EVALUATION OF HYDROGEOLOGIC CONDITIONS AND PREPARATION OF A PROPOSED GROUND-WATER MONITORING PROGRAM OSWEGO VALLEY LANDFILL OSWEGO COUNTY, NEW YORK

August 1984

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EVALUATION OF HYDROGEOLOGIC CONDITIONS AND PREPARATION OF A PROPOSED GROUND-WATER MONITORING PROGRAM OSWEGO VALLEY LANDFILL OSWEGO COUNTY, NEW YORK

INTRODUCTION

Geraghty & Miller, Inc. was retained by the Oswego County Department of Public Works in February 1984 to evaluate hydrogeologic conditions in the vicinity of the Oswego Valley Landfill, to review the hydrogeologic sections of the landfill closure plan (Barton & Loguidice, 1984), and to prepare a proposed ground-water monitoring program as part of the closure plan for the facility. The Oswego Valley Landfill (also known as the Volney Landfill) is located at the intersection of Silk and Howard Roads in the Town of Volney, New York, about 1.7 miles northeast of Fulton, New York.

Most of the waste materials disposed of in the landfill during the operating period of 1969 to 1983 consisted of residential, commercial, institutional, and industrial wastes and sludges. Small quantities of liquid chemical waste were also reportedly deposited in the landfill in the mid-1970's (Barton & Loguidice, 1984). Limited sampling of local residential wells and landfill test wells was conducted from 1976 through 1979. A number of test wells have been installed at the site by various parties, and extensive testing of ground-water samples from test wells and local residential wells has been conducted since 1979. A study of contaminant

migration in ground water at the landfill was conducted by the State University Research Center at Oswego (Scrudato and Hinrich, 1982). The landfill operating history and the previous ground-water testing programs are summarized in the engineering report for closure of the landfill (Barton & Loguidice, 1984).

Background data regarding the Oswego Landfill were provided to Geraghty & Miller, Inc. by Barton & Loguidice, Syracuse, New York, the engineering firm developing the landfill closure plan for Oswego County. Geraghty & Miller, Inc. personnel visited the site on March 28, 1984, with representatives of Barton & Loguidice. This report presents our evaluation of ground-water conditions in the vicinity of the Oswego Valley Landfill, our review of the hydrogeologic sections of the landfill closure plan, and our recommendations for a ground-water monitoring program for the facility.

SUMMARY AND CONCLUSIONS

1. An extensive data base of geology and ground-water quality conditions in the vicinity of the Oswego Valley Landfill has been assembled through studies by a number of concerned parties and agencies.

2. The glacial geology beneath the site has been defined and mapped in detail by the U.S. Geological Survey (USGS). Data regarding depth and lithology of the underlying bedrock are less complete due to lack of information on residential wells completed in the bedrock.

3. A water-table contour map compiled from May 1984 data indicates that ground water flows radially from beneath the Oswego Valley Landfill, toward the east, south, and west. The northerly and northeasterly components of ground-water flow are undefined due to an absence of test wells in this area.

4. Ground water in the bedrock occurs under confined conditions, with the low permeability lodgment till functioning as the overlying confining unit.

5. Comparison of water-level elevations in four adjacent pairs of water-table and bedrock wells indicates an upward vertical hydraulic gradient in two wells and a slightly downward gradient in the two other wells. Considering the vertical hydraulic gradients and the low permeability of the glacial till, net downward movement of ground water from the water table into the bedrock is either not possible or insignificant.

Premature
Is Lodgement
Till continuous
continuous?

6. Elevated levels of several common inorganic constituents in water samples from residential wells near the landfill are not diagnostic of contamination from the landfill. Use of such indicators as chloride, iron, manganese, and specific conductance to interpret the landfill's impact on the surrounding area is not advisable since background levels of these constituents detected in Oswego County are elevated and have been attributed to natural ground-water quality, road salting, and/or septic systems.

7. Selected USGS test wells sampled within 500 feet of the Oswego Valley Landfill provide indications of contaminant migration away from the landfill, as shown by constituents diagnostic of the landfill leachate (alkalinity, hardness, COD, ammonia nitrogen, TOC, and methyl ethyl ketone). However, the existing network of test wells and residential wells is not sufficient to allow a complete definition of landfill impacts on the ground-water system.

There is no question there is an impact.

8. The capping, drainage control, and leachate management measures included in the proposed closure plan for the Oswego Valley Landfill should eliminate infiltration of precipitation over the fill area and cause the mounded water table beneath the landfill to decline, thus reducing or eliminating leachate generation and movement of leachate-contaminated ground water away from the landfill.

Lateral infiltration ground/surface waters?

RECOMMENDATIONS

1. A proposed ground-water monitoring program is presented which includes the following tasks:

Task 1. Secure and redevelop selected existing test wells

Task 2. Install additional monitoring wells

Task 3. Install surface-water stations

Task 4. Survey selected monitoring stations

Task 5. Collect a complete round of water-level and water quality data

Task 6. Evaluate data, complete supplemental report, and prepare final ground-water monitoring program

Task 7. Data management

2. Following landfill capping, ground-water quality and water-level monitoring should be carried out to verify the predicted reduction in leachate production and decline in water-table head levels.

↑ must be done!

EXISTING LANDFILL SITE CONDITIONS

The Oswego Valley Landfill is described in detail in the engineering closure report (Barton & Loguidice, 1984). According to this report, the landfill property covers an area of approximately 85 acres, of which about 55 acres have been landfilled with refuse. The average refuse depth is 45 feet, and maximum refuse depths of 60 feet exist in the northern portion of the fill area. A minimum 5-foot separation between waste materials and ground water was reportedly maintained over the landfill area.

The southern half of the property was landfilled from 1969 through 1975 in an existing gravel pit. Prior to landfilling of the central portion of the site, the sand and gravel was removed and the underlying glacial till was graded toward a common collection trench dug into the till. The trench was connected to a drain pipe leading to a concrete sump, which facilitated removal of leachate from the landfill.

An additional leachate collection pipe was added as landfilling progressed in the northern part of the site. The new collection pipe and existing sump were eventually routed to a large concrete storage tank, which functions as the collection point for leachate produced by the northern portion of the landfill.

The existing land surface over the southern half of the property is a relatively flat plateau covered by native sand and gravel, capped by a layer of natural grass vegetation. It is believed that this area is the major source of uncontrolled leachate production. The northern half of the site

was terraced to control runoff of precipitation and to reduce infiltration into the landfill.

GEOLOGY

Geological conditions in the vicinity of the Oswego Valley Landfill have been investigated through a number of test borings, monitoring wells, and residential wells drilled in the area. The locations of these wells are shown on Figure 1. Construction data for test wells and residential wells are summarized in Tables 1 and 2, respectively. Well logs/data sheets for test wells and residential wells are included in Appendices A and B, respectively.

The geologic setting of the Oswego Valley Landfill area has been described in detail in publications of the USGS (Anderson, 1982, and Miller, 1982). These reports indicate that the area is underlain by glacial deposits over sandstone bedrock. The surficial glacial deposits have been identified as beach sand and gravel, lacustrine fine sand, and lodgment till, in accordance with environments of deposition. Figure 2 is a geologic cross section adapted from Miller, 1982, which illustrates the relative vertical positions of these geologic strata.

Geologic data from test wells and residential wells were used to plot cross section B-B' (Figure 3). Geologic descriptions were taken directly from the well logs, and no attempt was made to classify the sediments in terms of environment of deposition. Based on surficial geologic mapping of the area (Miller, 1980 a and b), the fine to coarse sand and gravel strata noted on cross section B-B' correspond to wave delta and beach sand and gravel, and the fine sand corresponds to the lacustrine deposits. The glacial till (lodgment till, according to origin) was described in the well

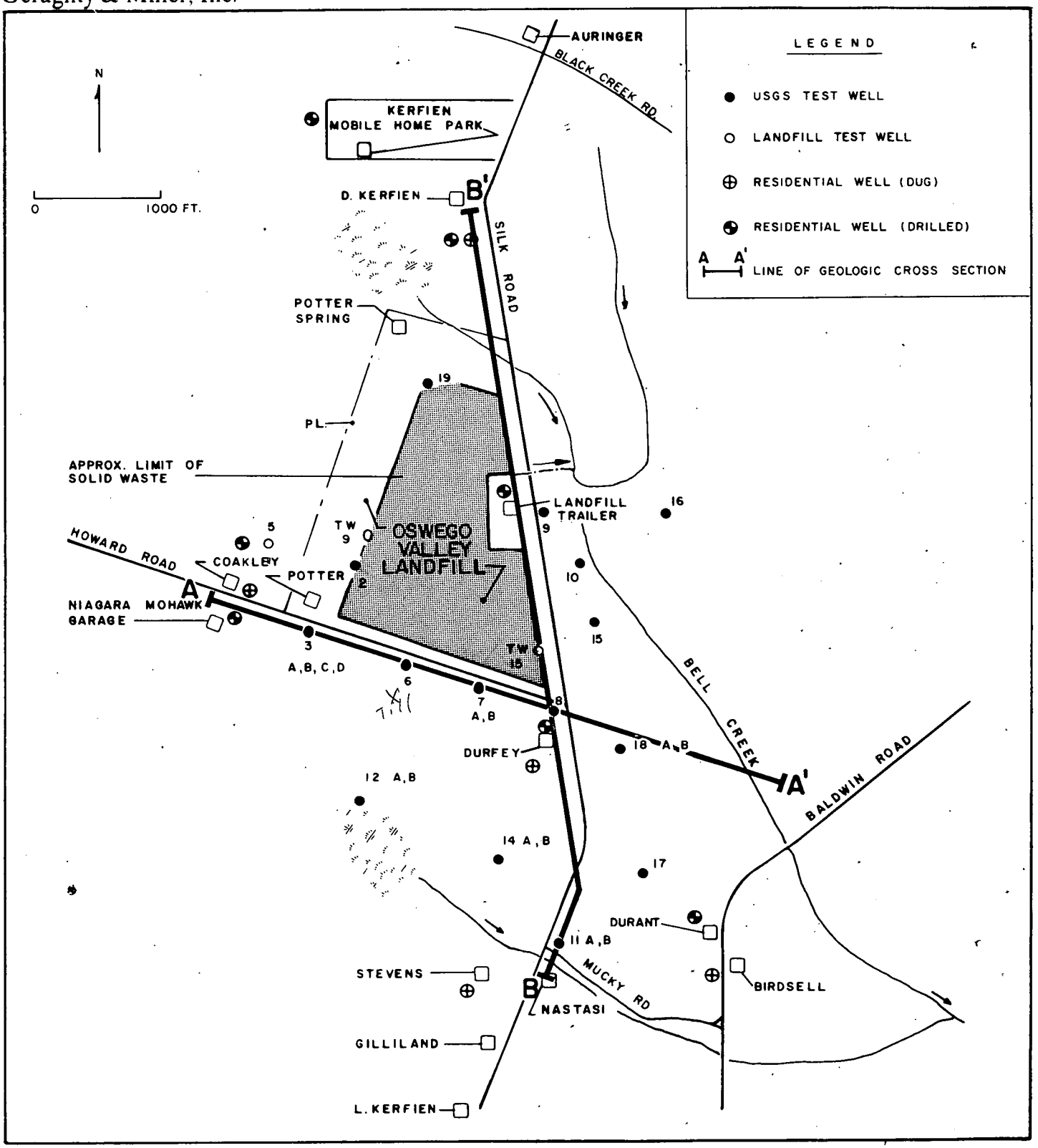


FIGURE 1 - SITE MAP SHOWING LOCATIONS OF TEST WELLS, RESIDENTIAL WELLS, AND LINES OF GEOLOGIC CROSS SECTION, Oswego Valley Landfill, Oswego County, New York.

Table 1. Data Summary for Test Wells, Oswego Valley Landfill, Oswego County, New York.

Well No.	Casing Diameter (inches)	Casing Material[1]	Screen Diameter (inches)	Screen Material	Borehole Depth[2]	Well Depth[2] Well Log[1]	Well Depth[2] Field Measurement[1]
USGS							
1	-	-[3]	-	-[4]	58	-	-
2	2	BI	2	SS[5]	20	14	13.2
3	2	BI	2	GS	49	34	34.3
3B	2	BI	2	SS	-	10.2	10.8
3C	2	PVC	2	PVC[6]	-	34.5	34.6
3D	2	PVC	2	PVC	-	10	10.2
4	-	-	-	-	19	-	-
5	2	BI	2	SS	8.5	8.5	6.3
6	2	BI	1.5	SS	14	10	10.3
7A	2	BI	1.25	?	14	10	10.6
7B	2	PVC	2	PVC	-	10	10.4
8	2	BI	1.5	SS	34	28	25.9
9	2	PVC	1.5	SS	63	34	35.9
10	3-4	BI	?	?	?	?	17.6
11A	2	PVC	2	PVC	29	18	17.1
11B	2	BI	?	GS	-	17.6	18.1
12A	2	PVC	?	PVC	25	17	-
12B	2	BI	2	GS	-	17.3	-
13	?	PVC	None	-	14	12.2	Destroyed
14A	2	PVC	?	PVC	24	17	17.2
14B	2	BI	?	GS	-	17	16.5
15	2	PVC	?	PVC	44	20	15.2
16	2	PVC	?	?	?	?	17.8
17	2	PVC	?	?	?	?	30.4
18A	2	BI	?	?	?	?	19.2
18B	2	PVC	?	?	?	?	21.6
19	?	PVC	?	?	?	?	1.2
TW 9	?	PVC	?	?	20	15	14.6
TW15	?	PVC	?	?	35	35	20.3

1) See Appendices A and B
2) Feet below land surface
3) Black Iron
4) Stainless Steel
5) Galvanized Steel
6) Polyvinyl chloride (plastic)

Table 1. (Continued)

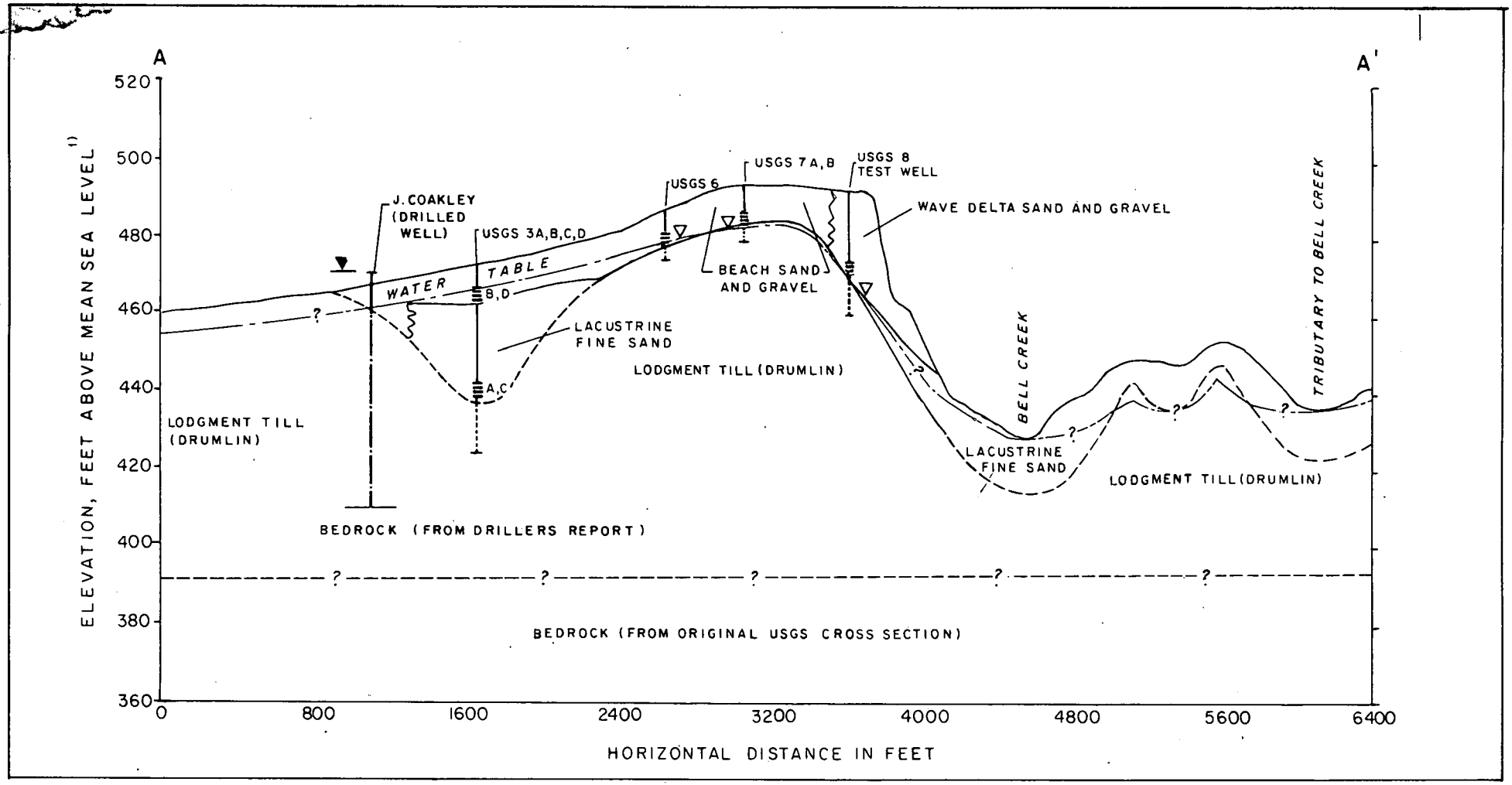
Well No.	Screened Interval[2] (based on well log)	Geology of Screened Zone	Depth[2] to Glacial Till	Land Surface Elevation (feet above mean sea level)	Date Drilled
USGS					
1	-	-	54	490 *	Sept. 1979
2	11.5-14.5	Till	11.5	483.4	do
3	31 -34	Sand, fine-medium	36	474.4	Oct. 1979
3B	7.2-10.2	Sand + gravel	-	474.4	do
3C	33 -34.5	Sand, fine-medium	-	474.5	do
3D	8.5-10	Sand + gravel	-	474.3	do
4	-	-	15	470 *	do
5	6 - 8.5	Till, sand	6.5	471.4	do
6	7.5-10	Sand + gravel	10	491.5	do
7A	8.5-10	Sand + gravel	12.5	495.9	do
7B	8.5-10	Sand + gravel	-	495.9	do
8	25 -28	Sand, fine-coarse	28.5	494.1	do
9	34 -36.5	Sand, fine	50	471.2	do
10	?	?	?	454.4	?
11A	14 -18	Sand + gravel	28	469.1	April 1980
11B	16.1-17.6	Sand + gravel	-	468.6	do
12A	13 -17	Sand, fine-medium	25	-	do
12B	15.1-17.3	Sand, fine-medium	-	-	do
13	Opened?	Gravel, clay	12	-	?
14A	15 -17	Sand, medium-coarse	24	472.3	?
14B	15 -17	Sand, medium-coarse	-	472	?
15	16 -20	Sand + silt	32(?)	448.3	?
16	?	?	?	467	?
17	?	?	?	463.4	?
18A	?	?	?	463.4	?
18B	?	?	?	464.6	?
19	?	?	?	458.1	?
TW 9	?	Sand, fine-medium + gravel	-	481.9	Aug. 1973
TW15	?	Sand, fine-medium + gravel	-	491.9	do

* Estimated from USGS topographic map

Table 2. Data Summary for Residential Wells, Oswego Valley Landfill, Oswego County, New York.

Well Owner	Well Type	Casing Material	Type of Cover	Well Diameter (inches)	Total Depth (feet)	Producing Interval[1]	Depth to Bedrock[1]	Interval of Sealed Casing	Land Surface Elevation[2]	Currently Used for Potable Water Supply
Birdsell	Dug	Concrete block	Plywood	36 x 60[3]	6.7	0- 6.7	-	None	443.6	Yes
Coakley	Dug	Steel	Wood & Concrete	36	16.3	0-16.3	-	None	471.7	Yes
Coakley	Drilled	Steel	-	6	64±	64±	64	?	470.78	No
Durant	Drilled	Steel	Sanitary seal	6	29.7	?	?	?	433.2	Yes
Durfey	Dug	?	Plywood	?	7.5	?	-	?	472.2	Yes
Durfey	Drilled	Steel	?	?	69±	69±	69±	?	495.6	No
D. Kerfien	Dug	Concrete tile	Concrete	36	7.3	0- 7.3	-	None	457.1	?
D. Kerfien	Drilled	Iron	Sanitary seal	6	61±	61±	61	?	477.5	Yes
Kerfien Mobile Home Park	Drilled	Iron	Sanitary seal	6	54.8	?	?	?	456.1	Yes
Niagara Mohawk	Drilled	Steel	Sanitary seal	6	54.8	?	?	?	466.8	Yes
Stevens	Dug	Concrete tile	Concrete	36	12.4	0-12.4	-	None	471.1	Yes
Landfill Trailer	Drilled	Iron	Sanitary seal	6	56	?	?	?	469.6	No

1) Feet below land surface
2) Feet above mean sea level
3) Rectangular dug well denoted by width x length



AFTER MILLER, 1982

EXPLANATION

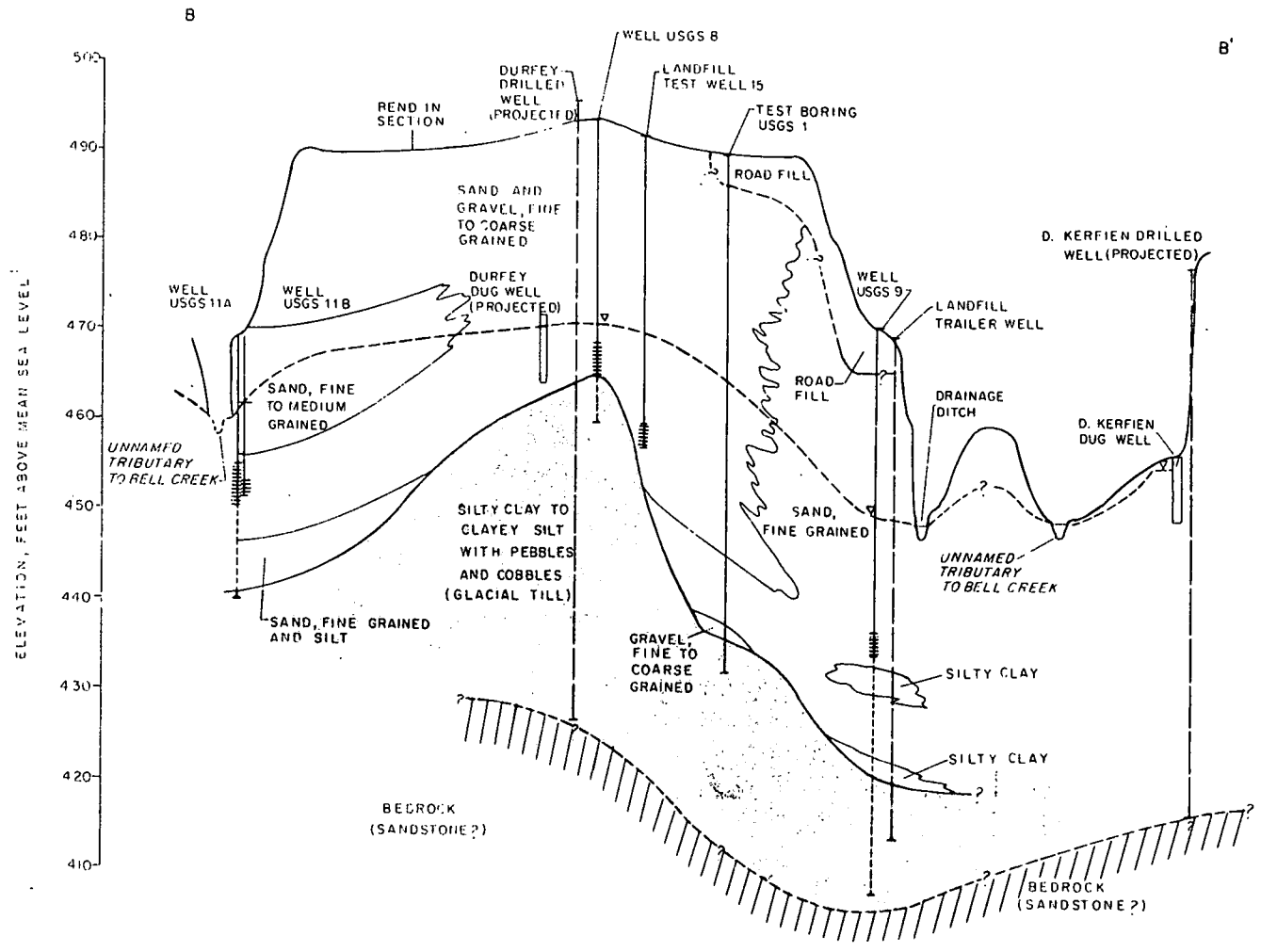
- TEST WELL
- SCREENED INTERVAL
- TOTAL BOREHOLE DEPTH
- DRILLED WELL, PRIVATE SUPPLY (SCREENED ZONE NOT KNOWN)
- ▽ WATER-TABLE ELEVATION (SEE TABLE 3)
- —·— WATER TABLE
- ▼ PIEZOMETRIC SURFACE ELEVATION (SEE TABLE 3)
- ? INFERRED FROM AVAILABLE DATA
- 1) NATIONAL GEODETIC VERTICAL DATUM OF 1929

GEOLOGIC CROSS SECTION A-A'

OSWEGO VALLEY LANDFILL

Oswego County, New York

Figure 2



EXPLANATION

- TEST WELL
- SCREENED INTERVAL
- TOTAL BOREHOLE DEPTH
- DUG WELL, PRIVATE SUPPLY (CASED WITH PERMEABLE BRICK OR SLOTTED CEMENT
- DRILLED WELL, PRIVATE SUPPLY (SCREENED ZONE NOT KNOWN)
- ▽ WATER-TABLE ELEVATION (SEE TABLE 3)
- ? INFERRED FROM AVAILABLE DATA
- 1) NATIONAL GEODETIC VERTICAL DATUM OF 1929

GEOLOGIC CROSS SECTION B-B'
OSWEGO VALLEY LANDFILL
Oswego County, New York

Figure 3

774-

logs as a dense, compact material. The influence of this resistant geological material on land surface topography is evident from the cross sections shown in Figures 2 and 3.

The bedrock underlying the lodgment till in the vicinity of the Oswego Valley Landfill is comprised of red sandstones and shales, and has been mapped as the Medina Group and Queenston Formation (Miller, 1982). The bedrock surface depicted in Figure 3 and noted in Figure 2 is based on driller's reports from nearby residential wells. Descriptive geologic data for the bedrock (rock type, grain size, fracturing, etc.) were not found in the available drilling records.

HYDROLOGY

Ground water in the vicinity of the Oswego Valley Landfill occurs in the glacial deposits and the underlying bedrock. In glacial (unconsolidated) materials, ground water occurs in pore spaces between individual particles of clay, silt, sand, and gravel. Ground water in the bedrock (consolidated) formations occurs in fractures within the rock matrix. Saturated permeable glacial deposits consisting of sand and gravel comprise the water-table aquifer in the area.

Water-level data from test wells and residential wells completed in the water-table aquifer (Table 3) were used to construct the water-table map shown in Figure 4. Most of the water levels were measured on May 2, 1984. Although three of the residential wells were measured on April 25, 1984, these data were included as an aid for determining the overall ground-water flow pattern. The water-table contour map indicates that ground water flows radially from beneath the Oswego Valley Landfill, toward the east, south, and west. Ground-water elevations range from about 480 feet above mean sea level (msl) adjacent to the southern portion of the landfill, to about 440 feet above msl near Bell Creek and its tributary, east and southeast of the landfill.

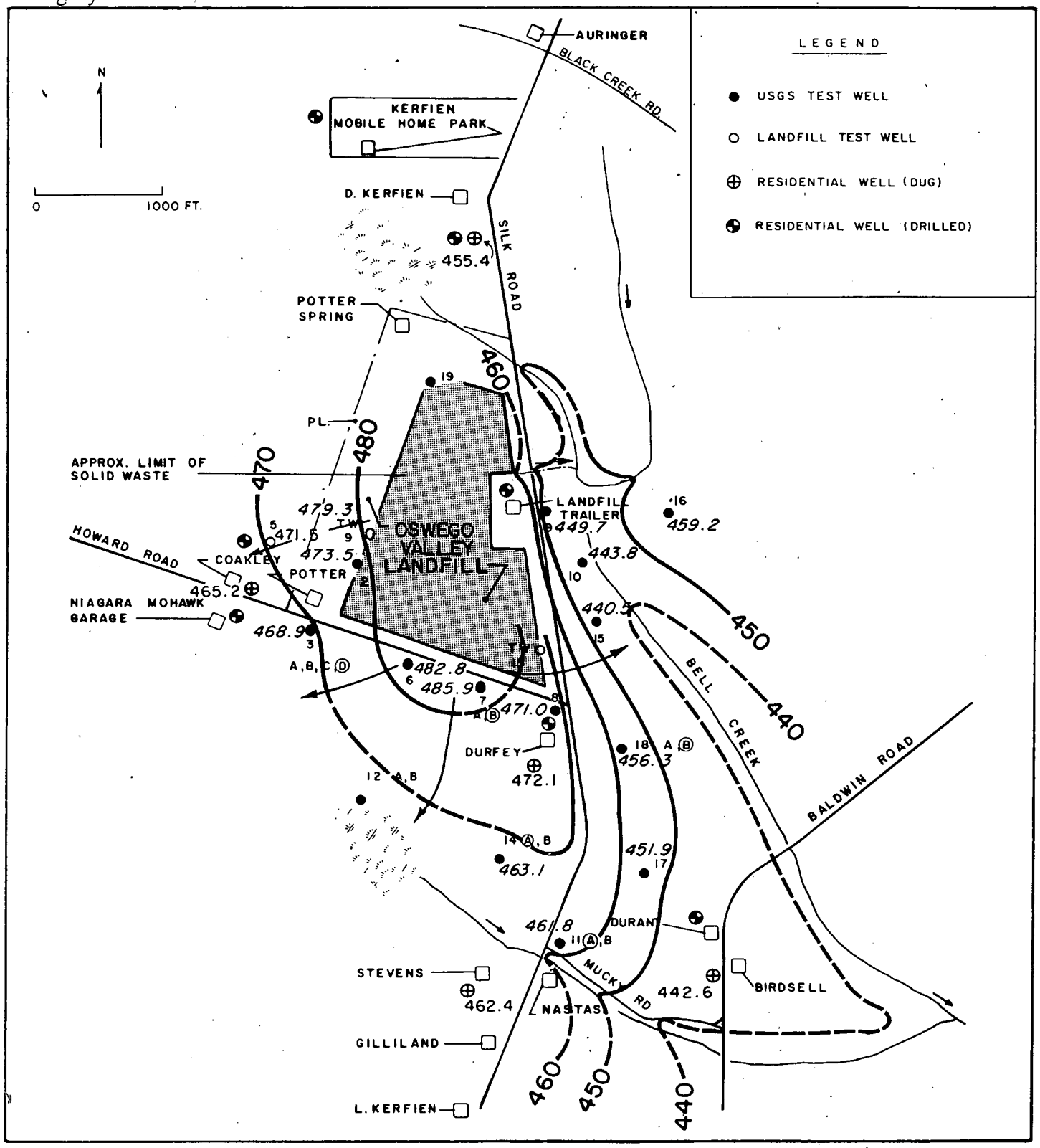
The radial flow pattern probably has a northward component, but lack of control in this area does not allow closure of the water-level elevation contours. Radial ground-water flow from the landfill would be expected, since the landfill occupies a topographic high in the area, which represents a confluence of drainage divides for both ground water and surface

Table 3. Water-Level Elevations Reported for Wells Completed in the Water-Table Aquifer, April-May 1984, Oswego Valley Landfill, Oswego County, New York.

Well No./ Owner	Total Depth[1] (feet below land surface)	Measuring Point[2] Elevation (feet above mean sea level)	Water-Level[1] Elevation (feet above mean sea level)	Date Measured
USGS 2	13.2	484.7	473.5	5- 2-84
USGS 3A	34.3	477.2	469	do
USGS 3B	10.8	477.2	469	do
USGS 3C	34.6	476.9	468.1	do
USGS 3D	10.2	477.7	468.9	do
USGS 5	6.3	473.4	471.5	4-25-84
USGS 6	10.3	494.8	482.8	5- 2-84
USGS 7A	10.6	498.2	486	do
USGS 7B	10.4	499.4	485.9	do
USGS 8	25.9	494.5	471	do
USGS 9	35.9	473.6	449.7	do
USGS 10	17.6	456.9	443.8	do
USGS 11A	17.1	469.8	461.8	do
USGS 11B	18.1	469.7	461.6	do
USGS 14A	17.2	473.3	463.1	do
USGS 14B	16.5	473.2	463	do
USGS 15	15.2	449.8	440.5	do
USGS 16	17.8	467.7	459.2	do
USGS 17	30.4	464.7	451.9	do
USGS 18A	19.2	464.4	455.1	do
USGS 18B	19.6	465.1	456.3	do
USGS 19	1.2	459.2	Dry	do
TW-9	14.6	483.2	479.3	do
TW-15	20.3	495.6	Dry	do
Birdsell	6.7	444.1	442.6	4-25-84
Coakley	16.3	472.1	465.2	5- 4-84
Durfey	7.5	472.7	472.1±	4-25-84
Kerfien	7.3	457.9	455.4	do
Stevens	12.4	472.5	462.4	do

Notes:

1) Field measurement by Barton & Loguidice/Oswego County personnel; see Appendices A and B.
2) See Appendices A and B for descriptions of water-level measuring points.



EXPLANATION

7 A,(B)	WELL NUMBER
463.1	WATER TABLE ELEVATION ON 5-2-84 (ft.above mean sea level)
462.4	WATER TABLE ELEVATION ON 4-25-85 (ft.above mean sea level)
———	LINE OF EQUAL WATER- TABLE ELEVATION (ft.above mean sea level, dashed where inferred)

FIGURE 4 - WATER-TABLE CONTOUR MAP, Oswego Valley Landfill, Oswego County, New York.

water. This is illustrated by the regional water-table map shown in Figure 5, which was constructed from stream elevations on USGS topographic maps.

Water levels from test wells and residential wells completed in the water-table aquifer were measured in June 1984. These data (Table 4) show a general drop in the water table of about 1/2 to 3 feet. This slight decrease did not appreciably change the water-table configuration shown in Figure 5, since the water-table contour interval selected for this figure was 10 feet.

Water levels from wells completed in the bedrock aquifer (Table 5) were used to construct the piezometric surface map shown in Figure 6. These data indicate that flow in the bedrock aquifer is toward the northeast. This is generally in agreement with the northward regional groundwater flow pattern in the bedrock discussed in published reports (Miller, 1982). Piezometeric levels measured in June 1984 (Table 6) showed a drop on the order of a foot or less, which does not change the configuration illustrated in Figure 6.

Ground water occurs in the bedrock aquifer under confined conditions, with the low-permeability lodgment till functioning as the overlying confining unit. The relative differences in water-level elevation (head) for selected adjacent pairs of water-table and bedrock wells are given in Table 7. The available water-level data show an upward hydraulic gradient (from the bedrock aquifer to the water table) at the Coakley and the landfill trailer locations, and a downward hydraulic gradient (from the water table to the bedrock aquifer) at the Durfey and D. Kerfien locations. It should

Table 4. Water-Level Elevations for Wells Completed in the Water-Table Aquifer, June 1984, Oswego Valley Landfill, Oswego County, New York.

