1-30-053B

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

VOLUME I
(WITH APPENDIX A)

NASSAU COUNTY
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Executive Summary

Through numerous regulatory and operational programs Nassau County has demonstrated a deep commitment to the protection of our water resources. One important area of protection is the identification of contaminated aquifer segments which pose a threat to the public water supply. The County Executive, cognizant of the importance of identifying sources of groundwater contamination, authorized in January 1988 the County Departments of Health and Public Works to jointly investigate potential contaminated aquifer segments and prepare technical reports identifying areas of contamination that require remedial action. The first product of this joint program and the subject of this report was the investigation of groundwater contamination by volatile organic chemicals (VOC's) associated with the Sea Cliff Avenue industrial zone in the City of Glen Cove.

The need for a more detailed study within the City of Glen Cove was based upon the detection of significant levels of volatile organic chemicals in existing monitoring, industrial, and public supply wells. This contamination caused the 1977 closure of three public supply wells owned by the City of Glen Cove at the Carney Street well field due to VOC levels exceeding New York State Department of Health drinking water guidelines. Additionally, this contamination could potentially affect other City of Glen Cove and Sea Cliff Water Company public supply wells.

A two-phased study approach was utilized to identify the areal and vertical extent of the groundwater contamination. Phase One involved the review of all existing water quality, hydrogeologic, well construction, and industrial chemical survey data. Thirteen (13) Phase One groundwater monitoring wells were installed based upon the results of this review. Phase Two involved the assessment of the Phase One water quality and hydrogeologic data, and included the installation of seven (7) additional monitoring wells to further define the three-dimensional

extent of the groundwater plume as well as potential source areas.

The industrial chemical profile noted that primary contaminants detected in the groundwater at the study area are common to those reported in the industrial chemical survey and predominantly include tetrachloroethylene, trichloroethylene, and 1,1,1-trichloroethane. Tetrachloroethylene was the VOC compound detected at the highest concentration of 3,700 micrograms/Liter (ug/L) followed by trichloroethylene at 500 ug/L. Lower levels of 1,1,1-trichloroethane were also detected as well as other chlorinated compounds, most notably cis-1,2-dichloroethylene, 1,1-dichloroethane and vinyl chloride, which represent potential breakdown compounds from tetrachlorethylene and trichloroethylene.

The findings of this investigation have identified a groundwater contamination plume of VOC's emanating from the Sea Cliff Avenue industrial zone extending from the water table to the base of the upper glacial aquifer. The water table portion of the plume bifurcates away from the source area (Sea Cliff Avenue industrial zone) moving westerly and northerly and has traveled a minimum of 2,400 ft. in each direction. The highest level of total VOC contamination in this plume ranges up to 5,500 ug/L immediately to the north of the Sea Cliff Avenue industrial zone at the Carney Street well field.

The deep upper glacial portion of the plume extends to the base of the upper glacial aquifer at the source area and at the furthest downgradient well. The plume has moved northwesterly with the groundwater flow a minimum distance of 2,400 ft. from the source area. Total VOC levels range from 698 ug/L in the vicinity of the source area to 79 ug/L at the downgradient fringe of the plume.

It should be noted that localized industrial pumpage at the Sea Cliff Avenue industrial zone, has caused groundwater contaminants to move vertically downward into the deep industrial supply wells where it is subsequently reintroduced back into the aquifer through diffusion wells set at various depths. This pumpage and

diffusion, in conjunction with the natural groundwater flow and contaminant advection, has caused the contamination to be spread throughout the aquifer at the source area and in the downgradient direction. These pumpage and diffusion impacts must be studied in more detail before any remedial measures can be accurately assessed.

It is recommended that this study be provided to the New York State Department of Environmental Conservation for review and regulatory action. In addition, site specific investigative work must be performed at the present or former industrial locations where VOC's were or are stored to better define contaminant source areas. These future studies also must address potential impacts from the Sea Cliff Avenue industrial zone contaminant plume on receptors such as public supply wells 9334 (City of Glen Cove, Kelly Street) and 7857 (Sea Cliff Water Company).

1.0 INTRODUCTION

1.1 Background

In January of 1988, the Nassau County Department of Health (NCDH) entered into a cooperative agreement with the Nassau County Department of Public Works (NCDPW) to perform detailed investigations of groundwater contamination in the City of Glen Cove and the Village of Lake Success, as recommended in a prior NCDH report identifying several areas in need of further water quality study. Further investigation in Lake Success was subsequently postponed pending the results of a current study in the area being performed by consultants to the Unisys Corporation. The investigation of groundwater contamination by volatile organic chemicals (VOC's) associated with the Sea Cliff Avenue industrial zone in the City of Glen Cove is the subject of this report.

The need for a more detailed study within the City of Glen Cove was based upon the detection of significant levels of volatile organic chemicals in existing monitoring, industrial, and public water supply wells. This contamination caused the 1977 closure of three public supply wells owned by the City of Glen Cove. These wells, located at the Carney Street well field were closed due to VOC levels exceeding New York State Department of Health drinking water guidelines. This contamination could potentially affect other City of Glen Cove and Sea Cliff Water Company public supply wells.

This investigation was jointly funded and administered by NCDH and NCDPW.

1.2 Purpose and Scope

The purpose of this study was to identify the areal and vertical extent of groundwater contamination by volatile organic chemicals at the Sea Cliff Avenue industrial zone in the City of Glen Cove by performing a subsurface investigation in the vicinity of the Carney Street well field. Based on the results of the investigation, potential sources of contamination are identified and

recommendations are made regarding methods to manage the contaminated aquifer segment.

The scope of this investigation was comprised of the following tasks:

- o Review of available data on the location, construction, and water quality of existing monitoring, industrial, and public supply wells in the study area.
- o Research of existing reports, records, and data to determine regional hydrogeology.
- o Review of NCDH records to determine the storage, use and disposal of industrial chemicals and chemical waste products by local industries. o Investigation of the location of other potential sources of groundwater contamination in the area including landfills, chemical and petroleum spills.
- o Analysis of existing data, development and implementation of a subsurface investigation of groundwater contamination.
- o Development of specifications and locations for monitoring well installations to be completed by a well drilling firm under contract to NCDPW.
- o Sampling of newly installed and existing wells to determine water quality.
- o Development of water level and volatile organic chemical concentration contour maps.
- o Evaluation of water quality, determine extent of contamination and evaluate possible source areas within the study area.
- o Development of groundwater flow maps and geologic profiles to determine potential contaminant pathways.
- o Report preparation on the investigation methodology and findings including recommendations for technical procedures regarding management of the

contaminated aquifer segment.

1.3 Study Approach

A two-phased study approach was utilized to identify the areal and vertical extent of groundwater contamination at the Sea Cliff Avenue industrial zone in the City of Glen Cove.

Phase One involved the review of all existing water quality, hydrogeologic, well construction, industrial survey and other pertinent information. Thirteen (13) Phase One groundwater monitoring wells were installed around the Sea Cliff Avenue industrial zone based upon the results of this review. Phase Two involved the assessment of the Phase One water quality and hydrogeologic data, and included the installion of seven (7) additional Phase Two wells to further define the three-dimensional extent of the groundwater contamination plume as well as potential source areas.

1.4 Study Area

The study area designated for this investigation encompasses approximately three square miles of the northeast corner of the Town of Oyster Bay, Nassau County, New York, including the southern portion of the City of Glen Cove, the northern portion of the Village of Glen Head, and small portions of the Villages of Sea Cliff and Old Brookville (see Figure 1-1).This area was selected to encompass a one-mile radius surrounding the Carney Street well field and to provide a judicious base from which existing land use and water quality information could be collected for analysis.

Water service within the study area is supplied by public supply wells operated by the City of Glen Cove, the Jericho Water District, and the Sea Cliff Water Company. Public sanitary sewering has been provided within the City of Glen Cove since the 1920's, with most areas sewered by the 1950's. Areas outside of the City rely on individual septic systems for waste disposal.

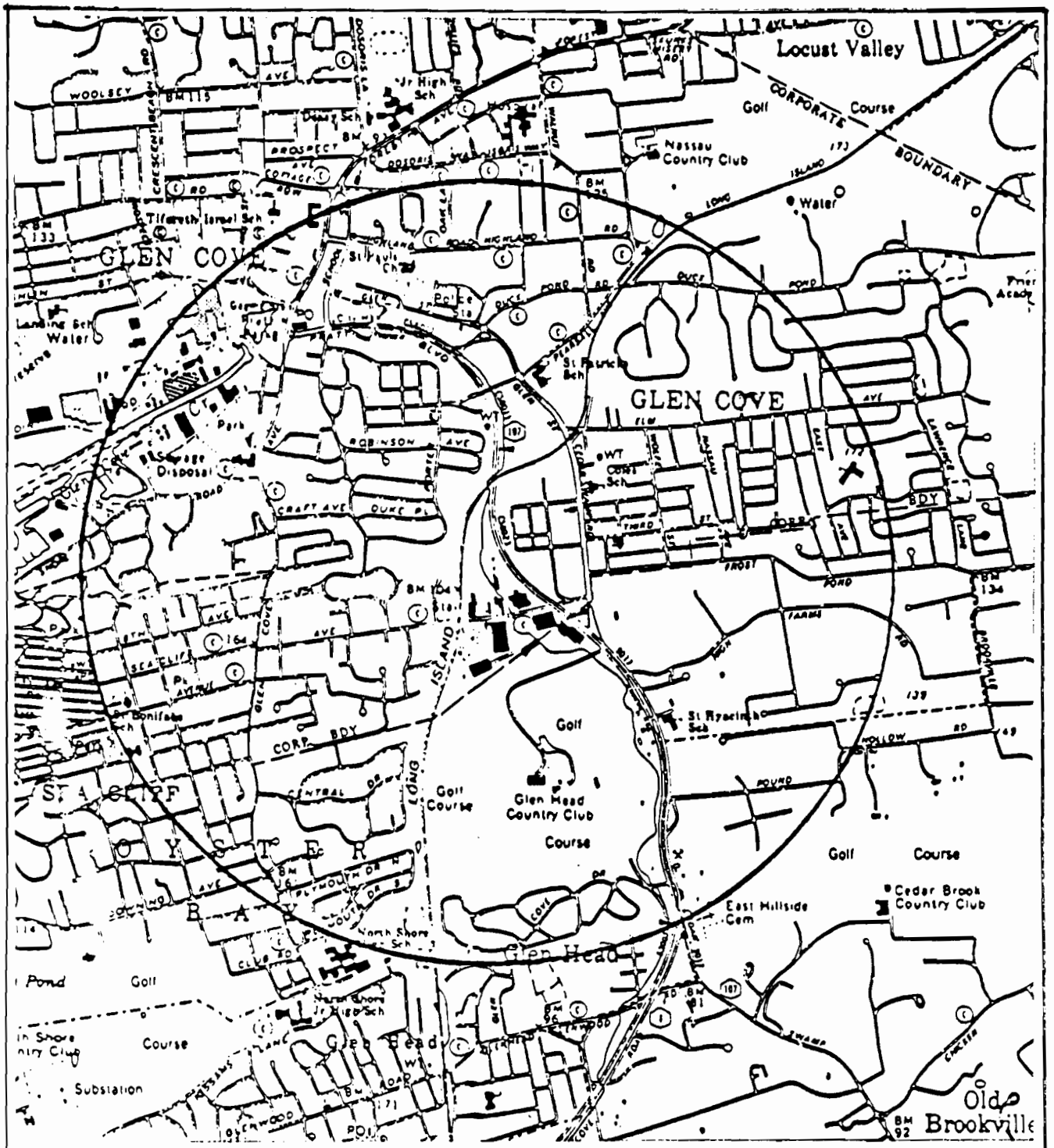
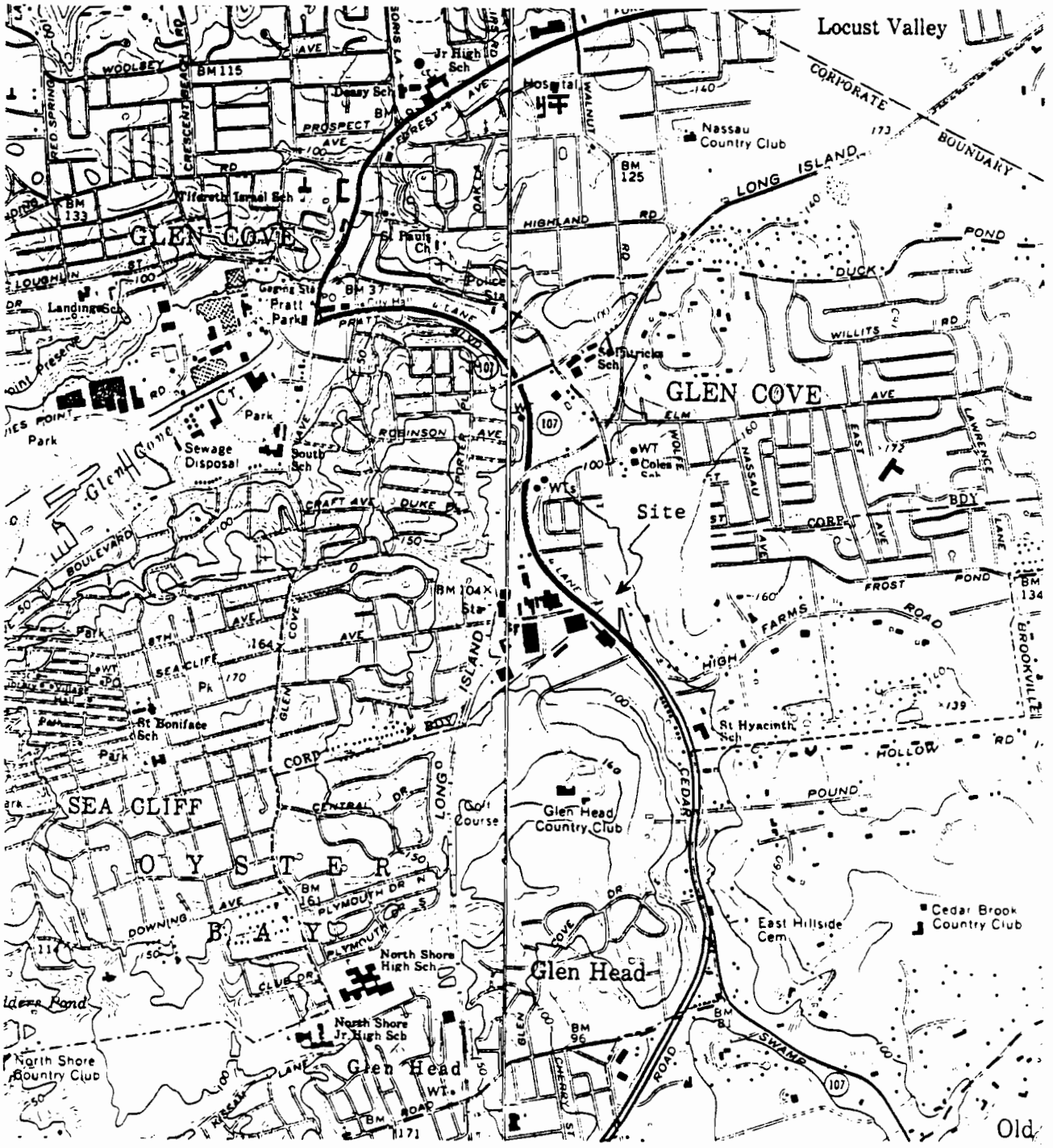


Figure 1-1 Glen Cove Site Location Map

Stormwater runoff in the study area is collected by underground drainage pipes and structures for transport to recharge basins. Installation of this system began in the 1920's and has continued to date with additional drainage networks being installed as required for new developments, road improvements, or to correct existing problem areas. The project study area is served by seven (7) stormwater recharge basins. Discharge of stormwater from the Sea Cliff Avenue industrial area is to either Nassau County recharge basin #469 or to Glen Cove Creek, which runs directly through the area's center. Recharge basin #469 has accepted stormwater discharges since 1940 while the remaining basins in the area were installed between 1940 and 1952.

There are no active municipal or private landfills within the study area, however, a municipal landfill located at the northwestern extreme of the study area on Morris Avenue was operated by the City of Glen Cove until approximately 1970. This landfill accepted all types of refuse and trash, including incinerator ash and agricultural wastes. The landfill has been capped and is currently a recreational area.

The study area features a surface topography which has been formed by the process of glacial r· ession (see Figure 1-2). Prominent landforms include glacial kames (conical hills deposited in contact with ice), kettles (depressions) and valleys. A north-to-south valley runs through the heart of the study area, featuring elevations of approximately 66 ft. at the Glen Head Country Club, 54 ft. at the Sea Cliff Avenue industrial area and dropping northward to approximately 42 ft. at the arterial highway railroad overpass. Glen Cove Creek occupies this valley. A large kame rises to approximately 175 ft. above sea level (asl) at the Glen Head Country Club, with Glen Cove Creek to the east. Kamic topographic highs exist to the east and west of the Sea Cliff Avenue industrial zone, rising to approximately 180 and 170 ft. asl, respectively.



Base Maps: U.S.G.S. Sea Cliff & Hicksville Quadrangles

Scale
1"= 2000 ft.

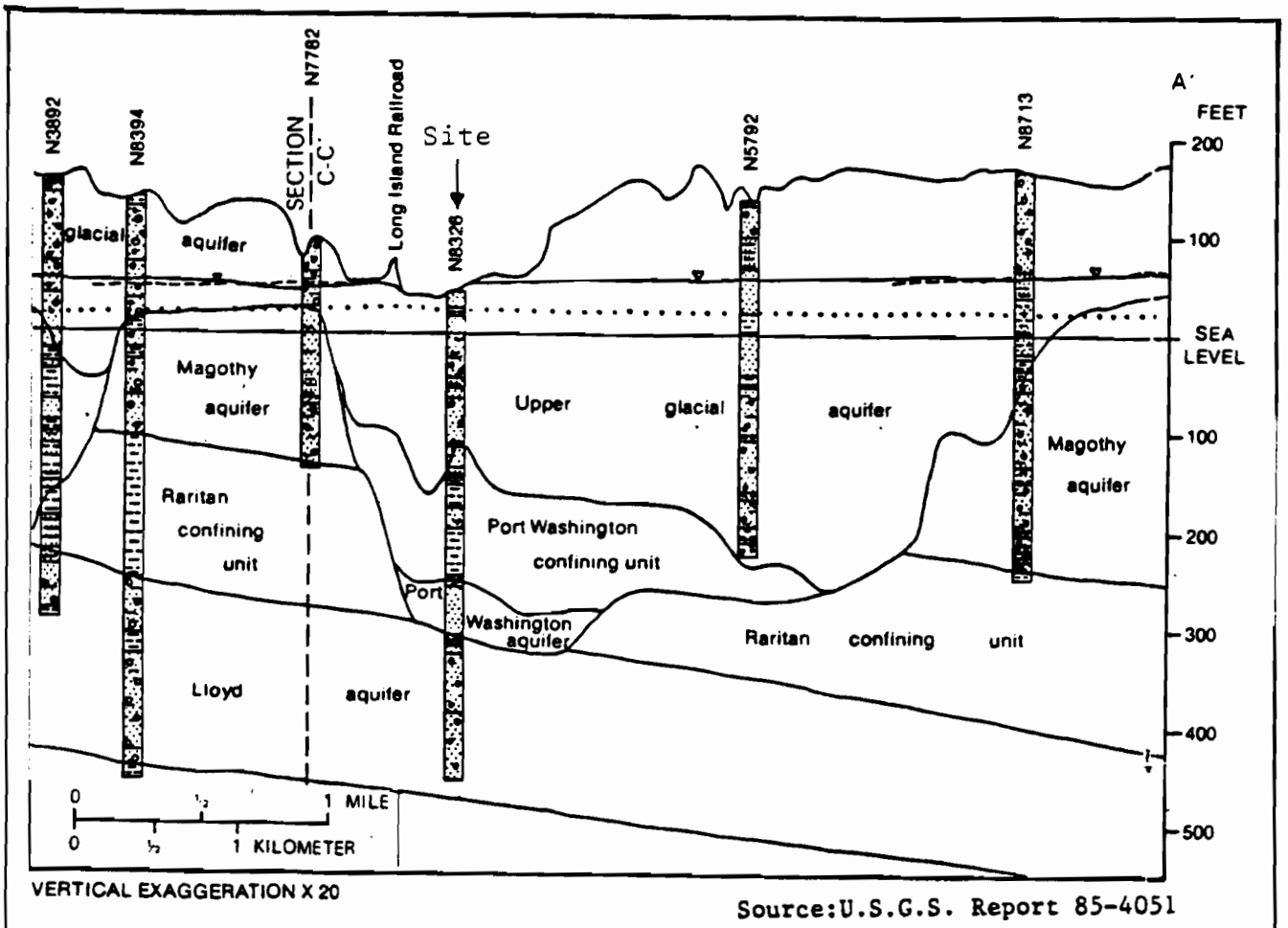
Figure 1-2 Site Topography

1.5 Regional Hydrogeology

The regional geologic formations of the northern part of the Town of Oyster Bay as described by Kilburn and Krulikas (USGS, 1987) are composed of unconsolidated glacial deposits of Pleistocene age, and coastal plain deposits of continental and marine origin of Cretaceous age. The unconsolidated deposits consist of gravel, sand, silt and clay underlain by bedrock of Lower Paleozoic and/or Precambrian age, which forms the base of the groundwater reservoir.

Figures 1-3 and 1-4 are regional geologic north-to-south and east-to-west cross-sections through the study area (see Figure 1-5 for cross section locations). The crystalline bedrock, generally consisting of schist and gneiss, features a gentle southeasterly dipping weathered surface. Overlying the bedrock is the Lloyd Sand member (Lloyd aquifer) of the Raritan Formation of Late Cretaceous age. This formation consists of discontinuous beds of gravel, sand, sandy clay, silt and clay and lies roughly parallel to the bedrock surface. The clay member of the Raritan Formation (Raritan Clay) overlies the Lloyd aquifer and consists of clay with varying amounts of silt and sand. The Raritan Clay confines groundwater in the underlying Lloyd aquifer.

The Matawan Group-Magothy Formation undifferentiated (Magothy aquifer) overlies the Raritan Clay. The Magothy Formation consists of discontinuous beds and lenses of fine to coarse sand and gravel with interstitial clay. The top of the Magothy is not planar, unlike the surfaces of the underlying units. The Magothy surface was deeply eroded during Tertiary time. The surface was ice shoved and probably eroded again during the Pleistocene. In portions of the northern part of the Town of Oyster Bay the Raritan Clay and the Magothy Formation have been completely removed and replaced with younger materials during the Pleistocene. In these areas, the Port Washington aquifer and the Port Washington confining unit were deposited.



Source:U.S.G.S. Report 85-4051

LEGEND

- CLAY
- SANDY CLAY
- SAND
- SAND AND GRAVEL
- GRAVEL AND BOULDERS
- BEDROCK--Weathered and crystalline
- N8326 — WELL NUMBER
- WATER TABLE AS OF APRIL 1980
- GEOLOGIC CONTACT--? when inferred
- MAGOTHY AQUIFER POTENTIOMETRIC SURFACE AS OF MARCH 1980
- LLOYD AQUIFER POTENTIOMETRIC SURFACE AS OF JANUARY 1979

Figure 1-3 North/South Regional Geologic Cross Section

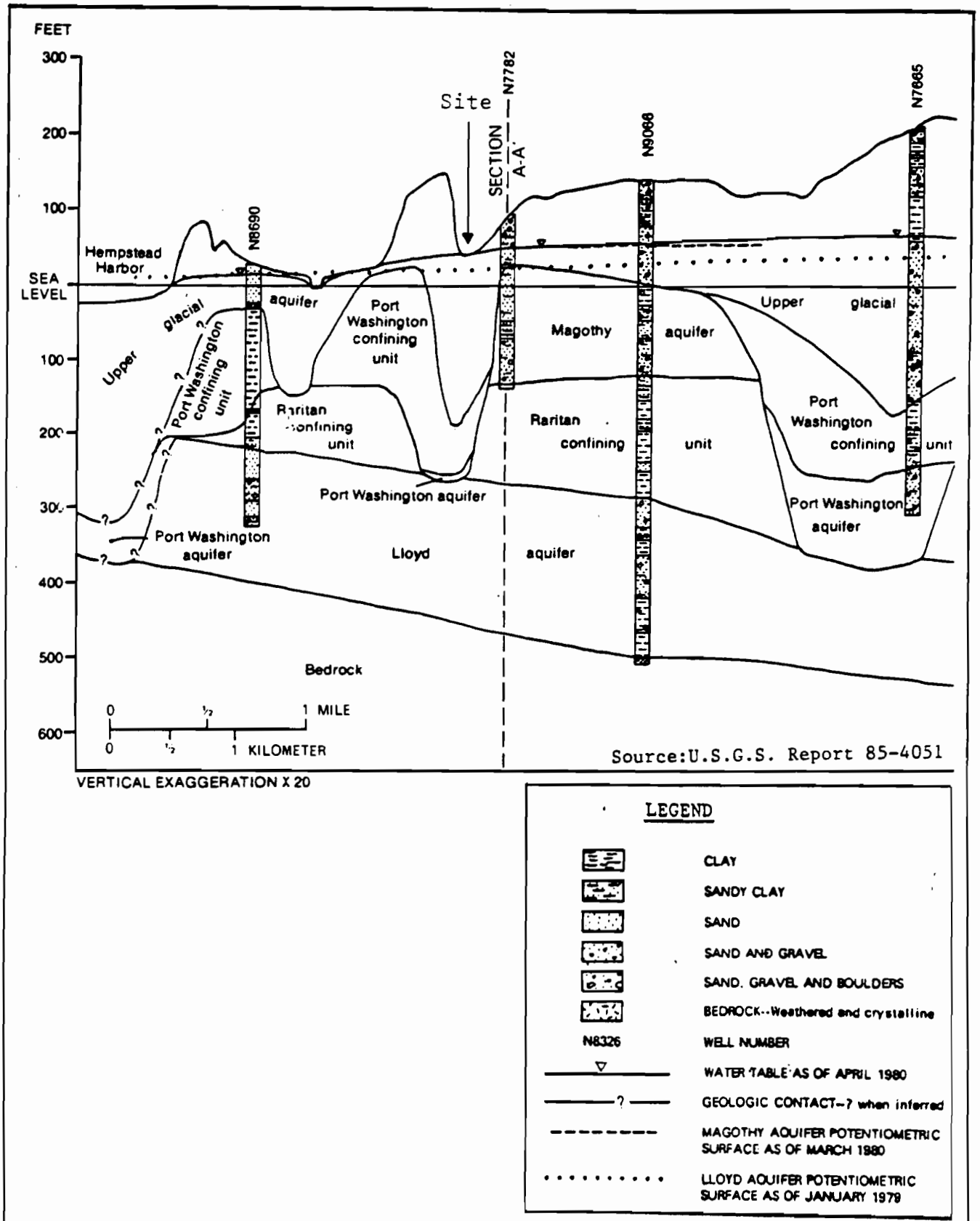


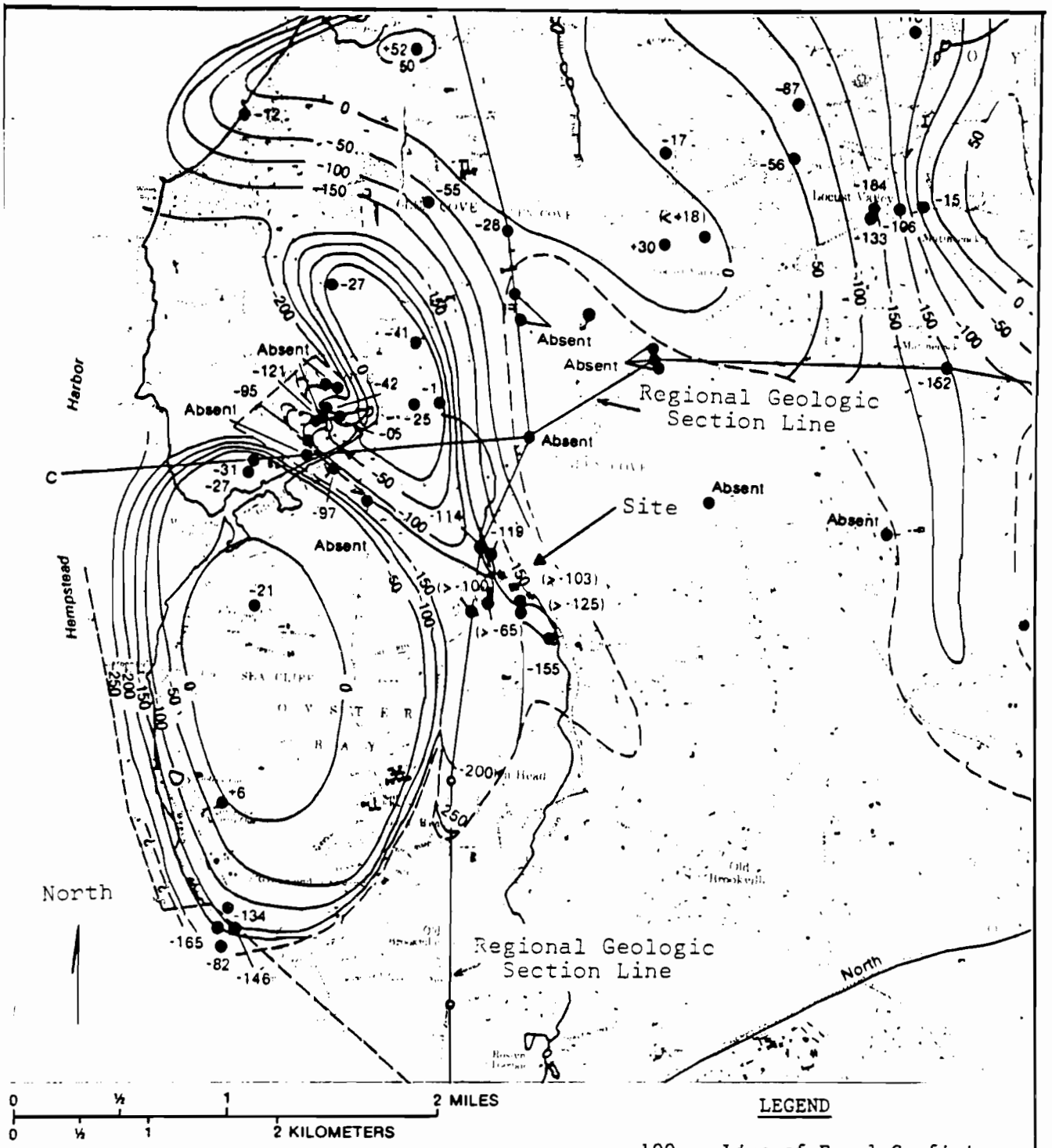
Figure 1-4 East/West Regional Geologic Cross Section

The Port Washington aquifer is a sequence of deposits of Pleistocene and/or Late Cretaceous age. These beds consist of sand, sand and gravel, and varying amounts of interbedded clay, silt and sandy clay. The beds of the Port Washington aquifer form part of the valley fill in the channels cut into the Cretaceous deposits by the glaciers. The Port Washington aquifer and the Lloyd aquifer are apparently hydraulically connected at the study area.

