ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATION

VOLUME I

Cantor Brothers, Inc.
Town of Babylon

Site No. 152021
Suffolk County

Final Report

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Prepared for :

New York State
Department of
Environmental Conservation

50 Wolf Road, Albany, New York 12233
Thomas C. Jorling, Commissioner

Division of Hazardous Waste Remediation
Michael J. O'Toole, P.E., Director

by:

LeRoy Callender, P.C.
Subcontractor to :
Gibbs & Hill, Inc.

Remediation

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ENGINEERING INVESTIGATIONS AT

INACTIVE HAZARDOUS WASTE SITES

IN THE STATE OF NEW YORK

PHASE II INVESTIGATIONS

VOLUME I

CANTOR BROTHERS, INC.

NYS SITE I.D. NO. 152021

TOWN OF BABYLON

SUFFOLK COUNTY

NEW YORK STATE

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EXECUTIVE SUMMARY

LeRoy Callender PC

SECTION I

EXECUTIVE SUMMARY

The Phase II investigation of Cantor Brothers, Inc. site (NYSDEC site ID # 152021) was conducted by LeRoy Callender, P.C. (LC/PC) under a subcontract dated March 21st, 1988 with Gibbs & Hill, Inc., for the New York State Department of Environmental Conservation (NYSDEC), Division of Hazardous Waste Remediation. The subcontract agreement referred to hereabove called for furnishing consultant services for Engineering Investigations of Inactive Hazardous Waste Disposal Sites in New York State - Phase II Investigations. On June 28, 1989, the subcontract agreement was amended by Amendment No. 1, which reduced LC/PC's scope of services in the original agreement by deleting the task of disposal of drilling cuttings drummed as a result of the installation of monitoring wells. This report presents the results of the Phase II investigation of Cantor Brothers, Inc. site performed by LC/PC. A Phase I investigation of this site was completed in September 1984 by Woodward-Clyde Consultants, Inc.

A. SITE DESCRIPTION

Cantor Brothers, Inc. site is a 3.2 -acre site located in East Farmingdale, Town of Babylon, Suffolk County, New York, (Figure I-1). The site is located in southwestern part of Suffolk County, approximately 2 miles east of the Nassau County line, and is presently owned by Cantor Brothers, Inc.

At the time of Phase II site investigation (July 1988), Cantor Brothers, Inc. was an active chemical repacker and manufacturer of paint products, handling petroleum distillate solvents, paint thinners, and caulking compounds. The site presently consists of a two-story building, comprised of a Warehouse Area, a Factory Area, and an Office Area, with a total floor space of approx. 51,500 square feet, (Figure I-2). In addition to indoor storage of hazardous substances (e.g. 1,1,1,-Trichloroethane, Turpentine, and Lacquer Thinner), there are thirteen underground storage tanks buried on the southeastern side of the building, used for the storage of hazardous chemicals and solvents (such as Kerosene, Turpentine, and Lacquer Thinner). There is no discernible process waste stream, as such.

Cantor Brothers, Inc. has been cited frequently by the Suffolk County Department of Health Services (SCDHS) for violations of Article 12 of the Suffolk County Sanitary Code. These violations have included storing toxic or hazardous materials (e.g. Kerosene, Turpentine, and the like) without a valid permit, spills of toxic or hazardous materials onto the ground and/or a storm drain, and removal of an underground fuel storage tank without proper notification of the SCDHS.

-Cantor Brothers has been assessed Civil Penalties, as much as $250 (in June of 1988) because of Suffolk County Sanitary Code violations, (See Order on Consent dated June 3, 1988, SCDHS 1988b).

-Hazardous wastes disposed on the site, either through surface spills or tank leakeage, have been classified under "RCRA" definition to be highly ignitable (Kerosene), highly or moderately toxic/persistent (Arsenic, & 1,1,1-Trichloroethane), and slightly reactive (1,1,1-Trichloroethane).

The Cantor Brothers, Inc. site is located in a generally flat area, entirely developed with paved roads and parking lots. The storm drainage system consists of catch basins and leaching pits.

The predominant land use is industrial/commerical. The site is surrounded by manufacturing and commercial facilities. Large cemeteries are located in the site vicinity, towards the south and south-east. Bethpage State Park is located 1.5 miles west of the site.

Within a 1 1/2 - mile radius of the site, there are several public supply wells, ranging in depth between 200 and 534 feet. The wells of Suffolk County Water Authority are located about 1 1/2- mile to the northwest.

B. PHASE II INVESTIGATION

A Phase II investigation of the site was conducted to collect sufficient information to assess the extent of the contamination released from the site, to classify the site for further action, and to calculate the final Hazard Ranking System (HRS) scores. Recommendations for future actions or studies are also included. Field investigations included a site reconnaissance, a geophysical survey, installation of four groundwater monitoring wells, and collection of five groundwater, three sediment and two soil samples. Groundwater, sediment and soil samples were analyzed to assess the extent of potential or actual contamination at the Cantor Brothers, Inc. site.

C. SITE ASSESSMENT

On July 19, 1988 a site reconnaissance was undertaken by LeRoy Callender, P.C. No visible signs of any hazardous waste discharges or spills of any kind were observed. However, results from the chemical analyses of collected samples, (Tables IV-2A, 2B, 4A, 4B, 4C, and 4D) indicate releases of 1,1,1 - Trichloroethane, Trichloroethene, and Tetrachloroethene from the site to the groundwater, and the presence of significantly higher than background concentrations of arsenic in the groundwater and lead in the sediment samples. These analytical results are discussed

in Section IV-D. Included in the discussion is a comparison between contaminant concentrations detected at the site and appropriate State and Federal environmental quality standards.

The geological stratigraphy at this site is relatively simple and straightforward. The site area is directly underlain by the Upper Glacial aquifer, which is probably less than 100 feet thick and mostly comprises fine to coarse sand with some gravel and/or boulders. Ground water in the Upper Glacial aquifer occurs at an approximate depth of 40 feet below the ground surface at the site. The next major water bearing unit underlying the Upper Glacial aquifer is the Magothy aquifer. The two aquifers are hydralically connected to each other (Reference No. 1, listed on Page V-32). The water table has a hydraulic gradient of about 11 feet per mile in a southeasterly direction.

D. HAZARD RANKING SYSTEM SCORE

The preliminary HRS scores for this site, calculated as part of the Phase I investigation, were S_M = 18.3, S_{DC} = 37.50, S_{FE} = 0. The S_M score reflects the potential for harm due to migration of hazardous substances away from the facility. This score is the composite of scores for groundwater (S_{GW}), surface water (S_{SW}), and air (S_A) transport routes. The S_{FE} score reflects the potential for harm from substances which can cause fire or explosions, and the S_{DC} score reflects the potential harm from direct contact with hazardous substances.

The final HRS scores for the Cantor Brothers Inc. site based on the results of this Phase II investigation have been calculated as follows:

$S_M = 51.13$

$S_{GW} = 88.46$

$S_{SW} = 0.00$

$S_A = 0.00$

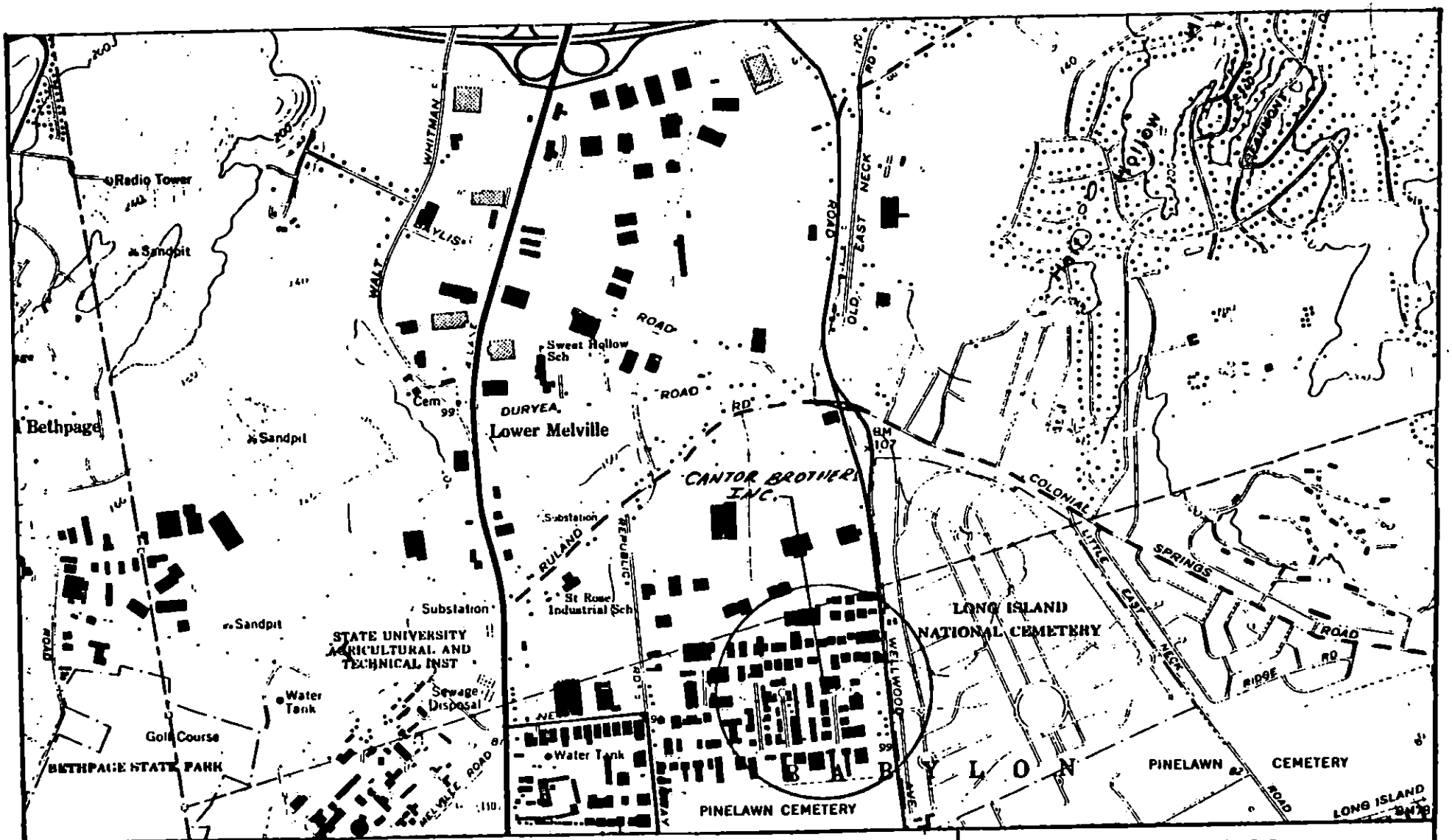
$S_{FE} = 35.00$

$S_{DC} = 50.00$

E. RECOMMENDATIONS

It is recommended that a remedial investigation and feasibility study be conducted at this site to determine the most cost-effective method(s) to determine the extent of contamination and to characterize the site in detail.

Due to the presence of certain contaminants in the upgradient well, if those sources could be identified, the Remedial Investigation (RI) should take into account those facts. Consideration should be given to either coordinate the RI with other nearby sites which may have an impact on this site's remediation, or to plan a comprehensive RI for all the nearby sites, including this one, for which contamination plumes are superimposed.



LONGITUDE: 73° 24' 17"
LATITUDE: 40° 45' 20"

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
HUNTINGTON QUADRANGLE, N.Y. (1979)

SCALE 0 1000 2000 3000 4000 FEET

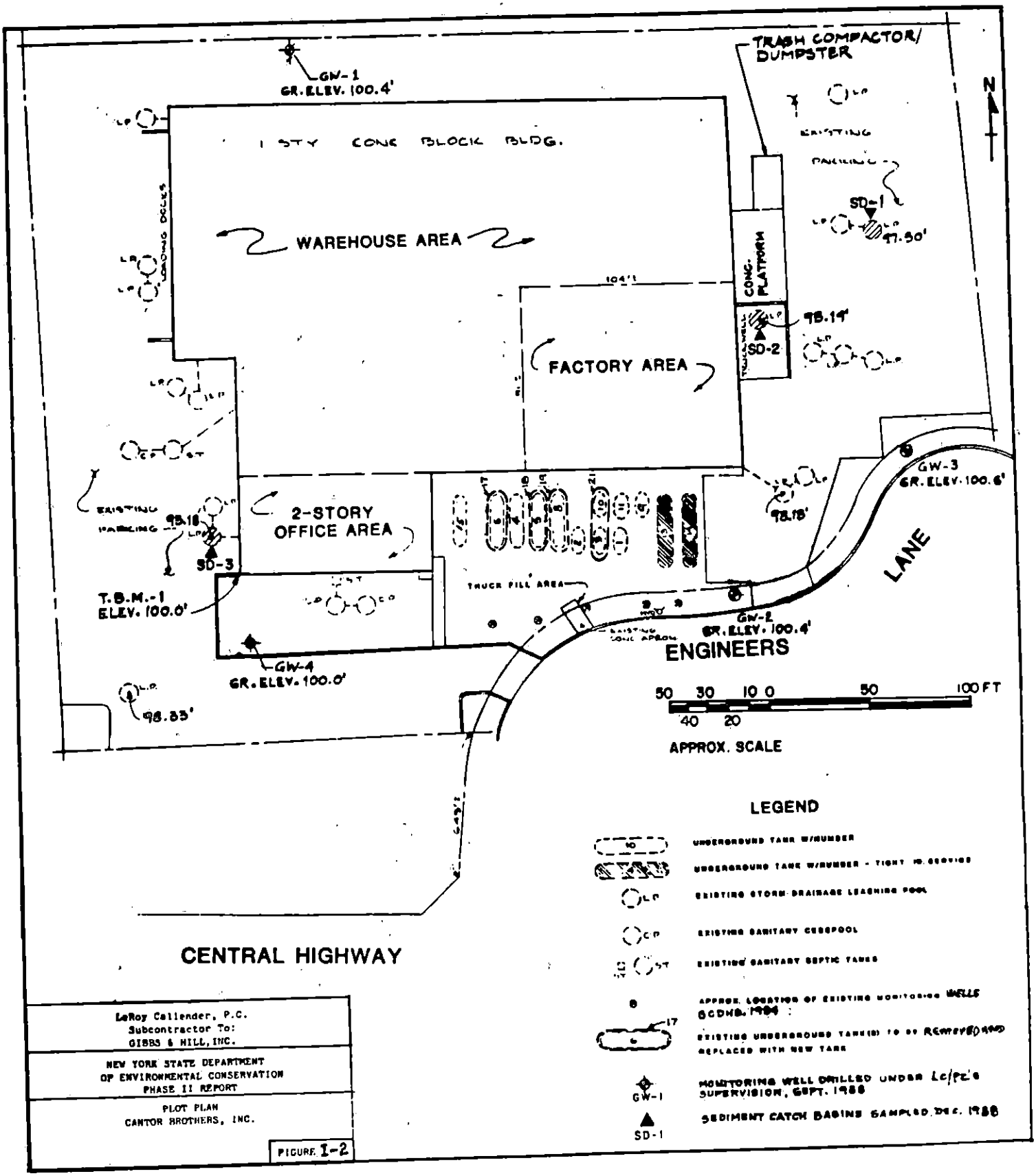
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PHASE II REPORT

SITE LOCATION MAP
CANTOR BROTHERS, INC.

FIGURE I-1


GW-1
GR. ELEV. 100.4'
1 STY CONC BLOCK BLDG.
TRASH COMPACTOR/
DUMPSTER
N
EXISTING
PARKING
SD-1
97.50'
LOADING DOCKS
WAREHOUSE AREA
CONC. PLATFORM
104'1
98.14'
SD-2
FACTORY AREA
GW-3
GR. ELEV. 100.6'
98.18'
EXISTING
PARKING
98.18'
SD-3
2-STORY
OFFICE AREA
T.B.M.-1
ELEV. 100.0'
TRUCK FILL AREA
LANE
GW-2
GR. ELEV. 100.4'
EXISTING
CONC APRON
ENGINEERS
GW-4
GR. ELEV. 100.0'
98.83'
50 30 10 0 50 100 FT
40 20
APPROX. SCALE
LEGEND
UNDERGROUND TANK W/NUMBER
UNDERGROUND TANK W/NUMBER - TIGHT NO SERVICE
EXISTING STORM DRAINAGE LEACHING POOL
EXISTING SANITARY CESSPOOL
EXISTING SANITARY SEPTIC TANKS
APPROX. LOCATION OF EXISTING MONITORING WELLS
GCDHS, 1984
EXISTING UNDERGROUND TANK(S) TO BE REMOVED AND
REPLACED WITH NEW TANK
GW-1
MONITORING WELL DRILLED UNDER LaTour's
SUPERVISION, SEPT. 1988
SD-1
SEDIMENT CATCH BASINS SAMPLED DEC. 1988
CENTRAL HIGHWAY
LeRoy Callender, P.C.
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PHASE II REPORT
PLOT PLAN
CANTOR BROTHERS, INC.
FIGURE 1-2

PURPOSE

LeRoy Callender PC

SECTION III

SCOPE OF WORK

A. INTRODUCTION

The Phase II investigation at the Cantor Brothers Site began in July 1988 and was completed in December 1988. A Phase II Work Plan had been prepared by the NYSDEC after a site visit in November 1985 to define the scope of work at the site. This work plan was updated in August 1988 based on the actual field conditions present during the site visit made in July 1988.

The locations of the four (4) monitoring wells proposed in the Work Plan Update were modified slightly based on the site accessibility and other field conditions (See Figure IV-2). A magnetometer survey was made in July 1988 to detect buried ferromagnetic objects which might be encountered during drilling

sampling and analysis and also ambient air sampling by an HNu Photoionizer was conducted to screen for release of contaminants to air.

SITE INVESTIGATION

The scope of the investigation is summarized in Table III-1 and is described below.

B. Geophysical Survey

A magnetometer survey was conducted around the areas where the installation of the wells was anticipated to detect buried ferromagnetic objects which might be encountered during drilling operations, and to ensure the proper placement of the wells. The field procedures and the results obtained are presented in

directions and water quality. Wells GW-2 thru GW-4 were installed at the locations shown in Figure III-1. These locations provided an opportunity for interception of any contaminant plume from the waste alleged to have leaked from the underground storage tanks (see Table III-2).

During drilling boreholes, soils samples were collected on a continuous basis from the ground surface to a maximum depth of 52 feet. PVC wells were installed with filter sand packs surrounding ten-foot long PVC screens with 20 slots per foot, and provided with primary and secondary bentonite seals.

Each well was logged visually during drilling. During well development by an air-lift pump, evacuation and recovery periods were measured for each well after its development, and permeability computations were made based on the in-situ falling head method. To further characterize the lithology of the site soils, a grain size analysis of each soil unit (one sample above the water table and one sample in the screened interval for each well) was performed in the laboratory according to ASTM D-422-63.

Boring logs and grain size analyses are included in Appendix B. Permeability computation results are shown in Table IV-1. Field procedures are detailed in Appendix B.

D. Groundwater Sampling and Analysis

Groundwater samples were taken from each of the four wells in December of 1988. These samples were analyzed for volatile organics, semi-volatile organics, inorganic constituents, pesticides and PCBs.

H2M Labs, Inc. in Melville, New York performed the analytical testing and reported the results in accordance with the NYSDEC Contract Laboratory Protocol (1987). The chemical analytical results are discussed in Section IV and listed in Appendix C. The field procedures are outlined in Appendix C.

E. Soil/Sediment Sampling and Analysis

Soil/sediment samples were collected from each of the three catch basins identified in Figure III-1. In addition, two soil samples were collected from the drill cuttings of GW-1 & GW-2.

The above samples were collected in October of 1988, but the samples from catch basins had to be collected again in December 1988, because the original samples did not meet QA/QC requirements. These samples were analyzed for volatile and semi-volatile organics, inorganics, pesticides, and PCBs by H2M Labs, Inc. in accordance with NYSDEC Protocols. The field procedures are outlined in Appendix C. The chemical analysis results are summarized in Section IV and detailed in Appendix C.

F. Air Survey

An HNu meter was used to screen the air along the perimeter of the site for organic contaminants. In addition, the air above the borings and the soil samples collected from each boring during drilling operations were monitored using an HNu meter to examine for potential release of organic contaminants to the environment.

TABLE III-1

WORK PLAN - TASK DESCRIPTION (1)

CANTOR BROTHERS

Tasks		Descripton of Task
Task		
II-A	Update Work Plan	Reviewed the information in the Phase I report, conducted a site visit, and revised the Phase II work plan.
II-B	Conduct magneto-meter survey	A magnetometer survey was conducted to ensure the proper placement of the monitoring wells.
II-C	Conduct Boring/ Install Monitoring Wells	Installed four wells into the aquifer (Upper Glacial). Wells were constructed of 2-inch PVC pipe. The depth of the wells ranged from 50 to 52 feet.
	Soil samples from borings	Eight samples were collected for grain size analysis, and two samples from drill cuttings (GW-1 & GW-2) for chemical analysis.

(1) As implemented

TABLE III-1 (Continued)

WORK PLAN - TASK DESCRIPTION

CANTOR BROTHERS

Tasks		Description of Task
II-D	Perform Sampling and Analysis	
	Soil (Sediment) Samples from catch basins	Three samples were collected and analyzed for volatile and semi-volatile organics, inorganics, pesticides & PCBs.
	Soil Samples from test pits and auger holes.	No sampling was performed.
	Sediment samples from surface waters	No sampling was performed.
	Groundwater samples	Four groundwater samples were collected and analyzed for volatile and semi-volatile organics, inorganics, pesticides & PCBs
	Surface water samples	No samples were collected.
	Leachate samples	No samples were collected.
	Air samples	HNu photoionizer was used to monitor the presence of organic vapors.
II-E	Calculate Final HRS	Based on the field data collected in Tasks II-B-II-D, the HRS form was completed.

TABLE III-1 (Continued)

WORK PLAN - TASK DESCRIPTION

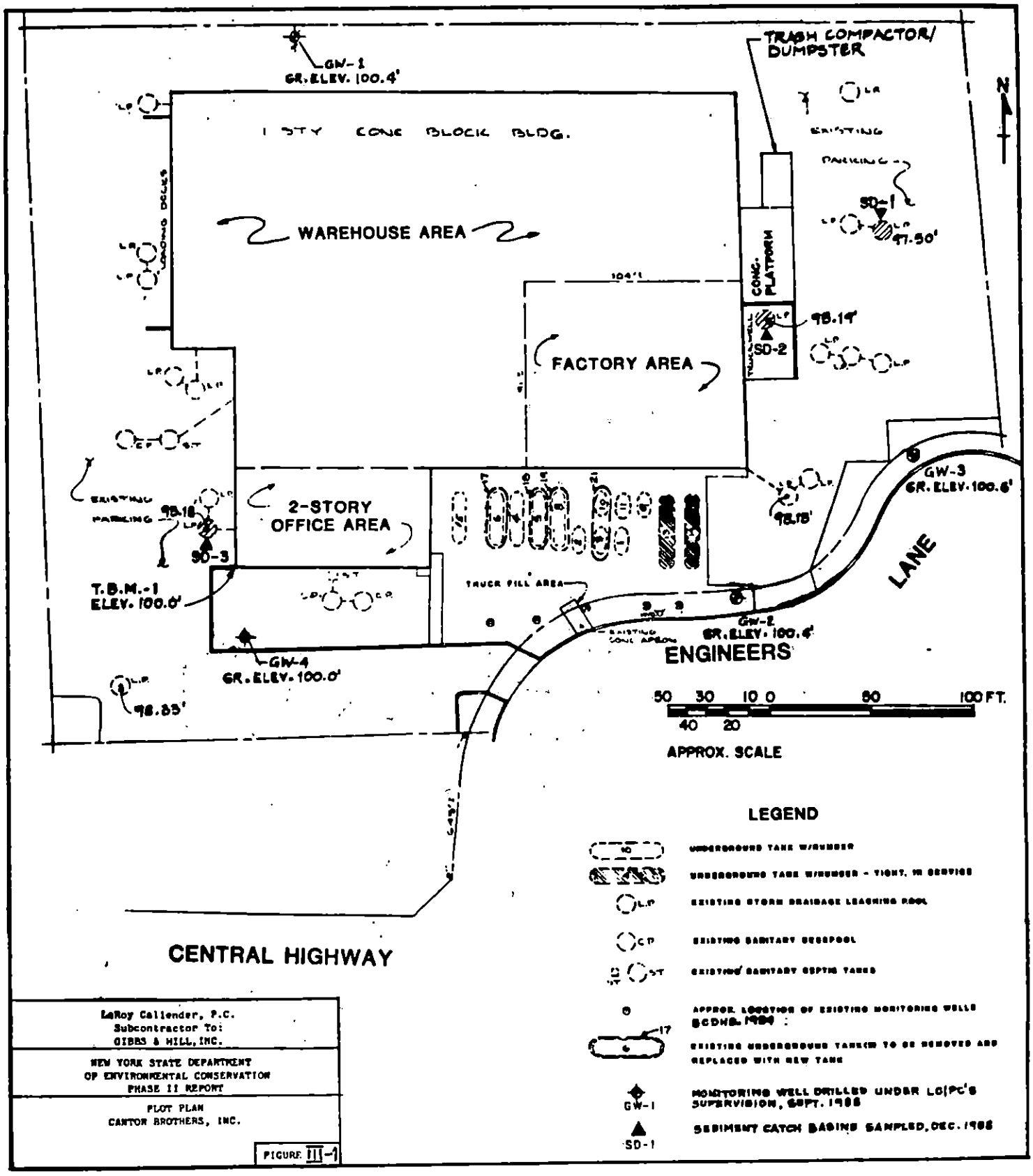
CANTOR BROTHERS

Tasks		Description
II-F	Conduct Site Assessment & Report Preparation	A final report containing significant Phase I information, additional field data, final HRS score and HRS documentation records, and site asessments was written. The site assessment included recommendations for possible future actions at the site.
II-G	Project Management	Project coordination, administration and reporting.

TABLE III-2

MONITORING WELL LOCATIONS AND SPECIFICATIONS

Well No.	Upgradient/ Downgradient	Depth (ft)	Depth of Screening (ft)
GW-1	Upgradient	50 (Upper Glacial aquifer)	39 - 49
GW-2	Downgradient	52 (U.G. aquifer)	40 - 50
GW-3	Downgradient	52 (U.G. aquifer)	40'-9" - 50'-9"
GW-4	Downgradient	50 (U.G. aquifer)	39 - 49



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PHASE II REPORT

PLOT PLAN
CANTOR BROTHERS, INC.

FIGURE III-1

SITE ASSESSMENT

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SECTION IV

SITE ASSESSMENT

A. SITE HISTORY

Cantor Brothers, Inc. has been in operation as a chemical repacker, manufacturer and distributor of paint products at the present site since at least 1975 (the first reported inspection by SCDHS was on 6/18/75) (SCDHS, 1983c). The present facility has been in existence since at least 1964, the year most of the underground tanks were reported to have been installed (SCDHS,1982C).

Another industrial waste site which may have an impact on this site is Lincoln Graphic Arts site located northwest of this site within a distance of 800 feet. Lincoln Graphic Arts is owned by Mr. Leo Sweedler, located at 200 Finn Court, Farmingdale, New York. No information on its area is available.

During the period beginning in 1980 and up to the end of 1983, periodic site inspections by the Suffolk County Department of Health Services (SCDHS) revealed several violations of Article 12 of the Suffolk County Sanitary Code (SCDHS, 1983d).

In September 1983, Woodward-Clyde Consultants, Inc. (WCC) was assigned by NYSDEC to perform a Phase I preliminary investigation at the site. The Final Phase I Report of Cantor Brothers Site by

WCC, dated September 20, 1984, includes documented Sanitary Code violations at the site (SCDHS, 1982 a, b, c; 1983a, b, c, d, & e). These violations included: (1) numerous leaking 55-gallon drums stored outside; (2) no provisions for spill containment inside the facility; (3) a 6000-gallon tanker truck containing creosote and oil found leaking; and (4) underground tanks not pressure tested.

The SCDHS informed Cantor Brothers, Inc. of these violations and ordered it to take remedial action in a letter dated August 30, 1982 (SCDHS, 1982c).

During 1983, violations of the Suffolk County Sanitary Code continued at the Cantor Brothers Site.

In April 1983, samples of the industrial waste were taken from a storm drain on the south side of the building (see Figure IV-2, storm drain w/top elevation 98.15'). Upon analysis, the following substances were found in concentrations above the maximum allowable standards (i.e. New York State Water Quality Standards of 1985 - see App. D. Vol. III): benzene: 330ppb, toluene: 4800ppb, m-xylene: 114ppb, and o-xylene: 90ppb (SCDHS, 1983e).

In June 1983, a SCDHS inspection indicated that the underground tanks were in the process of being "Kent Moore" tested, (i.e. tank system tightness test, in accordance with NFPA Code 329.30), creosote drums were scavenged by a licensed hauler, and wastewater operations were being properly conducted (SCDHS, 1983b).

In July 1983, the SCDHS informed Cantor Brothers, Inc. that a preliminary hearing had been scheduled on August 10, 1983 to resolve Article 12 violations of the Suffolk County Sanitary Code and notified it to participate (SCDHS, 1983d).

During the period from June 14, to October 4, 1983, Island Pump and Tank Corporation pressure tested the underground tanks at Cantor Brothers, Inc. Only three (3) tanks out of the thirteen underground tanks tested were tight under pressure. (SCDHS, 1983f).

In the Summer of 1984, the SCDHS arranged for the installation of five (5) monitoring wells near the southern boundary line of the Cantor Brothers, Inc. Site north of Engineers Lane, (SCDHS, 1984a).

Well logs and construction details for these wells are not available. The information obtained from Mr. Matthew Miller, General Manager of Cantor Brothers, Inc. indicates that these are 4" PVC groundwater monitoring wells, 30-35 feet deep, without sand packing and with no betonite seals. No further information was found about these wells either in SCDHS files or in Cantor Brothers, Inc. records. For sampling results and dates, reference may easily be made to SCDHS, 1984b, Pages 1 thru 5, in Volume III.

Sampling of these wells by SCDHS showed relatively high concentrations of some organic chemicals (Tetrachloroethylene

2600ppb, Cis Dichloroethylene 1900ppb, 1,1,2 Trichloroethylene 470 ppb). SCDHS notified Cantor Brothers of the Sanitary Code violations through a Notice of Violation dated September 14, 1984. (SCDHS, 1984b).

In November 1984, an engineering report by Allen & Grant, P.C. of Huntington, New York made recommendations to bring the underground storage tanks into compliance with Article 12 of the Suffolk County Sanitary Code. (SCDHS, 1984c). This report shows that at the time of Allen & Grant survey, there were sixteen underground tanks at the site, fifteen of which were located adjacent to the southeast corner of the building, and the other tank was located in the parking area on the west side of the building. The report includes the result of pressure testing of these tanks (Table 2-2, SCDHS, 1984c). Of the fifteen existing tanks located adjacent to the southeast corner of the building, only five were found to be tight (tank numbers 1, 2, 4, 13, & 14). The sixteenth tank in the west parking area was not tested, and was subsequently removed from the site.

The report indicates that the ten tanks which were found to be defective, (i.e. tank numbers 3,5,6,7,8,9,10,11,12, & 15) were subsequently removed from service. The report recommends that these tanks be removed from the site and be replaced with several new tanks. (SCDHS, 1984c, Section 3.1). The report also recommends that the five existing tanks which were tight be periodically retested, as required by Article 12. It also recommends that all eight tanks (five existing ones and the three new tanks) be monitored by careful, regular inventory control, as required by Article 12 (SCDHS, 1984C, Page 7).

Despite the recommendations of the Allen and Grant report, a SCDHS inspection of the Cantor Brothers site in early 1988 indicated that most of the defective underground tanks were still in service (SCDHS, 1988a, updated tank inventory).

In December 1984, a spill of No. 2 fuel oil occurred at the site, which was caused by a broken pressure gauge on a 5,000 gal. underground fuel tank, and resulted in the spilling of 450 gal. of No. 2 fuel oil into a nearby storm drain. The spill was reported to SCDHS, and the contaminated soil around the storm drain was bagged and transported to Babylon Town Landfill by a Licensed Hauler (Marine Pollution Control) (SCDHS, 1984d).

In November 1985, a site visit was conducted by the New York State Department of Environmental Conservation (NYSDEC) personnel. From the site visit a Work Plan for Phase II Investigation was put

together, which included the drilling of four boreholes and installation of four monitoring wells (See Appendix A Work Plan Update). The updating and implementation of the Work plan for Cantor Brothers began in July 1988 and completed in October 1988.

In June 1986, SCDHS notified Cantor Brothers, Inc. that existing underground tank No. 4, containing 5,000 gals. of fuel oil had failed the tank system tightness test, and required it to immediately empty the tank contents and remove the tank from service (SCDHS, 1986a).

In August 1987, SCDHS served Cantor Brothers, Inc. with a notice of violation for failing to properly notify SCDHS of the removal of an underground storage tank and the abandonment of another underground storage tank (SCDHS 1987a).

In January 1988, SCDHS inspected the site and found the following violations of Article 12 of the Suffolk County Sanitary Code:

Indoors - 50 plus drums of a viscous material used in manufacturing caulking compound, stored indoors but outside of Article 12 containment area;

Outdoors - 2-3 drums stored outdoors with unknown contents, 1/2 full to completely full. These drums must be moved indoors or disposed of in a proper manner. The inspection report also included an updated tank inventory, indicating thirteen (13)

underground storage tanks outdoors and one small storage tank indoors, in addition to 5 gal. containers and 55 gal. drums in the Warehouse Area and 55 gal. drums in the Packaging Area. (SCDHS, 1988a).

In May 1988, SCDHS signed a consent order with Cantor Brothers, Inc. The Order on Consent No. IW88-42 dated May 24, 1988 included a fine of $500, 1/2 of which was to be suspended and ultimately discharged contingent upon Respondent's compliance with the term, provisions and conditions of the Order on Consent, while the other half ($250) had to be paid to the SCDHS, to be remitted with the return of the duly executed Order on Consent by Respondent. The alleged violation against the Respondent (Cantor Brothers, Inc.) was that in Aug. 1987 it had failed to properly abandon an underground storage tank for toxic or hazardous materials (removal of an underground fuel storage tank) in that it did not notify SCDHS of said removal in writing, in violation of Section 760-1210 (h) (2) of Article 12 of the Suffolk County Sanitary Code.

In September 1988, SCDHS sent a letter to Cantor Brothers, Inc. and acknowledged satisfactory compliance with the provisions of the Order on Consent No. IW 88-42, (SCDHS, 1988c).

In October 1988, SCDHS sampled the storm drain at east side of building near the depressed loading dock (see Figure IV-2) and analyzed it for organic parameters. The results of the chemical analysis are attached to the SCDHS Inspection Report (SCDHS, 1988d, Reference No. 23).

In September and October 1988, the Phase II Investigation of the site started and the drilling and installation of four monitoring wells was completed as required by the NYSDEC Work Plan. The details of the Phase II investigations and the drilling and installation of monitoring wells are described under Section III.

B. SITE TOPOGRAPHY

This summary of site topography is based on the following sources and the site reconnaissance survey by LeRoy Callender, P.C. (LC/PC) in August 1988.

- Phase I - Preliminary Investigation - WCC - Sept. 1984
- NYSDEC - Phase II Work Plan - Nov. 1985
- Site Survey of Cantor Brothers by Storch Associates Oct. 1988.

The site of Cantor Brothers, Inc. is a 3.2-Acre parcel located in a generally flat area with an average ground surface slope of less than 0.5 percent.

The nearest downslope surface water is Neguntatogue Creek which is more than 4 miles from the site (USGS, 1979, Amityville Quandrangle). The area surrounding the site is paved, with drainage and surface run-off via catch basins and recharge basins.

The predominant land use in the area is industrial. The site is surrounded by manufacturing and commercial facilities. Large cemeteries are located immediately to the south and east of the site vicinity. In 1986, there were twenty-four similar Inactive Hazardous Waste Disposal Sites, within a three-mile radius of Cantor Brothers Site, being investigated by the NYSDEC. (See pp. V-54 and V-55).

There are several public and private wells within a one-mile radius of the site, ranging in depth from 60 to 712 feet. The nearest private well is 600 feet to the northwest and the nearest public well is about one mile to the southwest.

Within a 1 1/2-mile radius of the site, there are several public supply wells, ranging in depth between 200 and 534 feet. The wells of Suffolk County Water Authority are located about 1 1/2- mile to the northwest. (See Appendix D for well locations and permit data).

There are no freshwater wetlands or coastal wetlands within a one-mile radius of the site.

The nearest NYS recognized freshwater wetland area is located more than a mile to the northeast of the site and is about one acre in area (see Map of Freshwater Wetlands - Ref. 9).

The nearest NYS recognized coastal wetland area is located about 7 1/2 miles to the south of the site and has an area of about 30-acres (see map of Coastal Wetlands - Ref. 10).

The site does not have any potential impacts on endangered, threatened, or special concern wildlife species, rare plant, animal or natural occurrences, or other significant habitats (see letter dated January 27, 1989 by the Bureau of Wildlife, NYSDEC, Region I, Ref. 11).

C. SITE HYDROLOGY

Regional Geology and Hydrology

The site is located in an area consisting of unconsolidated sediments of Pleistocene and Cretaceous age. These deposits are approximately 1300 feet thick and are underlain by Precambrian Crystalline Bedrock (Taney, 1961; Jensen and Soren, 1974). The low hydraulic conductivity bedrock is considered to be the bottom of the groundwater reservoir (Jensen and Soren, 1974).

Site Geology

The following summary of site geology is based on the information from the Phase I report and the Phase II field boring program.

Figures IV-3 and IV-4 depict the subsurface geology at the Cantor Brothers site in cross-sectional views. The site area is directly underlain by glacial outwash deposits consisting of fine to coarse sand, and gravel. These deposits comprise the Upper Glacial aquifer and are probably less than 100 feet thick.

Underlying the Upper Glacial aquifer is the Creataceous Magothy Formation which consists of predominantly fine to coarse sand interbedded with clay, silt and lignite. It is believed to be approximately 750 feet thick in the site area (Taney, 1961; Jensen and Soren, 1974).

Underlying the Magothy Formation is the clay member of the Cretaceous Raritan Formation which overlies and confines the Lloyd sand member of the same formation. The Lloyd Sand consists of stratified beds of sand, gravel, silt, and clay.

The Raritan Formation directly overlies crystalline bedrock of Precambrian age. The bedrock surface dips approximately 60 feet per mile to the southwest, as do the overlying Cretaceous formations (Taney, 1961; Franke and McClymonds, 1972).

Site Hydrology

Several aquifers have been identified in the subsurface of the Cantor Brothers site and are defined as follows:

Upper Glacial Aquifer - this upper unit is immediately underlying the site. Ground water in the Upper Glacial aquifer occurs at an approximate elevation of 59.6 feet above mean sea level (MSL) (Phase II field activity) which translates to be approximately 40.8 feet below the ground surface at the site.

