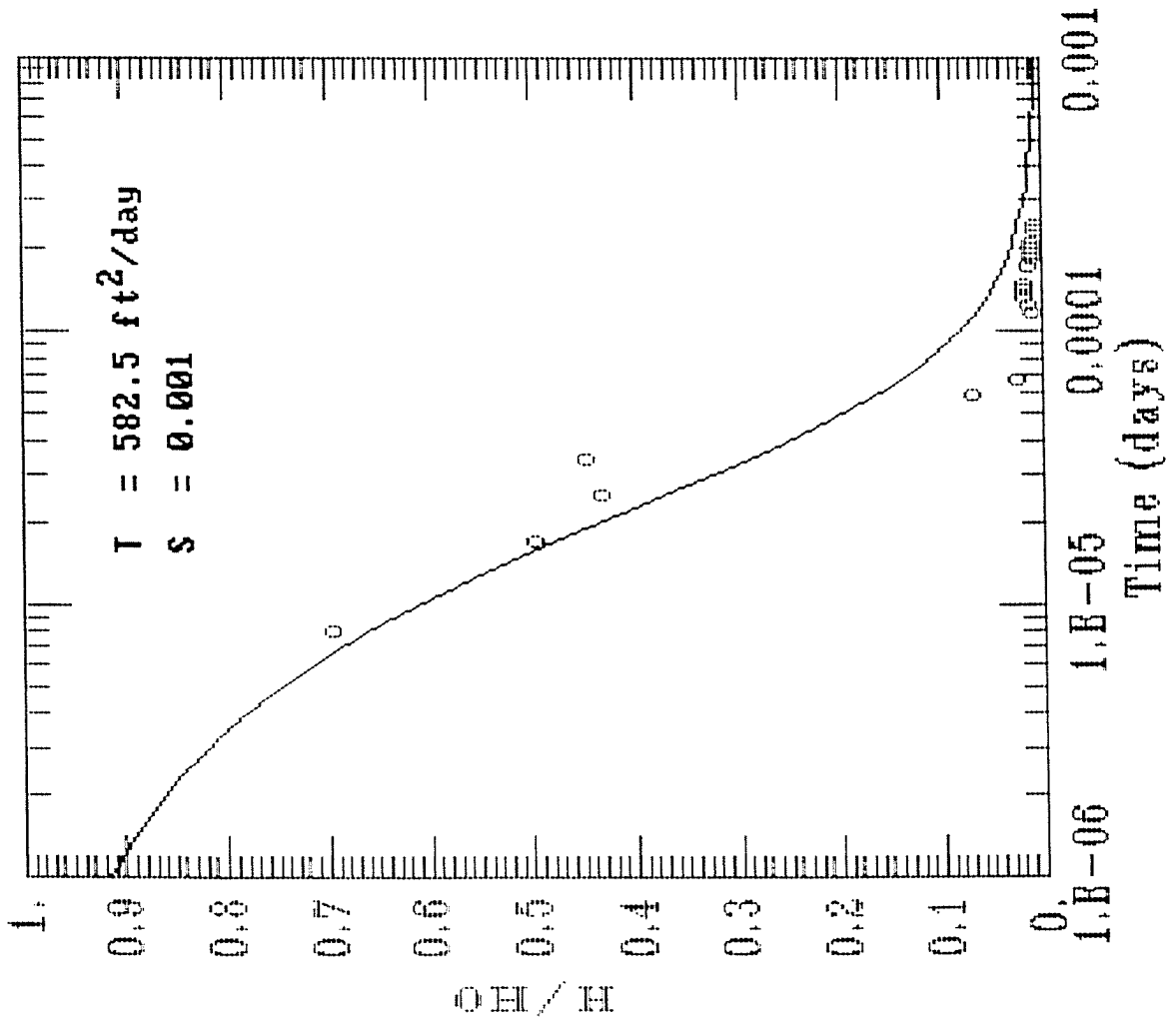
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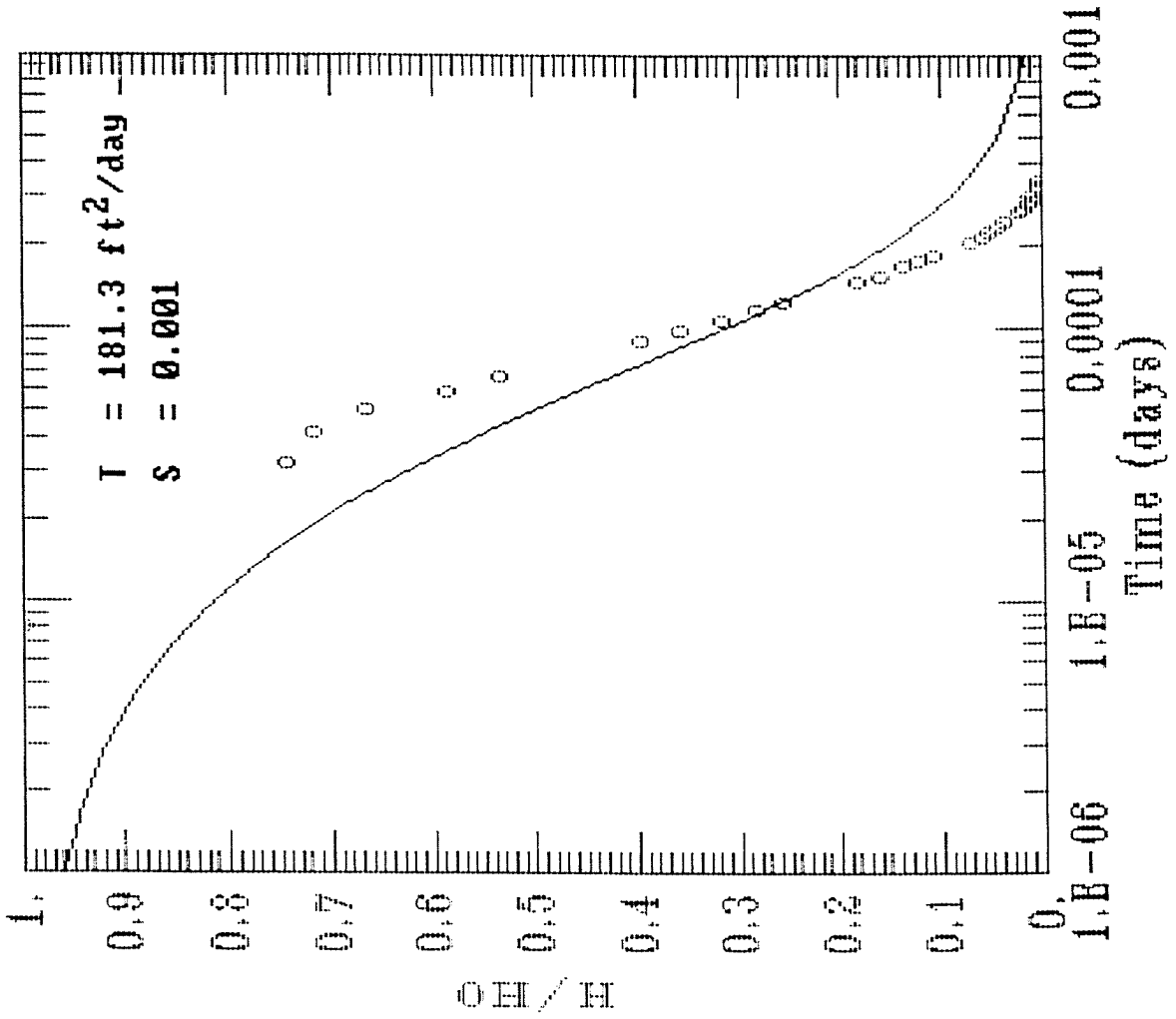
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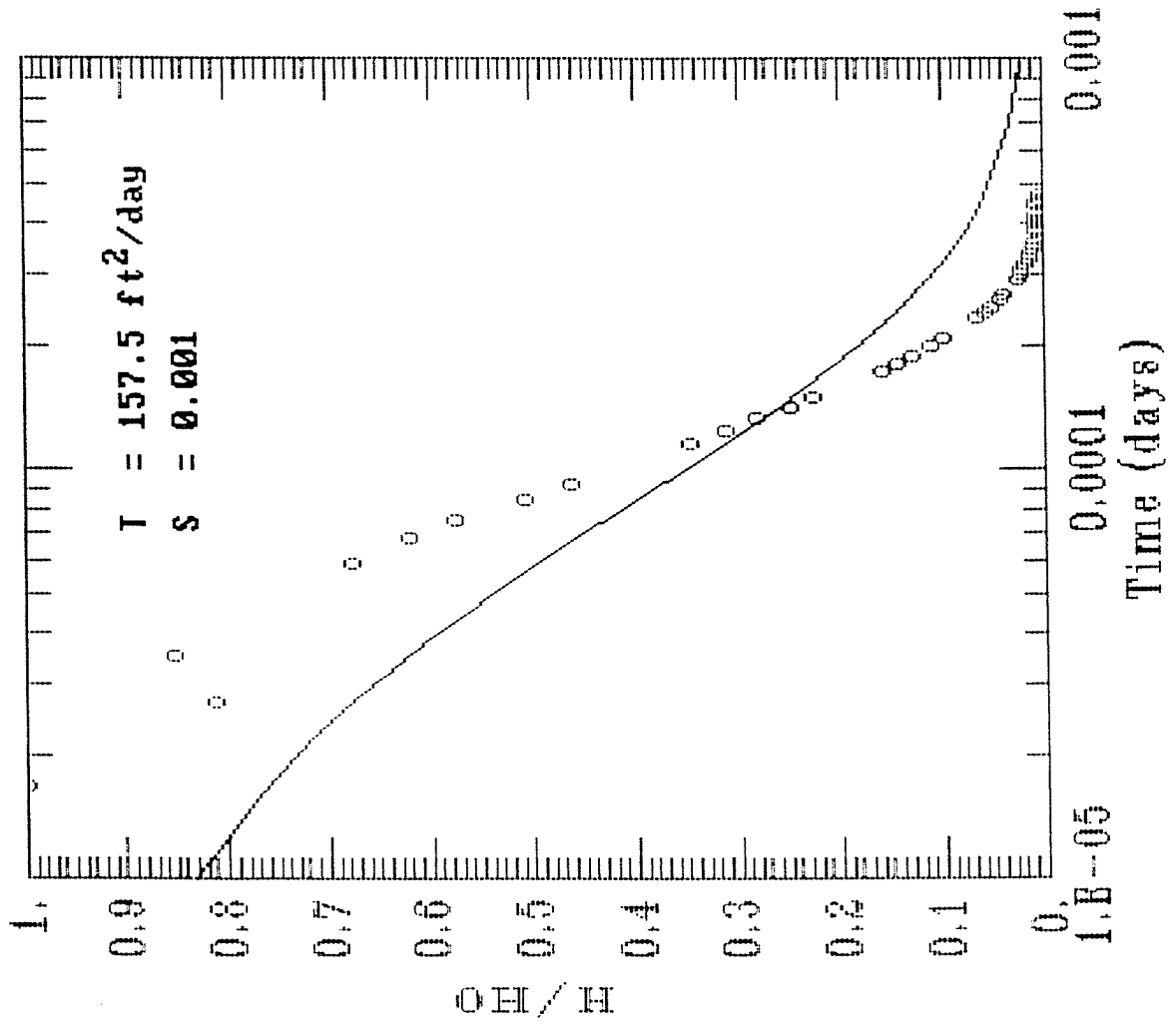
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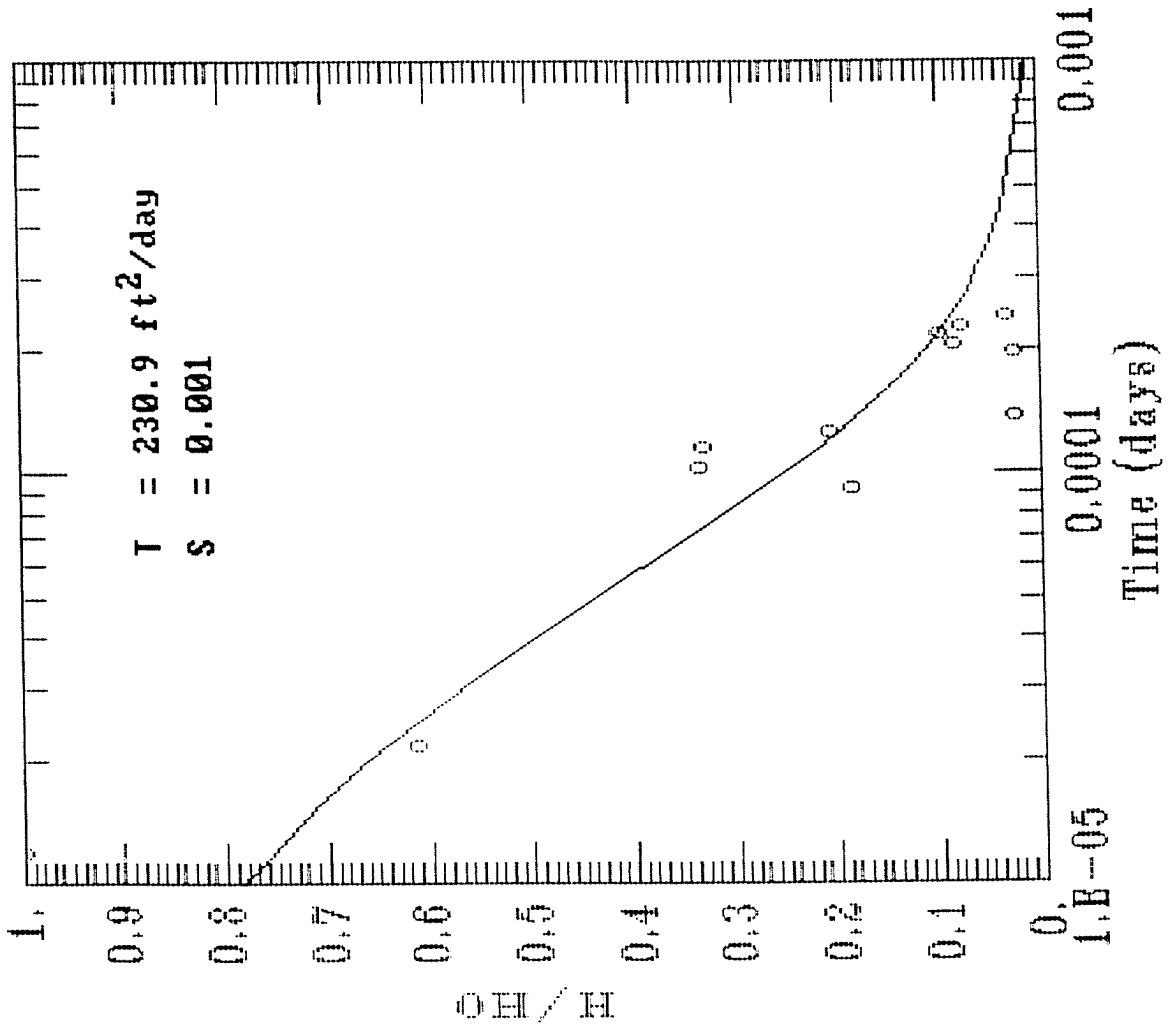
WPI MWS3 SLUG TEST #1/2