The Port Washington confining unit, which also forms part of the valley fill, is a sequence of deposits of Pleistocene or Late Cretaceous to Holocene? age that locally lies above the Port Washington aquifer or overlaps the local Cretaceous deposits. This unit consists mainly of clay and silt, with scattered lenses of sand or sand and gravel. This unit may include or consist of erosional remnants of the Raritan Clay.

The surface of the Port Washington confining unit features topographic highs and buried valleys into which the Upper glacial aquifer was deposited. Northwest of the Sea Cliff Avenue industrial zone the buried valley of the Port Washington confining unit features a northwesterly to southeasterly trending axis. The apparent deepest elevation of the buried valley is -150 ft. below sea level with the valley walls rising to sea level on each side (see Figure 1-5). It is noted that the regional horizontal groundwater flow direction in the upper glacial aquifer is towards the northwest at the study site, paralleling the valley axis (see Figure 1-6). For this study, the surface of the Port Washington confining unit will represent the base of the aquifer.

The uppermost formation consists of glacial deposits of Late Pleistocene age (upper glacial aquifer). These deposits consist of beds of fine to coarse stratified sand and gravel, but also contain thin discontinuous beds of silt, clay and tills. The upper glacial aquifer overlies the Port Washington confining unit and contains the water table. Table 1-1 shows the approximate surface elevations



Source: U.S.G.S. Report 85-4051

Figure 1-5

Altitude and Configuration of the Port Washington Confining Unit

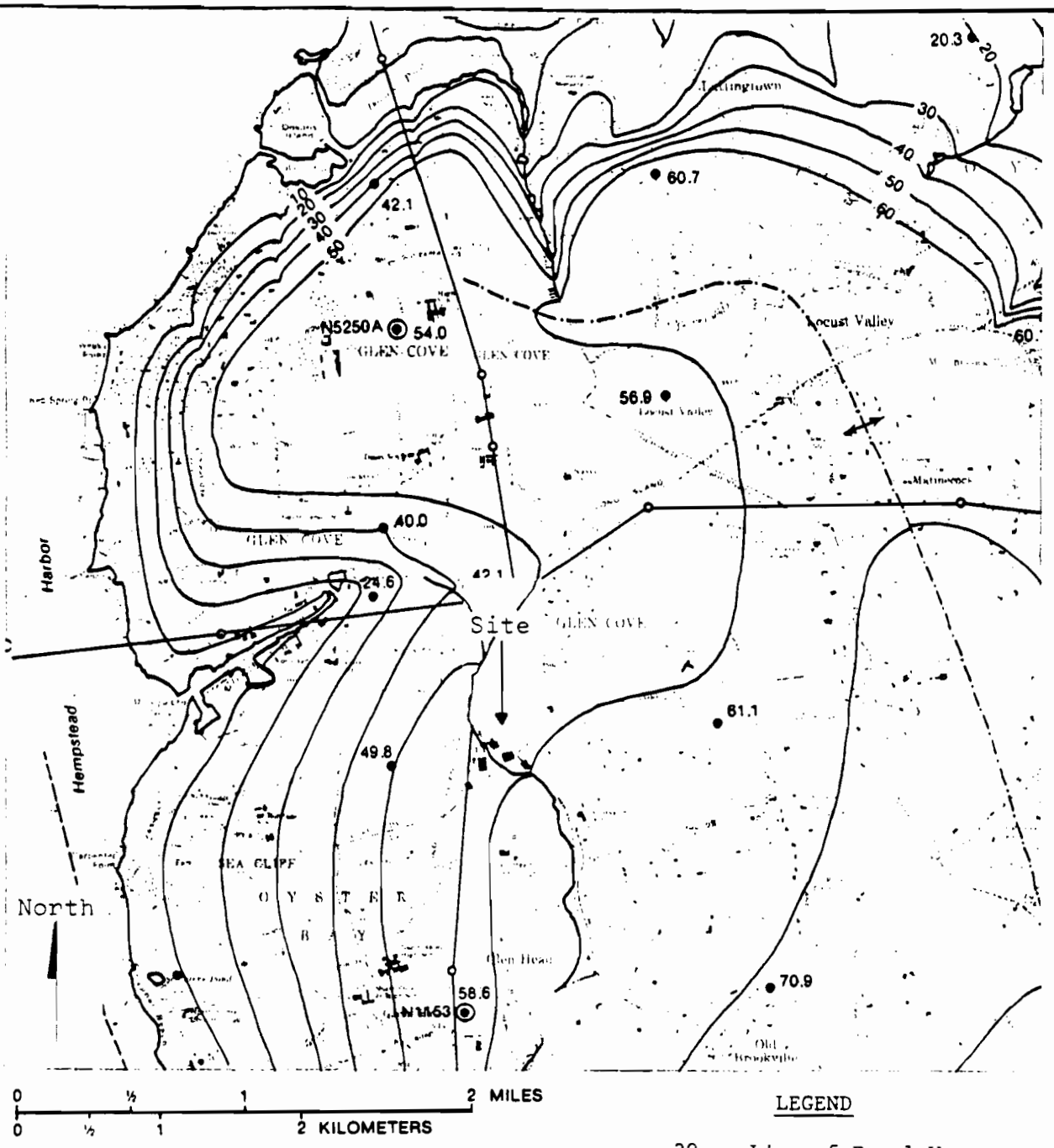


Figure 1-6 Water Table Configuration in 1980

TABLE 1-1

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

REGIONAL GEOLOGIC FORMATIONS

FORMATION NAME	APPROXIMATE FORMATION SURFACE ELEVATION RELATIVE TO SEA LEVEL (FT)	APPROXIMATE FORMATION THICKNESS (FT)
Upper Glacial Aquifer	50 to 165	150 to 300
Port Washington Confining Unit	-50 to -150	100 to 150
Port Washington Aquifer	-250	50
Lloyd Aquifer	-300	170
Bedrock	-470	-

and thicknesses of the regional geologic formations at the study area.

1.6 Water Quality

A groundwater quality database of the Sea Cliff Avenue area has been developed since 1977. This was accomplished through the routine sampling by the County Departments of Health and Public Works of industrial, public water supply and groundwater monitoring wells. The primary wells of interest include industrial supply wells 2316, 6579, 7427, 8224 and 8887, and restricted City of Glen Cove public supply wells 3466,8326 and 8327. Please refer to Section 1.9 for details relative to the well owners, well construction and individual well locations.

Table 1-2 is a historic water quality summary of the wells in the vicinity of Sea Cliff Avenue, and includes data collected through early 1988. As indicated in this table, trichloroethylene and tetrachloroethylene, common industrial solvents, were the two primary volatile organic compounds detected in both the industrial and public supply wells. Additional compounds include 1,1,1-trichloroethane, 1,1-dichloroethane and 1,1-dichloroethylene. Sporadic low levels of trichlorofluoroethane, chloroform and benzene were also detected.

Table 1-3 is a summary of the recent water quality sampling from mid 1988 through 1989. Generally, the types and levels of organic compounds are similar to those detected in the historic sampling, however, concentations of 1,1-dichloroethylene and total cis-and trans-dichloroethylene (potential breakdown compounds from trichloroethyene and tetrachloroethylene) are higher than previously detected. Appendix G encloses the full historical water quality statistical summary and the recent sampling results.

TABLE 1-2

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

HISTORICAL WATER QUALITY SUMMARY (1977 - 1988)
SEA CLIFF AVENUE VICINITY

INDUSTRIAL SUPPLY WELLS (7427, 8224, 8887, 6579 AND 2316)

COMPOUND	CONCENTRATIONS MINIMUM AND MAXIMUM (ug/l)		
	1977 - 1980	1981 - 1984	1985 - 1988
Trichloroethylene	5 - 600	40 - 160	3 - 1900*
Tetrachloroethylene	3 - 24	4 - 16	2 - 14
1,1,1-Trichloroethane	2 - 9	1 - 19	2 - 11
1,1-Dichloroethane	-	8 - 25	7 - 28
1,1-Dichloroethylene	-	1 - 6	-

CARNEY STREET PUBLIC SUPPLY WELLS (3466, 8326, AND 8327)

COMPOUND	CONCENTRATIONS MINIMUM AND MAXIMUM (ug/l)		
	1977 - 1980	1981 - 1984	1985 - 1988
Trichloroethylene	1 - 300	1 - 380	93 - 690
Tetrachloroethylene	2 - 375	1 - 64	7 - 46
1,1,1-Trichloroethane	1 - 20	2 - 18	2 - 14
1,1-Dichloroethane	-	11 - 16	7 - 12
1,1-Dichloroethylene	-	1 - 3	1 - 3
Trichlorofluoroethane	4 - 22	3	6
Chloroform **	1 - 20	-	2
Benzene	-	4	-

* Well 6579 reported one reading of 1900 ug/l.

** Chloroform may be due to laboratory procedures.

See Section 1-9 for Well Owners, Construction Information and Well Location.

Refer to Appendix G for complete water quality tables.

TABLE 1-3

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

RECENT WATER QUALITY SUMMARY (1988 - 1989)
SEA CLIFF AVENUE VICINITY

INDUSTRIAL SUPPLY WELLS (7427, 8224, 8887 AND 2316)

COMPOUND	CONCENTRATIONS MINIMUM AND MAXIMUM (ug/l)
Trichloroethylene	16 - 260
Tetrachloroethylene	2 - 21
1,1,1-Trichloroethane	2 - 11
1,1-Dichloroethane	1 - 28
C & T-1,2-Dichloroethylene	28 - 210
Chloroform	5 - 11
Vinyl Chloride	8

CARNEY STREET PUBLIC SUPPLY WELLS (3466, 8326, AND 8327)

COMPOUND	CONCENTRATIONS MINIMUM AND MAXIMUM (ug/l)
Trichloroethylene	210 - 580
Tetrachloroethylene	13 - 46
1,1,1-Trichloroethane	3 - 6
1,1-Dichloroethane	4 - 10
C & T-1,2-Dichloroethylene	100 - 280

NCDPW MONITORING WELL G-4 (1152)

COMPOUND	CONCENTRATIONS MINIMUM AND MAXIMUM (ug/l)
Trichloroethylene	2
Tetrachloroethylene	57 - 190
1,1,1-Trichloroethane	1
Cis 1,2-Dichloroethylene	2

Well 6579 restricted for drinking in 1977
See Section 1-9 for Well Owners, Construction Information and Well Location
Refer to Appendix G for complete water quality tables

1.7 Land Use

The primary land uses within the study area shown in Figure 1-1 are residential, commercial, industrial, institutional, and open space/recreational.

Residential development, which accounts for the greatest portion of land use in the study area, is mainly low to medium density with two to four units per acre. Primary residential development occurs southwest, west, northeast, and northwest of the Sea Cliff Avenue/Carney Street well field area. Commercial activity exists along Cedar Swamp Road and Glen Street. A high concentration of commercial development exists within the downtown business district, between Glen Street and the Glen Cove Arterial Highway.

Industrial facilities are generally concentrated along Sea Cliff Avenue, which runs east to west approximately 1000 ft. south of the Carney Street well field. Additional industrial activity is located in the northeast section of the study area along Glen Cove Creek.

Institutional development (primarily schools and churches) is scattered throughout the study area within residential areas and along commercial axes. The Glen Head Country Club, located south of the Sea Cliff Avenue industrial area, accounts for the majority of open space/recreational land use. A City of Glen Cove park, whose access is off of Leech Circle South, is located immediately northwest of the Carney Street well field.

1.8 Industrial Profile

An industrial profile was developed for the Sea Cliff Avenue industrial zone in order to determine potential sources of groundwater contamination through a historical survey and inventory of chemical usage and storage. The industrial profile area, shown in Figure 1-7, is located east of the Long Island Railroad, north of Glen Head Country Club, and south of Elm Avenue. It is comprised of an assortment of industrial and commercial facilities including electronic and

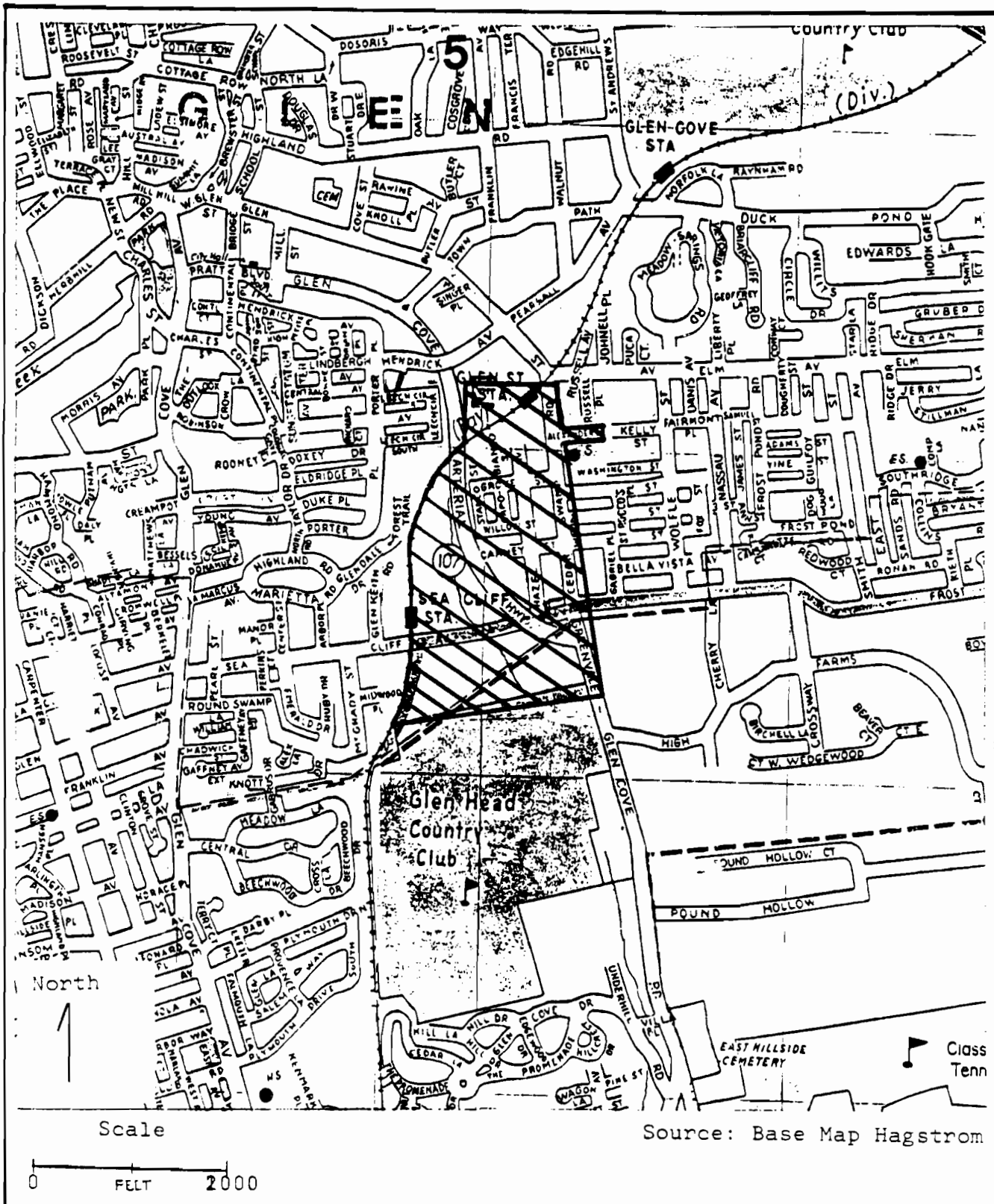


Figure 1-7 Sea Cliff Avenue Industrial Profile Area

electrical equipment manufacturing, metal fabrication, automotive repair, furniture repair, optical and medical goods manufacturing, wholesale and retail trade establishments, and a variety of service industries.

The initial profile was completed in 1977 and subsequently updated in 1988 as part of this study. Over seventy-eight (78) inspections/surveys were conducted at commercial and industrial sites in the profile area. The profile area includes fifty-four (54) active and twenty-four (24) inactive sites. Each facility was surveyed for chemical usage, storage, and waste disposal methods practiced between 1977 and 1988. Interviews were conducted by Health Department personnel with appropriate facility representatives to determine the type of business, number of employees, sources of water supply, sewage disposal, annual chemical usage, annual chemical waste generation and waste disposal practices. Surveyed facilities were grouped according to the Standard Industrial Classification (SIC) code as indicated on Table 1, enclosed in Appendix A. This table includes the fifty four active businesses.

A summary of the industrial chemical profile is outlined in Tables 2 and 3 of Appendix A and includes historical information on both active and inactive facilities. This summary is based upon NCHD records and interviews, information provided in the "Report on Industrial Waste Survey -City of Glen Cove" by William F. Cosulich Associates, October 1974, the "Report on Industrial Waste Survey for the City of Glen Cove" by Sidney B. Bowne and Son, July 1968, and from information provided by the New York State Department of Environmental Conservation (NYSDEC) Industrial Chemical Survey (ICS) program. Also enclosed in Appendix A are two NCDH 1977 and 1978 reports discussing the organic contamination of the Carney Street Well Field.

Figure 1-8, which includes a map and key, locates each of the active businesses in the industrial profile area. Facilities no longer in business but

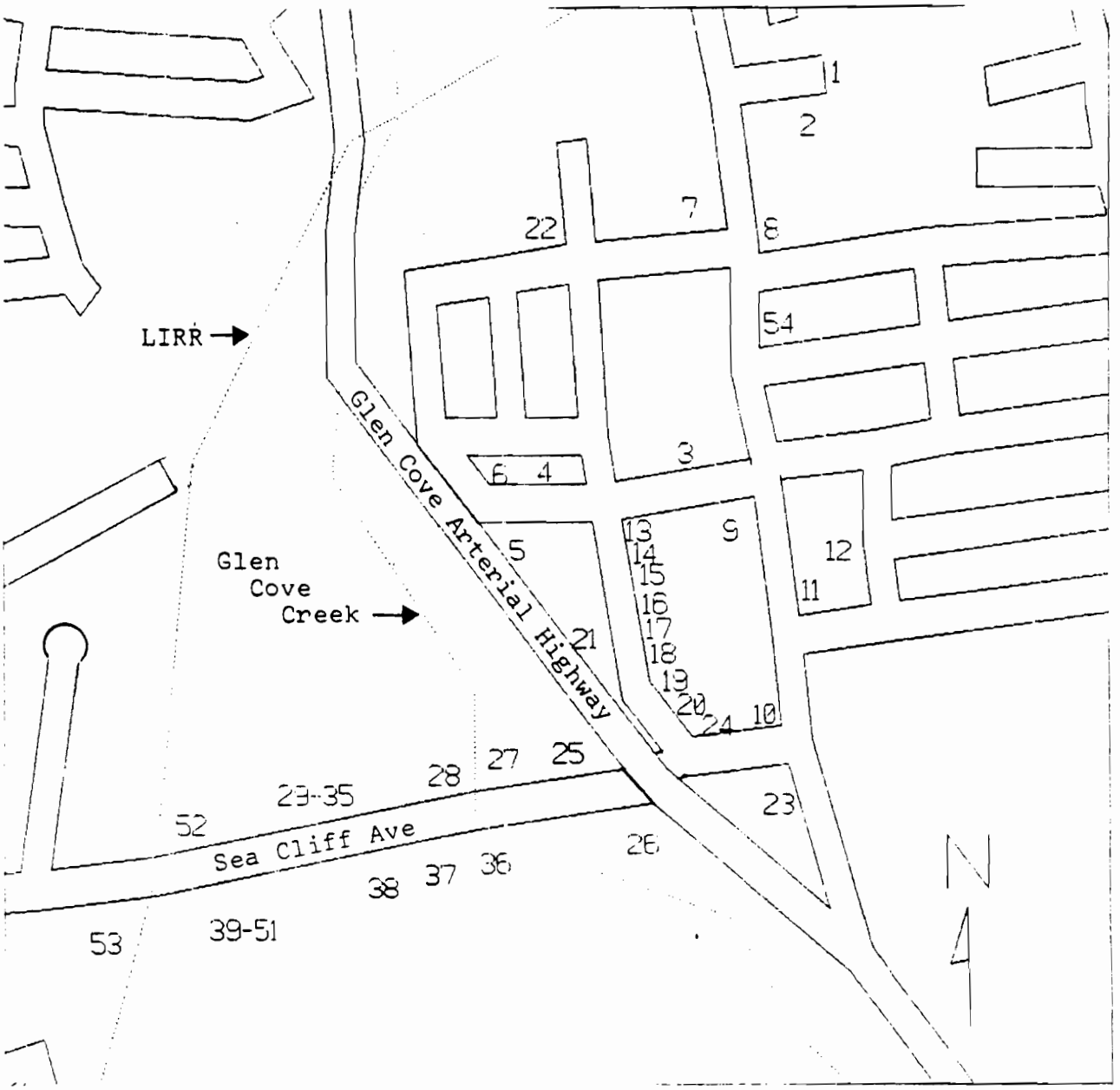


Figure 1-8 Study Area Business Locations

FIGURE 1-8 KEY

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

KEY TO STUDY AREA BUSINESS LOCATIONS

NO.	FACILITY NAME	STREET ADDRESS	FORMER OCCUPANTS
1	North Hills Electronics	Alexander Pl	CHIU Technical Corp.
2	Micronics Corp.	7 Alexander Pl	Vesuvio Cheese Inc.
3	Odin Claims	4 Carney St	
	(a)	10 Carney St	
4	Glen Cove Iron Works	34 Carney St	
5	Man Product	100 Carney St	
6	Glen Cove Bowl	200 Carney St	
7	Rallye Motors	20 Cedar Swamp Rd	
8	Mahoney Auto Parts	33 Cedar Swamp Rd	
9	M. L Bianconi Funeral Home	62 Cedar Swamp Rd	
10	Luyster Motors	70 Cedar Swamp Rd	
11	ANG's Service Station	73 Cedar Swamp Rd	
12	Angelina Izzo & Sons	3 Gabriel St	
13	Romm Art Creations	79 Hazel St	GC Fashions Manufacturing Mattiace Petrochemicals
14	TMBA Energy Cost Control	79 Hazel St	
15	Factory Service Parts & Controls	81 Hazel St	
16	Long Island Video	83 Hazel St	
17	Aqua Scooter	85 Hazel St	Acco-Bristol Datamaster
18	Shadow Box	85 Hazel St	
19	Greenvale Auto Parts	85 Hazel St	
20	Max Wiener & Co./Learsi Leather	88 Hazel St	Osrow Products/Moonshine Products
21	Photocircuits	90 Hazel St	Easter Unlimited
22	Village Laundromat	Hazel St/Grove St	
23	Joy Edd Trim Shop	1 Sea Cliff Ave	
24	Hinkle & Finlayson/Harbor Fuel Oil	10 Sea Cliff Ave	
25	Pall Corporation	30 Sea Cliff Ave	
26	Photocircuits	31 Sea Cliff Ave	
27	August Thomsen Corp.	36 Sea Cliff Ave	Glen Components (Div. of Pall)
28	Associated Drapery Equipment	40 Sea Cliff Ave	HMS Machine Shop
29	Earl Electric Mfg.	44 Sea Cliff Ave	
30	American Best Coffee	44 Sea Cliff Ave	
31	Lau's Cabinets	44 Sea Cliff Ave	Eastern-Bennett Heat Treatment Co.
32	Philip C. Antico Consultants	44 Sea Cliff Ave	Hadax Electronics (Doryt Systems)
33	Orobello Inc.	44 Sea Cliff Ave	Quadraframe
34	One Step Food Supply	44 Sea Cliff Ave	Telco Inc.
35	Slater Development Corp.	44 Sea Cliff Ave	
36	Slater Electric	45 Sea Cliff Ave	
37	Keyco Inc.	45B Sea Cliff Ave	
38	Zoomar Inc.	55 Sea Cliff Ave	

FIGURE 1-8 KEY

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

KEY TO STUDY AREA BUSINESS LOCATIONS

NO.	FACILITY NAME	STREET ADDRESS	FORMER OCCUPANTS
39	Sun Carting	59 Sea Cliff Ave	
40	Sea Cliff Coal and Lumber	59 Sea Cliff Ave	
41	Epco (Apco) Plastics	59 Sea Cliff Ave	
42	William T. Geertseen Landscaping	59 Sea Cliff Ave	
43	T&D Autobody Works	59 Sea Cliff Ave	
44	Tudors Auto Club	59 Sea Cliff Ave	Stasi Woodworking Co.
45	F&J Precision Tooling	59 Sea Cliff Ave	(Stasi Kitchens)
46	R-Tex Decoratives	59 Sea Cliff Ave	Raquette Sales
47	Let Byegones Be	59 Sea Cliff Ave	
48	Sea Cliff Auto Radiator	59 Sea Cliff Ave	
49	Walter J. Moretto Masonary	59 Sea Cliff Ave	
50	Sea Cliff Iron Works	59 Sea Cliff Ave	
51	Monte Displays	59 Sea Cliff Ave	
52	Cove Tennis Center	60 Sea Cliff Ave	
53	LI Glass & Mirror (b)	65 Sea Cliff Ave	Pall Corp.
54	JC Covino Electric	3 Second St	

NOTE:

(a) This location now an apartment house — 10 Carney St — Kolco Canvas Products; Carney Street Auto Repair

(b) LI Glass & Mirror moved to 65 Sea Cliff Ave from this location — 63 Sea Cliff Ave — Rosco Labs; The Olde Cabinet Shop; Lawrence Mills; Nippon Electric Co.; Pikwhit Industries; Olympic International LTD

which operated at these sites are also noted in the key. Table 1-4 is a summary from the industrial chemical profile (Appendix A) of those companies in the vicinity of the Carney Street well field who use or have used organic chemicals. It should be noted that primary contaminants detected in the groundwater at the Sea Cliff Avenue industrial zone are common to those reported in the industrial profile and include tetrachloroethylene, trichloroethylene, 1,1,1-trichloroethane, and their associated potential breakdown products dichloroethylene and dichloroethane.

1.8.1 State Pollution Discharge Elimination System (SPDES) Permits

There are two facilities in the industrial profile area that have had or will require SPDES permits from the NYSDEC. These facilities are as follows:

1. Slater Electric, 45 Sea Cliff Avenue - Issued SPDES Permit NY 1016241 effective 1/1/79 through 1/1/84 for the discharge of 360,000 gallons per day (gpd) of noncontact cooling water from two private wells on site. Originally the discharge was recharged on-site through one diffusion well. However, this well failed and three additional diffusion wells were installed as replacements by January 1981. The permit was deleted by the NYSDEC on October 31, 1986.

   Samples of water before recharge to the diffusion wells were collected by the NCDH on November 8, 1979, November 10, 1982, July 7, 1984 and January 30, 1986. Copies of the analysis results are attached (see Table 4, Appendix A) and, although these results do not illustrate the presence of a continous source of contamination, they do indicate that the discharged water was contaminated on two occasions with organic chemicals. The contamination in the discharge is consistent with the contamination detected in the wells used as the source of the cooling water (please see section 1.6).

2. Photocircuits, 31 Sea Cliff Avenue - Applied in January 1989 for a SPDES

TABLE 1-4

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

INDUSTRIAL CHEMICAL PROFILE - GLEN COVE

ORGANIC CHEMICAL SUMMARY

NAME OF INDUSTRY	LOCATION	ORGANIC CHEMICALS USED	PRESENT STATUS (1)	CHEMICAL USAGE
HMS Machine Shop	40 Sea Cliff Avenue	Possible TCE and PCE	Closed in 1969	Unknown (2)
Pall Corp	30 Sea Cliff Avenue	PCE, TCE used up to 1972. Small volumes PCE, TCE bought 1987.	Active	(2)
Photocircuits	31 Sea Cliff Avenue	PCE used in 1956, switched to 111 TCA prior to 1966	Active	(2)
Micronics	7 Alexander Place	Acetone, Freon, Pride FCA blend	Active	Approx. 20 gal/yr
North Hills Electric	Alexander Place	111 TCA in 1977. Freon in 1978.	Active	75 gal/yr 275 gal/yr
Slater Electric	45 Sea Cliff Avenue	PCE (1977 survey) 111 TCA (1977 Survey)	Active	4500 gal/yr 375 gal/yr
Telco Inc.	44 Sea Cliff Avenue	111 TCA (1977 Survey)	Moved in 1983	110 gal/yr
Zoomar Inc.	55 Sea Cliff Avenue	Acetone Purline Solvent	Active	20 gal/yr (2)

(1) Refer to Appendix A for description of present status
(2) Refer to Appendix A.