Magothy Aquifer - this is a major aquifer throughout most of Long Island and is hydraulically connected to the Upper Glacial aquifer.

Lloyd Sand Aquifer - this constitutes the deep confined aquifer in the site area and is overlain by the clay member of the Raritan Formation. Underlying the Lloyd Sand aquifer is crystalline bedrock (Franke and McClymonds, 1972).

In - situ permeability tests were performed on the GW-series wells during the Phase II investigation. The results of these tests are presented in Table IV-1. The average permeability in the Upper Glacial aquifer is computed as 7.38×10^{-2} cm/sec.

This value compares very favorably with the hydraulic conductivity of the upper glacial aquifer studied regionally by McClymonds and Franke (1972) with specific-capacity tests from existing wells. Their calculations showed an average hydraulic conductivity ($\bar{k}$) of 270 ft/day or 9.525×10^{-2} cm/sec. (See Ref. 1, Page 32.)

Groundwater flow directions can be inferred from the piezometric surface presented on figure IV-3. The direction of flow is in a southeasterly direction with a hydraulic gradient of 11 feet per mile* (Phase II investigation).

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*El. of piezometric surface at GW-1 = 60.3
El. of piezometric surface at GW-2 = 59.6
Distance between GW-1 and GW-2 = 334'

Hydraulic gradient = $\frac{60.3 - 59.6}{334'} \times \frac{5280'}{Mi}$ = 11.06 ft/mile.

TABLE IV-1
IN-SITU FALLING HEAD METHOD PERMEABILITY TEST RESULTS
CANTOR BROTHERS, INC. (1)

BOREHOLE NUMBER (4)	PERMEABILITY TEST NO.	h_1 (ft)	h_2 (ft)	r (in)	L (ft)	R (in)	t (sec)	El. of Ground-water table at start of test (2) (3) (ft)	K (cm/sec)
GW-1	1	8.92	10^{-7}	1	4.46	6	13.0	60.32	7.37×10^{-2}
GW-2	2	9.17	10^{-7}	1	4.58	6	18.0	59.57	5.21×10^{-2}
GW-3	3	8.92	10^{-7}	1	4.46	6	13.0	58.77	7.37×10^{-2}
GW-4	4	8.83	10^{-7}	1	4.41	6	10.0	59.83	9.55×10^{-2}

Average K = 7.38×10^{-2} cm/sec

(1) See notes on next sheet.
(2) For ground surface elevations, See Drawing #III-1.
(3) For total depth of borings, See Table III-2 on page III-9.
(4) For schematic diagrams of the monitoring wells, See field log book in appendix C, Volume II.

NOTES ON TABLE IV-1

1. Intermittent pumping (evacuation and recharge of the wells during and after development) was the method used to calculate the permeability or conductivity rate on the basis of recovery or recharge time, measured during and after completion of well development. An air-lift pump was used to develop each well.

   The pumping test described above approximates like a recovery test. However, due to the inadequacy of the data, the calculations for the permeability of the soil in the Upper Glacial aquifer were based on the Slug Test equations.

2. The permeability of the soil was computed based on the following formula:

$$K = \frac{r^2}{2L(t_2-t_1)} \ln(L/r) \ln h_1/h_2 \quad (1)$$

   K = Permeability rate in feet/sec (converted to cm/sec.)

   L = screen length below water table, since 1 varies with time, the arithmetic average, L/2 will be used (feet)

   R = Bore hole radius (inches)

   r = well radius

   h_1 = initial head causing flow at time t_1 (2)

   h_2 = final head causing flow at time t_2

Notes:

1. Formula recommended by Mr. Manickam, N.Y.S.D.E.C., Albany, New York.

2. In our test, the only reading that was made was the final head (h_2) after full recovery, in which case h_2=0. This will result in indeterminate value for K. Therefore, using a very low value for h_2 (i.e., 10^{-7} feet), the K value may be determined.

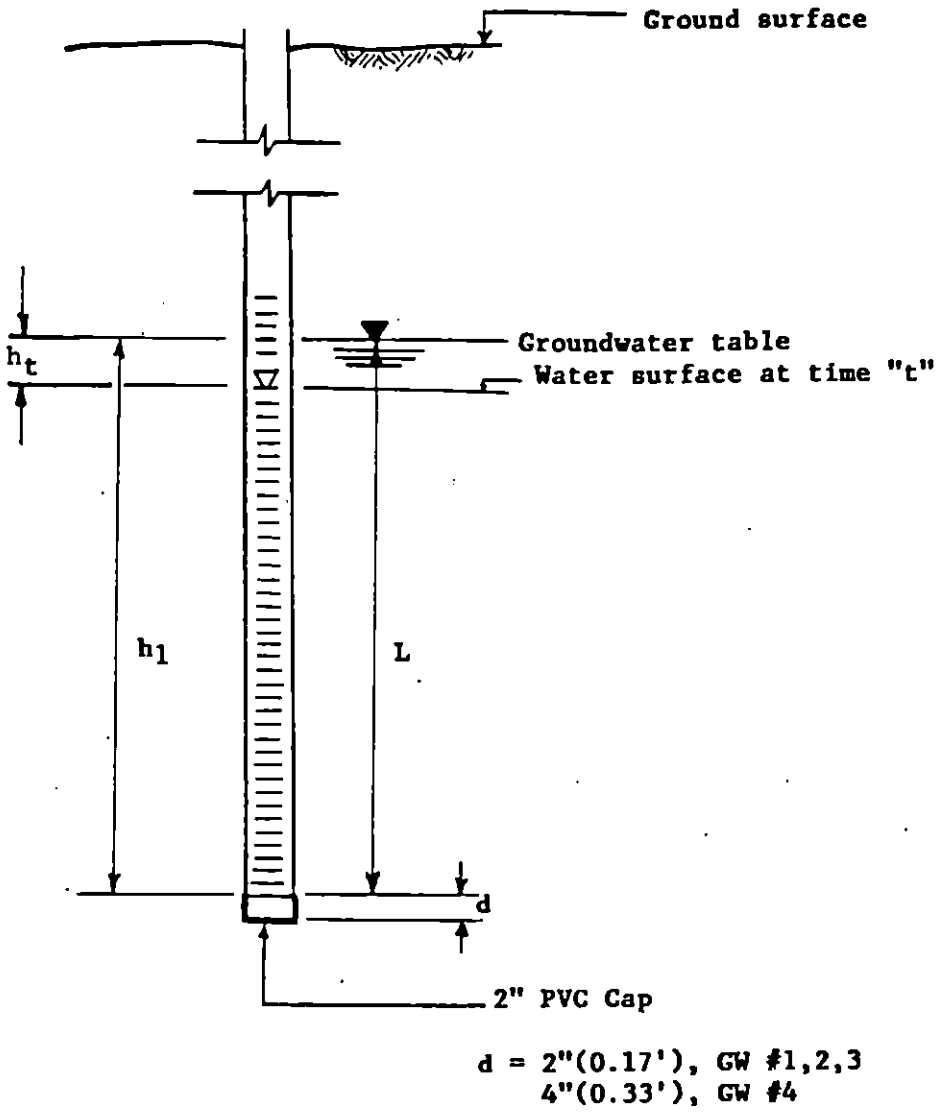


Figure IV-1 Permeability Test Nomenclature

D. SITE CONTAMINATION

Potential contamination of the environment within the site boundary lines was evaluated by a review of the character and quantity of wastes suspected at the site, chemical analysis of the groundwater and soil or sediment samples, and a survey of the air quality with an HNu meter.

1. WASTE CHARACTERISTICS

Cantor Brothers, Inc. has been active as a chemical repacker and paint specialities' manufacturer and distributor on the site since at least 1975. The latest site inspection by SCDHS carried out in January of 1988 (SCDHS 1988 a, Ref. No.24) lists three types of chemical storage, in 55-gal drums, in earth-covered underground tanks, and in 5-gal containers.

The 55-gal. drums were stored in three locations:

a) Indoors, inside spill-containment areas

b) Indoors, outside spill-containment areas

c) Outdoors

The b) and c) locations above could result in spills of hazardous chemicals into drainage catch basins, which could subsequently leach out into ground water aquifer.

The underground storage tanks (at the time of SCDHS inspection, there were thirteen underground tanks totaling 52,000 gallons in capacity) were all buried near the southern wall of the factory area (Figure III-1). These tanks contained organic solvents (namely, lacquer thinner and turpentine) and kerosene, and were suspected of leaking due to failed pressure tests (SCDHS 1986 a).

The 55-gal drums referred to above which were stored outside the spill-containment areas contained a viscous chemical material used in manufacturing caulking compounds. Although the owner claimed that the contents of these drums were non-toxic, this could not be verified or documented (SCDHS 1988a).

The 55-gal drums which were found outdoors during the SCDHS inspection (1/22/88) contained unknown chemicals which could have been hazardous materials. (These drums have been removed from the site since January of 1988.)

The 55-gal drums which were stored inside the spill-containment areas (Packaging Areas) contained 1,1,1 - Trichloroethane, paint thinner, and lacquer thinner, all of which are hazardous chemicals. Prior to 1983, there were no spill-containment provisions inside the Warehouse Area and there were spills of hazardous materials (e.g., creosote, caulking compound, and paint thinners) into the catch basins and ground water (page IV-1, Site History).

The 5-gal containers which were stored in the Warehouse Area during SCDHS inspection contained paint products, (such as lacquer thinner and turpentine) which are highly toxic chemicals.

2. GROUND WATER CONTAMINATION ASSESSMENT

Groundwater samples have been collected and analyzed from the Upper Glacial aquifer at the Cantor Brothers Site. In addition to the samples collected and analyzed as part of the phase II investigation in 1988, the results of the monitoring well samples collected and analyzed by the Suffolk County Department of Health Services (SCDHS) in 1984 were also considered in the assessment of groundwater contamination, (SCDHS, 1984 b).

Table IV-2A shows the volatile organic chemicals which were found in greater concentrations in downgradient samples as compared to upgradient samples. Two of the chemicals, i.e., 1,1,1 - Trichloroethane, and Tetrachloroethene were found in 1984 monitoring well samples collected and analyzed by SCDHS, (see SCDHS, 1984b). The chemical 1,1,1,- Trichloroethane, which was found in Phase II Investigation sampling of 1988 and in SCDHS sampling of 1984, is stored on the site in the Packaging Area of Cantor Brothers, as indicated in the SCDHS Site Inspection Report dated January 22, 1988, (See SCDHS, 1988a). The concentration of this chemical in MW#3 (19ug/L) is more than six times its concentration in MW#1(3 ug/L). MW#1 is on the upgradient side of groundwater flow, and MW#3 is on the downgradient side. Therefore,

it can be concluded from the above comparison that the increase in the 1,1,1, - Trichloroethane concentration in the downgradient well is attributable to the Cantor Brothers Site. The same reasoning can be made for Trichloroethene and Tetrachloroethene, (See Table IV-2A).

Comparison of the volatile organic compounds concentration in Phase II groundwater samples with the EPA and NYSDEC water quality standards indicates that the groundwater samples exceed the EPA and NYSDEC water quality standards in Trichloroethene (CAS No. 79-01-6) concentration and exceed the NYSDEC water quality criteria (except MW #4 for Trichloroethene concentration.)(1)

Table IV-2B shows the metals which were found in greater concentrations in downgradient samples as compared to upgradient sample. The last two columns show the EPA National Drinking Water Regulations of 1978, and the NYSDEC Water Quality Criteria of 1985.

Notes:

(1)-based on current standards of groundwater quality established by EPA & NYSDEC, this exception is not valid henceforth.

Iron, manganese, and selenium were found in excess of both standards. Chromium concentration varied in the four well samples from 8 to 67 ug/L, with the duplicate well at 85 ug/L, which exceeded both EPA and State standards. Lead concentration exceeded EPA & State standards in MW#2, MW#4, and the duplicate sample (which was taken from MW#2). Arsenic was significant because its concentration in downgradient samples (MW #2, MW # 3, and MW#4, and the duplicate sample) was ten times the upgradient well MW#1, and twice the State standard. It should be noted, however, that arsenic concentration is equal to EPA standard, i.e., 50 ug/L.

Pesticide organics Endrin, Lindane, and Methoxychlor were present in groundwater samples but in concentrations either below or at the same level of both EPA and State standards, (See Table IV-2B, continued.)

Semi-volatile Organics which exceeded the NYSDEC water quality criteria at this site consisted of bis (2-Chloroethyl) ether (CAS No. 111-44-4) and Benzo (a) pyrene (CAS No. 50-32-8). It should be noted, however, that the two chemicals appear in the Field Blank sample at the same concentration as in the well samples. (NYS drinking water standard for bis (2-Chloroethyl) ether and Benzo(a)pyrene is 50ppb, and groundwater standard for bis (2-Chloroethyl) ether is 1 ppb.)

3. SURFACE WATER CONTAMINATION ASSESSMENT

No surface water sources are located in the vicinity of this site, and no surface water sampling has been called for in the Work Plan for the site.

4. SEDIMENT CONTAMINATION ASSESSMENT

Sediment samples were collected from the three Catch Basins SD-1, SD-2, and SD-3 (See Figure IV-2) as part of the Phase II Investigations. The samples were analyzed for metals, volatile organics, semi-volatile organics, and pesticides/PCB's. In addition, soil samples were also collected from Monitoring Wells No. 1 & No. 2, and analyzed for the same parameters. The soil sample from MW#1 (36 ft. deep soil sample) is used as background soil type for this site.

Table IV-4A shows metals concentrations found in catch basin sediment samples (SD-1, SD-2, and SD-3) and in two of the four monitoring well soil samples (MW#1 and MW #2), comparing the concentrations with NYSDEC guidelines in Table 1, Land Application of Sewage Sludge, and with the ranges of concentration in non-contaminated soils.

Antimony, Cobalt, Copper, Lead, Selenium, and Zinc concentrations exceeded the ranges of concentration in uncontaminated soils in one or more catch basin sediment samples. Lead and Arsenic were of concern because of high concentrations in sediment samples in case of Lead, and in monitoring well soil samples in case of Arsenic. Cadium, Chromium, Copper, Lead, Mercury, and Nickel concentrations were well below the NYSDEC

guidelines, and also within the normal range of concentration in non-contaminated soils. Barium, Calcium, Magnesium, Potassium, and Vanadium had concentrations several times greater than the background soil levels, as represented by soil sample from Monitoring Well # 1.

The volatile organics contamination in the sediment and soil samples are presented in Table IV-4B. Acetone and toluene exhibited elevated levels of contamination in all catch-basin sediment samples, as compared to background levels in soil samples of MW#1 & MW#2. Methylene Chloride, Vinyl Acetate and 4-Methyl-2-Pentanone concentrations in sediment samples from catch-basins SD-1 & SD-2 were also several times higher than those in soil samples from MW#1 & MW#2. The two chemicals: 1,1,1 - Trichloroethane and Tetrachloroethene, which exhibited high levels of concentration in groundwater samples from downgradient wells demonstrate relatively high levels of concentration in SD-2 sediment samples. This might be attributable to the same sources of contamination which affected groundwater samples referred to in foregoing Paragraph 2, Page IV-19.

Table IV-4C shows the levels of contamination by semi-volatile compounds in catch-basin sediment samples and in monitoring well soil samples. Sediment sample SD-1, from catch-basin SD-1 located in the northeastern side of the Warehouse Area and in the vicinity of Trash Compactor/Dumpster exhibited elevated levels of Fluorenthene, Pyrene, Chrysene, and Benzo (b) fluoranthene, which are all polycyclic aromatic hydro-carbons (PAH's).

The last column in the table shows the range of Concentration of some of these compounds in Non-contaminated Soils. The level of concentration of Benzo (a) Pyrene (BaP) in SD-1 & SD-2 samples exceeds the typical range of concentration in non-contaminated soils, and also the typical background soil of Monitoring Well # 1. This compound has been researched extensively and has been found to be carcinogenic (See: Edwards, N.T., "Polycyclic Aromatic Hydrocarbons (PAH's) in the Terrestrial Environment, "Journal of Environmental Quality, Dec. 1983).

Pesticide organics which were found in elevated levels of concentration in all three sediment samples, SD-1, SD-2, and SD-3 are presented in Table IV-4D, comparing them with soil sample from MW#1 and MW#2. Chlordane, Methoxychlor, and Toxaphene exhibited levels of concentration in SD-1 sediment sample, which were twenty (20) times the levels found in the MW#1 or MW#2 soil samples. Since the drainage catch basins are not connected to any piped storm water collection system, the contaminants present in catch basin sediments would gradually leach out into the Upper Glacial aquifer, and possibly further down into the Magothy aquifer.

5. AIR CONTAMINATION ASSESSMENT

Perimeter air quality surveys were made throughout the drilling of monitoring wells on the site, using an HNu meter. The results of air monitoring were recorded in the Daily Log, giving the actual dates, the contaminant monitoring locations, levels of air contaminant concentration, and prevailing wind direction on a

daily basis. The range of air contaminant concentrations in the site perimeter was from 0.2 to 1.15 ppm. The maximum level of 1.15 ppm was monitored on the downwind side of the entrance door to the Factory Area, southeast of the building, (See Fig. IV-2).

6. QA/QC PLAN IMPLEMENTATION

The QA/QC Plan for Cantor Brothers, Inc. site was implemented rigorously throughout the well drilling/development and ground water, soil, and sediment sampling activities.

During well drilling/development, the following QA/QC plan requirements were fulfilled:

a. All drilling and sampling equipment (such as augers, drill heads, split spoon samplers, etc.), including all PVC screens and riser pipes, were steam cleaned. Steam cleaning of all equipment was performed prior to drilling a new well, i.e, before the first well on the site was commenced and thereafter between drilling each of the remaining wells. Upon completion of each day's activities, all gear, tools, and equipment were steam cleaned or washed with Alquinox detergent and rinsed properly with clean potable water and air dried, (the acetone wash, followed with a final hexane wash was waived by the NYSDEC representative.) This procedure was also observed at the end of well drilling/ development operations.

b. All down-hole equipment, instruments and tools were placed in a specially-designated staging area, surrounding each well. This staging area was made of wooden pallets, to ensure that all items to be used in the borehole were kept off the ground and out of mud and any other material that might potentially contaminate the well. Plastic sheets were spread on the ground around the work area to prevent dirt, mud, and other contaminating material from entering the borehole.

c. When drilling equipment had to be withdrawn from the borehole, then re-inserted in the hole at the start of the next day, the top of the borehole was covered by a wooden log, then covered with an overturned empty and clean drum to prevent the entry of any dirty or foreign matter into the hole overnight.

During sampling of groundwater from the wells or sediment sampling from Storm Drains or Catch Basins, the following QA/QC plan stipulations were complied with:

a. For sampling of groundwater from each of the monitoring wells, polyethylene bailers and dedicated "parachute cords" (nylon ropes) were used. Sampling bailers were steam cleaned before and after using them to withdraw samples from each well. A separate dedicated cord was used for each well.

b. The sample containers were obtained from the analyzing lab (i.e., H2M Labs, Inc. in Melville, L.I., N.Y. in the case of Cantor Brothers, Inc. site), sufficiently ahead of sampling date, and before filling the bottles, assurance was made that all the bottles were clean and ready for use. The groundwater samples were transferred immediately into their shipping bottles, and placed in the shipping container, after having been properly labeled. Refrigeration of the samples was provided by plastic ice-bags put in the shipping containers. To prevent the labels on the bottles to be wiped off by meltwater, pens with indelible ink were used to write on the labels. The samples were transported to the laboratory the same day for each well. Chain-of-Custody papers and forms were properly filled and signed by the sampling

personnel and also by lab personnel receiving the sample containers.

c. Sampling of sediment from Storm Drains or Catch Basins was accomplished by using split spoon samplers fastened to the end of long steel rods, which were hammered into the soil at the bottom of each Catch Basin. Dedicated split spoons were used for collecting sediment samples from each of the Catch Basins, and split spoons and rods were steam cleaned before insertion into the Catch Basin and after the sampling was completed.

d. The QA/QC plan stipulations for sediment samples were identical to those already described for ground water samples.

E. RECOMMENDATIONS

Based on the results of the analyses of ground water, soil and sediment samples from the monitoring wells and catch basins or storm drains on this site, the conclusion may be drawn that the activities and operations of Cantor Brothers, Inc. has contributed to the contamination of ground water and soil, in and around the site area. Furthermore, Cantor Brothers, Inc. has been operating on this site since at least 1975 without a SPDES permit from the State.

The following violations have been documented in the past for Cantor Brothers, Inc. facility:

(a) Violations of Article 7 and Article 12 of the Suffolk County Sanitary Code;

(b) Violations of Babylon Town Fire Prevention Code.

In order to determine the extent of contamination at this site, a remedial investigation and feasibility study for the Cantor Brothers, Inc. site should be made at the outset.

TABLE IV-2A

ANALYTICAL RESULTS OF PHASE II GROUNDWATER SAMPLES (1)

	SAMPLE LOCATIONS								
Compound (2)	MW#1 (ug/L)	MW#2 (ug/L)	MW#3 (ug/L)	MW#4 (ug/L)	Duplicate (ug/L)	Field Bl. (ug/L)	Trip Bl. (ug/L)	EPA National Drinking Water Reg's. (3) (ug/L)	NYS Groundwater Standards (ug/L)(5)
1,1,1-Trichloroethane	3J	7	19	5U	6	5U	5U	200 MCL & MCLG (4)	5
Trichloroethene	33	96	100	10	87	1J	5U	5 MCL	5
Tetrachloroethene	110	110	2000D	18	100	5	5U	NS	5

(1) Samples collected and analyzed by H2M Labs, Inc., 1988.

(2) Only those compounds whose concentrations in downgradient samples were several times greater than upgradient samples are presented.

(3) Environmental Protection Agency "National Drinking Water Regulations," Primary - 40 CFR 141; Secondary -40 CFR 143, (7-1-87 Edition).

(4) MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal.

J Estimated value, less than the instrument detection limit.

U Minimum attainable detection limit for the sample.

NS No standard

D Concentration is outside the calibration range of the analysis.

(5) Groundwater samples from MW #2 & MW #4 exceed NYS Standards.

TABLE IV-2B

ANALYTICAL RESULTS OF PHASE II GROUNDWATER SAMPLES [1]

Constituents[2]	Sample Locations MW#1 (ug/L)	MW#2 (ug/L)	MW#3 (ug/L)	MW#4 (ug/L)	DUPLICATE (ug/L)	FIELD BL. (ug/L)	EPA National Drinking Water Reg's[3] (ug/L)	NYSDEC Water Quality Criteria[4] (ug/L)
Arsenic	5UW	50U	50U	50U	50U	5U	50[5]	25
Barium	120	420	210	220	510	1B	1,000	1,000
Chromium	8B	71	26	67	85	3U	50	50
Copper	14B *	67 *	26 *	65 *	94 *	3B *	1,000S	1,000
Iron	14,700 *	55,800 *	19,100 *	75,200 *	74,000 *	2B	300S	300
Lead	13N	59N	25SN	54N	75+N	5UWN	50	25
Manganese	810	4,200	1,700	1,880	5,300	OU	50S	300
Potassium	3,900B	7,500	6,200	5,000	8,200	200U	NS	NS
Selenium	50UW	50U	50UW	50U	50U	5U	10	20
Silver	8B	17	9B	5B	11	10B	50	50
Zinc	45	130	72	170	170	1U	5,000S	5,000

(1) Samples collected and analyzed by H2M Labs, Inc., 1988.
(2) Only those constituents whose concentrations in downgradient samples were several times greater than upgradient sample are presented. Selenium is presented for its high concentration in all the samples.
(3) See Note 3 under Table IV-2A.
(4) "Groundwater Classifications, Quality Standards and Effluent Standards and/or limitations", 6NYCRR Part 703, 1978. Amended version in NYSDEC "Ambient Water Quality Standards and Guidance Criteria", Memorandum No. 85-w-38, July, 1985.
(5) All figures in this column are MCL (see Table IV-2A) except those marked with S, i.e., SMCL = Secondary Maximum Contaminant Level (40 CFR 143).

TABLE IV-2B (Continued)

ANALYTICAL RESULTS OF PHASE II GROUNDWATER SAMPLES (1)

B Reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL).
U Constituent was analyzed for but not detected, less than the IDL.
N Spiked sample recovery not within control limits.
S Reported value was determined by the Method of Standard Additions (MSA).
+ Correlation coefficient for the MSA is less than 0.995.
W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
* Duplicate analysis not within control limits.

TABLE IV-2B-PESTICIDE ORGANICS IN GROUNDWATER SAMPLES(2)

Compound	MW#1	MW#2	MW#3	MW#4	Duplicate	Field Bl.	EPA Standards	NYSDEC W. Quality St.
Endrin	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20MCL	0.20MCL
Lindane	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	4.0 MCL	4.0 MCL
Methoxychlor	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	100 MCL	35 MCL

(2) Notes to this table are the same as for inorganics content in groundwater samples.

TABLE IV-4A
ANALYTICAL RESULTS FOR SEDIMENT & SOIL SAMPLES (1)

Constituent (2)	Sample Locations SD-1 (mg/kg)	SD-2 (mg/kg)	SD-3 (mg/kg)	MW#1 (Soil) (mg/kg)	MW#2(Soil) (mg/Kg)	Range of Concentration in Noncontaminated Soil (mg/kg)	NYSDEC Land Application of Sewage Sludge Table 1 (mg/kg)
Aluminium	4,500*	2,600*	3,200*	4,000	4,000	150,000-600,000(3)	
Antimony	17	26	18	4.7B+	3.1B+	0.1-10(3)	
Arsenic	11UW	2.8W	1.6	87+	78+	<40(3)	
Barium	33B	47B	37B	7.5B	13.0B	1-1000(3)	
Beryllium	0.64B	0.35B	0.54B	0.39B	0.41B	<1(3)	
Cadmium	0.43U*	0.69B*	0.54B*	0.20U	0.21U	<1(3)	25
Calcium	21,600*	7,160*	21,700*	260B	620B*	NA	
Chromium	26E*	38E*	29E*	13.0N*	11.0	Trace - 250(3)	1,000
Cobalt	19N*	24N*	4.9BN*	2.5B*	2.3B*	0.1-13(3)	
Copper	340*	170*	53*	4.1BN	4.9B	2-100(4)	1,000
Iron	8,700	4,640	10,300	7,700	7,900	10,000-100,000(3)	
Lead	300*	160*	430*	2.0	11.0	2-200(3)	1,000
Magnesium	7,700*	1,640*	12,000*	360B	530B	NA(4)	
Manganese	87	35	88	60	79	20-30,000(4)	
Mercury	0.42	0.34	0.13U	0.1U*	0.1U*	<1(3)	10
Nickel	8.7B	9B	15	3.7BN	2.3B	3-1,000(3)	200
Potassium	520B	310B	430B	219B	300B	NA(3)	
Selenium	11U	1.7UW	1.4UW	5.0U	5.2U	1-10(3)	
Silver	3.4	6.9	1.1B	3.9	2.5	15-50(3)	
Sodium	1300	2030	1600	1700	1600	NA(4)	
Thallium	1.1 UWN*	1.7UWN*	1.4 UWN*	0.6U	0.6U	<2(3)	
Vanadium	24N*	19N*	26N*	6.9B	8.0B*	5-140(3)	
Zinc	340N	360N	200N	25N*	23.0	10-300(3)	2,500

(See continuation of Table IV-4A on next sheet)

TABLE IV-4A (Continued)
ANALYTICAL RESULTS FOR SEDIMENT & SOIL SAMPLES (1)

(1) Samples Collected by LC/PC & H2M Labs as part of Phase II investigation, September & December, 1988.
(2) Only constituents present in one or more samples are presented.
(3) Handbook on Toxicology of Metals. Friberg, L., et. al. (1979).
(4) Applied Soil Trace Elements. Davies (1980).

B The reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL).
E The reported value is estimated because of the presence of interference.
W Post- digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
U Entered if the constituent was analyzed for but not detected, less than the IDL.
N Spiked sample recovery not within control limits.
+ Correlation coefficient for the Method analyzed for but not detected, less than the IDL.
N Spiked sample recovery not within control limits.
+ Correlation coefficient for the Method of Standard Additions (MSA) is less than 0.995.
* Duplicate analysis not within control limits.

TABLE IV-4B
ANALYTICAL RESULTS FOR SEDIMENT & SOIL SAMPLES (1)

Compound (2)	Samples Locations					Range of Concentration in Noncontaminated Soils
	SD-1 (mg/kg)	SD-2 (mg/kg)	SD-3 (mg/kg)	MW#1 (Soil) (mg/kg)	MW#2 (Soil) (mg/kg)	(mg/kg)
Vinyl Chloride	46U	63U	21U	12U(3)	13U	NA
Methylene Chloride	55B	33B	20B	9	9	NA
Acetone	200B	110B	38B	4J	4J	NA
1,2-Dichloroethene (total)	23U	46	10U	6U	6U	NA
1,1,1-Trichloroethane	23U	32U	10U	21	24	NA
Vinyl Acetate	46U	63U	21U	12U	13U	NA
Trichloroethene	23U	15J	10U	6U	6U	NA
4-Methyl-2-Pentanone	46U	63U	21U	12U	13U	NA
Tetrachloroethene	6U	29J	10U	6U	6U	NA
Toluene	21 J,B	78B	68B	6U	6U	NA

(1) Samples collected by LC/PC & H2M labs as part of Phase II investigation, October, December 1988.
(2) Only those compounds which exhibited contaminant levels higher than background levels are presented.
(3) Concentrations in MW#1 soil sample represent background levels of soil contamination for the site.
U Minimum attainable detection limit for the sample.
B Indicates possible blank contamination.
J Concentration less than instrument detection limit, listed concentration is an estimated value.
NA Information not available.

TABLE IV-4C
ANALYTICAL RESULTS FOR SEDIMENT & SOIL SAMPLES (1)

Compound (2)	Samples Locations					Range of Concentration in Noncontaminated Soils
	SD-1 (ug/kg)	SD-2 (ug/kg)	SD-3 (ug/kg)	MW#1 (Soil) (ug/kg)	MW#2 (Soil) (ug/kg)	(ug/kg)
Anthracene	200,000	35,000J	13,000J	330U	340U	NA
Fluoranthene	540,000D	190,000	6,600J	330U	340U	70-100 (3)
Pyrene	430,000D	160,000	5,900J	330U	340U	50-1000 (3)
Chrysene	340,000	120,000	4,500J	330U	340U	30-80
Benzo (b) fluorantene	230,000	110,000	4,200J	330U	240U	NA
Benzo (a) pyrene	65,000	30,000J	2,200J	330U	340U	100-1000 (3)
Benzo (g,h,i) perylene	27,000	15,000J	1,500J	330U	340U	NA
Benzoic acid	120,000U	190,000U	65,000U	1,600U	1,700U	NA
Hexachlorobutadiene	24,000U	37,000U	13,000U	330U	340U	NA
Hexachlorocyclopentadiene	24,000U	37,000U	13,000U	330U	340U	NA
2,4,5,-Trichlorophenol	120,000U	190,000U	65,000U	1,600U	1,700U	NA
Hexachlorobenzene	24,000U	37,000U	13,000U	330U	340U	NA
Pentachlorophenol	120,000U	190,000U	65,000U	1,600U	1,700U	NA
Butylbenzylphthalate	24,000U	37,000U	13,000U	330U	340U	NA
3,3' - Dichlorobenzidine	48,000U	74,000U	26,000U	660U	680U	NA

(1) Samples collected by LC/PC, and analyzed by H2M labs, October, and December, 1988.

(2) Only those constituents which exhibited elevated levels of semi-volatile organic concentration in drainage catch basin sediment samples, or had high concentrations of PAH's (polycyclic aromatic hydrocarbons), or could be sources of emissions for hazardous air contaminants are presented.

(3) Edwards (1983). "Polycyclic Aromatic Hydrocarbons (PAH's) in the Terrestrial Environment - A Review", J.Envir. Quality.

J Concentration less than instrument detection limit, listed concentration is an estimated value.

D Entered if concentration was above the calibration range of the first analysis.

U Minimum attainable detection limit for the sample.

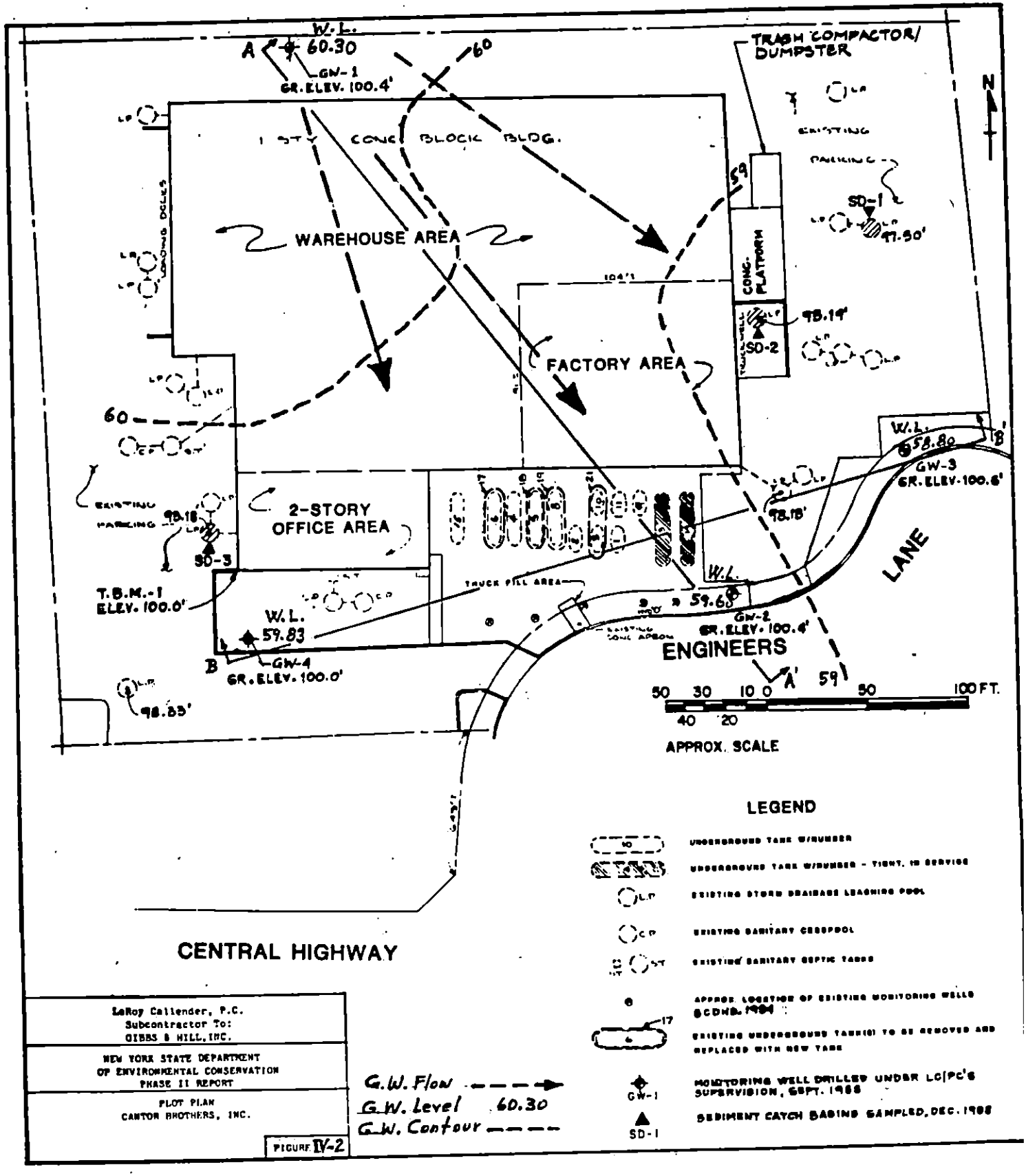
NA Information not available.

