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PHASE II HYDROGEOLOGIC REPORT

LOEFFEL SITE ENVIRONS REMEDIAL INVESTIGATION

Prepared for:
General Electric Company

HSI
GEOTRANS
46050 Manekin Plaza Suite 100
Sterling, Virginia 20166

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PHASE II HYDROGEOLOGIC REPORT

LOEFFEL SITE ENVIRONS REMEDIAL INVESTIGATION

Prepared for:

General Electric Company

Albany, New York

Prepared by:

HSI GeoTrans
46050 Manekin Plaza, Suite 100
Sterling, Virginia 20164

HSI GEOTRANS PROJECT NO. N039-002
MAY 8, 1997

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1 EXECUTIVE SUMMARY

Hydrogeologic studies have been completed as part of the Phase II Loeffel Landfill Environs Remedial Investigation. The Phase II hydrogeologic investigations were completed to characterize off-site hydrogeologic conditions and groundwater quality southwest and north of the Dewey Loeffel Landfill and to supplement data collected during the Phase I investigation for use in the preparation of a focused feasibility study to address groundwater contamination.

The Phase II data collection activities included: reviewing and verifying well construction of 34 residential wells; conducting geophysical surveys south of the site to characterize bedrock structure; gathering additional groundwater data through installation, packer testing, and sampling of new monitoring wells; evaluating landfill hydraulic parameters and leachate collection system hydraulics; and obtaining data to evaluate natural attenuation and degradation of contaminants in groundwater.

The results of the Phase II Investigation indicate:

- No contamination was detected in new deep bedrock monitoring wells installed south of the site along Central Nassau Road. Only Toluene at a concentration of 0.78 μg/L was detected in the new deep bedrock monitoring well north of the site, OMW-220.

- Hydrologic testing of the landfill and monitoring of the groundwater levels within the landfill during leachate extraction indicate that the current rate of leachate removal from the landfill ~240,000 gallons/year is inadequate for significantly reducing landfill groundwater levels.

- Groundwater sampling results indicate that natural degradation of contaminants is occurring. Both chlorinated solvents and BTEX contaminants are degrading primarily under anaerobic conditions. Rates of degradation are not currently known. Groundwater contamination is being further attenuated by dispersion of contaminants as they travel through the subsurface.

Based on the results of the Phase II investigations, the following recommendations are made:

- Residential wells within the immediate vicinity of the intersection of Central Nassau and Curtis Hill Roads should be monitored regularly for VOC's.

- Regular water levels and groundwater quality monitoring of RI wells should continue to provide an assessment of natural attenuation, contaminant migration, and remediation.

- Remedial alternatives should address source control options for containing groundwater and leachate within the vicinity of the landfill.

- More frequent pumping from the leachate collection system is appropriate to reduce the potential for continued leachate migration from the landfill.

2 INTRODUCTION

This Phase II Hydrogeologic Report describes the procedures, results, and interpretation of hydrogeologic studies performed at the Dewey Loeffel Landfill as part of hydrogeologic studies during Phase II of the Remedial Investigation (RI) for the site and environs. The RI was conducted in accordance with the RI Work Plan (Blasland & Bouck, July 1992a) approved by the New York State Department of Environmental Conservation (NYSDEC) and incorporated into a Stipulation and Order of Partial Settlement executed by the General Electric Company (GE) and the State of New York in the case of State of New York et al. V. General Electric Company, No. 89-CV-1135 (N.D.N.Y. September 1992).

In March 1996, GE submitted a two volume report entitled "Loeffel Site Environs Remedial Investigation Final Hydrogeologic Report" (GeoTrans, 1996) to NYSDEC. The Final Hydrogeologic Report summarizes the results of all Phase I RI hydrogeologic investigations completed between September 1993 and February 1996. The Work Plan for Phase II hydrogeologic investigations was submitted to NYSDEC on October 8, 1996 and approval was received by October 14, 1996. This work plan was amended on December 12, 1996 to specify protocols for low-flow sampling. This report summarizes the findings of the Phase II hydrogeologic investigations.

The Phase II work as identified in this report includes:

- A review of residential well specifications for wells in the vicinity of the landfill. This included both a literature search as well as a field survey of residential wells. A total of 34 wells were investigated.

- A seismic reflection and refraction survey completed along Central Nassau Road, south of the site, to evaluate bedrock trends and structures and aid in locating sites for additional bedrock wells.

- Installation and testing of four deep bedrock wells, three south of the site and one north of the site, to evaluate off-site migration of contaminants and provide hydrogeologic data.

- Groundwater sampling to evaluate the potential for natural degradation of chemicals.
- Monitoring of groundwater levels within the landfill in response to pumping the leachate collection system and discharge from a newly installed landfill well.
- A review of groundwater levels taken during each of the sampling events.

The report does not repeat the results described in the Interim Hydrogeologic Report (GeoTrans, 1994), or the Final Phase I Hydrogeologic Report (GeoTrans, 1996), but does revise previous interpretations as appropriate.

The main text of the report summarizes the results of all field investigations completed between October 1996 and February 1997. Appendices are provided as supporting material for calculations and specific investigation summaries. A timeline of the Phase II field activities is presented in Figure 2.1. A calendar of day-to-day field activities is provided in Appendix A.

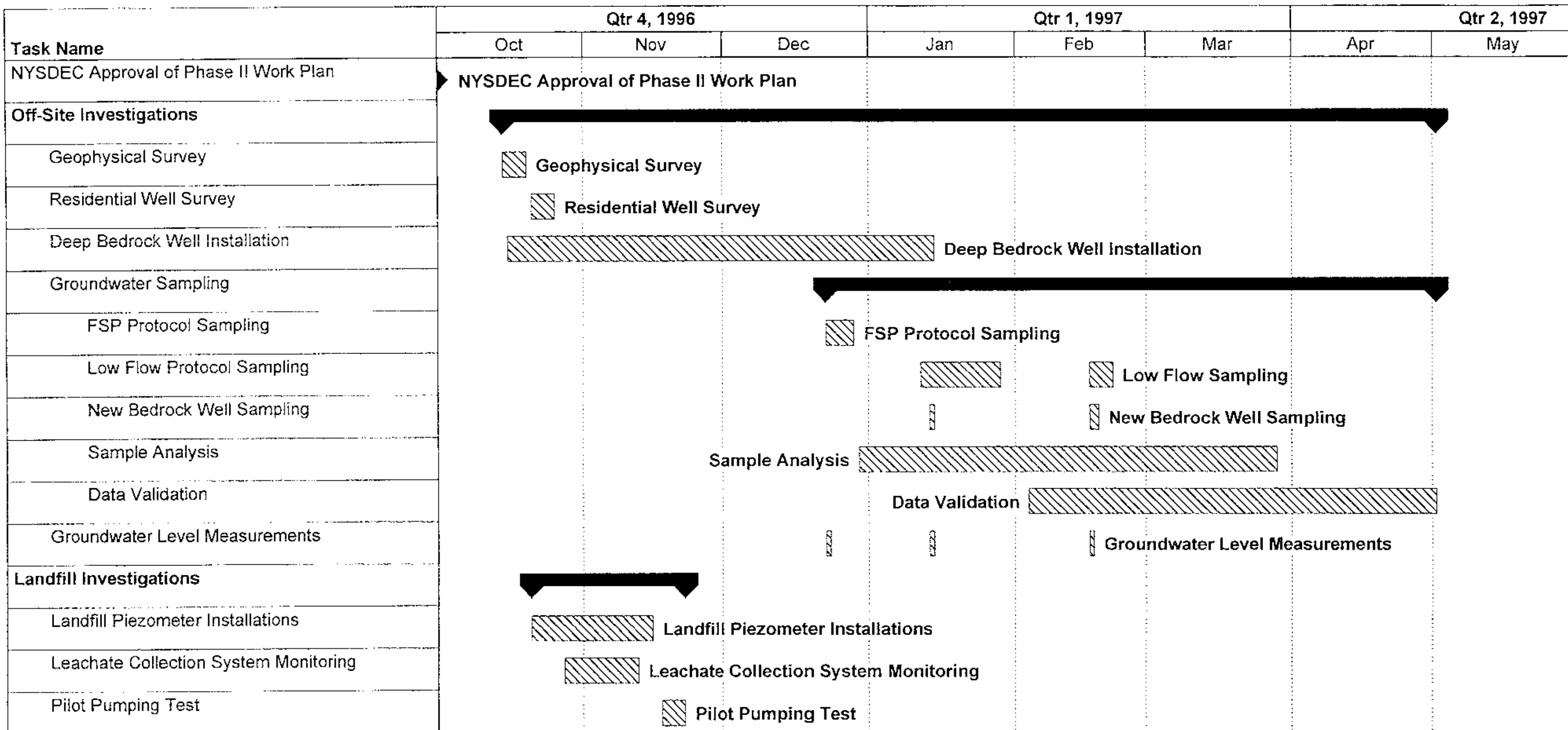

Figure 2.1 Timeline of Phase II Investigation Field Activities

FIGURE1.MPP

3 LANDFILL INVESTIGATIONS

3.1 INTRODUCTION

During the Phase I RI hydrogeologic investigations, landfill performance and characterization data were collected including: groundwater level monitoring data, landfill groundwater quality data, and containment wall performance data through pumping tests at selected locations. Based on the results of these investigations, it became apparent that a landfill or source control remedial action would be necessary to enhance the effectiveness of the existing containment system and to prevent further migration of leachate from the landfill. As a result, several source control remedial actions were conceptualized. Conceptual source control remedial actions include increased pumping and/or expansion of the existing leachate collection system, pumping and treating groundwater immediately outside of the landfill, or pumping and treating groundwater immediately outside the containment system.

In order to better evaluate the conceptual source control remedial alternatives, additional data was collected during the Phase II remedial investigations. The following Phase II remedial investigations were completed: landfill groundwater level monitoring during repeated extraction from the existing leachate collection system; lithologic characterization of the western portion of the landfill; and through a pilot pumping test, a further evaluation of landfill groundwater concentrations and landfill hydraulic parameters. In addition, an evaluation of the flow into and out of the landfill was made. Each of the Phase II landfill field investigations are summarized in appendices.

Much of the Phase II RI activities focused on collecting data for evaluation of potential source control actions within the landfill. The following summarizes the results of the Phase II landfill characterization.

3.2 LANDFILL CHARACTERIZATION

The Loeffel Landfill as constructed in 1984, covers an area of roughly 11 acres (Figure 3.1). Locally-derived fill material and a clay cap were placed over the existing surface to a maximum depth of about 20 feet. Swales were formed into the fill material to provide surface drainage and prevent ponding on the landfill. Prior to completion of landfilling, a leachate collection system consisting of gravel drainlines was installed in the western portion of the site and constructed to drain into a 10,000 gallon leachate collection tank (Figure 3.2).

As part of the September 1980 agreement between GE and NYSDEC, NYSDEC is responsible for ongoing landfill maintenance and leachate collection at the Loeffel Landfill. During the performance of the Phase I RI, the water level data indicate that groundwater levels within the landfill are higher than groundwater levels in bedrock in the western portion of the site. This suggests, at least for the western portion of the site, that leachate has the potential to flow out of the landfill into bedrock. Therefore it became evident that the existing leachate extraction process may not be effective in containing groundwater within the western portion of the landfill. In the eastern portion of the site, landfill groundwater levels appear to be lower than groundwater in bedrock indicating that upward flow from bedrock into the landfill is present. In order to confirm the Phase I investigations, landfill groundwater levels were monitored during extraction from the leachate collection system and during a separate extraction event from the pilot test pumping well installed Fall 1996. A total of five new piezometers and a pilot test pumping well were installed to monitor landfill groundwater levels, PO-2, PO-3, PO-4, PO-5, PO-6, and PW-4. Each of the piezometers were completed to a depth of 15-21 feet with 5 foot screens. PW-4 was completed to a depth of 30 feet with a 20 foot screen. Drilling protocols and specifications are presented in Appendix B and Table 3.1, respectively.

The piezometer monitoring intervals generally correspond to the elevation of the former landsurface prior to the 1982-1984 containment system construction. During installation of the piezometers, coarser sized materials were encountered just above peats and clays of the former landsurface. This coarser material is believed to represent "Type H"

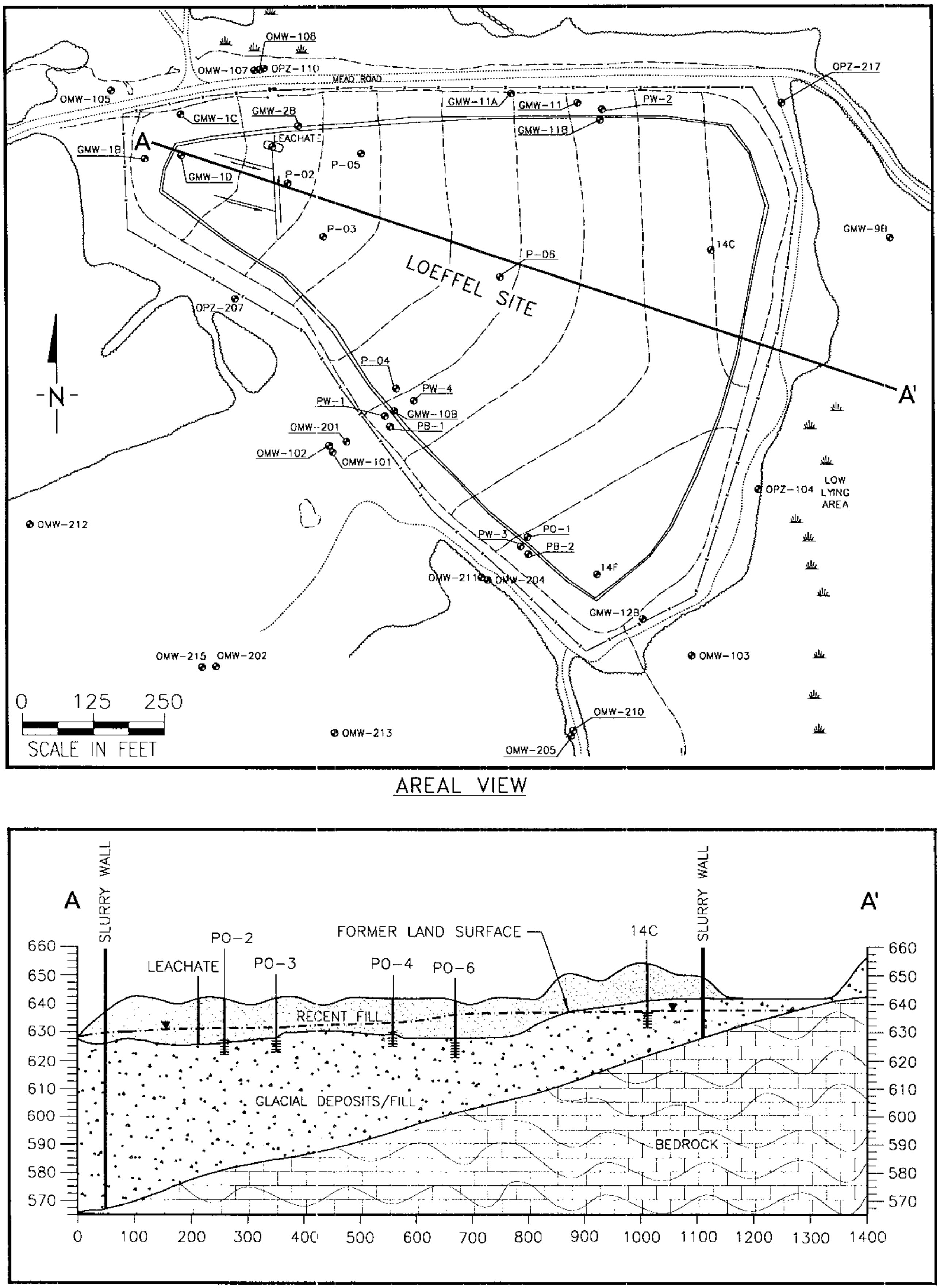

Figure 3.1 Areal and cross-sectional view of of the Loeffel Landfill.

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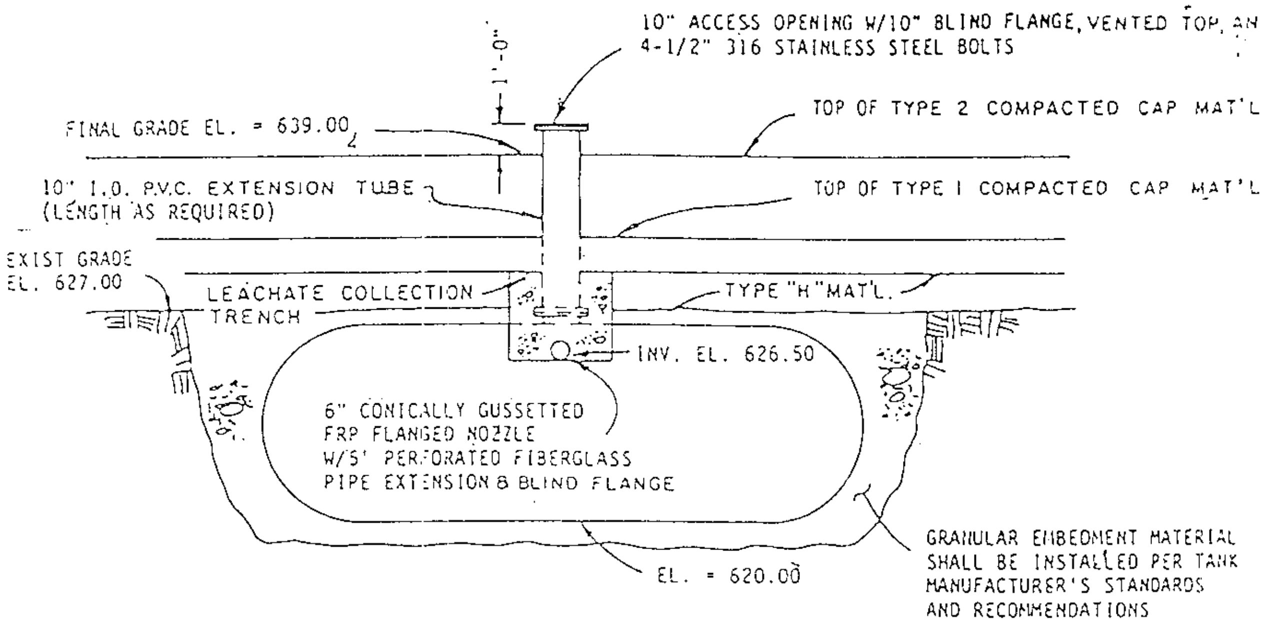

NOTES:

1. FIBERGLASS TANK SHALL BE MANUFACTURED BY OWENS/CORNING, JUSTIN INDUSTRIES, OR EQUAL.

2. TANK SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDATIONS AND INCLUDE ANCHORING AS REQUIRED TO SECURE TANK.

3. THE LEACHATE COLLECTION TANK ACCESS OPENING SHALL BE SURROUNDED BY A SERIES OF 100lb MIN. ROCKS AS A PROTECTIVE MEASURE.

Figure 3.2. Leachate collection system as originally proposed (O'Brien & Gere, 1982).

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Table 3.1 Specifications of piezometer and pilot pumping test well installed October-November, 1996.

MW/Piez ID	Installation Date	Northing (ft)	Easting (ft)	Elevation of MRP (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Screened Interval (ft bgs)	Depth to Bottom of Screened Interval (ft bgs)	Casing Diameter and Material	Monitoring Interval Elevation (ft MSL)
PO-2	10/14/96	933832.79	707546.15	644.30	641.50	13.00	14.50	19.50	2" PVC	627.0-622.0
PO-3	10/15/96	933736.18	707608.64	645.25	642.60	12.50	14.50	19.50	2" PVC	628.1-623.1
PO-4	10/15/96	933464.28	707737.50	643.14	640.50	8.50	10.50	15.50	2" PVC	630.0-625.0
PO-5	11/8/96	933885.90	707677.22	642.15	640.80	13.50	14.50	19.50	1" PVC	626.3-621.3
PO-6	11/8/96	933663.61	707923.73	642.05	640.70	15.00	16.00	21.00	1" PVC	624.7-619.7
PW-4	10/17/96	933442.78	707768.82	642.99	640.30	8.50	10.00	30.00	4" PVC	630.3-610.3

Notes:
1) MRP - Measured Reference Point marked on top of the inner casing.
2) PVC - Polyvinyl Chloride
3) Survey data source: Blasland & Bouck (1996)
4) Monitoring interval based on top of screen to bottom of screen or open borehole.

material emplaced as a base for construction machinery. Where present, this coarser material is a high permeability zone within the fill material. Lower permeable soil underlies this material.

3.3 LEACHATE COLLECTION SYSTEM MONITORING

To evaluate the zone of influence of the existing leachate collection and extraction system, groundwater levels within the landfill were monitored within the leachate cleanout, the newly installed piezometers and pilot pumping well during the period October 23 to November 14, 1996. During this time period, 5000 gallons of leachate were removed during each leachate collection event of October 28, 30, and 31, and November 12 for a total of 20,000 gallons. These extraction events represented the last NYSDEC leachate extraction events during 1996. The total leachate extraction for 1996 was approximately 240,000 gallons (personal communication, NYSDEC, 1996).

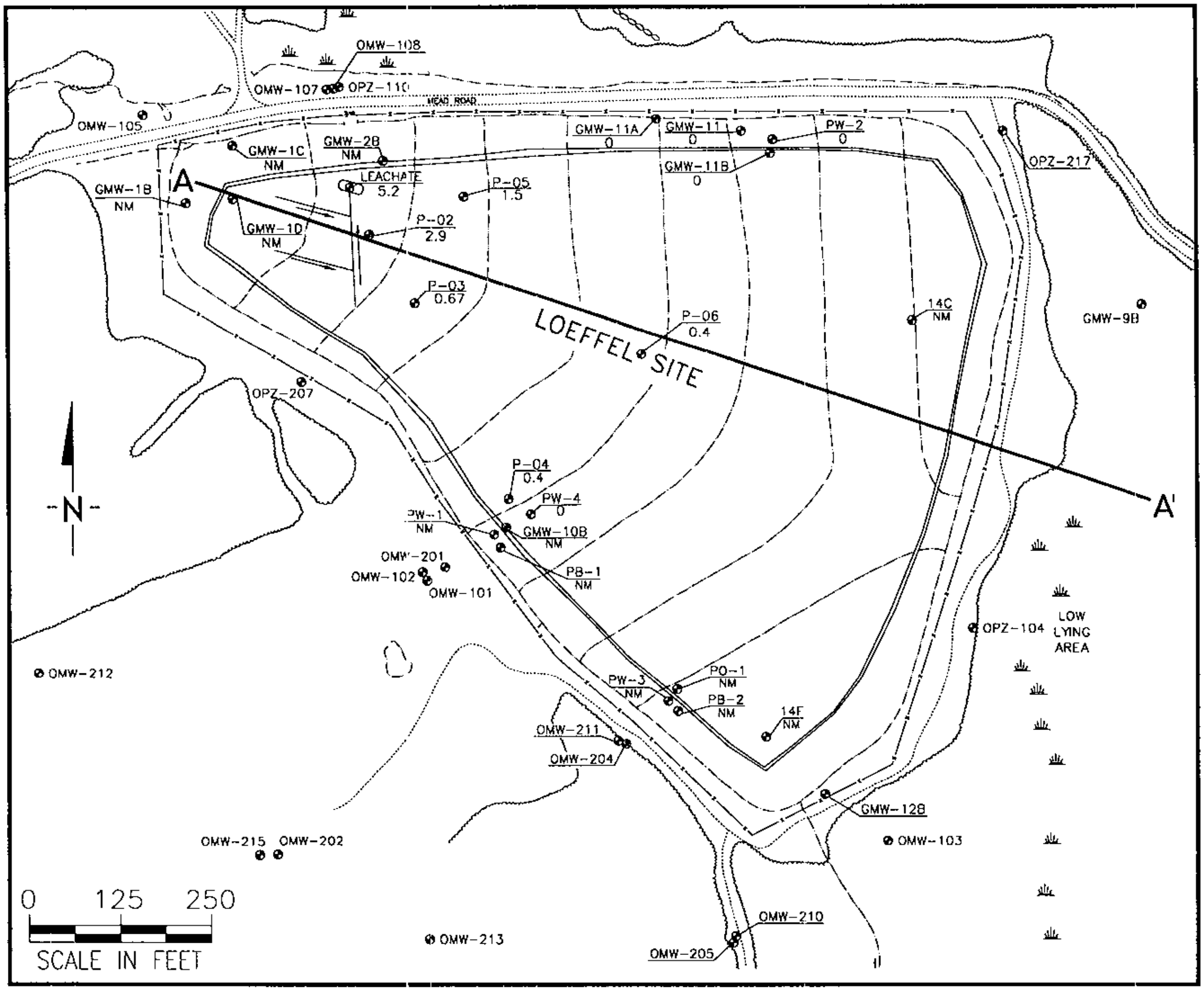
Maximum drawdowns experienced during the November 12 collection event are presented in Figure 3.3. As shown in this figure, measurable drawdown was limited to the western portion of the landfill. Groundwater levels within the landfill plotted against time show that groundwater levels after the October 28-31 extraction events recovered within one week following extraction cessation (Figure 3.4).

Immediate leachate level rise following extraction is likely due to re-equilibration of leachate within fill material voids or "in storage". Other sources may be influx from recharge or upward flow from bedrock. The volume of groundwater in the landfill in gallons contained within storage is approximated by:

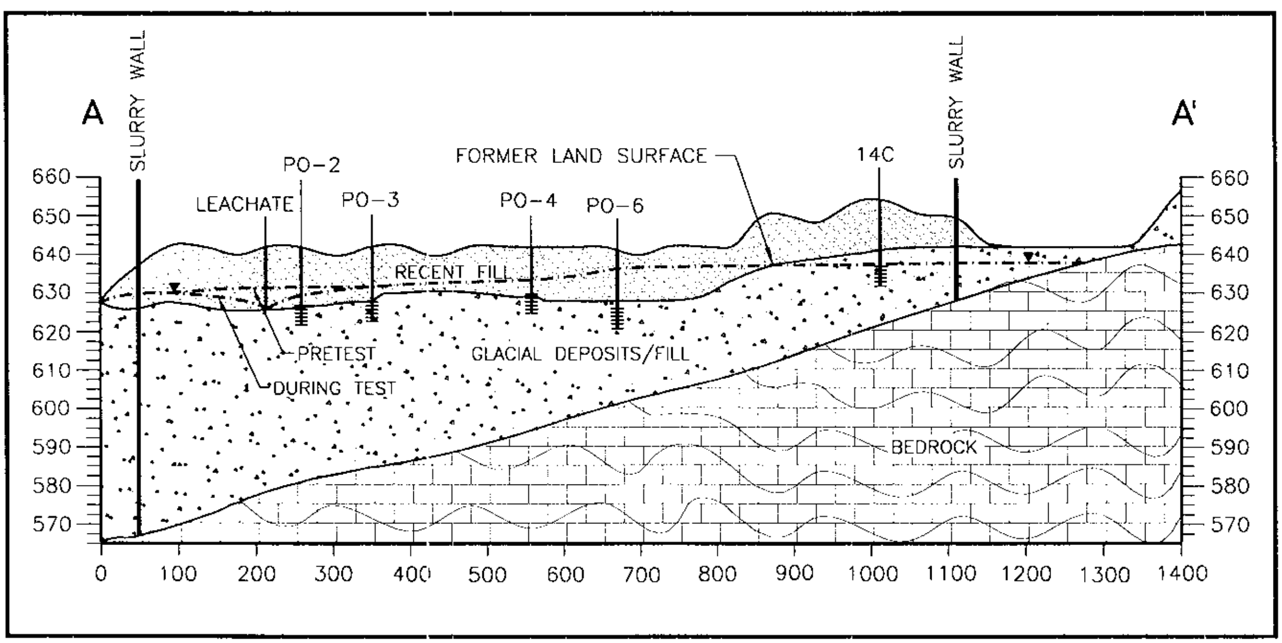
$$V_s = A_w \times h_f \times \phi_f \times 7.48 \text{ g/ft}^3$$

where V_s = volume of groundwater in the landfill in storage in gallons;

A_w = Area within the landfill wall in ft^2;



AREAL VIEW



CROSS-SECTIONAL VIEW

Figure 3.3 Areal and sectional view of landfill showing maximum drawdown (ft) during November 12, 1996 leachate extraction.

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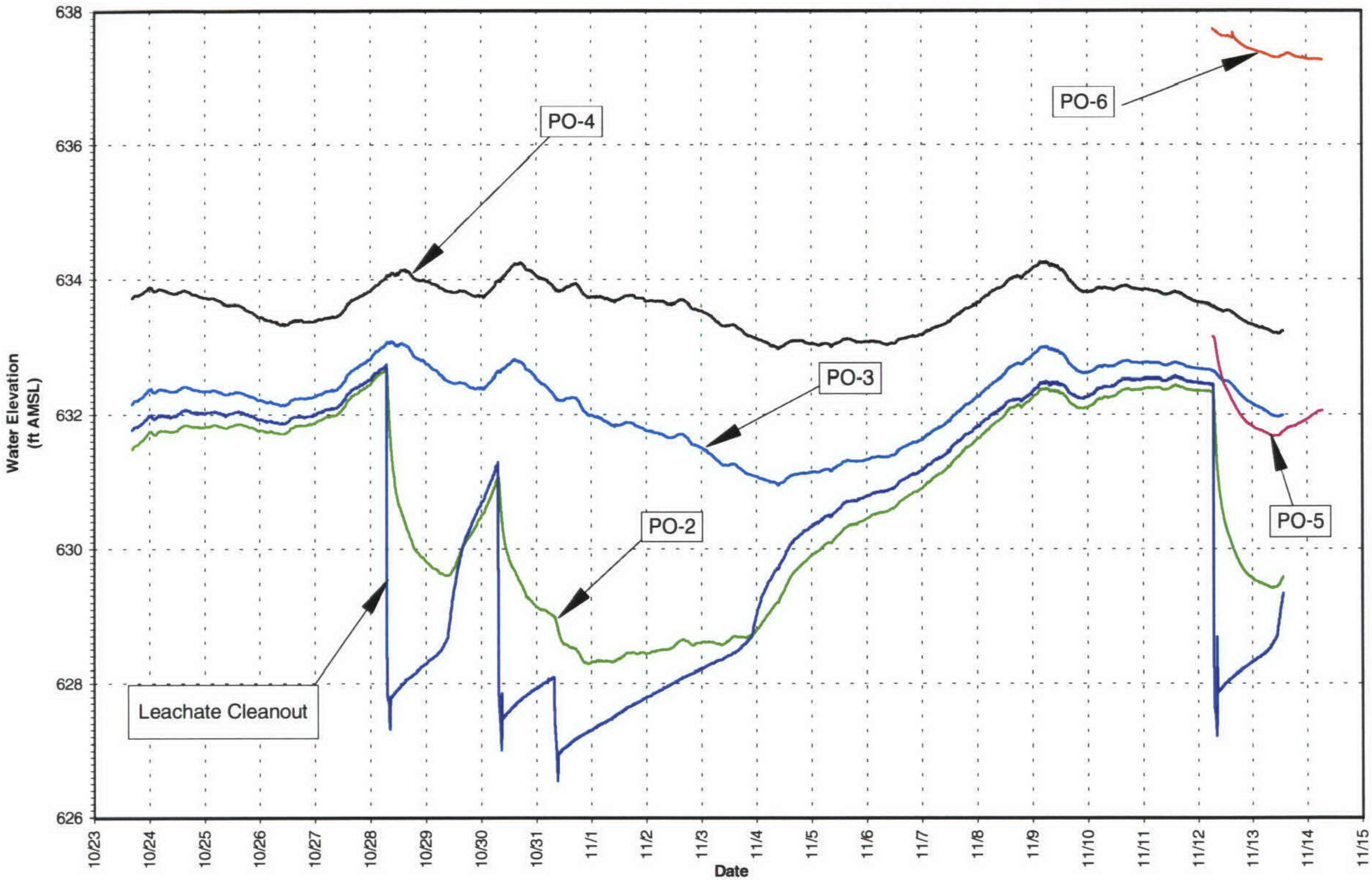

Figure 3.4 Landfill Groundwater Level Response to Leachate Collection System Withdrawals

h_f	=	average saturated thickness of fill material in feet;
ϕ_f	=	porosity of the fill material;
g	=	gallons.

The area within the landfill wall is approximately 547,500 ft^2. If an average saturated fill thickness of 7 feet and a fill porosity equivalent to silt, 0.30, are assumed, the volume of leachate in storage is 8.6 million gallons. Because of the large potential leachate volume, extraction from the existing leachate collection system would have to be significantly increased in order to greatly reduce the amount of water within the landfill within a short period of time.

3.4 RESULTS OF THE PUMPING TEST

From November 18 to 22, 1996, a 72-hour pumping test was conducted at the newly installed pilot pumping well, PW-4. The purpose of this test was to assess the hydrologic properties of the fill material within the landfill, to collect and analyze groundwater samples for treatment system alternative evaluation.

Due to the hydraulic characteristics of the fill material adjacent to PW-4, a maximum yield of 0.5-0.75 gpm was obtained and measurable drawdown was only noted at PO-4 which was 40 feet from PW-4 (Figure 3.5). Data collected were sufficient to calculate transmissivity and storage coefficients of the fill material (Appendix F).

Discharge from PW-4 was sampled twice during the pilot pumping test. The first sample taken at the beginning of the pilot pumping test was analyzed for a range of wet chemistry parameters (Table 3.2). A second sample was taken near the end of the pumping test and was analyzed for wet chemistry and VOCs, SVOCs, and PCBs (Table 3.2).

Chemical analyses indicated that high concentrations of total manganese and total iron were present, 81.9 mg/L and 51.3 mg/L, respectively, in unfiltered samples. These high concentrations are an important consideration in the design of the potential remedial

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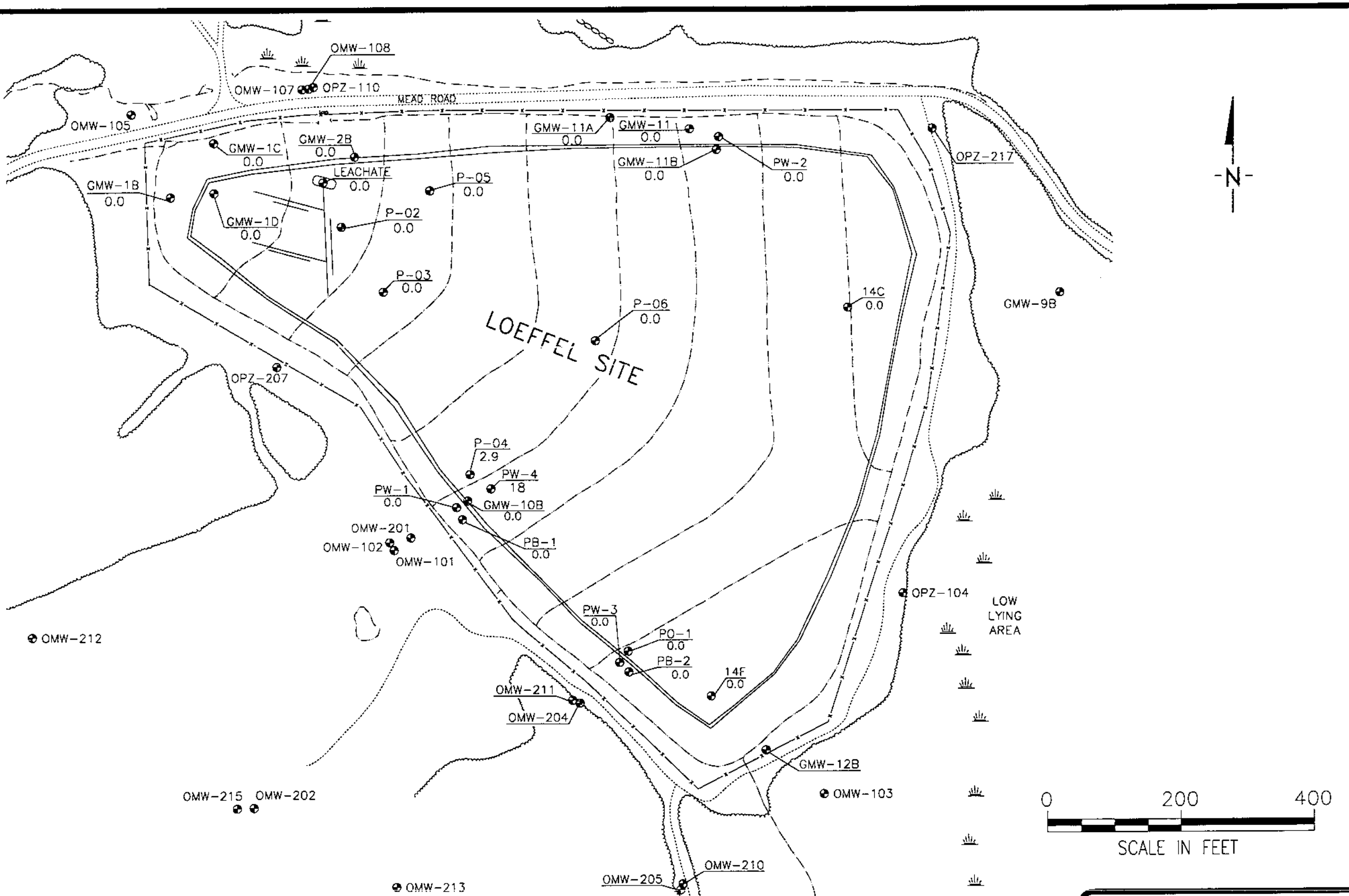

Figure 3.5 Maximum drawdown during 72 hour pumping test at PW-4 (Pumping Rate 0.5-0.75 gpm).

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Table 3.2 Detected compounds in groundwater samples collected from PW-4 during the 72-hour pilot pumping test.

Parameter	Value 11/18/96	Value 11/21/96	Units	Comments
Time Since Pumping Started	2.4	69.5	hrs	
Approximate Volume Removed	73	2462	gals	
Field Parameters				
Dissolved Oxygen	3.25	4.0	mg/L	
Temperature	12.1	11.1	Degrees C	
Specific Conductance	1278	1234	umhos/cm	
ORP	-25	-0.07	mV	
pH	6.0	6.4	s.u.	
Wet Chemistry				
Sulfide	0.07	0.03	mg/L	
Total Hardness as $CaCO_3$	170	156	mg/L	
Alkalinity (as $CaC0_3$)	288	292	mg/L	
Chloride	249	248	mg/L	
Sulfate	0.8	0.8	mg/L	
Nitrate as N	0.3	0.3	mg/L	
TSS	87	13.8	mg/L	
BOD5	12	8.7	mg/L	
TDS	940	860	mg/L	
Conductivity	1160	1060	umhos/cm	
pH	6.29	6.45	s.u.	
Ammonia-Nitrogen	2.7	2.3	mg/L	
Phosphate. Total as P	0.13	0.082	mg/L	
COD	170	151	mg/L	
TOC	37.3	17.6	mg/L	
Metals				
Iron	69.8	51.3	mg/L	
Manganese	78.6	81.9	mg/L	Estimated value
VOCs				
Benzene	NS	14000	ug/L	
Chlorobenzene	NS	2200	ug/L	
cis-1,2-Dichloroethene	NS	1100	ug/L	
SVOCs				
Phenol	NS	4.4	ug/L	Estimated value
1,2-Dichlorobenzene	NS	0.97	ug/L	Estimated value
1,3-Dichlorobenzene	NS	3.6	ug/L	Estimated value
1,4-Dichlorobenzene	NS	16	ug/L	
2,4-Dimethylphenol	NS	2.8	ug/L	Estimated value
Naphthalene	NS	1.3	ug/L	Estimated value
PCBs				
**Aroclors 1016,1221,1232,1242,1254, 1260 Below Detection	NS	**		

NS=Not Sampled

treatment system. Without pre-treatment, high concentrations of manganese and iron can foul air-stripping units.

The total of all volatile organic compounds (TVOC) above detection limits at PW-4 is 17,300 ug/L and consists primarily of BTEX compounds. The components and concentrations of the VOCs in this well are consistent with those of samples taken from the leachate collection system. SVOC concentrations were generally low with detections of phenols, dichlorobenzenes, and napthalene. PCBs were not detected in samples taken from PW-4. The results of all analyses for PW-4 are presented in Appendix F.

In addition to the groundwater samples taken during the pilot pumping test, a groundwater sample was also taken at piezometer PO-4 for VOCs, SVOCs, and PCBs (Table 3.3). TVOC concentration in PO-4 was 3,547 ug/L which was generally lower than typical for leachate in the western portion of the landfill. SVOC values were also low with detections of Dichlorobenzenes, and 2,4-Dimethylphenol less than 60 ug/L. PCB Aroclor 1260 was detected at PO-4 at a concentration of 260 mg/L, which is above its aqueous solubility of 0.05 mg/L. This concentration indicates that Aroclor 1260 exists at this location in a separate phase as a DNAPL (Dense-Non-Aqueous-Phase Liquid). A complete listing of PO-4 analyses and results are in Appendix B.

3.5 LANDFILL WATER BUDGET

The conceptual source control remedial alternatives for the landfill must consider the amount of groundwater flow into and out of the landfill. To assist in the evaluation of remedial alternatives, a landfill water budget or balance was calculated.

The various components of flow into and out of the landfill are illustrated in Figure 3.6. Water can flow into the landfill from recharge through the landfill cap, through the landfill wall from the overburden and from upward flow from the bedrock (Figure 3.6). Leachate can flow out of the landfill through the underlying till and overburden materials and through the landfill wall. The magnitude of these flow rates is dependent on groundwater elevation, the rate of recharge, and the permeability of materials within the landfill, the landfill wall, the overburden and underlying bedrock.

Table 3.3 Detected compcunds in groundwater detected in PO-4, October 21, 1996.

Parameter	Value	Units	Comments
Approximate Volume Removed	3	gals	
Field Parameters			
Dissolved Oxygen	1.8	mg/L	
Temperature	13.1	Degrees C	
Specific Conductance	1,375	umhos/cm	
ORP	-39	mV	
pH	5.8	s.u.	
VOCs			
Chlorobenzene	89	ug/L	
1,2-Dichlorobenzene	4.7	ug/L	
1,3-Dichlorobenzene	19	ug/L	
1,4-Dichlorobenzene	88	ug/L	
Benzene	3,300	ug/L	Diluted before analysis
Toluene	2.2	ug/L	
Ethybenzene	12	ug/L	
m/p-Xylene	28	ug/L	
o-Xylene	3.7	ug/L	
SVOCs			
1,3-Dichlorobenzene	19	ug/L	
1,4-Dichlorobenzene	80	ug/L	
2,4-Dimethylphenol	14	ug/L	
PCBs			
Aroclor 1260	260,000	ug/L	

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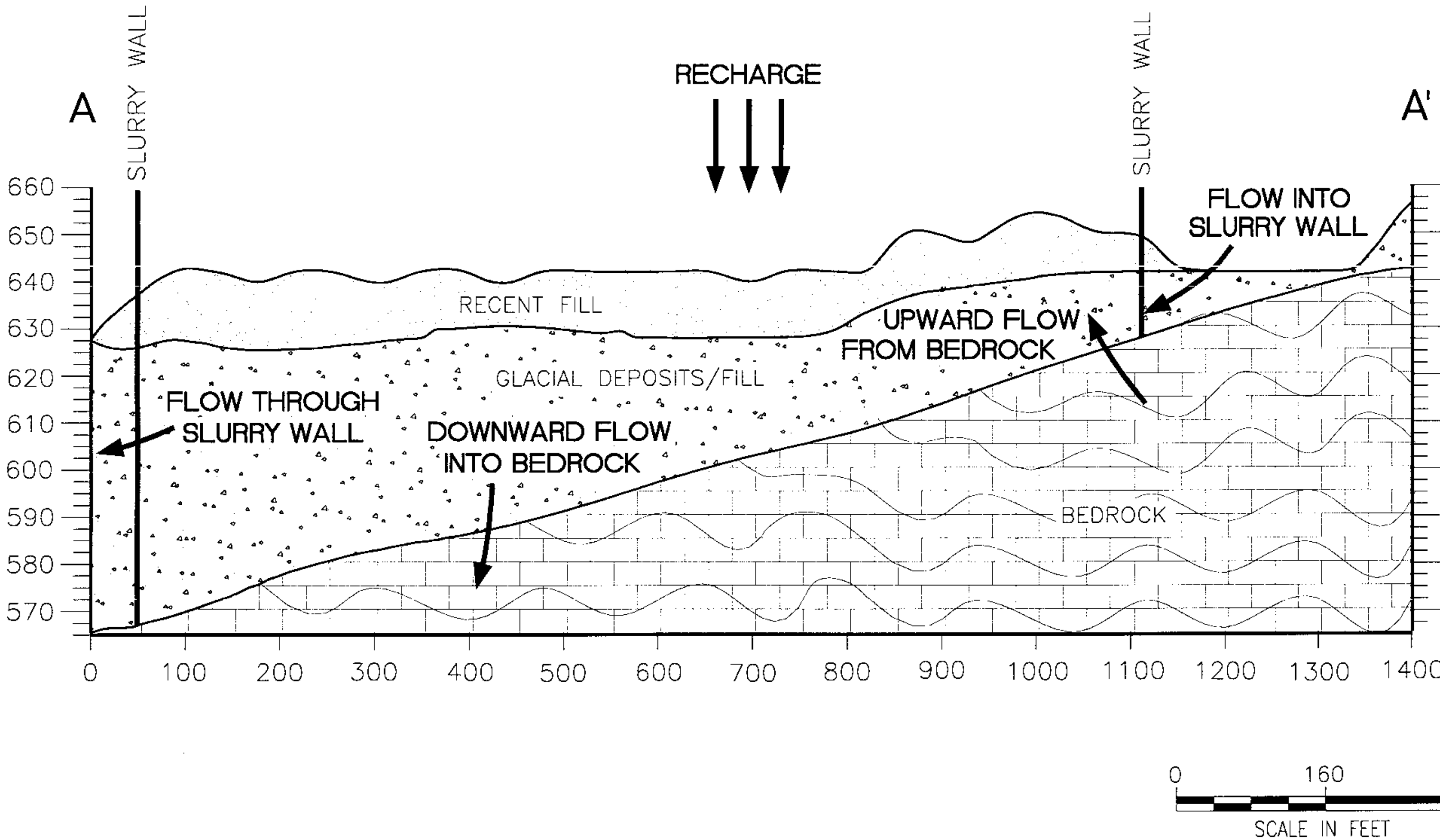

Figure 3.6 Landfill water budget components.

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Recharge through the landfill cap is estimated to be about 1.7 in/year or 508,000 gallons/year. This value was derived based on HELP modeling of existing landfill cap construction and historic climatological data for Albany, New York (Appendix J).

Fluxes into and out of the landfill were calculated using estimated potentiometric differences between the landfill and the bedrock and estimated overburden and bedrock hydraulic parameters. To calculate groundwater head differences, potentiometric surfaces of groundwater elevations from Fall, 1996 were created using SURFER™. Head differences were calculated by subtracting surface grid point values in the overburden potentiometric surface from those of the bedrock potentiometric surface. Areas of negative head difference indicate that potentiometric levels in the bedrock are higher than in the overburden and groundwater flows upward into the landfill. Areas of positive head difference suggest that groundwater flows downward from the landfill into bedrock. The volume of flow into and out of the landfill is proportional to the area of upward and downward gradients, respectively, the hydraulic conductivity of the overburden and bedrock, and the head difference between overburden and bedrock.

Flux into or out of the landfill can be determined using the following formula:

$$Q = -KAdh/dl$$

where K = vertical hydraulic conductivity

A = area of upward or downward flow

dh = head difference

dl = vertical distance between the depths at which hydraulic head was measured.

Horizontal hydraulic conductivity as determined in the Phase I hydrogeologic investigations averages 0.12 ft/day for both the overburden and bedrock. Vertical conductivity is assumed to be ten percent of horizontal hydraulic conductivity or for average conditions at this site, 0.012 ft/day.

For the area of the landfill with a net downward flow an estimated average head difference between the overburden and bedrock was calculated as 11.3 feet over a vertical distance of 40 feet. For the area of the landfill with net upward flow the average head difference between the overburden and the bedrock was 5.5 feet over a vertical distance of 10 feet.

The result of this landfill water budget analysis is shown in Table 3.4. Under this approach it has been assumed that the flow of water into the landfill wall is roughly equivalent to the flow of water out of the landfill wall. This analysis provides a rough estimate of the relative fluxes into and out of the landfill. Confirmation of these fluxes will be achieved through landfill remedial alternative monitoring.

Table 3.4 Estimated landfill water budget components.

	Rate (gpm)
Flow into the Landfill	
Recharge	0.96
From Bedrock	4.61
Through the Landfill Wall	--
Flow out of the Landfill	
Into the Bedrock	5.54
Through the landfill wall	--
Balance	-0.03

Note: The flow of water into the landfill wall has been assumed to be roughly equivalent to the flow of water out of the landfill wall.

4 OFF-SITE INVESTIGATIONS

To evaluate the extent of the VOCs and further characterize bedrock hydraulic conditions, four deep bedrock monitoring wells, OMW-220, 221, 222, and 223, were drilled, tested and monitored in the Phase II field investigations. Three deep bedrock wells, OMW-221, 222, and 223, were installed south of the landfill along Central Nassau Road to characterize the extent of hydrogeologic conditions on groundwater flow and the extent of contamination.

To the north of the landfill, a deep bedrock well, OMW-220, was installed between residential well 191-05-15 and the landfill (Figure 4.1). The purpose of this well was to determine if contamination from the landfill was migrating to residential well 191-05-15 through a deep bedrock pathway.

Residential well and seismic reflection/refraction surveys provided additional offsite characterization of bedrock hydrogeology. The results of the Phase II off-site field investigations are summarized in the following sections. Summaries of the deep bedrock well investigation and residential and seismic refraction/reflection surveys are presented in the appendices.

4.1 DEEP BEDROCK WELL INSTALLATIONS SOUTH OF LOEFFEL LANDFILL

A northwest/southeast trending fracture trace in the vicinity of Central Nassau and Curtis Hill Roads had been tentatively identified in aerial photos and topographic maps (Figure 4.2). OMW-222 was located to intersect this fracture trace as well as the north-south trending thrust fault identified adjacent to the Loeffel Landfill. Driller's logs indicated that residential well 191-05-22, which is southeast of Central Nassau and Curtis Hill Road intersection, had a yield of 15 gpm. This yield is higher than reported for other residential wells in this vicinity, further suggesting a permeable bedrock fracture zone.

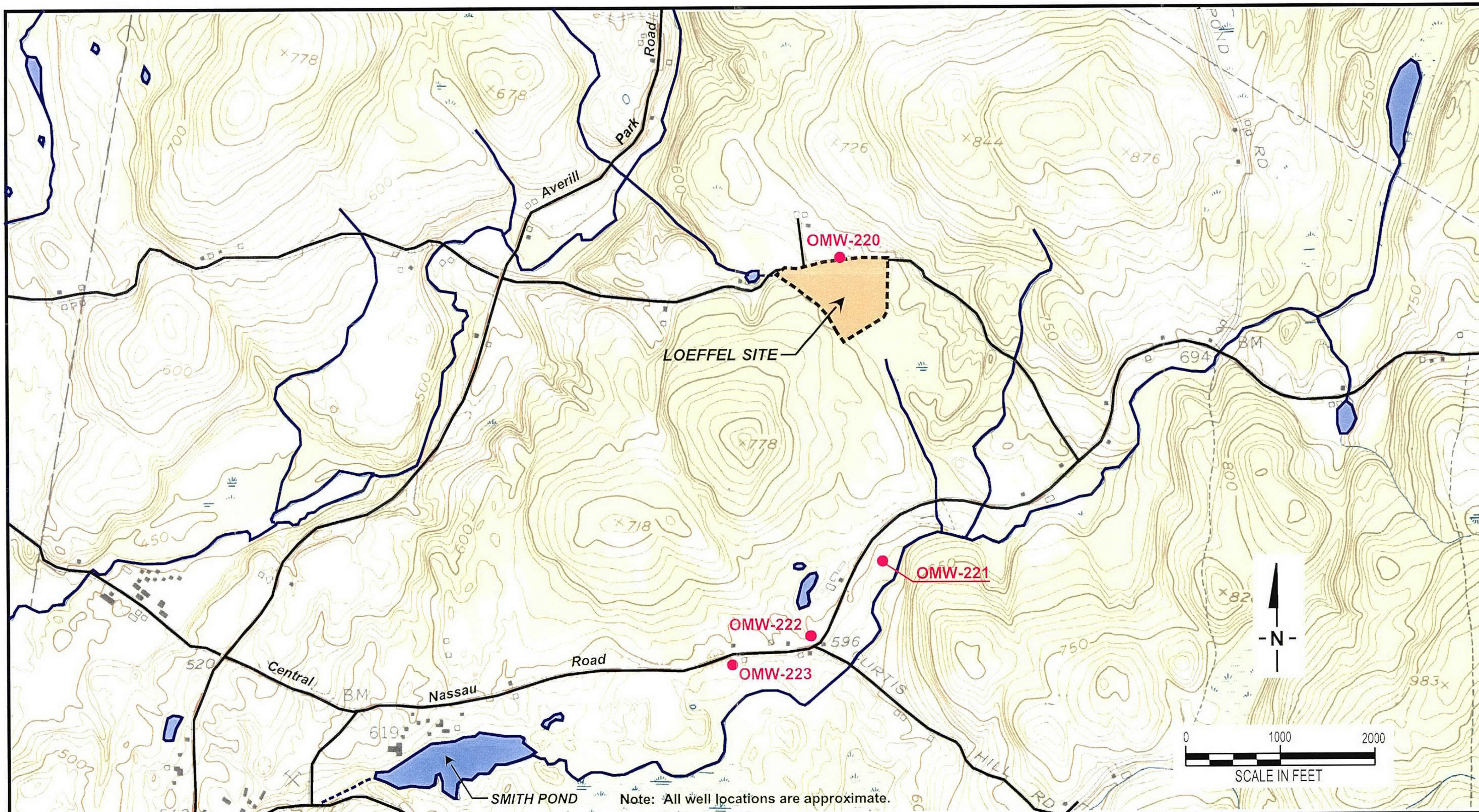

Figure 4.1 Location of deep bedrock wells installed Fall, 1996.

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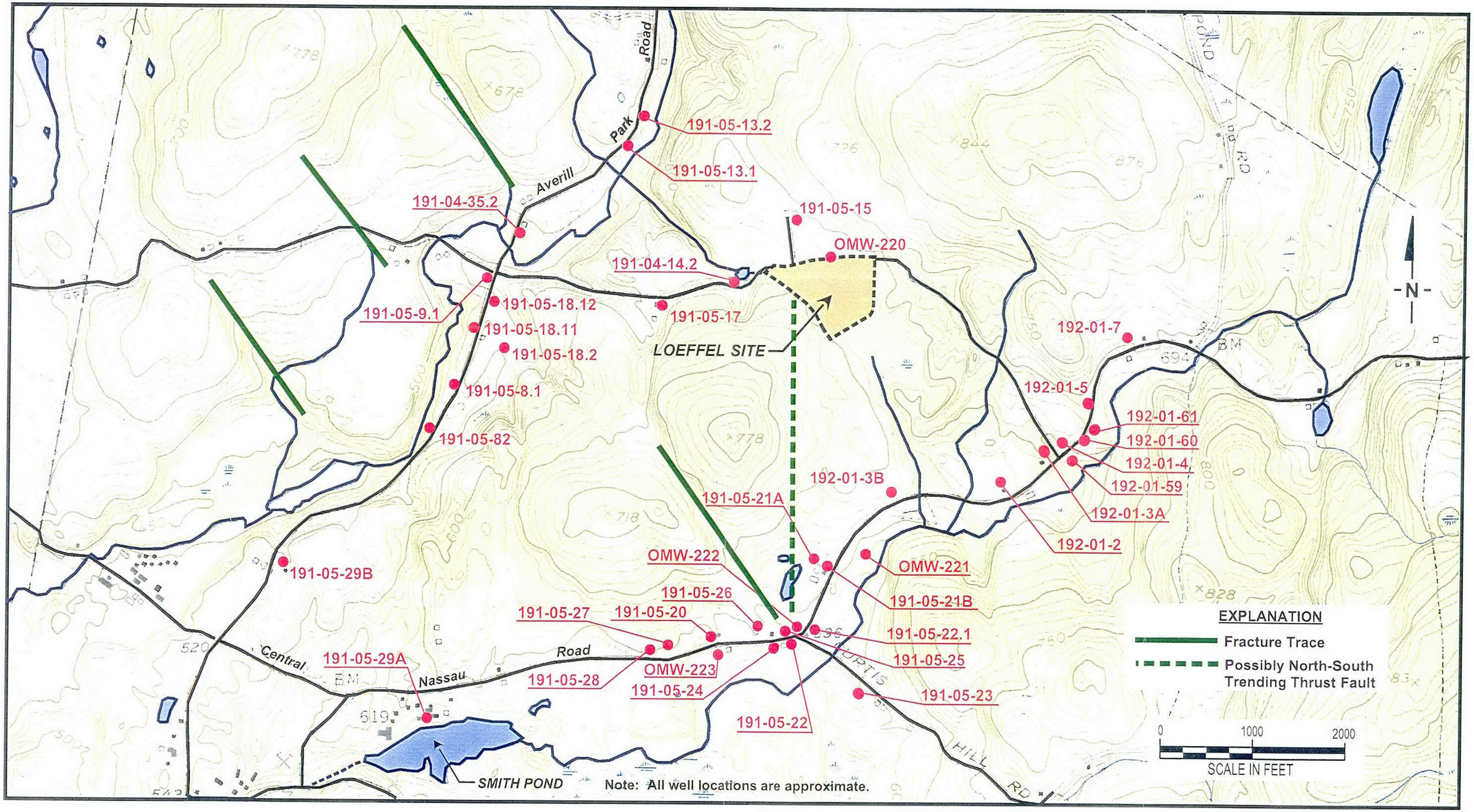

Figure 4.2. Location of possible fracture traces, North-South trending thrust fault, and Phase II deep bedrock wells.

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The seismic refraction survey completed along this section of Central Nassau Road identified several zones of lower seismic velocity in the bedrock which have been interpreted as indicative of increased bedrock fracturing (Appendix E).

Monitoring well, OMW-221, was located south and east of 191-05-21A, 191-05-21B, and 192-01-3B. These are residential wells that historically have had low levels of VOCs. Based on data collected during the Phase I RI and the residential well survey, groundwater appears to flow from topographic highs east of the Loeffel Landfill and ultimately discharges to regional streams(Figure 4.3). Well OMW-221 was placed near Valley Stream to intersect groundwater flow downgradient of the area of the residential wells impacted with VOCs.

The remaining deep bedrock well, OMW-223, was located west of the interpreted intersection of the fracture zones to be monitored by OMW-222. This location was selected to evaluate bedrock structural trends and provide groundwater quality and water level data further west along Central Nassau Road.

4.1.1 BOREHOLE TESTING

Drilling depths were comparable with residential wells in this portion of Central Nassau Road (Table 4.1, Appendix D). Prior to well completions, each borehole was evaluated through downhole video and acoustic televiewer logging, as well as packer tests.

Downhole video logging showed that bedrock in these wells consisted of dipping beds of red to gray shales and graywackes with calcite and silica filled fractures similar to bedrock cores previously taken during the RI. Due to borehole turbidity, downhole video logging of OMW-223 was of poor quality. As a result, acoustic televiewer logging (ATV) was completed on each of the boreholes.

ATV is an ultrasonic geophysical tool that records an oriented sonar image of the borehole wall. From the ATV images the dip direction and angle of features within the bedrock can be calculated. The dip direction and angle of bedrock features with depth as noted in OMW-221, 222, and 223 are presented in Figure 4.4. Both bedding plane and high

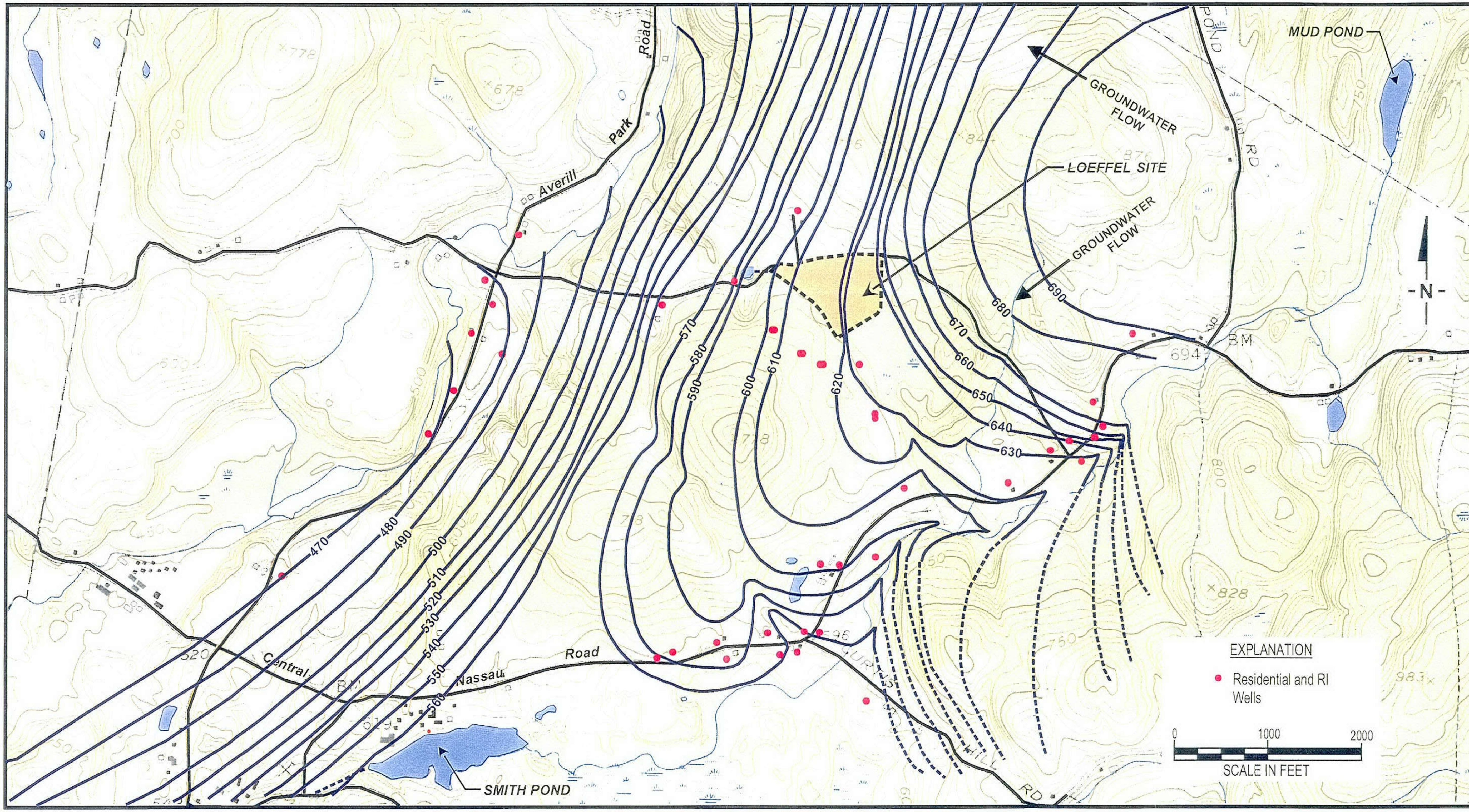

Figure 4.3. Estimated groundwater elevations, Fall 1996.

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Table 4.1 Specifications of bedrock wells installed Fall, 1996.

MW/Piez ID	Installation Date	Northing (ft)	Easting (ft)	Elevation of MRP (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Screened Interval (ft bgs)	Depth to Bottom of Screened Interval (ft bgs)	Casing Diameter and Material	Monitoring Interval Elevation (ft MSL)
OMW-220	11/18/96	934063.45	707794.54	637.31	635.50	-	-	-	4"-Steel	485.3-445.3
OMW-221	1/14/97	930789.80	708227.50	593.25	592.00	92.00	102.00	142.00	2"-PVC	500.0-460.0
OMW-222	1/14/97	929981.88	707453.71	600.59	598.60	154.00	165.00	205.00	2"-PVC	433.6-393.6
OMW-223	1/14/97	929691.58	706607.90	596.16	593.90	118.50	130.00	170.00	2"-PVC	463.9-423.9

Notes: 1) MRP - Measured Reference Point marked on top of the inner casing.
2) PVC - Polyvinyl Chloride
3) Survey data source: Blasland & Bouck (1996,1997)
4) Monitoring interval based on top of screen to bottom of screen or open borehole.

N039041A.DSF

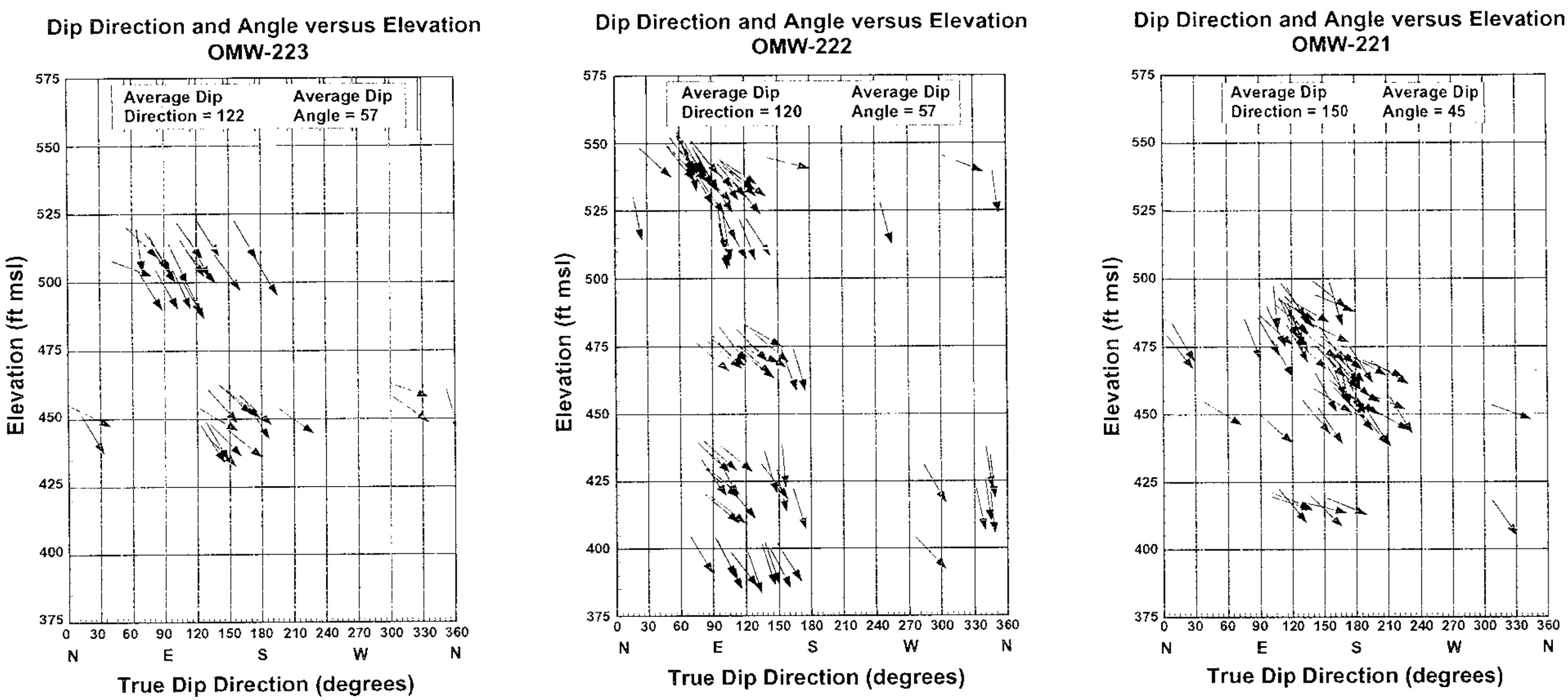

Figure 4.4. Dip direction and angle of bedrock features with depth as noted in OMW-221, 222 and 223.

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angle fractures were identified in the ATV logs. The dip directions indicate that the strike of the bedding planes primarily trends N 30 to 60° E with beds dipping in the range of 40 to 60°. Fractures in each of the wells show a more southerly dip direction trend in bedrock at an elevation of 450-475 ft msl. OMW-222 shows a more northerly dip direction trend at an elevation of 525-550 ft msl. Qualitatively, dip direction decreases and dip angle increases from OMW-221 to OMW-223 (east to west).

Packer test results indicate significant changes in bedrock permeability from east to west (Table 4.2). At OMW-221, average bedrock hydraulic conductivity is on the order of 0.5 ft/day, whereas OMW-222 and OMW-223 are 1 and 5 ft/day, respectively. The increase of hydraulic conductivity is likely due to more open fracturing at OMW-222 and 223 as noted in the ATV log.

4.1.2 GROUNDWATER LEVELS

Groundwater levels in OMW-221, 222, and 223 show trends similar to residential wells in the vicinity (Figure 4.5). Higher groundwater levels are noted on both the east and west side of the intersection of Central Nassau and Curtis Hill Road suggesting that groundwater flow converges toward this intersection. These levels also suggest groundwater discharge to Valley Stream and Smith Pond, which are at lower elevations than most of the water levels measured. OMW-221 which is near Valley Stream is a flowing artesian well. That is, the measured water level is actually above ground surface. Artesian conditions at this location suggest that groundwater flows upward from bedrock and discharges to Valley Stream.

4.1.3 GROUNDWATER SAMPLING

Two rounds of groundwater samples were collected one month apart from each of the new deep bedrock wells south of the site. These samples were analyzed for VOCs (EPA method 8010/8020), SVOCs (EPA method 8270-phenols only), and PCBs (EPA method 8080). No groundwater contaminants were detected in either sampling event.

Table 4.2 Hydraulic conductivity results from deep bedrock well packer tests.

Well	Test Date	Zone	Interval Elevation (ft msl)		Depth Interval (ft)		Hydraulic Conductivity (ft/day)	
			Top	Bottom	Top	Bottom	Bower and Rice (1976)	Cooper, Bredehoeft, Papadopulos (1967)
OMW220	11/11/96	1	446.8	405.5	188.7	230.0	0.05	0.06
	11/13/96	2	483.7	442.4	151.8	193.1	0.76	0.45
	11/12/96	3	524.4	483.1	111.1	152.4	0.07	0.20
	11/13/96	4	616.1	574.8	19.5	60.8	0.11	0.28
OMW221	1/10/97	1	454.8	411.0	137.2	181.0	0.26	0.24
	1/10/97	2	494.7	451.0	97.3	141.0	1.12	1.59
	1/10/97	3	537.1	493.4	54.9	98.6	0.55	0.53
OMW222	12/20/96	1	445.9	404.6	152.7	194.0	1.70	2.16
	12/20/96	2	488.3	447.0	110.3	151.6	1.02	1.16
	2/2/97	3	503.8	545.1	94.8	53.5	0.17	0.17
OMW223	1/7/97	1	463.4	419.6	130.5	174.3	6.09	8.20
	1/7/97	2	505.9	462.8	88.0	131.1	3.34	5.89
	1/7/97	3	548.4	504.6	45.5	89.3	4.31	4.31

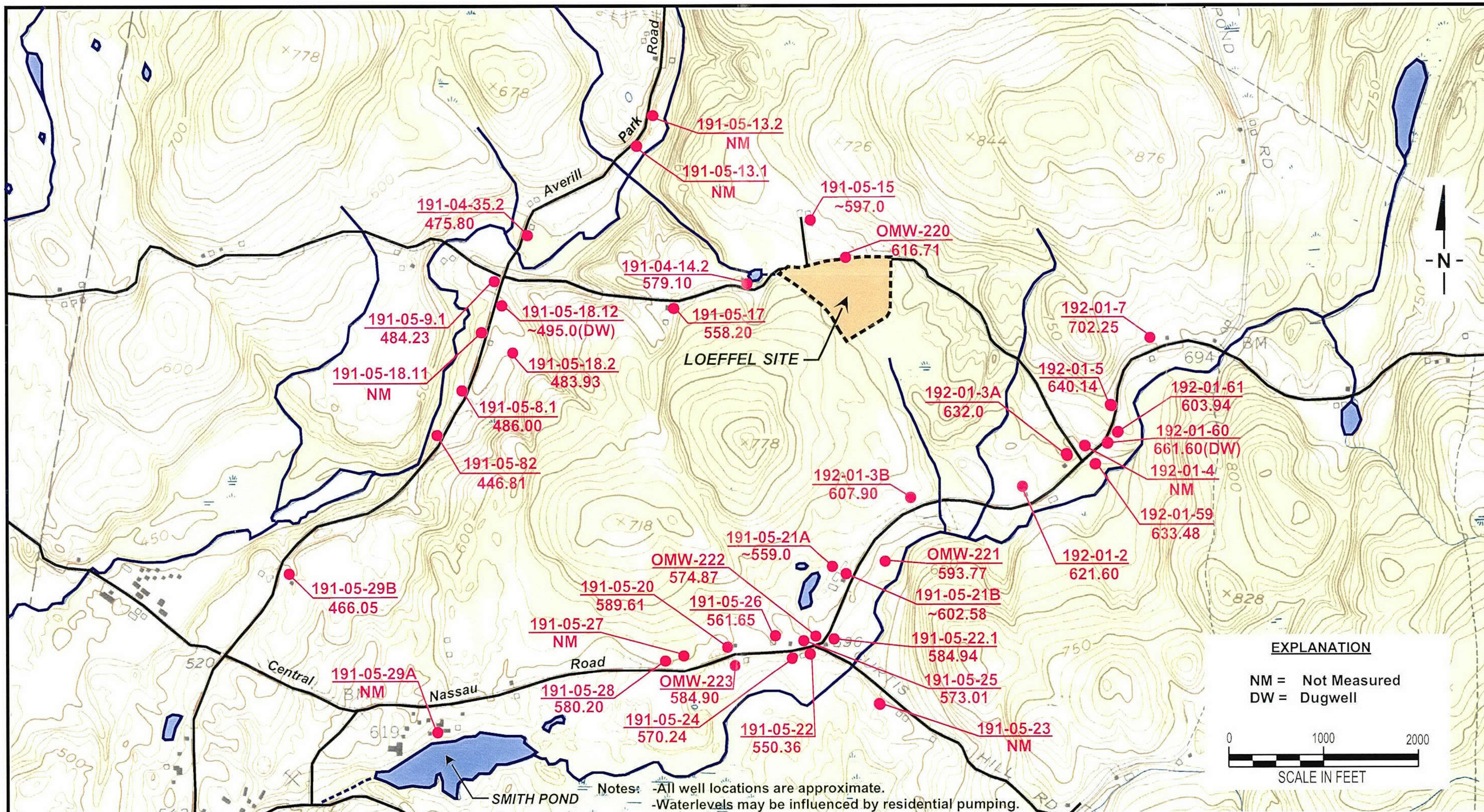

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Figure 4.5 Groundwater elevations in residential wells and OMW-221, 222, and 223, October 1996 and January 1997, respectively.

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The limit of VOCs detected in 191-05-21A, 191-05-21B, and 192-01-3B is likely between these residential wells and OMW-221 and OMW-222. Although VOCs have not been detected at OMW-221, 222, and 223, regular VOC sampling of OMW-221, 222, 223,, and residential wells in this vicinity is recommended.

4.2 DEEP BEDROCK WELL INSTALLATIONS NORTH OF THE SITE

Completion of OMW-220 included coring to a depth of 230 ft BGS, hydraulic packer testing, and completing a 4-inch well with a 40 foot open bedrock zone from 150.2 to 190.2 ft BGS. Bedrock cores indicated that the well had been located on a fold in the bedrock. Hydraulic conductivity at this location was low, in the range of 0.3 ft/day. Groundwater quality analyses, for VOCs, SVOCs, and PCBs only indicated the presence of toluene. This estimated concentration of toluene was 0.78 ug/L.

The water quality data from OMW-220 do not suggest a groundwater pathway from the Loeffel Landfill to residential well 191-05-15 through this location. Nearly all other bedrock wells north of the site have lower VOC concentrations than well 191-05-15 at this time. Groundwater quality at well 191-05-15 is monitored on a quarterly basis as part of the regular maintenance of the carbon treatment system on that well. Additional investigations are not recommended, however, well 191-05-15 should continue to be monitored regularly.

5 GROUNDWATER QUALITY

5.1 INTRODUCTION

On-site and off-site wells were sampled to evaluate groundwater quality trends and natural attenuation at the site. Evaluation of these trends provides for appropriate selection of remedial alternatives. A description of the sampling events and their results is provided.

5.2 SAMPLE ANALYSES AND PROTOCOLS

As proposed in the Phase II RI Work Plan, a selected set of wells were sampled using the protocols outlined in the FSP (Blasland and Bouck, 1992b) and QAPP (Blasland and Bouck, 1992c) during December 23-28, 1996 (Table 5.1). Sample analysis included VOCs (Method 8010/8020) and SVOCs (EPA Method 8270-phenols only). A subset of these wells were sampled for total iron and manganese (EPA Method 6010). In addition, OMW-209 was sampled for SVOCs (EPA Method 8270 full scan), primarily to check for bis (2-ethylhexyl) pthalate which was detected during the September 1995 sampling event.

For the purposes of natural attenuation monitoring, low flow sampling was also conducted at the selected set of wells (Table 5.1). Protocols for low-flow sampling were submitted to NYSDEC on December 12, 1996 with approval by December 21, 1996. Low-flow sampling occurred during two events, in the weeks of January 17 and February 17, 1996. Both laboratory and field analyses were performed. Analyses performed on low flow samples are listed in Table 5.2. Protocols and field forms for low flow sampling are presented in Appendix G.

The four newly installed bedrock wells OMW-220, 221, 222, and 223 were sampled for VOCs (EPA Method 8010/8020), SVOCs (EPA Method 8270-phenols only), and PCBs (EPA Method 8080). These new wells were sampled in two events, one month apart.

Table 5.1 Groundwater sampling conducted during the Phase II RI.

Well ID	Monitoring Zone	Original Protocols				Low Flow Sampling Parameters		
		Date	VOCs (8010/8020)	SVOCs (8070-phenols only)	PCBs (8080)	Date	Field Parameters	Laboratory Analysis
GMW-11	Overburden	12/26/96	▬	▬		1/21/97	▬	▬
GMW-2B	Overburden	12/27/96	▬	▬		Low Recharge Not Sampled		
OMW-101	Overburden	12/27/96	▬	▬		Low Recharge Not Sampled		
OMW-107	Overburden	12/24/96	▬	▬		1/16/97	▬	▬
OMW-211	Overburden	12/27/96	▬	▬		1/18/97	▬	▬
PW-1	Overburden	12/27/96	▬	▬		2/20/97	▬	▬
GMW-11A	Shallow Bedrock	12/24/96	▬	▬		1/21/97	▬	
GMW-1B	Shallow Bedrock	12/29/96	▬	▬		1/28/97	▬	
GMW-9B	Shallow Bedrock	12/27/96	▬	▬		1/23/97	▬	▬
OMW-102	Shallow Bedrock	12/29/96	▬	▬		Low Recharge Not Sampled		
OMW-103	Shallow Bedrock	12/28/96	▬	▬		1/23/97	▬	▬
OMW-108	Shallow Bedrock	12/29/96	▬	▬		1/13/97	▬	▬
OMW-201	Shallow Bedrock	12/29/96	▬	▬		1/22/97	▬	▬
OMW-202	Shallow Bedrock	12/28/96	▬	▬		1/15/97	▬	▬
OMW-204	Shallow Bedrock	12/29/96	▬	▬		2/20/97	▬	▬
OMW-205	Shallow Bedrock	12/27/96	▬	▬		1/22/97	▬	▬
OMW-206	Shallow Bedrock	12/29/96	▬	▬		1/15/97	▬	▬
OMW-209	Shallow Bedrock	12/28/96		▬				
OMW-212	Shallow Bedrock	12/29/96	▬	▬		Low Recharge Not Sampled		
OMW-213	Shallow Bedrock	12/29/96	▬	▬		1/21/97	▬	▬
OMW-214	Shallow Bedrock	12/28/96	▬	▬		1/20/97	▬	▬
PB-1	Shallow Bedrock	12/27/96	▬	▬		1/24/97	▬	
PB-2	Shallow Bedrock	12/29/96	▬	▬		1/24/97	▬	▬
191-05-15	Deep Bedrock	12/23/96	▬	▬		1/17/97	▬	▬
191-05-21A	Deep Bedrock	12/23/96	▬	▬		1/17/97	▬	▬
191-05-21B	Deep Bedrock	12/23/96	▬	▬		1/17/97	▬	
192-01-3B	Deep Bedrock	12/23/96	▬	▬		1/17/97	▬	

Table 5.1 Groundwater sampling conducted during the Phase II RI (continued).

Well ID	Monitoring Zone	Original Protocols				Low Flow Sampling Parameters		
		Date	VOCs (8010/8020)	SVOCs (8070-phenols only)	PCBs (8080)	Date	Field Parameters	Laboratory Analysis
OMW-215	Deep Bedrock	12/28/96	■	■		1/15/97	■	■
OMW-216	Deep Bedrock	12/28/96	■	■		1/20/97	■	■
OPZ-217	Deep Bedrock	12/28/96	■	■		2/19/97	■	■
OMW-218	Deep Bedrock	12/28/96	■	■		1/16/97	■	■
OMW-219	Deep Bedrock	12/28/96	■	■		1/21/97	■	■
OMW-220	Deep Bedrock	12/29/96	■	■	■	1/16/97	■	■
OMW-221	Deep Bedrock	1/14/97 2/17/97	■	■	■	2/20/97	■	■
OMW-222	Deep Bedrock	1/14/97 2/17/97	■	■	■	2/21/97	■	■
OMW-223	Deep Bedrock	1/14/97 2/17/97	■	■	■	2/21/97	■	■

Table 5.2 Analyses conducted on low-flow groundwater samples.

Parameter	Method	Comments
Field Parameters		
Total Ferrous Iron	Hach Kit 25130-25	
Total Manganese	Hach Kit 1467-00	
Dissolved Oxygen	EPA 360.1	Field probe with flow cell
pH	EPA 150.1	Field probe with flow cell
Redox potential (Eh)	SW 2580	Field probe with flow cell
Specific Conductivity	EPA 120.1	Field probe with flow cell
Temperature	EPA 170.1	Field probe with flow cell
Laboratory Analyses		
Alkalinity, as $CaCO_3$	EPA 310.1	
Dissolved Organic Carbon	EPA 415.1	
Ammonia-N	EPA 350.1	
Nitrate-N	EPA 353.1	
Nitrite-N	EPA 354.1	
Phosphate, Total-P	EPA 365.2	
Chloride	EPA 325.3	
Sulfate	EPA 375.4	
Sulfide	EPA 376.2	
Ethane	EPA 8015	
Ethene	EPA 8015	
Methane	EPA 8015	

Data validation was performed by C.C. Johnson and Malhotra (CCJM) following the data validation procedures in the QAPP (Blasland and Bouck, 1992cb). Results of groundwater quality analyses are provided in Appendix G.