PCE - Tetrachloroethylene
TCE - Trichloroethylene
111 TCA - 1,1,1-Trichloroethane

permit for discharge of noncontact cooling water from two private wells on site to ten diffusion wells on-site. The permit with interim and final discharge limits will be considered by the NYSDEC when an engineering report is submitted indicating how the facility will meet applicable discharge standards. The discharge presently is contaminated with organic chemicals in levels above the allowable standards. The contamination detected in the discharge is consistent with the contamination detected in the wells used as the source of the cooling water (please see section 1.6).

1.8.2 Hazardous Waste Sites

There are no existing Federal or State hazardous waste sites located in the study area. However, in April 1979 the Photocircuits Corp., 31 Sea Cliff Avenue, was listed by NYSDEC as a known or suspected hazardous waste disposal site but subsequently eliminated from the list due to insufficient information. In addition, the site was also listed in November 1981 by the United States Environmental Protection Agency (USEPA) as a Quick Look Hazard System Site - a "potential" site which may pose an "actual health or environmental threat" and which needs to be assessed to determine if a hazardous waste problem exists.

1.8.3 County Permits

There are seven industrial facilities permitted by the NCDH for the storage, handling and control of toxic and hazardous materials under Nassau County Public Health Ordinance (NCPHO) Article XI. These facilities include:

1. Luyster Motors, 70 Cedar Swamp Avenue
2. Man Products, 100 Carney Street
3. North Hills Electronics, 1 Alexander Place
4. Pall Corporation, 30 Sea Cliff Avenue
5. Photocircuits, 31 Sea Cliff Avenue

6. Rallye Motors, 20 Cedar Swamp Avenue

7. Slater Electric, 45 Sea Cliff Avenue

More specific information concerning the types of stored chemicals is presented in the Industrial Chemical Profile (Tables 2 and 3, Appendix A).

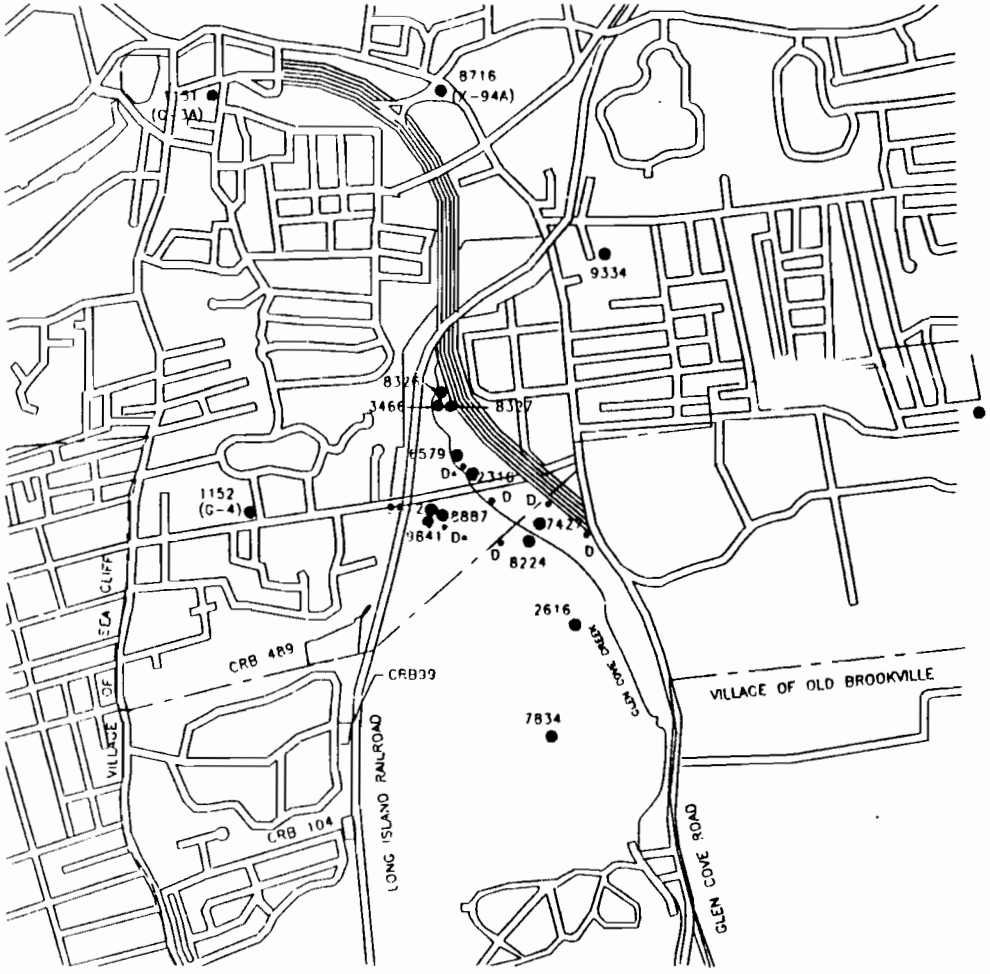
1.8.4 Spills

There were a number of reports filed with NCDH concerning spills of petroleum products/organic chemicals which occurred in the study area.

1. Photocircuits, 31 Sea Cliff Avenue - On May 24, 1989 a 20,000 gallon underground No. 2 fuel oil tank was removed from this site. There were no visible holes in the tank, but contaminated soil was noted in the vicinity of the piping. Sixty (60) cubic yards of oil contaminated soil was removed. No further action was required by the NYSDEC.
2. Slater Electric, 45 Sea Cliff Avenue - On November 30, 1987, a 10,000 gallon underground No. 2 fuel oil tank failed a leak test. The tank was abandoned in place in February 1988 and a monitoring well was installed in November 1988. No floating oil was detected on the water table. NYSDEC requires the well to be tested once each month.

1.9 Existing Wells and Pumpage

Figure 1-9 shows the locations of the existing industrial, monitoring and water supply wells within an approximate one mile radius of the Sea Cliff Avenue industrial zone. Table 1-5 shows individual well construction, present status, and a summary of the 1988 pumpage data as reported to the NYSDEC. In 1988, the Photocircuits Corp. pumped 1.1 million gallons per day (gpd) for non-contact cooling water purposes and 530,000 gpd for air conditioning during the demand season. This water is supplied by two supply wells and diffused on-site through 10 diffusion wells. Slater Electric pumped 150,680 gpd in 1988 for non-contact cooling water purposes and is also diffusing on-site. The Pall Corporation pumped



LEGEND

- 7427 EXISTING INDUSTRIAL WELL
- 9115 EXISTING NASSAU COUNTY (H-4A) DPW MONITORING WELL
- D DIFFUSION WELL CLUSTER
- D•, DIFFUSION WELL ESTIMATED LOCATION

DISTANCE IN FEET
200 400
0 400 800

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NO.	REVISION DESCRIPTION	DATE
0	FIRST RELEASE	3/13/89
A	FOR INFORMATION ONLY	3/22/89

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY

FIGURE 1-9
GLEN COVE STUDY AREA
INDUSTRIAL, WATER SUPPLY AND
EXISTING MONITORING WELLS

HAZARDOUS WASTE UNIT	DWG NO CC-100-81	DRAWN BY IE 3/21/89	SHEET NO 1 OF 1

TABLE 1-5

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

EXISTING PUBLIC SUPPLY, INDUSTRIAL AND MONITORING WELLS

WELL NUM	OWNER	MEASURING POINT ELEV. (FT)	SCREEN INTERVAL ABOVE OR BELOW SEA LEVEL (FT)	AQUIFER	USE	1988 PUMPAGE (GPD)
7834	Glen Head CC	150	-21 to -52	UG	Irrigation	
2626	Glen Head CC	75	-109 to -146	UG	Irrigation	
8224	Photocircuits	58	-46 to -97	UG	Air Cond	530,000
7427	Photocircuits	58	-62 to -103	UG	Ind. Cool	1,137,000
7452	Photocircuits	NA	75 to 107**	UG	Diffusion	
7453	Photocircuits	NA	90 to 122**	UG	Diffusion	
8028	Photocircuits	NA	72 to 120**	UG	Diffusion	
8930	Photocircuits	NA	74 to 125**	UG	Diffusion	
8931	Photocircuits	NA	74 to 125**	UG	Diffusion	
9773	Photocircuits	NA	131 to 182**	UG	Diffusion	
10107	Photocircuits	NA	105 to 183**	UG	Diffusion	
8887	Slater Electric	65	-40 to -6[illegible]	UG	Ind. Cool	Combined
9612	Slater Electric	NA	109 to 134[illegible]*	UG	Ind. Cool	150,680
9841	Slater Electric	NA	96 to 121**	UG	Ind. Cool	On Demand
9614	Slater Electric	NA	135 to 185**	UG	Diffusion	
8892	Slater Electric	NA	114 to 159**	UG	Diffusion	
8987	Slater Electric	NA	41 to 72**	UG	Diffusion	
9615	Slater Electric	NA	135 to 185**	UG	Diffusion	
9693	Slater Electric	NA	135 to 185**	UG	Diffusion	
6579	August Thomsen	57	-73 to -89	UG	Restr in 1977	
2316	Pall Corp.	75	to -110	UG	Air Cond	64,000
7153	Pall Corp.	NA	3[illegible] to 42**	UG	Diffusion	
7154	Pall Corp.	NA	26 to 36**	UG	Diffusion	
7155	Pall Corp.	NA	18 to 27**	UG	Diffusion	
7919	Pall Corp.	NA	152 to 190**	UG	Diffusion	
8886	Pall Corp.	NA	140 to 180**	UG	Diffusion	
3466	Glen Cove City	53	-95 to -120	UG	PWS Aban *	
8326	Glen Cove City	53	-67 to -112	UG	PWS Restr *	
8327	Glen Cove City	53	-65 to -115	UG	PWS Aban *	
9334	Glen Cove City	143	-100 to -150	M	PWS ***	
4980	Zoomar Industries	NA	NA	NA	NA	
1151	NCDPW G-3A	34	-5 to -9	UG	Monitoring	
1152	NCDPW G-4	154	28.5 to 23.5	UG	Monitoring	
9115	NCDPW H-4A	145	40 to 35	UG	Monitoring	
8716	NCDPW X-94A	47	27 to 22	UG	Monitoring	

NA - Not Available

UG - Upper Glacial

M - Magothy

* - Public Water Supply Well Abandoned or Restricted

** - Denotes the total depth of the well

*** - Well 9334, City of Glen Cove's Kelly Street Well, voluntarily removed from service in January 1989. Air-stripping treatment being installed.

64,000 gpd for air conditioning (in season) during the same year, and is also diffusing on-site. Active wells are routinely sampled as discussed in Section 1.6. According to and in conjunction with the NYSDEC (section 1.8), the Photocircuits Corp. is presently designing an industrial cooling water air stripping treatment system to be utilized prior to diffusion on-site.

2.0 DESCRIPTION OF MONITORING AND SAMPLING PROGRAMS

2.1 Monitoring Well Site Selection

A thorough review of all existing hydrogeologic reference material was conducted to assist in the development of a monitoring well network to characterize the three dimensional extent of the groundwater contamination. This included a review of the hydrogeology as described by Kilburn and Krulikas (USGS, 1987), existing geologic logs and well construction data (NYSDEC, NCDPW and USGS), the development of a water table contour map from existing NCDPW groundwater elevation data, and the review of historic water quality data compiled by the NCDH and NCDPW monitoring programs. Based upon this data, preliminary well placements were selected and field confirmed. Monitoring wells were subsequently installed at county right-of-ways, New York State right-of-ways, and City of Glen Cove property in a two-phased approach. Thirteen monitoring wells were installed during the Phase One investigation; seven additional monitoring wells and one well point were installed during the Phase Two investigation. Due to the presence of overhead electric wires along the north and south sides of Sea Cliff Avenue, which prevented safe drilling operations, monitoring wells were not installed in the industrial zone. However, a shallow-driven well point was constructed along the right-of-way during Phase Two. The Phase Two wells were installed after assessment of the Phase One water quality and hydrologic data.

Water table wells and deep well clusters were installed to establish the water table and deep flow regimes, water table and deep groundwater quality and to quantify vertical groundwater gradients. The deep well screens were set at elevations comparable to the City of Glen Cove's Carney Street wells or slightly deeper. These elevations were generally at the base of the upper glacial aquifer and slightly above the surface of the Port Washington confining unit. The screen elevation of monitoring well GC-1D (deep upgradient background well clustered with

upgradient water table well GC-1S), was set at the same elevation as the Carney Street supply wells above the surface of the Port Washington confining unit and below a locally significant confining unit.

2.2 Drilling Methods

Monitoring wells were installed by Hydro Group, Inc., Hauppauge, NY, utilizing the hollow stem auger and direct mud rotary drilling methods. A single well point was driven as part of this study. All drilling was supervised by NCDPW hydrogeologists and NCDH personnel. Split spoon soil samples were generally taken over twenty foot intervals or at select intervals as directed by the hydrogeologist (refer to Boring Logs, Appendix B, and Soil Sampling, Section). Drill cuttings were continuously observed and logged. The hollow stem auger installations produced a 12-inch diameter borehole. The direct mud rotary method produced an 8-inch diameter borehole. The drilling fluid for mud rotary installations was composed of quick gel bentonite and potable water. Continual air monitoring was accomplished with either a Century (Foxboro) Model 128 Organic Vapor Analyzer (OVA) or a HNu photoionization detector (PID).

2.3 Monitoring Well Construction

Table 2-1 is a list of the construction details for the monitoring wells installed during the study. Figure 2-1 shows the monitoring well locations. Monitoring wells GC-1S, 2S, 3S, 4S, 7S, 9S and 10S were drilled by the hollow stem auger method. All other wells, with the exception of the well point, were drilled by direct mud rotary methods. All wells were constructed following the NYSDEC's State Superfund Phase II protocol, as shown in Figure 2-2, however, all wells were set flush to grade. All wells were constructed with Schedule 40 flush joint threaded NSF approved polyvinyl chloride (PVC) casing with 20 ft. of 0.020 inch slot NSF approved Schedule 40 PVC well screen. The well screen was packed with #2 Morie gravel to a minimum of two feet above the top of the well screen. A Wyoming

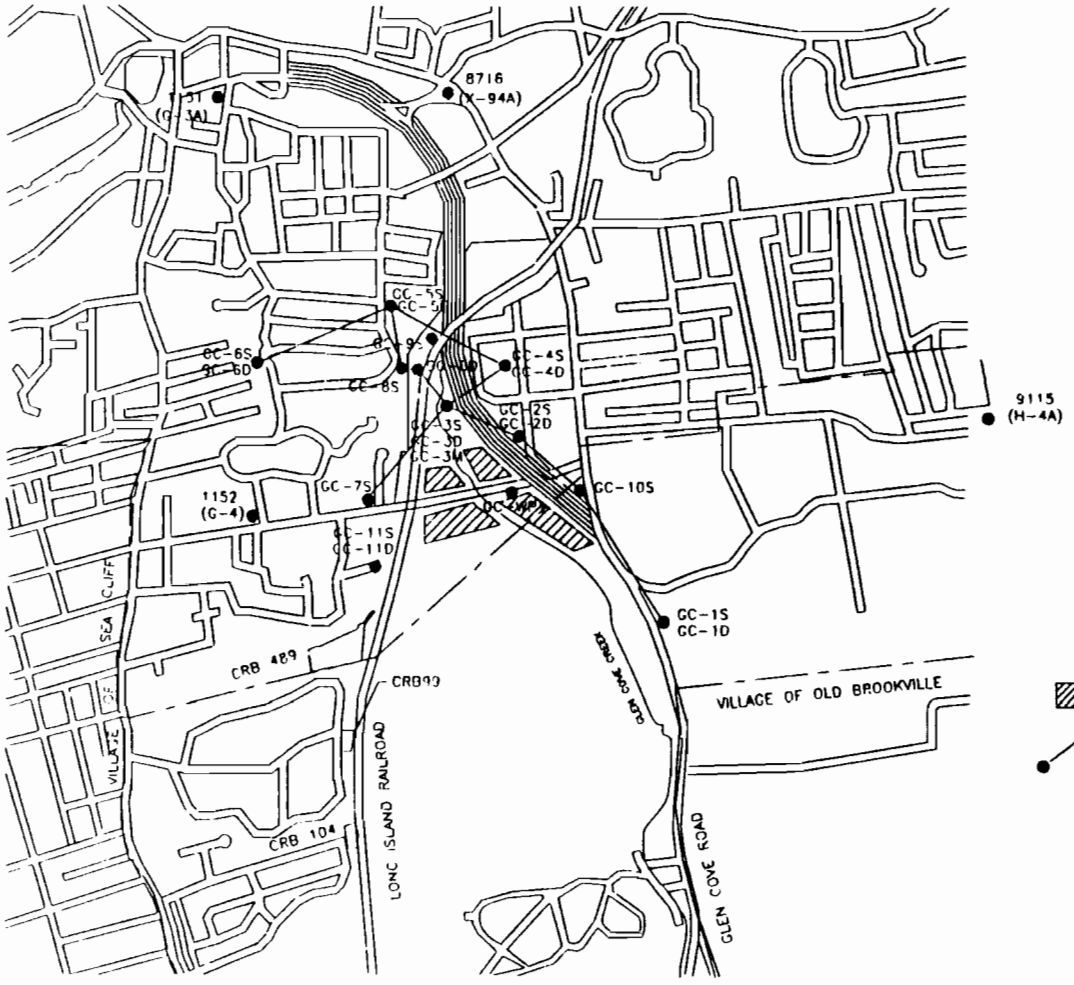
TABLE 2-1

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

MONITORING WELL CONSTRUCTION

WELL	MEASURING POINT ELEVATION (TOP PVC)	ELEVATION TOP SCREEN	ELEVATION BOTTOM SCREEN	TOTAL DEPTH	WATER ELEVATION 1/17/90	DRILLING METHOD	AQUIFER
GC-1S	78.25	59.4	39.4	39	58.59	Auger	UG
GC-1D	78.18	-96.6	-116.6	195	58.19	Mud Rotary	UG
GC-2S	74.80	55.8	35.8	39	57.44	Auger	UG
GC-2D	74.39	-113.9	-133.9	209	55.98	Mud Rotary	UG
GC-3S	51.98	48.3	28.3	24	47.98	Auger	UG
GC-3M	53.94	-39.7	-59.7	114	50.42	Mud Rotary	UG
GC-3D	52.48	-127.3	-147.3	200	50.66	Mud Rotary	UG
GC-4S	88.44	54.7	34.7	54	54.04	Auger	UG
GC-4D	88.75	-110.9	-130.9	220	54.78	Mud Rotary	UG
GC-5S	138.42	53.1	33.1	106	47.40	Mud Rotary	UG
GC-5D	138.47	-95.2	-115.2	254	47.59	Mud Rotary	UG
GC-6S	161.73	32.2	12.2	150	48.22	Mud Rotary	UG
GC-6D	162.02	-92.7	-112.7	275	47.88	Mud Rotary	UG
GC-7S	120.51	41.2	21.2	100	50.67	Auger	UG
GC-8S	135.13	48.5	28.5	107	49.02	Mud Rotary	UG
GC-8D	94.44	-74.5	-94.5	189	48.92	Mud Rotary	UG
GC-9S	90.27	49.7	29.7	61	46.42	Auger	UG
GC-10S	76.41	56.5	36.5	40	55.47	Auger	UG
GC-11S	133.49	38.8	18.8	115	51.29	Mud Rotary	UG
GC-11D	133.81	-76.9	-96.9	231	51.60	Mud Rotary	UG
GC-WP1	59.98	55.0	50.0	10	56.07	Driven	UG

All measurements in feet above or below (-) sea level
Elevations surveyed by NCDPW
UG - Upper Glacial



LEGEND

- GC-7S MONITORING WELL
- 9115 (H-4A) EXISTING NASSAU CO DPW MONITORING WELL
- INDUSTRIAL ZONE
- GEOLOGIC SECTION LOCATION

\DWG\GLENCOV

NO	REVISION DESCRIPTION	DATE
0	FIRST RELEASE	9/13/89
A	FOR INFORMATION ONLY	3/22/89

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY

FIGURE 2-1
GLEN COVE STUDY AREA
MONITORING WELL LOCATION

HAZARDOUS WASTE UNIT	DWG NO GC-100-01	DRAWN BY JT 3/22/89	SHEET NO 1 OF 1

DEPARTMENT OF PUBLIC WORKS
DIVISION OF SANITATION & WATER SUPPLY
NASSAU COUNTY, NEW YORK

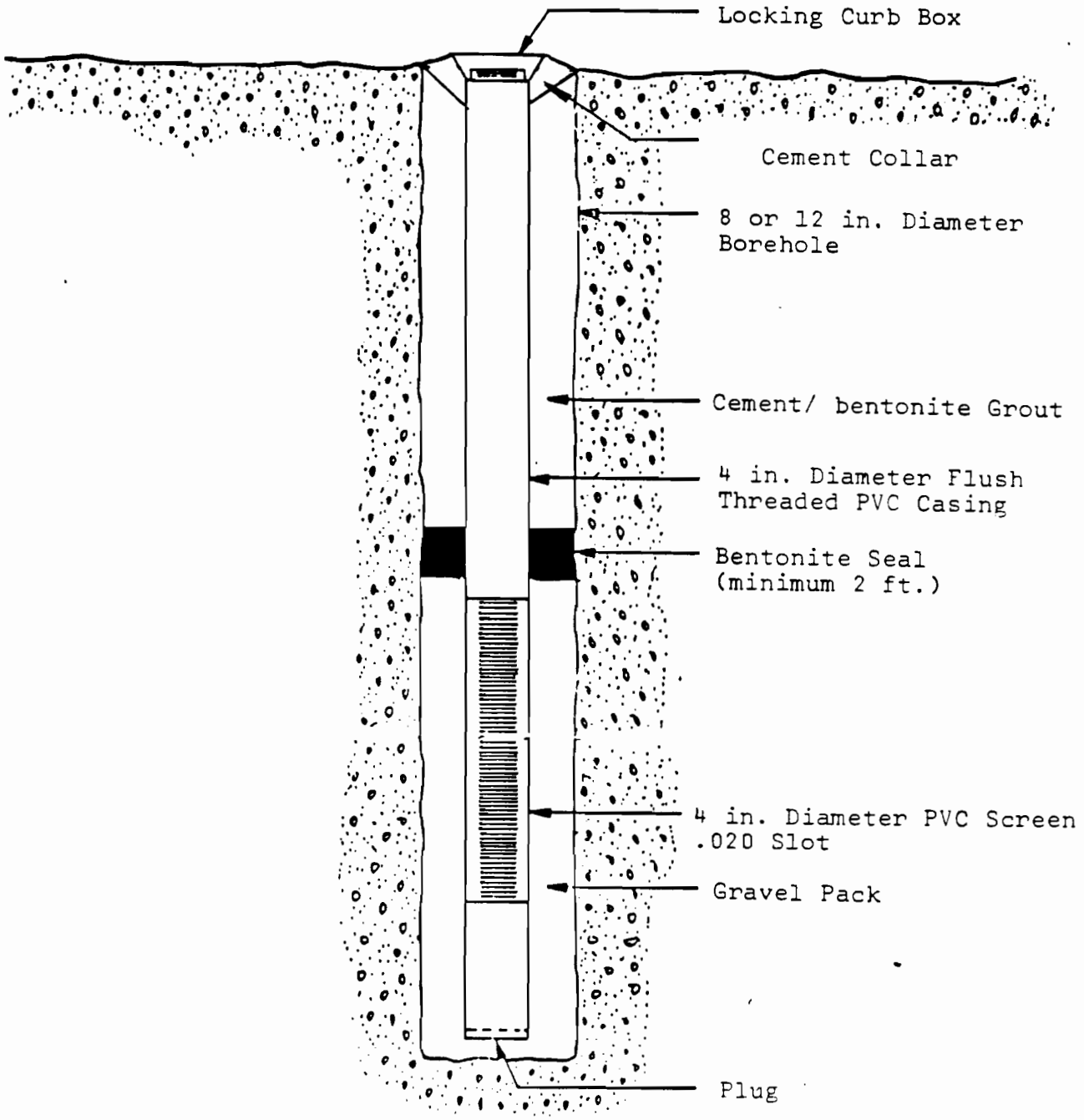


Figure 2-2 Monitoring Well Construction Detail

bentonite pellet seal, with a minimum thickness of two feet, was placed above the gravel pack. The remaining annular space was grouted to the surface with a cement/bentonite slurry. A locking cap was installed at the top of each well and the well was cemented flush to grade in a bolted valve box. The well point was constructed of five feet of 0.012 inch slot stainless steel screen coupled to five feet of galvanized steel pipe. Specific sampling, lithologic and construction details can be found in the well logs in Appendix B.

2.4 Well Development

Immediately after construction, all wells were developed by over pumping with a submersible pump for a minimum of one hour. The well point was hand surged and bailed with a stainless steel bailer. Specific well pumping rates and times are described in the well logs in Appendix B.

2.5 Well Logging

All monitoring wells were logged through a combination of techniques. For both the hollow stem auger and direct mud rotary drilling methods drill cuttings were continually logged by the hydrogeologist. Lithologic split spoon soil samples were generally taken over twenty-foot intervals, or as directed by the hydrogeologist. The drilling rig's response through the different formations was also noted. In addition, monitoring wells 1D, 2D, 3D, 4D, 5D, 6D, 8D and 11D were gamma logged with a Mineral Logging Services Model No. 1501 Gamma Logger. From this data the geologic well logs and cross-sections were produced. The gamma logs are included in Appendix C.

2.6 Well Construction QA/QC

Before all well drilling, the drill rig and all down hole drilling equipment were thoroughly steam cleaned. The split spoon soil sampler was steam cleaned prior to each boring effort and was washed with Liquinox and potable water between sampling efforts. All well development equipment was thoroughly steam cleaned

before all developing efforts.

2.7 Water Levels

After well construction, the elevation of the top of the PVC casing was determined to the nearest hundreth of an inch (mean sea level datum) by a survey crew from the NCDPW Division of Highways and General Engineering. All water levels were measured with a chalked steel tape and referenced to the top of the PVC casing. Water levels were completed prior to each sampling effort to determine the volume of groundwater to be purged per well. Synoptic water levels were completed at the wells over a period of approximately two hours for the development of water elevation maps for both the water table and the deep upper glacial aquifer. (see Hydrogeology Results, Section 3-2.) Additionally, three benchmarks were established at concrete culverts along Glen Cove Creek to determine the elevation of the creek during base flow periods. These base flow creek elevations were taken synoptically with water table measurements.

2.8 Water Quality Sampling

One round of groundwater quality sampling was completed after the installation of the Phase One wells and two additional rounds were completed after the installation of the Phase Two wells. Three to five well volumes of groundwater were purged at each well prior to sampling. During the purging process, the pH, specific conductance and temperature of the discharging groundwater were monitored until stabilization of these parameters had been attained. Monitoring of well parameters was completed with a YSI-3500 Water Quality Monitor and a Hanna Instruments Model 0624-00 pHep-pH electronic gauge. Appendix D encloses the pH, specific conductance and temperature data for each well for the first sampling effort.

[illegible]ging was completed with a Standard Pump Type 14x4P 1/2 horsepower submersible pump, a Keck Geophysical Model SP-81 submersible pump or a Homelite

centrifugal pump, depending on depths to water and well volumes. Well pumps or intake hoses were set just below the stabilized drawdown water level during purging to ensure evacuation of all standing water in the well casing. Monitoring wells 1D, 2D, 4D, 5D, 6S, 6D, 7S, 8D, 11S, 11D and G-4 (1152) were purged with the Standard submersible pump. Monitoring wells 1S, 2S, 4S, 5S, 8S, 9S and 10S were purged with the Keck submersible pump. Monitoring wells 3S, 3M and 3D were purged with the Homelite centrifugal pump. Well point GC-WP1 was hand bailed.

Groundwater sampling was completed following USEPA protocol with decontaminated bottom loading stainless steel bailers. Dedicated nylon rope and dedicated vinyl gloves were used at each well and subsequently discarded. The stainless steel bailer and dedicated rope were precluded from making contact with the ground surface. Groundwater samples were poured from the bailer into the appropriate sample bottles in such a way as to minimize agitation and to prevent excessive aeration. All samples were stored on ice until delivery to the laboratory. Chain of Custody sampling sheets were maintained for each sampling event and are enclosed in Appendix E.

2.9 Soil Sampling -Split Spoon

Subsurface soil sampling was completed with a split barrel (split spoon) sampler, 2-inch OD, 1-3/8 inch ID, 27-inch long. The spoon sampler was advanced below either the lead auger or rotary drilling rod and bit into undisturbed formation with a sliding sampling jar. The sampler was then retrieved and the sediments were logged by the hydrogeologist. The split spoon sampler was steam cleaned prior to each boring effort and washed with Alconox and potable water followed by potable water rinse between individual sampling efforts. All soil samples were screened for organic vapors with either the Century Model 128 OVA or the HNu photoionization detector.