Well Number/ Owner	Total Depth, feet below land surface	Measuring Point Elevation, feet above mean sea level	Water-Level Elevation, feet above mean sea level	Date Measured
USGS 2	13.2	484.7	471.4	6-21-84
USGS 3A	34.3	477.2	466.0	6-21-84
USGS 3B	10.8	477.2	467.6	6-21-84
USGS 3C	34.6	476.9	468.3	6-13-84
USGS 3D	10.2	477.7	468.2	6-13-84
USGS 5	6.3	473.4	469.2	6-21-84
USGS 6	10.3	494.8	482.8	6-21-84
USGS 7A	10.6	498.2	485.8	6-21-84
USGS 7B	10.4	499.4	485.5	6-21-84
USGS 8	25.9	494.5	469.9	6-21-84
USGS 9	35.9	473.6	449.2	6-21-84
USGS 10	17.6	456.9	443.4	6-13-84
USGS 11A	17.1	469.8	-	-
USGS 11B	18.1	469.7	460.9	6-21-84
USGS 14A	17.2	473.3	464.7	6-21-84
USGS 14B	16.5	473.2	464.4	6-21-84
USGS 15	15.2	449.8	440.0	6-21-84
USGS 16	17.8	467.7	457.8	6-21-84
USGS 17	30.4	464.7	450.9	6-21-84
USGS 18A	19.2	464.4	452.1	6-21-84
USGS 18B	19.6	465.1	453.0	6-21-84
USGS 19	1.2	459.2	Dry	6-21-84
TW-9	14.6	483.2	478.2	6-21-84
TW-15	20.3	495.6	470.0	6-21-84
Bridsell	6.7	444.1	442.1	6-25-84
Coakley	16.3	472.1	462.8	6-19-84
Durfey	7.5	472.7	470.2	6-20-84
Kerfien	7.3	457.9	454.5	6-19-84
Stevens	12.4	472.5	461.9	6-20-84

Notes:

1) Field measurements by Barton & Loguidice/Oswego County Personnel; see Appendices A and B.

2) See Appendices A and B for dscriptions of water-level measuring points.

Table 5. Water-Level Elevations Reported for Wells Completed in the Bedrock Aquifer,[3] March-May 1984, Oswego Valley Landfill, Oswego County, New York.

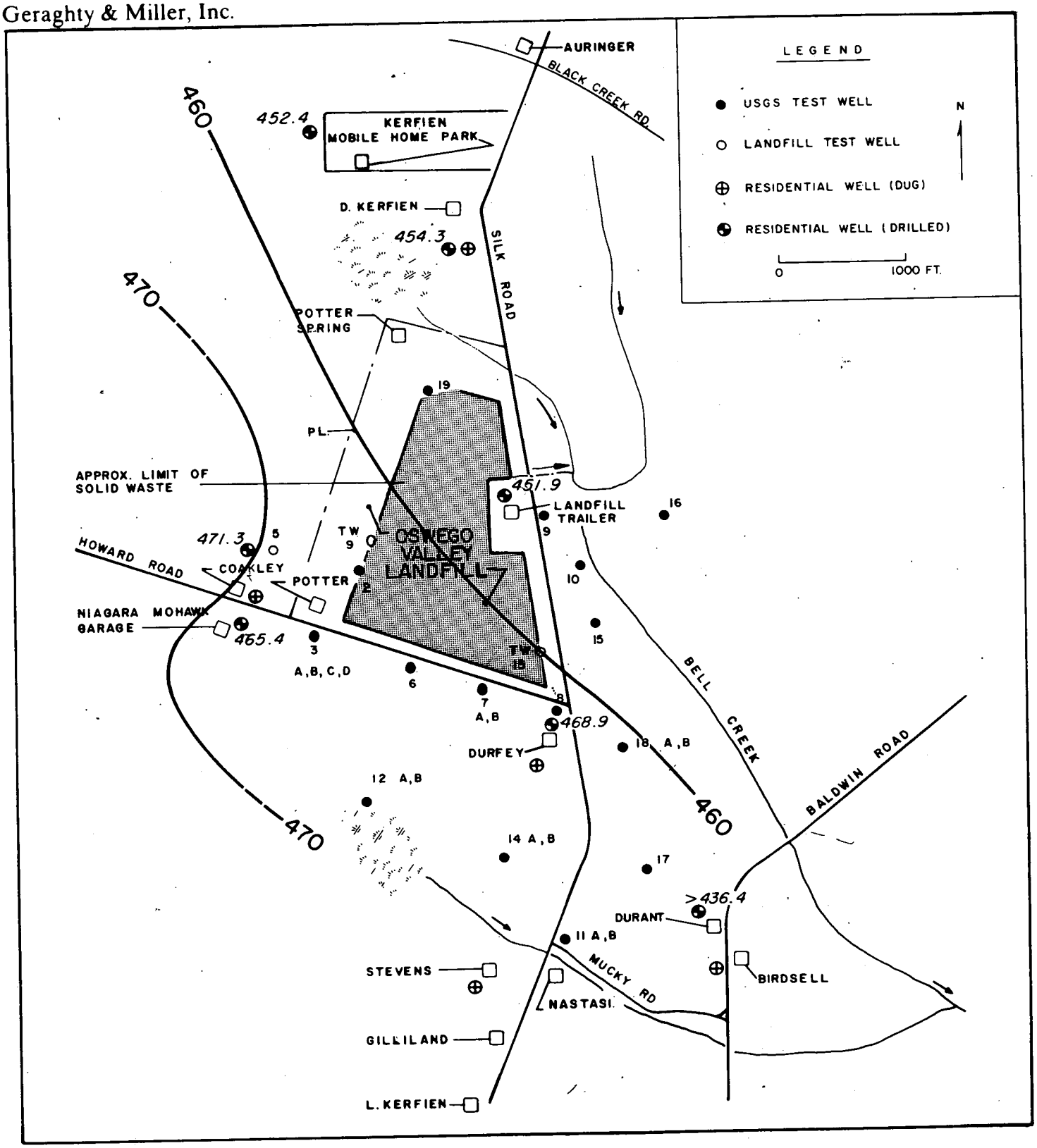
Well Number/ Owner	Total Depth,[1] feet below land surface	Measuring[2] Point Elevation, feet above mean sea level	Water-Level[1] Elevation, feet above mean sea level	Date Measured
Coakley	64±	472.6	471.3	4-25-84
Durant	29.7	436.4	>436.4	4-25-84
Durfey	69±	496.8	468.9	3-25-84
Kerfien	61±	479.1	454.3	4-25-84
Kerfien Mobile Home Park	45.9	458.2	452.4	4-24-84
Niagara Mohawk	54.8	467.9	465.4	5- 3-84
Landfill Trailer	56.0	469.9	451.8	5- 3-84

Notes:

1) Field measurement by Barton & Loguidice/Oswego County personnel; see Appendices A and B.

2) See Appendices A and B for descriptions of water-level measuring points.

3) Includes wells completed at the lodgment till/bedrock interface; based on available well completion information.



EXPLANATION

468.9 PIEZOMETRIC ELEVATION, ft.above mean sea level. (see Table 5 for dates of measurement)

LINE OF EQUAL PIEZOMETRIC ELEVATION (ft.above mean sea level, dashed where inferred)

FIGURE 6 - PIEZOMETRIC SURFACE CONTOUR MAP, Oswego Valley Landfill, Oswego County, New York.

Table 6. Water-Level Elevations Reported for Wells Completed in the Bedrock Aquifer,[3] June 1984, Oswego Valley Landfill, Oswego County, New York.

Well Number/ Owner	Total Depth,[1] feet below land surface	Measuring[2] Point Elevation, feet above mean sea level	Water-Level[1] Elevation, feet above mean sea level	Date Measured
Coakley	64±	472.6	469.5	6-21-84
Durant	29.7	436.4	>434.5	6-19-84
Durfey	69±	496.8	467.5	6-21-84
Kerfien	61±	479.1	454.1	6-19-84
Kerfien Mobile Home Park	45.9	458.2	437.7	6-19-84
Niagara Mohawk	54.8	467.9	465.3	6-20-84
Landfill Trailer	56.0	469.9	-	-

Notes:

1) Field measurement by Barton & Loguidice/Oswego County personnel; see Appendices A and B.

2) See Appendices A and B for descriptions of water-level measuring points.

3) Includes wells completed at the lodgment till/bedrock interface; based on available well completion information.

Table 7. Vertical Head Differences for Selected Adjacent Parts of Water-Table and Bedrock Wells, Oswego Valley Landfill, Oswego County, New York.

Location	Well Measured		Water-Level Elevations[1] (Date Measured)		Vertical Head Difference (feet)	Direction
	Water-Table	Bedrock	Water-Table[2]	Bedrock[3]		
Coakley	Dug well	drilled well	465.2 (5-4-84)	471.3 (4-25-84)	6.1	up
Durfey	USGS 8	drilled well	471.0 (5-2-84)	468.9 (3-25-84)	2.1	down
D.Kerfien	Dug well	drilled well	455.4 (4-25-84)	454.3[4] (4-25-84)	1.1	down
Landfill Trailer	USGS 9	drilled well	449.7 (5-2-84)	451.9 (5-3-84)	2.2	up

1) Feet above mean sea level

2) See Table 3

3) See Table 5

4) Wash being done at time of measurement

be noted that well construction details (total depth, cased interval, etc.) for these bedrock wells are not known, and accurate vertical gradients cannot be calculated. Considering the upward or slightly downward vertical gradient and the apparent low permeability of the glacial till, net downward movement of ground water from the water table into the bedrock aquifer is either not possible or is insignificant.

GROUND-WATER QUALITY

Regional Ground-Water Quality

Ground water in the unconsolidated deposits (water-table aquifer) in Oswego County is generally suitable for drinking, although excessive levels of iron, manganese, and hardness have been documented in samples from wells tapping this aquifer. Natural chloride concentrations in shallow ground water are low; however, several incidents of apparent road salt contamination due to application or storage have occurred in the County. Impacts of septic systems on shallow ground-water quality have also been documented in parts of Oswego County (McFarland Johnson Engineers, 1982).

Where Are Any Private Landfill?

Natural ground-water quality in the bedrock aquifer in Oswego County depends to a great extent on well depth and the formation tapped. A survey of wells completed in the Medina Group and the Queenston Formation (sandstones and shales), which occur beneath the glacial deposits in the area of the Oswego Valley Landfill, showed 24 percent with excessive hardness, 22 percent with excessive iron and manganese, and 20 percent with excessive hydrogen sulfide (Kantrowitz, 1970).

Historical Ground-Water Quality Data for the Oswego Valley Landfill

Ground-water quality monitoring in the vicinity of the Oswego Valley Landfill began in 1976 with testing of selected landfill and nearby residential wells, and was subsequently expanded by various parties and agencies to include a greater number of residential wells and test wells installed by the USGS. This extensive data base has been documented in the engineer-

ing report for closure (Barton & Loguidice, 1984). Based on these data, the engineering closure report concluded that although contaminants in ground water have occasionally migrated off the landfill property to the south/ southwest and east, no health risks have been detected at any of the residences surrounding the landfill from a water-quality standpoint. The New York State Health Department also stated that results to date (May 1983) do not indicate a problem with water quality at any of the homes near the landfill (Barton & Loguidice, 1984).

An extensive review of the historical quality data in the vicinity of the Oswego Valley Landfill was beyond the scope of this project; however, Geraghty & Miller, Inc's review of the ground-water quality data provided by Oswego County revealed notable patterns in the overall historical monitoring data. A major problem was the use of certain indicator parameters (chloride, iron, manganese, and specific conductance) to interpret water-quality data and impacts associated with the landfill. Due to the levels of these constituents attributed to natural ground-water quality, road salting, and/or septic systems in Oswego County (McFarland-Johnson Engineers, 1982), it is not advisable to utilize these constituents as landfill leachate indicator parameters.

Samples from residential wells show sporadic traces of organic compounds, some of which were later attributed to chlorination of raw water. A number of residential wells failed bacterial tests, possibly due to faulty well covers or septic systems. Detectable organic compounds and elevated levels of selected inorganic constituents in water samples from

residential wells are not diagnostic of contamination from the landfill. Samples from test wells within 500 feet of the landfill indicate probable migration of contaminated ground water from the landfill toward the east (Well USGS 10) and the south/southwest (Wells USGS 3 and 6).

Current Ground-Water Quality Data

The March 1984 results of the ongoing Oswego Valley Landfill quarterly monitoring program were the most recent data available for review. These data are summarized in Table 8, and copies of the laboratory reports are included in Appendix C.

The March 1984 data provide information on the quality of water in the landfill sump and in selected nearby residential and monitoring wells. Based on these data, the quality of the leachate can be characterized by indicator parameters such as alkalinity, hardness, COD, ammonia nitrogen, TOC, and methyl ethyl ketone. Chloride is commonly used as a leachate indicator, but an interpretation based on chloride can be difficult because of many potential chloride sources in the area. Using the indicators mentioned above, it appears that Wells USGS 3C and 10 are contaminated, and that the contamination may have originated at the landfill. There is some indication that Well USGS 3D is also contaminated.

WHAT Sources?

The most commonly occurring organic compound was toluene; it appeared at low levels (86 ug/L) in the sump, and at levels ranging from 12 to 76 ug/L at four other locations, including Wells USGS 3C and 10. Trace amounts (12 ug/L) were found in the wells at the Kerfien Mobile Home Park

Table 8. Summary of Ground-Water Quality Data Collected in March 1984, Oswego Valley Landfill, Oswego County, New York.

Parameter/Unit	Kerfein Mobile Home Park	Stevens	Niagara Mohawk	Coakley (dug well)	Durant
Alkalinity, mg/L	150	56	182	244	152
BOD_5, mg/L	<0.5	<0.5	<0.5	<0.5	<0.5
COD, mg/L	2.8	<1.0	4.4	3.2	<1.0
Chloride, mg/L	62	10	22	18	25
Specific Conductance, mg/L	385	140	405	510	410
Hardness, mg/L	156	72	184	236	168
Ammonia Nitrogen, mg/L	0.2	0.05	0.15	0.11	0.17
Nitrate, mg/L	0.47	0.66	<0.04	0.41	<0.04
Nitrite, mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
pH, units	7.6	8	7.4	7.3	7.4
Phenol, mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Total Phosphate, mg/L	<0.05	0.05	<0.05	<0.05	<0.05
Total Dissolved Solids, mg/L	248	100	268	360	276
Sulfate, mg/L	25.1	12.6	18.5	22.3	26.6
Total Organic Carbon, mg/L	<3.0	<3.0	<3.0	<3.0	<3.0
Iron, mg/L	0.05	0.01	1.4	0.08	0.3
Manganese, mg/L	0.03	0.02	0.27	0.02	0.24
Zinc, mg/L	0.06	0.06	0.1	0.12	0.1
Fecal Coliform, colonies/ 100 mL	<1	<1	<1	<1	<1
Total Coliform, colonies/ 100 mL	1	3	<1	<1	2
Acrolein, ug/L	<1,000	<1,000	<1,000	<1,000	<1,000
Acrylonitrite, ug/L	<1,000	<1,000	<1,000	<1,000	<1,000
Benzene, ug/L	<10	<10	<10	<10	<10
Toluene, ug/L	12	<10	12	<10	<10
Ethylbenzene, ug/L	<10	<10	<10	<10	<10
Carbon Tetrachloride, ug/L	<10	<10	<10	<10	<10
Chlorobenzene, ug/L	<10	<10	<10	<10	<10
1,2-dichloroethane, ug/L	<10	<10	<10	<10	<10
1,1,1-trichloroethane, ug/L	<10	<10	<10	<10	<10
1,1-dichloroethane, ug/L	<10	67	<10	<10	<10
1,1-dichloroethylene, ug/L	<10	<10	<10	<10	<10
1,1,2-trichloroethane, ug/L	<10	<10	<10	<10	<10
1,1,2,2-tetrachloroethane, ug/L	<10	<10	<10	<10	<10
Chloroethane, ug/L	<10	<10	<10	<10	<10
2-chloroethyl vinyl ether, ug/L	<10	<10	<10	<10	<10
Chloroform, ug/L	<10	<10	<10	<10	<10
Cis 1,3-dichloropropylene, ug/L	<10	<10	<10	<10	<10
Trans 1,3-dichloropropylene, ug/L	<10	<10	<10	<10	<10
Methylene Chloride, ug/L	<10	<10	<10	<10	<10
Methyl Chloride, ug/L	<10	<10	<10	<10	<10
Methyl Ethyl Ketone, ug/L	<10	<10	<10	<10	<10

Table 8. (Cont'd.)

Parameter/Unit	Landfill Sump	Birdsell	USGS 3C	USGS 3D	USGS 10
Alkalinity, mg/L	7,625	48	526	360	353
BOD_5, mg/L	480	<0.5	810	<0.5	9.9
COD, mg/L	1,550	2	980	24.4	56
Chloride, mg/L	680	13.5	103	72	180
Specific Conductance, mg/L	14,000	195	1,400	900	1,350
Hardness, mg/L	3,200	48	768	428	500
Ammonia Nitrogen, mg/L	895	<0.04	0.22	0.11	1.25
Nitrate, mg/L	<0.04	4.6	<0.04	1.83	<0.04
Nitrite, mg/L	0.02	<0.02	<0.02	<0.02	<0.02
pH, units	7.5	6.5	7.4	7	6.7
Phenol, mg/L	0.456	<0.010	0.341	<0.010	0.014
Total Phosphate, mg/L	2.29	<0.05	<0.05	0.32	0.13
Total Dissolved Solids, mg/L	7,918	100	1,257	676	895
Sulfate, mg/L	66.3	18.2	<2.0	93.1	15.8
Total Organic Carbon, mg/L	300	<3.0	373	35.5	39
Iron, mg/L	17	0.14	11	9.1	39
Manganese, mg/L	0.12	0.05	0.52	1.1	3.7
Zinc, mg/L	0.32	0.29	0.1	0.16	1.4
Fecal Coliform, colonies/ 100 mL	<1	<1	<1	<1	<1
Total Coliform, colonies/ 100 mL	20	<1	<1	<1	<1
Acrolein, ug/L	<1,000	<1,000	<1,000	<1,000	<1,000
Acrylonitrite, ug/L	<1,000	<1,000	<1,000	<1,000	<1,000
Benzene, ug/L	12	<10	<10	<10	<10
Toluene, ug/L	84	<10	76	<10	24
Ethylbenzene, ug/L	38	<10	<10	<10	<10
Carbon Tetrachloride, ug/L	<10	<10	<10	<10	<10
Chlorobenzene, ug/L	<10	<10	<10	<10	<10
1,2-dichloroethane, ug/L	<10	<10	<10	<10	<10
1,1,1-trichloroethane, ug/L	<10	<10	<10	<10	<10
1,1-dichloroethane	<10	<10	<10	<10	<10
1,1-dichloroethylene, ug/L	<10	<10	<10	<10	<10
1,1,2-trichloroethane, ug/L	<10	<10	<10	<10	<10
1,1,2,2-tetrachloroethane, ug/L	<10	<10	<10	<10	<10
Chloroethane, ug/L	<10	<10	<10	<10	<10
2-chloroethyl vinyl ether, ug/L	<10	<10	<10	<10	<10
Chloroform, ug/L	<10	<10	<10	<10	<10
Cis 1,3-dichloropropylene, ug/L	<10	<10	<10	<10	<10
Trans 1,3-dichloropropylene, ug/L	<10	<10	<10	<10	<10
Methylene Chloride, ug/L	<10	<10	<10	<10	<10
Methyl Chloride, ug/L	<10	<10	<10	<10	<10
Methyl Ethyl Ketone, ug/L	4,100	<10	1,900	50	-

Table 8. (Cont'd.)

Parameter/Unit	Kerfien (dug well)	Kerfien (drilled well)	Durfey (dug well)
Alkalinity, mg/L	74	124	220
BOD_5, mg/L	<0.5	<0.5	<0.5
COD, mg/L	<1.0	<1.0	3.6
Chloride, mg/L	36	21	21
Specific Conductance, mg/L	300	325	445
Hardness, mg/L	112	132	220
Ammonia Nitrogen, mg/L	0.07	0.08	<0.04
Nitrate, mg/L	1.1	0.07	0.49
Nitrite, mg/L	<0.02	<0.02	<0.02
pH, units	6.7	7.6	7.4
Phenol, mg/L	<0.010	<0.010	<0.010
Total Phosphate, mg/L	<0.05	<0.05	0.05
Total Dissolved Solids, mg/L	200	216	280
Sulfate, mg/L	8.7	17.7	6.9
Total Organic Carbon, mg/L	<3.0	<3.0	<3.0
Iron, mg/L	0.26	0.17	0.11
Manganese, mg/L	0.04	0.02	0.01
Zinc, mg/L	0.13	0.04	0.47
Fecal Coliform, colonies/ 100 mL	<1	<1	<1
Total Coliform, colonies/ 100 mL	<1	<1	<1
Acrolein, ug/L	<1,000	<1,000	<1,000
Acrylonitrite, ug/L	<1,000	<1,000	<1,000
Benzene, ug/L	<10	<10	<10
Toluene, ug/L	<10	<10	<10
Ethylbenzene, ug/L	<10	<10	<10
Carbon Tetrachloride, ug/L	<10	<10	<10
Chlorobenzene, ug/L	<10	<10	<10
1,2-dichloroethane, ug/L	<10	<10	<10
1,1,1-trichloroethane, ug/L	<10	<10	<10
1,1-dichloroethane	<10	<10	<10
1,1-dichloroethylene, ug/L	<10	<10	<10
1,1,2-trichloroethane, ug/L	<10	<10	<10
1,1,2,2-tetrachlorothane, ug/L	<10	<10	<10
Chloroethane, ug/L	<10	<10	<10
2-chloroethyl vinyl ether, ug/L	<10	<10	<10
Chloroform, ug/L	<10	<10	<10
Cis 1,3-dichloropropylene, ug/L	<10	<10	<10
Trans 1,3-dichloropropylene, ug/L	<10	<10	<10
Methylene Chloride, ug/L	<10	<10	<10
Methyl Chloride, ug/L	<10	<10	<10
Metnyl Ethyl Ketone, ug/L	<10	<10	<10

and Niagara Mohawk. The 12 ug/L values are of minimal significance because of their closeness to the detection limit. 1,1-dichloroethane was reported in the Stevens Well (67 ug/L). This compound was not reported in the landfill sump, nor are the landfill indicators at high levels in the Stevens Well. We do not believe the 1,1-dichloroethane reported in the Stevens Well can be attributed to the landfill. A resampling of three wells (Kerfien Mobile Home Park, Niagara Mohawk, and Stevens) in May 1984, analyzed by two independent laboratories, showed all volatile organic compounds below the detection limits. These data are included in Appendix D.

Adequacy of the Existing Ground-Water Monitoring Network

Although the test wells sampled in the vicinity of the Oswego Valley Landfill provide indications of contaminant migration away from the landfill, the existing network of test wells and residential wells is not sufficient to allow a complete definition of landfill impacts on the ground-water system. As noted in the previous discussion of the water-table contour map (Figure 4), wells are not available to define ground-water movement to the north and northeast, away from the landfill. In addition, sampling points do not exist downgradient of test wells where ground-water contamination has already been detected, a situation which does not allow the extent of contamination to be determined. These data needs are addressed in the section of this report which describes the proposed ground-water monitoring program for the Oswego Valley Landfill.

INFLUENCE OF THE PROPOSED LANDFILL CLOSURE PROGRAM ON GROUND-WATER QUALITY

The proposed closure program for the Oswego Valley Landfill involves construction of physical improvements to the landfill area, including a landfill cap, drainage control, gas control and recovery, vegetative cover, and leachate management (Barton & Loguidice, 1984). The top of the southern landfill area will be graded and capped with a PVC liner to eliminate percolation of precipitation into the underlying refuse. Drainage channels will be contoured into the PVC surface to promote controlled runoff of storm water, and the liner will be covered with a glacial till layer capable of supporting vegetative cover. The remaining landfill area (side slopes and terraces) will be capped with compacted glacial till and a vegetative cover to promote controlled surface water runoff.

Leachate will be collected from the existing bottom drainage system, which leads to a concrete storage tank. Leachate will be transported off site by truck to an appropriate wastewater treatment facility. Water balance calculations for the capped landfill result in a theoretical reduction in leachate generation of 90 percent, which corresponds to an expected leachate production of 16,000 to 20,000 gallons per year (Barton & Loguidice 1984).

The proposed landfill cap is designed to prevent infiltration of precipitation into the landfill and to stop leachate generation. The landfill is situated atop a ground-water and surface-water divide, with radial ground-water flow (Figures 4 and 5). Since the site is located on a divide

(ground-water recharge area), precipitation is the only source of input to the ground-water system, and lateral inflow of ground-water through the landfill from adjacent areas does not occur. Eliminating precipitation infiltration (recharge) over the fill area would cause the mounded water table beneath the landfill to decline, thus reducing or eliminating leachate generation and movement of leachate-contaminated ground water away from the landfill. Reduction in leachate production and decline of water-table head levels adjacent to the landfill resulting from the landfill capping, should be monitored over time to verify these predictions.

not necessarily so.

PROPOSED GROUND-WATER MONITORING PROGRAM

Based on our review of the available hydrogeologic and ground-water quality data, we have developed the following ground-water monitoring program for the Oswego Valley Landfill:

Task 1. Secure and Redevelop Selected Existing Test Wells

It is recommended that existing test wells be secured with proper surface seals and locking steel protector pipes. In addition, these wells should be redeveloped by pumping (airlift, centrifugal pump) or bailing to assure that the well screens open to the water-bearing formation. The recovery rate of each well, in response to pumpage, should be recorded for future reference, as was done for the new Bristol Hill Landfill ground-water monitoring program. In addition, deficiencies in the existing monitoring well data base (well logs, field measurements, etc.) should be addressed. It is suggested that the USGS be contacted regarding access to their wells and additional well construction information which may be available. Existing test wells to be secured and redeveloped are itemized in Table 9, and procedures for these activities are included in Appendix E. If an evaluation of well construction data indicates adjacent cluster wells to be redundant, it may be adviseable to select one well of the cluster for securing and redevelopment.

Task 2. Install Additional Monitoring Wells

Our data review indicates that the impacts of the Oswego Valley Landfill on ground water cannot be determined by the existing network of test

Table 9. Test Wells to be Secured and Redeveloped for Task 1, Oswego Valley Landfill, Oswego County, New York.

USGS Wells	Landfill Test Wells
2	9
3A,B,C,D	15
5	
6	Residential Wells
7A,B	Coakley (drilled)**
8	
9	
10*	
11A,B	
12A,B+	
14A,B	
15	
16*	
17*	
18A,B*	
19	

* Need well log and construction details

\+ Need field measurement of total depth and casing stick-up

** Secure open casing; no development necessary

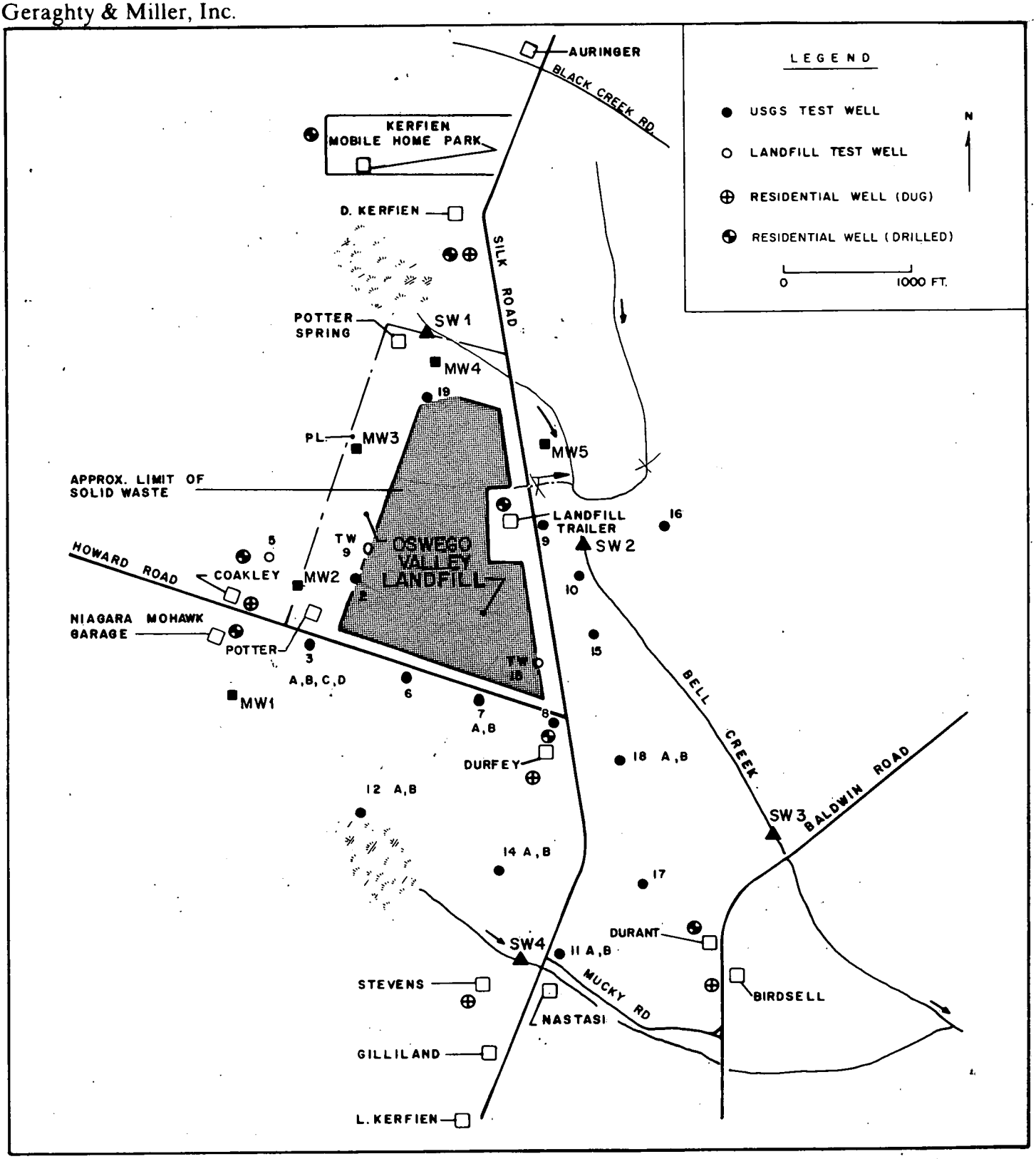
wells and residential wells. Additional wells are required to provide water levels and ground-water quality data around the landfill. It is recommended that monitoring wells be installed at the six locations shown in Figure 7. These well locations were selected to supplement the existing ground-water monitoring network of test wells and residential wells by providing water-level and water-quality data at key points in the vicinity of the landfill. Depending upon hydrogeologic conditions encountered, it may be necessary to install clusters of two wells each at the MW1 and MW2 locations, in order to adequately monitor the entire saturated thickness of the water-table aquifer. Specifications for monitoring well installation are included in Appendix F.

Task 3. Install Surface Water Stations.

Four surface-water stations are proposed at the locations shown in Figure 9. These stations will provide water-level and water-quality data at consistent points along key streams in the vicinity of the landfill. Specifications for installation of these surface-water stations are included in Appendix G.

Task 4. Survey Selected Monitoring Stations

The monitoring wells and surface-water stations installed during Tasks 2 and 3 should be accurately located and leveled in by a qualified land surveyor. In addition, key existing monitoring stations should also be surveyed. Table 10 lists monitoring points to be surveyed during this task. Vertical elevations should be surveyed to the nearest 0.1 foot with respect



EXPLANATION

- PROPOSED MONITORING WELL
- PROPOSED SURFACE-WATER STATION

FIGURE 7 - LOCATIONS OF PROPOSED MONITORING WELLS AND SURFACE-WATER STATIONS, Oswego County Landfill, Oswego County, New York.

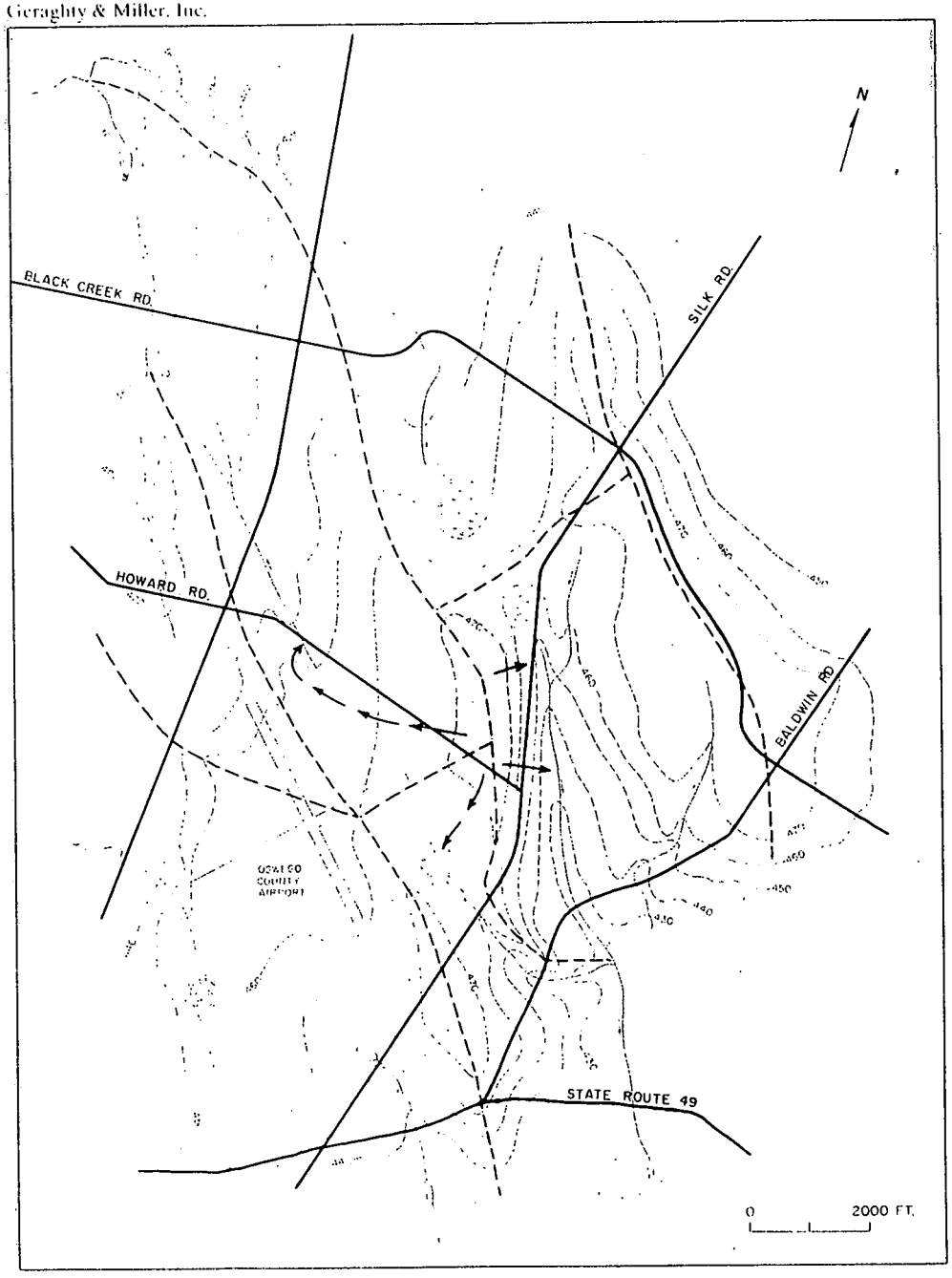
Table 10. Monitoring Stations to be Surveyed for Task 4, Oswego Valley Landfill, Oswego County, New York.