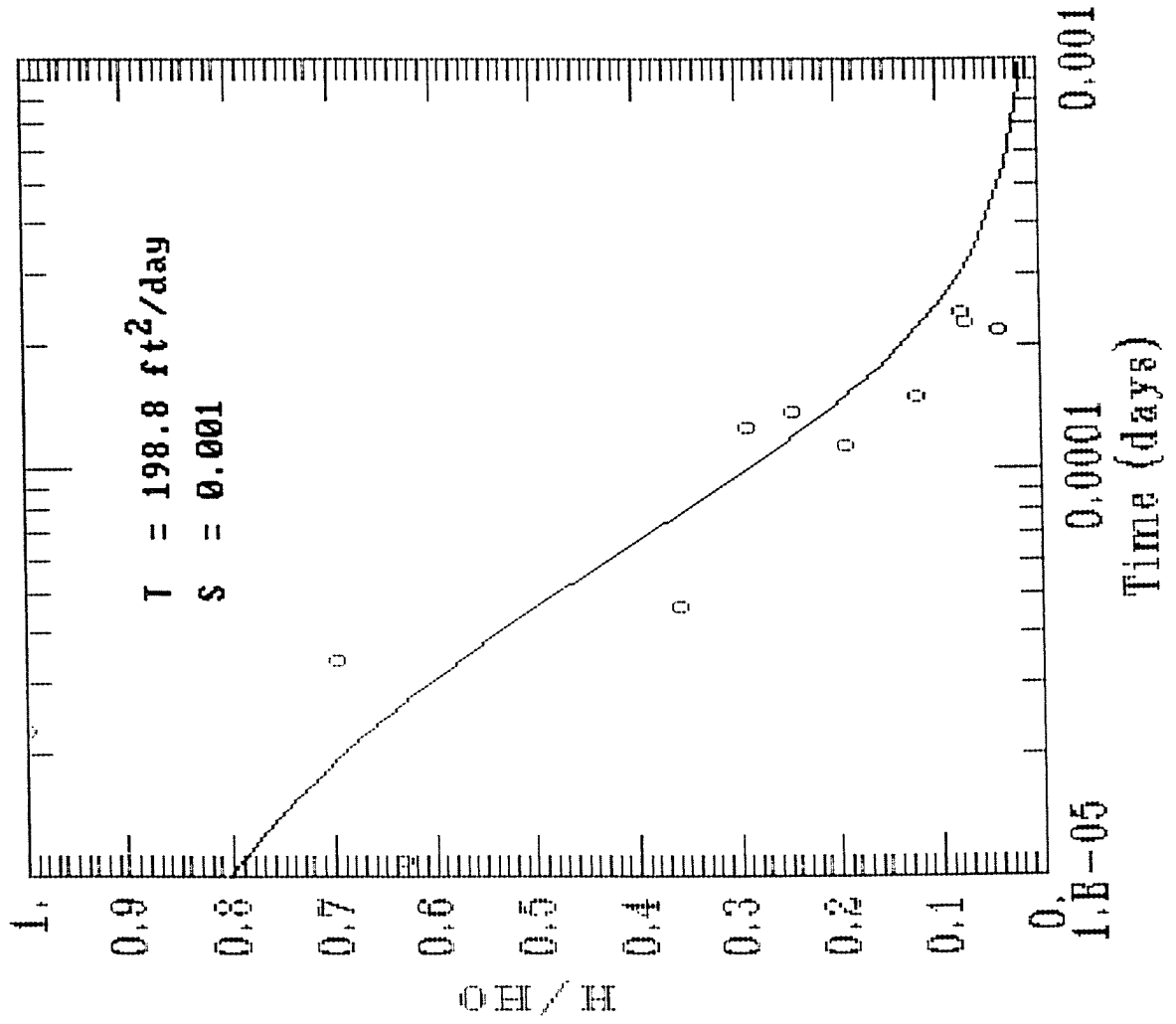
WPI MWS3 SLUG TEST #2/2



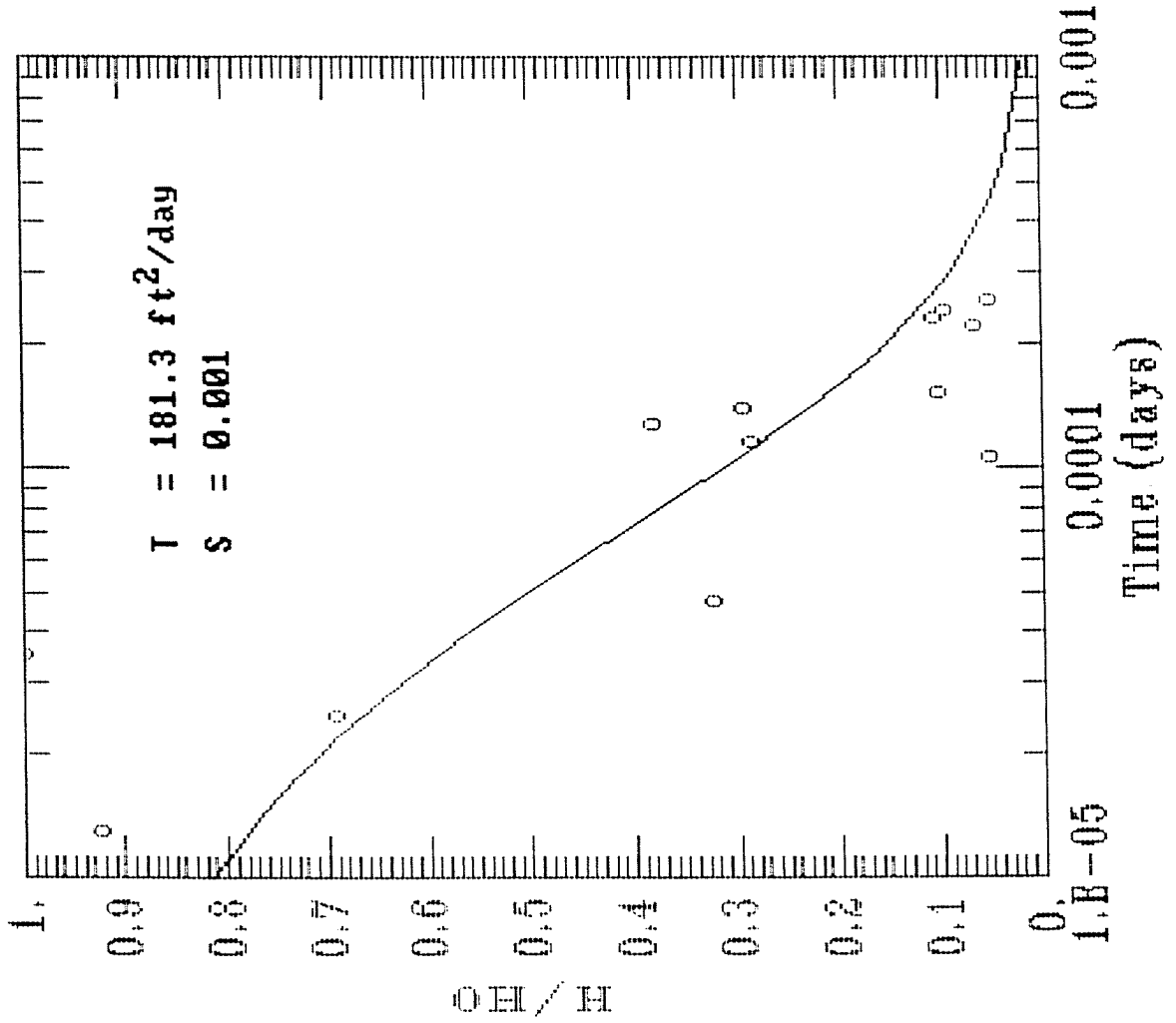
WPI MWS4 SLUG TEST #1/3



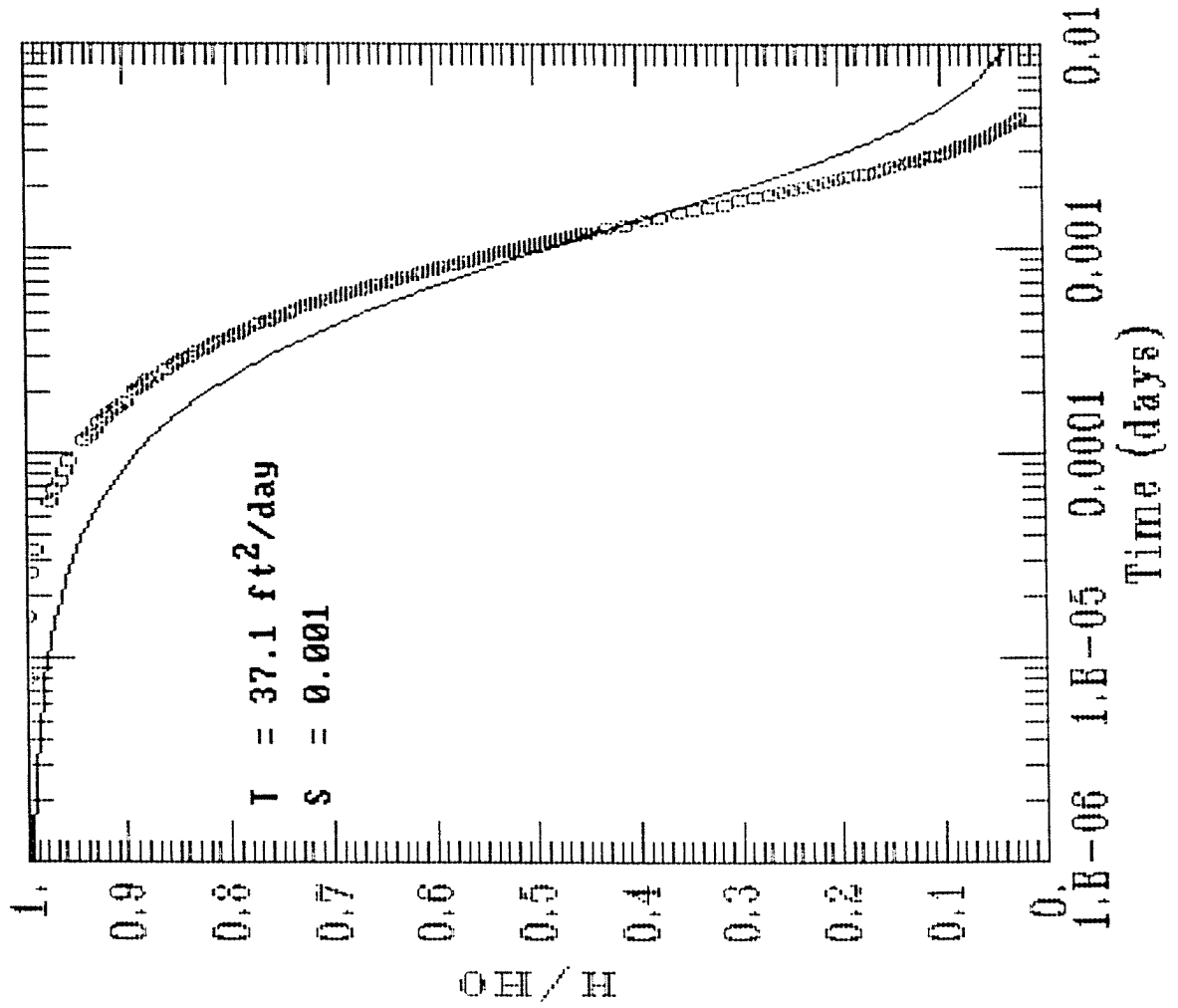
WPI MWS4 SLUG TEST #2/3



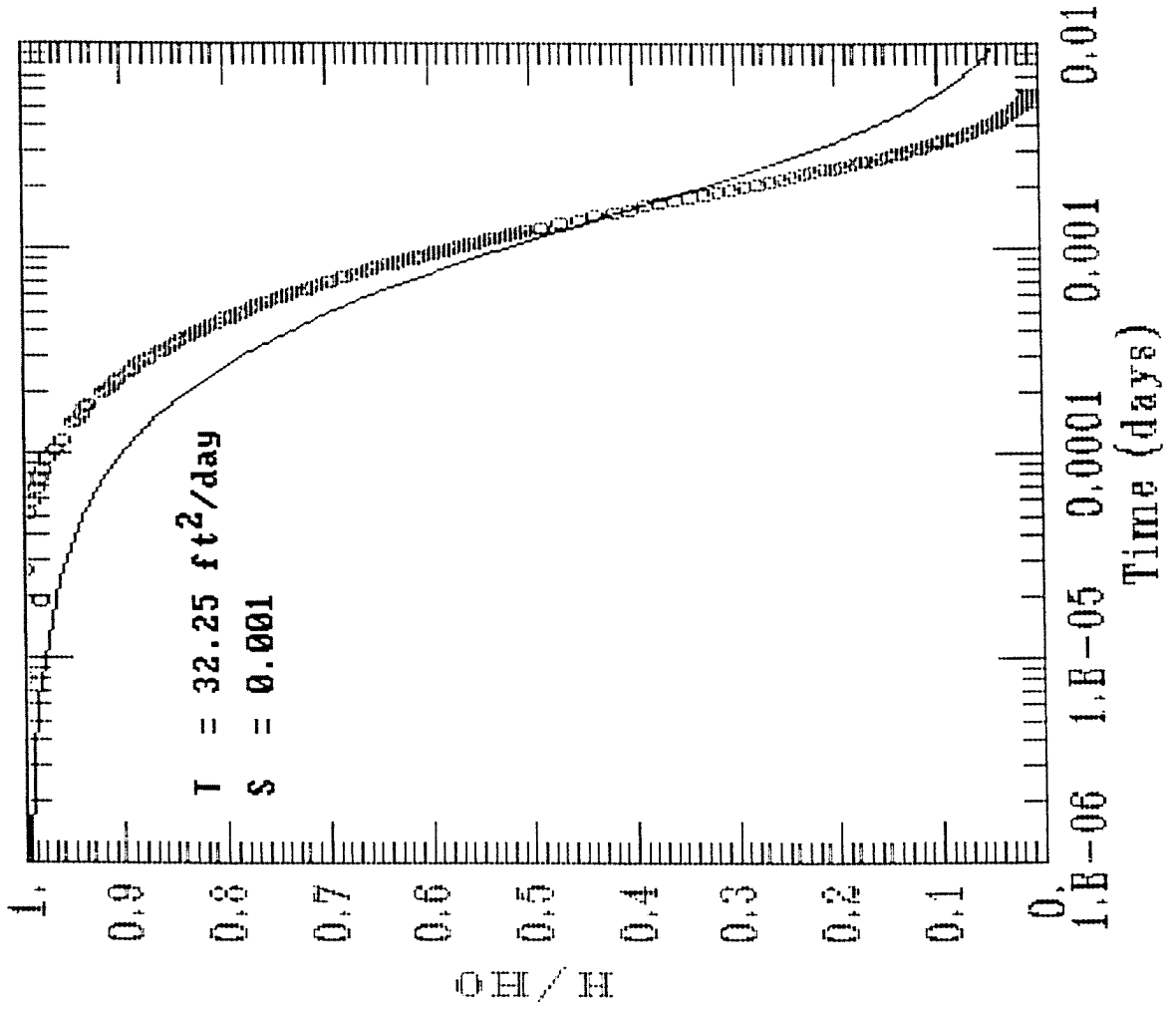
WPI MWS4 SLUG TEST #3/3



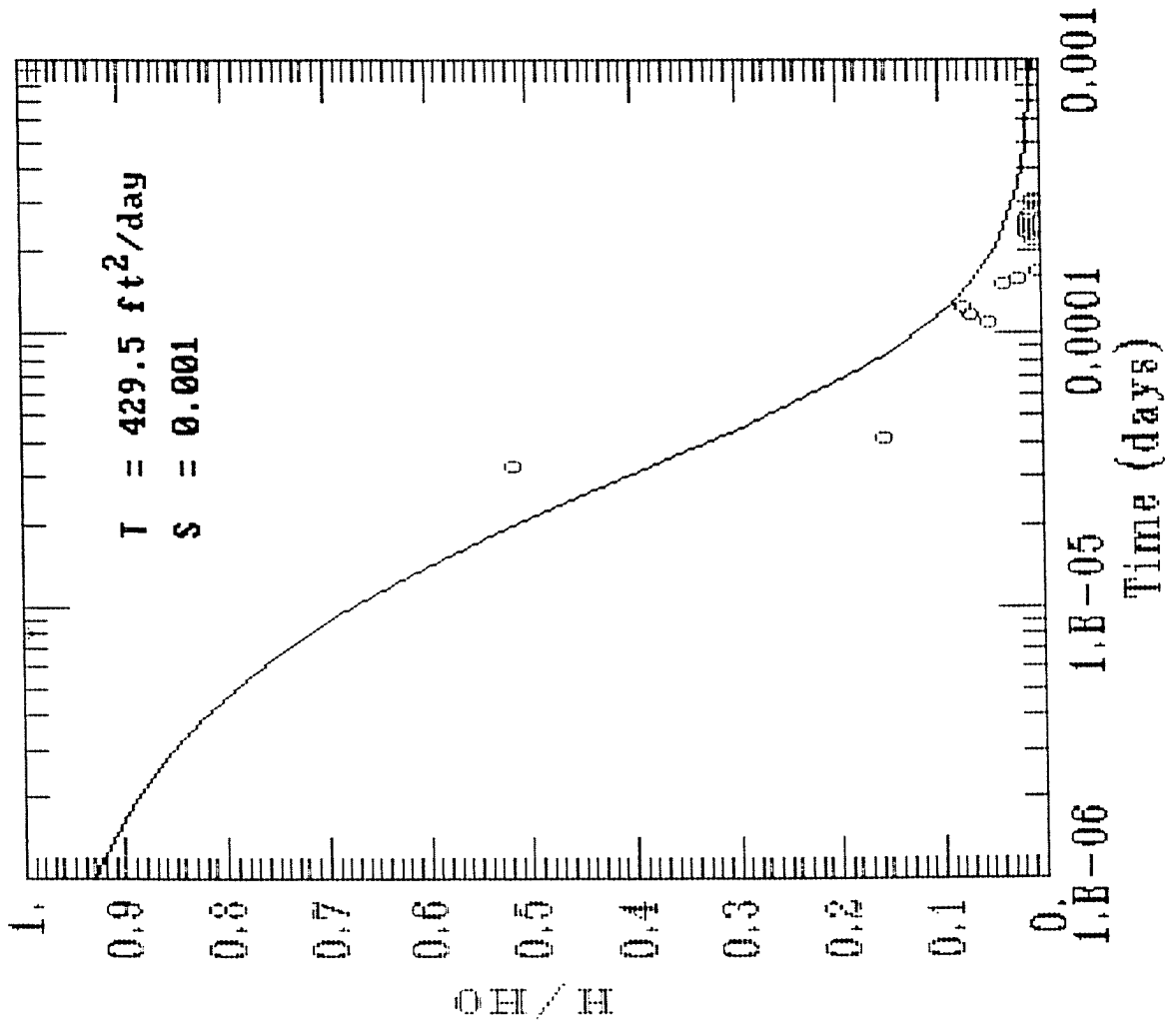
WPI PSI SLUG TEST #1/2



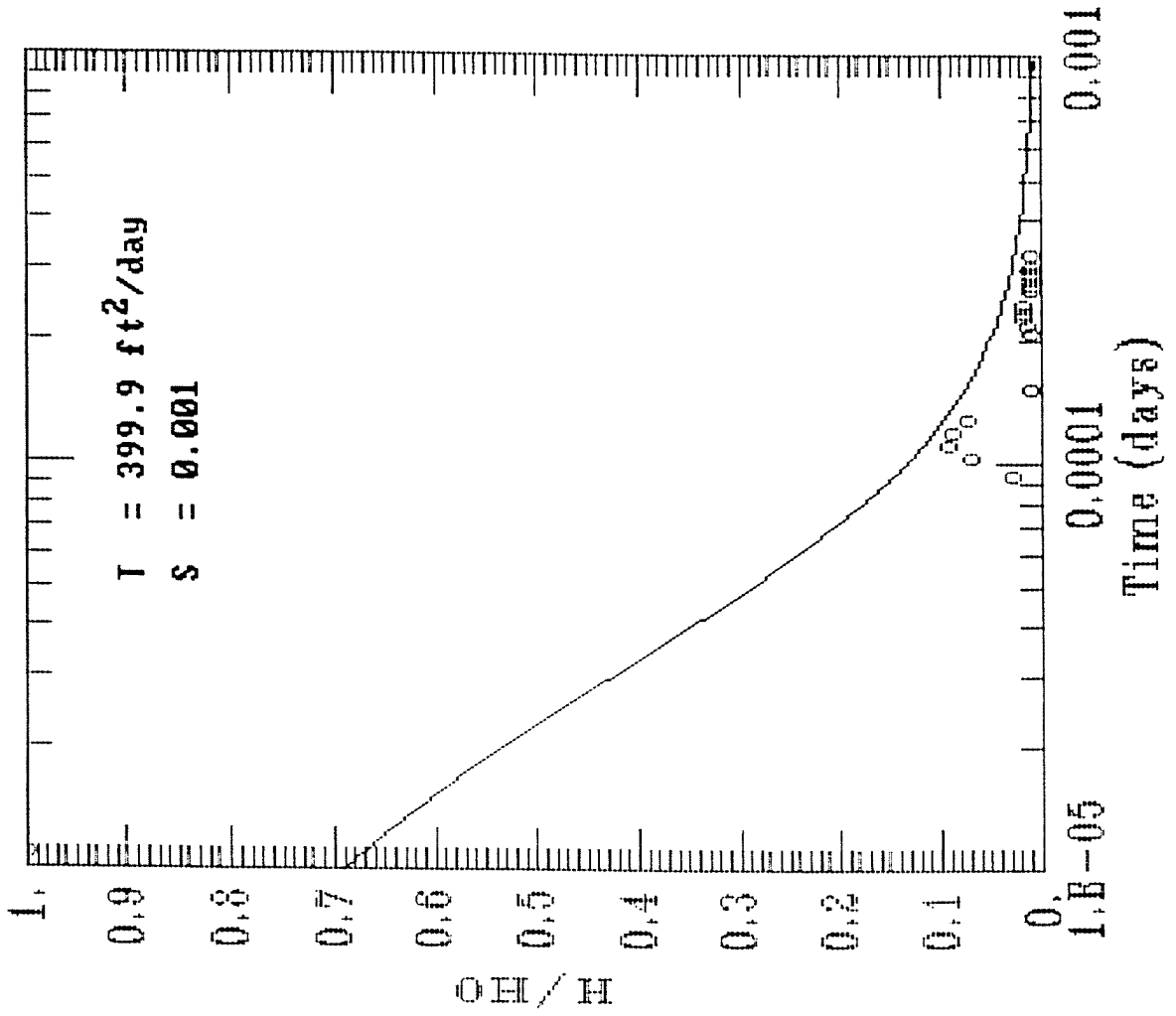
WPI PSI SLUG TEST #2/2



WPI PS2 SLUG TEST #2/3



WPI PS2 SLUG TEST #3/3



Appendix F
CREEK SEDIMENT SAMPLING REPORT

This data report summarizes the creek sediment sampling performed as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Creek sediment samples were collected during two sample rounds, the first was in May, 1992 and the second was in May, 1993.

MAY 1992

The first sampling round occurred from May 18 through May 20, 1992. GeoTrans, Inc. personnel collected 14 creek sediment samples along the Scajaquada Creek from 13 locations (ST1-13) on 50-ft centers (Figure F-1). The 13 locations were adjacent to the site. Thirteen samples were collected from zero to six inches below ground surface (bgs) at the water line of the creek along the eastern bank of the creek. One additional sample was obtained from 18 to 24 inches bgs at ST-11.

The samples were collected with a two-inch diameter, stainless steel hand auger. The samples were transferred from the hand auger to the sample jars by means of a stainless steel spoon. The samples were placed in coolers and iced down immediately. Sampling equipment was decontaminated between sample locations using a non-phosphate detergent wash, a tap water rinse, ten percent methanol solution rinse, a final deionized water rinse, and air drying.