2.10 Water Sampling QA/QC

Aqueous sampling QA/QC involved the decontamination of all purging and sampling equipment prior to and in between sampling efforts following NYSDEC Superfund Phase II protocol. The Standard Type 14x4P submersible pump and its associated PVC piping and electrical wiring was steamed cleaned prior to and in between sampling efforts. Additionally, the pump was flushed with a mixture of Alconox and potable water after steam cleaning. The Keck Model SP-81 submersible pump was decontaminated by using an Alconox and potable water rinse, a methanol and potable water rinse, followed by a potable water rinse. The centrifugal pump and its associated intake and discharge hoses were steam cleaned prior to and in between purging efforts.

Prior to each daily groundwater sampling event, one bottom loading stainless steel bailer for each well to be sampled was steam cleaned. Dedicated nylon rope and vinyl sampling gloves were used at each well and then discarded. Trip blanks and field blanks were utilized daily as described in Section 2.11. Samples were immediately preserved on ice and delivered to the laboratory. Chain of Custody documents for all sampling events are enclosed in Appendix E.

2.11 Analytical Parameters

All samples were analyzed by the NCDH Environmental Laboratory. Two 250 ml water samples were collected at each round; one sample was subsequently analyzed and the second was retained in reserve.

USEPA Method 502.2 entitled, "Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series" was the analytical method utilized for the water samples. A summary of the procedure is as follows.

Quality Assurance and Quality Control (QA/QC) practices used were as outlined in Method 502.2 as noted above. Highly volatile organic compounds with low water

solubility are extracted (purged) from the sample matrix by bubbling an inert gas through a 5 ml aqueous sample. Purged sample components are trapped in a tube containing suitable sorbent materials. When purging is complete, the sorbent tube is heated and backflushed with helium to desorb trapped sample components onto a capillary gas chromatograph (GC) column. The column is temperature programed to separate the analytes which are then detected with a photoionization detector and a halogen specific detector placed in series.

Identification of analytes is obtained by analyzing standards under the same condition used for samples and comparing resultant GC retention times. Additional confirmatory information can be gained by comparing the relative response from the two detectors. Each identified component is quantified using the external standard method.

Field and trip blanks were analyzed for each sampling run performed and their analyses are enclosed in Appendix E. In addition, the following areas of QA/QC are routinely addressed by the NCDH Laboratory's Quality Assurance Program:

- Documentation of day-to-day instrument performance.
- Records of instrument calibrations.
- Preparation of daily control charts.
- Records of personnel accountability to demonstrate chain of custody.
- Periodic laboratory replicate analysis.
- Regular use of laboratory blanks.
- Periodic recovery of standards by the method of standard additions.
- Regular participation in proficiency programs sponsored by regulatory agencies and consultants.
- Regular participation in inter-laboratory splitting of reference samples.
- Records of precision and accuracy.
- Records of instrument repair and preventive maintenance.

- Regular monitoring of reagent quality.

- Records establishing the quality of reconditioned adsorption tubes.

Full chain of custody procedures and records were kept for all samples taken as part of the project (see Appendix E).

3.0 STUDY RESULTS

3.1 Geology

The geology and hydrostratigraphic formations encountered during well installation generally include an upper glacial till of variable composition and thickness, a lower sand and sand and gravel unit with occasional zones of silt, and the Port Washington confining unit composed of clay and sandy clay forming the base of the upper glacial aquifer.

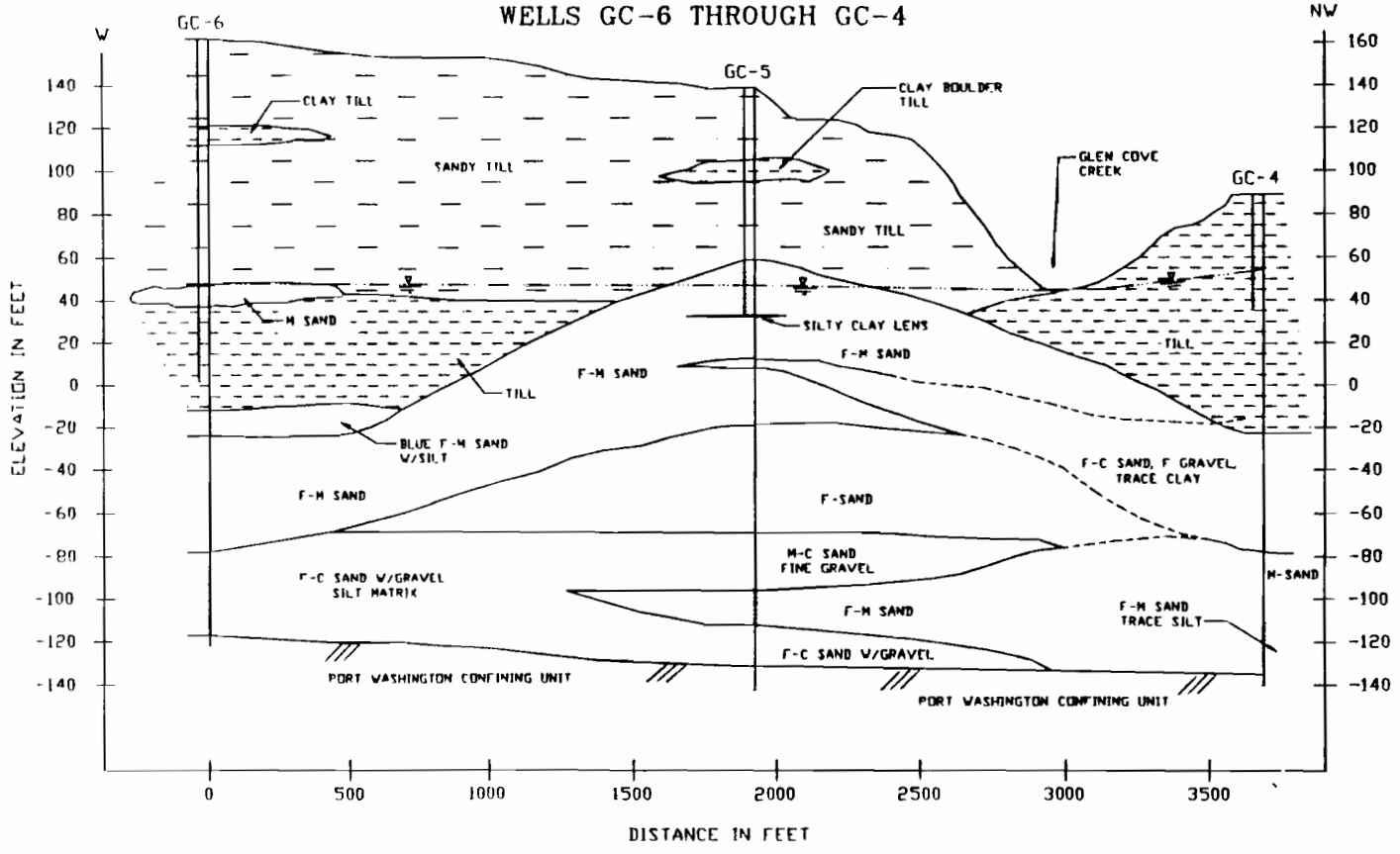
Four geologic cross-sections have been developed, two north to south and two east to west, through analysis of the well logs and gamma logs of the deep monitoring wells. These cross-sections are presented in Figures 3-1 through 3-4.

3.1.1 Upper Glacial Till

The upper glacial till formation ranges in thickness from 12 to 126 ft. at the well borings. The till varies in composition and can be divided into three separate facies (one part of a rock body as contrasted with other parts). The first has a composition ranging from a silty, clayey, fine-medium sand with gravel to cobbles and occasional boulders (wells GC-2, 3, 4, and 10S); the second, a sandy facies, is composed of compact medium to coarse sand and gravel, with cobbles and occasional zones of silt (wells GC -1, 5 and 7); and the third can be described as an irregular alternating sequence of the silt facies till with the sandy facies till as seen at wells GC-6, 8, 9S and 11. In general, the silty facies till is located east of Glen Cove Creek, while the sandy facies and alternating facies is located west of Glen Cove Creek. At wells GC-1 and 3 a thin fill layer overlies the till. Other observations include:

- A 5 ft. thick clayey, indurated boulder till logged within the sandy facies at well GC-5 approximately 40 ft. below grade.
- Sand lenses were logged in the till at wells GC-4, 6, 8S and 8D.
- A series of clay stringers (ice contact drift?) were logged at well GC-11D

FIGURE 3-1
GEOLOGIC CROSS SECTION
WELLS GC-6 THROUGH GC-4



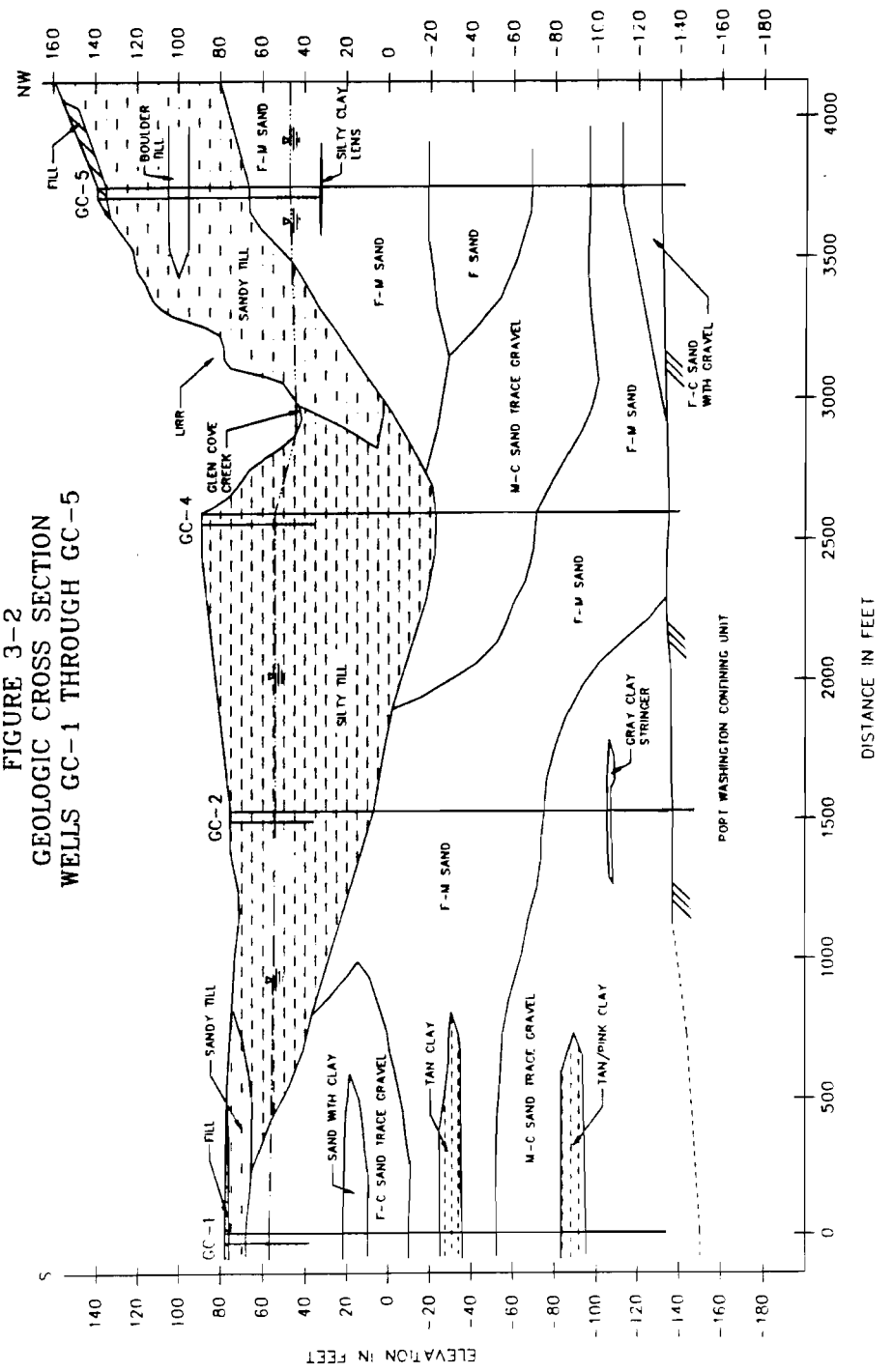
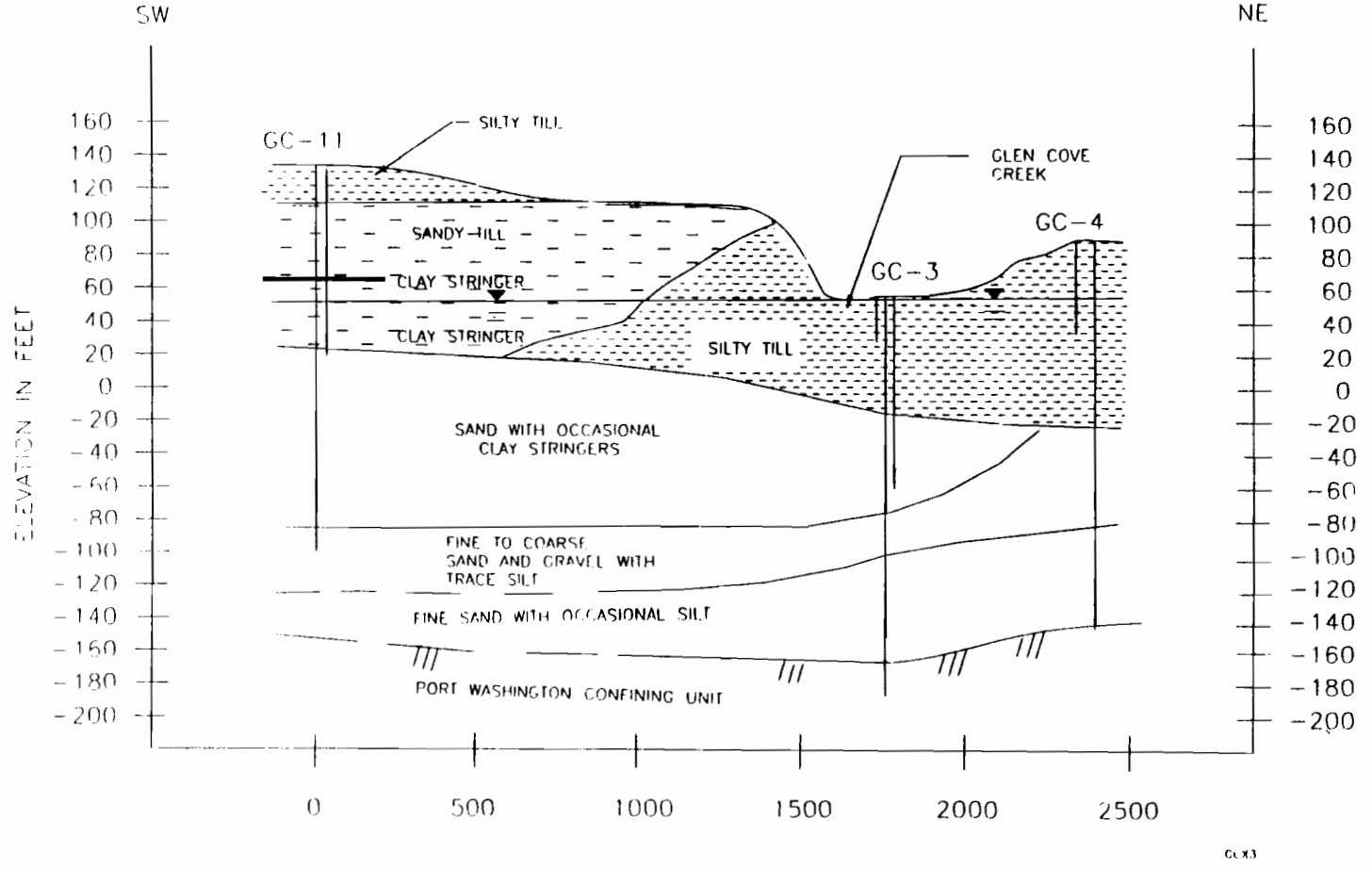


FIGURE 3-2
GEOLOGIC CROSS SECTION
WELLS GC-1 THROUGH GC-5

FIGURE 3-3
GEOLOGIC CROSS SECTION
WELLS GC-4 THRU GC-11



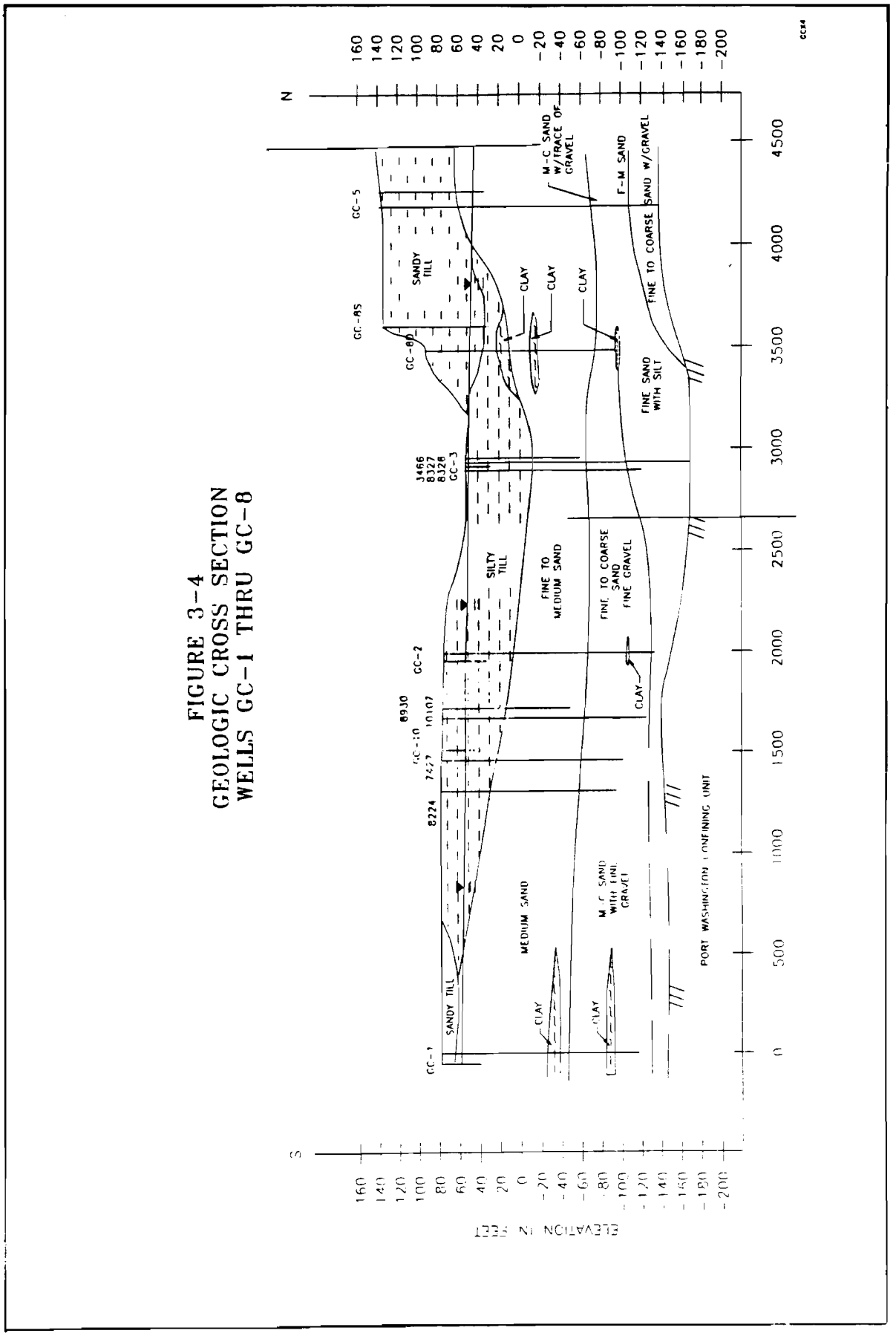


FIGURE 3-4
GEOLOGIC CROSS SECTION
WELLS GC-1 THRU GC-8
N
S
ELEVATION IN FEET
GC-5
GC-8S
GC-8D
GC-3
GC-2
GC-1
SANDY TILL
SILTY TILL
MEDIUM SAND
FINE TO MEDIUM SAND
FINE TO COARSE SAND FINE GRAVEL
M-C SAND W/TRACE OF GRAVEL
F-M SAND
FINE TO COARSE SAND W/GRAVEL
FINE SAND WITH SILT
CLAY
PORT WASHINGTON CONFINING UNIT

approximately 70 ft. below grade which is 63 ft. asl.

Areas of apparent Cretaceous sediment picked up from the north, transported and incorporated in the till, were identified at well GC-6D, where a blue, fine-medium sand with silt was observed and at well GC-3D, where a multi-colored gray/blue very fine quartz sand in a silt matrix was encountered (see Figures 3-1 through 3-4). Of note is the upper till's heterogeneous nature as shown by its silty and sandy facies, variable compaction, zones of indurated clayey boulder till and incorporated Cretaceous sediments.

3.1.2 Lower Sand and Gravel Formation

Underlying the till and extending down to the surface of the Port Washington confining unit is an interbedded sand and sand and gravel formation with occasional lenses of silt. The thickness of this formation ranges from a high of approximately 216 ft. at well GC-1D to a low of 112 ft. at wells GC-4 and GC-6. Based upon the lithologic data obtained during sampling this formation is composed of hydraulically connected glacial sediment, reworked glacial and Cretaceous sediment, and thrusted or in place Cretaceous sediment. Separation of glacial and Cretaceous sediment was accomplished through color analysis, lithologic examination, degree of weathering and determination of elevation relative to sea level. Defining the stratigraphy more concisely is beyond the scope of this investigation.

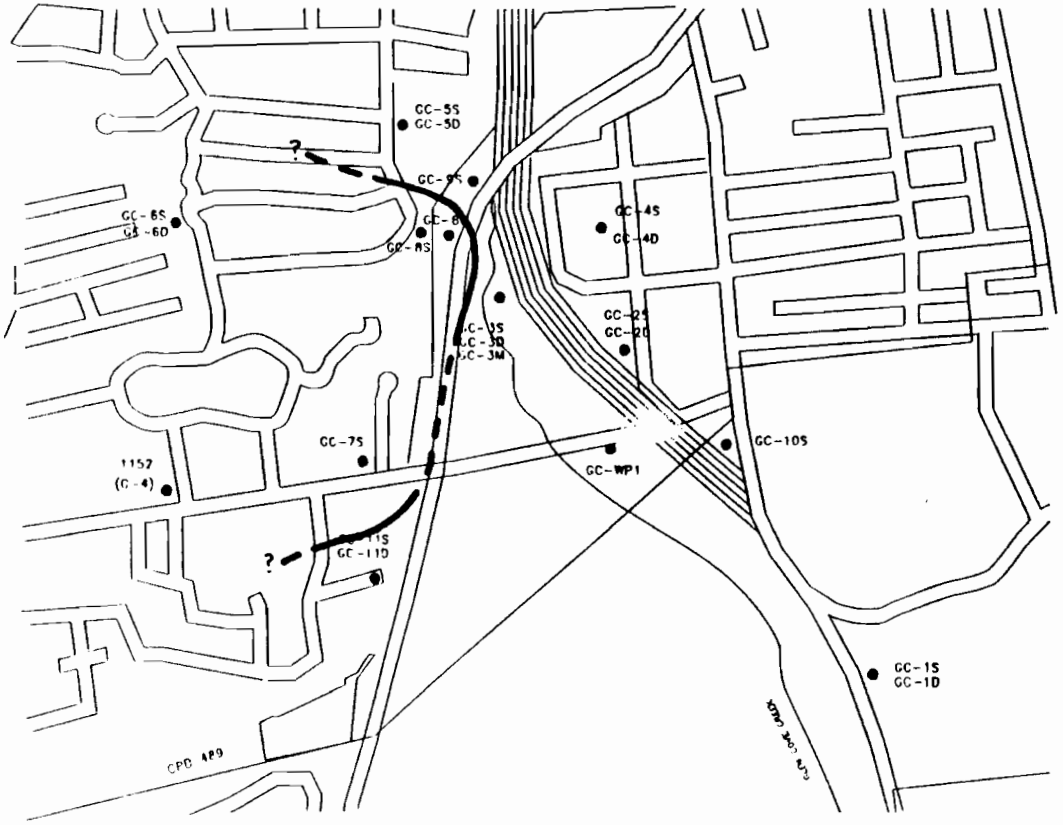
Generally, the till is underlain by either glacial or reworked glacial and Cretaceous sediment composed of fine to medium grained quartz sand with occasional traces of fine gravel and silt. Glacial and reworked glacial and Cretaceous sediment were logged to depth at wells GC-1, 10S and 11. At all other wells the glacial and reworked sediment extends to an apparent contact with in-place Cretaceous sediment.

The apparent in-place Cretaceous sediment is generally composed of whitish

fine to medium sand with occasional silt, very fine to fine sand with a light silt matrix and a basal fine to coarse weathered quartz sand with fine to medium quartz gravel with occasional silt. The basal sand and gravel unit generally overlies the Port Washington confining unit. The surface altitude of the Cretaceous contact encountered at wells 2, 3, 4, 5, 6 and 8 ranges from -52 to -118 ft. below sea level (bsl). An apparent Cretaceous high was logged at 33 feet asl at well GC-5D. Specific contacts are noted in well logs in Appendix B.

3.1.3 Confining Units

The Port Washington confining unit, which forms the base of the upper glacial aquifer, is the most significant areally extensive confining unit at the study area. Other significant but non-continuous confining units were encountered in the lower sand unit at wells GC-1D, 2D, 8D and in the upper till at abandoned boring GC-7D adjacent to well GC-7S (see Figures 3-1 through 3-5). A tan clay was logged from -84 to -93 bsl at well GC-1D. The well screen was set at -96 to -116 bsl (Carney Street supply well elevations range from -65 to -120 bsl). This clay unit pinches out (gradually disappears) to the north. A localized gray clay lens was logged at -105 to -107 bsl at well GC-2D. The GC-2D well screen was set below this clay from -114 to -134 bsl. During the borehole drilling for proposed well GC-7D (Phase Two) a solid light gray clay was encountered at 21 ft. asl. Because the Phase One water quality at GC-7S showed 404 micrograms/liter (ug/L) of total VOC's it was decided not to breach the confining layer. Therefore, the thickness and lower elevation of the clay at this location was not determined. The boring was subsequently grouted to depth. Wells GC-11S and 11D, installed at Midwood Court appoximately 600 ft. to the south (Phase Two), did not encounter the solid clay. Two confining units were encountered at well GC-8D approximately 1,250 ft. to the north of well GC-7S. The surface of the upper clay was logged at 22 ft. asl and is well correlated with the clay logged at GC-7D. The clay is 12 ft. thick at GC-8D.



LEGEND

EXTENT OF CLAY-DASHED WHERE INFERRED

DISTANCE IN FEET

0 300 600 900 1200

FILE NAME \DWG\GLENSHAL

NO	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	4/23/90

COUNTY OF NASSAU
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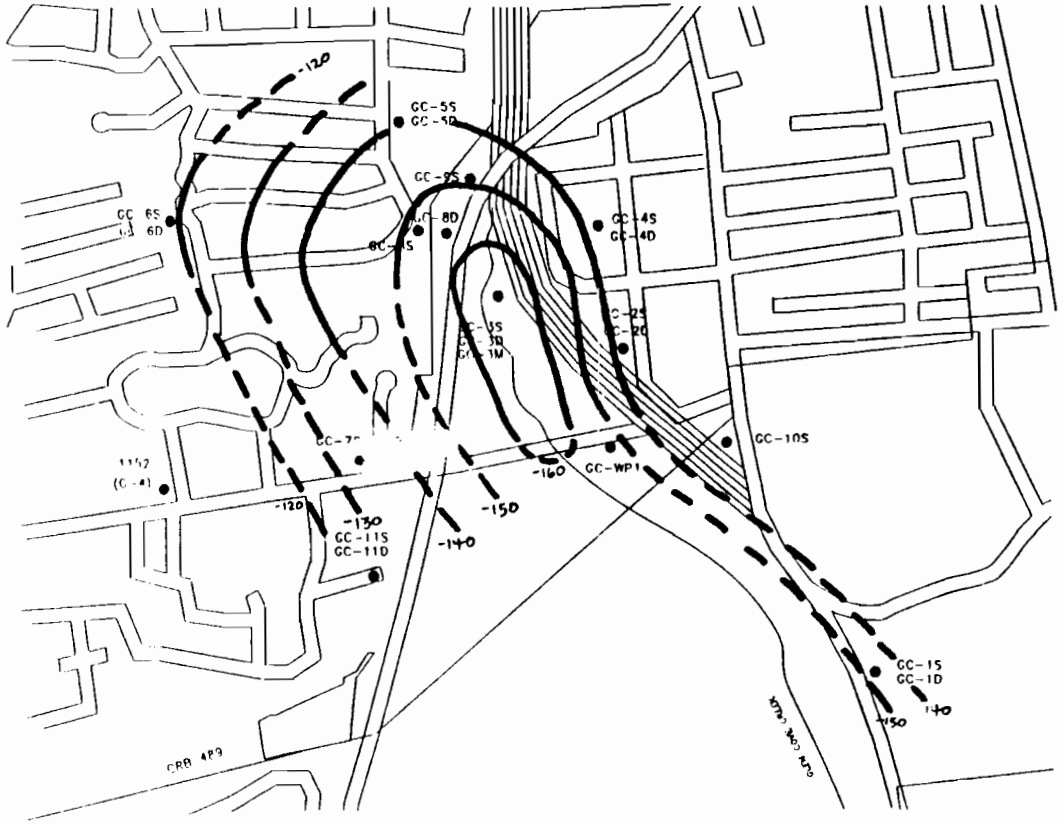
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-5
AREAL EXTENT OF CLAY
AT 20 FT ABOVE SEA LEVEL

CONTRACT NUMBER	DRG NO	DRAWN BY	SHEET NO
58002	GC-100-01	J SINNOTT 4/19/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
K STOKES	4/9/90	J DeFRANCO	4/20/90



LEGEND

~ -160 ~ SURFACE ALTITUDE OF CONFINING UNIT-DASHED WHERE INFERRED

DISTANCE IN FEET

0 600 1200

FILE NAME \DVG\GLENSHAL

NO	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	4/23/90

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-6
SURFACE ALTITUDE OF PORT WASHINGTON CONFINING UNIT AT STUDY VICINITY

CONTRACT NUMBER	DWG NO	DRAWN BY	SHEET NO
58002	GC-100-02	J ZIMMET 4/19/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
K STOKES	4/9/90	J DeFRANCO	4/20/90

The surface of the lower clay was logged at -11 bsl and is 6 ft. thick. Both units pinch out to the north and east as neither clay was logged at wells GC-5D and GC-3D, 700 and 540 ft. to the north and east, respectively. Figure 3-5 shows the areal extent of the clay at approximately 20 ft. asl.