New Monitoring Wells:	MW 1,2,3,4,5
New Surface Water Stations:	SW1,2,3,4
Existing Monitoring Wells:	USGS 12A,B
Other Existing Points:	Landfill Sump

Table 11. Monitoring Stations to be Measured/Sampled for Task 5, Oswego Valley Landfill, Oswego County, New York.

USGS Wells	Monitoring Wells	Residential Wells
2	MW1	Birdsell
3C,D (PVC)	MW2	Coakley (dug)
5	MW3	Coakley (drilled)
6	MW4	Durant
7B (PVC)	MW5	Durfey (dug)
8		Durfey (drilled)
9	Surface Water Stations	D. Kerfien (dug)
11A (PVC)		D. Kerfien (drilled)
12A (PVC)	SW1	Kerfien Mobile Home Park
14A (PVC)	SW2	Niagara Mohawk
15	SW3	Stevens
16	SW4	Landfill Trailer
17		
18B (PVC)		
19		Other
		Landfill Sump
Landfill Test Wells		Leachate Pump Station
9		
15		

Note: Water Levels to be measured at all monitoring stations and converted to elevations.



EXPLANATION

STREAM AND FLOW DIRECTION

DIRECTION OF HORIZONTAL GROUNDWATER FLOW

GROUNDWATER DIVIDE (WATER-TABLE AQUIFER)

LINE OF EQUAL WATER-TABLE ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (BASED ON STREAM LEVEL ELEVATIONS)

VOLNEY LANDFILL

FIGURE 5 - MAP SHOWING WATER-TABLE AQUIFER AND GROUNDWATER DIVIDES, BASED ON USGS TOPOGRAPHIC MAPS

VOLNEY LANDFILL, Oswego County, NY

Table 12. Water-Quality Parameters for Task 5, Oswego Valley Landfill, Oswego County, New York.

Alkalinity

Ammonia Nitrogen

COD

Total Hardness

TDS

TOC

Methyl Ethyl Ketone

Specific Conductance*

pH*

Temperature*

needed
iron heavy metals
mn
chlorides
~~bacteria~~
phenols
PCP's
Cyanide
Total Organics
~~Alkalinity~~

* Measured in the field at the time of sampling

Table 13. Preliminary Ground-Water Monitoring Program, Oswego Valley Landfill, Oswego County, New York.

Quarterly Ground-Water Monitoring
(3 times per year)

Stations

Wells: MW1,2,3,4,5; USGS 7B,10,18B; Coakley (dug), Durfey (dug)

Surface Water Stations: SW1,2,3,4

Other: Landfill sump

Water-Level Measurements: all available points (See Table 9)

Parameters

alkalinity, ammonia nitrogen, COD, total hardness, TDS, TOC, methyl ethyl ketone, specific conductance, pH, temperature

Annual Ground-Water Monitoring

Stations

Wells: same as quarterly; plus Birdsell, Durant, D. Kerfien (dug), D. Kerfien (drilled), Kerfien Mobile Home Park, Niagara Mohawk, Stevens

Surface Water Stations: same as quarterly

Other: same as quarterly

Water-Level Measurements: same as quarterly

Parameters

Same as quarterly; plus volatile organic compounds (+ need Halog. Organics PCE)

wells and residential wells. Additional wells are required to provide water levels and ground-water quality data around the landfill. It is recommended that monitoring wells be installed at the six locations shown in Figure 7. These well locations were selected to supplement the existing ground-water monitoring network of test wells and residential wells by providing water-level and water-quality data at key points in the vicinity of the landfill. Depending upon hydrogeologic conditions encountered, it may be necessary to install clusters of two wells each at the MW1 and MW2 locations, in order to adequately monitor the entire saturated thickness of the water-table aquifer. Specifications for monitoring well installation are included in Appendix F.

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Four surface-water stations are proposed at the locations shown in Figure 7. These stations will provide water-level and water-quality data at consistent points along key streams in the vicinity of the landfill. Specifications for installation of these surface-water stations are included in Appendix G.

Task 4. Survey Selected Monitoring Stations

The monitoring wells and surface-water stations installed during Tasks 2 and 3 should be accurately located and leveled in by a qualified land surveyor. In addition, key existing monitoring stations should also be surveyed. Table 10 lists monitoring points to be surveyed during this task. Vertical elevations should be surveyed to the nearest 0.1 foot with respect

Vertical elevations should be surveyed to the nearest 0.1 foot with respect to mean sea level datum (National Geodetic Vertical Datum of 1929). Horizontal locations should be determined with enough accuracy to allow plotting on a site base map.

During the course of our data analysis, several discrepancies (stream channels, houses) were noted between the page-sized landfill base map and the USGS topographic map. It is suggested that an up-dated site base map be prepared, based on the most recent USGS topographic maps and landfill plot plans. This map should correctly depict landfill property boundaries, stream channels, houses, roads, and monitoring stations.

Task 5. Collect a Complete Round of Water-Level and Water-Quality Data

Subsequent to completion of Tasks 1 through 4, a complete round of hydrogeologic data should be collected at monitoring stations associated with the Oswego Valley Landfill. Monitoring stations to be measured/sampled are given in Table 11, and water-quality parameters to be tested are shown in Table 12. These water-quality parameters were selected as appropriate indicators of landfill leachate contamination, as previously discussed in this report. Sampling procedures for monitoring stations are included in Appendix G.

Task 6. Evaluate Data, Complete Supplemental Report, and Prepare Final Ground-Water Monitoring Program

Data collected during Tasks 1 through 5 should be evaluated to update the geologic data base and water-table map, and to determine the extent of ground-water contamination in the vicinity of the landfill. Based on this

evaluation, the final ground-water monitoring program for the Oswego Valley Landfill will be prepared.

In order to aid Oswego County in estimating future levels of effort and costs, we have prepared a preliminary ground-water monitoring program for the Oswego Valley Landfill based on our evaluation of the current data base. The wells to be sampled and parameters to be analyzed for this preliminary program are included in Table 13.

Task 7. Data Management

Geologic, water-level, and water-quality data collected during the landfill closure period should be consistently recorded, tabulated and filed for future reference. The existing test well and domestic well record data base compiled by Barton & Loguidice should be maintained and updated as the closure program progresses. It is our understanding that the analytical laboratory which currently performs the water analysis for the ongoing monitoring program offers a computerized data management system. This system should be interfaced with a consistent field sampling protocol to assure all sampling data (well volumes evacuated, field parameters tested, chain of custody records, analytical results, etc.) are recorded and readily retrievable for future reference. The extensive, currently existing ground-water quality data base should be maintained by Barton & Loguidice in a format conducive to convenient future reference.

Respectfully submitted,

GERAGHTY & MILLER, INC.

Robert A. Saar
Senior Scientist

Michael R. Warfel
Senior Scientist

Frits van der Leeden
Vice President

August 31, 1984

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APPENDIX A

DATA SHEETS FOR TEST WELLS

OSWEGO VALLEY LANDFILL

OSWEGO COUNTY, NEW YORK

NO WELL INSTALLED

Site # Volney #1 Date 9/12/79

Location-Volney landfill, 775' north of intersection of Silk Rd. & Howard Rd, Approx. 30' east from centerline of Silk Road.

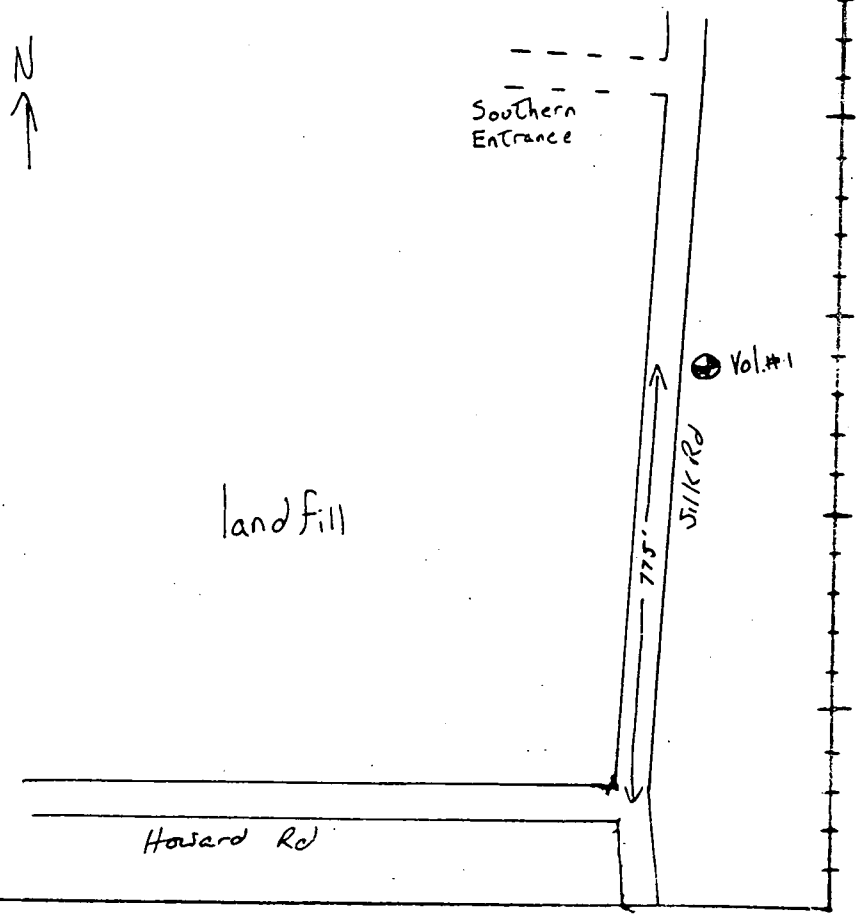
Sample	Remarks	Strat.	Geologic Description
	0-1'		Roadfill-determined by visual obs. of topography-probably local gravel was bulldozed for grading. Sandy gravel w/occasional cobbles.
	No recovery		Augers like gravel
			Gravel, brown, loose f.-m. gravel w/some c. sand 15-20% dominantly green Osw. ss pebbles w/some red Queenston-Medina pebbles, no smell, rare crystalline.
	No smell		Sandy gravel, f-c. pebbles w/occasional cobble, m-c. sand 40-50%, rough pebble count Osw. ss =48% Queen-Medina=20% Black-siltstone =20% Crystalline =12%
			Sandy gravel, no smell - same as above
			Sandy gravel, grading into coarser gravel- m-c. sand ≈ 20% rd-subrd gravel. No smell.
			Sandy gravel, f-m. pebbles, occasional c. pebble, m-c. sand ≈ 30% No smell.
			Sandy gravel-f-m. pebbles, round, sand 15-20% Smell of leachate from landfill.
			Sandy gravel, f.-c. pebbles, m.-c. sand, rd-subrd, a red coating on pebbles appears to be red sand grains smeared on the surface. Smell of leachate.

Site # Volney #1 cont'd

Date

Location-

Sample	Remarks	Strat.	Geologic Description
	Hit water @ 47'		gravel w/some sand, wet but not sat'd., f-c.pebbles Occasional cobble.
	51-52'		Olive-gray brown-f.sand, well sorted, mostly Qtz 99%-1% blackgrains wet
	52-52.5'		Silt, yellow brown-feels dry, well sorted
	52.5-53'		Gravel w/some sand, f.c.pebbles, occasional cobble, tr.silt, f.s. damp, smell of leachate
			Till, red, silty/f.s.matrix, compact, pebbles to cobbles, dry.
			Bottom of hole
			No screen set.



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

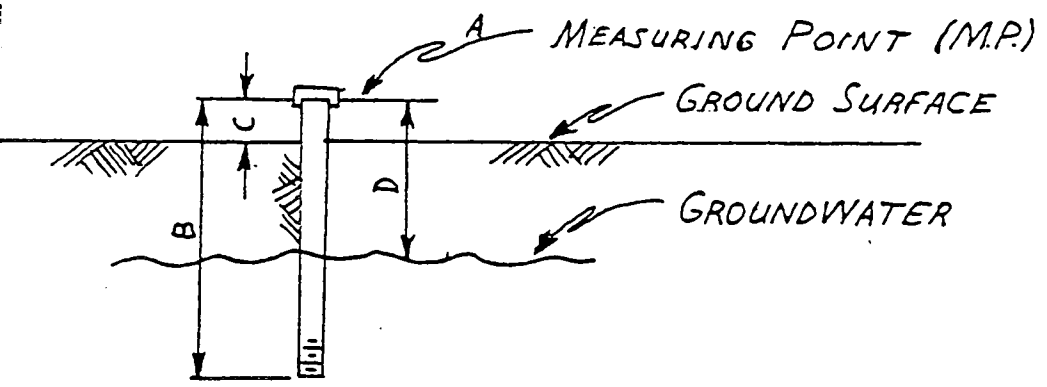
Well I.D.: USGS #2 Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 484.7 FT. Well Length (B): 14.5 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.3± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	11 AM	11.2 FT.	473.5 FT.	
4/21/84	12 AM	13.3 FT.	471.4 FT.	



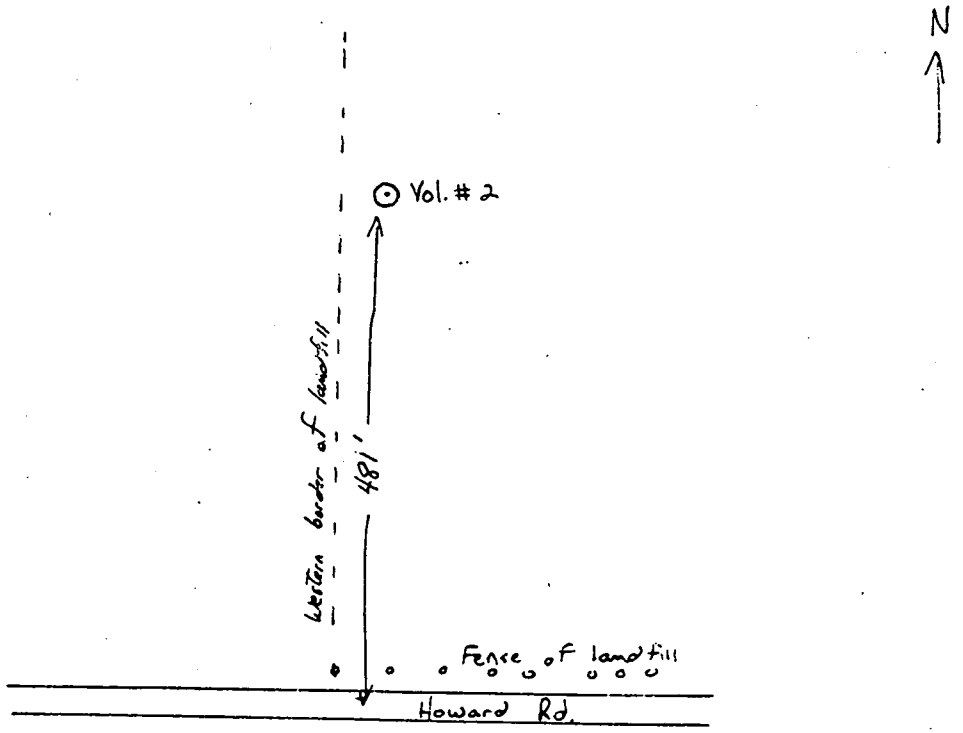
Site # Volney #2

Date 9/12/79

Location- 481' north of Howard Rd., along western boundary of Volney landfill

Sample	Remarks	Strat.	Geologic Description
	0-1.0'		Fill, from landfill operation, poorly sorted sand & gravel, probably reworked till, dominantly red qtz. grains, little or no leachate smell, occasional cobble & boulders.
			Auger bringing up gravel, m. pebbles, rd., loose (beach).
	No Recovery		Auger bringing up sand, olive-gray, f.s., loose (lacustrine).
	12.0'-14.0'		Till, red, v.f.s.-f.s. matrix, dominantly red Qtz. grains, low-mod. compactness, which is typical of the top couple of feet of lodgment till, saturation & weathering loosens the till, damp, some leachate smell, pebble to cobble clasts.
	17.0'-19.0'		Till, red, v.f.s.-f.s. matrix, dry, very compact. No leachate smell.

Bottom of hole at 19.0'
Installed well
2" dia. well screen, 60 gauze, stainless steel
3.5' long
Bottom of screen at 14.0' below LSD
Top of screen at 11.5' below LSD
Used 2" black iron pipe.



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

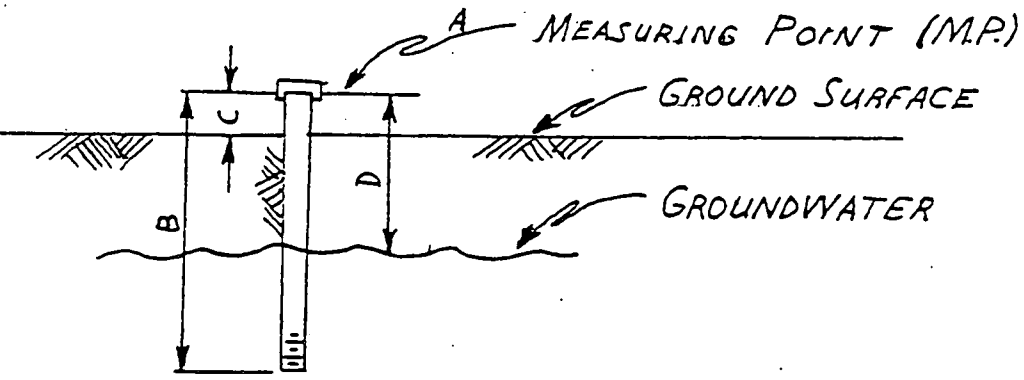
Well I.D.: USGS #3A (SOUTHERN WELL) Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 477.2 FT. Well Length (B): 37.1 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.8± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
1/25/84	2 PM	7.8 FT.	469.4 FT.	NO ODOR.
2/2/84	3 PM	8.2	469.0	
2/21/84	1 PM	11.2 FT.	466.0 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

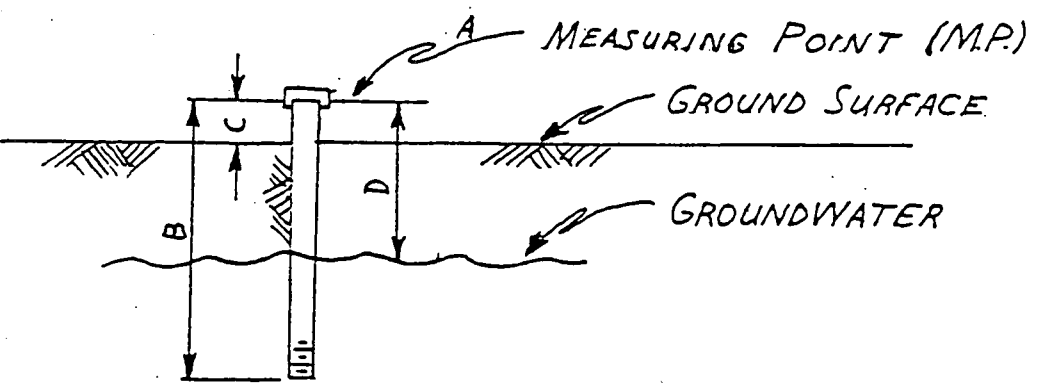
Well I.D.: USGS #3B (NORTHERN WELL) Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 477.2 FT. Well Length (B): 13.6 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.8 ± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
1/25/84	2 PM	8.1 FT.	469.1 FT.	NO ODOR.
2/2/84	3 PM	8.2	469.0	
2/21/84	1 PM	9.6 FT.	467.6 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

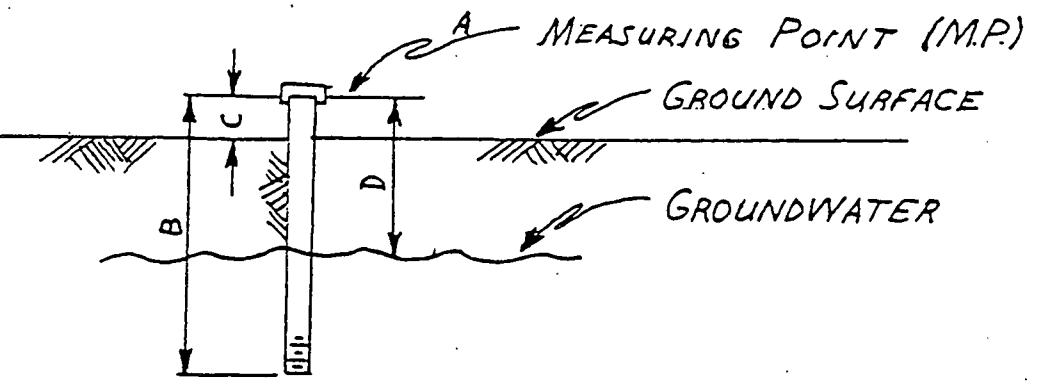
Well I.D.: USGS #3C PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 476.9 FT. Well Length (B): 37.0 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.4± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/25/84	2PM	7.4 FT.	469.5 FT.	PACKING AROUND CASING OPEN TO DEPTH OF 13 FT. BELOW GROUND SURFACE - NO ODOR.
5/2/84	3 PM	8.8 FT.	468.1	
5/13/84	11:30AM	8.6	468.3 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

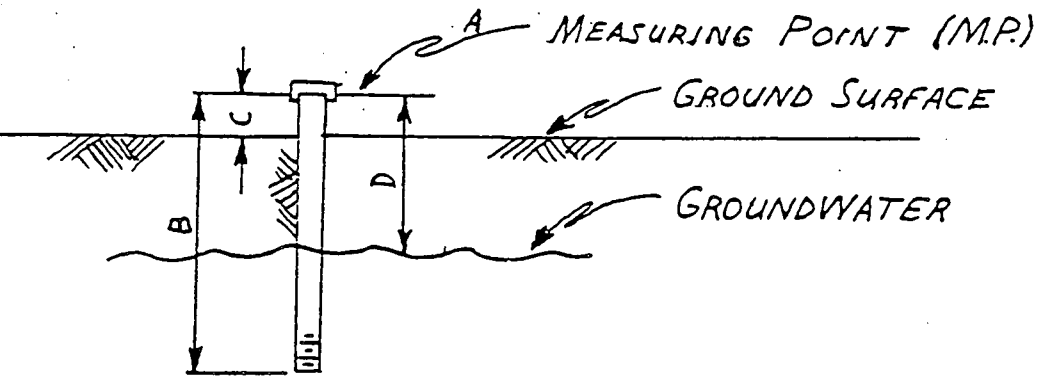
Well I.D.: USGS #3D / PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 477.7 FT. Well Length (B): 13.6 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 3.4± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/25/84	2 PM	8.4 FT.	469.3 FT.	PACKING AROUND CASING OPEN TO DEPTH OF 13 FT. BELOW GROUND SURFACE. N. ODOR.
5/2/84	3 PM	8.8	468.9	
5/13/84	11:30 PM	9.5 FT.	468.2 FT.	



Site # Volney #3 Date 10/3/79

Location- 23' south of centerline of Howard Rd., opposite Potter House

Sample	Remarks	Strat.	Geologic Description
			Cobbles, loose, subrd.-rd.-clean, dry (Beach?)
	2-4'		Gravel, brown, w/≈ 15% sand, pebble to cobble size (2-3" diam) loose, clasts are either green Osw. s.s. or red Queenston-medium s.s., no smell of leachate. (Beach deposit?).
	Hit water 7.0'-9.0'		Sandy cobble gravel, brown, f.-m. sand, coarse cobbles, sat'd., strong landfill leachate smell (beach deposit).
			Loud scraping noises stop - probably sand.
	12.0-14.0'		Sand, brown, f.-m., well sorted, sat'd., strong landfill leachate smell (lacustrine).
	17.0-19.0'		Sand, brown, f.s., well sorted, 95% clear or greenish grains, 3% black, 2% red, saturated, some smell of leachate.
	22.0-24.0'		Sand-same as above-some smell of leachate.
	27.0-28.0'		Pebbly sand, brown, m.-c.-sand, f.pebbles, 92% clear or green Qtz. grains, 4% red, 4% black, wet, subrd. faint or no smell of leachate (lacustrin
	28.-29.0'		Sand, olive brown, trace silt, v.f.s., 92% green Qtz., 4% red Qtz, 4% black, sat'd., little or no smell, well sorted (lacustrine).
	32.0-34.0'		sand, olive brown, f.-m. sand, sorted, subrd.-rd., 90% green Qtz. 5% red Qtz, 5% black shale grains, sat'd, little or no smell (lacustrine).
	37.0-39.0'		Till, gray, v.f.s.-f.s. matrix w/f.-c. pebble clasts, mushy-probably due to saturation, low-med, compactness, relatively impermeable, little or no smell of leachate. Pebbles dominantly black shale or green Osw. ss.
	42.0-44.0'		Till, red, silty-v.f.s., matrix w/pebble-cobble clasts, sat'd., mod. compt., dominantly Osw. s.s. clasts, little or no leachate smell.

Site # Volney #3 cont'd Date

Location-

Sample	Remarks	Strat.	Geologic Description
[redacted]	47.0-49.0		Till, red, silty-f.s. maxtrix w/pebble-cobble clasts, sat'd., compt. red Qtz. grains ≈ 50%, green Qtz ≈ 45%, & blackish ≈ 5%, little or no smell, larger than sand size is dominantly gr. Osw. ss w/occas red Queenston-Medina ss clasts.

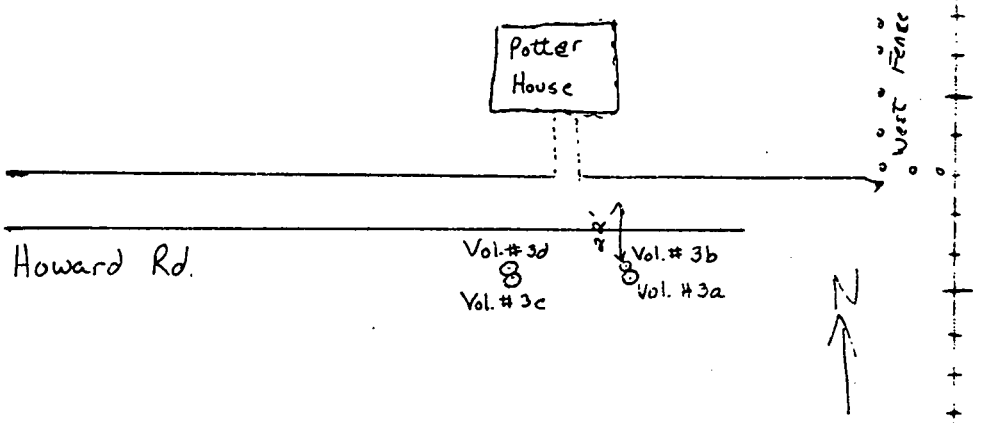
Bottom of hole at 49.0'
Installed 4 wells: 3a - iron pipe - deep
3b - iron pipe - shallow
3c - pvc pipe - deep
3d - pvc pipe - shallow

Well 3a - 2" dia. well screen, galvanized, 60 gauze, 2.5' long
Pipe = 2.5' 2" dia. black iron pipe
21.0' 2" dia. black iron pipe
10.5' 2" dia. black iron pipe
34.0'
+ 3.0' 2" dia. screen
37.0'
Pipe above LSD=3.0'
Bottom of screen at 34.0' below LSD

Well 3b - 2" dia. stainless steel screen, 60 gauze, 2.5' long
Pipe 10.5' 2" dia. black iron pipe
3.0' 2" dia. screen
13.5'
Pipe above LSD=3.3'
Screened interval=10.0-7.5' below LSD

Well 3c - 2" dia. pvc. screen, 10 slot, 1.5' long
Bottom of screen set at 34.5'
Screened interval = 34.5'-33.0' below LSD
Pipe above LSD = 2.8'

Well 3d - Pvc. screen, 2" dia., 10 slot, 1.5' long
Screened interval = 10.0-8.0' below LSD
Used 2" dia. pvc. pipe
Pipe above LSD=3.65'

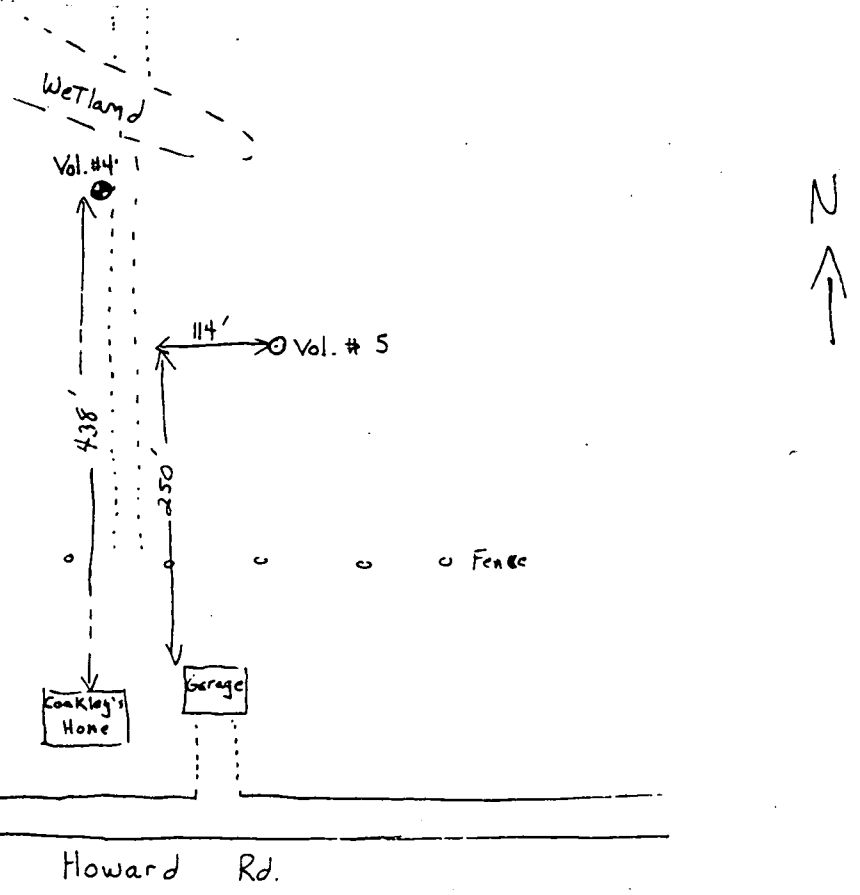


NO WELL INSTALLED

Site # Volney #4 Date 10/4/79

Location- 438' north of John Coakley's home - 85' south of wetland

Sample	Remarks	Strat.	Geologic Description
	0-1.0'		Sandy gravel, dk.br., w/org. f.-m.s., med. grav.-rd.,(Beach)
	No Rec		Auger bringing up gravelly sand.
	No rec. boulder		
	Water 12.0-12.1' No rec.		Sand,v.f.s.,brown,occasional peb., sat'd., no smell of leachate, tr. silt.
	17.0-19.0'		Till,reddish gray,silty-f.s.matrix,pebble to cobble clasts, sat'd.,compt.,low perm., 90%greenish Qtz.grains,5%red Qtz.,5% black shale,little or no leachate smell
			Bottom of hole at 19.0'
			No well installed



Sheet # 1 of 1

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

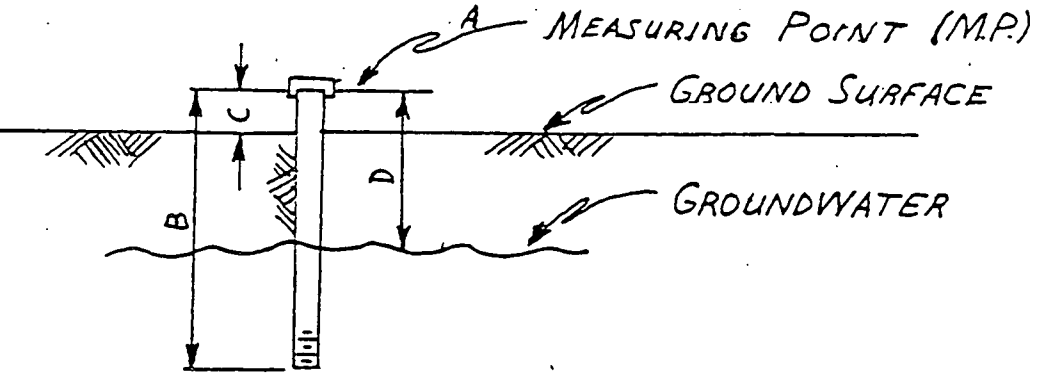
Well I.D.: USGS #5 Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 473.4 FT. Well Length (B): 8.3 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.0± FT.

(All measurements to nearest 0.1 ft.)

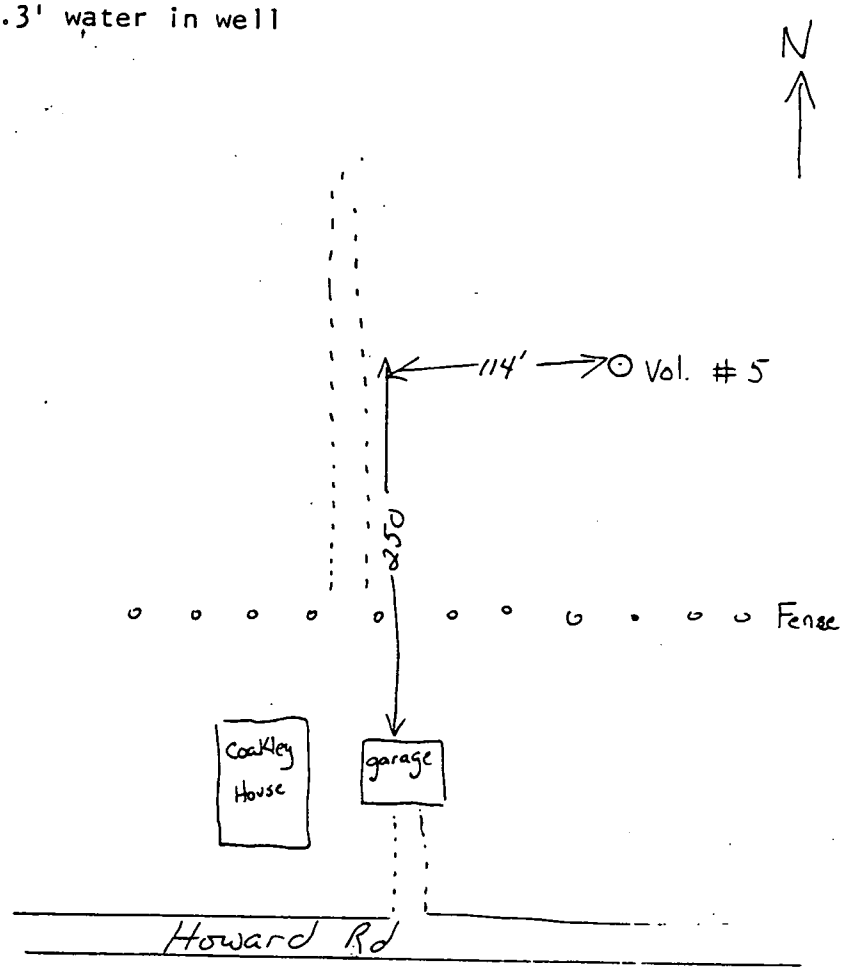
Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/25/84	2PM	1.9 FT.	471.5 FT.	No CAP
4/21/84	1 PM	4.2 FT.	469.2 FT	



Site # Volney #5 Date Oct. 4, 1979

Location- 250' north of John Coakley's residence on Howard Rd., 114' east of his garage.