5.4 RESULTS AND INTERPRETATION

Groundwater quality results and interpretation of the Phase II sampling events are presented in the following sections. Volatile and semi-volatile compound results are presented in sections describing the distribution of TVOCs (total volatile organic compounds) and SVOCs, respectively. This section is followed by a discussion of the evaluation of natural attenuation at the site. PCB concentrations in the newly installed bedrock wells were below detection limits and will not be discussed further.

5.4.1 DISTRIBUTION OF TOTAL VOCs (TVOCs)

The distribution of TVOCs based on the Phase II groundwater sampling events is presented in Plate 1 and in Table 5.3. In this plate, TVOC results based on the summation of those values above detection have been color coded to show the range of total volatiles across the site. Also wells shown on the plate are divided into overburden, shallow bedrock, and deep bedrock. The highest concentrations are within or immediately adjacent to the landfill. As in the previous groundwater sampling event, the highest TVOC concentration (147,900 ug/L) is in PB-2, a shallow bedrock well immediately outside the southeastern portion of the containment wall. TVOC concentrations in wells north of the landfill are generally lower than those south of the landfill. South of the landfill higher concentrations are primarily noted in shallow and deep bedrock wells with TVOC concentrations increasing with depth and decreasing with distance from the landfill.

TVOC detections were noted in residential wells within the Loeffel environs including wells 191-05-21A, 191-05-21B, and 192-01-3B south of the site and 191-05-15 north of the site. Volatiles, semi-volatiles and PCBs were not detected in the new deep bedrock RI wells OMW-221, 222, and 223 near the 191-05-21A, 191-05-21B and 192-01-3B

Table 5.3 VOC concentrations noted during Phase II groundwater sampling.

Well ID	191-05-15			191-05-21A			191-05-21B			192-01-3B			GMW-1B			GMW-2B			GMW-9B		
Date	12/23/96			12/23/96			12/23/96			12/23/96			12/29/96			12/27/96			12/27/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
1,1,1-Trichloroethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
1,1,2,2-Tetrachloroethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
1,1,2-Trichloroethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
1,2-Dichlorobenzene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
1,3-Dichlorobenzene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
1,4-Dichlorobenzene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
1,1-Dichloroethane	1.9		0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	12		5	0	UJ-C	0.5
1,1-Dichloroethene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	UJ-C	0.5
1,2-Dichloroethane	0.5		0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	UJ-C	0.5
1,2-Dichloropropane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
Benzene	15		0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	120	J-C	5	0	U	0.5
Bromodichloromethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
Bromoform	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
Bromomethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
Carbon tetrachloride	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
Chlorobenzene	15		0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
Chloroethane	0.68		0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
Chloroform	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
Chloromethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
cis-1,2-dichloroethene	1.1		0.5	0	U	1	0	U	1	1.1		1	0	U	0.5	0	U	5	0	U	0.5
cis-1,3-Dichloropropene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
Dibromochloromethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
Dichlorodifluoromethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
Ethylbenzene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	UJ-C	5	0	U	0.5
Freon-113	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	UJ-C	5	0	U	0.5
m/p-Xylene	0	U	1	0	U	2	0	U	2	0	U	2	0	U	1	0	UJ-C	10	0	U	1
Methyl tert-Butyl Ether	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	UJ-C	5	0	U	0.5
Methylene Chloride	0.71		0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
o-Xylene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	UJ-C	5	0	U	0.5
Styrene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	UJ-C	5	0	U	0.5
Tetrachloroethene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
Toluene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	UJ-C	5	0.75		0.5
trans-1,2-Dichloroethene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
trans-1,3-Dichloropropene	0	U	0.5	0	U	1	0	U	1	0	U	1	0	UJ-C	0.5	0	U	5	0	U	0.5
Trichloroethene	0	U	0.5	42		1	41		1	36		1	0	UJ-C	0.5	0	U	5	0	U	0.5
Trichlorofluoromethane	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5
Vinyl Chloride	0	U	0.5	0	U	1	0	U	1	0	U	1	0	U	0.5	0	U	5	0	U	0.5

Table 5.3 VOC concentrations noted during Phase II groundwater sampling.

Well ID	GMW-11			GMW-11A			OMW-101			OMW-102			OMW-103			OMW-107			OMW-108		
Date	12/26/96			12/24/96			12/27/96			12/29/96			12/28/96			12/24/96			12/29/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
1,1,1-Trichloroethane	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
1,1,2,2-Tetrachloroethane	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
1,1,2-Trichloroethane	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
1,2-Dichlorobenzene	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
1,3-Dichlorobenzene	0	U	1	4.3		0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
1,4-Dichlorobenzene	0	U	1	4	NJ	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
1,1-Dichloroethane	19		1	0	U	0.5	0	U	0.5	0	U	150	0	UJ-C	0.5	0	U	0.5	0	U	0.5
1,1-Dichloroethene	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	UJ-C	0.5	0	U	0.5	0	U	0.5
1,2-Dichloroethane	6.9		1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	UJ-C	0.5	0	U	0.5	0	UJ-C	0.5
1,2-Dichloropropane	1		1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Benzene	9.2	J-C	1	0	U	0.5	0	UJ-C	0.5	8000		150	0	U	0.5	0	U	0.5	0	U	0.5
Bromodichloromethane	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Bromoform	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Bromomethane	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Carbon tetrachloride	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Chlorobenzene	4.8		1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Chloroethane	2.5		1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Chloroform	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Chloromethane	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
cis-1,2-dichloroethene	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
cis-1,3-Dichloropropene	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Dibromochloromethane	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Dichlorodifluoromethane	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Ethylbenzene	28	J-C	1	0	U	0.5	0	UJ-C	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Freon-113	0	UJ-C	1	0	U	0.5	0	UJ-C	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
m/p-Xylene	11	J-C	2	0	U	1	0	UJ-C	1	0	U	300	0	U	1	0	U	1	0	U	1
Methyl tert-Butyl Ether	0	UJ-C	1	0	U	0.5	0	UJ-C	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Methylene Chloride	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
o-Xylene	10	J-C	1	0	U	0.5	0	UJ-C	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Styrene	0	UJ-C	1	0	U	0.5	0	UJ-C	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Tetrachloroethene	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Toluene	9.2	J-C	1	0	U	0.5	0	UJ-C	0.5	230		150	1.9		0.5	0	U	0.5	0.56		0.5
trans-1,2-Dichloroethene	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
trans-1,3-Dichloropropene	0	U	1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Trichloroethene	1.1		1	0	U	0.5	0	U	0.5	0	UJ-C	150	0	U	0.5	0	U	0.5	0	UJ-C	0.5
Trichlorofluoromethane	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5
Vinyl Chloride	0	U	1	0	U	0.5	0	U	0.5	0	U	150	0	U	0.5	0	U	0.5	0	U	0.5

Table 5.3 VOC concentrations noted during Phase II groundwater sampling.

Well ID	OMW-201			OMW-201 (diluted)			OMW-202			OMW-204			OMW-205			OMW-206			OMW-211		
Date	12/29/96			12/29/96			12/28/96			12/29/96			12/27/96			12/29/96			12/27/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
1,1,1-Trichloroethane	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
1,1,2,2-Tetrachloroethane	0	UJ-C	150	0	UJ-H	1500	0	UJ-C	0.5	0	UJ-C	1000	0	UJ-C	15	0	U	0.5	0	UJ-C	50
1,1,2-Trichloroethane	0	UJ-C	150	0	UJ-H	1500	0	UJ-C	0.5	0	UJ-C	1000	0	UJ-C	15	0	U	0.5	0	UJ-C	50
1,2-Dichlorobenzene	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
1,3-Dichlorobenzene	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
1,4-Dichlorobenzene	0	UJ-C	150	0	UJ-H	1500	0	UJ-C	0.5	0	UJ-C	1000	0	UJ-C	15	0	U	0.5	0	UJ-C	50
1,1-Dichloroethane	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
1,1-Dichloroethene	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	UJ-C	0.5	0	U	50
1,2-Dichloroethane	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	2100	J-C	1000	0	U	15	0	UJ-C	0.5	240	J-C	50
1,2-Dichloropropane	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	UJ-C	0.5	0	UJ-C	50
Benzene	44000	J-C	150	43000	J-H	1500	6.5		0.5	39000		1000	67		15	0	U	0.5	3500		50
Bromodichloromethane	0	UJ-C	150	0	UJ-HC	1500	0	UJ-C	0.5	0	UJ-C	1000	0	UJ-C	15	0	U	0.5	0	UJ-C	50
Bromoform	0	U	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	U	50
Bromomethane	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Carbon tetrachloride	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
Chlorobenzene	3000	J-C	150	0	UJ-H	1500	0	UJ-C	0.5	2600	J-C	1000	360	J-C	15	0	U	0.5	530	J-C	50
Chloroethane	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Chloroform	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	410		50
Chloromethane	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
cis-1,2-dichloroethene	0	U	150	0	UJ-H	1500	0.5		0.5	12000		1000	70		15	0	U	0.5	1600		50
cis-1,3-Dichloropropene	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Dibromochloromethane	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
Dichlorodifluoromethane	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Ethylbenzene	280		150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Freon-113	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
m/p-Xylene	810		300	0	UJ-H	3000	0	U	1	0	U	2000	0	U	30	0	U	1	0	U	100
Methyl tert-Butyl Ether	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Methylene Chloride	0	U	150	0	UJ-H	1500	0	U	0.5	4000		1000	0	U	15	0	U	0.5	490		50
o-Xylene	260		150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Styrene	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
Tetrachloroethene	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
Toluene	31000	J-C	150	30000	J-H	1500	1.1		0.5	12000		1000	0	U	15	0.58		0.5	0	U	50
trans-1,2-Dichloroethene	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50
trans-1,3-Dichloropropene	0	UJ-C	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
Trichloroethene	0	UJ-C	150	0	UJ-H	1500	0.9		0.5	0	UJ-C	1000	0	U	15	0	U	0.5	370	J-C	50
Trichlorofluoromethane	0	U	150	0	UJ-H	1500	0	U	0.5	0	UJ-C	1000	0	U	15	0	U	0.5	0	UJ-C	50
Vinyl Chloride	0	U	150	0	UJ-H	1500	0	U	0.5	0	U	1000	0	U	15	0	U	0.5	0	U	50

Table 5.3 VOC concentrations noted during Phase II groundwater sampling.

Well ID	OMW-212			OMW-213			OMW-214			OMW-215			OMW-216			OMW-218			OMW-219		
Date	12/29/96			12/29/96			12/28/96			12/28/96			12/28/96			12/28/96			12/28/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
1,1,1-Trichloroethane	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
1,1,2,2-Tetrachloroethane	0	U	0.5	0	UJ-C	5	0	UJ-C	0.5	0	UJ-C	10	0	UJ-C	0.5	0	U	0.5	0	UJ-C	100
1,1,2-Trichloroethane	0	U	0.5	0	UJ-C	5	0	UJ-C	0.5	0	UJ-C	10	0	UJ-C	0.5	0	U	0.5	0	UJ-C	100
1,2-Dichlorobenzene	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
1,3-Dichlorobenzene	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
1,4-Dichlorobenzene	0	U	0.5	0	UJ-C	5	0	UJ-C	0.5	0	UJ-C	10	0	UJ-C	0.5	0	U	0.5	0	UJ-C	100
1,1-Dichloroethane	0	UJ-C	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	UJ-C	0.5	0	U	100
1,1-Dichloroethene	0	UJ-C	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	UJ-C	0.5	0	U	100
1,2-Dichloroethane	0	UJ-C	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	UJ-C	0.5	0	U	100
1,2-Dichloropropane	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Benzene	0	U	0.5	140		5	11		0.5	360		10	14		0.5	0	U	0.5	3200		100
Bromodichloromethane	0	U	0.5	0	UJ-C	5	0	UJ-C	0.5	0	UJ-C	10	0	UJ-C	0.5	0	U	0.5	0	UJ-C	100
Bromoform	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Bromomethane	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Carbon tetrachloride	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Chlorobenzene	0	U	0.5	12	J-C	5	1.4	J-C	0.5	0	UJ-C	10	5.2	J-C	0.5	0	U	0.5	0	UJ-C	100
Chloroethane	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Chloroform	0	U	0.5	24		5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Chloromethane	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
cis-1,2-dichloroethene	0	U	0.5	18		5	1.3		0.5	0	U	10	3.9		0.5	0	U	0.5	0	U	100
cis-1,3-Dichloropropene	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Dibromochloromethane	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Dichlorodifluoromethane	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Ethylbenzene	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Freon-113	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
m/p-Xylene	0	U	1	0	U	10	0	U	1	0	U	20	0	U	1	0	U	1	0	U	200
Methyl tert-Butyl Ether	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Methylene Chloride	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
o-Xylene	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Styrene	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Tetrachloroethene	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Toluene	0.88		0.5	0	U	5	10		0.5	30		10	0.84		0.5	0.63		0.5	2900		100
trans-1,2-Dichloroethene	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
trans-1,3-Dichloropropene	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Trichloroethene	0	U	0.5	67		5	0	UJ-C	0.5	0	U	10	2.5		0.5	0	U	0.5	0	U	100
Trichlorofluoromethane	0	U	0.5	0	U	5	0	UJ-C	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100
Vinyl Chloride	0	U	0.5	0	U	5	0	U	0.5	0	U	10	0	U	0.5	0	U	0.5	0	U	100

Table 5.3 VOC concentrations noted during Phase II groundwater sampling.

Well ID	OMW-220			OMW-221			OMW-221			OMW-222			OMW-222			OMW-223			OMW-223		
Date	12/29/96			1/14/97			2/18/97			1/14/97			2/18/97			1/14/97			2/18/97		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
1,1,1-Trichloroethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,1,2,2-Tetrachloroethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,1,2-Trichloroethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,2-Dichlorobenzene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,3-Dichlorobenzene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,4-Dichlorobenzene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,1-Dichloroethane	0	UJ-C	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,1-Dichloroethene	0	UJ-C	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,2-Dichloroethane	0	UJ-C	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
1,2-Dichloropropane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Benzene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Bromodichloromethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Bromoform	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Bromomethane	0	U	0.5	0	U	0.5	0	UJ-C	0.5	0	U	0.5	0	UJ-C	0.5	0	U	0.5	0	UJ-C	0.5
Carbon tetrachloride	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Chlorobenzene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Chloroethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Chloroform	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Chloromethane	0	U	0.5	0	U	0.5	0	UJ-C	0.5	0	U	0.5	0	UJ-C	0.5	0	U	0.5	0	UJ-C	0.5
cis-1,2-dichloroethene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
cis-1,3-Dichloropropene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Dibromochloromethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Dichlorodifluoromethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Ethylbenzene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Freon-113	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
m/p-Xylene	0	U	1	0	U	1	0	U	1	0	U	1	0	U	1	0	U	1	0	U	1
Methyl tert-Butyl Ether	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Methylene Chloride	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
o-Xylene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Styrene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Tetrachloroethene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Toluene	0.78		0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
trans-1,2-Dichloroethene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
trans-1,3-Dichloropropene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Trichloroethene	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Trichlorofluoromethane	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5
Vinyl Chloride	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5	0	U	0.5

Table 5.3 VOC concentrations noted during Phase II groundwater sampling.

Well ID	OPZ-217			PB-1			PB-2			PW-1		
Date	12/28/96			12/27/96			12/29/96			12/27/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
1,1,1-Trichloroethane	0	U	0.5	0	U	250	0	U	1500	0	U	500
1,1,2,2-Tetrachloroethane	0	U	0.5	0	U	250	0	UJ-C	1500	0	U	500
1,1,2-Trichloroethane	0	U	0.5	0	U	250	0	UJ-C	1500	0	U	500
1,2-Dichlorobenzene	0	U	0.5	0	U	250	0	U	1500	0	U	500
1,3-Dichlorobenzene	0	U	0.5	0	U	250	0	U	1500	0	U	500
1,4-Dichlorobenzene	0	U	0.5	0	U	250	0	UJ-C	1500	0	U	500
1,1-Dichloroethane	0	UJ-C	0.5	0	U	250	0	U	1500	0	U	500
1,1-Dichloroethene	0	UJ-C	0.5	0	U	250	0	U	1500	0	U	500
1,2-Dichloroethane	0	UJ-C	0.5	0	U	250	2500		1500	0	U	500
1,2-Dichloropropane	0	U	0.5	0	U	250	0	U	1500	0	U	500
Benzene	0	U	0.5	18000		250	52000		1500	26000		500
Bromodichloromethane	0	U	0.5	0	U	250	0	UJ-C	1500	0	U	500
Bromoform	0	U	0.5	0	U	250	0	U	1500	0	U	500
Bromomethane	0	U	0.5	0	U	250	0	U	1500	0	U	500
Carbon tetrachloride	0	U	0.5	0	U	250	0	U	1500	0	U	500
Chlorobenzene	0	U	0.5	0	U	250	8600	J-C	1500	0	U	500
Chloroethane	0	U	0.5	0	U	250	0	U	1500	0	U	500
Chloroform	0	U	0.5	0	U	250	0	U	1500	0	U	500
Chloromethane	0	U	0.5	0	U	250	0	U	1500	0	U	500
cis-1,2-dichloroethene	0	U	0.5	0	U	250	22000		1500	0	U	500
cis-1,3-Dichloropropene	0	U	0.5	0	U	250	0	U	1500	0	U	500
Dibromochloromethane	0	U	0.5	0	U	250	0	U	1500	0	U	500
Dichlorodifluoromethane	0	U	0.5	0	U	250	0	U	1500	0	U	500
Ethylbenzene	0	U	0.5	0	U	250	0	U	1500	0	U	500
Freon-113	0	U	0.5	0	U	250	0	U	1500	0	U	500
m/p-Xylene	0	U	1	0	U	500	0	U	3000	0	U	1000
Methyl tert-Butyl Ether	0	U	0.5	0	U	250	0	U	1500	500		500
Methylene Chloride	0	U	0.5	0	U	250	6800		1500	0	U	500
o-Xylene	0	U	0.5	0	U	250	0	U	1500	0	U	500
Styrene	0	U	0.5	0	U	250	0	U	1500	0	U	500
Tetrachloroethene	0	U	0.5	0	U	250	0	U	1500	0	U	500
Toluene	0.9		0.5	6200		250	56000		1500	3500		500
trans-1,2-Dichloroethene	0	U	0.5	0	U	250	0	U	1500	0	U	500
trans-1,3-Dichloropropene	0	U	0.5	0	U	250	0	U	1500	0	U	500
Trichloroethene	0	U	0.5	0	U	250	0	U	1500	0	U	500
Trichlorofluoromethane	0	U	0.5	0	U	250	0	U	1500	0	U	500
Vinyl Chloride	0	U	0.5	0	U	250	0	U	1500	0	U	500

residential wells south of the site, nor have VOCs been detected in wells in other residential wells further from the site. This suggests that the limit of the areal extent of VOC concentrations above detection south of the landfill has been determined.

A discussion of the components of the TVOC concentration is included in the section of this report which describes an evaluation of natural attenuation.

5.4.2 DISTRIBUTION OF SVOCS

Groundwater sampled in the Phase II RI sampling events were analyzed for phenols and are presented in Table 5.4 and Plate 2. The results showed very little change in concentration from the last groundwater sampling event except for PW-1, which showed an increase in 2-4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol, and Phenol (Table 5.4). The distribution of SVOCs based on Phase I and Phase II sampling indicate that highest concentrations are in the southern portion of the landfill and immediately outside of the southern wall of the landfill. SVOC concentrations increase with depth in those well clusters where SVOCs have been noted.

In OMW-209, no bis (2-ethyl hexyl) pthalates were detected. It is very likely that the bis (2-ethyl hexyl) pthalates detected in the September 1995 samples at OMW-209 were due to the presence of this common plasticizer in groundwater sampling equipment.

5.4.3 DISTRIBUTION OF IRON AND MANGANESE

High total iron and manganese concentrations were noted in unfiltered samples taken during the pilot pumping test. These high levels are an important consideration for selection of appropriate groundwater treatment alternatives. Field analysis of wells sampled during low flow sampling events also showed higher ferrous iron and manganese concentrations within the landfill (Table 5.5).

5.4.4 NATURAL ATTENUATION PARAMETER RESULTS

The results of natural attenuation sampling are presented in Appendix G. The presence of TCE and Benzene daughter products indicate that natural attenuation is

Table 5.4. S . . C concentrations noted during Phase II groundwater sampling.

Well Id	191-05-15			191-05-21A			191-05-21B			192-01-3B			GMW-11			GMW-11A		
Date	12/23/96			12/23/96			12/23/96			12/23/96			12/26/96			12/24/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2-Chlorophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
4-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2-Nitrophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4-Dimethylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4-Dichlorophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
4-Chloro-3-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4,6-Trichlorophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4,5-Trichlorophenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	26	0	U	25
2,4-Dinitrophenol	0	U	25	0	UJ-C	25	0	U	25	0	U	25	0	U	26	0	U	25
4-Nitrophenol	0	U	25	0	UJ-C	25	0	U	25	0	U	25	0	U	26	0	U	25
4,6-Dinitro-2-methylphenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	26	0	U	25
Pentachlorophenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	26	0	U	25

Well Id	GMW-1B			GMW-2B			GMW-9B			OMW-101			OMW-102			OMW-103		
Date	12/29/96			12/27/96			12/27/96			12/27/96			12/29/96			12/28/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	0	U	10	29		14	0	U	10	0	U	10	5.8	J	10	0	U	10
2-Chlorophenol	0	U	10	0.64	J	14	0	U	10	0	U	10	0	U	10	0	U	10
2-Methylphenol	0	U	10	0	U	14	0	U	10	0	U	10	2.3	J	10	0	U	10
4-Methylphenol	0	U	10	0	U	14	0	U	10	0	U	10	1.8	J	10	0	U	10
2-Nitrophenol	0	U	10	0	U	14	0	U	10	0	U	10	0	U	10	0	U	10
2,4-Dimethylphenol	0	U	10	0	U	14	0	U	10	0	U	10	9.4	J	10	0	U	10
2,4-Dichlorophenol	0	U	10	0	U	14	0	U	10	0	U	10	0	U	10	0	U	10
4-Chloro-3-Methylphenol	0	U	10	0	U	14	0	U	10	0	U	10	0	U	10	0	U	10
2,4,6-Trichlorophenol	0	U	10	0	U	14	0	U	10	0	U	10	0	U	10	0	U	10
2,4,5-Trichlorophenol	0	U	25	0	U	34	0	U	25	0	U	25	0	U	25	0	U	25
2,4-Dinitrophenol	0	UJ-C	25	0	UJ-C	34	0	UJ-C	25	0	U	25	0	UJ-C	25	0	UJ-C	25
4-Nitrophenol	0	U	25	0	UJ-C	34	0	U	25	0	U	25	0	U	25	0	U	25
4,6-Dinitro-2-methylphenol	0	U	25	0	U	34	0	U	25	0	U	25	0	U	25	0	U	25
Pentachlorophenol	0	U	25	0	U	34	0	U	25	0	U	25	0	U	25	0	U	25

Well Id	OMW-107			OMW-108			OMW-201			OMW-202			OMW-204			OMW-205		
Date	12/24/96			12/29/96			12/29/96			12/28/96			12/29/96			12/27/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	0	U	10	0	U	10	26	J	330	0	U	10	1300		250	0	U	10
2-Chlorophenol	0	U	10	0	U	10	0	U	330	0	U	10	51	J	250	0	U	10
2-Methylphenol	0	U	10	0	U	10	160	J	330	0	U	10	340		250	0	U	10
4-Methylphenol	0	U	10	0	U	10	2300		330	0	U	10	1000		250	1.2	J	10
2-Nitrophenol	0	U	10	0	U	10	0	U	330	0	U	10	0	U	250	0	U	10
2,4-Dimethylphenol	0	U	10	0	U	10	220	J	330	0	U	10	85	J	250	1.2	J	10
2,4-Dichlorophenol	0	U	10	0	U	10	0	U	330	0	U	10	0	U	250	0	U	10
4-Chloro-3-Methylphenol	0	U	10	0	U	10	0	U	330	0	U	10	0	U	250	0	U	10
2,4,6-Trichlorophenol	0	U	10	0	U	10	0	U	330	0	U	10	0	U	250	0	U	10
2,4,5-Trichlorophenol	0	U	25	0	U	25	0	UJ-C	830	0	U	25	0	U	620	0	U	25
2,4-Dinitrophenol	0	U	25	0	U	25	0	U	830	0	UJ-C	25	0	U	620	0	UJ-C	25
4-Nitrophenol	0	U	25	0	U	25	0	U	830	0	U	25	0	U	620	0	U	25
4,6-Dinitro-2-methylphenol	0	U	25	0	U	25	0	U	830	0	U	25	0	U	620	0	U	25
Pentachlorophenol	0	U	25	0	U	25	0	U	830	0	U	25	0	U	620	0	U	25

Table 5-4 [illegible] concentrations noted during Phase II groundwater sampling

Well Id	OMW-206			OMW-211			OMW-212			OMW-213			OMW-214			OMW-215		
Date	12/29/96			12/27/96			12/29/96			12/29/96			12/28/96			12/28/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	0	U	10	6.8	J	10	0	U	10	1.8	J	10	0.98	J	10	1.3	J	10
2-Chlorophenol	0	U	10	1.8	J	10	0	U	10	0	U	10	0	U	10	0	U	10
2-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	1.4	J	10
4-Methylphenol	0	U	10	6.5	J	10	0	U	10	0	U	10	0	U	10	15		10
2-Nitrophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4-Dimethylphenol	0	U	10	6.3	J	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4-Dichlorophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
4-Chloro-3-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4,6-Trichlorophenol	0	U	25	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10
2,4,5-Trichlorophenol	0	UJ-C	25	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25
2,4-Dinitrophenol	0	U	25	0	UJ-C	25	0	UJ-C	25	0	UJ-C	25	0	UJ-C	25	0	UJ-C	25
4-Nitrophenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25
4,6-Dinitro-2-methylphenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25
Pentachlorophenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25

Well Id	OMW-216			OMW-218			OMW-219			OMW-220			OMW-221			OMW-221		
Date	12/28/96			12/28/96			12/28/96			12/29/96			1/14/97			2/18/97		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	0	U	10	0	U	10	1.9	J	40	0	U	10	0	U	10	0	U	10
2-Chlorophenol	0	U	10	0	U	10	0	U	40	0	U	10	0	U	10	0	U	10
2-Methylphenol	0	U	10	0	U	10	8.6	J	40	0	U	10	0	U	10	0	U	10
4-Methylphenol	0	U	10	0	U	10	200		40	0	U	10	0	U	10	0	U	10
2-Nitrophenol	0	U	10	0	U	10	0	U	40	0	U	10	0	U	10	0	U	10
2,4-Dimethylphenol	0	U	10	0	U	10	11	J	40	0	U	10	0	U	10	0	U	10
2,4-Dichlorophenol	0	U	10	0	U	10	0	U	40	0	U	10	0	U	10	0	U	10
4-Chloro-3-Methylphenol	0	U	10	0	U	10	0	U	40	0	U	10	0	U	10	0	U	10
2,4,6-Trichlorophenol	0	U	10	0	U	10	0	U	40	0	U	10	0	U	10	0	U	10
2,4,5-Trichlorophenol	0	U	25	0	U	25	0	U	100	0	U	25	0	U	25	0	U	25
2,4-Dinitrophenol	0	UJ-C	25	0	UJ-C	25	0	U	100	0	UJ-C	25	0	U	25	0	U	25
4-Nitrophenol	0	U	25	0	U	25	0	U	100	0	U	25	0	UJ-C	25	0	U	25
4,6-Dinitro-2-methylphenol	0	U	25	0	U	25	0	U	100	0	U	25	0	U	25	0	U	25
Pentachlorophenol	0	U	25	0	U	25	0	U	100	0	U	25	0	U	25	0	U	25

Well Id	OMW-222			OMW-222			OMW-223			OMW-223			OPZ-217			PB-1		
Date	1/14/97			2/18/97			1/14/97			2/18/97			12/28/96			12/27/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	69	J	190
2-Chlorophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	190
2-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	120	J	190
4-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	1400		190
2-Nitrophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	190
2,4-Dimethylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	92	J	190
2,4-Dichlorophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	190
4-Chloro-3-Methylphenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	190
2,4,6-Trichlorophenol	0	U	10	0	U	10	0	U	10	0	U	10	0	U	10	0	U	190
2,4,5-Trichlorophenol	0	U	25	0	U	25	0	U	25	0	U	25	0	UJ-C	25	0	U	490
2,4-Dinitrophenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25	0	UJ-C	490
4-Nitrophenol	0	UJ-C	25	0	U	25	0	UJ-C	25	0	U	25	0	U	25	0	UJ-C	490
4,6-Dinitro-2-methylphenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25	0	U	490
Pentachlorophenol	0	U	25	0	U	25	0	U	25	0	U	25	0	U	25	0	U	490

Table 5.4 SVOC concentrations noted during Phase II groundwater sampling

Well Id	PB-2			PW-1		
Date	12/29/96			12/27/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	1300		500	7.2	J	62
2-Chlorophenol	41	J	500	0	U	62
2-Methylphenol	390	J	500	82		62
4-Methylphenol	3500		500	420		62
2-Nitrophenol	0	U	500	0	U	62
2,4-Dimethylphenol	440	J	500	19	J	62
2,4 Dichlorophenol	0	U	500	0	U	62
4 Chloro-3 Methylphenol	0	U	500	0	U	62
2,4,6-Trichlorophenol	0	U	500	0	U	62
2,4,5-Trichlorophenol	0	U	1200	0	U	160
2,4-Dinitrophenol	0	U	1200	0	UJ-C	160
4-Nitrophenol	0	U	1200	0	UJ-C	160
4,6-Dinitro-2-methylphenol	0	U	1200	0	U	160
Pentachlorophenol	0	U	1200	0	U	160

Table 5.4 SVOC concentrations noted during Phase II groundwater sampling (continued).

Well Id	OMW-209			OMW-209 (Duplicate)		
Date	12/28/96			12/28/96		
Parameter	Value	Qualifier	Det. Limit	Value	Qualifier	Det. Limit
Phenol	0	R-S	10	0	U	10
bis(2-Chloroethyl)Ether	0	U	10	0	U	10
2-Chlorophenol	0	R-S	10	0	U	10
1,3-Dichlorobenzene	0	U	10	0	U	10
1,4-Dichlorobenzene	0	U	10	0	U	10
1,2-Dichlorobenzene	0	U	10	0	U	10
2,2'-oxybis(1-Chloropropane)	0	U	10	0	U	10
2-Methylphenol	0	R-S	10	0	U	10
N-Nitroso-di-n-propylamine	0	U	10	0	U	10
Hexachloroethane	0	U	10	0	U	10
4-Methylphenol	0	R-S	10	0	U	10
Nitrobenzene	0	U	10	0	U	10
Isophorone	0	U	10	0	U	10
2-Nitrophenol	0	R-S	10	0	U	10
2,4-Dimethylphenol	0	R-S	10	0	U	10
Bis(2-chloroethoxy)-methane	0	U	10	0	U	10
2,4-Dichlorophenol	0	R-S	10	0	U	10
1,2,4-Trichlorobenzene	0	U	10	0	U	10
Naphthalene	0	U	10	0	U	10
4-Chloroaniline	0	U	10	0	U	10
Hexachlorobutadiene	0	U	10	0	U	10
4-Chloro-3-Methylphenol	0	R-S	10	0	U	10
2-Methylnaphthalene	0	U	10	0	U	10
Hexachlorocyclopentadiene	0	UJ-C	10	0	U	10
2,4,6-Trichlorophenol	0	R-S	10	0	U	10
2,4,5-Trichlorophenol	0	R-S	25	0	U	25
2-Chloronaphthalene	0	U	10	0	U	10
2-Nitroaniline	0	U	25	0	U	25
Dimethylphthalate	0	U	10	0	U	10
Acenaphthylene	0	U	10	0	U	10
2,6-Dinitrotoluene	0	U	10	0	U	10
Acenaphthene	0	U	10	0	U	10
3-Nitroaniline	0	U	25	0	U	25
2,4-Dinitrophenol	0	R-S	25	0	UJ-C	25
Dibenzofuran	0	U	10	0	U	10
2,4-Dinitrotoluene	0	U	10	0	U	10
4-Nitrophenol	0	R-S	25	0	U	25
Diethylphthalate	0	U	10	0	U	10
Fluorene	0	U	10	0	U	10
4-Chlorophenyl-phenylether	0	U	10	0	U	10
4-Nitroaniline	0	U	25	0	U	25
N-nitrosodiphenylamine	0	U	10	0	U	10
4,6-Dinitro-2-methylphenol	0	R-S	25	0	U	25
4-Bromophenyl-phenylether	0	U	10	0	U	10
Hexachlorobenzene	0	U	10	0	U	10
Pentachlorophenol	0	R-S	25	0	U	25
Phenanthrene	0	U	10	0	U	10
Anthracene	0	U	10	0	U	10
Carbazole	0	U	10	0	U	10
Di-n-butylphthalate	0	U	10	0	U	10
Fluoranthene	0	U	10	0	U	10
Pyrene	0	U	10	0	U	10
Butylbenzylphthalate	0	U	10	0	U	10
Benzo(a)anthracene	0	U	10	0	U	10
3,3'-Dichlorobenzidine	0	U	10	0	U	10
Chrysene	0	U	10	0	U	10
bis(2-Ethylhexyl)phthalate	0	U	10	0	U	10
Di-n-octylphthalate	0	U	10	0	U	10
Benzo(b)fluoranthene	0	U	10	0	U	10
Benzo(k)fluoranthene	0	U	10	0	UJ-C	10
Benzo(a)pyrene	0	U	10	0	U	10
Indeno(1,2,3-cd)pyrene	0	U	10	0	U	10
Dibenz(a,h)anthracene	0	U	10	0	U	10
Benzo(g,h,i)perylene	0	U	10	0	U	10

Table 5.5 Concentration of Iron and Manganese in Groundwater.

	Field Analysis				Lab Analysis				
Well ID	Sampling Date	Ferrous Iron (mg/L)	Manganese (mg/L)	Filtered	Sampling Date	Ferrous Iron (mg/L)	Manganese (mg/L)	Filtered	Comments
Low Flow Sampling (Jan/Feb 1997)									
191-05-15	1/17/97	0.2	0.1	Y					
191-05-21A	1/17/97	ND	ND	Y					
191-05-21B	1/17/97	ND	ND	Y					
191-05-3B	1/17/97	ND	ND	Y					
GMW-11	1/21/97	ND	0.6	Y					
GMW-11A	1/21/97	3	>3	Y					
GMW-9B	1/23/97	ND	ND	Y					
OMW-103	1/23/97	ND	ND	Y					
OMW-107	1/16/97	1.1	2.3	Y					
OMW-201	1/22/97	4.6	1.05	Y					
OMW-202	1/15/97	0.1	0.3	Y					
OMW-204	2/20/97	ND	ND	Y	12/29/96	ND	0.001109	N	
OMW-205	1/22/97	ND	0.3	Y					
OMW-206	1/15/97	ND	ND	Y					
OMW-211	1/18/97	ND	ND	Y	12/27/96	0.1121	1.251	N	
OMW-213	1/21/97	ND	0.3	Y					
OMW-214	1/20/97	ND	ND	Y					
OMW-215	1/15/97	ND	ND	Y					
OMW-216	1/20/97	ND	ND	Y					
OPZ-217	2/19/97	0.1	0.3	Y					
OMW-218	1/16/97	ND	ND	Y					
OMW-219	1/21/97	ND	ND	Y					
OMW-220	1/16/97	ND	ND	Y					
OMW-221	2/20/97	ND	ND	Y					
OMW-222	2/21/97	ND	ND	Y					
OMW-223	2/21/97	ND	ND	Y					
PB-1	1/24/97	0.6	1.4	Y					
PB-2	1/12/97	9	1.8	Y	12/29/96	9.37	15.41	N	
PW-1	2/20/97	0.3	2.5	Y					
Other Sampling Events									
Leachate					5/1/96	23	18	N	Leachate Cleanout
PW-4					11/18/96	69.8	78.6	N	Early pilot pumping test
PW-4					11/21/96	51.3	81.9	N	Late pilot pumping test

ND = Not Detected.

occurring. A detailed analysis of natural attenuation well be presented in the Loeffel Feasibility Study.

6 SUMMARY AND CONCLUSIONS

VOC and SVOC contamination from the Loeffel Landfill is impacting groundwater quality within the Loeffel Environs. Source control remedial alternatives are required to prevent further migration of leachate and impacted groundwater from the vicinity of the landfill. Groundwater level monitoring within the landfill during leachate extraction suggests that NYSDEC's current rate of leachate removal from the landfill, 240,000 gallons/year is inadequate. Additional extraction of leachate from the landfill will likely reduce the potential for leachate migration by reducing hydraulic gradients from the landfill across the containment wall and into the underlying bedrock. In addition to more frequent pumping from the existing leachate collection system, other source control activities including groundwater extraction may be required. All treatment alternatives will have to consider high iron and manganese concentrations detected within the landfill.

Subsequent to implementation of the source control remedy, remedial alternatives for groundwater downgradient and outside the influence of source control measures may be needed. These alternatives may include pumping of groundwater in selected areas of elevated VOC concentrations; or natural attenuation based on effective source control. Natural attenuation effects including dispersion, dilution, and intrinsic biodegradation are currently occurring at the site and will reduce groundwater concentrations. The effect of source control on this mechanism needs to be evaluated before selecting an off-site remedy.

The Phase II investigation indicates that VOCs have not been detected in areas believed to be downgradient of residential wells 191-05-21A, 191-05-21B, and 192-01-3B. Groundwater quality will be monitored on a regular basis at OMW-221, OMW-222, and OMW-223 and residential wells near the intersection of Central Nassau and Curtis Hill Roads.

To the north of the site, groundwater quality and hydraulic testing at OMW-220 do not suggest that a groundwater pathway from the Loeffel Landfill to residential well 191-05-15 through this well location. As the residential well, 191-05-15, is currently on a carbon treatment system, and is sampled on a quarterly basis, further investigations are not recommended at this time.

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APPENDIX A

APPENDIX A

Calendar of Field Events

Landfill Field Activities

October

1996 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14 Mobilize on site. Install PO-2	15 Install PO-3, PO-4	16 Drilling PW-4	17 Install PW-4, Develop PO-2, PO-4	18 Perform Step Pumping Test on PW-4	19
20	21 Sample PO-4, Develop PO-2, PO-3	22 Install Pressure Transducers in PO-2, PO-3, PO-4	23 Install Pressure Transducer in Cleanout. Start Logging	24	25	26
27	28 Download Pressure Transducer Data, 5000 gallons of fluid removed from leachate	29	30 5000 gallons of fluid removed from leachate collection system by NYSDEC	31 5000 gallons of fluid removed from leachate collection system by NYSDEC		

Landfill Field Activities

November

1996 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8 Install Geoprobe piezometers PO-5, PO-6, Complete boring SDN006-5S for BBL	9
10	11 Install Pressure Transducers in PO-5, PO-6.	12 5000 gallons of fluid removed from leachate collection system by NYSDEC	13	14	15 Set up Pressure Transducers for 72-hour pumping test	16
17	18 Start 72-hour pumping test at PW-4	19 72-hour pumping test continues	20 72-hour pumping test continues	21 72-hour pumping test ends . Recovery monitored	22 Pumping test recovery monitored, site cleanup and decon.	23
24	25	26	27	28	29	30

Bedrock Well Investigations

October

1996 | 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16 Begin Air Rotary Drilling. Overburden at OMW-220. Drilled to 25 feet hole collapsed due to	17 Set 12-inch temporary casing in overburden to 15 ft. Drilled to 30 ft BGS, hole collapsed due to	18 Abandoned original location of OMW-220. Relocated well 10 feet to the west.	19
20	21 Initiated Mud Rotary drilling at OMW-220 Drilled to 31 ft BGS Residential Well Survey	22 Equipment difficulties at OMW-220 drilling operation. Residential Well Survey	23 Mud rotary drilling continues to 45 ft BGS at OMW-220. Residential Well Survey	24 Mud rotary drill to 61 ft BGS, set 8-inch casing and grout at OMW-220.	25 Air rotary drilling at OMW-220 to 67 ft. Remaining residential well examined, Residential Well	26
27	28 Prepare for coring at OMW-220.	29 Core OMW-220 from 67-90 ft BGS.	30 Core OMW-220 from 90-118 ft BGS.	31 Core OMW-220 from 118-155 ft BGS.		

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Bedrock Well Investigations

November

1996 1996

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 Core OMW-220 from 155-183 ft BGS	2
3	4 Drilling difficulties at OMW-220.	5 Drilling difficulties core OMW-220 from 183-186 ft BGS.	6 Core OMW-220 from 186-220 ft BGS	7 Core OMW-220 from 220-240	8 Removed core rods, set up for packer testing	9
10	11 Packer Test Lower 2 40 ft zones in OMW-220	12 Packer test zone 3 in OMW-220	13 Redo packer test 2, complete packer test in zone 4.	14 Backfill OMW-220 to 194.75 ft BGS. Pull temporary 4-inch casing.	15 Ream 220 to 150 ft BGS	16
17	18 Ream 150-195. Set and grout 4-inch casing in OMW-220. OMW-220 Completed.	19 Selected locations for	20 remaining wells →	21 →	22 →	23
24	25	26 Begin Drilling OMW-221 with mud rotary drilling.	27 Continue drilling OMW-221	28 Continue drilling OMW-221.	29 Thanksgiving	30

Bedrock Well Investigations

December

1996 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 Drill OMW-221 to 60 ft BGS, OMW-222 to 10 ft BGS	3 Set 6-inch casing in OMW-221 to 60 ft BGS. Drill OMW-222 to 15 ft BGS.	4 Switch to mud rotary drilling at OMW-222	5 Drill and set casing at OMW-222 to 40 ft BGS	6 Drill OMW-221 to 200 ft BGS. Set up on OMW-223	7 Drill OMW-222 to 215 ft BGS.
8 Drill OMW-223 to 190 ft BGS. BIPS downhole logging attempted, unsuccessful.	9	10 OMW-221, 222, and 223 flushed to clear borehole fluids.	11	12 BIPS attempted but unsuccessful. Acoustic Televiewer completed on OMW-221, 222, and 223.	13	14
15	16	17 Jet wash OMW-222	18 Jet wash OMW-223	19 Jet wash OMW-221. Downhole video completed on OMW-221, 222, 223. Results are poor	20 Set up packer testing at OMW-222	21 Completed packer testing of two lower zones in OMW-222
22	23 Remove packers from OMW-222 in preparation of completion of downhole video on Jan 2,	24	25 Christmas	26	27	28
29	30	31				

Bedrock Well Investigations

January

1997 1997

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 New Year's Day	2 Completed downhole video on OMW-221, 222. Video opaque at OMW-223. Completed packer tests,	3 Grouted OMW-222 cleaned-up site.	4
5	6 Completed grouting OMW-222. Set up for packer testing at OMW-223. Packer assembly unable to	7 Complete packer testing in 3 zones in OMW-223	8 Flush OMW-223. Complete down-hole video on OMW-223. Set screen and sand in OMW-	9 Completed OMW-223. Set up on OMW-221.	10 Packer Test OMW-221 Set well, sand and grout in OMW-221	11 Complete grouting of OMW-221, Develop OMW-222, 223. OMW-221
12	13 Holes dug around surface casings of OMW-221, 222, 223, PO-2, 3, 4, and PW-4.	14 Protective casings set in cement at OMW-221, 222, 223, PO-2, PO-3, PO-4, and PW-4.	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

APPENDIX B

APPENDIX B

Well Construction Protocols, Well Schematics and Geologic Logs for Landfill Piezometers and Pilot Test Pumping Well

Five piezometers (PO-2, 3, 4, 5, 6) and one pilot pumping test well, PW-4, were installed in the Loeffel Landfill to monitor water level changes during leachate pumping and leachate quality (Figure 1). Drilling was performed by Aquifer Drilling and Testing (ADT) of Albany, New York with oversight by HSI GeoTrans. Piezometers PO-2, 3, 4 and well PW-4 were installed October 14-17, 1996. PO-5 and PO-6 were installed on November 8, 1996. Well specifications are provided in Table 1. Well logs and schematics are provided as an attachment.

The following protocols for installation of PO-2, 3, and 4 were utilized:

1. A 6.25-inch borehole was be advanced to depths of approximately 18-20 feet below ground surface using hollow-stem auger drilling methods with an all-terrain drill rig with high floatation tires. During drilling, continuous split-spoon samples were taken to characterize cap, fill, and native materials, and the distribution of contaminants within landfill soils. Split-spoon samples were taken in accordance with ASTM standards. Split-spoon samples were characterized for lithology and for general contaminant level by head-space analyses with an OVA. Split-spoon samples taken below the estimated water table surface (approximately 6 ft BGS) were evaluated for the presence of NAPLs using a hydrophobic dye shake test (Cohen et al., 1992). Archive samples from each split-spoon and lithologic change were taken in labeled sample bottles and temporarily stored onsite. Drill cuttings were drummed and removed from the site for disposal.

3. Upon completion of each boring, 6-inches of No. 1 clean silica sand was placed at the bottom of the borehole. A 2-inch ID, flush-threaded, Schedule 40 PVC well casing, and 5-foot long 2-inch ID 0.010 slot stainless steel screen was placed inside the auger.

4. As the hollow-stem augers were removed from the borehole, No. 1 clean coarse silica sand was placed in the annulus around the well screen to 1.5 feet above the top of the screen using a tremie pipe. Six inches of No. 0 fine clean silica sand was placed above the coarse sand pack.

5. An approximately 2.5-foot seal of bentonite pellets was placed over the sandpack. Following emplacement, the pellets were hydrated with non-chlorinated potable water and allowed to set for a minimum of one hour.

6. The remaining annular space was grouted via a tremie pipe with a cement-bentonite grout. This grout mixture consisted of Type I portland cement mixed with powdered bentonite. The grout mixture consisted of approximately three to five pounds of bentonite, 6.5 to 7.0 gallons of water, and a 94-pound sack of cement. Grout density was tested using a mud balance

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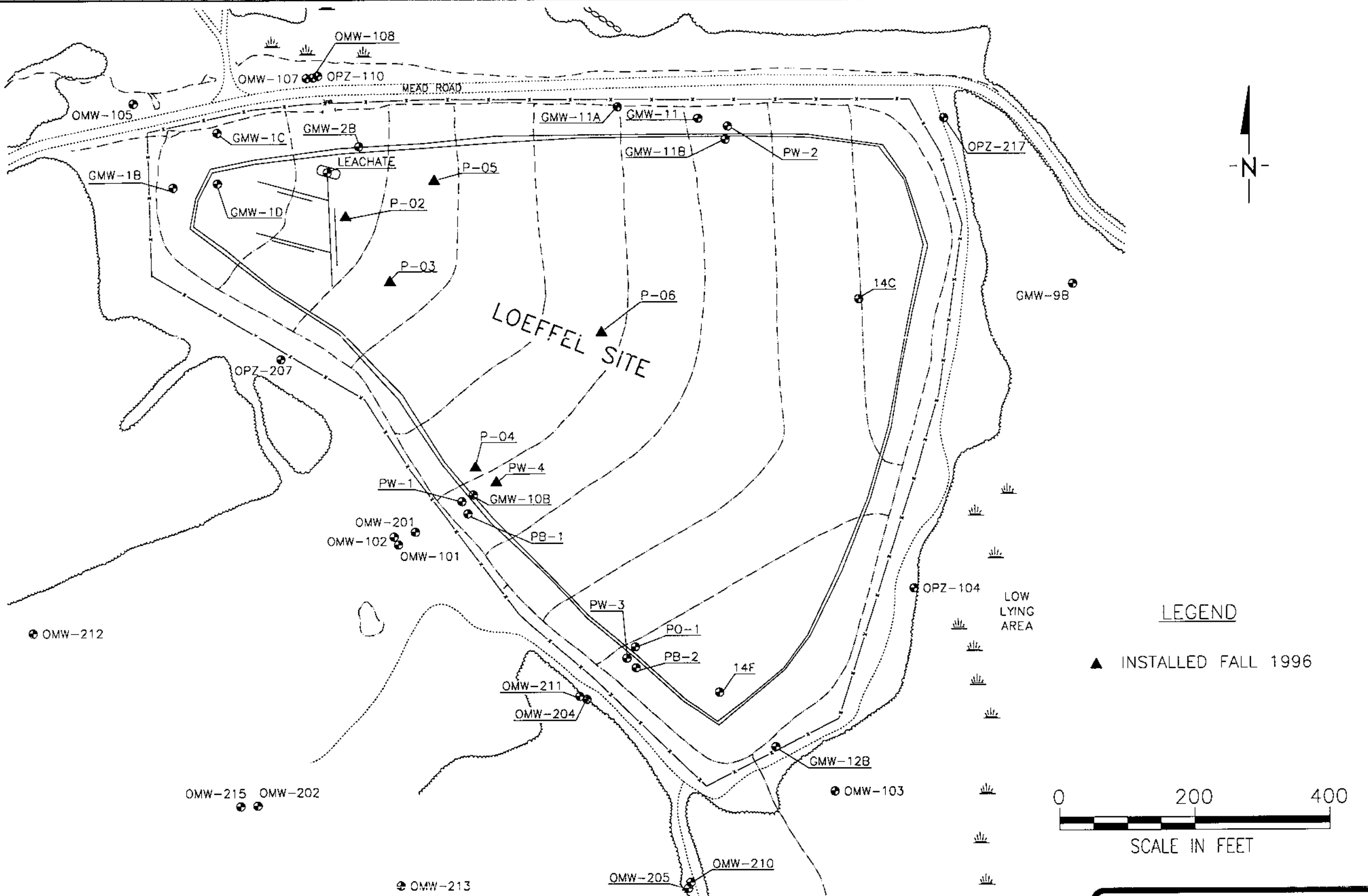

Figure 1. Location of piezometers and pilot test pumping wells installed Fall, 1996.

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prior to placement into the borehole and was within a range of 13 to 15 pounds per gallon.

7. After a minimum 24-hour grout set period, each well was developed to remove fines from the filter pack.

8. Each piezometer will be completed with a 3-foot square and 3-foot deep cement pad enclosing a 6-inch steel protective casing with a locking cap.

9. Each of the piezometers was surveyed by a qualified licensed surveyor in New York State Planar Coordinates to provide horizontal control and reference elevations for water levels, ground surface, and subsurface materials.

To provide additional information on leachate levels, PO-5 and PO-6 were installed using Geoprobe techniques. These piezometers were installed as follows:

1. Soil samples were taken to depths of 19-21 ft BGS using a 2 1/8-inch diameter Geoprobe MacroCore Sampler with acetate liners. Soil samples were characterized as described for split-spoon sampling.

2. Once the borehole was completed, a 5 foot 1-inch diameter Schedule 40 PVC well screen and a 1-inch Schedule 40 PVC casing was installed. A sandpack was installed from the bottom of the borehole to 1-foot over the top of the well screen. The remainder of the annulus was filled with bentonite pellets.

3. Each of the piezometers was surveyed by a qualified licensed surveyor in New York State Planar Coordinates to provide horizontal control and reference elevations for water levels, ground surface, and subsurface materials.

The pilot pumping test well, PW-4 was installed as follows:

1. A 4-inch diameter pumping well was located between swales on the landfill (Figure 1) to a depth of 30 feet.

2. Drilling of PW-4 was performed in a similar manner to piezometer installation, however, the well bore was 10-inches in diameter. Continuous split-spoon samples were taken for characterization of lithology.

3. A 20-foot stainless-steel screen with a Schedule 40 PVC riser was installed inside the auger flights.

4. As the hollow-stem augers were removed from the borehole, No. 1 clean coarse silica sand was placed in the annulus around the well screen to 1.5 feet

above the top of the screen using a tremie pipe. Six inches of No. 0 fine clean silica sand was placed above the coarse sand pack.

5. An approximately 2.5-foot seal of bentonite pellets was placed over the sandpack. Following emplacement, the pellets were hydrated with non-chlorinated potable water and allowed to set for a minimum of one hour.

6. The remaining annular space was grouted via a tremie pipe with a cement-bentonite grout. This grout mixture consisted of Type I portland cement mixed with powdered bentonite. The grout mixture consisted of approximately three to five pounds of bentonite, 6.5 to 7.0 gallons of water, and a 94-pound sack of cement. Grout density was tested using a mud balance prior to placement into the borehole and was within a range of 13 to 15 pounds per gallon.

7. After a minimum 24-hour grout set period, each well was developed to remove fines from the filter pack.

8. Following development of this well, a variable rate or step-pumping test was performed to determine the long-term pumping flow rate for a 72-hour pilot pumping test. The estimated yield of the well was determined to be ½ gpm.

Leachate Quality Sampling

Following the installation of PO-4, a leachate sample was collected from PO-4 on October 21, 1996 to evaluate groundwater quality within the containment system. Water from PO-4 was sampled for VOCs, SVOCs (including phenols), and PCBs in accordance with the protocols outlined in the Field Sampling Plan (FSP) (Blasland and Bouck, 1992a) and the QAPP (Blasland and Bouck, 1992b). During purging and prior to sampling, field measurements of pH, specific conductance, dissolved oxygen, and temperature were recorded for each well volume removed. The results of the analysis of PO-4 is attached. Final field parameter measurements are provided in Table 2.

Table 1. Specifications of piezometer and pilot pumping test well installed October-November, 1996.

MW/Piez ID	Installation Date	Easting (ft)	Northing (ft)	Elevation of MRP (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Screened Interval (ft bgs)	Depth to Bottom of Screened Interval (ft bgs)	Casing Diameter and Material	Monitoring Interval Elevation (ft MSL)
PO-2	10/14/96	707546.15	933832.79	644.30	641.50	13.00	14.50	19.50	2" PVC	627.0-622.0
PO-3	10/15/96	707608.64	933736.18	645.25	642.60	12.50	14.50	19.50	2" PVC	628.1-623.1
PO-4	10/15/96	707737.50	933464.28	643.14	640.50	8.50	10.50	15.50	2" PVC	630.0-625.0
PO-5	11/8/96	707677.22	933885.90	642.15	640.80	13.50	14.50	19.50	1" PVC	626.3-621.3
PO-6	11/8/96	707923.73	933663.61	642.05	640.70	15.00	16.00	21.00	1" PVC	624.7-619.7
PW-4	10/17/96	707768.82	933442.78	642.99	640.30	8.50	10.00	30.00	4" PVC	630.3-610.3

Notes: 1) MRP - Measured Reference Point marked on top of the inner casing.
2) PVC - Polyvinyl Chloride
3) Survey data source: Blasland & Bouck (1996)
4) Monitoring interval based on top of screen to bottom of screen or open borehole.

Table 2. Field parameter measurements of leachate in the piezometers installed October-November, 1996.

MW/Piez ID	Monitoring Date	pH	Specific Conductance (mu/cm)	ORP (mV)	Temp (C)	Dissolved Oxygen (mg/L)	Color
PO-2	10/14/96	6.00	1344	-40	12.20	1.80	Grayish Brown
PO-3	10/21/96	5.89	998	-42	12.40	2.20	Grayish Brown
PO-4	10/21/96	5.82	1370	-39	13.10	1.80	Grayish Brown

Notes: Measurements after final development using rapid pumping.

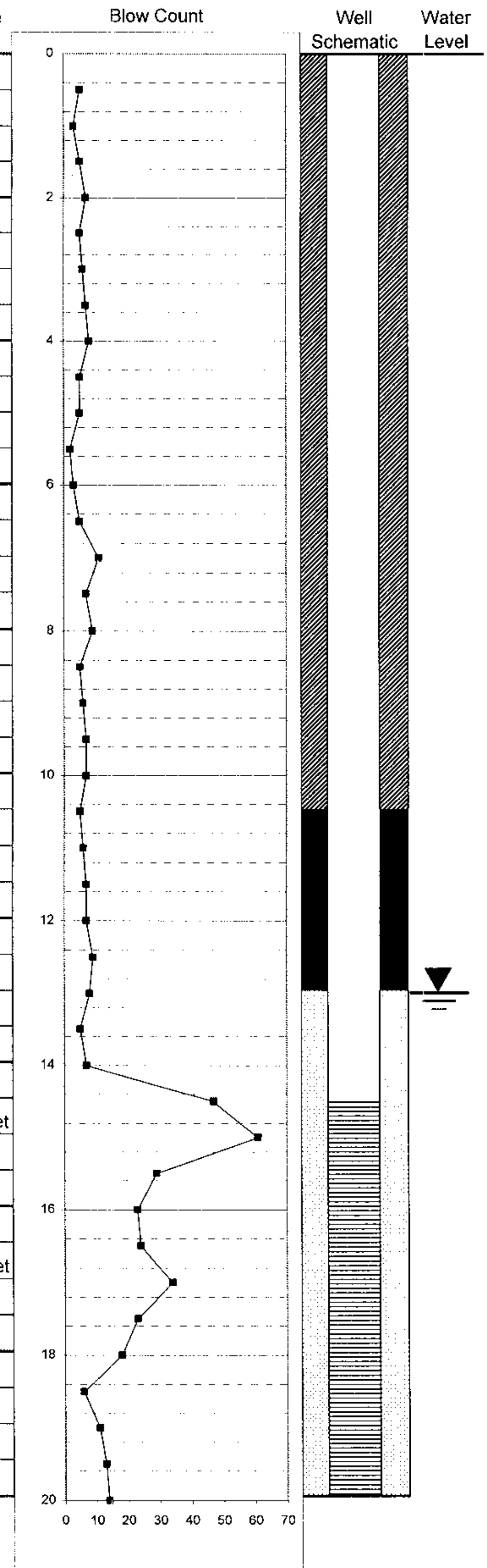
ATTACHMENT 1

WELL LOCATION, LOGS, AND SCHEMATIC FIGURES

Well Log PO-2

Completion Date 10/14/96

Depth (ft)	Description	Recovery (ft)	Moisture Content
0-2	*Pale Brown Dry Very Fine Sandy Silty Clay*	1.1	Dry
	Roots in top 0.7 feet		
2-4	*Same as above*	1.0	Dry
4-6	*Same as above*	0.7	Dry
6-8	*Same as above*	1.3	Dry
8-10	*Same as above*	1.0	Dry
10-12	*Same as above*	0.8	Damp
12-14	*Same as above (some gravel)*	1.0	Wet
14-16	*Grayish Brown Fine and Medium Sand*	0.7	Moist/Wet
	Some Coarse Sand and Fine Gravel, Roots		
16-18	*Same*	1.0	Moist/Wet
18-20	*Top 0.9 ft same as above, Peat, wood*	1.1	Wet

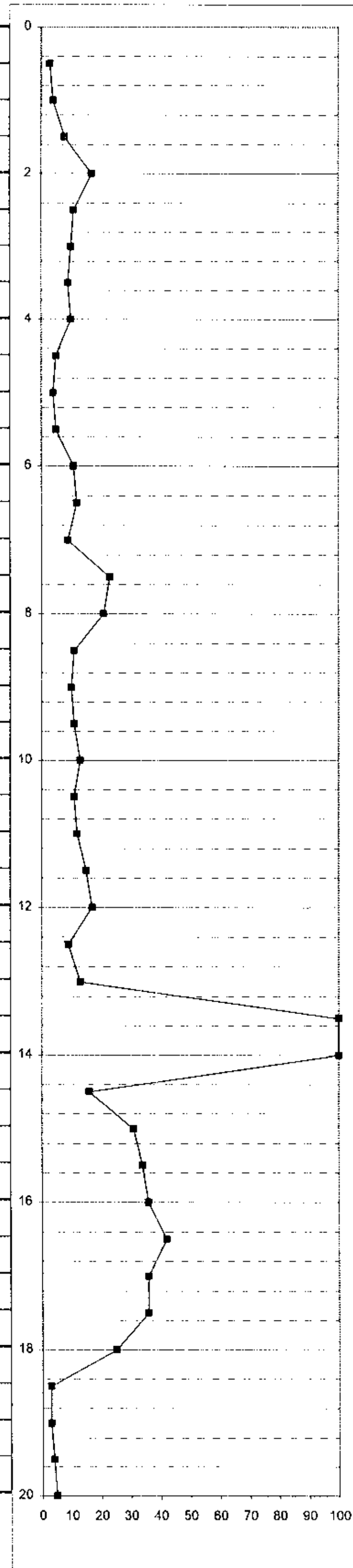


Well Log PO-3

Completion Date 10/15/96

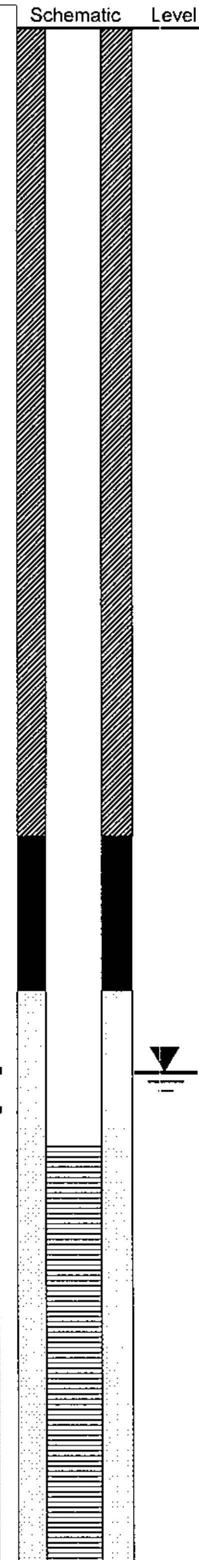
Depth (ft)	Description	Recovery (ft)	Moisture Content
0-2	*Yellow Brown Very Fine-Fine Sand*	1.2	Dry
	Some Coarse Sand		
2-4	*Pale Brown Silty Clay*	0.8	Moist
	Some Coarse Sand		
4-6	*Same as above*	0.4	Moist
6-8	*Same as above*	1.4	Moist
8-10	*Same as above*	1.5	Dry
10-12	*Same as above*	1.1	Dry
12-14	*Same as above*	0.4	Dry
14-16	*Yellow Brown Fine Sand*	1.3	Moist
	Some Coarse Sand, Trace Wood		
16-18	*Same*	NM	Moist
18-20	*Same*	1.6	Wet
	Some Pale Green-Grayish Red Clay		

Blow Count



Well Schematic

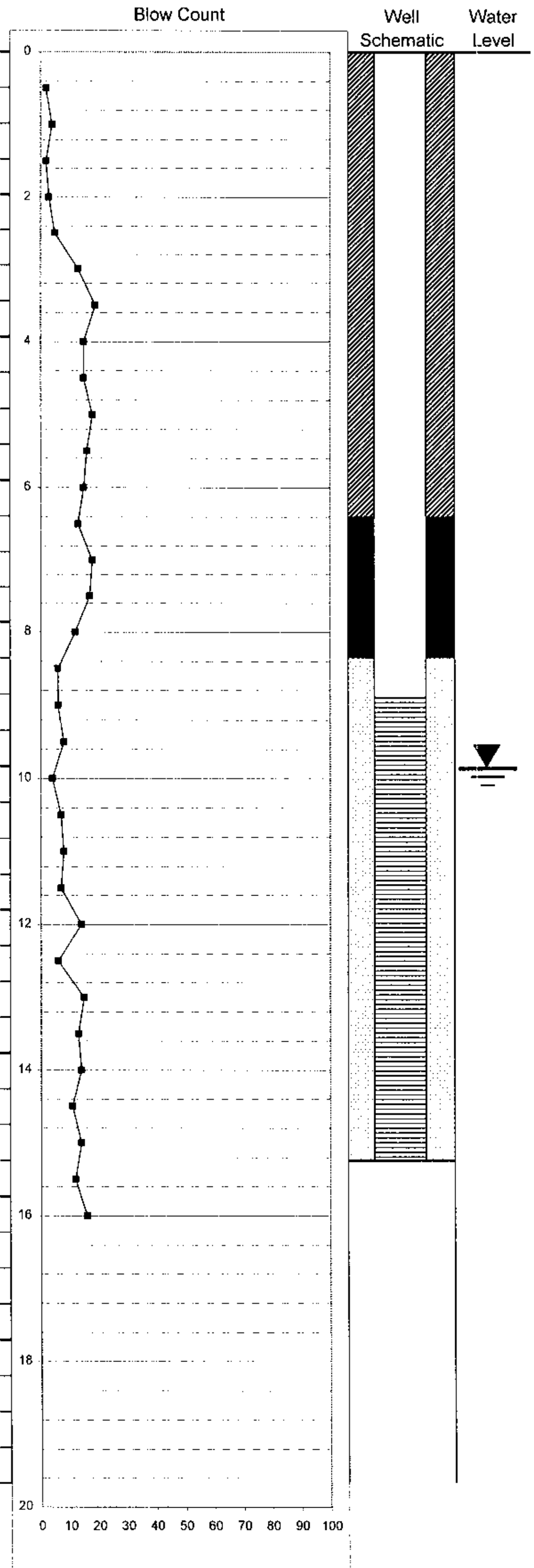
Water Level



Well Log PO-4

Completion Date 10/15/96

Depth (ft)	Description	Recovery (ft)	Moisture Content
0-2	*Top Soil, Yellowish Brown Fine Sand*	1.1	Moist
	Some Coarse Sand		
	Pale Brown Clay		
2-4	*Pale Brown Silty Clay*	NM	Moist
	Some Coarse Sand		
4-6	*Pushed Cobble*	0.0	NM
6-8	*Pale Brown Silty Clay*	0.9	Moist
	Some Coarse Sand		
8-10	*Gravel in Split Spoon*	0.0	NM
10-12	*Top 0.8 Pale Brown Silty Clay*	1.0	Moist
	Last 0.3 Grayish Brown Peat		
12-14	*Same as above (Peat)*	0.9	Wet
	Roots, Some lenses of Silt(fill)		
14-16	*Same as above (Peat)*	1.3	Wet
	Some Light Yellowish NAPL		
16-18	*No Recovery*	NM	NM

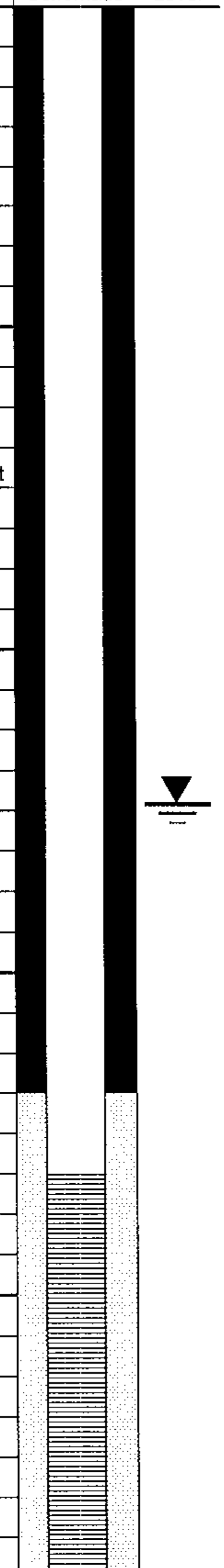


Well Log PO-5

Completion Date 11/8/96

Depth (ft)	Description	Recovery (ft)	Moisture Content
0-4	*0.0-0.7 Top Soil Grass Roots*	2.9	Moist
	0.7-4.0 Pale Brown Silt		
	Some Coarse Sand		
	Some Fine Gravel		
4-8	*Pale Brown Silt*	2.0	Wet/Moist
	Some Coarse Sand		
	Some Fine Gravel		
8-12	*Same as above*	2.6	Wet
12-14.6	*Pale Brown Silty Clay*	2.6	Wet
14.6-18.4	*Pale Brown Silty Clay*	2.6	Wet
	Some Fine Sand/Coarse Sand		

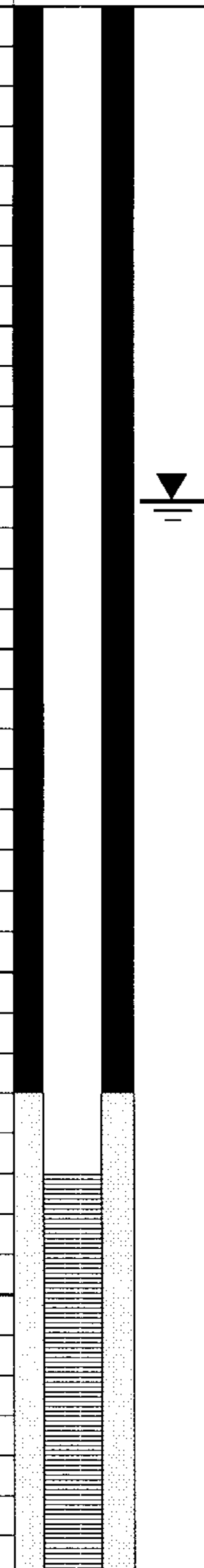
Well Schematic | Water Level



Well Log PO-6

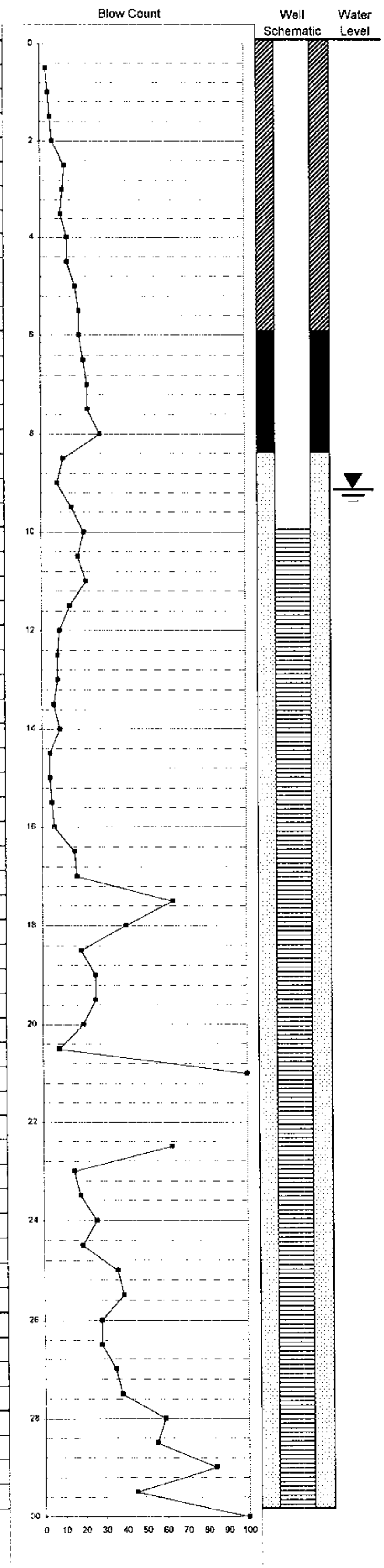
Completion Date 11/8/96

Depth (ft)	Description	Recovery (ft)	Moisture Content	Well Schematic	Water Level
0-4	*0.0-0.6 Top Soil Grass Roots*	3.3	Dry		
	0.7-4.0 Pale Brown Silt				
	Some Coarse Sand				
	Some Fine Gravel				
4-8	*Pale Brown Silt*	4.0	Dry		
	Some Coarse Sand				
	Some Fine Gravel				
8-12	*Pale Brown Silt*	3.3	Damp		
12-17	*Same*	0.0	Wet		
17-21	*Pale Brown Silty Clay*	2.0	Wet		
	Peat				



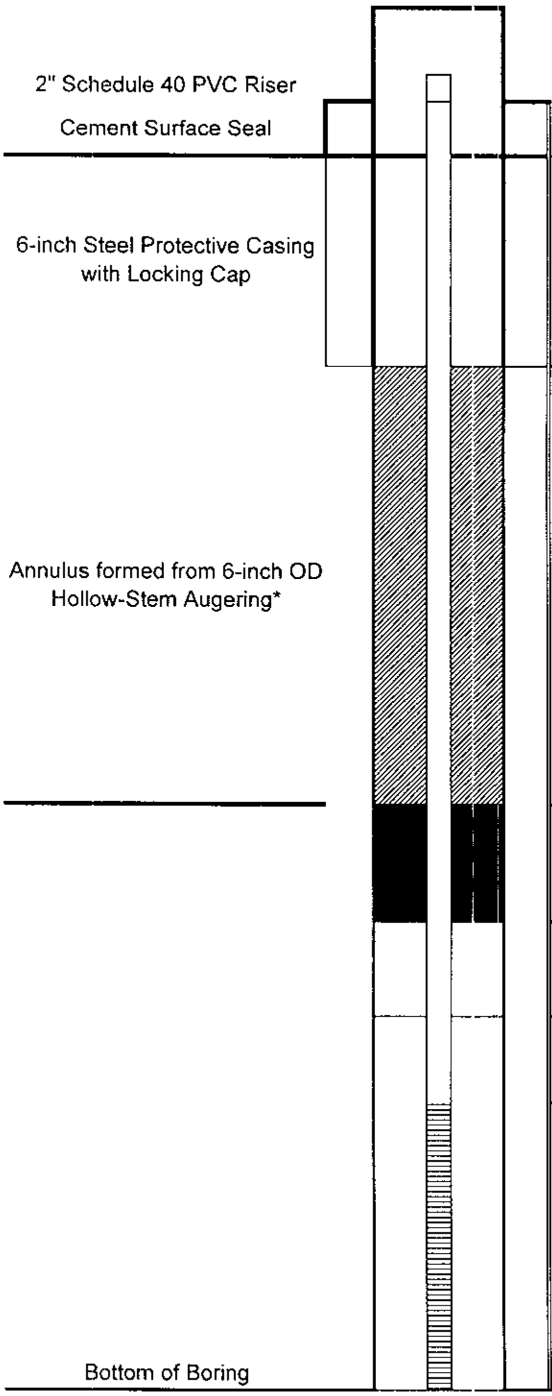
Well Log PW-4

Depth (ft)	Description	Recovery (ft)	Moisture Content
0-2	*Dark Yellow Brown Fine Sand/Silt*	0.7	Moist
	Some Roots, Grass		
	Dark Yellow Brown Silty Clay in last 0.2 ft		
2-4	*Dark Yellow Brown Silty Clay*	1.0	Dry
4-6	*Same as above*	1.2	Dry
6-8	*Same as above*	1.1	Moist
8-10	*Same as above*	0.8	Moist
10-12	*Medium Dark Brown Silt*	0.6	Dry
	Some Sand Lenses		
12-14	*Same as above*	0.7	Moist
14-16	*Top 0.15 Same as above*	0.7	Wet
	Remainder of spoon saturated		
16-18	*Medium Dark Yellow Brown, Sand/Silt*	1.8	Wet
	Some Gravel (Till)		
18-20	*Same*	1.0	Moist
	Some argillite/shale fragments		
20-22	*No Recovery*	0.0	Wet
22-24	*No Recovery*	0.0	Wet
24-26	*Stiff grayish red very fine sand/silt (Till)*	0.9	Moist
	Some fine gravel, trace clay		
26-28	*Same*	0.6	Moist
28-30	*Same*	0.6	Moist



PO-2

Installation Date 10/14/96



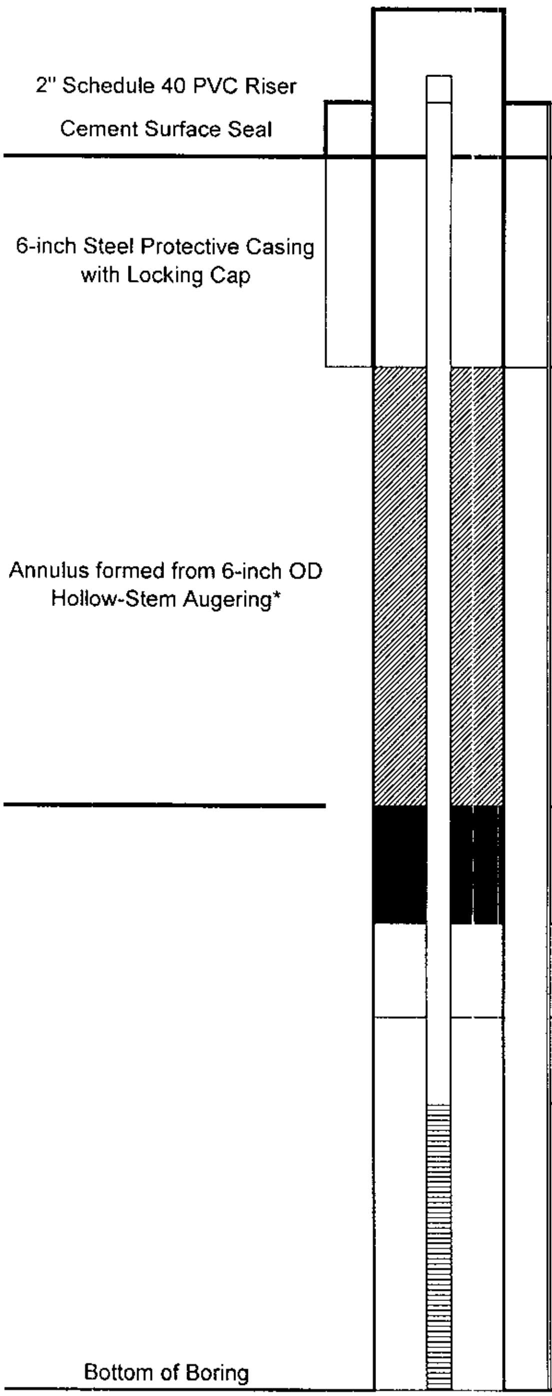
Thickness (ft)			Depth (ft)	Elevation (ft msl)
1.0		Ground surface	0.0	641.50
3.0	*Cement Surface Seal*	Top of Bentonite/Grout	3.0	638.50
7.5	*Bentonite/Grout*	Top of Bentonite	10.5	631.00
2.5	*Bentonite*	Top of Fine Sandpack	13.0	628.50
0.5	*No. 0 Fine Sandpack (above coarse sandpack)*	Top of Coarse Sandpack	13.5	628.00
1.0	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	14.5	627.00
5	*2" Stainless Steel Screen and No. 1 Coarse Sandpack (in borehole annulus)*	Bottom of Boring	19.5	622.00

Not Drawn to Scale

* With Continuous Split-Spoon Sampling

PO-3

Installation Date 10/15/96



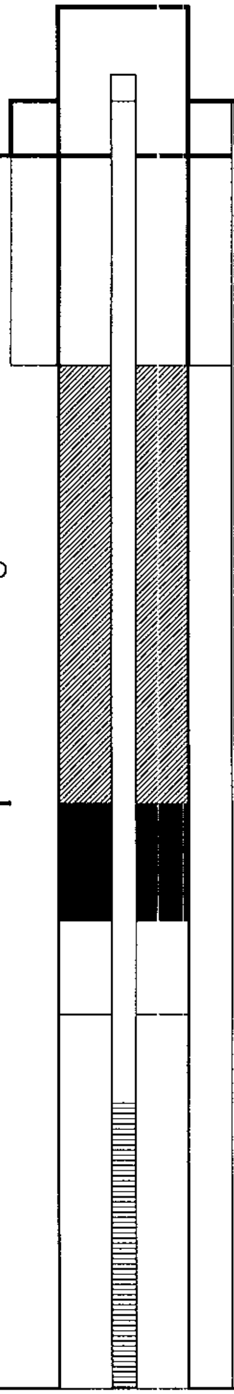
Thickness (ft)			Depth (ft)	Elevation (ft msl)
1.0		Ground surface	0.0	642.60
3.0	*Cement Surface Seal*	Top of Bentonite/Grout	3.0	639.60
7.0	*Bentonite/Grout*	Top of Bentonite	10.0	632.60
2.5	*Bentonite*	Top of Fine Sandpack	12.5	630.10
0.5	*No. 0 Fine Sandpack (above coarse sandpack)*	Top of Coarse Sandpack	13.0	629.60
1.5	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	14.5	628.10
5	*2" Stainless Steel Screen and No. 1 Coarse Sandpack (in borehole annulus)*	Bottom of Boring	19.5	623.10

Not Drawn to Scale

* With Continuous Split-Spoon Sampling

PO-4

Installation Date 10/15/96



Thickness (ft)			Depth (ft)	Elevation (ft msl)
1.0		Ground surface	0.0	640.50
3.0	*Cement Surface Seal*	Top of Bentonite/Grout	3.0	637.50
3.0	*Bentonite/Grout*	Top of Bentonite	6.0	634.50
2.5	*Bentonite*	Top of Fine Sandpack	8.5	632.00
0.5	*No. 0 Fine Sandpack (above coarse sandpack)*	Top of Coarse Sandpack	9.0	631.50
1.5	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	10.5	630.00
5	*2" Stainless Steel Screen and No. 1 Coarse Sandpack (in borehole annulus)*	Bottom of Boring	15.5	625.00

Not Drawn to Scale

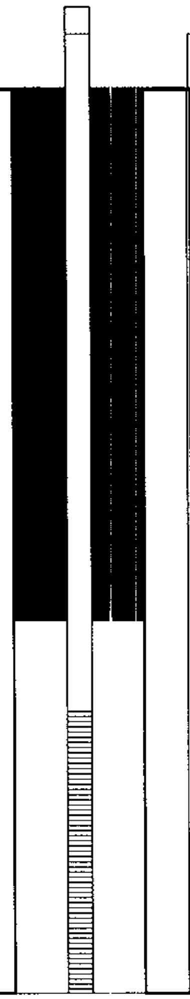
* With Continuous Split-Spoon Sampling

PO-5

Installation Date 11/8/96

1" Schedule 40 PVC Riser

Cement Surface Seal



Bottom of Boring

Thickness (ft)			Depth (ft)	Elevation (ft msl)
		Ground surface	0.0	640.80
13.5	*Bentonite*	Top of Fine Sandpack	13.5	627.30
1.0	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	14.5	626.30
5	*1" Stainless Steel Screen and No. 1 Coarse Sandpack (in borehole annulus)*	Bottom of Boring	19.5	621.30

Not Drawn to Scale

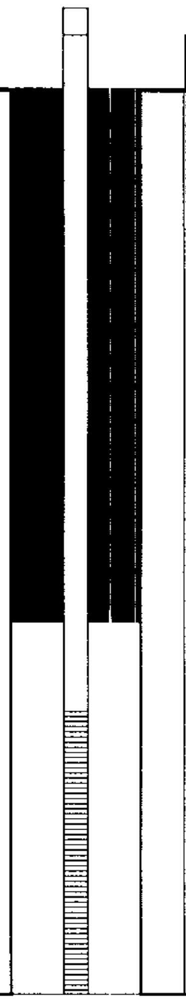
* With Continuous Split-Spoon Sampling

PO-6

Installation Date 11/8/96

1" Schedule 40 PVC Riser

Cement Surface Seal



Bottom of Boring

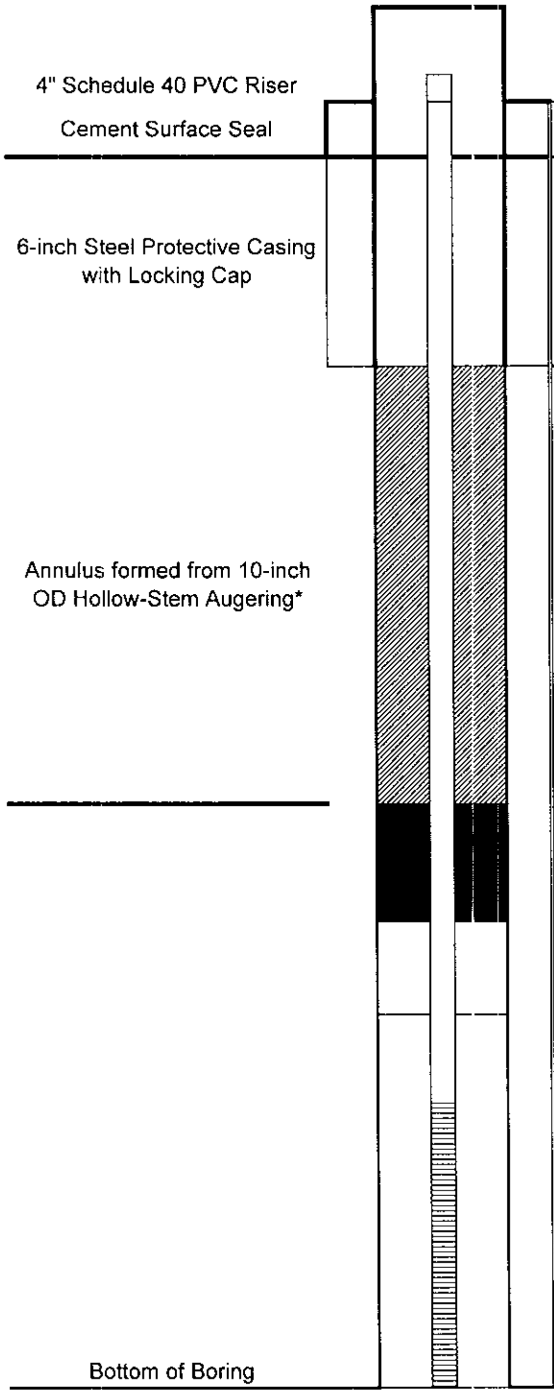
Thickness (ft)			Depth (ft)	Elevation (ft msl)
		Ground surface	0.0	640.70
15.0	*Bentonite*	Top of Fine Sandpack	15.0	625.70
1.0	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	16.0	624.70
5	*1" Stainless Steel Screen and No. 1 Coarse Sandpack (in borehole annulus)*	Bottom of Boring	21.0	619.70

Not Drawn to Scale

* With Continuous Split-Spoon Sampling

PW-4

Installation Date 10/17/96



Thickness (ft)			Depth (ft)	Elevation (ft msl)
1.0		Ground surface	0.0	640.30
3.0	*Cement Surface Seal*	Top of Bentonite/Grout	3.0	637.30
3.0	*Bentonite/Grout*	Top of Bentonite	6.0	634.30
2.5	*Bentonite*	Top of Fine Sandpack	8.5	631.80
0.5	*No. 0 Fine Sandpack (above coarse sandpack)*	Top of Coarse Sandpack	9.0	631.30
1.0	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	10.0	630.30
20	*4" Stainless Steel Screen and No. 1 Coarse Sandpack (in borehole annulus)*	Bottom of Boring	30.0	610.30

Not Drawn to Scale

* With Continuous Split-Spoon Sampling

ATTACHMENT 2

RESULTS OF LEACHATE SAMPLING, PO-4

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

P04-1021

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 96000

Lab Code: INCHVT   Case No.: LOEFF   SAS No.:   SDG No.: 62168

Matrix: (soil/water) WATER   Lab Sample ID: 316890

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 25OCT960041-I011

Level: (low/med) LOW   Date Received: 10/22/96

% Moisture: not dec. ________   Date Analyzed: 10/25/96

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 3.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	1.5	U
74-87-3	Chloromethane	1.5	U
75-01-4	Vinyl Chloride	1.5	U
74-83-9	Bromomethane	1.5	U
75-00-3	Chloroethane	1.5	U
75-69-4	Trichlorofluoromethane	1.5	U
76-13-1	Freon-113	1.5	U
75-35-4	1,1-Dichloroethene	1.5	U
75-09-2	Methylene Chloride	1.5	U
156-60-5	trans-1,2-Dichloroethene	1.5	U
75-34-3	1,1-Dichloroethane	1.5	U
156-59-2	cis-1,2-dichloroethene	1.5	U
67-66-3	Chloroform	1.5	U
71-55-6	1,1,1-Trichloroethane	1.5	U
56-23-5	Carbon tetrachloride	1.5	U
107-06-2	1,2-Dichloroethane	1.5	U
79-01-6	Trichloroethene	1.5	U
78-87-5	1,2-Dichloropropane	1.5	U
75-27-4	Bromodichloromethane	1.5	U
10061-01-5	cis-1,3-Dichloropropene	1.5	U
10061-02-6	trans-1,3-Dichloropropene	1.5	U
79-00-5	1,1,2-Trichloroethane	1.5	U
127-18-4	Tetrachloroethene	1.5	U
124-48-1	Dibromochloromethane	1.5	U
108-90-7	Chlorobenzene	89	
75-25-2	Bromoform	1.5	U
79-34-5	1,1,2,2-Tetrachloroethane	1.5	U
541-73-1	1,3-Dichlorobenzene	19	
106-46-7	1,4-Dichlorobenzene	88	
95-50-1	1,2-Dichlorobenzene	4.7	

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PO4-1021

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 96000

Lab Code: INCHVT   Case No.: LOEFF   SAS No.:   SDG No.: 62168

Matrix: (soil/water) WATER   Lab Sample ID: 316890

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 25OCT960041-I011

Level: (low/med) LOW   Date Received: 10/22/96

% Moisture: not dec. ________   Date Analyzed: 10/25/96

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 3.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	1.5	U
71-43-2	Benzene	1100	E
108-88-3	Toluene	2.2	
100-41-4	Ethylbenzene	12	
----------------	m/p-Xylene	28	
95-47-6	o-Xylene	3.7	
100-42-5	Styrene	1.5	U

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

P04-1021DL

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: LOEFF SAS No.: SDG No.: 62168

Matrix: (soil/water) WATER Lab Sample ID: 316890D1

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 24OCT962004-I031

Level: (low/med) LOW Date Received: 10/22/96

% Moisture: not dec. ________ Date Analyzed: 10/24/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 100.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	50	U
74-87-3	Chloromethane	50	U
75-01-4	Vinyl Chloride	50	U
74-83-9	Bromomethane	50	U
75-00-3	Chloroethane	50	U
75-69-4	Trichlorofluoromethane	50	U
76-13-1	Freon-113	50	U
75-35-4	1,1-Dichloroethene	50	U
75-09-2	Methylene Chloride	50	U
156-60-5	trans-1,2-Dichloroethene	50	U
75-34-3	1,1-Dichloroethane	50	U
156-59-2	cis-1,2-dichloroethene	50	U
67-66-3	Chloroform	50	U
71-55-6	1,1,1-Trichloroethane	50	U
56-23-5	Carbon tetrachloride	50	U
107-06-2	1,2-Dichloroethane	50	U
79-01-6	Trichloroethene	50	U
78-87-5	1,2-Dichloropropane	50	U
75-27-4	Bromodichloromethane	50	U
10061-01-5	cis-1,3-Dichloropropene	50	U
10061-02-6	trans-1,3-Dichloropropene	50	U
79-00-5	1,1,2-Trichloroethane	50	U
127-18-4	Tetrachloroethene	50	U
124-48-1	Dibromochloromethane	50	U
108-90-7	Chlorobenzene	100	D
75-25-2	Bromoform	50	U
79-34-5	1,1,2,2-Tetrachloroethane	50	U
541-73-1	1,3-Dichlorobenzene	50	U
106-46-7	1,4-Dichlorobenzene	58	D
95-50-1	1,2-Dichlorobenzene	50	U

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

P04-1021DL

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 96000

Lab Code: INCHVT   Case No.: LOEFF   SAS No.:   SDG No.: 62168

Matrix: (soil/water) WATER   Lab Sample ID: 316890D1

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 24OCT962004-I031

Level: (low/med) LOW   Date Received: 10/22/96

% Moisture: not dec. ________   Date Analyzed: 10/24/96

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 100.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	CONCENTRATION	Q
1634-04-4	Methyl tert-Butyl Ether	50	U
71-43-2	Benzene	3300	D
108-88-3	Toluene	50	U
100-41-4	Ethylbenzene	50	U
----------------	m/p-Xylene	100	U
95-47-6	o-Xylene	50	U
100-42-5	Styrene	50	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

P04-1021

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: LOEFF SAS No.: SDG No.: 62168

Matrix: (soil/water) WATER Lab Sample ID: 316890

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: Q316890S

Level: (low/med) LOW Date Received: 10/22/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 10/24/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/28/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	19	
106-46-7	1,4-Dichlorobenzene	80	
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
95-48-7	2-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
106-44-5	4-Methylphenol	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	14	
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	26	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	26	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
83-32-9	Acenaphthene	10	U
99-09-2	3-Nitroaniline	26	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

P04-1021

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: LOEFF SAS No.: SDG No.: 62168

Matrix: (soil/water) WATER Lab Sample ID: 316890

Sample wt/vol: 980.0 (g/mL) ML Lab File ID: Q316890S

Level: (low/med) LOW Date Received: 10/22/96

% Moisture: _______ decanted: (Y/N)____ Date Extracted:10/24/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/28/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	26	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
100-02-7	4-Nitrophenol	26	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	26	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
534-52-1	4,6-Dinitro-2-methylphenol	26	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	26	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
OTHER ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

P04-1021

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: LOEFF SAS No.: SDG No.: 62168

Matrix: (soil/water) WATER Lab Sample ID: 316890

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ______

% Moisture: ______ decanted: (Y/N) ___ Date Received: 10/22/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 10/25/96

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/31/96

Injection Volume: ______ (uL) Dilution Factor: 2000.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	20	U
11104-28-2	Aroclor-1221	20	U
11141-16-5	Aroclor-1232	20	U
53469-21-9	Aroclor-1242	20	U
12672-29-6	Aroclor-1248	20	U
11097-69-1	Aroclor-1254	20	U
11096-82-5	Aroclor-1260	260000	
	Aroclor-1660	20	U

APPENDIX C

APPENDIX C

WELL CONSTRUCTION PROTOCOLS, WELL SCHEMATICS AND GEOLOGIC LOGS FOR BEDROCK WELLS INSTALLED FALL, 1996

Four deep bedrock wells, OMW-220, 221, 222, and 223 were installed in the vicinity of the Loeffel Landfill to provide bedrock hydrogeologic data for remedial alternative assessment. All wells were first drilled to an elevation equivalent to the elevation of the bottom of the residential well 191-05-21B - 400 ft msl. Following drilling, each well was packer tested to determine relative yields and permeability versus depth. A summary of well specifications are provided in Table 1. The location of these wells is presented in Figure 1.