The surface altitude of the Port Washington confining unit, based upon borings installed during this program and USGS report 85-4051, is shown in Figure 3-6. The surface represents the base of the upper glacial aquifer. Drill cuttings of the Port Washington confining unit observed from wells GC-2D, 4D, 5D and 6D were a white, sandy plastic clay, although GC-6D was installed at the contact of the Raritan Clay and Port Washington confining unit as described by Kilburn and Krulikus (USGS, 1987). A hard dark gray clay, however, was logged at well GC-3D, which may represent in-place Raritan Clay.

3.2 Hydrogeology

The hydrogeology of the upper glacial aquifer in the study area was determined through the installation of water table wells, which allowed determination of the water table configuration and flow directions, and through the installation of deep upper glacial wells, which allowed determination of the deep upper glacial potentiometric heads and flow directions. Vertical groundwater gradients and flow components were established by measuring the water table and deep upper glacial hydrostatic heads at the paired well clusters. A Stevens Water Level Recorder was installed at well GC-3D to help quantify the effects of the industrial well pumpage on the deep upper glacial aquifer. Additionally, three bench marks were established at culverts along Glen Cove Creek to allow the determination of the Creek's elevation. The base flow creek elevations were necessary to map the water table configuration.

3.2.1 Water Table Aquifer

Full synoptic rounds to determine groundwater elevations at all wells and the three creek locations were completed four times and are summarized in Tables 3-1 through 3-4. Nonprecipitation conditions for at least two days were a prerequisite to ensure creek base flow discharging conditions. Water table configuration maps are shown in Figures 3-7 through 3-10. The water table contour maps show a general northwesterly regional flow direction with a consistent west to northwest horizontal flow direction south of Sea Cliff Avenue, and northerly flow in the vicinity of Glen Cove Creek.

The influence of Glen Cove Creek appears minimal in the regional water table map (see Figure 1-6); however, as shown in the site-specific water table figures developed during the study, Glen Cove Creek represents a significant water table discharge point, through and immediately north of the industrial zone along Sea Cliff Avenue. Groundwater flow is deflected to the north where the contours "V" around the creek. Increased groundwater gradients exist around and toward the creek, especially between well GC-4S and the creek benchmark established at the culvert south of the railroad overpass, where a gradient of 0.018 ft./ft. existed August 22, 1989. Additionally, the flow direction is southeast between well GC-9S and the benchmark at the railroad overpass, reversed from the regional northwesterly direction. The point of flow inflection is located just west of Glen Cove Creek and apparently is a result of the increased gradients adjacent to the creek, combined with the water table's contact with the thick till wedge logged at GC-6S and the silty till through the water table at well GC-8S. The water table is also located in the upper till unit at wells GC-2S, 3S, 4S, 7S, 9S, 10S, 11S and WP1 and in the lower sand at wells GC-1S and 5S.

Water table elevations are the result of a dynamic balance between precipitation (recharge), the geologic media, discharge and potential effects from

TABLE 3-1

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

GROUNDWATER LEVELS - AUGUST 22, 1989

WELL	MEASURING POINT ELEVATION (TOP PVC)	ELEVATION TOP SCREEN	ELEVATION BOTTOM SCREEN	DEPTH TO WATER	WATER ELEVATION	VERTICAL GRADIENT
GC-1S	78.25	59.4	39.4	21.31	56.94	Downward
GC-1D	78.18	-96.6	-116.6	21.52	56.66	
GC-2S	74.80	55.8	35.8	17.59	57.21	Downward
GC-2D	74.39	-113.9	-133.9	19.89	54.50	
GC-3S	51.98	48.3	28.3	4.51	47.47	
GC-3D	52.48	-127.3	-147.3	2.86	49.62	Upward
GC-4S	88.44	54.7	34.7	34.88	53.56	Downward
GC-4D	88.75	-110.9	-130.9	35.23	53.52	
GC-5S	138.42	53.1	33.1	91.69	46.73	Downward
GC-5D	138.47	-95.2	-115.2	91.80	46.67	
GC-6S	161.73	32.2	12.2	113.72	48.01	Downward
GC-6D	162.02	-92.7	-112.7	114.78	47.24	
GC-7S	120.51	41.2	21.2	70.57	49.94	
G-4	153.85	28.5	23.5	104.73	49.12	
H-4A	144.71	39.4	35.4	86.73	57.98	
GLEN COVE CREEK						
@ Sea Cliff Avenue 59.46 (bench)				4.15	55.31	
@ RR overpass 51.48 (bench)				10.11	41.37	
@ Hendrick 40.83 (bench)				9.87	30.96	

All measurements in feet above or below (-) sea level
Elevations surveyed by NCDPW

TABLE 3-2

INVESTIGATION OF . ONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

GROUNDWATER LEVELS - SEPTEMBER 5, 1989

WELL	MEASURING POINT ELEVATION (TOP PVC)	ELEVATION TOP SCREEN	ELEVATION BOTTOM SCREEN	DEPTH TO WATER	WATER ELEVATION	VERTICAL GRADIENT
GC-1S	78.25	59.4	39.4	21.66	56.59	Downward
GC-1D	78.18	-96.6	-116.6	22.25	55.93	
GC-2S	74.80	55.8	35.8	17.90	56.90	Downward
GC-2D	74.39	-113.9	-133.9	19.98	54.41	
GC-3S	51.98	48.3	28.3	4.73	47.25	
GC-3D	52.48	-127.3	-147.3	2.83	49.65	Upward
GC-4S	88.44	54.7	34.7	34.90	53.54	
GC-4D	88.75	-110.9	-130.9	35.08	53.67	Upward
GC-5S	138.42	53.1	33.1	91.65	46.77	Downward
GC-5D	138.47	-95.2	-115.2	91.75	46.72	
GC-6S	161.73	32.2	12.2	113.97	47.76	Downward
GC-6D	162.02	-92.7	-112.7	114.75	47.27	
GC-7S	120.51	41.2	21.2	70.57	49.94	
G-4	153.85	28.5	23.5	104.71	49.14	
H-4A	144.71	39.4	35.4	86.85	57.86	
GLEN COVE CREEK						
@ Sea Cliff Avenue 59.46 (bench)				3.93	55.53	
@ RR overpass 51.48 (bench)				10.18	41.30	
@ Hendrick 40.83 (bench)				9.80	31.03	

All measurements in feet above or below (-) sea level
Elevations surveyed by NCDPW

TABLE 3–3

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

GROUNDWATER LEVELS – JANUARY 17, 1990

WELL	MEASURING POINT ELEVATION (TOP PVC)	ELEVATION TOP SCREEN	ELEVATION BOTTOM SCREEN	DEPTH TO WATER	WATER ELEVATION	VERTICAL GRADIENT
GC–1S	78.25	59.4	39.4	19.66	58.59	Downward
GC–1D	78.18	–96.6	–116.6	19.99	58.19	
GC–2S	74.80	55.8	35.8	17.36	57.44	Downward
GC–2D	74.39	–113.9	–133.9	18.41	55.98	
GC–3S	51.98	48.3	28.3	4.00	47.98	
GC–3M	53.94	–39.7	–59.7	3.52	50.42	
GC–3D	52.48	–127.3	–147.3	1.82	50.66	Upward
GC–4S	88.44	54.7	34.7	34.40	54.04	
GC–4D	88.75	–110.9	–130.9	33.97	54.78	Upward
GC–5S	138.42	53.1	33.1	91.02	47.40	
GC–5D	138.47	–95.2	–115.2	90.88	47.59	Upward
GC–6S	161.73	32.2	12.2	113.51	48.22	Downward
GC–6D	162.02	–92.7	–112.7	114.14	47.88	
GC–7S	120.51	41.2	21.2	69.84	50.67	
GC–8S	135.13	48.5	28.5	86.11	49.02	
GC–8D	94.44	–74.5	–94.5	45.52	48.92	
GC–9S	90.27	49.7	29.7	43.85	46.42	
GC–10S	76.41	56.5	36.5	20.94	55.47	
GC–11S	133.49	38.8	18.8	82.20	51.29	
GC–11D	133.81	–76.9	–96.9	82.21	51.60	Upward
GC–WP1	59.98	55.0	50.0	3.81	56.17	
G–4	153.85	28.5	23.5	104.71	49.14	
GLEN COVE CREEK						
@ Sea Cliff Avenue 59.46 (bench)				3.98	55.48	
@ RR overpass 51.48 (bench)				9.35	42.13	
@ Hendrick 40.83 (bench)				Not Measured		

All measurements in feet above or below (–) sea level
Elevations surveyed by NCDPW

TABLE 3–4

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

GROUNDWATER LEVELS – FEBRUARY 13, 1990

WELL	MEASURING POINT ELEVATION (TOP PVC)	ELEVATION TOP SCREEN	ELEVATION BOTTOM SCREEN	DEPTH TO WATER	WATER ELEVATION	VERTICAL GRADIENT
GC–1S	78.25	59.4	39.4	18.94	59.31	Downward
GC–1D	78.18	–96.6	–116.6	19.28	58.90	
GC–2S	74.80	55.8	35.8	16.50	58.30	Downward
GC–2D	74.39	–113.9	–133.9	17.47	56.92	
GC–3S	51.98	48.3	28.3	3.80	48.18	
GC–3M	53.94	–39.7	–59.7	3.06	50.88	
GC–3D	52.48	–127.3	–147.3	1.31	51.17	Upward
GC–4S	88.44	54.7	34.7	33.88	54.56	
GC–4D	88.75	–110.9	–130.9	33.47	55.28	Upward
GC–5S	138.42	53.1	33.1	91.82	46.60	
GC–5D	138.47	–95.2	–115.2	90.81	47.66	Upward
GC–6S	161.73	32.2	12.2	113.25	48.48	Downward
GC–6D	162.02	–92.7	–112.7	113.90	48.12	
GC–7S	120.51	41.2	21.2	69.35	51.16	
GC–8S	135.13	48.5	28.5	85.81	49.32	
GC–8D	94.44	–74.5	–94.5	45.11	49.33	
GC–9S	90.27	49.7	29.7	43.65	46.62	
GC–10S	76.41	56.5	36.5	19.90	56.51	
GC–11S	133.49	38.8	18.8	81.74	51.75	
GC–11D	133.81	–76.9	–96.9	81.74	52.07	Upward
GC–WP1	59.98	55.0	50.0	3.04	56.94	
G–4	153.85	28.5	23.5	103.92	49.93	
GLEN COVE CREEK						
@ Se[illegible]f Avenue 59.46 (bench)				3.95	55.51	
@ RR [illegible]erpass 51.48 (bench)				10.09	41.39	
@ He[illegible]ck 40.83 (bench)				9.78	31.05	

All measurements in feet above or below (–) sea level
Elevations surveyed by NCDPW

LEGEND

48 LINE OF EQUAL WATER TABLE ALTITUDE

DISTANCE IN FEET

0 300 600 900 1200

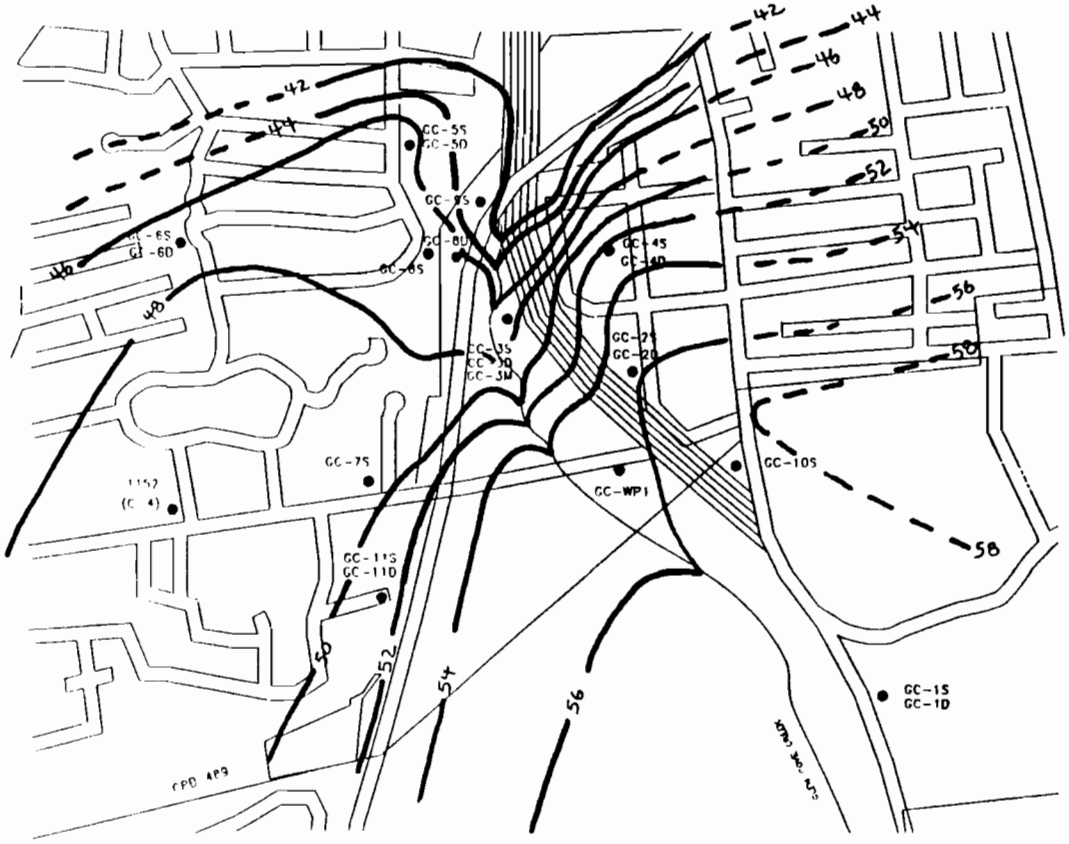
FILE NAME \DWG\GLENSMAL

NO.	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	4/23/90

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-7
WATER TABLE
CONFIGURATION 8/22/89

CONTRACT NUMBER	DWG NO	DRAWN BY	SHEET NO
58003	CC-100-03	J SIMMEY 4/18/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
K STOKES	4/5/90	J DeFRANCO	4/20/90



LEGEND

48 LINE OF EQUAL WATER TABLE ALTITUDE

DISTANCE IN FEET

0 300 600 900 1200

FILE NAME \DWG\GLENSMAL

NO	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	4/23/90

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-8
WATER TABLE CONFIGURATION
3/5/89

CONTRACT NUMBER	DWG NO	DRAWN BY	SHEET NO
5A002	GC-100-Q4	J ZIMMET 4/19/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
K STOKES	4/5/90	J DeFRANCO	4/20/90

LEGEND

48 LINE OF EQUAL WATER TABLE ALTITUDE

DISTANCE IN FEET

0 300 600 900 1200

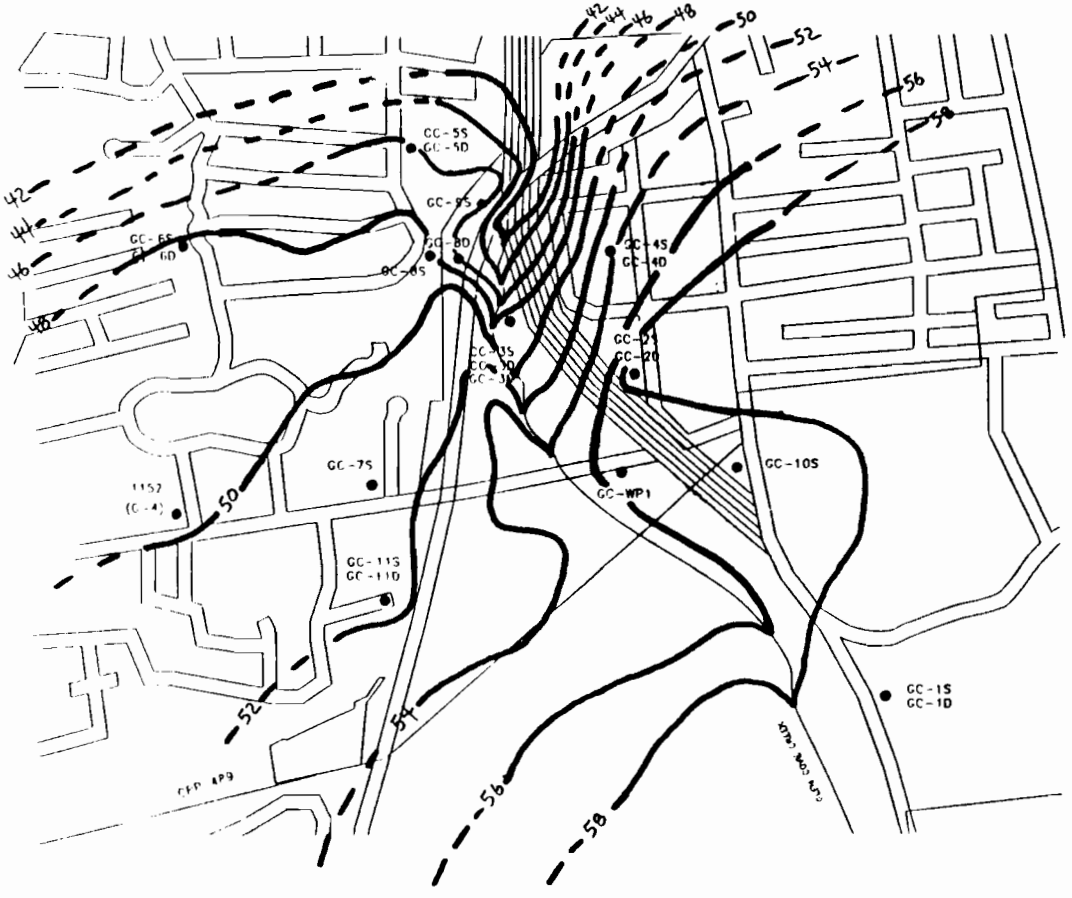
FILE NAME \DWG\GLENSMAL

NO	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	4/23/90

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-9
WATER TABLE CONFIGURTAION
1/17/90

CONTRACT NUMBER	DWG NO	DRAWN BY	SHEET NO
58002	GC-100-08	J ZIMMET 4/19/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
R STORES	4/5/90	J DeFRANCO	4/20/90



LEGEND

48 LINE OF EQUAL WATER TABLE ALTITUDE

DISTANCE IN FEET

0 300 600 900 1200

FILE NAME \DWG\GLENSHAL

NO	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	6/23/90

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-10
WATER TABLE CONFIGURTAION
2/13/90

CONTRACT NUMBER	DWG NO	DRAWN BY	SHEET NO
5H002	CC-100-06	J ZIMMET 4/19/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
K STOKES	4/5/90	J DeFRANCO	4/20/90

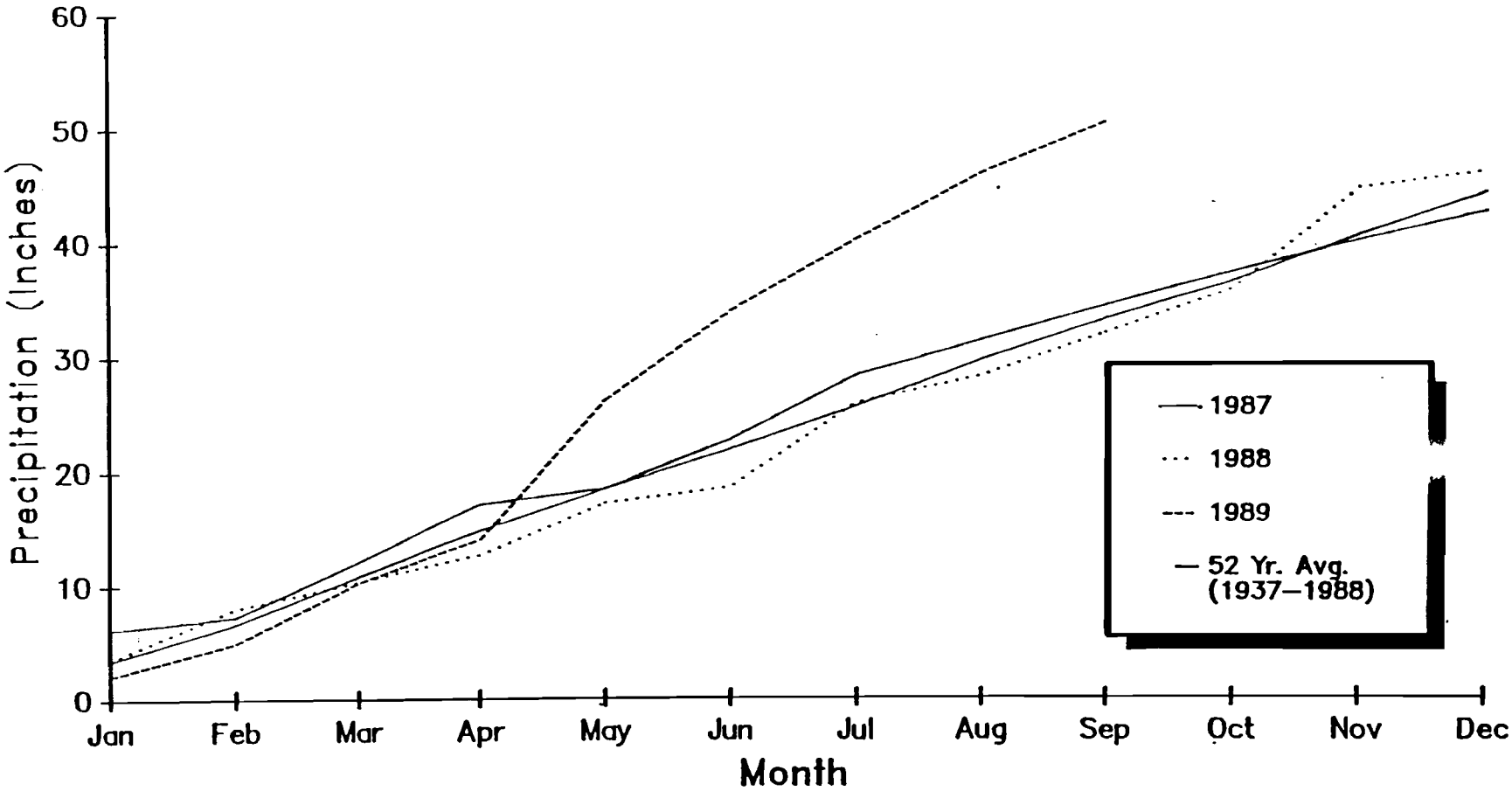
industrial pumpage and diffusion. Figure 3-11 shows the cumulative precipitation for 1988, 1989 and the cumulative 51-year average for the NCDPW, Water Resource Management Unit's Mineola weather station. As shown in this figure, significant above-average precipitation occurred from March to August 1989 (16-inches over average), in comparison to the 51-year cumulative average. This increase in recharge results in higher water table elevations throughout the study area which causes increased gradients and discharge into Glen Cove Creek. Nassau County monitoring well G-4 (1152) showed a water elevation approximately 2 ft. higher in August 1989 than in June 1988.

3.2.2 Deep Upper Glacial Aquifer

The deep upper glacial monitoring wells have screen elevations between -75 to -147 ft. bsl depending on the depth to the Port Washington confining unit and their position with respect to existing wells. The deep potentiometric head elevations are shown in Tables 3-1 through 3-4 for each period of water elevation measurement. The deep potentiometric contours are shown in Figures 3-12 through 3-15. The deep contours indicate a consistent west-northwest horizontal flow direction at Sea Cliff Avenue bending to a northwesterly direction northwest of Sea Cliff Avenue.