Well	Sample	Remarks	Strat.	Geologic Description
0	2.0-4.0'			Gravelly sand, brown, dominantly f.s. w/subord, m.s., f.-c. gravl. loose, dry, sand 50-60%, gravel 40%, No leachate smell.
5	7.0-8.5'			Till, reddish gray, silty-f.s. matrix, pebble-cobble clasts, compact, cohesive, dominantly br. s.s. grains, 10% red Qtz. & 5% blackshale, low permeability.
				Bottom of hole at 8.5'
				Water slowly seeping into hole
				Installed well.
				2" dia. stainless steel screen, 60 gauze, 2.5' long, Torpedo type
				Pipe = 5' 2" dia. black iron
				3.6' screen
				8.6' Total
				Inside length = 8.7'
				.3' water in well



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

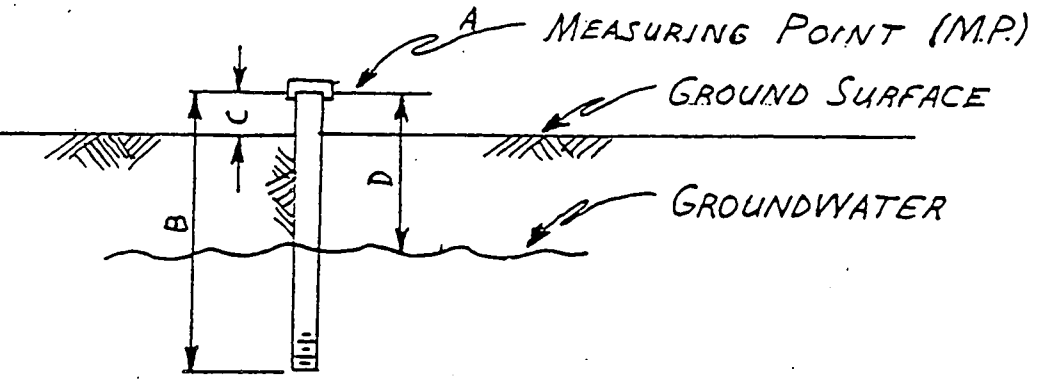
Well I.D.: USGS #6 Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 494.8 FT. Well Length (B): 13.6 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 3.3 ± FT.

(All measurements to nearest 0.1 ft.)

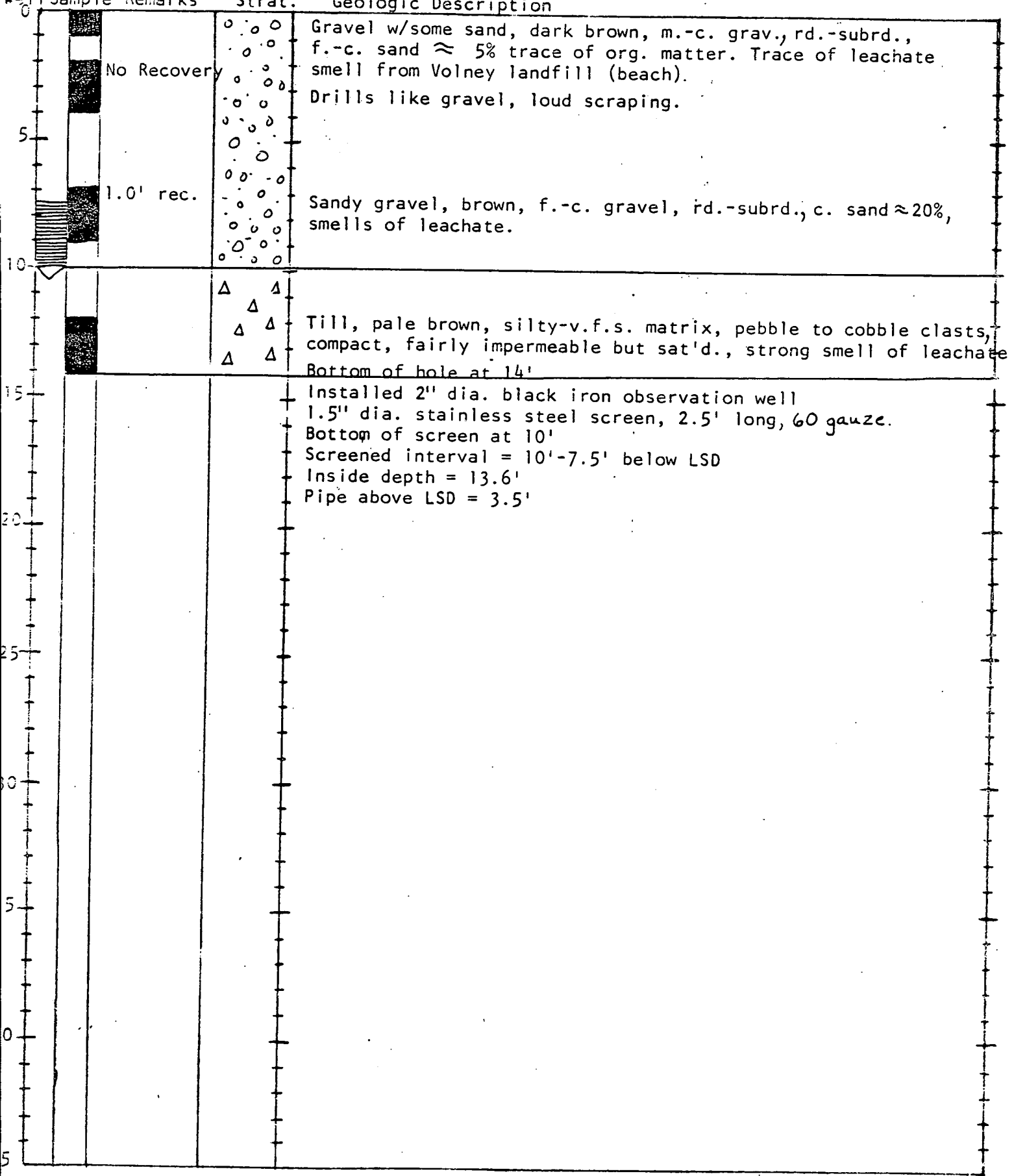
Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/25/84	3 PM	11.4 FT.	483.4 FT.	NO ODOR.
5/2/84	3 PM	12.0	482.8	
5/21/84	12:45 PM	12.0	482.8	



Site # Volney #6

Date 10/4/79

Location- South side of Howard Road, 20' s. of centerline of road, 1060' w. of intersection of Silk Road and Howard Rd.



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

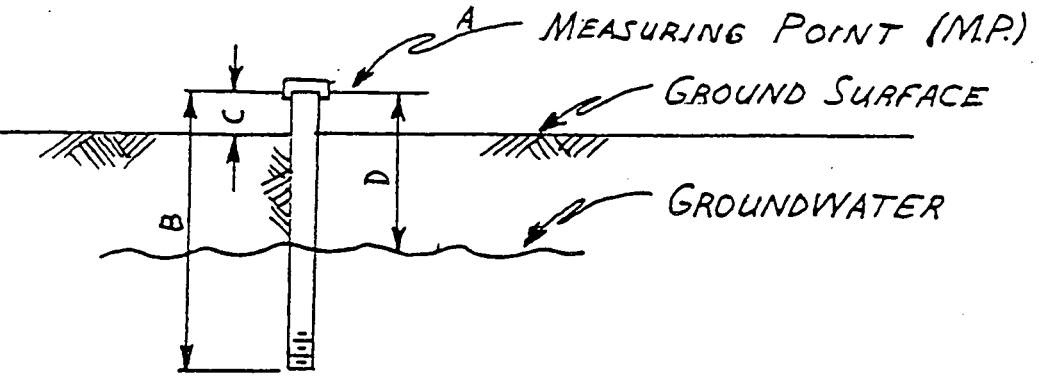
Well I.D.: USGS # 7A — Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 498.2 FT. Well Length (B): 12.9 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.3± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/25/84	3 PM	11.7 FT.	486.5 FT.	
5/2/84	3 PM	12.2	486.0	
5/21/84	1245 PM	12.4 FT	485.8 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

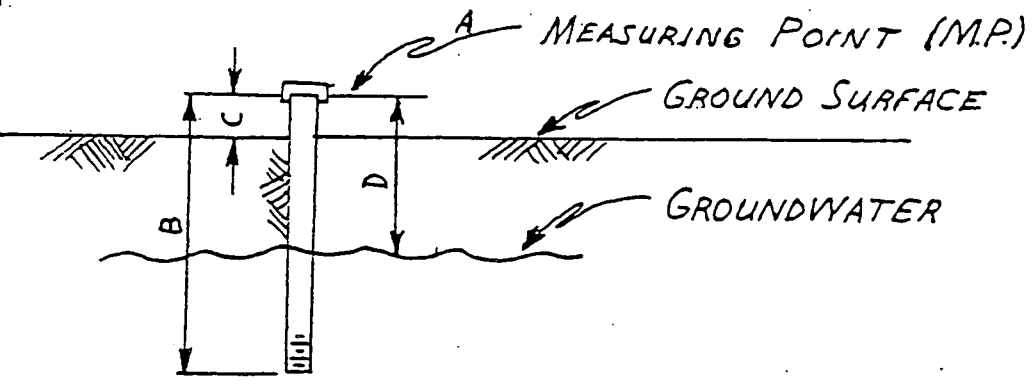
Well I.D.: USGS #7B PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 499.4 FT. Well Length (B): 13.9 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 3.5± FT.

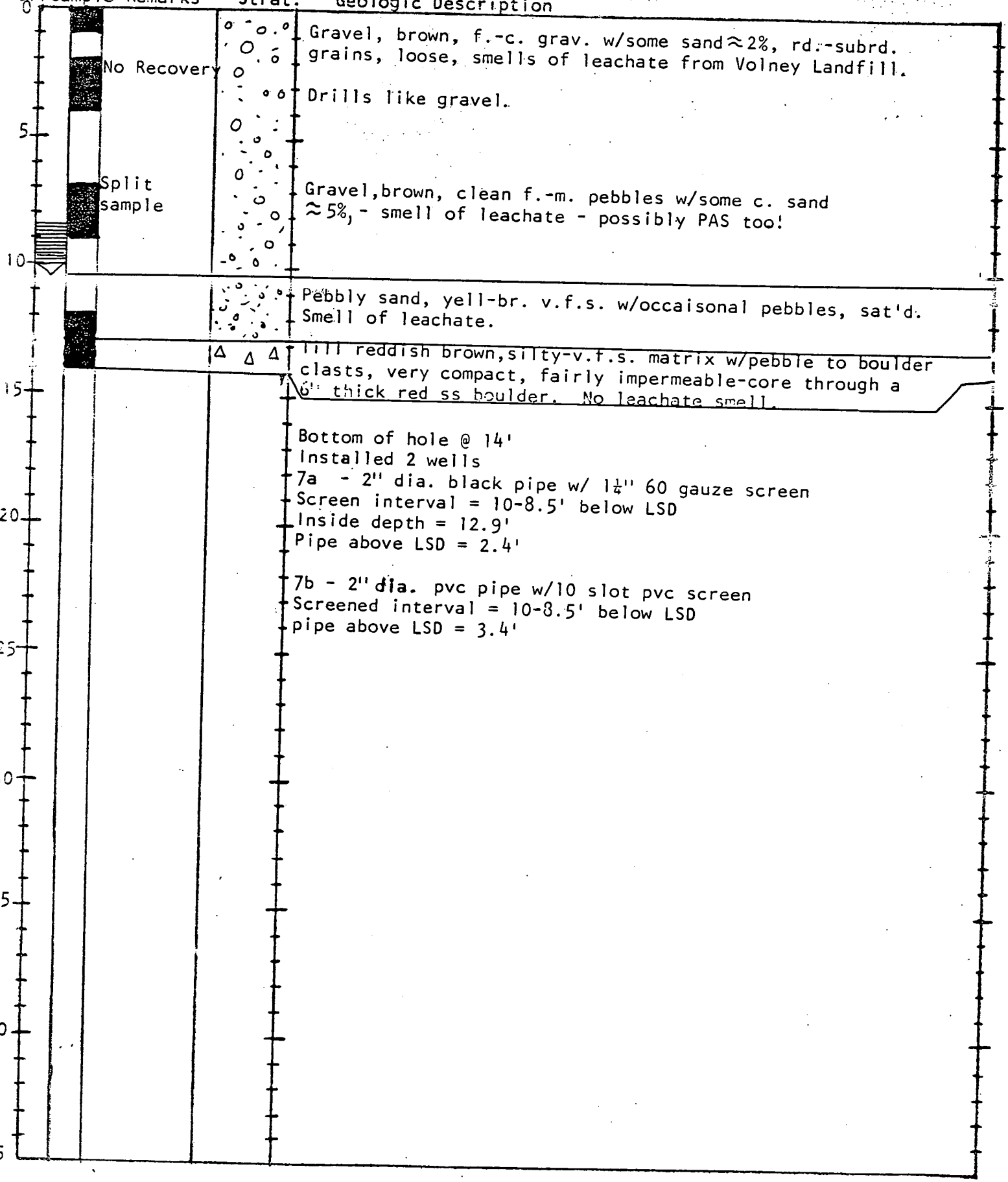
(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	3 PM	13.5 FT.	485.9 FT.	NO ODOR.
12/1/84	12:45PM	DRY	485.5 FT.	



Volney #7 — 10/4/79

Location- 22' s. of centerline of Howard Rd., 650' w. of intersection of Silk & Howard R



Sheet # 1, of 1

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

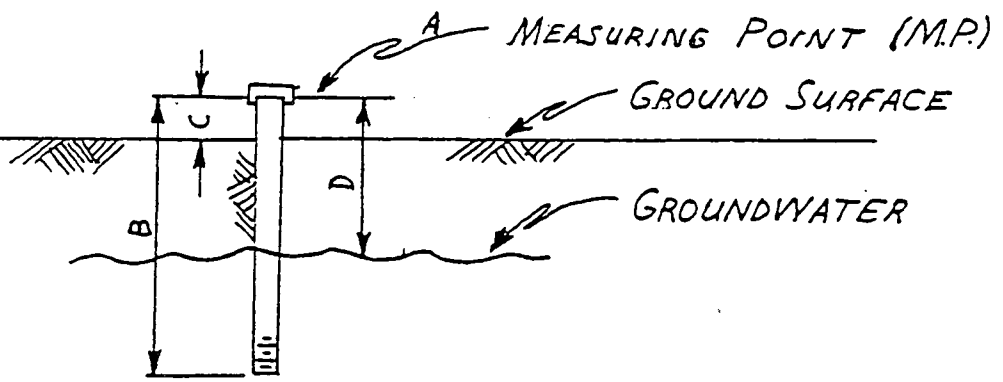
Well I.D.: USGS #8 Fo CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 494.5 FT. Well Length (B): 26.3 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.4± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	2 PM	23.5 FT.	471.0 FT.	No ODOR.
12/21/84	12:30 PM	24.6 FT	469.9 FT	



84

Site # Vol. #8 Date 10/9/79

Location-20' south of centerline of Howard Rd., 122' w. of intersection of Howard & Silk Rd., 10.5' we of stop sign/

Sample Remarks	Strat.	Geologic Description
		Sand and gravel, dk.br.-black, f.-c. gravel, m.-sand
No recovery		drills like sand and gravel
		Sandy gravel, brown, f.gravel, c.-sand-well sorted, loose, no smell of leachate
		Sandy gravel, reddish brown, f.grav., c.sand, well sorted, loose, sand 5%, no smell 50% red. ss pebbles 50% green ss pebbles
		same as above
22'-23.5'		Sandy gravel, brown, f.-c. gravel, rd-subrd., loose, f.-c.sand
23.5'-24.0'		very stony, no smell
Hit water		Sand, grey-br. m.-c., sorted, damp.
		Pebbly, sand, brown, f.-c. sand, f.c. pebbles, damp. tough augering-possibly slurry till.
		Till, reddish brown, silty-v.f.s. matrix, pebble-cobble clasts, compact., damp, probably sat'd.

Bottom of hole @ 34'
Installed 2" dia. black iron pipe
3.0' long 1½" dia.-stainless steel screen, 60 gauze
inside depth = 28.4' below LSD
.8" pipe above LSD

Lengths of pipe
1 - 21' pipe
1 - 5' pipe
1 - 3' pipe
1 - 3' screen

Screened interval 28-25'

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

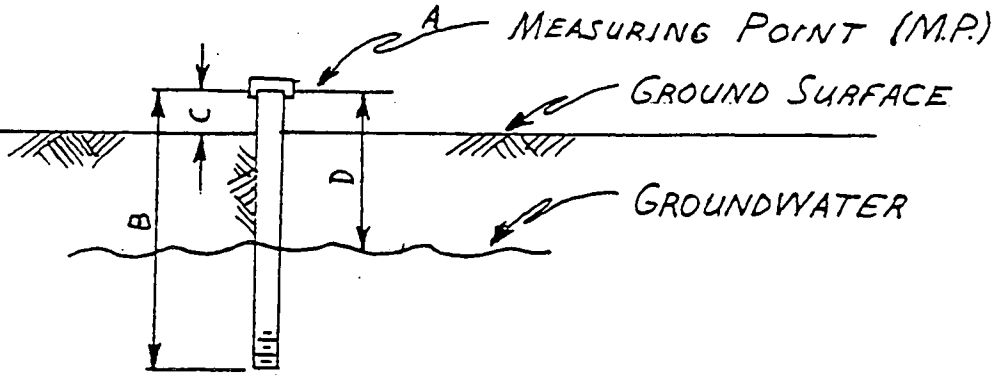
Well I.D.: USGS #9 FC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 473.6 FT. Well Length (B): 38.3 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.4 ± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	10 AM	23.9 FT.	449.7 FT.	
5/21/84	11:15 AM	24.4 FT	449.2 FT	



84

Volney #9 cont'd

Location-

Well	Sample	Remarks	Strat.	Geologic Description
45		Split sample 45-47.5'		Sand, grayish brown, f.s., well sorted,
		47.5-48'		Silt/clay, grayish brown, sticky, sat'd.
50				Pebbly sand (loose till?), reddish brown, f.-m.s. w/f.-m. pebbles moderate compact
55				
60				Till, reddish brown, f.s. matrix, pebble clasts, moderate compact, damp.
				Bottom of hole @ 63'
65				Installed 2" dia. black iron pipe observation well.

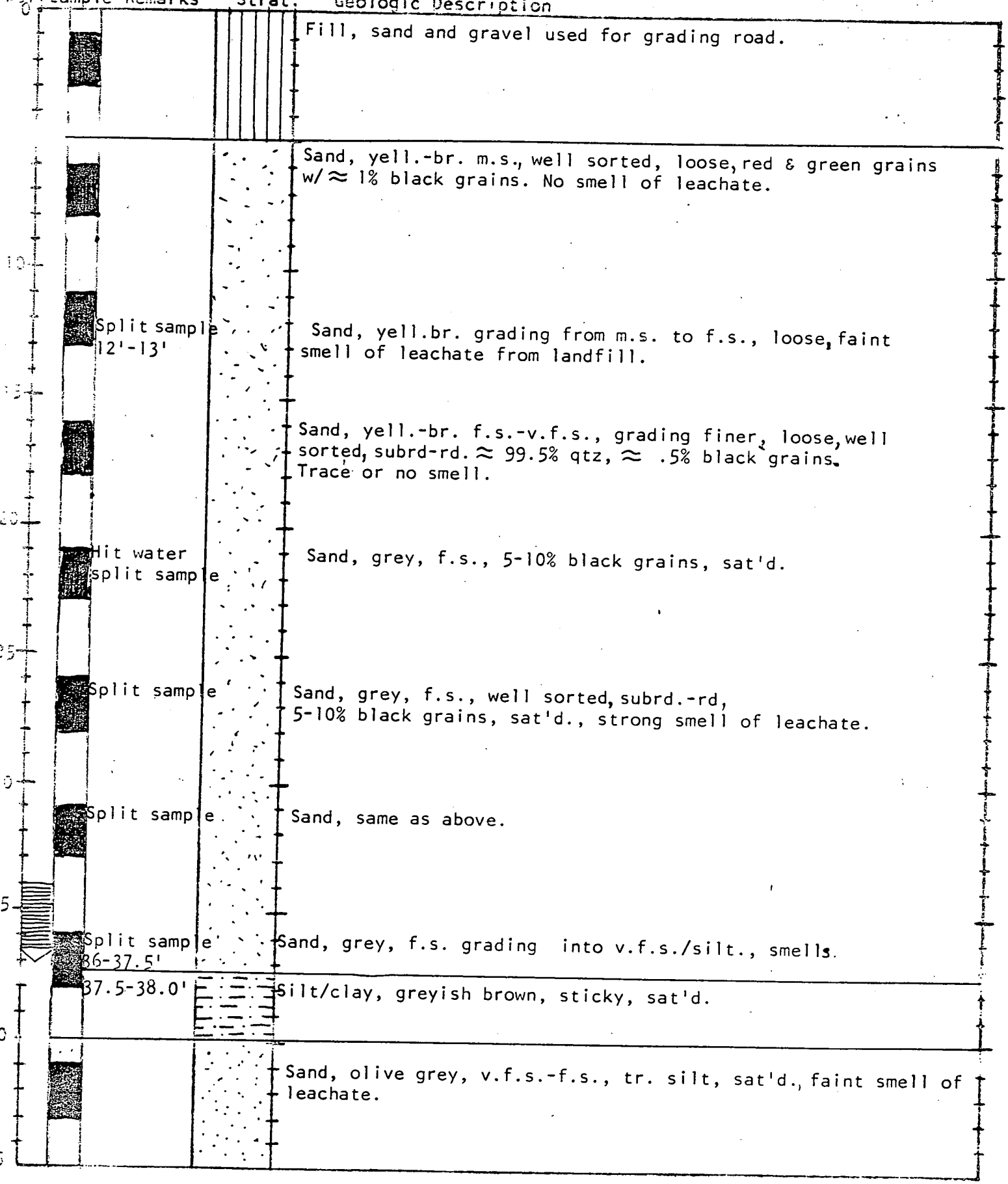
1½" dia. screen, 60 gauze, 2.5' long, stainless steel

Length of pipe - 3.0' screen
10.7' 2" dia. pipe
21.0' 2" dia. pipe
5.3' 2" dia. pipe
Inside depth = 40.0'

Screened interval 34 - 36.5' from LSD
Pipe above LSD = 3.5'

Volney #9 10/10/79

Location- 23' s. of main entrance to Volney landfill, 23' E of centerline of Silk Road



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

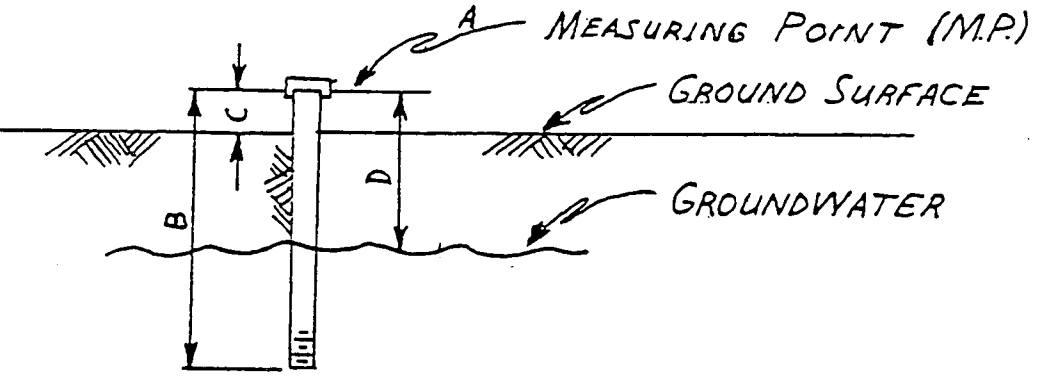
Well I.D.: USGS #10 Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 456.9 FT. Well Length (B): 20.1 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.5 FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	10 AM	13.1 FT.	443.8 FT.	No Cap. 3.5" OUTSIDE DIAM. No THREADS.
5/13/84	11 AM	13.5 FT	443.4 FT	



84

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

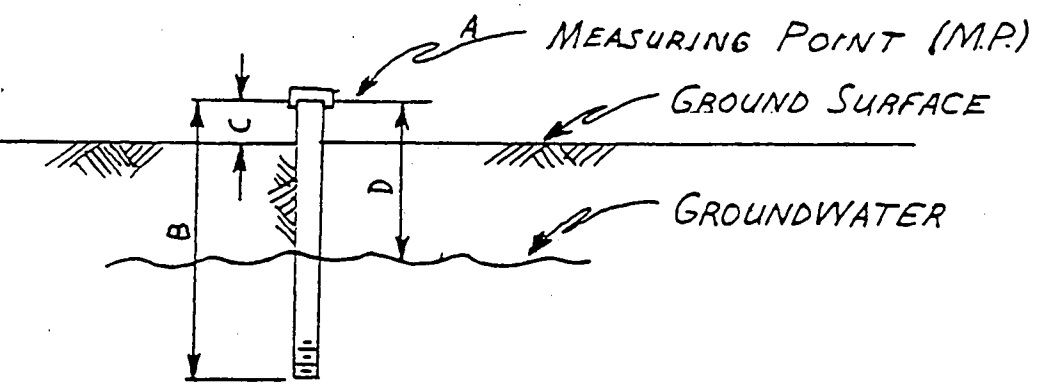
Well I.D.: USGS #11A PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 469.8 FT. Well Length (B): 17.8 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.7 FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	2 PM	8.0 FT.	461.8 FT.	IRREGULARITY IN CASING - TAPE CAUGHT AT ±15 FT.



84

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

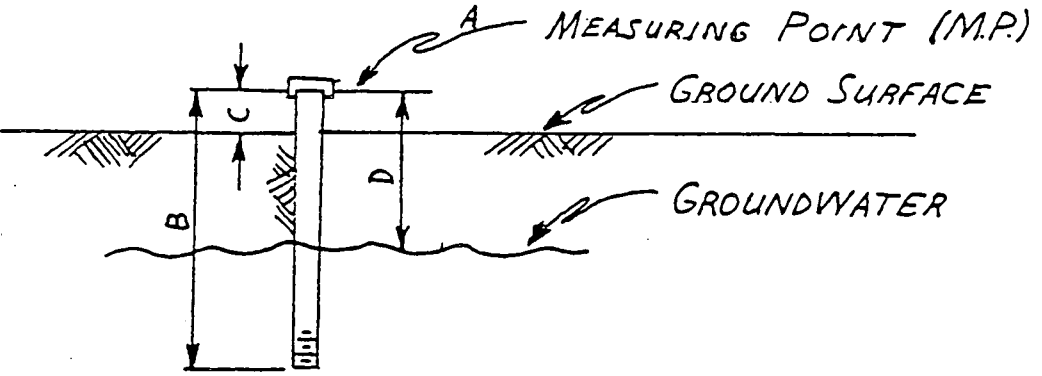
Well I.D.: USGS #11 B — Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 469.7 FT. Well Length (B): 19.2 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.1 FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	2 PM	8.1 FT.	461.6 FT.	PVC CAP IS SPLIT. 2" DIAM. NO THREADS.
5/21/84	10AM	8.8 FT.	460.9 FT.	
1				



84

Date [illegible] a PVC Well No. [illegible] at Muckey (time) [illegible] Sheet [illegible] of [illegible]

Depth	Material	Drilling Time	Sample	Remarks
	soil			
	gravel (road bed?)			
	firm drilling			
	sand, fine to medium, earthy brown.			
5				
7	core - no recovery			
	sand, fine, firm, brown			
10				
12				
	core sand, v.f. to fine well sorted gray.			
core 13				
14	sand, fine to coarse, with granules, clayey (slightly) gray			
16	gravel (driller)			
17	None pumping water in, to force out sand in core barrel			
core	gravel, fine, tomed gray, subang.			
	sand, fine, silty, clayey, gray.			
20	Layered sand & gravel			
	sand, coarse-very coarse, gray			
core	silt, very fine sand, gray.			
25	hard drilling			
	sand, very fine - fine, gray			
core	Till, - silt, clayey, pebbly, very hard, pink			
	end hole @ 28'			
	PVC casing 2 in. diam 15.2 ft. long			
	PVC. - screen PVC spiro #8 slot 4' long. 10-14 feet deep.			
	TOC 1.2' above LS			
	HRA Avaie (driller)			

Well No. About 6 ft. W. of 11a (re-e) 4-24-80 Sheet ___ of ___

Depth	Material	Drilling Time	Sample	Remarks
	steel casing 16.4' screen 2.2' Johnson Red Head Galv. wire wound 60 slot. Drive point screen { 0-.3 = blank .3-1.8 screen area 1.8-2.2 drive point screen set 15-16' screen area 17.6-16.1 pea gravel poured around screen after augers removed Toc 1.3 above ground			

HRA Auger Driller

Date 4-24-80 Well No. V12a Sheet of

Depth	Material	Drilling Time	Sample	Remarks
	Soil			
	Gravel, coarse, bouldery.			
5				
	water @ 7'			
Core	no recovery - wet sand!			
10	Gravel			
core	sand, fine to medium, clean gray			
15	driller added water to			
core	core pipe to wash out.			
	clay, silty, gray			
20	sand & clay layers			
core	sand, fine-med, gray			
	clay, pebbly, soft, wet.			
25	Hard Till @ 25'			
	PVC spiro & slot, diam. 2 in screen 17 to 13 feet depth			
	TOC 1 ft. above LSD.			

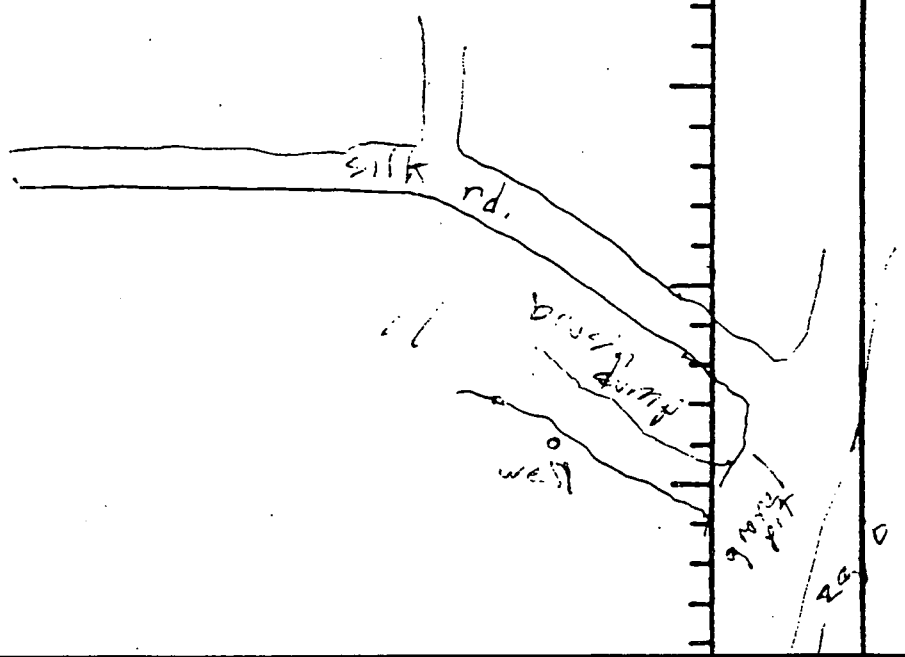
HRA Annie (Miller)

Date 4-24-80 Well No. V12b Mi _____ at _____ (time) Sheet _____ of _____

Depth	Material	Drilling Time	Sample	Remarks
	18.3' casing + drivepoint. Johnson red head 40 slot galv. steel wire wound 2.2' long. 2 in. diam. Toc 1 ft. above LSD.			
core	sand, fine-med, uniform gray.			
	poured pea gravel into hole to pack screen. but sand collapsed around hole. Sand inside screen.			

Date 1 Well No. V13a in PVC at In county brush pit (site) west of silk road Sheet of

Depth	Material	Drilling Time	Sample	Remarks
	Gravel, sandy, clayey, brown			South of land fill.
5				
	water.			
10	Till ?			
core	Till, clayey, pebbly, red brown dry. 4 inch rec.			
	End of hole 13'. Spinup is damp.			
	put 12.2' PVC casing, no screen, TOC at ground level.			
	Water level outside casing at 8 ft. below lsd.			
	No steel well drilled			



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

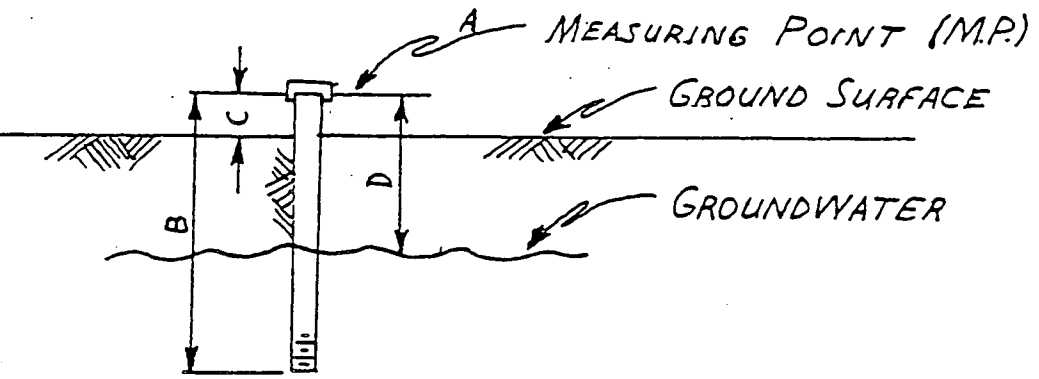
Well I.D.: USGS # 14A PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 473.3 FT. Well Length (B): 18.2 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.0± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	4 PM	10.2 FT.	463.1 FT.	
7/21/84	10:15 AM	8.6 FT.	464.7 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

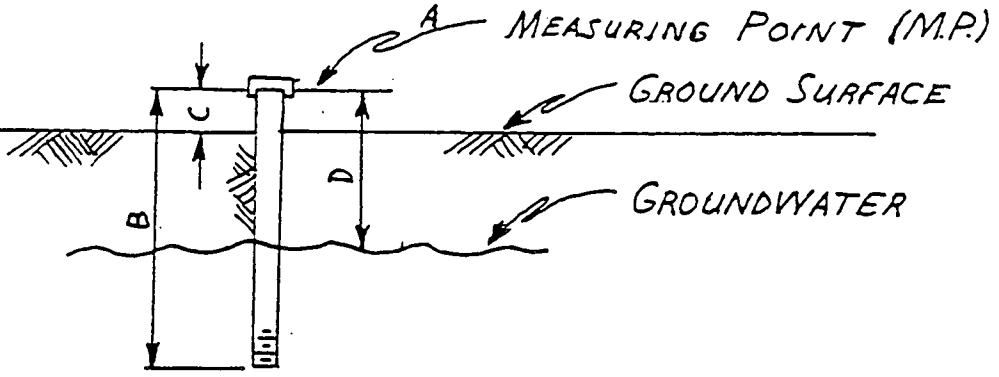
Well I.D.: USGS # 148 Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 473.2 FT. Well Length (B): 17.7 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.2± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
7/2/84	4 PM.	10.2 FT.	463.0 FT.	
7/21/64	10:15 AM	8,8 FT.	464.4 FT.	