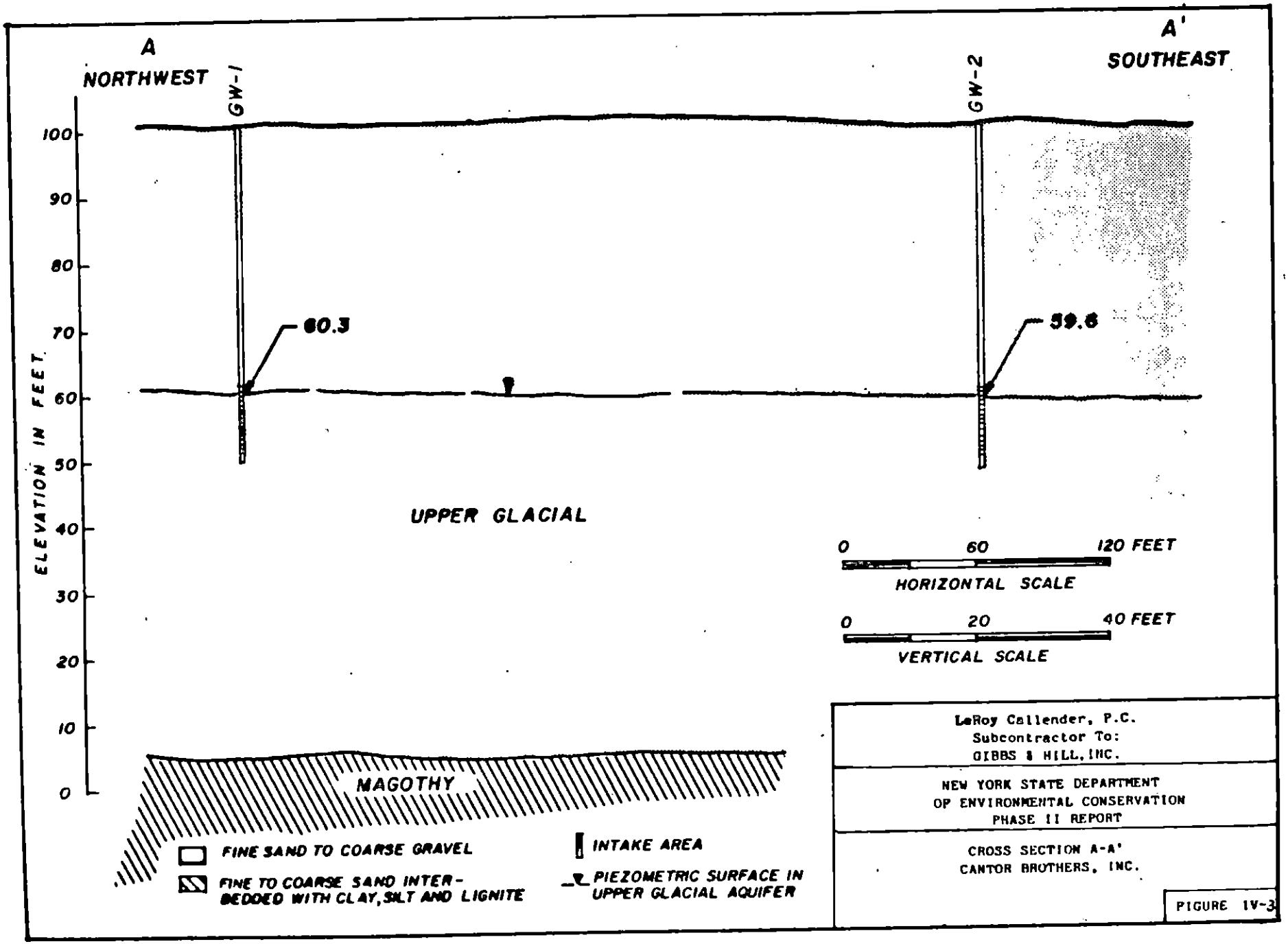
TABLE IV-4D
ANALYTICAL RESULTS FOR SEDIMENT & SOIL SAMPLES (1)

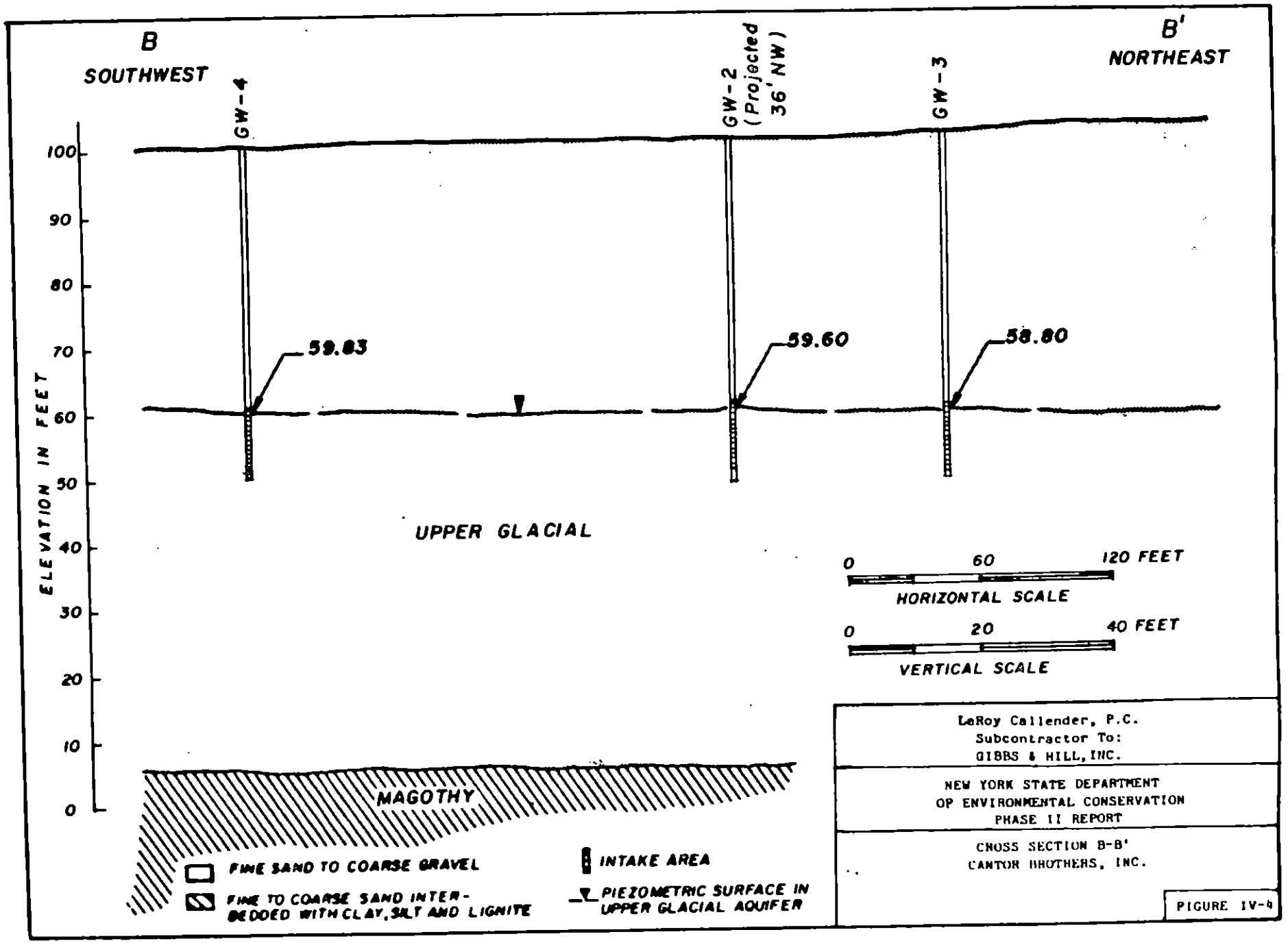
Compound (2)	Sample Locations					Range of Concentration in Noncontaminated Soils (ug/kg)
	SD-1 (DL) (ug/kg)	SD-2 (DL) (ug/kg)	SD-3 (DL) (ug/kg)	MW#1 (Soil) (ug/kg)	MW#2 (Soil) (ug/kg)	
Aldrin	160U	70U	67	8U (3)	8U	NA
Chlordane	1,600U	700U	550U	80U	80U	NA
Dieldrin	320U	140U	120	16U	16U	NA
Endrin	180J	140U	240	1	16U	NA
Heptachlor	160U	70U	55U	8U	8U	NA
Lindane	160U	70U	55U	8U	8U	NA
Methoxychlor	1,600U	700U	550U	80U	80U	NA
Toxaphene	3,200U	1,400U	1,100U	160U	160U	NA

(1) Samples collected by LC/PC & H2M labs, September and October 1988.
(2) Only those constituents which exhibited elevated levels of pesticide organic concentration in catch basin sediment samples, and whose concentrations in groundwater are regulated under State Standards 6NYCRR Part 703, 1978, are presented.

(3) Concentrations in MW#1 soil sample represent background levels of soil contamination for the site.
DL Entered when the sample extract had to be diluted, because of suspected interference.
U Minimum attainable detection limit for the sample.
NA Information not available.


W.L.
60.30
A
GW-1
GR. ELEV. 100.4'
60
1 STY CONC. BLOCK BLDG.
WAREHOUSE AREA
FACTORY AREA
TRASH COMPACTOR/
DUMPSTER
EXISTING
PARKING
SD-1
97.50'
CONC. PLATFORM
98.19'
SD-2
LOADING DOCKS
2-STORY
OFFICE AREA
EXISTING
PARKING
98.18'
SD-3
T.B.M.-1
ELEV. 100.0'
W.L.
59.83
B
GW-4
GR. ELEV. 100.0'
98.85'
TRUCK FILL AREA
W.L.
59.63
GW-2
GR. ELEV. 100.4'
W.L.
58.80
GW-3
GR. ELEV. 100.6'
98.18'
LANE
ENGINEERS
A
A'
59
B'
50 30 10 0 50 100 FT.
40 20
APPROX. SCALE
CENTRAL HIGHWAY
N
LEGEND
UNDERGROUND TANK W/NUMBER
UNDERGROUND TANK W/NUMBER - TIGHT, IN SERVICE
EXISTING STORM DRAINAGE LEACHING POOL
EXISTING SANITARY CESSPOOL
EXISTING SANITARY SEPTIC TANKS
APPROX. LOCATION OF EXISTING MONITORING WELLS SCONDA 1984
EXISTING UNDERGROUND TANK(S) TO BE REMOVED AND REPLACED WITH NEW TANK
MONITORING WELL DRILLED UNDER LC/PC'S SUPERVISION, SEPT. 1988
GW-1
SEDIMENT CATCH BASINS SAMPLED, DEC. 1988
SD-1
G.W. Flow
G.W. Level 60.30
G.W. Contour
LeRoy Callender, P.C.
Subcontractor To:
GIBBS & HILL, INC.
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT
PLOT PLAN
CANTOR BROTHERS, INC.
FIGURE IV-2


A
NORTHWEST
A'
SOUTHEAST
GW-1
GW-2
100
90
80
70
60
50
40
30
20
10
0
ELEVATION IN FEET
60.3
59.6
UPPER GLACIAL
0
60
120 FEET
HORIZONTAL SCALE
0
20
40 FEET
VERTICAL SCALE
MAGOTHY
FINE SAND TO COARSE GRAVEL
FINE TO COARSE SAND INTER-BEDDED WITH CLAY, SILT AND LIGNITE
INTAKE AREA
PIEZOMETRIC SURFACE IN UPPER GLACIAL AQUIFER
LeRoy Callender, P.C.
Subcontractor To:
GIBBS & HILL, INC.
NEW YORK STATE DEPARTMENT
OP ENVIRONMENTAL CONSERVATION
PHASE II REPORT
CROSS SECTION A-A'
CANTOR BROTHERS, INC.
FIGURE IV-3


B
SOUTHWEST
B'
NORTHEAST
GW-4
GW-2 (Projected 36' NW)
GW-3
59.83
59.60
58.80
ELEVATION IN FEET
100
90
80
70
60
50
40
30
20
10
0
UPPER GLACIAL
MAGOTHY
0 60 120 FEET
HORIZONTAL SCALE
0 20 40 FEET
VERTICAL SCALE
FINE SAND TO COARSE GRAVEL
FINE TO COARSE SAND INTER-BEDDED WITH CLAY, SILT AND LIGNITE
INTAKE AREA
PIEZOMETRIC SURFACE IN UPPER GLACIAL AQUIFER
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NEW YORK STATE DEPARTMENT
OP ENVIRONMENTAL CONSERVATION
PHASE II REPORT
CROSS SECTION B-B'
CANTOR BROTHERS, INC.
FIGURE IV-4

FINAL APPLICATION OF HRS

LeRoy Callender PC

A. NARRATIVE SUMMARY

Cantor Brothers, Inc. site is a 3.2-acre site on Engineers Lane, Town of Babylon, in southwestern Suffolk County, New York, approximately 2 miles east of the Nassau County line.

At the time of the LC/PC site survey (July, 1988), Cantor Brothers, Inc. was an active chemical repacker, handling petroleum distillate solvents, paint thinners, and caulking compounds. Cantor Brothers, Inc. is a private corporation which owns the site property, and its operations are directed by its General Manager, Mr. Matthew J. Miller.

Contamination of the groundwater and catch basin sediments was detected during the Phase II ivestigation and earlier site inspections. Several inorganic and organic contaminants were found in the groundwater, and catch basin sediments. The upper glacial aquifer was found to be contaminated. An HNu meter survey showed no significant organic contamination of the air at the site.

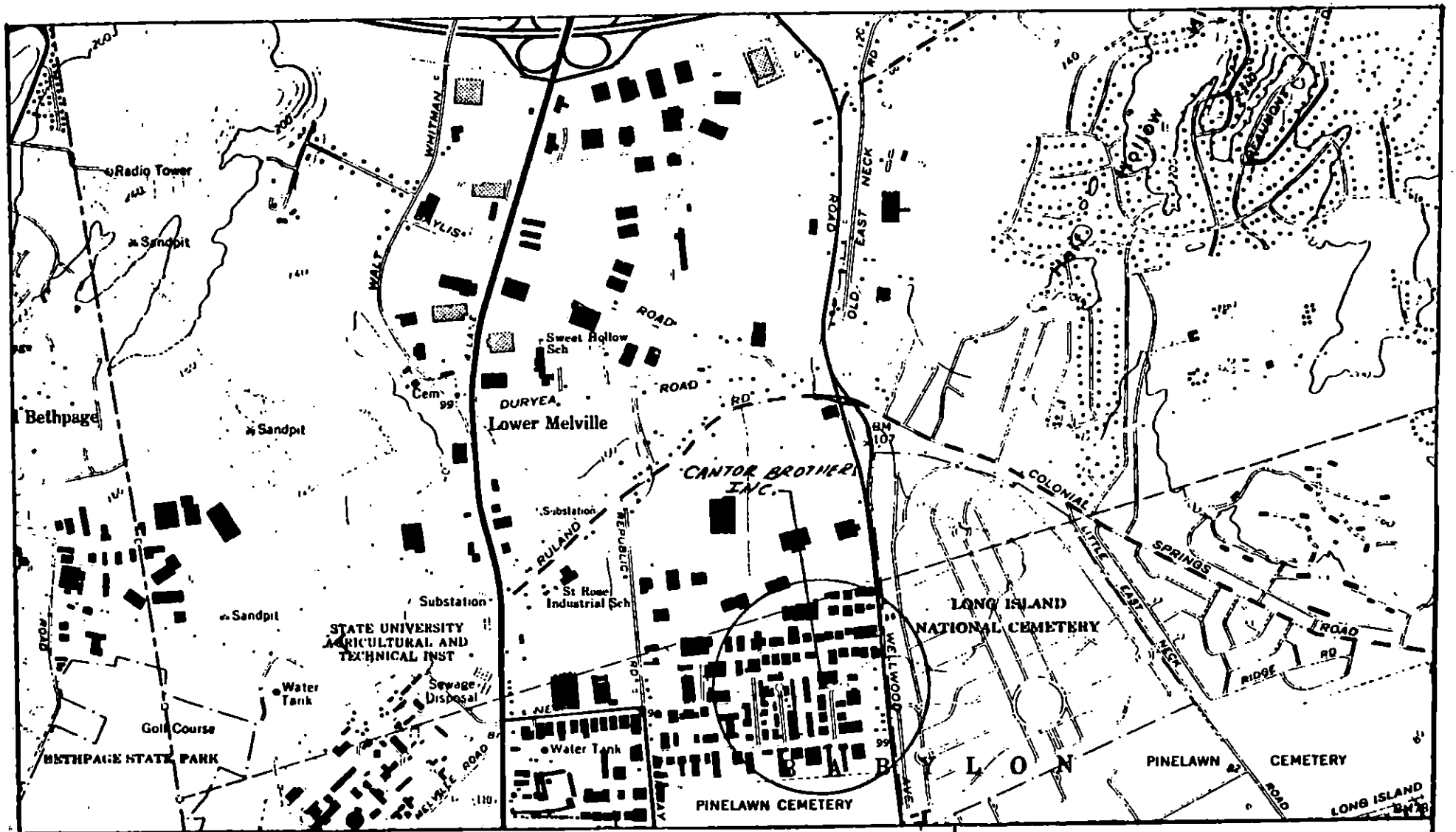
Approximately 5,454 people live within 1-mile radius of the site, and groundwater is their primary source of drinking water supply.

The site is surrounded by numerous commercial and manufacturing facilities, and Bethpage State Park is located approximately 1.5 miles to the west. There are no surface water intakes, freshwater or coastal wetlands within a one-mile radius of the site. The site has no potential impacts on endangered species, rare plant, animal or natural occurrences, or other significant habitats.

State officials have cited Cantor Brothers, Inc. for violation of Article 12 of the Suffolk Country Sanitary Code on several occasions. These violations include spills of hazardous chemicals onto the ground, leaking underground chemical storage tanks, and improper storage of hazardous materials indoors, outside spill-containment areas.

5.B. SITE LOCATION MAP

LeRoy Callender PC



LONGITUDE: 73° 24' 17"
LATITUDE: 40° 45' 20"

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
HUNTINGTON QUADRANGLE, N.Y. (1979)

SCALE 0 1000 2000 3000 4000 FEET

N

LeRoy Callender, P.C.
Subcontractor To:
GIBBS & HILL, INC.

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT

SITE LOCATION MAP
CANTOR BROTHERS, INC.

FIGURE V-1

5.C. HRS WORKSHEETS

LeRoy Callender PC

Facility name: Cantor Brothers, Inc.

Location: Farmingdale, New York

EPA Region: II

Person(s) in charge of the facility: Matthew Miller, Gen. Mgr.

Name of Reviewer: LeRoy Callender, P.C. Date: May 1, 1989

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Site Activities at present consist of chemical repacking and manufacturing paint products, involving petroleum distillate solvents, paint thinners, and caulking compounds. The route of major concern is groundwater. Contamination by organic and inorganic chemicals was found in groundwater and catch-basin sediment samples.

Scores: S_M =51.13 S_{gw} =88.46 S_{sw} =0.0 S_a =0.0)

S_{FE} =35

S_{DC} =50.00

HRS COVER SHEET

Ground Water Route Work Sheet					
Rating Factor	Assigned Value Circle One	Multi-plier	Score	Max. Score	Ref Section
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 (3)	2	6	6	
Net Precipitation	0 1 (2) 3	1	2	3	
Permeability of the Unsaturated Zone	0 1 2 (3)	1	3	3	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			14	15	
3 Containment	0 1 2 (3)	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
Total Waste Characteristics Score			23	26	
5 Targets					3.5
Ground Water Use	0 1 2 (3)	3	9	9	
Distance to Nearest Well/Population Served	0 4 6 9 10 / 12 16 18 20 / 24 30 32 35 (40)	1	40	40	
Total Targets Score			49	49	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			50,715	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{GW} = 88.46		

GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	(0) 1 2 3	2	0	6	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			5	15	
3 Containment	0 1 2 (3)	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
Total Waste Characteristics Score			23	26	
5 Targets					4.5
Surface Water Use	(0) 1 2 3	3	0	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			0	55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			0	64,350	
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} =	0.0		

SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
[1] Observed Release	(0) 45	1	0	45	5.1
Date and Location: From 9/14/88 to 10/6/88 on site, once daily.					
Sampling Protocol: Perimeter survey with an HNu meter.					
If line [1] is 0, the S_a = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2].					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 (1) 2 3	1	1	3	
Toxicity	0 1 2 (3)	3	3	9	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
	Total Waste Characteristics Score		9	20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 / 21 (24) 27 30	1	24	30	
Distance to Sensitive Environment	(0) 1 2 3	2	0	6	
Land Use	0 1 2 (3)	1	3	3	
	Total Targets Score		27	39	
[4] Multiply [1] x [2] x [3]			0	35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a = 0.0			

AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	88.46	7825.17
Surface Water Route Score (S_{sw})	0.0	0.0
Air Route Score (S_a)	0.0	0.0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		7825.17
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		88.46
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73 = S_M =$		51.13

WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet *						
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 (3)	1	3	3	7.1
2 Waste Characteristics					7.2
Direct Evidence	(0) 3	1	0	3	
Ignitability	0 1 (2) 3	1	2	3	
Reactivity	0 (1) 2 3	1	1	3	
Incompatibility	(0) 1 2 3	1	0	3	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
Total Waste Characteristics Score			8	20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 (5)	1	5	5	
Distance to Nearest Building	0 1 2 (3)	1	3	3	
Distance to Sensitive Environment	(0) 1 2 3	1	0	3	
Land Use	0 1 2 (3)	1	3	3	
Population Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Buildings Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Total Targets Score			21	24	
4 Multiply 1 x 2 x 3			504	1,440	
5 Divide line 4 by 1,440 and multiply by 100			S FE = 35*		

FIRE AND EXPLOSION WORK SHEET

* Note: Although local Fire Marshal has not declared this site a fire and/or explosion hazard, several violations of the Babylon Town Fire Prevention Code have been found at this site.

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 (3)	1	3	3	8.2
3 Containment	0 (15)	1	15	15	8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 (4) 5	4	16	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
Total Targets Score			16	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			10,800	21,600	
7 Divide line 6 by 21,600 and multiply by 100			Soc = 50.00		

DIRECT CONTACT WORK SHEET

5.D. HRS DOCUMENTATION RECORDS

LeRoy Callender PC

LeRoy
Callender
PC

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

Instructions: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible, summarize the information you used to assign the score for each factor (e.g., "Waste quantity= 4,230 drums plus 800 cubic yards of sludges."). The source of information should be provided for each entry and should be bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevent page (s) for ease in review.

Facility Name: Cantor Brothers, Inc.

Location: East Farmingdale, Town of Babylon,
Suffolk County, New York

Date Scored: May 1, 1989

Person Scoring: Sirous H. Nabavi, LeRoy N. Callender, P.C.

GROUNDWATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (5 maximum)
- Tetrachloroethene
- 1,1,1-Trichloroethane
- Trichloroethene
- Arsenic

Rationale for attributing the contaminants to the facility:

Downgradient sample (MW#3) exhibits several times concentration of above-mentioned contaminants found in upgradient sample(MW#1). (Ref. #3, H2M Labs, Inc. 1989).

Assigned Value = 45

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/Description of aquifer(s) of concern:

Upper glacial aquifer; Magothy aquifer (Ref. #1, Franke and McClymonds, 1972; Ref. #4, Jensen and Soren, 1974).

Depth (s) from the ground surface to the highest seasonal level of the saturated zone [water table (s)] of the aquifer of concern:

39 feet (measured in monitoring wells drilled 9/88).

Depth from the ground surface to the lowest point of waste disposal/storage:

15 feet (measured in Catch Basin No.2).

Assigned Value = 3

Net Precipitation
(Ref. #19, Climatic Atlas of the United States, U.S. Dept. of Commerce, National Climatic Center, 1979).

Mean annual or seasonal precipitation (list months for seasonal):

46 inches (Normal Annual Total Precipitation).

Mean annual lake or seasonal evaporation (list months for seasonal):

31 inches (Mean Annual Lake Evaporation).

Net precipitation (subtract the above figures):

15 inches.

Assigned Value = 2

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

sand and gravel (Ref. #1 on Page V-32).

Permeability associated with soil type:

greater than 10^{-3} cm/sec (Ref. #21, User's Manual). See, also, permeability calculations from Phase II Monitoring well test results, page IV-13.

Assigned Value = 3

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Liquid (Ref. #24 SCDHS, Insp. Report dated 1/22/88).

Assigned Value = 3

3. CONTAINMENT

Containment

Method (s) of waste or leachate containment evaluated:

13 underground tanks; approximately 40 55-gal. drums; indoors concrete curbs or berms around drum storage area.

Method with highest score:

Leaking underground tanks.

Assigned Value = 3 (Ref. #21, User's Manual).

4. WASTE CHARACTERISTICS

Toxicity and Persistance

Compound(s) evaluated:

Arsenic, tetrachloroethene, 1, 1, 1 - trichloroethane, trichloroethene (Ref. #3, H2M Labs, Inc. 1989).

Compound with highest score:

Arsenic - Matrix Value = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (give a reasonable estimate even if quantity is above maximum):

270 tons (13 underground tanks = 52,000 gallons: 40 drums @ 50 gals. each = 2,000 gallons. Total = 54,000 gallons or 270 tons.)

Assigned Value = 5

This is an estimated amount based on the capacity of the storage tanks. It could be higher or lower depending on the total period of leakage.

Basis of estimating and/or computing waste quantity:

Inspection Report dated 1/22/88, by Suffolk County Dept. of Health Services (Ref. #24, SCDHS, 1988 a).

5. TARGETS

Groundwater Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Public supply wells and industrial wells.

(Ref. #13, NYS Atlas of Community Water System Sources, 1982 - 1988 Update. Also, Ref. #12, Well Permits obtained from NYSDEC-Region I.)

Groundwater sources of Magothy aquifer are used for public water supplies. This aquifer is hydraulically connected to Upper Glacial aquifer, which overlies it (Ref. #16, Taney, 1961; Ref. #4, Jensen and Soren, 1974).

Assigned Value = 3

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

495 Smith Street, (Long Island Transmission, Inc.)

Distance to above well or building:

600 feet (Ref. #12, Well Permit No. S-30062, NYSDEC-Reg.1).

Population Served by Groundwater Wells Within a 3-Mile Radius

Public water supplies of East Farmingdale (affected popultion: 7,850); Babylon (Suffolk County Water Authority-affected population, estimated @ 29,221): South Huntington (affected population, estimated @ 15,378): and Dix Hills (affected population estimated @ 6,666). Total affected population : 59,115.

(Ref. #13, NYS Atlas of Community Water System Sources - 1982 - 1988 Update. Also, Ref. #6, 1988 Long Island Almanac).

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

None

Total population served by ground water within a 3-mile radius: 59,115. (Ref. #8, on Page V-32).

Assigned Value = 40

SURFACE WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

None known.

Assigned Value = 0

Rationale for attributing the contaminants to the facility:

Not applicable.

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

0.14 percent (Ref. #14, Storch Assoc. Site Survey, 1988).

[100.4' - 100.00' = 0.4' - 291 = 0.137%]

Name/description of nearest downslope surface water:

Neguntatogue Creek (Ref. #22, USGS, Amityville Quadrangle, 1979).

[The Creek is situated 4.1 miles south-east of the site]

Average slope of terrain between facility and above-cited surface water body in percent:

Less than 1% (Ref. #22, USGS, Amityville Quadrangle, 1979).

[100.0' - 28.0' = 72.0' - 21,600.0' = 0.33%]

Is the facility located either totally or partially in surface water?

No (Ref. #22, USGS, Huntington Quadrangle, 1979: LC/PC Site Reconnaissance, 1988).

Is the facility completely surrounded by areas of higher elevation?

No (Ref. #22, USGS, Huntington Quadrangle, 1979).

Matrix Value = 0

1-Year 24-Hour Rainfall in Inches

2.7" (Ref. #20, U.S. Department of Commerce Technical Paper NO. 40).

Assigned Value = 2

Distance to Nearest Downslope Surface Water

4 miles (Ref. #22, USGS, Amityville Quadrangle, 1979).

Assigned Value = 0

Physical State of Waste

Liquid (Ref. #24, SCDHS, 1988 a).

Assigned Value = 3

* * *

3. CONTAINMENT

Containment

Methods(s) of waste or leachate containment evaluated:

13 Underground storage tanks: approximately 40 55-gal. drums; indoor concrete berms or curbs around 55-gal. containers. (Ref. #24, on Page V-34).

Method with highest Score:

Leaking underground tanks.

Assigned Value =3

4. WASTE CHARACTERISTICS

Toxicity and Persistance

Compound(s) evaluated:

Arsenic, Tetrachloroethene, 1,1,1 - Trichloroethane, Trichloroethene(Ref. #3, H2M Labs., Inc.1989).

Compound with highest score:

Arsenic - Matrix Value = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

270 tons (13 underground tanks = 52,000 gallons : 40[1] drums @ 50 gal. each = 2,000 gallons. Total = 54,000 gallons or 270 tons.

Assigned Value = 5

This is an estimated amount based on the capacity of the storage tanks. It could be higher or lower depending on the total period of leakage.

Basis of estimating and/or computing waste quantity:

Inspection Report dated January 22, 1988 by Suffolk County Dept. of Health Services (Ref. #24, SCDHS, 1988 a).

* * *

Note (1)-For capacity of drums, see User's Manual, Ref. #21, Page 19.

5. TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

None known. (See Ref. #1 on Page V-32; Franke & McClymonds, Page F8.)

Is there tidal influence?

No (Ref. #22, USGS, Amityville Quadrangle, 1979).

Assigned Value = 0

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None (Ref. #10, NYSDEC, Region I-Bureau of Marine Habitat, Map of State Recognized Coastal Wetlands, January 1989).

Distance to 5-acre (minimum) freshwater wetlands, if 1 mile or less:

None (Ref. #9, NYSDEC, Reg. I - Bureau of Freshwater Wetlands, Map of State Recognised Freshwater Wetlands, January 1989).

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None (Ref. #11, NYSDEC, Reg. I - Bureau of Wild Life Corres., January 1989).

Assigned Value = 0

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

Not applicable.

Matrix Value = 0

Computation of land area by above-cited intake(s) and conversion to population (1.5 people per acre):

Not applicable.

Total population served:

Not applicable.

Name/description of nearest of above water bodies:

Not applicable.

Distance to above-cited intakes, measured in stream miles:

Not applicable.

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected:

No significant organic contamination detected during Phase II investigation with an HNu meter (LC/PC, 1988).

Date and location of detection of contaminants:

See above.

Methods used to detect the contaminants:

See above

Rationale for attributing the contaminants to the site:

See above.

Assigned Value = 0

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

1,1,1 - Trichloroethane - score = 1.

Most incompatible pair of compounds:

No incompatible substances are present, (Ref. #7, Mallinckrodt, Inc., 1989).

Score = 0

Assigned Value = 1

Toxicity

Most toxic compound:

Arsenic - Score = 3

Hazardous Waste Quantity

Total quantity of hazardous substances:

270 tons (13 underground tanks = 52,000 gallons; 40 drums @ 50 gal. each = 2,000 gallons. Total = 54,000 gallons or 270 tons.) (See note on Page V-19).

Basis of estimating and/or computing waste quantity:

Inspection Report dated Jan. 22, 1988 by Suffolk County Dept. of Health Services (Ref. #24, SCDHS, 1988a).

Assigned Value = 5

This is an estimated amount based on the capacity of the storage tanks. It could be higher or lower depending on the total period of leakage.

* * *

3. TARGETS

Population within 4-mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi (0 to 1/4 mi)

1,298.

(Ref. #22, USGS, Huntington Quadrangle, 1979) - Number of industrial buildings: 63, assumed population per building: 20; number of dwellings: 10, assumed population per dwelling: 3.8. Thus:

(63 x 20 = 1,260) + (10 x 3.8 = 38) = 1,298.)

Assigned Value = 24

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None within 2 miles (Ref. #10, NYSDEC, Region I - Bureau of Marine Habitat, Map of State-Recognised Wetlands, Jan./89).

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within a mile (Ref. #9, NYSDEC, Region I - Bureau of Freshwater Wetlands, Map of State Recognized Freshwater Wetlands, Jan. 1989).

Distance to critical habitat of an endangered species, if 1 mile or less:

None within 1 mile (Ref. #11, NYSDEC, Region I- Bureau of Wildlife, Corres., Jan. 1989).

Assigned Value = 0

Land Use

(Ref. #22, on Page V-34; USGS Quandrangle Maps)

Distance to commercial/industrial area, if 1 mile or less:

Immediately adjacent to site. Score = 3

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

1.5 miles - Bethpage State Park.

Distance to residential area, if 2 miles or less:

Less than 1/4-mile (Ref. #14, Site Survey). - Score = 3

Distance to agricultural land in production within past 5 years, if 1 mile or less:

1/2 to 1 mile (Ref. #15, Suffolk County Soil & Water Conservation District, Corres. 1989).
Score = 1

Is a historic or Landmark Site (National Register of Historic Places and National Landmarks) within the view of the site?

No. (Ref. #18, Corres. w/ Historian, Town of Babylon, 1/89)
Score = 0

Assigned Value = 3

FIRE AND EXPLOSION

NOTE: Although the local Fire Marshal has not declared this site a Fire and/or explosion hazard, several violations of the Babylon Town Fire Prevention Code have been found at the site. In addition, the Fire Prevention Permit (#524) has not been issued for this location in a number of years. (Ref. #17, Senior Fire Marshal's letter of 1/4/89).

1. CONTAINMENT

Hazardous substances present:

1,1,1-Trichloroethane, Trichlorothene, Tetrachloroethene, Kerosene, Lacquer thinner (Ref. #24, SCDHS, 1988a).

Type of containment, if applicable:

Underground tanks; 55-gal. drums; 5-gal. containers.

Assigned Value = 3 (Ref. #21, User's Manual).

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

Not applicable.

Assigned Value = 0

Ignitability

Compound used:

Kerosene (Ref. #21, User's Manual)

Assigned Value = 2

Reactivity

Most reactive compound:

1,1,1 - Trichloroethane (Ref. #24, SCDHS, 1988a.) - score = 1.

Incompatibility

No incompatible substances are present (Ref. #7, Mallinckrodt, Inc., 1989).

Assigned Value = 0

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

270 tons (13 underground tanks = 52,000 gallons; 40 drums @ 50 gal. each = 2,000 gals. Total = 54,000 gallons or 270 tons.)

Basis of estimating and/or computing waste quantity:

Inspection Report dated 1/22/88 by SCDHS (Ref. #24, SCDHS, 1988 a.)

Assigned Value = 5 (Ref. #21, User's Manual).

This is an estimated amount based on the capacity of the storage tanks. It could be higher or lower depending on the total period of leakage.

* * *

3. TARGETS

Distance to Nearest Population

0.0 mile (Ref. #14, on Page V-33).

Assigned Value = 5

Distance to Nearest Building

0.0 mile (Ref. #14, on Page V-33).

Assigned Value = 3

Distance to Sensitive Environment

Distance to wetlands:

More than 100 feet (Ref. #9, Map of State Recognized Wetlands - NYSDEC, Region 1).

Score =0

Distance to critical habitat:

More than 1/2 mile (Ref. #11, NYSDEC, Region 1- Bureau of Wildlife Correspondence 1/89). Score = 0

Assigned Value = 0

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Immediately adjacent to site (Ref. #22, on Page V-34, USGS Quadrangle Maps). Score =3

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

1.5 miles - Bethpage State Park.

Distance to residential area , if 2 miles or less:

Less than 1/4 mile (Ref. #14, Site Survey).

Score = 3

Distance to agricultural land in production within past 5 years, if 1 mile or less:

1/2 to 1 mile (Ref. #15, Suffolk County Soil& Water Conservation District, Correspondence, 1/89); Ref. #6, Long Island Almanac, Sheet #6.

Score = 1

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

No, (Ref. #18, Corres. w/ Historian, Town of Babylon - 1/89).

Assigned Value = 3

Population within 2-mile Radius

32,886 (Ref. #22, USGS Amityville, Huntington, Greenlawn, and Bay Shore West Quadrangles, 7.5 Minutes Series, topographic, 1979; Ref. #6, Long Island Almanac, 1988).

Assigned Value = 5

Buildings within 2-Mile Radius

2,653 (Estimated - Ref. #22, USGS Amityville, Huntington, Greenlawn,and Bay Shore West Quadrangles, 7.5 Minute Series, Topographic, 1979).

Assigned Value = 5 (User's Manual)

DIRECT CONTACT

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No known observed incidents.

Assigned Value = 0

2. ACCESSIBILITY

Describe type of barrier(s):

No barrier completely surrounds the facility.

Assigned Value = 3

3. CONTAINMENT

Type of containment, if applicable:

Underground and above-ground tanks; 55-gal. drums and 5 gal. containers.

Assigned Value = 15

4. WASTE CHARACTERISTICS

Compounds evaluated:

Arsenic, 1,1,1, - Trichloroethane, Tetrachloroethene, Trichloroethene, and Kerosene (Ref. #3 on Page V-32, H2M Labs, Inc., 1989; Ref #24, SCDHS, 1988a).

Compound with highest score:

Arsenic - Score = 3

Assigned Value = 3

5. TARGETS

Population within one-mile radius

5,454 people (Ref. #22, USGS Amityville, and Huntington Quadrangles, 7.5 Minute Series, Topographic, 1979).

Assigned Value = 4 (User's Manual)

Distance to critical habitat (of endangered species)

Greater than 1 mile (Ref. #11, NYSDEC, REGION 1-Bureau of Wildlife Corresp. 1/89).

Assigned Value = 0

HRS DOCUMENTATION REFERENCES
CANTOR BROTHERS, INC.

1. Franke, O.L. and McClymonds, N.E., 1972, Summary of the Hydrologic Situation on Long Island, New York, as a Guide to Water-Management Alternatives, U.S. Geological Survey Professional Paper 627-F, Washington, D.C.

2. Guidebook for Initial Response to Hazardous Materials Incidents (1987). U.S. Dept. of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Transportation, Washington, D.C.

3. H2M Labs, Inc. (1989). Analytical Results for Groundwater and Soil Samples.

4. Jensen, H.M. and Soren, Julian, 1974, Hydrogeoloy of Suffolk County, Long Island New York, U.S. Geological Survey Hydrologic Investigations Atlas HA-501, Washington, D.C.

5. LeRoy Callender, P.C. Phase II Investigation Well Boring Logs.

6. Long Island Business News (1988). "Long Island Almanac - An Annual Comprehensive factbook recording the status of the Nassau-Suffolk region".

7. Mallinckrodt, Inc. (1989). Material Safety Data for Hazardous Substances: Tetrachloroethylene; 1,1,1 - Trichloroethane; and, Trichloroethylene. Mallinckrodt, Science Products Div., Paris, KY.

8. Methodology for estimating population- Prepared by LC/PC, based on NYSDEC, Albany Guidelines and User's Manual.

9. NYSDEC-Region I, Bureau of Freshwater Wetlands, Map of State Recognized Freshwater Wetlands, Jan. 1989.

10. NYSDEC - Region I, Bureau of Marine Habitat, Map of State Recognized Coastal Wetlands, Jan 1989.

11. NYSDEC - Region I, Bureau of Wildlife, Corresp. dated January 27, 1989 with Mr. Michael S. Scheibel, Senior Wildlife Biologist.

12. NYSDEC - Region I, Division of Well Permits (1989). Map of Public & Private Wells in Vicinity of Cantor Brothers, Inc. Site.

13. NYSDOH (1982). "New York State Atlas of Community Water System Sources". Updated Population Data (1988).

14. Storch Associates, 1988. Topographic Site Survey Map of Cantor Brothers, Inc. Site, Scale 1" = 80'.

15. Suffolk County, Soil & Water Conservation District, Corresp. dated January 17, 1989 with Mr. Thomas J. McMahon, Senior District Technician.

16. Taney, N.E., 1961, Geomorphology of the South Shore of Long Island, New York, Technical Memorandum No. 128, Beach Erosion Board, Corps of Engineers, Washington, D.C.

17. Town of Babylon, Suffolk County, N.Y. Correspondence dated January 4, 1989, with Mr. Thomas J. Karn, Senior Fire Marshal.

18. Town of Babylon, Suffolk County, N.Y. Correspondence dated January 26, 1989 with Mr. Robert Mills Smith, Town Historian.

19. United States Department of Commerce (1979). "Climatic Atlas of the United States."

20. United States Department of Commerce (1963). " Rainfall Frequency Atlas of the United States", Technical Paper No. 40.

21. United States Environmental Protection Agency (1984). "Uncontrolled Hazardous Waste Site Ranking System, A User's Manual (HEW-10)", Washington, D.C.

22. United States Geological Survey (1979). Amityville, Huntingtown, Greenlawn, and Bay Shore West Quadrangles, 7.5 Minute Series, Topographic Maps.

23. Suffolk County Department of Health Services, Industrial Waste and Hazardous Materials Control, Inspection Report dated 10/19/88, on sampling results of Storm Drain at east side of main building at Cantor Brothers, Inc. site in East Farmingdale, Suffolk County, New York.

24. SCDHS, Inspection Report dated 1/22/88, re Cantor Brothers, Inc. site including a description of the status of chemicals storage in the Warehouse Area, Package Area, and the Article XII sections of the Warehouse Area, plus an updated Tank Inventory.

REF. 1.