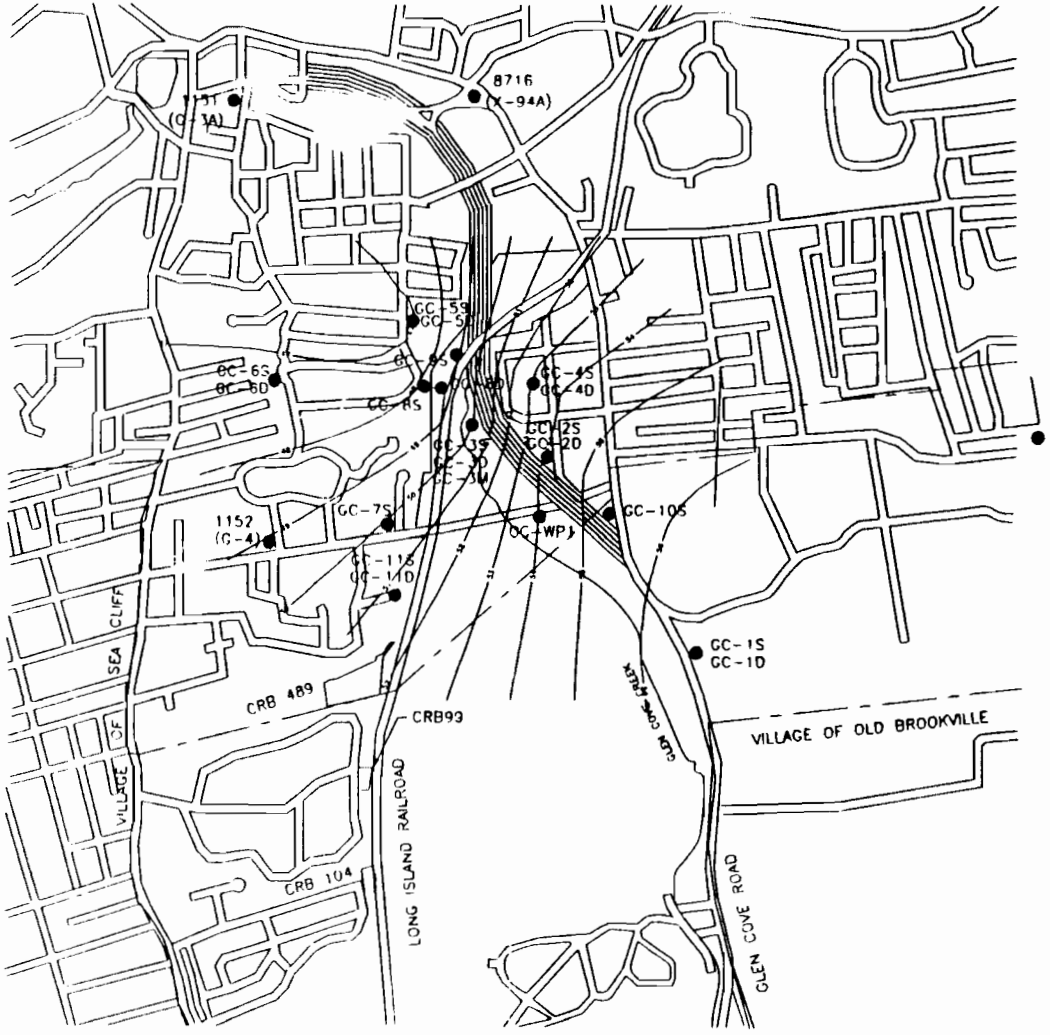
3.2.3 Hydraulic Conductivity

Without a definitive pump test, a range of hydraulic conductivities can be estimated (Morris and Johnson 1967, Driscoll 1986) based upon the sediments logged during well installation. The lower sand and gravel unit, which consists of glacial, reworked glacial and Cretaceous sediment, ranges from a very fine to fine silty sand to a fine to coarse sand with fine gravel. However, the unit can be described as predominantly fine to medium sand. The estimated hydraulic conductivity of the fine to medium sand ranges from 10 to 60 ft./day. The low and high conductivity estimates for the formation range from approximately 5 to 20 ft./day for the fine to silty sand and 100 to 250 ft./day for the fine to coarse sand



Cumulative Monthly Precipitation
at Mineola Weather Station

FIGURE 3-11



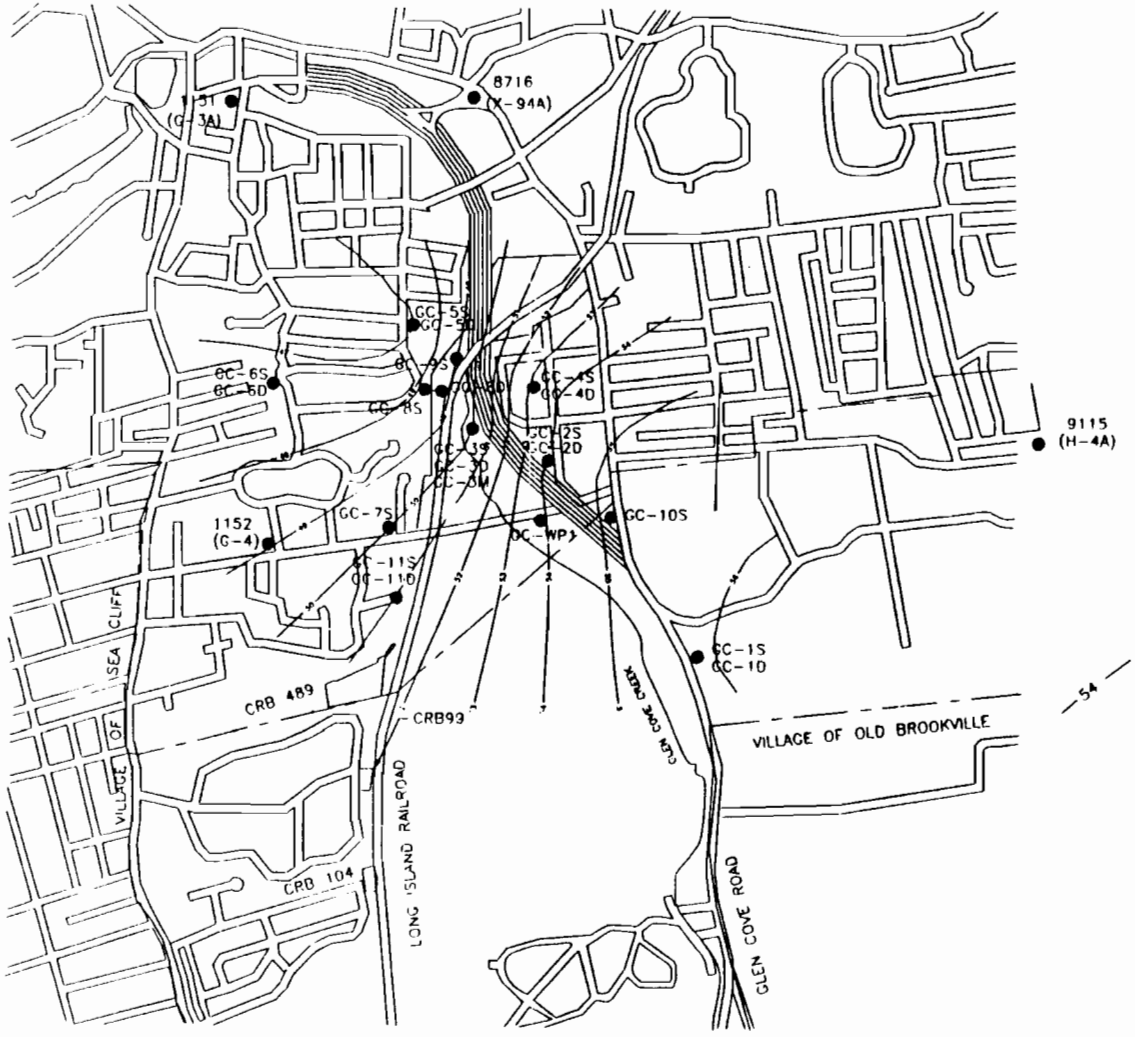
\DWG\GLENCOV

NO.	REVISION DESCRIPTION	DATE
0	FIRST RELEASE	
A	FOR INFORMATION ONLY	3/22/89

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY

FIGURE 3-12
DEEP GLACIAL POTENTIOMETRIC CONTOURS 8/22/89

HAZARDOUS WASTE UNIT	DRG NO	DRAWN BY	SHEET NO
	GC-100-C1	IB 3/22/89	1 OF 1



LEGEND

LINE OF EQUAL POTENTIOMETRIC ELEVATION

DISTANCE IN FEET

200 600

0 400 800

\DWG\GLENCOV

NO.	REVISION DESCRIPTION	DATE
0	FIRST RELEASE	9/13/89
A	FOR INFORMATION ONLY	3/22/89

COUNTY OF NASSAU
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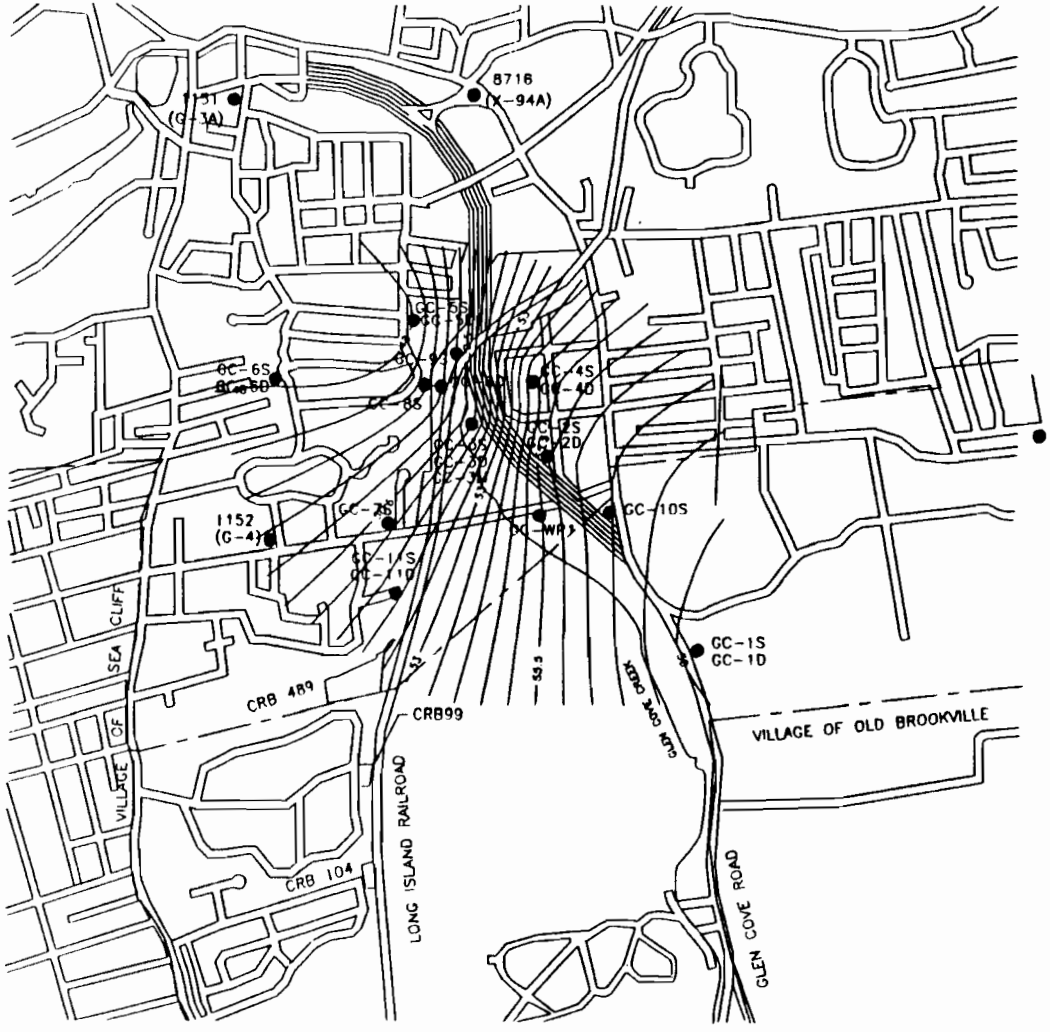
FIGURE 3-13
DEEP GLACIAL POTENTIOMETRIC CONTOURS 9/5/89

HAZARDOUS WASTE UNIT	DWG NO GC-100-C4	DRAWN BY TR 3/31/89	SHEET NO 1 OF 1



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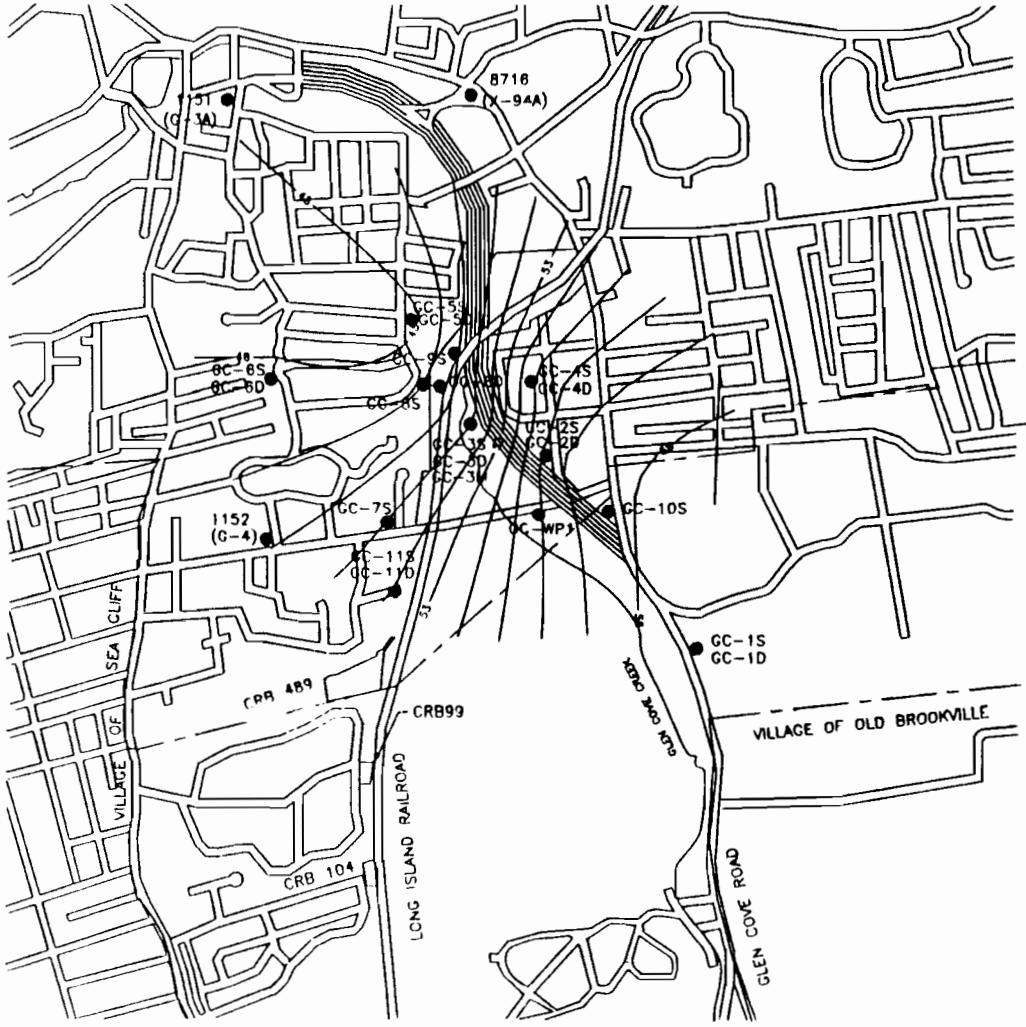
NO.	REVISION DESCRIPTION	DATE
A	FOR INFORMATION ONLY	3/22/89

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY

FIGURE 3-14
DEEP GLACIAL POTENTIOMETRIC CONTOURS 1/17/90

HAZARDOUS WASTE UNIT	DRG NO	DRAWN BY	SHEET NO
		I.S. 3/22/89	1 OF 1



\DWG\GLENCOV

NO.	REVISION DESCRIPTION	DATE
A	FOR INFORMATION ONLY	3/22/89

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY

FIGURE 3-15
DEEP GLACIAL POTENTIOMETRIC CONTOURS 2/13/90

HAZARDOUS WASTE UNIT	DWG NO	DRAWN BY JS 3/22/89	SHEET NO 1 OF 1

with fine gravel. As discussed earlier, two till facies were logged, a sandy facies and a silty clayey facies. Due to their poor sorting and heterogeneous nature, both facies represent low hydraulic conductivity formations. The estimated range of conductivity for the silty clayey facies logged at wells GC-2, 3, 4, 6, 8, 9, 10 and 11 is from 0.01 to 1 ft./day. The sandy facies range is estimated to be from 1 up to 100 ft./day in well-washed areas. Previous estimates of the ratio of the horizontal to vertical conductivity, due to the anisotropic nature of the primarily horizontally bedded sediments, range from 5:1 to 24:1 in the upper glacial aquifer (Lindner and Reilly 1983).

3.2.4 Vertical Gradients

Vertical groundwater gradients and flow components can be quantified by comparing the synoptic differences in the hydrostatic heads at the well clusters. Well clusters 1, 2, and 6 (Fig. 2-1) have shown consistent downward vertical gradients. Of note is the high downward vertical gradient (0.015 ft./ft., August 1989) at well cluster 2, adjacent to the Sea Cliff Avenue industrial zone. D: g the summer of 1989, well clusters GC-4 and 5 have shown a general horizontal o slightly downward gradient, shifting to an upward vertical gradient in Februar 1990. This fluctuation may reflect the seasonal variation in industrial and a conditioning pumpage from high summer pumpage (indicated by the slight downwara vertical gradient) to the low or non-pumpage conditions in the mid-winter. Well cluster GC-8 has indicated near horizontal flow during two periods of measurement taken in mid-winter. Well cluster GC-11 has shown an upward vertical gradient during two periods of measurement taken in mid-winter. Well cluster GC-3, located at the Carney Street well field and immediately adjacent to Glen Cove Creek, has shown a consistently upward vertical gradient (range 0.012 to 0.015 ft./ft.) from the summer of 1989 through the winter of 1990. The upward vertical gradient is apparently due to the higher consistent deep glacial potentiometric heads relative

to the lower water table heads at, and adjacent to, Glen Cove Creek during base flow discharge periods. This difference in heads is created by rapid local changes in surface topography.

Generally, vertical gradients at the well clusters indicate downward components of flow during the summer pumpage season. Measured vertical gradients during the winter of 1990 compared to the summer of 1989, however, have shown a reversal from slightly downward or near horizontal to upward vertical flow at well clusters GC-4 and 5 and a steady upward component at GC-11, probably reflecting mid winter low industrial pumpage conditions. The exception is the consistent upward vertical gradient exhibited at well cluster GC-3 immediately adjacent to Glen Cove Creek. The effects of industrial pumpage on the aquifer is discussed further in the following section.

3.2.5 Industrial Pumpage

Photocircuits Corporation, Slater Electric and the Pall Corporation have water supply wells for industrial cooling and air conditioning purposes. All three companies discharge the water on-site through diffusion wells (see Table 1-5 for pumpage rates). This pumpage will cause localized increased vertical gradients at the wellhead, localized reversals of normal horizontal gradients during pumpage cycles and groundwater mounding at the diffusion wells. Additionally, there may be overlapping cones of influence when two or more pumps are operating simultaneously. Pending the lack of on-site quantitative data, a Stevens Water Level Recorder was installed at well GC-3D, the closest deep monitoring well not subject to vandalism and adjacent to the Sea Cliff Avenue industrial zone, to help assess the industrial pumpage effects on the aquifer. Wells 2316 (Pall Corp.), 8887 and 9612 (Slater Electric), and 7427 and 8224 (Photocircuits Corp.) are approximately 900, 1,400 and 1,650 ft., respectively, from well GC-3D (refer to Figure 1-9).

A hydrograph of well GC-3D was completed from mid September 1989 to early

January 1990 and is enclosed in Appendix F. Consistent pumping effects (cycles of drawdown and recovery) can be seen from October 3 through October 19, 1989. Based upon the hydrograph there are AM and PM pump cycles starting and ending at approximately 6:00 - 11:00 AM and 5:00 - 10:00 PM, respectively. The AM pump cycle shows a greater water level deflection (up to 0.39 ft.) indicating higher pumping rates. Thus, the cone(s) of influence of either the closest well (2316) or the combined effects of 2316 and additional wells in the area extend outward a minimum of 900 ft. from the wellhead(s). Additionally, the pumping effects extend to the base of the upper glacial aquifer and apparently have a measurable effect on the vertical gradients at well clusters GC-4 and 5. Prior to October 3rd, the hydrograph apparently shows the superimposed drawdown of both the industrial and air conditioning wells. This is shown by the overall lower water level, less water level deflection and slight water level perturbations, as no consistent pump cycle is established. Erratic pumping cycles were recorded from October 19 until approximately January 1990, when pumpage effects were no longer detected. Due to a lack of site specific data, a limited amount of data from well GC-3D's hydrograph and the inherent hydrodynamic complexities involved with the volume of industrial pumpage occurring during the demand seasons (up to 1.9 million gpd total pumpage), further in-depth study is warranted to more thoroughly establish the relationship between the aquifer, pumpage rates and contaminant transport.

3.3 Groundwater Quality

Tables 3-5 and 3-6 are summaries of the Phase One and Phase Two volatile organic analyses for each well. Additionally, Glen Cove Creek was analyzed for VOC's during base flow periods as summarized in Tables 3-7 and 3-8. Throughout the sampling period tetrachloroethylene was the VOC compound detected at the highest concentration (range 2 to 3700 ug/L). Trichloroethylene was detected ranging from 1 to 500 ug/L. Low levels of 1,1,1-Trichloroethane were also detected. Other

TABLE 3-5

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
VOLATILE ORGANIC ANALYSIS SUMMARY - PHASE I

Well Number Number of Samples	GC-2S 1	GC-3S 1	GC-5S 1	GC-5D 1	GC-6D 1	GC-7S 1	G-4* 1
1,1-Dichloroethane		8		1		2	
1,1-Dichloroethylene		4	3	2		4	
c-1,2-Dichloroethylene		1,300		14		3	2
t-1,2-Dichloroethylene		4					
1,1,1-Trichloroethane	2	3	1	3		37	1
Tetrachloroethylene		3,700	74	2		340	57
Trichloroethylene	2	500	9	25		5	2
Vinyl Chloride				1	5		

All results in ug/l

* Existing NCDPW Well G-4, N-1152

TABLE 3-6

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
VOLATILE ORGANIC ANALYSIS SUMMARY - PHASE II

Well Number	GC-2S	GC-2D	GC-3S	GC-3M	G-4*	GC-4S	GC-4D	GC-5S	GC-5D	GC-6S	GC-6D	GC-7S	GC-8S	GC-8D	GC-9S	GC-10S	GC-11S	GC-11D	GC-WP1
Number of Samples	1	2	3	2	1	1	2	1	1	1	2	1	2	2	2	2	2	2	1
Chloroform	1		ND-3	2-3								1	ND-1	4-5		1-5			
1,1-Dichloroethane		ND-5	10-12	7-9			1-3		2			2		9-10	1-2	6-7			2
1,2-Dichloroethane		ND-3	ND-1	2-2				6	33										
1,1-Dichloroethylene		10-16	8-19	3-5			4-9		3		1-2	9		4-4	1-1	3-5			
c-1,2-Dichloroethylene	1		160-320	140-260	1			2	34			10		120-150	35-36	49-67			14
t-1,2-Dichloroethylene			1-2	1-2										1-1					
1,2-Dichloropropane			3-5																3
Methylene Chloride																		1-1	
1,1,2,2-Tetrachloroethane			ND-1																
Tetrachloroethylene	1		1,300-2,500	25-34	17	2		45	4	1		500	4-6	10-14	12-13	6-8	ND-1	ND-2	1
Toluene			ND-4	ND-4				5				1	ND-4					1-1	4
1,1,1-Trichloroethane	5	50-440	11-18	3-8	1	1	34-150	6	3	1	9-13	45	ND-4	5-6	1-1	15-19			5
1,1,2-Trichloroethane				ND-1															
Trichloroethylene	3	ND-1	110-210	210-370	1							8	1-1	87-110	19-27	41-44		1-1	
Trichlorofluromethane		2-19	14-40				ND-2												
Vinyl Chloride			ND-6	ND-1							1-2			3-3				1-4	1

All results in ug/l
ND = Not Detected
(-) = Range (low and high result)
* Existing NCDPW Well G-4 (1152)

TABLE 3–7

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

VOLATILE ORGANIC CHEMICAL SUMMARY *

GLEN COVE CREEK, AUGUST 2, 1989

COMPOUND	AT GLEN HEAD COUNTRY CLUB	AT SEA CLIFF AVENUE	AT CARNEY STREET WELL FIELD	AT ARTERIAL HIGHWAY RAILROAD OVERPASS
1,1–Dichloroethylene **	N.D.	1	21	N.A.
1,1–Dichloroethane	N.D.	10	3	N.A.
Trichloroethylene **	N.D.	48	19	N.A.
Tetrachloroethylene **	N.D.	3	18	N.A.

All results in ug/l
N.D. – Not Detected
N.A. – Not Analyzed
* Analysis by NCDPW Cedar Creek Laboratory
** All 'ethylene' compounds reported by laboratory as 'ethene'

TABLE 3-8

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

VOLATILE ORGANIC CHEMICAL SUMMARY *

GLEN COVE CREEK, SEPTEMBER 6, 1989

COMPOUND	AT GLEN HEAD COUNTRY CLUB	AT SEA CLIFF AVENUE	AT CARNEY STREET WELL FIELD	AT ARTERIAL HIGHWAY RAILROAD OVERPASS
1,1-Dichloroethylene **	N.A.	N.D.	9	19
1,1-Dichloroethane	N.A.	N.D.	1	1
1,1,1-Trichloroethane	N.A.	3	N.D.	5
Trichloroethylene **	N.A.	N.D.	7	63
Tetrachloroethylene **	N.A.	N.D.	16	29

All results in ug/l
N.D. - Not Detected
N.A. - Not Analyzed
* Analysis by NCDPW Cedar Creek Laboratory
** All 'ethylene' compounds reported by laboratory as 'ethene'

chl inated compounds detected, most notably cis-1,2-dichloroethylene, 1,1-dic.loroethane and vinyl chloride, represent potential breakdown compounds from tetrachloroethylene and/or trichloroethylene. Samples from wells GC-3S, 7S, 8D and G-4 were split during Phase Two with NYSDEC-certified Weston Laboratory of Lionville, Pennsylvania, confirming the types and levels of compounds present (see Appendix E). Inorganic analyses were primarily performed to determine if potential metal plating industrial effluent had affected the aquifer. A review of the inorganic water quality has shown lead and manga se above NYSDEC Class GA groundwater standards (NYSDEC Water Quality Regu.ations, Title 6, Chapter X, Part 703.5) at wells GC-3S and 8S. Manganese was above these standards at wells GC-9S and 10S. As previously discussed well GC-10S is adjacent to the Photocircuit Corporation's diffusion wells and wells GC-3S, 8S and 9S are downgradient of the Sea Cliff Avenue industrial zone. Metal samples were not field filtered and results represent total amounts. Please refer to Appendix E for the full laboratory results.

3.3.1 Shallow Groundwater Quality

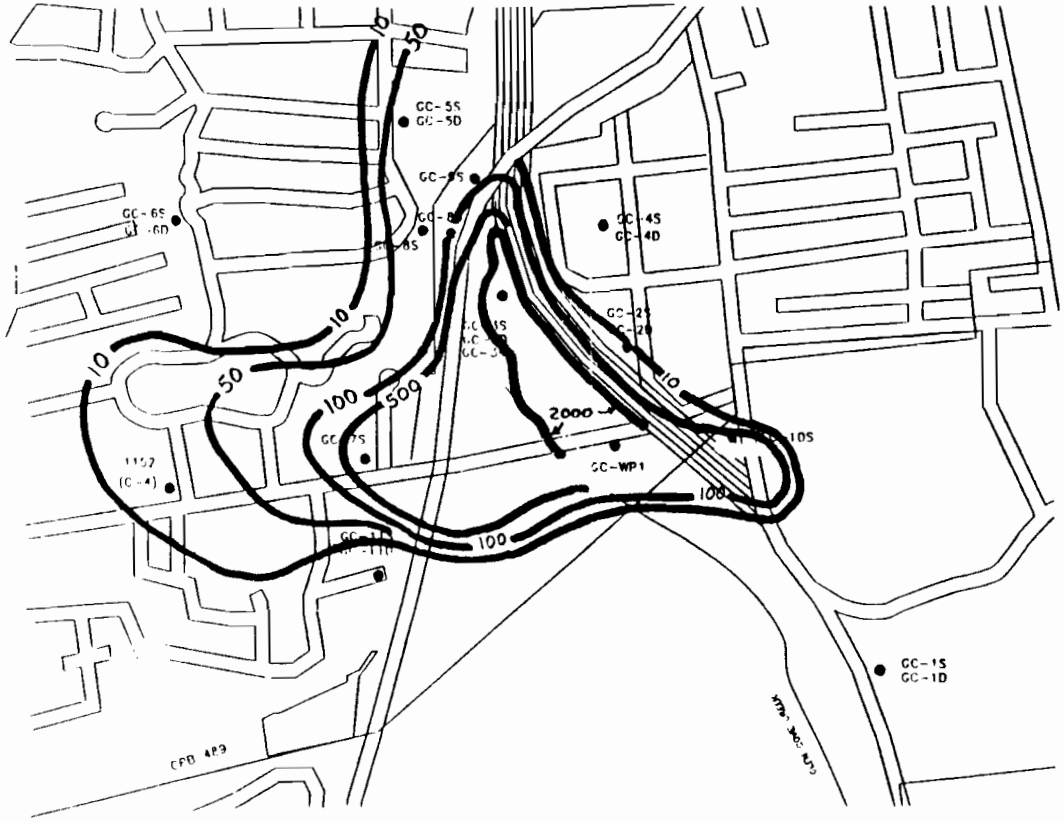
Evaluation of the lithologic data obtained during the drilling portion of the investigation, in conjunction with a knowledge of existing monitoring well constructions, allowed for optimal placement of the shallow groundwater monitoring well screens (see Figure 3-16). The bottom screen elevations for each of the shallow wells were set at comparable intervals to maximize the correlation of groundwater quality data. Since existing monitoring well G-4 had exhibited volatile organic levels up to 190 ug/L in previous sampling rounds, its screen setting of approximately 30 ft. into the water table was used for new wells GC-7S and 11S (see Figure 2-1).

Because the contamination extends a minimum of thirty feet into the water table at well G-4 approximately 2,000 ft. west of the industrial zone, it is

possible to eva te the presence and movement of volatile organic chemical contamination i .is segment of the aquifer in terms of the local geology. The sediments at the shallow saturated zone in this area are predominantly moderate to poorly sorted fine to medium grained sand with gravel featuring a generally clean matrix. Although featuring areas of poor sorting, these sediments will have a greater hydraulic conductivity than the silty till identified east of the creek, creating a preferred groundwater flow pathway.

Shallow groundwater flow and quality can be described by contouring total VOC levels in ug/L (see Figure 3-16). As shown in the figure, there is a bifurcating VOC plume originating from the industrial zone along Sea Cliff Avenue. The southern fork of the plume is moving with the existing shallow groundwater gradient south of Sea Cliff Avenue through the more permeable sediments in a westerly direction. Total VOC levels in this portion of the plume range up to 576 ug/L. The primary volatile organic compound is tetrachloroethylene (PCE) with low levels of 1,1,1-trichloroethane. The apparent western boundary of this segment of the plume extends west of well G-4. Public water supply well 7857 (Sea Cliff Water Company), screened in the Lloyd aquifer, is approximately 3,800 ft. west of well G-4. Well GC-11S reported only 1 ug/L of PCE delineating the southern boundary of the shallow plume.

The northern plume extension moves with the creek-influenced gradient and northerly flow direction extending beyond well GC-5S. Trace levels of contamination have been detected at well GC-6S where the water table is in the upper till unit (refer to Hydrogeology, section 3-2). The highest total VOC levels (ranging from 1,700 to 5,500 ug/L) were recorded at well GC-3S immediately downgradient of the Sea Cliff Avenue industrial zone. The groundwater contours east of the creek direct the plume towards well GC-3S. The primary volatile organic chemical identified at well GC-3S is tetrachloroethylene. Other primary



LEGEND

500 LINE OF EQUAL TOTAL VOC CONCENTRATION IN PPB

DISTANCE IN FEET

0 500 1000 1500 2000

FILE NAME: \DWG\GLENSHAL

NO	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	4/23/90

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-16
WATER TABLE
GROUNDWATER QUALITY

CONTRACT NUMBER	DWG NO	DRAWN BY	SHEET NO
58002	GC-100-07	J ZIMMET 4/19/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
K STOKES	4/5/90	J DeFRANCO	4/20/90

volatiles at GC-3S and further downgradient (wells GC-5S and 9S), include trichloroethylene and cis-1,2-dichloroethylene. Total water table VOC levels drop off to 78 ug/L at well GC-9S and to 60 ug/L at well GC-5S, 750 and 1,150 ft. downgradient from well GC-3S, respectively. The water table is in the silty till at well GC-3S immediately downgradient of the industrial zone, the lower sand formation at well GC-5S and the predominantly silty till at well GC-9S (see Figure 3-4). Wells monitoring the north plume extension generally have screens set approximately 18-19 ft. into the water table.