84

Date ______ Well No. V14a + WL V14b at County Gravel Pit (time) East of 12 a, b, W. of ... Sheet ___ of ___

Depth	Material	Drilling Time	Sample	Remarks
	Gravel, brown, clayey			
5				
	water			
	sand, brown.			
10				
core	no recovery			
15				
core 17	sand, ~~fine~~ med to v. coarse			
	clay, silty, gray			
20				
core	silt, clayey, fine sandy, gray			
25	Till, gray clay, pebbly			
	PVC - 1½ casing & screen, screen 2 ft 6 slot Johnson wire wound.			
	TOC 1 ft. above ground			
	V14 b steel 40 slot galv			
	15 - 17 core sand, med. - v. coarse gray brown			
	1½ (?) steel + screen TOC 1' + LSD			

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

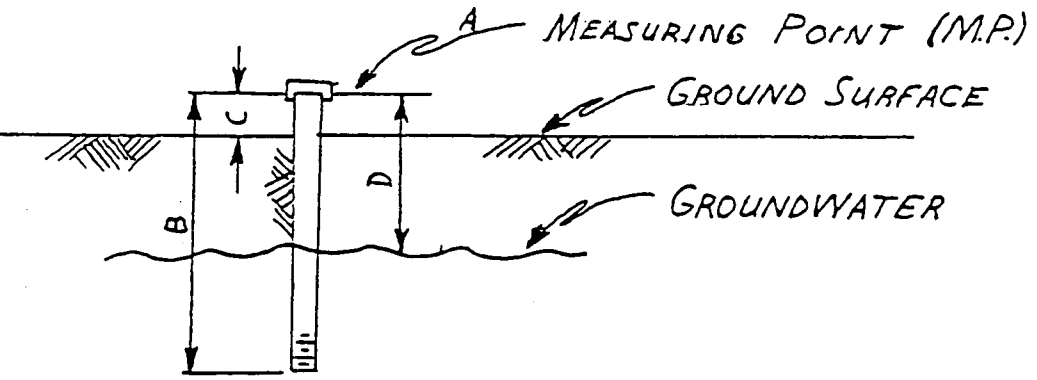
Well I.D.: USGS #15 PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 449.8 FT. Well Length (B): 16.7 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.5± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	10 AM	9.3 FT.	440.5 FT.	
1/21/84	11:45 AM	9.8 FT.	440.0 FT.	



84

Date Volney 1990	Well No. V15a	WL	at (time)	Sheet of	Northern West Bell Gravel Creek

Depth	Material	Drilling Time	Sample	Remarks
	Gravel, brown			
5				
	water			
	gravel			
10				
core	silt, clayey, brown			
15				
	silt, very fine sand brown			
20	Till,? pink, clay			
core	Gravel, fine to med. clayey			
25				
core	Gravel, medium silt, very fine sand			
30				
core	silt, slightly clayey, pebbly, gray			
35				
core	silt, clayey gray pebbly			
	clay & silt, gray			
core	PVC Casing & screen 21'. 4ft spiro screen 8 slot. Casing jumped up so couldn't screen 20-24 screen @ 16-20			water level in well rose to land surface (artesian)
	TOC 1.2 above LSD			

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

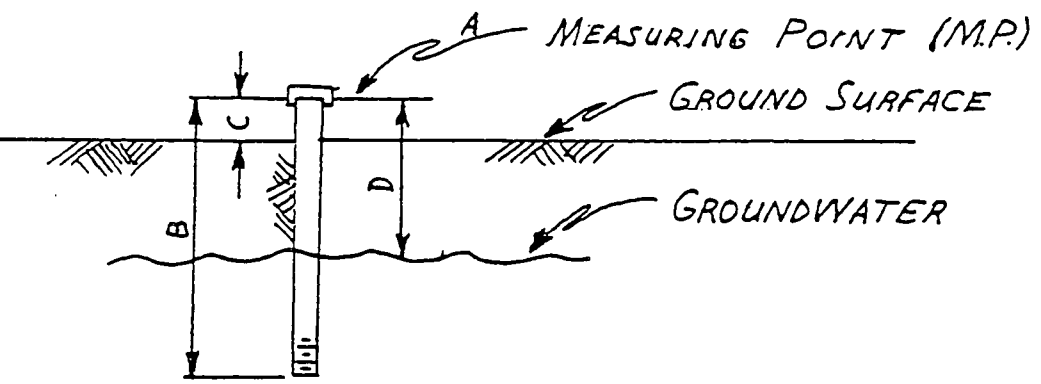
Well I.D.: USGS #16 PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 467.7 FT. Well Length (B): 18.5 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.7± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	10 AM	8.5 FT.	459.2 FT.	
1/21/86	11:30 AM	9.9 FT.	457.8 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

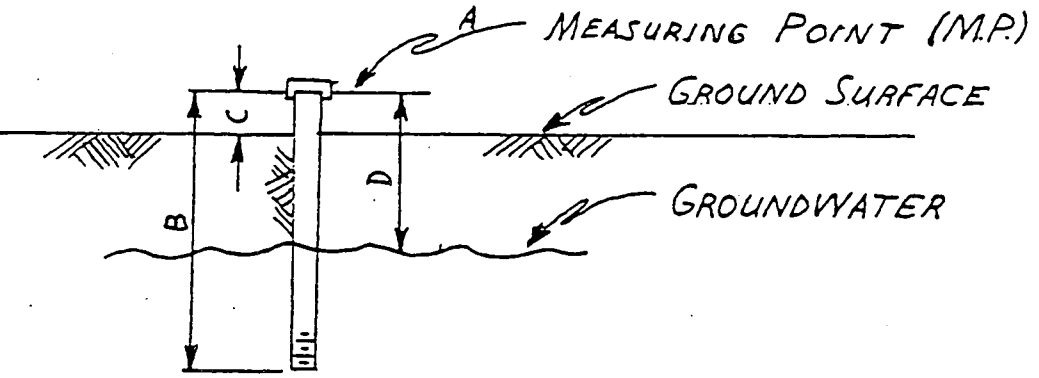
Well I.D.: USGS #17 PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 464.7 FT. Well Length (B): 31.7 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.3± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	2PM	12.8 FT.	451.9 FT.	
1/21/84	10:30AM	13.8 FT.	450.9 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

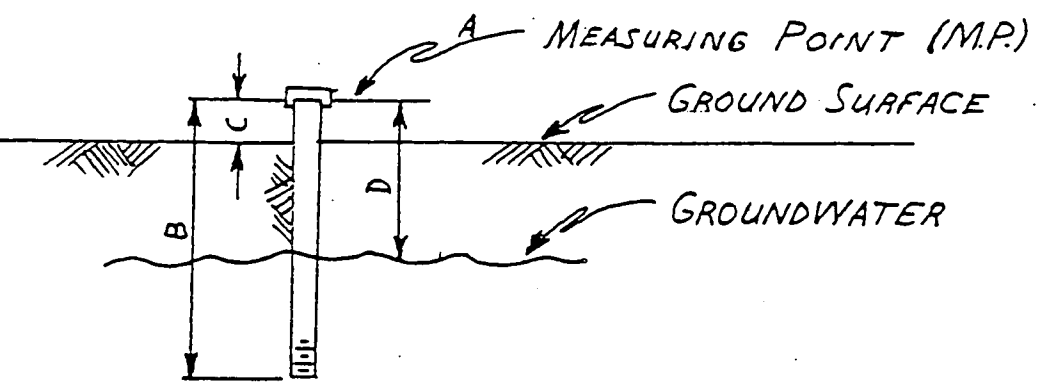
Well I.D.: USGS #18 A Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 464.4 FT. Well Length (B): 20.2 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.0± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	2PM	9.3	455.1 FT.	
12/18/84	10:45 AM	12.3	452.1 FT.	



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

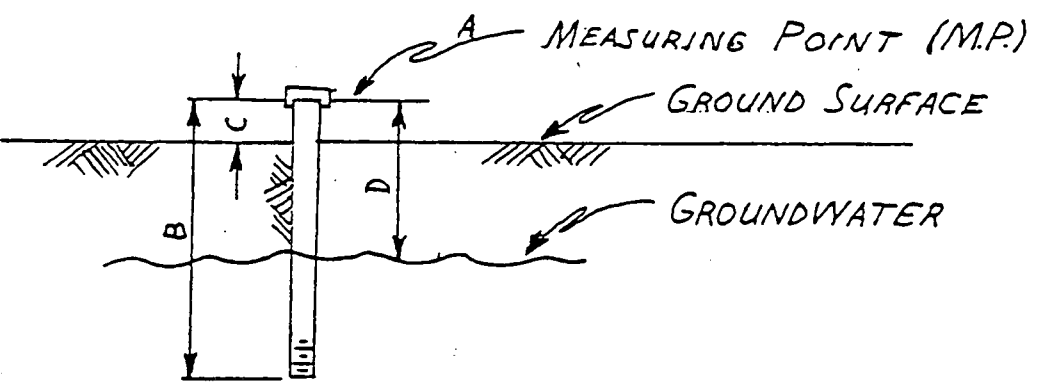
Well I.D.: USGS #18B PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 465.1 FT. Well Length (B): 22.1 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.5± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	2PM	8.8 FT.	456.3 FT.	
12/21/84	10:45 AM	12.1 FT.	453.0 FT	



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Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

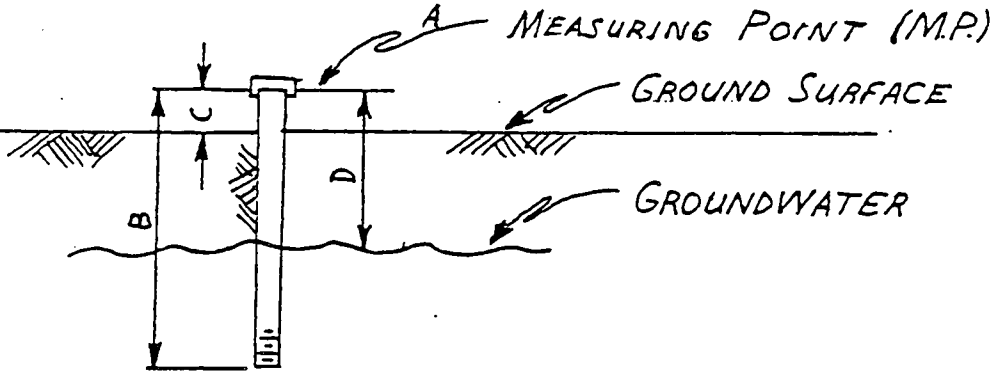
Well I.D.: USGS #19 PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 459.2 FT. Well Length (B): 2.3 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.1 FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
7/2/84	11 AM	DRY		WELL LOCATED IN BORROW AREA. FORM-
				ERLY ±31 FT. DEEP. NO CAP, 2.5" O.D.
7/21/84	1145 AM	DRY		



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Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

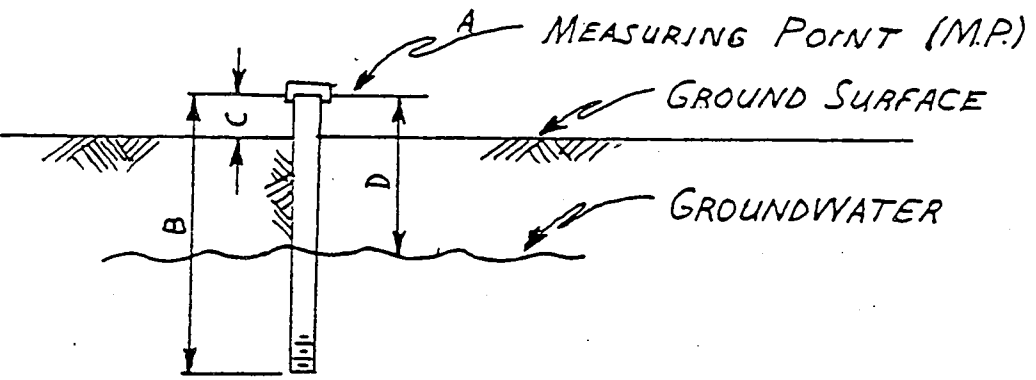
Well I.D.: LANDFILL T.W. # 9 Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM (GRAY PVC PORTION)

M.P. Elevation (A): 483.2 FT. Well Length (B): 15.9 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.3 I FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
F/2/84	11 AM	3.9 FT.	479.3 FT.	REMOVED 3/4" O.D. PVC RISER PIPE FROM INTERIOR. PIPE HAD GLUED CONNECTIONS.
/21/84	12 AM	5.0 FT	478.2 FT.	



84

perratt wolff inc
FISHER ROAD
EAST SYRACUSE, N.Y. 13057

TEST BORING LOG

PROJECT Oswego Valley Sanitary Landfill HOLE NO. B-9

LOCATION Town of Volney, New York SURF. ELEV.

DATE STARTED 8/18/73 COMPLETED 8/18/73 JOB NO. 7358

GROUND WATER Struck water @ 9'0" while drilling

N= NO. OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C= NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

AUGER BORING

SHEET 1 OF 1

DEPTH	C.	N.	SAMPLE NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
5'0"					Brown moist fine SAND and fine to coarse GRAVEL
					7'6"
10'0"					Brown wet fine SAND and fine to coarse GRAVEL 9'0"
15'0"					Red wet fine to medium SAND and fine to coarse GRAVEL
20'0"					Bottom of boring 15'0"
					NOTE: Installed wellpoint to 15'0"

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

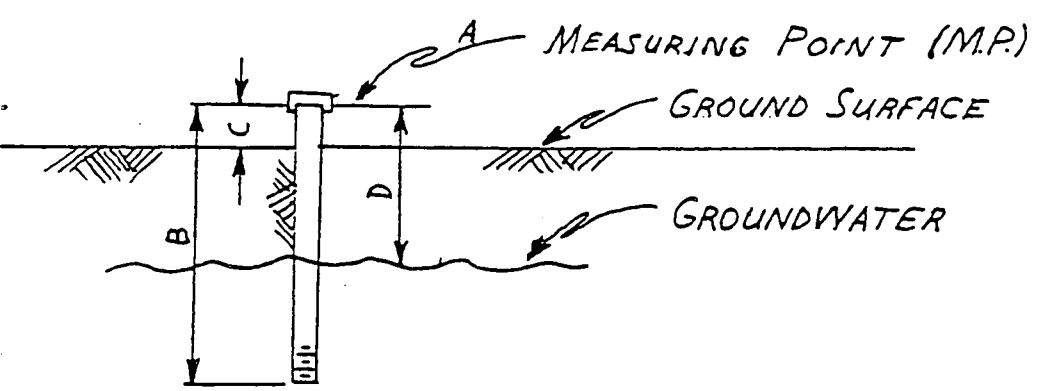
Well I.D.: LANDFILL T.W. #15 PVC CASING

Measuring Point (M.P.) I.D.: CASING RIM (WHITE SCREW-CONNECT PORTION)

M.P. Elevation (A): 495.6 Well Length (B): 24.0 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 3.7 FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/2/84	12 PM	DRY	< 471.6 FT.	REMOVED 3/4" OD. RISER PIPE FROM INTERIOR. PIPE HAD GLUED CONNECTIONS.
6/21/84	12:15 PM	25.6	470.0 FT.	



84

parratt wolff inc

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

TEST BORING LOG

PROJECT Oswego Valley Sanitary Landfill — HOLE NO. B-15

LOCATION Town of Volney, New York — SURF. ELEV.

DATE STARTED 8/24/73 COMPLETED 8/24/73 — JOB NO. 7358

GROUND WATER Depth on completion 30'0"

N= NO. OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C= NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

AUGER BORING

SHEET 1 OF 1

DEPTH	C.	N.	SAMPLE NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Brown moist fine SAND
					2'6"
5'0"					Brown moist fine SAND, medium to coarse gravel and trash
10'0"					
15'0"					
20'0"					
25'0"					
30'0"					
					30'0"
35'0"					Brown wet fine SAND and fine to medium GRAVEL
					Bottom of boring 35'0"
40'0"					NOTE: Installed wellpoint to 35'0"

parratt wolff inc

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

TEST BORING LOG

PROJECT Oswego Valley Sanitary Landfill — HOLE NO. B-14

LOCATION Town of Volney, New York — SURF. ELEV.

DATE STARTED 8/24/73 COMPLETED 8/24/73 — JOB NO. 7358

GROUND WATER Depth on completion 40'0"

N= NO. OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C= NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 2 OF 2

AUGER BORING

DEPTH	C.	N.	SAMPLE NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
45'0"					Brown wet fine SAND and fine to coarse GRAVEL
50'0"					Bottom of boring 45'0"
					NOTE: Installed wellpoint to 45'0"

parratt wolff inc

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

TEST BORING LOG

PROJECT Oswego Valley Sanitary Landfill HOLE NO. B-12

LOCATION Town of Volney, New York SURF. ELEV.

DATE STARTED 8/24/73 COMPLETED 8/24/73 JOB NO. 7358

GROUND WATER Depth on completion 4'0"

N= NO. OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C= NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

AUGER BORING

DEPTH	C.	N.	SAMPLE NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Brown moist medium to coarse SAND and fine to coarse GRAVEL
					4'0"
5'0"					Brown wet fine to medium SAND
10'0"					Bottom of boring 10'0"
15'0"					NOTE: Installed wellpoint to 10'0"

APPENDIX B

DATA SHEETS FOR RESIDENTIAL WELLS

OSWEGO VALLEY LANDFILL

OSWEGO COUNTY, NEW YORK

Birdsell

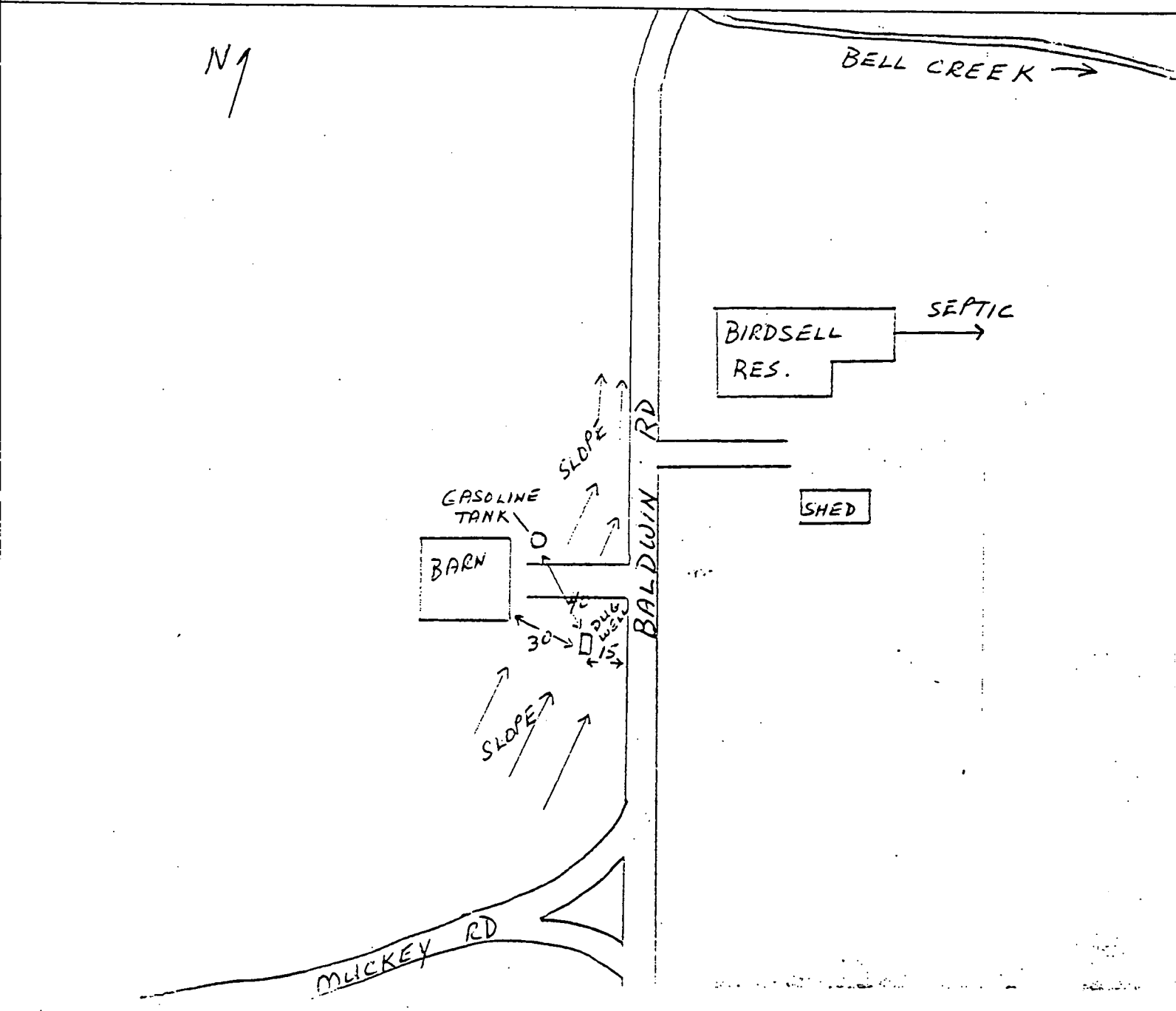
~~BRISTOL HILL LANDFILL~~

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

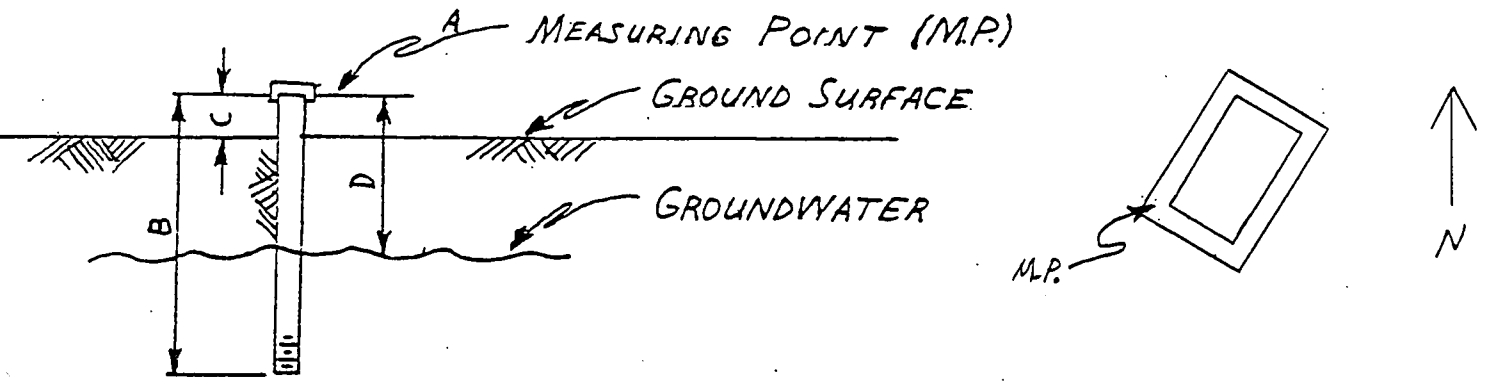
Well I.D.: GEORGE BIRDSELL (10) CEMENT CASING

Measuring Point (M.P.) I.D.: TOP OF WELL - S.W. CORNER

M.P. Elevation (A): 444.1 FT. Well Length (B): 7.2 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.5 I FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
2/25/84	11 AM	1.5 FT.	442.6 FT.	PILL BUGS, CENTIPEDE ON CASING; CRICKET IN WATER. USE NOT DETERMINED.
3/5/84	10:15 AM	2.0 FT.	442.1 FT.	PUMPED WELL DRY 1 MONTH PRIOR



VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

AME: MR. GEORGE BIRDSELL, JR. SITE:# 10

DDRESS: RD #6 BALDWIN RD FULTON, NY 13069 TELEPHONE# 592-7065

IRE CODE #: _____ DATE: 3/22/83

ad Name and Directions: BALDWIN RD BETWEEN MUCKEY RD
ID ROWLEE RD.

nich side: ~~RIGHT~~ ~~LEFT~~ EAST

olor: WHITE

istinguishing Features: 2ND HOUSE NORTH OF THE
INTERSECTION OF MUCKEY AND BALDWIN RDS.

SKETCH SEE ADDITIONAL SHEET SHOWING:

LOCATION:
n showing:
ximate house dimensions
nce to well
nce to driveway
nce to road
ion of septic facilities
ion of other pertinent features
ximate north

SITE Investigation: Water samples to be collected as part of the Volney Landfill (Silk Rd) monitoring program

Investigated by	Date
E. Walsh	3/22/83

Geological Character of Area

SOURCE

(X) DUG
( ) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well	8' ft.
Diameter of well	3' X 5' RECTANGULAR ~~ft.~~ Tim.
Depth of casing	8' ft.
Top of well above ground	6 in.

		yes	no
ype of cover	PLYWOOD		
ype of casing	CONCRETE BLOCK		
ell seal type			
Tight cover and sides		( )	(X)
Well grouted		( )	(X)
Casing seals out surface water ?		( )	(X)

Coakley

BRISTOL HILL LANDFILL

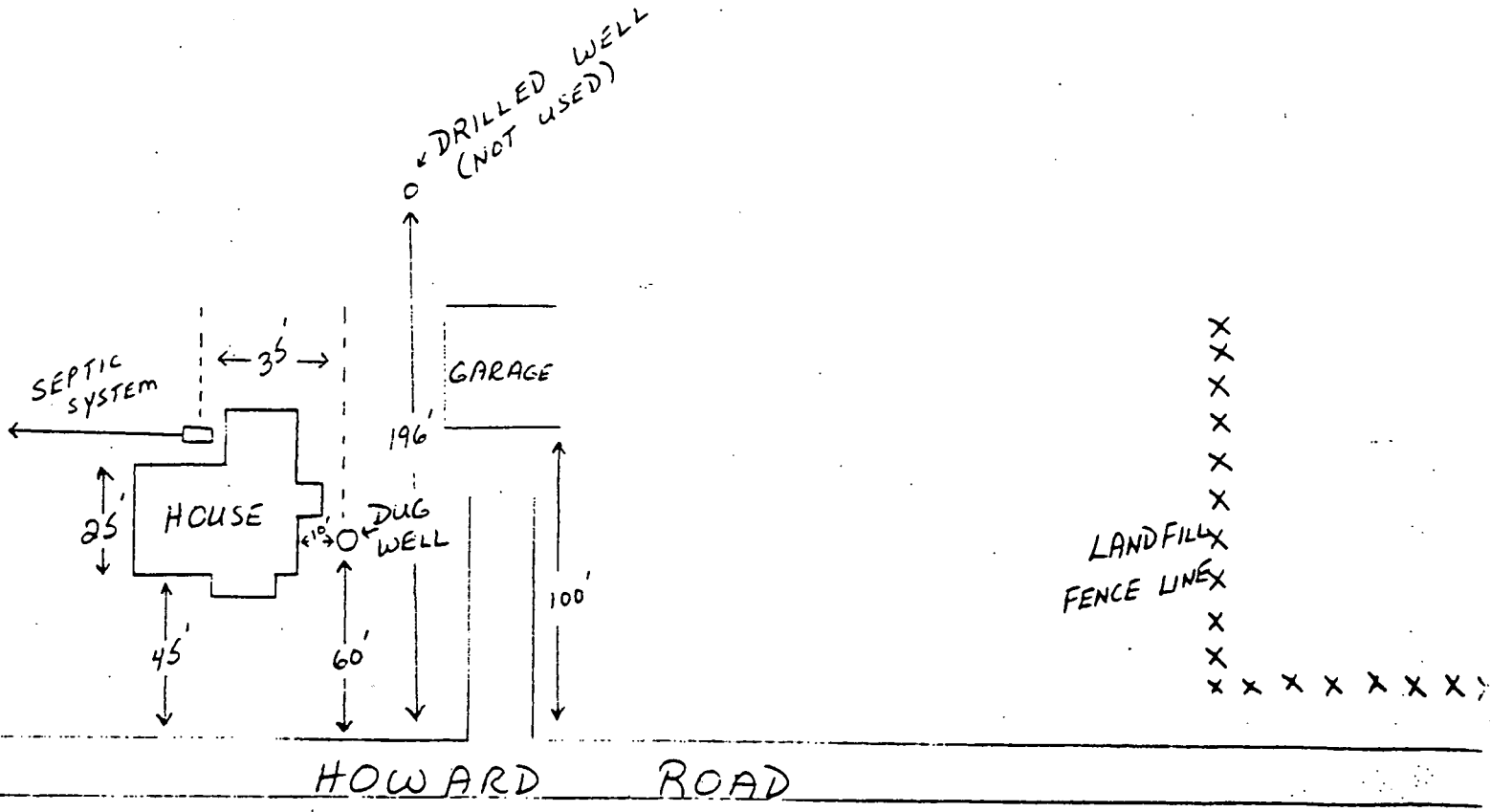
QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations

N



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

Well I.D.: JOHN COAKLEY - OLD (6)

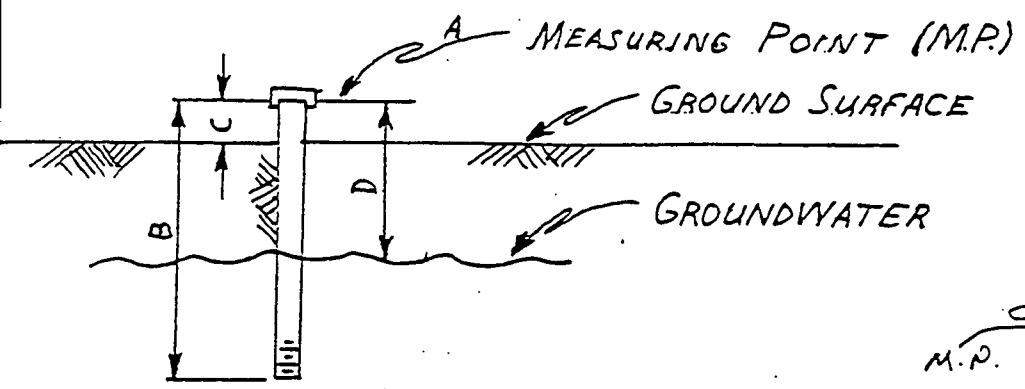
Measuring Point (M.P.) I.D.: S.W. CORNER OF CEMENT CASING

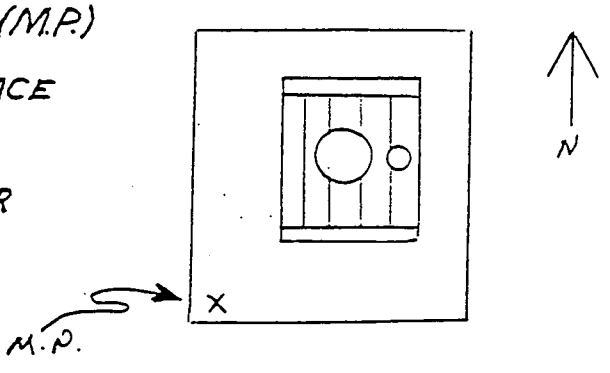
M.P. Elevation (A): 472.1 FT. Well Length (B): 16.7 FT.
(USGS Datum)

Dist. from M.P. to Ground Surface (C): 0.4 ± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
1/25/84				VENT HOLE NOT LARGE ENOUGH TO PUT TAPE THROUGH.
2/4/84		6.9 FT.	465.2	HAD TO DISMANTLE PART OF COVER.
2/6/84	11:30 AM	9.3 FT.	462.8	" " "





VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: MR. JOHN COAKLEY SITE:# 6

ADDRESS: RD#2 HOWARD RD, FULTON, NY 13069 TELEPHONE# 593-3919

FIRE CODE #: _____ DATE: _____

Road Name and Directions: HOWARD ROAD BETWEEN SILK RD AND CO RT 176

Which side: (RIGHT) NORTH ~~LEFT~~

Color: WHITE

Distinguishing Features: FIRST HOUSE WEST OF SILK RD LANDFILL AND DIRECTLY ACROSS ROAD FROM NIAGARA MOHAWK FACILITY

SKETCH SEE ADDITIONAL SHEET SHOWING:

LOCATION:
ch showing:
oximate house dimensions
ance to well
ance to driveway
ance to road
tion of septic facilities
tion of other pertinent features
oximate north

SITE Investigation: _____

Investigated by E. Walsh

Date

R SOURCE

Geological Character of Area

(X) DUG
( ) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well _____ ft.
Diameter of well _____ ft./in.
Depth of casing _____ ft.
Top of well above ground _____ in.

		yes	no
ype of cover			
ype of casing	STONE		
ell seal type			
	Tight cover and sides	( )	(X)
	Well grouted	( )	(X)
	Casing seals out sur-		

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

Well I.D.: JOHN COAKLEY - NEW (NOT HOOKED UP) F= CASING

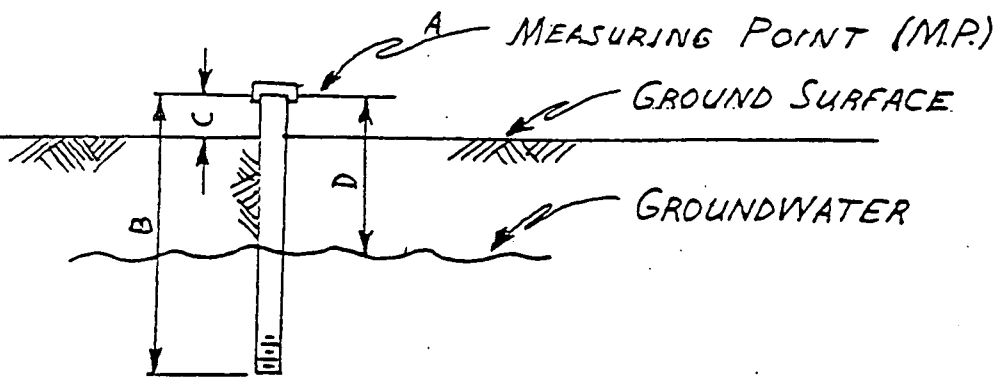
Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 472.6 FT. (USGS Datum) Well Length (B): UNKNOWN - 64 ± FT. TO WATER SOURCE (BEDROCK INTERFACE).

Dist. from M.P. to Ground Surface (C): 1.9 ± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/05/84	1PM	1.3 FT.	471.3 FT.	WELL NOT HOOKED UP BECAUSE OF SALTY TASTE.
4/21/84	1PM	3.1 FT.	469.5 FT.	

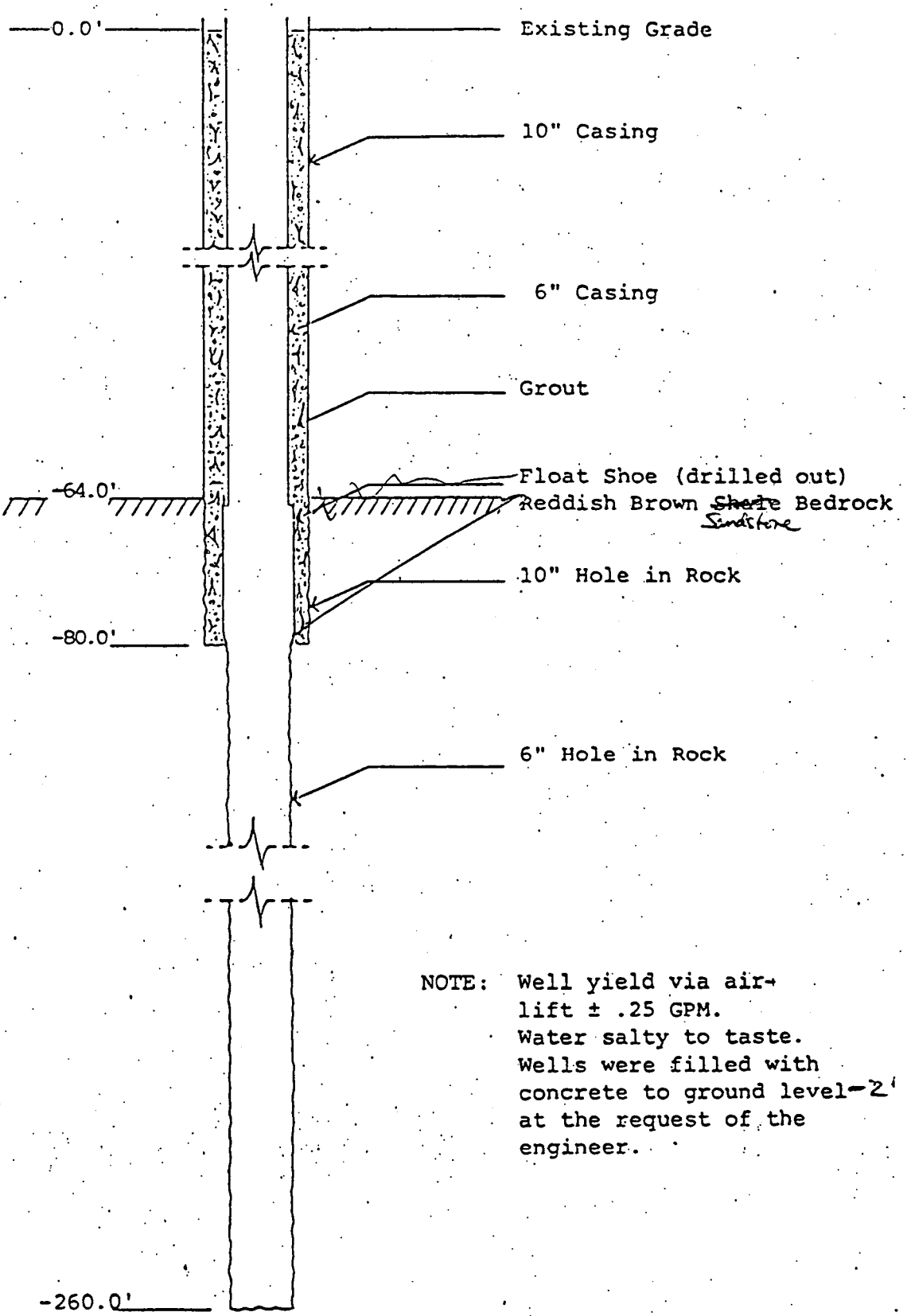


One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Residential Water Well
Property Owner: John W. Coakley

Client: County of Oswego
Oswego Valley L.F.
Date Started:
Date Completed:
Driller: Tim Crowell

Project No.: C1122
Boring No.: WW 2
Surface Elev.:
Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:



NOTE: Well yield via air-lift ± .25 GPM.
Water salty to taste.
Wells were filled with concrete to ground level-2' at the request of the engineer.