Samples were analyzed for volatile organic compounds (VOCs), base neutral analytes (BNAs), acid extractable organics (AEOs), pesticides/PCBS, total organic carbon (TOC), and target analyte metals (TALs) including cyanide. A list of the individual analytes is presented in Table F-1. Analytical services were provided by General Testing Corporation Inc., of Rochester, New York. The results of the organic and inorganic chemical analyses are presented in Table F-2 and F-3, respectively.

MAY 1993

The second sampling round occurred from May 10 through May 13, 1993. GeoTrans, Inc. and Buffalo Drilling Inc., personnel collected 36 creek

sediment samples. Samples were collected with a split-spoon sampler, driven 24 inches into the sediments, using a slide hammer from the deck of a pontoon boat. A core catcher was inserted into the bottom of the split-spoon sampler to increase sediment recovery. A hole in the floor of the pontoon boat allowed access to lower and raise sampling equipment to the creek bottom. In cases where insufficient quantity of sediment was collected, the split-spoon sampler was re-advanced at approximately the same location. Composite samples of multiple split-spoon samples were collected from several locations. The samples were transferred from the split-spoon sampler to sample jars by means of a stainless steel spoon. The samples were placed in coolers and iced down immediately. Sampling equipment was decontaminated between sample locations using non-phosphate detergent wash, a tap water rinse, ten percent methanol solution rinse, a final deionized water rinse, and air drying.