The following installation protocols were utilized:

Completion of OMW-220

1. Due to the presence of a gravel layer in the overburden at OMW-220, 12-inch mud-rotary methods were used to advance drilling to competent bedrock (61 ft BGS).

2. A 8-inch ID steel isolation casing was installed from ground surface to 61 ft BGS and grouted via a tremie pipe. Grout density was monitored using a mud balance within 13 to 15 pounds per gallon. The grout was then allow to cure for 24 hours.

3. A 7-5/8-inch air hammer bit was advanced through the bedrock to 66 ft BGS. A 4-inch temporary casing and shale trap was set in five feet of hydrated bentonite chips to 66 ft BGS. The bentonite was allowed to hydrate overnight.

4. A 3-25/32-inch (HQ) core barrel was used to core to a depth of 240 ft BGS. Each core run was sampled, logged, and boxed. An approximate water balance was maintained to quantify the amount of drilling fluids that entered and exited the borehole.

5. Packer testing was completed in 40 foot intervals (230.0-188.7, 193.9-151.8, 152.4-111.1, 111.1-69.8). Based on the results of the packer testing, and open interval of 190.2-150.2 was maintained and the interval from 190.2-240 ft BGS was backfilled with bentonite.

6. The interval from 66 to 150.2 ft BGS was reamed and a 4-inch steel casing was installed to 150.2 ft BGS. The 4-inch steel casing was grouted in place using tremie pipe and grout with a density of 13 to 15 gallons per pound

7. Following a 24-hour grout set period, the interval from 150.2 to 192.6 was reamed with a 3-7/8-inch tricone bit.

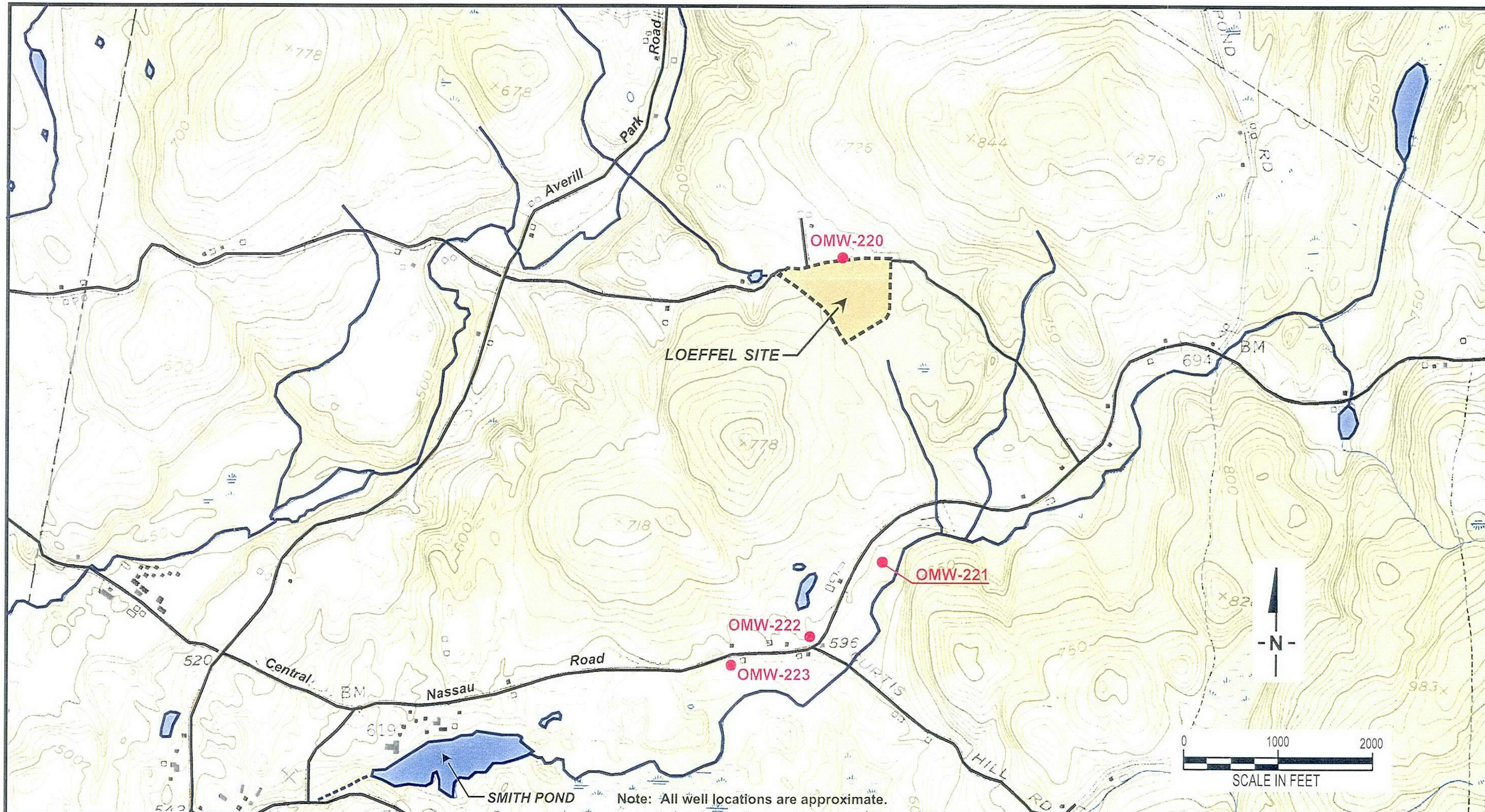


Figure 1. Location of deep bedrock wells installed Fall, 1996.

N039023B.DSF

8. Well completion included a protective casing with lock and a permanent 3-foot diameter, 4-foot deep cement pad.

9. Each of the wells was surveyed by a qualified licensed surveyor in New York State Planar Coordinates to provide horizontal control and reference elevations for water levels, ground surface, and subsurface materials.

Completion of OMW-221, OMW-222, and OMW-223

1. The borehole was advanced through unconsolidated deposits to the overburden-bedrock interface using 12-inch OD mud-rotary drilling. The borehole was advanced a minimum of five feet into the top of competent shale bedrock. Unconsolidated deposits were permanently sealed off by grouting a 6-inch diameter casing into the bedrock.

2. After the grout has cured for 24 hours, a 5-7/8 inch air rotary bit was advanced to 400 ft msl. During drilling well yield changes with depth were recorded.

3. Each borehole was flushed to provide clarity for the proposed downhole geophysical survey. Potable water from the Town of Nassau was used. Once the borehole drilling had been flushed each borehole was examined for geologic structure using a color downhole video camera. Several attempts were required to achieve a clear image of the borehole. Because of timing and the clarity of fluids within the boreholes it was not possible to use the Borehole Imaging Processing (BIPS) tool as had been proposed. In addition to the downhole video, a Acoustic Televiewer Log (ATV) was obtained from each borehole. The ATV log was used to examine fracture rate and bedrock structure trends.

4. Following downhole geophysical logging, each borehole was packer tested on 40-foot intervals to determine yield and permeability versus depth.

5. The final monitoring interval for each well was selected as the highest yielding zone. No visible or olfactory evidence of contamination was noted in any of the boreholes. Each well was completed by installing a 40-foot 2-inch Schedule 40 PVC screen to the selected monitoring interval. In OMW-221, the selected interval was shallower than the bottom of the borehole, and the borehole was backfilled with bentonite. The well riser consisted of 2-inch Schedule 80 PVC flush-threaded casing.

6. A No. 1 clean coarse silica sandpack was placed around the screen to a minimum of 3 feet above the top of the screen using a tremie pipe. A minimum of one foot of No. 0 clean fine silica sand was placed above the

coarse sandpack. A minimum of a 5 foot seal of bentonite pellets was placed over the sandpack. Following emplacement, the pellets were hydrated with non-chlorinated potable water and were allowed to set for a minimum of one hour.

7. The remaining annular space as grouted via a tremie pipe with a cement bentonite grout. The grout mixture consisted of approximately three to five pounds of bentonite, 6.5 to 7.0 gallons of water, and a 94-pound sack of Type I portland cement. Grout density was tested using a mud balance prior to placement into the borehole and was within a range of 13 to 15 lbs/gallon. Grout was emplaced over a period of days to prevent damage to the well casing and bentonite seal.

8. Each well was completed with a 3-foot square and 4-foot deep cement pad enclosing an 8-inch steel protective casing with a locking cap.

9. Each of the wells were surveyed by a qualified licensed surveyor in New York State Planar Coordinates to provide horizontal control and reference elevations for water levels, ground surface, and subsurface materials. This survey included the elevation of inner and outer casing, ground surface, and horizontal location of the center of the well casing. Horizontal survey measurements were taken with an accuracy of 0.1 feet. Elevation survey measurements were taken with an accuracy of 0.01 feet.

Table 1. Specifications of bedrock wells installed October 1996-January 1997.

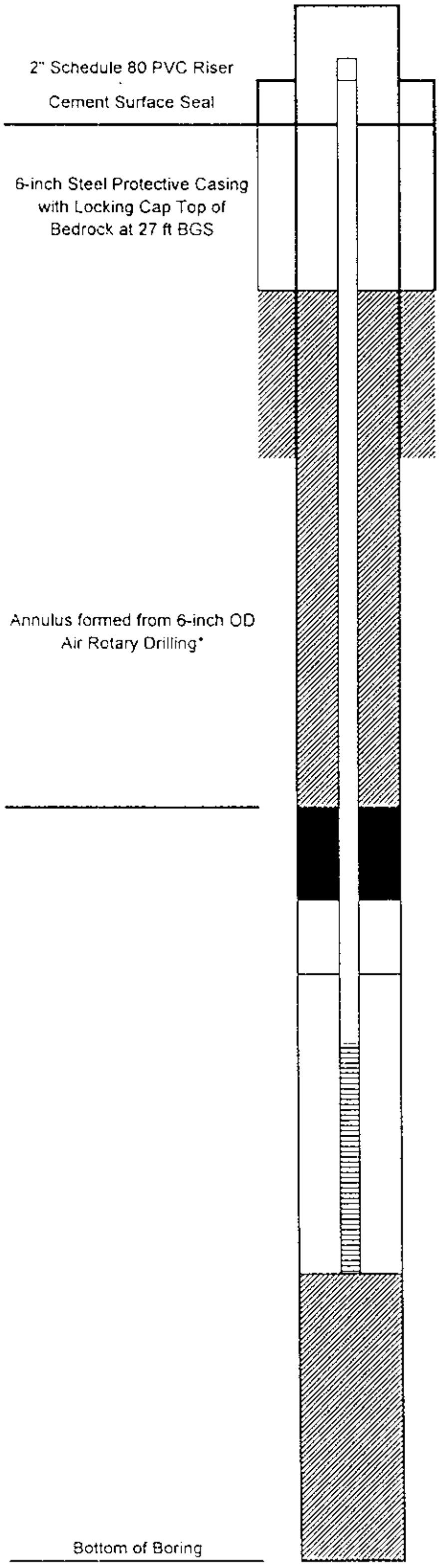
MW/Piez ID	Installation Date	Northing (ft)	Easting (ft)	Elevation of MRP (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Screened Interval (ft bgs)	Depth to Bottom of Screened Interval (ft bgs)	Casing Diameter and Material	Monitoring Interval Elevation (ft MSL)
OMW-220	11/18/96	934063.45	707794.54	637.31	635.50	-	-	-	4"-Steel	485.3-445.3
OMW-221	1/14/97	930789.80	708227.50	593.25	592.00	92.00	102.00	142.00	2"-PVC	492.0-452.0
OMW-222	1/14/97	929981.88	707453.71	600.59	598.60	154.00	165.00	205.00	2"-PVC	433.6-393.6
OMW-223	1/14/97	929691.58	706607.90	596.16	593.90	118.50	130.00	170.00	2"-PVC	463.9-423.9

Notes: 1) MRP - Measured Reference Point marked on top of the inner casing.
2) PVC - Polyvinyl Chloride
3) Survey data source: Blasland & Bouck (1996,1997)
4) Monitoring interval based on top of screen to bottom of screen or open borehole.

ATTACHMENT 1

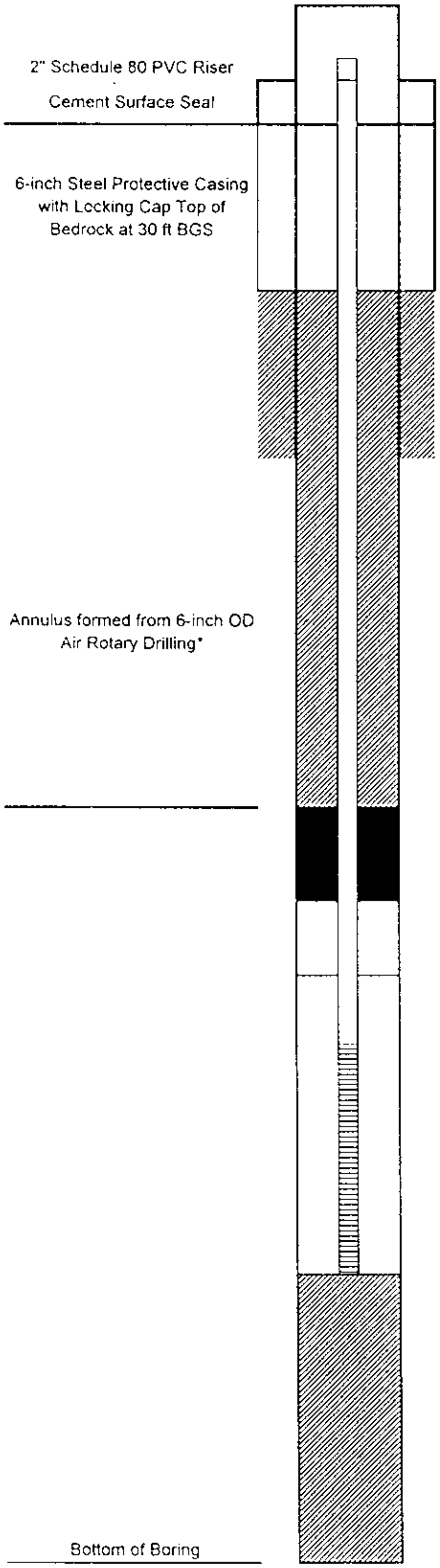
WELL LOCATION, LOGS, AND SCHEMATIC FIGURES

OMW-221



Thickness (ft)			Depth (ft)	Elevation (ft msl)
1.0		Ground surface	0.0	592.00
3.0	*Cement Surface Seal*	Top of Bentonite/Grout	3.0	589.00
	6-inch Steel Casing	Bottom of Surface Casing	40.0	552.00
84.0	*Bentonite/Grout*	Top of Bentonite	87.0	505.00
5.0	*Bentonite*	Top of Fine Sandpack	92.0	500.00
5.0	*No. 0 Fine Sandpack (above coarse sandpack)*	Top of Coarse Sandpack	97.0	495.00
5.0	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	102.0	490.00
40	*2" Schedule 80 10-Slot Screen and No. 1 Coarse Sandpack (in borehole annulus)*		142.0	450.00
	Bentonite Chips	Bottom of Boring	200.0	392.00

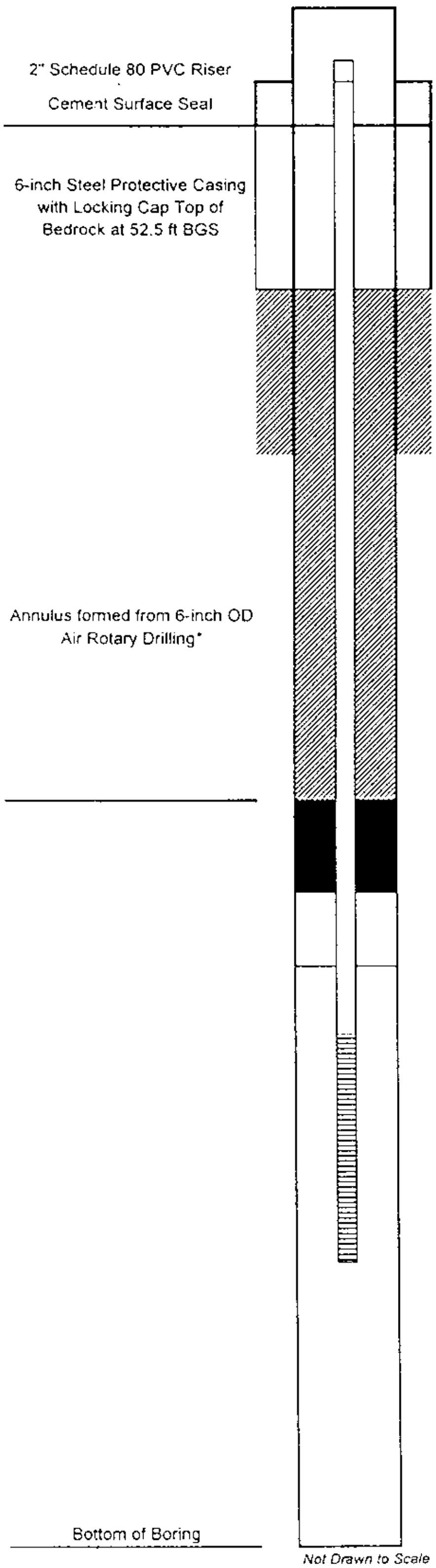
OMW-222



Not Drawn to Scale

Thickness (ft)			Depth (ft)	Elevation (ft msl)
1.0		Ground surface	0.0	598.60
3.0	*Cement Surface Seal*	Top of Bentonite/Grout	3.0	595.60
	6-inch Steel Casing	Bottom of Surface Casing	41.0	557.60
139.0	*Bentonite/Grout*	Top of Bentonite	142.0	456.60
8.0	*Bentonite*	Top of Fine Sandpack	150.0	448.60
4.0	*No. 0 Fine Sandpack (above coarse sandpack)*	Top of Coarse Sandpack	154.0	444.60
11.0	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	165.0	433.60
40	*2" Schedule 80 10-Slot Screen and No. 1 Coarse Sandpack (in borehole annulus)*		205.0	393.60
	Cave-in	Bottom of Boring	215.0	383.60

OMW-223



Thickness (ft)			Depth (ft)	Elevation (ft msl)
1.0		Ground surface	0.0	592.00
3.0	*Cement Surface Seal*	Top of Bentonite/Grout	3.0	589.00
	6-inch Steel Casing	Bottom of Surface Casing	40.0	552.00
108.0	*Bentonite/Grout*	Top of Bentonite	87.0	505.00
7.5	*Bentonite*	Top of Fine Sandpack	92.0	500.00
6.5	*No. 0 Fine Sandpack (above coarse sandpack)*	Top of Coarse Sandpack	97.0	495.00
5.0	*No. 1 Coarse Sandpack (above screen)*	Top of Screen	102.0	490.00
40	*2" Schedule 80 10-Slot Screen and No. 1 Coarse Sandpack (in borehole annulus)*		142.0	450.00
	No. 1 Coarse Sandpack	Bottom of Boring	190.0	402.00

CORING LOG OMW-220

Project No.:	N039-002	Start Date: October 29, 1996	
Project Name:	GE Loeffel	Completion Date: November 7, 1996	
Location:	Dewey Loeffel Landfill	Total Depth: 240 ft	
Drilling Co.:	Aquifer Drilling and Testing	Surface Elev.: 635.5 ft MSL	
Core Size:	HQ		
Geologist:	Jaime Zera, HSI-GeoTrans		

HSI-GEOTRANS

OMW-220

Depth (ft)	Run Length (ft)	Recovery (%)	RQD (%)	Net Drilling Fluid Gain/Loss (gal.)	Drilling Rate (ft/min)	Description and Classification grain size/shape, color, structure, composition, sorting, texture, moisture, odor
						OVERBURDEN drilling completed using mud rotary drilling-detailed logging not possible. Sands, clays, and gravels noted in return. Top of bedrock noted at 55' BGS.
66–70	4.0	87.5	8	-10	0.10	***ARGILLITE***, greenish-gray w/ gray streaks, apparent bedding dips 45-50° tight fold structure @68'. No natural open fractures.
70–80	10.0	97	49	0	0.15	***SAME***, few thin white, calcite filled offsets.
80–90	10.0	87.5	39	0	0.11	***SAME***, some calcite stringers, first appearance of wacke beds up to 1.3 cm thick, siliceous beds, beds dip 55-60°
90–100	10.0	95	38	0	0.10	***SAME***, dip increases to 90° abruptly @ 97.9', broken up zone, tight but open frac. @96.8' in 3.5 cm thick wacke bed, some pyrite on fracture surface.

Depth (ft)	Run Length (ft)	Recovery (%)	RQD (%)	Net Drilling Fluid Gain/Loss (gal.)	Drilling Rate (ft/min)	Description and Classification grain size/shape, color, structure, composition, sorting, texture, moisture, odor
108.6	8.6	100	74	-10	0.09	***SAME***, dip decreases from 90° to 70° to 30-35° dipping beds at 104.1' At 104.1' transition into dark reddish brown ***ARGILLITE*** with yellow green and greenish gray laminations. Some laminations of Wacke No natural fractures.
118	10.0	90	64	-5	0.08	***SAME***, 50-55° dips, few white calcite veinlets that cross bedding @ 20-40° Wacke beds occur as lenses in argillite.
126	8.0	100	71	-25	0.10	***SAME***, slicken-sided fracture @ 121.5', reverse motion, 50° dip, abundant calcite veining, drag fold below is evident
135	9.0	98	76	2	0.14	***SAME***, some large, dominantly wacke up to 1.1' thick, core has silver sheen from pervasive muscovite/chlorite, bedding dips 30°, no natural fractures
145	10.0	99	96	0	0.11	***SAME***, open fractures @ 136' and 139' wacke w/ calcite veinlets, bedding dips 45°

HSI GEOTRANS

OMW-220

Depth (ft)	Run Length (ft)	Recovery (%)	RQD (%)	Net Drilling Fluid Gain/Loss (gal.)	Drilling Rate (ft/min)	**Description and Classification** grain size/shape, color, structure, composition, sorting, texture, moisture, odor
155	10.0	97	70	-10	0.15	***SAME,*** slickensided fractures @ 146.7' and 147.4' (open) multiple thin, partially calcite-healed fractures. Bedding dips 50-55°
163.5	8.5	100	58	-15	0.12	***SAME*** to 155.5', ***WACKE/QUARTZITE*** grayish-blue green, f-grained, open fracs. @ 156.3', 157.6', 158.4', 158.85', 161.9', and 162'
170	6.5	100	58	10	0.12	***SAME***, calcareous quartzite w/ argillaceous laminae fracture at 167.5'-169.6'
176.3	6.3	100	44	10	0.09	***ARGILLITE***, grayish-green and olive gray open fractures at 170.2', 172.2', 173.8'. Contact w/ bluish green ***QUARTZITE*** @ 175.8'
183	6.7	103	87	-	0.09	***SAME*** to 178.1', ***ARGILLITE***, dusky yellow-green to greenish-black, fracture @ 179.1', ***QUARTZITE*** below, fracture @ 180.9'

HSI GEOTRANS

OMW-220

Depth (ft)	Run Length (ft)	Recovery (%)	RQD (%)	Net Drilling Fluid Gain/Loss (gal.)	Drilling Rate (ft/min)	Description and Classification grain size/shape, color, structure, composition, sorting, texture, moisture, odor
195	12.0	95	70	-100	0.12	***QUARTZITE*** to 184', then interbedded dark, reddish ***ARGILLITE***, yellow green gray ***ARGILLITE***, and gray ***WACKE/QUARTZITE*** Open fractures at 189.2' and 191.6' with pyrite on fracture surface.
202	7.0	99	61	-40	0.12	***SAME,*** with abundant calcite veinlets.
207	5.0	100	88	20	0.13	***SAME***, w/fault breccia, calcite matrix. No obvious open fractures.
220	13.0	100	91	40	0.07	***ARGILLITE***, red, interbedded with quartzite wacke to 211.3' Pale blue and greenish gray ***ARGILLITE*** "melange" deformation with micro breccia zones. Dips of 60-90° in all features Open fractures at 209.8', 211.4', 212.2', 213.2', 215.9', 216.7', 218.1', and 219.1' At 218.6 red ***ARGILLITE*** and ***WACKE.***
229	10.0	100	90	40	0.08	***SAME***, folded and brecciated, beds dipping 70°. Open fractures at 225.2', 227.8', 229' and 229.7'

HSI GEOTRANS

OMW-220

Depth (ft)	Run Length (ft)	Recovery (%)	RQD (%)	Net Drilling Fluid Gain/Loss (gal.)	Drilling Rate (ft/min)	**Description and Classification** grain size/shape, color, structure, composition, sorting, texture, moisture, odor
240	10.0	100	89	-	0.07	***SAME***, Open fractures at 230', 231', 231.2' 235.1', and 237.9'

DOWNHOLE VIDEO LOG OMW-221

Project No.:	N039-001	Start Date:	January 2, 1997
Project Name:	GE Loeffel	Completion Date:	
Location:	Dewey Loeffel Landfill	Total Depth:	200 ft
Geophysics Co:	AQUAFREED	Surface Elev.:	592.0 ft MSL
Borehole Size:	6 inches		
Geologist:	Jaime Zera, HSI-GeoTrans		

HSI GEOTRANS

OMW-221

Depth (ft)	Description and Classification
	OVERBURDEN drilling completed using mud rotary drilling-detailed logging not possible. Sands, clays, and gravels noted in return. Top of bedrock noted at 52.5' BGS. Bottom of Casing at 57' BGS
	Log from Downhole Video 1/2/97
57	***WACKE***, greenish-gray w/ calcite veins Some interbeds of red ***ARGILLITE~0.25'***
116	Rough zone in borehole, possible fracture or increased rock hardness.
126	***ARGILLITE***, red with calcite veins
130	***WACKE***, greenish-gray w/ calcite veins
146	***ARGILLITE***, red with calcite veins
147	***WACKE***, greenish-gray w/ calcite veins
166	***WACKE***, greenish-gray w/ calcite veins Borehole image starting to get cloudy.
180	Bottom of open borehole. Some caving has occurred.

DOWNHOLE VIDEO LOG OMW-222

Project No.:	N039-001	Start Date: January 2, 1997
Project Name:	GE Loeffel	Completion Date:
Location:	Dewey Loeffel Landfill	Total Depth: 215 ft
Geophysics Co.:	AQUAFREED	Surface Elev.: 598.6 ft MSL
Borehole Size:	6 inches	
Geologist:	Jaime Zera, HSI-GeoTrans	

HSI GEOTRANS

OMW-222

Depth (ft)	Description and Classification
	OVERBURDEN drilling completed using mud rotary drilling-detailed logging not possible. Sands, clays, and gravels noted in return. Top of bedrock noted at 30' BGS. Bottom of surface casing at 41' BGS
41	***ARGILLITE***, red with calcite veins
50	***SAME***
54	***WACKE***, gray with possible fracture
57	***WACKE***, gray with some interbeds of red ***ARGILLITE***
60	***ARGILLITE***, red with calcite veins
101	***WACKE***, gray within red ***ARGILLITE***
118	***WACKE***, gray within red ***ARGILLITE***
119	***WACKE***, gray within red ***ARGILLITE***
135	Rough zone in borehole, possible fracture or increased rock hardness
148	Rough zone in borehole, possible fracture or increased rock hardness
154	Rough zone in borehole, possible fracture or increased rock hardness
163	***WACKE***, gray with calcite veins
204	Bottom of borehole, some caving has occurred.

DOWNHOLE VIDEO LOG OMW-223

Project No.:	N039-001	Start Date:	January 7, 1997
Project Name:	GE Loeffel	Completion Date:	
Location:	Dewey Loeffel Landfill	Total Depth:	190 ft
Geophysics Co:	Hager-Richter Geophysics	Surface Elev.:	593.9 ft MSL
Borehole Size:	6 inches		
Geologist:	Jaime Zera, HSI-GeoTrans		

HSI GEOTRANS

OMW-223

Depth (ft)	Description and Classification
	OVERBURDEN drilling completed using mud rotary drilling-detailed logging not possible. Sands, clays, and gravels noted in return. Top of bedrock noted at 27' BGS. Bottom of Casing at 40' BGS *Log from Downhole Video 1/7/97*
41	***WACKE***, greenish-gray w/ calcite veins Borehole walls rough
64	***ARGILLITE***, red with calcite veins Some interbeds of gray ***WACKE***
68	***WACKE***, greenish-gray w/ calcite veins Some interbeds of greenish gray ***WACKE***
77	Rough zone in borehole, possible fracture or increased rock hardness.
79	***WACKE***, greenish-gray w/ large calcite vein
108	Rough zone in borehole, possible fracture or increased rock hardness.
118	Rough zone in borehole, possible fracture or increased rock hardness.
161	Rough zone in borehole, possible fracture or increased rock hardness.
162	Rough zone in borehole, possible fracture or increased rock hardness.
165	Rough zone in borehole, possible fracture or increased rock hardness.
186	Bottom of borehole. Some caving occurred.

APPENDIX D

APPENDIX D

RESULTS OF RESIDENTIAL WELL SURVEY

1.0 INTRODUCTION

A residential well survey was conducted in the vicinity of the Loeffel site from October 21 - 25, 1996. The objective of the survey was to collect all available information on the well construction specifications, depths, water levels and yields of all residential wells near the site. The survey was attempted at a total of 34 wells as identified in Figure 1.

2.0 PROTOCOLS

Each residence was visited by a HSI GeoTrans geologist and a Residential Well Survey form, as provided in Attachment 1, was completed as fully as possible. Information gathered included:

- Date and time of survey
- Well Location (including site schematic sketch)
- Well Pad type/dimensions
- Presence of protective cap/lock
- Diameter of inner/outer casing
- Outer casing material
- Inner casing material
- Inner/Outer casing stickup
- Total depth of well
- Depth to water (non-pumping or pumping conditions noted)
- Water level measuring point
- Pump description
- Downpipe description
- Photo number (each well was photographed)
- Other comments

The residential well survey was coordinated with the New York State Department of Health (NYSDOH). The NYSDOH assisted with property access and was present during a portion of the survey.

3.0 RESULTS

The results of the residential well survey are summarized in Table 1. In this table, field information has been supplemented with well information from NYSDOH and local drilling firms within the area. Depths of wells are presented in Figure 2. A photograph of each well is included in Attachment 2 (where access was granted and the well head was visible). At a number of locations, access to the residential well was not available because residents could not be reached prior to or during the survey.

The information collected during this survey was used to supplement the seismic reflection survey along Central Nassau Road in selection of additional monitoring wells. All data collected was used to update the HSI GeoTrans Site GIS database for the Loeffel site.

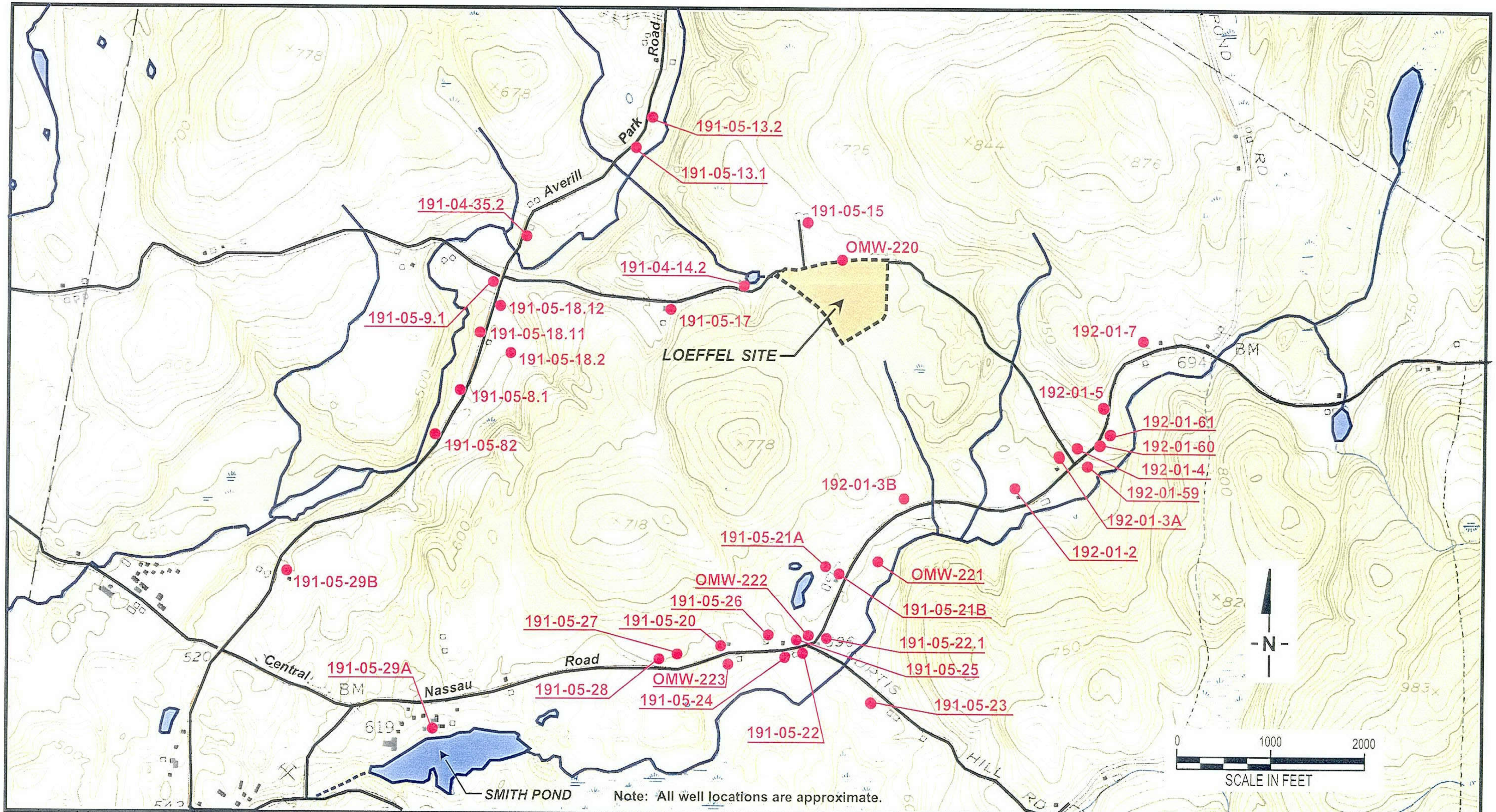


Figure 1. Location of wells in the Residential Well Survey.

HSI GEOTRANS

N039031B.DSF

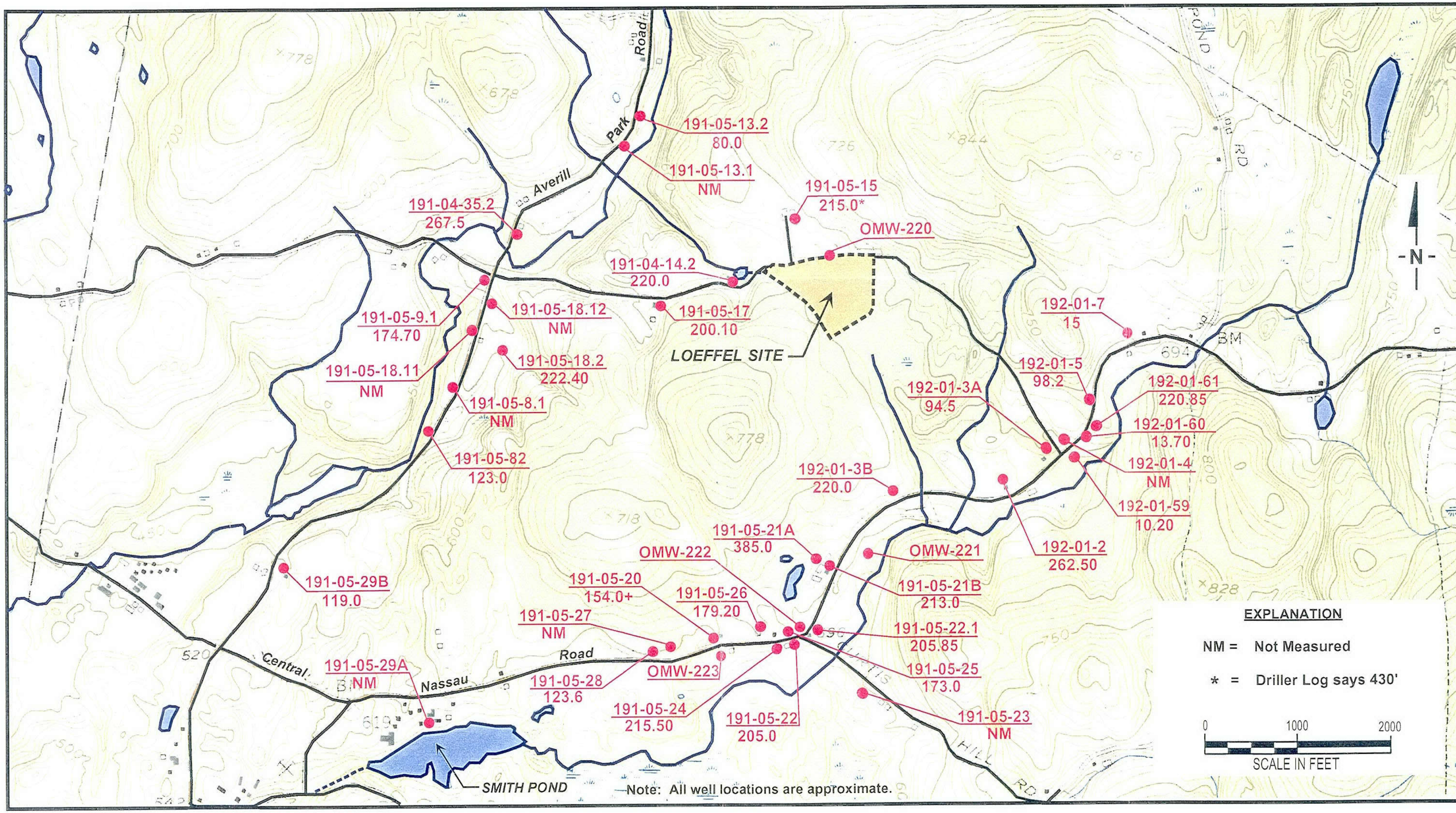


Figure 2. Total depth of residential wells in feet.

HSI GEOTRANS

N039031D.DSF

Table 1. Residential Well Specifications.

Well Alias	Address Information	Ref	NYS Planar Coordinates		Ref	Well Elevation	Ref	Survey Data						
	Location		Approximate Easting	Approximate Northing		Estimated Elevation of Well at GS (ft MSL)		Survey Date	Pit/ Non-pit	Cap condition	Casing Diameter- Material	Well Casing stickup (ft)	Total Depth (ft TOC)	Depth to Water (ft TOC)
191-05-13.1	Averill Park Road	6	705496.1	935190.9	4	520.00	6	10/21/96	NA	NA	NA	NA	NA	NA
191-05-18.11	Averill Park Road	6	703868.9	933192.1	4	495.00	6	10/21/96	NA	NA	NA	NA	NA	NA
192-01-2	385 Central Nassau Road	2	709633.6	931583.5	4	625.00	6	10/21/96	non-pit	good	6"ID, Steel	0.80	262.50	4.20
191-05-22.1	272 Central Nassau Road	2	707707.0	930117.0	4	600.01	5	10/22/96	non-pit	good	6"ID, Steel	0.91	205.85	15.98
192-01-3B	Central Nassau Road	6	708533.300	931520.149	3	640.50	3	NA	non-pit	good	6"ID, Steel	0.64	220.00	33.24
191-05-17	278 Mead Road	2	705911.4	933498.7	4	610.00	6	10/22/96	non-pit	good	6"ID, Steel	2.00	200.10	53.80
191-05-23	Curtis Hill Road	6	708124.3	929228.0	4	590.00	6	NA	NA	NA	NA	NA	NA	NA
191-05-18.2	860 Averill Park Road	2	704199.5	932978.0	4	501.00	6	10/21/96	non-pit	good	6"ID, Steel	3.85	222.40	20.92
192-01-61	Central Nassau Road	6	710631.0	932189.1	4	675.00	6	10/25/96	non-pit	excellent	5"ID, Steel	1.32	220.25	72.38
191-05-13.2	Averill Park Road	6	705649.2	935555.1	4	520.00	6	10/21/96	pit	NA	NA	NA	80.00	NA
191-05-18.12	Averill Park Road	6	704091.8	933510.1	4	495.00	6	NA	dug well	NA	NA	NA	9.00	NA
191-05-27	Central Nassau Road	6	706030.0	929750.2	4	600.00	6	NA	non-pit	NA	6"ID, Steel	2.00	78.00	NA
192-01-7	Central Nassau Road	6	710957.8	933181.8	4	705.00	6	10/22/96	dug well	fair	3' Concrete	~0.00	10-15	2.75
191-05-22	Central Nassau Road	6	707376.2	929758.7	4	589.07	5	10/21/96	non-pit	good	6"ID, Steel	1.40	200.00	40.11
191-05-21A	Central Nassau Road	6	707630.696	930706.710	3	619.00	3	NA	non-pit	good	6"ID, Steel	1.00	385.00	61.00
191-05-21B	Central Nassau Road	6	707841.906	930696.903	3	613.50	3	NA	non-pit	good	6"ID, Steel	2.08	213.00	13.00
191-05-24	Central Nassau Road	6	707112.0	929730.9	4	590.86	5	10/21/96	non-pit	good	6"ID, Steel	2.25	215.50	22.87
191-05-26	Central Nassau Road	6	707112.0	929958.7	4	609.86	5	10/21/96	non-pit	good	6"ID, Steel	1.70	179.20	49.91
192-01-60	Central Nassau Road	6	710525.3	932074.0	4	665.00	6	10/22/96	dug well	good	3' Concrete	0.60	13.70	4.00
191-05-82	Averill Park Road	6	703405.3	932109.1	4	470.00	6	10/22/96	non-pit	good	6"ID, Steel	1.75	123.00	24.94
191-05-8.1	Averill Park Road	6	703668.4	932574.4	4	490.00	6	10/21/96	non-pit	NA	NA	NA	99.00	4.00
191-05-9.1	Averill Park Road	6	704006.4	933764.1	4	515.00	6	10/21/96	non-pit	good	6"ID, Steel	1.20	174.70	31.97
192-01-59	Central Nassau Road	6	710420.0	931820.0	4	635.00	6	10/21/96	dug well	good	3' Concrete	1.00	10.20	2.52
191-04-35.2	Averill Park Road	6	704357.3	934257.9	4	495.00	6	10/22/96	non-pit	good	6"ID, Steel	0.85	267.50	20.05
191-05-14.2	~200 Mead Road	6	706688.2	933750.7	4	610.00	6	10/21/96	non-pit	good	6"ID, Steel	1.50	220.00	32.40
191-05-20	Central Nassau Road	6	706577.0	929853.8	4	600.11	5	10/22/96	non-pit	fair	6"ID, Steel	1.00	154.00+	11.50
191-05-28	Central Nassau Road	6	705825.0	929695.4	4	608.20	5	10/22/96	non-pit	good	6"ID, Steel	2.08	123.60	30.08
192-01-5	Central Nassau Road	6	710540.2	932455.0	4	690.00	6	10/22/96	non-pit	good	6"ID, Steel	0.95	98.20	50.81
191-05-15	148 Mead Road	2	707359.7	934453.5	4	640.00	6	8/14/96	non-pit	good	6"ID, Steel	2.00	430.00	45.00
191-05-29B	Averill Park Road	6	701830.2	930588.8	4	510.00	6	10/22/96	non-pit	good	6"ID, Steel	1.45	119.00	45.40
191-05-29A	Central Nassau Road	6	703414.0	928916.4	4	575.00	6	10/22/96	non-pit	fair	NA	NA	NA	NA
191-05-25	Central Nassau Road	6	707427.0	929941.0	4	599.33	5	10/22/96	non-pit	poor	6"ID, Steel	0.78	173.00	27.10
192-01-3A	403 Central Nassau Road	2	710088.8	931920.8	4	650.00	6	10/22/96	non-pit	poor	6"ID, Steel	0.50	94.50	18.50
192-01-4	Central Nassau Road	6	710290.9	932030.9	4	655.00	6	10/21/96	Covered	NA	NA	NA	NA	NA

Table 1. Residential Well Specifications (continued).

Well Alias	Survey Data		Ref	Calculated and other well information								Comments
	Pumping status	Pump type		Depth to Water (ft BGS)	Water Level Elevation (ft MSL)	Bottom of Casing (ft BGS)	Depth to Bedrock (ft BGS)	Bedrock Identifier	Well Yield (gpm)	Driller	Date of Installation	
191-05-13.1	NA	Jet pump	5	NA	NA	NA	NA	NA	NA	Unknown	Unknown	Residents do not know well location, well could not be located
191-05-18.11	NA	Submersible?	5	NA	NA	NA	NA	NA	NA	Unknown	Unknown	Well not found, neighbors indicated well buried.
192-01-2	Non-pumping	Submersible	5	3.40	621.60	NA	<130	Deepened from 130	20+	Goold	pre-1980	Well deepened in 1990 from 130 ft BGS to 262.5 ft BGS.
191-05-22.1	Non-pumping	Submersible	5	15.07	584.94	45	31	Resident	NA	Hacker	1981	Depth to bedrock information provided by resident
192-01-3B	Non-pumping	Submersible	5	32.60	607.90	80	<80	Bottom of Casing	3	Unknown	pre-1980	Well specifications collected during previous RI activities, water level taken during geophysics survey.
191-05-17	Non-pumping	Submersible	5	51.80	558.20	NA	NA	NA	NA	Unknown	pre-1980	
191-05-23	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA	Well not found.
191-05-18.2	Non-pumping	Submersible	5	17.07	483.93	NA	NA	NA	NA	Unknown	1980	
192-01-61	Recently Pumping	NA	5	71.06	603.94	NA	NA	NA	NA	Hanson	Unknown	
191-05-13.2	NA	Jet	5	NA	NA	NA	NA	NA	NA	Unknown	Unknown	Well in 6' pit, owner did not want to disturb well
191-05-18.12	NA	Shallow pump	2, 5	NA	~495.00	NA	NA	NA	NA	Unknown	1990	According to NYSDOH, well is a dug well
191-05-27	NA	Submersible	2, 5	NA	NA	40	40	Bottom of Casing	5.5	Kris	Unknown	Resident not available for access. Most information from NYSDOH
192-01-7	Non-pumping	Shallow pump	5	~2.75	~702.25	NA	NA	NA	NA	Unknown	1956	Owner says well was dug to a depth of 10-15 feet.
191-05-22	Non-pumping	Submersible	5	38.71	550.36	>26	26	Resident	15	Hacker	1960	Well deepened in 1991 from 155 ft BGS to 205 ft BGS.
191-05-21A	Pumping Average	Submersible	5	60.00	~559.00	62	<62	Bottom of Casing	15	Hanson	1989	Well specifications collected during previous RI activities, rate estimated by Tony Bryda
191-05-21B	~Non-pumping est.	Submersible	5	10.92	~602.58	73	<73	Bottom of Casing	5	Hanson	pre-1980	Well specifications collected during previous RI activities, rate estimated by Tony Bryda
191-05-24	Non-pumping	Submersible	5	20.62	570.24	32	<32	Bottom of Casing-Resident	NA	Unknown	Unknown	
191-05-26	Non-pumping	Submersible	5	48.21	561.65	45	<45	Bottom of Casing	2	Goold	1971	Well log says well 200 feet deep.
192-01-60	Non-pumping	NA	5	3.40	661.60	NA	NA	NA	NA	Unknown	Unknown	Well is a dug well
191-05-82	Non-pumping	Jet pump	5	23.19	446.81	40	<40	Bottom of Casing-Resident	40	Unknown	1994	
191-05-8.1	Static post drilling	NA	5	NA	~486.00	>38	38	Resident	NA	Unknown	Unknown	Well data from resident

Table 1. Residential Well Specifications (continued).

Well Alias	Survey Data		Ref	Calculated and other well information								Comments
	Pumping status	Pump type		Depth to Water (ft BGS)	Water Level Elevation (ft MSL)	Bottom of Casing (ft BGS)	Depth to Bedrock (ft BGS)	Bedrock Identifier	Well Yield (gpm)	Driller	Date of Installation	
191-05-9.1	Non-pumping	Submersible	5	30.77	484.23	NA	NA	NA	NA	Unknown	Unknown	
192-01-59	Not Pumping	Shallow pump	5	1.52	633.48	NA	NA	NA	NA	Unknown	Unknown	
191-04-35.2	Non-pumping	Submersible	5	19.20	475.80	NA	NA	NA	NA	Goold	Unknown	
191-05-14.2	Non-pumping	Submersible	5	~30.9	~579.10	114	60-114	Well history, NYSDOH	4	Goold	1978	Residence is no longer standing. Well originally 60 feet deep, deepened to 220 ft (1978), sleeved to 114 (1980)
191-05-20	Non-pumping	Submersible	5	~10.5	~589.61	NA	NA	NA	NA	Unknown	Unknown	Clear viscous fluid on end of probe likely due to malfunctioning pump
191-05-28	Non-pumping	Submersible	5	28.00	580.20	NA	NA	NA	NA	Unknown	Unknown	
192-01-5	Non-pumping	Submersible	5	49.86	640.14	NA	NA	NA	NA	Goold	Unknown	
191-05-15	Non-pumping	Submersible	5	43.00	597.00	70	70		NA	Goold	1985	Well specifications collected during previous RI activities by BBL, Drillers log says well 430 ft deep.
191-05-29B	Non-pumping	Submersible	5	43.95	466.05	NA	NA	NA	NA	Goold	Unknown	
191-05-29A	NA	NA	5	NA	NA	NA	NA	NA	NA	Unknown	Unknown	Resident would not let uncover well to take measurements.
191-05-25	Non-pumping	Submersible	5	26.32	573.01	35	<35	Bottom of Casing	6	Goold	1978	
192-01-3A	Non-pumping	Jet pump	5	18.00	632.00	NA	NA	NA	NA	Unknown	1948	
192-01-4	NA	NA	5	NA	NA	NA	NA	NA	NA	Unknown	Unknown	Well under new concrete pad for reconstruction of front steps

1 Nassau Phonebook
2 NYSDOH Notes
3 GeoTrans SiteGIS Database
4 Digitized from Fig. 2.5 Final Hydrogeologic Report
5 Residential Well survey - October, 1996
6 USGS Topo Map
NA = Data not obtainable or available

ATTACHMENT 1

RESIDENTIAL WELL SURVEY FORMS

Loeffel Residential Well Survey

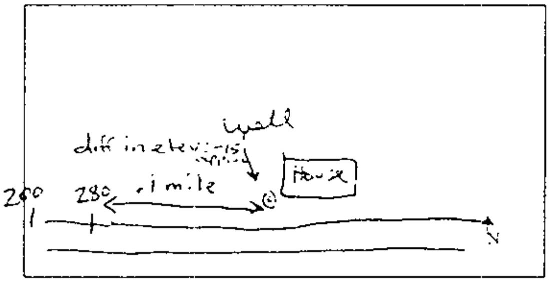
Well ID/Alias / 192-01-2

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 1435

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6"

Material of inner/outer casing steel

Inner/outer casing stickup (AGS) .8'

Total depth of well 262.5' from steel

Total depth to water (note if pumping or non-pumping) 4.20', not pumping

Water level measuring point Steel casing

Pump description Submersible

Downpipe description None

Photo Number #9 Roll #1

Comments Owner info:
approx 240' deep

lost depth to bottom probe down well
@ aprox 144'

Loeffel Residential Well Survey

Well ID/Alias L191-05-8.1

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 1600

Location map:

Well Not Accesible

N

Observations

Well location (pit/non-pit) Not accesible - sealed off

Well pad type/dimensions NM

Well pad condition NM

Presence of protective cap/lock NM

Condition of protective cap/lock NM

Diameter inner/outer casing NM

Material of inner/outer casing NA

Inner/outer casing stickup (AGS) NM

Total depth of well NM

Total depth to water (note if pumping or non-pumping) NM

Water level measuring point NA

Pump description NA

Downpipe description NA

Photo Number none Roll

Comments Owner's Well Log:
Depth: 99'
Bedrock: @ 38' bgs
overburden: 26' hardpan
: 26-38 red & grey clay
Static W.L. after constr.: 4' bgs

Loeffel Residential Well Survey

191-05-29A

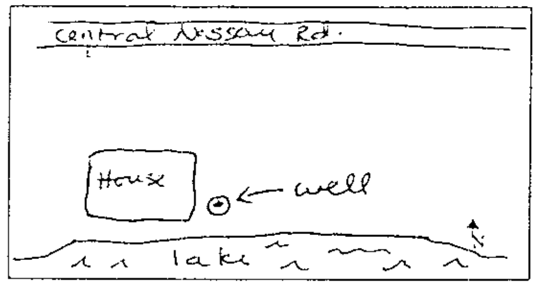
Well ID/Alias ( )

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 1105

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions concrete pad

Well pad condition fair

Presence of protective cap/lock well pad = cement casing covering well w/a riveted metal plate covering all

Condition of protective cap/lock cap is in fair condition

Diameter inner/outer casing NA

Material of inner/outer casing NA

Inner/outer casing stickup (AGS) NA

Total depth of well NA

Total depth to water (note if pumping or non-pumping) NA

Water level measuring point NA

Pump description NA

Downpipe description NA

Photo Number none taken Roll

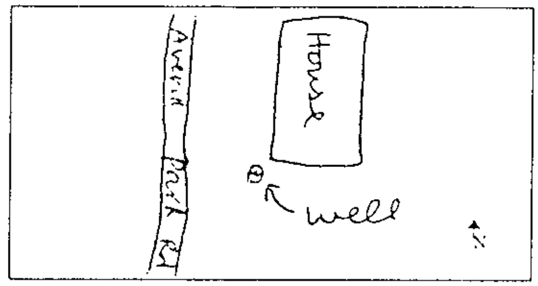
Comments Resident would not let me uncover well to take measurements

P:\Loeffel\Admin\Wel_cond.doc

Loeffel Residential Well Survey

191-05-29B

Location map:



Well ID/Alias

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 1200

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6" ID

Material of inner/outer casing ~~~~ steel

Inner/outer casing stickup (AGS) 1.45'

Total depth of well 119' from steel

Total depth to water (note if pumping or non-pumping) 45.40', not pumping

Water level measuring point steel casing

Pump description submersible

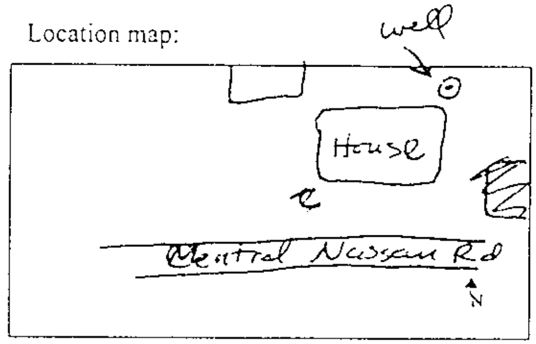
Downpipe description none

Photo Number #13, #14 Roll #1

Comments

Loeffel Residential Well Survey

Location map:



Well ID/Alias 192-01-3A

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 1340

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap is a 1.5' 6" pipe w/cap sitting on top of casing

Condition of protective cap/lock poor

Diameter inner/outer casing 6"

Material of inner/outer casing Steel

Inner/outer casing stickup (AGS) .5'

Total depth of well 94.5' from steel

Total depth to water (note if pumping or non-pumping) 18.5' not pumping

Water level measuring point Steel casing

Pump description Jet pump

Downpipe description

Photo Number #15 Roll #1

Comments

Loeffel Residential Well Survey

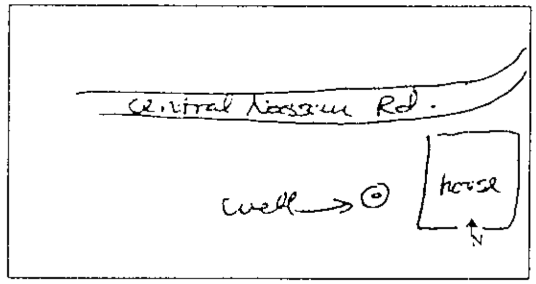
Well ID/Alias: 1192-01-60

Project Name/Number: Loeffel

Inspector: D. Finney

Date/Time: 10-22-96 / 1400

Location map:



Observations

Well location (pit/non-pit): non-pit

Well pad type/dimensions: none

Well pad condition: none

Presence of protective cap/lock: plywood & metal caps, no lock

Condition of protective cap/lock: good

Diameter inner/outer casing: 3' ID

Material of inner/outer casing: concrete or clay

Inner/outer casing stickup (AGS): .6'

Total depth of well: 13.7' from casing lip

Total depth to water (note if pumping or non-pumping): 4.00' from casing lip

Water level measuring point: top lip of concrete casing

Pump description: NA

Downpipe description: 1" poly. tubing

Photo Number: #16 Roll: # 1

Comments: well is a dug well, unclear what type of pump, think just a dug well pump.

Loeffel Residential Well Survey

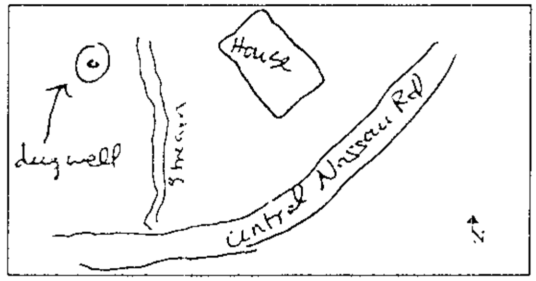
Well ID/Alias 1192-01-7

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 1430

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock well has large cap

Condition of protective cap/lock fair

Diameter inner/outer casing aprox. 3' (could not uncover to measure

Material of inner/outer casing concrete

Inner/outer casing stickup (AGS) N/M

Total depth of well 10'-15' (according to Mr. Levine)

Total depth to water (note if pumping or non-pumping) 2.75, not pumping

Water level measuring point opening on cap

Pump description shallow well pump

Downpipe description N/A

Photo Number #17 Roll #1

Comments owner says well was dug aprox 40 yrs ago and is spring fed. Aprox 10-15' deep

Loeffel Residential Well Survey
192-01-5

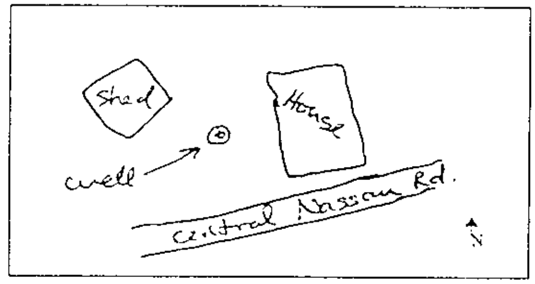
Well ID/Alias

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 1450

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6" I.D.

Material of inner/outer casing Steel

Inner/outer casing stickup (AGS) .95'

Total depth of well 98.2'

Total depth to water (note if pumping or non-pumping) 50.81', not pumping

Water level measuring point Steel casing

Pump description Submersible

Downpipe description none

Photo Number #18 Roll #1

Comments

Loeffel Residential Well Survey

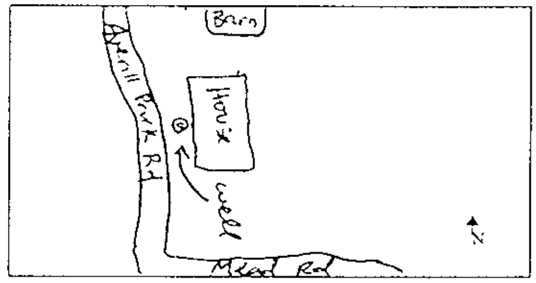
Well ID/Alias 91-04-35.2

Project Name/Number Loelfel

Inspector D. Finney

Date/Time 10-22-96 / 1540

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6" I.D

Material of inner/outer casing steel

Inner/outer casing stickup (AGS) .85'

Total depth of well 267.5' from steel

Total depth to water (note if pumping or non-pumping) 20.05', not pumping

Water level measuring point Steel casing

Pump description Submersible

Downpipe description none

Photo Number #1 Roll #2

Comments

Loeffel Residential Well Survey

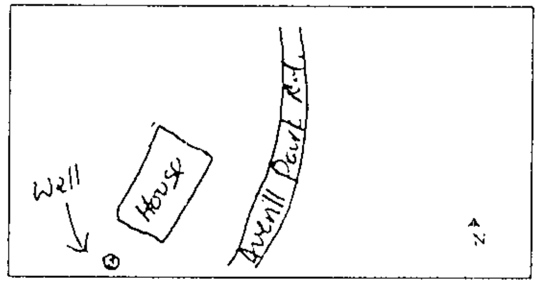
Well ID/Alias 191-05-82

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 1620

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6"

Material of inner/outer casing steel

Inner/outer casing stickup (AGS) 1.75'

Total depth of well 123

Total depth to water (note if pumping or non-pumping) 24.94', not pumping

Water level measuring point Steel Casing

Pump description Jet pump

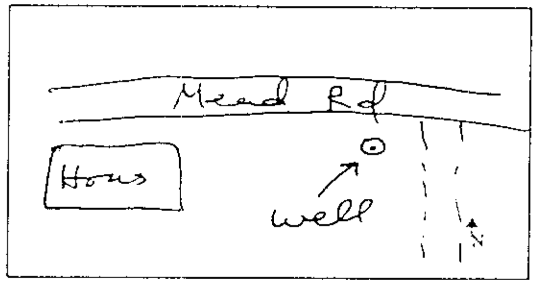
Downpipe description NA

Photo Number #2 Roll #2

Comments * Mr. Nally says well was drilled to 120' w/ 40' of casing & yields 40 GPM well was new 2 yrs ago

Loeffel Residential Well Survey

Location map:



Well ID/Alias ___ 1191-05-17

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / $17:20

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition None

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6" ID

Material of inner/outer casing Steel

Inner/outer casing stickup (AGS) 2.0'

Total depth of well 200.1' from casing *

Total depth to water (note if pumping or non-pumping) 53.80', not pumping

Water level measuring point Steel casing

Pump description submersible

Downpipe description none

Photo Number #3 Roll #2

Comments * got DTB probe stuck @ 198'
~~will have to pull pump @ 3:30~~
~~tommorow when residents are home &~~
~~can supervise~~. Tay Carlson will
pull pump tomorrow for $120.

Loeffel Residential Well Survey

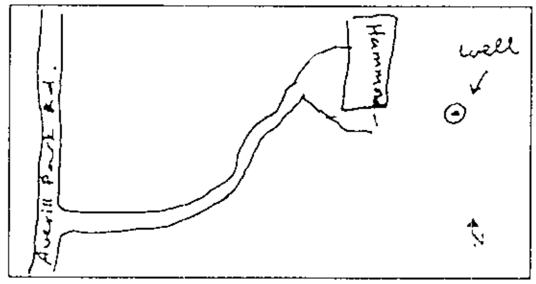
Well ID/Alias /191-05-18.2

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 0928

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap w/ pinch bolts

Condition of protective cap/lock good

Diameter inner/outer casing 6" ID

Material of inner/outer casing Steel

Inner/outer casing stickup (AGS) 3.85' from high point

Total depth of well 224'

Total depth to water (note if pumping or non-pumping) 20.92

Water level measuring point steel casing

Pump description Submersible

Downpipe description none

Photo Number 2 Roll # 1

Comments

Loeffel Residential Well Survey

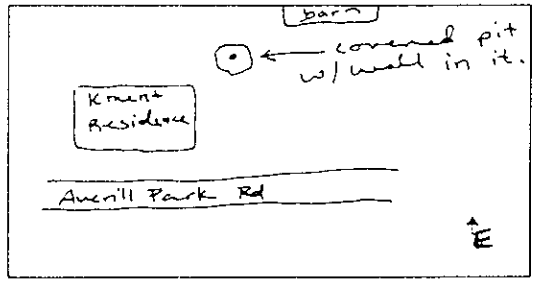
Well ID/Alias 191-05-13.2

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 08:40

Location map:



Observations

Well location (pit/non-pit) pit

Well pad type/dimensions non

Well pad condition non

Presence of protective cap/lock ---

Condition of protective cap/lock ---

Diameter inner/outer casing —

Material of inner/outer casing —

Inner/outer casing stickup (AGS) —

Total depth of well 80' pump @ 75' *

Total depth to water (note if pumping or non-pumping) —

Water level measuring point —

Pump description —

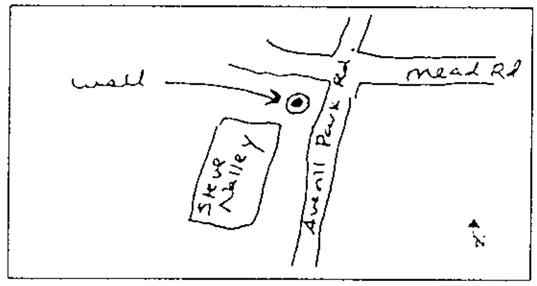
Downpipe description —

Photo Number not taken Roll 3

Comments * information from owner
owner would not allow well to be uncovered
or cap removed. Well was in a 6' hole
and cap to well was missing a gasket so
owner did not want to disturb it

Loeffel Residential Well Survey

Location map:



Well ID/Alia: /191-05-9.1

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 0850

Observations

Well location (pit/non-pit) non

Well pad type/dimensions non

Well pad condition non

Presence of protective cap/lock cap present w/pinch bolts

Condition of protective cap/lock good

Diameter inner/outer casing 6" I.D.

Material of inner/outer casing ~~[illegible]~~ Steel

Inner/outer casing stickup (AGS) 1.2'

Total depth of well 174.7'

Total depth to water (note if pumping or non-pumping) not pumping - 31.97'

Water level measuring point Steel casing

Pump description Submersible

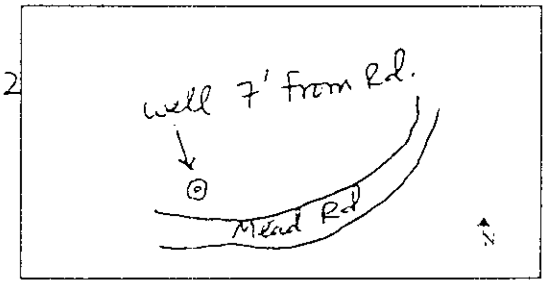
Downpipe description none

Photo Number 1 Roll 1

Comments

Loeffel Residential Well Survey

Location map:



Well ID/Alias L/191-05-14.2

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 1204

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions no pad

Well pad condition no pad

Presence of protective cap/lock protective pad, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6"

Material of inner/outer casing Steel

Inner/outer casing stickup (AGS) 6.51'

Total depth of well 139.5'

Total depth to water (note if pumping or non-pumping) 32.4' (not pumping)

Water level measuring point top of steel casing.

Pump description submersible - disconnected (wires cut @ toc)

Downpipe description none

Photo Number 3 Roll #1

Comments House no longer standing - has been demolished

Loeffel Residential Well Survey

Location map:

N

Well ID/Alias 192-01-4

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 1410

Observations

Well location (pit/non-pit) well covered, inaccesible

Well pad type/dimensions

Well pad condition

Presence of protective cap/lock

Condition of protective cap/lock

Diameter inner/outer casing

Material of inner/outer casing

Inner/outer casing stickup (AGS)

Total depth of well

Total depth to water (note if pumping or non-pumping)

Water level measuring point

Pump description

Downpipe description

Photo Number Roll

Comments Well not accessible, under new concrete pad laid for reconstruction of front steps.

Loeffel Residential Well Survey

tel #

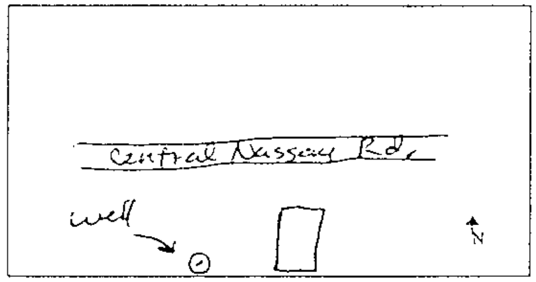
Well ID/Alias '192-01-59

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 1420

Location map:



Observations

Well location (pit/non-pit) dug well

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock concrete cap (approx 3' diam)

Condition of protective cap/lock good

Diameter inner/outer casing NM

Material of inner/outer casing Concrete

Inner/outer casing stickup (AGS) NM

Total depth of well 10.2'

Total depth to water (note if pumping or non-pumping) 2.52' from concrete casing

Water level measuring point concrete casing

Pump description shallow well pump

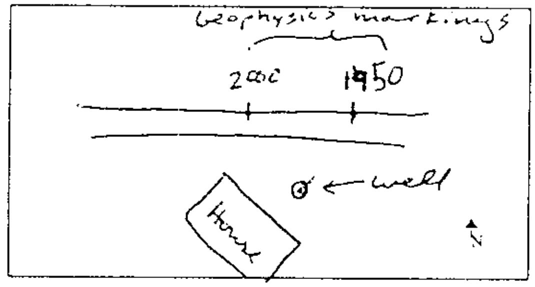
Downpipe description none

Photo Number #8 Roll #1

Comments

Loeffel Residential Well Survey

Location map:



Well ID/Alias 191-05-22.1

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 0840

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6" ID

Material of inner/outer casing steel

Inner/outer casing stickup (AGS) .91'

Total depth of well 205.85' from steel

Total depth to water (note if pumping or non-pumping) 15.98' not pumping

Water level measuring point Steel casing

Pump description Gould's submersible

Downpipe description none

Photo Number #10 Roll #1

Comments Owner info: 206' deep
pump @ 200'
surface of bedrock @ 31'

well was right between the Geophysics 1950 & 2000
marks @ almost the same elevation as both

Loeffel Residential Well Survey

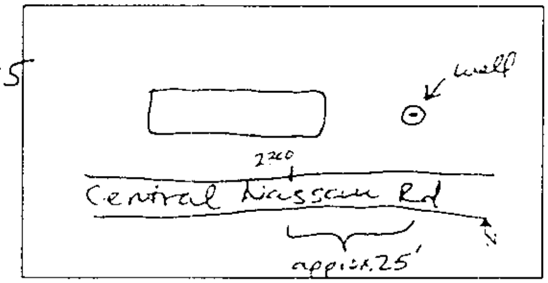
Well ID/Alias /191-05-25

Project Name/Number Loeffel

Inspector D. Finne

Date/Time 10-21-96 / 1230

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock no lock, cap in poor condition

Condition of protective cap/lock cap in poor condition

Diameter inner/outer casing 6" ID

Material of inner/outer casing steel

Inner/outer casing stickup (AGS) .78'

Total depth of well 173'

Total depth to water (note if pumping or non-pumping) 27.1'

Water level measuring point steel casing

Pump description submersible

Downpipe description none

Photo Number 4 Roll # 1

Comments well is 25' East of the Geophysics 2300 mark on rd. & aprox 40' North of the rd. Diff. in elevation appears to be aprox. +5'-6'.

Loeffel Residential Well Survey

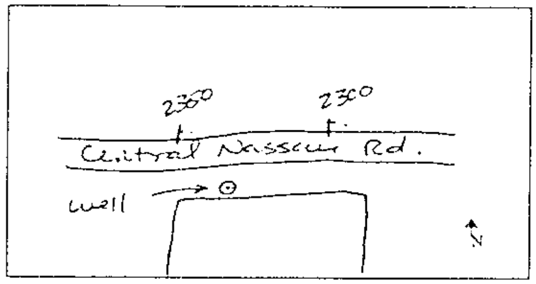
Well ID/Alia: 191-05-22

Project Name/Number: Loeffel

Inspector: D. Finney

Date/Time: 10-21-96 / 1305

Location map:



Observations

Well location (pit/non-pit): non-pit

Well pad type/dimensions: none

Well pad condition: none

Presence of protective cap/lock: cap w/no lock

Condition of protective cap/lock: good

Diameter inner/outer casing: 6" I.D.