Durant

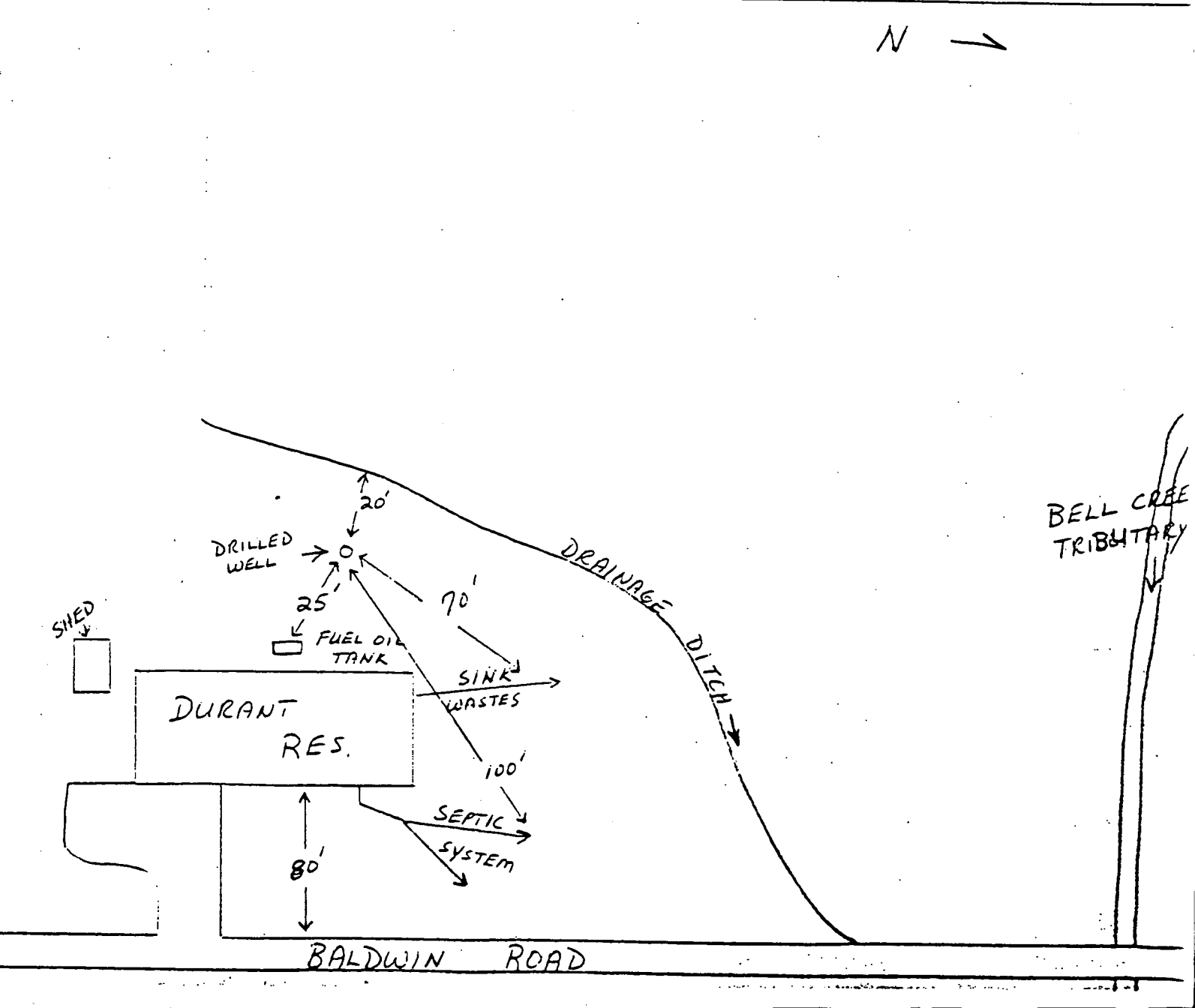
~~BRISTOL HILL LANDFILL~~

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

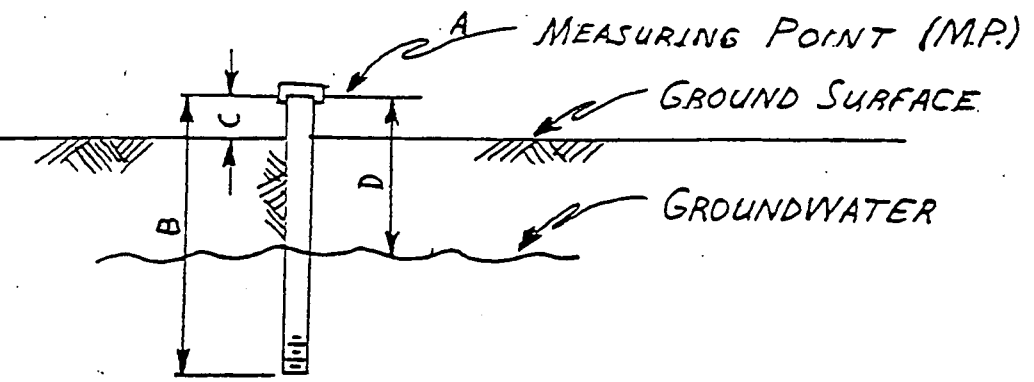
Well I.D.: HAROLD DURANT (7) Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 436.4 FT. Well Length (B): 32.9 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 3.2± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	OVERFLOW LOCATED 1.8 FT. BELOW CASING RIM. Remarks
4/25/84	11 AM	1.8 FT	> 436.4 FT.	OVERFLOW RUNNING
4/9/84	12 AM	1.9 FT.	> 434.5 FT.	" "



VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: MR. HAROLD DURANT SITE:# 7

ADDRESS: RD#6 BALDWIN ROAD TELEPHONE# 592-9085

FIRE CODE #: DATE: 4/19/84

Road Name and Directions: BALDWIN RD BETWEEN MUCKEY RD AND ROWLEE RD

Which side: ~~RIGHT~~ ~~LEFT~~ WEST

Color: GREEN

Distinguishing Features: STREAM CROSSES BALDWIN RD APPROX 150' NORTH OF DURANT RESIDENCE

SKETCH SEE ADDITIONAL SHEET SHOWING:

LOCATION:
ch showing:
roximate house dimensions
ance to well
ance to driveway
ance to road
tion of septic facilities
tion of other pertinent features
oximate north

SITE Investigation:

Investigated by: E. Walsh

Date: 4/19/84

Geological Character of Area

R SOURCE

( ) DUG
(X) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well ft.
Diameter of well 6 in./in.
Depth of casing ft.
Top of well above ground 3 1/2 ft.

ype of cover SANITARY SEAL
ype of casing STEEL
ell seal type

	yes	no
Tight cover and sides	( )	(X)
Well grouted ?	( )	( )
Casing seals out sur- ?		

Durfey

~~BRISTOL HILL LANDFILL~~

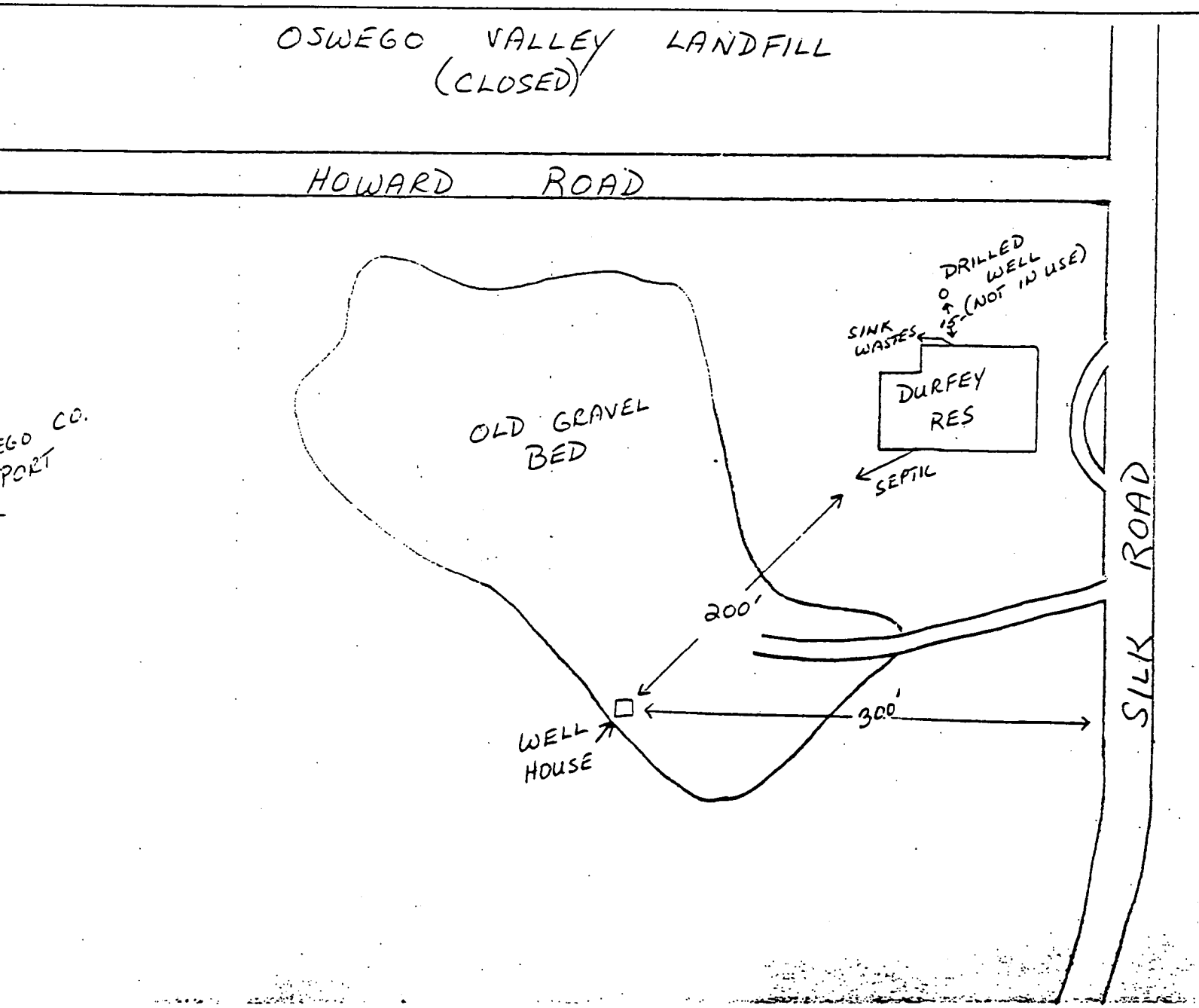
QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations

N1



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

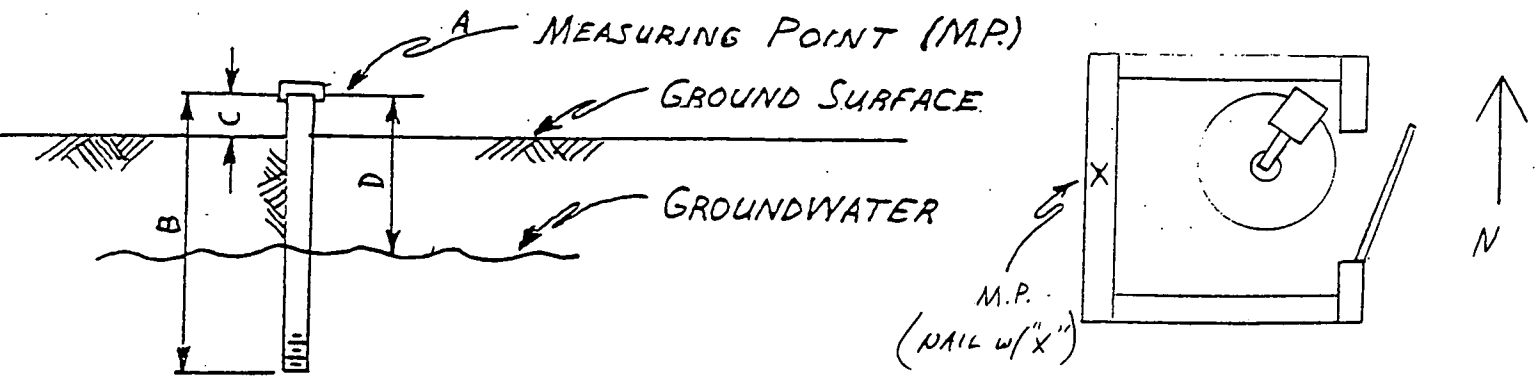
Well I.D.: STEVEN DURFEY - OLD WELL (3A) CEMENT CASING

Measuring Point (M.P.) I.D.: NAIL ON WEST SILL

M.P. Elevation (A): 472.7 FT. Well Length (B): 8.0 FT. (±0.3 FT.)
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.5 FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
1/25/84	1 PM	0.6 FT. (±0.3 FT.)	472.1 FT. (±0.3)	POSSIBLE LEAK IN LINE. PUMP TURNED ON EVERY ±20 SEC.
2/20/84	11 AM	2.5 FT (±.3 FT)	470.2 FT (±0.3)	Doing Laundry at Time of Measurement



VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: MR. STEVEN DURFEY SITE:# 301 (3A ON MAP)

ADDRESS: RD #6 SILK RD, FULTON, NY 13069 TELEPHONE# 593-240

FIRE CODE #: _____ DATE: 4/12/84

Road Name and Directions: SILK RD AT INTERSECTION WITH HOWARD RD.

Which side: ~~RIGHT~~ (LEFT) WEST

Color: GRAY

Distinguishing Features:

E SKETCH SEE ADDITIONAL SHEET SHOWING:

L LOCATION:
tch showing:
roximate house dimensions
tance to well
tance to driveway
tance to road
ation of septic facilities
ation of other pertinent features
roximate north

SITE Investigation:

Investigated by E. Walsh

Date 4/12/84

ER SOURCE

Geological Character of Area

(X) DUG
( ) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well _____ ft.
Diameter of well _____ ft./in.
Depth of casing _____ ft.
Top of well above ground _____ in.

Type of cover _____
Type of casing _____
Well seal type _____

	yes	no
Tight cover and sides	( )	( )
Well grouted	( )	( )
Casing seals out sur-		

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

Well I.D.: STEVEN DURFEY - NEW WELL (3B) FC CASING

Measuring Point (M.P.) I.D.: CASING RIM

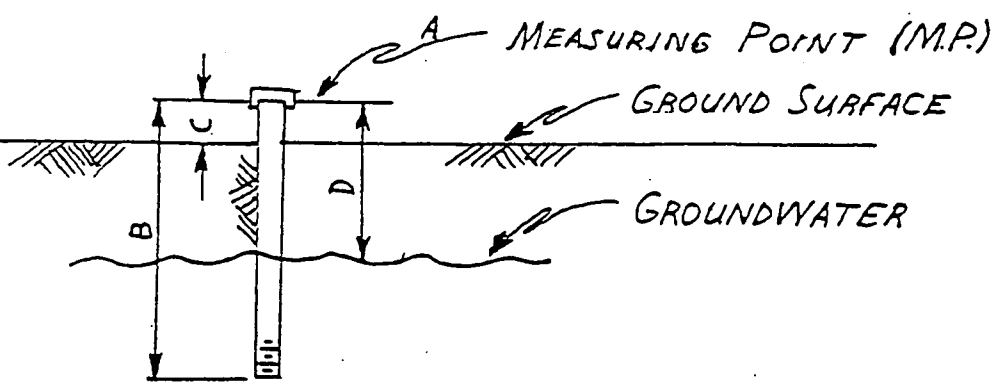
M.P. Elevation (A): 496.8 FT. (USGS Datum)

Well Length (B): UNKNOWN - 69± FT. TO WATER SOURCE (BEDROCK INTERFACE).

Dist. from M.P. to Ground Surface (C): 1.2± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
1/25/84	1 PM	27.9 FT.	468.9 FT.	WELL NOT IN USE.
2/11/84	11:15 AM	29.3 FT.	467.5 FT.	" " " "



Kerfien, D
Dug Well

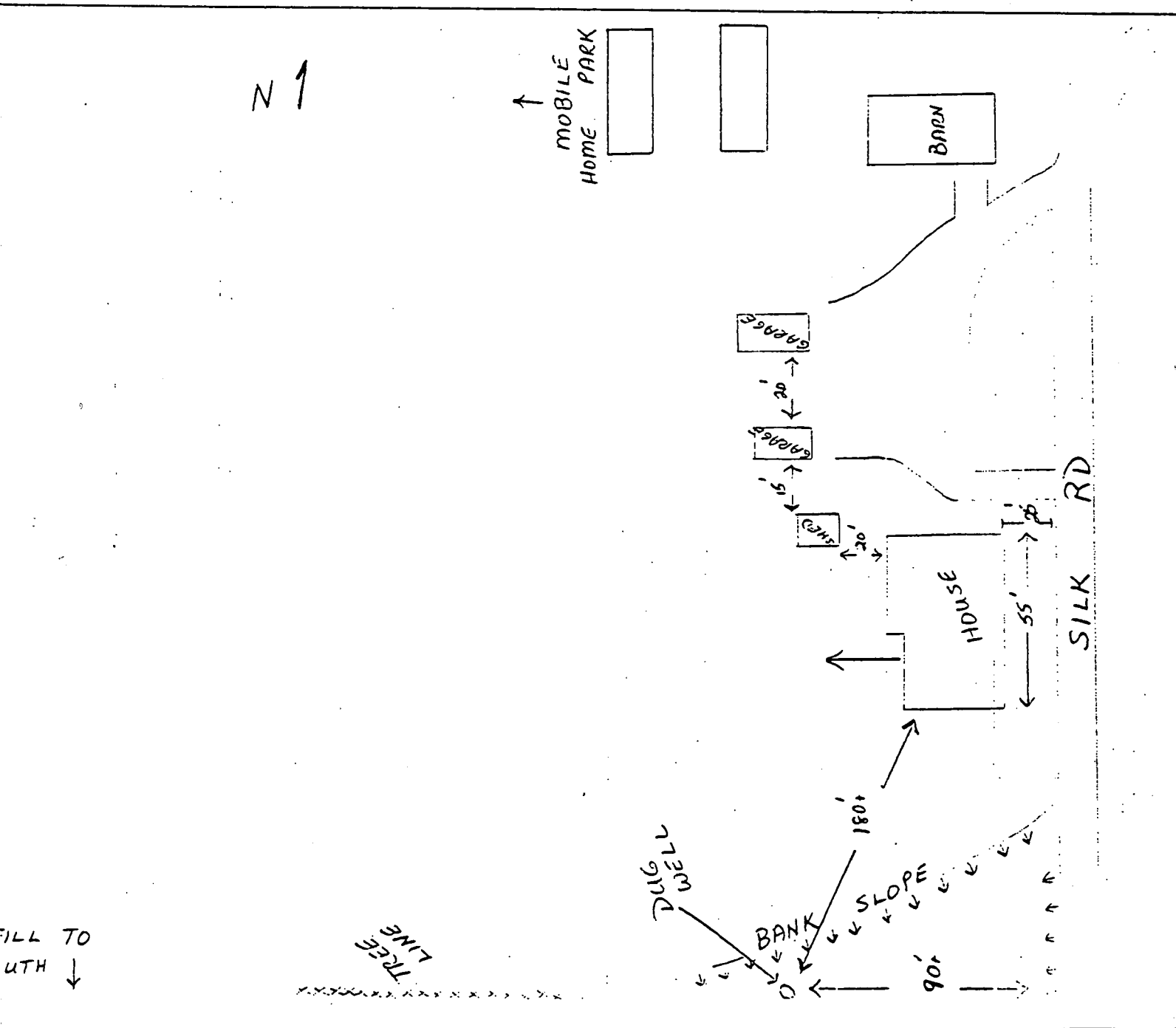
~~BRISTOL HILL LANDFILL~~

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

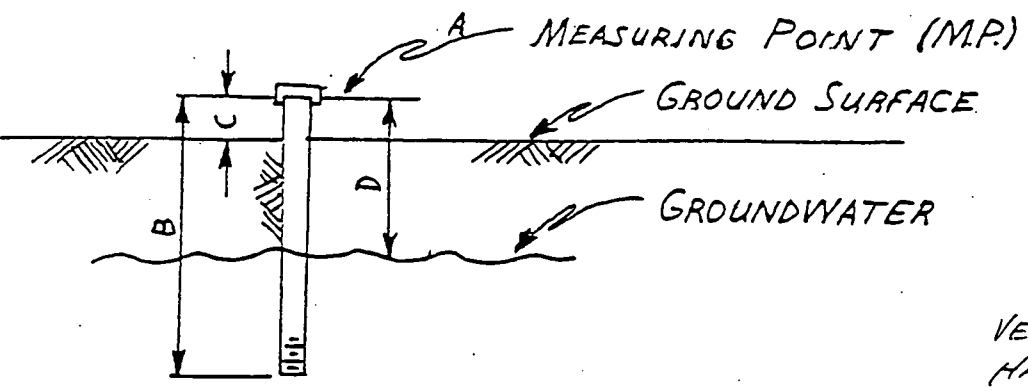
Well I.D.: DONALD KERFIEN - OLD WELL (1A) CEMENT CASING

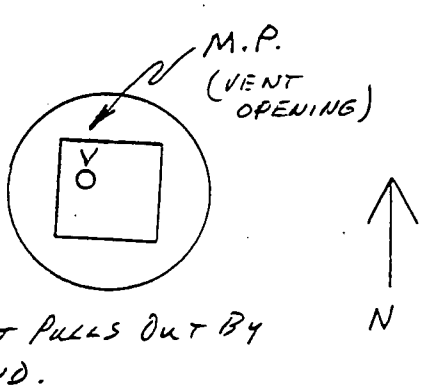
Measuring Point (M.P.) I.D.: "A" AT VENT CAP OPENING

M.P. Elevation (A): 457.9 FT. Well Length (B): 8.1 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.8 ± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/25/84	10 AM	2.5 FT.	455.4 FT.	NOT BEING USED ON DAY OF MEASUREMENT
5/9/84	10 AM	3.4 FT.	454.5 FT.	LOAD OF LAUNDRY DONE THAT MORNING





VENT PULLS OUT BY HAND.

VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: MR. DONALD KERFIEN, SR. SITE:# 101 (1A)

ADDRESS: RD#6 SILK RD., FULTON, N.Y 13069 TELEPHONE# 592-4704

FIRE CODE #: _____ DATE: 4/4/84

Road Name and Directions: SILK RD BETWEEN ROWLEE RD AND HOWARD RD

Which side: RIGHT (LEFT) WEST

Color: WHITE

Distinguishing Features: LARGE RED BARN JUST NORTH OF HOUSE

MOBILE HOME PARK NORTH OF THE BARN

SKETCH SEE ADDITIONAL SHEET SHOWING:

LOCATION:
ch showing:
oximate house dimensions
ance to well
ance to driveway
ance to road
tion of septic facilities
tion of other pertinent features
oximate north

SITE Investigation:

Investigated by E. Walsh

Date 4/4/84

Geological Character of Area

R SOURCE

(X) DUG
( ) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well	12-15	ft.
Diameter of well	3	ft./in.
Depth of casing	12-15	ft.
Top of well above ground	4	in.

		yes	no
Type of cover	Concrete		
Type of casing	Concrete tile		
Well seal type	NONE		
Tight cover and sides		( )	(X)
Well grouted		( )	(X)
Casing seals out sur-			

Kenfield, D
Drilled Well

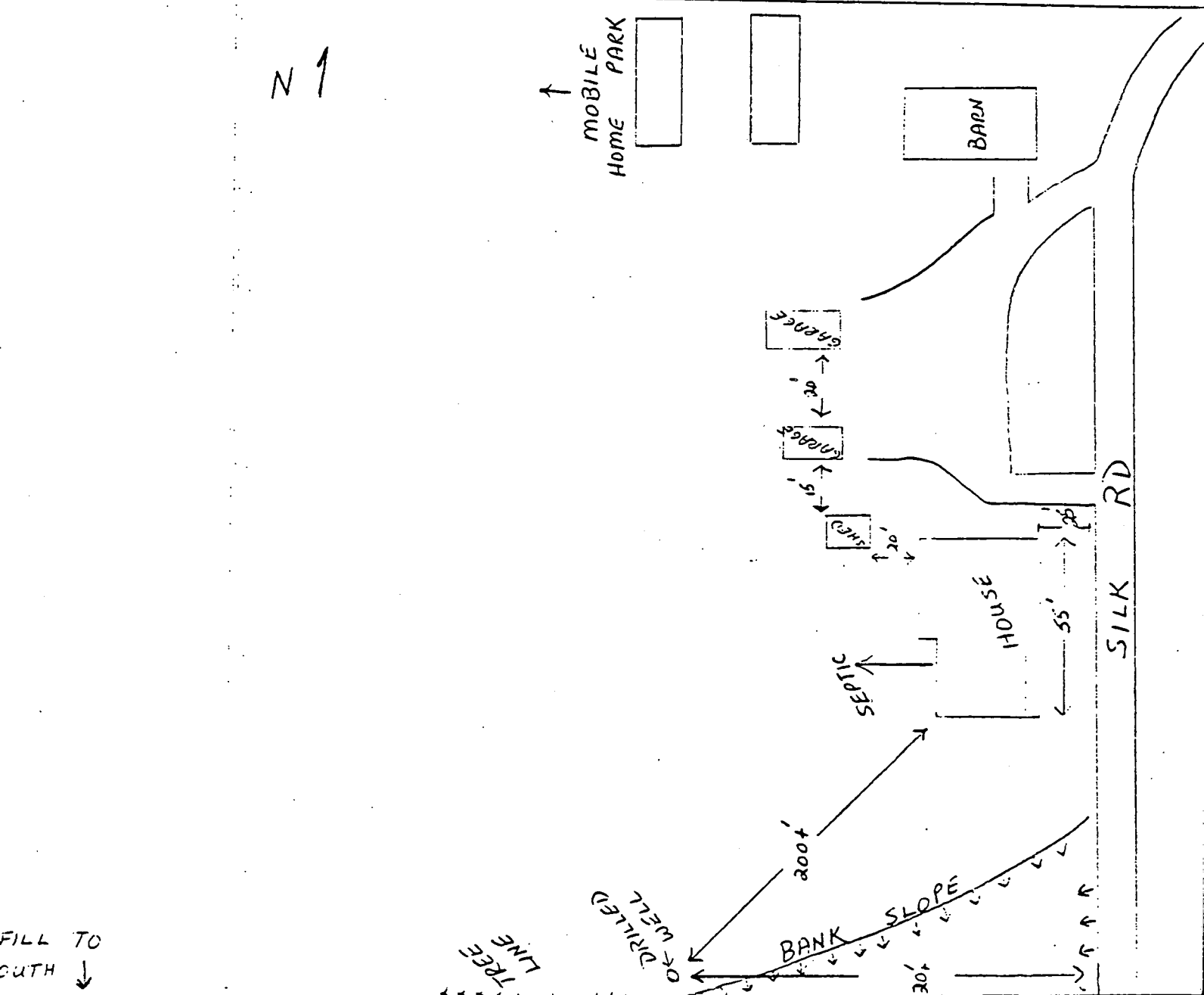
~~BRISTOL HILL LANDFILL~~

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

Well I.D.: DONALD KERFIEN - NEW WELL (1B) Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

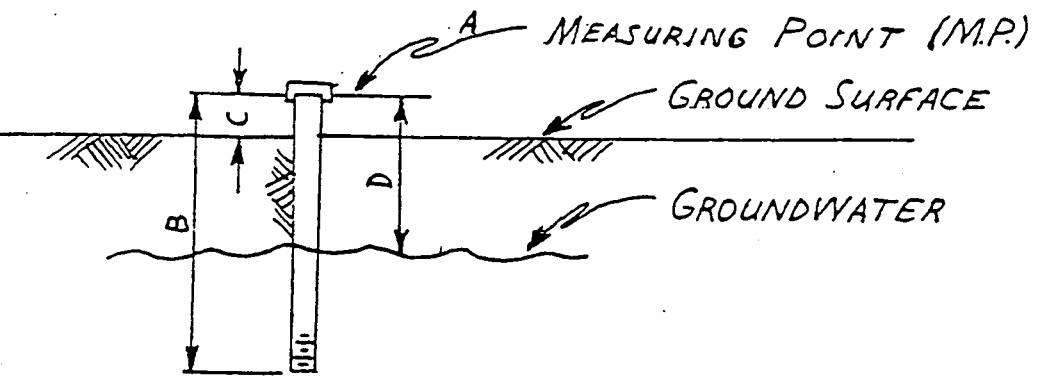
M.P. Elevation (A): 479.1 FT. (USGS Datum)

Well Length (B): UNKNOWN - 61± FT. TO WATER SOURCE (BEDROCK INTERFACE).

Dist. from M.P. to Ground Surface (C): 1.6± FT

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
4/25/84	10 AM	24.8 FT.	454.3 FT.	WASH BEING DONE AT TIME OF MEASUREMENT
6/19/84	10 AM	25.0 FT.	454.1 FT.	



NEED SCREW DRIVER TO REMOVE WELL CAP.

VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: MR DONALD KERFIEN SITE:# 102 (1B ON MAP)

ADDRESS: RD #6 SILK RD, FULTON, NY 13069 TELEPHONE# 592-470

FIRE CODE #: _____ DATE: 4/4/84

Road Name and Directions: SILK RD BETWEEN ROWLEE RD AND HOWARD RD

Which side: RIGHT (LEFT) WEST

Color: WHITE

Distinguishing Features: LARGE RED BARN JUST NORTH OF HOUSE MOBILE HOME PARK NORTH OF THE BARN

TE SKETCH SEE ADDITIONAL SHEET SHOWING:

LL LOCATION:
tetch showing:
proximate house dimensions
stance to well
stance to driveway
stance to road
cation of septic facilities
cation of other pertinent features
proximate north

SITE Investigation: _____

Investigated by E. Walsh

Date 4/4/84

Geological Character of Area

TER SOURCE

( ) DUG
(X) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well 80± ft.
Diameter of well 6 N./in.
Depth of casing UNKNOWN ft.
Top of well above ground 2 feet in.

Type of cover SANITARY SEAL
Type of casing iron pipe
Well seal type _____

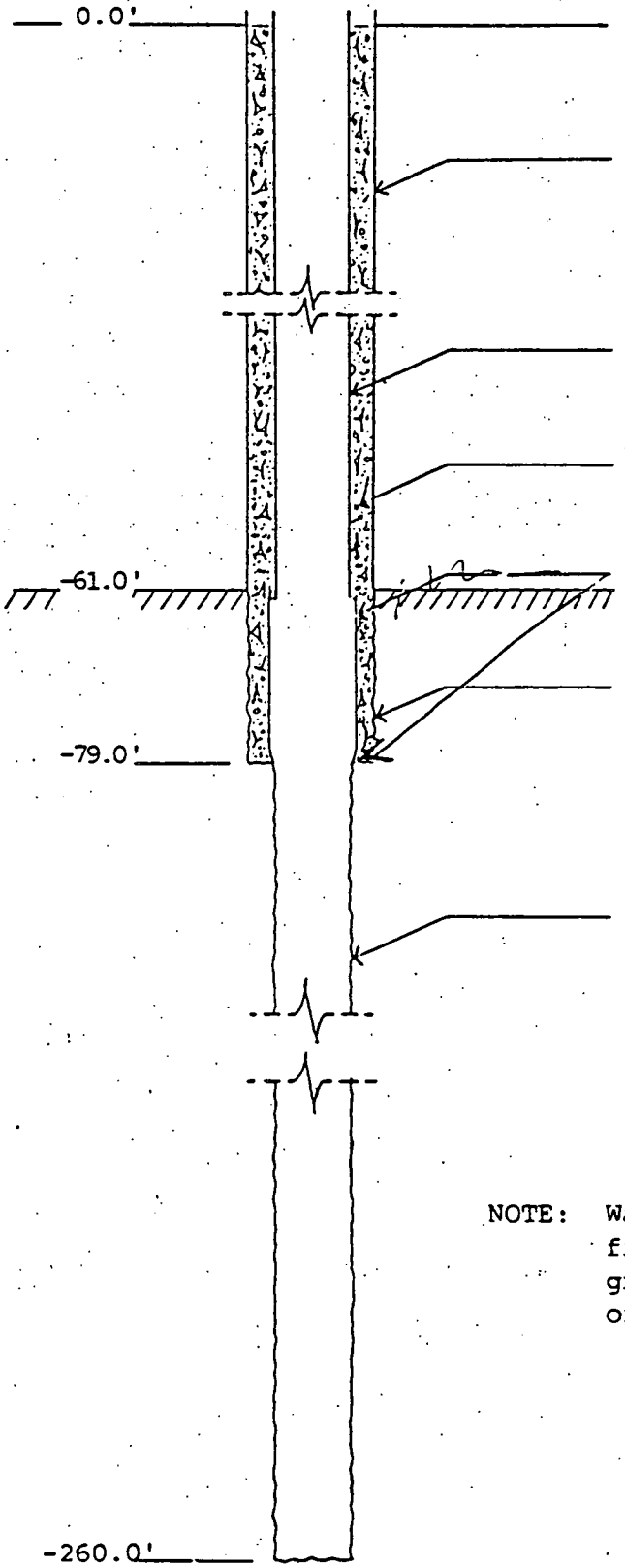
Tight cover and sides yes (X) no ( )
Well grouted UNKNOWN ( ) ( )
Casing seals out sur-

CATOH Environmental Companies, Inc.
One Industrial Place, Savannah, New York 13146
Phone: 315/365-2891

Project: Residential Water Well
Property Owner: Donald E. Kerfien

Client: County of Oswego
Oswego Valley L.F.
Date Started:
Date Completed:
Driller: Tim Crowell

Project No.: C1122
Boring No.: WW 1
Surface Elev.:
Groundwater Depth-Casing In:
Below Ground Surf.-Casing Out:



NOTE: Water salty to taste, well filled with concrete to -2' ground level at the request of the engineer.