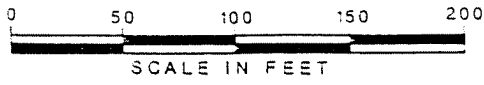
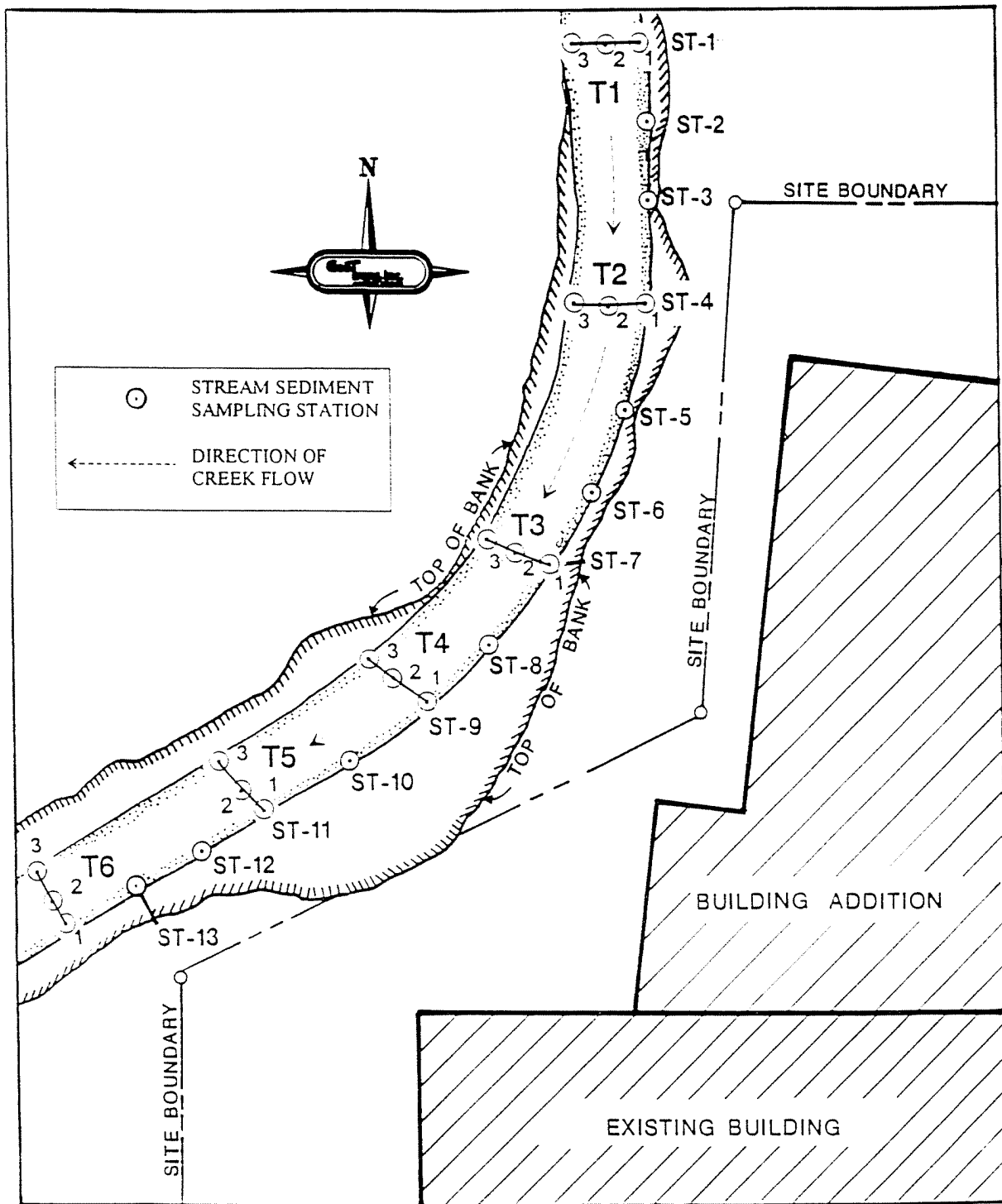
The samples were collected along six transects (Figure F-1). The six transects (T-1 through T-6) were located along the western property line of the site and Scajaquada Creek. Transect T-1 was located 100 ft north of the northern property boundary. Transect T2 is located 150 ft south of T1 and 50 ft south of the northern property boundary. Transect T3 is located 150 ft south of T2. Transect T4 is located 100 ft south of T3. Transect T5 is located 100 ft south of T4. And T6 is located 150 ft south of T5 and 50 ft south of the southern property line. Transects T4, T5, and T6 are spaced at 100 ft intervals because of the higher concentrations of polycyclic aromatic hydrocarbons (PAHs) found near these locations during the previous sampling round.

Three sample locations were along each transect. The locations were labeled one, two, and three. Location one was on the east side of Scajaquada Creek approximately five ft from the shore line, location two was along the center line of the creek, and location three was on the west side of the creek, approximately five ft from the shore line.

Two samples were collected from each sample location. The samples were collected from depth-discrete intervals within the recovered split-spoon sampler. The samples were collected from the zero- to six-inch interval, and the 18- to 24-inch interval, from the first sediments

encountered. These samples were labelled A and B, for the zero- to six-inch interval and the 18- to 24-inch interval, respectively.

Samples were analyzed for BNAs, AEOs, cyanide, and vanadium. A list of the individual BNA and AEOs was presented in Table F-1. Analytical services were again provided by General Testing Corporation Inc., of Rochester, New York. The results of the organic and inorganic chemical analyses are presented in Table F-4. A description of the sediments encountered is provided in Table F-5.



GeoTrans, Inc.
GROUNDWATER SPECIALISTS

Creek sediment sampling locations

PREPARED BY : T.S.	DATE : 7/22/88	FIGURE F-1
CHECKED BY : T.S.	REVISED : 7/27/88	
DRAWN BY : JPM	DRAWING NO : S/A/7947-042/04/3	

Table F-1. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Basic Neutral Analytes Compounds (47)	TAL Metals (24)	Pesticides and PCBs (28)
<p>Acetone Benzene Bromochloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes</p>	<p>4-Chloro-3-methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitrophenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol</p>	<p>Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane</p>	<p>Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide</p>	<p>alpha-BHC beta-BHC delta-BHC gamma-BHC (Lindane) Heptachlor Aldrin Heptachlor epoxide Endosulfan I Dieldrin 4,4'-DDE Endrin Endosulfan II 4,4'-DDD Endosulfan sulfate 4,4'-DDT Methoxychlor Endrin ketone Endrin aldehyde alpha-Chlordane gamma-Chlordane Toxaphene PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 PCB-1260</p>
Miscellaneous (1)				
				Total Organic Carbon

Table F-2.
1992 CREEK SEDIMENT ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification						
	ST1-1	ST2-1	ST3-1	ST4-1	ST5-1	ST6-1	ST7-1
VOLATILE ORGANIC COMPOUNDS							
2-Butanone	<12	<12	<63	2200 J	<13	<13	<14
Acetone	22	<12	<63	<3500	<13	<13	<14
Ethylbenzene	<6	<6	13 J	<1800	<7	<6	<7
Methylene chloride	4 J	<6	<32	<1800	<7	<6	<7
Trichloroethene	<6	2 J	<32	<1800	<7	<6	<7
SEMIVOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	<820	<790	130 J	<940	120 J	370 J	<900
Acenaphthene	<820	<790	180 J	440 J	280 J	180 J	180 J
Acenaphthylene	140 J	86 J	270 J	360 J	980 J	290 J	530 J
Anthracene	200 J	97 J	1000 J	190 J	330 J	120 J	210 J
Benzo(a)anthracene	850	500 J	3500 J	720 J	1000	360 J	1000 J
Benzo(a)pyrene	950	620 J	3000 J	1200	3600 J	560 J	2200 J
Benzo(b)fluoranthene	940	650 J	2300 J	690 J	1400 J	540 J	1400 J
Benzo(g,h,i)perylene	1300	900	3800	4200	16000 E	1700 J	6000 J
Benzo(k)fluoranthene	700 J	710 J	2200	810 J	1200 J	600 J	1100 J
Benzoic acid	<4100	<4000	<4200	<940	<4400	<4200	110 J
Bis(2-Ethylhexyl)phthalate	<820	2900	3400	<940	<880	<840	<900
Butyl benzyl phthalate	<820	<790	<840	<940	<880	<840	<900
Chrysene	930	620 J	3300	940	1400 J	410 J	<900
Di-n-Butylphthalate	89 J	170 J	210 J	220 J	<880	180 J	<900
Dibenz(a,h)anthracene	<820	<790	<840	<940	<880	<840	<900
Dibenzofuran	<820	<790	190 J	<940	<880	<840	<900
Fluoranthene	1400	830	5100	910 J	710 J	540 J	1000
Fluorene	87 J	<790	260 J	120 J	<880	89 J	<900
Indeno(1,2,3-cd)pyrene	820 J	490 J	2600	1700	7200 J	890 J	2900 J
Naphthalene	<820	<790	100 J	400 J	570 J	480 J	290 J
Phenanthrene	940	570 J	3400	600 J	470 J	730 J	740 J
Pyrene	2300	1300	9100	2800	5000	1700	4200 J
Total Organic Carbon (%)	1.08	0.87	2.24	0.94	0.89	0.9	1.04

J = Estimated value, analyte detected below contract required detection limits.
Sample identification are from the numbered creek sediment samples (ST). The "-1" denotes the 0 to 6 inch interval below ground surface (bgs). "-2" denotes the 18 to 24 inch interval bgs.

Table F-2 (Continued).
1992 CREEK SEDIMENT ORGANIC RESULTS

Analysis (ug/kg)	Sample Identification						
	ST8-1	ST9-1	ST10-1	ST11-1	ST11-2	ST12-1	ST13-1
VOLATILE ORGANIC COMPOUNDS							
2-Butanone	<14	<16	<14	<12000	<2300	<13	<13
Acetone	<14	<16	<14	<12000	<2300	<13	<13
Ethylbenzene	<7	<8	<7	<5900	<12000	<7	<6
Methylene chloride	<7	<8	<7	<5900	<12000	<7	<6
Trichloroethene	<7	4 J	<7	<5900	<12000	<7	<6
SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	300 J	110 J	<930	1100 J	25000 J	<890	94 J
Acenaphthene	<900	130 J	<930	12000	1400000	<890	94 J
Acenaphthylene	1200	560 J	<930	5100	95000 J	110 J	220 J
Anthracene	610 J	490 J	<930	14000 J	990000	130 J	410 J
Benzo(a)anthracene	9800 J	3000 J	420 J	35000 J	650000	440 J	1800
Benzo(a)pyrene	7500 J	4300 J	640 J	46000 J	620000	550 J	1800
Benzo(b)fluoranthene	6500 J	2600 J	480 J	21000 J	230000	420 J	1700
Benzo(g,h,i)perylene	13000 J	9700 J	370 J	27000 J	250000	<890	1000
Benzo(k)fluoranthene	6900 J	2700 J	240 J	14000 J	300000	400 J	1300
Benzoic acid	<4500	170 J	<4600	<6300	<930000	<4200	<4200
Bis(2-Ethylhexyl)phthalate	1000 J	1000 J	<930	7000 J	<190000	<890	<830
Butyl benzyl phthalate	120 J	260 J	<930	<1300	<190000	<890	<830
Chrysene	11000 J	3400 J	790 J	35000 J	590000	570 J	1900
Di-n-Butylphthalate	150 J	220 J	220 J	<1300	<190000	<890	410 J
Dibenz(a,h)anthracene	3500 J	<1100	<930	8700 J	<190000	<890	<830
Dibenzofuran	<900	<1100	<930	1100 J	130000 J	<890	180 J
Fluoranthene	7900	3300	370 J	19000 J	1100000	690 J	4200
Fluorene	120 J	120 J	<930	11000	910000	<890	240 J
Indeno(1,2,3-cd)pyrene	10000 J	5500 J	150 J	19000 J	160000 J	280 J	840
Naphthalene	520 J	230 J	<930	1700	250000	<890	170 J
Phenanthrene	3200	2200	230 J	55000 J	1800000	370 J	1400
Pyrene	35000 J	11000 J	770	110000 J	2000000	840 J	3400
Total Organic Carbon (%)	2.35	3.57	3.06	6.32	6.93	1.61	1.07

J = Estimated value, analyte detected below contract required detection limits.
Sample identification are from the numbered creek sediment samples (ST). The "-1" denotes the 0 to 6 inch interval below ground surface (bgs). "-2" denotes the 18 to 24 inch interval bgs.
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Table F-3.
1992 CREEK SEDIMENT INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification						
	ST1-1	ST2-1	ST3-1	ST4-1	ST5-1	ST6-1	ST7-1
Aluminum	12000	6570	8690	20500	8920	9340	5610
Antimony	<12.7	<12.7	<12.7	<12.7	<12.7	<12.7	<12.7
Arsenic	9.7	14.4	19.5	24.5 J	18.7	8.5	16.3
Barium	482 J	58.5 J	662 J	178 J	45.3 J	90.6 J	271 J
Beryllium	<1	<1	<1	<1	<1	<1	<1
Cadmium	<2	<2	3.3	<2	<2	<2	<2
Calcium	55700 J	137000 J	51500 J	21500 J	111000 J	51300 J	23300 J
Chromium	82.2 J	52.3 J	221 J	52.5 J	34.8 J	17.4 J	47.2 J
Cobalt	9	6	27.8	9.4	4.4	6.3	10.3
Copper	158.0 J	67.1 J	118 J	80.8 J	30.1 J	57.6 J	118 J
Iron	29200 J	11300 J	87400 J	22000 J	9470 J	17300 J	15600 J
Lead	401 J	297 J	2360 J	195 J	62.6 J	195 J	469 J
Magnesium	23000 J	29400 J	8120 J	7460 J	6480 J	17400 J	40600 J
Manganese	625 J	246 J	639 J	309 J	137 J	299 J	202 J
Mercury	0.21	<0.1	0.18	<0.1	<0.1	0.14	0.41
Nickel	21.6	10	29	29.8	12.8	17	119
Potassium	2730 J	<241	1620 J	2780 J	1950 J	1980 J	<241
Selenium	1.2 J	1.7 J	2.4 J	1.1 J	<2.8	0.73 J	<2.8
Silver	<3	<3	<3	<3	<3	<3	<3
Sodium	<110	247	207	204	128	213	120
Thallium	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Vanadium	23.9	6.3	17.6	28.6	9.4	17.8	9.3
Zinc	585	289	1800	261	168	232	931
Cyanide	<20	<20	<20	<20	<20	1.7	2.4

J = Estimated value, analyte detected below contract required detection limits.
Sample identification are from the numbered creek sediment samples (ST). The "-1" denotes the 0-6" inch interval below ground surface (bgs), "-2" denotes the 18-24" interval bgs.