Summary of the Hydrologic Situation on Long Island, New York, as a Guide to Water-Management Alternatives

By O. L. FRANKE *and* N. E. McCLYMONDS

HYDROLOGY AND SOME EFFECTS OF URBANIZATION ON LONG ISLAND, NEW YORK

GEOLOGICAL SURVEY PROFESSIONAL PAPER 627-F

Prepared in cooperation with the New York State Department of Conservation, Division of Water Resources; the Nassau County Department of Public Works; the Suffolk County Board of Supervisors; and the Suffolk County Water Authority



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UNITED STATES DEPARTMENT OF THE INTERIOR

ROGERS C. B. MORTON, *Secretary*

GEOLOGICAL SURVEY

W. A. Radlinski, *Acting Director*

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In this section of the report the basic time unit for presenting hydrologic information is the water year, which is the 12-month period beginning on October 1 and ending on September 30; it is designated by the calendar year in which it ends.

HOW AND WHERE THE WATER OCCURS

On Long Island and its environs, water occurs as vapor, as a liquid, and at times during the winter as a solid in the form of ice or snow. The water vapor occurs primarily in the atmosphere and in the zone of aeration. In this study the water vapor of the atmosphere is not of concern until it condenses and reaches the land surface as precipitation.

Liquid water occurs mainly in bodies of surface water and as ground water. Fresh surface-water bodies include lakes and streams. In addition, Long Island is surrounded by the salty water of Long Island Sound and the Atlantic Ocean. Brackish surface water occurs in the estuaries and bays between the fresh-water streams and ocean water.

Most of the fresh ground water occurs from the bedrock surface to the water table beneath the entire mainland of Long Island, except for the Forks where only the upper layers contain fresh ground water. Locally, small, and probably insignificant, amounts of fresh ground water occur in fractures and in the upper part of the bedrock where it is highly weathered. The occurrence of fresh ground water beneath the adjacent bays and barrier beaches varies with depth and specific location, and salty ground water occurs seaward of fresh ground water around the entire perimeter of Long Island.

BODIES OF SURFACE WATER

Several lakes and most of the principal streams on Long Island are shown in figure 3. Lake Ronkonkoma, with an area of about 0.35 square mile, is the largest lake on Long Island. The northward-flowing Nissequogue River has the greatest average discharge—about 42 cfs (cubic feet per second) for the period 1940–65—of any stream on Long Island. The eastward-flowing Peconic River is the longest stream, having a main wet-channel length of about 9–10 miles upstream from the gaging station. The remaining larger streams flow southward into Great South Bay. Relative to the southward-flowing streams—except for the Nissequogue River—the northward-flowing streams are short, few in number, and discharge relatively small amounts of water.

ZONE OF AERATION

The zone of aeration is that part of the solid earth lying above the water table. The interstices in this zone are largely filled with atmospheric gases (including water vapor) and liquid water. The extremely significant process of evapotranspiration occurs primarily on and within several feet of the upper surface of the zone of aeration (land surface), and most of the water that recharges the ground-water reservoir passes through the zone of aeration.

The volumes of the zone of aeration for all of Long Island and for the water-budget area were about 11 and 10 cubic miles, respectively, in September 1965. If the specific retention of the deposits in the zone of aeration is assumed to be 10–15 percent (see section on "Infiltration to the Zone of Aeration," p. F20), an average of about 1 cubic mile of water was stored in this zone on Long Island at that time. However, this water cannot move into a well and, therefore is not available for direct use by man.

The distribution of areas with various depths to the water table in the water-budget area and the immediately adjacent nearshore areas is shown in figure 6. The data show that the depth to the water table is less than 10 feet for about 14 percent, or for about 120 square miles of this area. Within the water-budget area, however, the depth to the water table is less than 10 feet in only about 50 square miles.

Figure 7 shows the depth to the water table in a typical area in the southern part of Long Island, based on water levels in October 1961. An appreciable area near the south shore is characterized by depths to the water table that are less than 10 feet; the depth to the water table generally increases gradually northward to the terminal moraine. In most of the areas

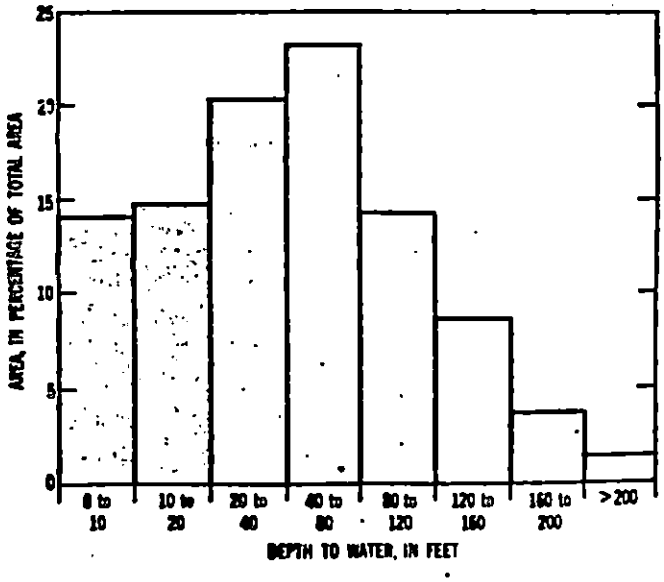


FIGURE 6.—Distribution of depths to the water table in the water-budget and adjacent nearshore areas, based on ground-water levels in September 1965.

SHEET 4 OF 12

underlain by terminal-moraine deposits, the depth to the water table is more than 50 feet, and in small areas the depth to the water table is more than 200 feet. Depths to the water table near the northern coast of the island generally are more than 20 feet, except adjacent to stream channels or in narrow bands near the shoreline.

GROUND-WATER RESERVOIR

HYDROLOGIC FEATURES OF THE GROUND-WATER RESERVOIR

The overall hydrogeologic setting of Long Island was described in considerable detail by Veatch (1906), Fuller (1914), and Suter, De Laguna, and Perlmutter (1949). The geology and related hydrology of several smaller areas of Long Island have been studied in greater detail by others, including De Laguna (1963), Isbister (1966), Lubke (1964), Lusczynski and Swarzenski (1966), Perlmutter and Geraghty (1963), Pluhowski and Kantrowitz (1964), and Swarzenski (1963).

Long Island is underlain by consolidated bedrock, which, in turn, is overlain by a wedge-shaped mass of unconsolidated rock materials (fig. 8).[1] These materials, which constitute Long Island's ground-water reservoir, consist primarily of a series of Pleistocene glacial deposits and Cretaceous fluvial or deltaic deposits composed of gravel, sand, silt, clay, and mixtures thereof. The Cretaceous deposits were eroded by

[1] The actual dip of the upper bedrock surface is slightly less than 1° to the southeast. The much greater inclination of the bedrock surface and the Magothy aquifer shown in figure 8 is due to the large vertical-scale exaggeration of this cross section.

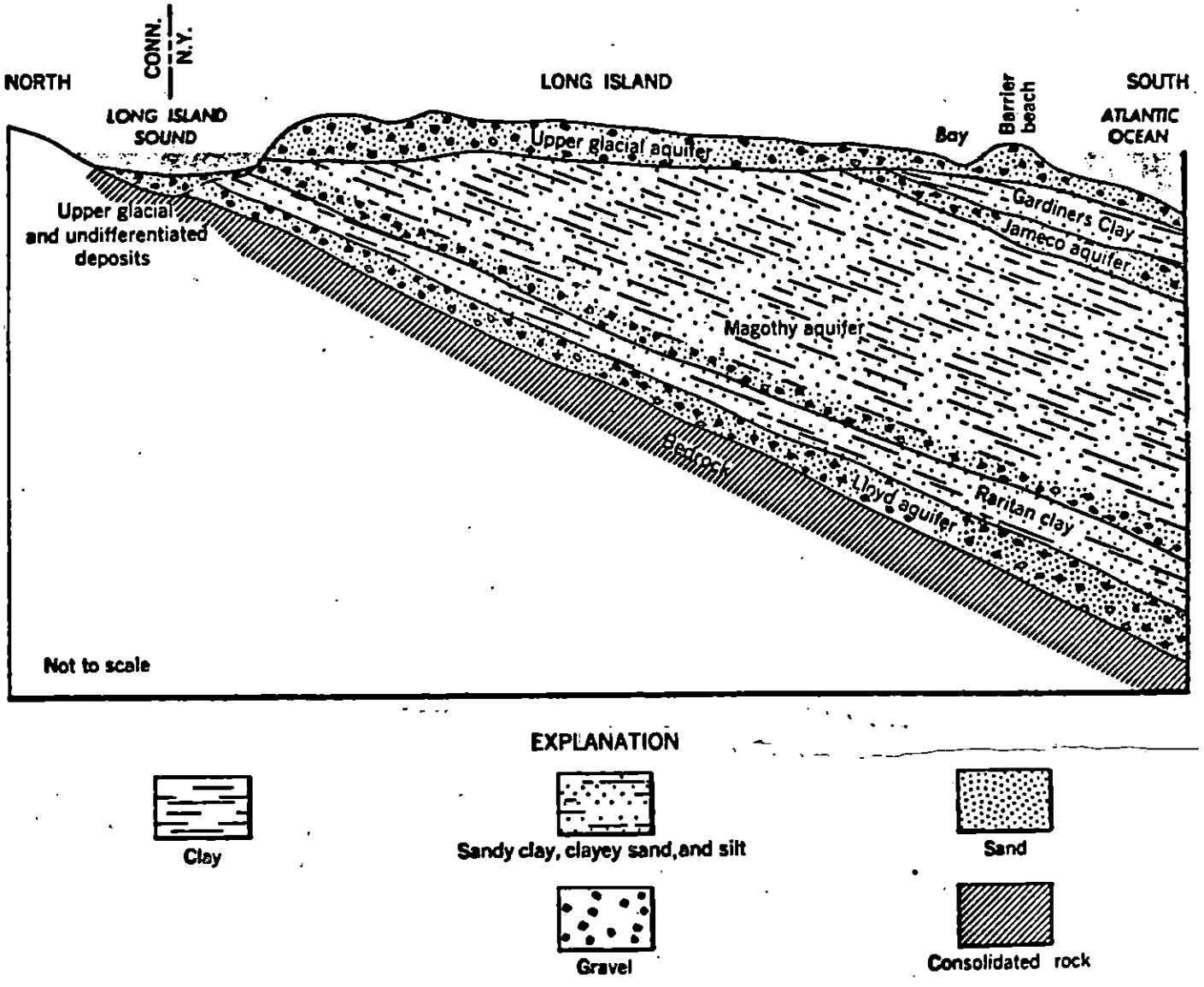


FIGURE 8.—Geologic features of the ground-water reservoir.

reams and glaciers so that the Pleistocene deposits ... on an irregular Cretaceous surface, and in places ... Pleistocene deposits fill valleys cut by preglacial ...d glacial streams. These valleys have been fairly well defined in Kings and Queens Counties and along ... northern margin of the island eastward to the ...ddle of Suffolk County. In eastern Suffolk County, ...owever, data on the contact between the Pleistocene ... the Cretaceous are very sparse.

The upper surface of the Cretaceous deposits is ...ove sea level in a large area in northern Nassau and ...stern Suffolk Counties, and in all but a few small ...as, the Pleistocene deposits cover the Cretaceous ...posits throughout Long Island. Pertinent informa-...n concerning the principal hydrogeologic units ...hin the ground-water reservoir are briefly sum-...arized in table 2.

Ground water in the uppermost part of the zone ... saturation on Long Island (mainly in the upper ...cial aquifer, but locally also in the Magothy ...uifer) is generally under water-table conditions. ...esian conditions predominate in most of the other ...ts of the ground-water reservoir of Long Island, ...ere the saturated deposits are overlain and confined ... silty and clayey layers of low hydraulic conduc-...ty. The hydraulic head in the confined aquifers ...ges from several feet below the water table to ...rly 20 feet above it. At places along the north and ...th shores and on the barrier beaches, the head in ... Lloyd aquifer is high enough to cause some wells ...which penetrate this aquifer to flow.

...n addition to the Raritan clay, which confines water ...the Lloyd aquifer, the other major well-defined ...fining layer in the ground-water reservoir is the ...diners Clay. This unit locally confines water in ... Jameco and Magothy aquifers. Numerous clayey ... silty layers in the Magothy aquifer and clay ... in the glacial deposits also are significant con-...g layers. Normally, the degree of confinement in ... Magothy aquifer increases with depth as more ... more clayey layers intervene between the deep ... and the water table.

BOUNDARIES OF THE FRESH GROUND-WATER RESERVOIR

...e boundaries of the fresh ground-water reservoir ... the water table, the fresh-salt water interface, and ...r bedrock surface. The estimated average position ...f ...e water table under natural conditions is shown ...n figure 9. The position of the contours is based on ...map of the water table in Kings, Queens, and ...au Counties in 1903 (prepared by Veatch in 1906), ... on later water-table maps of Suffolk County. Major features of this map are the two areas of highest ground-water altitude (represented by closed 80-ft and 60-ft contours) which extend approximately westward in the north-central parts of Nassau and Suffolk Counties. Also noteworthy are the steep water-level gradients near the north shore of Long Island compared to the gradients near the south shore.

The water table, which is the upper boundary of the ground-water reservoir, is a dynamic (moveable) feature. Present information indicates that recharge to the water table occurs throughout virtually all of Long Island. Therefore, the water table is not, from the point of view of potential theory, a stream surface. It is instead a surface characterized by a constantly varying potential which is equal to the altitude of the water table at any point. Because the water table on Long Island is largely a recharging potential boundary of the ground-water reservior, streamlines flow perpendicularly from the water table into the ground-water reservoir. Locally, as near the shorelines where ground water is lost by evapotranspiration, the water table is a discharging potential boundary.

The ground-water reservoir is bordered laterally by a second moveable boundary—the fresh-salt water interface. The position of this interface (or these interfaces) is fairly accurately known only in southwestern Nassau and southeastern Queens Counties as a result of an intensive investigation by Luszczynski and Swarzenski (1966). A north-south cross section through the ground-water reservoir in this area (fig. 10) shows three separate salt-water wedges—a shallow wedge in the glacial aquifer and intermediate and deep wedges in the Magothy aquifer. Furthermore, a fourth wedge exists in the Lloyd aquifer somewhere seaward of the barrier beaches.

The occurrence of fresh ground water in the Lloyd aquifer below salty ground water in the lower part of the Magothy aquifer has never been adequately explained. However, this occurrence must be related in some way to the relatively impermeable Raritan clay overlying the Lloyd aquifer. At least four separate wedges of salty ground water with relative positions approximately as indicated in figure 10 probably occur for a considerable distance eastward from western Nassau County (on the order of tens of miles) along the south shore of Long Island.

Very scanty information indicates that the Lloyd aquifer and the deep Magothy aquifer contain salty ground water beneath the Forks of Long Island. The fresh ground water beneath the Forks occurs in a lens ranging in thickness from a few feet to several hundred feet.

TABLE 2.—*Summary of the rock units and their water-bearing properties, Long Island, N.Y.*

[After McClymonds and Franke, 1971]

System	Series	Geologic unit	Hydrogeologic unit	Approximate maximum thickness (feet)	Depth from land surface to top (feet)	Character of deposits	Water-bearing properties
Quaternary	Holocene	Artificial fill, salt marsh deposits, stream alluvium, and shoreline deposits.	Holocene deposits	80	0	Sand, gravel, clay, silt, organic mud, peat, loam, and shells. Colors are gray, brown, green, black, and yellow. Holocene artificial-fill deposits of gravel, sand, clay, and rubbish.	Permeable sandy beds beneath barrier beaches yield fresh water at shallow depths, brackish to salty water at greater depth. Clay and silt beneath bays retard salt-water encroachment and confine underlying aquifers. Stream-flood-plain and marsh deposits may yield small quantities of water, but are generally clayey or silty and much less permeable than underlying upper glacial aquifer.
	Pleistocene	Upper Pleistocene deposits	Upper glacial aquifer	600	0–80	Till (mostly along north shore and in moraines) composed of clay, sand, gravel, and boulders. Forms Harbor Hill and Ronkonkoma terminal moraines. Outwash deposits (mostly between and south of terminal moraines, but also interlayered with till) consist of quartzose sand, fine to very coarse, and gravel, pebble to boulder sized. Glaciolacustrine deposits (mostly in central and eastern Long Island) and marine clay (locally along south shore) consist of silt, clay, and some sand and gravel layers; includes "20-foot clay" in southern Nassau County and Queens County. Colors are mainly gray, brown, and yellow; silt and clay locally are grayish green. Contains shells and plant remains, generally in finer grained beds; also contains Foraminifera. Contains chlorite, biotite, muscovite, hornblende, olivine, and feldspar as accessory minerals; "20-foot clay" commonly contains glauconite.	Till is poorly permeable; commonly causes perched-water bodies and impedes downward percolation of water to underlying beds. Outwash deposits are moderately to highly permeable; specific capacities of wells tapping them range from about 10 to more than 200 gpm per foot of drawdown. Good to excellent infiltration characteristics. Glaciolacustrine and marine clay deposits are mostly poorly permeable, but locally have thin moderately permeable layers of sand and gravel; generally retard downward percolation of ground water. Contains fresh water, except near the shorelines. Till and marine deposits locally retard salt-water encroachment.
		—Unconformity?—					
		Gardiners Clay	Gardiners Clay	300	80–400	Clay, silt, and few layers of sand and gravel. Colors are grayish green and brown. Contains marine shells, Foraminifera, and lignite; also glauconite, locally. Altitude of top generally is 80–60 ft below mean sea level. Occurs in Kings and Queens Counties, southern Nassau County, and Suffolk County; similar clay occurs in buried valleys near north shore.	Poorly permeable; constitutes confining layer for underlying Jameco aquifer. Locally, sand layers yield small quantities of water.
		—Unconformity?—					
		Jameco Gravel	Jameco aquifer	200	80–680	Sand, fine to very coarse, and gravel to large-pebble size; few layers of clay and silt. Gravel is composed of crystalline and sedimentary rocks. Color is mostly dark brown. Contains chlorite, biotite, muscovite, hornblende, and feldspar as accessory minerals. Occurs in Kings and Queens Counties, and southern Nassau County; similar deposits occur in buried valleys near north shore.	Moderately to highly permeable; contains mostly fresh water, but brackish water and water with high iron content locally in southeastern Nassau County and southern Queens County. Specific capacities of wells in the Jameco range from about 20 to 150 gpm per foot of drawdown.
		—Unconformity—					
Tertiary(?)	Pliocene(?)	Mannetto Gravel	(Commonly included with upper glacial aquifer.)	200	0–120	Gravel, fine to coarse, and lenses of sand; scattered clay lenses. Colors are white, yellow, and brown. Occurs only near Nassau-Suffolk County border near center of island.	Highly permeable, but occurs mostly above water table. Excellent infiltration characteristics.
		—Unconformity—					
Cretaceous		Magothy Formation	Magothy aquifer	1,100	0–600	Sand, fine to medium, clayey in part; interbedded with lenses and layers of coarse sand and sandy and solid clay. Gravel is common in basal 50–200 ft. Sand and gravel are quartzose. Lignite, pyrite, and iron oxide concretions are common; muscovite, magnetite, rutile, and garnet are accessory minerals. Colors are gray, white, red, brown, and yellow.	Most layers are poorly to moderately permeable; some are highly permeable locally. Specific capacities of wells in the Magothy generally range from 1 to about 30 gpm per foot of drawdown, rarely are as much as 80 gpm per ft. Water is unconfined in uppermost parts, elsewhere is confined. Water is generally of excellent quality but has high iron content locally along north and south shores. Constitutes principal aquifer for public-supply wells in western Long Island, except Kings County where it is mostly absent. Has been invaded by salty-ground water locally in southwestern Nassau County and southern Queens County, and in small areas along north shore.

TABLE 2.—*Summary of the rock units and their water-bearing properties, Long Island, N.Y.*—Continued

System	Series	Geologic unit		Hydrogeologic unit	Approximate maximum thickness (feet)	Depth from land surface to top (feet)	Character of deposits	Water-bearing properties
		Unconformity						
	Upper Cretaceous	Raritan Formation	Clay member	Raritan clay	800	70–1,600	Clay, solid and silty; few lenses and layers of sand; little gravel. Lignite and pyrite are common. Colors are gray, red, and white, commonly variegated.	Poorly to very poorly permeable; constitutes confining layer for underlying Lloyd aquifer. Very few wells produce appreciable water from these deposits.
			Lloyd Sand Member	Lloyd aquifer	800	200–1,600	Sand, fine to coarse, and gravel, commonly with clayey matrix; some lenses and layers of solid and silty clay; contains thin lignite layers and iron concretions locally. Locally, has gradational contact with overlying Raritan clay. Sand and most of gravel are quartzose. Colors are yellow, gray, and white; clay is red locally.	Poorly to moderately permeable. Specific capacities of wells in the Lloyd generally range from 1 to about 26 gpm per foot of drawdown, rarely are as much as 50 gpm per ft. Water is confined under artesian pressure by overlying Raritan clay; generally of excellent quality but has high iron content locally. Has been invaded by salty ground water locally in necks near north shore, where aquifer is mostly shallow and overlying clay discontinuous. Called deep confined aquifer in some earlier reports.
		Unconformity						
		Bedrock		Bedrock	.....	0–2,700	Crystalline metamorphic and igneous rocks; muscovite-biotite schist, gneiss, and granite. A soft clayey zone of weathered bedrock locally is more than 100 ft thick.	Poorly permeable to virtually impermeable; constitutes virtually the lower boundary of ground-water reservoir. Some hard, fresh water is contained in joints and fractures, but is impracticable to develop at most places; however, a few wells near the western edges of Queens and Kings Counties obtain water from the bedrock.

e fresh-salt water interface is not a sharp dary. The horizontal distance over which the lved-solids content of ground water changes completely fresh to completely salty is gen- y on the order of 2–3 thousand feet near the shore of Long Island. Over this distance, dissolved-solids content of the ground water ases at first gradually in the direction of the ground water and then more rapidly.

The fresh-salt water interface is a complex streamline surface, and fresh ground water discharging into the ocean and bays moves parallel to the interface and not across it. The hydrodynamics of a stable interface and, to an even greater degree, an unstable interface that changes position in response to changes in head within the ground-water reservoir, is complicated and beyond the scope of this report. (See Lusczynski, 1961; Cooper, 1964; and Kohout, 1964.)

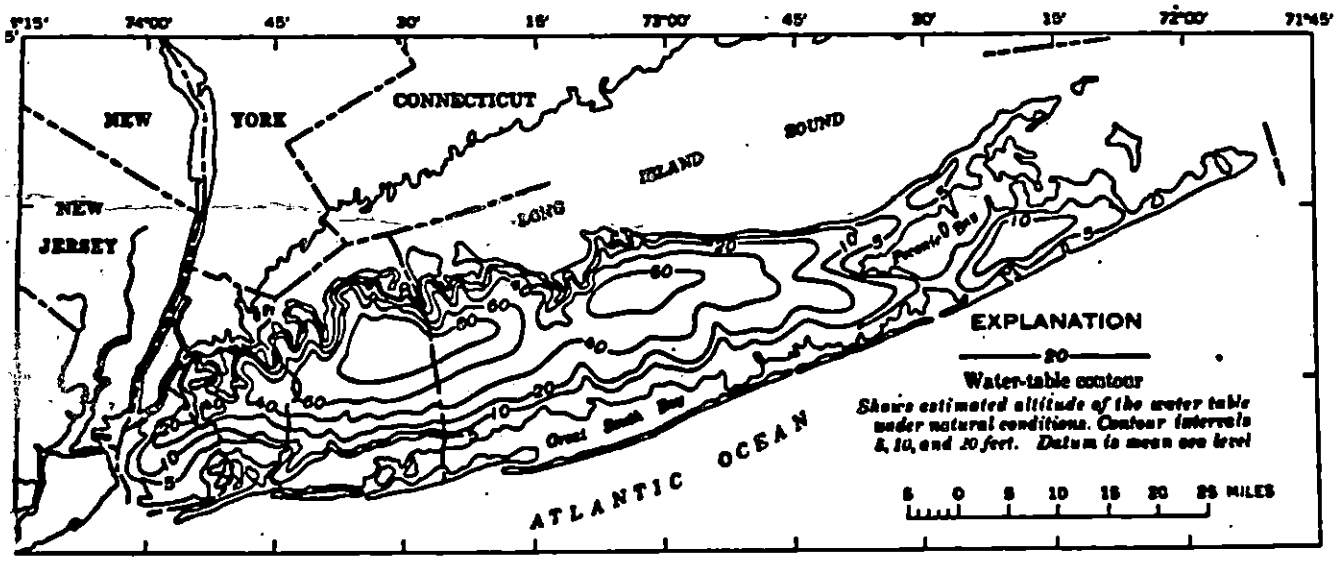


FIGURE 9.—Estimated average position of the water-table under natural conditions.

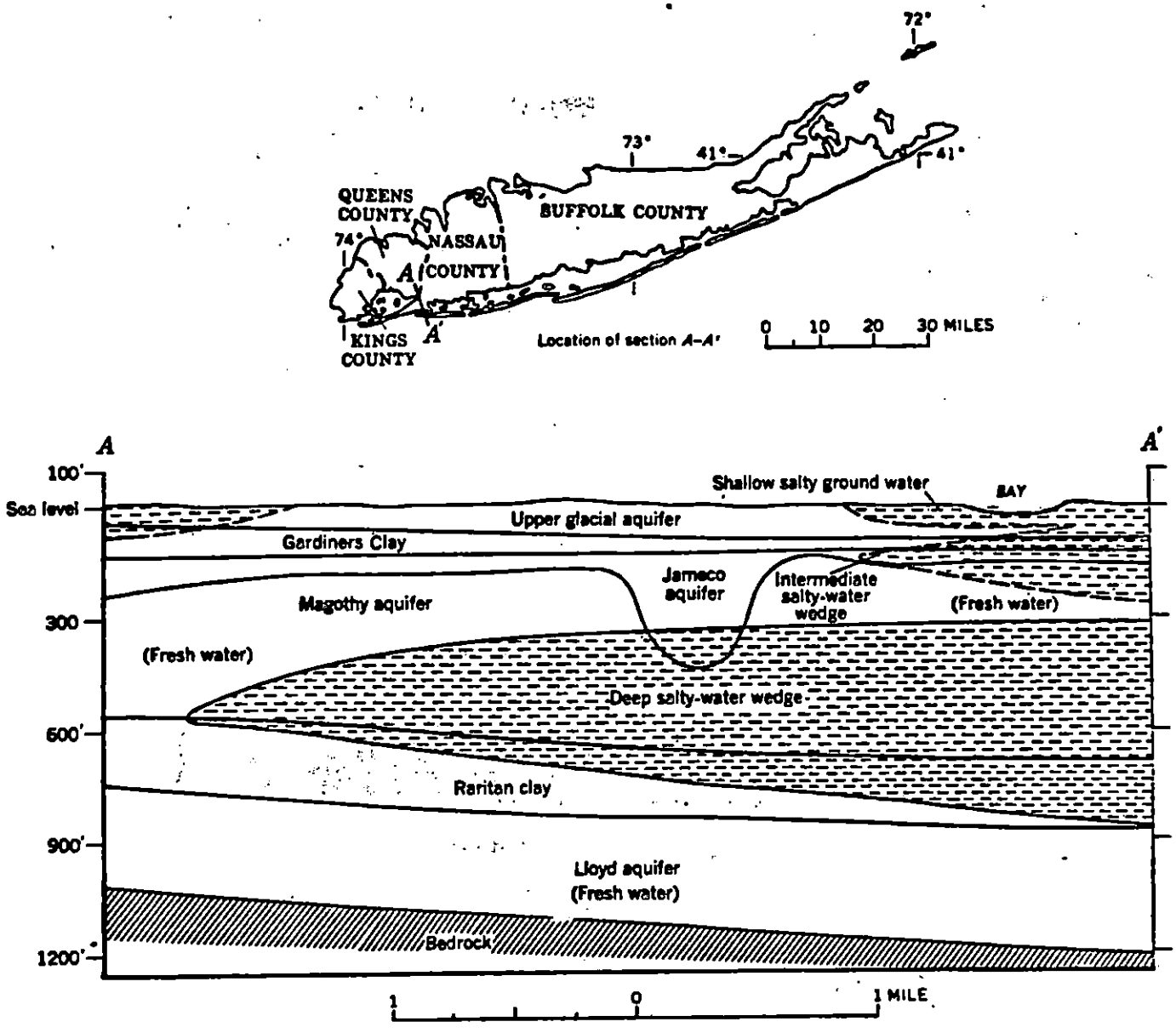


FIGURE 10.—Occurrence of salty ground water in southwestern Nassau County, in 1961. Adapted from Luszynski and Swarzenski (1966, pl. 3).

The top of the bedrock surface, which outcrops in western Queens County, dips southeast on the average about 65 feet per mile, or slightly less than 1°, to an estimated depth of about 2,000 feet in south-central Suffolk County (fig. 11). The number of control points on the bedrock surface, particularly in Suffolk County, is small; therefore, the surface undoubtedly is more irregular than is indicated in figure 11.

For practical purposes the bedrock surface is the impervious bottom of the ground-water reservoir. Hydraulically, therefore, the top of the bedrock is a stream surface; ground water flows parallel to the bedrock and not across it, and equipotential lines or surfaces intersect the bedrock at right angles.

Generally, the flowing parts of the streams on Long Island are ground-water drains, and the ground water continually discharges into these parts under natural conditions. Therefore, in relation to the ground-water reservoir, the streams are discharging potential boundaries. The potential at a given point on the stream is equal to the altitude of the stream at that point. Thus, the potential along the stream channel varies continuously from the altitude of start of flow of the stream to the altitude of the surrounding bay or ocean.

The approximate location and altitude of the points of start of flow for several streams in June 1967 are shown in figure 8. Because ground-water levels and

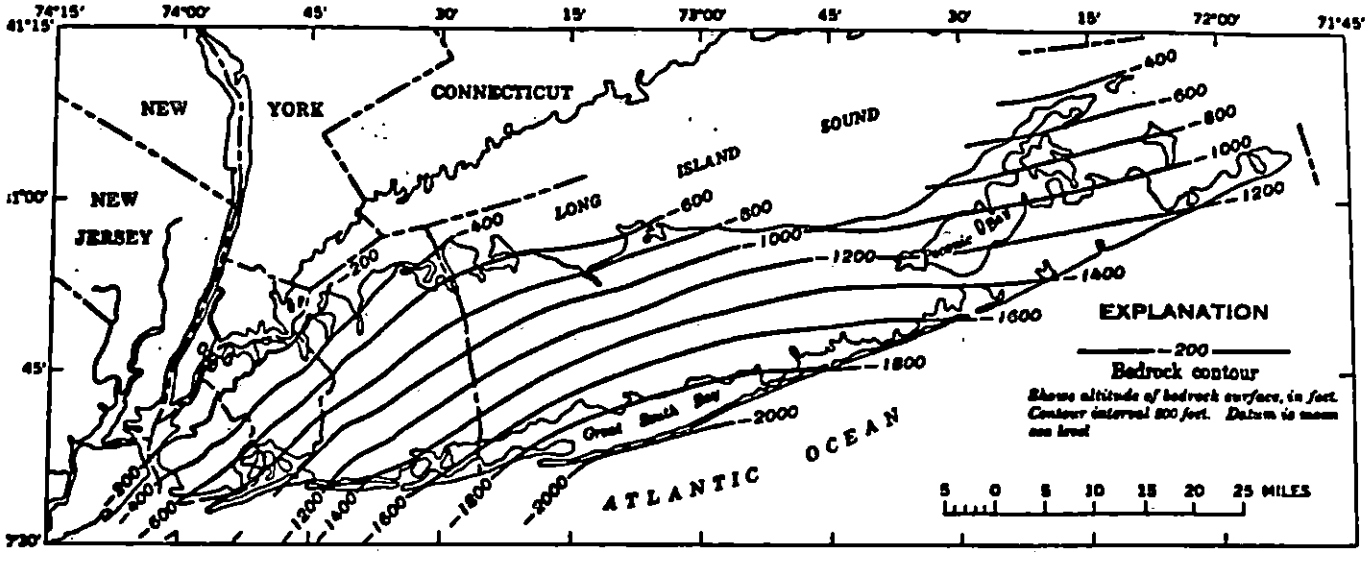


FIGURE 11.—Contour map of the bedrock surface. Modified from Suter, De Laguna, and Perlmutter (1949, pls. 8–10).

streamflow were below average for this month, these altitudes are slightly lower than (on the order of ft) and the points of start of flow are slightly seaward (on the order of several hundred feet) of their average positions. The points of start of flow of the streams are points on the water table, and the locations of these points reflect local conditions relating to topography and position of the water table.

SIZE OF THE FRESH GROUND-WATER RESERVOIR

The volumes of various parts of the fresh ground-water reservoir are given in table 3. The estimates of the volumes of unconsolidated deposits saturated with fresh ground water (col. 2) were derived mainly from a map showing the saturated thickness of the ground-water reservoir in 1965 (fig. 12). The water table at this time, particularly in Kings, Queens, and western Nassau Counties, was considerably lower than the water table under natural conditions. However, the difference in the total volume of fresh ground water in the ground-water reservoir in 1965 compared to the volume under natural conditions is negligible compared to the total volume of fresh ground water in the ground-water reservoir.

The values in column 2 of table 3 are probably accurate to within about 10 percent, except for one entry—the volume of deposits "beneath areas adjacent to the water-budget area" (item *c*). The magnitude

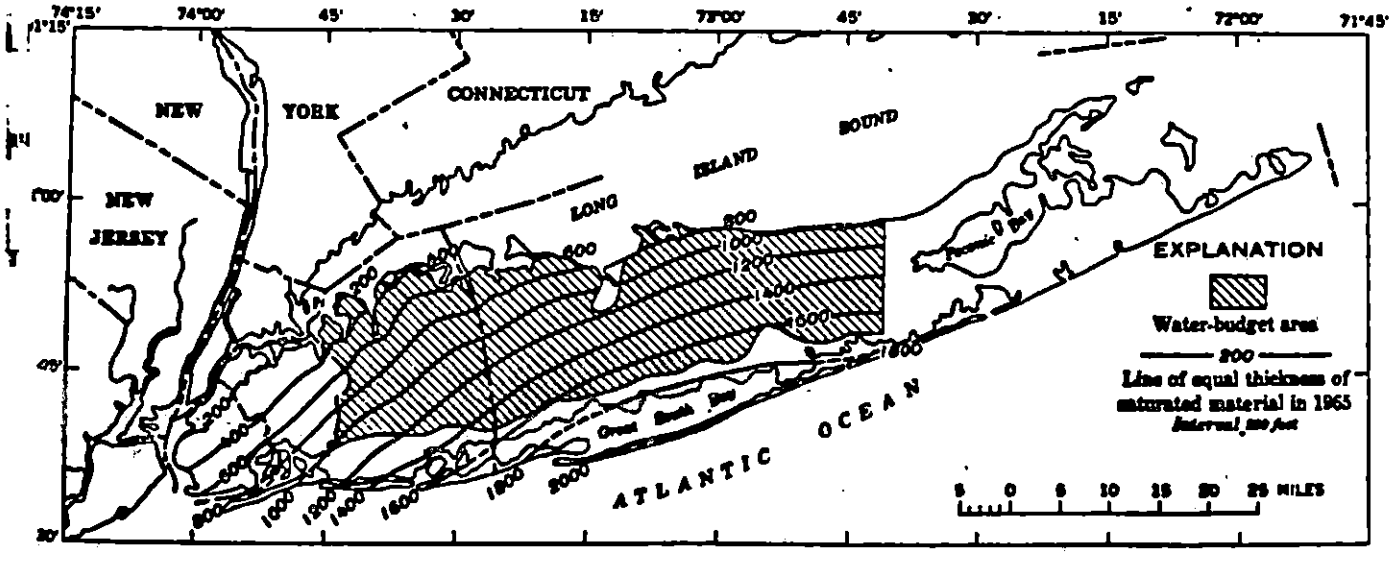


FIGURE 12.—Thickness of unconsolidated deposits saturated with fresh ground water in 1965. After Cohen, Franke, and Foxworthy (1968, pl. 2G).

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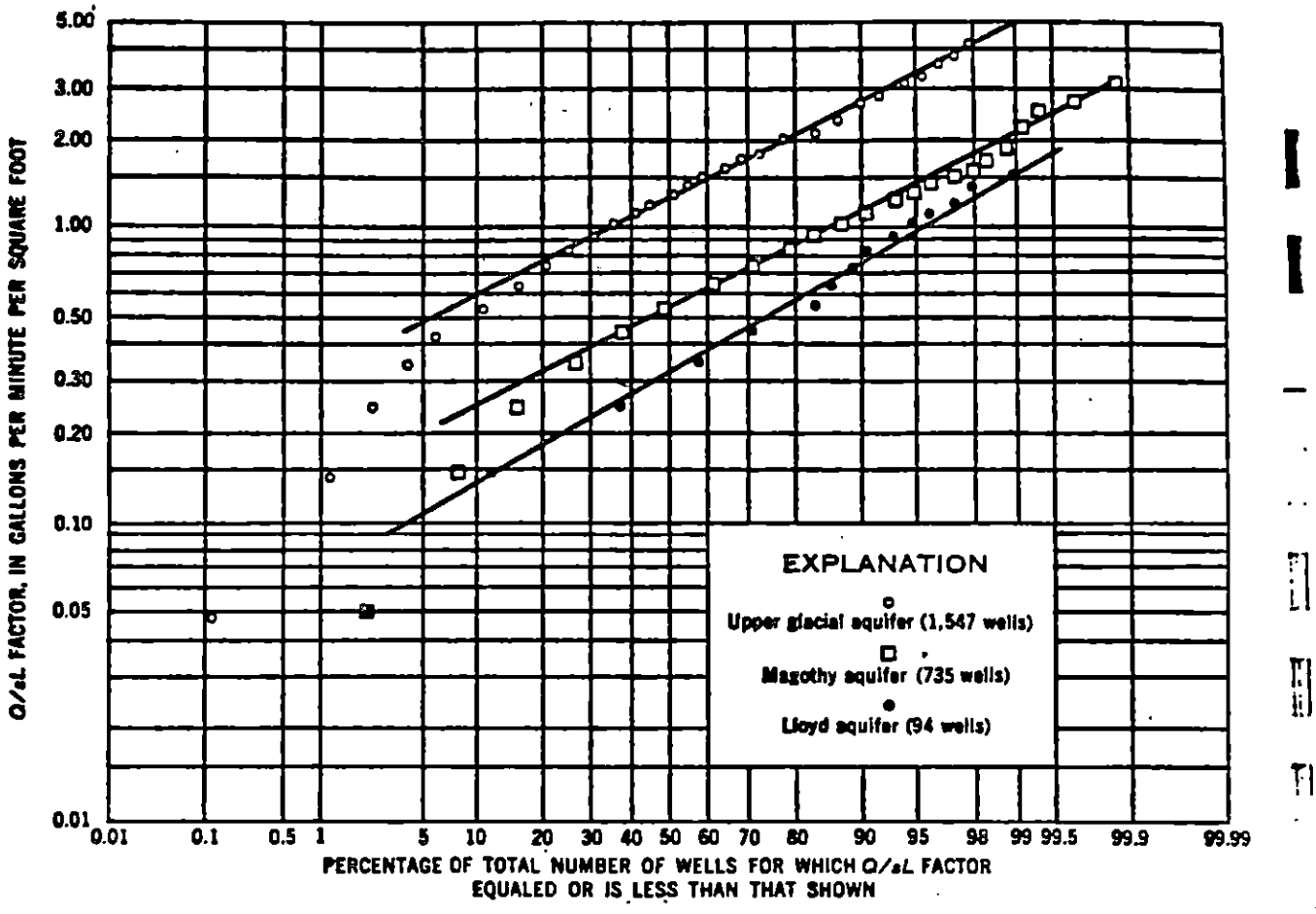


FIGURE 30.—Relation between a modified specific capacity factor (Q/sL) and percentage of total number of wells for the principal aquifers of Long Island, N.Y. After McClymonds and Franke (1971).