Kerfien
Mobile Home Park

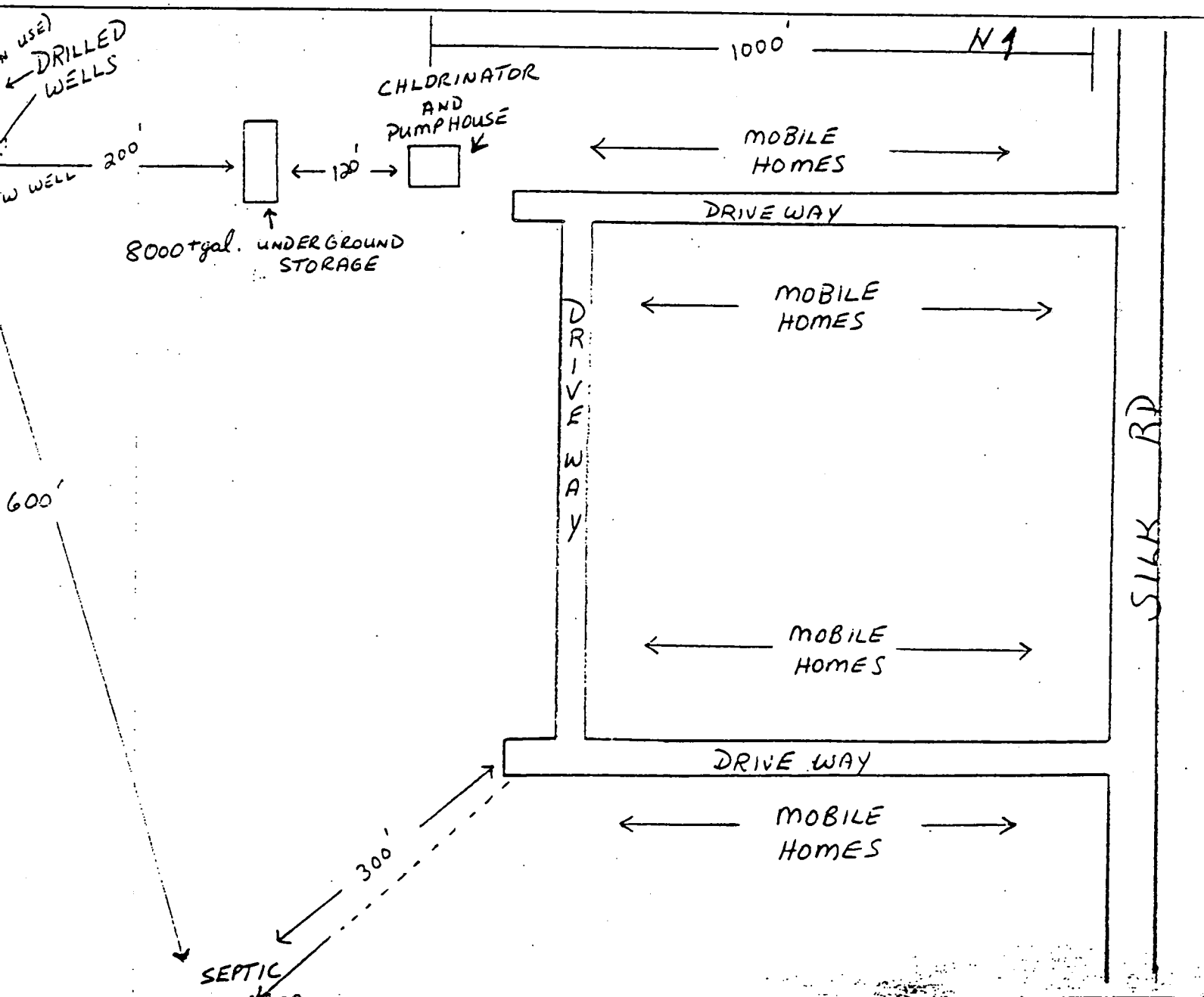
~~BRISTOL HILL LANDFILL~~

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

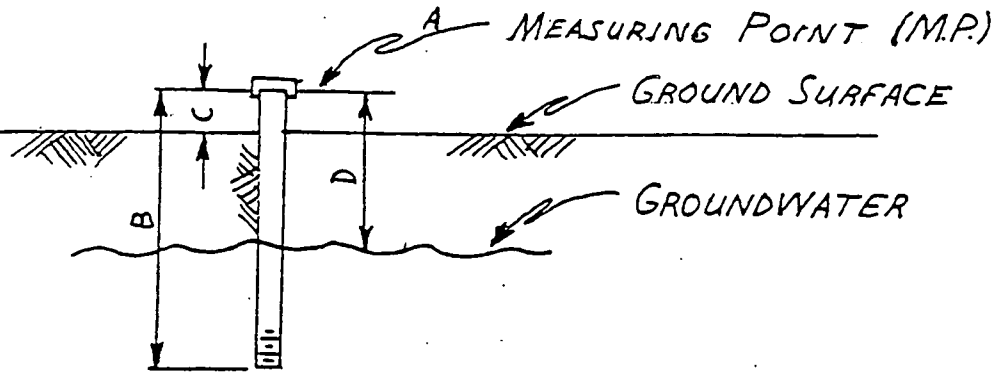
Well I.D.: KERFIEN MOBILE HOME PARK (2) Fe CASING

Measuring Point (M.P.) I.D.: CASING RIM

M.P. Elevation (A): 458.2 FT. Well Length (B): 48.0 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 2.1± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	POSSIBLE DRAW DOWN AFFECTS DUE TO USE AS MHP SUPPLY WELL. Remarks
4/24/84	1 PM	5.8 FT.	452.4 FT.	SEE NOTE ABOVE
1/19/84	10:30 AM	20.5 FT.	437.7 FT.	PUMP IN WELL RUNNING AT MEASUREMENT TIME



NEED 9/64 and 5/32 HEX WRENCH TO REMOVE WELL CAP.

VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: KERFIEN MOBILE HO. PK. SITE:# 2

ADDRESS: RD#6 SILK RD, FULTON NY 13069 TELEPHONE# 592-4704

FIRE CODE #: _____ DATE: 4/4/84

Road Name and Directions: SILK RD) BETWEEN ROWLEE RD AND ~~BUCK~~ HOWARD RD

Which side: ~~RIGHT~~ (LEFT) WEST

Color:

Distinguishing Features:

E SKETCH SEE ADDITIONAL SHEET SHOWING:

L LOCATION:
tch showing:
roximate house dimensions
tance to well
tance to driveway
tance to road
ation of septic facilities
ation of other pertinent features
roximate north

SITE Investigation:

Investigated by E. Walsh

Date 4/4/84

ER SOURCE

Geological Character of Area

( ) DUG
(X) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well 80.I ft.
Diameter of well 6" ~~in~~./in.
Depth of casing _____ ft.
Top of well above ground _____ in.

Type of cover SANITARY SEAL
Type of casing IRON
Well seal type

	yes	no
Tight cover and sides	X	( )
Well grouted UNKNOWN	( )	( )
Casing seals out sur-		

N TMo

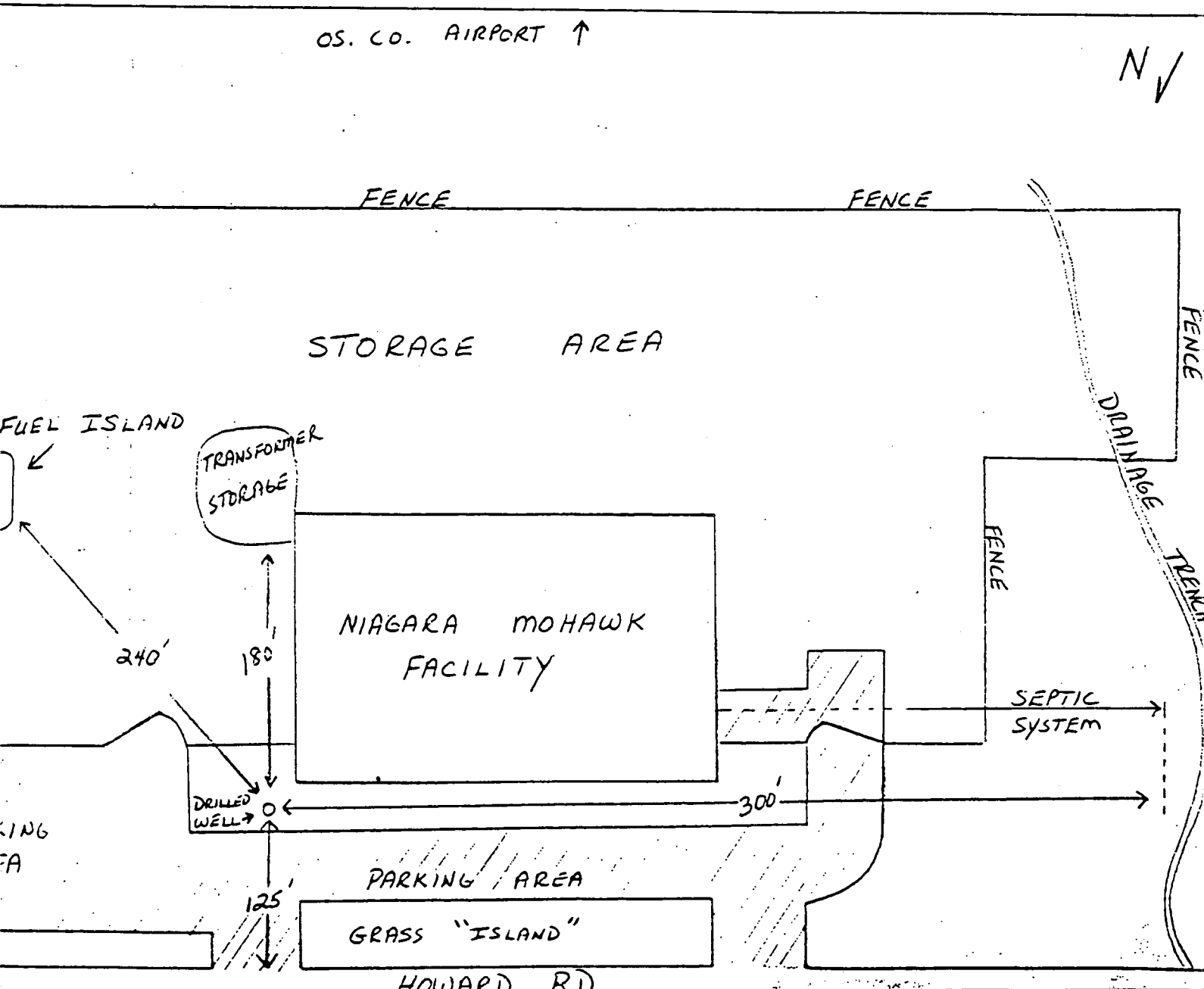
~~BRISTOL HILL LANDFILL~~

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

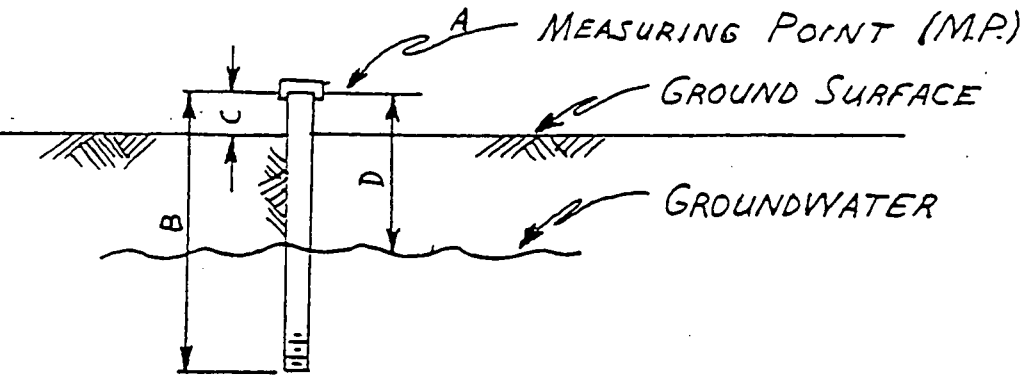
Well I.D.: NIAGARA MOHAWK FACILITY (5) Fe CASING

Measuring Point (M.P.) I.D.: WELL FLANGE

M.P. Elevation (A): 467.8 FT. Well Length (B): 55.8 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.0± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
7/3/84		2.4 FT.	465.4 FT.	
20/84	9:15 AM	2.5 FT.	465.3 FT.	



VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: NIAGARA MOHAWK FACILITY SITE:# 5

ADDRESS: RD# 2 HOWARD RD FULTON NY TELEPHONE# 592-013

FIRE CODE #: _____ DATE: 4/19/84

Road Name and Directions: HOWARD RD BETWEEN SILK RD AND CO. RT. 176

Which side: ~~RIGHT~~ ~~LEFT~~ SOUTH

Color: BLUE

Distinguishing Features: INDUSTRIAL COMPLEX WITH CHAIN LINK FENCE

ITE SKETCH SEE ADDITIONAL SHEET SHOWING:

ELL LOCATION:
ketch showing:
pproximate house dimensions
istance to well
istance to driveway
istance to road
ocation of septic facilities
ocation of other pertinent features
pproximate north

SITE Investigation: REVIEW OF BUILDING MAINTANENCE PLANS

Investigated by: E. Walsh

Date: 4/19/84

Geological Character of Area

ATER SOURCE

( ) DUG
(X) DRILLED
( ) DRIVEN
( ) OTHER

Depth of well _____ ft.
Diameter of well 6 in./in.
Depth of casing _____ ft.
Top of well above ground 12 in.

Type of cover SANITARY SEAL
Type of casing STEEL
Well seal type _____

	yes	no
Tight cover and sides	(X)	( )
Well grouted	( )	( )
Casing seals out sur-	?	?

Stevens

~~BRISTOL HILL LANDFILL~~

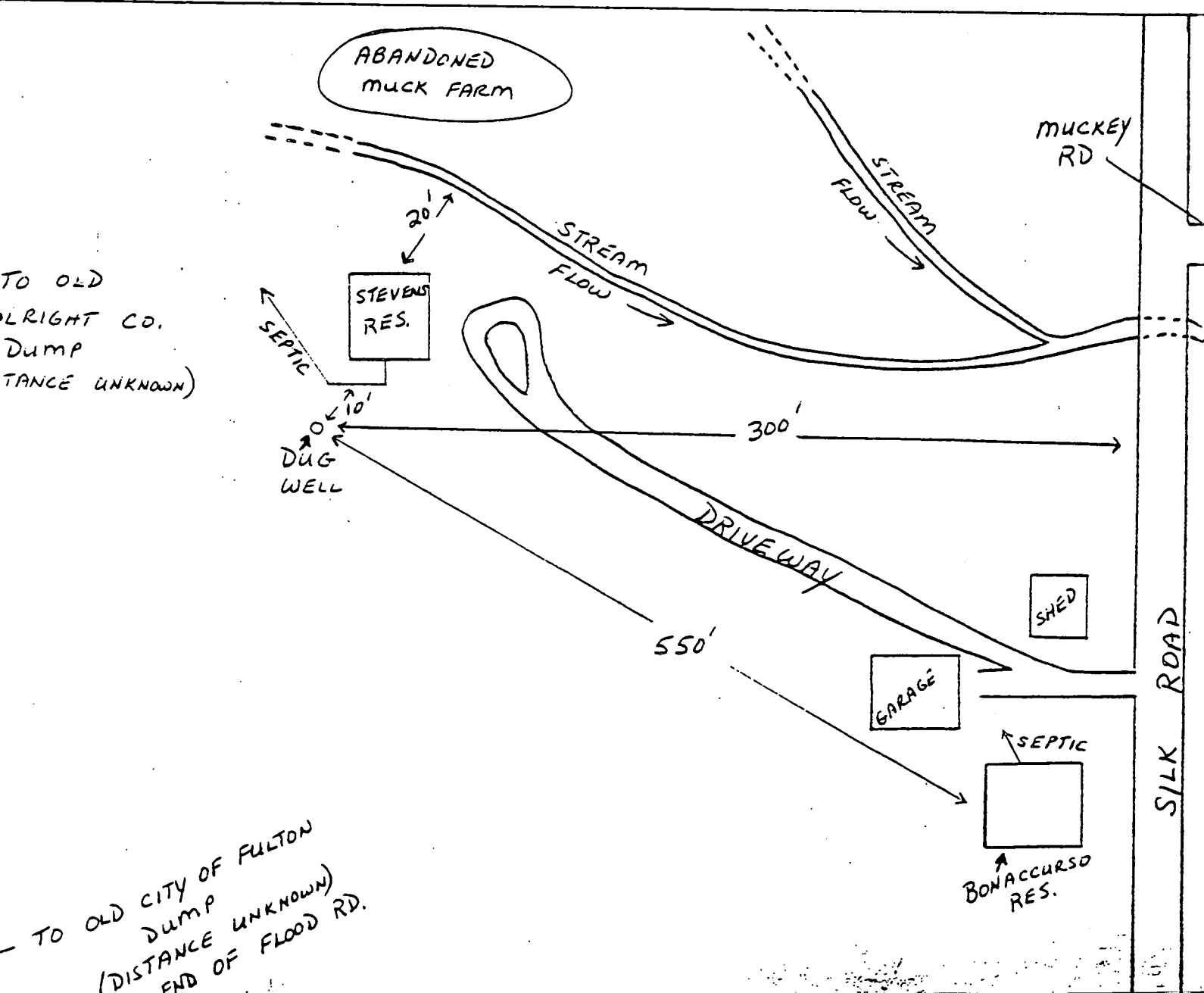
QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE SKETCH

INCLUDING:

(1) Approx. north
(2) Approx. house location and dimensions
(3) Well location
(4) Septic system location
(5) Location of all roads and/or driveways
(6) Location of other pertinent features
(7) Approx. distances between all sited locations

N1



Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

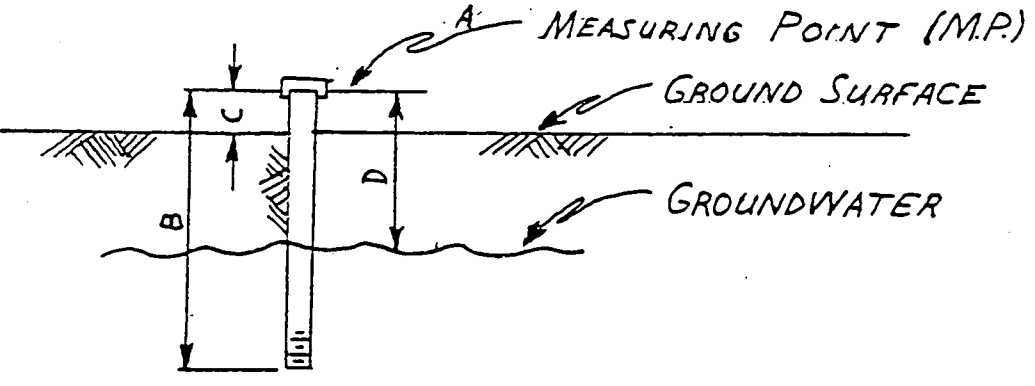
Well I.D.: JOSEPH STEVENS (4) CEMENT CASING

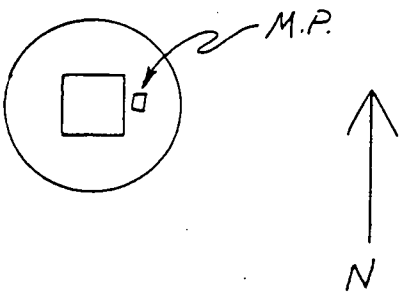
Measuring Point (M.P.) I.D.: "□" ON TOP OF CONCRETE COVER

M.P. Elevation (A): 472.5 FT. Well Length (B): 13.8 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 1.4 FT

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
1/25/84	11AM	10.1 FT	462.4 FT.	USE NOT DETERMINED.
1/20/84	10:30 AM	10.6 FT.	461.9 FT.	





VOLNEY LANDFILL

QUARTERLY RESIDENTIAL WELL MONITORING PROGRAM

SITE INFORMATION SHEET

NAME: MR. JOSEPH STEVENS SITE:# 4

ADDRESS: RD#6 SILK RD, FULTON, NY 13069 TELEPHONE# 598-19[illegible]

FIRE CODE #: _____ DATE: 4/12/84

J. STEVENS IS THE TENANT OF : MR. JOHN BONACCURSO
RD#6 SILK RD
FULTON, NY 13069
593-3081

Road Name and Directions: SILK RD BETWEEN MUCKEY RD AND NY RT 3

Which side: ~~RIGHT~~ (LEFT) WEST

Color: WHITE

Distinguishing Features: STEVENS' HOUSE SITS APPROX. 275' OFF ROAD

TE SKETCH SEE ADDITIONAL SHEET SHOWING:

LL LOCATION:
etch showing:
roximate house dimensions
tance to well
tance to driveway
tance to road
ation of septic facilities
ation of other pertinent features
roximate north

SITE Investigation:

Investigated by: E. Walsh

Date: 4/12/84

ER SOURCE

(X) DUG
( ) DRILLED
( ) DRIVEN
( ) OTHER

Geological Character of Area

Depth of well _____ ft.
Diameter of well 3 ft./~~in.~~
Depth of casing _____ ft.
Top of well above ground 3 ft. ~~in.~~

Type of cover CONCRETE
Type of casing CONCRETE TILE
Well seal type

	yes	no
Tight cover and sides	( )	(X)
Well grouted	( )	(X)
Casing seals out sur-		

Oswego Valley Landfill
Water Quality Monitoring Program

132.19C

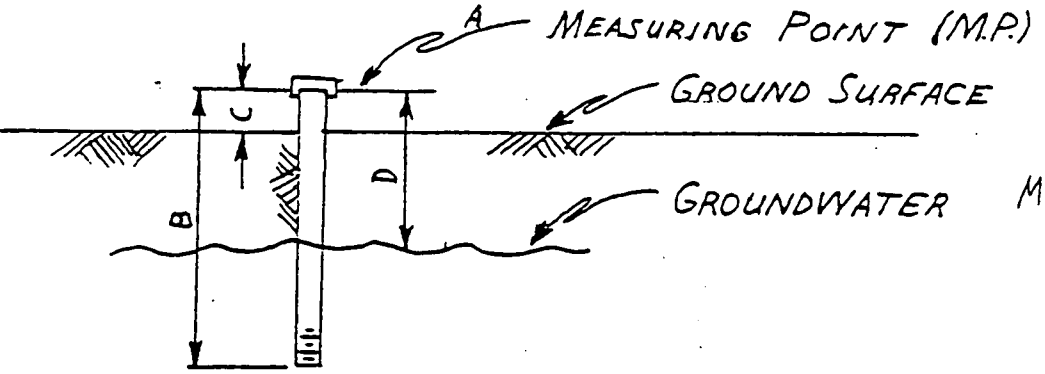
Well I.D.: LANDFILL TRAILER WELL (8) Fe CASING

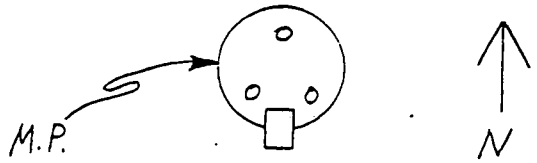
Measuring Point (M.P.) I.D.: "+" ON WEST SIDE OF CASING

M.P. Elevation (A): 469.9 FT. Well Length (B): 56.3 FT.
(USGS Datum)
Dist. from M.P. to Ground Surface (C): 0.3 ± FT.

(All measurements to nearest 0.1 ft.)

Date	Time (AM/PM)	Dist. to Ground-water (D)	Groundwater Elev. (USGS Datum) (=A-D)	Remarks
5/3/84		18.0 FT.	451.9 FT.	WELL NOT IN USE DUE TO LF. CLOSURE.





NEED 3/4" WRENCH TO REMOVE BOLTS. (LARGE SOCKET IF POSSIBLE)

APPENDIX C

LABORATORY REPORTS FOR MARCH 1984

GROUNDWATER SAMPLES

OSWEGO VALLEY LANDFILL

OSWEGO COUNTY, NEW YORK

OSWEGO VALLEY GROUNDWATER MONITORING PROGRAM 3/84 Data

LOCATION	CH3Br ug/l	CHBr3 ug/l	CHBrCl2 ug/l	CHBr2Cl ug/l	Cl2C::CCl2 ug/l	Cl2C::CHCl ug/l	ClHC::CHI ug/l	E-C2H2Cl2 ug/l
AIRPORT	<10	<10	<10	<10	<10	<10	<10	<10
1 KAMA	<10	<10	<10	<10	<10	<10	<10	<10
4 STEVENS	<10	<10	<10	<10	<10	<10	<10	<10
5 NIRO	<10	<10	<10	<10	<10	<10	<10	<10
6 COAK	<10	<10	<10	<10	<10	<10	<10	<10
7 DUFANT	<10	<10	<10	<10	<10	<10	<10	<10
9 SUMP	<10	<10	<10	<10	<10	<10	<10	<10
10 BIRD	<10	<10	<10	<10	<10	<10	<10	<10
11 TW 3C	<10	<10	<10	<10	<10	<10	<10	<10
12 TW 3D	<10	<10	<10	<10	<10	<10	<10	<10
13 TW 10	<10	<10	<10	<10	<10	<10	<10	<10
101 KOLD	<10	<10	<10	<10	<10	<10	<10	<10
102 S NEW	<10	<10	<10	<10	<10	<10	<10	<10
301 DUKE	<10	<10	<10	<10	<10	<10	<10	<10

3/84 Data

OSWEGO VALLEY GROUNDWATER MONITORING PROGRAM

LOCATION	C3H4O	C3H3N	C6H6	C6H5CH3	C6H4C2H5	CCL4	C6H5CL	CL(CH3)2CL	CL3CCH3	CL3HCCH3	CL2C::CH3	CL2HCCH3CL	CL2HCCHCL2	CLH2CCH3	C4H7CLO	CHCL3	C3H6CL2	E-C3H4CL2	Z-C3H4CL3	CH2CL2	CH3CL
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
AIRPORT	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
2 KUHF	<1000	<1000	<10	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
4 STEVENS	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	67	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
5 NIMO	<1000	<1000	<10	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
6 CORN	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
7 DIFFITT	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
9 SUMP	<1000	<1000	12	86	38	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
10 BRESS	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
11TV 3C	<1000	<1000	<10	76	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
12TV 3D	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
13TV 10	<1000	<1000	<10	24	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
101 KOCH	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
102 KOCH	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
201 DUKE	<1000	<1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

OSWEGO VALLEY GROUNDWATER MONITORING PROGRAM 3/84 Quarterly Monitoring Data.

Liverpool, New York 13088

PART C

DATE	LOG NO.		ALK.	BOD5	COD	CHLORIDE	SP. COND.	HARDNESS	NH3-N	NITRATE	NITRITE	pH	PHENOL	TPO4-T	TDS	SULFATE	TOC	Fe	Mn	Zn	Coli-F	Coli-T
			mg/l	mg/l	mg/l	mg/l	umhos/cm	mg/l	mg/l	mg/l	mg/l	units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	Col/100ml	Col/100ml
3/19/84	1547	AIRPORT	147	.6	3.6	210	1010	180	.69	(0.04	(0.02	7.8	(0.010	(0.05	583	15.9	11.5	.72	.07	.18	(1	(1
3/26/84	1665	K.MHP 2	150	(0.5	2.8	62	385	156	.2	.47	(0.02	7.6	(0.010	(0.05	248	25.1	(3.0	.05	.03	.06	(1	1
3/26/84	1662	STEVENS 4	56	(0.5	(1.0	10	140	72	.05	.46	(0.02	8	(0.010	.05	180	12.6	(3.0	.01	.02	.06	(1	3
3/26/84	1667	NiMo 5	182	(0.5	4.4	22	485	184	.15	(0.04	(0.02	7.4	(0.010	(0.05	268	18.5	(3.0	1.4	.27	.1	(1	(1
3/26/84	1663	COAKLEY 6	244	(0.5	3.2	18	510	236	.11	.41	(0.02	7.3	(0.010	(0.05	360	22.3	(3.0	.88	.02	.12	(1	(1
3/27/84	1716	DURRANT 7	152	(0.5	(1.0	25	410	168	.17	(0.04	(0.02	7.4	(0.010	(0.05	276	26.6	(3.0	.3	.24	.1	(1	2
3/26/84	1660	SUMP 9	7625	680	1550	680	14000	3200	895	(0.04	.02	7.5	.656	3.29	7918	66.3	300	17	.12	.32	(1	20
3/26/84	1659	BIRDSELL 10	48	(0.5	2	13.5	195	48	(0.04	4.6	(0.02	6.5	(0.010	(0.05	100	18.2	(3.0	.14	.05	.29	(1	(1
3/19/84	1548	11TW 3C DEEP	526	810	980	103	1400	760	.22	(0.04	(0.02	7.4	.341	(0.05	1257	(3.0	373	11	.52	.1	(1	(1
3/19/84	1549	12TW 3D SHALLOW	360	(0.5	24.4	72	908	438	.11	1.83	(0.02	7	(0.010	.32	676	93.1	35.5	9.1	1.1	.16	(1	(1
3/19/84	1550	13TW 10	353	9.9	56	180	1350	500	1.25	(0.04	(0.02	6.7	.014	.13	895	15.8	39	39	3.7	1.4	(1	(1
3/26/84	1664	KERF. 101 OLD	74	(0.5	(1.0	36	308	112	.07	1.1	(0.02	6.7	(0.010	(0.05	200	8.7	(3.0	.26	.04	.13	(1	(1
3/26/84	1666	KERF. 102 NEW	124	(0.5	(1.0	31	325	132	.08	.07	(0.02	7.6	(0.010	(0.05	216	17.7	(3.0	.17	.02	.04	(1	(1
3/26/84	1661	DURELY 301	220	(0.5	3.6	31	465	220	(0.04	.49	(0.02	7.4	(0.010	.05	288	6.9	(3.0	.11	.01	.47	(1	(1

APPENDIX D

LABORATORY REPORTS FOR MAY 1984

RESAMPLING FOR VOLATILE ORGANICS

CAMO LABORATORIES

A DIVISION OF CAMO POLLUTION CONTROL, INC.

POUGHKEEPSIE AREA FACILITY:
CAMO LABORATORY
367 VIOLET AVENUE
POUGHKEEPSIE, N.Y. 12601
(914) 473-9200

ROCHESTER AREA FACILITY:
LOZIER/CAMO LABORATORY
23 NORTH MAIN STREET
FAIRPORT, N.Y. 14450
(716) 425-2210

June 20, 1984

Mr. Conrad Tuefel
Calocerinos & Spina
1020 Seventh North Street
Liverpool, N.Y. 13088

RE: Analytical Report
CAMO Log No.: 84-5-878

Dear Mr. Tuefel:

CAMO Laboratories received seven (7) water samples labelled "2944", "2945", "2946", "2947", "2948", "2949", and "2950" on May 23, 1984, with a request to analyze for Method 601 and 602 Volatile Organic Scan.

All analyses were performed in accordance with EPA "Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations", Federal Register, Monday, December 3, 1979; Method 601 and 602.

The results of this analytical investigation are the subject of this report. If you have any questions, please feel free to call. Thank you.

Sincerely,

Joann M. Potter

Joann M. Potter
Laboratory Manager

JMP:sjr
Enclosure

CAMO LOG NO.: 84-5-878

VOLATILES

EPA 601 METHOD — SAMPLE IDENTIFICATION

PARAMETERS	A KERFEIN MHP 2944	B NIAGARA MOHAWK FACIL 2945	C J. STEVENS RES. 2946	D KERFEIN MHP 2947	E J. STEVENS RES. 2948
chloromethane	<1	<1	<1	<1	<1
bromomethane	<1	<1	<1	<1	<1
vinyl chloride	<1	<1	<1	<1	<1
chloroethane	<1	<1	<1	<1	<1
methylene chloride	<1	<1	<1	<1	<1
trichlorofluoromethane	<1	<1	<1	<1	<1
1,1-dichloroethylene	<1	<1	<1	<1	<1
1,1-dichloroethane	<1	<1	<1	<1	<1
trans-1,2-dichloroethylene	<1	<1	<1	<1	<1
dichlorodifluoromethane	<1	<1	<1	<1	<1
chloroform	<1	<1	<1	<1	<1
1,2-dichloroethane	<1	<1	<1	<1	<1
1,1,1-trichloroethane	<1	<1	<1	<1	<1
carbon tetrachloride	<1	<1	<1	<1	<1
bromodichloromethane	<1	<1	<1	<1	<1
1,2-dichloropropane	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	<1	<1	<1	<1	<1
trichloroethylene	<1	<1	<1	<1	<1
dibromochloromethane	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	<1	<1	<1	<1	<1
1,1,2-trichloroethane	<1	<1	<1	<1	<1
2-chloroethylvinyl ether	<1	<1	<1	<1	<1
bromoform	<1	<1	<1	<1	<1
tetrachloroethylene	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	<1	<1	<1	<1	<1

NOTE: All results expressed in ug/L unless otherwise noted.

CAMO LOG NO.: 84-5-878

VOLATILES

EPA 601 METHOD

SAMPLE IDENTIFICATION

PARAMETERS	F NL Mc FACIL. 2949	G BLANK 2950			
chloromethane	<1	<1			
bromomethane	<1	<1			
vinyl chloride	<1	<1			
chloroethane	<1	<1			
methylene chloride	<1	3			
trichlorofluoromethane	<1	<1			
1,1-dichloroethylene	<1	<1			
1,1-dichloroethane	<1	<1			
trans-1,2-dichloroethylene	<1	<1			
dichlorodifluoromethane	<1	<1			
chloroform	<1	<1			
1,2-dichloroethane	<1	<1			
1,1,1-trichloroethane	<1	<1			
carbon tetrachloride	<1	<1			
bromodichloromethane	<1	<1			
1,2-dichloropropane	<1	<1			
trans-1,3-dichloropropene	<1	<1			
trichloroethylene	<1	<1			
dibromochloromethane	<1	<1			
cis-1,3-dichloropropene	<1	<1			
1,1,2-trichloroethane	<1	<1			
2-chloroethylvinyl ether	<1	<1			
bromoform	<1	<1			
tetrachloroethylene	<1	<1			
1,1,2,2-tetrachloroethane	<1	<1			

NOTE: All results expressed in ug/L unless otherwise noted.

AROMATICS

(METHOD 602)

All results in ug/l unless noted otherwise

MPOUND	SAMPLE IDENTIFICATION				
	A	B	C	D	E
	2944	2945	2946	2947	2948
nzene	<1	<1	<1	<1	<1
uene	<1	<1	<1	<1	<1
ylbenzene	<1	<1	<1	<1	<1
orobenzene	<1	<1	<1	<1	<1
,Dichlorobenzene	<1	<1	<1	<1	<1
,Dichlorobenzene	<1	<1	<1	<1	<1
,Dichlorobenzene	<1	<1	<1	<1	<1

AROMATICS

(METHOD 602)

All results in ug/l unless noted otherwise

POUND	SAMPLE IDENTIFICATION				
	F	G			
	2949	2950			
zene	<1	<1			
uene	<1	<1			
ylbenzene	<1	<1			
orobenzene	<1	<1			
Dichlorobenzene	<1	<1			
Dichlorobenzene	<1	<1			
Dichlorobenzene	<1	<1			

Environmental
LABORATORY
Division of Calocerinos & Spina Consulting Engineers • 1020 Seventh North Street, Liverpool, NY 13088
(315) 457-6711

IDENTIFICATION/CHAIN OF CUSTODY FORM

	C & S ID #	LOCATION		C & S ID #	LOCATION
1.	#2944	N/A	11.	#	
2.	#2945	N/A	12.	#	
3.	#2946	N/A	13.	#	
4.	#2947	N/A	14.	#	
5.	#2948	N/A	15.	#	
6.	#2949	N/A	16.	#	
7.	#2950	Field Blank	17.	#	
8.	#		18.	#	
9.	#		19.	#	
10.	#		20.	#	

*N/A - Not Applicable

RELINQUISHED BY : Conrad Teufel Jr. DATE: 5/22/84 TIME: 1600
C & S ENVIRONMENTAL LABORATORY

METHOD OF SHIPMENT: Purolator Courier

RECEIVED BY : Michael Dunn DATE: 5/23/84 TIME: 11:30 AM
CAMO LABORATORIES, INC.