Material of inner/outer casing: Steel

Inner/outer casing stickup (AGS): 1.40'

Total depth of well: 200'

Total depth to water (note if pumping or non-pumping): 40.11, not pumping

Water level measuring point: Steel

Pump description: Submersible

Downpipe description: none

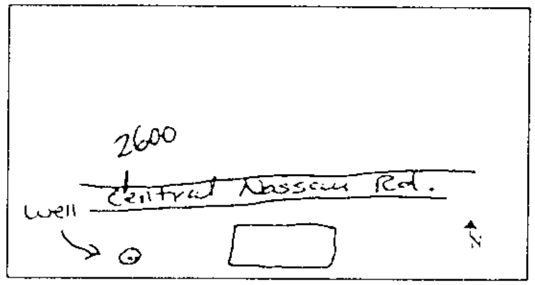
Photo Number: #5 Roll: #1

Comments: Owners says hole is aprox 205' deep
& 20' to bedrock.
Measured DTB might have been depth to pump
talked to driller - he had set pump aprox. 5' from bottom.

Well is approx 3-5 lower than 2350 Geophysics mark.

Loeffel Residential Well Survey

Location map:



Well ID/Alias ___ 191-05-24

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 / 1320

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6"

Material of inner/outer casing steel

Inner/outer casing stickup (AGS) 2.25'

Total depth of well 215.5' from m.p.

Total depth to water (note if pumping or non-pumping) 22.87' from casing

Water level measuring point steel casing

Pump description submersible

Downpipe description none

Photo Number #6 Roll #1

Comments Owner info : tot. depth = 213
length of casing = 32'
Static W.L. = 18.0' static W.L.

Well is aprox. 10' lower than Geophysics
2000 mark

Loeffel Residential Well Survey

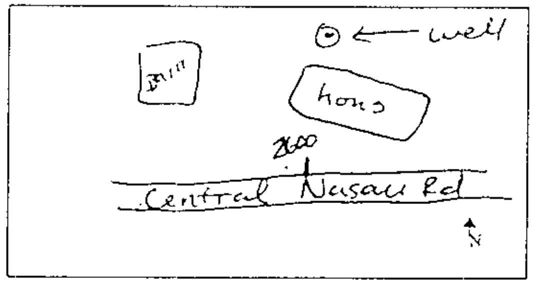
Well ID/Alias 191-05-26

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 1350

Location map:



Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6"

Material of inner/outer casing Steel

Inner/outer casing stickup (AGS) 1.7'

Total depth of well 179.2' from Steel

Total depth to water (note if pumping or non-pumping) 49.91' not pumping

Water level measuring point Steel casing

Pump description Submersible

Downpipe description none

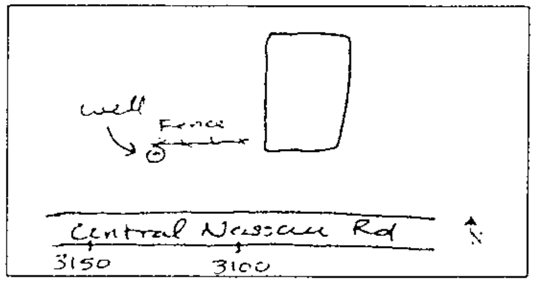
Photo Number #7 Roll #1

Comments Well is aprox. 8'-10' higher than Geophysics 2600 mark.

Loeffel Residential Well Survey

191-05-20

Location map:



Well ID/Alias

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 0930

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap w/ no lock

Condition of protective cap/lock fair (pinch bolts broken)

Diameter inner/outer casing 6" ID

Material of inner/outer casing steel

Inner/outer casing stickup (AGS)

Total depth of well NM - could not get probe past 154'

Total depth to water (note if pumping or non-pumping) 11.50' not pumping *

Water level measuring point Steel casing

Pump description Submersible

Downpipe description none

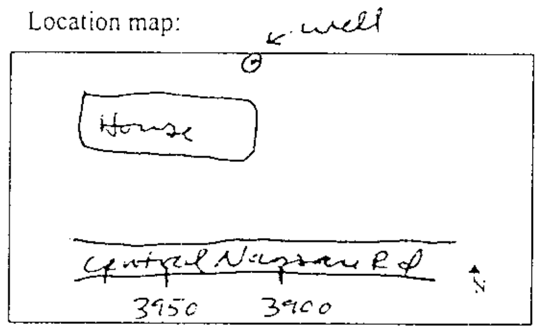
Photo Number #11 Roll #1

Comments * clear viscous gelatin like substance on the end of W.L probe - (hard to read W.L.).

Well is aprox. 4-5' higher in elevation than 3100 geophysics mark

Loeffel Residential Well Survey

/ 191-05-28

Location map: 

Well ID/Alias

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-22-96 / 1020

Observations

Well location (pit/non-pit) non-pit

Well pad type/dimensions none

Well pad condition none

Presence of protective cap/lock cap, no lock

Condition of protective cap/lock good

Diameter inner/outer casing 6" I.D.

Material of inner/outer casing Steel

Inner/outer casing stickup (AGS) 2.08'

Total depth of well 123.6'

Total depth to water (note if pumping or non-pumping) 30.08, not pumping

Water level measuring point Steel casing

Pump description Submersible

Downpipe description none

Photo Number #12 Roll #1

Comments diff in elevation between well & 3900 is + 6' approx. (well is aprox. 6' higher in elev)

Loeffel Residential Well Survey

/ 192-01-61

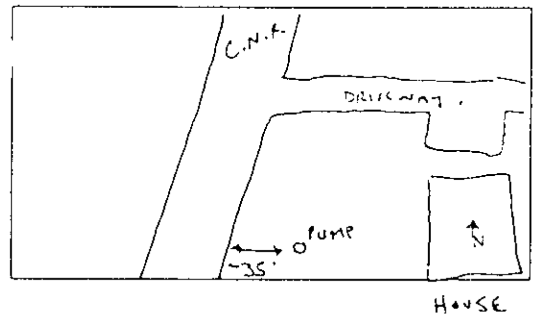
Well ID/Alias

Project Name/Number LOEFFEL

Inspector J. ZERA

Date/Time 10/25/96 1045 HRS

Location map:



Observations

Well location (pit/non-pit) NON-PIT

Well pad type/dimensions N/A

Well pad condition N/A

Presence of protective cap/lock CAP W/ BOLTS / NO LOCK

Condition of protective cap/lock EXCELLENT

Diameter inner/outer casing 5.1" ID / 5.5" OD

Material of inner/outer casing STEEL

Inner/outer casing stickup (AGS) 1.32'

Total depth of well 220.25' TOC / 218.93' BGS / COVER SAYS 278' / BOTTOM IS SOLID.

Total depth to water (note if pumping or non-pumping) 73.7' PUMP ON/OFF / RECHARGE @ ~0.1'/3-5 SEC.

Water level measuring point TOC / DTW: 72.38' BGS

Pump description N/A TWO WIRES BLACK + YELLOW

Downpipe description N/A NEED A GOOD FLASHLIGHT

Photo Number — Roll —

Comments WELL CAP FROM HANSEN / MR. KING SAID THAT WHEN THE POND SW OF HIS HOUSE WAS DRAINED + DREDGED, THEY "HAD BLACK WATER COMMING FROM THEIR WELL FOR SEVERAL DAYS".

Loeffel Residential Well Survey

Well ID/Alia ______ / 131-05-18.12

Project Name/Number Loeffel

Inspector B. Bour

Date/Time 11/6/96

Location map:

N/A

N

Observations

Well location (pit/non-pit) Dug well

Well pad type/dimensions N/A

Well pad condition N/A

Presence of protective cap/lock N/A

Condition of protective cap/lock N/A

Diameter inner/outer casing N/A

Material of inner/outer casing N/A

Inner/outer casing stickup (AGS) N/A

Total depth of well N/A

Total depth to water (note if pumping or non-pumping) N/A

Water level measuring point N/A

Pump description N/A

Downpipe description N/A

Photo Number N/A Roll ______

Comments Based on discussion with John Sheehan (NYSDOH) well is shallow well and was not included in residential well survey

Loeffel Residential Well Survey

Well ID/Alias: / 191-05-23

Project Name/Number: Loeffel

Inspector: B. Bour

Date/Time: 11/6/96

Location map:

Well could not be located

N

Observations

Well location (pit/non-pit): N/A

Well pad type/dimensions: N/A

Well pad condition: N/A

Presence of protective cap/lock: N/A

Condition of protective cap/lock: N/A

Diameter inner/outer casing: N/A

Material of inner/outer casing: N/A

Inner/outer casing stickup (AGS): N/A

Total depth of well: N/A

Total depth to water (note if pumping or non-pumping): N/A

Water level measuring point: N/A

Pump description: N/A

Downpipe description: N/A

Photo Number: N/A Roll: N/A

Comments: well could not be located

Loeffel Residential Well Survey

Well ID/Alia: 191-05-27

Project Name/Number: Loeffel

Inspector: B. Bour

Date/Time: 11/6/96

Location map:

N/A

N

Observations

Well location (pit/non-pit): N/A

Well pad type/dimensions: N/A

Well pad condition: N/A

Presence of protective cap/lock: N/A

Condition of protective cap/lock: N/A

Diameter inner/outer casing: N/A

Material of inner/outer casing: N/A

Inner/outer casing stickup (AGS): N/A

Total depth of well: N/A

Total depth to water (note if pumping or non-pumping): N/A

Water level measuring point: N/A

Pump description: N/A

Downpipe description: N/A

Photo Number: N/A Roll

Comments: Resident not available to grant access during survey. Driller's Log used (see Table 1)

Loeffel Residential Well Survey

Well ID/Alias 1192-01-3B

Project Name/Number Loeffel

Inspector B. Boul

Date/Time 11/6/96

Location map:

Observations

Well location (pit/non-pit) N/A

Well pad type/dimensions N/A

Well pad condition N/A

Presence of protective cap/lock N/A

Condition of protective cap/lock N/A

Diameter inner/outer casing N/A

Material of inner/outer casing N/A

Inner/outer casing stickup (AGS) N/A

Total depth of well N/A

Total depth to water (note if pumping or non-pumping) N/A

Water level measuring point N/A

Pump description N/A

Downpipe description N/A

Photo Number N/A Roll

Comments Information collected in previous RI activities (see Table 1).

Loeffel Residential Well Survey

Well ID/Alias '141-05-21A

Project Name/Number Loeffel

Inspector B. Bovr

Date/Time 11/6/96

Location map:

N/A

N

Observations

Well location (pit/non-pit)

Well pad type/dimensions

Well pad condition

Presence of protective cap/lock

Condition of protective cap/lock

Diameter inner/outer casing

Material of inner/outer casing

Inner/outer casing stickup (AGS)

Total depth of well

Total depth to water (note if pumping or non-pumping)

Water level measuring point

Pump description

Downpipe description

Photo Number Roll

Comments Information collected in previous RI activities (see Table 1)

Loeffel Residential Well Survey

Well ID/Alias 141-05-21B

Project Name/Number Loeffel

Inspector B. Bour

Date/Time 11/6/96

Location map:

N/A

N

Observations

Well location (pit/non-pit) N/A

Well pad type/dimensions N/A

Well pad condition N/A

Presence of protective cap/lock N/A

Condition of protective cap/lock N/A

Diameter inner/outer casing N/A

Material of inner/outer casing N/A

Inner/outer casing stickup (AGS) N/A

Total depth of well N/A

Total depth to water (note if pumping or non-pumping) N/A

Water level measuring point N/A

Pump description N/A

Downpipe description N/A

Photo Number N/A Roll

Comments Information collected in previous RI activities (see Table 1)

Loeffel Residential Well Survey

Well ID/Ali: /191-05-18.11

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 /0915

Location map:

could not locate
well

N

Observations

Well location (pit/non-pit) Could not locate well

Well pad type/dimensions

Well pad condition

Presence of protective cap/lock

Condition of protective cap/lock

Diameter inner/outer casing

Material of inner/outer casing

Inner/outer casing stickup (AGS)

Total depth of well

Total depth to water (note if pumping or non-pumping)

Water level measuring point

Pump description Goulds Jet pump in bulkhead

Downpipe description

Photo Number none Roll none

Comments *pump was replaced 20 yrs ago by Don Nalley, according to Mary Arnold a submersible was put in the well.

Loeffel Residential Well Survey

Well ID/Alias '191-05-13.1

Project Name/Number Loeffel

Inspector D. Finney

Date/Time 10-21-96 0830

Location map:

Could Not Locate Well.

N

Observations

Well location (pit/non-pit) could not Locate well

Well pad type/dimensions

Well pad condition

Presence of protective cap/lock

Condition of protective cap/lock

Diameter inner/outer casing

Material of inner/outer casing

Inner/outer casing stickup (AGS)

Total depth of well

Total depth to water (note if pumping or non-pumping)

Water level measuring point

Pump description Jet Pump in basement

Downpipe description

Photo Number none Roll

Comments Residents do not know location of well
Well could not be located

Loeffel Residential Well Survey

Well ID/Alias L 191-05-15

Project Name/Number Loeffel

Inspector B. Bour

Date/Time 11/6/96

Location map:

N/A

N

Observations

Well location (pit/non-pit)

Well pad type/dimensions

Well pad condition

Presence of protective cap/lock

Condition of protective cap/lock

Diameter inner/outer casing

Material of inner/outer casing

Inner/outer casing stickup (AGS)

Total depth of well

Total depth to water (note if pumping or non-pumping)

Water level measuring point

Pump description

Downpipe description

Photo Number Roll

Comments Information collected during Previous RI activities (see Table 1).

ATTACHMENT 2

RESIDENTIAL WELL PHOTOGRAPHS

Residential Well Survey

Well ID:
191-05-17

Well ID:
191-05-18.2

7775001pg2

Residential Well Survey

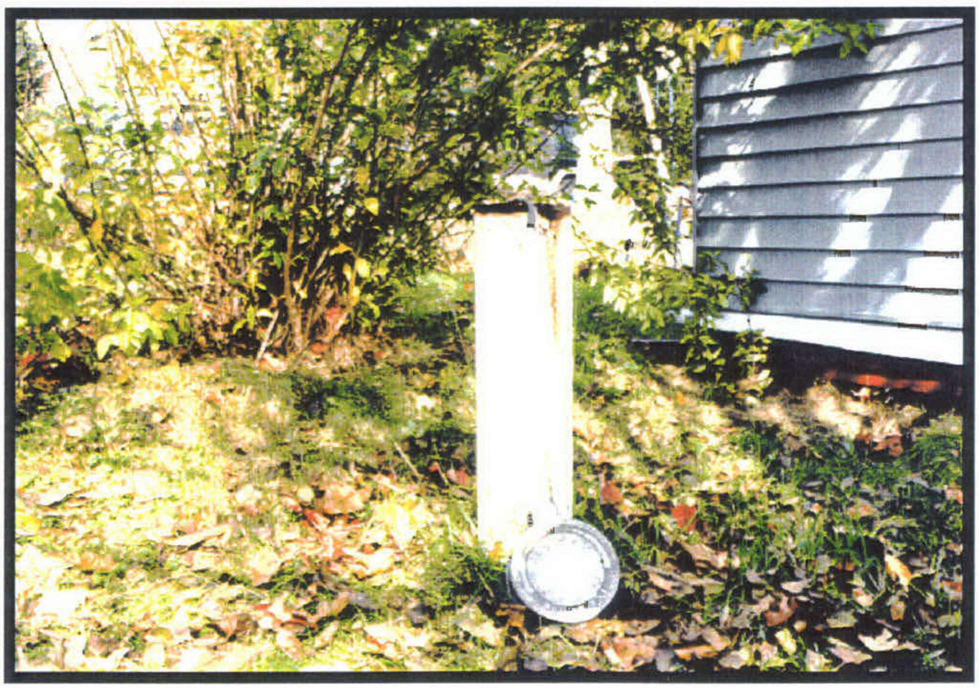
Well ID:
191-05-22.1

Well ID:
192-01-2

7775001pg3

Residential Well Survey

Well ID:
191-05-22



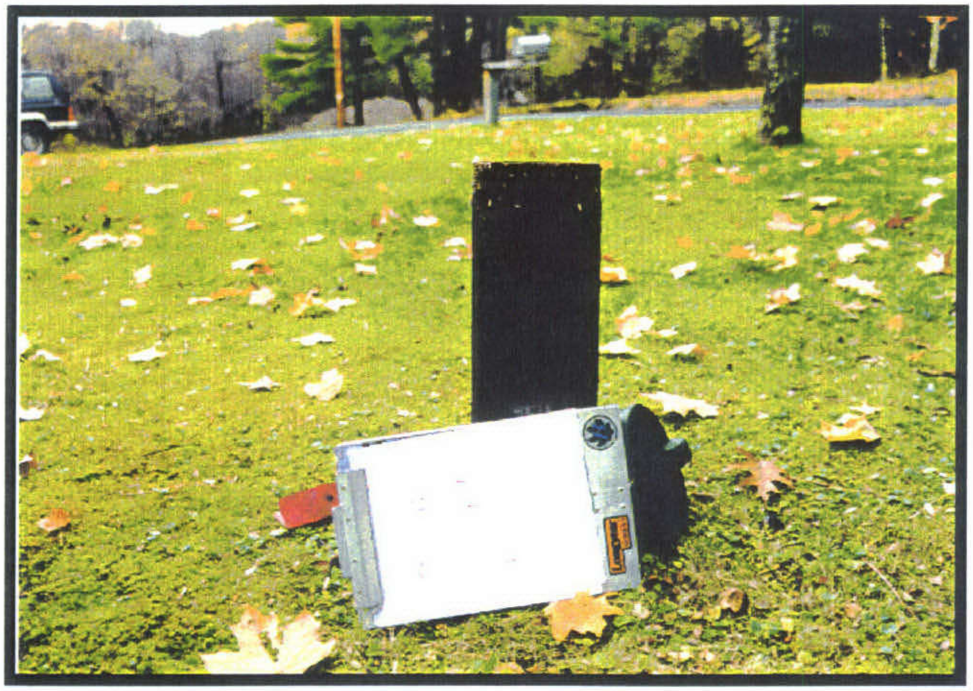
Well ID:
191-05-24

Residential Well Survey

Well ID:
191-05-26

Well ID:
192-01-60

Residential Well Survey



Well ID:
191-05-82

Well ID:
191-05-9.1

Residential Well Survey

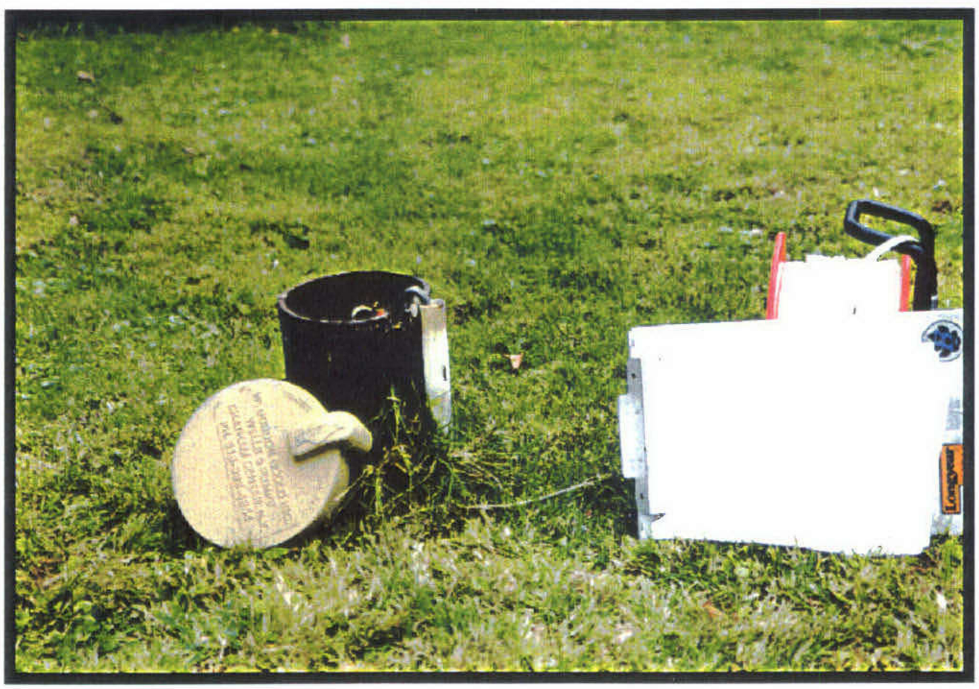
Well ID:
191-05-28

Well ID:
192-01-7

7775001-pg1

Residential Well Survey

Well ID:
192-01-59



Well ID:
191-04-35.2

7775001pg7

Residential Well Survey

Well ID:
192-01-3A

Well ID:
191-05-20

Residential Well Survey

**Well ID:
191-05-29B**

**Well ID:
191-05-25**

7775001pg9

Residential Well Survey

Well ID:
191-05-14.2

Well ID:
192-01-5

7775001pg8

ATTACHMENT 3

NYSDOH Residential Well Information

RESIDEN   WELL INFORMATION NASSAU, NY
Loeffel Site Environs

NYSDOH - 1993

GENERAL INFORMATION	Parcel ID (Tax Map, Block Lot No.)	191.00 - 05 - 17	191 - 04 - 14.2	191 - 05 - 15	191.00 - 05 - 20
	Street Address				
	Property Owner				
	Tenant (If applicable)				
	How long has owner/tenant lived there and used well?	8 YRS	—	8 YRS	
WELL LOCATION Relative to:	Residence/building it serves	BETWEEN HOUSE + DRIVE	FRONT	BACK OF HOUSE	
	Septic system(s)	BACK OF HOUSE	?	FRONT OF HOUSE	
	Above ground or underground storage tanks or fill ports		NONE	NONE	
	Storage areas for gasoline, solvents, pesticides/fertilizers, etc.		NONE	NONE	
	Other potential sources of contaminants (i.e. garage/ repair shop).		NONE	NONE	
WATER YIELD/QUALITY	Well yield (gpm)		3 gpm ±	?	
	Does well ever run dry?		NO	NO	
	Any seasonal changes in water? (i.e sediment content)		NO		
	Has well ever been sampled? If so, when, by whom, and what were the results? Use attachment if necessary.	NYSDOH + KCHD EARLY 80s + 1988 CLEAN	1980 TO 1993 ROUTINELY BY NYSDOH + KCHD	1988 TO 1995 ROUTINELY BY NYSDOH	YES DOH/KCHD EARLY 80s + 1988 1992 - ~~PLEASANT~~ GE
WELL INSTALLATION	Name of well driller	?	GOULD	GOULD	
	Date/year of Installation	?	1980	1985 ±	?
	Boring log available/obtained	NO	NO	NO	
	Depth of well	200 ±	220	250	
	Size and depth of casings	6" DEPTH UNKNOWN	DOUBLE CASED 114 4" SLEEVE	?	
	Type of pump (electric, jet pump, other)	SUBMERSIBLE	SUBMERSIBLE	SUBMERSIBLE	
	Date of/company performing repairs				

RESIDEN[illegible] WELL INFORMATION NASSAU, NY
[illegible]offel Site [illegible]virons

NYSDO[illegible] 1993

GENERAL INFORMATION	Parcel ID (Tax map, Block Lot No.)	191.00 - 05 - 21	192.00 - 01 - 03	192 - 01 - 2	191.00 - 05 - 22.1
	Street Address				RD
	Property Owner				
	Tenant (if applicable)				
	How long has owner/tenant lived there and used well?	15 YRS ±	1 YR	15 YRS	12 YRS
WELL LOCATION Relative to:	Residence/building it serves	OLD well - FRONT NEW well - BACK	BACK OF House	SIDE OF HOUSE	FRONT OF house
	Septic system(s)	OLD well - 100' NEW well 150'	FRONT OF House	BACK OF HOUSE	BACK OF house
	Above ground or underground storage tanks or fill ports	FUEL OIL	FUEL OIL	FUEL OIL	NONE
	Storage areas for gasoline, solvents, pesticides/fertilizers, etc.	NONE	NONE	NONE	NONE
	Other potential sources of contaminants (i.e. garage/ repair shop)	NONE	NONE	NONE	NONE
WATER YIELD/QUALITY	Well yield (gpm)	OLD well LOW NEW well MODERATE	?	?	?
	Does well ever run dry?	NO	NO	NO	NO
	Any seasonal changes in water? (i.e sediment content)	NO	NO	NO	NO
	Has well ever been sampled? If so, when, by whom, and what were the results? Use attachment if necessary.	YES NYSDOH RCHD 1982 + 1988 CLEAN	YES NYSDOH RCHD EARLY 80S - 1988 1993 CLEAN	YES NYSDOH RCHD CLEAN EARLY 80S, 1988 1993 + 1994 - 1995	NYSDOH 1993 - 1995 CLEAN
WELL INSTALLATION	Name of well driller	HANSON	?	GOULD	ADAM HACKER
	Date/year of installation	OLD well ?? NEW well 1989 - 90	1948	DEEPENED 1990	1981
	Boring log available/obtained	NO	NO	NO	YES / NO
	Depth of well	OLD well 212 NEW well 380	96	250 ±	206' WATER AT 151
	Size and depth of casings	6"	6" DEPTH UNKNOWN	6" DEPTH UNKNOWN	45'
	Type of pump (electric, jet pump, other)	SUBMERSIBLE	JET	SUBMERSIBLE	SUBMERSIBLE
	Date of/company performing repairs				

GENERAL INFORMATION	Parcel ID (Tax map, Block Lot No.)	191.00-05-27	191.00-05-22.2	191.00-05-18.12	191.00-05-18.2
	Street Address	?			
	Property Owner				
	Tenant (If applicable)				
	How long has owner/tenant lived there and used well?	7 YRS	20 YRS	3 YRS	10 YRS
WELL LOCATION Relative to:	Residence/building it serves	FRONT OF HOUSE	FRONT		?
	Septic system(s)	BACK OF HOUSE	BACK		?
	Above ground or underground storage tanks or fill ports	?	NO	NO	NO
	Storage areas for gasoline, solvents, pesticides/fertilizers, etc.	?	NO	NO	NO
	Other potential sources of contaminants (i.e. garage/repair shop).	?	NONE	NONE	NONE
WATER YIELD/QUALITY	Well yield (gpm)	5.5 GPH	15 GPH	?	?
	Does well ever run dry?	NO	NO	NO	NO
	Any seasonal changes in water? (i.e sediment content)	NO	NO	NO	NO
	Has well ever been sampled? If so, when, by whom, and what were the results? Use attachment if necessary.	NYSDOH 1993 + 94 CLEAN	LOW LEVEL CONTAMINATE. YES NYSDOH 1993 TO 1995	NYSDOH 1993 CLEAN	NYSDOH 1988 CLEAN
WELL INSTALLATION	Name of well driller	See Log	ADAM HACKER	Dug well	?
	Date/year of installation	See Log	1960 DEEPENED 1991	1990	1980 ±
	Boring log available/obtained	YES	NO	—	NO
	Depth of well	75'	155 - 1960 205 - 1991	9' Dug well	200'
	Size and depth of casings	6" / 40' Deep	6" / ?	BLOCK CASING	6" DEPTH UNKNOWN
	Type of pump (electric, jet pump, other)	SUBMERSIBLE	SUBMERSIBLE	Shallow Well Pump	
	Date of/company performing repairs				

Rural Water Supply

Well at Hoag Rd in Nassau County of Renss.
Name of place — City village or (town)

Owner 191-05-27 P.O. Address E. Nassau

Depth of well 78 ft. Diameter 6 in. Yield 5½ gpm. Was well disinfected? YES (yes or no)

Amt. of casing above ground 24 in. Below ground 40 ft. Well seal cement (packer, cement grout.)

Draw a well diagram in the space provided below and show the depth of casing, the well seal, kind and thickness of formations penetrated, water bearing formations, diameter of drill holes with dotted lines and casing(s) with solid lines.

WELL DIAGRAM Diameter, inches	Depth in ft.	FORMATIONS PENETRATED Kind, thickness and if water bearing
	Grade	
	25	30' Clay
	50	
	75	Stone water bearing 78'
	100	
	150	
	200	
	250	

REMARKS

Type of well drilled
Drilling method hammer
Was well dynamited? NO

PUMPING TESTS

Details	#1	#2	#3
Static water level, in ft. below grade			
Pumping rate in g.p.m.			
Pumping level in ft. below grade			
Duration of test, in hrs.			

Water at end of test:
Clear X Cloudy ..... Turbid .....

Recommended depth of pump in well feet below grade 75'

Wells in sand & gravel:
Sand Eff. size .... mm
Unif. Coef. ....
Length of screen .... ft.
Diam. of screen .... in.
Type of screen ....
Screen openings ....x....

Comments:

Show cross-section of well & formations penetrated above. Draw a sketch of the property on the right of this sheet locating the well and sewage disposal systems.

Drilling started 5/10 Completed 5/15
Well Driller X Edmund Kross
Signature

WELL DRILLER'S LOG AND REPORT

10 11--61--500

Rensselaer County Department of Health

Draw a sketch showing outline of property, general slope of ground, location of structures, roads, ditches, watercourses, wooded areas, swamps, ponds, rock outcrops, sewers, septic tanks, leaching systems for sewage, test holes, wells and springs. Give direction and distance to nearest community.

Consider space between lines equal to 25, 50, or 100 feet. Make top of page North and draw sketch accordingly.

WELL LOCATION SKETCH

ATTACHMENT 4

DRILLER'S DATA SHEETS

W. Gordon Goold, Inc
17 Goold Rd
Valatie, NY 12184
(518) 392-4254

Well Record of: 191-05-14.2

Name:

Address:

City: Nassau

State: NY Zip:

Last Service: 4/15/96

Well Information		Pump Information:			
Drilled:	1/15/80	Installed:	1/17/80		
Dia:	6"	Pump Mfgr:	His 1/3 hp Goulds	Model:	
Depth:	220'	Drop Pipe:	140' PVC		
Casing:	115'	Tank:		Size:	
Elevation:	38'				
Flow GPM:	4				
Analysis:	Shale				
Screen if used:					

W. Gordon Goold, Inc
17 Goold Rd
Valatie, NY 12184
(518) 392-4254

191-05-15

Well Record of:

Name:

Address:

County: Nassau

State: NY Zip:

Last Service Date: 11/6/84

Well Information:		Pump Information:			
Drilled:	10/30/84	Installed:	11/6/84		
Dia:	6"	Pump Mfgr:	Goulds	Model:	5ES05422
Depth:	430'	Drop Pipe:	200' PVC		
Casing:	72'	Tank:	Extrol	Size:	202
Elevation:	24'				
Flow GPM:	5				
Analysis:	state				
Screen if used:					

W. Gordon Goold, Inc
17 Goold Rd
Valatie, NY 12184
(518) 392-4254

Well Record of:

Name: 191-05-26

191-05-26

Address:

City: Nassau

State: NY Zip: 12123

Last Service:

Well Information:

Drilled: 7/11/71

Dia:

Depth: 200'

Casing: 45'

Elevation: Depth to water

Flow GPM: 2

Analysis: Red Shale

Screen if used:

Pump Information:

Installed:

Pump Mfgr: Model:

Drop Pipe:

Tank: Size:

✓

Owners Name 192-01-2

Former Owners

Address

Billing Address East Nassau, NY 12062

City Hoags Corners State NY Contractor

Zip 12062 County Ren Town Nassau

Phone Other Phone

Services Notes Last Service Date 8/30/90 Jobsite

Deepen from 130'

Quit

Start Date	8/30/90	End Date	8/30/90
Depth	160'	Drill method	R
Casing		Dia	6"
Yield	10	DriveShoe	
Static	0'	Well Cap	
Screen			
Driller	Roger & Keith		
Analysis	Red & Gray Shale & Grit		
Water		Type Deepen	Use Dom
Formation			

1st Date	8/30/90	LastDate	
Pump	Burk		
Type	2W5SNB11AA 1/2 HP		
Drop Pipe	160' sch 40		
Ft Wire	170' 12/2w	Ga	
Tank	Extrol		
Size	250		
Kit	1 1/4"	Lght Arr	
Pit	Martiosnos	Tor Arr	
Poly Pipe		UF Wire	

Owner's Name 192-01-5

Former Owners

Address East Nassau Rd.

Billing Address Nassau, N.Y. 12123

City East Nassau State NY Contractor

Zip 1?062 County Ren Town Nassau

Phone

Other Phone 766-2125

Service Notes Last Service Date 11/9/90

Jobsite 192-01-5

Quit

Start Date 1?/8/90	End Date 11/9/90	1st Date	LastDate
Depth ?20'	Drill method R	Pump	
Casing 6"	Dia 6"	Type	
Flow ?0	DriveShoe X	Drop Pipe	
Elevation 40'	Well Cap X	Ft Wire	Ga
		Tank	
Screen		Size	
Driller Walter & Keith		Kit	Lght Arr
Analysis Red & Gray Shale		Pit	Tor Arr
Well Type New	Use Dom	Poly Pipe	UF Wire

Formation 0 - 20 Hardpan & Boulders 20 - 53 Hardpan 53 - 320 RRed & Gray Shale - Seams of Sandstone

Owner 192-01-5

Former Owners

Address East Nassau Rd.

Billing Address

City East Nassau State NY Contractor

Zip 12062 County Ren Town Nassau

Phone Other Phone

Service Notes Last Service Date 6/1/71

71 - DEEPEN

Jobsite 192-01-5

Quit

Start Date End Date 3/30/71

Depth 120' Drill method r

Casing 65' Dia 6"

Flow 4 DriveShoe x

Elevation Well Cap x

Driller

Well 71-27 Type Deepen Use dom

Formation

1st Date 6/1/71 LastDate

Pump Tait

Type 5P27

Drop Pipe 100' PVC

Ft Wire Ga

Tank

Size 42 Gal.

Kit Lght Arr

Pit Martinson Tor Arr

Poly Pipe UF Wire

Owner/Name 191-05-25

Former Owners

Address H..ags Corners Rd.

Billing Address

City Nassau. State NY Contractor

Zip 1.123 County Ren Town

Phone Other Phone

Service Notes Last Service Date

Jobsite 191-05-25

Quit

Start Date . 19/78 End Date 8/21/78

Depth 70' Drill method r

Casing 5' Dia 6"

Flow DriveShoe x

Elevation 2' Well Cap x

Screen

Driller Alan & George

Analysis gray & red shale

Water Type new Use Dom.

Formation

1st Date 9/15/78 LastDate

Pump Type his

Drop Pipe 100' PVC

Ft Wire 110' Ga 12/2

Tank Size

Kit Lght Arr

Pit Martinson Tor Arr

Poly Pipe UF Wire

APPENDIX E

APPENDIX E

SEISMIC REFLECTION/REFRACTION SURVEY REPORT

GEOPHYSICS GPR
INTERNATIONAL INC.

SEISMIC REFLECTION AND REFRACTION INVESTIGATION

DEWEY LOEFFEL LANDFILL SITE AREA
GENERAL ELECTRIC COMPANY

CENTRAL NASSAU ROAD
NASSAU, NEW YORK

Prepared for:

HSI-GEOTRANS, INC.
46050 Manekin Plaza, Suite 100
Sterling, Virginia 20166

Prepared by:

GEOPHYSICS GPR INTERNATIONAL, INC.
13 Highland Circle, Suite E
Needham Heights, Massachusetts 02194

March 14, 1997

Our Project No. B96142
Your Project No. N039-010

GEOPHYSICS GPR INTERNATIONAL INC.

13 Highland Circle Suite E
Needham Heights, MA
02194-3031

Tel.: (617) 455-0185
Fax: (617) 455-0522

March 14, 1997

Our Project No B96142
Your Project No. N039-010

Mr. Charles Spalding
HSI-GeoTrans, Inc.
46050 Manekin, Suite 100
Sterling, VA 02142

Re: Seismic Reflection and Refraction Services,
Dewey Loeffel Landfill Site Area, Nassau, New York

Dear Mr. Spalding:

In accordance with your General Contract, Geophysics GPR International, Inc. has conducted a seismic reflection and refraction investigation near the Dewey Loeffel Landfill, Central Nassau Road, Nassau, New York.

This preliminary report contains the results of our findings, and is intended for the use of HSI-GeoTrans and its client.

Sincerely,

GEOPHYSICS GPR INTERNATIONAL, INC.

Lm Tyrala

Lester M. Tyrala,
District Manager

LMT/hp

Att - 2 Bound & 1 Unbound Final Reports
8 Colored Seismic Reflection Figures
3 Foldout Combined Reflection/Refraction Maps

SEISMIC REFLECTION AND REFRACTION INVESTIGATION

DEWEY LOEFFEL LANDFILL SITE AREA
GENERAL ELECTRIC COMPANY

CENTRAL NASSAU ROAD
NASSAU, NEW YORK

Presented to:

HSI-GEOTRANS, INC
46050 Manekin Plaza, Suite 100
Sterling, Virginia 20166

Presented by:

GEOPHYSICS GPR INTERNATIONAL, INC.
13 Highland Circle, Suite E
Needham Heights, Massachusetts 02194

March 14, 1997

Our Project No. B96142
Your Project No. N039-010

CONTENTS

FIGURES

LIST OF MAPS

APPENDICES

1.0 INTRODUCTION

Geophysics GPR International, Inc., under a directive of GeoTrans, Inc., performed a geophysical investigation within the Dewey Loeffel Landfill environs, as described in the GeoTrans Statement of Work.

The seismic reflection and refraction surveys were conducted during the period of October 15 to 19, 1996, along Central Nassau Road (Fig. 1), Nassau, New York. The objectives of this geophysical survey were to evaluate bedrock trends and structures south of the landfill and aid in locating sites for deep bedrock wells. The area investigated by seismic reflection and refraction is flatlying and was free of moveable obstructions during the time of the survey.

The investigated site is in the town of Nassau, Rensselaer County, New York, located about twelve miles southeasterly of Albany. Previous geological and geophysical work at and near the landfill have indicated a complex nature of the sedimentary bedrock in terms of folding, deformation, and fracturing.

The surveyed site is a portion of Central Nassau Road generally located between the well 192-01-3B and an unpopulated interval of the road west of the intersection with Curtis Hill Road. The surveyed road interval is bounded on the north side by private residences and agricultural land and the south side by a westerly flowing stream, private residences, and agricultural land.

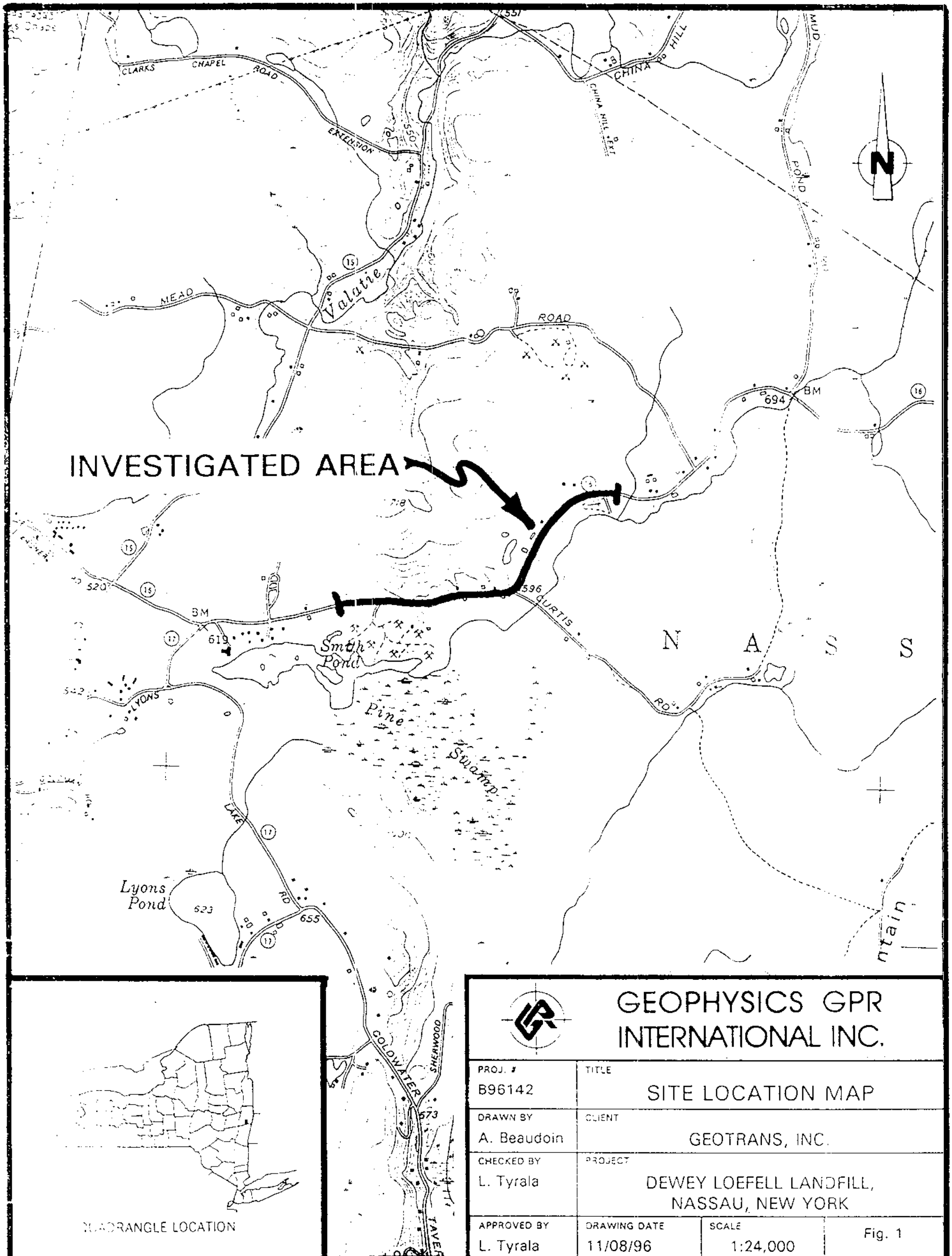
2.0 SITE AND AREA CONDITIONS

The site and environs are flatlying with a gentle southwesterly slope toward the stream. The seismic surveys were performed entirely along the northern unpaved, grassy shoulder of Central Nassau Road.

The surficial materials consist of placed road fill of gravel and unconsolidated glacial debris at and away from the shoulder. The area is well drained with the water table from 10 to 25 feet below ground surface (BGS) and the depth of overburden ranging from zero to 100 feet in the area. Cultural disturbance has slightly altered the natural topography and soil composition within the top few feet along the road and abutting properties.

3.0 SITE AREA GEOLOGY

The area of this investigation is underlain by an sequence of glacial deposits ranging in thickness from less than five feet to about 100 feet. The underlying materials consist of unconsolidated glacial deposits and till (GeoTrans, 1996).


INVESTIGATED AREA
CLARKS CHAPEL ROAD
EXTENSION
CHINA HILL
CHINA HILL EXT
MUD POND
MEAD ROAD
Valatie
CURTIS RD
Smith Pond
Pine Swamp
Lyons Pond
LAKE RD
COLDWATER
SHERWOOD
N A S S
BM
694
596
619
520
655
673
523
QUADRANGLE LOCATION
GEOPHYSICS GPR INTERNATIONAL INC.
PROJ. # B96142
TITLE SITE LOCATION MAP
DRAWN BY A. Beaudoin
CLIENT GEOTRANS, INC.
CHECKED BY L. Tyrala
PROJECT DEWEY LOEFELL LANDFILL, NASSAU, NEW YORK
APPROVED BY L. Tyrala
DRAWING DATE 11/08/96
SCALE 1:24,000
Fig. 1

The results of previous borings and excavations at the Loeffel Landfill, situated to the north about 3,500 feet, together with the results of a seismic reflection survey performed there in January, 1996, indicate that glacial till with stringers of sand and gravel form the overburden, generally thickening westerly of the landfill (GeoTrans, 1996). The bedrock is the early Cambrian Nassau Formation consisting of shale and greywacke.

The previous investigations have indicated a structural trend of horizontal to slightly dipping, relatively unfractured bedrock occurring at the eastern portion of the site and fold, fractured bedrock occurring at the western portion of the site. These features have been interpreted as possibly representing a shear zone or fault.

Shortly after the completion of the seismic surveys, a residential well survey was conducted at a number of private wells located along the interval of Central Nassau Road where the seismic surveys were performed. Data collected during the survey including depth to water table, depth to the bottom of overburden casing, total depth of the well, and yield rate, were evaluated during the interpretation of the geophysical profiles to aid in the understanding of bedrock trends.

4.0 METHODS OF INVESTIGATION

4.1 Seismic Reflection Survey

A digital seismograph was employed and configured for a reflection survey. The seismic reflection survey, ten foot spacing, was configured to aid in evaluating bedrock trends within the surveyed area and defining the bedrock surface. Interfaces which exhibit a contrast in acoustic impedance (the product of velocity and density) will reflect seismic energy back to the surface. Seismic reflection has the potential of detecting units of glacial strata and the detailed configuration of the bedrock surface and deeper structures (see App. A).

The performed seismic reflection survey employed common depth point (CDP) data acquisition with multi-fold coverage (12-fold (1,200% coverage)). Refer to Appendix A for the profile displaying the fold coverage. The energy source was a percussive industrial shotgun shell.

4.2 Seismic Refraction Survey

The same digital seismograph was used and set up in the seismic refraction mode. The objectives of the refraction survey were to provide information about possible low-velocity intervals in the bedrock and additional subsurface information. These traverses were laid out to be coincident with the reflection traverses with seven energy points (shots) along each spread for our quality control of field data collection: forward and reverse offset (far) shots, end shots, a center shot, and quarter shots. A two geophone overlap was laid out for contiguous spreads.

The offset (far) shots allow detailed calculation of the profile and velocity of the bedrock, while the shots within the spread provide information on the lateral variation in the velocity of the overburden, which is required to determine the depth to bedrock (see App. B). A percussive energy source was used for all shots.

5.0 DATA ACQUISITION

5.1 Equipment

A digital seismograph, a 24-channel EG&G SmartSeis, was employed for this investigation. Amplification of the signals from the geophones is accomplished using integrated floating point technology, which allows maximum trace size throughout the record. Each seismogram is recorded digitally on the seismograph hard drive, transferred to floppy disk, and printed onsite.

For the seismic reflection survey, a roll-along switch was used to select the appropriate 24 geophone position for each shotpoint from the total 48 geophone positions laid out as one spread. This switch allows for "rolling in and out" of the spread to efficiently increase the fold coverage and for continuous common-midpoint recording within the spread. Also, a three-geophone array was placed as a cluster at each of the 48 geophone positions. The purpose of this array was to minimize surface cultural noise, such as ground roll and out-of-plane reflections. For the refraction survey, a 24 geophone array was used.

A percussive Betsy seisgun (8-gauge industrial shotgun shell) was used as the energy source for the reflection and refraction surveys. Typically, ambient acoustic noise was at acceptable levels and, where at higher levels, overcome by stacking and filtering of the seismic records and/or waiting for lulls in the infrequent traffic on Central Nassau Road. Seismic reflection and refraction data were collected along the traverse during the period of October 15 to 19, 1996.

5.2 Walkaway Test

As the first field activity at this site, a walkaway test was performed to determine the optimal acquisition parameters for the seismic reflection survey. The results of this test are presented in detail in Appendix A, as well as the data signal analysis and the processing sequence used to obtain the final reflection stack version.

5.3 Survey Procedures

The specified configuration for the site required that a seismic traverse be performed as one continuous seismic line (see Fig. 2 and foldout map, pocket). The seismic reflection survey was performed with a ten foot geophone spacing along the specified locations. Depending upon the location constraint and anticipated depth to bedrock, the seismic refraction survey was conducted with a geophone spacing of 10 and 16.5 (5 m.) feet, yielding spread lengths from 230 and 380 feet, respectively. Weather conditions were typical for early autumn with seasonal temperatures and minor rainfall.

5.4 Interpretation

The results of the geophysical surveys were correlated with the relevant water well data at the time of the interpretation of the data. Not all of the water well that were consulted during the interpretation were plotted on profiles, primarily due to its distance from the seismic line and/or shallow depth of the boring. For example, monitoring well OMW 216 was referred to during the interpretation of the line, but not plotted on the profile due to its distance from the traverse.

The interpretation of the seismic reflection data involved 2-D inverse computer modeling. Full CDP data processing was accomplished including normal move out (NMO), filtering, and deconvolution. Each trace on the processed seismic section was spaced at one-half of the geophone spacing and represent the summation of the traces that receive reflections from the same subsurface point.

The results of the performed seismic refraction survey along portions of the seismic reflection traverse, together with water well information collected shortly after the demobilization of the GPR field crew, allowed for accurate determination of bedrock depths from the two-way travel times on the reflection profiles.

Appendix A contains the processed and interpreted reflection profile along the traverse with colored intervals to mark the top of the bedrock surface (green) and bedrock trends (red). Depth conversion of the seismic reflection data was performed by using average velocities derived from the refraction data and calibrated with the relevant well information.

Small bedrock discontinuities were not seen in the refraction records and are, typically, relief on the bedrock surface, for example, fracture breakouts of the rock, that can be imaged with reflection. Typically, these discontinuities are not manifested in the refraction profiles as low-velocity zones and are indicative of small, near-surface bedrock features.

Preliminary interpretation of the seismic refraction data was accomplished with the cross-over distance method. This method provides the depth to significant interfaces beneath the shotpoints. The reciprocal method of L.V. Hawkins (also known as Hawkins Method) was used to provide the detailed interpretation. Unlike the cross-over distance method, the reciprocal method allows the calculation of the depth to bedrock beneath each geophone. The concurrent use of both interpretive methods provides an important means of checking the validity of the interpretation.

6.0 RESULTS

6.1 Seismic Reflection and Refraction Surveys

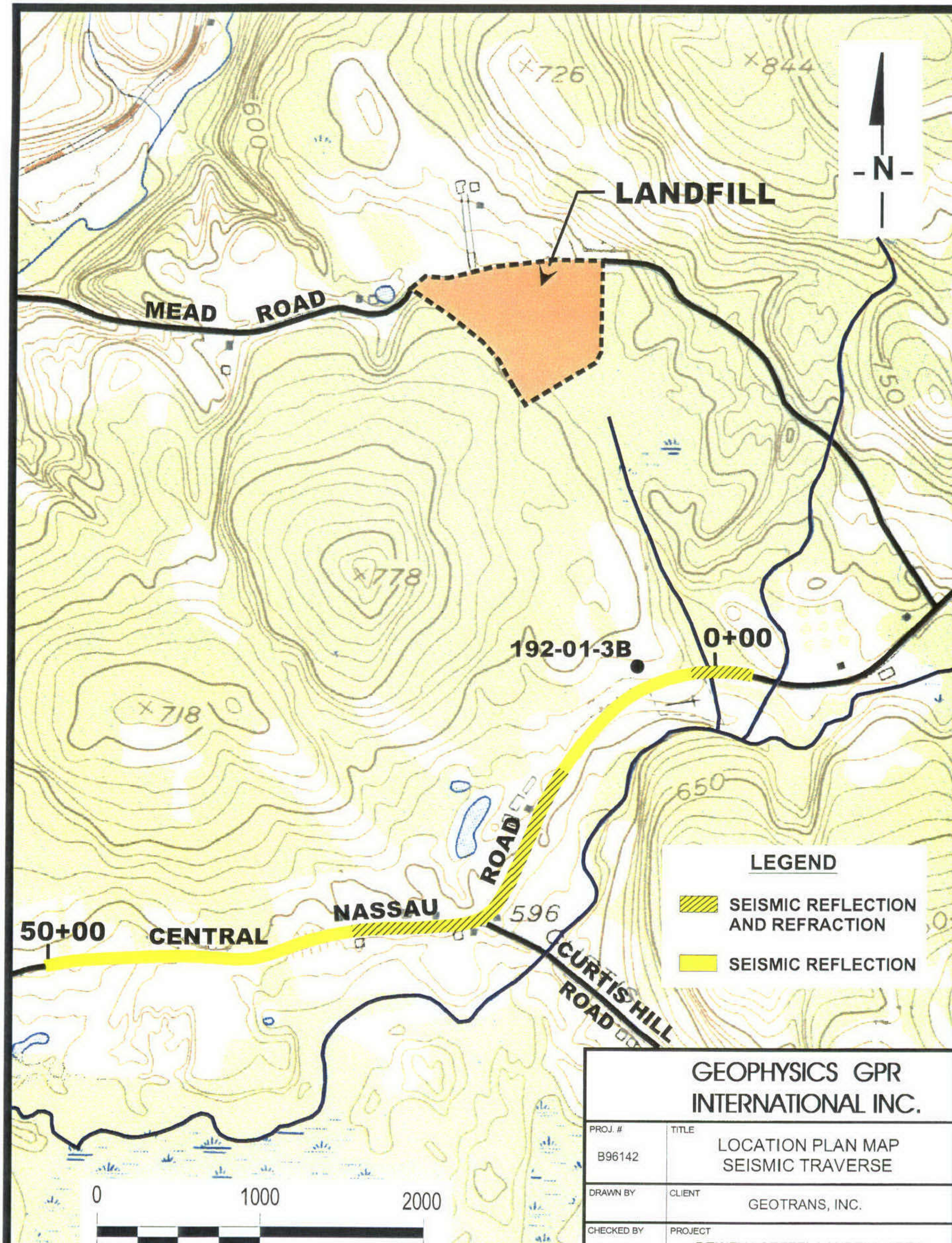
Approximately 5,000 linear feet of seismic reflection and 2,055 linear feet of seismic refraction profiling was accomplished along one continuous line traverse during the field surveys (Figure 2 and foldout map, pocket). The seismic surveys were performed at locations specified by GeoTrans, as required, to conform to the specified positions. Information provided by relevant water well data were integrated into the final geophysical interpretation. Differences between depths to the top of the water table, as determined from the seismic data and measured well data, may be related to pumping of individual wells during the time of the field surveys.

The results of the seismic reflection and refraction surveys are presented as an integrated cross-section. The seismic reflection fieldstack section is presented in Appendix A. A layer of dry surficial soils was determined along the traverse, deeper unconsolidated overburden being fully water saturated containing intervals of more compact/dense materials overlying bedrock. The velocities of the bedrock are in distinct contrast to the overlying materials.

The integrated cross-section displays the overburden and bedrock, as determined from the refraction velocity and depth calculations and the reflection travel time conversions. The depth scale shown on the cross-section is valid for the results of the refraction survey and approximate for the results of the reflection survey. This is due to the seismic response of the transected subsurface materials at each chainage position along the profile, which is not necessarily the same from one location to another.

6.2 Precision and Limitations

The typical velocities for sound, unweathered sedimentary rocks range from 13,000 to 18,000 ft/s and for weathered and/or fractured rocks from 7,500 to 13,000 ft/s. The bedrock velocity values are shown on the profile, and those in parentheses, if shown, are interpolated values.



GEOPHYSICS GPR INTERNATIONAL INC.

PROJ. # B96142	TITLE LOCATION PLAN MAP SEISMIC TRAVERSE		
DRAWN BY	CLIENT GEOTRANS, INC.		
CHECKED BY	PROJECT DEWEY LOEFFEL LANDFILL AREA, NASSAU, NEW YORK		
APPROVED BY	DRAWING DATE 3-5-97	SCALE 1"=2000'	Fig. 2

The precision of seismic reflection and refraction surveys depends upon the conditions within the interval of the traverse where the reflection and/or refraction was performed. The precision for a reflection traverse is based upon the accuracy of acoustic travel time measurement, accuracy of the reflector (time pick) choice, and accuracy of the depth conversion process. Typically, a reflection traverse with all shots collected and high quality records will yield a high precision of $\pm$8 to 10 percent, and with most shots and/or moderate quality records will yield a moderate precision of $\pm$10 to 12 percent. The precision at this site is high for the reflection traverse.

Typically, a refraction traverse with all seven shots collected and high quality records will yield a high precision of $\pm$7 to 10 percent for depths greater than thirty feet with a precision of $\pm$3 to 5 percent for bedrock velocities, and with five to seven shots and/or moderate quality records will yield a moderate precision of $\pm$10-15 percent for depths greater than thirty feet with a precision of $\pm$4 to 6 percent for bedrock velocities. The precision at this site is high for the refraction traverse.

Altogether, the quality of the interpretation for the segment of combined seismic reflection and refraction at this site is high, $\pm$5 percent, due to the combination of the two methods and correlation with the local water well data. As explained in the Appendices, each method does have certain constraints with respect to detection of particular layers.

As with all geophysical methods, there are minimum detectible limits. Major limitations for seismic refraction are velocity inversions and hidden layers (see App. B). Calibration with borehole data can define and overcome most of these limitations. With respect to widths of low velocity bedrock intervals that could correlate to open fracture zones, widths greater than $\pm$ten feet should be detectible with the refraction configuration that was used here.

For the seismic surveys at this site, the minimum thickness of a layer that could be defined is about five feet near-surface and about 15 feet within the deeper portions of the investigated area. This resolution corresponds to the minimum thickness of more or less parallel layers which allow detection of the lower interface. Thinner dipping layers and fracture zones $\pm$five feet or more in width should be recognizable in the records.

6.3 Seismic Lines

Central Nassau Road, Seismic Line

The seismic line (east to west for traffic safety considerations) consists of reflection from chainage 00+00 to 50+00 and refraction from chainage -00-15 to 01+15 and 12+00 to 30+25. The seismic line starts on the northern shoulder of Central Nassau Road near a small culvert beneath the road southeasterly of well 192-01-3B, continues southwesterly along the northerly shoulder, and ends near a small agricultural road west of the cluster of residences centered generally about the Curtis Hill Road intersection.

The combined profile shows zero to 11 feet of unsaturated surficial soils (1,300 to 1,500 ft/s) and 14 to 86 feet fully saturated higher-velocity materials (6,500 to 7,000 ft/s) indicative of more compact layers.

The bedrock surface, from east to west, starts at a depth of about 27 feet BGS, inclined downward, generally horizontal to about chainage 2+80, then is more or less continuously inclined downward to a depth of 86 feet at chainage 9+40, forms a small bedrock high about 46 feet BGS at chainage 11+90, is inclined downward to 70 feet BGS at chainage 12+90, is slightly inclined upward to 18 feet at chainage 22+60, then generally horizontal at depths of about 40 to 50 feet BGS to the end of the traverse at chainage 50+00.

The bedrock depths show a good correlation to the water wells projected on to this traverse (allowing for offset adjustments and pumping). The profile, within the refraction segments, show moderate to high-bedrock velocities (11,800 to 18,000 ft/s) indicative of fractured, weathered to unfractured, unweathered bedrock.

A number of bedrock structures and trends were observed. The results of the reflection survey detected several shallow discontinuities within the uppermost interval of the bedrock surface. As discussed previously, most of these features appear to represent break-out planes at the bedrock surface. There are several deeper bedrock trends indicative of deeper bedrock features.

These features can be traced to depths BGS of 800 to 1,000 feet. From east to west, one trend dips moderately to the west at about chainage 2+80. A more significant westerly dipping feature occurs from chainage 22+80 to 24+10, and is characterized by a number of parallel reflectors within this interval. A water well within this interval, 191-05-22, has higher than average water yields for this area and may be indicative of more fractured bedrock. Another interpretation of this trend is that it is part of a westerly dipping flank of a possible synclinal fold occurring immediately to the west.

A broad interval, from chainage 23+00 to 33+80, may represent a syncline, based on the continuity of dipping reflectors. The feature is moderately continuous to depths approaching 1,000 feet BGS. Previous workers have identified folding in the region and small-scale folding was noted by GPR personnel within the general site area.

A discontinuous deeper reflector occurs at chainage 39+00 to the end of the line at 50+00 with a slight dip to the east. The inclination of this trend is consistent with the trend associated with the western flank of the possible synclinal structure. Additionally, limited bedrock mapping performed by GPR at several outcrops about 2,000 feet west of the end of the seismic line, near the intersection of Central Nassau Road and Route

17, indicate the bedrock is trending northeast-southwest and dipping slightly to moderately to the east. This inclination correlates with the inclination of the seismic reflector.

The results of the seismic refraction survey are useful to assess the presence of low-velocity bedrock indicative of fractured and/or weathered bedrock. Assuming the observed lithologies, shale and greywacke, to the west and north of the seismic line represent the lithologies beneath the line, then the determined moderate to high bedrock velocities, ranging from 11,800 to 18,000 ft/s, indicate moderately fractured, weathered bedrock to relatively unfractured, unweathered sedimentary rock.

The shown bedrock velocities are representative of the uppermost interval of the bedrock. If a low-velocity zone, for example, reverse or thrust-faulted competent rock overlying incompetent rock or a significant fault zone, occurred at a greater depth, the trend could not be detected by the refraction method due to the "blind zone" effect inherent in the method itself (see App. B).

7.0 CONCLUSIONS

The specified objectives for the seismic investigation were to identify bedrock trends, in particular, intervals of fracturing/shearing that might serve as conduits from the landfill in a southerly direction. The results of this investigation identified several trends in the bedrock.

The complementary nature of seismic reflection and refraction surveys defined, with a high degree of precision, the overburden and the bedrock surfaces. The results of the seismic refraction survey, in terms of overburden and bedrock seismic velocities, together with local water well data, allowed for calibration of the seismic reflection travel times for depth determination purposes.

Seismic reflection could not map the top of the water saturated zone due to its shallow depth, but seismic refraction delineated the top of the water saturated zone along a portion of the seismic line. Small discontinuities appear at the overburden/bedrock interface may be related to small bedrock breakouts and/or remnants of near-surface static effects.

Seismic reflection continuously profiled the bedrock along the entire seismic line. The reflectors and limited water well data suggest a possible zone of fractured bedrock dipping to the west from chainage 22+80 to 24+10. Overall, the seismic reflectors indicate a possible synclinal structure. Seismic reflectors at the western end of the line, together with limited outcrop readings, indicate the strata are dipping to the east.

Dipping reflectors have been interpreted within the bedrock, one of which may correspond to a shear/fault interval determined by seismic reflection and higher water yield from the private wells in proximity to the investigated area.

The refraction surveys showed that the overburden at this site consists of unsaturated and saturated materials with more compact/dense materials. These overburden layers have velocity ranges of 1,300 to 1,500 ft/s and 6,500 to 7,000 ft/s, respectively. The bedrock velocities are generally indicative of moderately fractured to relatively unfractured rock (11,800 to 18,000 ft/s).

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SEISMIC REFLECTION PROFILE

The interpretation of the seismic reflection data involved 2-D inverse computer modeling. Full common depth point (CDP) data processing was accomplished including normal move out (NMO), filtering, and static corrections. Each trace on the processed seismic section was spaced at one-half of the geophone spacing and represents the summation of the traces that receive reflections from the same subsurface point.

The attached profile is the processed and interpreted reflection data set, together with the fold values and recording and processing parameters. The colored reflectors are:

- Green marks the top of the bedrock surface
- Red marks the minor near-surface and deeper bedrock trends

The horizontal scale is the distance along the traverse as chainage positions with each vertical seismic trace ten feet apart. The vertical scale is in milliseconds (two-way travel time of the seismic wave).

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APPENDIX A

THE SEISMIC REFLECTION METHOD

The basic technique of the seismic reflection method consists of generating energy source waves and measuring the time required for the waves to travel from the source to an array of geophones place along a straight line directed towards the energy source. The measurement of travel time to each geophone or cluster of geophones, together with the energy wave velocities, allow the reconstruction of the paths of the seismic waves.

Subsurface structural information is principally derived from the energy paths which fall in two main categories: refracted paths in which the principal portion of the path is along the interface between two rock layers, and reflected paths in which the wave travels downward initially and at some point is reflected back to the surface. The energy travel times depend upon physical properties of the rocks and the orientation of transected strata.

Depths to reflecting interfaces can be determined from the travel times using velocity information that can be obtain from surveys in borings such as, uphole or downhole surveys or by using seismic refraction data over the same area.

The reflection method is based on the measurement of time taken for the acoustic energy to travel from a source (shot location) to a receiver (geophone) location. The acoustic energy is produced by a seismic source, which can be either sledgehammer striking a steel plate, weight drops of different of different weights and designs, or from percussive sources such as, Betsy seisgun, or detonation of explosives.

This energy will travel downward and be reflected back towards the surface from any subsurface interface across which there is a contrast in density and/or seismic velocity.

The arrivals of these seismic waves causes displacements of the ground which are picked up by geophones and recorded as a function of time by the seismograph. The analysis of these arrival times, which have traveled through the subsurface, will allow identification of subsurface features.

Typically, the output of the reflection survey is a series of seismic records that are processed to produce a seismic section. The seismic section is a plot of two-way travel time versus the distance along the ground surface and can be interpreted as a geological cross-section when the two-way travel time is converted to a depth scale (the calculation of a depth scale requires information about the seismic velocity).

MULTIPLE COVERAGE IN SEISMIC REFLECTION

When using simple coverage, only one reflection of the subsurface point is recorded (figure 1). The sampling of this point is referred to as "fold," in this case, 1-fold and is frequently expressed as a percentage (1-fold equals 100%). When a coverage of 600% is planned (figure 2), six reflections are recorded at the same subsurface point. However, the distance between the energy source and each geophone is different. A correction factor is applied to the time of the wave travelling path from its shotpoint to the seismograph so that it can be converted to the line of the vertical trajectory by six oblique time measurements. These are then added together to obtain the most precise average.

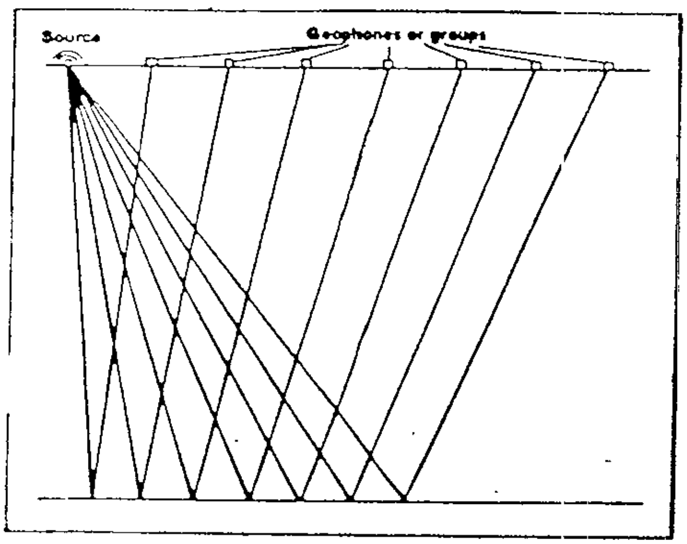


FIGURE 1

100% Coverage
Single-ended spread

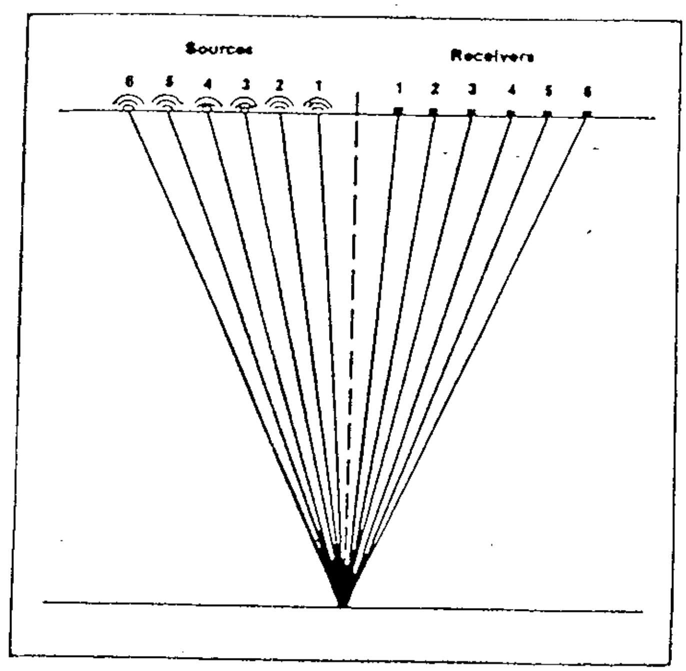


FIGURE 2

600% Coverage
Common Depth Point (CDP)

A 1200% coverage involves shotpoints at every geophone along the spread, keeping the same distance between shots and geophones. A detailed discussion of this technique can be found in Telford & Al (1976).

FIELD ACQUISITION

When using obtaining a coverage of 300%, the cable and geophone setup remains the same (figure 3). However, three more shotpoints are required.

Therefore, the accuracy of data recording when using multiple coverage is largely dependant on obtaining shotpoints. Data are digitally recorded to facilitate calculations of time values.

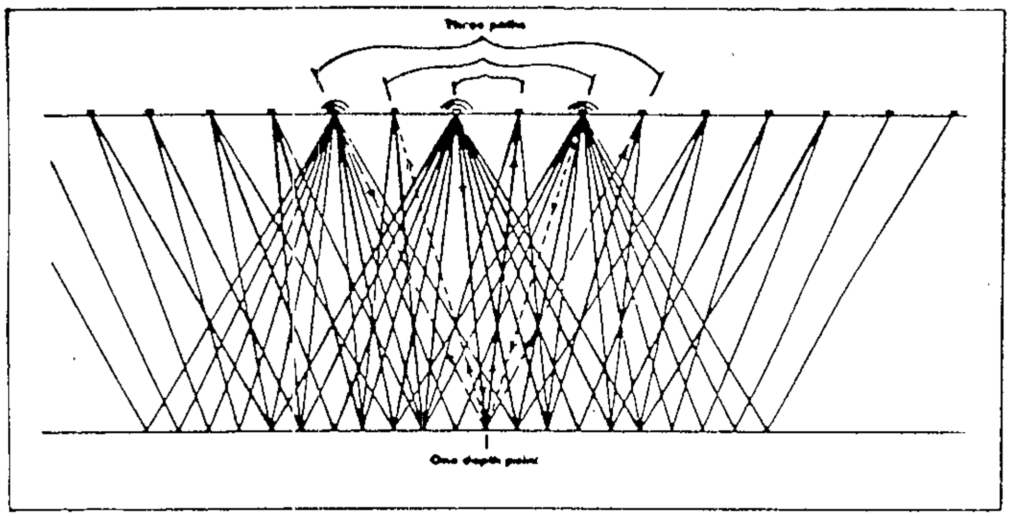


FIGURE 3

SCHEMATIC DIAGRAM FOR 300% COVERAGE

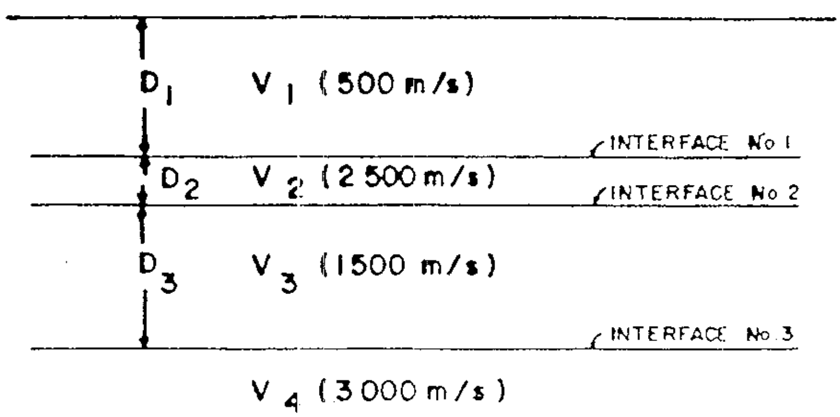
DATA PROCESSING

1) Gather all relative trajectories, referred to as a "gather," corresponding to the same common depth point (CDP).

2) Perform all obliquity corrections, referred to as "normal move out." This is done by making successive approximations using hyperbolic functions. The best approximate value gives the velocity down to the geological unit.

3) Stack the corrected trajectories and take an average.

SEISMIC REFLECTION



100% coverage	:	determines interfaces 1 to 3 and V1
600% multiple coverage	:	determines interfaces 1 to 3, V1 to V4, D1 to D3.

FIGURE 4

SCHEMATIC CROSS-SECTION

ADVANTAGE

The advantages of multiple coverage are very significant:

The quality improvement of reflection quality is generally dramatic since the reflectivity is multiplied by the factor of the fold with the spectrum of random "noise" remaining at initial levels or cancelling out.

TOPOGRAPHIC CORRECTION

The precision is increased when the influence of topographic corrections is reduced.

KNOWLEDGE OF VELOCITIES

Resolution with increase depth have been greatly improved. A variation in lateral velocity can then be identified (figure 4).

INTERPRETATION

The interpretation of seismic data in geological terms is the objective and end product of seismic work.

The basic task of interpreting seismic records is that of selecting those events on the record which represent primary reflections, translating the arrival times for these reflections into depths and dips, and mapping the reflecting horizons.

In addition, the interpreter must be alert to other types of events which may yield valuable information such as multiple reflections and diffractions.

Recognition and identification of seismic events are based upon different characteristics of the reflected signal, such as its amplitude, its coherence from trace to trace, its frequency content and its waveform appearance.

Drawing of horizons on the seismic section and conversion to depth yields a two-dimensional geological profile of the subsurface.

WALKAWAY TEST

A walkaway test was conducted prior to the survey from chainage 0 to 220 ft. Single geophone array was used for the test with a 2 feet spacing. The spread covered offsets 0 to 220 feet in steps of 48 feet per shot.

The composite raw records is shown on figure A1. On this record, we see the two dominant sources of noise:

- the low frequency ground roll at a speed of 3200 feet/sec;
- the high frequency on blast at a speed of 1100 feet/sec.

We can also identify the water table and bedrock refracted wave front. One reflection can be interpreted at shallow depth. This reflector appears at the strongest amplitude between offsets 40' and 140'.

Following these tests; the following acquisition parameters were set for the survey:

- Configuration split spread
- No of channels: 24
- Station spacing: 10 ft
- Shot spacing: 10 ft
- Fold: 1200%
- Sample internal: 0.125 ms
- Record length: 512 ms
- Acquisition filter: Notch: 60 Hz
- Geophone array: 3/group - in a bunch

The 60 Hz notch filter was set because the survey was conducted along an electrical power line accross the road. The geophone array could not be designed to eliminate ground roll in this case due to the shallow depth of investigation. However it provided for higher signal emplitude and for possible side swipe cancellation.

We relied on data processing to eliminate the ground roll and air blast energy from the records and on stacking for boosting up the reflected energy.

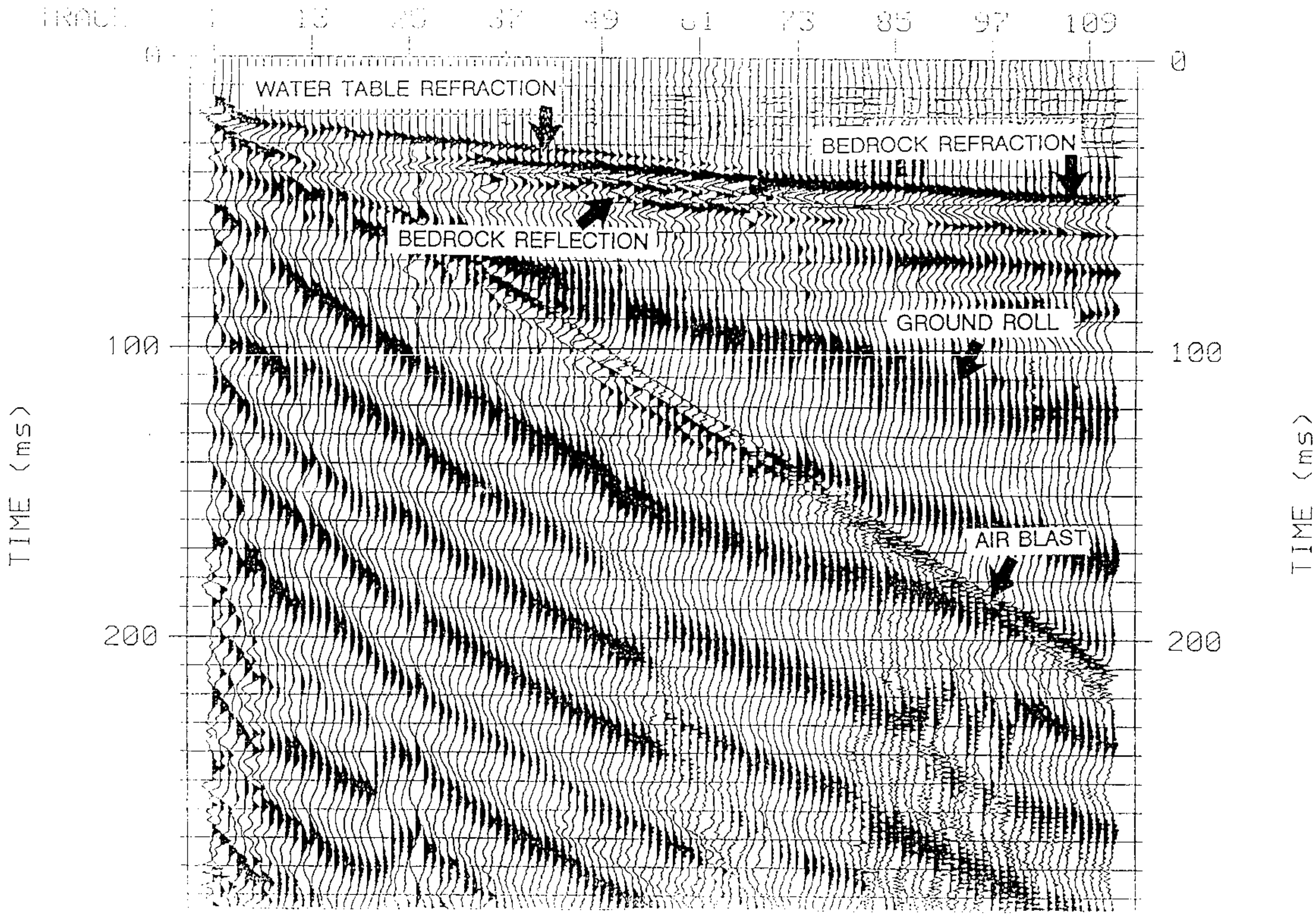


FIGURE A1

RAW WALKAWAY TEST RECORD

The first processing step to eliminate noise is band pass filtering. Filter pannels are shown in figures A2 to A6. Frequency spectrum are also shown on figures A7 and A8 for different offsets.

Based on these tests a band pass filter of 60 to 400 Hz was applied to the data. We can see that all the energy below 60 Hz is ground roll energy, while the air blast energy dominates the upper end of the spectrum.

Another type of filter to eliminate coherent noise, is to use F-K filtering. The frequency-Wave number domain profides an energy partition as a function of the type of wavefront recorded. On figure A9, we show such a plot for the data recorded at Nassau Road where we easily identify the ground roll energy at 35 Hz-32000 ft/sec and the air blast at 1100 ft/sec over a broader frequency spectrum.

We designed an F-K filtering to remove this coherent noise from our data. The other steps used in our processing sequence are standard:

- Trace editing
- CMP sorting
- Band pass filtering (discussed above)
- Muting
- Statics correction
- Velocity analysis
- Normal move cut
- Surface consistent residual status
- Stacking
- F-K filtering
- Gain A.G.C.