2 or 3 square miles. Average-hydraulic conductivity maps were prepared for each aquifer in the manner described above. The average-hydraulic conductivity maps and thickness maps of each aquifer were used to construct the transmissivity maps in figure 29. Average values of thickness, hydraulic conductivity, and transmissivity of the principal aquifers in the water-budget area, which were derived from figure 29 and from additional maps in the report by McClymonds and Franke, are given in table 9.

Estimated rates of subsurface outflow from the water-budget area and for each aquifer are given in table 10. These estimates were computed by applying Darcy's law, $Q=TIL$, to appropriate parts of each aquifer and by summing the flow from each part. In this formula, Q is the flow of ground water, in gallons per day; T is the transmissivity, in gallons per day per foot; I is the hydraulic gradient, in feet per foot; and L is the width, in feet, of the cross section through which the flow occurs. Appropriate T values were obtained from figure 29, and approximate values of the hydraulic gradient I were obtained from water-level contour maps.

TABLE 9.—*Average transmissivity of the principal aquifers for the water-budget area, Long Island, N.Y.*

Aquifer	Average thickness (feet)	Average hydraulic conductivity (gallons per day per square foot)	Average transmissivity (gallons per day per foot)
Upper glacial	120	1,800	210,000
Magothy	620	400	250,000
Lloyd	350	250	85,000

Estimating the quantity of subsurface outflow from the upper glacial aquifer presented special difficulties because much of the water in the upper part of this aquifer discharges into streams. Thus, for the purpose of calculating subsurface outflow, it was assumed that ground water in the upper 40–50 feet of the upper glacial aquifer discharged to streams (see previous discussion on movement through the ground-water reservoir), and calculations of underflow were made only for the material below the upper 40–50 feet. In

measured at wells of different depths at the same site and at many locations in both areas, were virtually identical.

The hydraulic conductivity of the upper glacial aquifer was studied regionally by McClymonds and Franke (1972) with specific-capacity tests from wells. They used the relation proposed by Theis, Brown, and Meyer (1963, p. 332):

$$\bar{K} = 2{,}000\ (Q/s)L$$

where $\bar{K}$ = average hydraulic conductivity of materials opposite the well screen, in gallons per day per foot squared,
Q/s = specific capacity of the well, in gallons per minute per foot of drawdown, and
L = length of the well screen, in feet.

The constant factor 2,000 was found to be average for conditions on Long Island. Values of hydraulic conductivity contoured on maps (McClymonds and Franke, 1972, pl. 1) indicate that the average hydraulic conductivity ($\bar{K}$) in the area of the Babylon and Islip landfills is about 2,000 (gal/d)/ft² or 270 ft/d.

In the upper glacial aquifer south of the Babylon landfill, there are seven public-supply wells at four stations and, in the vicinity of the Islip landfill, five public-supply wells at two stations (fig. 5). These wells partly penetrate the aquifer, and screens are set near the bottom of the aquifer. About 35 percent of the aquifer is screened at Babylon and about 25 percent at Islip. Specific capacities ranged from 17 to 104 gal/ft of drawdown when the wells were new.

A computer analysis by T. E. Reilly (written commun., 1976) to determine the vertical and horizontal hydraulic conductivity took into consideration the partial penetration of the aquifer and used a 10:1 ratio of horizontal to vertical hydraulic conductivity. This ratio seems valid for regional models (Getzen, 1975; Franke and Getzen, 1976, p. 78). Where data were available from more than one supply well at a given station, only data from the well with the highest specific capacity were used; it was assumed that wells with the higher value would indicate more accurately the hydraulic conductivity in the area because those with lower values could be reflecting screen losses or other losses due to variations in well construction. Hydraulic conductivities obtained from three stations at Babylon and two stations at Islip are given in figure 5. Data from the two wells at the Albans Road station near Babylon were not included because their specific capacity was 17 and 18 gal/ft —only 20 percent of the next lowest value in the area. This amount suggests that the data from the wells would not accurately reflect the hydraulic conductivity at the well site. Values of hydraulic conductivity ranged from 470 to 500 ft/d for the Babylon area and from 190 to 360 ft/d for the Islip area (fig. 5). The values for the Babylon area are about twice the values obtained by the method used in McClymonds and Franke (1972), and those values probably more nearly reflect the hydraulic conductivity in the area of the landfill than those of McClymonds and Franke.

Fine-grained deposits in the Magothy aquifer (Cohen and others, 1968) occur directly beneath the Gardiners Clay at Babylon and the outwash deposits at Islip. The Magothy aquifer is composed of beds of sand, silt, and clay and is between 800 and 1,000 ft thick in the area. At Babylon, water in the Magothy is currently (1974) 3 ft below the water in the upper glacial aquifer at the site of the Babylon landfill; it is probably lower because of public-supply withdrawals. Samples from 9 ft of drilling below the Gardiners Clay at Babylon indicate that the Magothy aquifer consists of lignitic and micaceous, silty, fine to medium sand. Pyrite is associated with the lignite. Observation wells of the kind used in this study that are screened in the Magothy aquifer at Babylon yield very little water—1 to 2 gal/min. The average hydraulic conductivity of the Magothy aquifer in the region of the two sites is estimated to be 50 ft/d (McClaymonds and Franke, 1972). Although one hole is hardly sufficient to characterize the Magothy in the report area, logs for the three public-supply-well stations near Babylon (fig. 5) indicate that the sampling point was characteristic of the top of the Magothy in that area.

QUALITY OF NATIVE AND AMBIENT GROUND WATER

Fresh, uncontaminated ground water—native ground water—generally contains only small amounts of dissolved mineral matter on Long Island. Water from several wells in the vicinity of the landfills (table 2) had dissolved-solids concentrations of 51 mg/L (milligrams per liter) or less, which indicates a chemical character close to that of native ground water in at least some parts of the upper glacial aquifer.

In native ground water on Long Island, the concentration of individual species of the major cations (calcium, magnesium, sodium, potassium) and anions (bicarbonate, sulfate, chloride) is usually less than 10 mg/L, and only minor amounts of other ions are present. However, the quality of ground water in this region has been altered to various degrees, mostly by cesspool and septic-tank wastewater; thus, the ambient water in areas affected by landfill leachate can be different from native water.

Analyses of water samples listed in table 2 (well locations are shown in figs. 3 and 4) indicate that during the time of sampling (1972–73), the ground water in some places was of essentially native quality. Sub-

REF. 2.

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1987 EMERGENCY RESPONSE GUIDEBOOK

GUIDEBOOK FOR INITIAL RESPONSE TO HAZARDOUS MATERIALS INCIDENTS

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Name of Material	Guide No.	ID No.
ANTIMONY TRICHLORIDE SOLUTION	60	1733
ANTIMONY TRIFLUORIDE	60	1549
ANTIMONY TRIFLUORIDE SOLUTION	60	1549
ANTIMONY TRIOXIDE	31	9201
ARGON, compressed	12	1006
ARGON, refrigerated liquid (cryogenic liquid)	21	1951
ARSENIC, white, solid	53	1561
ARSENIC ACID, liquid	55	1553
ARSENIC ACID, solid	53	1554
ARSENICAL DUST	53	1562
ARSENICAL FLUE DUST	53	1562
ARSENICAL PESTICIDE, flammable liquid, n.o.s.	28	2760
ARSENICAL PESTICIDE, flammable liquid, n.o.s.	28	2993
ARSENICAL PESTICIDE, liquid, n.o.s.	55	2994
ARSENICAL PESTICIDE, n.o.s.	55	2759
ARSENIC BROMIDE	53	1555
ARSENIC CHLORIDE	55	1560
ARSENIC COMPOUND, liquid, n.o.s.	55	1556
ARSENIC COMPOUND, solid, n.o.s.	53	1557
ARSENIC DISULFIDE	53	1557
ARSENIC IODIDE, solid	53	1557
ARSENIC METAL	53	1558
ARSENIC PENTOXIDE	53	1559
ARSENIC TRICHLORIDE	55	1560
ARSENIC TRIOXIDE	53	1561
ARSENIC TRISULFIDE	53	1557
ARSINE *	18	2188
ARYL SULFONIC ACID, liquid	60	2584
ARYL SULFONIC ACID, liquid	60	2586
ARYL SULFONIC ACID, solid	60	2583
ARYL SULFONIC ACID, solid	60	2585
ASBESTOS, blue	31	2212
ASBESTOS, white	31	2590
ASPHALT	27	1999
AZINPHOS METHYL (Guthion)	55	2783
1-AZIRIDINYL PHOSPHINE OXIDE (TRIS)	55	2501
2,2'-AZODI(2,4-DIMETHYL-4-METHOXYVALERONITRILE)	70	2955
2,2'-AZODI(2,4-DIMETHYL-VALERONITRILE)	70	2953
AZODI(1,1'-HEXAHYDRO-BENZONITRILE)	72	2954
AZODI(ISOBUTYRONITRILE)	70	2952
AZODI(2-METHYL-BUTYRONITRILE)	70	3030
BARIUM	40	1400
BARIUM ALLOY	40	1399
BARIUM ALLOY, pyrophoric	37	1854
BARIUM AZIDE, with not less than 50% water or alcohol	36	1571
BARIUM BROMATE	42	2719
BARIUM CHLORATE	42	1445
BARIUM COMPOUND, n.o.s.	55	1564
BARIUM CYANIDE	53	1565
BARIUM HYPOCHLORITE	44	2741
BARIUM METAL	40	1400
BARIUM NITRATE	42	1446
BARIUM OXIDE	53	1884
BARIUM PERCHLORATE	42	1447
BARIUM PERMANGANATE	42	1448
BARIUM PEROXIDE	42	1449
BARIUM SELENATE	53	2630
BARIUM SELENITE	53	2630
BATTERY, electric, storage, dry, containing POTASSIUM HYDROXIDE	60	1813
BATTERY, electric, storage, dry, containing POTASSIUM HYDROXIDE	60	3028
BATTERY, electric, storage, wet, filled with acid	60	2794
BATTERY, electric, storage, wet, filled with alkali	60	2795
BATTERY, electric, storage, wet, filled with alkali	60	2797
BATTERY, electric, storage wet, nonspillable	60	2800
BATTERY, wet, filled with acid (electric storage)	60	2794
BATTERY, wet, filled with alkali (electric storage)	60	2795
BATTERY, wet, nonspillable (electric storage)	60	2800
BATTERY FLUID, acid	39	2796
BATTERY FLUID, alkali	60	2797
BENZALDEHYDE	26	1989
BENZENE	27	1114
BENZENE-1,3-DISULFO-HYDRAZIDE	72	2971
BENZENE PHOSPHORUS DICHLORIDE	39	2798
BENZENE PHOSPHORUS THIODICHLORIDE	39	2799
BENZENE SULFOHYDRAZIDE	72	2970
BENZENE SULFONYL CHLORIDE	59	2225
BENZIDINE	53	1885
BENZINE	26	1115
BENZOIC ACID	31	9094
BENZOIC DERIVATIVE PESTICIDE, flammable liquid, n.o.s.	28	2770
BENZOIC DERIVATIVE PESTICIDE, flammable liquid, n.o.s.	28	3003
BENZOIC DERIVATIVE PESTICIDE, liquid, n.o.s.	55	3004
BENZOIC DERIVATIVE PESTICIDE, solid, n.o.s.	53	2769
BENZONITRILE	55	2224
BENZOQUINONE	55	2587
BENZOTRICHLORIDE	60	2226
BENZOTRIFLUORIDE	28	2338
BENZOYL CHLORIDE	39	1736
BENZOYL PEROXIDE	49	2085
BENZOYL PEROXIDE	49	2086
BENZOYL PEROXIDE	49	2087
BENZOYL PEROXIDE	49	2088
BENZOYL PEROXIDE	49	2089
BENZOYL PEROXIDE	49	2090
BENZOYL PEROXIDE, not more than 62%, with not less than 28% inert solid and not less than 10% water	49	3074
BENZYL BROMIDE	59	1737
BENZYL CHLORIDE	59	1738
BENZYL CHLOROFORMATE	39	1739
BENZYL DIMETHYLAMINE	26	2619
4-(BENZYL(ETHYL)AMINO)-3-ETHOXYBENZENEDIAZONIUM ZINC CHLORIDE	70	3037

* Look for information next to this **NAME** in the TABLE OF EVACUATION DISTANCES in the back of this book. Use this in addition to the Guide Page if there is NO FIRE.

KEEP YOURSELF AND OTHERS AWAY FROM ALL SPILLS, FUMES AND SMOKE. AN
NEVER ASSUME VAPORS ARE HARMLESS BECAUSE OF LACK OF SMELL.

GUIDEBOOK - ARSENIC

GUIDE 52

POTENTIAL HAZARDS

FIRE OR EXPLOSION

May ignite itself if exposed to air.
May be ignited by heat, sparks or flames.
May burn rapidly with flare-burning effect.
May explode from heat, contamination or loss of temperature control.
Runoff to sewer may create fire or explosion hazard.

HEALTH HAZARDS

Contact may cause burns to skin and eyes.
Fire may produce irritating or poisonous gases.
Runoff from fire control or dilution water may cause pollution.

EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.
Stay upwind; keep out of low areas.
Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.
CALL CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE. If water pollution occurs, notify the appropriate authorities.

LOSS OF COOLING

Specified control temperature of material must be maintained. Obtain liquid nitrogen, Dry Ice or ice for cooling. If none can be obtained, evacuate area.

FIRE

Small Fires: Dry chemical, CO_2, Halon, water spray or standard foam.
Large Fires: Flood fire area with water.
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.
If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out.
If this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.
Shut off ignition sources; no flares, smoking or flames in hazard area.
Small Spills: Take up with sand or other noncombustible material; move containers from spill area.
Large Spills: Dike liquid spill for later disposal.

FIRST AID

Move victim to fresh air; call emergency medical care.
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.
Remove and isolate contaminated clothing and shoes at the site.
Keep victim quiet and maintain normal body temperature.

GUIDE 53

ARSENIC

POTENTIAL HAZARDS

HEALTH HAZARDS

Poisonous if swallowed.
Inhalation of dust poisonous.
Fire may produce irritating or poisonous gases.
Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

Some of these materials may burn, but none of them ignites readily.

EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.
Stay upwind; keep out of low areas.
Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.
CALL CHEMTREC AT 1-800-424-9300 FOR EMERGENCY ASSISTANCE. If water pollution occurs, notify the appropriate authorities.

FIRE

Small Fires: Dry chemical, CO_2, Halon, water spray or standard foam.
Large Fires: Water spray, fog or standard foam is recommended.
Move container from fire area if you can do it without risk.

SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.
Large Spills: Dike far ahead of liquid spill for later disposal.

FIRST AID

Move victim to fresh air; call emergency medical care.
Remove and isolate contaminated clothing and shoes at the site.
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.

GUIDEBOOK – ARSEN

SHEET 3 OF 3

REF. 3.*

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

ENVIRONMENTAL and INDUSTRIAL ANALYTICAL LABORATORY

VOLATILE ORGANICS ANALYSIS DATA SHEET

MW A
LEROY CALLENDER, P.C.
CANTOR BROTHERS SITE
AQUEOUS SAMPLES

Lab Name: H2M LABS, INC. Contract: GIBBS & HILL

Matrix: WATER
Sample vol: 5 mL
Level: LOW
% Moisture: not dec. -- dec.
Column: (pack/cap) PACK

Lab Sample ID: 874719
Lab File ID: PU9550
Date Received: 12/28/88
Date Analyzed: 12/30/88
Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q	MW #1 ug/L	Q
74-87-3	Chloromethane	10	U	10	U
74-83-9	Bromomethane	10	U	10	U
75-01-4	Vinyl Chloride	10	U	10	U
75-00-3	Chloroethane	10	U	10	U
75-09-2	Methylene Chloride	11	B	11	B
67-64-1	Acetone	8	J,B	7	J,B
75-15-0	Carbon Disulfide	5	U	5	U
75-35-4	1,1-Dichloroethene	5	U	5	U
75-34-3	1,1-Dichloroethane	5	U	5	U
540-59-0	1,2-Dichloroethene (total)	7		45	
67-66-3	Chloroform	10	B	10	B
107-06-2	1,2-Dichloroethane	5	U	5	U
78-93-3	2-Butanone	10	U	3	J,B
71-55-6	1,1,1-Trichloroethane	6		3	J
56-23-5	Carbon Tetrachloride	5	U	5	U
108-05-4	Vinyl Acetate	10	U	10	U
75-27-4	Bromodichloromethane	5	U	5	U
78-87-5	1,2-Dichloropropane	5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U	5	U
79-01-6	Trichloroethene	87		33	
124-48-1	Dibromochloromethane	5	U	5	U
79-00-5	1,1,2-Trichloroethane	5	U	5	U
71-43-2	Benzene	5	U	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U	5	U
75-25-2	Bromoform	5	U	5	U
108-10-1	4-Methyl-2-Pentanone	10	U	10	U
591-78-6	2-Hexanone	10	U	10	U
127-18-4	Tetrachloroethene	100		110	
79-34-5	1,1,2,2-Tetrachloroethane	5	U	5	U
108-88-3	Toluene	5	U	2	J
108-90-7	Chlorobenzene	5	U	5	U
100-41-4	Ethylbenzene	5	U	5	U
100-42-5	Styrene	5	U	5	U
1330-20-7	Xylene (total)	5	U	5	U

Date Reported: 01/31/89

John J. Molloy, P.E.
Laboratory Director

*FOR COMPLETE RESULTS, SEE APPENDIX C.

REF. 3

SHEET 2 OF 6

Y. 11747

MW #1		MW # 2		MW # 3		MW # 3 DL		MW # 4		FIELD BLAN	
	Q	ug/L	Q	ug/L	Q	Ug/L	Q	Ug/L	Q	Ug/L	
	U	10	U	10	U	200	U	10	U	10	
	U	10	U	10	U	200	U	10	U	10	
	U	10	U	10	U	200	U	10	U	10	U
	U	10	U	10	U	200	U	10	U	10	U
	B	8	B	9	B	130	B	8	B	4	
	J, B	5	J, B	5	J, B	48	J, B	4	J, B	4	J,
	U	5	U	5	U	110	B	5	U	5	
	U	5	U	5	U	100	U	5	U	5	
	U	1	J	2	J	100	D	5	U	5	J
		9		17		100	D	5	U	5	U
	B	13	B	2	B	100	D	5	U	1	
	U	5	U	5	U	100	U	5	U	5	J
	J, B	4	J, B	3	J, B	140	J, B	10	U	2	J,
	J	7		19		34	J	5	U	5	
	U	5	U	5	U	100	U	5	U	5	
	U	10	U	10	U	200	U	10	U	10	J
	U	5	U	5	U	100	U	5	U	5	
	U	5	U	5	U	100	U	5	U	5	
	U	5	U	5	U	100	U	5	U	5	J
		96		100		130		10		1	J
	U	5	U	5	U	100	U	5	U	5	J
	U	5	U	5	U	100	U	5	U	5	J
	U	5	U	5	U	100	U	5	U	5	U
	U	5	U	5	U	100	U	5	U	5	J
	U	5	U	5	U	100	U	5	U	5	J
	U	10	U	10	U	200	U	10	U	10	U
	U	10	U	10	U	200	U	10	U	10	U
		110		2000	D	3700		18		5	
	U	5	U	5	U	100	U	5	U	5	U
	J	5	U	5	U	100	U	5	U	5	U
	U	5	U	5	U	100	U	5	U	5	U
	U	5	U	5	U	100	U	5	U	5	U
	U	5	U	5	U	100	U	5	U	5	U
	U	5	U	5	U	100	U	5	U	5	U

sediment samples

P BLANK		SD 1		SD 2		SD - 3		SOIL MW # 1		SOIL MW # 2
ug/L	Q	ug/L	Q	ug/L	Q	ug/L	Q	ug/L	Q	ug/L
10	U	46	U	63	U	21	U	12	U	13
0	U	46	U	63	U	21	U	12	U	13
0	U	46	U	63	U	21	U	12	U	13
0	U	46	U	63	U	21	U	12	U	13
3	J,B	55	B	33	B	20	B	9		9
3	B	200	B	110	B	38	B	4	J	4
5	U	23	U	45		8	J	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	46	U	10	U	6	U	6
5	U	23	U	16	J	5	J	6	U	6
5	U	23	U	32	U	10	U	6	U	6
3	J,B	31	J,B	10	J,B	14	J,B	12		13
5	U	23	U	32	U	10	U	21		24
5	U	23	U	32	U	10	U	6	U	6
10	U	46	U	63	U	21	U	12	U	13
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	15	J	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
10	U	46	U	63	U	21	U	12	U	13
10	U	6	J	63	U	21	U	12	U	13
5	U	23	U	29	J	10	U	6	U	6
5	U	21	J,B	32	U	10	U	6	U	6
5	U	23	U	78	B	68	B	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6
5	U	23	U	32	U	10	U	6	U	6

REF. 3

SHEET 4 OF 6

H2M LABS, INC.

575 BROAD HOLLOW ROAD, MELVILLE, N.Y. 11747 • 516-694-3040

ENVIRONMENTAL and INDUSTRIAL ANALYTICAL SERVICES

INORGANIC ANALYSIS DATA SHEET

MW #0

Lab Name: H2M LABS, INC. Contract: G & H

Matrix (soil/water): WATER Lab Sample ID: 859376

Level (low/med): LOW Date Received: 10/06/88

% Solids : -

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

CAS No.	Analyte	Concentration	C	Q	M	MW #1 ug/L	C
7429-90-5	Aluminum	46000		*	P	7950	
7440-36-0	Antimony	100			P	46	B
7440-38-2	Arsenic	50	U		F	5	U
7440-39-3	Barium	510			P	120	
7440-41-7	Beryllium	6			P	1	B
7440-43-9	Cadmium	2	U		A	2	U
7440-70-2	Calcium	15700			P	12040	
7440-47-3	Chromium	85			P	8	B
7440-48-4	Cobalt	80		N	P	16	B
7440-50-8	Copper	94			P	14	B
7439-89-6	Iron	74000		*	P	14700	
7439-92-1	Lead	75		+N	F	13	U
7439-95-4	Magnesium	11000			P	3900	
7439-96-5	Manganese	5300			P	810	
7439-97-6	Mercury	0.2	U		CV	0.2	U
7440-02-0	Nickel	69			A	5	U
7440-09-7	Potassium	8200			A	3900	B
7782-49-2	Selenium	50	U		F	50	U
7440-22-4	Silver	11			P	8	B
7440-23-5	Sodium	30000			P	21300	
7440-28-0	Thallium	5	U		F	5	U
7440-62-2	Vanadium	95		N	P	15	B
7440-66-6	Zinc	170			P	45	
	Cyanide	10	U		C	10	U

COMMENTS:

Date Reported: 10/26/88

John J. Molloy, P.E.
Laboratory Director

REF. 3

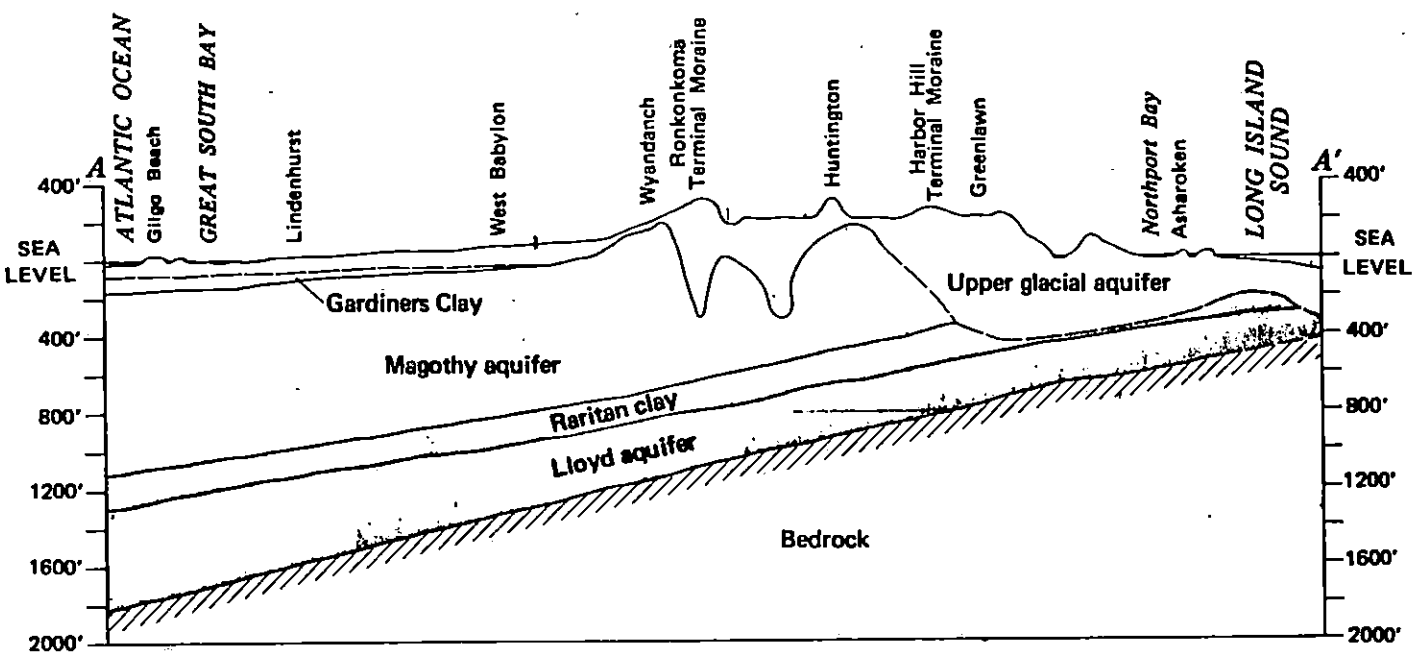
SHEET 5 OF 6

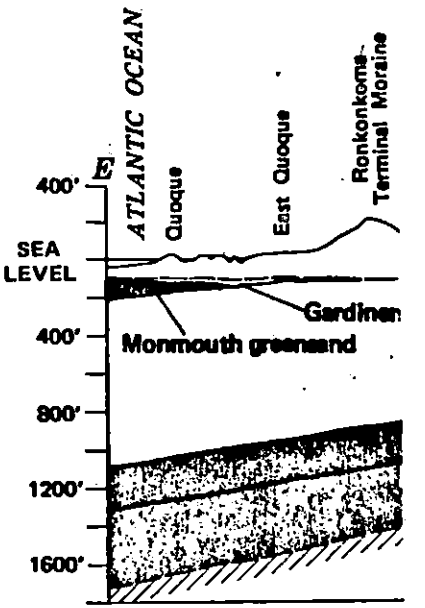
MW#2 Ug/L	Q	C	Q	MW#3 Ug/L	Q	C	Q	MW#4 Ug/L	Q	C	Q	FIELD BLANK Ug/L	Q	C	Q	CATCH Ug/
35200	*		*	16600	*		*	42500	*		*	200	U	U	*	45
100				88				98				35	B			
50	W	U		50		U		50		U		5	U			
420				210				220				1	B			
5		B		2		B		5		B		0	U			
2		U		2		U		2		U		2	U			
15100				89500				7900				6	U	U		216
71				26				67				3	U	U		
66	N		N	23		B		54			N	4	B		N	
67				26				65				3	B			34
55800	*		*	19100			*	75200			*	2	B		*	87
59	SN		SN	25			SN	54			N	5	U		N	3
8800				7900				7300				56	B			77
4200				1700				1880				0	U			8
0.2		U		0.2		U		0.2		U		0.2	U			
44				14				29				5	U			
7500				6200				5000				200	U			52
50		U		50		U	W	50		U		5	U			1
17				9		B		5		B		10	B			3
28800				21000				9100				18	U			130
5		U		5		U		5		U		5	U			
78			N	34		B	N	99			N	6	B		N	2
130				72				170				1	U			34
10		U		10		U		20				10	U			

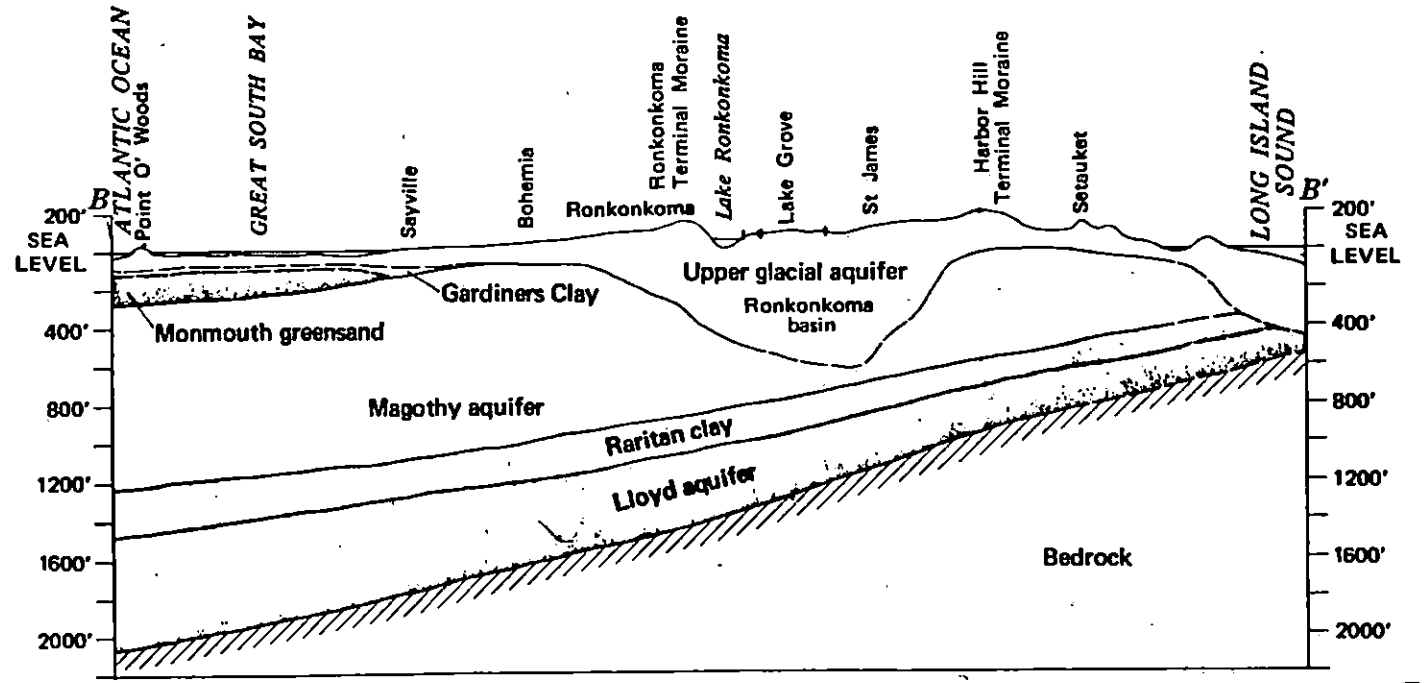
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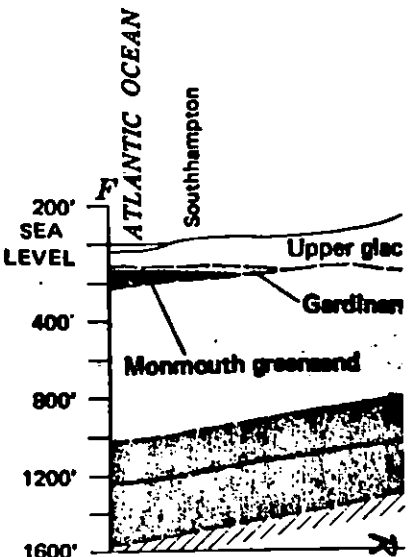
SHEET 6 OF 6

AS IN #1		CATCH BASIN #2 Ug/L			CATCH BASIN #3 Ug/L			MW#1 (SOIL) Ug/L			MW#2 (SOIL) Ug/L		
C	Q		C	Q		C	Q		C	Q		C	Q
	*	2600		*	3200		*	4000			4000		
		26			18			4.7	B		3.1	B	
U		2.8			1.6			87		+	78		+
B		47	B		37	B		7.5	B		13.0	B	
64 B		0.35	B		0.54	B		0.39	B		0.41	B	
4.3 U		0.69	B		0.54	B		0.20	U		0.21	U	
	*	7160		*	21700		*	260	B		620	B	
	*E	38		*E	29		*E	13.0		*N	11.0		*
	*N	24		*N	4.9	B	*N	2.5	B		2.3	B	
	*	170		*	53		*	4.1	B	*N	4.9	B	*
	*	4640		*	10300		*	7700			7900		
		160			430			2.0			11.0		
	*	1640		*	12000		*	360	B		530	B	
	*	35		*	88		*	60			79		
42		0.34			0.13	U		0.1	U		0.1	U	
B		9	B		15			3.7	B	*N	2.3	B	*
B		310	B		430	B		219	B		300	B	
U		1.7	U	W	1.4	U	W	5.0	U		5.2	U	
		6.9			1.1	B		3.9			2.5		
		2030			1600			1700			1600		
U	WN	1.7	U	WN	1.4	U	WN	0.6	U		0.6	U	
	*N	19		*N	26		*N	6.9	B		8.0	B	
	N*	360		N*	200		N*	25		*N	23.0		*
U		1.7	U		1.4	U		0.5			0.50	U	









41°15'

71°45'

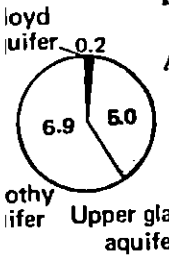
41°00'

Jensen & Soren, 1974 REF. 4.

SHEET 1 OF 3


A
A'
B
B'
C
C'
40°45'
73°30'
40°30'
73°15'
Huntington
Northport
East Northport
Commack
Smithtown Bay
Stony Brook
Old Field Point
Crane Neck Point
Eatons Neck Point
Lloyd Point
Centerport
Dix Hills
Deer Park
Brentwood
Central Islip
Islip
West Babylon
North Babylon
Babylon
Massapequa Park
Amityville
Copiague
Lindenhurst
Oakdale
Great South Bay
Fire Island
Fire Island Lighthouse
Fire Island Inlet
Gilgo Beach Light
Point O' Woods
Cherry Grove
Water Island
Davis Park
Patchogue
Bellport
Mastic
Mastic Beach
Shirley
Moriches Bay
Numerous fishtraps with possible submerged pilings
Fishtraps with possible submerged pilings
INTRACOASTAL WATERWAYS
REF. 4
SHEET 2 OF 3

L. LANATION



APPROXIMATE AREAL CENTER OF MAJOR GROUND-WATER PUMPING AND SOURCE AQUIFERS – Diameter of circle is proportional to pumpage; number is average daily pumpage, in million gallons per day

REF. 4
SHEET 3 OF 3

REF. No. 5

LeRoy Callender, P.C. Boring Logs

One boring log for each drilling location has been submitted. The log is representative of the subsurface conditions found in the well at that drilling location. The dates shown on the logs represent the total amount of time needed to complete all drilling activities at that drilling location. Drilling was done by Marine Pollution Control, Inc. Further details regarding the drilling operations are given in Appendix C.

Driller: Joe Kaufman

Consultant Representatives:
Sirous H. Nabavi
Larrington D. Naraysingh

The United Soil Classification system was used.

G = gravel
S = sand
M = silt
W = well-graded
P = poorly graded
SS= split spoon
GW-1 = monitoring well - number 1
HNu = Photoionization detector

LEROY CALLENDER P.C.
BORING LOG

CLIENT: NYSDEC
LOCATION: CANTOR BROTHERS, INC.

BORING NO.: GW-1
SURFACE ELEV: 100.4'

DRILLING METHOD: HOLLOW STEM AUGERS

SAMPLING METHOD: SPLIT SPOON

DATE STARTED: 9/14/88
DATE FINISHED: 9/15/88

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRIPTION
1	9	SS	0		Light brown mixture of fine to coarse sand with some pebbles. HNu=0.2 ppm
	29		1		
2	5	SS	2		
	32		3		
3	12	SS	4		HNu=0.4 ppm
	28		5		
4	7	SS	6		Light brown mixture of fine to coarse sand with some fine gravel. HNu=0.5 ppm
	20		7		
5	7	SS	8		grading with white sand. HNu=0.4 ppm
	20		9		
6	8	SS	10		grading with rounded pebbles.
	26		11		
7	7	SS	12		Brown/light brown mixture of fine to coarse sand and some gravel.
	8		13	SP-SM GP	
8	9	SS	14		
	16		15		
			16		
			17		
			18		
			19		
9	6	SS	20		grading moist, and with some pebbles.
	13		21		
			22		
			23		
			24		
10	8	SS	25		grading moist with boulders.
	22		26		HNu=0.6ppm

LEROY CALLENDER P.C.
BORING LOG

CLIENT:NYSDEC
LOCATON: CANTOR BROTHERS, INC.

BORING NO.: GW-1

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRIPTION
			27		
			28		
			29		
11	9	SS	30		grading with some gravel HNu=0.6 ppm
	18		31		
			32		
			33	SP-SM GP	
			34		
12	21	SS	35		grading moist and reddish with boulders.
	38		36		
			37		HNu=0.5 ppm
			38		
			39		
13	14		40		grading wet
	17		41		
			42		
			43		
			44		
14	20	SS	45	SP -- GP	Brown, wet sand and gravel with pebbles
	12		46		
			47		
			48		
			49		
15	33	SS	50		Brown, wet, fine sand with granite pebbles.
	28		51		
			52		Boring terminated at a depth of 50.0 feet on Sept. 15, 1988

LEROY CALLENDER P.C.
BORING LOG

CLIENT: NYSDEC
LOCATION: CANTOR BROTHERS, INC.