Table F-3 (Continued).
1992 CREEK SEDIMENT INORGANIC RESULTS

Analysis (mg/kg)	Sample Identification						
	ST8-1	ST9-1	ST10-1	ST11-1	ST11-2	ST12-1	ST13-1
Aluminum	31800	11200	19600	18400	17100	15100	15600
Antimony	<12.7	<12.7	<12.7	<12.7	<12.7	1.7 J	<12.7
Arsenic	18.5	10.4	10.5	14.7	21.4 J	9.8 J	12.1 J
Barium	496 J	228 J	120 J	168 J	595 J	406 J	224 J
Beryllium	6.8	<1	<1	<1	0.96	0.69	1.1
Cadmium	0.97	<2	<2	<2	12.4	3.2	1.3
Calcium	204000 J	32100 J	63500 J	85100 J	56400 J	69900 J	50200 J
Chromium	10.7 J	77.5 J	31.4 J	77.3 J	138 J	24 J	57.5 J
Cobalt	2.8	8.1	10.9	12.5	15.1	9.4	7.8
Copper	25 J	210 J	72.9 J	83.3 J	895 J	127 J	229 J
Iron	6830 J	17100 J	26300 J	28100 J	42000 J	29000 J	37900 J
Lead	48.5 J	561 J	183 J	338 J	1110 J	631 J	1420 J
Magnesium	47100 J	7820 J	21400 J	22500 J	9090 J	22300 J	9440 J
Manganese	4200 J	230 J	488 J	517 J	474 J	3680 J	2490 J
Mercury	<0.1	0.58	0.24	0.26	1.6	0.35	0.12
Nickel	9.3	36.2	29.6	35.7	52.8	31.2	25.1
Potassium	1840 J	1410 J	5340 J	3820 J	3220 J	3040 J	2340 J
Selenium	4.5 J	1.7 J	1.6 J	2.4 J	4.6 J	0.50 J	0.76 J
Silver	<3	2.4	<3	<3	6.2	1.2	1.0
Sodium	844	241	255	243	320	261	339
Thallium	<2.2	<2.2	<2.2	<2.2	0.52 J	0.33 J	0.25 J
Vanadium	<25.5	18.5	32.2	30.5	34.1	38.4	32.5
Zinc	113	792	189	330	2400 J	438 J	418 J
Cyanide	18.7	<20	<20	<20	<20	<20	<20

J = Estimated value, analyte detected below contract required detection limits.
Sample identification are from the numbered creek sediment samples (ST). The "-1" denotes the 0-6" inch interval below ground surface (bgs), "-2" denotes the 18-24" interval bgs.
sedin.wq1

Table F-4.
1993 CREEK SEDIMENT RESULTS

Analysis (ug/kg)	Sample Identification									
	T1-1A	T1-1B	T1-2A	T1-2B	T1-3A	T1-3B	T2-1A	T2-1B	T2-2A	
SEMIVOLATILE ORGANIC COMPOUNDS										
2-Methylnaphthalene	2900	110000	960000	1700000	240 J	110 J	220000	3500000	11000	
4-Nitroaniline	<5500	<160000	<680000	<770000	<4800	140 J	<210000	<1900000	<4400	
Acenaphthene	2200	98000	500000	910000	490 J	170 J	120000	2500000	7000	
Acenaphthylene	330 J	<32000	39000 J	67000 J	310 J	110 J	7300 J	150000 J	600 J	
Anthracene	1300	58000	260000	530000	1100	410 J	48000	1200000	4000	
Benzo(a)anthracene	2100	28000 J	140000	270000	3500	1100	35000 J	620000	3400	
Benzo(a)pyrene	1700	17000 J	130000 J	250000	2900	790 J	27000 J	480000	2900	
Benzo(b)fluoranthene	1700	11000 J	90000 J	160000	3900	1100	21000 J	370000 J	1500	
Benzo(g,h,i)perylene	270 J	7400 J	59000 J	110000 J	780 J	270 J	14000 J	200000 J	680 J	
Benzo(k)Fluoranthene	1100	5300 J	29000 J	65000 J	2000	390 J	8200 J	95000 J	1200	
Bis(2-Ethylhexyl)Phthalate	170 J	<32000	<140000	<150000	400 J	130 J	<42000	<380000	130 J	
Butyl benzyl phthalate	<1100	<32000	<140000	<150000	<970	<930	<42000	<380000	<880	
Chrysene	1800	31000 J	130000 J	260000	4000	1000	33000 J	590000	2600	
Di-n-Butylphthalate	<1100	<32000	<140000	<150000	<970	<930	<42000	<380000	<880	
Dibenz(a,h)anthracene	<1100	<32000	14000 J	27000 J	330 J	99 J	<42000	55000 J	180 J	
Dibenzofuran	<1100	8500 J	38000 J	72000 J	280 J	160 J	7800 J	150000 J	660 J	
Fluoranthene	<1100	58000	260000	370000	6900	2200	60000	1400000	6300	
Fluorene	1600	57000	270000	490000	570 J	270 J	53000	1500000	3600	
Indeno(1,2,3-cd)pyrene	240 J	5800 J	37000 J	75000 J	810 J	<930	10000 J	140000 J	580 J	
Naphthalene	3200	98000	1400000	2400000	260 J	130 J	350000	4800000	20000 D	
Phenanthrene	4600	190000	780000	1500000	5100	1700	160000	3800000	11000	
Pyrene	5500	100000	450000	820000	7300	2100	92000	1700000	9400	
OTHER PARAMETERS										
Cyanide	1700 J	2100 J	<120	5700 J	2800 J	3500 J	<190	<170	<120	
Vanadium	31300	14900	16500	20100	36400	21600	32200	23400	8900	

B = Analyte found in associated blank as well as in the sample.

D = Reported concentration of diluted sample.

J = Estimated value, analyte detected below contract required detection limits or due to low matrix spike recovery.

U = Concentration found at less than five times concentration found in associated sample blank.

Sample identification are from the numbered transect, location, and depth intervals (e.g. T1-1B denotes Transect 1, location 1, the A refers to the 0-to-6-inch interval and the B refers to the 18-to-24-inch interval below ground surface, respectively).

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Table F-4 (Continued).
1993 CREEK SEDIMENT RESULTS

Analysis (ug/kg)	Sample Identification								
	T2-2B	T2-3A	T2-3B	T3-1A	T3-1B	T3-2A	T3-2B	T3-3A	T3-3B
SEMIVOLATILE ORGANIC COMPOUNDS									
2-Methylnaphthalene	67000	110000	180 J	<26000	110000	1000000	8600	<6300	19000
4-Nitroaniline	<140000	<140000	<6300	<"<1300000	<1300000	<7800000	<4700	<31000	<21000
Acenaphthene	53000	94000	660 J	57000	160000	5900000	4500	1600 J	14000
Acenaphthylene	3600 J	9200 J	1300	7000 J	15000 J	47000 J	330 J	750 J	1600 J
Anthracene	30000	73000	7300	37000	93000	350000	2500	1800 J	9700
Benzo(a)anthracene	17000 J	46000	15000	24000 J	54000	180000	1300	4000 J	8600
Benzo(a)pyrene	16000 J	33000	11000	22000 J	52000	180000	1100	4200 J	8900
Benzo(b)fluoranthene	9000 J	28000 J	17000	16000 J	41000	120000 J	640 J	4400 J	7900
Benzo(g,h,i)perylene	6800 J	10000 J	700 J	11000 J	25000 J	77000 J	460 J	2700 J	4000 J
Benzo(k)Fluoranthene	5500 J	9200 J	7100	5600 J	11000 J	48000 J	410 J	2100 J	3000 J
Bis(2-Ethylhexyl)Phthalate	<28000	<29000	<1300	<26000	<26000	<160000	100 J	3700 J	650 J
Butyl benzyl phthalate	<28000	<29000	<1300	<26000	<26000	<160000	<940	<6300	<4300
Chrysene	15000 J	43000	13000	21000 J	45000	160000	970	4500 J	8100
Di-n-Butylphthalate	<28000	<29000	<1300	<26000	<26000	<160000	110 J	<6300	<4300
Dibenz(a,h)anthracene	<28000	<29000	520 J	<26000	4800 J	19000 J	110 J	780 J	1200 J
Dibenzofuran	4300 J	8700 J	390 J	5500 J	15000 J	49000 J	330 J	<6300	1500 J
Fluoranthene	40000	85000	20000	49000	98000	370000	2400	7800	17000
Fluorene	26000 J	62000	1800	35000	94000	340000	2400	1200 J	9100
Indeno(1,2,3-cd)pyrene	4700 J	8000 J	1200 J	7100 J	16000 J	51000 J	300 J	2100 J	3200 J
Naphthalene	98000	23000 J	280 J	9400 J	280000	1600000	24000 D	<6300	5500
Phenanthrene	94000	200000	13000	120000	250000	1100000	7600	6000 J	31000
Pyrene	58000	110000	19000	81000	170000	620000	4200	9300	24000
OTHER PARAMETERS									
Cyanide	3500 J	2500 J	<170	1500 J	<120	3800 J	<130	4600 J	1400 J
Vanadium	19600	227000	43600	11200	21000	15100	31000	30600	23900

B = Analyte found in associated blank as well as in the sample.
D = Reported concentration of diluted sample.
J = Estimated value, analyte detected below contract required detection limits or due to low matrix spike recovery.
U = Concentration found at less than five times concentration found in associated sample blank.
Sample identification are from the numbered transsect, location, and depth intervals (e.g. T1-1B denotes Transsect 1, location 1, the A refers to the 0-to-6-inch interval and the B refers to the 18-to-24-inch interval below ground surface, respectively).
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Table F-4 (Continued).
1993 CREEK SEDIMENT RESULTS

Analysis (ug/kg)	Sample Identification									
	T4-1A	T4-1B	T4-2A	T4-2B	T4-3A	T4-3B	T5-1A	T5-1B	T5-2A	T5-2B
SEMIVOLATILE ORGANIC COMPOUNDS										
2-Methylnaphthalene	150000	3400	93000 D	24000 J	24000 J	120000	960000	730 J	1900000	
4-Nitroaniline	<170000	<6200	<4400	<140000	<160000	<180000	<810000	<6700	<1600000	
Acenaphthene	130000	2400	60000 D	11000 J	34000	380000	530000	8000	750000	
Acenaphthylene	7500 J	240 J	3500	<28000	<31000	43000	31000 J	730 J	280000 J	
Anthracene	66000	1900	33000 D	8000 J	17000 J	170000	300000	4600	510000	
Benzo(a)anthracene	37000	2100	20000 D	12000 J	13000 J	240000	160000 J	4900	240000 J	
Benzo(a)pyrene	36000	1800	11000	8700 J	11000 J	190000	150000 J	3400	220000 J	
Benzo(b)fluoranthene	27000 J	2300	9400	11000 J	13000 J	180000	140000 J	2500	180000 J	
Benzo(g,h,i)perylene	17000 J	1000 J	4400	5400 J	7000 J	92000	72000 J	1700	100000 J	
Benzo(k)fluoranthene	9900 J	560 J	3900	5200 J	3500 J	54000	32000 J	1200 J	55000 J	
Bis(2-Ethylhexyl)Phthalate	<34000	<1200	280 J	11000 J	<31000	<36000	<160000	<1300	<320000	
Butyl benzyl phthalate	<34000	<1200	<890	<28000	<31000	<36000	<160000	<1300	<320000	
Chrysene	34000	1900	12000	12000 J	14000 J	230000	160000 J	4700	200000	
Di-n-Butylphthalate	<34000	210 U	<890	<28000	<31000	<36000	<160000	210 U	<320000	
Dibenz(a,h)anthracene	4100 J	240 J	1100	<28000	<31000	21000 J	18000 J	370 J	<320000	
Dibenzofuran	11000 J	250 J	3200	<28000	5700 J	22000 J	44000 J	420 J	74000 J	
Fluoranthene	78000	4700	9200 J	22000 J	39000	360000	390000	8700	490000	
Fluorene	68000	1400	12000	12000 J	22000 J	170000	280000	4500	570000	
Indeno(1,2,3-cd)pyrene	11000 J	760 J	3100	4300 J	5400 J	64000	53000 J	1100 J	68000	
Naphthalene	220000	5500	120000 D	22000 J	4900 J	280000	1400000	1500	3000000	
Phenanthrene	190000	4700	88000 D	42000	58000	350000	800000	12000	1500000	
Pyrene	120000	4200	54000 D	34000	36000	470000	450000	11000	780000	
OTHER PARAMETERS										
Cyanide	1800	<170	3700	3000	3100	4500	3400	<180	2000	
Vanadium	28200	41900	22800	27300	23300	27100	36100	42600	3300 B	

B = Analyte found in associated blank as well as in the sample.

D = Reported concentration of diluted sample.

J = Estimated value, analyte detected below contract required detection limits or due to low matrix spike recovery.

U = Concentration found at less than five times concentration found in associated sample blank.

Sample identification are from the numbered transect, location, and depth intervals (e.g. T1-1B denotes Transect 1, location 1, the A refers to the 0-to-6-inch interval and the B refers to the 18-to-24-inch interval below ground surface, respectively).

Table F-4 (Continued).
1993 CREEK SEDIMENT RESULTS

Analysis (ug/kg)	Sample Identification								
	T5-2B	T5-3A	T5-3B	T6-1A	T6-1B	T6-2A	T6-2B	T6-3A	T6-3B
SEMIVOLATILE ORGANIC COMPOUNDS									
2-Methylnaphthalene	520000	200000	50000	8800	<1100	850000	5700	180000	750000
4-Nitroaniline	<240000	<160000	<120000	<6500	<5700	<630000	<4000	<140000	<440000
Acenaphthene	72000	180000	24000	9600	280 J	310000	3200	190000	410000
Acenaphthylene	210000	16000 J	8300 J	1400	<1100	240000	1400	13000 J	44000 J
Anthracene	160000	110000	13000 J	8200	760 J	210000	2000	94000	240000
Benzo(a)anthracene	72000	85000	8300 J	7400	1400	120000 J	1200	53000	110000
Benzo(a)pyrene	67000	70000	6900 J	4500	940 J	110000 J	990	49000	100000
Benzo(b)fluoranthene	45000 J	50000	5100 J	3300	1200	63000 J	720 J	32000	78000 J
Benzo(g,h,i)perylene	31000 J	35000 J	2900 J	2200	490 J	49000 J	570 J	22000 J	49000 J
Benzo(k)fluoranthene	21000 J	16000 J	<23000	1600	480 J	33000 J	230 J	10000 J	22000 J
Bis(2-Ethylhexyl)phthalate	<48000	<33000	<23000	210 J	<1100	<130000	<790	<29000	<89000
Butyl benzyl phthalate	<48000	<33000	<23000	<1300	<1100	<130000	<790	<29000	<89000
Chrysene	62000	80000	7300 J	5700	1200	93000 J	920	48000	100000
Di-n-Butylphthalate	<48000	<33000	<23000	<1300	190 U	<130000	83 U	<29000	<89000
Dibenz(a,h)anthracene	5800 J	6100 J	<23000	490 J	120 J	<130000	91 J	5400 J	<89000
Dibenzofuran	26000 J	17000	<23000	<1300	120 J	41000 J	330 J	15000 J	36000 J
Fluoranthene	140000	160000	17000 J	<1300	2500	220000	2200	110000	230000
Fluorene	170000	120000	18000 J	7700	470 J	260000	<790	94000	240000
Indeno(1,2,3-cd)pyrene	22000 J	21000 J	<23000	1400	400 J	32000 J	300 J	13000 J	30000 J
Naphthalene	650000	330000	73000	4500	<1100	1300000	7900	310000	950000
Phenanthrene	380000	340000	51000	19000	2000	710000	6100	290000	600000
Pyrene	210000	240000	28000	12000	2000	400000	3500	170000	350000
OTHER PARAMETERS									
Cyanide	<110	2300	1200	<180	<160	<110	<110	<130	<210
Vanadium	237000	20700	14200	36500	31800	56400 B	249000	31000	21700

B = Analyte found in associated blank as well as in the sample.
D = Reported concentration of diluted sample.
J = Estimated value, analyte detected below contract required detection limits or due to low matrix spike recovery.
U = Concentration found at less than five times concentration found in associated sample blank.
Sample identification are from the numbered transect, location, and depth intervals (e.g. T1-1B denotes Transect 1, location 1, the A refers to the 0-to-6-inch interval and the B refers to the 18-to-24-inch interval below ground surface, respectively).