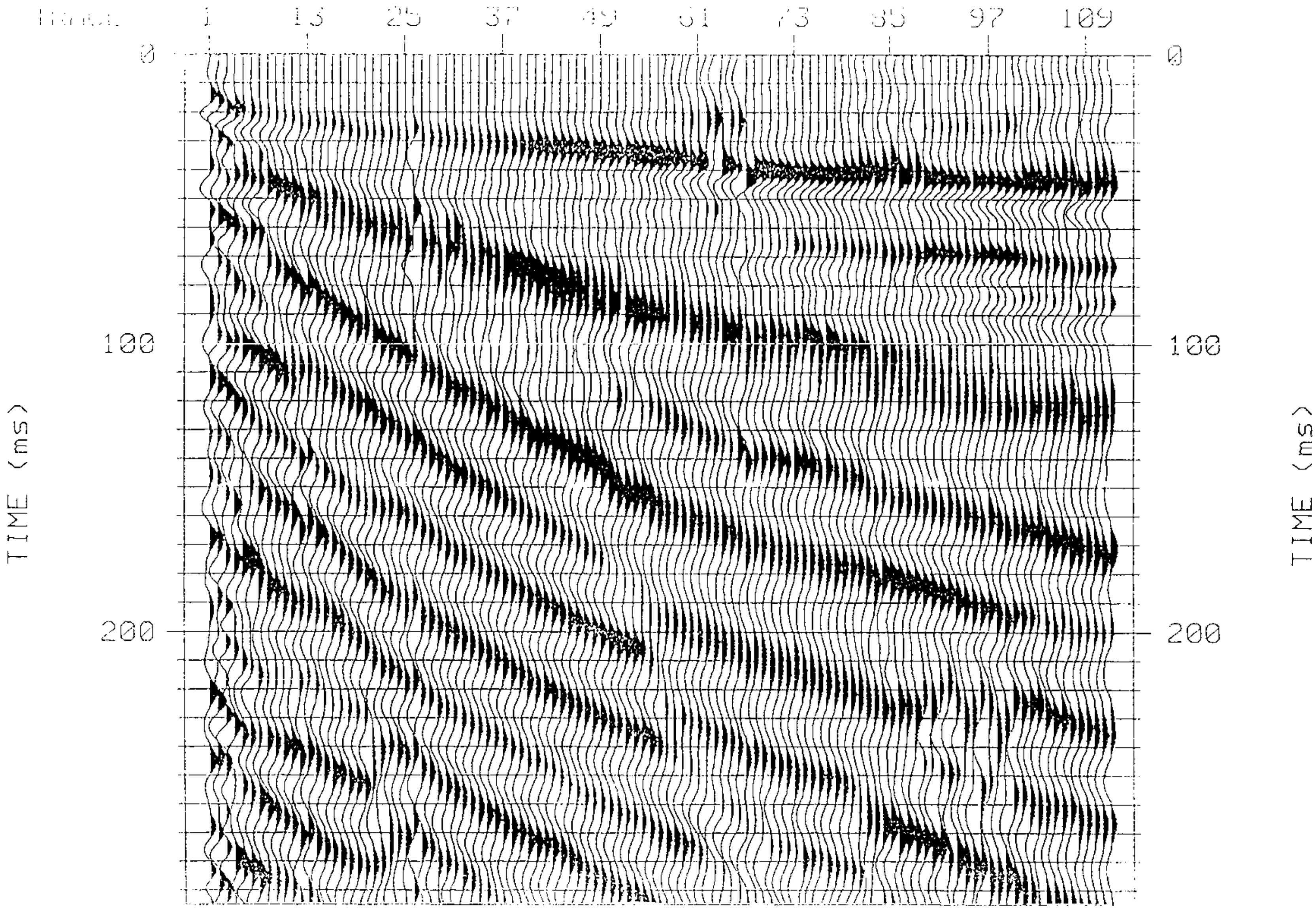


FIGURE A2

FILTER PANNEL 0 - 60 Hz

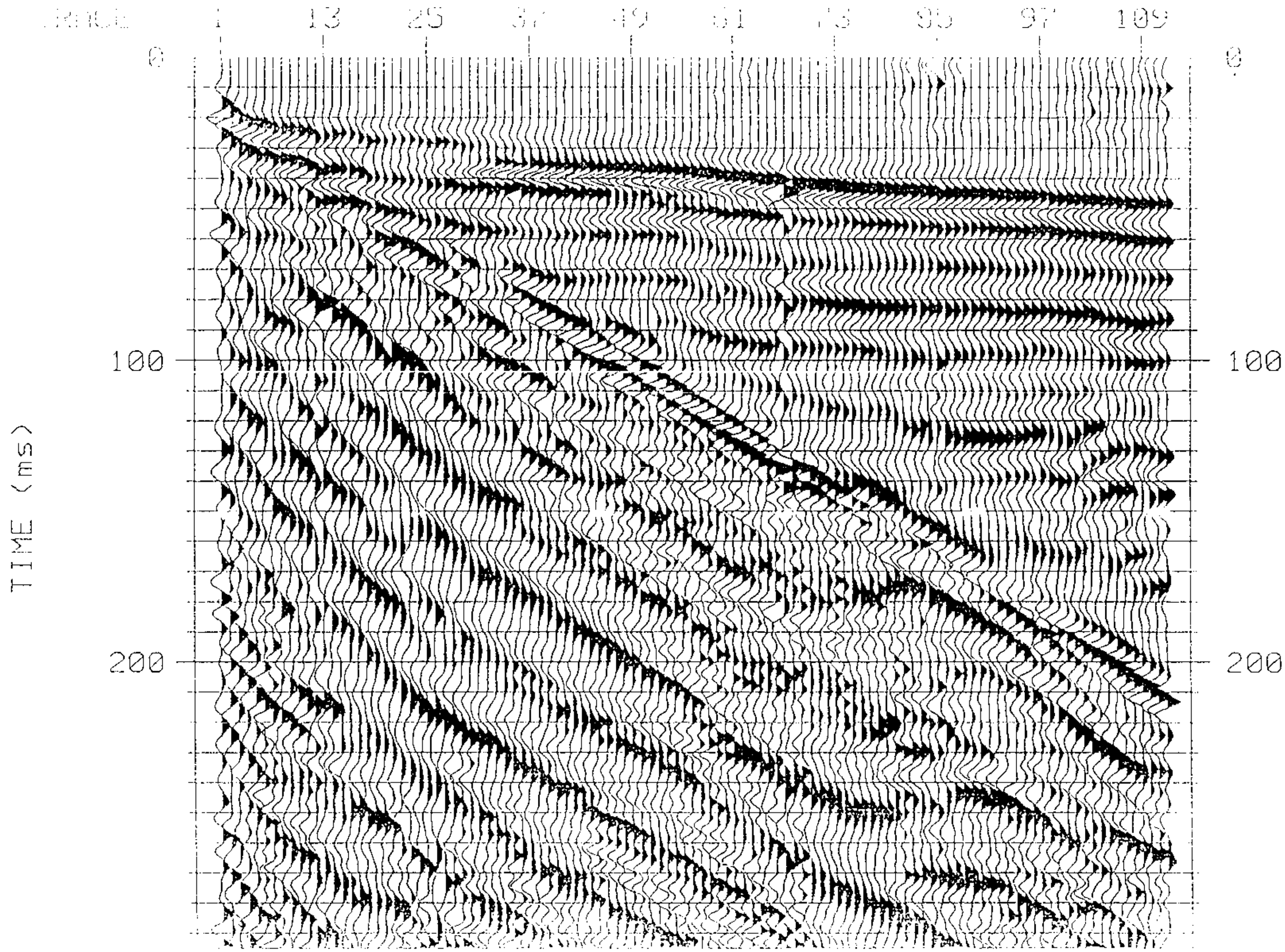
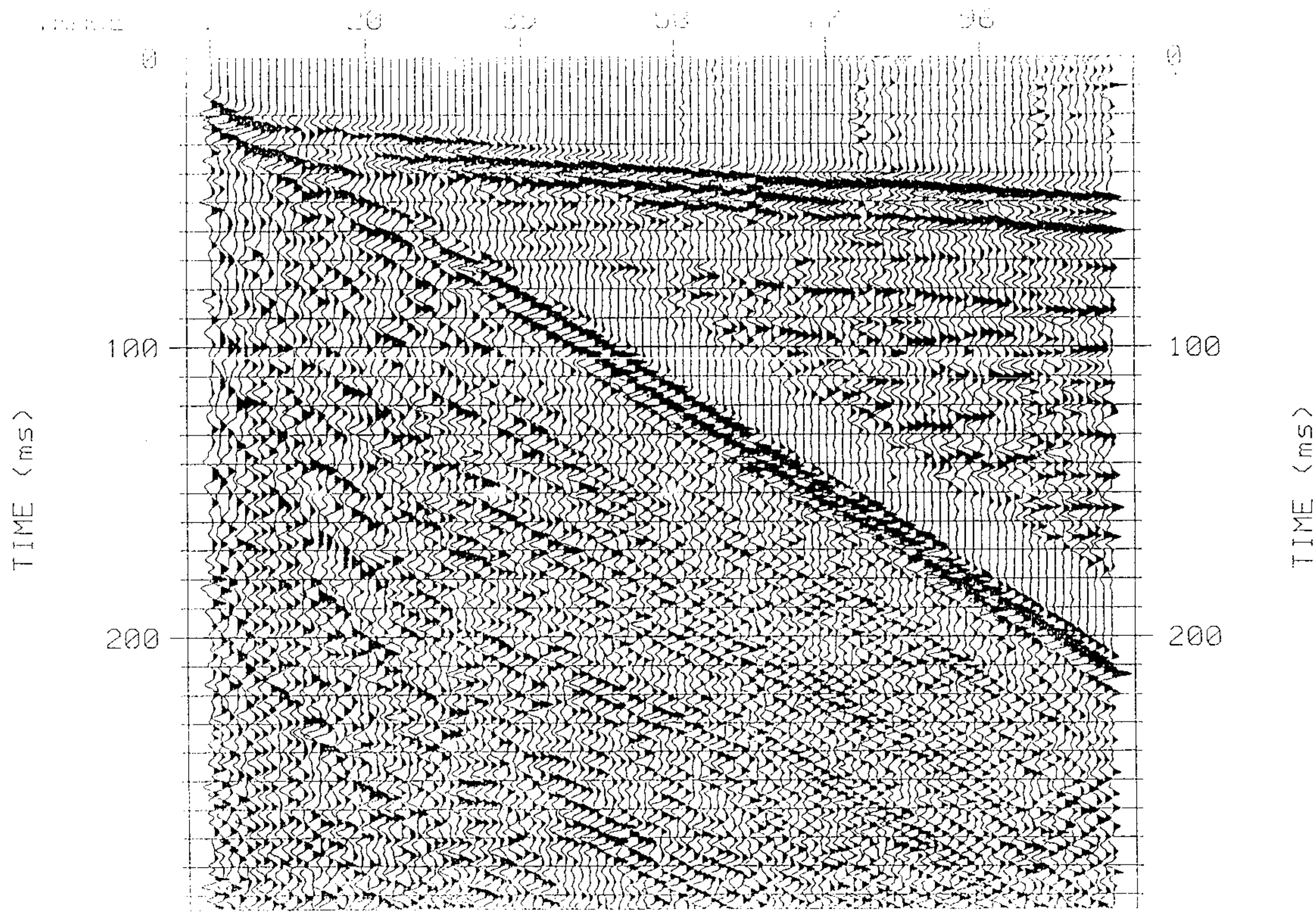


FIGURE A3

FILTER PANNEL 60-120 Hz



<u>FIGURE A4</u>

FILTER PANNEL 120-240

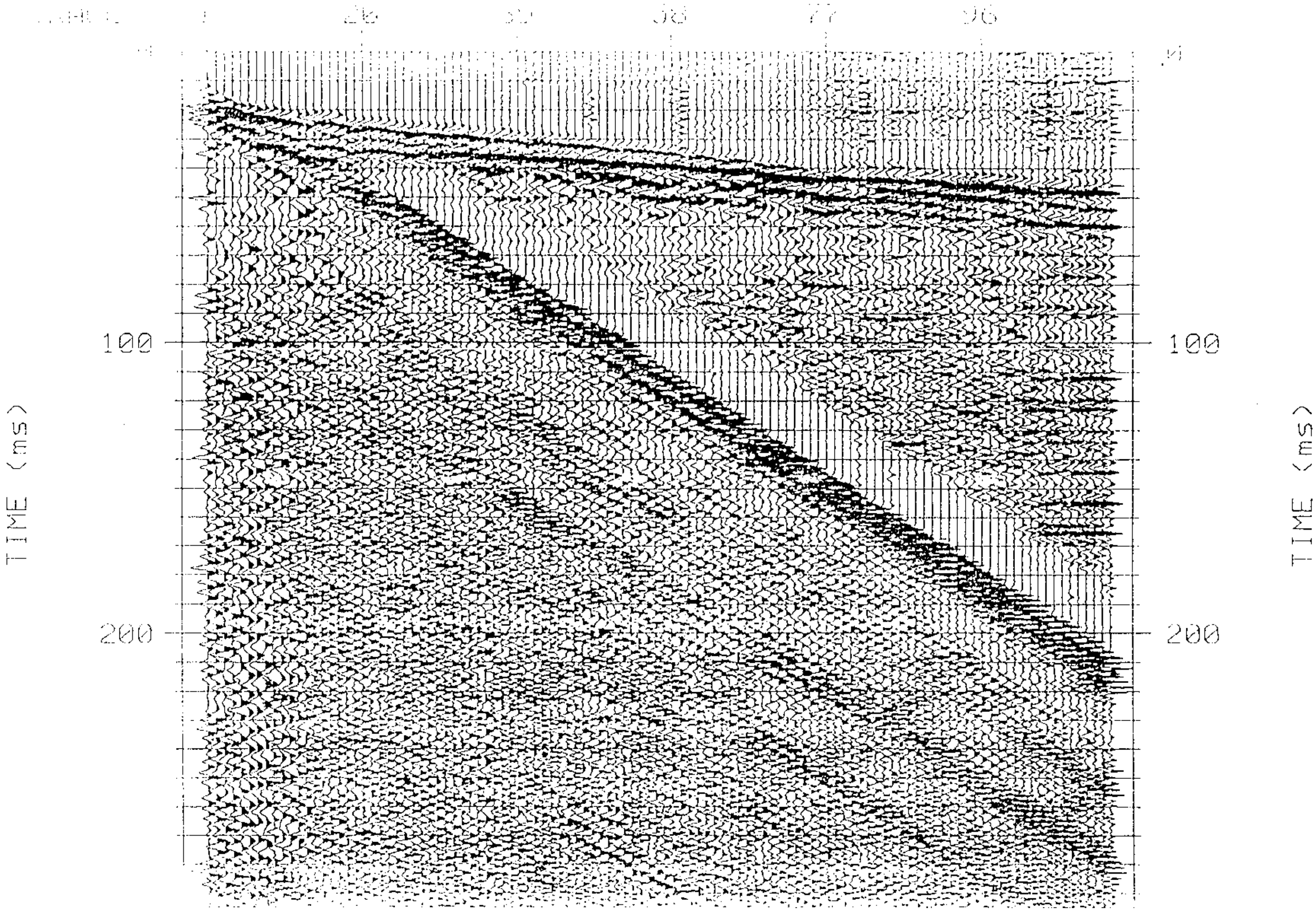


FIGURE A5

FILTER PANNEL 240-480 Hz

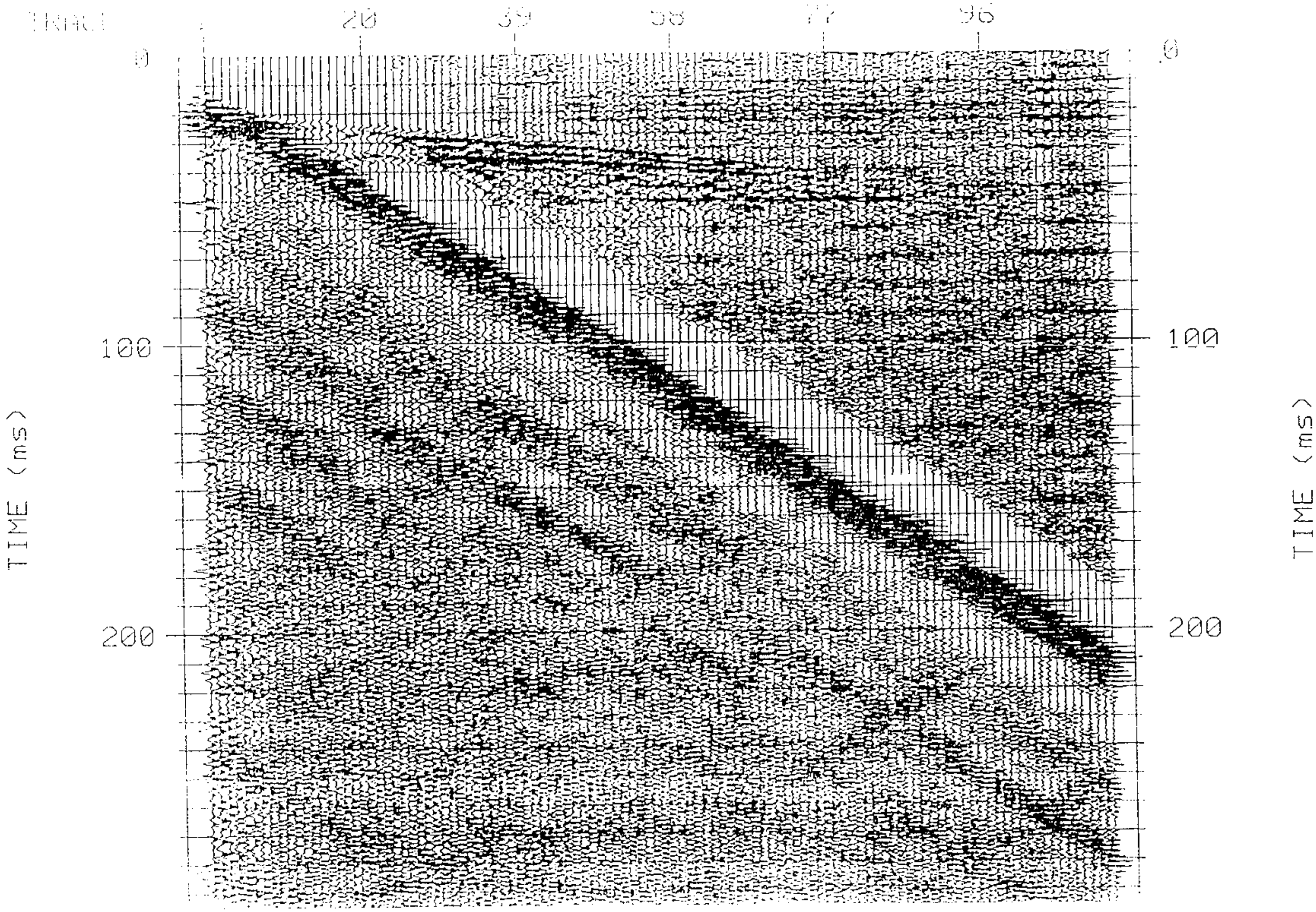


FIGURE A6

FILTER PANNEL 480-960 Hz

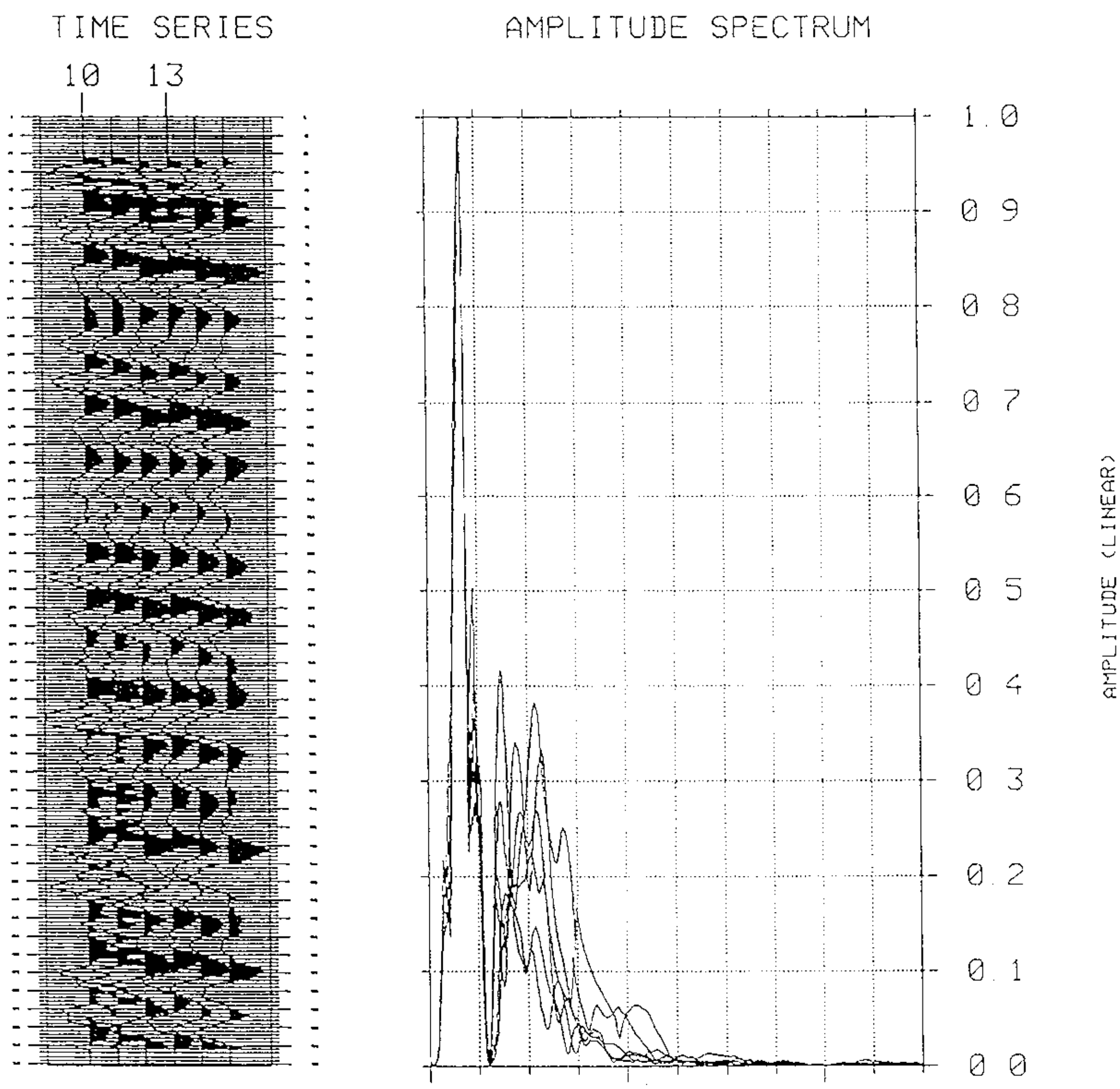


FIGURE A7

FREQUENCY SPECTRUM OFFSETS 20' TO 30'

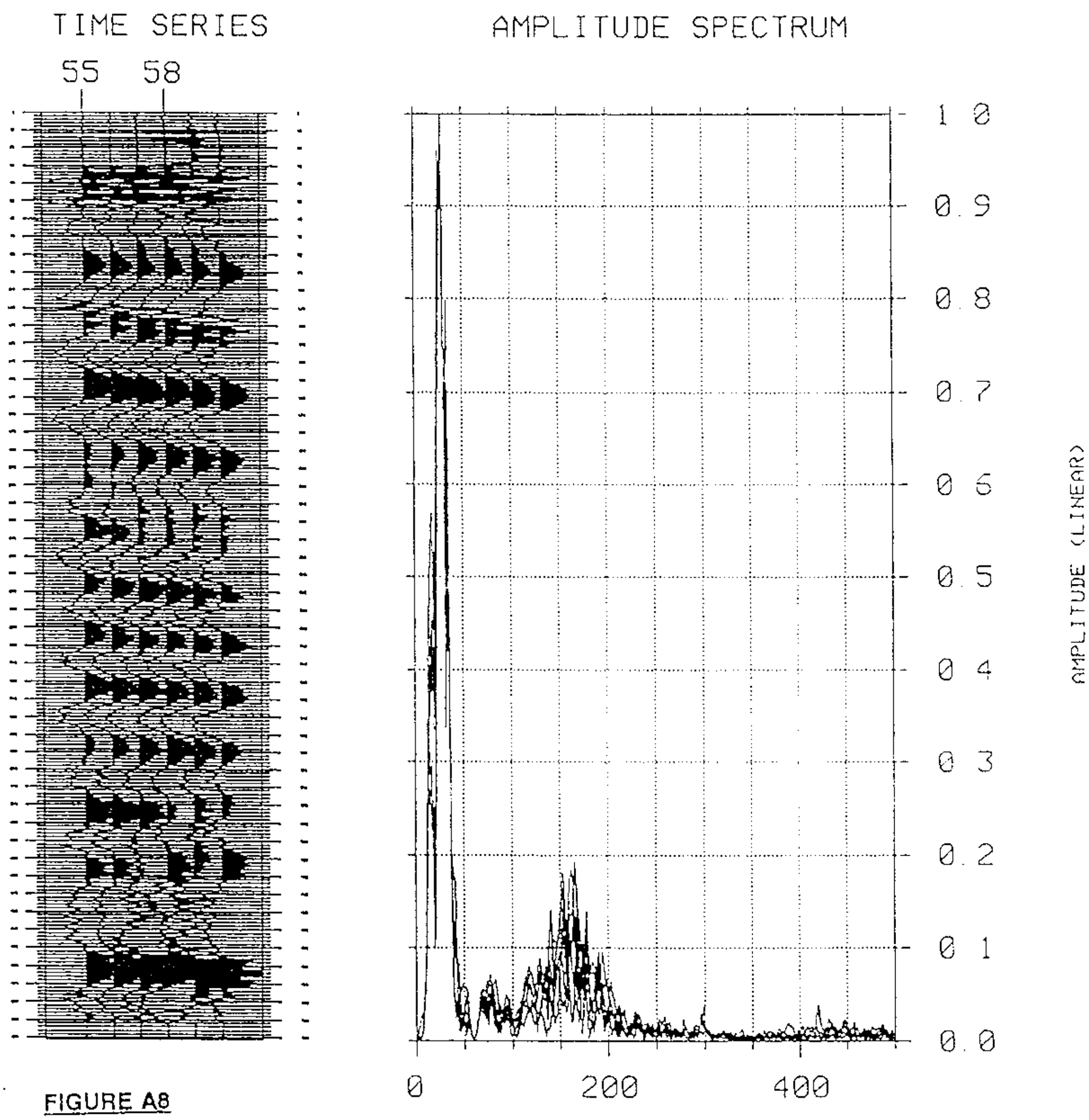
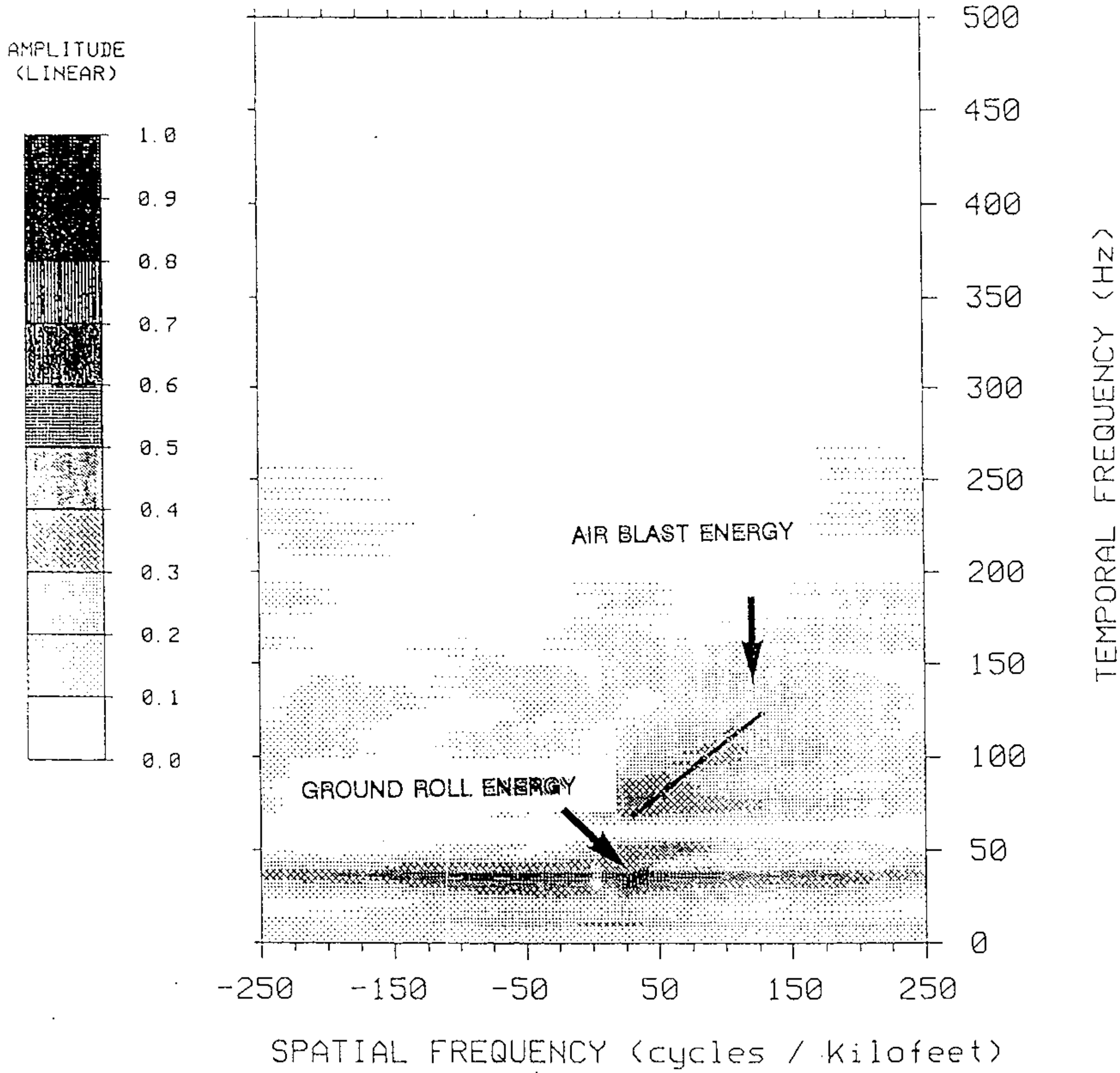


FIGURE A8

FREQUENCY SPECTRUM OFFSETS 110' TO 120'

FIGURE A9

F-K ANALYSIS



APPENDIX B

THE SEISMIC REFRACTION METHOD

The seismic refraction method is used to infer subsurface conditions on the basis of contrasting seismic wave velocities. The primary goal of the seismic survey is to rapidly and efficiently obtain subsurface information, thereby reducing direct investment costs, such as drilling. Geological information typically obtained from a well-planned and executed seismic refraction survey will include: depth and configuration of the bedrock surface, nature and competency of bedrock (degree of fracturing, alteration, weathering), whether it is faulted or sheared, nature of overburden, and depth to the water table. Modern portable equipment makes the method accessible to remote and rough regions. A review of the seismic refraction theory, field methods and interpretational procedures can be found in Dobrin (1976) and Telford et al (1990).

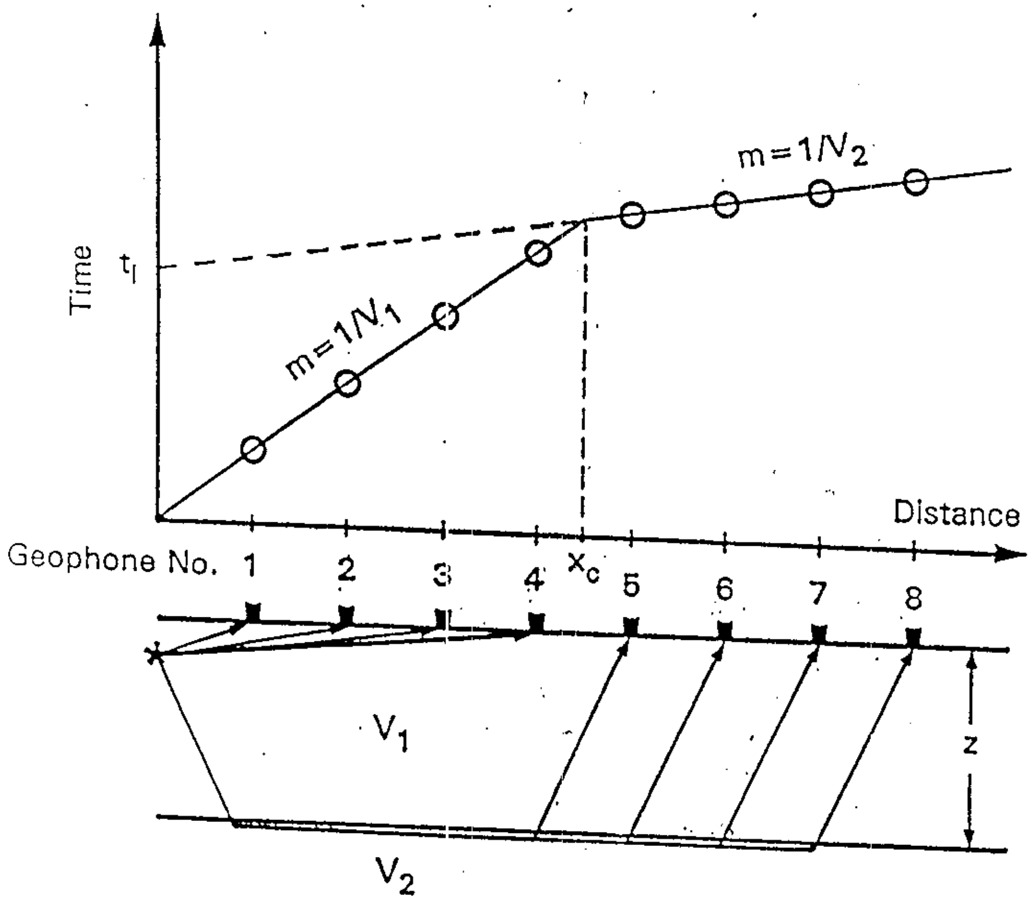
INSTRUMENTATION

The instrumentation involved in a seismic refraction survey consists of an acoustic seismic energy source to generate seismic waves, a line of geophones to detect the seismic energy, and a seismograph which is essentially a highly accurate stopwatch. By measuring the arrival times of the first seismic waves at various distances from the energy source (shotpoint), depths to interfaces and seismic velocities can be determined. Seismographs are usually 12 or 24-channel, in that they can simultaneously record the energy arrivals at 12 or 24 geophones. The record of these vibrations is a seismogram. Digital seismographs (for example, ABEM Terraloc, EG&G SMARTSEIS S24) acquire data with a built-in computer, whereas analog seismographs (e.g ABEM Trio) output the data to photographic paper as it is acquired. The energy source must be coupled to the seismograph so that the instant of detonation or impact can be recorded. Timing marks, at 1 or 2 milliseconds intervals, are provided to permit very accurate estimates of arrival times.

FUNDAMENTAL PRINCIPLES

The seismic refraction method relies on measuring the transit time of the seismic wave that takes the shortest time to travel from the shotpoint to each geophone. The fastest seismic waves are the compressional (P) or acoustic waves, where displaced particles oscillate in the direction of wave propagation. The energy that follows this first arrival, such as reflected waves or transverse (S) waves, is not considered under routine seismic refraction interpretation.

Figure 1 shows a simple geological structure, where a layer with a velocity of V_1 overlies a second layer with a higher velocity, V_2. At one end of the spread, an energy source is triggered and the vibrations at each geophone are recorded. Seismic waves will travel via the direct path from the source to each of the geophones. Waves may also be refracted at some critical angle along the interface and travel at the higher velocity V_2.



V_1 = Velocity of Upper Layer
V_2 = Velocity of Lower Layer
m = Slope of Line Segment
x_c = Crossover Distance
t_I = Intercept Time

$$z=\frac{x_c}{2}\sqrt{\frac{V_2-V_1}{V_2+V_1}} \quad or \quad z=\frac{t_i}{2}\frac{V_2V_1}{\sqrt{V_2^2-V_1^2}}$$

Principles of Seismic Refraction

Figure 1

Energy is continually transmitted back to the surface as it travels along the interface. A time-distance graph may be constructed, plotting the first arrival transit times as a function of position along the seismic line. The first arrival at the closest geophones is the direct wave. However, at the critical or crossover distance (Xc) the refracted wave which travels along the higher velocity layer overtakes the direct arrival. The inverse slope of a straight line segment of the time-distance curve is equal to the velocity in that layer. The crossover distance is directly proportional to the depth of the interface.

INTERPRETATION

The simplest methods of interpretation are illustrated in figure 1. Having determined the velocity of compressional waves through each layer, the calculation of depths can be done according to crossover distance or the intercept time formulas. The case of a horizontal interface, illustrated in figure 1, becomes slightly more complicated if the planar interface is dipping. The general case of an irregular interface can be handled by more complex interpretational calculations, including various delay-time methods, the reciprocal and generalized reciprocal methods, and ray tracing. One method may be better suited than another to a particular geological environment.

LIMITATIONS

Two important limitations of the seismic refraction method must be kept in mind. First, layers of insufficient thickness and velocity contrast will not produce first arrivals at the surface. This is the **hidden layer** problem. For example, a thin layer of glacial till or weathered bedrock overlying unweathered bedrock might be such a hidden layer. The presence of a hidden layer will lead to calculated depths that are too shallow. Secondly, the seismic refraction method requires that the velocities of all layers increase with depth. A low velocity layer at depth is termed a **blind zone**. Such layers will not yield first arrivals because critical refractions cannot occur. Computed depths will be greater than actual depths in this case. Fortunately, such velocity reversals are seldom encountered in shallow surveys. The generalized reciprocal method can be used to infer the absence or presence of blind zones and hidden layers. However, correlation with boreholes and uphole surveys may be necessary to accurately gauge the effects of such layers.

DESCRIPTIVE CLASSIFICATION OF BEDROCK SEISMIC VELOCITIES WITH RQD VALUES

The following table represents a descriptive classification of bedrock seismic velocities that can be correlated with RQD (Rock Quality Designation) values. The following table is extracted from a study by Coon and Merritt (ASTM STP 477).

This table may proved helpful for the developmental phase of this project, in terms of planning, security, and cost. The seismic refraction method measures the velocity of the bedrock to a depth of approximately 45 feet.

TABLE

ENGINEERING CLASSIFICATION FOR IN SITU ROCK (1)				
RQD (%)	VELOCITY INDEX	SEISMIC VELOCITY (ft/s) (2)	DESCRIPTION	SEISMIC DESCRIPTION
0 - 25	0.00 - 0.20	8000	Very poor	Low velocity
25 - 50	0.20 - 0.40	8000 - 11400	Poor	Low velocity
50 - 75	0.40 - 0.60	11400 - 14000	Fair	Intermediate
75 - 90	0.60 - 0.80	14000 - 16000	Good	Sound rock
90 - 100	0.80 - 1.00	16000 - 22000	Excellent	Sound rock

(1) Taken and adapted from: Coon,R.F. and Merritt,A.H.,**Predicting in-situ Modulus of Deformation using Rock Quality Indexes**, Determination of the in-situ modulus of deformation of rock, ASTM STP 477, American Society for testing and materials 1970, pp. 154-173.

(2) Taking into account a velocity of 18 000 ft/sec for the compressional wave measured in the laboratory (V_L)for a limestone rock.

The classification of Coon and Merritt is based upon the velocity index property of in situ rock, which is a measure of the discontinuities in the rock mass. According to Coon and Merritt, the velocity index is defined as the square of the ratio of seismic field velocity to laboratory compressional wave velocities, measured on a core sample, representative of a sound rock. The field seismic velocities are normalized by the laboratory results in order to minimize the influence of lithology. Hence as the number of joints decreases, the ratio of the velocities will approach one. This ratio is then squared to make the velocity index equivalent to the ratio of dynamic moduli.

GeoTrans, inc.

RECORDING PARAMETERS

RECORDED BY
INSTRUMENT
SOURCE
SOURCE INTERVAL 10 00 ft
CHANNELS 24
SAMPLES/TRACE 4176
SPREAD SPLIT -110 0 - -10 0 - 0 - 10 0 - 110.0

DATE RECORDED 18-OCT-96
FIELD FILTERS
GEOPHONES
GROUP INTERVAL 10 00 ft
SAMPLE INTERVAL 0 13 ms
FOLD 1200 %

PROCESSING SEQUENCE

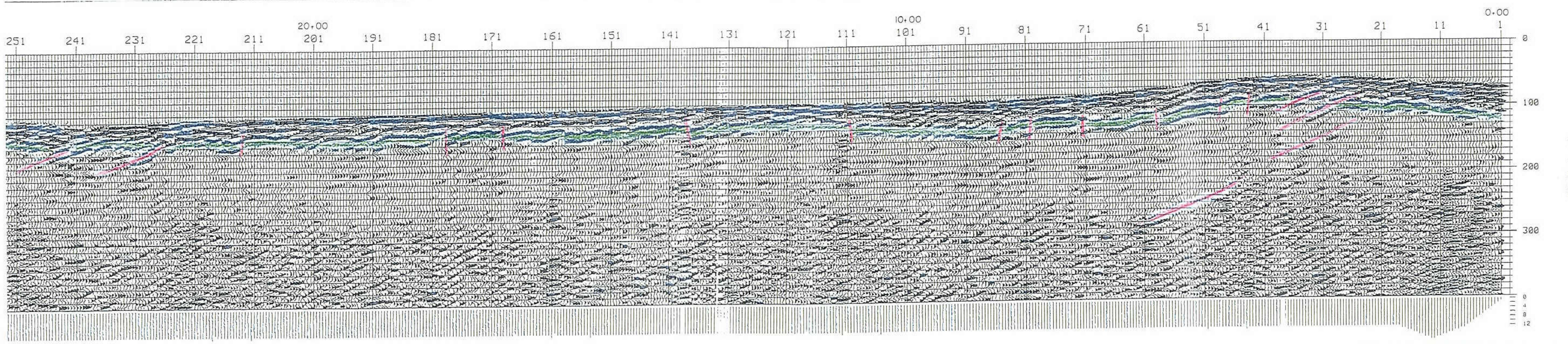
1) IMPORT FIELD RECORDS
2) TRACE EDIT
3) CMP SORT
4) BANDPASS FILTER
   60/24-400/24
   ZERO PHASE
5) MUTE FIRST BREAKS
6) DATUM STATICS
7) NORMAL MOVEOUT
   STRETCH MUTE 150%
8) SURFACE-CONSISTENT RESIDUAL STATICS
   CORRELATION WINDOW 5 TO 102 ms
   MAXIMUM SHIFT 5 ms
9) CMP STACK
10) FK FILTER
   POLYGONAL FILTER

DISPLAY PARAMETERS

HORIZONTAL SCALE 18 01 tr / in
POLARITY NORMAL
DATE PROCESSED 11-NOV-96

VERTICAL SCALE 12 00 in / sec
GAIN AGC - WINDOW 150 ms

GEOPHYSICS GPR INTERNATIONAL INC.



0.00
10.00
20.00
251 241 231 221 211 201 191 181 171 161 151 141 131 121 111 101 91 81 71 61 51 41 31 21 11 1
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100
200
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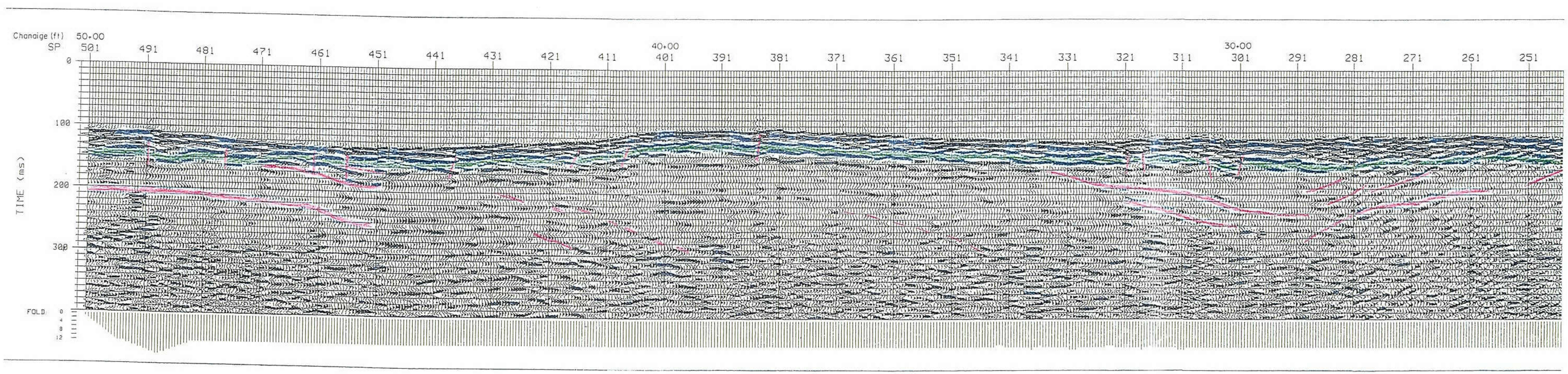
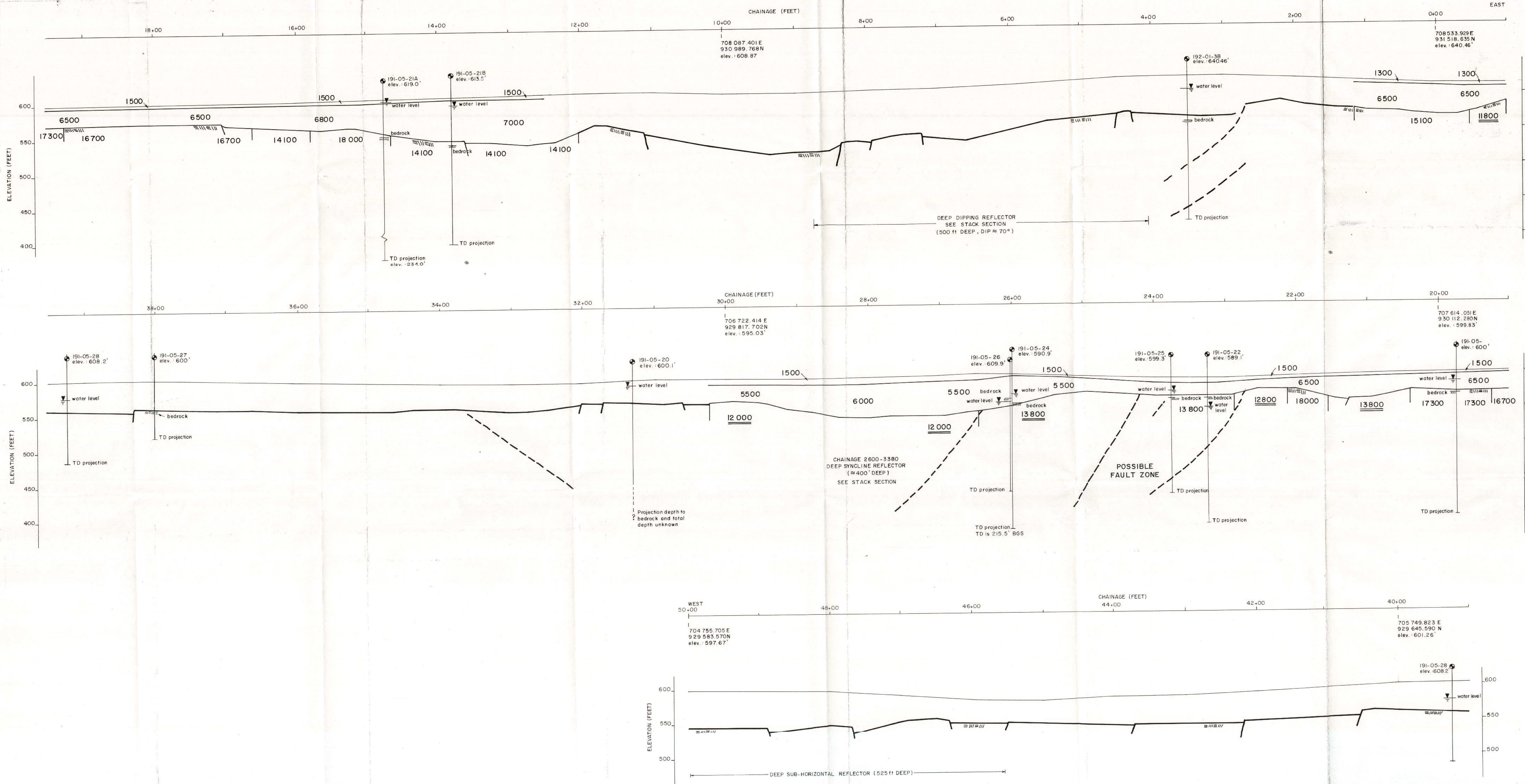
TIME (ms)



Chanaige (ft)
SP
50+00
501
491
481
471
461
451
441
431
421
411
40+00
401
391
381
371
361
351
341
331
321
311
30+00
301
291
281
271
261
251
0
100
200
300
TIME (ms)
FOLD



LEGEND

	TOPOGRAPHIC PROFILE
16 500	SEISMIC VELOCITY IN FEET/SECOND
	REFRACTOR PROFILE
	CONTACT LIMIT
	BEDROCK PROFILE FROM SEISMIC REFRACTION AND REFLECTION DATA
	BEDROCK PROFILE FROM SEISMIC REFLECTION DATA ONLY
	DIPPING REFLECTOR (FAULT PLANE OR BEDROCK BEDDING)
13 800	INTERMEDIATE VELOCITY ZONE IN THE BEDROCK
	BOREHOLE

- All well locations, surface elevations, water level elevations and well bottom elevations are approximate. Bedrock elevations are based on driller's logs and may represent elevation of bottom of casing.

N°	NOTES
1	THE SURVEY WAS CONDUCTED BY GEOPHYSICS GPR INTERNATIONAL INC. FROM 16 TO 19th, OCTOBER, 1996
2	THE CHAINING AND SURVEYING WERE DONE BY GEOPHYSICS GPR INTERNATIONAL INC.

N° DESSINS DE REFERENCE DRAWINGS

N° DATE MODIFICATIONS G.P.R. APP.

SCEAU PROFESSIONNEL
PROFESSIONAL SEAL

GEOPHYSICS GPR INTERNATIONAL INC.

DESSINE PAR / DRAWN BY	A. Beaudoin, tech. Beaudoin
VERIFIE PAR / CHECKED BY	M. Poulin, geoph. C. Robillard, geoph.
APPROUVE PAR / APPROVED BY	L. Tyrala, P.G.
N° CONTRAT / CONTRACT N°	B-96142
DATE	November 1996
ECHELLE / SCALE	Hor. 1" : 50' Vert. 1" : 50'
N° DESSIN / DRAWING N°	96-11-246

CLIENT: **HSI- GEOTRANS INC.**

PROJET / PROJECT: **NASSAU Rd, NASSAU N.Y.**

TITRE / TITLE: **SEISMIC REFRACTION/REFLECTION PROFILE**

APPROUVE PAR / APPROVED BY — DATE

LES INDUSTRIES POLY INC.

APPENDIX F

APPENDIX F

RESULTS OF LANDFILL PILOT PUMPING TEST ANALYSIS

INTRODUCTION

A 72-hour pumping test was conducted at the Dewey Loeffel Landfill site from November 18 through 21 to assess the hydrologic properties and assist in evaluation of source control remedies for the site.

PRETEST ACTIVITIES

Prior to the test, transducers were positioned in PW-4 (pumping well), PO-1, PO-4, PO-6, PB-1, and GMW-10B. The pump was then installed in PW-4 and discharge line was run from the pump to the containment and carbon filter units. Water levels were manually collected from all wells scheduled to be monitored, and the transducers were connected to the multi-channel datalogger and recording was initiated.

SAMPLING

Sampling of discharged water occurred twice during the test, shortly after the pumping began and shortly before the pump was turned off. These samples were collected from the discharge line prior to the water being run through the carbon filter. For each sampling event, field parameters including pH, conductivity, temperature, dissolved oxygen, and color were recorded. The first sample collected was analyzed for the following:

- pH (EPA Method 150.1)
- Total Dissolved Solids (EPA Method 160.1)
- Total Suspended Solids (EPA Method 160.2)
- Biochemical Oxygen Demand (EPA Method 405.1)
- Alkalinity (EPA Method 310.1)
- Hardness (EPA Method 130.2)
- Iron (EPA Method 6010)
- Chloride (EPA Method 300.0)
- Manganese (EPA Method 6010)
- Sulfide (EPA Method 376.2)

- Sulfate (EPA Method 300.0)
- Conductivity (EPA Method 120.1)
- Ammonia (EPA Method 350.2)
- Nitrate/Nitrite Nitrogen (EPA Method 354.1)
- Phosphate (EPA Method 365.2)
- Chemical Oxygen Demand (EPA Method 410.1)
- Total Organic Carbon (EPA Method 415.1)

The sample collected prior to the end of pumping was analyzed for VOCs (EPA method 8010/8020 including MTBE), SVOCs (EPA method 8270 including phenols) and PCBs (EPA method 8080), in addition to those listed above. The results of the analyses are found in Attachment 1.

Pumping Rates

The test was begun at 4:20 p.m. on November 18. The initial rate was 0.5 gallons per minute (gpm) as measured by an inline instantaneous flow meter. Since this rate was at the extreme low end of the flow meter's range, the flow meter was calibrated against the time it took to fill a one gallon bottle.

A flow rate of 0.5 gpm was maintained for the first 10 hours of the test when a malfunction in the pump controller shut the pump off. Since the generator continued to run, this was not discovered until the next water level was measured at the pumping well, approximately one hour later. The pump was restarted and a discharge rate of 0.5 gpm was reestablished. After 43 hours of pumping, the rate was increased to approximately 0.75 gpm in order to increase drawdown in nearby observation wells inside and outside the slurry wall.

The generator powering the pump shutdown after approximately 68 hours of pumping due to mechanical failure. The pump was restarted within two minutes using an alternate generator and continued until the 72-hour mark. After the pump was shut off, recovery was monitored manually for about one hour and by datalogger for a period of approximately 17 hours.

DISPOSAL OF INVESTIGATION DERIVED WASTE

Water was pumped from PW-4 into an initial containment tank, then pumped through a carbon filter unit and contained. After the pumping test was completed and all water filtered, the water was discharged to the leachate tank cleanout as discussed with the NYSDEC.

RESULTS

During the course of the test the only observation well that showed recognizable drawdown was PO-4. Total drawdown measured in PO-4 was 2.95 feet (Figure 1). The drawdown data was analyzed using AQTESOLV™ (Hydrosolve, 1997) to perform a Theis Confined solution method. Table 1 summarizes the results of the analyses.

Table 1. Dewey Loeffel Landfill 72-Hour Pumping Test Results.

Well ID	Solution Method	T (ft^2/day)	S (S' for Recovery)
PW-4	Theis Confined	9.9	--
PW-4	Theis Recovery	7.3	--
PO-4	Theis Confined	9.5	0.002102

Plots of the solutions for the test and drawdown data are included in Attachment 2.

N039024A.DWG

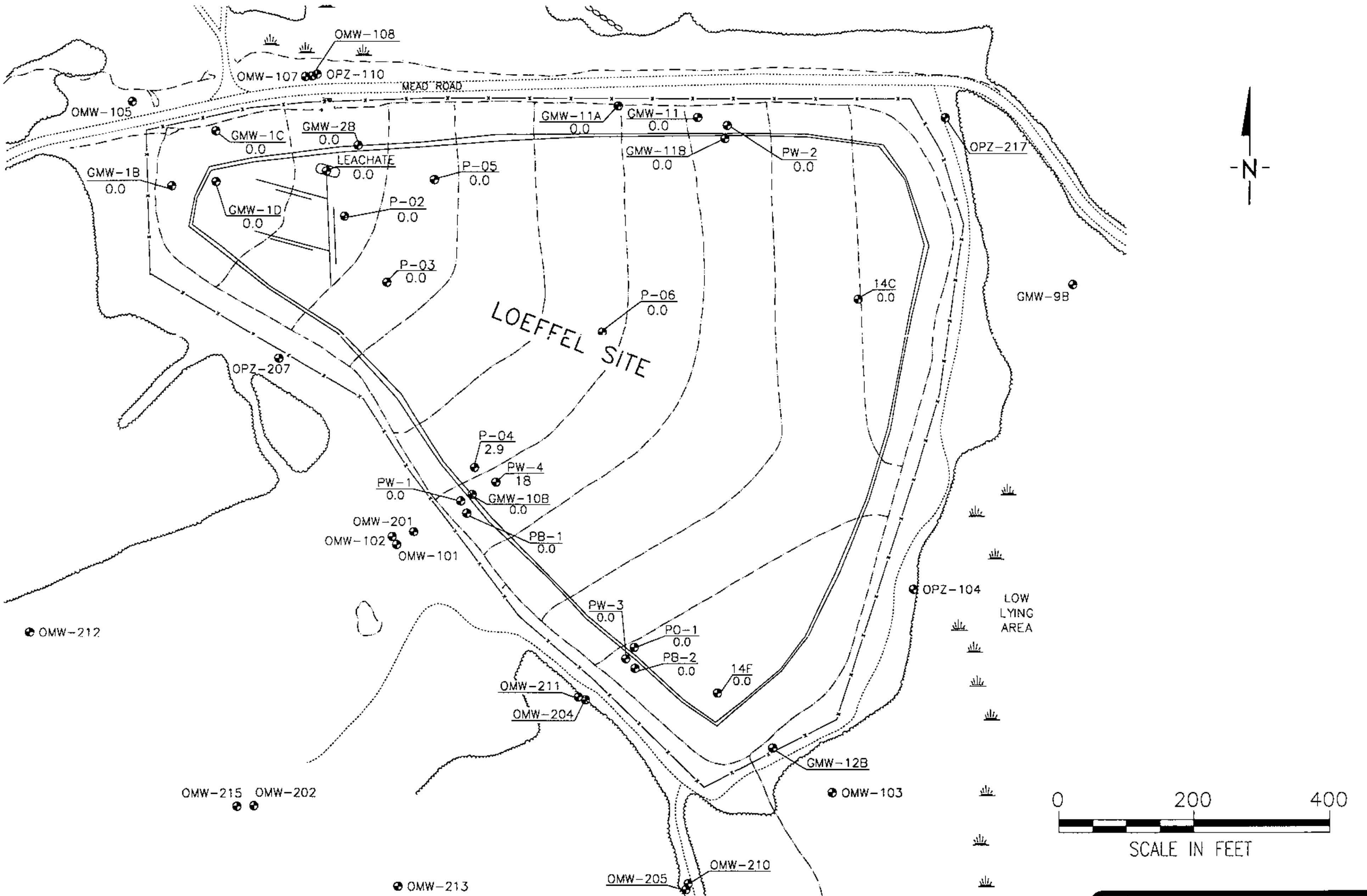


Figure 1. Maximum drawdown during 72 hour pumping test at PW-4 (Pumping Rate 0.5-0.75 gpm).

HSI GEOTRANS
A TETRA TECH COMPANY

ATTACHMENT 1

RESULTS OF ANALYSES OF LEACHATE FROM THE PW-4 PILOT PUMPING TEST

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW4-1121

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: 96000 SAS No.: SDG No.: 62673

Matrix: (soil/water) WATER Lab Sample ID: 319573

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 27NOV961850-I051

Level: (low/med) LOW Date Received: 11/22/96

% Moisture: not dec. ________ Date Analyzed: 11/29/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 800.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	400	U
74-87-3	Chloromethane	400	U
75-01-4	Vinyl Chloride	400	U
74-83-9	Bromomethane	400	U
75-00-3	Chloroethane	400	U
75-69-4	Trichlorofluoromethane	400	U
76-13-1	Freon-113	400	U
75-35-4	1,1-Dichloroethene	400	U
75-09-2	Methylene Chloride	400	U
156-60-5	trans-1,2-Dichloroethene	400	U
75-34-3	1,1-Dichloroethane	400	U
156-59-2	cis-1,2-dichloroethene	1100	
67-66-3	Chloroform	400	U
71-55-6	1,1,1-Trichloroethane	400	U
56-23-5	Carbon tetrachloride	400	U
107-06-2	1,2-Dichloroethane	400	U
79-01-6	Trichloroethene	400	U
78-87-5	1,2-Dichloropropane	400	U
75-27-4	Bromodichloromethane	400	U
10061-01-5	cis-1,3-Dichloropropene	400	U
10061-02-6	trans-1,3-Dichloropropene	400	U
79-00-5	1,1,2-Trichloroethane	400	U
127-18-4	Tetrachloroethene	400	U
124-48-1	Dibromochloromethane	400	U
108-90-7	Chlorobenzene	2200	
75-25-2	Bromoform	400	U
79-34-5	1,1,2,2-Tetrachloroethane	400	U
541-73-1	1,3-Dichlorobenzene	400	U
106-46-7	1,4-Dichlorobenzene	400	U
95-50-1	1,2-Dichlorobenzene	400	U

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW4-1121

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: 96000 SAS No.: SDG No.: 62673

Matrix: (soil/water) WATER Lab Sample ID: 319573

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 27NOV961850-I051

Level: (low/med) LOW Date Received: 11/22/96

% Moisture: not dec. ________ Date Analyzed: 11/29/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 800.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	14000	
108-88-3	Toluene	400	U
100-41-4	Ethylbenzene	400	U
	m/p-Xylene	800	U
95-47-6	o-Xylene	400	U
100-42-5	Styrene	400	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW4-1121

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: 96000 SAS No.: SDG No.: 62673

Matrix: (soil/water) WATER Lab Sample ID: 319573

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R319573S

Level: (low/med) LOW Date Received: 11/22/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:11/22/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/02/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
110-86-1	Pyridine	10	U
62-53-3	Aniline	25	U
108-95-2	Phenol	4.4	J
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	3.6	J
106-46-7	1,4-Dichlorobenzene	16	
95-50-1	1,2-Dichlorobenzene	0.97	J
100-51-6	Benzyl Alcohol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
95-48-7	2-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
106-44-5	4-Methylphenol	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	2.8	J
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
65-85-0	Benzoic Acid	25	U
91-20-3	Naphthalene	1.3	J
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW4-1121

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: 96000 SAS No.: SDG No.: 62673

Matrix: (soil/water) WATER Lab Sample ID: 319573

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R319573S

Level: (low/med) LOW Date Received: 11/22/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:11/22/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/02/96

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: ___

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

CAS NO.	COMPOUND	CONCENTRATION	Q
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
83-32-9	Acenaphthene	10	U
99-09-2	3-Nitroaniline	25	U
51-28-5	2,4-Dinitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
100-02-7	4-Nitrophenol	25	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
103-33-3	Azobenzene	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
92-87-5	Benzidine	25	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U

(1) - Cannot be separated from Diphenylamine

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW4-1121

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 96000

Lab Code: INCHVT   Case No.: 96000   SAS No.:   SDG No.: 62673

Matrix: (soil/water) WATER   Lab Sample ID: 319573

Sample wt/vol: 1000 (g/mL) ML   Lab File ID: R319573S

Level: (low/med) LOW   Date Received: 11/22/96

% Moisture: ______ decanted: (Y/N) ___   Date Extracted: 11/22/96

Concentrated Extract Volume: 1000 (uL)   Date Analyzed: 12/02/96

Injection Volume: 2.0 (uL)   Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y   pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

FORM 1
OTHER ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW4-1121

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96000

Lab Code: INCHVT Case No.: 96000 SAS No.: SDG No.: 62673

Matrix: (soil/water) WATER Lab Sample ID: 319573

Sample wt/vol: 1000 (g/mL) ML Lab File ID: ________

% Moisture: ______ decanted: (Y/N)___ Date Received: 11/22/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 11/22/96

Concentrated Extract Volume: 10 (mL) Date Analyzed: 11/30/96

Injection Volume: _______ (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	0.50	U
11096-82-5	Aroclor-1260	0.50	U

ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

GeoTrans, Inc.
46050 Manekin Plaza
Suite 100
Sterling, VA 20166

Attention : Chuck Spaulding

Date : 12/04/96
ETR Number : 62673
Project No.: 96000
No. Samples: 1
Arrived : 11/19/96

Case:96000 SDG:62673

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
319309	PW4-1118:11/18/96 (Water)	
376.2	Sulfide	0.07
130.2	Total Hardness as CaCO3	170
354.1	Nitrite Nitrogen	<0.01
310.1	Alkalinity (as CaCO3)	288
300.0	Chloride	249
300.0	Sulfate	0.8
300.0	Nitrate as N	0.3
160.2	Total Suspended Solids	87.0
405.1	BOD5	12
160.1	Total Dissolved Solids	940
120.1	Conductivity (umhos/cm)	1160
150.1	pH (std. units)	6.29
350.2	Ammonia-Nitrogen	2.7
365.2	Phosphate, Total as P	0.13
410.1	Chemical Oxygen Demand	170
415.1	Organic Carbon, Total	37.3

< Last Page > Submitted By : Aquatec Inc.

ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

GeoTrans, Inc.
46050 Manekin Plaza
Suite 100
Sterling, VA 20166

Attention : Chuck Spaulding

Date : 12/06/96
ETR Number : 62722
Project No.: 96000
No. Samples: 1
Arrived : 11/22/96

Case:96000 SDG:62673

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
319573	PW4-1121:11/21/96 (Water)	
376.2	Sulfide	0.03
130.2	Total Hardness as CaCO3	156
354.1	Nitrite Nitrogen	<0.01
310.1	Alkalinity (as CaCO3)	292
300.0	Chloride	248
300.0	Sulfate	0.8
300.0	Nitrate as N	0.3
160.2	Total Suspended Solids	13.8
405.1	BOD5	8.7
160.1	Total Dissolved Solids	860
120.1	Conductivity (umhos/cm)	1060
150.1	pH (std. units)	6.45
350.2	Ammonia-Nitrogen	2.3
365.2	Phosphate, Total as P	0.082
410.1	Chemical Oxygen Demand	151
415.1	Organic Carbon, Total	17.6

< Last Page >   Submitted By :   Aquatec Inc.

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PW41118

Lab Name: ITS_ENVIRONMENTAL________ Contract: 96000_____

Lab Code: INCHVT Case No.: 96000_ SAS No.: _______ SDG No.: 62673_

Matrix (soil/water): WATER Lab Sample ID: 319309

Level (low/med): LOW__ Date Received: 11/19/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	69800			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese	78600		E	P
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: YELLOW___ Clarity Before: CLOUDY Texture: _______

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _______

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PW41121

Lab Name: ITS_ENVIRONMENTAL________ Contract: 96000_____

Lab Code: INCHVT Case No.: 96000_ SAS No.: _______ SDG No.: 62673_

Matrix (soil/water): WATER Lab Sample ID: 319573

Level (low/med): LOW__ Date Received: 11/22/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	51300			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese	81900		E	P
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

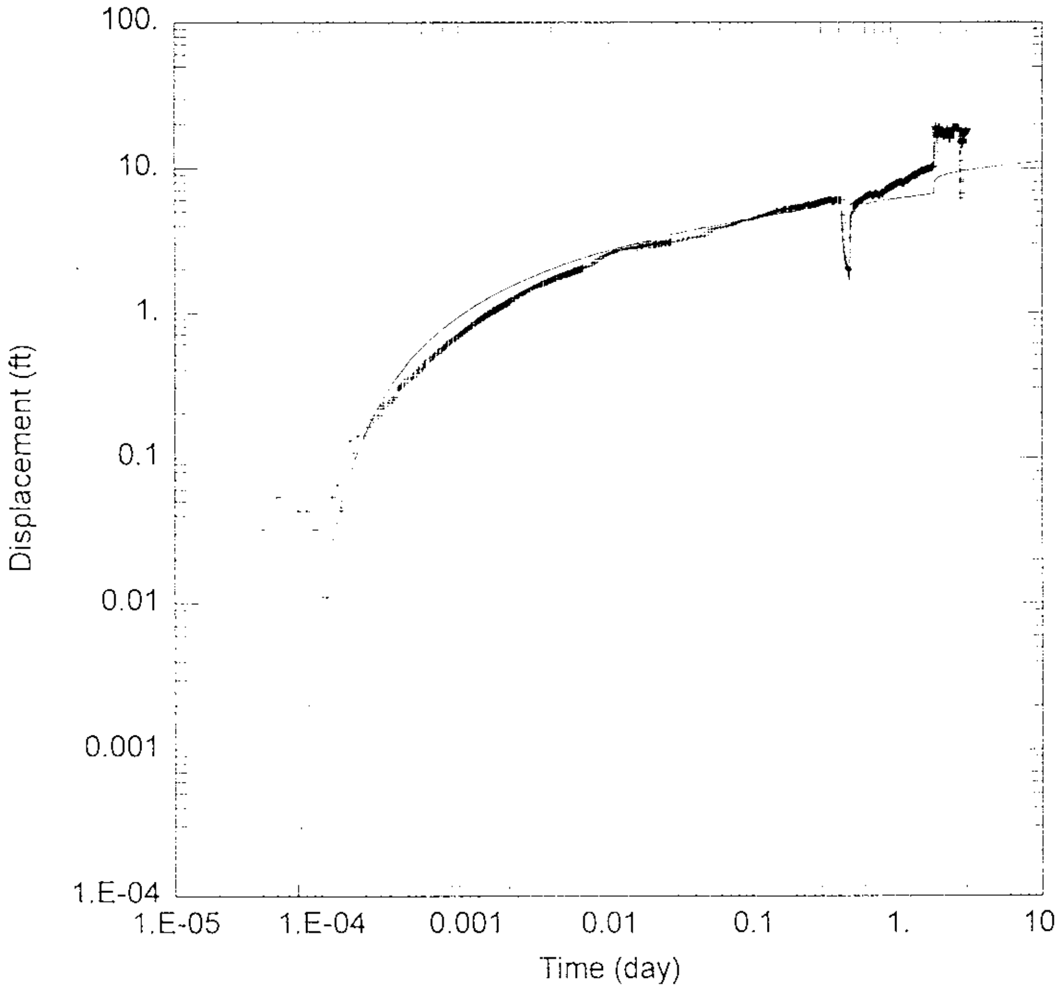
Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _______

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _______

Comments:

ATTACHMENT 2

DRAWDOWN VERSUS TIME DATA AND SOLUTIONS



GE LOEFFEL PW4 72 HOUR PUMPTEST

Data Set: F:\LOEFFEL\PHASE2\PUMPTEST\PW4ALL.AQT
Date: 12/17/96 Time: 16:15:24

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 1.

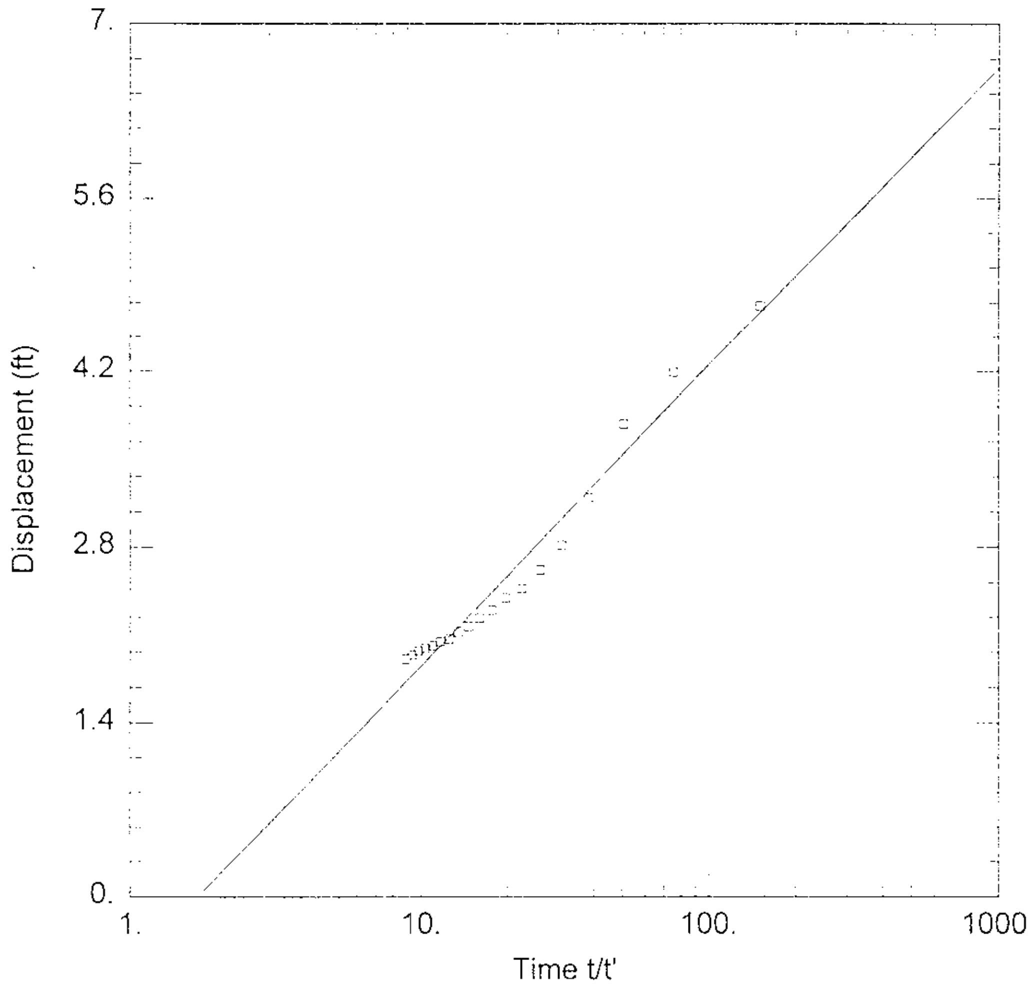
WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
PW 4	7.078E+005	9.334E+005	- PW4	7.078E+005	9.334E+005

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 9.883 ft^2/day
S = 0.009968



GE LOEFFEL PW4 72 HOUR PUMPTEST

Data Set: F:\LOEFFEL\PHASE2\PUMPTEST\PW4REC.AQT
Date: 12/20/96 Time: 14:55:12

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 1.

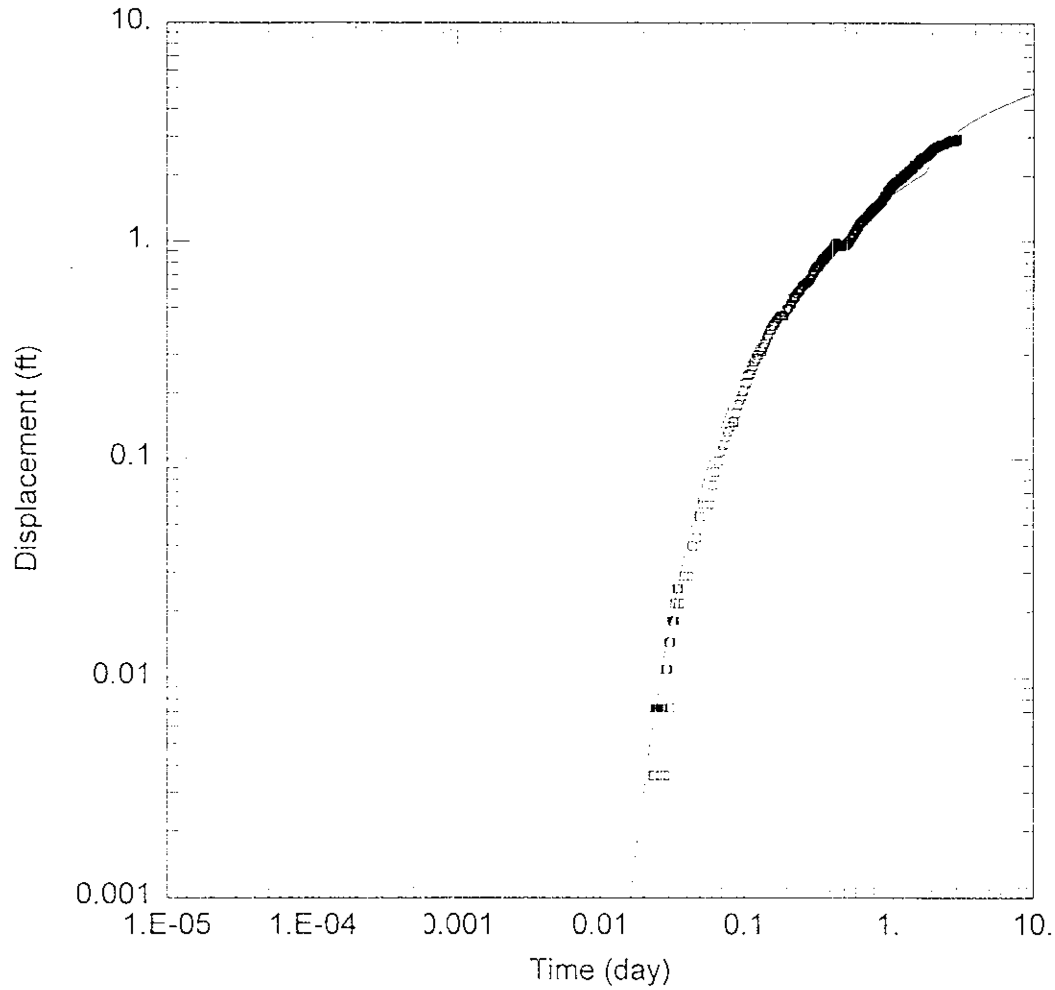
WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
PW 4	7.078E+005	9.334E+005	PW4	7.078E+005	9.334E+005

SOLUTION

Aquifer Model: Confined
Solution Method: Theis Recovery

T = 7.342 ft^2/day
S' = 1.706



GE LOEFFEL PW4 72 HOUR PUMPTEST

Data Set: F:\LOEFFEL\PHASE2\PUMPTEST\PO4ALL.AQT
Date: 12/17/96 Time: 16:05:55

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells		
Well Name	X (ft)	Y (ft)
PW 4	7.078E+005	9.334E+005

Observation Wells		
Well Name	X (ft)	Y (ft)
PO4	7.077E+005	9.335E+005

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 9.479 ft^2/day
S = 0.002102

APPENDIX G

APPENDIX G

WATER QUALITY ANALYSIS RESULTS FROM RI WELLS AND SAMPLING PROTOCOLS

ATTACHMENT I

DATA QUALIFIER DEFINITIONS

ORGANIC DATA QUALIFIER DEFINITIONS

The first five qualifier codes following are specified for use by the National Functional Guidelines for Organic Data Review.

U The analyte was not detected during laboratory analysis. The associated numerical value is the reported sample Quantitation Limit (QL). If present, the compound concentration may be presumed to be less than this amount.

J The analyte was positively identified; the associated numerical value is the **approximate** concentration of the analyte in the sample, either because its concentration was lower than the QL (laboratory "J" flag), or because QC criteria were not met (validation "J," plus subqualifier listed below).

UJ The analyte was not detected above the reported sample QL. However, the reported sample QL is **approximate**; the compound concentration may not reliably be presumed to be less than the QL value.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification. Further analysis would be necessary for positive identification and accurate quantitation.

The following subqualifiers provide further detail about the type and number of deficiencies leading to qualification of a given data point.

-H The value reported was qualified due to excessive holding time.

-C The value reported was qualified due to instrument calibration or resolution problems. A laboratory "C" flag indicates GC/MS confirmation of a Pesticide/PCB target compound identity.

-B The compound was detected in an associated blank as well as in the sample.

UJ-B The compound is considered to be undetected and the value reported is an estimated sample QL. The value of this reported QL is determined by the amount of the compound found in the sample:

- The sample value was less than the CRQL and less than 5 times the amount of the compound found in the blank (less than 10 times for the common laboratory contaminants Methylene Chloride, Acetone, 2-Butanone, Toluene, and Phthalates): the sample QL has been adjusted by the reviewer to be equal to the CRQL.

- The sample value was greater than the CRQL but less than 5 times (less than 10 times for common lab contaminants): the sample QL is reported as equal to the reported sample value.

- The sample value was greater than 5 times the blank value (10 times for common contaminants), see J-B qualifier.

J-B The reported value is an estimated amount with a potential high bias. The compound was detected in the blank and the quantity reported in the sample is greater than 5 times the amount found in the blank (greater than 10 times for common lab contaminants), but less than 100 times the blank amount.

-S The value reported was qualified due to surrogate or matrix spike recovery problems.

-I The value reported was qualified due to internal standard response or retention time deficiencies.

-M Compounds could not be separated or were subject to interference problems attributable to sample matrix.

-A The TIC was identified as a laboratory artifact or aldol condensation product.

-P The lab uses this flag for a Pesticide or Aroclor when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I. The reviewer applies this flag when chromatographic methods using two columns differ in quantitation between the columns by 25% or more.

-Q Please see validation report text for a discussion of this qualifier.