BORING NO.: GW-2
SURFACE ELEV: 100.4'

DRILLING METHOD: HOLLOW STEM AUGERS

SAMPLING METHOD: SPLIT SPOON

DATE STARTED: 9/29/88
DATE FINISHED: 9/29/88

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRIPTION
1	8	SS	0		Dark/light brown, layered fine sand.
	17		1		HNu=1.0 ppm
2	30	SS	2		grading with white rock particles.
	64		3		
3	10	SS	4		grading with white sand.
	28		5		HNu=0.8 ppm
4	7	SS	6		HNu=0.6 ppm
	11		7		
5	15	SS	8		
	34		9		
6	9	SS	10		grading with organic soil and white pebbles.
	20		11		HNu=0.7 ppm
7	10	SS	12		grading with roots.
	16		13	SP	HNu= 0.8 ppm
8	25	SS	14		
	31		15		HNu=0.7 ppm
			16		
			17		
			18		
			19		
9	12	SS	20		Light brown, fine sand and some gravel with organic material.
	17		21		
			22		
			23		
			24		
10	11		25		
	21		26		

LEROY CALLENDER P.C.
BORING LOG

CLIENT: NYSDEC
LOCATION: CANTOR BROTHERS, INC.

BORING NO.: GW-2

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRIPTION
			27		
			28		
			29		
11	14	SS	30		HNu=0.8 ppm
	18		31	SP	
			32		
			33		
			34		
12	12	SS	35		
	34		36		
			37		
			38		
			39		
13	12	SS	40	SP-SM GP-GM	Dark/light, wet sand with gravel, rounded pebbles and boulders.
	30		41		
			42		HNu=1.2 ppm
			43		
			44		
14	13	SS	45		HNu=1.1 ppm
	9		46		
			47		
			48	SP	
			49	-- GP	
15	7	SS	50		Light brown sand and gravel HNu=1.4 ppm
	3		51		
			52		Boring terminated at a depth of 52.0 feet on Sept. 29, 1988.

LEROY CALLENDER P.C.
BORING LOG

CLIENT: NYSDEC
LOCATION: CANTOR BROTHERS, INC.

BORING NO.: GW-3
SURFACE ELEV: 100.6'

DRILLING METHOD: HOLLOW STEM AUGERS

SAMPLING METHOD: SPLIT SPOON

DATE STARTED: 9/20/88
DATE FINISHED: 9/20/88

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRIPTION
1	17	SS	0		Brown mixture of fine to coarse sand, with pebbles and organic soil.
	16		1		HNu=0.6 ppm
2	7	SS	2		grading layered with more fine sand.
	8		3		HNu=0.55 ppm
3	5	SS	4		
	9		5		
4	16	SS	6		grading with boulders, and coarse white sand.
	40		7		
5	14	SS	8		Dark/light brown, fine to coarse sand with some gravel.
	21		9		HNu=0.4 ppm
6	24	SS	10		
	22		11		
7	6	SS	12		
	21		13	SW-SM GW	
8	10	SS	14		
	21		15		
			16		
			17		
			18		
			19		
9	23	SS	20		
	15		21		
			22		
			23		
			24		
10	19	SS	25		
	26		26		

LEROY CALLENDER P.C.
BORING LOG

CLIENT: NYSDEC
LOCATION: CANTOR BROTHERS, INC.

BORING NO.: GW-3

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRIPTION
			27		
			28		
			29		
11	20	SS	30		grading with pebbles.
	17		31		
			32		
			33		
			34		
12	15	SS	35		
	45		36		
			37		
			38		
			39	SW-SM GW	
13	19	SS	40		grading with dark brown, moist sand. HNu=0.3 ppm
	16		41		
			42		
			43		
			44		
14	9	SS	45		grading wet HNu=0.2 ppm.
	12		46		
			47		
			48		
			49		
15	9	SS	50		Boring terminated at a depth of 52.0 feet on Sept. 20, 1988.
	9		51		
			52		

LEROY CALLENDER P.C.
BORING LOG

CLIENT: NYSDEC
LOCATION: CANTOR BROTHERS, INC.

BORING NO.: GW-4
SURFACE ELEV: 100.0'

DRILLING METHOD: HOLLOW STEM AUGERS

SAMPLING METHOD: SPLIT SPOON

DATE STARTED: 9/30/88
DATE FINISHED: 9/30/88

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRIPTION
1	11	SS	0		Dark/light brown fine sand with pebbles. HNu=0.6 ppm
	31		1		
2	40	SS	2		grading with boulders and gravel.
	56		3		
3	7	SS	4		grading with large cobbles.
	22		5		
4	17	SS	6		grading with organic soil.
	23		7		
5	22	SS	8		grading with traces of white clay. HNu=0.5 ppm
	23		9		
6	20	SS	10		White/light brown, fine to coarse sand.
	11		11		
7	8	SS	12		grading increase in coarse sand. HNu= 0.6 ppm
	17		13	SW	
8	17	SS	14		HNu= 0.4 ppm
	30		15		
			16		
			17		
			18		
			19		
9	15	SS	20		White/brown, fine to medium sand. HNu=0.5 ppm
	18		21		
			22		
			23		
			24		
10	12	SS	25		grading with quartz pebbles.
	28		26		

LEROY CALLENDER P.C.
BORING LOG

CLIENT: NYSDEC
LOCATION: CANTOR BROTHERS, INC.

BORING NO.: GW-4

SAMPLE NO.	BLOWS/FT	SAMPLE TYPE	DEPTH IN FT	SOIL GRAPH	MATERIAL DESCRITION
			27	SW	
			28		
			29		
11	5	SS	30		Brown/light brown, fine to coarse sand with gravel. HNu= 0.4 ppm
	13		31		
			32		
			33		
			34	GW -- SW	
12	14	SS	35		grading with some pebbles. HNu= 0.5 ppm
	30		36		
			37		
			38		
			39		
13	10	SS	40		Brown/dark brown, fine to medium, wet sand and gravel with quartz pebbles.
	12		41		
			42		HNu= 0.4 ppm
			43		
			44		
14	15	SS	45		
	11		46	GP-GM SP	
			47		
			48		
			49		
15	9	SS	50		grading with few boulders HNu= 0.3 ppm
	3		51		Boring terminated at a depth of 50.0 feet on Sept. 30, 1988.
			52		

Nassau/Suffolk Community Statistics

	Community	Township	Area Square Miles	Population 1987 Est.	Population 1980 Census	Density Persons/ Sq Mile	Median* Family Income	Congress District
	Albertson	North Hempstead	1.12	5,339	5,561	4,767	43,273	3
	Amagansett	East Hampton	20.02	2,415	2,188	121	25,288	1
	Amityville (v)	Babylon	*2.20	9,297	9,076	4,245	38,000	2
	Amityville (uninc)	Babylon	—	43	43	4,425	38,000	
	Aquebogue	Riverhead	2.50	1,006	895	402	28,345	1
	Asharoken (v)	Huntington	1.50	690	635	460	85,270	3
	Atlantic Beach (v)	Hempstead	.63	1,938	1,775	3,076	54,363	5
	Atlantic Beach (uninc)	Hempstead	.66	2,202	2,008	3,336	48,954	5
X	Babylon (v)	Babylon	2.51	12,500	12,388	4,980	39,738	2
	Baldwin	Hempstead	4.29	31,337	31,630	7,304	43,489	4 & 5
	Baxter Estates (v)	North Hempstead	.16	871	911	5,444	51,924	3
	Bay Park	Hempstead	.46	2,299	2,353	4,998	36,040	5
	Bay Shore	Islip	2.97	11,351	10,777	3,822	27,198	2
	Bayport	Islip	4.32	9,183	9,282	2,126	38,798	2
	Bayville (uninc)	Oyster Bay	.29	523	487	1,803	53,453	3
	Bayville (v)	Oyster Bay	1.39	7,477	7,034	5,379	41,348	3
	Belle Terre (v)	Brookhaven	.93	872	826	937	67,996	1
	Bellerose (v)	Hempstead	.13	1,224	1,187	9,415	51,302	5
	Bellerose Terrace	Hempstead	.13	1,930	1,951	14,846	36,965	5
	Bellmore	Hempstead	2.47	17,565	18,106	7,111	42,789	4
	Bellport (v)	Brookhaven	1.39	2,876	2,809	2,069	43,279	1
X	Bethpage	Oyster Bay	3.55	16,567	16,840	4,666	41,384	4
	Blue Point	Brookhaven	1.70	4,340	4,096	2,552	36,614	1
	Bohemia	Islip	8.57	9,314	9,308	1,086	33,926	2
	Brentwood	Islip	9.85	45,097	44,321	4,578	34,689	2
	Pilgrim Psych Center (sp)	Islip	—	2,949	3,865	—	—	—
	Bridgehampton	Southampton	†20.21	2,244	1,941	170	30,573	1
	Brightwaters (v)	Islip	1.00	3,200	3,286	3,200	50,360	2
	Brookhaven	Brookhaven	5.30	3,041	3,050	573	40,800	1
	Brookhaven Natl Lab (sp)	Brookhaven	—	205	205	—	—	
	Poospatuck Indian Res (sp)	Brookhaven	.09	203	203	2,255	17,935	
	Brookville (v)	Oyster Bay	4.17	3,686	3,290	883	93,106	3
	CW Post Center	Oyster Bay	—	1984	1629	—	—	
	Calverton-Roanoke	Riverhead	30.93	5,660	4,952	183	22,627	1
	Captree Island	Babylon	.22	38	37	173	—	
	Captree State Park	Islip	—	10	10	—	—	
	Carle Place	North Hempstead	.89	5,224	5,470	5,869	38,765	3
	Cedarhurst (v)	Hempstead	1.00	5,896	6,162	5,896	42,132	5
	Center Moriches	Brookhaven	5.60	6,950	5,703	1,241	31,733	1
	Centereach	Brookhaven	8.76	31,660	30,136	3,614	35,879	1
	Centerport	Huntington	3.36	6,612	6,576	1,967	46,193	3
	Central Islip	Islip	12.16	16,957	17,341	4 533	32,198	2
	CI Psychiatric Center (sp)	Islip	—	1,100	2,194	—	—	
	NY Inst of Technology (sp)	Islip	—	642	—	—	—	
	Centre Island (v)	Oyster Bay	1.15	400	378	347	79,929	3
	Cold Spring Harbor	Huntington	3.74	5,228	5,336	1,397	53,095	3
	Commack	Huntington	*10.62	13,214	13,687	3,250	45,934	3
		Smithtown	—	21,304	21,032	3,250	45,934	3
	Copiague	Babylon	3.17	21,454	20,132	6,767	34,158	2
	Coram	Brookhaven	13.59	29,838	24,752	2,195	36,467	1
	Cove Neck (v)	Oyster Bay	1.51	335	331	221	63,349	3
	Cutchogue-New Suffolk	Southold	9.30	2,964	2,788	318	33,262	1
X	Deer Park	Babylon	6.14	30,643	30,394	4,990	37,885	2
	Dering Harbor (v)	Shelter Island	.40	17	16	42	NA	1
X	Dix Hills	Huntington	15.75	27,455	26,693	1,743	54,889	2 & 3
X	East Farmingdale	Babylon	5.79	6,134	5,522	1,059	33,176	2
X	SUNY Farmingdale	Babylon	—	900	1,025	—	—	
	East Garden City	Hempstead	3.08	4,243	2,781	1,377	39,234	5
	Hofstra University	Hempstead	—	3,141	1,680	—	—	
	East Hampton (v)	East Hampton	4.80	1,911	1,886	398	41,951	1
	East Hills (v)	North Hempstead	*2.08	6,843	7,146	3,296	83,191	3
		Oyster Bay	—	14	14	3,296	83,191	3
	East Islip	Islip	4.02	14,586	13,852	3,628	36,158	2
	East Marion-Orient	Southold	8.40	1,573	1,511	187	30,521	1
	East Massapequa	Oyster Bay	2.36	13,340	13,987	5,652	47,032	4
	East Meadow	Hempstead	6.64	39,834	39,317	5,999	41,346	5
	NC Jail	Hempstead	—	1,044	595	—	—	
	East Moriches	Brookhaven	5.40	4,340	3,613	803	30,372	1

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Community	Township	Area Square Miles	Population 1987 Est.	Population 1980 Census	Density Persons/ Sq Mile	Median* Family Income	Congress District
East Northport	Huntington	4.25	19,823	20,187	4,664	40,277	3
East Norwich	Oyster Bay	1.17	2,700	2,841	2,307	49,732	3
East Patchogue	Brookhaven	6.46	20,873	18,139	2,467	32,397	1
East Quogue	Southampton	3.47	3,890	3,668	1,121	31,349	1
East Rockaway (v)	Hempstead	1.00	10,529	10,917	10,529	40,257	4
East Shoreham	Brookhaven	3.05	4,091	3,817	1,341	46,945	1
East Williston (v)	North Hempstead	.69	2,614	2,708	4,356	59,070	3
Eastport	Brookhaven	*1.48	490	425	897	30,372	1
	Southampton	—	837	852	897	30,372	1
Eatons Neck	Huntington	.90	1,613	1,574	1,792	56,476	3
Elmont	Hempstead	3.36	27,201	27,592	8,095	36,124	5
Elwood	Huntington	4.79	11,678	11,847	2,437	44,871	3
X Farmingdale (v)	Oyster Bay	1.08	7,998	7,946	7,406	38,395	4
Farmingville	Brookhaven	4.48	14,793	13,398	3,302	33,629	1
Fire Island	Brookhaven	*9.39	88	83	36	33,722	1
	Islip	—	247	226	36	33,722	2
Fishers Island	Southold	5.32	405	318	76	43,468	1
Floral Park (v)	Hempstead	*1.39	13,800	14,478	11,742	39,822	3 & 5
	North Hempstead	—	2,522	2,327	11,742	39,822	3
Flower Hill (v)	North Hempstead	1.58	4,578	4,558	2,897	82,044	3
Fort Salonga	Huntington	*8.57	6,386	5,760	1,228	51,371	3
	Smithtown	—	4,137	3,790	1,228	51,371	3
Franklin Square	Hempstead	2.90	28,646	29,051	9,877	37,656	5
Freeport (v)	Hempstead	4.59	38,641	38,272	8,418	34,048	4 & 5
Garden City (v)	Hempstead	5.29	21,998	22,927	4,158	61,132	5
Adelphi Univ	Hempstead	—	837	788	—	—	
Garden City Park	North Hempstead	.97	7,746	7,712	7,985	42,352	3
Garden City South	Hempstead	.39	4,043	4,273	10,366	40,373	5
Gilgo-Oak Beach	Babylon	8.44	380	381	45	41,407	2
Glen Cove City	Oyster Bay	6.45	25,733	24,618	3,989	38,287	3
Glen Head	Oyster Bay	1.70	4,513	4,513	2,654	46,279	3
Glenwood Landing	North Hempstead	*.98	216	220	3,670	46,423	3
	Oyster Bay	—	3,381	3,335	3,670	46,423	3
Gordon Heights	Brookhaven	1.40	1,621	1,590	1,157	27,847	1
Great Neck (uninc)	North Hempstead	1.01	6,566	7,033	6,500	60,075	8
Great Neck (v)	North Hempstead	1.39	8,936	9,168	6,428	52,208	8
Great Neck Estates (v)	North Hempstead	.81	2,794	2,936	3,449	86,500	8
Great Neck Plaza (v)	North Hempstead	.31	6,029	5,604	19,448	40,084	3
Great River	Islip	6.90	1,599	1,631	231	58,709	1 & 2
Greenlawn	Huntington	3.82	14,179	13,869	3,711	41,951	3
Greenport (uninc)	Southold	2.60	1,792	1,571	689	25,650	1
Greenport (v)	Southold	.90	2,475	2,273	2,750	26,650	1
Greenvale	North Hempstead	*.26	776	766	4,062	39,027	3
	Oyster Bay	—	280	232	4,062	39,027	3
Hampton Bays	Southampton	10.62	8,073	7,256	760	29,132	1
Hampton Park	Southampton	5.30	1,511	1,331	285	31,436	
Hauppauge	Islip	*10.23	10,232	10,145	2,036	41,436	1, 2 & 3
	Smithtown	—	10,600	10,764	2,036	41,436	1, 2 & 3
Head of The Harbor (v)	Smithtown	3.00	1,196	1,023	398	63,731	1 & 3
Hempstead (v)	Hempstead	3.78	41,389	40,404	10,949	31,683	5
Herricks	North Hempstead	1.16	7,761	8,123	6,690	52,192	3
Hewlett	Hempstead	.89	7,127	6,986	8,007	43,040	5
Hewlett Bay Park (v)	Hempstead	.39	464	489	1,189	114,227	5
Hewlett Harbor (v)	Hempstead	.86	1,240	1,331	1,441	114,227	5
Hewlett Neck (v)	Hempstead	.23	449	472	1,952	110,210	5
Hicksville	Oyster Bay	6.64	41,824	43,245	6,298	40,970	4
Holbrook	Brookhaven	*6.68	5,313	4,899	3,903	36,011	1 & 2
	Islip	—	20,756	19,483	3,903	36,011	1 & 2
Holtsville	Brookhaven	*7.15	11,497	11,073	1,980	36,052	1 & 2
	Islip	—	2,662	2,442	1,980	36,052	1 & 2
X Huntington	Huntington	8.38	22,170	21,727	2,645	50,900	3
Huntington Bay (v)	Huntington	1.06	1,777	1,783	1,676	81,281	3
Huntington Station	Huntington	5.41	29,625	28,769	5,475	36,225	2 & 3
Inwood	Hempstead	1.70	9,196	8,228	5,409	27,123	5
Island Park (uninc)	Hempstead	1.18	4,693	4,108	3,977	38,792	4
Island Park (v)	Hempstead	.39	4,812	4,847	12,338	29,584	4
Islandia (v)	Islip	—	2,797	2,569	—	—	2
Islip	Islip	3.94	14,680	13,438	3,725	34,389	2
Islip Terrace	Islip	1.31	5,966	5,588	4,554	35,827	2
Jamesport	Riverhead	1.70	1,142	1,069	671	37,036	1
Jericho	Oyster Bay	4.21	13,347	12,739	3,170	55,864	3 & 4
Kensington (v)	North Hempstead	.24	1,124	1,132	4,683	93,282	8

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	Community	Township	Area Square Miles	Population 1987 Est.	Population 1980 Census	Density Persons/ Sq Mile	Median* Family Income	Congress District
	Kings Park	Smithtown	6.22	16,417	16,131	2,639	40,465	3
	Kings Park Psych Center (sp)	Smithtown	—	2,520	2,681	—	—	—
	Kings Point (v)	North Hempstead	3.59	5,245	5,235	1,461	113,497	8
	USMM Academy	North Hempstead	—	1,000	803	—	—	
	Lake Grove (v)	Brookhaven	3.01	10,277	9,692	3,414	35,177	1
	Lake Ronkonkoma	Brookhaven	*13.40	15,317	14,305	3,028	34,143	1 & 2
	Lake Ronkonkoma	Islip	—	20,626	19,567	3,028	34,143	1 & 2
	Lake Ronkonkoma	Smithtown	—	4,628	4,339	3,028	34,143	1 & 2
	Lake Success (v)	North Hempstead	1.86	2,198	2,396	1,181	81,797	3
	Lakeview	Hempstead	.58	5,217	5,276	8,994	41,075	5
	Lattingtown (v)	Oyster Bay	3.94	2,013	1,749	510	61,173	3
	Laurel	Southold	2.60	1,079	962	415	36,430	1
	Laurel Hollow (v)	Oyster Bay	3.08	1,663	1,527	539	79,577	3
	Lawrence (v)	Hempstead	4.29	6,166	6,175	1,437	65,299	5
	Levittown	Hempstead	6.76	55,280	57,045	8,177	39,971	4 & 5
	Lido-Point Lookout	Hempstead	2.02	4,909	4,504	2,430	54,517	4
X	Lindenhurst (v)	Babylon	3.78	27,177	26,919	7,189	34,111	2
	Lloyd Harbor (v)	Huntington	9.19	3,555	3,405	386	90,025	3
	Locust Grove	Oyster Bay	2.08	9,095	9,670	4,372	50,204	3 & 4
	Locust Valley	Oyster Bay	1.04	3,461	3,576	3,327	37,917	3
	Long Beach City	Hempstead	2.08	34,595	34,073	16,632	31,176	5
	Lynbrook (v)	Hempstead	2.51	19,615	20,424	7,814	38,704	5
	Malverne (uninc)	Hempstead	.19	1,289	1,183	6,784	45,920	5
	Malverne (v)	Hempstead	1.31	8,872	9,262	6,772	48,821	5
	Manhasset	North Hempstead	2.39	8,518	8,485	3,564	52,414	3
	Manorhaven (v)	North Hempstead	.62	5,792	5,384	9,341	36,688	3
	Manorville	Brookhaven	27.70	8,171	6,548	294	28,987	1
	Massapequa	Oyster Bay	3.94	23,659	24,454	6,004	43,011	4
	Massapequa Park (v)	Oyster Bay	2.32	19,304	19,779	8,320	45,826	4
	Mastic	Brookhaven	5.10	11,396	10,413	2,234	26,922	1
	Mastic Beach	Brookhaven	4.29	9,447	8,318	2,202	23,450	1
	Matinecock (v)	Oyster Bay	2.71	1,095	985	404	85,264	3
	Mattituck	Southold	8.76	4,270	3,923	487	35,550	1
	Medford	Brookhaven	10.73	21,961	20,418	2,046	34,354	1
X	Melville	Huntington	10.19	11,334	10,380	1,112	61,113	2 & 3
	LI Developmental Center		—	1,200	1,480	—	—	
	Sagamore Children's Center		—	84	—	—	—	
	Merrick	Hempstead	4.25	23,781	24,478	5,595	48,972	4
	Middle Island	Brookhaven	8.22	8,149	5,703	991	30,104	1
	Mill Neck (v)	Oyster Bay	3.00	1,026	959	342	68,342	3
	Miller Place	Brookhaven	6.52	8,863	7,877	1,359	41,351	1
	Mineola (v)	Hempstead	*1.81	52	52	11,240	37,562	3
		North Hempstead	—	20,293	20,705	11,240	37,562	3
	Montauk	East Hampton	15.67	3,102	2,819	197	31,776	1
	Mount Sinai	Brookhaven	6.14	8,436	6,591	1,373	37,385	1
	Munsey Park (v)	North Hempstead	.50	2,731	2,806	5,462	78,261	3
	Muttontown (v)	Oyster Bay	6.64	3,329	2,725	501	80,548	3
	Napeague Hither Hills	East Hampton	6.54	245	151	37	38,922	1
	Nesconset	Smithtown	3.78	11,977	10,706	3,168	39,603	1
	New Cassel	North Hempstead	1.47	10,469	9,635	7,121	32,565	4
	New Hyde Park (v)	Hempstead	*1.00	3,961	4,047	9,484	38,541	3 & 5
		North Hempstead	—	5,523	5,754	9,484	38,541	3 & 5
	Nissequogue (v)	Smithtown	4.20	1,647	1,462	392	70,200	1 & 3
X	North Amityville	Babylon	2.39	13,333	13,140	5,578	29,804	2
	North Babylon	Babylon	3.36	18,751	19,019	5,580	38,998	2
	North Bay Shore	Islip	8.49	35,133	35,020	4,138	34,913	2
	North Bellmore	Hempstead	2.66	20,017	20,630	7,525	43,698	4 & 5
	North Bellport	Brookhaven	4.59	7,804	7,432	1,700	26,165	1
	North Great River	Islip	4.52	11,789	11,416	2,608	32,437	2
	North Haven (v)	Southampton	2.60	755	738	290	36,700	1
	North Hills (v)	North Hempstead	2.84	2,859	1,587	1,006	82,894	3
x	North Lindenhurst	Babylon	1.89	11,553	11,511	6,112	34,403	2
	North Massapequa	Oyster Bay	2.78	20,955	21,385	7,537	43,669	4
	North Merrick	Hempstead	1.74	12,487	12,848	7,176	43,465	4 & 5
	North New Hyde Park	North Hempstead	1.97	14,548	15,114	7,384	41,072	3 & 5
	North Patchogue	Brookhaven	2.12	7,517	7,126	3,545	31,348	1
	North Sea	Southampton	2.50	1,460	1,171	584	29,019	1
	North Valley Stream	Hempstead	1.89	14,452	14,530	7,646	41,898	5
	North Wantagh	Hempstead	1.85	13,077	12,677	7,068	45,676	4 & 5
	Northport (v)	Huntington	2.55	7,950	7,651	3,117	44,176	3
	Northport VA Hosp (sp)	Huntington	—	309	650	—	—	—
	Northville	Riverhead	18.53	3,227	2,583	174	30,806	1

Continued on Next Page

Population

Community	Township	Area Square Miles	Population 1987 Est.	Population 1980 Census	Density Persons/ Sq Mile	Median* Family Income	Congress District
Northwest Harbor	East Hampton	17.35	2,922	2,459	168	35,611	1
Noyack	Southampton	16.99	3,476	2,657	204	28,265	1
Oakdale	Islip	3.20	8,072	8,090	2,522	39,811	2
Dowling College	Islip	—	204	204	—	—	—
Ocean Beach (v)	Islip	.14	164	155	1,171	36,171	2
Oceanside	Hempstead	5.13	33,470	33,639	6,524	43,837	4
Old Bethpage	Oyster Bay	4.02	6,336	6,215	1,576	49,525	4
Old Brookville (v)	Oyster Bay	4.03	1,725	1,574	428	91,643	3
Old Field (v)	Brookhaven	2.20	909	829	413	70,676	1
Old Westbury (uninc)	North Hempstead	.02	96	96	4,800	35,854	3
Old Westbury (v)	North Hempstead	*8.49	2,360	2,175	410	88,118	3
Old Westbury (v)	Oyster Bay	—	1,129	1,102	410	88,118	3
Oyster Bay	Oyster Bay	1.24	7,467	6,497	6,021	38,162	3
Oyster Bay Cove (v)	Oyster Bay	4.30	2,292	1,799	533	93,547	3
Patchogue (v)	Brookhaven	2.20	11,243	11,291	5,110	27,709	1
Peconic	Southold	4.00	1,249	1,056	312	31,205	1
Plainedge	Oyster Bay	1.43	9,396	9,629	6,570	40,338	4
Plainview	Oyster Bay	5.64	27,572	28,037	4,888	49,546	4
Plandome (v)	North Hempstead	.50	1,469	1,503	2,938	83,185	3
Plandome Heights (v)	North Hempstead	.19	956	986	5,031	67,445	3
Plandome Manor (v)	North Hempstead	.58	924	883	1,593	99,111	3
Poquott (v)	Brookhaven	.47	692	588	1,472	33,220	1
Port Jefferson (v)	Brookhaven	3.51	7,390	6,731	2,105	44,470	1
Port Jefferson Station	Brookhaven	5.87	17,623	17,009	3,002	35,862	1
Port Washington	North Hempstead	3.90	14,301	14,521	3,666	46,864	3
Port Washington NE & NW	North Hempstead	.30	1,504	1,484	5,013	50,851	3
Port Washington North (v)	North Hempstead	.46	3,074	3,147	6,683	52,711	3
Quogue	Southampton	1.20	631	609	525	28,133	1
Quogue (v)	Southampton	4.14	1,354	966	327	38,249	
Remsenberg-Speonk	Southampton	3.62	2,187	1,868	604	35,513	1
Ridge	Brookhaven	18.53	10,916	8,977	589	29,988	1
Riverhead	Riverhead	4.29	6,516	6,339	1,518	25,525	1
Riverside-Flanders	Southampton	27.22	5,712	5,400	209	22,359	1
SC Jail	Southampton	—	459	375	—	—	
Rockville Centre (v)	Hempstead	3.32	24,997	25,412	7,529	47,833	5
Rocky Point	Brookhaven	10.39	7,690	7,012	740	24,526	1
Roosevelt	Hempstead	1.74	14,578	14,109	8,378	33,696	5
Roslyn (v)	North Hempstead	.70	2,253	2,134	3,218	47,292	3
Roslyn Estates (v)	North Hempstead	.44	1,235	1,292	2,806	96,866	3
Roslyn Harbor (v)	Oyster Bay	*1.20	347	344	956	84,036	3
Roslyn Harbor (v)	North Hempstead	—	801	785	956	84,036	3
Roslyn Heights	North Hempstead	1.43	6,288	6,546	4,397	48,977	3
Russell Gardens (v)	North Hempstead	.18	1,343	1,263	7,461	87,413	3
Saddle Rock (v)	North Hempstead	.26	954	921	3,669	90,154	8
Sag Harbor (v)	East Hampton	*2.01	906	895	1,361	28,342	1
Sag Harbor (v)	Southampton	—	1,870	1,686	1,361	28,342	1
Sagaponack	Southampton	†20.21	330	245	—	37,314	1
Saint James	Smithtown	4.52	12,154	12,122	2,688	38,325	1
Saltaire (v)	Islip	.30	40	35	132	114,227	2
Sands Point (v)	North Hempstead	4.29	2,730	2,742	636	114,227	3
Sayville	Islip	3.47	12,696	12,013	3,658	37,961	2
Sea Cliff (v)	Oyster Bay	1.00	5,385	5,364	5,385	43,340	3
Seaford	Hempstead	2.61	15,898	16,117	6,091	42,678	4
Searingtown	North Hempstead	.99	5,167	4,900	5,219	70,212	3
Selden	Brookhaven	3.71	18,749	17,259	5,053	32,169	1
Setauket-E.Setauket	Brookhaven	6.95	11,283	10,176	1,623	43,169	1
Shelter Island	Shelter Island	*11.68	1,332	1,115	204	26,653	1
Shelter Island Heights	Shelter Island	—	1,054	940	204	36,933	1
Shinnecock Hills	Southampton	5.40	3,079	2,344	570	32,132	1
Shinnecock Indian Res (sp)	Southampton	1.28	297	297	232	28,556	
Southampton College	Southampton	—	675	625	—	—	
Shirley	Brookhaven	10.93	19,923	18,072	1,822	28,201	1
Shoreham (v)	Brookhaven	.45	582	555	1,293	54,647	1
Smithtown	Smithtown	13.01	31,758	30,906	2,441	46,624	1 & 3
Sound Beach	Brookhaven	2.66	8,733	8,071	3,283	33,346	1
X South Farmingdale	Oyster Bay	2.16	15,706	16,439	7,271	42,505	4
South Floral Park (v)	Hempstead	.10	1,647	1,490	16,470	36,056	5
South Hempstead	Hempstead	.58	3,207	3,217	5,529	42,396	5
X South Huntington	Huntington	3.94	14,579	14,854	3,700	43,873	2 & 3
South Valley Stream	Hempstead	.89	5,200	5,462	5,842	54,849	5
South Westbury	Hempstead	1.27	9,435	9,732	7,429	45,743	4 & 5
Southampton (v)	Southampton	5.60	4,171	4,000	744	31,550	1

Continued on Next Page

Community	Township	Area Square Miles	Population 1987 Est.	Population 1980 Census	Density Persons/ Sq Mile	Median* Family Income	Congress District
Southold	Southold	12.20	5,196	4,770	425	29,424	1
Springs	East Hampton	8.65	3,831	3,201	442	26,002	1
Stewart Manor (v)	Hempstead	.22	2,477	2,373	11,259	45,717	5
Stony Brook	Brookhaven	7.34	25,428	22,393	3,464	48,553	1
SUNY Stony Brook	Brookhaven	—	6804	6,238	—	—	
Syosset	Oyster Bay	2.66	10,403	9,818	3,910	51,651	3 & 4
Thomaston (v)	North Hempstead	.35	2,642	2,684	7,548	55,539	3
Tuckahoe	Southampton	4.70	1,022	953	217	33,169	1
Uniondale	Hempstead	2.66	19,448	20,016	7,311	36,276	5
AH Patterson-Home For Aged & Infirm	Hempstead	—	889	900	—	—	
Upper Brookville (v)	Oyster Bay	4.32	1,401	1,245	324	83,628	3
Valley Stream (v)	Hempstead	3.98	34,670	35,769	8,711	40,026	5
Village of The Branch (v)	Smithtown	.80	1,775	1,707	2,218	51,480	1 & 3
Wading River	Riverhead	8.00	4,648	4,405	581	35,114	1
Wainscott	East Hampton	6.90	570	421	82	25,493	1
Wantagh	Hempstead	3.94	20,354	19,817	5,165	45,015	4 & 5
Watermill	Southampton	†20.21	865	722	—	37,314	1
West Amityville	Oyster Bay	1.24	7,202	6,623	5,808	39,217	2
X West Babylon	Babylon	7.64	44,695	41,699	5,850	34,828	2
West Bay Shore	Islip	2.36	5,241	5,118	2,220	45,536	2
West Hempstead	Hempstead	2.63	17,994	18,536	6,841	41,872	5
West Hills	Huntington	4.79	6,038	6,071	1,260	51,806	2 & 3
West Islip	Islip	6.18	29,177	29,533	4,721	40,698	2
West Sayville	Islip	3.17	8,602	8,185	2,713	32,942	2
Westbury (v)	North Hempstead	2.59	13,775	13,871	5,318	44,137	4 & 5
Westhampton	Southampton	20.96	3,461	2,774	165	25,655	1
Westhampton Beach (uninc)	Southampton	*3.10	19	39	582	36,806	1
Westhampton Beach (v)	Southampton	—	1,805	1,629	588	36,511	1
Williston Park (v)	North Hempstead	.62	7,817	8,216	12,608	40,340	3
Woodbury	Oyster Bay	4.94	7,718	7,043	1,562	60,416	3 & 4
Woodmere	Hempstead	2.63	16,017	17,205	6,090	60,433	5
Woodsburgh (v)	Hempstead	.44	849	847	1,929	104,622	5
X Wyandanch	Babylon	5.64	13,375	13,215	2,371	33,316	2
Yaphank	Brookhaven	12.30	4,254	2,812	345	29,027	1

Notes:
* Figure is for total area of community.
† area of Watermill-Bridgehampton-Sagaponak is 20.21 sq miles.
Note: No adjustment was made for Islandia which was incorporated in 1985.
(v) - incorporated village (have their own elected officials)
(uninc) - unincorporated area, although clearly defined communities, have no village gov't. See pg 8 - How LI is Governed.
(sp) - Special population.
* - 1980 Census - adjusted using the consumer price index.
Source: Lilco

Your Representative In Congress Is:

District #	Name	Address	Phone #
1	George J Hochbrueckner (D),	3771 Nesconset Hwy, Centereach 11720,	(689-6767)
2	Thomas J Downey (D)	4 Udall Rd, W Islip 11795	(661-8777)
3	Robert Mrazek (D)	143 Main St, Huntington 11743	(673-6500)
4	Norman F Lent (R-C)	2280 Grand Ave, Baldwin 11510	(223-1616)
5	Raymond J McGrath (R)	203 Rockaway Ave, Valley Stream 11580	(872-9550)
8	James H Scheuer (D)	137-08 Northern Blvd, Flushing 11354	(468-3939)

REF. 6.
SHEET 6 OF 6

Top 19 Colleges & Universities

(By number of faculty)

Rank	School/Location/President/Phone	Full-Time Faculty/ Tuition Per Year	'86-'87 Enrollment Under-grad	Grad	'86-'87 # Undergrad Degrees	'86-'87 # Grad Degrees
4-Year Schools						
1	**SUNY at Stony Brook** (Stony Brook), Dr John Marburger III 632-6265	1,400/$1,600	11,200	4,900	2,800	1,300
2	**LI University** (includes CW Post in Greenvale, Brentwood and Southampton campuses), Dr David Steinberg 299-0200	431/$6,450	7,300	4,350	1,394	957
3	**Hofstra University** (Hempstead), Dr James Shuart, Pres 560-6800	457/$6,870	8,189	3,744	1,454	495
4	**Adelphi University** (Garden City), Dr Peter Diamandopoulos 663-1135	354/$6,660	5,396	5,104	784	659
5	**NY Institute of Technology** (Old Westbury/Central Islip), Dr Matthew Schure, Pres 686-7650	266/$5,370	8,045	1,424	1,167	270
6	**SUNY at Old Westbury** (Old Westbury), Dr L Eudora Pettigrew, Pres 876-3000	140/$1,350	3,624	—	720	—
7	**Molloy College** (Rockville Centre), Sister Janet Fitzgerald 678-5000	102/$5,700	1,472	—	347	—
8	**NY Chiropractic College** (Old Brookville), Keith Asplin, PhD, Pres 626-2700	103/$7,950	700	—	220	—
9	**US Merchant Marine Academy** (Kings Pt), Rear Admiral Paul Krinsky, Act Supt 773-5000	73/Pd by Fed'l Gov't	926	—	219	—
10	**Dowling College** (Oakdale), Dr Victor Meskill, Pres 244-3040	72/$4,950	2,523	540	511	131
11	**Polytechnic Univ LI Campus** (Farmingdale), Dr George Bugliarello 454-5111	60/$9,900	657	805	140	200
12	**St Joseph's College** (Patchogue), Sister George Aquin O'Connor 654-3200	47/$4,400	1,470	—	321	—
13	**SUNY Empire State College** (Old Westbury), Dr Patricia Lefor, Dean LI Ctr 997-4700	21/$1,107	585	—	362	1 (new prog)
14	**Friends World College** (Huntington), Dr Lawrence Weiss 549-5000	34/$5,700	550	—	21	—
15	**Webb Inst of Naval Arch** (Glen Cove), Vice Admiral Benedict Stabile 671-2213	8/None*	87	—	19	—
2-Year Schools						
1	**Nassau Community College** (Garden City), Dr Sean Fanelli 222-7205	530/$1,350	19,363	—	3,100	—
2	**Suffolk Community College** (Selden), Robert Kreiling 451-4110	502/$1,340	17,629	—	2,200	—
3	**SUNY at Farmingdale** (Farmingdale), Dr Frank Cipriani 420-2000	285/$1,350	11,747	—	1,465	—
4	**Five Towns College** (Seaford), Dr Stanley Cohen 783-8800	18/$4,250	393	—	71	—

*All students receive 4yr tuition free scholarships. Source: *LI/BUSINESS NEWS* Research Dept (8/87)

TRIVIA:

In 1912 Farmingdale College was founded as agricultural institute reflecting Suffolk's position as NY State's leading agricultural county.

In the 1870s, Greenlawn became the center of the production of pickles.

Land Surveyors	94	141	235
Landscape Architects	27	42	69
Licensed Practical Nurses	4,507	5,535	10,042
Masseuses	174	126	300
Medical Doctors (MD)	5,822	2,786	8,608
Occupational Therapists	240	145	385
Occupational Therapy Assistants	27	32	59
Ophthalmologists	316	163	479

Estimated LI Acreage

(Under Cultivation — 1987)

Commodity	Acres	Commodity	Acres
Potatoes	9,000	Cucumbers	3
Grain	7,000	Peppers	3
Nursery	5,500	Onions	300
Sod	4,000	Spinach	300
Cauliflower	1,500	Strawberries	3[illegible]
Cabbage	1,500	Tomatoes	2[illegible]
Sweet Corn	1,000	Lettuce	200
Pasture	1,200	Squash	200
Grapes	1,500	Pumpkins	3
Green Beans	500	Melons	1
Peaches	400	Other	1,4
Apples	300	TOTAL	37,280

Source: LI Farm Bureau, Cornell Cooperative Extension, US Dept of Agriculture

Mallinckrodt
Material Safety Data

Emergency Phone Number: 314-982-5000

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Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361.