Table F-5. 1993 Creek sediment sample description.

Location ID	Sediment Depth	Sediment Description
T1-1	3	Clayey gravel, oily coated
T1-2	8	Gravel fill, oily coated
T1-3	4	Clayey gravel
T2-1	5	Fill material, oily coated
T2-2	5	0-18" Sand and gravel fill, oily coated 18-24" Shelly clay
T2-3	3	Clayey gravel, oily coated, and shelly clay
T3-1	3	Fill material
T3-2	6	Fill gravel and shelly silty clay
T3-3	3	Clayey gravel, oily coated
T4-1	3	Sand and gravel, oily coated
T4-2	5	0-12" Gravel, oily coated, organic odor 12-24" Silty clay, oily coated, organic odor
T4-3	1.5	0-12" Clayey sand, loose, organic odor 12-24" Clayey sand with shells, organic odor
T5-1	2	Clayey silt with wood fragments
T5-2	8	0-12" Silty sand with shells, oily coated
T5-3	3	0-12" Sand and clay, loose, oily coated, organic odor 12-24" Sand with shells, oily coated, organic odor
T6-1	5	0-18" Sandy clay with wood chips, 18-24" Clay, clayey sand and gravel
T6-2	10	0-12" Silty clayey sand, oily coated 12-24" Clay
T6-3	4	0-18" Silty clay, loose, oily coated 18-24" Sandy clay with shells

- Note: 1) Sediment sample collected with a 24" split-spoon sampler.
2) Organic vapor readings recorded of sediment sample in the opened split-spoon sampler.
3) BG - Background

Appendix G
DENSE NONAQUEOUS PHASE LIQUID INVESTIGATION REPORT

This data report summarizes the dense nonaqueous phase liquid (DNAPL) sampling, the results of oil and grease analysis of groundwater samples, and DNAPL-level measurements performed as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Based on DNAPL-level and -thickness measurements, two monitor wells were found to contain sufficient DNAPL thickness for sampling. On May 20, 1992, and May 13, 1993, GeoTrans, Inc. personnel collected DNAPL samples from monitor wells MWF2 and B8. Sample locations are shown on Figure G-1. No appreciable light nonaqueous phase liquid was found at any well onsite.

DNAPL samples collected in May, 1992, were analyzed for volatile organic compounds (VOCs), base neutral analytes (BNAs), and acid extractable organics (AEOs). A list of the individual analytes is presented in Table G-1. The DNAPL samples were collected in 40 ml glass vials with teflon septa and four ounce glass containers with teflon lined lids. The 40 ml vials were filled so that no air was present in the sample bottle. The four ounce glass containers were filled to near the rim of the container. Analytical services were provided by General Testing Corporation (GTC) Inc., of Rochester, New York. The results of the chemical analyses are presented in Table G-2.

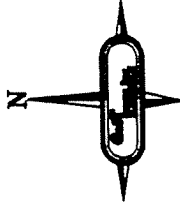
DNAPL samples collected in May, 1993, were analyzed for density and viscosity. American Society for Testing Materials (ASTM) Method D 1298 was used to determine the sample density. ASTM Method D 88 was used to determine the sample viscosity. Analytical services were provided by the GTC laboratory in Hackensack, New Jersey. The results of the viscosity and density analyses are presented in Table G-3.

Also in May, 1993, three time-sequence groundwater samples were collected from wells B8 and MWF2. The samples were collected after approximately one well volume of groundwater was discharged and after one and two hours of sustained pumping. The discharge rate in well B8 was approximately 0.3 gallons per minute (gpm). The initial discharge rate in MWF2 was approximately 0.3 gpm, however, this decreased to approximately

0.15 gpm shortly after pumping began. Analytical services for groundwater samples were provided by the GTC laboratory in Rochester, New York, using EPA Method 413.1. The results of the oil and grease analyses are presented in Table G-4.

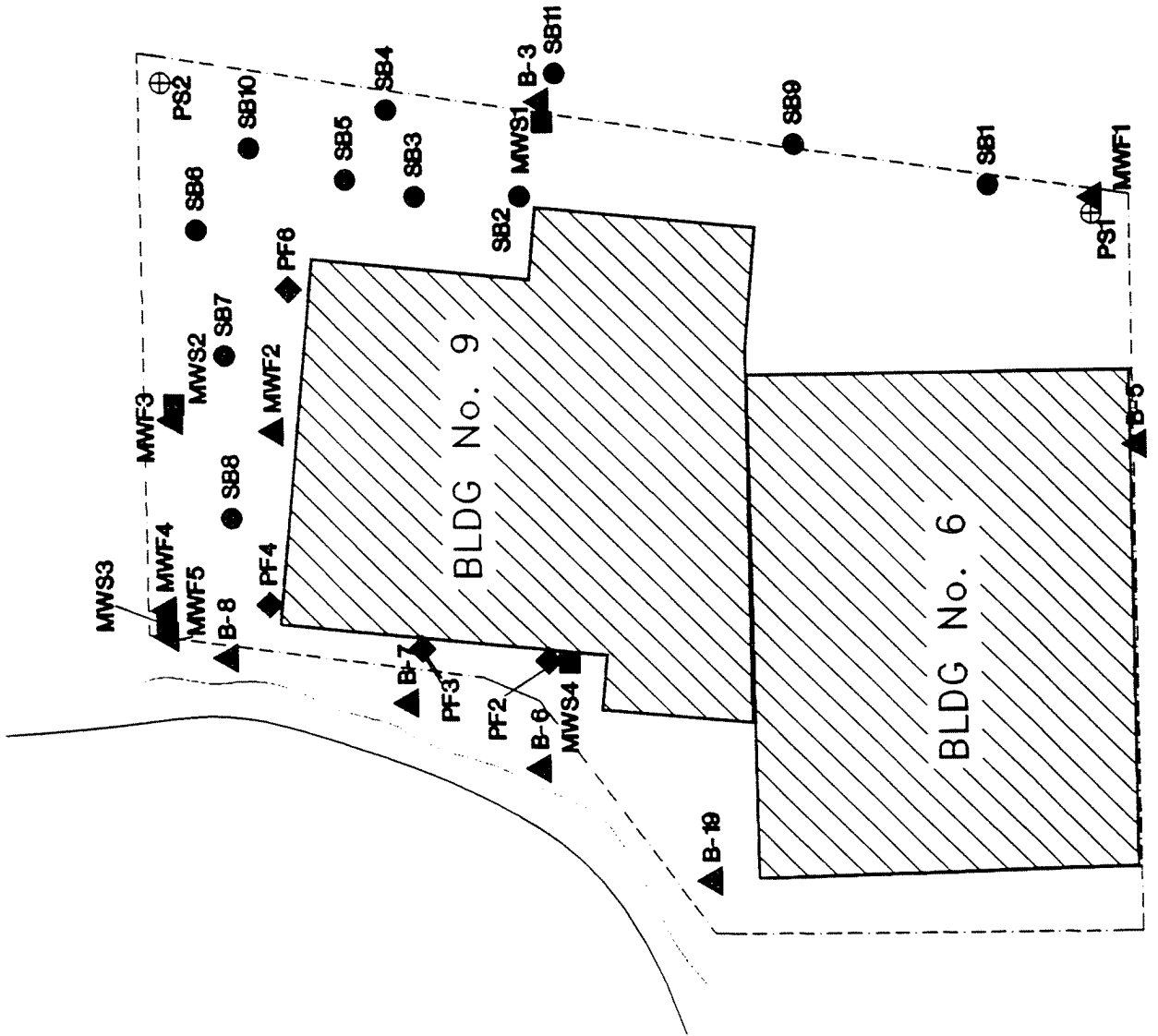
The DNAPL and groundwater samples were collected using a peristaltic pump with Teflon tubing. For DNAPL samples, the tubing intake was lowered to the bottom of each well. For groundwater samples, the tubing was lowered to a point at least five ft above the bottom of each well. The samples were discharged directly to the sample jars from the tubing. New tubing was used for each sample; therefore, no decontamination procedure was necessary. Upon collection, all samples were placed immediately on ice in coolers to ensure preservation. Samples were sent via a courier or overnight shipping to the analytical laboratory for analysis. All samples were analyzed shortly after collection and were within holding times for the various analytical methods. All excess well fluid removed while purging and sampling was placed in storage tanks onsite for disposal.

Fluid-level measurements were obtained weekly for a period of three months, and monthly for an additional period of nine months. Measurements were made using an oil-water interface probe. The probe was decontaminated between each borehole by wiping excess NAPL from the probe and tape with a clean paper towel wetted with a ten percent methanol solution and water. The probe and tape were rinsed with deionized water after testing each well. Results of the fluid-level measurements are presented in Table G-5.



Legend

- Soil Borings (11)
- ▲ Fill Monitor Wells (10)
includes "B" Series Wells
- ◆ Fill Piezometers (4)
- Lower Sand Monitor Wells (4)
- ⊕ Lower Sand Piezometers (2)



GeoTrans, Inc.
GROUNDWATER SPECIALISTS

Location of the RI/FS
Monitoring System

PREPARED BY : T.A.	DATE : 7/22/98	PLATE
CHECKED BY : T.A.	REVISED : 7/28/98	G-1
DRAWN BY : J.W.	DRAWING NO : 780025/98	

Table G-1. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	
Acetone Benzene Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloroethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes	4-Chloro-3-methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitrophenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane	Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Ideno(1,2,3-cd)pyrene Isophorone 2-Methylnaphthalene Naphthalene 2-Nitroaniline 3-Nitroaniline 4-Nitroaniline Nitrobenzene N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Phenanthrene Pyrene 1,2,4-Trichlorobenzene	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide

Table G2
 DENSE NON-AQUEOUS PHASE LIQUID
 ORGANIC COMPOUND RESULTS
 CONCENTRATION IN mg/kg

PARAMETER	SAMPLE LOCATION	
	B8	MWF2
Volatile Organic Compounds		
Benzene	750	250 J
Ethylenebenzene	6600	1400
Toluene	500 U	480 J
(m+p) Xylene	3600	980
o-Xylene	1600	390 J
Semivolatile Organic Compounds		
2-Methylnaphthalene	27000	34000
Acenaphthene	17000	14000
Acenaphthylene	1500 J	2500 J
Anthracene	7900	7300
Benzo(a)Anthracene	4100 J	4200 J
Benzo(a)Pyrene	3400 J	3400 J
Benzo(b)fluoranthene	1200 J	1300 J
Benzo(k)Fluoranthene	1900 J	1700 J
Chrysene	3800 J	4000 J
Dibenzofuran	970 J	1000 J
Fluoranthene	8700	7900
Fluorene	8100	8600
Naphthalene	57000	66000
Phenanthrene	25000	25000
Pyrene	14000	13000

J = analyte detected; the value was less than the quantitation limit
 or estimated value reported due to matrix interference.

U = non detect

naplorg.wq1

Table G-3. DNAPL density and viscosity analysis results from May, 1993.

Well	B8	MWF2
Viscosity (CP)	68.75	44.35
Density (gm/cc)	1.031	1.054

Note: Density and viscosity analyzed at 25°C.

Table G-4. Time-sequence oil and grease analysis from May, 1993.

Sample	Concentration (mg/l)
B8-0	72.5
B8-1	45.1
B8-2	23.6
MWF2-0	16.2
MWF2-1	39.1
MWF2-2	28.6

Note: The hyphenated sample number refers to the number of hours since pumping began (i.e., "-1" samples were collected after one hour of pumping). The discharge rate of well B8 was 0.3 gpm. The discharge rate of MWF2 started at 0.3 gpm and declined to 0.15 gpm after a few minutes.