VOCs December 1996

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW9B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322930

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I051

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	UJ-C
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	UJ-C
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	UJ-C
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

FORM I 8010-VOA

3/24/97

FORM 1
8020-VOA O! NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW9B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322930

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I051

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.75	
100-41-4	Ethylbenzene	0.50	U
----------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

3/24/97

FORM I 8020-VOA

FORM 1
8010-VOA OR(ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CMW103

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322924

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I011

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	UJ-C
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	UJ-C
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	UJ-C
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

FORM I 8010-VOA

3/26/97

FORM 1
8020-VOA OR ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW103

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322924

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 04JAN972126-I011

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ______   Date Analyzed: 01/05/97

GC Column: DB-VRX   ID: 0.45 (mm)   Dilution Factor: 1.0

Soil Extract Volume:______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	1.9	
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

3/96/97

FORM I 8020-VOA

FORM 1
8010-VOA OR ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW202

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322942

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I021

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	0.50		
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.90		
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	u.5-C
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	u.5-C
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	u.5-C
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	u.5-C
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	u.5-C
95-50-1	1,2-Dichlorobenzene	0.50	U	

FORM I 8010-VOA

3/16/97

FORM 1
8020-VOA OR JICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW202

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322942

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I021

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	6.5	
108-88-3	Toluene	1.1	
100-41-4	Ethylbenzene	0.50	U
	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

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3/26/97

FORM I 8020-VOA

FORM 1
8010-VOA OR .NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW204

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322938

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971520-I031

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2000.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	1000	U	
74-87-3	Chloromethane	1000	U	
75-01-4	Vinyl Chloride	1000	U	
74-83-9	Bromomethane	1000	U	
75-00-3	Chloroethane	1000	U	
75-69-4	Trichlorofluoromethane	1000	U	UJ-C
76-13-1	Freon-113	1000	U	
75-35-4	1,1-Dichloroethene	1000	U	
75-09-2	Methylene Chloride	4000		
156-60-5	trans-1,2-Dichloroethene	1000	U	
75-34-3	1,1-Dichloroethane	1000	U	
156-59-2	cis-1,2-dichloroethene	12000		
67-66-3	Chloroform	1000	U	
71-55-6	1,1,1-Trichloroethane	1000	U	UJ-C
56-23-5	Carbon tetrachloride	1000	U	UJ-C
107-06-2	1,2-Dichloroethane	2100		J-C
79-01-6	Trichloroethene	1000	U	UJ-C
78-87-5	1,2-Dichloropropane	1000	U	UJ-C
75-27-4	Bromodichloromethane	1000	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	1000	U	
10061-02-6	trans-1,3-Dichloropropene	1000	U	UJ-C
79-00-5	1,1,2-Trichloroethane	1000	U	UJ-C
127-18-4	Tetrachloroethene	1000	U	UJ-C
124-48-1	Dibromochloromethane	1000	U	UJ-C
108-90-7	Chlorobenzene	2600		J-C
75-25-2	Bromoform	1000	U	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	UJ-C
541-73-1	1,3-Dichlorobenzene	1000	U	
106-46-7	1,4-Dichlorobenzene	1000	U	
95-50-1	1,2-Dichlorobenzene	1000	U	

1/4/97

FORM 1
8020-VOA OI   NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW204

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322938

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 06JAN971520-I031

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ________   Date Analyzed: 01/06/97

GC Column: DB-VRX   ID: 0.45 (mm)   Dilution Factor: 2000.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	1000	U
71-43-2	Benzene	39000	
108-88-3	Toluene	12000	
100-41-4	Ethylbenzene	1000	U
----------------	p/m-Xylene	2000	U
95-47-6	o-Xylene	1000	U
100-42-5	Styrene	1000	U

FORM I 8020-VOA

3/26/97

FORM 1
8010-VOA OR .ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW205

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322941

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I041

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 30.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q	
75-71-8	Dichlorodifluoromethane	15	U	
74-87-3	Chloromethane	15	U	
75-01-4	Vinyl Chloride	15	U	
74-83-9	Bromomethane	15	U	
75-00-3	Chloroethane	15	U	
75-69-4	Trichlorofluoromethane	15	U	
76-13-1	Freon-113	15	U	
75-35-4	1,1-Dichloroethene	15	U	
75-09-2	Methylene Chloride	15	U	
156-60-5	trans-1,2-Dichloroethene	15	U	
75-34-3	1,1-Dichloroethane	15	U	
156-59-2	cis-1,2-dichloroethene	70		
67-66-3	Chloroform	15	U	
71-55-6	1,1,1-Trichloroethane	15	U	
56-23-5	Carbon tetrachloride	15	U	
107-06-2	1,2-Dichloroethane	15	U	
79-01-6	Trichloroethene	15	U	
78-87-5	1,2-Dichloropropane	15	U	
75-27-4	Bromodichloromethane	15	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	15	U	
10061-02-6	trans-1,3-Dichloropropene	15	U	
79-00-5	1,1,2-Trichloroethane	15	U	UJ-C
127-18-4	Tetrachloroethene	15	U	
124-48-1	Dibromochloromethane	15	U	
108-90-7	Chlorobenzene	360		J-C
75-25-2	Bromoform	15	U	
79-34-5	1,1,2,2-Tetrachloroethane	15	U	UJ-C
541-73-1	1,3-Dichlorobenzene	15	U	UJ-C
106-46-7	1,4-Dichlorobenzene	15	U	UJ-C
95-50-1	1,2-Dichlorobenzene	15	U	

FORM I 8010-VOA

3/24/97

FORM 1
8020-VOA OI NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW205

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322941

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I041

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 30.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	15	U
71-43-2	Benzene	67	
108-88-3	Toluene	15	U
100-41-4	Ethylbenzene	15	U
	p/m-Xylene	30	U
95-47-6	o-Xylene	15	U
100-42-5	Styrene	15	U

3/20/97

FORM 1
8010-VOA OR NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW206

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322934

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I081

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	UJ-C
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	UJ-C
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	UJ-C
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

3/24/97

FORM 1
8020-VOA OR TICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW206

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322934

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I081

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.58	
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

3/26/97
JH

FORM 1
8010-VOA OR .ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW211

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322944

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971520-I021

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 100.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	UG/L	Q	
75-71-8	Dichlorodifluoromethane	50	U	
74-87-3	Chloromethane	50	U	
75-01-4	Vinyl Chloride	50	U	
74-83-9	Bromomethane	50	U	
75-00-3	Chloroethane	50	U	
75-69-4	Trichlorofluoromethane	50	U	uJ-C
76-13-1	Freon-113	50	U	
75-35-4	1,1-Dichloroethene	50	U	
75-09-2	Methylene Chloride	490		
156-60-5	trans-1,2-Dichloroethene	50	U	
75-34-3	1,1-Dichloroethane	50	U	
156-59-2	cis-1,2-dichloroethene	1600		
67-66-3	Chloroform	410		
71-55-6	1,1,1-Trichloroethane	50	U	uJ-C
56-23-5	Carbon tetrachloride	50	U	uJ-C
107-06-2	1,2-Dichloroethane	240		J-C
79-01-6	Trichloroethene	370		J-C
78-87-5	1,2-Dichloropropane	50	U	uJ-C
75-27-4	Bromodichloromethane	50	U	uJ-C
10061-01-5	cis-1,3-Dichloropropene	50	U	
10061-02-6	trans-1,3-Dichloropropene	50	U	uJ-C
79-00-5	1,1,2-Trichloroethane	50	U	uJ-C
127-18-4	Tetrachloroethene	50	U	uJ-C
124-48-1	Dibromochloromethane	50	U	uJ-C
108-90-7	Chlorobenzene	530		J-C
75-25-2	Bromoform	50	U	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	uJ-C
541-73-1	1,3-Dichlorobenzene	50	U	
106-46-7	1,4-Dichlorobenzene	50	U	
95-50-1	1,2-Dichlorobenzene	50	U	

3/26/97

FORM I 8010-VOA

FORM 1
8020-VOA OF IICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW211

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322944

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971520-I021

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 100.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	50	U
71-43-2	Benzene	3500	
108-88-3	Toluene	50	U
100-41-4	Ethylbenzene	50	U
	p/m-Xylene	100	U
95-47-6	o-Xylene	50	U
100-42-5	Styrene	50	U

3/26/97

FORM 1

8010-VOA OR [illegible]ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW212

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322933

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 04JAN972126-I071

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ________   Date Analyzed: 01/05/97

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 1.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	uJ-C
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	uJ-C
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	uJ-C
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

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FORM I 8010-VOA

FORM 1
8020-VOA OF NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW212

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322933

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I071

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

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

CAS NO.	COMPOUND	CONCENTRATION (UG/L)	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.88	
100-41-4	Ethylbenzene	0.50	U
-------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

3/26/97

FORM 1
8010-VOA OR TICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW215

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322925

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 04JAN972138-I031

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ________   Date Analyzed: 01/05/97

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 20.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: ________ (uL)

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

CAS NO.	COMPOUND	CONCENTRATION	Q	
75-71-8	Dichlorodifluoromethane	10	U	
74-87-3	Chloromethane	10	U	
75-01-4	Vinyl Chloride	10	U	
74-83-9	Bromomethane	10	U	
75-00-3	Chloroethane	10	U	
75-69-4	Trichlorofluoromethane	10	U	
76-13-1	Freon-113	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-09-2	Methylene Chloride	10	U	
156-60-5	trans-1,2-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
156-59-2	cis-1,2-dichloroethene	10	U	
67-66-3	Chloroform	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon tetrachloride	10	U	
107-06-2	1,2-Dichloroethane	10	U	
79-01-6	Trichloroethene	10	U	
78-87-5	1,2-Dichloropropane	10	U	
75-27-4	Bromodichloromethane	10	U	uJ-C
10061-01-5	cis-1,3-Dichloropropene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	uJ-C
127-18-4	Tetrachloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
108-90-7	Chlorobenzene	10	U	uJ-C
75-25-2	Bromoform	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	uJ-C
541-73-1	1,3-Dichlorobenzene	10	U	
106-46-7	1,4-Dichlorobenzene	10	U	uJ-C
95-50-1	1,2-Dichlorobenzene	10	U	

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FORM 1
8020-VOA OF IICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW215

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322925

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I031

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 20.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	10	U
71-43-2	Benzene	360	
108-88-3	Toluene	30	
100-41-4	Ethylbenzene	10	U
----------------	p/m-Xylene	20	U
95-47-6	o-Xylene	10	U
100-42-5	Styrene	10	U

FORM I 8020-VOA

3/26/97

FORM 1
8010-VOA OF [illegible]NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW213

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322937

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I051

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	UG/L	Q	
75-71-8	Dichlcrodifluoromethane	5.0	U	
74-87-3	Chlorcmethane	5.0	U	
75-01-4	Vinyl Chloride	5.0	U	
74-83-9	Bromomethane	5.0	U	
75-00-3	Chlorcethane	5.0	U	
75-69-4	Trichlorofluoromethane	5.0	U	
76-13-1	Freon-113	5.0	U	
75-35-4	1,1-Dichloroethene	5.0	U	
75-09-2	Methylene Chloride	5.0	U	
156-60-5	trans-1,2-Dichloroethene	5.0	U	
75-34-3	1,1-Dichloroethane	5.0	U	
156-59-2	cis-1,2-dichloroethene	18		
67-66-3	Chloroform	24		
71-55-6	1,1,1-Trichloroethane	5.0	U	
56-23-5	Carbon tetrachloride	5.0	U	
107-06-2	1,2-Dichloroethane	5.0	U	
79-01-6	Trichloroethene	67		
78-87-5	1,2-Dichloropropane	5.0	U	
75-27-4	Bromodichloromethane	5.0	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	5.0	U	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	
79-00-5	1,1,2-Trichloroethane	5.0	U	UJ-C
127-18-4	Tetrachloroethene	5.0	U	
124-48-1	Dibromochloromethane	5.0	U	
108-90-7	Chlorobenzene	12		J-C
75-25-2	Bromoform	5.0	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	UJ-C
541-73-1	1,3-Dichlorobenzene	5.0	U	
106-46-7	1,4-Dichlorobenzene	5.0	U	UJ-C
95-50-1	1,2-Dichlorobenzene	5.0	U	

3/24/97

FORM 1
8020-VOA O[illegible] NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW213

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322937

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 04JAN972138-I051

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ________   Date Analyzed: 01/05/97

GC Column: DB-VRX   ID: 0.45 (mm)   Dilution Factor: 10.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	5.0	U
71-43-2	Benzene	140	
108-88-3	Toluene	5.0	U
100-41-4	Ethylbenzene	5.0	U
	p/m-Xylene	10	U
95-47-6	o-Xylene	5.0	U
100-42-5	Styrene	5.0	U

FORM I 8020-VOA

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FORM 1
8010-VOA OR JICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW214

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322928

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971520-I011

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	UJ-C
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	1.3		
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	UJ-C
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	UJ-C
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	1.4		J-C
75-25-2	Bromoform	0.50	U	UJ-C
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

3/25/97

FORM I 8010-VOA

FORM 1
8020-VOA O NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW214

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322928

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 06JAN971520-I011

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ________   Date Analyzed: 01/06/97

GC Column: DB-VRX   ID: 0.45 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	11	
108-88-3	Toluene	10	
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

FORM I 8020-VOA

1/24/97

FORM 1
8010-VOA OR ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW216

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322940

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 04JAN972138-I011

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ________   Date Analyzed: 01/05/97

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	3.9		
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	2.5		
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	UJ-C
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	5.2		J-C
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	UJ-C
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	UJ-C
95-50-1	1,2-Dichlorobenzene	0.50	U	

3/26/97

FORM 1
8020-VOA OI NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW216

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322940

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I011

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	14	
108-88-3	Toluene	0.84	
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

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FCRM 1
8010-VOA O NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW218

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322926

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I021

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	UJ-C
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	UJ-C
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	UJ-C
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

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CLIENT SAMPLE NO.

OMW218

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322926

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I021

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.63	
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

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CLIENT SAMPLE NO.

OMW219

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322943

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I061

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 200.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	100	U	
74-87-3	Chloromethane	100	U	
75-01-4	Vinyl Chloride	100	U	
74-83-9	Bromomethane	100	U	
75-00-3	Chloroethane	100	U	
75-69-4	Trichlorofluoromethane	100	U	
76-13-1	Freon-113	100	U	
75-35-4	1,1-Dichloroethene	100	U	
75-09-2	Methylene Chloride	100	U	
156-60-5	trans-1,2-Dichloroethene	100	U	
75-34-3	1,1-Dichloroethane	100	U	
156-59-2	cis-1,2-dichloroethene	100	U	
67-66-3	Chloroform	100	U	
71-55-6	1,1,1-Trichloroethane	100	U	
56-23-5	Carbon tetrachloride	100	U	
107-06-2	1,2-Dichloroethane	100	U	
79-01-6	Trichloroethene	100	U	
78-87-5	1,2-Dichloropropane	100	U	
75-27-4	Bromodichloromethane	100	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	100	U	
10061-02-6	trans-1,3-Dichloropropene	100	U	
79-00-5	1,1,2-Trichloroethane	100	U	UJ-C
127-18-4	Tetrachloroethene	100	U	
124-48-1	Dibromochloromethane	100	U	
108-90-7	Chlorobenzene	100	U	UJ-C
75-25-2	Bromoform	100	U	
79-34-5	1,1,2,2-Tetrachloroethane	100	U	UJ-C
541-73-1	1,3-Dichlorobenzene	100	U	
106-46-7	1,4-Dichlorobenzene	100	U	UJ-C
95-50-1	1,2-Dichlorobenzene	100	U	

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CLIENT SAMPLE NO.

OMW219

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL   SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322943

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 04JAN972138-I061

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ______   Date Analyzed: 01/05/97

GC Column: DB-VRX   ID: 0.45 (mm)   Dilution Factor: 200.0

Soil Extract Volume:______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	100	U
71-43-2	Benzene	3200	
108-88-3	Toluene	2900	
100-41-4	Ethylbenzene	100	U
----------------	p/m-Xylene	200	U
95-47-6	o-Xylene	100	U
100-42-5	Styrene	100	U

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CLIENT SAMPLE NO.

OMW220

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322932

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I061

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	UJ-C
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	UJ-C
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	UJ-C
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

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FCRM 1
8020-VOA O NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW220

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322932

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I061

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.78	
100-41-4	Ethylbenzene	0.50	U
	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

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8010-VOA OI NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OPZ217

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322929

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I041

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlcrodifluoromethane	0.50	U	
74-87-3	Chlorcmethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chlorcethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	UJ-C JH
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	UJ-C JH
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chlorcform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	UJ-C JH
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

JH
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FORM 1

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CLIENT SAMPLE NO.

OPZ217

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322929

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972126-I041

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.90	
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

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FORM I

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PB2

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322946

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I091

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 3000.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	1500	U	
74-87-3	Chloromethane	1500	U	
75-01-4	Vinyl Chloride	1500	U	
74-83-9	Bromomethane	1500	U	
75-00-3	Chloroethane	1500	U	
75-69-4	Trichlorofluoromethane	1500	U	
76-13-1	Freon-113	1500	U	
75-35-4	1,1-Dichloroethene	1500	U	
75-09-2	Methylene Chloride	6800		
156-60-5	trans-1,2-Dichloroethene	1500	U	
75-34-3	1,1-Dichloroethane	1500	U	
156-59-2	cis-1,2-dichloroethene	22000		
67-66-3	Chloroform	1500	U	
71-55-6	1,1,1-Trichloroethane	1500	U	
56-23-5	Carbon tetrachloride	1500	U	
107-06-2	1,2-Dichloroethane	2500		
79-01-6	Trichloroethene	1500	U	
78-87-5	1,2-Dichloropropane	1500	U	
75-27-4	Bromodichloromethane	1500	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	1500	U	
10061-02-6	trans-1,3-Dichloropropene	1500	U	
79-00-5	1,1,2-Trichloroethane	1500	U	UJ-C
127-18-4	Tetrachloroethene	1500	U	
124-48-1	Dibromochloromethane	1500	U	
108-90-7	Chlorobenzene	8600		J-C
75-25-2	Bromoform	1500	U	
79-34-5	1,1,2,2-Tetrachloroethane	1500	U	UJ-C
541-73-1	1,3-Dichlorobenzene	1500	U	
106-46-7	1,4-Dichlorobenzene	1500	U	UJ-C
95-50-1	1,2-Dichlorobenzene	1500	U	

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CLIENT SAMPLE NO.

PB2

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322946

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 04JAN972138-I091

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/05/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 3000.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

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

CAS NO.	COMPOUND	CONCENTRATION	Q
1634-04-4	Methyl tert-Butyl Ether	1500	U
71-43-2	Benzene	52000	
108-88-3	Toluene	56000	
100-41-4	Ethylbenzene	1500	U
	p/m-Xylene	3000	U
95-47-6	o-Xylene	1500	U
100-42-5	Styrene	1500	U

FORM 1
8010-VOA OR[illegible]ANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

191-05-21B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322765

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I071

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q
75-71-8	Dichlorodifluoromethane	1.0	U
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl Chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
76-13-1	Freon-113	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene Chloride	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
156-59-2	cis-1,2-dichloroethene	1.0	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	41	
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U

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FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

191-05-21B

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63244

Matrix: (soil/water) WATER   Lab Sample ID: 322765

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 30DEC961854-I071

Level: (low/med) LOW   Date Received: 12/26/96

% Moisture: not dec. ______   Date Analyzed: 12/31/96

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 2.0

Soil Extract Volume: ______ (uL)   Soil Aliquot Volume: ______ (uL)

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

CAS NO.	COMPOUND		Q
1634-04-4	Methyl tert-Butyl Ether	1.0	U
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
----------	m/p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
100-42-5	Styrene	1.0	U

3/29/97 JR

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

191-05-21A

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322766

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I061

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume: ________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	1.0	U
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl Chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
76-13-1	Freon-113	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene Chloride	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
156-59-2	cis-1,2-dichloroethene	1.0	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	42	
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U

3/29/97 JR

FORM I 8010-VOA

FORM 1
8020-VOA OI NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

191-05-21A

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322766

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I061

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	1.0	U
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
----------------	m/p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
100-42-5	Styrene	1.0	U

3/29/97 JR

FORM 1
8010-VOA (ANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

191-05-15

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322767

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I011

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ______ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ______ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.68	
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon-113	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.71	
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	1.9	
156-59-2	cis-1,2-dichloroethene	1.1	
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	15	
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U

3/29/97 JR

FORM 1
8020-VOA OR. .NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

191-05-15

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322767

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I011

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	15	
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
--------	m/p-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

3/29/97 JR

FORM 1
8010-VOA (ANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

192-01-3B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322768

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I051

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

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

CAS NO.	COMPOUND	UG/L	Q
75-71-8	Dichlorodifluoromethane	1.0	U
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl Chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
76-13-1	Freon-113	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene Chloride	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
156-59-2	cis-1,2-dichloroethene	1.1	
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	36	
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U

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FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

192-01-3B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322768

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I051

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	1.0	U
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
	m/p-Xylene	2.0	U
95-47-6	o-Xylene	1.0	U
100-42-5	Styrene	1.0	U

3/29/97 JR

FORM 1
8010-VOA C ANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW-107

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322769

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I021

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

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

CAS NO.	COMPOUND		Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon-113	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U

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FORM 1
8020-VOA OR. .ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW-107

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322769

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I021

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
----------	m/p-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

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FORM 1
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CLIENT SAMPLE NO.

GMW-11A

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322770

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I031

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

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

CAS NO.	COMPOUND	UG/L	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon-113	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	4.3	
106-46-7	1,4-Dichlorobenzene	4.0	NJ
95-50-1	1,2-Dichlorobenzene	0.50	U

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FORM 1
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CLIENT SAMPLE NO.

GMW-11A

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322770

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 30DEC961854-I031

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: not dec. ________ Date Analyzed: 12/31/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
----------------	m/p-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

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CLIENT SAMPLE NO.

GMW101

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322805

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 31DEC961754-I051

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/01/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	UJ-C JR
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

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CLIENT SAMPLE NO.

GMW101

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63244

Matrix: (soil/water) WATER   Lab Sample ID: 322805

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 31DEC961754-I051

Level: (low/med) LOW   Date Received: 12/27/96

% Moisture: not dec. ________   Date Analyzed: 01/01/97

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
1634-04-4	Methyl tert-Butyl Ether	0.50	U	UJ-C
71-43-2	Benzene	0.50	U	
108-88-3	Toluene	0.50	U	
100-41-4	Ethylbenzene	0.50	U	
	m/p-Xylene	1.0	U	
95-47-6	o-Xylene	0.50	U	
100-42-5	Styrene	0.50	U	SR

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FORM 1
8010-VOA OI NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW1

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322807

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 03JAN971243-I051

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/03/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1000.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	500	U
74-87-3	Chloromethane	500	U
75-01-4	Vinyl Chloride	500	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	500	U
75-69-4	Trichlorofluoromethane	500	U
76-13-1	Freon-113	500	U
75-35-4	1,1-Dichloroethene	500	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-34-3	1,1-Dichloroethane	500	U
156-59-2	cis-1,2-dichloroethene	500	U
67-66-3	Chloroform	500	U
71-55-6	1,1,1-Trichloroethane	500	U
56-23-5	Carbon tetrachloride	500	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	500	U
78-87-5	1,2-Dichloropropane	500	U
75-27-4	Bromodichloromethane	500	U — ~~UJ~~ e JR
10061-01-5	cis-1,3-Dichloropropene	500	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	500	U
124-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U
541-73-1	1,3-Dichlorobenzene	500	U
106-46-7	1,4-Dichlorobenzene	500	U
95-50-1	1,2-Dichlorobenzene	500	U

3/29/97 JR

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW1

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322807

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 03JAN971243-I051

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/03/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1000.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	500	
71-43-2	Benzene	26000	
108-88-3	Toluene	3500	
100-41-4	Ethylbenzene	500	U
	p/m-Xylene	1000	U
95-47-6	o-Xylene	500	U
100-42-5	Styrene	500	U

3/29/97 JR

FORM 1
8010-VOA OI NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PB1

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322815

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 03JAN971243-I041

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/03/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 500.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	250	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	250	U
74-83-9	Bromomethane	250	U
75-00-3	Chloroethane	250	U
75-69-4	Trichlorofluoromethane	250	U
76-13-1	Freon-113	250	U
75-35-4	1,1-Dichloroethene	250	U
75-09-2	Methylene Chloride	250	U
156-60-5	trans-1,2-Dichloroethene	250	U
75-34-3	1,1-Dichloroethane	250	U
156-59-2	cis-1,2-dichloroethene	250	U
67-66-3	Chloroform	250	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon tetrachloride	250	U
107-06-2	1,2-Dichloroethane	250	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
10061-02-6	trans-1,3-Dichloropropene	250	U
79-00-5	1,1,2-Trichloroethane	250	U
127-18-4	Tetrachloroethene	250	U
124-48-1	Dibromochloromethane	250	U
108-90-7	Chlorobenzene	250	U
75-25-2	Bromoform	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
541-73-1	1,3-Dichlorobenzene	250	U
106-46-7	1,4-Dichlorobenzene	250	U
95-50-1	1,2-Dichlorobenzene	250	U

3/29/97 JR

FCRM 1
8020-VOA OI NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PB1

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322815

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 03JAN971243-I041

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/03/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 500.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	250	U
71-43-2	Benzene	18000	
108-88-3	Toluene	6200	
100-41-4	Ethylbenzene	250	U
	p/m-Xylene	500	U
95-47-6	o-Xylene	250	U
100-42-5	Styrene	250	U

3/29/97 SR

FORM I 8020-VOA

CLIENT SAMPLE NO.

FORM 1
8010-VOA OR ICS ANALYSIS DATA SHEET

GMW2B

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63244

Matrix: (soil/water) WATER   Lab Sample ID: 322817

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 31DEC961754-I081

Level: (low/med) LOW   Date Received: 12/27/96

% Moisture: not dec. ________   Date Analyzed: 01/01/97

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 10.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	5.0	U	
74-87-3	Chloromethane	5.0	U	
75-01-4	Vinyl Chloride	5.0	U	
74-83-9	Bromomethane	5.0	U	
75-00-3	Chloroethane	5.0	U	
75-69-4	Trichlorofluoromethane	5.0	U	
76-13-1	Freon-113	5.0	U	UJ-C SR
75-35-4	1,1-Dichloroethene	5.0	U	
75-09-2	Methylene Chloride	5.0	U	
156-60-5	trans-1,2-Dichloroethene	5.0	U	
75-34-3	1,1-Dichloroethane	12		
156-59-2	cis-1,2-dichloroethene	5.0	U	
67-66-3	Chloroform	5.0	U	
71-55-6	1,1,1-Trichloroethane	5.0	U	
56-23-5	Carbon tetrachloride	5.0	U	
107-06-2	1,2-Dichloroethane	5.0	U	
79-01-6	Trichloroethene	5.0	U	
78-87-5	1,2-Dichloropropane	5.0	U	
75-27-4	Bromodichloromethane	5.0	U	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	
79-00-5	1,1,2-Trichloroethane	5.0	U	
127-18-4	Tetrachloroethene	5.0	U	
124-48-1	Dibromochloromethane	5.0	U	
108-90-7	Chlorobenzene	5.0	U	
75-25-2	Bromoform	5.0	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	
541-73-1	1,3-Dichlorobenzene	5.0	U	
106-46-7	1,4-Dichlorobenzene	5.0	U	
95-50-1	1,2-Dichlorobenzene	5.0	U	

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FORM 1
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CLIENT SAMPLE NO.

GMW2B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322817

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 31DEC961754-I081

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/01/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	UG/L	Q	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	UJ-C
71-43-2	Benzene	120		J-C
108-88-3	Toluene	5.0	U	UJ-C
100-41-4	Ethylbenzene	5.0	U	
	m/p-Xylene	10	U	
95-47-6	o-Xylene	5.0	U	
100-42-5	Styrene	5.0	U	

SR

3/29/97 SR

FORM I 8020-VOA

FORM 1
8010-VOA OR ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW102

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322884

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971035-I081

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: ~~1.0~~ 300.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	150 ~~0.50~~	U	
74-87-3	Chloromethane	150 ~~0.50~~	U	
75-01-4	Vinyl Chloride	150 ~~0.50~~	U	
74-83-9	Bromomethane	150 ~~0.50~~	U	
75-00-3	Chloroethane	150 ~~0.50~~	U	
75-69-4	Trichlorofluoromethane	150 ~~0.50~~	U	
76-13-1	Freon-113	150 ~~0.50~~	U	
75-35-4	1,1-Dichloroethene	150 ~~0.50~~	U	
75-09-2	Methylene Chloride	150 ~~0.50~~	U	
156-60-5	trans-1,2-Dichloroethene	150 ~~0.50~~	U	
75-34-3	1,1-Dichloroethane	150 ~~0.50~~	U	
156-59-2	cis-1,2-dichloroethene	150 ~~0.50~~	U	
67-66-3	Chloroform	150 ~~0.50~~	U	
71-55-6	1,1,1-Trichloroethane	150 ~~0.50~~	U	UJ-C
56-23-5	Carbon tetrachloride	150 ~~0.50~~	U	UJ-C
107-06-2	1,2-Dichloroethane	150 ~~0.50~~	U	UJ-C
79-01-6	Trichloroethene	150 ~~0.50~~	U	UJ-C
78-87-5	1,2-Dichloropropane	150 ~~0.50~~	U	UJ-C
75-27-4	Bromodichloromethane	150 ~~0.50~~	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	150 ~~0.50~~	U	
10061-02-6	trans-1,3-Dichloropropene	150 ~~0.50~~	U	UJ-C
79-00-5	1,1,2-Trichloroethane	150 ~~0.50~~	U	UJ-C
127-18-4	Tetrachloroethene	150 ~~0.50~~	U	UJ-C
124-48-1	Dibromochloromethane	150 ~~0.50~~	U	UJ-C
108-90-7	Chlorobenzene	150 ~~0.50~~	U	UJ-C
75-25-2	Bromoform	150 ~~0.50~~	U	
79-34-5	1,1,2,2-Tetrachloroethane	150 ~~0.50~~	U	UJ-C
541-73-1	1,3-Dichlorobenzene	150 ~~0.50~~	U	↓
106-46-7	1,4-Dichlorobenzene	150 ~~0.50~~	U	
95-50-1	1,2-Dichlorobenzene	150 ~~0.50~~	U	UJ-C

JR

JR

JR

3/29/97 JR

FORM I 8010-VOA

FORM 1
8020-VOA OR NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW102

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322884

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971035-I081

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 300.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	150	U
71-43-2	Benzene	8000	
108-88-3	Toluene	230	
100-41-4	Ethylbenzene	150	U
----------	p/m-Xylene	300	U
95-47-6	o-Xylene	150	U
100-42-5	Styrene	150	U

3/29/97 SR

FORM 1
8010-VOA ORG. .ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW1B

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63244

Matrix: (soil/water) WATER   Lab Sample ID: 322886

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 06JAN971035-I061

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: not dec. ________   Date Analyzed: 01/06/97

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	JR
71-55-6	1,1,1-Trichloroethane	0.50	U	UJ-C
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	0.50	U	JR
10061-02-6	trans-1,3-Dichloropropene	0.50	U	UJ-C
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	UJ-C
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	UJ-C
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	JR

3/29/97 JR

FORM I 8010-VOA

FORM 1
8020-VOA OR TICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW1B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322886

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971035-I061

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ______ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ______ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

3/29/97 SR

FORM 1
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CLIENT SAMPLE NO.

OMW108

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322888

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971035-I071

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	SR
71-55-6	1,1,1-Trichloroethane	0.50	U	UJ-C
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	UJ-C
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	UJ-C SR
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	UJ-C
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	SR

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FORM 1

8020-VOA OR NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW108

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322888

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971035-I071

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.56	
100-41-4	Ethylbenzene	0.50	U
	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

3/29/97 SR

FORM 1
8010-VOA OR .ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW201

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322890

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971035-I091

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 300.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlcrodifluoromethane	150	U	
74-87-3	Chlorcmethane	150	U	
75-01-4	Vinyl Chloride	150	U	
74-83-9	Bromomethane	150	U	
75-00-3	Chlorcethane	150	U	
75-69-4	Trichlorofluoromethane	150	U	
76-13-1	Freon-113	150	U	
75-35-4	1,1-Dichloroethene	150	U	
75-09-2	Methylene Chloride	150	U	
156-60-5	trans-1,2-Dichloroethene	150	U	
75-34-3	1,1-Dichloroethane	150	U	
156-59-2	cis-1,2-dichloroethene	150	U	
67-66-3	Chloroform	150	U	SR
71-55-6	1,1,1-Trichloroethane	150	U	UJ-C
56-23-5	Carbon tetrachloride	150	U	
107-06-2	1,2-Dichloroethane	150	U	
79-01-6	Trichloroethene	150	U	
78-87-5	1,2-Dichloropropane	150	U	
75-27-4	Bromodichloromethane	150	U	UJ-C
10061-01-5	cis-1,3-Dichloropropene	150	U	SR
10061-02-6	trans-1,3-Dichloropropene	150	U	UJ-C
79-00-5	1,1,2-Trichloroethane	150	U	
127-18-4	Tetrachloroethene	150	U	
124-48-1	Dibromochloromethane	150	U	UJ-C
108-90-7	Chlorobenzene	3000		J-C
75-25-2	Bromoform	150	U	
79-34-5	1,1,2,2-Tetrachloroethane	150	U	UJ-C
541-73-1	1,3-Dichlorobenzene	150	U	
106-46-7	1,4-Dichlorobenzene	150	U	
95-50-1	1,2-Dichlorobenzene	150	U	SR

3/29/97 SR

FORM I 8010-VOA

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CMW201

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322890

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 06JAN971035-I091

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/06/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 300.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q	
1634-04-4	Methyl tert-Butyl Ether	150	U	
71-43-2	Benzene	* 44000	E	J-C
108-88-3	Toluene	* 31000	E	J-C
100-41-4	Ethylbenzene	280		
	p/m-Xylene	810		
95-47-6	o-Xylene	260		
100-42-5	Styrene	150	U	

jk

* see diluted analysis

3/29/97 jk

FORM I 8020-VOA

FORM 1
8010-VOA O. .NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW201DL

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322890D1

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 10JAN971541-I061

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/10/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 3000.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	1500	U	UJ-H
74-87-3	Chloromethane	1500	U	
75-01-4	Vinyl Chloride	1500	U	
74-83-9	Bromomethane	1500	U	
75-00-3	Chloroethane	1500	U	
75-69-4	Trichlorofluoromethane	1500	U	
76-13-1	Freon-113	1500	U	
75-35-4	1,1-Dichloroethene	1500	U	
75-09-2	Methylene Chloride	1500	U	
156-60-5	trans-1,2-Dichloroethene	1500	U	
75-34-3	1,1-Dichloroethane	1500	U	
156-59-2	cis-1,2-dichloroethene	1500	U	
67-66-3	Chloroform	1500	U	
71-55-6	1,1,1-Trichloroethane	1500	U	
56-23-5	Carbon tetrachloride	1500	U	
107-06-2	1,2-Dichloroethane	1500	U	
79-01-6	Trichloroethene	1500	U	
78-87-5	1,2-Dichloropropane	1500	U	
75-27-4	Bromodichloromethane	1500	U	UJ-HC
10061-01-5	cis-1,3-Dichloropropene	1500	U	UJ-H
10061-02-6	trans-1,3-Dichloropropene	1500	U	
79-00-5	1,1,2-Trichloroethane	1500	U	
127-18-4	Tetrachloroethene	1500	U	
124-48-1	Dibromochloromethane	1500	U	
108-90-7	Chlorobenzene	1500	U	
75-25-2	Bromoform	1500	U	
79-34-5	1,1,2,2-Tetrachloroethane	1500	U	
541-73-1	1,3-Dichlorobenzene	1500	U	
106-46-7	1,4-Dichlorobenzene	1500	U	
95-50-1	1,2-Dichlorobenzene	1500	U	

SR

3/29/97 SR

FORM I 8010-VOA

FORM 1
8020-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW201DL

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322890D1

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 10JAN971541-I061

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: not dec. ________ Date Analyzed: 01/10/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 3000.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
1634-04-4	Methyl tert-Butyl Ether	1500	U	UJ-H
71-43-2	Benzene	43000	D	J-H
108-88-3	Toluene	30000	D	J-H
100-41-4	Ethylbenzene	1500	U	UJ-H
	p/m-Xylene	3000	U	
95-47-6	o-Xylene	1500	U	
100-42-5	Styrene	1500	U	

JR

3/29/97 JR

FORM I 8020-VOA

FORM 1
8010-VOA O[illegible]NICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW11

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322813

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 31DEC961754-I071

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/01/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	1.0	U
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl Chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	2.5	
75-69-4	Trichlorofluoromethane	1.0	U
76-13-1	Freon-113	1.0	U UJ-C jk
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene Chloride	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	19	
156-59-2	cis-1,2-dichloroethene	1.0	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
107-06-2	1,2-Dichloroethane	6.9	
79-01-6	Trichloroethene	1.1	
78-87-5	1,2-Dichloropropane	1.0	
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	4.8	
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U

3/29/97 jk

FORM 1
8020-VOA ORG ICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GMW11

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322813

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 31DEC961754-I071

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: not dec. ________ Date Analyzed: 01/01/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
1634-04-4	Methyl tert-Butyl Ether	1.0	U	UJ-C
71-43-2	Benzene	9.2		J-C
108-88-3	Toluene	9.2		
100-41-4	Ethylbenzene	28		
---------	m/p-Xylene	11		
95-47-6	o-Xylene	10		
100-42-5	Styrene	1.0	U	UJ-C

JR

3/29/97 JR

FORM I 8020-VOA

SVOCs (Phenols) December 1996

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GMW9B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322930

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322930I2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND		Q	
108-95-2	Phenol	10	U	
95-57-8	2-Chlorophenol	10	U	
95-48-7	2-Methylphenol	10	U	
106-44-5	4-Methylphenol	10	U	
88-75-5	2-Nitrophenol	10	U	
105-67-9	2,4-Dimethylphenol	10	U	
120-83-2	2,4-Dichlorophenol	10	U	
59-50-7	4-Chloro-3-Methylphenol	10	U	
88-06-2	2,4,6-Trichlorophenol	10	U	
95-95-4	2,4,5-Trichlorophenol	25	U	
51-28-5	2,4-Dinitrophenol	25	U	UJ-C
100-02-7	4-Nitrophenol	25	U	
534-52-1	4,6-Dinitro-2-methylphenol	25	U	
87-86-5	Pentachlorophenol	25	U	

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SEMIVOLATIL: RGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW103

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322924

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322924I2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
108-95-2	Phenol	10	U	
95-57-8	2-Chlorophenol	10	U	
95-48-7	2-Methylphenol	10	U	
106-44-5	4-Methylphenol	10	U	
88-75-5	2-Nitrophenol	10	U	
105-67-9	2,4-Dimethylphenol	10	U	
120-83-2	2,4-Dichlorophenol	10	U	
59-50-7	4-Chloro-3-Methylphenol	10	U	
88-06-2	2,4,6-Trichlorophenol	10	U	
95-95-4	2,4,5-Trichlorophenol	25	U	
51-28-5	2,4-Dinitrophenol	25	U	UJ-C
100-02-7	4-Nitrophenol	25	U	
534-52-1	4,6-Dinitro-2-methylphenol	25	U	
87-86-5	Pentachlorophenol	25	U	

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rs 3/21/97

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SEMIVOLATII ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW202

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322942

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322942S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U UJ-C
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

2-25-97
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3/21/97

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW204

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322938

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322938D2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N) ___ Date Extracted: 01/03/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/10/97

Injection Volume: 2.0 (uL) Dilution Factor: 25.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	1300	
95-57-8	2-Chlorophenol	51	J
95-48-7	2-Methylphenol	340	
106-44-5	4-Methylphenol	1000	
88-75-5	2-Nitrophenol	250	U
105-67-9	2,4-Dimethylphenol	85	J
120-83-2	2,4-Dichlorophenol	250	U
59-50-7	4-Chloro-3-Methylphenol	250	U
88-06-2	2,4,6-Trichlorophenol	250	U
95-95-4	2,4,5-Trichlorophenol	620	U
51-28-5	2,4-Dinitrophenol	620	U
100-02-7	4-Nitrophenol	620	U
534-52-1	4,6-Dinitro-2-methylphenol	620	U
87-86-5	Pentachlorophenol	620	U

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SEMIVOLATIL RGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW205

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322941

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322941S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	1.2	J
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	1.2	J
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

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EPA SAMPLE NO.

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SEMIVOLATILI RGANICS ANALYSIS DATA SHEET

OMW206

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322934

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322934I2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
108-95-2	Phenol	10	U	
95-57-8	2-Chlorophenol	10	U	
95-48-7	2-Methylphenol	10	U	
106-44-5	4-Methylphenol	10	U	
88-75-5	2-Nitrophenol	10	U	
105-67-9	2,4-Dimethylphenol	10	U	
120-83-2	2,4-Dichlorophenol	10	U	
59-50-7	4-Chloro-3-Methylphenol	10	U	
88-06-2	2,4,6-Trichlorophenol	10	U	
95-95-4	2,4,5-Trichlorophenol	25	U	
51-28-5	2,4-Dinitrophenol	25	U	UJ-C
100-02-7	4-Nitrophenol	25	U	
534-52-1	4,6-Dinitro-2-methylphenol	25	U	
87-86-5	Pentachlorophenol	25	U	

2-25-97
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B 3/4/97

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW211

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322944

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322944S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	6.8	J
95-57-8	2-Chlorophenol	1.8	J
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	6.5	J
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	6.3	J
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

UJ-C

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3/21/97

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SEMIVOLATII)RGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW212

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322933

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322933S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

UJ-C

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3/21/97

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW213

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322937

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322937S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	1.8	J
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U UJ-C
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

2-25-97
NF
B 3/24/97

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW214

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322928

Sample wt/vol: 1000 (g/mL) ML   Lab File ID: U322928S

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___   Date Extracted: 01/03/97

Concentrated Extract Volume: 1000(uL)   Date Analyzed: 01/09/97

Injection Volume: 2.0(uL)   Dilution Factor: 1.0

GPC Cleanup: (Y/N) N   pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	0.98	J
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

UJ-C

2-25-97
NF
MJ 3/21/97

FORM I SV-1   3/90

1B

SEMIVOLATIL RGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW215

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322925

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322925S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N) ___ Date Extracted: 01/03/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/09/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	1.3	J
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	1.4	J
106-44-5	4-Methylphenol	15	
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

UJ-C

2-25-97

3/4/97

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW216

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322940

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322940S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U UJ-C M
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

2-25-97
AF
M 3/21/97

1P
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW218

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322926

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322926I2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U UJ-C
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

3-25-97
NF
M 3/21/97

1B

SEMIVOLATILE GANICS [illegible]ALYSIS DATA SHEET

EPA SAMPLE NO.

OMW219

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322943

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322943D2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	1.9	J
95-57-8	2-Chlorophenol	40	U
95-48-7	2-Methylphenol	8.6	J
106-44-5	4-Methylphenol	200	
88-75-5	2-Nitrophenol	40	U
105-67-9	2,4-Dimethylphenol	11	J
120-83-2	2,4-Dichlorophenol	40	U
59-50-7	4-Chloro-3-Methylphenol	40	U
88-06-2	2,4,6-Trichlorophenol	40	U
95-95-4	2,4,5-Trichlorophenol	100	U
51-28-5	2,4-Dinitrophenol	100	U
100-02-7	4-Nitrophenol	100	U
534-52-1	4,6-Dinitro-2-methylphenol	100	U
87-86-5	Pentachlorophenol	100	U

2-25-97
NF

1B

SEMIVOLATIL: RGANIC NALYSIS DATA SHEET

EPA SAMPLE NO.

OMW220

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322932

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322932I2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

UJ-C

2-25-97
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M 3/21/97

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OPZ217

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322929

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322929S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/09/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

UJ-C

2-25-97

NF

3/17/97

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PB2

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322946

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322946D2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/03/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	1300	
95-57-8	2-Chlorophenol	41	J
95-48-7	2-Methylphenol	390	J
106-44-5	4-Methylphenol	3500	
88-75-5	2-Nitrophenol	500	U
105-67-9	2,4-Dimethylphenol	440	J
120-83-2	2,4-Dichlorophenol	500	U
59-50-7	4-Chloro-3-Methylphenol	500	U
88-06-2	2,4,6-Trichlorophenol	500	U
95-95-4	2,4,5-Trichlorophenol	1200	U
51-28-5	2,4-Dinitrophenol	1200	U
100-02-7	4-Nitrophenol	1200	U
534-52-1	4,6-Dinitro-2-methylphenol	1200	U
87-86-5	Pentachlorophenol	1200	U

2-25-97
NF

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW209

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322927

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322927I2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N) ___ Date Extracted: 01/02/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/09/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND	Concentration	Q	
108-95-2	Phenol	10	U	R-S
111-44-4	bis(2-Chloroethyl)Ether	10	U	
95-57-8	2-Chlorophenol	10	U	R-S
541-73-1	1,3-Dichlorobenzene	10	U	
106-46-7	1,4-Dichlorobenzene	10	U	
95-50-1	1,2-Dichlorobenzene	10	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U	
95-48-7	2-Methylphenol	10	U	R-S
621-64-7	N-Nitroso-di-n-propylamine	10	U	
67-72-1	Hexachloroethane	10	U	
106-44-5	4-Methylphenol	10	U	R-S
98-95-3	Nitrobenzene	10	U	
78-59-1	Isophorone	10	U	
88-75-5	2-Nitrophenol	10	U	R-S
105-67-9	2,4-Dimethylphenol	10	U	R-S
111-91-1	bis(2-Chloroethoxy)methane	10	U	
120-83-2	2,4-Dichlorophenol	10	U	R-S
120-82-1	1,2,4-Trichlorobenzene	10	U	
91-20-3	Naphthalene	10	U	
106-47-8	4-Chloroaniline	10	U	
87-68-3	Hexachlorobutadiene	10	U	
59-50-7	4-Chloro-3-Methylphenol	10	U	R-S
91-57-6	2-Methylnaphthalene	10	U	
77-47-4	Hexachlorocyclopentadiene	10	U	UJ-C
88-06-2	2,4,6-Trichlorophenol	10	U	R-S
95-95-4	2,4,5-Trichlorophenol	25	U	R-S
91-58-7	2-Chloronaphthalene	10	U	
88-74-4	2-Nitroaniline	25	U	
131-11-3	Dimethylphthalate	10	U	
208-96-8	Acenaphthylene	10	U	
606-20-2	2,6-Dinitrotoluene	10	U	
83-32-9	Acenaphthene	10	U	
99-09-2	3-Nitroaniline	25	U	

FORM I SV-1

3/90

RS 4 NT
3/21/97

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW209

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63271

Matrix: (soil/water) WATER   Lab Sample ID: 322927

Sample wt/vol: 1000 (g/mL) ML   Lab File ID: U322927I2S

Level: (low/med) LOW   Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___   Date Extracted: 01/02/97

Concentrated Extract Volume: 1000 (uL)   Date Analyzed: 01/09/97

Injection Volume: 2.0 (uL)   Dilution Factor: 1.0

GPC Cleanup: (Y/N) N   pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
51-28-5	2,4-Dinitrophenol	25	U	R-S
132-64-9	Dibenzofuran	10	U	
121-14-2	2,4-Dinitrotoluene	10	U	
100-02-7	4-Nitrophenol	25	U	R-S
84-66-2	Diethylphthalate	10	U	
86-73-7	Fluorene	10	U	
7005-72-3	4-Chlorophenyl-phenylether	10	U	
100-01-6	4-Nitroaniline	25	U	
86-30-6	N-nitrosodiphenylamine (1)	10	U	
534-52-1	4,6-Dinitro-2-methylphenol	25	U	R-S
101-55-3	4-Bromophenyl-phenylether	10	U	
118-74-1	Hexachlorobenzene	10	U	
87-86-5	Pentachlorophenol	25	U	R-S
85-01-8	Phenanthrene	10	U	
120-12-7	Anthracene	10	U	
86-74-8	Carbazole	10	U	
84-74-2	Di-n-butylphthalate	10	U	
206-44-0	Fluoranthene	10	U	
129-00-0	Pyrene	10	U	
85-68-7	Butylbenzylphthalate	10	U	
56-55-3	Benzo(a)anthracene	10	U	
91-94-1	3,3'-Dichlorobenzidine	10	U	
218-01-9	Chrysene	10	U	
117-81-7	bis(2-Ethylhexyl)phthalate	10	U	
117-84-0	Di-n-octylphthalate	10	U	
205-99-2	Benzo(b)fluoranthene	10	U	
207-08-9	Benzo(k)fluoranthene	10	U	
50-32-8	Benzo(a)pyrene	10	U	
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	
53-70-3	Dibenz(a,h)anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	

(1) - Cannot be separated from Diphenylamine

RS ENF
3/21/97

1B

SEMIVOLATILE C. .ANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

191-05-21B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322765

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q322765S

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 12/30/96

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/08/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RS
3/27/97

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

191-05-21A

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322766

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322766S

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: ______ decanted: (Y/N)____ Date Extracted: 12/30/96

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/27/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U UJ-C
100-02-7	4-Nitrophenol	25	U UJ-C
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

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3/27/97

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

191-05-15

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322767

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q322767S

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 12/30/96

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/08/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RS
3/27/97

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

192-01-3B

Lab Name: INCHCAPE ENVIRONMENTIAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322768

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q322768S

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:12/30/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/08/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RS
3/27/97

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW-107

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322769

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q322769S

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: ______ decanted: (Y/N) ___ Date Extracted: 12/30/96

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/08/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RS
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1B

SEMIVOLATILE (ANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GMW-11A

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322770

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q322770S

Level: (low/med) LOW Date Received: 12/26/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 12/30/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/08/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND	UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RS
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1B

SEMIVOLATILE C NICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GMW102

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322884

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322884S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/02/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/08/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	5.8	J
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	2.3	J
106-44-5	4-Methylphenol	1.8	J
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	9.4	J
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U UJ-C
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

B
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1B
SEMIVOLATILE ..GANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GMW1B

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322886

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322886S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/02/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/08/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND		Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U UJ-C
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RS
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW108

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322888

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322888I2S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/02/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/09/97

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RS
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW201

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322890

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322890D3S

Level: (low/med) LOW Date Received: 12/30/96

% Moisture: ______ decanted: (Y/N) ___ Date Extracted: 01/02/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 01/09/97

Injection Volume: 2.0 (uL) Dilution Factor: 33.3

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	26	J
95-57-8	2-Chlorophenol	330	U
95-48-7	2-Methylphenol	160	J
106-44-5	4-Methylphenol	2300	
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	220	J
120-83-2	2,4-Dichlorophenol	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	830	U
51-28-5	2,4-Dinitrophenol	830	U
100-02-7	4-Nitrophenol	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
87-86-5	Pentachlorophenol	830	U

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1B

SEMIVOLATILE C .ANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GMW101

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322805

Sample wt/vol: 1000 (g/mL) ML Lab File ID: U322805S

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:12/31/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlcrophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dicnlorophenol	10	U
59-50-7	4-Chlcro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

RJ
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GMW11

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322813

Sample wt/vol: 955.0 (g/mL) ML Lab File ID: U322813S

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted:12/31/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/10/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chlcro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	26	U
51-28-5	2,4-Dinitrophenol	26	U
100-02-7	4-Nitrophenol	26	U
534-52-1	4,6-Dinitro-2-methylphenol	26	U
87-86-5	Pentachlorophenol	26	U

RJ
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW1

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322807

Sample wt/vol: 800.0 (g/mL) ML Lab File ID: U322807D2S

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 12/31/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/11/97

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND		Q	
108-95-2	Phenol	7.2	J	
95-57-8	2-Chlorophenol	62	U	
95-48-7	2-Methylphenol	82		
106-44-5	4-Methylphenol	420		
88-75-5	2-Nitrophenol	62	U	
105-67-9	2,4-Dimethylphenol	19	J	
120-83-2	2,4-Dichlorophenol	62	U	
59-50-7	4-Chloro-3-Methylphenol	62	U	
88-06-2	2,4,6-Trichlorophenol	62	U	
95-95-4	2,4,5-Trichlorophenol	160	U	
51-28-5	2,4-Dinitrophenol	160	U	UJ-C
100-02-7	4-Nitrophenol	160	U	UJ-C
534-52-1	4,6-Dinitro-2-methylphenol	160	U	
87-86-5	Pentachlorophenol	160	U	

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EPA SAMPLE NO.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

PB1

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63244

Matrix: (soil/water) WATER Lab Sample ID: 322815

Sample wt/vol: 855.0 (g/mL) ML Lab File ID: U322815D2S

Level: (low/med) LOW Date Received: 12/27/96

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 12/31/96

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/11/97

Injection Volume: 2.0(uL) Dilution Factor: 16.7

GPC Cleanup: (Y/N) N pH: ___

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

CAS NO.	COMPOUND	UG/L	Q	
108-95-2	Phenol	69	J	
95-57-8	2-Chlorophenol	190	U	
95-48-7	2-Methylphenol	120	J	
106-44-5	4-Methylphenol	1400		
88-75-5	2-Nitrophenol	190	U	
105-67-9	2,4-Dimethylphenol	92	J	
120-83-2	2,4-Dichlorophenol	190	U	
59-50-7	4-Chloro-3-Methylphenol	190	U	
88-06-2	2,4,6-Trichlorophenol	190	U	
95-95-4	2,4,5-Trichlorophenol	490	U	
51-28-5	2,4-Dinitrophenol	490	U	UJ-C
100-02-7	4-Nitrophenol	490	U	UJ-C
534-52-1	4,6-Dinitro-2-methylphenol	490	U	
87-86-5	Pentachlorophenol	490	U	

PS
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1395

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GMW2B

Lab Name: INCHCAPE ENVIRONMENTAL   Contract: 92017

Lab Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63244

Matrix: (soil/water) WATER   Lab Sample ID: 322817

Sample wt/vol: 725.0 (g/mL) ML   Lab File ID: U322817I2S

Level: (low/med) LOW   Date Received: 12/27/96

% Moisture: ______ decanted: (Y/N)___   Date Extracted: 12/31/96

Concentrated Extract Volume: 1000(uL)   Date Analyzed: 01/11/97

Injection Volume: 2.0(uL)   Dilution Factor: 1.0

GPC Cleanup: (Y/N) N   pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
108-95-2	Phenol	29		
95-57-8	2-Chlorophenol	0.64	J	
95-48-7	2-Methylphenol	14	U	
106-44-5	4-Methylphenol	14	U	
88-75-5	2-Nitrophenol	14	U	
105-67-9	2,4-Dimethylphenol	14	U	
120-83-2	2,4-Dichlorophenol	14	U	
59-50-7	4-Chloro-3-Methylphenol	14	U	
88-06-2	2,4,6-Trichlorophenol	14	U	
95-95-4	2,4,5-Trichlorophenol	34	U	
51-28-5	2,4-Dinitrophenol	34	U	UJ-C
100-02-7	4-Nitrophenol	34	U	UJ-C
534-52-1	4,6-Dinitro-2-methylphenol	34	U	
87-86-5	Pentachlorophenol	34	U	

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3/27/97

PCBs December 1996

FORM 1
OTHER ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW220

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63271

Matrix: (soil/water) WATER Lab Sample ID: 322932

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ________

% Moisture: ______ decanted: (Y/N)___ Date Received: 12/30/96

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:01/02/97

Concentrated Extract Volume: 500(uL) Date Analyzed: 01/30/97

Injection Volume: _______(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	0.010	U
11104-28-2	Aroclor-1221	0.010	U
11141-16-5	Aroclor-1232	0.010	U
53469-21-9	Aroclor-1242	0.010	U
12672-29-6	Aroclor-1248	0.010	U
11097-69-1	Aroclor-1254	0.010	U
11096-82-5	Aroclor-1260	0.010	U

2-20-97
NF

VOCs January 1997

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW221

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324064

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 21JAN970511-I021

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: not dec. ________ Date Analyzed: 01/21/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	CONCENTRATION (UG/L)	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlcrofluoromethane	0.50	U
76-13-1	Freon-113	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U

4/4/97

FORM 1
8020-VOA ORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW221

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324064

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 21JAN970511-I021

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: not dec. ________ Date Analyzed: 01/21/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

4/4/97

FORM 1
8010-VOA ORGANICS ALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW222

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324066

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 21JAN970511-I041

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: not dec. ________ Date Analyzed: 01/21/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon-113	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U

2/4/97

FORM 1
8020-VOA ORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW222

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324066

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 21JAN970511-I041

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: not dec. ________ Date Analyzed: 01/21/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

FORM I 8020-VOA

4/4/97

FORM 1
8010-VOA ORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW223

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324063

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 21JAN970511-I011

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: not dec. ________ Date Analyzed: 01/21/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon-113	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U

4/6/97

FORM 1
8020-VOA ORGANIC ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW223

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324063

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 21JAN970511-I011

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: not dec. ________ Date Analyzed: 01/21/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

FORM I 8020-VOA

SVOCs (Phenols) January 1997

1B

SEMIVOLATILE ORGA 'S ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW221

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324064

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q324064S

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 01/21/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/28/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
108-95-2	Phenol	10	U	
95-57-8	2-Chlorophenol	10	U	
95-48-7	2-Methylphenol	10	U	
106-44-5	4-Methylphenol	10	U	
88-75-5	2-Nitrophenol	10	U	
105-67-9	2,4-Dimethylphenol	10	U	
120-83-2	2,4-Dichlorophenol	10	U	
59-50-7	4-Chloro-3-Methylphenol	10	U	
88-06-2	2,4,6-Trichlorophenol	10	U	
95-95-4	2,4,5-Trichlorophenol	25	U	
51-28-5	2,4-Dinitrophenol	25	U	
100-02-7	4-Nitrophenol	25	U	UJ-C
534-52-1	4,6-Dinitro-2-methylphenol	25	U	
87-86-5	Pentachlorophenol	25	U	

1B

SEMIVOLATILE ORG CS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW222

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324066

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q324066S

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: ______ decanted: (Y/N)___ Date Extracted:01/21/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/28/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

UJ-C

4/8/97

FORM I SV-1

3/90

1B

SEMIVOLATILE ORGA S ANALYSIS DATA SHEET

EPA SAMPLE NO.

OMW223

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324063

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q324063S

Level: (low/med) LOW Date Received: 01/16/97

% Moisture: ______ decanted: (Y/N) ___ Date Extracted: 01/21/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/28/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

PCBs January 1997

FORM 1
OTHER ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW221

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324064

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ________

% Moisture: ______ decanted: (Y/N)___ Date Received: 01/16/97

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 01/21/97

Concentrated Extract Volume: 500(uL) Date Analyzed: 01/30/97

Injection Volume: _______(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	0.010	U
11104-28-2	Aroclor-1221	0.010	U
11141-16-5	Aroclor-1232	0.010	U
53469-21-9	Aroclor-1242	0.010	U
12672-29-6	Aroclor-1248	0.010	U
11097-69-1	Aroclor-1254	0.010	U
11096-82-5	Aroclor-1260	0.010	U

4/2/97

FORM 1
OTHER ORGANICS ` `LYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW222

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324066

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ______

% Moisture: ______ decanted: (Y/N) ___ Date Received: 01/16/97

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 01/21/97

Concentrated Extract Volume: 500 (uL) Date Analyzed: 01/30/97

Injection Volume: ______ (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	------Aroclor-1016	0.010	U
11104-28-2	------Aroclor-1221	0.010	U
11141-16-5	------Aroclor-1232	0.010	U
53469-21-9	------Aroclor-1242	0.010	U
12672-29-6	------Aroclor-1248	0.010	U
11097-69-1	------Aroclor-1254	0.010	U
11096-82-5	------Aroclor-1260	0.010	U

ct
4/9/97

FORM 1
OTHER ORGANICS ALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW223

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63521

Matrix: (soil/water) WATER Lab Sample ID: 324063

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ______

% Moisture: ______ decanted: (Y/N) ___ Date Received: 01/16/97

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 01/21/97

Concentrated Extract Volume: 500 (uL) Date Analyzed: 01/30/97

Injection Volume: ______ (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	0.010	U
11104-28-2	Aroclor-1221	0.010	U
11141-16-5	Aroclor-1232	0.010	U
53469-21-9	Aroclor-1242	0.010	U
12672-29-6	Aroclor-1248	0.010	U
11097-69-1	Aroclor-1254	0.010	U
11096-82-5	Aroclor-1260	0.010	U

GK 4/97

VOCs February 1997

FORM 1
8010-VOA ORGAN S ANALYSIS DATA SHEET

OMW-221

Lab Name: ITS ENVIRONMENTAL Contract: 92017

b Code: INCHVT Case No.: LCEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325712

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 22FEB970157-I071

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: not dec. ________ Date Analyzed: 02/22/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	UJ-C SR
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	UJ-C SR
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

4/14/97 SR

CLIENT SAMPLE NO.

FORM 1
8020-VOA OR ICS ANALYSIS DATA SHEET

OMW-221

Lab Name: ITS ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325712

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 22FEB970157-I071

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: not dec. ________ Date Analyzed: 02/22/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND	CONCENTRATION	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
----------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

4/14/97 SR

FORM I 8020-VOA

CLIENT SAMPLE NO.

FORM 1
8010-VOA ORGAN[illegible] ANALYSIS DATA SHEET

OMW-222

Lab Name: ITS ENVIRONMENTAL   Contract: 92017

[illegible] Code: INCHVT   Case No.: LOEFFEL SAS No.:   SDG No.: 63915

Matrix: (soil/water) WATER   Lab Sample ID: 325710

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: 22FEB970157-I051

Level: (low/med) LOW   Date Received: 02/19/97

% Moisture: not dec. ________   Date Analyzed: 02/22/97

GC Column: DB-VRX   ID: 0.53 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	
74-87-3	Chloromethane	0.50	U	UJ-C SK
75-01-4	Vinyl Chloride	0.50	U	
74-83-9	Bromomethane	0.50	U	UJ-C SK
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

4/14/97 SK

FORM 1
8020-VOA ORG[illegible]CS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW-222

Lab Name: ITS ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325710

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 22FEB970157-I051

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: not dec. ________ Date Analyzed: 02/22/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

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

CAS NO.	COMPOUND		Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

4/14/97 ik

FORM I 8020-VOA

CLIENT SAMPLE NO.

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

OMW-223

Lab Name: ITS ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325709

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 22FEB970157-I041

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: not dec. ________ Date Analyzed: 02/22/97

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ________ (uL)

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

CAS NO.	COMPOUND	CONCENTRATION	Q	
75-71-8	Dichlorodifluoromethane	0.50	U	UJ-C SK
74-87-3	Chloromethane	0.50	U	
75-01-4	Vinyl Chloride	0.50	U	UJ-C SK
74-83-9	Bromomethane	0.50	U	
75-00-3	Chloroethane	0.50	U	
75-69-4	Trichlorofluoromethane	0.50	U	
76-13-1	Freon-113	0.50	U	
75-35-4	1,1-Dichloroethene	0.50	U	
75-09-2	Methylene Chloride	0.50	U	
156-60-5	trans-1,2-Dichloroethene	0.50	U	
75-34-3	1,1-Dichloroethane	0.50	U	
156-59-2	cis-1,2-dichloroethene	0.50	U	
67-66-3	Chloroform	0.50	U	
71-55-6	1,1,1-Trichloroethane	0.50	U	
56-23-5	Carbon tetrachloride	0.50	U	
107-06-2	1,2-Dichloroethane	0.50	U	
79-01-6	Trichloroethene	0.50	U	
78-87-5	1,2-Dichloropropane	0.50	U	
75-27-4	Bromodichloromethane	0.50	U	
10061-01-5	cis-1,3-Dichloropropene	0.50	U	
10061-02-6	trans-1,3-Dichloropropene	0.50	U	
79-00-5	1,1,2-Trichloroethane	0.50	U	
127-18-4	Tetrachloroethene	0.50	U	
124-48-1	Dibromochloromethane	0.50	U	
108-90-7	Chlorobenzene	0.50	U	
75-25-2	Bromoform	0.50	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U	
541-73-1	1,3-Dichlorobenzene	0.50	U	
106-46-7	1,4-Dichlorobenzene	0.50	U	
95-50-1	1,2-Dichlorobenzene	0.50	U	

4/14/97 SK

FORM 1
8020-VOA ORG' 'CS ANALYSIS DATA SHEET

OMW-223

Lab Name: ITS ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325709

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 22FEB970157-I041

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: not dec. ________ Date Analyzed: 02/22/97

GC Column: DB-VRX ID: 0.45 (mm) Dilution Factor: 1.0

Soil Extract Volume:________(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4	Methyl tert-Butyl Ether	0.50	U
71-43-2	Benzene	0.50	U
108-88-3	Toluene	0.50	U
100-41-4	Ethylbenzene	0.50	U
----------------	p/m-Xylene	1.0	U
95-47-6	o-Xylene	0.50	U
100-42-5	Styrene	0.50	U

4/14/97 SK

SVOCs (Phenols) February 1997

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BLAB02 SAMPLE NO.

OMW-221

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325712

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q325712S

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 02/21/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/25/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

4-17-97
NF

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BLAB02 SAMPLE NO.

OMW-222

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325710

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q325710S

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 02/21/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/25/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

4-17-97
NF

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BLAB02 SAMPLE NO.

OMW-223

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325709

Sample wt/vol: 1000 (g/mL) ML Lab File ID: Q325709S

Level: (low/med) LOW Date Received: 02/19/97

% Moisture: ______ decanted: (Y/N)___ Date Extracted: 02/21/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/25/97

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
87-86-5	Pentachlorophenol	25	U

4-17-97
NF

PCBs February 1997

FORM 1
OTHER ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW-221

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325712

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ______

% Moisture: ______ decanted: (Y/N) ___ Date Received: 02/19/97

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 02/21/97

Concentrated Extract Volume: 0.5 (mL) Date Analyzed: 02/25/97

Injection Volume: ______ (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
12674-11-2	Aroclor-1016	0.0075	U	UJ-5 ↓
11104-28-2	Aroclor-1221	0.0075	U	
11141-16-5	Aroclor-1232	0.0075	U	
53469-21-9	Aroclor-1242	0.0075	U	
12672-29-6	Aroclor-1248	0.0075	U	
11097-69-1	Aroclor-1254	0.0075	U	
11096-82-5	Aroclor-1260	0.0075	U	UJ-5 NF

4-17-97
NF

FORM 1
OTHER ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW-222

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325710

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ______

% Moisture: ______ decanted: (Y/N) ___ Date Received: 02/19/97

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 02/21/97

Concentrated Extract Volume: 0.5 (mL) Date Analyzed: 02/25/97

Injection Volume: ______ (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
12674-11-2	------Aroclor-1016	0.0075	U	UJ-S
11104-28-2	------Aroclor-1221	0.0075	U	
11141-16-5	------Aroclor-1232	0.0075	U	
53469-21-9	------Aroclor-1242	0.0075	U	
12672-29-6	------Aroclor-1248	0.0075	U	
11097-69-1	------Aroclor-1254	0.0075	U	
11096-82-5	------Aroclor-1260	0.0075	U	UJ-S NF

4-17-97
NF

FORM 1
OTHER ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OMW-223

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 92017

Lab Code: INCHVT Case No.: LOEFFEL SAS No.: SDG No.: 63915

Matrix: (soil/water) WATER Lab Sample ID: 325709

Sample wt/vol: 2000 (g/mL) ML Lab File ID: ______

% Moisture: ______ decanted: (Y/N) ___ Date Received: 02/19/97

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 02/21/97

Concentrated Extract Volume: 0.5 (mL) Date Analyzed: 02/25/97

Injection Volume: ______ (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
12674-11-2	Aroclor-1016	0.0075	U	UJ-S
11104-28-2	Aroclor-1221	0.0075	U	
11141-16-5	Aroclor-1232	0.0075	U	
53469-21-9	Aroclor-1242	0.0075	U	
12672-29-6	Aroclor-1248	0.0075	U	
11097-69-1	Aroclor-1254	0.0075	U	
11096-82-5	Aroclor-1260	0.0075	U	UJ-S

4-17-97
NF

Natural Attenuation Parameters January-February, 1997

ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63521
Project No.: 92017
No. Samples: 14
Arrived : 01/16/97

Page 1

Case:LOEFFEL SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater.
All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324057	OMW202:01/15/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	88
350.2	Ammonia-Nitrogen	0.04
353.2	Nitrate/Nitrite Nitrogen	0.01
365.2	Phosphate, Total as P	0.02
325.2	Chloride	9.1
375.4	Sulfate	350
376.2	Sulfide	0.03
324058	OMW202F:01/15/97 (Filtrate)	
415.1	Organic Carbon, Total	1.2
324059	OMW206:01/15/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	118
350.2	Ammonia-Nitrogen	0.06
353.2	Nitrate/Nitrite Nitrogen	0.01
365.2	Phosphate, Total as P	0.04
325.2	Chloride	2.0
375.4	Sulfate	37
376.2	Sulfide	<0.02
324060	OMW206F:01/15/97 (Filtrate)	
415.1	Organic Carbon, Total	0.6
324061	OMW215:01/15/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	128
350.2	Ammonia-Nitrogen	1.8
353.2	Nitrate/Nitrite Nitrogen	0.02
365.2	Phosphate, Total as P	0.09
325.2	Chloride	121

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ITS Environmental
Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63521
Project No.: 92017
No. Samples: 14
Arrived : 01/16/97

Page 2

Case:LOEFFEL SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324061	OMW215:01/15/97 (Liquid)	
375.4	Sulfate	15
376.2	Sulfide	0.59
324062	OMW215F:01/15/97 (Filtrate)	
415.1	Organic Carbon, Total	3.6

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ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63553
Project No.: 92017
No. Samples: 14
Arrived : 01/18/97

Page 1

Case:LOEFFEL SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324194	OMW107:01/16/97 (Liquid)	71
310.1	Alkalinity (as CaCO3)	0.11
350.2	Ammonia-Nitrogen	<0.01
353.2	Nitrate/Nitrite Nitrogen	0.04
365.2	Phosphate, Total as P	7.6
325.2	Chloride	19
375.4	Sulfate	<0.02
376.2	Sulfide	
324195	OMW107F:01/16/97 (Filtrate)	1.7
415.1	Organic Carbon, Total	
324196	OMW220:01/16/97 (Liquid)	157
310.1	Alkalinity (as CaCO3)	0.06
350.2	Ammonia-Nitrogen	<0.01
353.2	Nitrate/Nitrite Nitrogen	0.04
365.2	Phosphate, Total as P	3.8
325.2	Chloride	51
375.4	Sulfate	<0.02
376.2	Sulfide	
324197	OMW220F:01/16/97 (Filtrate)	2.0
415.1	Organic Carbon, Total	
324198	OMW218:01/16/97 (Liquid)	166
310.1	Alkalinity (as CaCO3)	0.07
350.2	Ammonia-Nitrogen	<0.01
353.2	Nitrate/Nitrite Nitrogen	0.07
365.2	Phosphate, Total as P	22.1
325.2	Chloride	

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ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63553
Project No.: 92017
No. Samples: 14
Arrived : 01/18/97

Page 2

Case:LOEFFEL SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324198	OMW218:01/16/97 (Liquid)	
375.4	Sulfate	43
376.2	Sulfide	<0.02
324199	OMW218F:01/16/97 (Filtrate)	
415.1	Organic Carbon, Total	0.6
324200	OMW211:01/16/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	149
350.2	Ammonia-Nitrogen	<0.02
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	0.03
325.2	Chloride	128
375.4	Sulfate	242
376.2	Sulfide	<0.02
324201	OMW211F:01/16/97 (Filtrate)	
415.1	Organic Carbon, Total	4.4
324202	1910521A:01/17/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	125
350.2	Ammonia-Nitrogen	0.03
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	<0.01
325.2	Chloride	1.5
375.4	Sulfate	6
376.2	Sulfide	<0.02

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ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63553
Project No.: 92017
No. Samples: 14
Arrived : 01/18/97

Case:LOEFFEL SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/	Parameter	Result
324203	1910521AF:01/17/97	(Filtrate)	
415.1		Organic Carbon, Total	<0.5
324204	1910515:01/17/97	(Liquid)	
310.1		Alkalinity (as CaCO3)	143
350.2		Ammonia-Nitrogen	<0.02
353.2		Nitrate/Nitrite Nitrogen	<0.01
365.2		Phosphate, Total as P	<0.01
325.2		Chloride	10.8
375.4		Sulfate	107
376.2		Sulfide	<0.02
324205	1910515F:01/17/97	(Filtrate)	
415.1		Organic Carbon, Total	1.2
324206	OMWDup2:01/17/97	(Liquid)	
310.1		Alkalinity (as CaCO3)	126
350.2		Ammonia-Nitrogen	0.04
353.2		Nitrate/Nitrite Nitrogen	<0.01
365.2		Phosphate, Total as P	<0.01
325.2		Chloride	1.5
375.4		Sulfate	6
376.2		Sulfide	<0.02
324207	OMWDup2F:01/17/97	(Filtrate)	
415.1		Organic Carbon, Total	<0.5

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ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63572
Project No.: 92017
No. Samples: 8
Arrived : 01/22/97

Page 1

Case:LOEFFEL SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324278	OMW216:01/20/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	122
350.2	Ammonia-Nitrogen	0.03
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	0.01
325.2	Chloride	6.7
375.4	Sulfate	106
376.2	Sulfide	0.07
324279	OMW216F:01/20/97 (Filtrate)	
415.1	Organic Carbon, Total	1.2
324280	OMW219:01/21/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	195
350.2	Ammonia-Nitrogen	0.12
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	0.02
325.2	Chloride	343
375.4	Sulfate	<5
376.2	Sulfide	0.90
324281	OMW219F:01/21/97 (Filtrate)	
415.1	Organic Carbon, Total	62.4
324282	OMW213:01/21/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	133
350.2	Ammonia-Nitrogen	0.06
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	0.03
325.2	Chloride	12.0

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ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63572
Project No.: 92017
No. Samples: 8
Arrived : 01/22/97

Page 2

Case:LOEFFEL SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Standard Methods for the Examination of Water and Wastewater. Test Methods for Evaluating Solid Waste, SW-846, or
All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324282	OMW213:01/21/97 (Liquid)	
375.4	Sulfate	278
376.2	Sulfide	<0.02
324283	OMW213F:01/21/97 (Filtrate)	
415.1	Organic Carbon, Total	1.6
324284	GMW11:01/21/97 (Liquid)	
310.1	Alkalinity (as CaCO3)	139
350.2	Ammonia-Nitrogen	0.03
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	0.02
325.2	Chloride	8.3
375.4	Sulfate	20
376.2	Sulfide	0.03
324285	GMW11F:01/21/97 (Filtrate)	
415.1	Organic Carbon, Total	1.3

< Last Page > Submitted By : Aquatec Inc.

ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Date : 02/17/97
ETR Number : 63598
Project No.: 92017
No. Samples: 6
Arrived : 01/24/97

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Page 1

Case:Loeffel SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324460	OMW103:01/23/97 @1250(Liquid)	
310.1	Alkalinity (as CaCO3)	18
350.2	Ammonia-Nitrogen	<0.02
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	0.03
325.2	Chloride	2.0
375.4	Sulfate	21
376.2	Sulfide	<0.02
324460MS	OMW103MS:[MS]01/23/97 @1250(Liquid)	
310.1	Alkalinity (as CaCO3)	40
350.2	Ammonia-Nitrogen	0.21
353.2	Nitrate/Nitrite Nitrogen	0.10
365.2	Phosphate, Total as P	0.12
325.2	Chloride	4.0
375.4	Sulfate	30
376.2	Sulfide	0.04
324460DP	OMW103REP:[REP]01/23/97 @1250(Liquid)	
310.1	Alkalinity (as CaCO3)	16
350.2	Ammonia-Nitrogen	<0.02
353.2	Nitrate/Nitrite Nitrogen	<0.01
365.2	Phosphate, Total as P	0.03
325.2	Chloride	2.0
375.4	Sulfate	22
376.2	Sulfide	<0.02
324461	OMW103F:01/23/97 @1250(Filtrate)	
415.1	Organic Carbon, Total	1.1

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ITS Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Blasland & Bouck Engineers
6723 Towpath Road
Box 66
Syracuse, NY 13214

Attention : Laurie Indick

Date : 02/17/97
ETR Number : 63598
Project No.: 92017
No. Samples: 6
Arrived : 01/24/97

Page 2

Case:Loeffel SDG:63521

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
324461MS OMW103FMS:[MS]01/23/97 @1250(Filtrate) 415.1	Organic Carbon, Total	10.7
324461DP OMW103FREP:[REP]01/23/97 @1250(Filtrate) 415.1	Organic Carbon, Total	1.1

< Last Page > Submitted By : Aquatec Inc.

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2647653
Collected: 1/15/97 at 11:45 by GR

Submitted: 1/17/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-216 Grab Water Sample

GE - Loeffel Site, NY
OW216 SDG#: LFL01-15

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive

Colchester, VT 05446

P.O. 35363
Rel. GE - LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	36.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 5 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2647654
Collected: 1/15/97 at 12:05 by GR

Submitted: 1/17/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-202 Grab Water Sample

GE - Loeffel Site
OM202 SDG#: LFL01-16

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive

Colchester, VT 05446

P.O. 35363
Rel. GE - LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	N.D.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 5 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2647655
Collected: 1/15/97 at 15:50 by GR

Submitted: 1/17/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-206 Grab Water Sample

GE - Loeffel Site
OM206 SDG#: LFL01-17

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive

Colchester, VT 05446

P.O. 35363
Rel. GE - LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	N.D.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 5 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2647656
Collected: 1/15/97 at 15:50 by GR

Submitted: 1/17/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-215 Grab Water Sample

GE - Loeffel Site
OM215 SDG#: LFL01-18

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive

Colchester, VT 05446

P.O. 35363
Rel. GE - LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	440.	30.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	76.	5.	ug/l

Due to dilution of the sample made necessary by the high levels of methane, normal quantitation limits were not attained for methane.

The volatile headspace analysis was performed 5 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2647657
Collected: 1/16/97 at 11:30 by GR

Submitted: 1/17/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-107 Grab Water Sample

GE - Loeffel Site
OM107 SDG#: LFL01-19

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive

Colchester, VT 05446

P.O. 35363
Rel. GE - LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	46.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	6.	5.	ug/l

The volatile headspace analysis was performed 4 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2647658
Collected: 1/16/97 at 11:45 by GR

Submitted: 1/17/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-220 Grab Water Sample

GE - Loeffel Site
OM220 SDG#: LFL01-20*

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive

Colchester, VT 05446

P.O. 35363
Rel. GE - LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	N.D.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 4 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

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A division of Thermo Analytical Inc.

LLI Sample No. WW 2648291
Collected: 1/16/97 at 16:00 by GR

Submitted: 1/18/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-218 Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.090
OM218 SDG#: LFL01-01

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	17.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 4 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2648292
Collected: 1/16/97 at 17:05 by GR

Submitted: 1/18/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

OMW-211 Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.090
OM211 SDG#: LFL01-02

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	90.	10.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	9.	5.	ug/l

Due to dilution of the sample made necessary by the high levels of methane, the normal quantitation limit was not attained for methane.

The volatile headspace analysis was performed 4 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2648293
Collected: 1/16/97 at 12:45 by GR
Submitted: 1/18/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

191-05-21A Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.090
0521A SDG#: LFL01-03

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	N.D.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 4 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2648294
Collected: 1/16/97 at 13:35 by GR
17 ga 2/4/97
Submitted: 1/18/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

191-05-15 Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.090
05-15 SDG#: LFL01-04

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	13.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 4 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2648295
Collected: 1/16/97 by GR
17 @ 2161 97
Submitted: 1/18/97 Reported: 1/28/97
Discard: 2/5/97

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

OMW-Dup.-2 Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.09)
DMWD2 SDG#: LFL01-05

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	N.D.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

The volatile headspace analysis was performed 4 days past the 7 day hold time.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2649671
Collected: 1/20/97 at 16:45 by RC

Submitted: 1/22/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-216 Grab Water Sample

G.E. · Loeffel Site, NY Project No. 100.73.09C
OM216 SDG#: LFL01-06

Account No: 09362
ITS Environmental Labs.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	43.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2649672
Collected: 1/21/97 at 11:30 by RC

Submitted: 1/22/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental Labs.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

OMW-219 Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.090
OM219 SDG#: LFL01-07

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS		LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon				
7106	Methane	700.		100.	ug/l
7107	Ethane	110.	J	200.	ug/l
7108	Ethene	600.		50.	ug/l

Due to dilution of the sample made necessary by the high levels of methane and ethene, normal quantitation limits were not attained for methane, ethane and ethene.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2649673
Collected: 1/21/97 at 13:00 by RC

Submitted: 1/22/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental Labs.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

OMW-213 Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.090
213XX SDG#: LFL01-08

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS		LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon				
7106	Methane	N.D.		5.	ug/l
7107	Ethane	N.D.		5.	ug/l
7108	Ethene	0.9	J	5.	ug/l

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2649674
Collected: 1/21/97 at 16:00 by RC

Submitted: 1/22/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental Labs.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

GMW-11 Grab Water Sample

G.E. - Loeffel Site, NY Project No. 100.73.090
11GMW SDG#: LFL01-09

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	320.	30.	ug/l
7107	Ethane	74.	5.	ug/l
7108	Ethene	N.D.	5.	ug/l

Due to dilution of the sample made necessary by the high levels of methane, normal quantitation limits were not attained for methane.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2651208
Collected: 1/22/97 at 10:45 by GR

Submitted: 1/24/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

OMW-205 Grab Water Sample
Project #100.73.090
G.E. - Loeffel Site, NY
OM205 SDG#: LFL01-10

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS		LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon				
7106	Methane	420.		30.	ug/l
7107	Ethane	59.		5.	ug/l
7108	Ethene	3.6	J	5.	ug/l

Due to dilution of the sample made necessary by the high levels of methane, normal quantitation limits were not attained for methane.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2651209
Collected: 1/22/97 at 12:45 by GR

Submitted: 1/24/97 Reported: 1/28/97
Discard: 2/ 5/97

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

OMW-201 Grab Water Sample
Project #100.73.090
G.E. - Loeffel Site, NY
OM201 SDG#: LFL01-11

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS		LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon				
7106	Methane	3,300.		500.	ug/l
7107	Ethane	510.	J	600.	ug/l
7108	Ethene	3,800.		300.	ug/l

Due to dilution of the sample made necessary by the high levels of methane and ethene, normal quantitation limits were not attained for methane, ethane and ethene.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2651210
Collected: 1/23/97 at 12:50 by GR

Submitted: 1/24/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-103 Unspiked Grab Water Sample
Project #100.73.090
G.E. - Loeffel Site, NY
OM103 SDG#: LFL01-12BKG

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	N.D.	5.	ug/l
7107	Ethane	N.D.	5.	ug/l
7108	Ethene	9.	5.	ug/l

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2651211
Collected: 1/23/97 at 12:50 by GR

Submitted: 1/24/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-103 Matrix Spike Grab Water Sample
Project #100.73.090
G.E. - Loeffel Site, NY
OM103 SDG#: LFL01-12MS

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	47.	5.	ug/l
7107	Ethane	50.	5.	ug/l
7108	Ethene	50.	5.	ug/l

LL sample 2651211, client designated matrix spike, was spiked with approximately 50 ug/L of methane, ethane, and ethene.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2651212
Collected: 1/23/97 at 12:50 by GR

Submitted: 1/24/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-103 Matrix Spike Duplicate Grab Water Sample
Project #100.73.090
G.E. · Loeffel Site, NY
OM103 SDG#: LFL01-12MSD

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon			
7106	Methane	49.	5.	ug/l
7107	Ethane	51.	5.	ug/l
7108	Ethene	52.	5.	ug/l

LL sample 2651212, client designated matrix spike duplicate, was spiked with approximately 50 ug/L of methane, ethane, and ethene.