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TETRACHLOROETHYLENE

PRODUCT IDENTIFICATION:

Synonyms: tetrachloride ethylene; tetrachloroethene

Formula CAS No.: 127-18-4

Molecular Weight: 165.83

Chemical Formula: C_2Cl_4

Hazardous Ingredients: Tetrachloroethylene

PRECAUTIONARY MEASURES

WARNING! HARMFUL IF SWALLOWED OR INHALED.
CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
AFFECTS CENTRAL NERVOUS SYSTEM.

Do not get in eyes, on skin, or on clothing.
Do not breathe mist.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

EMERGENCY/FIRST AID

If swallowed, induce vomiting immediately by giving two glasses of water, or milk if available and sticking finger down throat. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. In all cases call a physician.
SEE SECTION 5.

DOT Hazard Class: ORM-A

SECTION 1 Physical Data

Appearance: Clear, colorless liquid.

Odor: Ethereal.

Solubility: 0.015 g in 100 g of water.

Boiling Point: 119-121°C (246-250°F)

Melting Point: -22°C (-8°F)

Density: 1.63

Vapor Density (Air=1): 5.83

Vapor Pressure (mm Hg): 16 @ 22°C (72°F)

Evaporation Rate: (CCl_4=1) 0.27

SECTION 2 Fire and Explosion Information

Fire:
Not considered to be a fire hazard but becomes hazardous in a fire situation because of vapor generation and possible degradation to phosgene (highly toxic) and hydrogen chloride (corrosive).

Explosion:
Not considered to be an explosion hazard.

Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Thermo-oxidative reactions can produce highly toxic phosgene or hydrogen chloride.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

SECTION 3 Reactivity Data

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:
This substance does not polymerize.

Incompatibilities:
Strong oxidizers, strong alkalies, especially NaOH, KOH; finely divided metals, especially zinc.

SECTION 4 Leak/Spill Disposal Information

Clean-up personnel require protective clothing and respiratory protection from vapors. Contain and recover liquid when possible. Chlorinated solvents in large amounts should be burned in an approved incinerator with appropriate scrubbers. Alternatively, absorb with vermiculite, dry sand, earth, or similar material. Scoop up with non-sparking tools and place in a closed container, and dispose in a RCRA approved facility. Do not flush to the sewer.

Reportable Quantity (RQ)(CWA/CERCLA): 1 lb.

Ensure compliance with local, state and federal regulations.

RECEIVED
MAY 04 1989

NFPA Ratings: Health: 2 Flammability: 0 Reactivity: 0

Effective Date: 06-10-86 Supersedes 10-16-85

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ergency Phone Number: 314-982-5000

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TION 5 Health Hazard Information

EXPOSURE / HEALTH EFFECTS

alation:
ating to the upper respiratory tract. Giddiness, headache, tication, nausea and vomiting may follow the inhalation of : amounts while massive amounts can cause breathing arrest death. Concentrations of 600 ppm and more may effect the ral nervous system after a few minutes.

estion:
highly toxic by this route because of low water solubility. d as an oral dosage for hookworm (1 to 4 ml). May cause ominal pain, nausea, diarrhea, headache, and dizziness.

n Contact:
onged or repeated contact may produce irritation or natitis due to defatting the skin. Soreness or skin flaking occur.

Contact:
and tearing will be experienced after contact with the id solvent or strong concentrations of vapors.

onic Exposure:
cause liver, kidney or central nervous system damage after ated or prolonged exposures.

revation of Pre-existing Conditions:
ons with pre-existing skin disorders or eye problems or aired kidney function may be more susceptible to the effects ie substance. Use of alcoholic beverages enhances the toxic cts of exposure.

B. FIRST AID

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:
If swallowed, induce vomiting immediately by giving two glasses of water, or milk if available and sticking finger down throat. Call a physician immediately. Never give anything by mouth to an unconscious person.

Skin Exposure:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician immediately.

Eye Exposure:
Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

C. TOXICITY DATA (RTECS, 1986)

Oral rat LD50: 8850 mg/kg. Oral mouse LD50: 8100 mg/kg. Irritation data: Skin rabbit: 810 mg/24H Severe. Eye rabbit: 162 mg Mild. Tumorigenic effects cited. Mutation references cited. Reproductive effects cited. Aquatic toxicity rating: TLm96: 100-10 ppm. Carcinogenic Determination: Limited evidence in animals. Category III - cannot be classified as to its caranogenicity in humans. (IARC Supp. 4, 1982).

SECTION 6 Occupational Control Measures

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA) 200 ppm ceiling 300/5M/3H peak.
-ACGIH Threshold Limit Value (TLV):
50 ppm (TWA) 200 ppm (STEL)

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators: (NIOSH Approved)
If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 7 Storage and Special Information

Store in a cool, dry, ventilated area away from sources of heat or ignition. Isolate from flammable materials. Protect from direct sunlight.

TOROE

Mallinckrodt provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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Mallinckrodt
Material Safety Data

Emergency Phone Number: 314-982-5000

05/04/89 08:49 8606 987 3456 Mallinckrodt Ky. 004

Addendum to Material Safety Data Sheet

REGULATORY STATUS

This Addendum Must Not Be Detached from the MSDS

Identifies SARA 313 substance(s)

ny copying or redistribution of the MSDS

ust include a copy of this addendum

(Chem.Key: TOROE)

Hazard Categories for SARA Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X	X			

Product or Components of Product:	SARA EHS Sect. 302 RQ (lbs.)	SARA EHS Sect. 302 TPQ (lbs.)	SARA Section 313 Chemicals Name List	SARA Section 313 Chemicals Chemical Category	CERCLA Sec.103 RQ (lbs.)	RCRA Sec. 261.33
ETRACHLOROETHYLENE (127-18-4)	No	No	Yes	No	1	U210

SARA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.
SARA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.
SARA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.
CERCLA Sec. 103: Comprehensive Enviromental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4
RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

Mallinckrodt
Material Safety Data

Emergency Phone Number: 314-982-5000

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Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361.

1,1,1-TRICHLOROETHANE

PRODUCT IDENTIFICATION:

Synonyms: Methyl chloroform; trichloroethane; chloroetene; 1,1,1-trichlorethane

Formula CAS No.: 71-55-6

Molecular Weight: 133.40

Chemical Formula: CH_3CCl_3

Hazardous Ingredients:
Every lot contains a minimum 96% Trichloroethane (stabilized).
Stabilizers can vary for each lot and may include
the following in proprietary concentrations:
CAS No. 123-91-1 diethylene ether
78-92-2 sec butanol

PRECAUTIONARY MEASURES

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION.

Avoid breathing vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.

EMERGENCY/FIRST AID

Call a physician immediately. If swallowed give several glasses of milk or water. If medical help is not immediately available and the amount swallowed was appreciable, induce vomiting. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes.
SEE SECTION 5.

DOT Hazard Class: ORM-A

SECTION 1 Physical Data

Appearance: Clear, colorless solution.

Odor: Mild chloroform-like odor.

Solubility: 0.07g/100g water @ 25°C (77°F)

Boiling Point: 74°C (165°F).

Melting Point: -32°C (-26°F).

Specific Gravity: 1.32

Vapor Density (Air=1): 4.55

Vapor Pressure (mm Hg): 100 @ 20°C (68°F).

Evaporation Rate: (ethylether=1): 0.35

SECTION 2 Fire and Explosion Information

Fire:
Considered nearly nonflammable.
Autoignition temperature: 537°C (998°F).
Flammable limits in air, % by volume; lel 8.0, uel: 10.5.
Within the flammable limits, ignition may occur upon contact with a high-intensity source of heat.

Explosion:
Can react with strong caustic, such as potash to form a flammable or explosive material.

Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Do not use water.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

SECTION 3 Reactivity Data

Stability:
Requires inhibitor content to prevent corrosion of metals.
Slowly hydrolyzes in water to form hydrochloric and acetic acid.

Hazardous Decomposition Products:
Emits toxic and corrosive hydrogen chloride, and small amounts of chlorine and phosgene when heated to decomposition.

Hazardous Polymerization:
This substance does not polymerize.

Incompatibilities:
Acetone, nitrogen tetroxide, oxygen, liquid oxygen, sodium, sodium hydroxide, and sodium-potassium alloy.

SECTION 4 Leak/Spill Disposal Information

Dike and cover leaking or spilled liquid with dirt, vermiculite, kitty-litter or other inert absorbent. Collected waste may be transferred to a closed, preferably metal, container and sent to a RCRA-approved waste disposal facility. Ventilate the area of the leak or spill. Do not use aluminum, magnesium or zinc metal for storage container.

Reportable Quantity (RQ)(CWA/CERCLA): 1000 lbs.

Ensure compliance with local, state and federal regulations.

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 1

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SECTION 5 Health Hazard Information

A. EXPOSURE / HEALTH EFFECTS

Inhalation:
May cause headache, dizziness, nausea, fall in blood pressure, unconsciousness, and death. May cause sensitization to the myocardium, and kidney and liver damage after severe exposure. Affects the central nervous system.

Ingestion:
Systemic poisoning may occur through ingestion; symptoms may parallel inhalation. Swallowing irritates the gastrointestinal tract. Vomiting and subsequent aspiration into the lungs may lead to chemical pneumonia and pulmonary edema which is a potentially fatal condition.

Skin Contact:
May cause mild irritation and redness.

Eye Contact:
Liquids and vapors may cause irritation.

Chronic Exposure:
Prolonged or repeated skin contact may cause dermatitis.

Aggrevation of Pre-existing Conditions:
Preclude personnel with CNS, liver or heart disease from exposure. Use of alcoholic beverages may aggravate symptoms.

B. FIRST AID

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:
Aspiration hazard.
Call a physician immediately. If swallowed give several glasses of milk or water. If medical help is not immediately available and the amount swallowed was appreciable, induce vomiting. Never give anything by mouth to an unconscious person.

Skin Exposure:
Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Eye Exposure:
Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

C. TOXICITY DATA (RTECS, 1986)

Oral rat LD50: 10300 mg/kg. Mutation references cited. Reproductive data cited. Irritation data: skin rabbit 500my/24H modeate eye rabbit 2mg/24H severe

SECTION 6 Occupational Control Measures

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
350 ppm (TWA)
-ACGIH Threshold Limit Value (TLV):
350 ppm (TWA).
450 ppm (STEL)

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators: (NIOSH Approved)
If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

Skin Protection:
Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure.

Eye Protection:
Use chemical safety goggles. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 7 Storage and Specinl Information

Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect against physical damage.

TRICH

05/04/89 08:53 606 987 3456 Mallinckrodt Ky. 006

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Material Safety Data

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Addendum to Material Safety Data Sheet

REGULATORY STATUS

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ust include a copy of this addendum
Chem.Key: TRICH)

Hazard Categories for SARA Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X				X

roduct or Components f Product:	SARA EHS Sect. 302 RQ (lbs.)	SARA EHS Sect. 302 TPQ (lbs.)	SARA Section 313 Chemicals Name List	SARA Section 313 Chemicals Chemical Category	CERCLA Sec.103 RQ (lbs.)	RCRA Sec. 261.33
,1-TRICHLOROETHANE						
Methyl chloroform (71-55-6) 96-100%	No	No	Yes	No	1000	U226
Dioxane (123-91-1) < 4%	No	No	Yes	No	1	U108
sec-Butyl alcohol (78-92-2) < 4%	No	No	Yes	No	No	No
Actual concentrations proprietary						

SARA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.
SARA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.
SARA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.
CERCLA Sec. 103: Comprehensive Enviromental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4
RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

Mallinckrodt
Material Safety Data

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Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361.

05/04/88 09:57 3606 887 3456 Mallinckrodt Ky. 008

TRICHLOROETHYLENE

PRODUCT IDENTIFICATION:

Synonyms: Trichloroethene; TCE; acetylene trichloride

Formula CAS No.: 79-01-6

Molecular Weight: 131.39

Chemical Formula: C_2HCl_3

Hazardous Ingredients: Not applicable.

PRECAUTIONARY MEASURES

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION. AFFECTS CENTRAL NERVOUS SYSTEM. POSSIBLE CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS. EXPOSURE MAY CREATE A CANCER RISK.

Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

EMERGENCY/FIRST AID

If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. In all cases call a physician. Note to physician: Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning. SEE SECTION 5.

DOT Hazard Class: ORM-A

SECTION 1 Physical Data

Appearance: Clear, colorless liquid.

Odor: Chloroform-like.

Solubility: Practically insoluble in water. Readily miscible in organic solvents.

Boiling Point: 87°C (188.6°F).

Melting Point: -73°C (-99.4°F).

Specific Gravity: 1.45

Vapor Density (Air=1): 4.5

Vapor Pressure (mm Hg): 57.8 @ 20°C (68°F).

Evaporation Rate: No information found.

SECTION 2 Fire and Explosion Information

Fire:
Flashpoint: None by standard methods.
Flammable limits in air, % by volume at 57°C (135°F): lel: 12.5, uel: 90.
Autoignition temperature: 410°C (770°F).

Explosion:
A strong ignition source, e.g., a welding torch, can produce ignition.

Fire Extinguishing Media:
Use water spray to keep fire exposed containers cool. If substance does ignite, use CO*2, dry chemical or foam.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

SECTION 3 Reactivity Data

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
Decomposed by heat or flame and in the presence of oxygen and light, especially UV radiation. Can form carbon monoxide, phosgene, and emit corrosive fumes of hydrochloric acid.

Hazardous Polymerization:
This substance does not polymerize.

Incompatibilities:
Alkali hydroxides, powdered metals, liquid oxygen.

SECTION 4 Leak/Spill Disposal Information

Ventilate area of leak or spill. Clean-up personnel require protective clothing.
Contain and recover liquid when possible.

Larger Spills: absorb with vermiculite, dry sand, earth, or similar material for disposal as hazardous waste in a RCRA approved facility.

Do Not Flush To Sewer.

Reportable Quantity (RQ)(CWA/CERCLA) : 1000 lbs.

Ensure compliance with local, state and federal regulations.

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 0

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Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361.

05/04/89 10:00 9606 887 3456 Mallinckrodt Ky.

SECTION 5 Health Hazard Information

A. EXPOSURE / HEALTH EFFECTS

Inhalation:
Acute exposure causes depression of the central nervous system that may include symptoms of visual disturbances and mental confusion, incoordination, headache, nausea, euphoria, and dizziness. Inhalation of high concentrations could cause unconsciousness and death.

Ingestion:
Low to moderately toxic. May cause effects similar to inhalation. May cause coughing, abdominal pain, diarrhea, dizziness, unconsciousness. Kidney failure can result in severe cases. Estimated fatal dose is 3-5 mls/kg.

Skin Contact:
May cause irritation. Continued skin contact has a defatting action and can produce rough, dry, red skin resulting in secondary infection.

Eye Contact:
Vapors may cause severe irritation with redness and pain. Splashes may cause eye damage.

Chronic Exposure:
Chronic exposures may cause liver and kidney damage and nervous system effects. Workers chronically exposed may exhibit central nervous system depression, intolerance to alcohol, and increased cardiac output.

Aggrevation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

B. FIRST AID

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:
If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately.

Skin Exposure:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician immediately.

Eye Exposure:
Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

C. TOXICITY DATA (RTECS, 1986)

Oral rat LD50: 4920 mg/kg. Mutation references cited. Reproductive effects cited. Tumorigenic effects cited. Carcinogenic determination: limited evidence in experimental animals (IARC Supplement 4, 1982) Aquatic Toxicity Rating: TL 96: 1000-100 ppm.

SECTION 6 Occupational Control Measures

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA); 200 ppm (Ceiling);
300 ppm/5M/2H (Peak).
-ACGIH Threshold Limit Value (TLV):
50 ppm (TWA) 200 ppm (STEL).

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators: (NIOSH Approved)
If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible.Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 7 Storage and Special Information

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage.

TRILO

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Material Safety Data

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Emergency Phone Number: 314-982-5000

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Addendum to Material Safety Data Sheet

REGULATORY STATUS

This Addendum Must Not Be Detached from the MSDS

Identifies SARA 313 substance(s)

Any copying or redistribution of the MSDS must include a copy of this addendum

(Chem.Key: TRILO)

Product or Components of Product:	SARA EHS Sect. 302 RQ (lbs.)	SARA EHS Sect. 302 TPQ (lbs.)	SARA Section 313 Chemicals Name List	SARA Section 313 Chemicals Chemical Category	CERCLA Sec.103 RQ (lbs.)	RCRA Sec. 261.33
TRICHLOROETHYLENE (79-01-6)	No	No	Yes	No	1000	U228

Hazard Categories for SARA Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X	X			

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MAY 04 1989
LeRoy Callender P.C.

SARA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.
SARA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.
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RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33



1" = 2000'

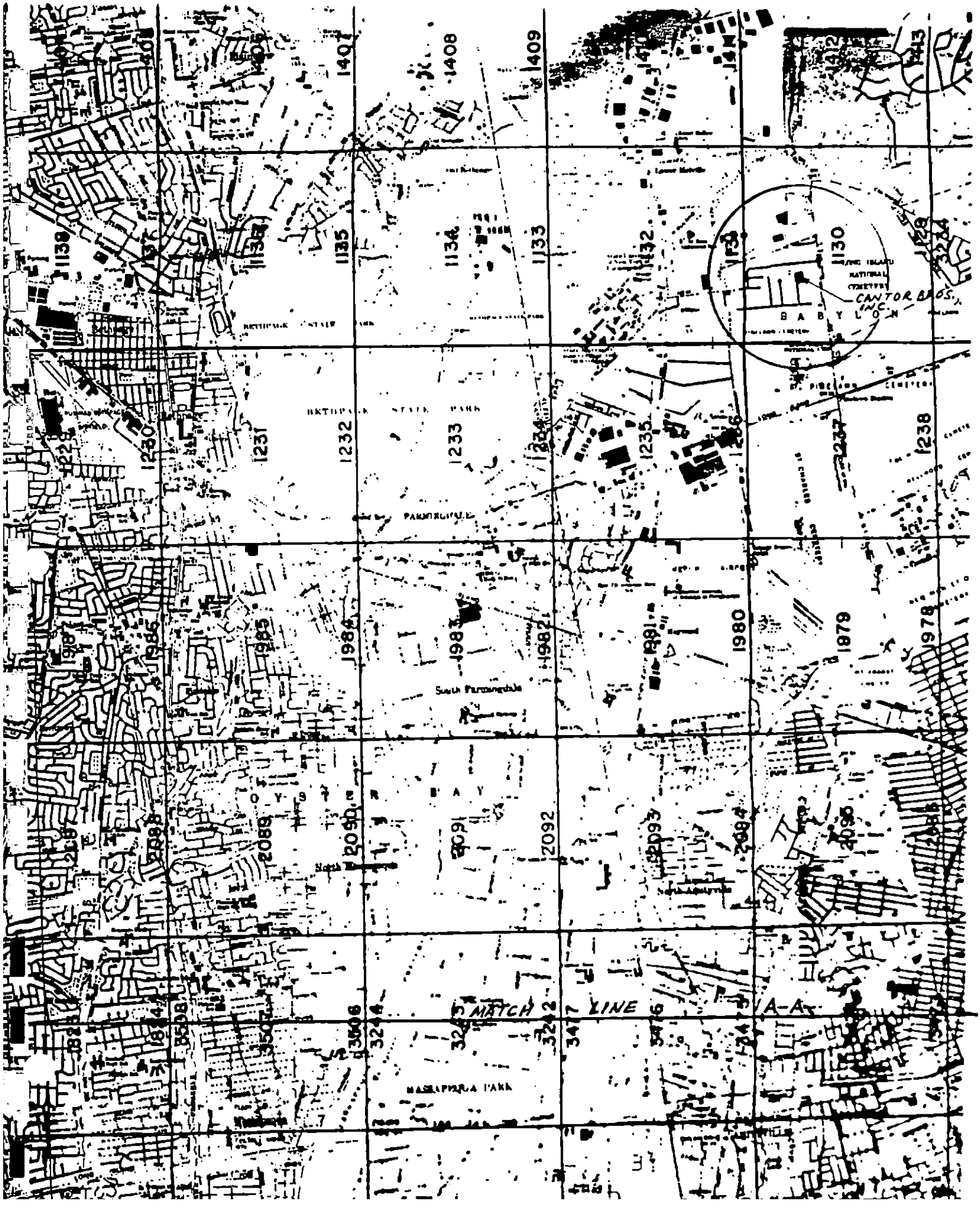
Map of State Recognized Freshwater Wetlands

SCALE: 1:48,000

SHEET 1 of 2

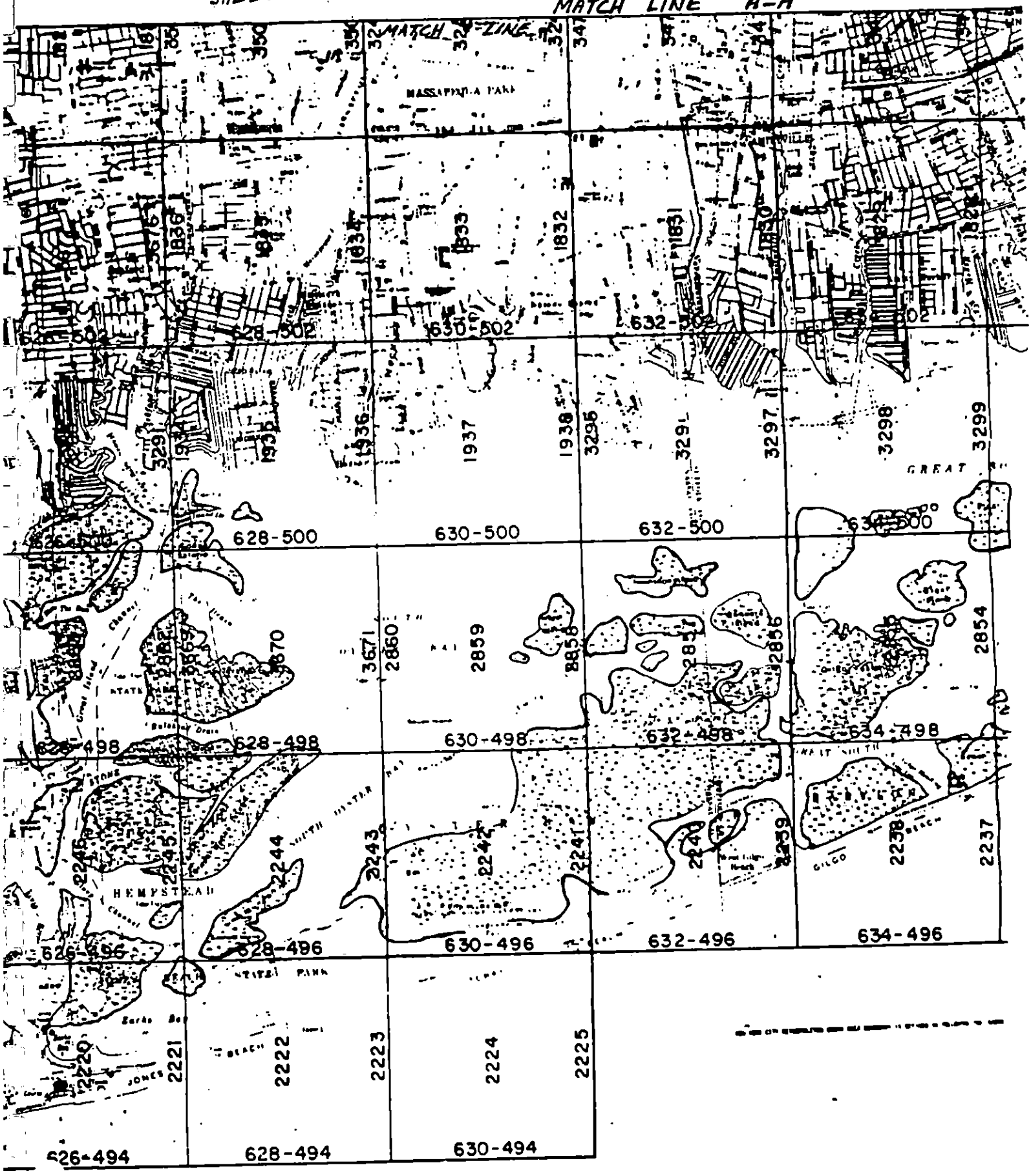
Map Of State Recognized Coastal/Wetlands

REF 10.



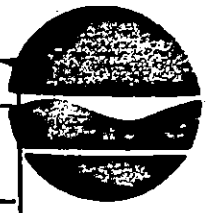
SHEET 2 OF 2

MATCH LINE A-A



REF. 11.

New York State Department of Environmental Conservation
Building 40 - SUNY, Stony Brook, New York 11794
(516) 751-7900 (ext. 248)



Thomas C. Jorling
Commissioner

ACTION ROUTING
ACKNOWLEDGMENT
DATE
1.
2.
3.
4.
5. 86-279
FILE NO.

January 27, 1989

Mr. Sirous H. Nabavi
LeRoy Callender, PC
236 West 26th Street
New York, New York 10001

Re: Phase II Investigations
@ Cantor Brothers, Inc.
E. Farmingdale, New York

Dear Mr. Nabavi:

We have reviewed the Significant Habitat Program and the Natural Heritage Program files with respect to the above site.

We did not identify any potential impacts on endangered, threatened, or special concern wildlife species, rare plant, animal or natural community occurrences, or other significant habitats.

The absence of data does not necessarily mean that rare or endangered elements, natural communities or other significant habitats do not exist on or adjacent to the proposed site, but rather that our files currently do not contain any information which indicates the presence of these. Our files are continually growing as new habitats and occurrences of rare species and communities are discovered. In most cases, site-specific or comprehensive surveys for plant and animal occurrences have not been conducted. For these reasons, we cannot provide a definitive statement on the presence or absence of species, habitats or communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

If this proposed project is still active one year from now we recommend that you contact us again so that we can update this response.

If we can be of further assistance please do not hesitate to contact me at the above address and telephone number.

Sincerely,

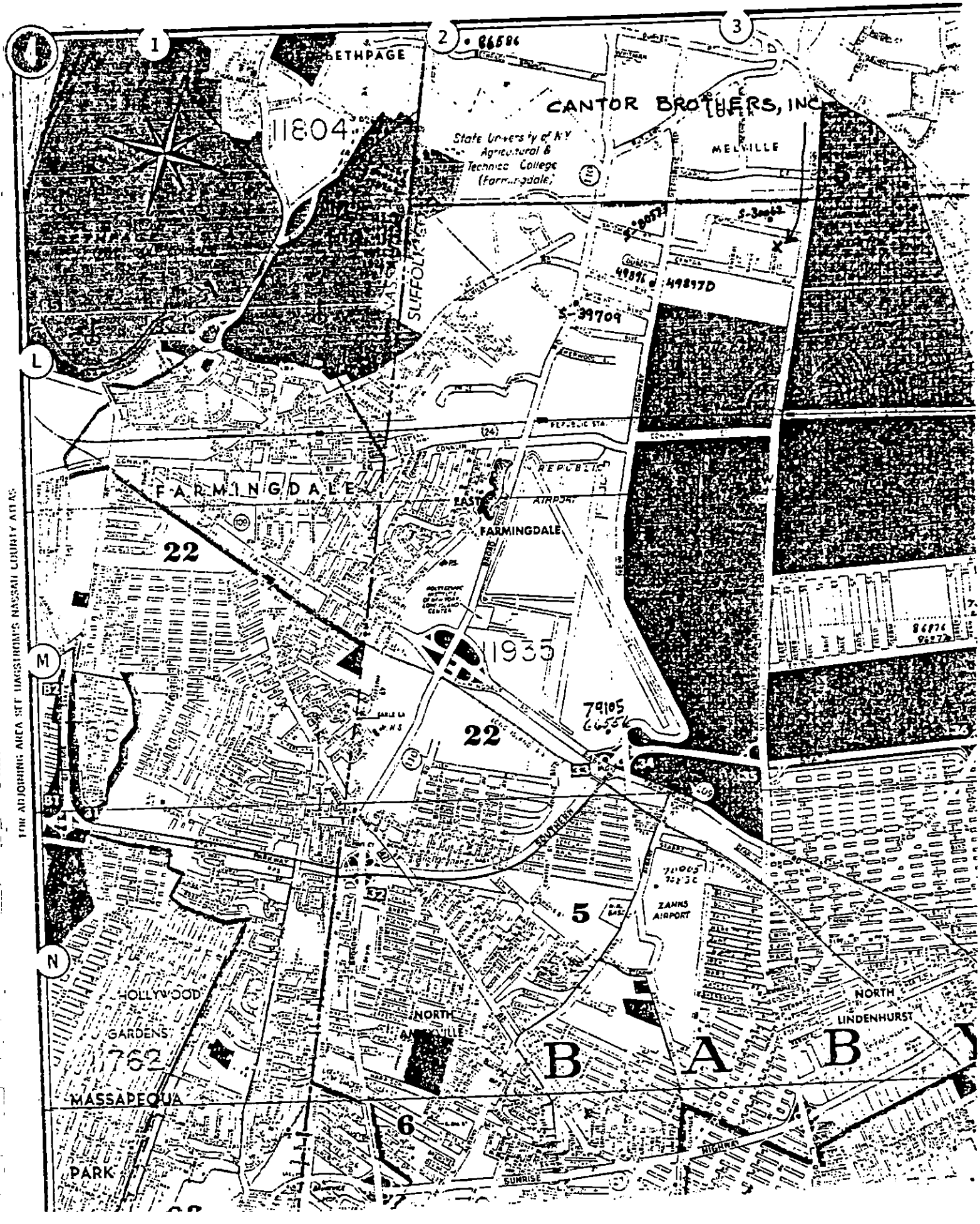
Michael S. Scheibel
Senior Wildlife Biologist

RECEIVED
FEB 01 1989
LEROY CALLENDER/P.C.

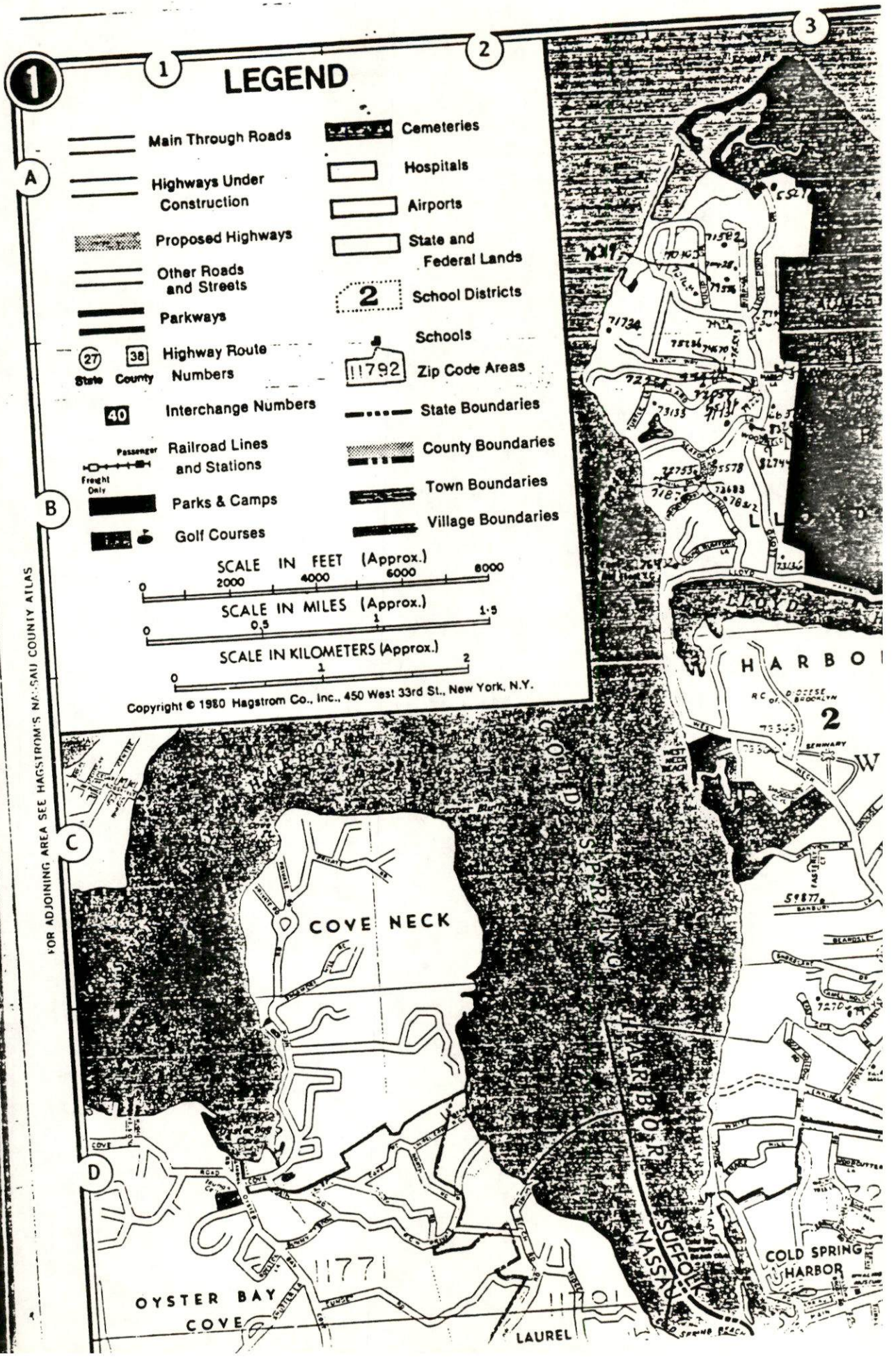
MSS/sjmr

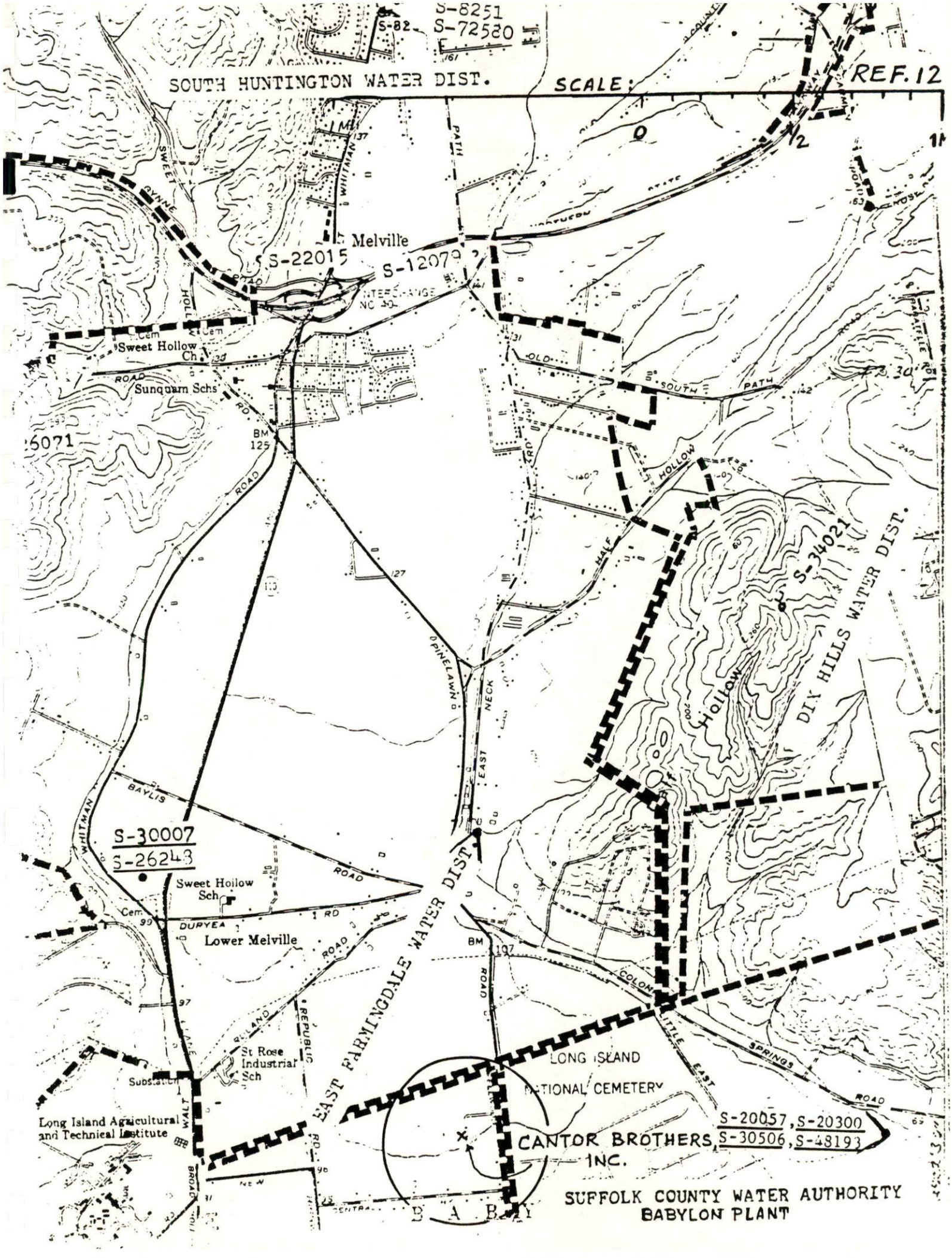
APPENDIX D REF. 12.

PUBLIC & PRIVATE WELLS



REF. 12


LEGEND
Main Through Roads
Highways Under Construction
Proposed Highways
Other Roads and Streets
Parkways
27 State 38 County Highway Route Numbers
40 Interchange Numbers
Passenger Freight Only Railroad Lines and Stations
Parks & Camps
Golf Courses
Cemeteries
Hospitals
Airports
State and Federal Lands
2 School Districts
Schools
11792 Zip Code Areas
State Boundaries
County Boundaries
Town Boundaries
Village Boundaries
SCALE IN FEET (Approx.)
0 2000 4000 6000 8000
SCALE IN MILES (Approx.)
0 0.5 1 1.5
SCALE IN KILOMETERS (Approx.)
0 1 2
Copyright © 1980 Hagstrom Co., Inc., 450 West 33rd St., New York, N.Y.
FOR ADJOINING AREA SEE HAGSTROM'S NASSAU COUNTY ATLAS
COVE NECK
OYSTER BAY COVE
LAUREL
COLD SPRING HARBOR
HARBOR
NASSAU
SUFFOLK
11771
11701
1 2 3 A B C D


S-8251
S-72580
SOUTH HUNTINGTON WATER DIST.
SCALE:
REF. 12
Melville
S-22015
S-12079
INTERCHANGE NO 49
Sweet Hollow Ch
Sunquam Schs
BM 125
S-34021
DIX HILLS WATER DIST.
S-30007
S-26243
Sweet Hollow Sch
Lower Melville
BM 107
EAST FARMINGDALE WATER DIST.
St Rose Industrial Sch
Substation
Long Island Agricultural and Technical Institute
LONG ISLAND NATIONAL CEMETERY
S-20057, S-20300
CANTOR BROTHERS, S-30506, S-48193
INC.
SUFFOLK COUNTY WATER AUTHORITY
BABYLON PLANT
BABYLON

County Suffolk

ORIGINAL—TO COMMISSION

State of New York
Department of Conservation
Division of Water Resources

Well No. S [illegible]

Ground Surf. El. [illegible]

COMPLETION REPORT—LONG ISLAND WELL

Owner GUILD ARTS & CRAFTS, INC.