Table G-5
 BROOKLIS GAS/WESTWOOD PHARMACEUTICALS SITE RIFES
 DEPTH TO DNAPL, DNAPL LEVEL ELEVATION, AND DNAPL THICKNESS

Station Location	MRP Elevation	Ground Surface Elevation	Well Bottom Depth	Top of Silty Clay Elevation	5/18/92	5/17/92	5/16/92	5/27/92	6/3/92	6/8/92	6/15/92	6/22/92	6/29/92	7/6/92	7/14/92	7/21/92	8/17/92	9/13/92	10/21/92	11/18/92	12/12/92	1/22/93	2/24/93	3/12/93	4/29/93	
DEPTH TO DNAPL (FEET)																										
MWF2	592.74	590.47	28.5	562	27.55	27.3	27.16	27.4	27.95	28	27.98	28	27.91	27.94	27.96	27.91	28.12	28.02	28.09	27.84	28.12	28.09	27.9	28.09	27.9	28.02
PF6	593.55	591.22	27.8	565.7			27.6	27.7	27.69						27.6											
B6	593.03	589.98	27.2	569		27.1	26.9	26.9	26.9	26.9	26.9	26.9	26.9	26.9	27	27										
B8	593.03	590.27	27.7	568.3		23.8	24.18	22.8	23.14	24.21	23.97	24	24.05	24.5	24.34	24.61	24.23	24.02	24.19	24.43	24.2	23.94	23.87	24.19	24.23	

DNAPL Level Elevation (FEET ABOVE MSL)

MWF2	592.74	590.47	28.5	562	565.19	565.44	565.38	565.34	564.79	564.74	564.76	564.74	564.83	564.8	564.78	564.83	564.62	564.72	564.65	564.9	564.62	564.65	564.84	564.65	564.72	
PF6	593.55	591.22	27.8	565.7			565.95	565.95	565.95	565.95	565.85	565.86			565.95											
B6	593.03	589.98	27.2	569		565.93	565.93	566.13	566.13	566.13	566.13	566.13	566.13	566.13	566.03	566.03	566.13	566.13	566.13	566.13	566.13	566.13	566.13	566.13	566.13	566.13
B8	593.03	590.27	27.7	568.3		569.23	568.85	570.13	569.89	568.82	569.06	569.03	568.98	568.53	568.69	568.42	568.8	569.01	568.84	568.6	568.83	569.09	569.16	568.84	568.8	

APPARENT DNAPL THICKNESS IN WELL (FEET)

MWF2	592.74	590.47	28.5	562	0.95	1.2	1.14	1.1	0.55	0.5	0.52	0.5	0.59	0.56	0.54	0.59	0.38	0.48	0.41	0.66	0.38	0.41	0.6	0.41	0.48
PF6	593.55	591.22	27.8	565.7			0.2	0.2	0.2	0.2	0.1	0.11			0.2										
B6	593.03	589.98	27.2	569		0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2									
B8	593.03	590.27	27.7	568.3		3.9	3.52	4.9	4.56	3.49	3.73	3.7	3.65	3.2	3.36	3.09	3.47	3.68	3.51	3.27	3.5	3.76	3.83	3.51	3.47

DNAPL THICKNESS ABOVE THE SILTY CLAY (FEET)

MWF2	592.74	590.47	28.5	562	3.19	3.44	3.38	3.34	2.79	2.74	2.76	2.74	2.83	2.8	2.78	2.83	2.62	2.72	2.65	2.9	2.62	2.65	2.84	2.65	2.72
PF6	593.55	591.22	27.8	565.7			0.25	0.25	0.25	0.25	0.15	0.16			0.15										
B6	593.03	589.98	27.2	569		-3.07	-3.07	-2.87	-2.87	-2.87	-2.87	-2.87	-2.87	-2.87	-2.97	-2.97									
B8	593.03	590.27	27.7	568.3		0.93	0.55	1.93	1.59	0.52	0.76	0.73	0.68	0.23	0.39	0.12	0.5	0.71	0.54	0.3	0.33	0.79	0.86	0.54	0.5

MRP IS THE MEASURED REFERENCE POINT (TOP OF LOWER PROTECTIVE CASING)
 ** MEASUREMENT NOT TAKEN OR DNAPL NOT PRESENT

Appendix H
SURFACE WATER AND STORM SEWER SAMPLING REPORT

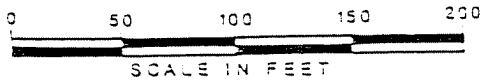
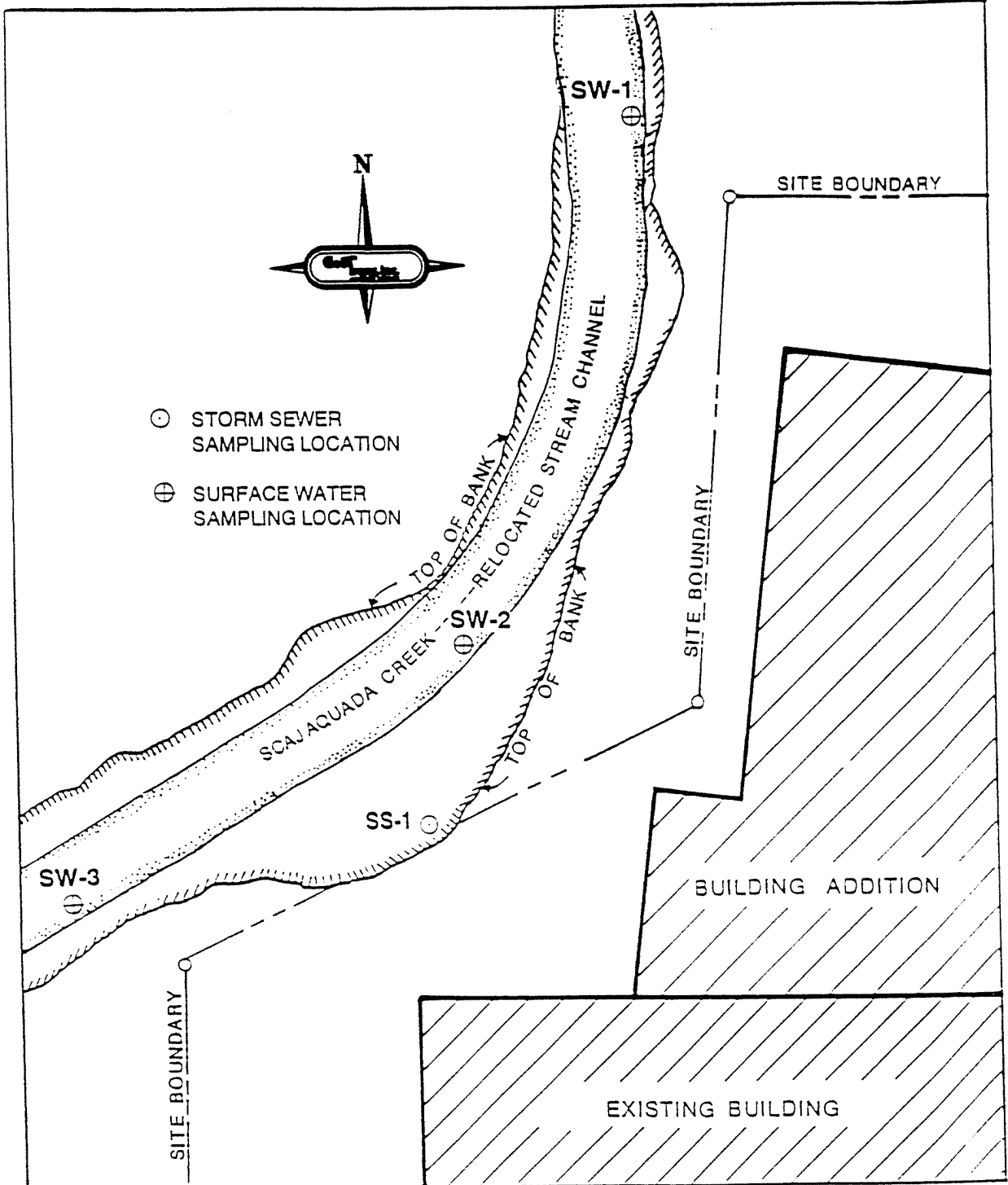
This data report summarizes the procedure used to obtain surface water and storm sewer samples as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Samples were collected by GeoTrans personnel at one storm sewer, and three surface water locations. One storm sewer and the surface water samples were collected on May 22, 1992. A second storm water sample was collected on November 18, 1992. These locations are shown on Figure H-1.

The surface water samples were obtained along the eastern bank of Scajaquada Creek. Surface water was collected by submerging sample bottles below the water surface until full. Bottles containing preservatives were prevented from overflowing to avoid preservative dilution. Metal samples were pumped from the creek through tygon tubing with a peristaltic pump through a 0.45 micron, positive pressure, in-line filter into a container with preservatives. The tubing intake was set approximately one ft off shore and just below the water surface. All samples were stored on ice, in coolers, immediately upon collection.

The storm sewer samples were collected by directing runoff through clean tygon tubing into the sample containers. Metal samples were collected using the same procedure as described for surface water samples.

Samples were analyzed for volatile organic compounds (VOCs), base neutrals (BNAs), acid extractable organics (AEOs), target analyte metals (TAL) and cyanide. In the May 1992, total organic carbon (TOC) and pesticide/PCB samples were also collected and analyzed. For metal samples, preservative was added after filtration. A list of the individual analytes is presented in Table H-1. The results of the organic and inorganic chemical sampling are presented in Tables H-2 and H-3 respectively. The analytical testing services were provided by General Testing Corporation Inc., of Rochester, New York.

No seeps were identified during several reconnaissance visits of the eastern creek bank. Therefore, no seep samples were collected.



GeoTrans, Inc.
GROUNDWATER SPECIALISTS

Surface water and storm sewer sample locations

PREPARED BY : T.S.	DATE : 7/22/99	FIGURE H-1
CHECKED BY : T.S.	REVISED : 7/27/99	
DRAWN BY : JPM	DRAWING NO : S/A/7907-042/0A/3	

Table H-1. Chemical parameters analyzed.

Volatile Organic Compounds (33)	Acid Extractable Organic Compounds (12)	Base Neutral Analytes Compounds (47)	TAL Metals (24)	Pesticides and PCBs (28)	
<p>Acetone Benzene Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane Dibromochloromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone 4-Methyl-2-pentanone Methylene chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Toluene Vinyl Chloride Xylenes</p>	<p>4 Chloro-3 methyl phenol 2-Chlorophenol 2,4-Dimethylphenol 2-methyl-4,6-Dinitro-phenol 2-Methyl phenol 4-Methyl phenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol</p>	<p>Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(e)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzy l phthalate 4-Chloroaniline 4-Chlorophenyl phenyl ether Chrysene Dibenz(a,h)anthracene Dibenzofuran Di-n-butylphthalate 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Fluorene Fluoranthene Hexachloroethane</p>	<p>Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Ideno(1,2,3-c,d)pyrene Isophorone 2-Methylnaphthalene Naphthalene 2-Nitroaniline 3-Nitroaniline 4-Nitroaniline Nitrobenzene N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Phenanthrene Pyrene 1,2,4-Trichlorobenzene</p>	<p>Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide</p>	<p>alpha-BHC beta-BHC delta-BHC gamma-BHC (Lindane) Heptachlor Aldrin Heptachlor epoxide Endosulfan I Dieldrin 4,4'-DDE Endrin Endosulfan II 4,4'-DDD Endosulfan sulfate 4,4'-DDT Methoxychlor Endrin ketone Endrin aldehyde alpha-Chlordane gamma-Chlordane Toxaphene PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 PCB-1260</p>
				<p>Miscellaneous (1)</p>	
				<p>Total Organic Carbon</p>	

Table H-2
SURFACE WATER AND STORM SEWER ORGANIC RESULTS

Analysis (ug/l)	SW-1		SW-2		SW-3		SS-1 May, 1992		SS-1 Nov., 1992	
	SW-1	SW-2	SW-2	SW-3	SW-3	SS-1 May, 1992	SS-1 May, 1992	SS-1 Nov., 1992	SS-1 Nov., 1992	
VOLATILE ORGANIC COMPOUNDS										
Acetone	<10	<10	<10	<10	<10	<10	<10	<10	21	21
Benzene	<5	<5	<5	<5	<5	<5	<5	<5	3 J	3 J
Ethylbenzene	<5	<5	<5	<5	<5	<5	<5	<5	2 J	2 J
SEMIVOLATILE ORGANIC COMPOUNDS										
Acenaphthene	<10	<10	<10	<10	<10	<10	<10	<10	3 J	3 J
Acenaphthylene	<10	1 J	1 J	2 J	2 J	<10	<10	<10	1 J	1 J
Anthracene	1 J	1 J	1 J	<10	<10	<10	<10	<10	1 J	1 J
Benzo(a)anthracene	4 J	7 J	7 J	7 J	7 J	<10	<10	<10	1 J	1 J
Benzo(a)pyrene	3 J	7 J	7 J	8 J	8 J	<10	<10	<10	1 J	1 J
Benzo(b)fluoranthene	3 J	3 J	3 J	5 J	5 J	<10	<10	<10	1 J	1 J
Benzo(k)fluoranthene	3 J	5 J	5 J	6 J	6 J	<10	<10	<10	1 J	1 J
Chrysene	5 J	10	10	10	10	<10	<10	<10	1 J	1 J
Fluoranthene	6 J	15	15	10 J	10 J	<10	<10	<10	2 J	2 J
Fluorene	<10	<10	<10	<10	<10	<10	<10	<10	2 J	2 J
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	3 J	3 J
Phenanthrene	5 J	11	11	4 J	4 J	<10	<10	<10	2 J	2 J
Pyrene	11	27	27	21	21	<10	<10	<10	2 J	2 J
bis (2-Ethylhexyl) Phthalate	7 JB	9 JB	9 JB	8 JB	8 JB	10 JB	10 JB	10 JB	1 J	1 J
Pesticide/PCBs										
Endosulfan Sulfate	0.19	0.14	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	-	-
Total Organic Carbon (%)	6.2	<0.5	<0.5	<0.5	<0.5	6.8	6.8	6.8	-	-

J = Estimated values, analyte detected below detection limits.

B = Chemical found in associated blank sample.

SW = Surface water sample.

SS = Storm sewer sample.

"-" Sample not collected or analyzed.

SWSSORG.WQ1

Table H-3
 SURFACE WATER AND STORM SEWER INORGANIC RESULTS

Analysis (ug/l)	SW-1		SW-2		SW-3		SS-1 May, 1992		SS-1 Nov., 1992	
	905	879	1210	139	95.4	139	<3	<1.6	15.4	22000
Aluminum	4.1 J	5.4	3.1	<3	<1.6					
Arsenic	75.1 J	65.8 J	65.4 J	117 J	15.4					
Barium	226000 J	207000 J	201000 J	136000 J	22000					
Calcium	1710 J	1600 J	1980 J	1970 J	46.4					
Iron	10.8	13.4	14.3	<19.1	<1.3					
Lead	28900 J	26700 J	26300 J	24500 J	3680					
Magnesium	730	174	141	156	15.4					
Manganese	<7.8	8.9	8.7	10.1	<22.6					
Nickel	<241	<241	<241	17500	2500					
Potassium	79400 J	78700 J	77100 J	72800 J	10300					
Sodium	139	36	62.7	37.7	318					
Zinc	<20	<20	<20	112	<10					
Cyanide										

J = Estimated values, analyte detected below detection limits.
 SW = Surface water sample.
 SS = Storm sewer sample.
 "-" Sample not collected or analyzed.