Well GC-10S, located south of Sea Cliff Avenue and immediately east of the industrial zone, reported 152 ug/L total VOC's. Primary volatiles identified include cis-1,2-dichloroethylene, trichloroethylene and 1,1,1-trichloroethane. It should be noted that these volatiles are the primary volatiles historically quantified in recent sampling of industrial supply wells at Photocircuits, Pall Corporation and Slater Electric (see Table 1-3). Additionally, elevated specific conductance and temperature levels were recorded during sampling. Photocircuits Corporation has two diffusion wells immediately to the west of well GC-10S (see Figure 1-9). Therefore, it is possible that the diffusion wells have extended the plume in an easterly direction as shown in Figure 3-16.

Sampling of Glen Cove Creek during base flow discharge periods can be used to indicate shallow water table quality, although there will be a loss of organic compounds to volatilization associated with surface water. Sampling completed on August 2, 1989 showed no detectable contamination at Glen Head Country Club (upgradient), 62 ug/L total VOC at Sea Cliff Avenue and 61 ug/L total VOC at Carney Street. Sampling completed on September 6, 1989 reported 3, 33 and 117 ug/L total VOC in Glen Cove Creek at Sea Cliff Avenue, Carney Street, and at the Arterial Highway railroad overpass, respectively. Previous sampling of Glen Cove Creek by the NCDH has never detected VOC's at the Glen Head Country Club. This data, in

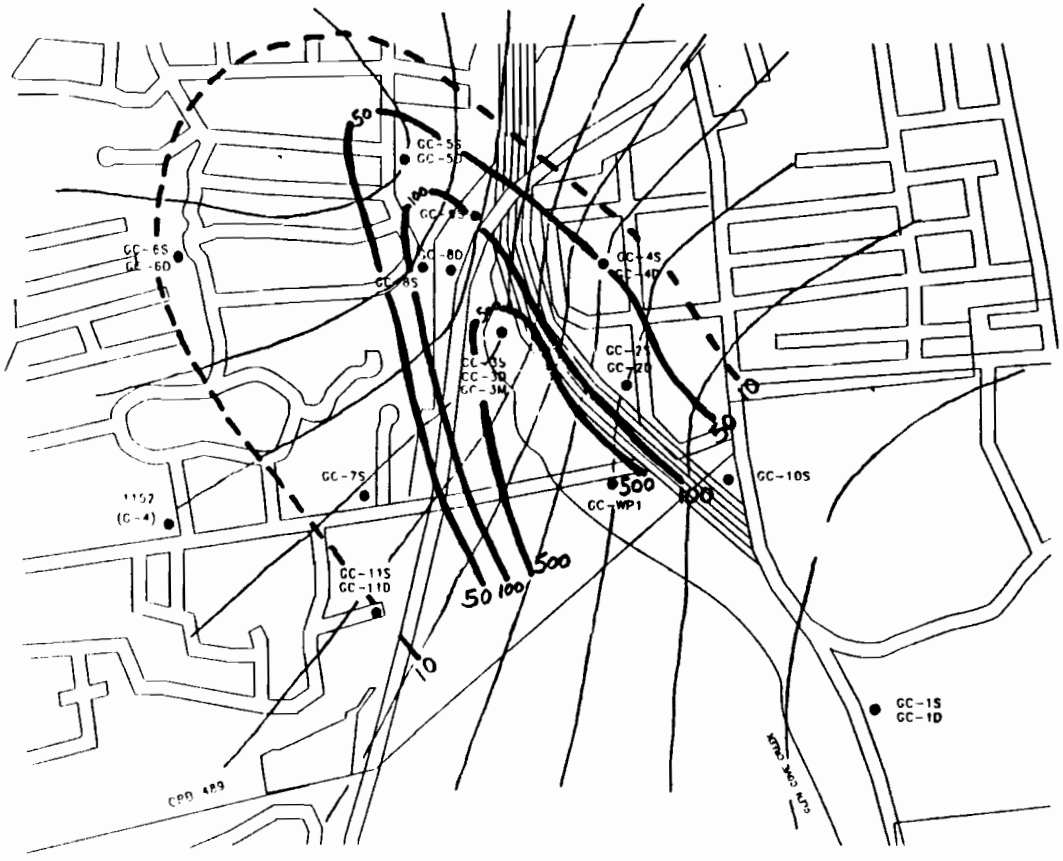
conjunction with the water quality at well GC-10S, indicates a source area of VOC's somewhere north of the Glen Head Country Club, possibly due to industrial water diffusion or a surface point source.

3.3.2 Deep Glacial Water Quality

As with the shallow glacial zone, deep glacial water quality, potentiometric flow and contaminant transport can be contoured and evaluated relative to local geology and stratigraphy. Total VOC levels are contoured in ug/L as shown in Figures 3-17 and 3-18. Pending the lack of a deep monitoring well at Sea Cliff Avenue, the historical water quality of the Pall Corporation, Slater Electric and Photocircuits wells can be utilized to provide information on deep glacial groundwater quality. Analysis of this data indicates that there is a low level plume of VOC's emanating from the Sea Cliff Avenue industrial zone, moving northwest with the groundwater flow through the lower sand and gravel formation to a depth of approximately -115 ft. below sea level. Public Water supply well 9334 (City of Glen Cove - Kelly Street well), screened from - 100 to -150 ft. bsl, is approximately 1,300 ft. northeast of well GC-4D (see Figures 1-9 and 2-1). The primary VOC's identified include tri- oroethylene, cis-1,2-dichloroethylene, and tetrachloroethylene. Of note is the sporadic detection of 1,1,1-trichloroethane at wells GC-2D, 4D and 6D, all of which are screened at the base of the aquifer. This may be due to a combination of industrial usage/discharge and residential cesspool and drain cleaners (Kilburn and Krulikas, USGS, 1987).

3.3.3 Contaminant Dispersion and Hydrodynamics

Figure 3-18 is a January 1990 hydrogeologic water quality cross-section running south to north through the study area. Wells 7427, 8224, 8930 and 10107 have been projected onto the section due to their close proximity to the section line (see Table 1.9 for the full listing of industrial supply and diffusion wells). Water quality for diffusion well 8930 was supplied by the NYSDEC and is enclosed in



LEGEND

100 LINE OF EQUAL TOTAL VOC CONCENTRATION IN PPB

DISTANCE IN FEET

0 300 600 900 1200

FILE NAME \DWG\GLENSMAL

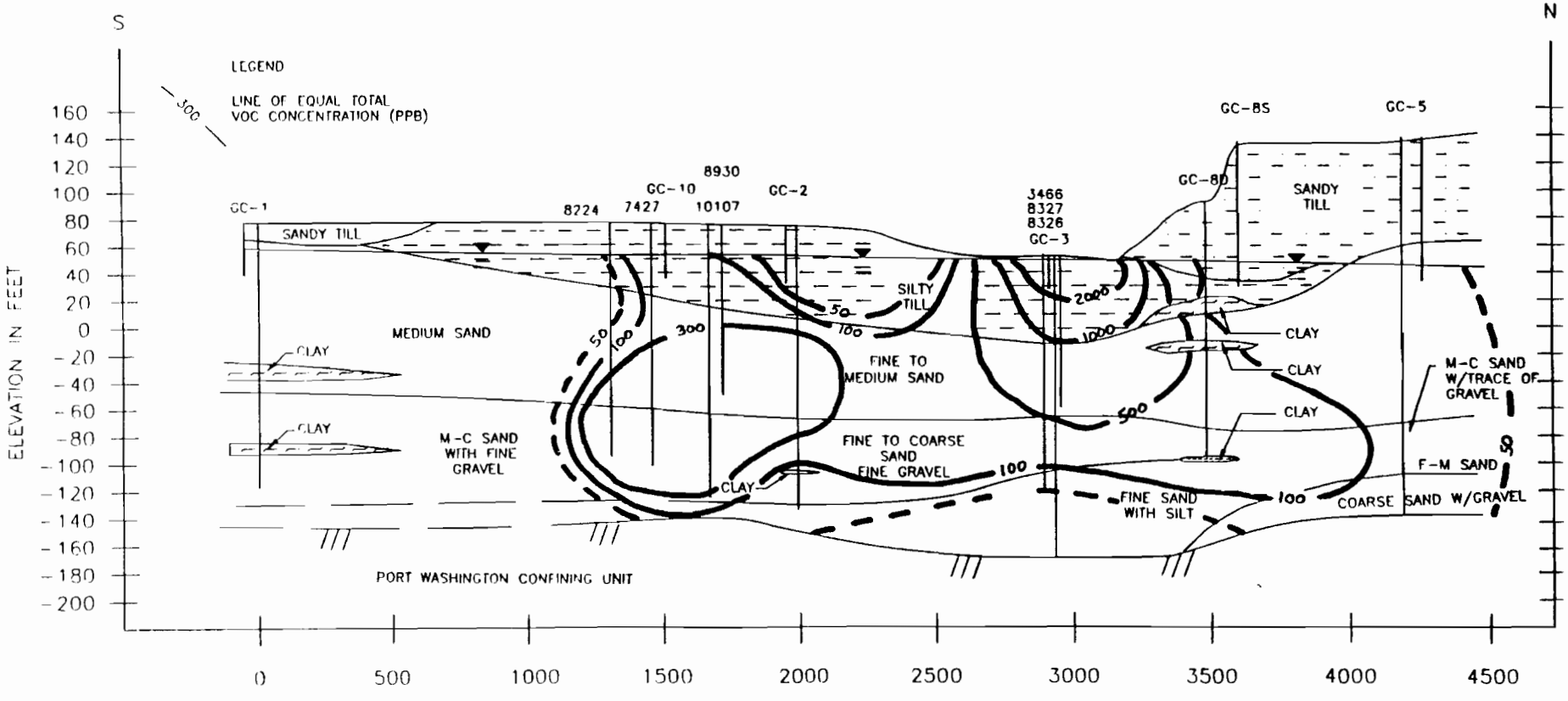
NO.	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	4/23/90

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
SANITATION & WATER SUPPLY
HAZARDOUS WASTE SERVICES UNIT

FIGURE 3-17
DEEP GLACIAL
GROUNDWATER QUALITY

CONTRACT NUMBER	DRG NO	DRAWN BY	SHEET NO
58002	GC-100-08	J ZIMMET 4/19/90	1 OF 1
DESIGNED BY	DATE	CHECKED BY	DATE
K STOKES	4/5/90	J DeFRANCO	4/20/90

FIGURE 3-18
WATER QUALITY CROSS SECTION
WELLS GC-1 THRU GC-8



NOTE: WATER QUALITY DATA JANUARY 1990

Appendix E.

As shown in Figure 3-18, and as discussed previously, there is an upper water table plume and a lower deep glacial plume. The water table plume, located in the low permeability upper till, is moving downgradient with the groundwater flow through advection. Over time, through advection and an increase in vertical groundwater gradients due to pumpage, contamination has probably breached the contact between the till and the lower sand formation, migrated downward for intake into the deep supply well screens, and was eventually reintroduced back into the aquifer through the industrial diffusion wells. An important factor affecting contaminant transport is the strong upward vertical groundwater gradient at the Carney Street monitoring well cluster (wells GC-3S, 3M and 3D), which effectively limits contamination to the mid and water table levels of the aquifer at Carney Street. It should be noted, however, that a review of the NYSDEC well construction reports completed for Carney Street well 3466 did not show the outer casing to be grouted to depth (please refer to Appendix B). The potential for water table contaminants to migrate vertically down the borehole to the deep well screen during pumpage existed. This could result in non-representative water quality samples.

Therefore, a likely contaminant transport scenario would involve localized water table contamination and downgradient advection at the Sea Cliff Avenue industrial zone, the vertical migration of contaminants caused by pre-1977 Carney Street Supply well pumpage (up to 4.7 million gpd) and industrial well pumpage, and the eventual dispersion of contamination throughout the aquifer caused by the use of diffusion wells screened at different elevations. As discussed in the industrial pumpage section (3.2.5), a mid-winter non to low pumpage condition would allow downgradient migration of the contamination to an area outside the effective radius of influence of the industrial supply wells during the pumpage season. Contamination has migrated to a depth of -115 ft. bsl approximately 2,400 ft. to the

northwest of the Sea Cliff Avenue industrial zone at well GC-5D. Water level data indicates that there are reversals of vertical gradients from near horizontal or slightly downward to upward at certain well clusters between the heavy summer pumpage season and the non to low winter pumpage. However, these effects need to be more thoroughly quantified through additional study.

As shown in Figure 3-17, the isoconcentration lines of the deep plume are slightly oblique to the true flow direction (perpendicular to the potentiometric contours). This discrepancy is most likely due to a limited number of monitoring wells in relation to the large volume of industrial pumpage (up to 1.9 million gpd) during the demand season.

3.4 Possible Sources

Although site-specific data acquisition from private property was beyond the scope of this study, the data which was complied during the course of this investigation could indicate potential source areas. As presented in Table 1-4, eight companies reported the use of organic chemicals through the industrial chemical profile. The Pall Corporation, Photocircuits Corporation and Slater Electric are companies reporting the historic use of significant quantities of volatile organic chemicals. Additionally, during the 1978 Industrial Chemical resurvey/inspection, a chemical engineer at the Pall Corporation alledged a past history of chemical dumpage down drains and in the yard of both the Pall Corporation and the neighboring HMS machine shop yard (see Appendix A). Any company using or storing organic chemicals may be subject to inadvertent discharges caused by improper storage and handling techniques, container leaks or accidental spills. Stormwater drywells and/or floor drains connected to drywells could provide a direct conduit for entry of such chemical discharges into the water table aquifer.

A report by the NCDH dated August 6, 1978 (see Apendix A) documents the

discussion with the Pall Corporation engineer. Additionally, an August 31, 1977 NCDH report discusses the discharge of low level solvent waste to the City of Glen Cove sewer system and the presence of small quantities of solvents in the local storm drains. Leaky storm and sanitary sewers, therefore, could represent a low level diffuse source to the water table.

As discussed previously, VOC analyses of Glen Cove Creek and of the numerous monitoring wells indicate a source area of VOC's between Glen Head Country Club and Sea Cliff Avenue. In light of this information, site-specific investigations are warranted.

4.0 CONCLUSIONS

Based upon the findings of this investigation, the following conclusions are presented.

1. A groundwater contamination plume of volatile organic chemicals has been identified emanating from the Sea Cliff Avenue industrial zone. The plume extends from the water table to the base of the upper glacial aquifer. The plume apparantly has migrated into the capture zone of the City of Glen Cove's Carney Street public supply wells causing their closure in 1977.

2. The water table portion of the plume bifurcates away from the source area. The southern fork of the plume has migrated westerly with groundwater flow a minimum horizontal distance of 2,400 ft. from the source area. Total volatiles range to 576 ug/L and the plume extends a minimum of 30 ft. into the aquifer. The northern fork of the plume has migrated northerly with the ground water flow a minimum of 2,400 ft. from the source area and extends a minimum of 18 ft. into the aquifer. Total volatiles range from up to 5,500 ug/L immediately downgradient of the Sea Cliff Avenue industrial zone dropping off to 60 ug/L at the northern fringe of the plume.

3. The deep glacial portion of the plume has migrated northwest with the deep glacial groundwater flow a minimum horizontal distance of 2,400 ft. from the source area. The plume has extended to the base of the aquifer at the source area to a depth of - 134 ft. below sea level and at the furthest downgradient well to a depth of - 115 ft. below sea level. A strong upward component of groundwater flow at the City of Glen Cove's Carney Street well field due to the higher consistent deep glacial potentiometric heads relative to the lower water table heads at, and adjacent to, Glen Cove Creek has limited the contamination to the mid and water table levels of the aquifer. Total VOC levels range from 698 ug/L in the vicinity of the source area to 79 ug/L at the downgradient fringe of

the plume.

4. The water table contamination, through advection and vertical components of groundwater flow brought about by industrial well pumpage, has migrated downward into the deep industrial supply wells and is subsequently reintroduced back into the aquifer through diffusion wells set at different depths (screen elevations). Winter non to low industrial pumpage conditions apparantly has allowed the downgradient advective migration of the deep plume to an area outside the effective radius of influence of the industrial supply wells during the pumpage season.

5. Industrial pumpage and diffusion of up to 2 million gpd during the demand season has been partially quantified with regard to the hydrodynamic dispersion of the groundwater contamination. Pumpage induced water level deflections of up to 0.4 ft. at the Carney Street well field have been quantified 900 ft. north of the closest industrial supply well. Therefore, the cone(s) of influence(s) of the industrial supply well(s) extend outward a minimum of 900 ft. and to the base of the aquifer during the demand season. As can be seen in Figure 3-18, this pumpage and diffusion has caused the contamination to remain localized at the Sea Cliff industrial zone. Additionally, demand season pumpage apparently has a measurable effect on the vertical gradients at downgradient wells GC-4 and 5, approximately 1,100 and 2,000 ft. north and northwest of the industrial zone, respectively. A reversal of vertical groundwater gradients were recorded from near horizontal to slightly downward during the demand season to upward during the winter non to low pumpage season at these wells. However, due to the volume of industrial pumpage, a lack of site specific data, and the inherent hydrodynamic complexities involved with the pu[illegible]e and contaminant dispersion, further study is warranted to more thoroughly [illegible]iblish the relationship between the aquifer, pumpage rates and contaminant transport.

6. Numerous industries, both past and present, have used the organic chemicals identified in the groundwater. Additionally low level solvent waste has been discharged to the sanitary sewers in the past which could potentially leak into the water table aquifer. Accidental or intentional discharge of solvents are not uncommon at industrial establishments handling such chemicals over a period of forty years. Therefore, site-specific investigative work is warranted to define potential source areas and the overall contribution of each of these industries to the extensive groundwater VOC plume which currently exists.

5.0 RECOMMENDATIONS

1. The findings of this report should be presented to the City of Glen Cove and the New York State Department of Environmental Conservation for State or Federal Superfund Consideration.

2. All industrial users of groundwater for non contact cooling and air conditioning purposes who may not be in compliance with the New York State Pollutant Discharge Elimination System (SPDES) regulations should be required to meet all relevant SPDES standards.

3. Further site-specific investigations are warranted at the present or former industrial locations where volatile organic chemicals were or are stored and utilized to further define potential sources. These investigations should include:

- Soil gas surveys and soil sampling at present or former drum/chemical storage areas
- Soil sampling of all storm water drywells open to the aquifer
- The investigation of inadvertent or potential chemical discharge or spill areas
- The review of all industrial chemical storage and usage to assure compliance with all applicable County, State and Federal regulations and laws
- The installation of water table and deep monitoring wells to further define the three dimensional extent of the VOC plume and to further determine the effects of industrial pumpage on contaminant dispersion.
- If warranted, conduct full Remedial Investigations and Feasibility Studies (RI/FS) under CERCLA following Federal Environmental Protection Agency and New York State Department of Environmental Conservation protocols at the sites representing a potential or significant threat to human health or the environment.

4. Continue monitoring the VOC plume emanating from the Sea Cliff Avenue industrial zone, and construct additional monitoring wells if necessary, to assess its impact on potential downgradient receptors such as the well capture zone of public water supply well 9334 (City of Glen Cove-Kelly Street well) and the well head of public water supply well 7857 (Sea Cliff Water Company).

5. All future efforts by the private and government sectors should focus on an expeditious plan for the remediation of the local contaminated aquifer segment.

6.0 REFERENCES

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Appendix A

Nassau County Department of Health
Industrial Chemical Profile

APPENDIX A

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 1 - TYPES OF FACILITIES FOUND IN THE GLEN COVE STUDY AREA

Industrial Division by SIC Group No. (1)	Number of Facilities
Agricultural, Forestry, Fishing	
Major Group 07. Agricultural Services	1
Construction	
Major Group 17. Construction - Special Trade Contractor	2
Manufacturing	
Major Group 23. Apparel and other finished products made from fabrics and similar materials	4
Major Group 24. Lumber and wood products	2
Major Group 25. Furniture and fixtures	4
Major Group 30. Rubber and miscellaneous plastic products	2
Major Group 32. Stone, clay, glass, and concrete products	1
Major Group 34. Fabricated metal products	6
Major Group 35. Industrial and Commercial Machinery and computer equipment	2
Major Group 36. Electronic and other electrical equipment and components	8
Major Group 37. Transportation equipment	2
Major Group 38. Measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks	2
Major Group 39. Miscellaneous manufacturing industries	1

APPENDIX A

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CITY OF GLEN COVE
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TABLE 1 - TYPES OF FACILITIES FOUND IN THE GLEN COVE STUDY AREA

Industrial Division by SIC Group No. (1)	Number of Facilities
Transportation, communications, electric, gas, and sanitary services	
Major Group 42. Motor freight transportation and warehousing	1
Wholesale Trade	
Major Group 50. Durable goods	3
Major Group 51. Nondurable goods	6
Retail Trade	
Major Group 52. Building materials, hardware, garden supply	2
Major Group 54. Food stores	1
Major Group 55. Automotive dealers and gasoline service stations	3
Major Group 59. Miscellaneous retail	1
Services	
Major Group 72. Personal services	2
Major Group 73. Business services	3
Major Group 75. Automotive repair, services, and parking	8
Major Group 76. Miscellaneous repair services	3
Major Group 78. Motion pictures	1
Major Group 79. Amusement and recreational services	2
Major Group 87. Engineering, accounting, research, management and related services	1

(1) The Standard Industrial Classification (SIC) is the statistical classification standard underlying all establishment based Federal economic statistics classified by industry. Each establishment is assigned an industry code based on its primary activity, which is determined by its principal product(s) produced or distributed, or services rendered.

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 2 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
CURRENTLY IN BUSNESS

MAP NO.	FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
1	North Hills Electronic Alexander Pl	Manufacturing (electronic equipment/PC Boards)	8/2/77 3/27/87 ARTICLE XI	1,1,1 Trichloroethane (75) Paint thinner (10) Ferric Chloride (50) Photochemicals (20) Freon (PT35/TMS) (275) Alcohol (110) Ferric chloride (110) Misc. oils (5) Alodine (15 lbs) Photochemicals (5 lbs) Paint (30) Paint thinners (10) Cutting oil (5) Solder flux (15)	Applied w/ rags Used in paints Spent plating solution goes to drywell Industrial waste transporter	Yes Since 1968		1974 Cosulich report - Rinse water from Alodi Ferric chloride & Tin baths dumped in back ya once a year. 1977 NCOH survey - Rinse solution from platin pumped to drywell. 1977 SPDES application indicates a discharge rinsewater (50 gal/day) going into the ground 1983 survey - indicates use of industrial was transporters. Facility listed in 1968 Sidney Bowne & Sons P
2	Micronics Technology 7 Alexander Pl	Manufacturing (microwave sub-assemblies)	9/26/88	Conformal coating (1) Acetone (5) Isopropanol (5) Epoxy glue (2) Solder flux (1) Metal cleaner (16% HCl) (1) Freon (1) Pride FCA blend (1,1,1 Tri, Freon TF, isopropanol) (20) Freon TP (No longer used)	Applied to products Applied w/Q tips, then discarded On products On products Q tips discarded Evaporates Solvent exhausted	Unknown		At location since 1/88 - previously occupied Displex (subsidary of North Hills Electronics
3	Odin Claims 4 Carney St	Private investigations office	9/25/88	None		Yes		At location since 1986. Building vacant prior to current occupant.
4	Glen Cove Iron Works 34 Carney St	Welding shop	9/26/88	Paint (10) Paint thinner (2) Turpentine (2) Kerosene (5)	Product Mixed with paint Evaporates Used in heating	Unknown		At location since 1981. No water service at this address. Property sublet from residence next door.
5	Man Product (MJM Product) 100 Carney St	Fabrication of steel sheds & cellar doors	3/24/77 7/20/77 2/3/87 ARTICLE XI	Paint primer (1750) Naptha (1000) VMP Naptha (12,000) Naptha U/G tank (4,000) #2 Fuel oil U/G tank (1,000) Paint (250) Hydraulic oil (15)	Product Product Product Industrial transporter and/or Glen Cove Resource Recovery Facility	Yes (since 1960)		1981 - Inspector noted paint and solvent accumulated for pickup. 1982 - Received first waste report. 6/87 - U/G #2 fuel oil tank leaked. 1987 - Waste disposed of at Glen Cove Resourc Recovery Facility. 1984 Inspection revealed an accumulation of s ified paint primer dumped in back of bldg. Co. removed as directed.

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 2 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
CURRENTLY IN BUSNIESS

MAP NO.	FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
6	Glen Cove Bowl 200 Carney St	Bowling alley	9/26/88	Lane cleaner (UK) Lubes - spray cans (UK) Hand cleaner (UK) General purpose cleaner (UK) Safety Kleen (30 gal tank)	Rags service On machinery Sewer Rags service Picked up by Safety Kleen	Yes		At location since 1958. Previous to bowling alley was a casket mfg.
7	Rallye Motors 20 Cedar Swamp Rd	Sales & Service autos	12/6/77 9/88 PHONE SURVEY	Klearflo (60) (aliphatic hydrocarbons & mineral spirits) Safety Kleen	Picked up by industrial waste transporters Picked up by Safety Kleen	Yes		1977 survey - rinse water goes to sewer Previous to Rallye Motors was vacant land. 1981 State ICS indicates liquid is discharged t
8	Mahoney Auto Parts 33 Cedar Swamp Rd	Sales of auto parts	9/15/88	Safety Kleen	Picked up by Safety Kleen	Yes		At location since 1976. Have a 500 gal U/G fuel oil tank.
9	M. L Bianconi Funeral Home 62 Cedar Swamp Rd	Funeral Home	9/21/77 6/29/88	Formaldehyde (100) Misc. Embalming fluids (155)	Body preservative	Yes		9/88 survey of area- still at this location.
10	Luyster Motors 70 Cedar Swamp Rd	Car repair & body shop	10/20/88	Paint thinners (900) Lacquer thinner (30) Lube oil (100) Motor oils (5,000) Antifreeze (100) Transmission fluid (125) Safety Kleen (720)	Picked by industrial scavenger Drain into u/g tank (tank 25 years old) Picked up by Safety Kleen	Yes		At location since 1948. Floor drain in middle o shop connected to sewers. 1980 flow of kerose from a storm drain on property. Interior drai were connected to an oil/water separator whose discharge went to several leaching basins whic overflowed to the storm drainage system which discharged to Cedar Swamp creek.
11	ANG's Service Station 73 Cedar Swamp Rd	Auto repairs	10/17/88	Brake fluid (25) Lube oil (900) Gear oil (900) Kerosene (825)	Waste oil tank Picked up by industrial transporters	Yes		At location since 1946. Previously vacant lan No degreasers are used. Underground tanks: waste oil - 2,000 gal gasoline - (2) 6,000 gal fual oil - 550 gal Above ground tanks: kerosene - (3) 275 gal 1988 survey- rents part of the property to Ang Stanco Landscaping (used primarily for pesticid
12	Angelina Izzo & Sons 3 Gabriel St (corner of 4th St)	Import & store grapes	10/17/88	None		Yes		At location since 1973.
13	Pomm Art Creations LTD 79 Hazel St	Distribute art prints	9/25/88	None		Unknown		At location since 1987.
14	TMBA Energy Cost Control Center	Engineering office, air & heating	9/15/88	Ammonia (10)	Used in blueprint machines	No		At location since 1978.