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
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LLI Sample No. WW 2651213
Collected: 1/23/97 at 16:10 by GR

Submitted: 1/24/97 Reported: 1/28/97
Discard: 2/ 5/97

GMW-9B Grab Water Sample
Project #100.73.090
G.E. - Loeffel Site, NY
GMW9B SDG#: LFL01-13

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS		LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon				
7105	Methane	N.D.		5.	ug/l
7107	Ethane	N.D.		5.	ug/l
7108	Ethene	2.5	J	5.	ug/l

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. WW 2651214
Collected: 1/23/97 by GR

Submitted: 1/24/97 Reported: 1/28/97
Discard: 2/ 5/97

OMW-Dup-3 Grab Water Sample
Project #100.73.090
G.E. - Loeffel Site, NY
03DUP SDG#: LFL01-14

Account No: 09362
ITS Environmental, Inc.
55 South Park Drive
Colchester, VT 05446

P.O. 35363
Rel. GE LOEFFEL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS		LIMIT OF QUANTITATION	UNITS
	Volatile Headspace Hydrocarbon				
7106	Methane	N.D.		5.	ug/l
7107	Ethane	N.D.		5.	ug/l
7108	Ethene	1.8	J	5.	ug/l

Questions? Contact your Client Services Representative
F. Bradley Ayars at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

WELLID	DATE	PARAMETER	VALUE	QUALIFIER	UNITS	NOTE	SOURCE
191-05-15	1/17/97	Field Temperature	6.4000		Degrees C	Field Parameter	WQ25
191-05-15	1/17/97	Field Specific Conductance	0.3210		mS/cm	Field Parameter	WQ25
191-05-15	1/17/97	Field pH	7.4800		-	Field Parameter	WQ25
191-05-15	1/17/97	Field Turbidity	0.0000	U	NTU	Field Parameter	WQ25
191-05-15	1/17/97	Field Dissolved Oxygen (DO)	0.1100		mg/L	Field Parameter	WQ25
191-05-15	1/17/97	Field ORP	-110.8000		mV	Field Parameter	WQ25
191-05-15	1/17/97	Field Ferrous Iron	0.2000		mg/L	Field Parameter	WQ25
191-05-15	1/17/97	Field Manganese	0.1000		mg/L	Field Parameter	WQ25
191-05-21A	1/17/97	Field Temperature	10.6000		Degrees C	Field Parameter	WQ25
191-05-21A	1/17/97	Field Specific Conductance	0.2020		mS/cm	Field Parameter	WQ25
191-05-21A	1/17/97	Field pH	8.1300		-	Field Parameter	WQ25
191-05-21A	1/17/97	Field Turbidity	0.0000	U	NTU	Field Parameter	WQ25
191-05-21A	1/17/97	Field Dissolved Oxygen (DO)	0.2500		mg/L	Field Parameter	WQ25
191-05-21A	1/17/97	Field ORP	-170.7000		mV	Field Parameter	WQ25
191-05-21A	1/17/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
191-05-21A	1/17/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
191-05-21B	1/17/97	Field Temperature	6.4000		Degrees C	Field Parameter	WQ25
191-05-21B	1/17/97	Field Specific Conductance	0.2880		mS/cm	Field Parameter	WQ25
191-05-21B	1/17/97	Field pH	8.0800		-	Field Parameter	WQ25
191-05-21B	1/17/97	Field Turbidity	0.0000	U	NTU	Field Parameter	WQ25
191-05-21B	1/17/97	Field Dissolved Oxygen (DO)	0.1500		mg/L	Field Parameter	WQ25
191-05-21B	1/17/97	Field ORP	-149.9000		mV	Field Parameter	WQ25
191-05-21B	1/17/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
191-05-21B	1/17/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
191-05-3B	1/17/97	Field Temperature	6.8000		Degrees C	Field Parameter	WQ25
191-05-3B	1/17/97	Field Specific Conductance	0.2390		mS/cm	Field Parameter	WQ25
191-05-3B	1/17/97	Field pH	7.7500		-	Field Parameter	WQ25
191-05-3B	1/17/97	Field Turbidity	0.0000	U	NTU	Field Parameter	WQ25
191-05-3B	1/17/97	Field Dissolved Oxygen (DO)	0.2300		mg/L	Field Parameter	WQ25
191-05-3B	1/17/97	Field ORP	-98.6000		mV	Field Parameter	WQ25
191-05-3B	1/17/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
191-05-3B	1/17/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
GMW-11	1/21/97	Field Temperature	10.0400		Degrees C	Field Parameter	WQ25
GMW-11	1/21/97	Field Specific Conductance	0.2610		mS/cm	Field Parameter	WQ25

GMW-11	1/21/97	Field pH	8.0800		-	Field Parameter	WQ25
GMW-11	1/21/97	Field Turbidity	1.0000		NTU	Field Parameter	WQ25
GMW-11	1/21/97	Field Dissolved Oxygen (DO)	0.4600		mg/L	Field Parameter	WQ25
GMW-11	1/21/97	Field ORP	-170.5000		mV	Field Parameter	WQ25
GMW-11	1/21/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
GMW-11	1/21/97	Field Manganese	0.6000		mg/L	Field Parameter	WQ25
GMW-11A	1/21/97	Field Temperature	6.7700		Degrees C	Field Parameter	WQ25
GMW-11A	1/21/97	Field Specific Conductance	0.2060		mS/cm	Field Parameter	WQ25
GMW-11A	1/21/97	Field pH	6.2900		-	Field Parameter	WQ25
GMW-11A	1/21/97	Field Turbidity	1.0000		NTU	Field Parameter	WQ25
GMW-11A	1/21/97	Field Dissolved Oxygen (DO)	0.0800		mg/L	Field Parameter	WQ25
GMW-11A	1/21/97	Field ORP	-28.1000		mV	Field Parameter	WQ25
GMW-11A	1/21/97	Field Ferrous Iron	3.0000		mg/L	Field Parameter	WQ25
GMW-11A	1/21/97	Field Manganese	3.0000	>	mg/L	Field Parameter	WQ25
GMW-1B	1/28/97	Field Temperature	10.1900		Degrees C	Field Parameter	WQ25
GMW-9B	1/23/97	Field Temperature	11.3100		Degrees C	Field Parameter	WQ25
GMW-9B	1/23/97	Field Specific Conductance	0.1970		mS/cm	Field Parameter	WQ25
GMW-9B	1/23/97	Field pH	7.0200		-	Field Parameter	WQ25
GMW-9B	1/23/97	Field Turbidity	1.0000		NTU	Field Parameter	WQ25
GMW-9B	1/23/97	Field Dissolved Oxygen (DO)	4.1100		mg/L	Field Parameter	WQ25
GMW-9B	1/23/97	Field ORP	43.7000		mV	Field Parameter	WQ25
GMW-9B	1/23/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
GMW-9B	1/23/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-103	1/23/97	Field Temperature	6.2000		Degrees C	Field Parameter	WQ25
OMW-103	1/23/97	Field Specific Conductance	0.0420		mS/cm	Field Parameter	WQ25
OMW-103	1/23/97	Field pH	6.0800		-	Field Parameter	WQ25
OMW-103	1/23/97	Field Turbidity	16.0000		NTU	Field Parameter	WQ25
OMW-103	1/23/97	Field Dissolved Oxygen (DO)	10.8100		mg/L	Field Parameter	WQ25
OMW-103	1/23/97	Field ORP	183.6000		mV	Field Parameter	WQ25
OMW-103	1/23/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-103	1/23/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-107	1/16/97	Field Temperature	8.6000		Degrees C	Field Parameter	WQ25
OMW-107	1/16/97	Field Specific Conductance	0.1480		mS/cm	Field Parameter	WQ25
OMW-107	1/16/97	Field pH	6.6300		-	Field Parameter	WQ25
OMW-107	1/16/97	Field Turbidity	1.0000		NTU	Field Parameter	WQ25

OMW-107	1/16/97	Field Dissolved Oxygen (DO)	0.4000		mg/L	Field Parameter	WQ25
OMW-107	1/16/97	Field ORP	-39.7000		mV	Field Parameter	WQ25
OMW-107	1/16/97	Field Ferrous Iron	1.1000		mg/L	Field Parameter	WQ25
OMW-107	1/16/97	Field Manganese	2.3000		mg/L	Field Parameter	WQ25
OMW-108	1/13/97	Field Temperature	12.6000		Degrees C	Not Sampled	WQ25
OMW-108	1/13/97	Field Specific Conductance	0.3310		mS/cm	Not Sampled	WQ25
OMW-108	1/13/97	Field pH	7.8700		-	Not Sampled	WQ25
OMW-108	1/13/97	Field Turbidity	13.0000		NTU	Not Sampled	WQ25
OMW-108	1/13/97	Field Dissolved Oxygen (DO)	0.3100		mg/L	Not Sampled	WQ25
OMW-108	1/13/97	Field ORP	-221.0000		mV	Not Sampled	WQ25
OMW-108	1/13/97	Field Ferrous Iron			mg/L	Not Sampled	WQ25
OMW-108	1/13/97	Field Manganese			mg/L	Not Sampled	WQ25
OMW-201	1/22/97	Field Temperature	10.6900		Degrees C	Field Parameter	WQ25
OMW-201	1/22/97	Field Specific Conductance	1.7290		mS/cm	Field Parameter	WQ25
OMW-201	1/22/97	Field pH	6.9200		-	Field Parameter	WQ25
OMW-201	1/22/97	Field Turbidity	6.0000		NTU	Field Parameter	WQ25
OMW-201	1/22/97	Field Dissolved Oxygen (DO)	0.2700		mg/L	Field Parameter	WQ25
OMW-201	1/22/97	Field ORP	-163.3000		mV	Field Parameter	WQ25
OMW-201	1/22/97	Field Ferrous Iron	4.6000		mg/L	Field Parameter	WQ25
OMW-201	1/22/97	Field Manganese	1.0500		mg/L	Field Parameter	WQ25
OMW-202	1/15/97	Field Temperature	11.0000		Degrees C	Field Parameter	WQ25
OMW-202	1/15/97	Field Specific Conductance	1.1900		mS/cm	Field Parameter	WQ25
OMW-202	1/15/97	Field pH	7.8500		-	Field Parameter	WQ25
OMW-202	1/15/97	Field Turbidity	5.0000		NTU	Field Parameter	WQ25
OMW-202	1/15/97	Field Dissolved Oxygen (DO)	0.4200		mg/L	Field Parameter	WQ25
OMW-202	1/15/97	Field ORP	87.0000		mV	Field Parameter	WQ25
OMW-202	1/15/97	Field Ferrous Iron	0.1000		mg/L	Field Parameter	WQ25
OMW-202	1/15/97	Field Manganese	0.3000		mg/L	Field Parameter	WQ25
OMW-204	1/22/97	Field Temperature	12.6400		Degrees C	Not sampled	WQ25
OMW-204	1/22/97	Field Specific Conductance	1.9990		mS/cm	Not sampled	WQ25
OMW-204	1/22/97	Field pH	11.8200		-	Not sampled	WQ25
OMW-204	1/22/97	Field Turbidity	1.0000		NTU	Not sampled	WQ25
OMW-204	1/22/97	Field Dissolved Oxygen (DO)	0.3800		mg/L	Not sampled	WQ25
OMW-204	1/22/97	Field ORP	-132.2000		mV	Not sampled	WQ25
OMW-204	1/22/97	Field Ferrous Iron			mg/L	Not sampled	WQ25

OMW-204	1/22/97	Field Manganese			mg/L	Not sampled	WQ25
OMW-204	2/20/97	Field Temperature	8.3330		Degrees C		WQ25
OMW-204	2/20/97	Field Specific Conductance	1.9150		mS/cm		WQ25
OMW-204	2/20/97	Field pH	11.6100		-		WQ25
OMW-204	2/20/97	Field Turbidity	20.0000		NTU		WQ25
OMW-204	2/20/97	Field Dissolved Oxygen (DO)	0.3800		mg/L		WQ25
OMW-204	2/20/97	Field ORP	177.3000		mV		WQ25
OMW-204	2/20/97	Field Ferrous Iron	0.0000		mg/L		WQ25
OMW-204	2/20/97	Field Manganese	0.0000		mg/L		WQ25
OMW-205	1/22/97	Field Temperature	10.5800		Degrees C	Field Parameter	WQ25
OMW-205	1/22/97	Field Specific Conductance	0.3430		mS/cm	Field Parameter	WQ25
OMW-205	1/22/97	Field pH	7.6700		-	Field Parameter	WQ25
OMW-205	1/22/97	Field Turbidity	4.0000		NTU	Field Parameter	WQ25
OMW-205	1/22/97	Field Dissolved Oxygen (DO)	0.4000		mg/L	Field Parameter	WQ25
OMW-205	1/22/97	Field ORP	-163.3000		mV	Field Parameter	WQ25
OMW-205	1/22/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-205	1/22/97	Field Manganese	0.3000		mg/L	Field Parameter	WQ25
OMW-206	1/15/97	Field Temperature	11.6000		Degrees C	Field Parameter	WQ25
OMW-206	1/15/97	Field Specific Conductance	0.3870		mS/cm	Field Parameter	WQ25
OMW-206	1/15/97	Field pH	8.2400		-	Field Parameter	WQ25
OMW-206	1/15/97	Field Turbidity	10.0000		NTU	Field Parameter	WQ25
OMW-206	1/15/97	Field Dissolved Oxygen (DO)	0.2600		mg/L	Field Parameter	WQ25
OMW-206	1/15/97	Field ORP	-212.5000		mV	Field Parameter	WQ25
OMW-206	1/15/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-206	1/15/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-211	1/18/97	Field Temperature	15.4000		Degrees C	Field Parameter	WQ25
OMW-211	1/18/97	Field Specific Conductance	1.0170		mS/cm	Field Parameter	WQ25
OMW-211	1/18/97	Field pH	7.5200		-	Field Parameter	WQ25
OMW-211	1/18/97	Field Turbidity	1.0000		NTU	Field Parameter	WQ25
OMW-211	1/18/97	Field Dissolved Oxygen (DO)	1.1000		mg/L	Field Parameter	WQ25
OMW-211	1/18/97	Field ORP	-1.3000		mV	Field Parameter	WQ25
OMW-211	1/18/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-211	1/18/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-213	1/21/97	Field Temperature	10.5600		Degrees C	Field Parameter	WQ25
OMW-213	1/21/97	Field Specific Conductance	0.7020		mS/cm	Field Parameter	WQ25

OMW-213	1/21/97	Field pH	8.0200		-	Field Parameter	WQ25
OMW-213	1/21/97	Field Turbidity	6.0000		NTU	Field Parameter	WQ25
OMW-213	1/21/97	Field Dissolved Oxygen (DO)	0.2400		mg/L	Field Parameter	WQ25
OMW-213	1/21/97	Field ORP	-208.6000		mV	Field Parameter	WQ25
OMW-213	1/21/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-213	1/21/97	Field Manganese	0.3000		mg/L	Field Parameter	WQ25
OMW-214	1/20/97	Field Temperature	8.9100		Degrees C	Field Parameter	WQ25
OMW-214	1/20/97	Field Specific Conductance	0.6080		mS/cm	Field Parameter	WQ25
OMW-214	1/20/97	Field pH	10.7500		-	Field Parameter	WQ25
OMW-214	1/20/97	Field Turbidity	4.0000		NTU	Field Parameter	WQ25
OMW-214	1/20/97	Field Dissolved Oxygen (DO)	0.0800		mg/L	Field Parameter	WQ25
OMW-214	1/20/97	Field ORP	-226.7000		mV	Field Parameter	WQ25
OMW-214	1/20/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-214	1/20/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-215	1/15/97	Field Temperature	8.7300		Degrees C	Field Parameter	WQ25
OMW-215	1/15/97	Field Specific Conductance	0.5730		mS/cm	Field Parameter	WQ25
OMW-215	1/15/97	Field pH	9.2800		-	Field Parameter	WQ25
OMW-215	1/15/97	Field Turbidity	435.0000		NTU	Field Parameter	WQ25
OMW-215	1/15/97	Field Dissolved Oxygen (DO)	0.4500		mg/L	Field Parameter	WQ25
OMW-215	1/15/97	Field ORP	-199.5000		mV	Field Parameter	WQ25
OMW-215	1/15/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-215	1/15/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-216	1/20/97	Field Temperature	10.2500		Degrees C	Field Parameter	WQ25
OMW-216	1/20/97	Field Specific Conductance	0.4950		mS/cm	Field Parameter	WQ25
OMW-216	1/20/97	Field pH	8.3500		-	Field Parameter	WQ25
OMW-216	1/20/97	Field Turbidity	3.0000		NTU	Field Parameter	WQ25
OMW-216	1/20/97	Field Dissolved Oxygen (DO)	0.2100		mg/L	Field Parameter	WQ25
OMW-216	1/20/97	Field ORP	-297.4000		mV	Field Parameter	WQ25
OMW-216	1/20/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-216	1/20/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-218	1/16/97	Field Temperature	9.5300		Degrees C	Field Parameter	WQ25
OMW-218	1/16/97	Field Specific Conductance	0.3500		mS/cm	Field Parameter	WQ25
OMW-218	1/16/97	Field pH	9.3900		-	Field Parameter	WQ25
OMW-218	1/16/97	Field Turbidity	72.0000		NTU	Field Parameter	WQ25
OMW-218	1/16/97	Field Dissolved Oxygen (DO)	0.1900		mg/L	Field Parameter	WQ25

OMW-218	1/16/97	Field ORP	-120.8000		mV	Field Parameter	WQ25
OMW-218	1/16/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-218	1/16/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-219	1/21/97	Field Temperature	8.6500		Degrees C	Field Parameter	WQ25
OMW-219	1/21/97	Field Specific Conductance	1.2090		mS/cm	Field Parameter	WQ25
OMW-219	1/21/97	Field pH	8.7500		-	Field Parameter	WQ25
OMW-219	1/21/97	Field Turbidity	1.0000		NTU	Field Parameter	WQ25
OMW-219	1/21/97	Field Dissolved Oxygen (DO)	0.2100		mg/L	Field Parameter	WQ25
OMW-219	1/21/97	Field ORP	-242.0000		mV	Field Parameter	WQ25
OMW-219	1/21/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-219	1/21/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-220	1/16/97	Field Temperature	10.2600		Degrees C	Field Parameter	WQ25
OMW-220	1/16/97	Field Specific Conductance	0.3370		mS/cm	Field Parameter	WQ25
OMW-220	1/16/97	Field pH	9.0400		-	Field Parameter	WQ25
OMW-220	1/16/97	Field Turbidity	8.0000		NTU	Field Parameter	WQ25
OMW-220	1/16/97	Field Dissolved Oxygen (DO)	0.1800		mg/L	Field Parameter	WQ25
OMW-220	1/16/97	Field ORP	-673.1000		mV	Field Parameter	WQ25
OMW-220	1/16/97	Field Ferrous Iron	0.0000	U	mg/L	Field Parameter	WQ25
OMW-220	1/16/97	Field Manganese	0.0000	U	mg/L	Field Parameter	WQ25
OMW-221	2/20/97	Field Temperature	9.7980		Degrees C	Dup #2 Collected	WQ25
OMW-221	2/20/97	Field Specific Conductance	0.3840		mS/cm	Dup #2 Collected	WQ25
OMW-221	2/20/97	Field pH	7.9200		-	Dup #2 Collected	WQ25
OMW-221	2/20/97	Field Turbidity	46.0000		NTU	Dup #2 Collected	WQ25
OMW-221	2/20/97	Field Dissolved Oxygen (DO)	0.1100		mg/L	Dup #2 Collected	WQ25
OMW-221	2/20/97	Field ORP	-33.4000		mV	Dup #2 Collected	WQ25
OMW-221	2/20/97	Field Ferrous Iron	0.0000		mg/L	Dup #2 Collected	WQ25
OMW-221	2/20/97	Field Manganese	0.0000		mg/L	Dup #2 Collected	WQ25
OMW-222	2/21/97	Field Temperature	9.8170		Degrees C		WQ25
OMW-222	2/21/97	Field Specific Conductance	0.2360		mS/cm		WQ25
OMW-222	2/21/97	Field pH	8.5500		-		WQ25
OMW-222	2/21/97	Field Turbidity	115.0000		NTU		WQ25
OMW-222	2/21/97	Field Dissolved Oxygen (DO)	1.0700		mg/L		WQ25
OMW-222	2/21/97	Field ORP	127.0000		mV		WQ25
OMW-222	2/21/97	Field Ferrous Iron	0.0000		mg/L		WQ25
OMW-222	2/21/97	Field Manganese	0.0000		mg/L		WQ25

OMW-223	2/21/97	Field Temperature	10.0950		Degrees C		WQ25
OMW-223	2/21/97	Field Specific Conductance	0.4490		mS/cm		WQ25
OMW-223	2/21/97	Field pH	8.3600		-		WQ25
OMW-223	2/21/97	Field Turbidity	14.0000		NTU		WQ25
OMW-223	2/21/97	Field Dissolved Oxygen (DO)	0.2000		mg/L		WQ25
OMW-223	2/21/97	Field ORP	4.7000		mV		WQ25
OMW-223	2/21/97	Field Ferrous Iron	0.0000		mg/L		WQ25
OMW-223	2/21/97	Field Manganese	0.0000		mg/L		WQ25
OPZ-217	1/23/97	Field Temperature	10.0600		Degrees C	Not Sampled	WQ25
OPZ-217	1/23/97	Field Specific Conductance	0.2930		mS/cm	Not Sampled	WQ25
OPZ-217	1/23/97	Field pH	8.4100		-	Not Sampled	WQ25
OPZ-217	1/23/97	Field Turbidity	28.0000		NTU	Not Sampled	WQ25
OPZ-217	1/23/97	Field Dissolved Oxygen (DO)	0.0500		mg/L	Not Sampled	WQ25
OPZ-217	1/23/97	Field ORP	-329.8000		mV	Not Sampled	WQ25
OPZ-217	1/23/97	Field Ferrous Iron			mg/L	Not Sampled	WQ25
OPZ-217	1/23/97	Field Manganese			mg/L	Not Sampled	WQ25
OPZ-217	2/19/97	Field Temperature	9.8200		Degrees C		WQ25
OPZ-217	2/19/97	Field Specific Conductance	0.3100		mS/cm		WQ25
OPZ-217	2/19/97	Field pH	7.3000		-		WQ25
OPZ-217	2/19/97	Field Turbidity	1.0000		NTU		WQ25
OPZ-217	2/19/97	Field Dissolved Oxygen (DO)	6.0400		mg/L		WQ25
OPZ-217	2/19/97	Field ORP	4.2000		mV		WQ25
OPZ-217	2/19/97	Field Ferrous Iron	0.1000		mg/L		WQ25
OPZ-217	2/19/97	Field Manganese	0.3000		mg/L		WQ25
PB-1	1/24/97	Field Temperature	8.0600		Degrees C	Field Parameter	WQ25
PB-1	1/24/97	Field Specific Conductance	1.3180		mS/cm	Field Parameter	WQ25
PB-1	1/24/97	Field pH	7.3900		-	Field Parameter	WQ25
PB-1	1/24/97	Field Turbidity	155.0000		NTU	Field Parameter	WQ25
PB-1	1/24/97	Field Dissolved Oxygen (DO)	0.1500		mg/L	Field Parameter	WQ25
PB-1	1/24/97	Field ORP	-128.9000		mV	Field Parameter	WQ25
PB-1	1/24/97	Field Ferrous Iron	0.6000		mg/L	Field Parameter	WQ25
PB-1	1/24/97	Field Manganese	1.4000		mg/L	Field Parameter	WQ25
PB-2	1/12/97	Field Temperature	10.0200		Degrees C	Field Parameter	WQ25
PB-2	1/12/97	Field Specific Conductance	2.1440		mS/cm	Field Parameter	WQ25
PB-2	1/12/97	Field pH	7.3600		-	Field Parameter	WQ25

PB-2	1/12/97	Field Turbidity	3.0000		NTU	Field Parameter	WQ25
PB-2	1/12/97	Field Dissolved Oxygen (DO)	0.1900		mg/L	Field Parameter	WQ25
PB-2	1/12/97	Field ORP	-194.4000		mV	Field Parameter	WQ25
PB-2	1/12/97	Field Ferrous Iron	9.0000		mg/L	Field Parameter	WQ25
PB-2	1/12/97	Field Manganese	1.8000		mg/L	Field Parameter	WQ25
PW-1	1/24/97	Field Temperature	16.5400		Degrees C	Not sampled	WQ25
PW-1	1/24/97	Field Specific Conductance	1.2040		mS/cm	Not sampled	WQ25
PW-1	1/24/97	Field pH	7.4100		-	Not sampled	WQ25
PW-1	1/24/97	Field Turbidity	1000.0000	>	NTU	Not sampled	WQ25
PW-1	1/24/97	Field Dissolved Oxygen (DO)	0.2200		mg/L	Not sampled	WQ25
PW-1	1/24/97	Field ORP	-150.3000		mV	Not sampled	WQ25
PW-1	1/24/97	Field Ferrous Iron	0.0000	U	mg/L	Not sampled	WQ25
PW-1	1/24/97	Field Manganese	2.1000		mg/L	Not sampled	WQ25
PW-1	2/20/97	Field Temperature	9.6960		Degrees C		WQ25
PW-1	2/20/97	Field Specific Conductance	1.4420		mS/cm		WQ25
PW-1	2/20/97	Field pH	7.6800		-		WQ25
PW-1	2/20/97	Field Turbidity	1000.0000	>	NTU		WQ25
PW-1	2/20/97	Field Dissolved Oxygen (DO)	1.2700		mg/L		WQ25
PW-1	2/20/97	Field ORP	-127.8000		mV		WQ25
PW-1	2/20/97	Field Ferrous Iron	0.3000		mg/L		WQ25
PW-1	2/20/97	Field Manganese	2.5000		mg/L		WQ25

ATTACHMENT 1

LOWFLOW SAMPLING PROTOCOLS

Low-Flow Ground-Water Sampling Procedures for Monitoring Wells

I. Introduction

This protocol describes the low-flow sampling procedures to be used to collect ground-water samples. No wells will be sampled until well development has been performed. During precipitation events, ground-water sampling will be discontinued until precipitation ceases. When a round of water levels is taken for the purpose of generating water elevation data, the water levels will be taken consecutively at one time prior to sampling or other activities.

II. Materials

The following materials, as required, shall be available during ground-water sampling:

- Low-flow sample pump;
- Sample tubing;
- Power source (i.e., generator)
- Photoionization detector (PID);
- Appropriate health and safety equipment as specified in the Health and Safety Plan;
- Plastic sheeting (for each sampling location);
- Graduated cylinder to check low-flow rate;
- Buckets to measure purge water;
- Water level probe;
- 6' rule with gradation in hundredths of a foot;

- Water quality meters setup with a closed flow-through cell and appropriate probes to measure dissolved oxygen, oxidation/reduction potential, specific conductivity, pH, and temperature;

- Turbidity meter;

- Hach kits for ferrous iron and manganese (25130-25 and 1467-00, respectively);

- Appropriate water sample containers;

- Appropriate blanks (trip blank supplied by the laboratory);

- Appropriate transport containers (coolers) with ice and appropriate labeling, packing, and shipping materials;

- Ground-water sampling logs;

- Chain-of-Custody forms;

- Indelible ink pens;

- Site map with well locations and ground-water contour maps;

- Keys to wells.

III. Procedures

A. The procedures to sample monitoring wells will be as follows:

1. Review materials check list (Part II) to ensure the appropriate equipment has been acquired.

2. Identify site and well sampled on sampling log sheets, along with date, arrival time, and weather conditions. Identify the personnel and equipment utilized and other pertinent data requested on the Ground-Water Sampling Log (Attachment 1).

3. Label all sample containers using the label in Attachment 2 (or the equivalent).

4. Don safety equipment, as required in the Health and Safety Plan.

5. Place plastic sheeting adjacent to well to use as a clean work area.

6. Establish the background reading with the PID and record the reading on the field log (Attachment 1).

7. Remove lock from well and if rusted or broken, replace.

8. Unlock and open the well cover while standing upwind of the well. Remove well cap and place on the plastic sheeting. Insert PID probe in the breathing zone above the well casing following instructions in the Health and Safety Plan.

9. Set out on plastic sheeting the dedicated or disposable sampling device and meters.

10. Prior to sampling, ground-water elevations will be measured at each monitoring well and the presence of LNAPL (if any) within the well will be evaluated. Obtain a water level depth using an electric well probe and record on sampling log sheet. Clean the well probe after each use with a soapy (Alconox) water wash and a tap water rinse. [Note: water levels will be measured at all wells prior to initiating a sampling event].

11. After ground-water elevations are measured and LNAPLs are determined not to be present, initiate installation of the sampling pump. If LNAPL is found in any wells, a representative sample will be collected. Purge water will be collected and contained for disposal.

12. Pump, safety cable, tubing, and electrical lines will be lowered slowly into the well to the mid-screen or mid-interval depth. The pump intake must be kept at least two feet above the bottom of the well to prevent mobilization of any sediment or LNAPL present in the bottom of the well.

13. Measure the water level again with the pump in the well before starting the pump. Start pumping the well at approximately 200 to 500 milliliters per minute. Ideally, the pump rate should cause little or no water level drawdown in the well (less than 0.3 feet and the water level should stabilize). The water level should be monitored every three to five minutes (or as appropriate) during pumping. Care should be taken not to cause pump suction to be broken or entrainment of air in the sample. Record pumping rate adjustments and depths to water. Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to avoid pumping the well dry and/or to ensure stabilization of indicator parameters. If the recharge rate of the well is very low, purging should be interrupted so as not to cause the drawdown withing the well to advance below the pump. However, a steady flow rate should be maintained to the extent practicable.

Sampling of wells with very low recharge rates should commence as soon as the volume in the well has recovered sufficiently to permit collection of samples.

14. During purging of the well, monitor the field indicator parameters including dissolved (DO) oxygen, oxidation/reduction potential (ORP), turbidity, specific conductivity, pH, and temperature) every three to five minutes (or as appropriate). The well is considered stabilized and ready for sample collection once all the field indicator parameter values are within the following criteria ranges;

    a. Dissolved Oxygen -0.1 milligrams/liter
    b. Conductivity - 3% of full scale
    c. pH - 0.1 pH units;
    d. Temperature - 0.2 degrees C; and
    e. Redox Potential - 3% of full scale.

    Puls et al. (1991 and 1992) have shown temperature, specific conductance, and pH to be the least sensitive indicators of aquifer equilibration, while ORP, dissolved oxygen, and constituent concentration are more sensitive, and turbidity is the most sensitive indicator of equilibrated conditions. Measurements for DO and ORP must be obtained using a closed flow through cell. Other parameters may be measured via a clean container such as a glass beaker. Water quality meter calibration will be consistent with manufacturer's recommendations and as described in Appendix E with the exception that the DO meter will be calibrated using a two point calibration method with a sodium sulfite solutions as a zero DO reference. The ORP meter will be calibrated using Zobells Solution.

15. After the field parameters have stabilized the ground water samples will be obtained. Fill sample bottles immediately from sampling device discharge point and minimize contact with the atmosphere. The order of sample collection will be as follows:

    a. Volatile organic compounds
    b. Dissolved gas;
    c. All other constituents; and
    d. Metals.

16. Perform field tests for ferrous iron and manganese using Hach kits (25140-25 and 1467-00, respectively) and record on the Ground-Water Sampling Log. Analyses for iron and manganese require filtration through an in-line 0.45 micron disposable filter.

17. Complete the sample labels and cover the labels with clear packing tape to secure the labels onto the container.

18. Secure with packing material and store at 4 degrees C on wet ice in an insulated transport container provided by the laboratory.

19. After all sampling containers have been filled, continue pumping ground water to measure and record pH, ORP, DO, temperature, turbidity, and conductivity and record results on Ground-Water Sampling Log. Also record the physical appearance of the ground water.

20. Obtain bottom of well depth using an electric well probe and record on sampling log sheet. Clean the well probe after each use with a soapy (Alconox) water wash and tap water rinse.

21. Replace the well cap and lock well.

22. Record the time sampling procedures were completed on the field logs.

23. Clean sampling devices (i.e. pumps) as per Appendix C.

24. Place all disposable sampling materials (plastic sheeting and health and safety equipment) in appropriately labeled containers. Go to next well and repeat Step 1 through 25 until all wells are sampled.

25. Complete the procedures for packaging, shipping, and handling with associated chain-of-custody.

ATTACHMENT 2

LOWFLOW GROUND-WATER SAMPLING LOG

Attachment 1
GROUND-WATER SAMPLING LOG

Well No. ________________ Site Name ________________
Key No. ________________ Sampling Personel ________________
Date ________ Weather ________________

Well Information

Reference Point Marked on Casing	TIC	TOC	BGL
Well Diameter			
Well Depth(ft)			
Water Table Depth (ft)			
Depth to Casing Below Grade (ft)			

Well Water Information	
Length of Water Column (ft)	
Volume of Water in Well (gal)	
Pumping Rate of Pump	
Minutes of Pumping	

EVACUATION INFORMATION
Volume of Water Removed from Well ________ Evacuation Method: Pump ( ) Other ( )
Did well go dry Y N Evacuation Rate: ________________

Parameter	Initial	After 5 min Pumping	After 10 min Pumping	After 15 min Pumping	After 20 min Pumping	After 25 min Pumping	After 30 min Pumping	After 35 min Pumping	After 40 min Pumping
Temperature									
Conductance									
pH									
Turbidity									
DO									
ORP (mv)									
Depth to Water (ft)									
Flow rate									

GROUND-WATER CHARACTERISTICS AFTER SAMPLE COLLECTED Sampled at

Temperature (C)	
Conductivity (mS/cm)	
pH	
Turbidity (NTUs)	
Dissolved Oxygen (mg/L)	
ORP (mv)	
Ferrous Iron (mg/L)	
Manganese (mg/L)	

Calibration Standard Readings

MISCELLANEOUS OBSERVATIONS/PROBLEMS ________________

ANALYSES TO BE PERFORMED

SAMPLE DESTINATION
Laboratory ________________ Via ________ Sent By ________________

____
Field Sampling Coordinator

Notes:

TIC=Top of inner casing
TOC=Top of outer casing
BGL=Below ground level

gpm=Gallons per minute
C=degrees Centigrade
mS/cm=milliSiemens per cm

SU=Standard unit.
NTU=Nephlometric Turbidity Unit
mg/L=Milligrams per liter

APPENDIX H

APPENDIX H
RESULTS OF BEDROCK PACKER TEST ANALYSES

INTRODUCTION

Packer tests were performed on four wells at the Dewey Loeffel site during the period November 1996 - January 1997. The tests were completed to define vertical variations in relative water yielding capabilities of bedrock intervals. Packer testing was performed prior to well completion in OMW220, OMW221, OMW222 and OMW223 so that the monitoring intervals could be located in the highest yielding bedrock zones.

FIELD PROCEDURE

Inflatable packer assemblies isolate vertical intervals of 42 feet. The packers are set into the zone of open rock and inflated, sealing off the zone. A vertical riser screened in the isolated interval extends through the upper packer to the surface. A submersible pump and pressure transducer are lowered into the riser and placed above the upper packer. The pump removes water from the riser, dropping the head in the isolated zone.

To ensure that the top packer is properly seated during the packer test, the water level above the upper packer in the borehole is monitored with a water level probe. An air line with a pressure gauge monitors the pressure below the bottom packer to check for leakage upward through the borehole.

To start the test, the pump is switched on and the transducer begins recording at 5 second intervals. Pumping quickly drops the water level in the riser to the level of the pump. The pump is then switched off and the transducer measures the water level recovery in the riser.

DATA ANALYSIS

Digital water level data from each zone was converted to time versus water level displacement using an EXCEL™ spreadsheet. Initial time is set as the time at which the maximum water level drop occurs and pumping. As time increases from this point water levels rise and the net water level displacement decreases until displacement is zero.

Hydraulic conductivity was determined by analyzing time versus water level displacement data using AQTESOLV™ software (Hydrosolve, 1996). The test was analyzed using the Bouwer and Rice (1976) and Cooper, Bredehoeft, and Papadopolous (1967) solutions for confined falling head slug tests. In these solutions, a volume of water is removed rapidly from the riser in the packer assembly, quickly dropping the head in the isolated zone. The subsequent rate of rise of water levels is a function of the permeability of the interval tested.

For this analysis, casing diameter as described in the solutions is considered to be 2 inches representing the 2-inch riser above the packer assembly. The packer tests were completed in open bedrock intervals and therefore the early time data should reflect aquifer properties (Bouwer and Rice, 1976).

RESULTS

The results of the packer test analyses and intervals tested are summarized in Table 1. These results have been presented in terms of hydraulic conductivity in feet/day. The results from both analysis methods are generally closely matched and overall the range of values are representative of values previously observed in other RI bedrock wells. The highest hydraulic conductivities overall appear in OMW-223 and the lowest appear in OMW-220.

Summary sheets and time-displacement plots for each well and zone for Bouwer and Rice (1976) and the Cooper, Bredehoeft, Papadopulos (1967) methods are provided in Attachment 1. Early-time displacement data was used to match the curves whenever possible.

Table 1. Hydraulic Conductivity Results From Packer Tests.

Well	Test Date	Zone	Interval Elevation (ft msl)		Depth Interval (ft)		Hydraulic Conductivity (ft/day)	
			Top	Bottom	Top	Bottom	Bower and Rice (1976)	Cooper, Bredehoeft, Papadopulos (1967)
OMW220	11/11/96	1	446.8	405.5	188.7	230.0	0.05	0.06
	11/13/96	2	483.7	442.4	151.8	193.1	0.76	0.45
	11/12/96	3	524.4	483.1	111.1	152.4	0.07	0.20
	11/13/96	4	616.1	574.8	19.5	60.8	0.11	0.28
OMW221	1/10/97	1	454.8	411.0	137.2	181.0	0.26	0.24
	1/10/97	2	494.7	451.0	97.3	141.0	1.12	1.59
	1/10/97	3	537.1	493.4	54.9	98.6	0.55	0.53
OMW222	12/20/96	1	445.9	404.6	152.7	194.0	1.70	2.16
	12/20/96	2	488.3	447.0	110.3	151.6	1.02	1.16
	2/2/97	3	503.8	545.1	94.8	53.5	0.17	0.17
OMW223	1/7/97	1	463.4	419.6	130.5	174.3	6.09	8.20
	1/7/97	2	505.9	462.8	88.0	131.1	3.34	5.89
	1/7/97	3	548.4	504.6	45.5	89.3	4.31	4.31

REFERENCES

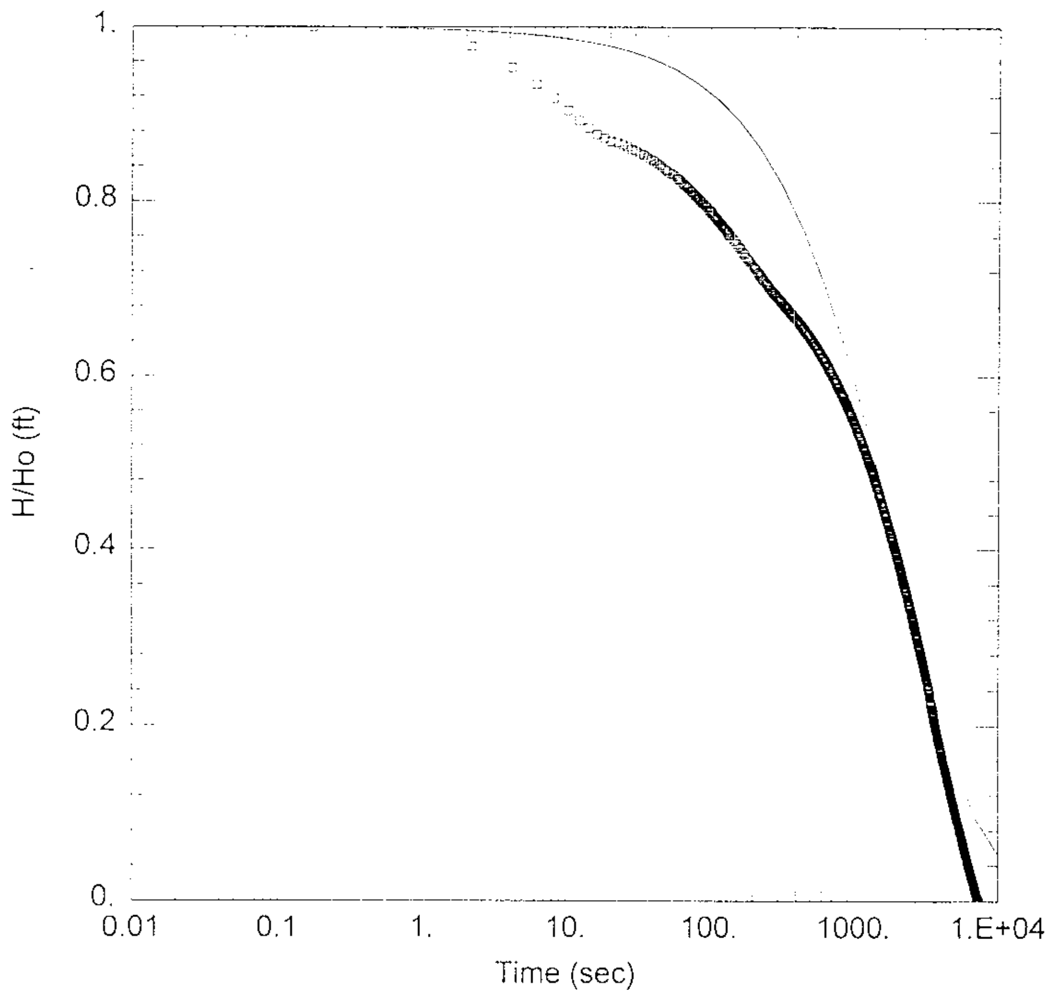
Cooper, H.H., J.D. Bredehoeft, and S. S. Papadopulos, 1967. Response of a finite-diameter well to an instantaneous charge of water. Water Resources Research, 3(1): 263-269.

Bouwer H. and R.C. Rice, 1976. A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. Water Resources Research 12 (3): 423-428.

Hydrosolve, Inc., 1996. AQTESOLV™ for Windows, Version 1.15.

ATTACHMENT 1

WATER LEVEL DISPLACEMENT VERSUS TIME GRAPHS AND AQTESOLV ™ RESULTS



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P1.AQT
Date: 03/11/97 Time: 08:53:51

AQUIFER DATA

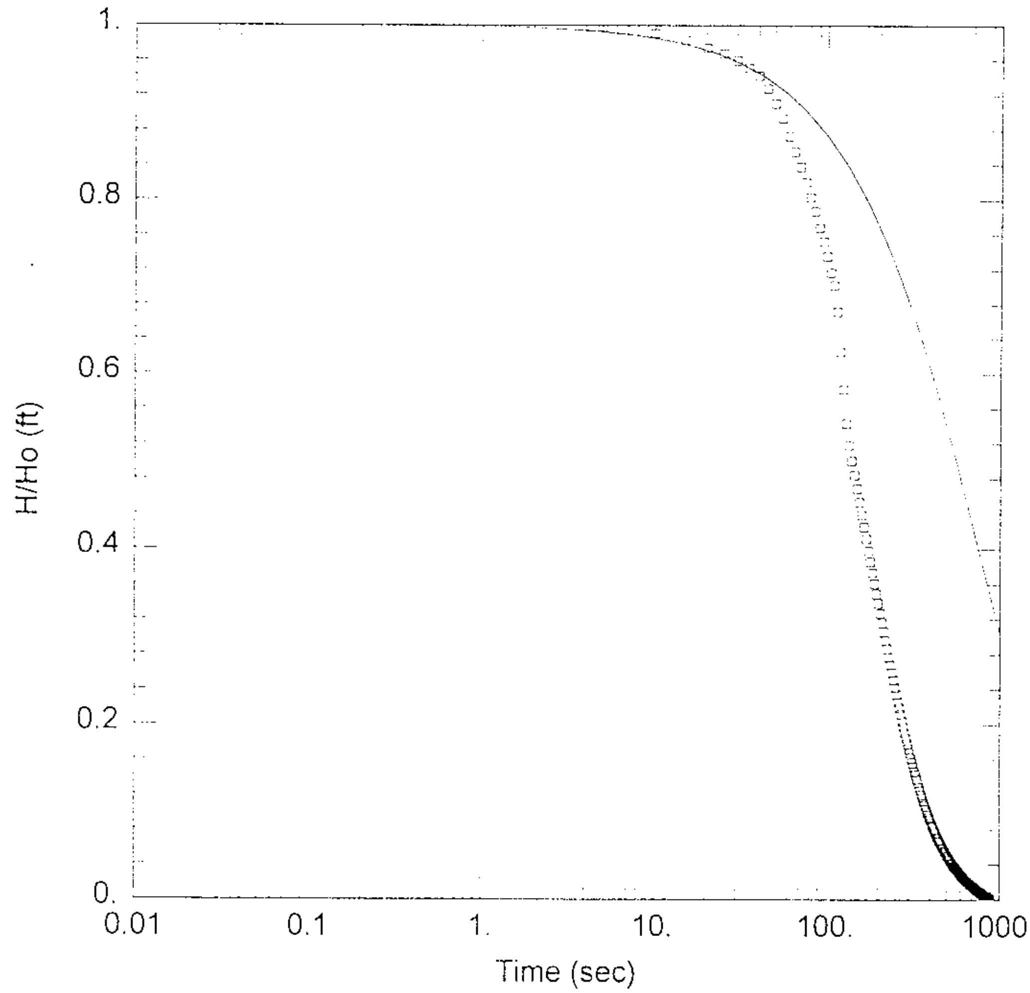
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 23.66 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.1615 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined $T = 2.286\ ft^2/day$
Solution Method: Cooper-Bredehoeft-Papadopulos $S = 0.0008523$



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P2.AQT
Date: 03/11/97 Time: 08:55:33

AQUIFER DATA

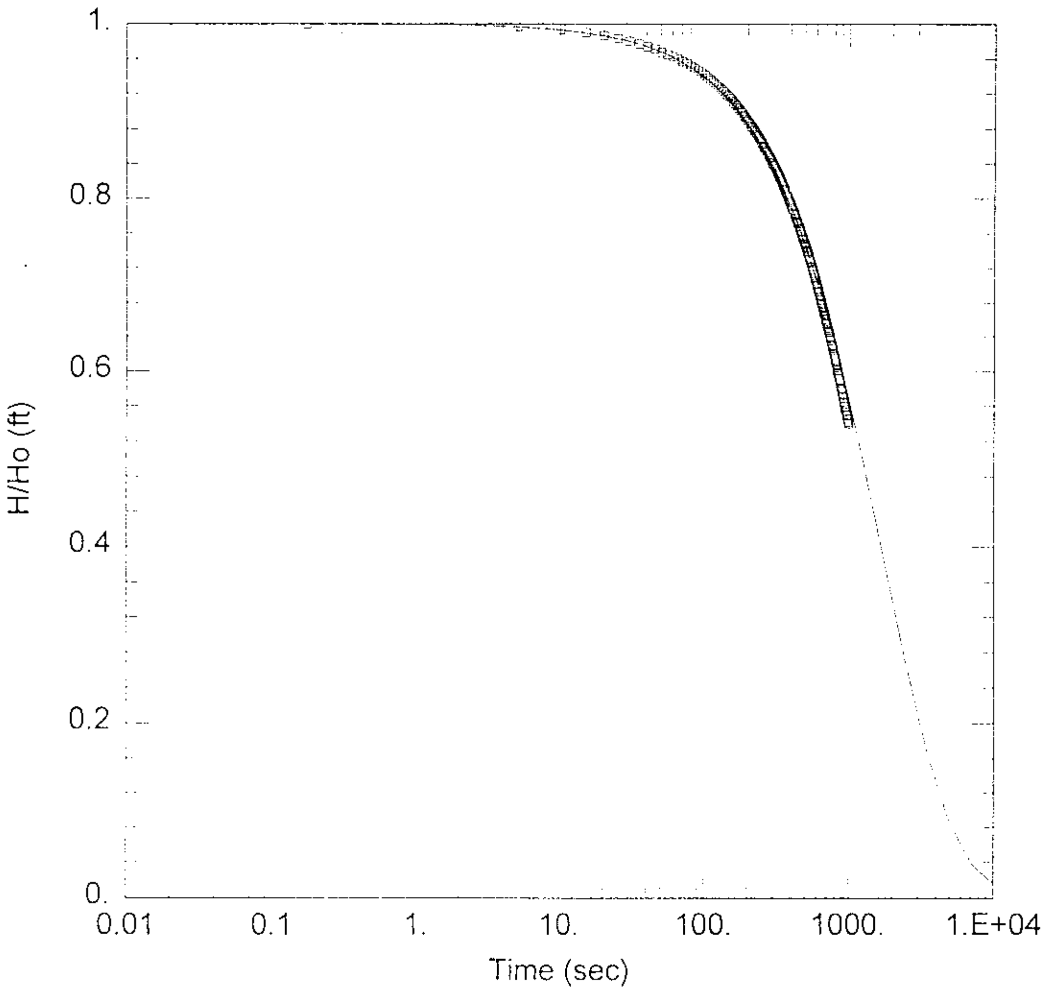
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 22.37 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.1615 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined T = 18.44 ft^2/day
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P3.AQT
Date: 03/11/97 Time: 09:01:42

AQUIFER DATA

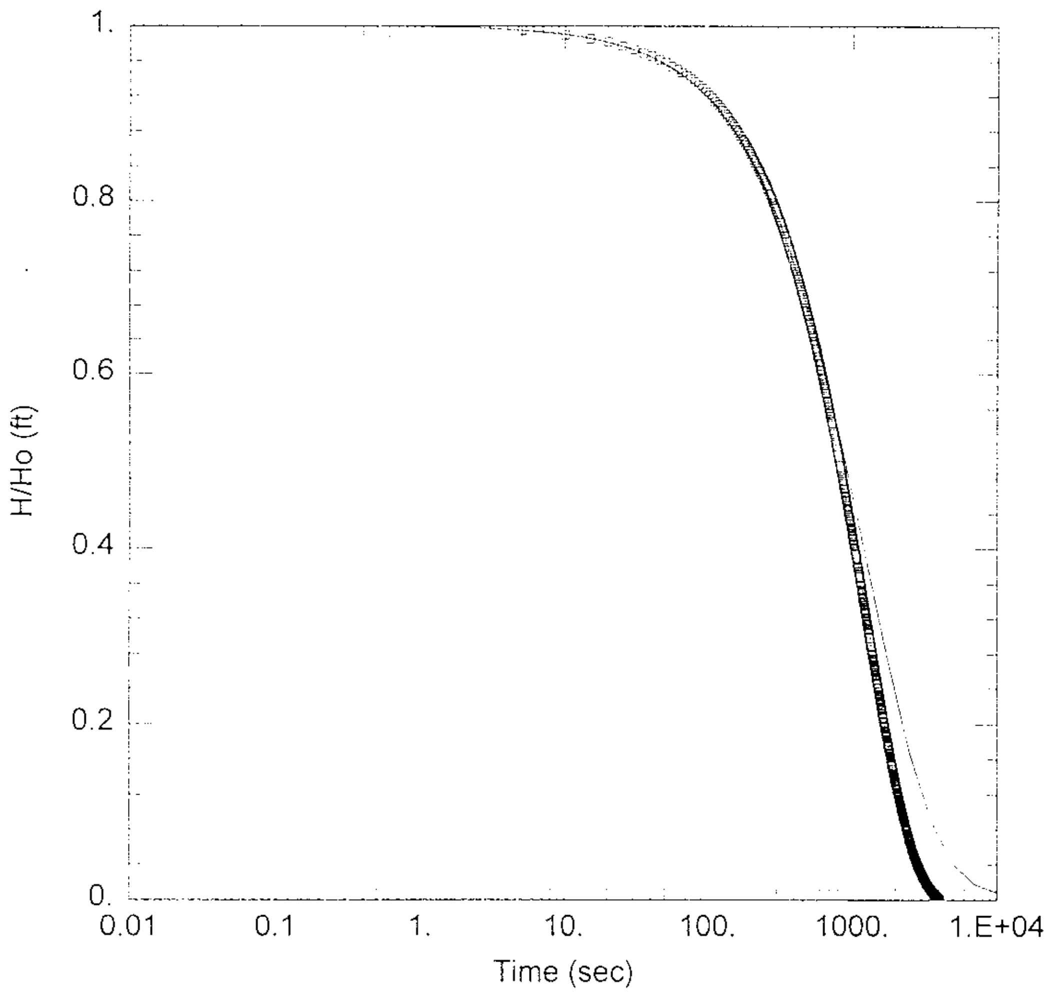
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 28.65 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.1615 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined $T = 8.241\ ft^2/day$
Solution Method: Cooper-Bredehoeft-Papadopulos $S = 1.E-10$



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P4.AQT
Date: 03/11/97 Time: 09:06:24

AQUIFER DATA

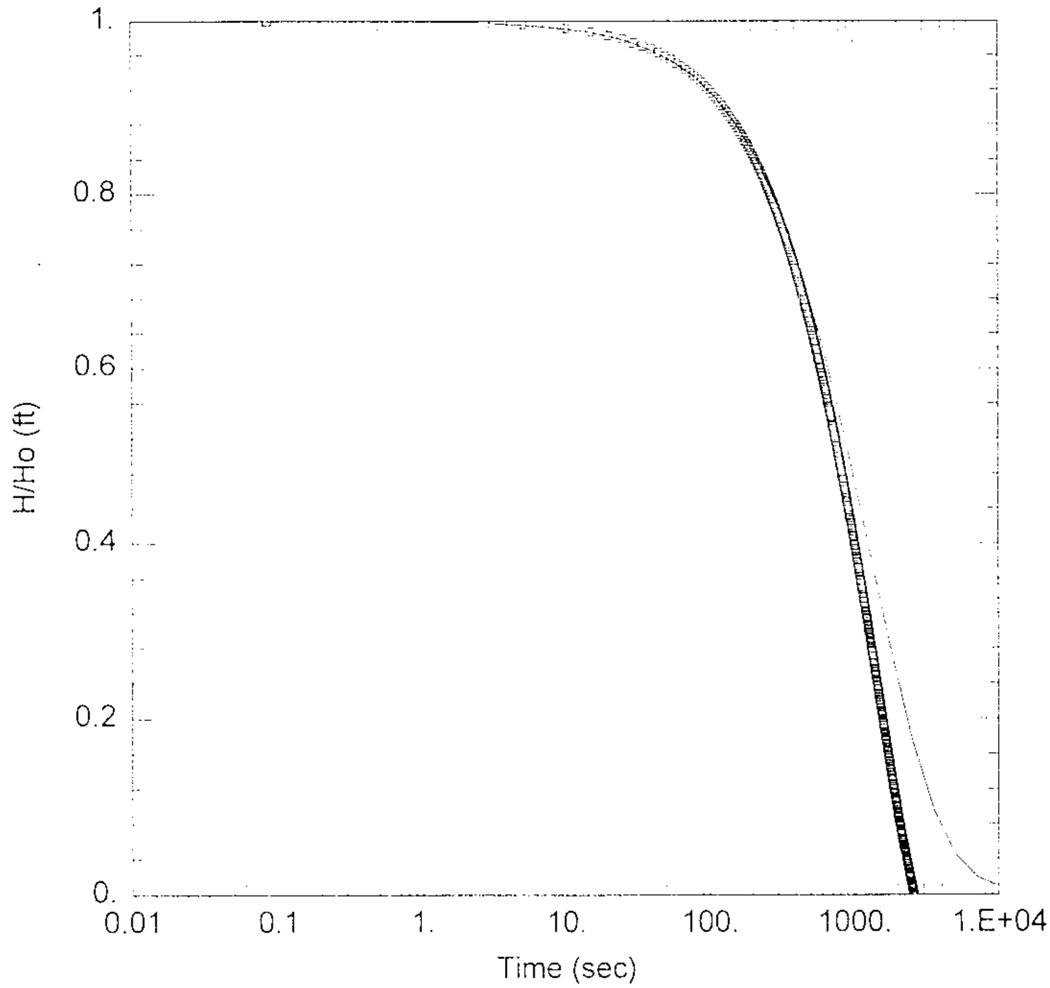
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 28.23 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.1615 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined T = 11.46 ft^2/day
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW221P1.AQT
Date: 03/07/97 Time: 13:48:30

AQUIFER DATA

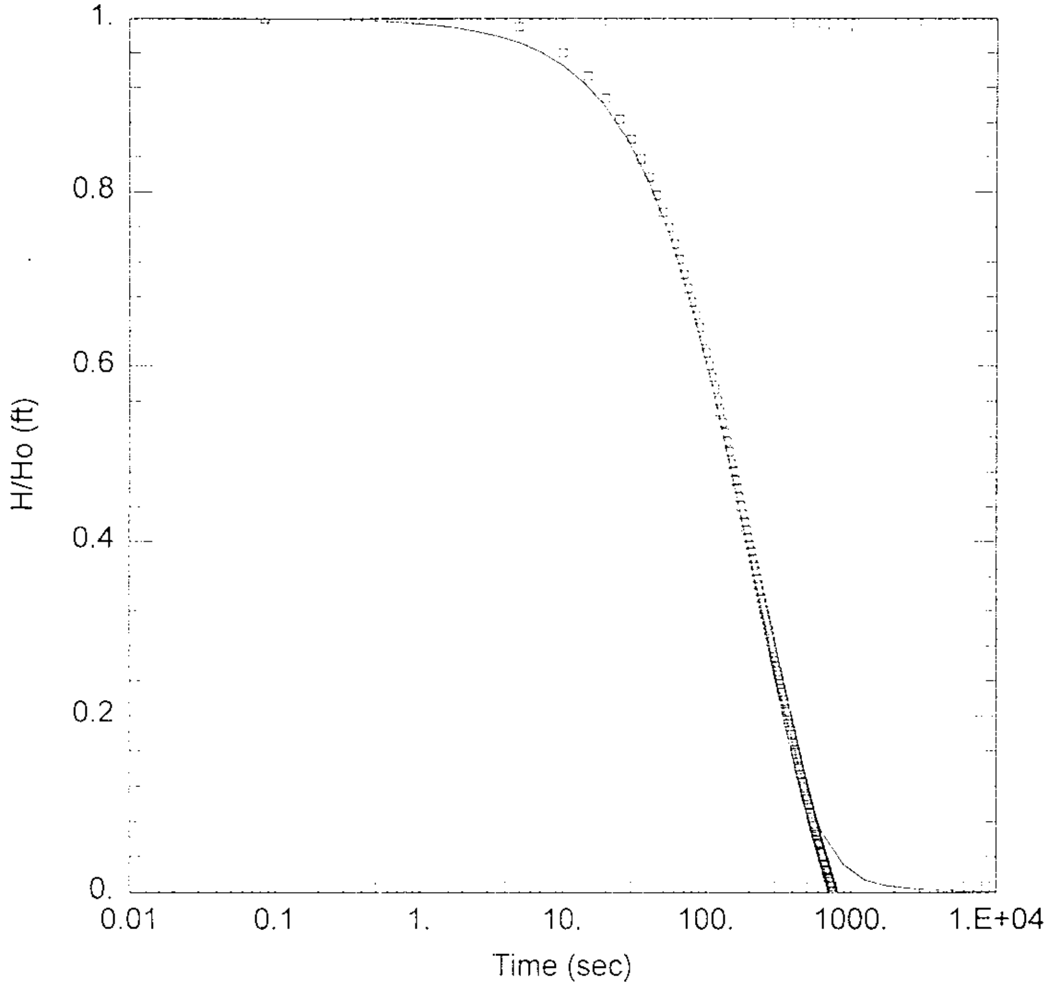
Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 38.42 ft Water Column Height: 43.78 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43.78 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined T = 10.63 ft^2/day
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW221P2.AQT
Date: 03/07/97 Time: 12:55:50

AQUIFER DATA

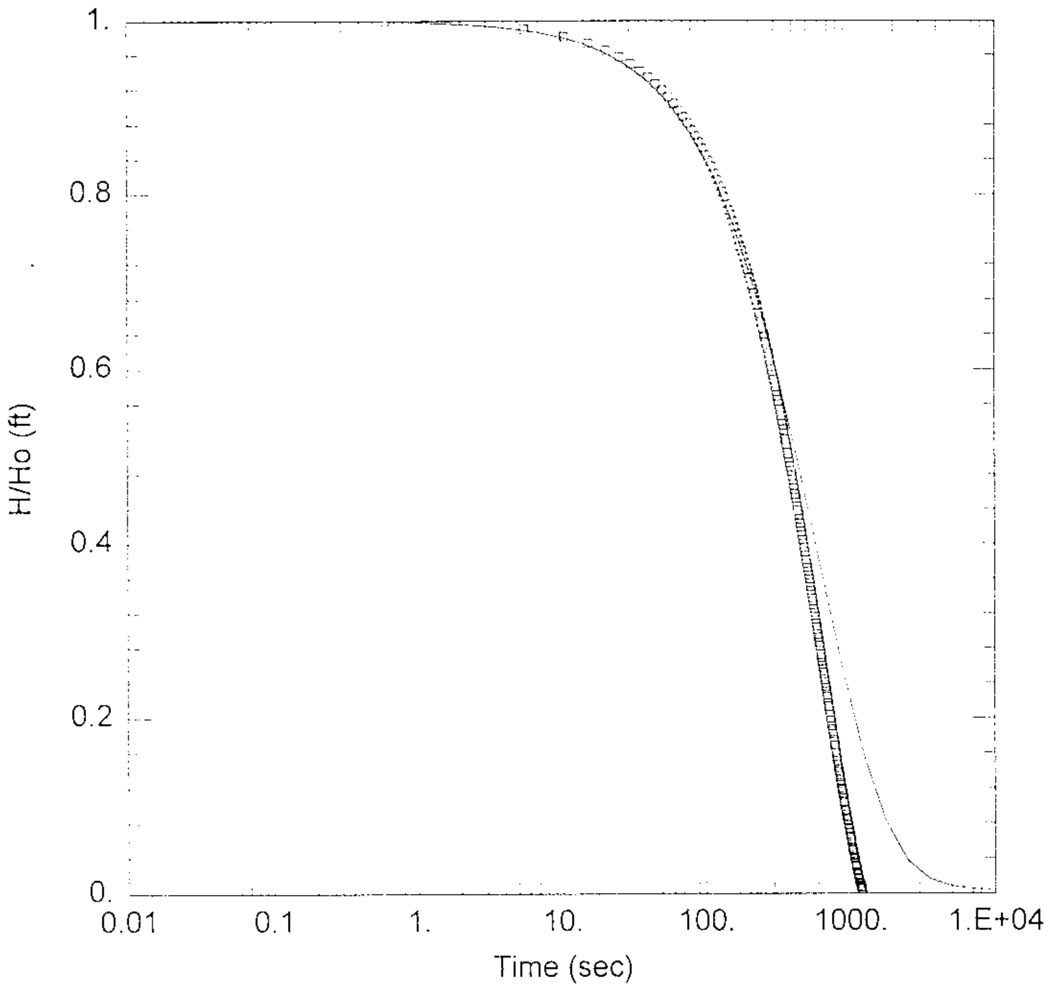
Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 33.44 ft Water Column Height: 43.78 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43.78 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined $T = 69.82\ ft^2/day$
Solution Method: Cooper-Bredehoeft-Papadopulos $S = 1.E-10$



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW221P3.AQT
Date: 03/07/97 Time: 13:47:13

AQUIFER DATA

Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

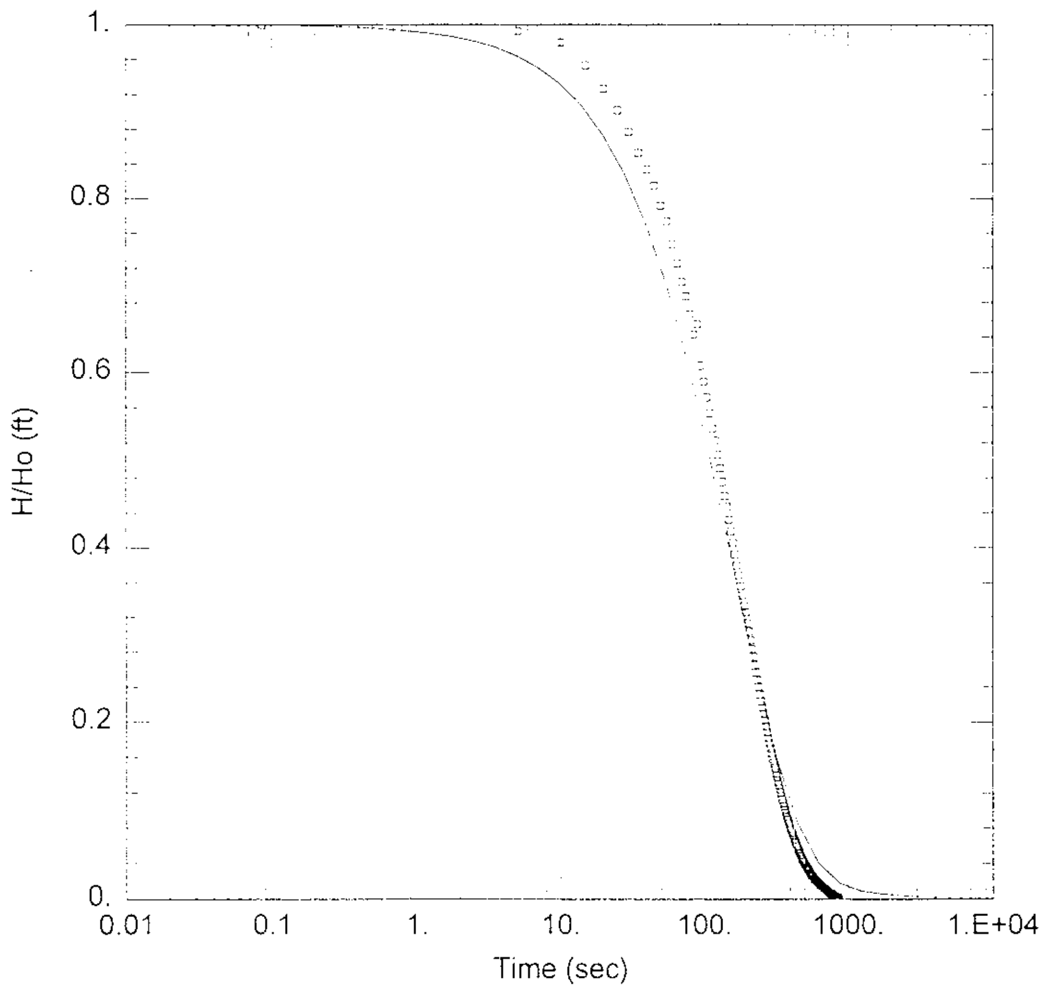
Initial Displacement: 39.84 ft
Casing Radius: 0.167 ft
Screen Length: 43.78 ft

Water Column Height: 43.78 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 23.04 ft^2/day
S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW222P1.AQT
Date: 03/07/97 Time: 17:19:07

AQUIFER DATA

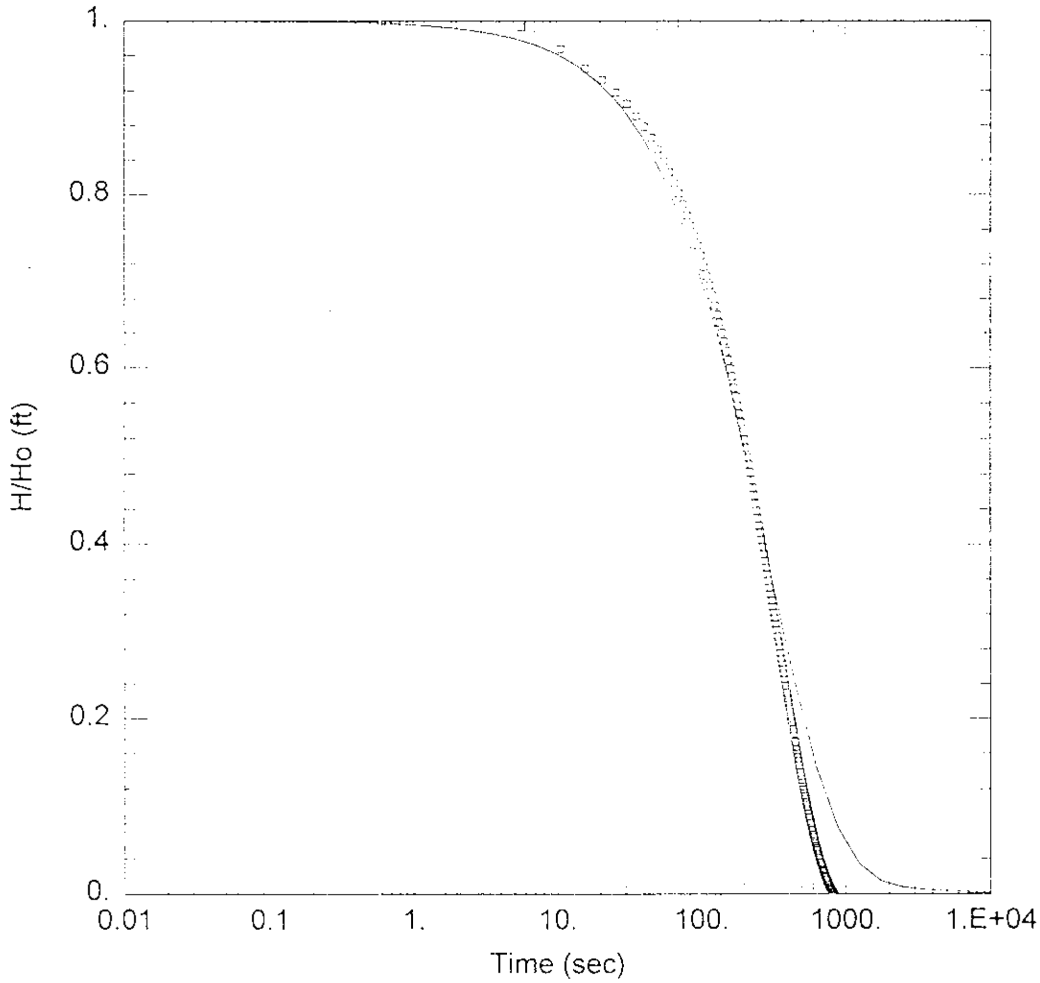
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 26.87 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined T = 89.21 ft^2/day
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW222P2.AQT
Date: 03/07/97 Time: 17:21:58

AQUIFER DATA

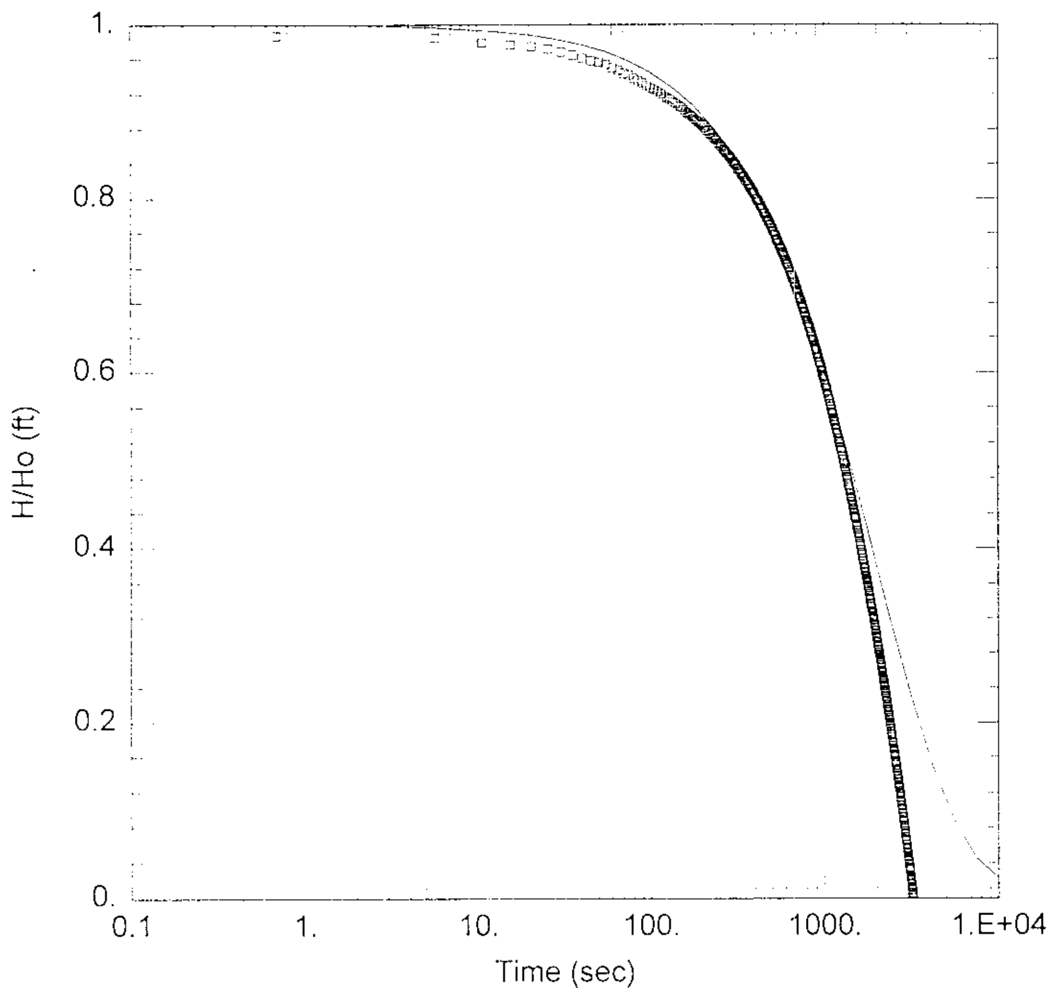
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 29.26 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined T = 47.98 ft^2/day
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW222P3.AQT
Date: 03/07/97 Time: 13:46:22

AQUIFER DATA

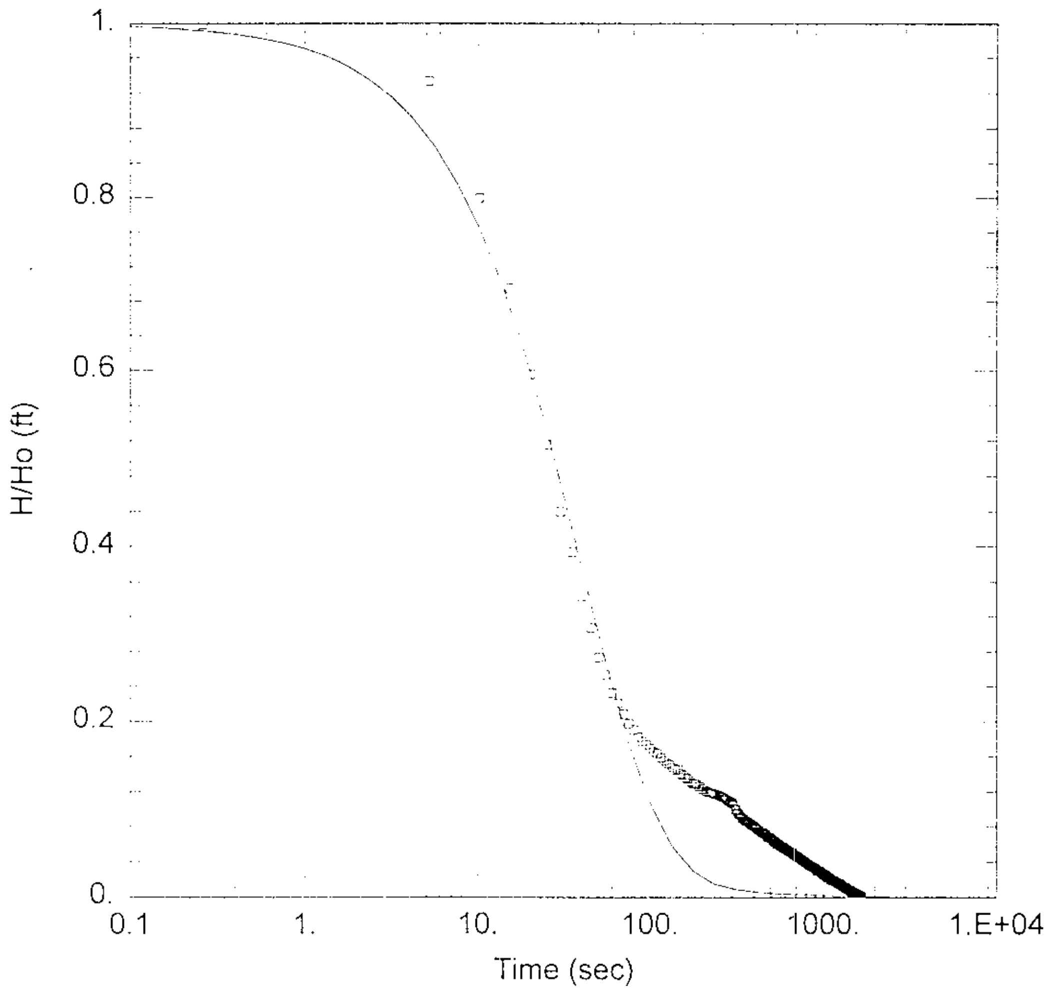
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 12. ft
Casing Radius: 0.167 ft
Screen Length: 41.3 ft
Water Column Height: 41.3 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos
T = 7.094 ft^2/day
S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW223P1.AQT
Date: 03/07/97 Time: 13:12:31

AQUIFER DATA

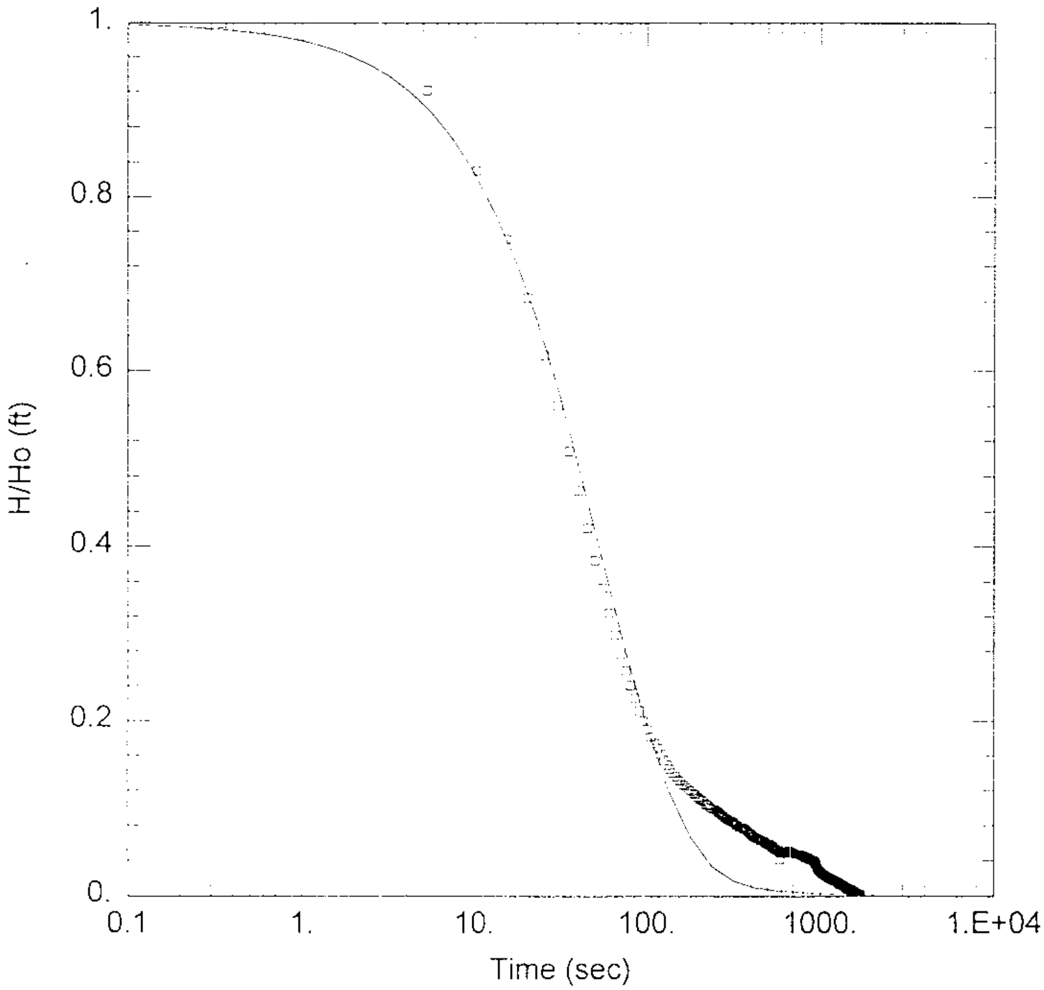
Saturated Thickness: 43. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 14.48 ft Water Column Height: 43. ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43. ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined T = 358.9 ft^2/day
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW223P2.AQT
Date: 03/07/97 Time: 13:19:01

AQUIFER DATA

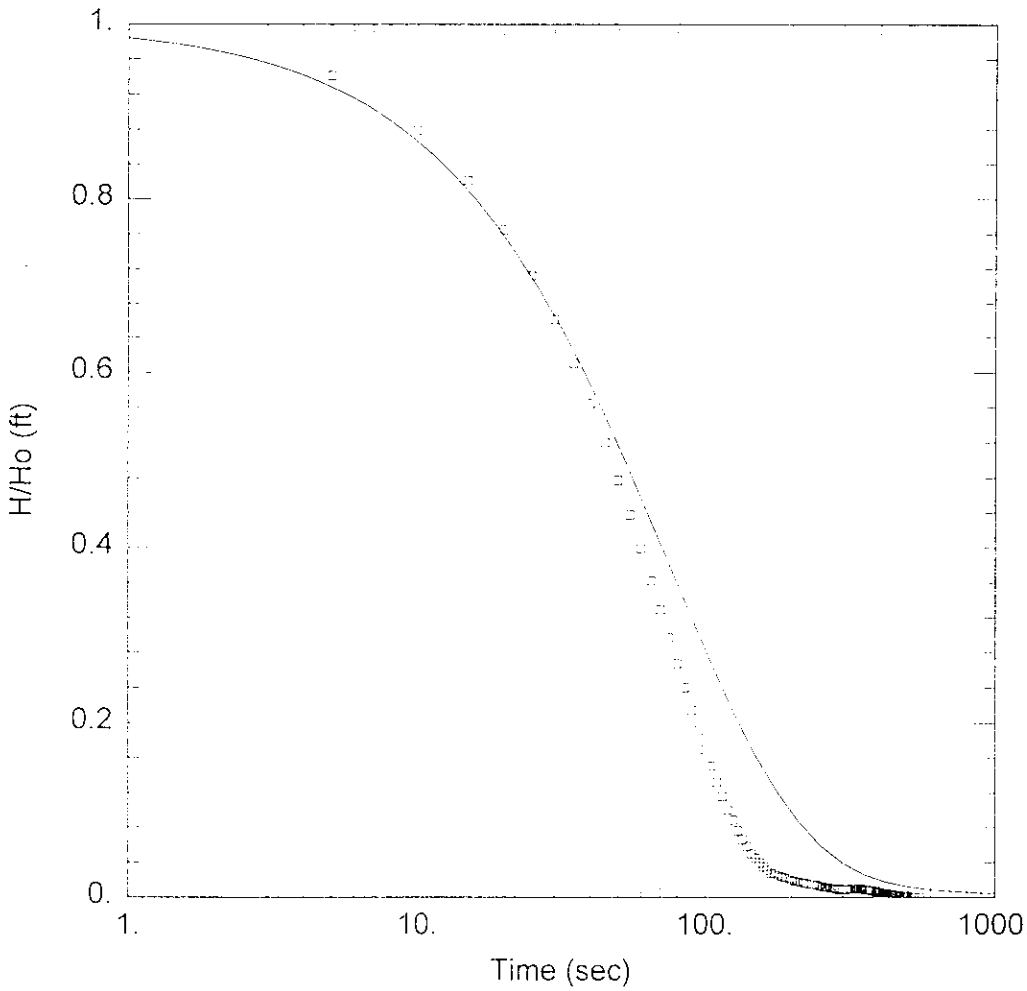
Saturated Thickness: 43. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 21.45 ft Water Column Height: 43. ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43. ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined T = 253.7 ft^2/day
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW223P3.AQT
Date: 03/07/97 Time: 13:17:18

AQUIFER DATA

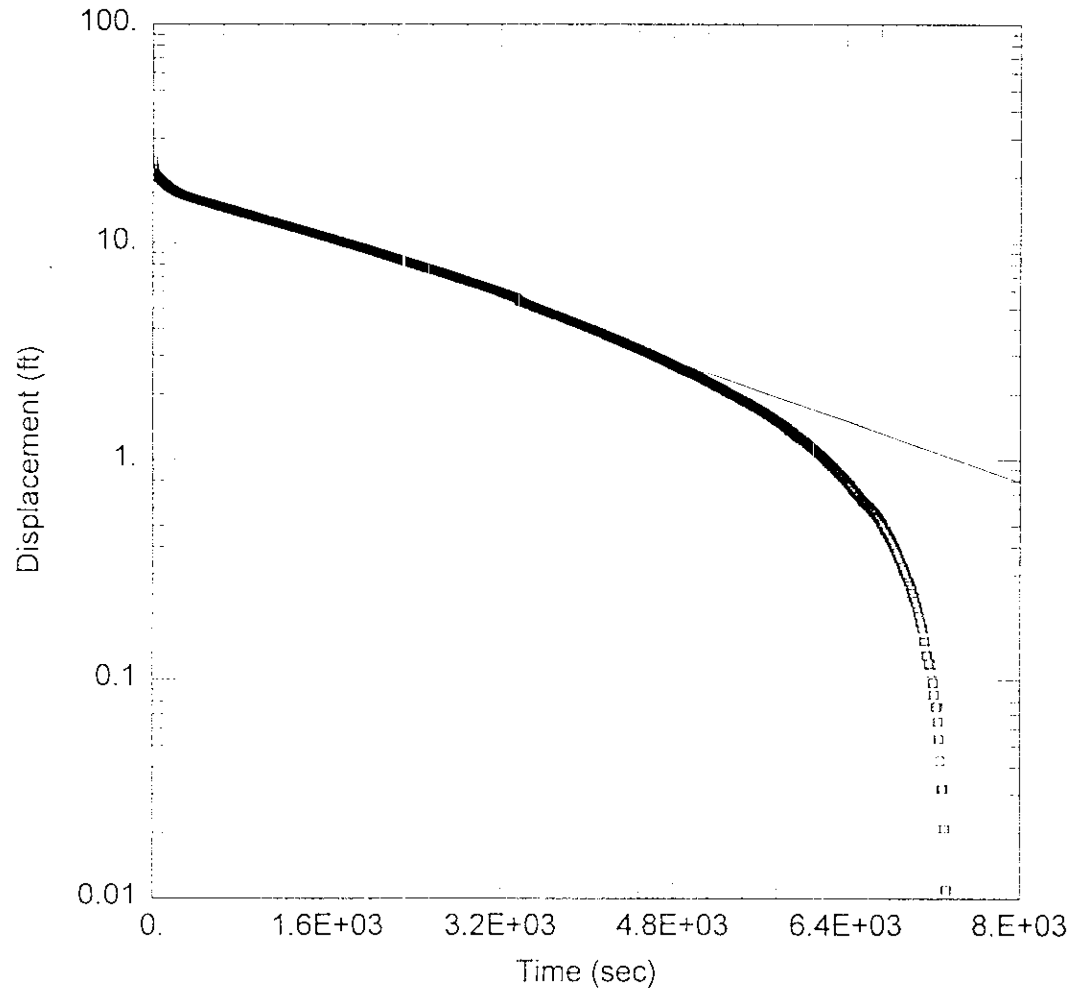
Saturated Thickness: 43. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 25.85 ft
Water Column Height: 43. ft
Casing Radius: 0.167 ft
Wellbore Radius: 0.25 ft
Screen Length: 43. ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
$T = 188.7\ ft^2/day$
Solution Method: Cooper-Bredehoeft-Papadopulos
$S = 1.E-10$