APPENDIX I

CONTAMINANT LOADINGS TO SCAJAQUADA CREEK

This data report summarizes the procedures used to determine the contaminant loadings to Scajaquada Creek as part of the Iroquois Gas/Westwood Squibb Site RI/FS (NYSDEC Site No. 915141). Contaminants below the water table occur in dissolved and undissolved (Nonaqueous Phase Liquid, NAPL) forms. Dissolved contaminants will move with groundwater. NAPL can move under the combined potentials of groundwater flow and gravity. To estimate contaminant loading to the creek, calculations are performed for both the dissolved and undissolved forms.

DISSOLVED CONTAMINANTS

The loading rate for a dissolved contaminant is stated in terms of mass per unit time (e.g., pounds per year). It represents the amount of a specific chemical constituent, or group of constituents, discharging to the creek from groundwater seeping along the creek bank, or entering the creek from below the creek bed. The data used to estimate loading rates includes: (1) transmissivity values, (2) hydraulic gradients, and (3) contaminant concentrations in groundwater samples. Transmissivity is a measure of the ability of a material to transmit water. The transmissivity values were determined from slug tests. The hydraulic gradient is the difference between water-level elevations at two points in the direction of groundwater flow divided by the horizontal distance between the two points. The groundwater concentration values were determined from the analytical results of the groundwater sampling program.

The groundwater flow rate was determined for a cross-section along the creek corresponding to wells B19, B6, B7, B8, and MWF5 (Figure I-1). The following equation was used:

$$Q = T i w \quad (1)$$

where: Q = groundwater flow (ft³)
 T = aquifer transmissivity (ft²)
 i = hydraulic gradient
 w = cross-sectional width of the flow path (ft)

The groundwater flow rate was then used with the laboratory-determined concentrations of groundwater contaminants in equation 2 to estimate the mass loadings of chemicals to the creek.

$$\text{Total mass loading} = \sum_{j=1}^5 Q_j C_j \quad (2)$$

Where: j = the index for the cross section corresponding to one of the five monitor wells
 c = the contaminant concentrations of concern found in groundwater (mg/l)

Groundwater contaminant concentrations in individual wells were fairly consistent during each of the four quarterly sampling rounds. The concentrations used in the loading calculations were based on the data collected from the May 1992 sampling round, with two exceptions. The results of the August 1992 sampling round was used for well B6 because B6 was not sampled in May. The results of the groundwater sample from well MWF2 were assumed to apply to well B8. This assumption was made because complete analyses for B8 were not available. The concentrations of oil and grease measurements in MWF2 are similar to the oil and grease measurements made for well B8. The groundwater concentrations from well MWF2 are also believed to approximate the groundwater concentrations in well B8, because the results of DNAPL samples from both wells were similar. Some of the contaminants were detected at concentrations significantly above solubility limits, indicating the potential for the aqueous sample to include small amounts of NAPL.

The results and the information used to make the dissolved contaminant loading calculation are presented in Table I-1. As can be seen in the table, the total loading to the creek for benzene, toluene, ethylbenzene, and xylenes (BTEX) is approximately 62 lbs per year. The loading for total polycyclic aromatic hydrocarbons (TPAHs) is approximately

110 lbs per year. The loading for the carcinogenic PAHs (a carcinogenic subset of TPAHs) is approximately 11 lbs per year, and the loading for cyanide is approximately 6 lb per year.

NAPL CONTAMINANTS

The potential for free-phase NAPL migration in the fill layer exists. NAPL has been observed in wells on site. Also the concentration of some chemical constituents were above or approached their solubility limits in groundwater samples collected from some of the wells. NAPL presence and the observed concentrations in groundwater samples could reflect NAPL at residual saturation in the pore spaces or in isolated pools or pockets. Drilling, well development, and sampling of the wells could cause otherwise static NAPL to migrate toward the well over a very limited area. The calculations presented in this section are conservative (tend to over predict NAPL loadings), because they assume that the NAPL is not at static conditions. No direct NAPL migration to the creek was observed during the field investigation. Therefore, the following calculations indicate the probable upper limit of NAPL migration to the creek, if NAPL is actually migrating to the creek.

For the contaminants contained in NAPL, two conceptual calculations are presented. The first calculation is similar to the calculation for dissolved contaminants, but is based on oil and grease measurements made for well B8. The second calculation is based on total flow of groundwater to the creek, combined with factors that account for the mobility and extent of NAPL in the cross section.

Of the five wells in the cross section used for the calculation of dissolved contaminant loadings, only B-8 contains consistent, significant amounts of NAPL. Up to three feet in the bottom of the well has been observed. The amount of NAPL that can be pumped from B8 is small. To approximate the fraction of NAPL that could move with groundwater, oil and grease measurements were taken during two hours of pumping (see Appendix G). The initial oil and grease measurement was 72.5 mg/l and declined to 23.6 mg/l after two hours of pumping. The average of three analyses was 47.1 mg/l.

The oil and grease loading to the creek through this cross section is given by:

$$Q C_{\text{oil \& grease}} = T i w C_{\text{oil \& grease}} \quad (3)$$

Using the previously listed T for well B8 of $196.9 \text{ ft}^2/\text{d}$, an i of 0.02, a w of one-half the horizontal distance between wells B7 and B8 plus one-half the distance between wells B8 and MWF5 of 101 feet, and the average oil and grease measurement of 47.1 mg/l, the NAPL loading to the creek is 1.2 lbs/d or 440 lbs/yr.

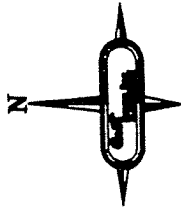
The chemical analysis of DNAPL samples (Appendix G, Table G-2) can be used to further estimate the loading amounts of TPAH, CPAH, and BTEX to the creek. The percentage of TPAH, CPAH, and BTEX in the DNAPL sample collected from B8 was 15%, 2.8% and 1.3%, respectively. Using these percentages, the mass of TPAH, CPAH, and BTEX entering the creek is 66, 12, and 6 lbs/yr, respectively.

A second conservative estimate of the loading of NAPL to the creek can be made using the physical properties of NAPL. Two properties, viscosity and density, are noted in Appendix G. The hydraulic conductivity of fluid in a porous medium is directly proportional to density, and inversely proportional to viscosity. Using the viscosity and density measurements presented (Appendix G, Table G-3), the mobility of NAPL relative to water is between 0.015 and 0.024. From the boring logs of the wells along the creek, the presence of oil-soaked material was noted and determined to be approximately 25% of the saturated zone along this cross section. Using the higher mobility number (M_{NAPL}), 0.024, the total flow (Q) between B19 and MWF5 $983 \text{ ft}^3/\text{d}$, the fraction of the cross section noted to be oil soaked soil, (S_{oil}) 0.25, and a relative permeability (K_r) of 0.25 due to the presence of water in the pore space, NAPL loading can be expressed in the following manner:

$$\text{NAPL}_{\text{loading}} = M_{\text{NAPL}} Q S_{\text{oil}} K_r \quad (4)$$

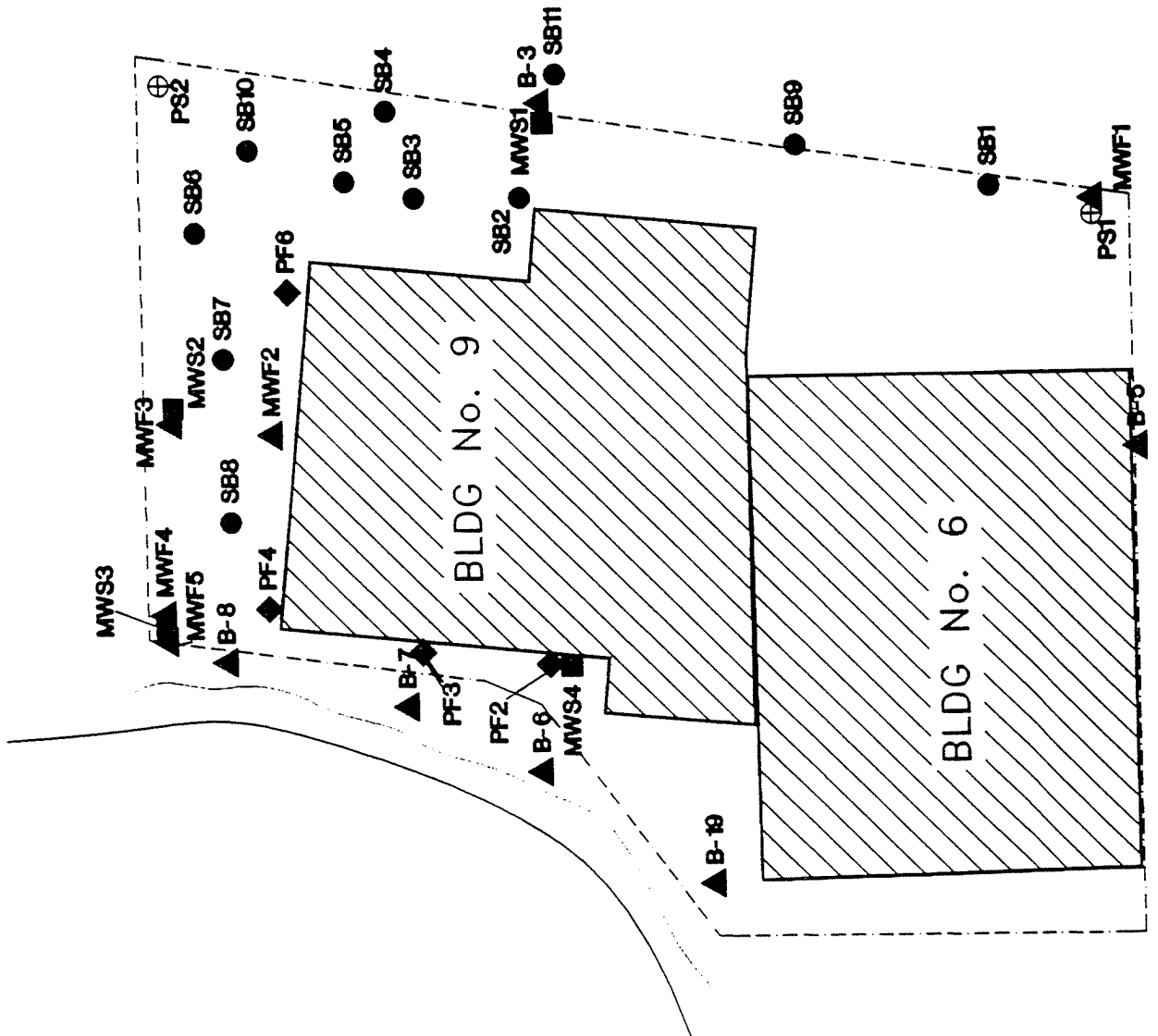
This loading to the creek was calculated to be $1.5 \text{ ft}^3/\text{d}$ or $540 \text{ ft}^3/\text{yr}$. This calculated loading of DNAPL is considered unrealistic when one

considers that evidence of NAPL is limited to a relatively small area of the site and the small NAPL recovery rates observed at wells that do contain NAPL (oil and grease measurements in B-8 and MWF2). Of the two calculations for NAPL loadings to the creek, the first calculation, which is lower, appears to be more consistent with observed data.



Legend

- Soil Borings (11)
- ▲ Fill Monitor Wells (10)
includes "B" Series Wells
- ◆ Fill Piezometers (4)
- Lower Sand Monitor Wells (4)
- ⊕ Lower Sand Piezometers (2)



GeoTrans, Inc.
ENVIRONMENTAL SPECIALISTS

Location of the RI/FS
 Monitoring System

PREPARED BY: J.T.A.	DATE: 7/26/98	PLATE
CHECKED BY: J.T.A.	REVISION: 1/7/99	1-1
DESIGNED BY: J.P.M.	ISSUANCE NO: 1-1000032098	

Table I-1. Hydrogeologic information for dissolved contaminant loading to Scajaquada Creek.

	B19	B4	B7	B8*	MWF5		
GS Elev	589.4	590	590.3	590.3	589.8		
WT Elev	581.9	572.8	572.9	572.9	576.8		
DT H ₂ O	7.5	17.2	17.4	17.4	13	ON 5/18/92	
DT Clay	13.5	21	32	22	28		
b (FT)	6	3.8	14.6	4.6	15		
K (FT/D)	0.5	36.6	3.9	42.8	9.7		
T (FT ² /D)	3.0	139.1	56.9	196.9	145.5	T = K b	
i (B3 to B7)	0.02	0.02	0.02	0.02	0.02	Gradient across the site	
CHEM CONC (µg/l)							
BTEX	0	97	1680	8420	140		
TPAH	0	7275	2435	10071	968		
CPAH	0	2606	20	1092	359		
CN	275	433	280	159	24.4		
B19-B4	B6-B7	B7-B8	B8-MWF5				
Tavg (FT ² /D)	71.0	98.0	126.9	171.2		Tavg = (T1 + T2)/2	
i avg	0.02	0.02	0.02	0.02		iavg = (i1 + i2)/2	
w (FT)	148	108	148	54			
Q(FT ³ /D)	210.3	211.7	375.7	184.9		Q = T i W	Qtot = 983
CHEM CONC (µg/l) PER WELL PAIR							
BTEX	48.5	888.5	5050	4280			
TPAH	3637.5	4855	6253	5519.5			
CPAH	1303	1313	556	725.5			
CN	354	356.5	219.5	91.7			
TOTAL MASS LOADING TO SCAJAQUADA CREEK						TOTAL LOADING	
	TML - SUM (j = 1-4) Qj Cj (lbs/day)					lbs/day	lbs/year
BTEX	0.0006	0.011	0.11	0.046		0.17	62.0
TPAH	0.045	0.058	0.14	0.058		0.30	110.0
CPAH	0.016	0.016	0.012	0.0077		0.052	11.0
CN	0.0043	0.0044	0.0048	0.0010		0.015	5.5

Note: * DNAPL was present in Well B8, and a groundwater sample was not collected. DNAPL from both wells B8 and MWF2 were sampled and found to have similar concentrations. The results of a groundwater sample from MWF2 were used for groundwater results for well B8 to calculate the loading to the creek.