O'BRIEN & GERE

June 5, 1984

Mr. David Ulm
BARTON & LOGUIDICE, P.C.
290 Elwood David Road
Liverpool, NY 13088

Re: Lab Data Report

File: 2083.001.517

Dear Dave:

Please find enclosed the results of laboratory analysis on samples received 5-21-84.

If you have any questions concerning these results, please do not hesitate to contact us.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

David R. Hill
Manager of Analytical Services

DRH/bpp

Enclosure

O'BRIEN & GERE

Purgeable Priority Pollutants

CLIENT BARTON & LOGUIDICE, P.C. JOB NO. 2083.001.517

DESCRIPTION A KERFEIN MHP

SAMPLE NO. 36362 DATE COLLECTED 5-21-84 DATE REC'D. 5-21-84 DATE ANALYZED 5-23-84

	ppb		ppb
Chloromethane	<1.	1,2-Dichloropropane	<1.
Bromomethane		t-1,3-Dichloropropene	
Dichlorodifluoromethane		Trichloroethene	
Vinyl chloride		Benzene	
Chloroethane		Dibromochloromethane	
Methylene chloride		1,1,2-Trichloroethane	
Trichlorofluoromethane		c-1,3-Dichloropropene	
1,1-Dichloroethene		2-Chloroethylvinyl ether	<10.
1,1-Dichloroethane		Bromoform	<10.
t-1,2-Dichloroethene		1,1,2,2-Tetrachloroethane	<1.
Chloroform		Tetrachloroethene	
1,2-Dichloroethane		Toluene	
1,1,1-Trichloroethane		Chlorobenzene	
Carbon tetrachloride		Ethylbenzene	
Bromodichloromethane			

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

Authorized: [signature]

Date: 6-5-84

O'Brien & Gere Engineers, Inc.
Box 4873 / 1304 Buckley Rd. / Syracuse, NY / 13221 / (315) 451-4700

O'BRIEN & GERE

Purgeable Priority Pollutants

CLIENT BARTON & LOGUIDICE, P.C. JOB NO. 2083.001.517

DESCRIPTION B NIAGARA MOHAWK FACILITY

SAMPLE NO. 36363 DATE COLLECTED 5-21-84 DATE REC'D. 5-21-84 DATE ANALYZED 5-23-84

	ppb		ppb
Chloromethane	<1.	1,2-Dichloropropane	<1.
Bromomethane		t-1,3-Dichloropropene	
Dichlorodifluoromethane		Trichloroethene	
Vinyl chloride		Benzene	
Chloroethane		Dibromochloromethane	
Methylene chloride		1,1,2-Trichloroethane	
Trichlorofluoromethane		c-1,3-Dichloropropene	
1,1-Dichloroethene		2-Chloroethylvinyl ether	<10.
1,1-Dichloroethane		Bromoform	<10.
t-1,2-Dichloroethene		1,1,2,2-Tetrachloroethane	<1.
Chloroform		Tetrachloroethene	
1,2-Dichloroethane		Toluene	
1,1,1-Trichloroethane		Chlorobenzene	
Carbon tetrachloride		Ethylbenzene	
Bromodichloromethane			

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

O'Brien & Gere Engineers, Inc.
Box 4873 / 1304 Buckley Rd. / Syracuse, NY / 13221 / (315) 451-4700

Authorized: [signature]

Date: 6-5-84

O'BRIEN & GERE

Purgeable Priority Pollutants

CLIENT BARTON & LOGUIDICE, P.C. JOB NO. 2083.001.517

DESCRIPTION C JOSEPH STEVENS RESIDENCE

SAMPLE NO. 36364 DATE COLLECTED 5-21-84 DATE REC'D. 5-21-84 DATE ANALYZED 5-23-84

	ppb		ppb
Chloromethane	<1.	1,2-Dichloropropane	<1.
Bromomethane		t-1,3-Dichloropropene	
Dichlorodifluoromethane		Trichloroethene	
Vinyl chloride		Benzene	
Chloroethane		Dibromochloromethane	
Methylene chloride		1,1,2-Trichloroethane	
Trichlorofluoromethane		c-1,3-Dichloropropene	
1,1-Dichloroethene		2-Chloroethylvinyl ether	<10.
1,1-Dichloroethane		Bromoform	<10.
t-1,2-Dichloroethene		1,1,2,2-Tetrachloroethane	<1.
Chloroform		Tetrachloroethene	
1,2-Dichloroethane		Toluene	
1,1,1-Trichloroethane		Chlorobenzene	
Carbon tetrachloride		Ethylbenzene	
Bromodichloromethane			

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

Authorized: [signature]

Date: 6-5-84

O'Brien & Gere Engineers, Inc.
Box 4873 / 1304 Buckley Rd. / Syracuse, NY / 13221 / (315) 451-4700

O'BRIEN & GERE

Purgeable Priority Pollutants

CLIENT BARTON & LOGUIDICE, P.C. JOB NO. 2083.001.517

DESCRIPTION Field Blank

SAMPLE NO. 36365 DATE COLLECTED 5-21-84 DATE REC'D. 5-21-84 DATE ANALYZED 5-23-84

	ppb		ppb
Chloromethane	<1.	1,2-Dichloropropane	<1.
Bromomethane		t-1,3-Dichloropropene	
Dichlorodifluoromethane		Trichloroethene	
Vinyl chloride		Benzene	
Chloroethane		Dibromochloromethane	
Methylene chloride		1,1,2-Trichloroethane	
Trichlorofluoromethane		c-1,3-Dichloropropene	
1,1-Dichloroethene		2-Chloroethylvinyl ether	<10.
1,1-Dichloroethane		Bromoform	<10.
t-1,2-Dichloroethene		1,1,2,2-Tetrachloroethane	<1.
Chloroform		Tetrachloroethene	
1,2-Dichloroethane		Toluene	
1,1,1-Trichloroethane		Chlorobenzene	
Carbon tetrachloride		Ethylbenzene	
Bromodichloromethane			

Methodology: Federal Register — 40 CFR, Part 136, December 3, 1979

Comments:

O'Brien & Gere Engineers, Inc.
Box 4873 / 1304 Buckley Rd. / Syracuse, NY / 13221 / (315) 451-4700

Authorized: DRiley

Date: 6-5-84

Environmental Engineers & Scientists
HOLZMACHER, McLENDON and MURRELL, P.C.
575 BROAD HOLLOW ROAD, MELVILLE, NEW YORK 11747 (516) 694-3040

WATER RESOURCES • WATER SUPPLY & TREATMENT • SEWERAGE & TREATMENT • ECOLOGICAL & IMPACT STUDIES
MODEL STUDIES • PILOT PLANT STUDIES • WATER/WASTE WATER LABORATORY AND ANALYTICAL SERVICES

LABORATORY REPORT

LAB NO. 454199
PROJECT NO. ORG

CLIENT'S NAME AND ADDRESS

BARTON & LOGUIDICE, P.C.
PO Box 3107
Syracuse, NY 13220

TYPE OF SAMPLE - MISCELLANEOUS
DATE COLLECTED - 3/28/84
COLLECTED BY CL 99
DATE RECEIVED - 3/29/84

MEK ANALYSIS
JOB # 132.19a

MAY 18 1984

LAB NO.	SAMPLE ID INFORMATION	
454199	#2 Kerfien MW	<10.0 #
454200	#4 Stevens	<10.0 #
454201	#5 Niagara Mohawk	<10.0 #
454202	#6 Coakley, dup	<10.0 #
454203	#7 Durant	<10.0 #
454204	#9 Landfill Sump	4100 #
454205	#10 Birdsell	<10.0 #
454206	#11 USGS 3C	1900 #
454207	#12 USGS 3D	50.0 #
454208	#100 Airport	<10.0 #

ALL RESULTS IN (MG/L) EXCEPT AS NOTED BY # (UG/L) OR % (PERCENT) AND
T.COLI BACT. & FECAL COLI (MPN/100ML)
COLOR, ODOR, TURBIDITY & PH (UNITS)
APC & FECAL STREP (COUNTS/ML)
SPEC.COND. (UMHOS) SETT.SOLIDS(ML/L)

DATE REPORTED 4/24/84

S. C. McLENDON, P.E., LABORATORY DIRECTOR

H2M
Environmental Engineers & Scientists
HOLZMACHER, McLENDON and MURRELL, P.C.
575 BROAD HOLLOW ROAD, MELVILLE, NEW YORK 11747 (516) 694-3040

WATER RESOURCES • WATER SUPPLY & TREATMENT • SEWERAGE & TREATMENT • ECOLOGICAL & IMPACT STUDIES
MODEL STUDIES • PILOT PLANT STUDIES • WATER/WASTE WATER LABORATORY AND ANALYTICAL SERVICES

LABORATORY REPORT

LAB NO. 454199
PROJECT NO. ORG

CLIENT'S NAME AND ADDRESS

BARTON & LOGUIDICE, P.C.
PO Box 3107
Syracuse, NY 13220

TYPE OF SAMPLE - MISCELLANEOUS
COLLECTED BY CL 99
DATE COLLECTED - 3/28/84
DATE RECEIVED - 3/29/84

MEK ANALYSIS
JOB # 132.19a

MAY 18 1984

LAB NO.	SAMPLE ID INFORMATION		
454209	#101	D. Kerfien, dug	<10.0 #
454210	#102	D. Kerfien, drilled	<10.0 #
454211	#301	Durfey, dug	<10.0 #

ALL RESULTS IN (MG/L) EXCEPT AS NOTED BY # (UG/L) OR % (PERCENT) AND
T.COLI BACT. & FECAL COLI (MPN/100ML)
COLOR, ODOR, TURBIDITY & PH (UNITS)
APC & FECAL STREP (COUNTS/ML)
SPEC.COND. (UMHOS) SETT.SOLIDS(ML/L)

DATE REPORTED 4/24/84

S. C. McLENDON, P.E., LABORATORY DIRECTOR

APPENDIX E

PROCEDURES FOR SECURING AND REDEVELOPING EXISTING TEST WELLS OSWEGO VALLEY LANDFILL OSWEGO COUNTY, NEW YORK

Appendix E. Procedures for Securing and Redeveloping Existing Test Wells, Oswego Valley Landfill, Oswego County, New York

Securing Test Wells

Test wells should be secured with proper surface seals and locking steel protector pipes. For wells with existing steel protector pipes, inspect the surface seal (annulus between outer casing and borehole) by slightly excavating around the casing, then determine the type of seal (bentonite, cement) and the tightness of the seal. Note the slope of the seal with respect to the surrounding ground surface and nearby surface water (streams, road, ditches, puddles, etc.). Replace inadequate seals by digging out around the casing and installing a cement or bentonite seal which is not subject to frost heave and is sloped away from the well, to prevent infiltration of surface water into the annulus. Equip existing steel protector pipes fitted with a locking cap, confirm that the surveyed measuring point on the inner well casing is clearly marked, and affix the well number to the outside of the protector pipes.

For wells without protector pipes, dig a hole around the well casing sufficient to allow installation of a steel protector pipe and cement surface seal such that the seal is not subject to frost heave. Select the protector pipe diameter to allow sufficient clearance around the well casing. The top rim of the installed protector pipe should be no more than 1 or 2 inches above the top of the inner casing. Considering the average yearly snowfall for the area, and the proximity of many test wells to roads, it may be adviseable to design the protector lengths and caps in a

manner to be accessible in winter and to avoid snow melt entering the well. For well casings which are extended or trimmed to accommodate protector pipes, establish new measuring point elevations, mark new measuring points on the casings, and record the new data.

Redeveloping Test Wells

Test wells should be redeveloped to assure that the well screen is open to the water-bearing formation. Measure the total well depth with a tape and heavy weight, and note if silt or other material is encountered in the casing (weight will sink slowly or be covered with silt). Also, measure the static water level, and compute the volume of water standing in the casing. Evacuate the well at a pumping rate approximately equal to the recovery rate until the discharge is as free of turbidity as possible. An airlift pump constructed of 3/4-inch tubing with an inner 1/4-inch air line (set about 3 inches from the bottom of the outer tubing) is the best method for development, since it has the capability of pumping silt and fine sand which may have accumulated in the bottom of the well. A mechanical pump or bailer can also be used for well development. Monitor and record the volume evacuated, discharge turbidity (relative), water-level recovery rate, and any changes in the total well depth (due to removal of silt). The recovery data will be useful for future sampling events.

APPENDIX F

SPECIFICATIONS FOR INSTALLATION OF NEW MONITORING WELLS

Appendix F. Specifications for Installation of New Monitoring Wells, Oswego Valley Landfill, Oswego County, New York.

Drilling

The hollow-stem auger method will be used to drill all boreholes in the overburden for soil sampling and well installation purposes. This technique is relatively fast, the drilling rig is small and mobile, and the overall costs are relatively low. One of the major advantages of this drilling technique in contamination investigations is that water does not have to be added during the drilling. This technique is appropriate for depths up to 60 or 70 feet and may even be used in cohesive non-caving formations to depths of 100 feet.

Split spoon soil samples will be collected from land surface continuously to the total depth of the hole. These samples provide excellent geologic control. During the collection of the split spoon samples, blow counts will be recorded.

The drilling rig will be decontaminated by steam cleaning before the start of work and again before the rig leaves the site at the completion of the work. The auger flights of the drilling rig will be cleaned (wire bushed) between each borehole to remove any potentially contaminated soil particles. In this manner the possibility of cross-contamination between boreholes will be substantially reduced. The split-spoon sample barrels will also be decontaminated after each use by washing with detergent solution and rinsing with tap water.

inadequate

Development time is reduced with this drilling technique because the possibility of cross contamination has been reduced, and therefore less water has to be pumped than if accidentally induced contaminants had to be removed during development. Additionally, because water is not added to the borehole during drilling, less time is needed to develop the well. If water were added to the borehole, many times the volume of water lost to the borehole during drilling would have to be removed to insure that any water samples eventually collected from the wells would be representative of formation water and not of water added during the drilling.

Soil Samples

The field hydrologist will carefully describe all materials penetrated as the hole is drilled. In addition to the normal lithologic and hydrologic description, any unusual odors or colors will be noted and recorded in the field log.

All split spoon samples collected during the drilling will be retained in jars that will be labelled with the well or boring number, the date of collection, and the depth interval below land surface at which the soil sample was collected.

Well Installation

All wells installed as part of this field program will consist of 1-1/2 inch diameter PVC casing and screen. Flush joint, threaded and coupled casing will be used to avoid gluing pipe joints.

Each well will be equipped with a well screen of slot size large enough to allow sufficient water into the wells for sampling purposes. Upper well screens of cluster wells will straddle the water table so that a separate phase of contamination on the water table, if present, would be able to enter the well. The screened zone of each well will be sand packed with an appropriate sized sand. However, in certain situations, if the formation sand collapses around the well screen, it will not be possible nor necessary to install the sand pack. The sand pack will be carried up to approximately 2 feet above the top of the well screen.

A bentonite seal approximately 1-foot thick will be emplaced in the borehole annulus on top of the sand pack. Above the bentonite seal, a cement/bentonite slurry will be tremied into the borehole annulus from the bottom of the hole up to land surface. The granular bentonite and the cement/bentonite slurry prevent surface water from migrating down the disturbed annular soil zone of the borehole. In this manner the screened zone is sealed off from all zones above the screen, and any water samples subsequently collected from the well will be representative of the screened zone.

Before the sand pack is added to the borehole, the auger flights will be pulled up to expose the screened section to the formation. Then, if the formation has not caved in around the well screen, the sand pack will be added. The reason for proceeding in this manner is to prevent a sand lock from occurring between the well and the auger flights, which would result in the well being pulled from the hole when the augers are pulled back.

After the sand pack has been emplaced or the formation has collapsed, the bentonite seal will be installed, after which the auger flights will be pulled up an additional few feet. Finally, cement/bentonite slurry will be added to the hole and the remaining auger flights will be pulled from the hole. An appropriately-sized steel protector pipe with a locking cap will be installed over the PVC casing at land surface, cemented securely in place. The height of the well casings/protector pipes will be about 3 feet above land surface. A 6-foot marker will be set adjacent to the completed well to allow locating the well in winter (snow conditions).

Well Development

Well development will be carried out with either a centrifugal pump, an air compressor, or by bailing. If the wells yield freely, a centrifugal pump or compressor will be used. However, if the formation material surrounding the well screen is relatively tight and low yielding as expected, it may be necessary to bail the wells, because a steady yield will not be attainable. The purpose of the development is to assure that the well screen is open to the surrounding formation and that the water produced is as sediment free as possible.

Water-Level Measurements

Water-level measurements in monitoring wells will be made with the use of a chalked measuring tape or an electric drop line, to the nearest 0.1 foot. The tape will be cleaned between each well to prevent the possibility of cross contamination. The date and time of each measurement will

also be recorded. The measuring tape line will have a lead sinker or other weight attached to the bottom that will keep the tape taut and prevent it from kinking or bending when it enters the water.

Surveying

After all wells have been installed, a surveyor will level in the tops of the well casings to a sea level datum. The elevation of each well will be leveled in to the nearest one hundredth of a foot. At each well, the actual point on the casing that was surveyed in will be appropriately marked by the surveyor.

APPENDIX G

SPECIFICATIONS FOR INSTALLATION OF SURFACE-WATER STATIONS

Appendix G. Specifications for Installation of Surface-Water Stations, Oswego Valley Landfill, Oswego County, New York.

Surface-water stations provide water-level and water-quality points. Select a point on the stream near the proposed station locations that is accessible and has a channel suitable for measurements/sampling. Drive a metal pipe into the stream bed a sufficient depth such that it is solid. The pipe height should be selected to allow high-water measurement, surveying access, and visibility. Mark a permanent measuring point on the top of the pipe for determination of elevation. Mark the station number on the pipe. It is often convenient to make 0.1-foot graduations on the pipe (or affix a weatherproof measuring tape to the pipe), to allow measurements of water levels by sighting from the stream bank. The surface-water staff gage will function as a permanent measuring point for water-level and for collection of water samples.

APPENDIX H

SAMPLING PROCEDURES FOR

GROUND-WATER MONITORING PROGRAM

Appendix H. Sampling Procedures for Ground-Water Monitoring Program Oswego Valley Landfill, Oswego County, New York.

Water-Level Measurements

1. Identify the well and record its number.

2. Clean the top of the well with a clean rag.

3. Remove the well cap or plug, wipe the inside of the casing with a clean rag and place the cap down so as to keep it clean.

4. Clean the first 5 feet of the steel measuring tape/electric line with hexane or methanol, followed by distilled or deionized water; measure the depth to water from the top of the well casing.

5. Record the depth to water, date, and time on the appropriate data form.

6. Measure water levels at surface-water stations by reference to the staff gage measuring points.

7. Collect a complete round of water-level measurements prior to sampling.

Ground-Water Samples

Well Evacuation Procedures

1. Calculate the volume of standing water in the well by subtracting the total well depth from the depth to water (same measuring point), and multiplying this difference by the casing storage (gallons per linear foot).

Casing storage factors for various casing diameters can be found in reference manuals or calculated.

2. For freely yielding wells, remove three to five times the volume of standing water in the well using a centrifugal pump if the water is within suction limit or a bailer if it is not.

3. If a pump is used, the intake opening of the pump hose should be positioned and maintained just below the water surface in the well casing to ensure that the well is properly flushed. If there is a decrease in water levels as a result of pumping, the intake line should be lowered as needed. The intake opening of the hose should be lifted to break suction at the end of the flushing period to ensure that all standing water has been removed. The intake hose should be flushed with clean water between well samplings.

4. If the well has been pumped or developed recently, the water level may not yet have recovered or returned to its normal level. This does not require a change in the evacuation procedures outlined above. Although the actual volume of water in the casing under such conditions is less than normally found, the removal of three to five times this volume is sufficient to provide samples for analysis that are representative of the water in the surrounding formation.

5. If the well is pumped dry during this evacuation and shows essentially complete recovery within 15 minutes, removal of water should continue for two to four additional pump-down and recovery periods. If recovery is less than 75 percent during the 15 minutes after complete evacuation, sampling can begin where there is sufficient water.

6. For residential wells, run the cold water tap approximately 10 minutes prior to sampling. Sample the system before the tank and water softener, if possible.

7. After the pumping response of each sampled well has been documented, maintain consistency in subsequent sampling events by following the same procedures and evacuating the same volume of water prior to sampling, if possible.

Well Sampling and Sample Handling Procedures

1. Water samples will be collected with a bailer. Any bailers used will be lowered with a disposable plastic line, which will reduce the chance of introducing foreign matter into the bailer or well. For organics sampling, cleaning of bailers or other sampling equipment will be done with hexane or methanol, followed by rinsing with distilled or deionized water.

2. For inorganics (primarily metals) sampling, cleaning will be done with 2 percent Micro solution or dilute nitric acid, followed by rinsing with distilled or deionized water.

3. Once samples have been collected they will be prepared and preserved according to USEPA guidelines. Measurement of temperature, pH, and specific conductance will be made in the field.

4. Volatile vials will be filled completely with sample (that is, no headspace should be present in bottles) and sealed with Teflon-lined caps.

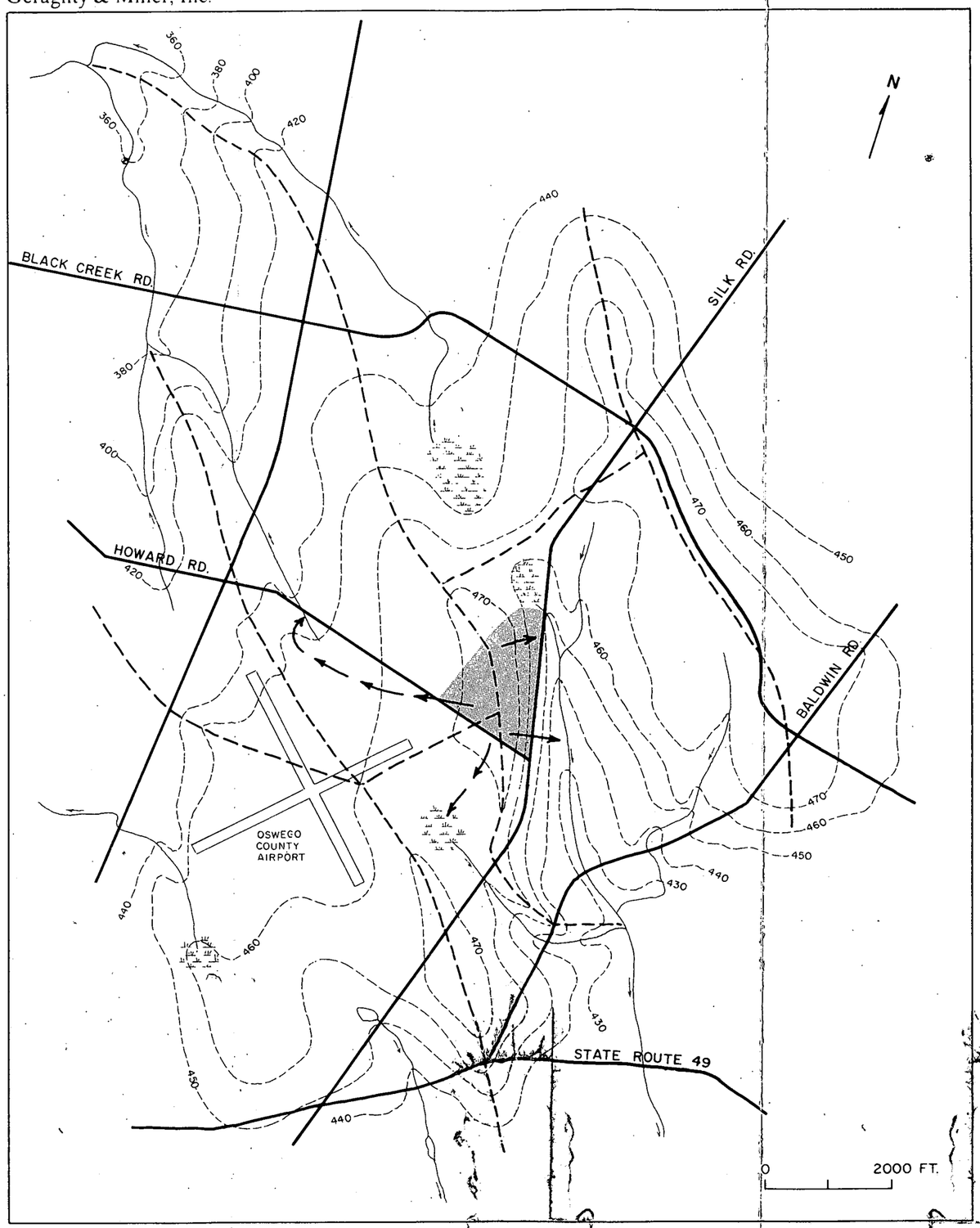
5. Other bottles will be filled and samples will be preserved as per laboratory guidelines.

Surface-water Samples

Surface water samples will be collected as close together in time as is practical. Sampling will begin at the furthest downstream location, so that any sediment disturbed during the sampling will not affect subsequent samples. If it is necessary for the sampling personnel to enter the surface-water body, it will be done from the downstream side. Samples will be taken into a large glass jug (to insure a uniform sample) and then transferred to sample bottles. A peristaltic pump may be used for taking the sample if conditions dictate. Sample bottles will be filled and preserved in accordance with laboratory instructions.

Chain-of-Custody Procedures

Field personnel and the laboratory will follow appropriate guidelines to assure that the chain-of-custody control measures will withstand legal and technical scrutiny. Chain-of-custody forms will be completed in the field and sealed in the sample shipping cases. Copies of the forms will be sent to the project manager. The original forms will be completed by the laboratory and sent to Oswego County with the test results.

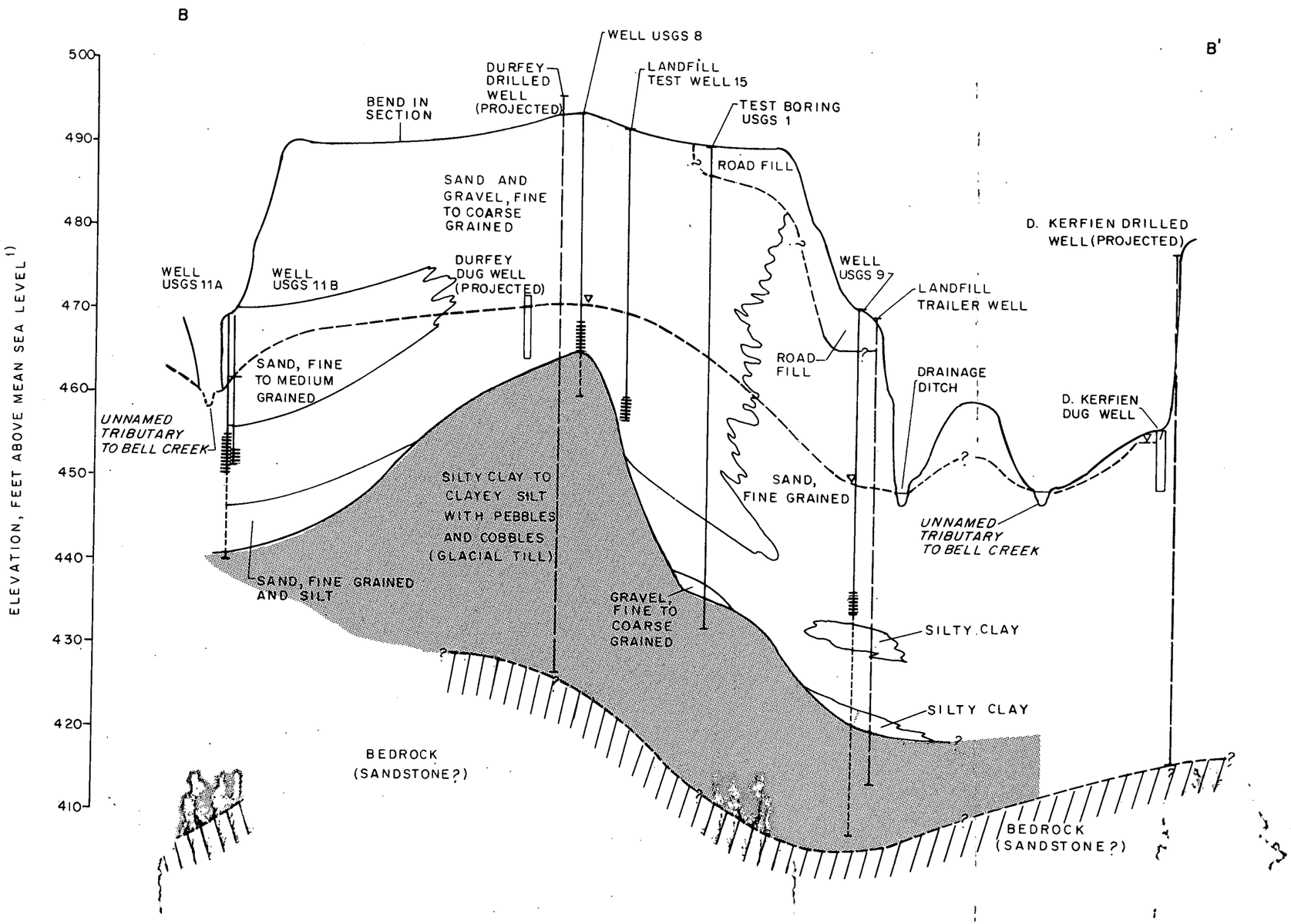


EXPLANATION

- STREAM AND FLOW DIRECTION
- DIRECTION OF HORIZONTAL GROUNDWATER FLOW
- GROUNDWATER DIVIDE (WATER-TABLE AQUIFER)
- 440 LINE OF EQUAL WATER-TABLE ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (BASED ON STREAM LEVEL ELEVATIONS)
- VOLNEY LANDFILL

FIGURE 5 - MAP SHOWING WATER-TABLE AQUIFER AND GROUNDWATER DIVIDES, BASED ON USGS TOPOGRAPHIC MAPS

VOLNEY LANDFILL, Oswego County, NY

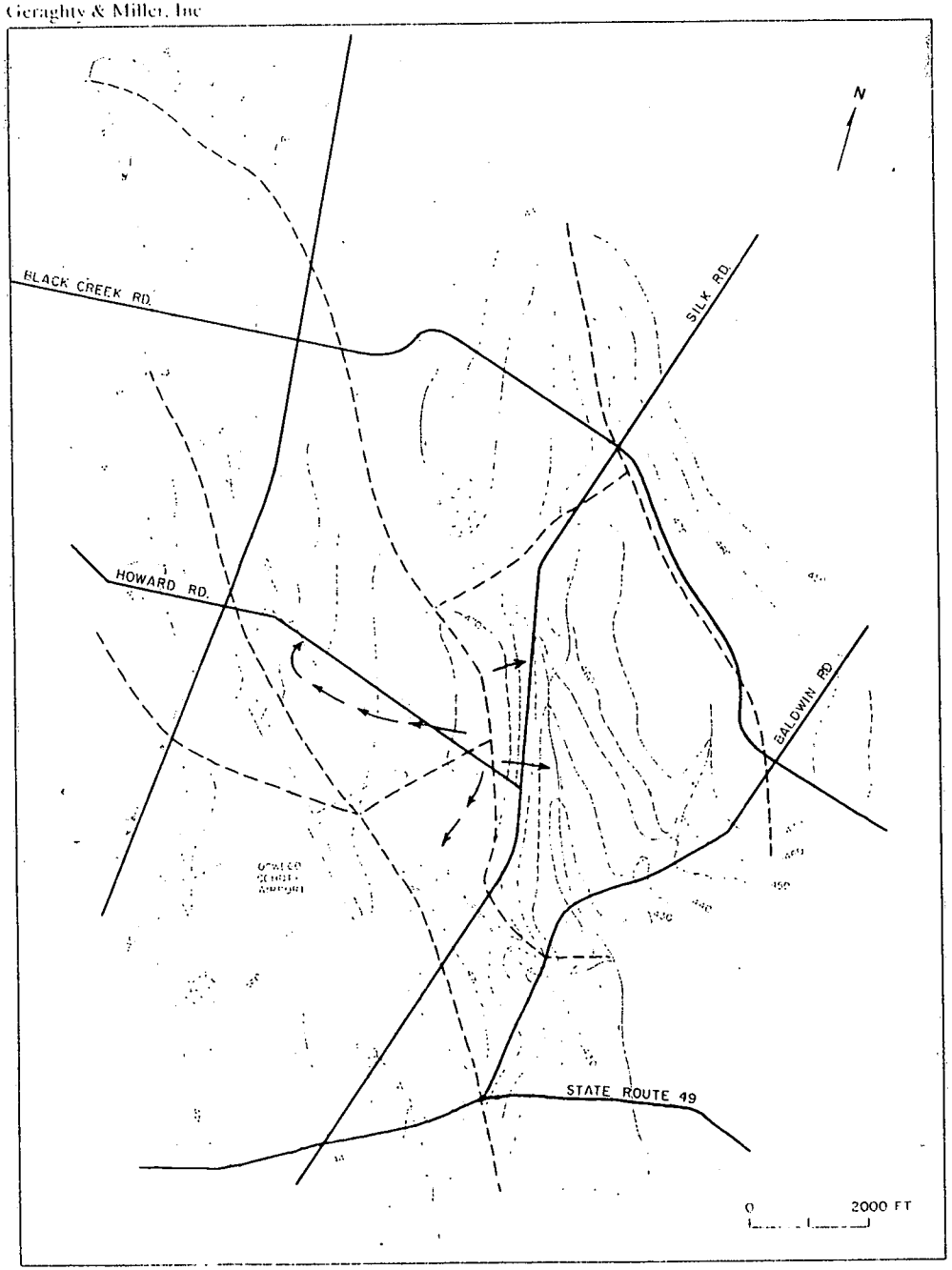


EXPLANATION

- TEST WELL
- SCREENED INTERVAL
- TOTAL BOREHOLE DEPTH
- DUG WELL, PRIVATE SUPPLY (CASED WITH PERMEABLE BRICK OR SLOTTED CEMENT
- DRILLED WELL, PRIVATE SUPPLY (SCREENED ZONE NOT KNOWN)
- ▽ WATER-TABLE ELEVATION (SEE TABLE 3)
- ? INFERRED FROM AVAILABLE DATA
- 1) NATIONAL GEODETIC VERTICAL DATUM OF 1929

GEOLOGIC CROSS SECTION B-B'
OSWEGO VALLEY LANDFILL
Oswego County, New York

Figure 3



EXPLANATION

- STREAM AND FLOW DIRECTION
- DIRECTION OF HORIZONTAL GROUNDWATER FLOW
- GROUNDWATER DIVIDE (WATER-TABLE AQUIFER)
- LINE OF EQUAL WATER TABLE ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (BASED ON STREAM LEVEL ELEVATIONS)
- VOLNEY LANDFILL

FIGURE 5 - MAP SHOWING WATER-TABLE AQUIFER AND GROUNDWATER DIVIDES, BASED ON USGS TOPOGRAPHIC MAPS

VOLNEY LANDFILL, Oswego County, NY

File on eDOCs X Yes _____ No
Site Name Volney
Site No. 738003
County Oswego
Town Volney
Foilable X Yes _____ No
File Name 1984-08-01, Hydro Geologic Condition Report
Scanned & eDOC _____