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 2 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
CURRENTLY IN BUSNESS

MAP NO.	FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
15	Factory Service Parts & Controls 81 Hazel St	Distribute pump parts	9/26/88	None		Yes		Rent from TMBA
16	Long Island Video 83 Hazel St	Produce video tapes	9/26/88	Lens cleaner (2)	Evaporates	Yes		At location since 1/88.
17	Aqua Scooter 85 Hazel St	Distribute & service water scooters	9/15/88	None		Yes		At location since 1984. Precessor - Acco-Bristol Datamaster
18	Shadow Box 85 Hazel St	Picture frames	9/15/88	Alcohol (12)	Evaporates	No		At location since 8/88.
19	Greenvale Auto Parts 85 Hazel St	Sales - auto parts	9/15/88	None		No		At location since 1988.
20	Max Wiener & Co. Learsi Leather 88 Hazel St	Import leather outerweer	9/25/88	Propane tanks Floor cleaner	Fuel for fork lift Sewer	Yes		At location since 1978.
21	Photocircuits 90 Hazel St	Drilling printed circuit boards	8/88	None		Yes	Uses water cooled air compressor (closed loop)	Photocircuits took samples of building before moving in: Swipe sample of floor, testing soil & indoor air; indicate presence of methylene chloride, 1,1,1 trichloroethane, toluene (0.09 1.85 ppb) from the floor swipe. Soil samples: methylene chloride (10 ppb), trichlorofluoromet (59 ppb), tetrachloroethylene (9 ppb)
22	Village Laundromat Hazel St/Grove St	Laundromat	NEVER SURVEYED					No dry cleaning - only washing machines noted.
23	Joy Edd Trim Shop 1 Sea Cliff Ave	Dog Grooming	9/15/88	None		No		At location since 1976
24	Hinkle & Finlayson Harbor Fuel Oil 10 Sea Cliff Ave	Office, oil truck garage, maintenance	10/31/88	Safety Kleen (UK) National Chemsearch 150 (UK) Engine degreaser (UK) Motor oil (UK)	Recycled, picked up by Safety Kleen Waste oil tank Waste oil Tank Waste oil Tank	Yes		At location since 1933 Underground Tanks: Gasoline (1,000) gallons Fuel oil (2,000) gallons Fuel oil (1,000) gallons Aboveground Tanks: waste oil (275) gallons

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
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CURRENTLY IN BUSNESS

MAP NO.	FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
25	Pall Corporation 30 Sea Cliff Ave (Former names: Micrometalic Aircraft Porous Media and Glen Components)	Manufacturing (Filters)	3/10/87 ARTICLE XI	Ethylene glycol monoether (110) Hydraulic oil (1100) Freon TF (110) Machine oil (55) Acetic acid (1) Ethanol (55) Petroleum ether (55) Hydrochloric acid (110) Dimethylacetamide (110) Isopropanol (55) Sodium Hydroxide (55) Methylene chloride (275) Acrylic Acid (110)	Records on file (since 1979) wastes picked up by industrial waste transporters	Yes	N-2316 N-6872 N-7919D N-7083T N-7084D N-7085D N-7153D N-7154D N-7155D N-8886D	At location since 1946. 1967 inspection - wasteline removed adjacent to well. A whiteish sludge (aluminum oxide) noted at severed pipe. 1977 survey - Halogenated solvents (tetrachloroethylene and trichloroethylene) used in past but mfg. facilities have moved to Florida in 1972 1978 Resurvey/Inspection - Chemical engineer at Pall indicates past history of dumping chemicals down drains and yards. 1978 inspection revealed a messy chemical storage shed approximately 250 feet from the wells. 1980 -Issued Non-Discharge SPDES (Store & Remove permit 1987 Waste Report - Following chemicals bought: Tetrachloroethylene - 1000 ml Methylene chloride - 16,200 lbs Trichloroethylene - 16 liters 1,1,1 Trichloroethylene - 1.8 liters 1974 Cosulich report indicates cooling water was recharged to the ground in the past.
26	Photocircuits 31 Sea Cliff Ave	Manufacturing (printed circuit boards)	3/17/87 ARTICLE XI 2/25/77 SURVEY	PM Acetate (4,000) Copper chloride (5,000) Methylene chloride (5,000) Hydrochloric Acid (7,000) Copper bath (8,000) Sulfuric Acid (6,000) Trichloromethane (6,000) Ammonium hydroxide (2,500) Sodium persulfate (4,000) Caustic solutions (1,000) Formaldehyde (5,000) Methylene chloride (71,013) 1,1,1 Trichloroethane (11,194)	NCDH has records (since 1980) that 1,1,1 Trichloroethane and methylene chloride sludge picked up by industrial waste transporters	Yes since 1956	N-7427 N-8224 N-7452D N-7453D N-8930D N-8931D N-9773D N-10107D 10 diffusion wells Cooling water wells are chlorinated before recharge	From a 1977 survey - Tetrachloroethylene used in 1956. Switched to 1,1,1 Trichloroethane prior to 1966 Using 1,1,1 Trichloroethane and Methylene chloride since this time. 1961 files indicates sewers overflowed on many occasions. 1962 letter stated during the construction of t system, Photocircuits given permission to remov wastewater from the sanitary sewer and connect storm sewer which discharges into the creek. Aboveground tanks of 1,1,1 Trichloroethane: waste (2,000) gallons fresh 3-(1,000) gallons fresh (6,000) gallons Aboveground tanks of Methylene chloride: waste (2,000) gallons fresh 2-(6,000) gallons fresh (100) gallons 1977 Inspection - Roof drains and parking lot s drains discharge to the creek.

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 2 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
CURRENTLY IN BUSNESS

MAP NO.	FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
27	August Thomsen Corp. 36 Sea Cliff Ave.	Manufacturing (Cake decorating utensils)	10/6/88	Inks (2) Paints (16) Paint thinners (2) Oils, misc (2) Polishing compounds (20)	On products On products Evaporates Exhausted Treated w/lime Sludge collected in 55 gal drums	Yes since 1962	private well abandoned N-6579	At location since 1971 Note: Owner of well as listed in the well sched Aircraft Porous Media (Division of Pall Corp.
28	Associated Drapery Equipment Novelty Scenic Studios 40 Sea Cliff Ave	Manufacturing (draperies)	10/31/88	None		Yes since 1962		No treatment of fabrics performed on premises. At location since 1972.
29	Earl Electric Mfg. 44 Sea Cliff Ave	Assemble electrical conduit fittings	6/27/77 NCDH ICS 4/3/83 STATE ICS	No chemicals No chemicals		Yes since 1960		Cooling water f[illegible]die casting is discharged to sewers. At location since 1973.
30	American Best Coffee 44 Sea Cliff Ave	Distributor (expresso & pasta machines)	9/22/88	None		No		At location since 1987.
31	Lau's Cabinets 44 Sea Cliff Ave	Manufacturing (Cabinets)	9/14/88	Lacquer thinner (60)	Evaporates	No		At location since 3/88
32	Philip C. Antico Consultants 44 Sea Cliff Ave	Interior designers for food & lounging industry	NEVER SURVEYED					1989 survey of area. Current occupant At location since 1986.
33	Orobello Inc. 44 Sea Cliff Ave	Electrical contractors	NEVER SURVEYED					1988 survey of area. Current Occupant - At location since 1982.
34	One Stop Food Supply 44 Sea Cliff Ave	Food store	NEVER SURVEYED					1988 survey of area. Current Occupant - At location since 1986.
35	Slater Development Corp. 44 Sea Cliff Ave	Office only	NEVER SURVEYED					1988 survey of area. Current Occupant
36	Slater Electric 45 Sea Cliff Ave	Manufacturing (wiring devices)	2/26/77	Tetrachloroethylene (4500) 1,1,1 Trichloroethane (375) Xylol (165) Acetone (10)	Industrial transporters (1,1,1 Trichloroethane & Tetrachloroethylene sludge)	Yes since 1957	N-8887 N-9612 N-8892 N-8987D N-9614D N-9615D N-9693D	1988 Inspection - Recent spill of #2 fuel oil 1981 inspection - A storm drain is located in [illegible] of waste solvent storage area which is not ber[illegible] SPDES facility from 1979 to 1986, discharged [illegible] non-contact cooling water. Storm water drains located on east side of pro[illegible] drains into Glen Cove Creek.

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 2 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
CURRENTLY IN BUSNESS

MAP NO.	FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
37	Keyco Inc. 458 Sea Cliff Ave	Freight transfer station & truck repair shop	9/14/88 2/17/78	None Kerosene (UK)	Waste oil transporter	Yes but Cesspools indicated in 1974 report by Cosulich		At location since 1965. 1977 survey indicated cesspools for sanitary waste.
38	Zsomar Inc. 55 Sea Cliff Ave	Grinding and polishing optical lenses	10/26/88	Polishing Compounds (3) Soluble oil (5) Acetone (20) Pureline solvent	Exhausted in process Oil bath to garbage Evaporates Recycled	Yes since 1953	N-4980	Floor drains in room where pureline is used. At location since 1953. (No predessessor - only vacant land).
39	Sun Carting 59 Sea Cliff Ave	Carting Co.	NEVER SURVEYED					At location since 1984.
40	Sea Cliff Coal and Lumber 59 Sea Cliff Ave	Bldg. material supplier	7/21/77	None		Yes		
41	Epco (Apco) Plastics 59 Sea Cliff Ave	Machining of plastic aircraft parts	9/14/88	None		No		At location since 1963.
42	William T. Geertseen Landscaping 59 Sea Cliff Ave	Grounds maintenance	11/4/88	Fertilizer (1250) Gasoline (5) Pesticide (5)	Lawns Lawn mowers Lawns	Unknown (no running water)		Used primarily as storage of lawn mowers and trucks. At location since 1973.
43	T&D Autobody Works 59 Sea Cliff Ave	Autobody repairs and towing	9/14/88	None		No		Noted antifreeze puddles in front of buildin At location since 1973.
44	Tudors Auto Club 59 Sea Cliff Ave	Auto club (car repairs)	NEVER SURVEYED	Site inspection: Kerosene Lacquer thinner		Unknown		Club open only on nights and weekends. At location since 1976.
45	F&J Precision Tooling Precision Machine Pdts 59 Sea Cliff Ave	Machine products	9/14/88 7/21/77	None Cutting oils (55)	Used on machined parts	No		At location since 1973
46	R-Tex Decoratives 59 Sea Cliff Ave	Fabric distributor (window displays)	9/14/88 4/18/86	Water based glue (UK) Ammonia (100) Water based adhesive (600) Dyes (5)	Product Product	No		At location since 1970.
47	Let Byegones Be 59 Sea Cliff Ave	Furniture refinishing	11/4/88	Enamel paints (small quanity) Paint thinner (small quanity) Adhesives (small quanity)	On furniture Mixed w/paints On furniture	Unknown		At location since 1978.

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
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TABLE 2 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
CURRENTLY IN BUSNESS

MAP NO.	FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
48	Sea Cliff Auto Radiator 59 Sea Cliff Ave	Auto radiator repairs	11/4/88	Muriatic acid (12) Zinc solder flux (12)	Dissipates in tank On parts	Yes		Floor drains in metal cleaning area. At location since 1975.
49	Walter J. Moretto ...nary 59 Sea Cliff Ave	Sales of masonary supplies	11/4/88	Muriatic acid (30) Silicone (60) Kerosene (50)	Resale products Resale products Fuel for heater	Unknown		Occupies 3 buildings within 59 Sea Cliff Ave complex. At location since 1976.
50	Sea Cliff Iron Works 59 Sea Cliff Ave	Manufacturing (iron railings)	11/4/88	Enamel paints (25) Mineral spirits (15) Cutting oils (2qts)	Product Mix w/paints On machines	Yes		At location since 1964. A body shop was at this location before S.C. Iron Works.
51	Monte Displays 59 Sea Cliff Ave	Manufacturing (scale models of swimming pools)	11/4/88	Adhesive (10) Lacquers (15) Lacquers thinners (15) Contact cement (50) Denatured alcohol (2) Conbond Kleen-Up (15) contains benzene and toluene) Silk screening inks (10)	On product On product or use wipe rags to wipe excesses - rags are discarded in dumpsters after drying	No		Previous occupant was a wood molding mfg. plant At location since 1972.
52	Cove Tennis Center 60 Sea Cliff Ave	Tennis courts	9/14/88			Yes		At location since 1982.
53	LI Glass & Mirror 65 Sea Cliff Ave	Manufacturing (glass items)	9/15/88	Kerosene (55) Grinding oil (55) Glass cleaner (110)	Rags Discarded Machines Rags Discarded	No		Floor drains in glass grinding area. 1988 inspection - outside storm drains overflowing with water. Formerly at 63 Sea Cliff Ave. Present location
54	JC Covino Electric 3 Second St	Electrical contractors	10/17/88	None		Yes		At location since 1980.

APPENDIX A

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 3 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
OUT OF BUSINESS

FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
CHIU Technical Corp. Alexander Pl	Manufacturing (medical instruments)	8/2/77	None		Yes		1988 site inspection - out of business
Vesuvio Cheese Inc. 7 Alexander Pl	Distributes natural cheese	4/12/81*	None		Yes		* Information from NYSDEC Industrial Chemical Survey 1988 site inspection - out of business
Kolco Canvas Products 10 Carney St	Manufacturing (canvas products)	1974*	None		Unknown		* Information from 1974 Cosulich Report. 1988 site inspection - out of business. Address is now an apartment house.
Carney St Auto Body 10 Carney St	General auto repair	6/12/80	Motor oil (60) Safety Kleen (30)	Waste oil scavenger Picked up by Safety Kleen	Yes		9/88 survey of area. 1988 site inspection - out of business. Address is now an apartment house.
G. Glessman Inc. 10 Cedar Swamp Rd	Manufacturing (furniture frames)	8/17/77	None		Yes		1988 site inspection - out of business Currently at location - commercial stores
GC Fashions Mfg.Co. 79 Hazel St	Manufacturing (ladies coats)	8/2/77	Ever-Blum Cleaning Fluid (2) (1,1,1 Trichloroethane)	Evaporated	Yes		1988 survey - out of business.
Mattiace Petrochemical 79 Hazel St	Office only	Never Surveyed			Yes		Evicted in 1987. NOTE: In 1986, 79 Hazel St became 79, 81 and 83 Hazel This address equal to 83 Hazel St.
Acco-Bristol Datamaster 85 Hazel St	Manufacturing (supervisory control equipment) *	Never Surveyed		Machining waste to sewer *	Yes *		* Information from 1968 S. Bowne and 1974 Cosulich re
Osrow Products (OSP Corp.) (Moonshine Products) 88 Hazel St	Manufacturing & assembling (plastic houseware items)	10/25/77	Ethylene dichloride (240)	Evaporates or on product	Yes		1988 survey of area - out of business. 1974 Cosulich report indicates a previous location: 160 Hazel St. 1968 Sidney Bowne report states the facility address 84 Hazel St.
Easter Unlimited 90 Hazel St	Assemble Easter baskets	NEVER SURVEYED	Adhesives (unknown)	Product	Yes		Photocicuits moved into location 8/88. 1988 site inspection - out of business.
Glen Components (Div. of Pall Corp.) 36 Sea Cliff Ave	Machine Shop and Anodizing (aircraft parts)	NEVER SURVEYED					Predecessor to August Thomsen Corp. Company moved to Florida in 1971.

APPENDIX A

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 3 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
OUT OF BUSINESS

FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
HMS Machine Shop 40 Sea Cliff Ave	Machine Shop (aircraft parts)	NEVER SURVEYED	Through interviews possible chemical usage: Tetrachloroethylene (UK) Trichloroethylene (UK)		Yes since 1961		1978 Resurvey of Pall Corp - Engineer stated he noted company spilled or dumped waste solvents in their yard. Co. closed in 1969. 1961 inspection indicates this facility was notified t have their sewer connection repaired.
Eastern Heat Treatment Co. Bennett Heat Treatment Co. 44 Sea Cliff Ave	Metal Plater	NEVER SURVEYED	Unknown - possible solvents used in cleaning metal parts prior to plating operations.		1968 (Info from S. Bowne Report)		Information from the 1978 resurvey of Pall Corp. and 1977 survey of Earl Electric. Predecessor to Telco. Moved out between 1968-1976.
Telco Inc. 44 Sea Cliff Ave	Maunfacturing (PCB for telephone related products)	1977	1,1,1 Trichloroethane (110)	1978 - Dirty solvent returned to distributor 1980 - Switched to recycling solvent. 1981 to closing - vapor degreaser not in use.	Yes		1980 - Non-discharge SPDES (Store & Remove) permit 1983 - Co. moved to Roslyn.
Quadraframe 44 Sea Cliff Ave	Manufacturing (picture frames)	2/5/86	None		Yes		At location in 1984. 1988 survey out of business.
Hadax Electronics Doryt Systems 44 Sea Cliff Ave	Assemble switching components	2/5/86 7/23/86	Butyl cellosolve (5) Tapping oil (1)	On hand (given list of waste transporters) Used in machines.	Yes		At location since 1984 1988 survey - Out of business (moved to New Jersey)
Stasi Woodworking Co. Tom Stasi Kitchens 59 Sea Cliff Ave	Cabinet maker	NEVER SURVEYED	None		No		Information from 1974 Cosulich Associates report.
Racquette Sales 59 Sea Cliff Ave	Packaging plant	7/20/77	None		No		9/19/88 survey of area - out of business. Listed in 1974 Cosulich report.
Rosco Labs/Gelatine Products Corp. 63 Sea Cliff Ave	Repackage theatrical smoke fluid & mfg gelatine sheets for stage lights	9/14/88	Essential oils (150) Smoke fluid (400)	Final product Final product	Yes		At location since 1980. 1989 Site inspection - Out of Business. Reflections (part of LI Glass & Mirror) occupies this location 1974 Cosulich report indicates their former address: 32 Morris Ave., Glen Cove
The Olde Cabinet Shop 63 Sea Cliff Ave	Woodworking	6/19/86	Lacquer (50) Lacquer thinner (50) Contact Cement (25) water base Glue (25)	Product Evaporates Product Product	No		10/88 survey of area - out of business.

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK
TABLE 3 - INDUSTRIAL CHEMICAL PROFILE OF CARNEY STREET WELL FIELD AREA
OUT OF BUSINESS

FACILITY/ADDRESS	TYPE OF BUSINESS	DATE SURVEYED	CHEMICAL USAGE (IN GALLONS)	DISPOSAL METHOD	SEWERED	WELLS	COMMENTS
Lawrence Mills 63 Sea Cliff Ave	Sales and warehouse	7/20/77	None		Yes		1988 site inspection - out of business. Information from 1974 Cosulich Report.
Nippon Electric Co. (NEC) Telephones 63 Sea Cliff Ave	Telephone equipment	NEVER SURVEYED	None		Unknown		Information from 1974 Cosulich Report 1988 site inspection - out of business.
Pikwhit Industry 63 Sea Cliff Ave	Manufacturing (oil pumping units)	NEVER SURVEYED	None		Unknown		Information from 1974 Cosulich Report 1988 site inspection - out of business.
Olympic International LTD 63 Sea Cliff Ave	Distribution of electronic equipment	8/18/80	None		Yes		10/88 survey of area - out of business.
Pall Corp. 65 Sea Cliff Ave	Offices and warehouse	8/18/86	None		Yes		10/88 survey of area - out of business.

APPENDIX A

INVESTIGATION OF CONTAMINATED AQUIFER SEGMENT
CITY OF GLEN COVE
NASSAU COUNTY, NEW YORK

TABLE 4 - RESULTS OF NCDH TESTING OF SPDES PERMIT DISCHARGES
FROM SLATER ELECTRIC, 45 SEA CLIFF AVENUE

COMPOUND	DATE SAMPLED			
	11/08/79	11/10/82	07/05/84	01/30/86
Trichloroethylene	NA	85	<1	110
Tetrachloroethylene	NA	10	<1	11
1,1,1-Trichloroethane	NA	5	<1	7
Total Halogenated and Aromatic Hydrocarbons	ND	112	ND	136

Results in micrograms per liter (ug/l)
NA = Not Analyzed
ND = Not Detected
SPDES = State Pollution Discharge Elimination System
NCDH = Nassau County Depatment of Health

NASSAU COUNTY DEPARTMENT OF HEALTH

240 OLD COUNTRY ROAD
MINEOLA, N.Y. 11501

RALPH G. CASO
County Executive
JOHN J. DOWLING, M.D., M.P.H.
Commissioner
FRANCIS V. PADAR, P.E.
Asst. Deputy Commissioner
Div. of Environmental Health

STATUS REPORT OF INVESTIGATION OF ORGANIC CONTAMINATION CARNEY STREET WELLFIELD, GLEN COVE

August 31, 1977

Background

In response to the closure of public water supply wells at Glen Cove's Carney Street wellfield, the Department initiated an investigation into the source of contamination.

During the period June 30 to July 26, a series of ten samples were collected for organic analysis from various locations in the vicinity of Carney Street, including waste discharges, drains, groundwater, and Cedar Swamp Creek. Not included in this report are sample results from public and private wells located within and in the vicinity of the affected area.

Results

Sampling results are included in the attached table.

Interim Conclusions

1. The contamination of the Carney Street wellfield by trichloroethylene and tetrachloroethylene is due to past waste discharges originating in an industrial area possibly as recent as five to ten years ago. The groundwater in the area is generally contaminated with these solvents, with highest concentrations focused in the industrial area located 1,000 feet southeast of the Carney Street wellfield.

2. Presently only two industries in the area, Slater Electric Company and Photo Circuits Corporation, use solvents of the general type found in the wells, as follows: Slater, 4500 gallons per year tetrachloroethylene; and Photo Circuits, 71,000 and 11,200 gallons per year of dichloromethane* and 1,1,1 trichloroethane, respectively. No present waste disposal practices were found which could account for the extent of contamination found. Solvent waste discharges of significant magnitude from both of these industries are presently being discharged into the Glen Cove sewer system. These include 1200 ppb of tetrachloroethylene from Slater Electric Company and 480 ppb of methylenechloride from Photo Circuits Corporation. No groundwater samples have been analyzed for dichloromethane because

*Also known as methylene chloride

of State Health Department limited laboratory capability. It is recommended, now, that groundwater samples be collected and analyzed for dichloromethane. Photo Circuits Corporation is a large user of this substance. Miscellaneous drains in the vicinity of both industries, which empty into Cedar Swamp Creek, show small quantities of solvents. The source of these solvents warrants further investigation.

3. Past contamination cannot be attributed to any single industry because of changes in solvent usage, the industries themselves, and waste disposal practices.

4. The feasibility of purging the contaminated groundwater from the aquifer in the vicinity of Carney Street should be explored. This would include a hydrological investigation to determine the extent of contamination. Changes in water supply practices which may be required would include maximizing industrial pumpag and discharging of cooling water into Cedar Swamp Creek rather than groundwater recharging as presently required. The environmental consequences of further increasing solvent concentrations in Cedar Swamp Creek would also require investigation.

SOS:yk

Sheldon O. Smith, P.E., M.C.E.
Deputy Direct
Division of Environmental Services

SAMPLING RESULTS OF GLEN COVE INDUSTRIAL AREA

	Sample	Trichloro-ethylene ppb	Tetrachloro-ethylene ppb	Dichloromethane (Methylene chloride) ppb	1,1,1 Trichloro-ethane ppb
1.	Photo Circuits, treated effluent to sewer	2.1	3.0	480	**
2.	Photo Circuits, parking lot drain to stream	30	23	N.D.	**
3.	Glen Head drain at stream	25	77	N.D.	**
4.	Slater, effluent to sewer	22	1210	N.D.	**
5.	Sewage from industrial area	4.7	43	440	**
6.	Groundwater at Well #20	52	5.3	N.D.	**
7.	Pall Corp. A/C recharge	16	5.2	N.D.	**
8.	Keyco truck wash area	N.D.	N.D.	N.D.	**
9.	Stream at Glen Head Country Club	<5	<2.5	**	5
10.	Stream at Carney Street	115	12	**	6

**Not analyzed or reported

MBF:yk
(8/31/77)

240 OLD COUNTRY ROAD
MINEOLA, N.Y. 11501

JOHN J. DOWLING, M.D., M.P.H.
COMMISSIONER

FRANCIS V. PADAR, P.E.
ASST. DEPUTY COMMISSIONER
DIV. OF ENVIRONMENTAL SERVICES

FINAL REPORT OF INVESTIGATION OF ORGANIC CONTAMINATION OF GROUNDWATERS GLEN COVE

April 6, 1978

Background

In response to the closure of public water supply wells in Glen Cove, the Department conducted an investigation to identify the sources of contamination.

Survey Program

During the period June 30 to July 26, 1977, a series of samples were collected for organic analysis from various locations in the vicinity of Carney Street and Seamans Avenue, including waste discharges, drains, groundwater and Cedar Swamp Creek. Several of the organic analyses were made at the E.P.A. Laboratories, the balance by New York State Health Department Labs. Additional samples were taken in August, 1977, of groundwater at Glen Cove Well No. 20, and the storm drain at Sea Cliff Avenue. Results of these analyses are attached to this report.

Over one hundred inspection/surveys were made of commercial/industrial sites in the Glen Cove area. The industrial facilities in the area of the Carney Street well field area including Sea Cliff Avenue, Hazel Street and Bridge Street, were surveyed for chemical usage and wastewater disposal methods during February and June 1977, and again in December 1977. Resurveys were made of twelve companies in this area, a summary of which is attached. The commercial area near the Seamans Avenue well was visited and those using solvents at this time were inspected.

Discussion of Results

Only four companies in the Carney Street area were identified that use the halogenated organic solvents. Slater Electric Company and Photo Circuits Corporation, use solvents of the halogenated hydrocarbon type, as follows: Slater, 4500 gallons per year of tetrachloroethylene; and Photo Circuits, 71,000 and 11,200 gallons per year of dichloromethane (methylene chloride) and 1,1,1-trichloroethane, respectively. Slater Electric Company has issued a directive to all their personnel to control the use and disposal of solvents. None of these companies, however, use

trichloroethylene which is the major contaminant of the wellwater in this area. The two smaller companies located both use small amounts of 1,1,1-trichloroethane as a cloth cleaner. One company admitted to dumping halogenated hydrocarbons in past years and indicated that others did the same. No present dumping/spilling was noted, either intended or accidental. Solvent waste discharges of significant magnitude from two of these industries are presently being discharged into the Glen Cove sewer system. These include 1200 ppb of tetrachloroethylene from Slater Electric Company and 480 ppb of methylene chloride from Photo Circuits Corporation.

The survey of the commercial area near the Seamans Avenue wells located two present users and one prior user of solvents. The present users are a gasoline/service station who has just started to use solvent cleaners and a dry cleaner using 3000 gallons/year of tetrachloroethylene. The prior user was also a drycleaning company who has since gone out of business.

Abatement action including litigation has commenced against a major polluter of ground and surface waters by organic chemicals in Glen Cove due to the combined efforts of the U.S. Coast Guard, New York State Department of Environmental Conservation and the Nassau County Department of Health.

Conclusions

No present waste disposal practices were found which could account for the extent of contamination of the Carney Street well field, or the Seamans Avenue well. None of the companies presently use trichloroethylene. It, therefore, is concluded that the contamination of the Carney Street wellfield by trichloroethylene and tetrachloroethylene is due to past waste discharges originating in the Sea Cliff Avenue industrial area, possibly as recent as five to ten years ago. Past contamination cannot be attributed to any single industry because of changes in solvent usage, the industries themselves, and waste disposal practices. The groundwater in the area is generally contaminated with these solvents, with highest concentrations focused in this industrial area located 1,000 feet southeast of the Carney Street wellfield. The possible source of contamination of the Seamans Avenue well could not be indicated since the users are small and 3,000 feet away.

Recommendations

The feasibility of purging the contaminated groundwater from the aquifer in the vicinity of Carney Street should be explored. This would include a hydrological investigation to determine the quantity and area of contamination. Changes in water supply practices which may be required would include maximizing industrial pumpage and discharge of cooling water into Cedar Swamp Creek rather than groundwater recharging as presently required. The environmental

consequences of further increasing solvent concentrations in Cedar Swamp Creek would also require investigation.

Groundwater samples should be analyzed for dichloromethane (methylene chloride) since this solvent is used in significant quantity in the Glen Cove industrial area. This is not presently analyzed for due to difficulties in laboratory procedure.

MBF:ceg
Attachments

Marvin B. Fleisher, P.E.
Public Health Engineer
Chief, Organic Chemical Survey
Bureau of Wastewater Management

SUMMARY OF SURVEY INSPECTIONS
GLEN COVE INDUSTRIAL AREA

The industries located in the vicinity of the Carney Street wells were reinspected on December 6 and 12, 1977, by R. Zimmer and D. Bornholdt. The following report summarizes these inspection/interviews:

1. Osrow Products, 88 Hazel Street - Contact: L. Osrow

There is no change in their chemical usage. They are not aware of any problems in the area. When asked about "Man Products", 100 Carney Street, Mr. Osrow said he had never heard of them dumping chemicals or solvents.

2. Pall Corporation, 30 Sea Cliff Avenue - Contact: S. Krakauer

They do not presently use any of the chemicals found in the area wells. The building now occupied by Novelty Scenic Studio, 40 Sea Cliff Avenue had been used by HMS Machine Corp. Mr. Krakauer stated that he believes that they used both tetrachloroethylene and trichloroethylene and spilled/dumped waste solvents in their yard. The Telco Company was previously Eastern Heat Treatment Co., and they used both chemicals also.

Mr. Krakauer, who is a chemical engineer, mentioned the possibility of a reservoir of these chemicals from past dumping practices could be in the ground and are leaking at a very slow constant rate due to its low water solubility. He said that in the past, industries including his company would and did dump these chemicals because they felt they were too volatile to cause a problem. He said usage of these chemicals by Pall Corp. was extensive until 1971 when the aircraft part of the Company was moved to Florida.

The inspectors observed a very messy chemical storage shed at the rear of the property approximately 250 feet from the wells. No storage of trichloroethylene or tetrachloroethylene was noted. We intend to sample the soil in this area for volatile halogenated organics.

3. Photo Circuits, 31 Sea Cliff Avenue - Contact: W. Dubicki

No change in information supplied in prior interviews. They use methylene chloride, 1,1,1 Trichloroethane, cellosolve acetate and n-butyle alcohol.

4. Hinkle & Finlayson (Harbor Fuel), 10 Sea Cliff Ave. - Contact: R. Booth

No chemicals or solvents used in their operation. There was no evidence of spilled or dumped chemicals at time of inspection.

5. Glen Cove Manufacturing, 18 Bridge St. - Contact: Secretary to Mr. Reizer

No chemicals or solvents used.

6. Glen Cove Fashions, 79 Hazel Street - Contact: Mr. LoMonaco

1,1,1 Trichloroethane used as a spot remover only. No indication of other chemicals or dumping.

7. August Thomson, 36 Sea Cliff Ave. - Contact: Mr. Schneider

No organic chemicals used, only inorganic cleaning chemicals used.

8. Keyco, 45 Sea Cliff Avenue - Contact: Mr. Lindberg

No chemicals or solvents used other than kerosine for cleaning truck parts.

9. Telco, 40 Sea Cliff Avenue - Contact: Mr. Burger

They use 1,1,1 Trichloroethane, dirty solvent is returned to supplier for reclaiming.

10. Zoomar, 55 Sea Cliff Avenue

Use small amounts of acetone, alcohol, and varnolene for cleaning lenses.

11. Slater Electric Company, 45 Sea Cliff Avenue

They use tetrachloroethylene in vapor degreasers. Significant amounts found in their sewerage effluent, but no evidence of dumping or ground contamination was indicated. They distributed a memo to all their personnel to be very careful with the use and disposal of all organic chemicals.

12. F & J Precision Tooling Co., 59 Sea Cliff Avenue

Small (60 gal/year) of cutting oils used, no other chemicals or solvents indicated.

MBF:yk
(3/29/78)