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P1.AQT
Date: 03/11/97 Time: 08:53:01

AQUIFER DATA

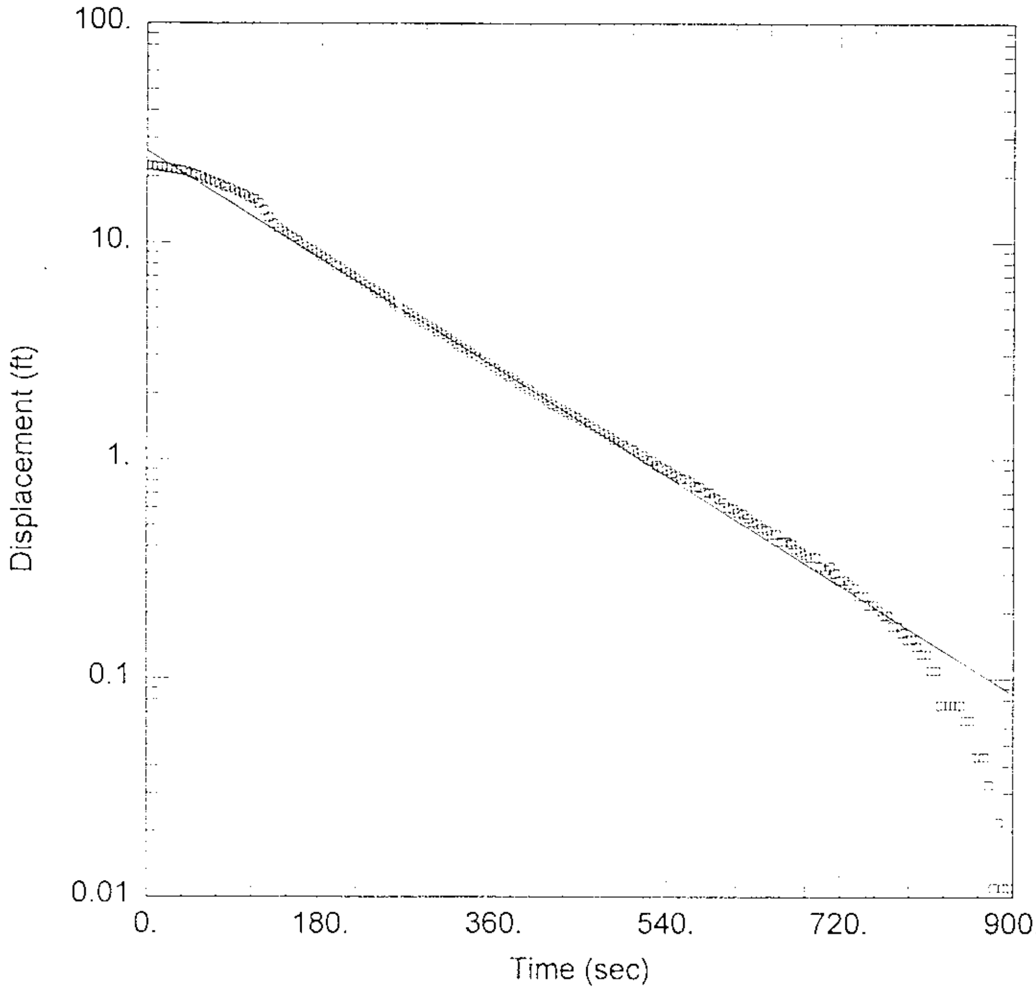
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 23.66 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.1615 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined K = 0.04758 ft/day
Solution Method: Bouwer-Rice y0 = 19.51 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P2.AQT
Date: 03/11/97 Time: 09:01:02

AQUIFER DATA

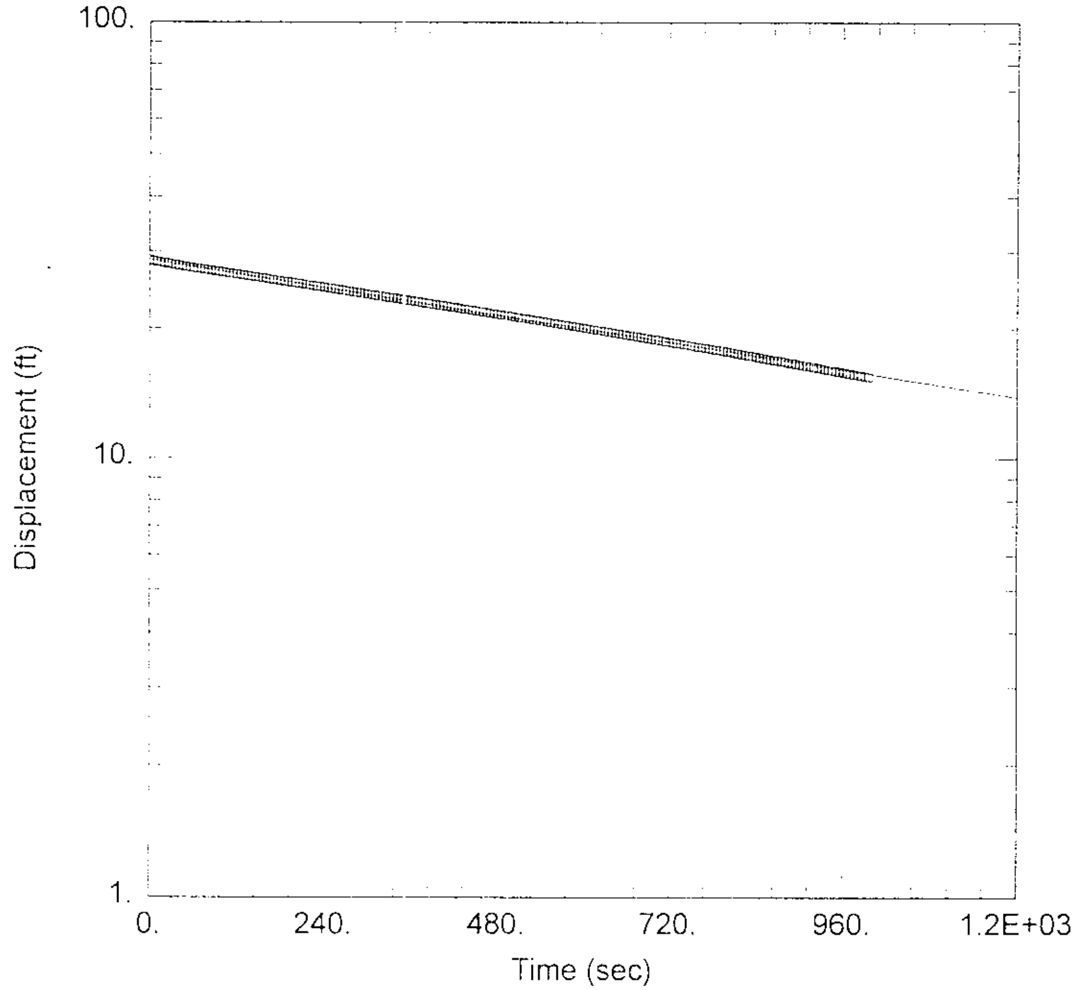
Saturated Thickness: 41.3 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 22.37 ft
Casing Radius: 0.167 ft
Screen Length: 41.3 ft
Water Column Height: 41.3 ft
Wellbore Radius: 0.1615 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.7573 ft/day
y0 = 26.18 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P3.AQT
Date: 03/11/97 Time: 09:01:58

AQUIFER DATA

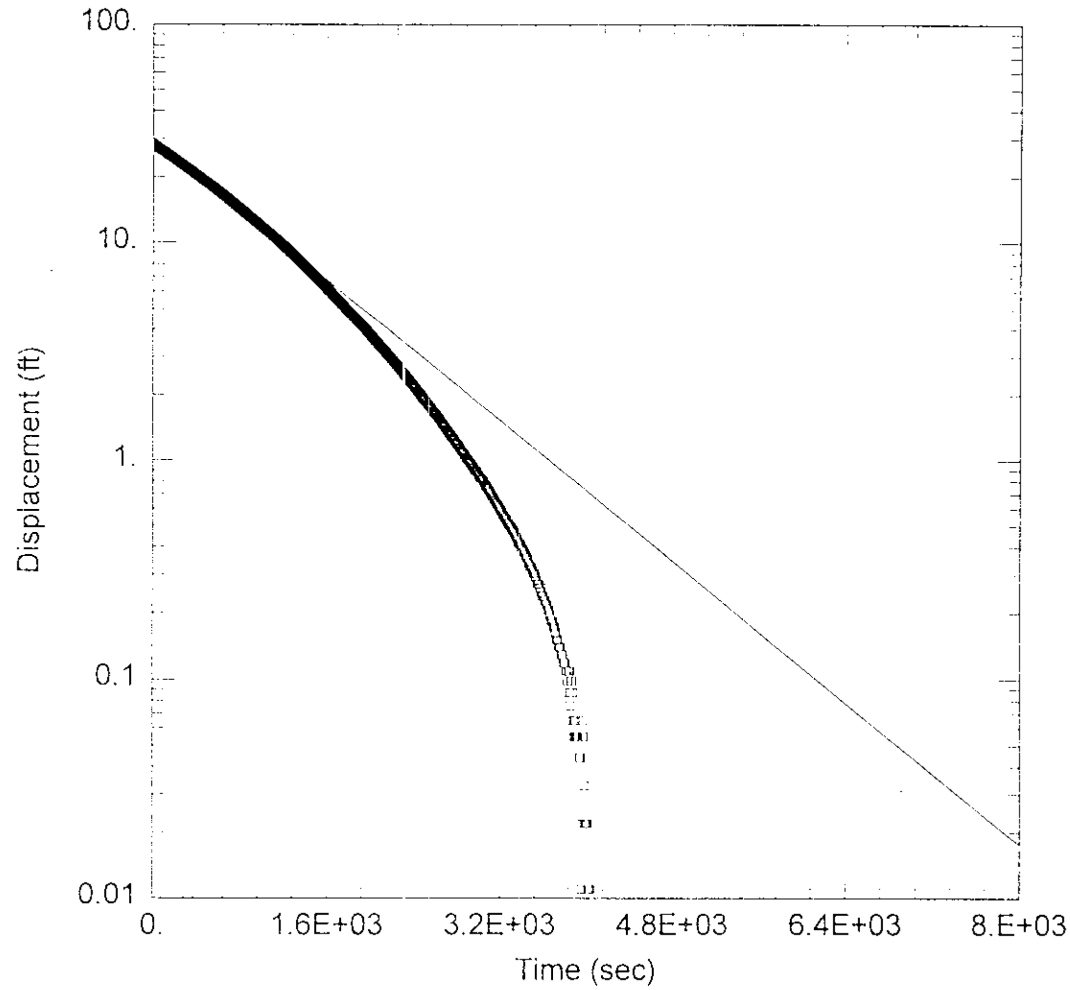
Saturated Thickness: 41.3 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 28.65 ft
Casing Radius: 0.167 ft
Screen Length: 41.3 ft
Water Column Height: 41.3 ft
Wellbore Radius: 0.1615 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.07234 ft/day
y0 = 28.76 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW220P4.AQT
Date: 03/11/97 Time: 09:05:48

AQUIFER DATA

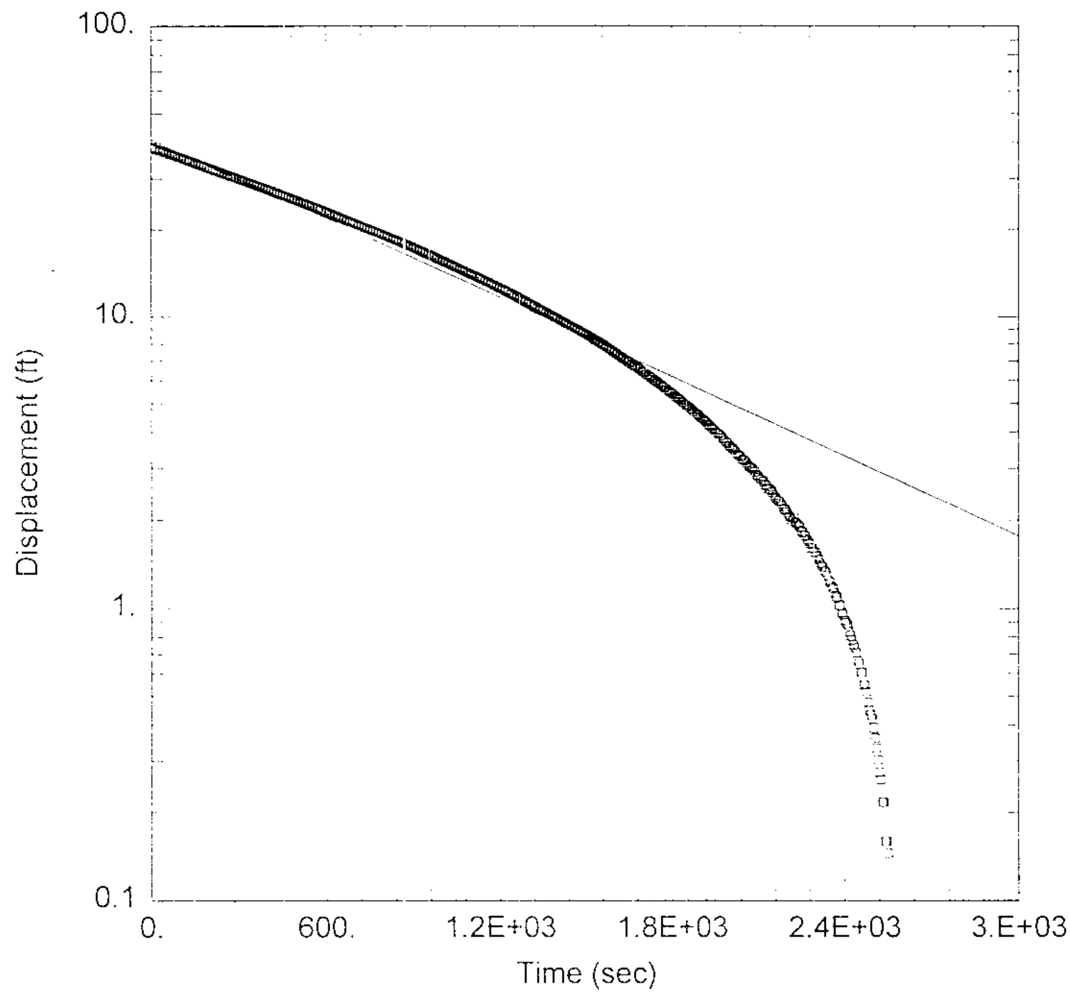
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 28.23 ft
Casing Radius: 0.167 ft
Screen Length: 41.3 ft
Water Column Height: 41.3 ft
Wellbore Radius: 0.1615 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.1105 ft/day
y0 = 29.9 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW221P1.AQT
Date: 03/07/97 Time: 10:16:21

AQUIFER DATA

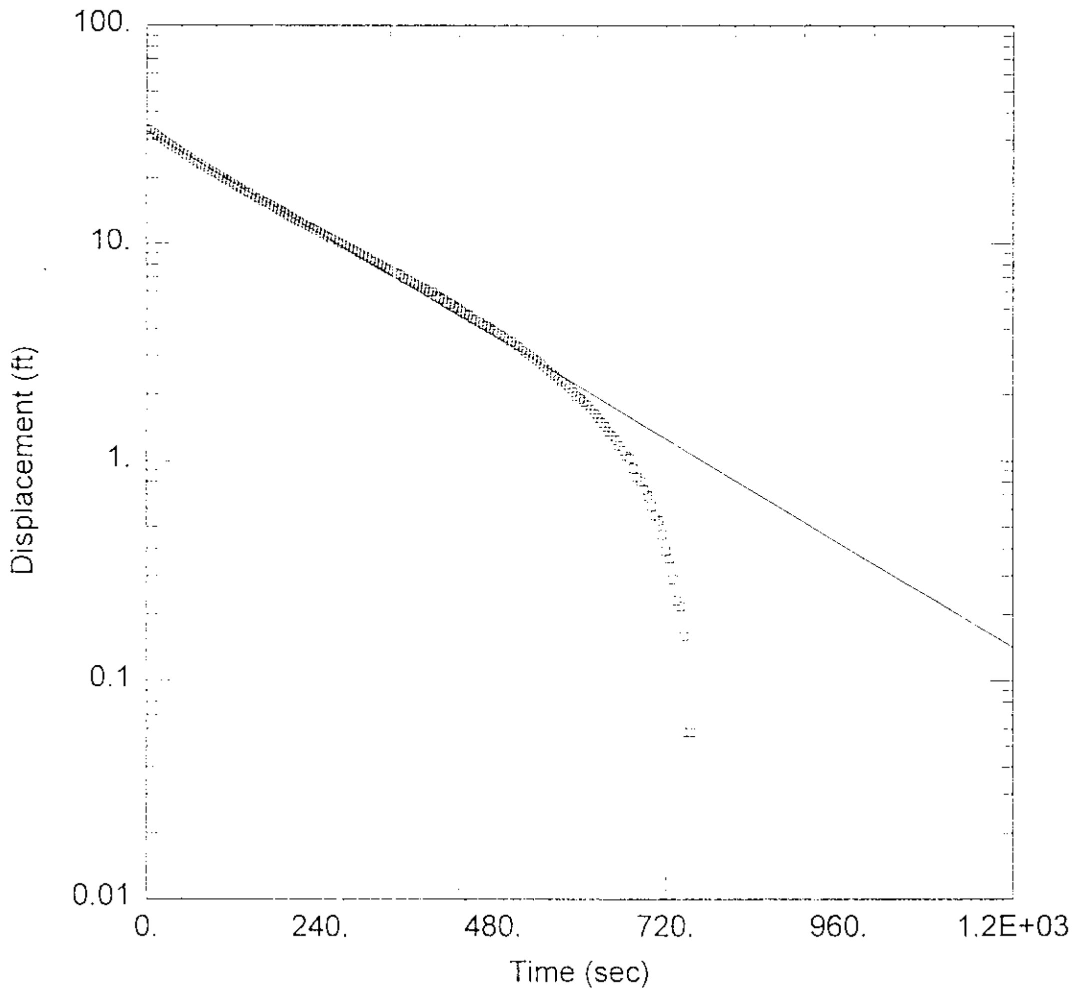
Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 38.42 ft
Casing Radius: 0.167 ft
Screen Length: 43.78 ft
Water Column Height: 43.78 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.259 ft/day
y0 = 40.9 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW221P2.AQT
Date: 03/07/97 Time: 10:18:09

AQUIFER DATA

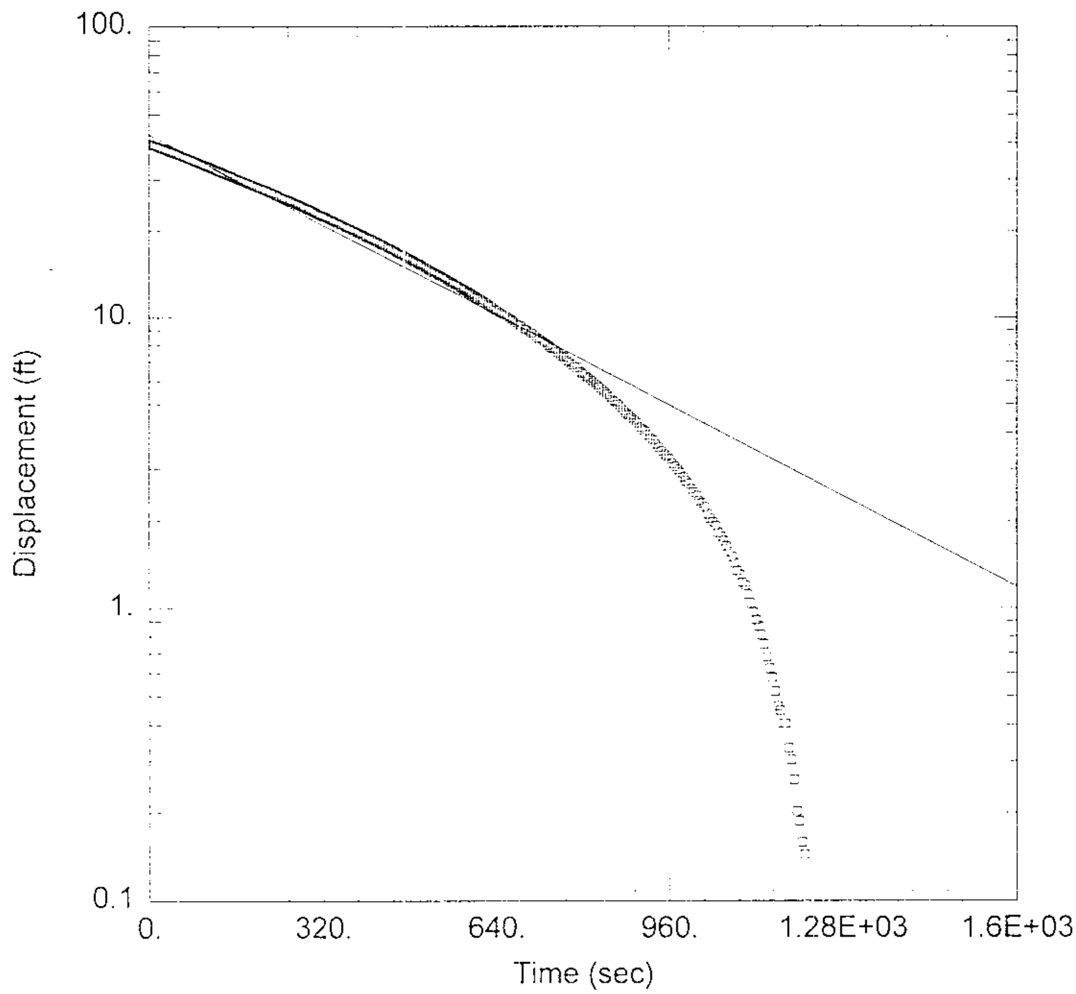
Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 33.44 ft Water Column Height: 43.78 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43.78 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined K = 1.122 ft/day
Solution Method: Bouwer-Rice y0 = 32.94 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW221P3.AQT
Date: 03/07/97 Time: 10:20:44

AQUIFER DATA

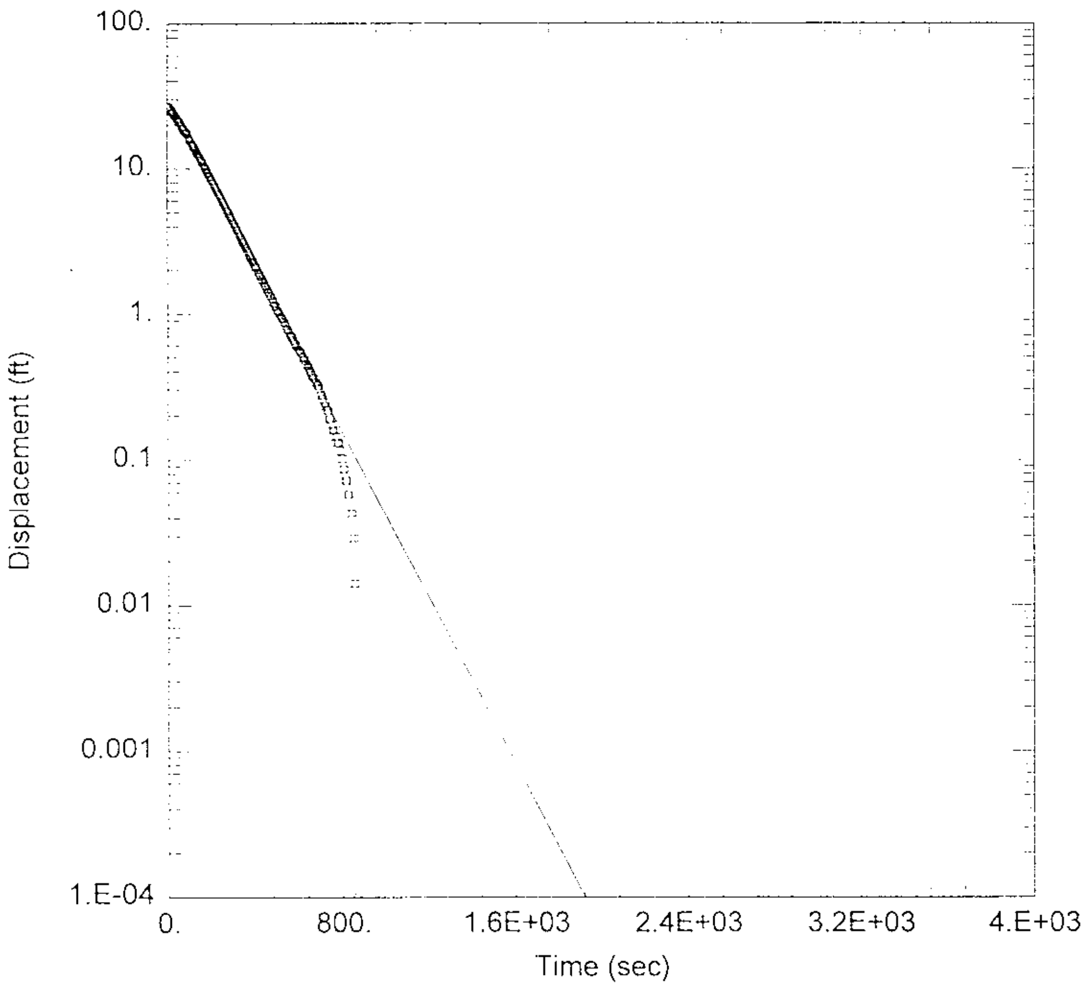
Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 39.84 ft Water Column Height: 43.78 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43.78 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined K = 0.5547 ft/day
Solution Method: Bouwer-Rice y0 = 42.87 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW222P1.AQT
Date: 03/07/97 Time: 17:19:57

AQUIFER DATA

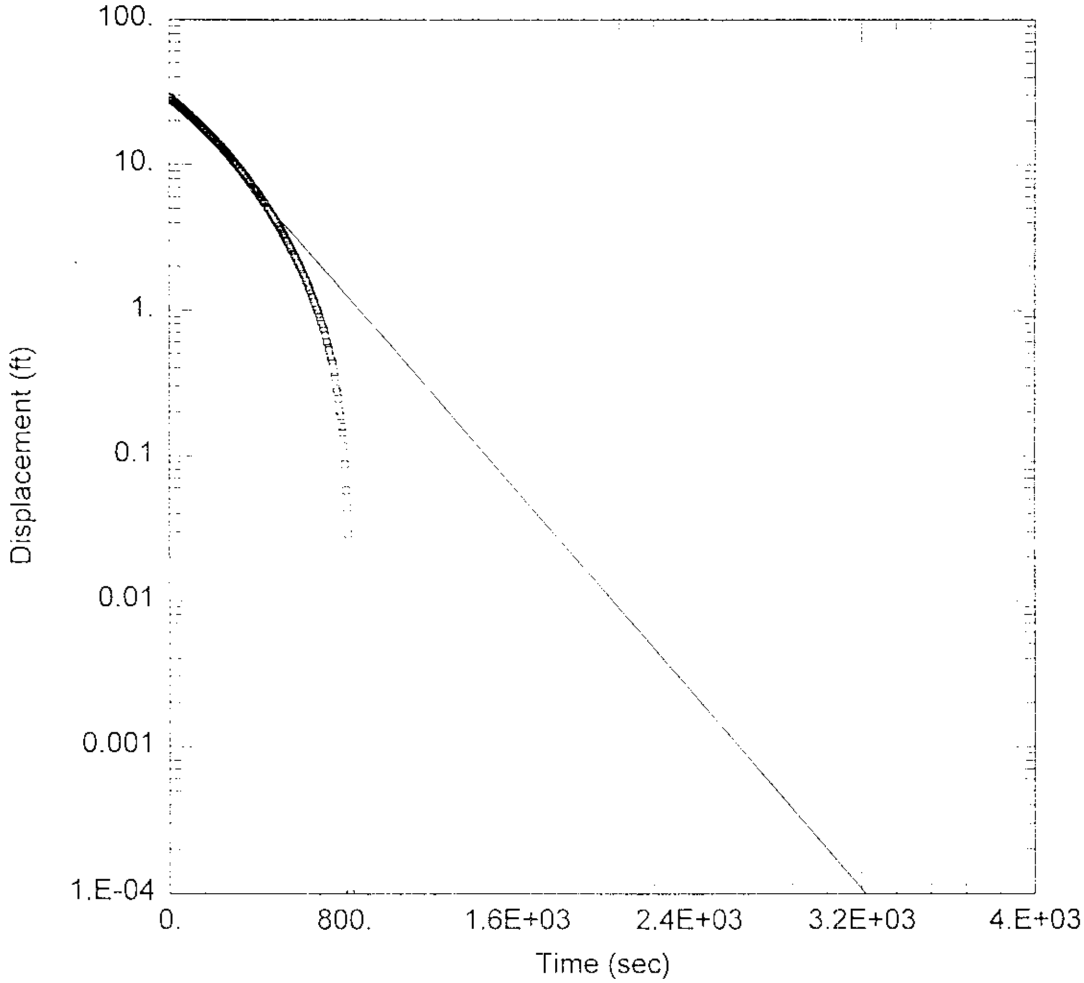
Saturated Thickness: 41.3 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 26.87 ft
Casing Radius: 0.167 ft
Screen Length: 41.3 ft
Water Column Height: 41.3 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.696 ft/day
y0 = 29.1 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW222P2.AQT
Date: 03/07/97 Time: 17:24:41

AQUIFER DATA

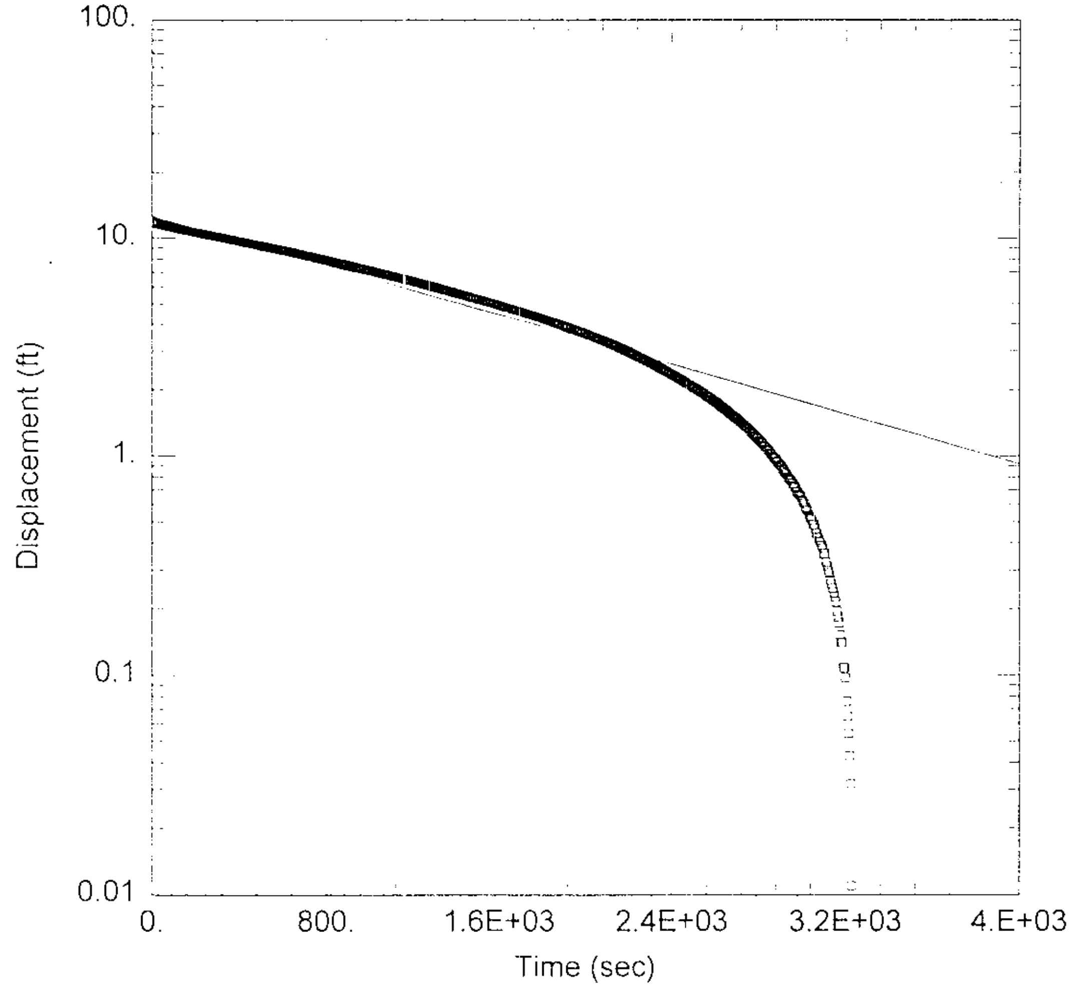
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 29.26 ft Water Column Height: 41.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 41.3 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined K = 1.017 ft/day
Solution Method: Bouwer-Rice y0 = 31.12 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW222P3.AQT
Date: 03/06/97 Time: 16:12:32

AQUIFER DATA

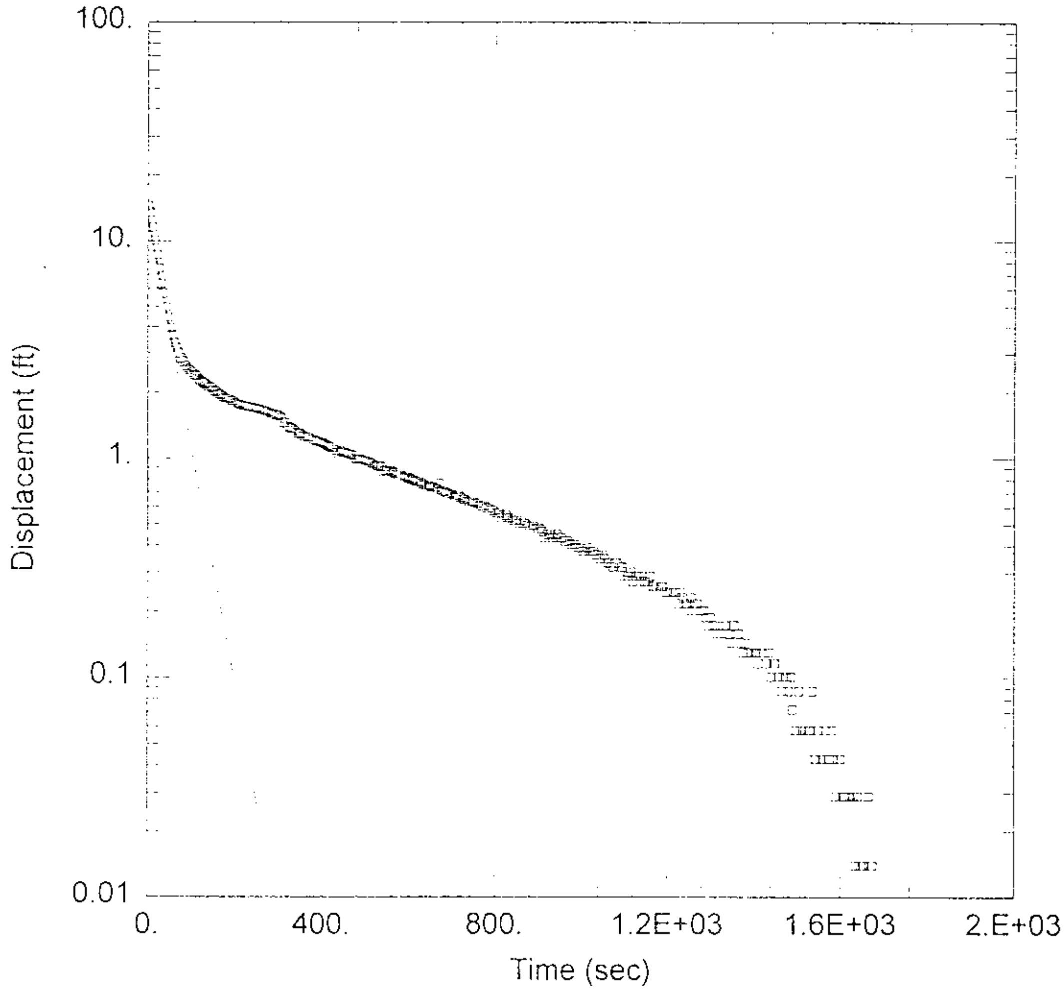
Saturated Thickness: 41.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 12. ft
Casing Radius: 0.167 ft
Screen Length: 41.3 ft
Water Column Height: 41.3 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.1699 ft/day
y0 = 12.67 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW223P1.AQT
Date: 03/11/97 Time: 10:12:01

AQUIFER DATA

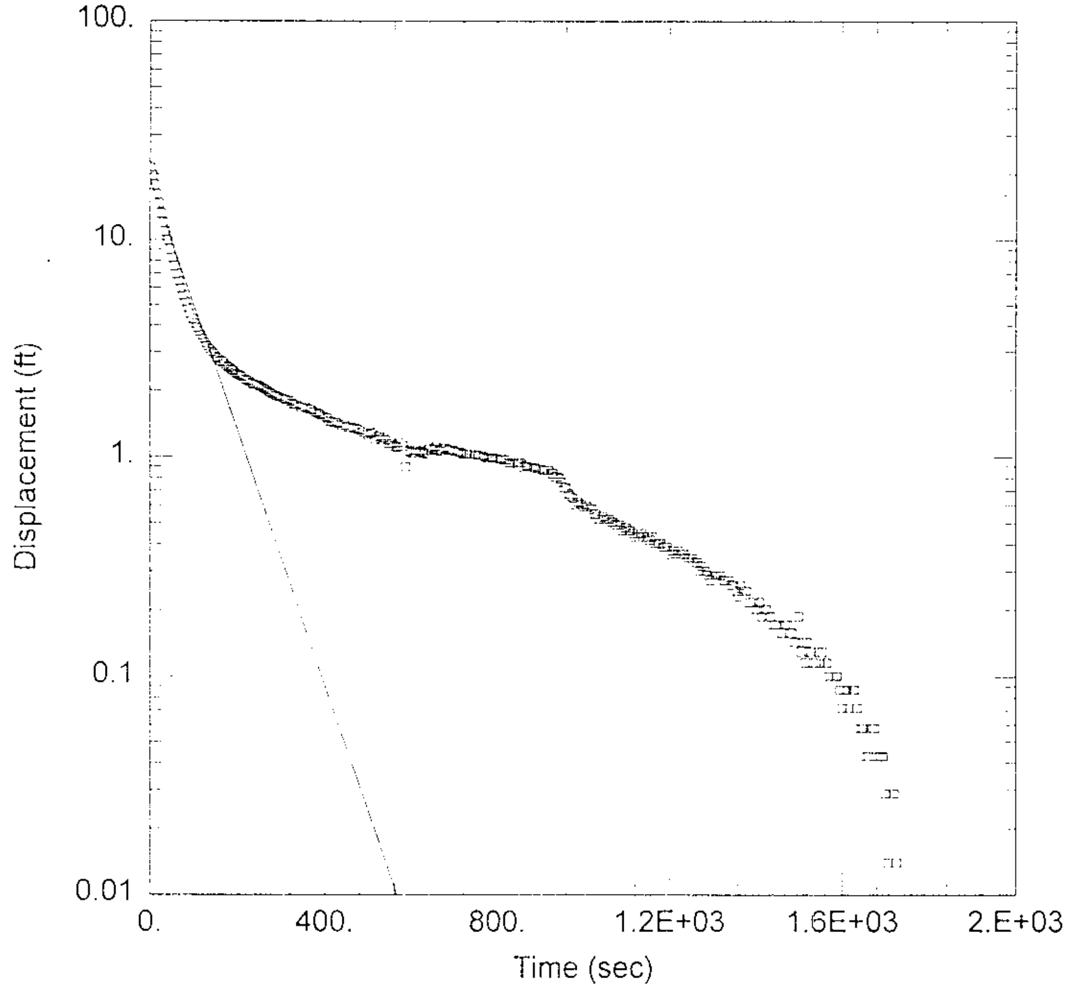
Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 14.48 ft Water Column Height: 43.78 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43.78 ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Unconfined K = 6.093 ft/day
Solution Method: Bouwer-Rice y0 = 12.92 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW223P2.AQT
Date: 03/06/97 Time: 17:09:53

AQUIFER DATA

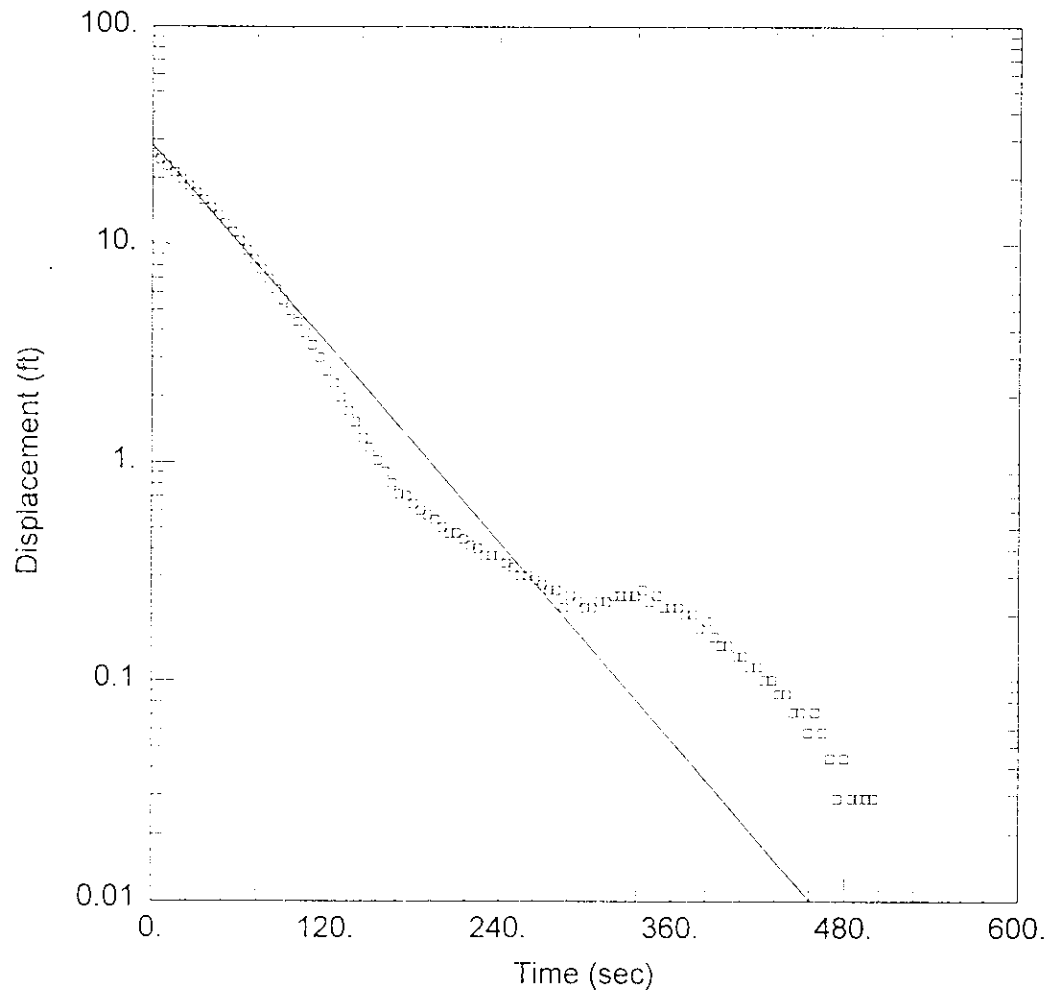
Saturated Thickness: 43. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 21.45 ft Water Column Height: 43. ft
Casing Radius: 0.167 ft Wellbore Radius: 0.25 ft
Screen Length: 43. ft Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined K = 3.343 ft/day
Solution Method: Bouwer-Rice y0 = 18.92 ft



WELL TEST ANALYSIS

Data Set: P:\GE\LOEFFEL\PHASE2\PACKER\OMW223P3.AQT
Date: 03/11/97 Time: 10:30:04

AQUIFER DATA

Saturated Thickness: 43.78 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 25.85 ft
Casing Radius: 0.167 ft
Screen Length: 43.78 ft
Water Column Height: 43.78 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 1.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.311 ft/day
y0 = 28.38 ft

APPENDIX I

APPENDIX I

RESULTS OF BEDROCK WELL DOWNHOLE GEOPHYSICS INVESTIGATIONS

INTRODUCTION

Acoustic Televiewer (ATV) logs were run in wells OMW-221, -222, and -223 to assess the subsurface geology, particularly the attitude of bedding and fractures in the vicinity of the Loeffel landfill (Figure 1). This memo describes the instrumentation and methods used and presents the data and interpretations.

ACOUSTIC TELEVIEWER DESCRIPTION

The ATV is an ultrasonic tool that employs a ceramic transducer which emits a burst of acoustic energy while being rotated about a vertical axis of the downhole probe. The transducer serves as both a transmitter and a receiver of acoustic energy, with a predominant frequency of about 1.3 megahertz. The rotating transducer emits pulses of energy directed toward the borehole at three revolutions per second at a rate of 1600 pulses per second. The high frequency energy reflected by the borehole wall is received by the transducer and processed by the associated electronics for transmission to the surface. A fluxgate magnetometer within the probe fires a triggering pulse each time the transducer passes magnetic north. The ATV signal is recorded to videotape. The resulting image is essentially an oriented sonar image of the borehole wall.

WELL LOGGING PROCEDURES

Wells OMW-221, -222, and -223 were logged on December 12, 1996 by personnel from COLOG supervised by a HSI GeoTrans geologist. The holes were logged with the ATV tool in the ascending mode. Data were reviewed on a monitor during the logging process to ensure that reasonable information was being collected. Logs were later printed out and turned over to the HSI GeoTrans geologist.

DATA PRESENTATION AND ANALYSIS

Data from the ATV logging were printed out as strip logs that represent the borehole cylinder "unwrapped."

The ATV log has two axes, the vertical axis represents depth and the horizontal axis represents orientation relative to north (Figure 2). The left and right sides are north, the middle is south, and 1/4 and 3/4 across are east and west, respectively. Planar features that

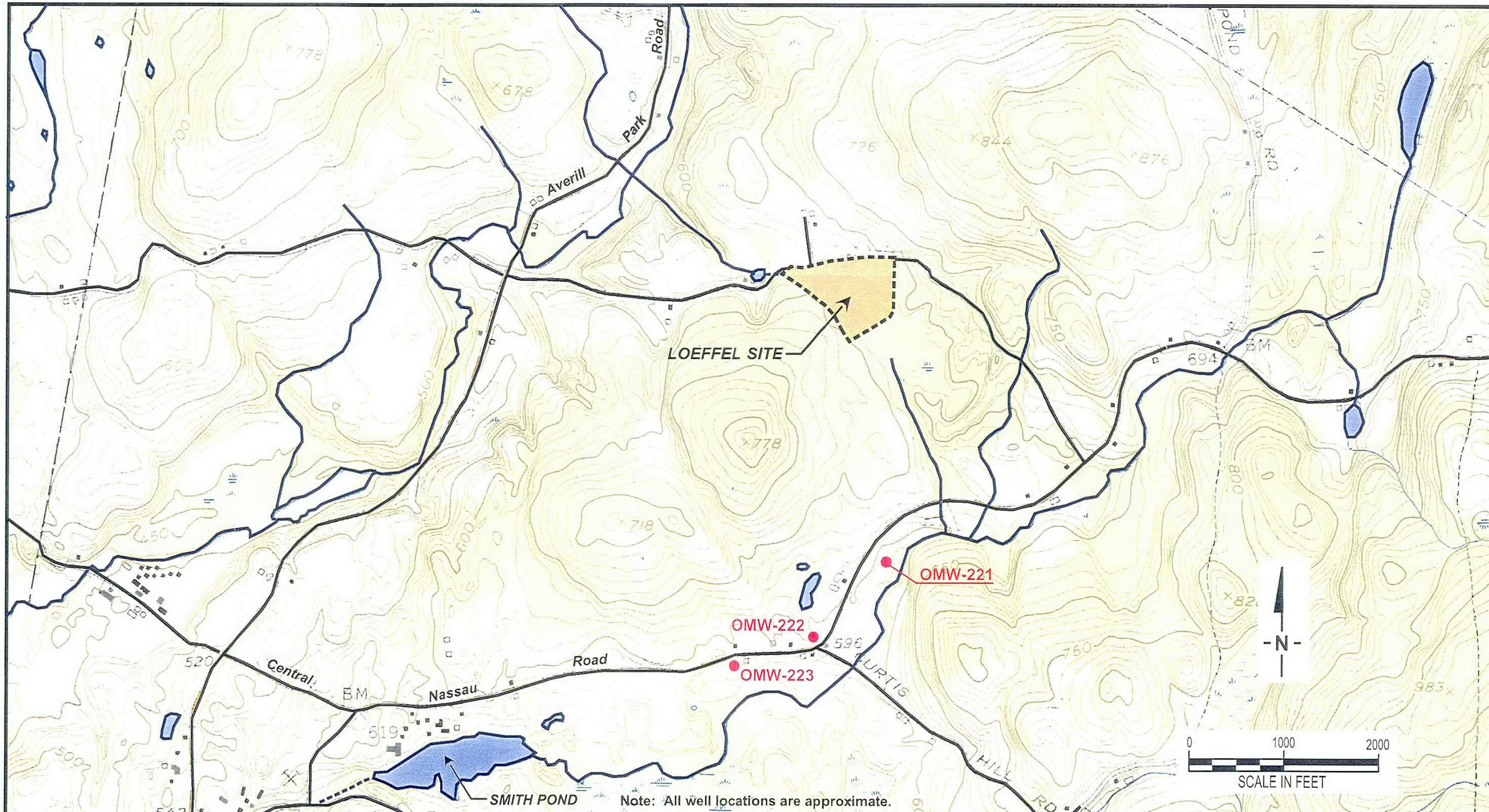


Figure 1. Location of wells logged using the Acoustic Televiewer (ATV).

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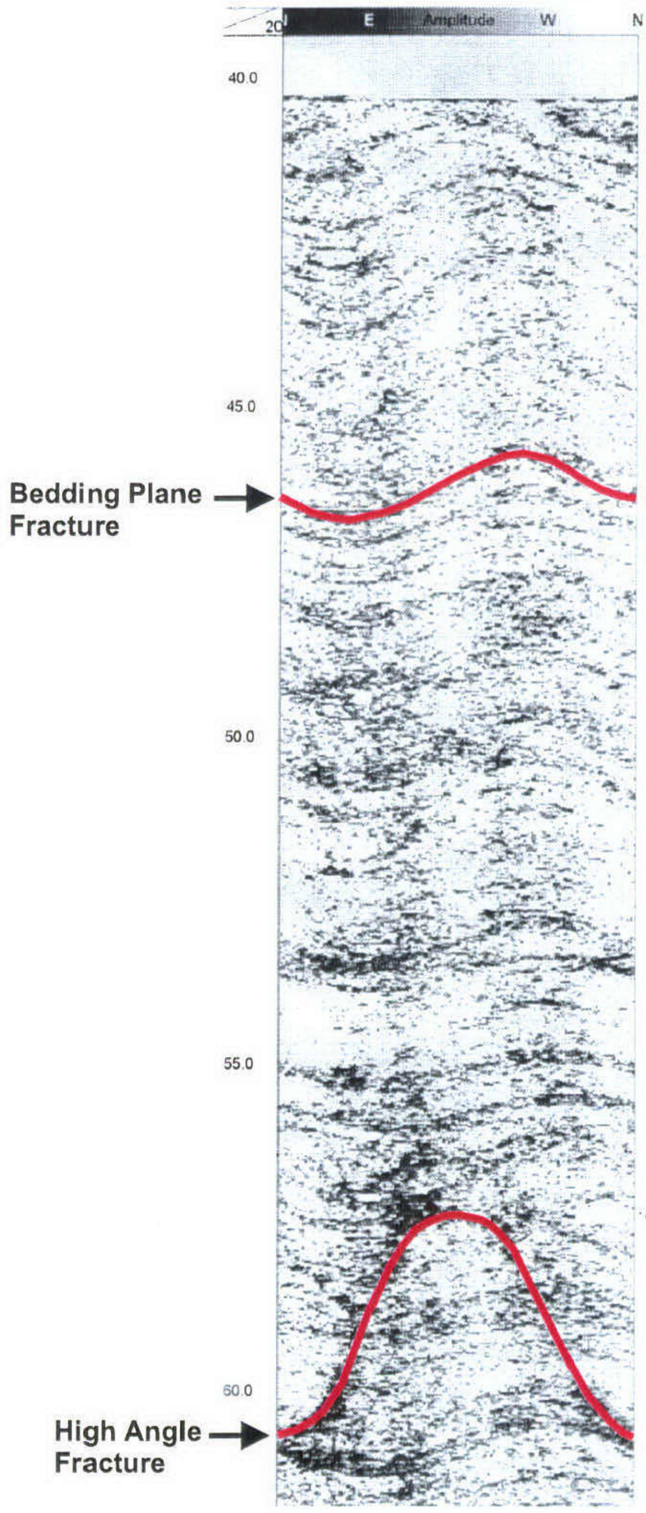
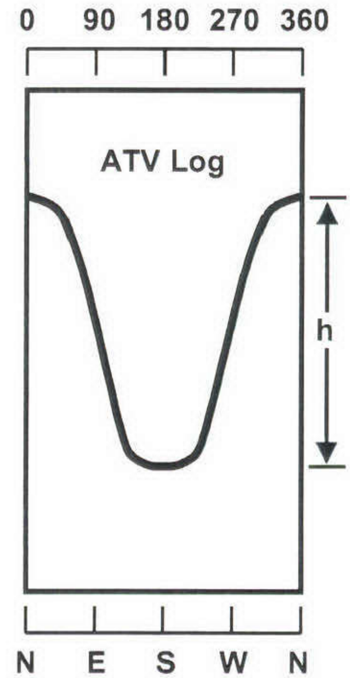
N039023C.DSF

OMW-222





Dip Direction = Orientation of Sinusoid Minimum
Dip Angle = ArcTan h/d
where: h = height of sunusoid
d = borehole diameter

Figure 2. Example acoustic televiewer log (ATV) from OMW-222(40-63 ft bgs).

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N039042A.DSF

intersect the borehole appear to be sinusoids on the unwrapped image. To calculate the dip direction and dip angle of a fracture a measure of the amplitude of the sinusoid is needed (h), the direction of dip from the ATV log, and the diameter (d) of the borehole. The angle of dip is equal to the arc tangent of h/d and the dip direction is picked at the trough of the sinusoid.

COLOG was contracted to create fracture tables from the ATV logs. An interval was selected for inclusion in the tables to evaluate the monitored zone of the well, or a representative interval of the rock penetrated by the borehole (Table 1). The fracture tables list fractures by depth, dip direction (apparent and corrected for magnetic declination), dip angle, and rank (see Table 2).

Statistics from the fracture tables were used to generate figures illustrating the distribution and attitudes of fractures in the selected intervals of the boreholes. Tadpole plots show the azimuth of the dip direction (tail of the arrow) and the dip angle inclined from the horizontal plotted against the depth of the fractures (Figure 3). The fracture point diagrams show distribution of dip angle and direction plotted as a compass bearing (Figure 4). Note that to determine the strike of fracturing, 90° is subtracted from the dip direction.

OMW-221

Analysis of the data plots shows that most of the dip directions fall in the southeast compass quadrant with most dip angles between 20° and 50°, averaging 45°. For the intervals selected, average dip direction results in a fracture strike of N60°E (Figure 3). The deeper interval shows a slight trend towards shallower dip angles (Figure 4).

OMW-222

Dip directions in OMW-222 average 120°, and dip angles between 30° and 65°, averaging 57°. Bedding fractures dip steeper and in a more easterly direction than at OMW-222. Calculated average fracture strike is N30° E.

Table 1. Selected Intervals for Fracture Tables.

Well ID	Selected Depth Intervals for Fracture Tables (ft)
OMW-221	92-142, 170-175
OMW-222	45-55, 70-80, 115-125, 160-180, 195-200
OMW-223	70-90, 130-150

Table 2. Fracture Dip Direction, Angle, and Rank Versus Depth for DMW-221, 222, and 223.

Fracture No.	Depth (feet)	Elevation (ft msl)	Dip Direction (degrees)	True Dip Direction (degrees)	Dip Angle (degrees)	Feature Rank (0-5)
OMW-221						
1	93.1	498.9	154	140	39	1
2	93.9	498.1	170	156	73	1
3	94.1	497.9	124	110	52	1
4	94.9	497.1	117	103	85	1
5	95.5	496.5	129	115	59	2
6	98.3	493.7	156	142	62	3
7	98.7	493.3	127	113	46	1
8	99.3	492.7	122	108	66	1
9	99.8	492.2	121	107	50	3
10	100	492	124	110	52	2
11	100.5	491.5	134	120	30	1
12	100.9	491.1	130	116	69	2
13	102	490	119	105	40	2
14	102.4	489.6	110	96	65	1
15	103.1	488.9	130	116	64	1
16	104	488	130	116	70	1
17	104.9	487.1	133	119	66	2
18	105.9	486.1	104	90	42	1
19	106.5	485.5	102	88	60	1
20	107.1	484.9	90	76	70	3
21	108.6	483.4	23	9	61	1
22	108.6	483.4	151	137	46	2
23	109.3	482.7	129	115	58	1
24	109.9	482.1	160	146	57	1
25	110.5	481.5	0	346	0	1
26	111.5	480.5	145	131	14	1
27	112.6	479.4	17	3	52	1
28	113.5	478.5	161	147	39	1
29	114.1	477.9	137	123	45	2
30	114.5	477.5	115	101	62	1
31	115.6	476.4	168	154	60	2
32	116.9	475.1	156	142	49	1
33	117	475	188	174	59	1
34	118.7	473.3	180	166	27	4
35	119.4	472.6	172	158	43	2
36	119.9	472.1	168	154	46	2
37	120.4	471.6	187	173	28	1
38	121.2	470.8	169	155	39	2

Table 2. Fracture Dip Direction, Angle, and Rank Versus Depth for DMW-221, 222, and 223 (continued).

Fracture No.	Depth (feet)	Elevation (ft msl)	Dip Direction (degrees)	True Dip Direction (degrees)	Dip Angle (degrees)	Feature Rank (0-5)
39	121.5	470.5	168	154	43	3
OMW-221 (continued)						
40	122.3	469.7	200	186	23	1
41	122.7	469.3	208	194	31	2
42	123.5	468.5	178	164	37	2
43	124.1	467.9	178	164	46	2
44	124.9	467.1	168	154	40	3
45	126.3	465.7	0	346	0	1
46	127.2	464.8	156	142	23	1
47	127.9	464.1	184	170	64	1
48	129.2	462.8	181	167	32	1
49	129.6	462.4	169	155	68	1
50	130.4	461.6	180	166	64	1
51	132.2	459.8	178	164	75	1
52	132.4	459.6	173	159	47	4
53	133.1	458.9	155	141	33	1
54	133.7	458.3	181	167	32	1
55	134.3	457.7	202	188	21	2
56	135.7	456.3	225	211	59	1
57	136.3	455.7	183	169	50	1
58	136.6	455.4	0	346	0	1
59	137	455	144	130	52	2
60	137.7	454.3	52	38	33	1
61	138.9	453.1	320	306	20	1
62	139.8	452.2	158	144	55	1
63	140.1	451.9	208	194	33	1
64	140.6	451.4	203	189	56	1
65	141.6	450.4	198	184	50	1
66	142.4	449.6	103	89	41	1
67	170.2	421.8	121	107	30	1
68	171.4	420.6	114	100	19	1
69	172.5	419.5	151	137	27	1
70	172.8	419.2	114	100	21	1
71	173.3	418.7	166	152	23	1
72	173.7	418.3	13	359	65	1
73	174.2	417.8	321	307	56	1
74	175	417	145	131	40	1
OMW-222						
1	44.5	554.1	72	58	69	1
2	44.8	553.8	71	57	69	1

Table 2. Fracture Dip Direction, Angle, and Rank Versus Depth for DMW-221, 222, and 223 (continued).

Fracture No.	Depth (feet)	Elevation (ft msl)	Dip Direction (degrees)	True Dip Direction (degrees)	Dip Angle (degrees)	Feature Rank (0-5)
3	46.2	552.4	71	57	62	2
4	46.7	551.9	65	51	56	2
5	47.1	551.5	71	57	51	1
OMW-222 (continued)						
6	47.4	551.2	76	62	58	1
7	47.8	550.8	84	70	51	1
8	49	549.6	61	47	48	1
9	49.9	548.7	62	48	52	1
10	50.3	548.3	86	72	65	2
11	50.4	548.2	36	22	43	1
12	50.9	547.7	80	66	77	1
13	50.9	547.7	73	59	50	1
14	52.2	546.4	89	75	59	1
15	53.2	545.4	89	75	58	3
16	53.4	545.2	315	301	21	1
17	53.7	544.9	95	81	47	2
18	54.1	544.5	154	140	15	3
19	55	543.6	111	97	34	2
20	55.7	542.9	112	98	40	2
21	56.4	542.2	109	95	51	1
22	56.8	541.8	104	90	55	1
23	57.3	541.3	114	100	44	1
24	57.9	540.7	84	70	60	1
25	58.7	539.9	94	80	49	1
26	58.9	539.7	1	347	82	3
27	59.1	539.5	120	106	36	1
28	61	537.6	100	86	56	2
29	61.7	536.9	92	78	56	1
30	62.2	536.4	123	109	52	2
31	68.6	530	31	17	80	2
32	70.4	528.2	108	94	63	2
33	70.6	528	258	244	74	1
34	72.7	525.9	109	95	80	1
35	75.7	522.9	114	100	80	3
36	76.7	521.9	135	121	57	1
37	76.9	521.7	129	115	70	1
38	77.6	521	116	102	62	2
39	78.5	520.1	110	96	77	3
40	79.1	519.5	110	96	80	1
41	115.8	482.8	133	119	30	3

Table 2. Fracture Dip Direction, Angle, and Rank Versus Depth for DMW-221, 222, and 223 (continued).

Fracture No.	Depth (feet)	Elevation (ft msl)	Dip Direction (degrees)	True Dip Direction (degrees)	Dip Angle (degrees)	Feature Rank (0-5)
42	116.8	481.8	110	96	53	3
43	117.5	481.1	126	112	47	2
44	119.1	479.5	143	129	42	2
45	119.9	478.7	104	90	50	2
46	120.8	477.8	102	88	39	3
OMW-222 (continued)						
47	121.9	476.7	85	85	39	2
48	122.3	476.3	88	74	41	1
49	123	475.6	137	123	32	2
50	123.4	475.2	127	113	42	2
51	123.7	474.9	127	113	23	2
52	124.6	474	178	164	76	3
53	124.9	473.7	167	153	71	2
54	125.6	473	129	115	39	2
55	158.8	439.8	95	81	44	2
56	159.4	439.2	89	75	43	2
57	159.9	438.7	167	153	86	3
58	160	438.6	108	94	39	2
59	160.5	438.1	354	340	81	3
60	162.7	435.9	151	137	75	3
61	164.1	434.5	358	344	84	3
62	164.8	433.8	107	93	62	1
63	165.7	432.9	93	79	57	2
64	167.5	431.1	148	134	53	3
65	167.7	430.9	297	283	60	2
66	168.4	430.2	97	83	40	2
67	168.9	429.7	96	82	43	3
68	169.4	429.2	162	148	78	2
69	172.8	425.8	353	339	82	3
70	175.3	423.3	116	102	50	1
71	176.3	422.3	177	163	75	1
72	176.4	422.2	345	331	79	3
73	177.4	421.2	358	344	84	2
74	178.6	420	96	82	42	3
75	179.3	419.3	101	87	38	1
76	194.3	404.3	82	68	60	3
77	194.8	403.8	289	275	47	1
78	194.8	403.8	105	91	63	2
79	196	402.6	107	93	62	2
80	196.6	402	151	137	72	1

Table 2. Fracture Dip Direction, Angle, and Rank Versus Depth for DMW-221, 222, and 223 (continued).

Fracture No.	Depth (feet)	Elevation (ft msl)	Dip Direction (degrees)	True Dip Direction (degrees)	Dip Angle (degrees)	Feature Rank (0-5)
81	197.1	401.5	148	134	72	3
82	197.1	401.5	162	148	58	3
83	199	399.6	156	142	63	2
84	199.4	399.2	111	97	63	3
85	200.1	398.5	119	105	53	1
86	200.2	398.4	135	121	71	3
1	71	522.9	133	119	57	1
OMW-223						
2	71.6	522.3	169	155	60	1
3	72.3	521.6	115	101	55	1
4	73.7	520.2	68	54	43	1
5	74.3	519.6	78	64	81	3
6	75.7	518.2	86	72	58	3
7	76.5	517.4	89	75	60	3
8	78.2	515.7	127	113	62	2
9	78.7	515.2	118	104	56	3
10	80.1	513.8	108	94	64	1
11	80.9	513	91	77	55	1
12	82.5	511.4	124	110	46	2
13	84	509.9	151	137	56	3
14	85.1	508.8	188	174	59	1
15	86.2	507.7	55	41	20	1
16	89	504.9	111	97	66	2
17	89.6	504.3	96	82	61	3
18	90.2	503.7	80	66	58	1
19	91.9	502	118	104	60	4
20	92.7	501.2	123	109	65	4
21	130.9	463	311	297	19	2
22	131.5	462.4	154	140	43	1
23	133.4	460.5	144	130	49	2
24	133.5	460.4	161	147	40	3
24	133.6	460.3	6	352	74	2
26	135.4	458.5	173	159	43	0
27	136.2	457.7	316	302	35	1
28	137.9	456	179	165	58	1
29	139.5	454.4	17	3	28	1
30	140.1	453.8	209	195	36	3
31	140.4	453.5	136	122	30	2
32	142.9	451	26	12	60	1
33	145.2	448.7	142	128	61	1

Table 2. Fracture Dip Direction, Angle, and Rank Versus Depth for DMW-221, 222, and 223 (continued).

Fracture No.	Depth (feet)	Elevation (ft msl)	Dip Direction (degrees)	True Dip Direction (degrees)	Dip Angle (degrees)	Feature Rank (0-5)
34	146.2	447.7	146	132	46	2
35	146.4	447.5	137	123	59	2
36	148.3	445.6	162	148	39	1
37	149.7	444.2	141	127	46	2
38	150.4	443.5	35	21	16	3

Rank	Observation	Flow Rating System
0	Probable bedding feature or foliation	Sealed - no flow
1	Weak feature (possibly bedding) - not continuous around borehole	Partial open crack
2	Clean distinct feature	Continuous open crack
3	Distinct feature with apparent aperture (feature is visible on Travel Time image)	Wide open crack or cracks
4	Very distinct, wide fracture or fractures, possibly interconnected	Very wide crack or multiple interconnected fractures
5	Major fracture zone with large openings indicated on both the Amplitude and Travel Time images	Major fracture zone

N039041A.DSF

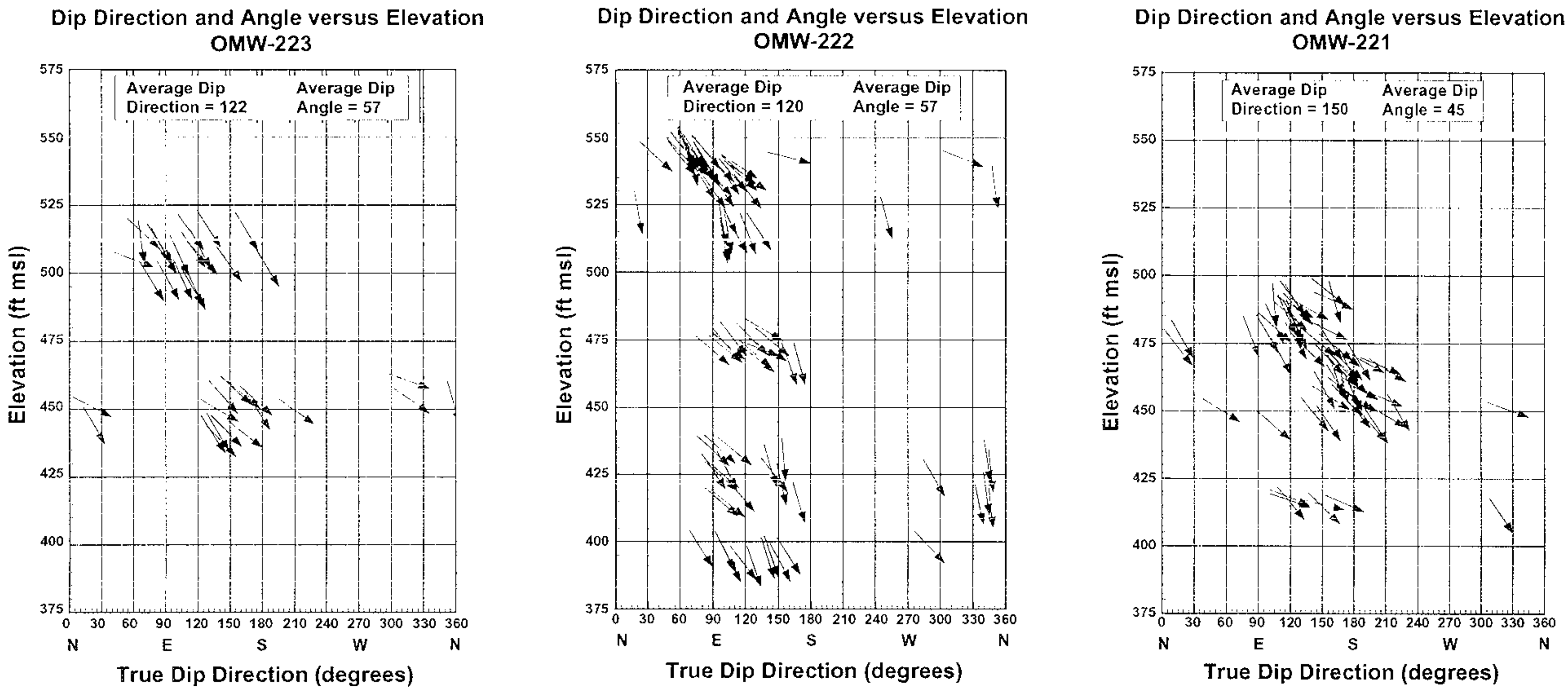

Figure 3. Dip direction and angle of bedrock features with depth as noted in OMW-221, 222 and 223.

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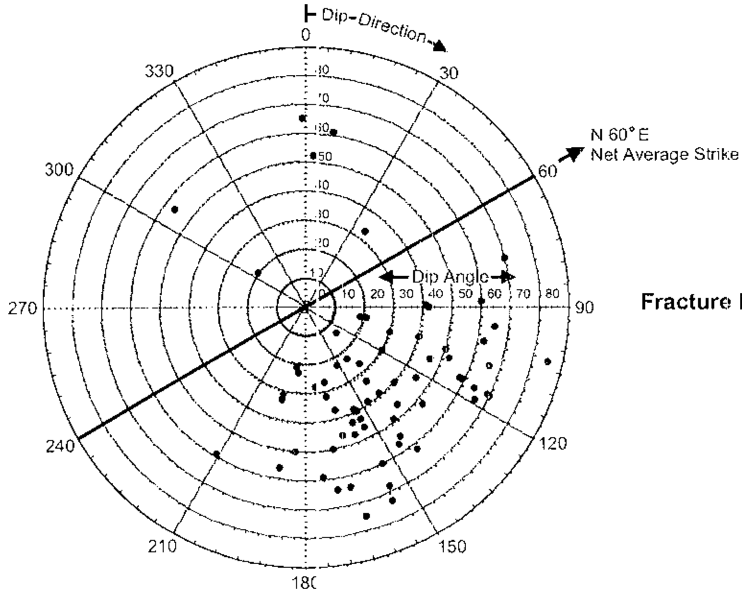
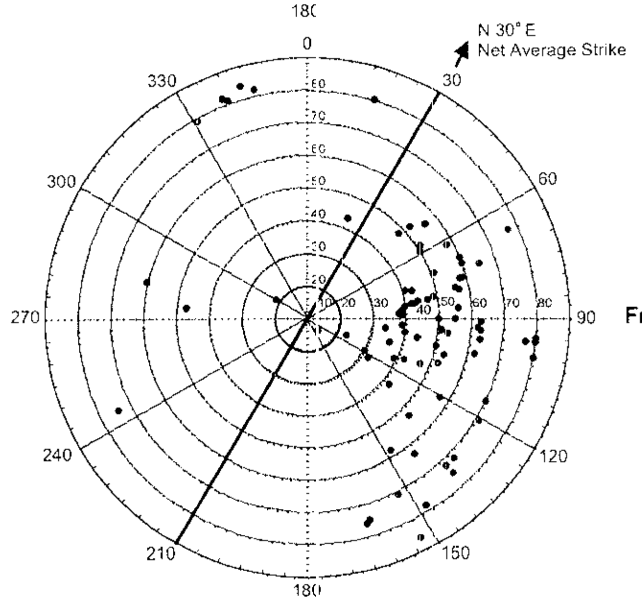
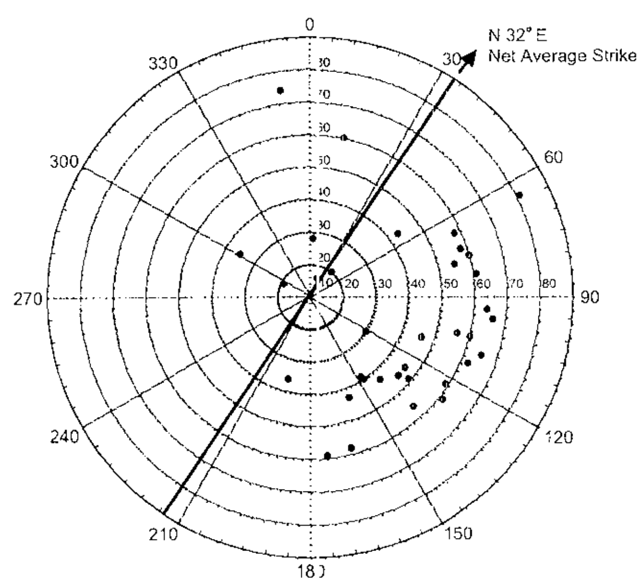


Fracture Point Diagram OMW-221



Fracture Point Diagram OMW-222



Fracture Point Diagram OMW-223

Figure 4. Calculated dip direction and angle for OMW-221, 222 and 223 plotted on a fracture point diagram.

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N039043A.DSF

OMW-223

Dip angles for the both depth intervals cluster between 30° and 70°, averaging 57°. The tadpole plot shows that dip direction for the 70-90 foot depth interval clustering in the range from 60° to 120° and the 130-150 foot interval has dip directions generally falling in the 120° to 180° range. The average dip direction is 122°, resulting in a fracture strike of N32°E which is very similar to OMW-222.

SUMMARY

The data from the ATV log analysis generally conforms with the geologic structural trends in the region. Bedding and foliation generally have strikes to the northeast (N30-60°E) with dip directions predominantly to the southeast. A small number of dip directions trend to the northwest which may be associated with foliation or bedding features on minor folds within the larger structures.

APPENDIX J

APPENDIX J

HELP MODELING FOR CALCULATION OF LANDFILL INFILTRATION

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******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.04   (10 APRIL 1995)                 **
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                   USAE WATERWAYS EXPERIMENT STATION                      **
**              FOR USEPA RISK REDUCTION ENGINEERING LABORATORY             **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     c:\Help3\GELPREC.D4
TEMPERATURE DATA FILE:       C:\HELP3\GELTEMP.D7
SOLAR RADIATION DATA FILE:   c:\help3\GELSCL.D13
EVAPOTRANSPIRATION DATA:     c:\help3\GELEVAP.D11
SOIL AND DESIGN DATA FILE:   c:\help3\GELOC1.D10
OUTPUT DATA FILE:            c:\help3\GELO01.OUT


TIME:  19: 4     DATE:   5/ 5/1997


******************************************************************************

     TITLE:  GE Loeffel Landfill Run #1

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                 LAYER  1
                                 --------

                   TYPE 1 - VERTICAL PERCOLATION LAYER
                       MATERIAL TEXTURE NUMBER  24
           THICKNESS                  =       4.00   INCHES
           POROSITY                   =       0.3650 VOL/VOL
           FIELD CAPACITY             =       0.3050 VOL/VOL
           WILTING POINT              =       0.2020 VOL/VOL
           INITIAL SOIL WATER CONTENT =       0.3768 VOL/VOL
           EFFECTIVE SAT. HYD. COND.  =  0.270000010000E-05 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  3.00
                FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.


                                 LAYER  2
                                 --------

                    TYPE 2 - LATERAL DRAINAGE LAYER
                       MATERIAL TEXTURE NUMBER   9
           THICKNESS                  =      48.00   INCHES
           POROSITY                   =       0.5010 VOL/VOL
           FIELD CAPACITY             =       0.2840 VOL/VOL
           WILTING POINT              =       0.1350 VOL/VOL
           INITIAL SOIL WATER CONTENT =       0.3282 VOL/VOL
           EFFECTIVE SAT. HYD. COND.  =  0.190000006000E-03 CM/SEC
           SLOPE                      =       3.00   PERCENT
           DRAINAGE LENGTH            =     300.0    FEET
```

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4270 VOL/VOL
FIELD CAPACITY	=	0.4180 VOL/VOL
WILTING POINT	=	0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #24 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 3.% AND A SLOPE LENGTH OF 300. FEET.

SCS RUNOFF CURVE NUMBER	=	90.30	
FRACTION OF AREA ALLOWING RUNOFF	=	90.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	11.000	ACRES
EVAPORATIVE ZONE DEPTH	=	20.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	7.055	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	9.476	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	2.968	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	27.511	INCHES
TOTAL INITIAL WATER	=	27.511	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
ALBANY NEW YORK

STATION LATITUDE	=	42.45 DEGREES
MAXIMUM LEAF AREA INDEX	=	2.00
START OF GROWING SEASON (JULIAN DATE)	=	123
END OF GROWING SEASON (JULIAN DATE)	=	282
EVAPORATIVE ZONE DEPTH	=	20.0 INCHES
AVERAGE ANNUAL WIND SPEED	=	8.90 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	66.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR ALBANY NEW YORK

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
2.39	2.26	3.01	2.94	3.31	3.29
3.00	3.34	3.23	2.93	3.04	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR ALBANY NEW YORK

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
21.10	23.40	33.80	46.60	57.50	66.70
71.40	69.20	61.20	50.50	39.30	26.50

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR ALBANY NEW YORK
AND STATION LATITUDE = 42.45 DEGREES

WARNING: TEMPERATURE FOR YEAR 1974 USED WITH PRECIPITATION FOR YEAR 1

WARNING: SOLAR RADIATION FOR YEAR 1974 USED WITH PRECIPITATION FOR YEAR 1

****

ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	36.09	1441074.000	100.00
RUNOFF	12.435	496538.781	34.46
EVAPOTRANSPIRATION	20.269	809342.062	56.16
DRAINAGE COLLECTED FROM LAYER 2	0.3448	13767.358	0.96
PERC./LEAKAGE THROUGH LAYER 3	1.695631	67706.531	4.70
AVG. HEAD ON TOP OF LAYER 3	8.7553		
CHANGE IN WATER STORAGE	1.328	53025.863	3.68
SOIL WATER AT START OF YEAR	27.511	1098520.620	
SOIL WATER AT END OF YEAR	28.839	1151546.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0174	693.431	0.05

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.46	2.10	3.03	2.21	1.88	3.93
	2.75	2.83	3.98	1.31	5.59	4.02

STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	1.532	0.293	3.302	0.472	0.272	0.251
	0.393	0.945	1.079	0.516	1.392	1.987
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	0.389	0.423	0.362	3.193	2.053	4.233
	2.661	1.789	3.096	0.488	1.196	0.385
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 2

TOTALS	0.0160	0.0127	0.0121	0.0360	0.0426	0.0383
	0.0374	0.0346	0.0308	0.0292	0.0257	0.0294
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.1265	0.1120	0.1214	0.1494	0.1615	0.1525
	0.1547	0.1510	0.1426	0.1439	0.1359	0.1442
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	4.7947	4.2206	3.6253	11.1380	12.7585	11.8634
	11.2198	10.3684	9.5414	8.7448	7.9738	8.8155
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 1

	INCHES		CU. FEET	PERCENT
PRECIPITATION	36.09	(0.000)	1441074.0	100.00
RUNOFF	12.435	(0.0000)	496538.78	34.456
EVAPOTRANSPIRATION	20.269	(0.0000)	809342.06	56.162
LATERAL DRAINAGE COLLECTED FROM LAYER 2	0.34479	(0.00000)	13767.358	0.95535
PERCOLATION/LEAKAGE THROUGH LAYER 3	1.69563	(0.00000)	67706.531	4.69834
AVERAGE HEAD ON TOP OF LAYER 3	8.755	(0.000)		

CHANGE IN WATER STORAGE	1.328	(0.0000)	53025.86	3.680

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 1

	(INCHES)	(CU. FT.)
PRECIPITATION	1.10	43923.000
RUNOFF	1.365	54490.8164
DRAINAGE COLLECTED FROM LAYER 2	0.00142	56.50859
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.005265	210.24303
AVERAGE HEAD ON TOP OF LAYER 3	13.150	
MAXIMUM HEAD ON TOP OF LAYER 3	28.085	
SNOW WATER	1.97	78770.4219

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4179

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1484

*** MAXIMUM HEADS ARE COMPUTED USING THE MOUND EQUATION. ***

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FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(INCHES)	(VOL/VOL)
1	1.5073	0.3768
2	17.0838	0.3559
3	10.2480	0.4270
SNOW WATER	0.000	

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