Address 495 Smith Street, Farmingdale, N.Y.

Location of well Same as above

Dept of well below surface [illegible] ft

Depth to ground water from surface 45 feet

CASING:

Diameter	6" in.	in.	in.	in.
Length	121'-2" ft.	ft.	ft.	ft.
Sealing				
Casings removed				

SCREENS: Make Cock Openings #20

Diameter	4 in.	in.	in.	in.
Length	10'-7" ft.	ft.	ft.	ft.
Depth to top from top of casing				ft.

PUMPING TEST: Date 4/15/67 Test or permanent pump? Perm.

Duration of Test 2 hours

Maximum Discharge 45 gallons per minute

Static level prior to test 45 ft. [illegible] below top of casing

Level during Max. Pumping 50 ft. [illegible] below top of casing

Maximum Drawdown 5 ft.

Approx. time of return to original level after cessation of pumping 29 minutes

PUMP INSTALLED:

Type Subm. Make Reda Model No. [illegible]

Motive power Elec. Make Reda H.P. [illegible]

Capacity 45 g.p.m. against [illegible] ft. of discharge

No. bowls or stages 9 [illegible] ft. of suction

DROP LINE: Diameter 1¼" in. Length 80' ft.

SUCTION LINE: [illegible]

Use of water Plant Process Cooling Supply

Work started 2/24/67 Completed [illegible]

Date 5/1/67 Driller MATHIES WELL & PUMP CO., INC.

License No. 153

NOTE: Show log of well—materials encountered, with depth below ground surface, water bearing beds and water levels in each, casings, screens, [illegible], additional pumping tests and other matters of interest. Describe [illegible].

See Instructions as to Well Drillers' Licenses and Reports—pp. 5-7.

RECEIVED
JAN 25 1989
LEROY CALLENDER/P.E.

REF. 12

ORIGINAL S-30062

COUNTY Suffolk WELL NO. S-30062

Water Resources Commission—State of New York

PRELIMINARY REPORT ON PROPOSED WELL

OWNER Guild Arts & Crafts, Inc.

MAIL ADDRESS 495 Smith Str. Farmingdale, NY

WELL LOCATION Same as above

DEPTH 200 FT. DIAM. CASINGS 6 IN.

PUMP CAPACITY 45 G.P.M. TYPE Subm.

PURPOSE Plant Process Cooling Supply

DATE 2/10/67 19 LIST OF EXISTING WELLS S-22304 to be abandoned S-22305D

DRILLER (SIGNATURE) MATHIES WELL & PUMP CO., INC. LIC. NO. 153

WATER RESOURCES COMMISSION

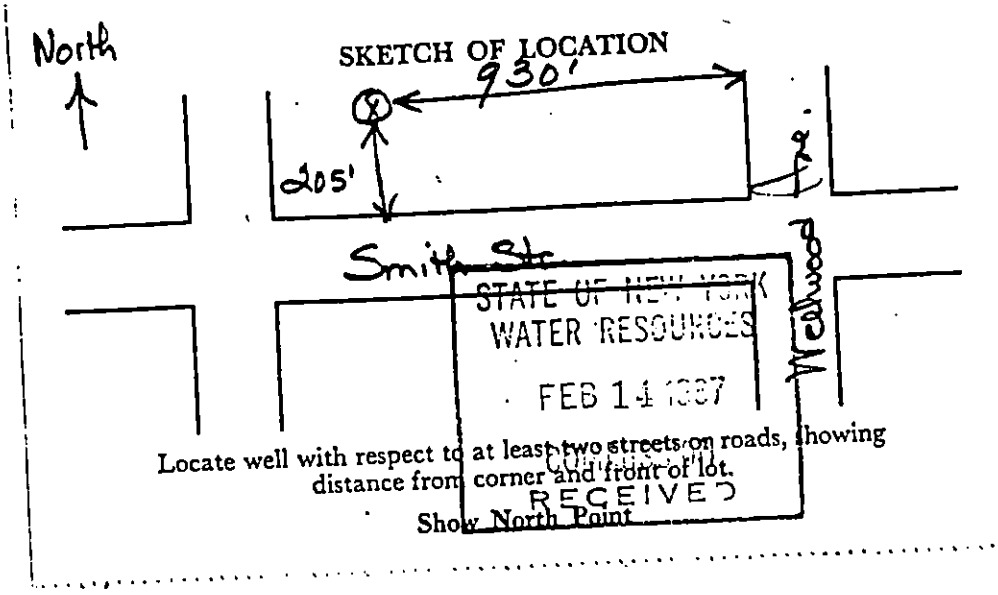
BY [signature] ENGINEER IN CHARGE

PERMIT TO SINK WELL

FEB 14 1967 DATE

U585 x 43-3900 1/2

REF. 12



Locate well with respect to at least two streets or roads, showing distance from corner and front of lot.

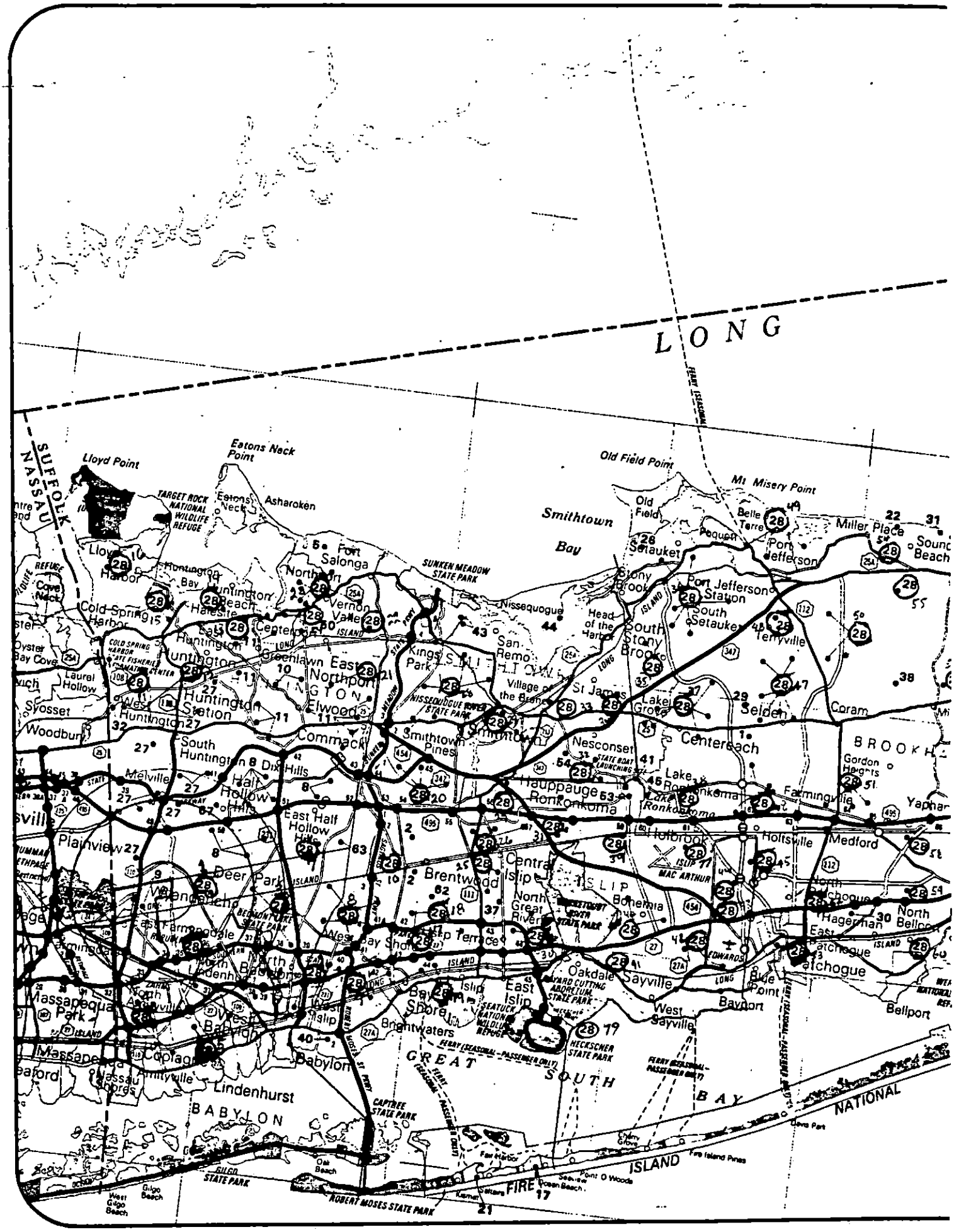
Show North Point

SUFFOLK COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Bevon Water Corporation.	1150.	.Wells
2	Brentwood Water District.	25812.	.Wells
3	Bridgehampton Water Company.	1916.	.Wells
4	Captain Kidd Water Company.	580.	.Wells
5	Crab Meadow Beach.	50.	.Wells
6	Culross Corporation (Culross Beach).	.104.	.Wells
7	Dering Harbor Village.	.130.	.Wells
8	Dix Hills Water District.	30000.	.Wells
9	East Farmingdale Water District.	7850.	.Wells
10	Fishers Island Water Works Corporation.	.250.	.Barlow, Middle Farms and Treasure Ponds, Wells
11	Greenlawn Water District.	40000.	.Wells
12	Greenport Village.	6851.	.Wells
13	Hampton Bays Water District.	9500.	.Wells
14	Hawthorne - Maple Civic Association.	50.	.Wells
15	Herod Point Association.	80.	.Wells
16	North Shores Water Company.	.5000.	.Wells
17	Ocean Beach Village.	.155.	.Wells
18	Reeves Beach Water Company.	650.	.Wells
19	Riverhead Water District.	.9300.	.Wells
20	Roanoke Water Corporation.	.201.	.Wells
21	Saltaire Village.	.35.	.Wells
22	Scott's Beach Water Company.	.342.	.Wells
23	Shelter Island Heights Association.	498.	.Wells
24	Shirley Water Works.	3400.	.Wells
25	Shorewood Water Corporation.	.10000.	.Wells
26	Soundview Association.	.236.	.Wells
27	South Huntington Water District.	.51260.	.Wells
28	Suffolk County Water Authority.	.900000.	.Wells
29	Sunhill Water Corporation.	3959.	.Wells
30	Swan Lake Water Corporation.	1485.	.Wells
31	Terrace-on-the-Sound.	400.	.Wells
32	Woodbury Triangle Corporation.	.800.	.Wells
Non-Municipal Community			
33	Aquebogue Mobile Home Court.	.120.	.Wells
34	Brookhaven National Labs.	.3373.	.Wells
35	Calverton Hills Owners Association.	.897.	.Wells
36	Cedar Lodge Nursing Home.	100.	.Wells
37	Central Islip Psychiatric Center.	.4525.	.Wells
38	Crest Hall Health Related Facility.	120.	.Wells
39	East Quogue Mobile Estates.	160.	.Wells
40	Good Samaritan Hospital.	NA.	.Wells
41	Greis Mobile Park.	70.	.Wells
42	Hampton Gateway Apartments.	304.	.Wells
43	Kings Park Psychiatric Center.	3100.	.Wells
44	Knox School.	NA.	.Wells
45	Lake Hurst Lodge Adult Home.	57.	.Wells
46	Leier's Mobile Park.	.350.	.Wells
47	Little Flower Children's Services.	.150.	.Wells
48	Montauk Air Force Station.	10.	.Wells
49	Napeague Trailer Park.	78.	.Wells
50	Northport VA Hospital.	3000.	.Wells
51	Oak Park Trailer Park.	50.	.Wells
52	Oakland Ridge Mobile Park.	74.	.Wells
53	Park Lake Rest Home.	46.	.Wells
54	Peacock Alley.	35.	.Wells
55	Peconic River Trailer Park.	.90.	.Wells
56	Peconic View Adult Mobile Home Park.	70.	.Wells
57	Pinecrest Garden Apartments.	.392.	.Wells
58	Ramblewood Mobile Homes.	.210.	.Wells
59	Ridge Rest Home.	58.	.Wells
60	Rocky Point Family Housing.	.55.	.Wells
61	Rollin Mobile Homes.	.220.	.Wells
62	St Joseph Convent - Long Island University.	1177.	.Wells
63	Sam A Lewison Start Center.	.40.	.Wells
64	South Bay Adult Home.	.40.	.Wells
65	Southampton College.	1000.	.Wells
66	Speonk Mobile Home Park.	50.	.Wells
67	Suffolk Developmental Center.	.3500.	.Wells
68	Three Mile Harbor Trailer Park.	.40.	.Wells
69	Thurm's Mobile Estates.	450.	.Wells
70	USCG Station - Moriches.	23.	.Wells
71	Wes Dubicki Apartments.	.NA.	.Wells

LOCATION OF COMMUNITY WATER SYSTEM SOURCES-1982

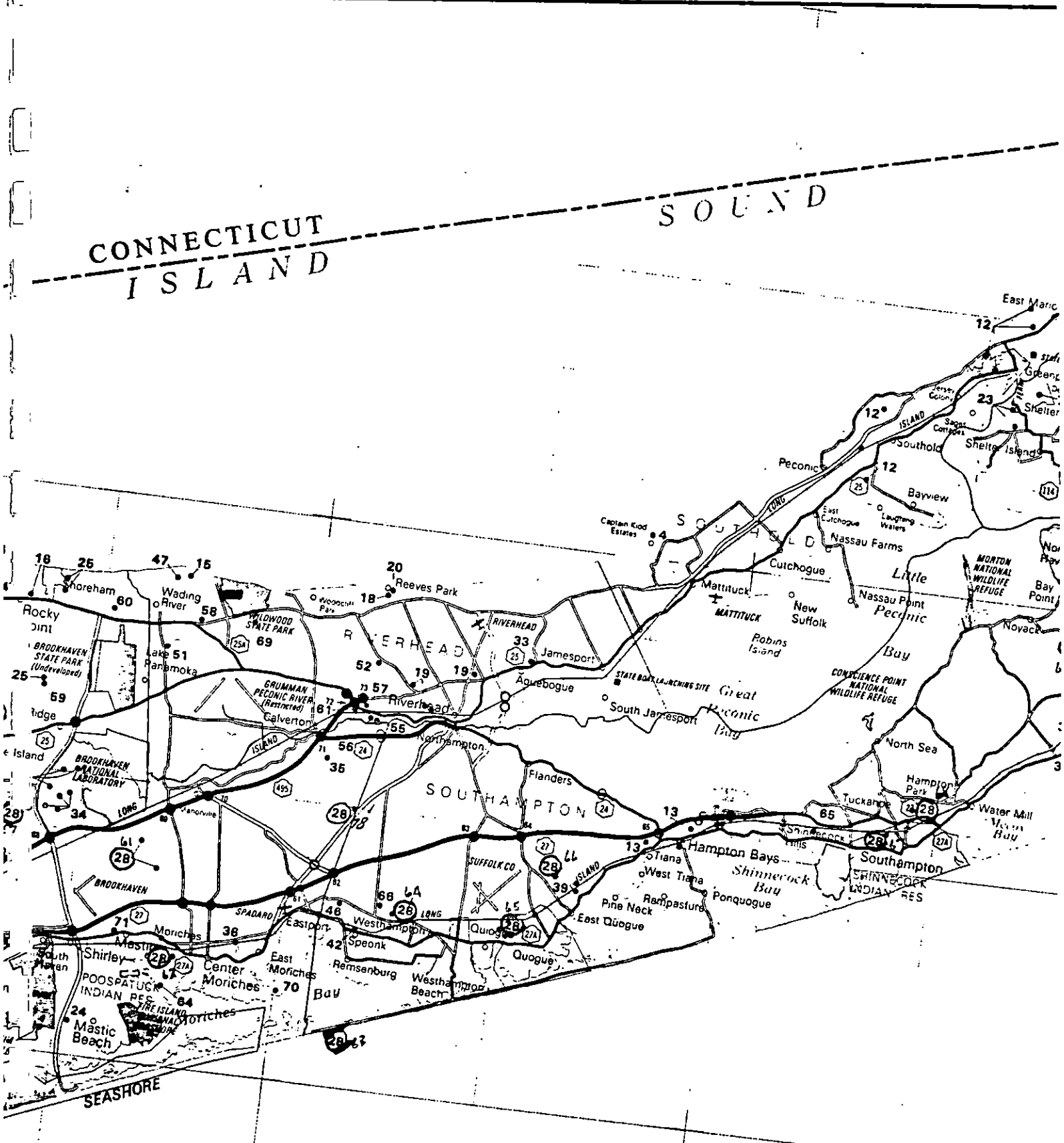
REF. 13



ADAPTED FROM THE FOUR-SHEET, 1 250,000 SCALE NEW YORK STATE MAP © 1980 BY THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

REF. 13

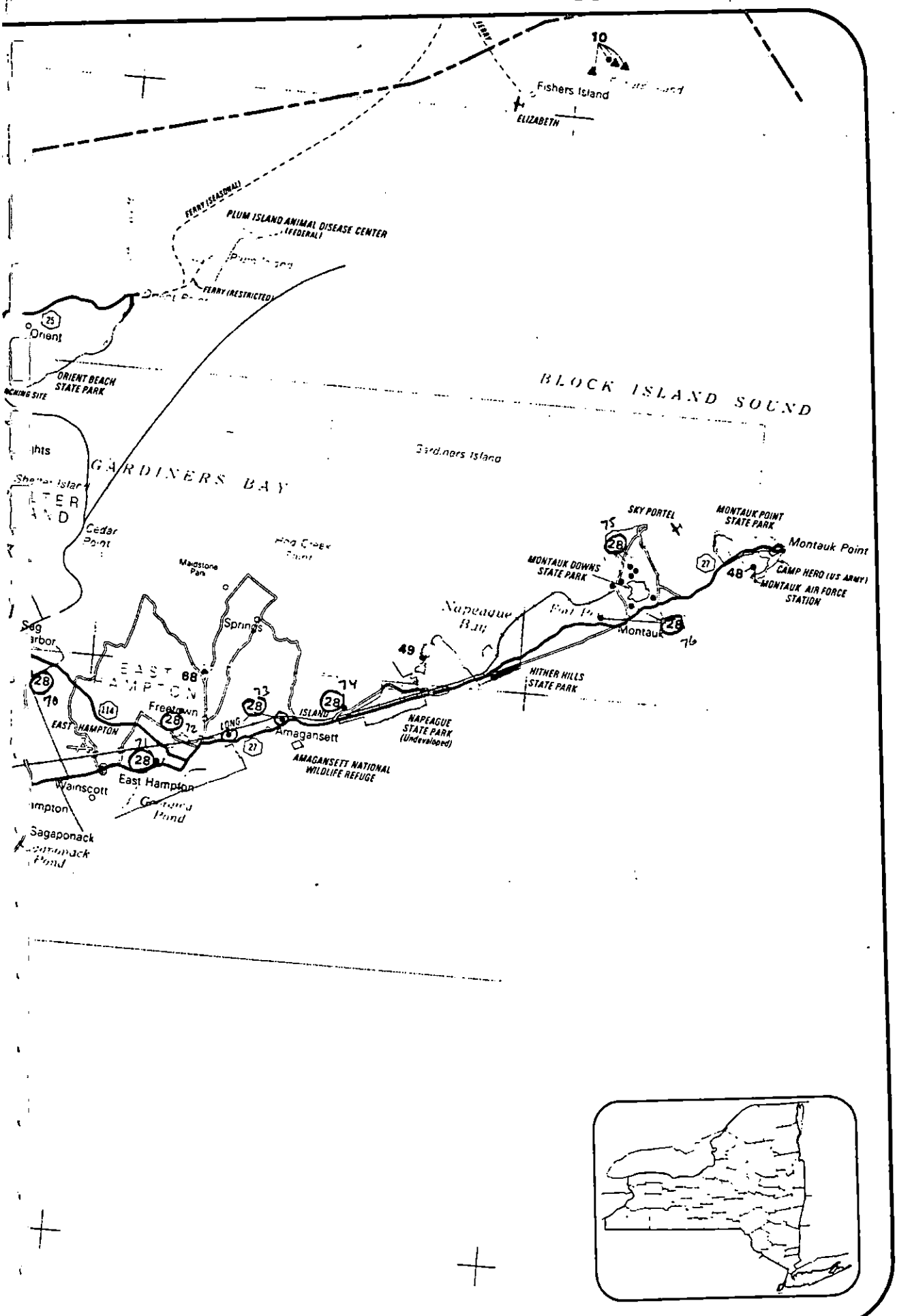


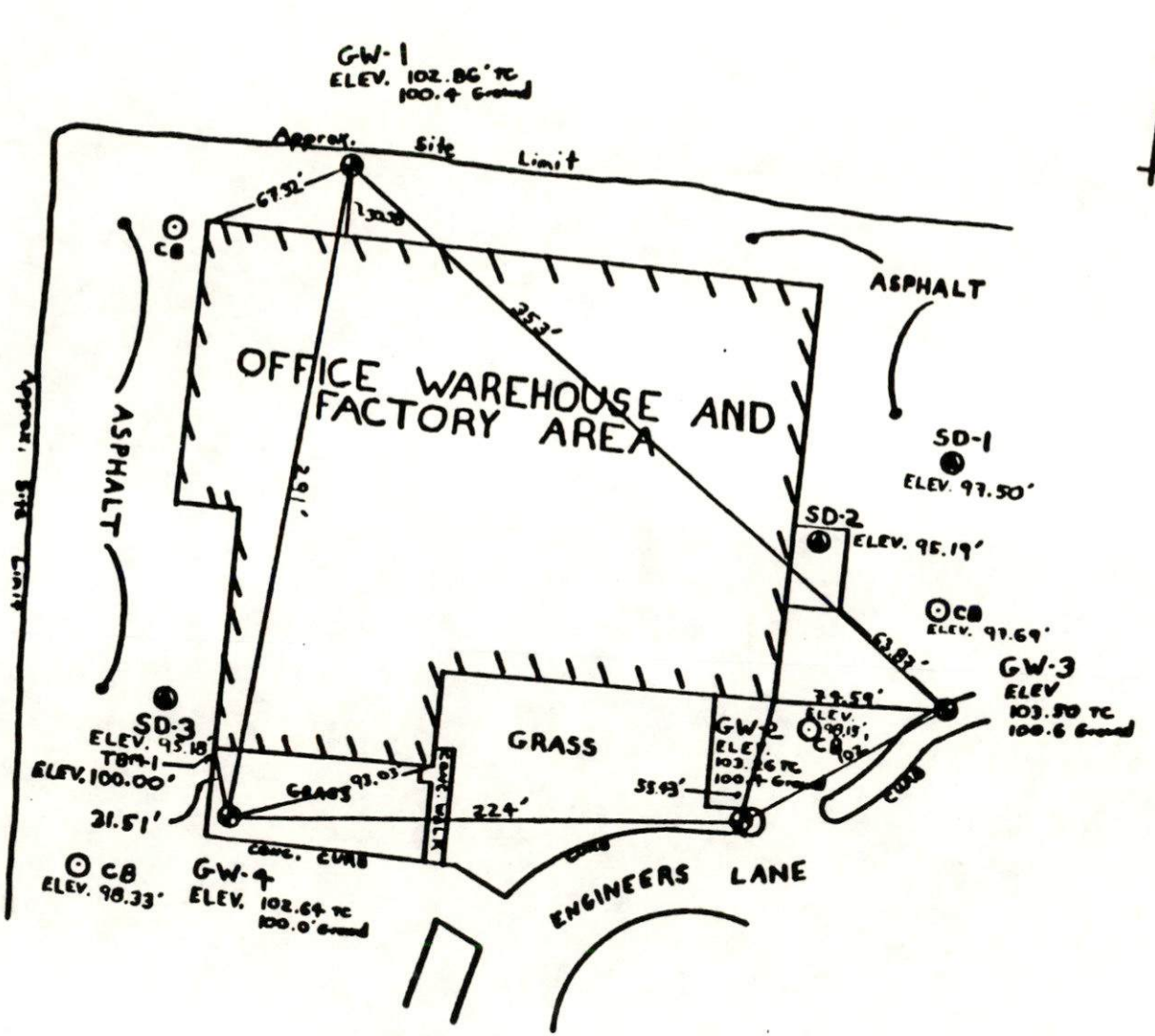
SCALE 1:250,000

5 0 5 MILES

NORTH

SUFFOLK COUNTY




GW-1
ELEV. 102.86' TC
100.4 Ground
Approx. Site Limit
67.52'
CB
OFFICE WAREHOUSE AND FACTORY AREA
ASPHALT
253'
ASPHALT
SD-1
ELEV. 97.50'
SD-2
ELEV. 95.19'
CB
ELEV. 97.69'
63.82'
GW-3
ELEV
103.50 TC
100.6 Ground
SD-3
ELEV. 95.18'
TBM-1
ELEV. 100.00'
GRASS
GW-2
ELEV.
103.46 TC
100.4 Ground
38.59'
224'
21.51'
CB
ELEV. 98.33'
GW-4
ELEV. 102.64 TC
100.0' Ground
ENGINEERS LANE
N
80'
CANTOR BROTHERS
NYSDEC # 152021
MONITORING WELL
SEDIMENT SAMPLING LOC
CATCH BASIN
STORCH ASSOCIATES
30 JERICHO TURNPIKE
JERICHO, NEW YORK 11753

REF 14.

REF 15.

COUNTY OF SUFFOLK

PATRICK G. HALPIN
SUFFOLK COUNTY EXECUTIVE

SOIL AND WATER
CONSERVATION DISTRICT

STANLEY A. PAUZER
DISTRICT MANAGER

January 17, 1989

Sirous H. Nabavi, P.E., Project Engineer
LeRoy Callendar PC
236 West 26th Street
New York, New York 10001

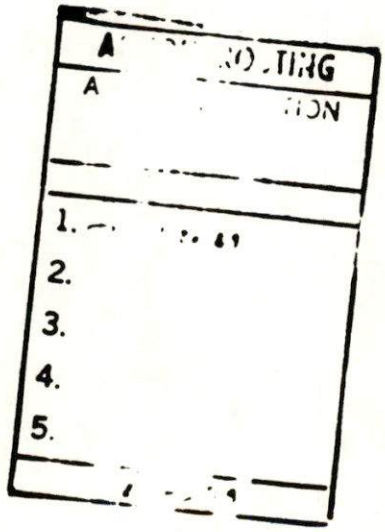
Dear Mr. Nabavi:

Regarding your request for the proximity of Cantor Brothers, Inc., of East Farmingdale to agricultural land and prime agricultural land in production within the past 5 years. Please be advised that there are both agricultural land and prime agricultural land within 1 and 2 miles of the site, respectively. However, this office does not have any direct specific sources regarding production status or ownership of such lands.

Sincerely yours,

Thomas J. McMahon

Thomas J. McMahon
Senior District Technician



RECEIVED
JAN 20 1989
LEROY CALLENDER/P.C.

PECONIC PLAZA
184 OLD COUNTRY ROAD, ROUTE 58
RIVERHEAD, NEW YORK 11901
(516) 727-2315

REF. 16.

GEOMORPHOLOGY OF THE SOUTH SHORE OF LONG ISLAND, NEW YORK

TECHNICAL MEMORANDUM NO. 128
BEACH EROSION BOARD
CORPS OF ENGINEERS

RECEIVED
FEB 02 1989
LEROY CALLENDER/P.C.

SEPTEMBER 1961

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APPENDIX A: Ranges Along the South Shore of Long Island

APPENDIX B: Comparative Profile Data for the South Shore of Long Island

Manhasset times also complicates the determination of the history of the island during the late Wisconsin.

Fuller, table 2, postulated a long period of erosion, the Vineyard, after the deposition of the Manhasset and then the final advance, slight withdrawal, readvance and retreat of the ice during the Wisconsin glacial stage. Contemporary geologists, table 3, do not recognize the Vineyard and place all post-Gardiners deposits into the Wisconsin age of glaciation. No erosional features, interglacial lagoon nor marine deposits similar to the Gardiners clay have been found and identified as Vineyard in age. In general, an oscillating ice front which first deposited the Manhasset formation, then the Ronkonkoma moraine and its attendant drift and outwash, and finally the Harbor Hill moraine and outwash is the mechanism used to explain the Wisconsin glacial stage. Fleming, in fact, suggests that the Harbor Hill and Ronkonkoma ridges were built during Herod times and then veneered with boulders during a later ice advance.

On the order of 10,000 years ago as the ice melted and withdrew at the end of the Wisconsin sub-epoch, sea level rose and reached its present elevation. During the recent epoch stream erosion and deposition have been minor, but the headlands of the eastern end of the south fluke have been cut back and truncated by wave and littoral forces and the sediments moved westward. As these littoral materials moved westward, a narrow beach was built abutting the headlands and separating the headlands from the sea. This process also sealed off the small bays from the ocean to the south. West of Southampton a combination of spit and offshore bar has enclosed a series of bays or lagoons which are intermittently connected to the ocean by tidal inlets. The inlets are cut through during storms and would, in the normal course of events, be sealed naturally unless they are stabilized and maintained. During the most recent past migration of the inlets to the west has resulted in overlapping, such as is found at Fire Island, Rockaway, and East Rockaway Inlets, see figures 22, 23 and 24.

Two features are found on and north of the barrier beaches. On the beaches and offshore islands the winds have erected sand dunes of varying height and length. Ranging in height from 10 to more than 30 feet and in length from circular mounds to miles, the dunes front most of the Atlantic coast. However, those of the Rockaways, as well as the once conspicuous dunes of Coney Island have been modified greatly by human activity. In the lagoons north of the barrier islands are the fresh and salt marshes of Recent age. The salt marshes have increased the area of the island by at least 100 square miles. The marshes fringe the shores of the bays and, west from Fire Island Inlet, are present as islands.

GEOLOGIC FORMATIONS

Most of the surface of Long Island is covered with stratified or unstratified glacial deposits. The narrow barrier beaches formed by marine forces and the marshes are the non-glacial areas. All of the surface

deposits rest unconformably upon Cretaceous sediments. No Tertiary deposits are now visible on the surface nor have they been found in wells. Beneath the Cretaceous is the peneplained basement complex.

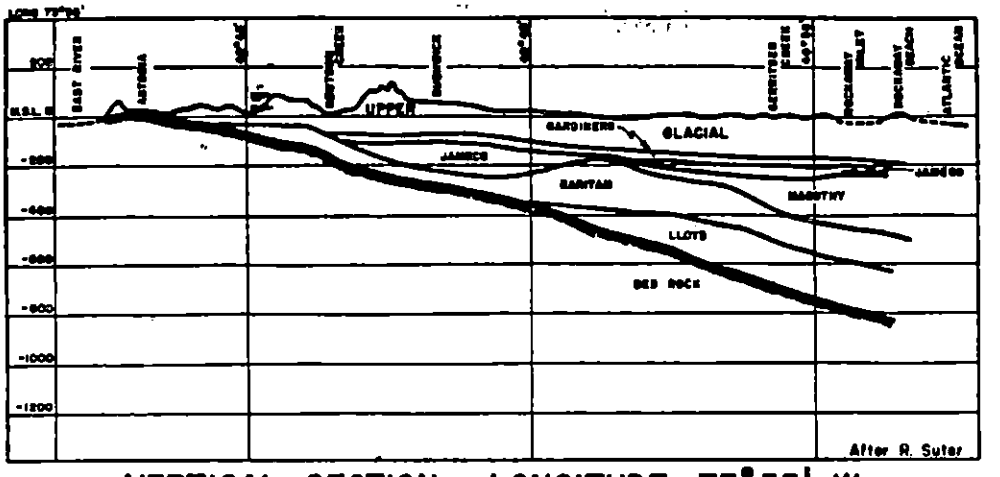
Subsurface Formations. The attitude of the subsurface has been deduced by many geologists from the geologic correlation of well logs. Vertical sections are given by Fuller (1914) and Suter, de Laguna, and Perlmutter (1949) and are shown in figures 4, 5, 6, and 7; however, such sections contain inherent inaccuracies due to the means of collecting and analyzing the data. The wells are not equally spaced and are lacking in some areas, such as along the Harbor Hill moraine in Kings County or in eastern Suffolk County. Difficulties in distinguishing various formations and in correlating such well logs lead to erroneous information. Contouring a hidden surface without knowledge of critical areas of change lacks precision. The above, plus the absence of numbers of deep wells in Suffolk County, subject the maps and the vertical sections derived from them to change as further data are acquired.

The basement complex has been penetrated by a number of wells at the western end of the island; however, only six wells reach to this surface in all of Suffolk County. Because data are so lacking, only a very generalized subsurface contour map on top of the basement can be drawn, figure 8. The basement is made up of gneiss, schist, some quartzite and some dolomite of pre-Cambrian and early Paleozoic age. It is a deeply weathered peneplain which slopes gently to the southeast.

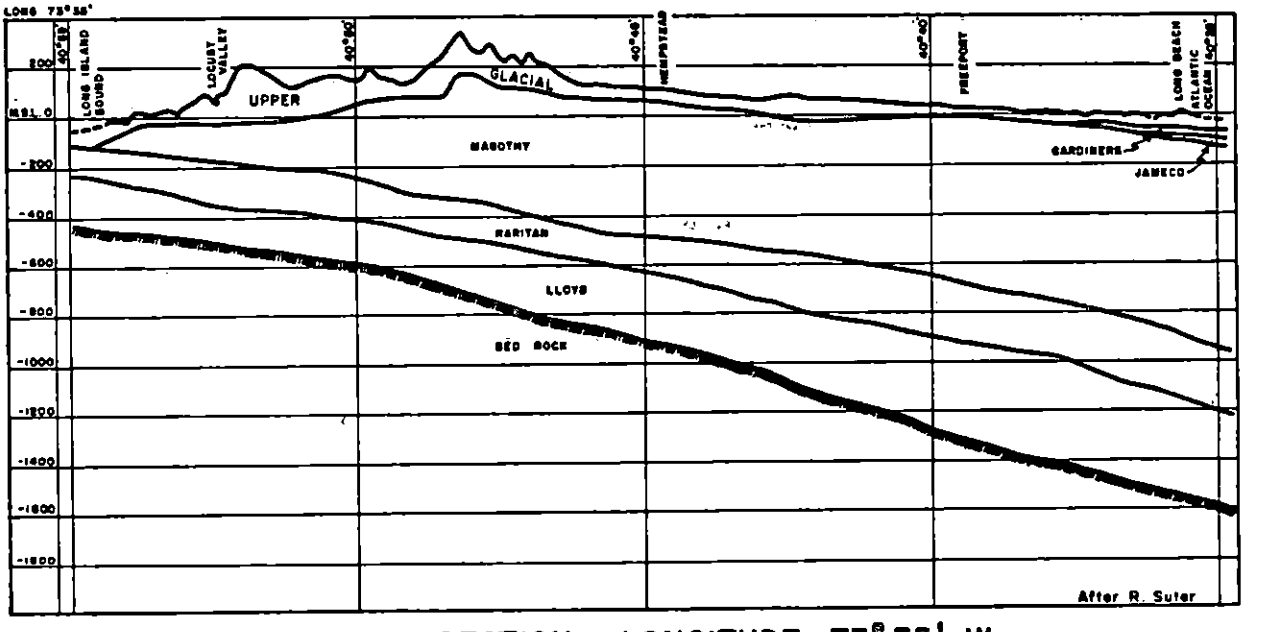
The Cretaceous sediments lying unconformably on the basement pinch out along the northeast-southwest line at the western end of the island. Usually the younger formations overlap the older and extend further to the northwest. All of the Cretaceous formations thicken toward the southeast.

The Lloyd gravel, a part of the oldest Cretaceous formation found in the wells, ends approximately along a line from Flushing Bay to Coney Island. The upper face of this member slopes downward to the southeast at approximately 60 feet per mile. The gradually thickening member is composed of medium to coarse clear sand and fine to coarse gravel. Mixed with the gravels in patches locally are some fine sandy clay, clayey sand, and very thin layers of clay. The thickness varies from 20 to slightly over 300 feet.

The second part of the Raritan formation, the Raritan clay member, lies conformably on the Lloyd gravel. Clay, silty clay, and some sandy layers make up this member with light to dark gray colors being most common. Floral fossils present at all depths and the absence of marine fossils would point to subaerial deposition. Erosion subsequently removed parts of the Raritan clay until it now extends just to the west and northwest of the Lloyd member. The same erosion may have completely removed the clay member in limited areas and exposed the Lloyd to the overlying Magothy. The surface of the Raritan clay is shown in figure 9. The thickness of the Raritan clay varies from 30 to 300 feet.



VERTICAL SECTION — LONGITUDE 73° 55' W.
FIGURE 4.



VERTICAL SECTION — LONGITUDE 73° 35' W.
FIGURE 5.

ARTHUR G. PITTS, Supervisor

Town of Babylon

200 EAST SUNRISE HIGHWAY, LINDENHURST, N.Y. 11757-2598

January 4, 1989

Sirous H. Nabavi, P.E.
Project Engineer
LeRoy Callender, PC
236 West 26th Street
New York, New York 10001

RE: Cantor Brothers, Inc.
50 Engineers Lane
Farmingdale, New York 11735

Dear Mr. Nabavi:

There are presently several violations of the Babylon Town Fire Prevention Code at the above subject location.

In addition, the Fire Prevention Permit (#524) has not been issued for this location in a number of years.

If you have any questions, please contact my office.

Very truly yours,

Thomas J. Karn
Sr. Fire Marshal

TJK/mlg

RECEIVED
JAN 0 6 1989

Department of Planning & Development — DANIEL FALASCO, Commissioner
Division of Fire Prevention — GILBERT W. HANSE, Chief Fire Marshal
(516) 957-3069

REF 18

ARTHUR PITTS, Supervisor

Town of Babylon

(Founded in 1872)

Phelps Lane Mansion
151 Phelps Lane
North Babylon, NY 11703

Town Historian
Robert Mills Smith
(516) 422-7205 Ext. 65

January 26,1989

Mr. Sirous Nabivi
Lero Callender Construction Eng.
236 W. 26th Street
New York, NY 10001

Dear Mr. Nabavi,

In answer to your inquiry concerning the site of the Cantor Brothers Repackaging Plant.

There are no nearby Historic Sites that are listed by New York State, nor that I am aware of.

There are also no sensitive Archeological Sites nearby, that I know of.

This should be sufficient for your DEIS report.

If I can be of any further help please contact me.

Sincerely,

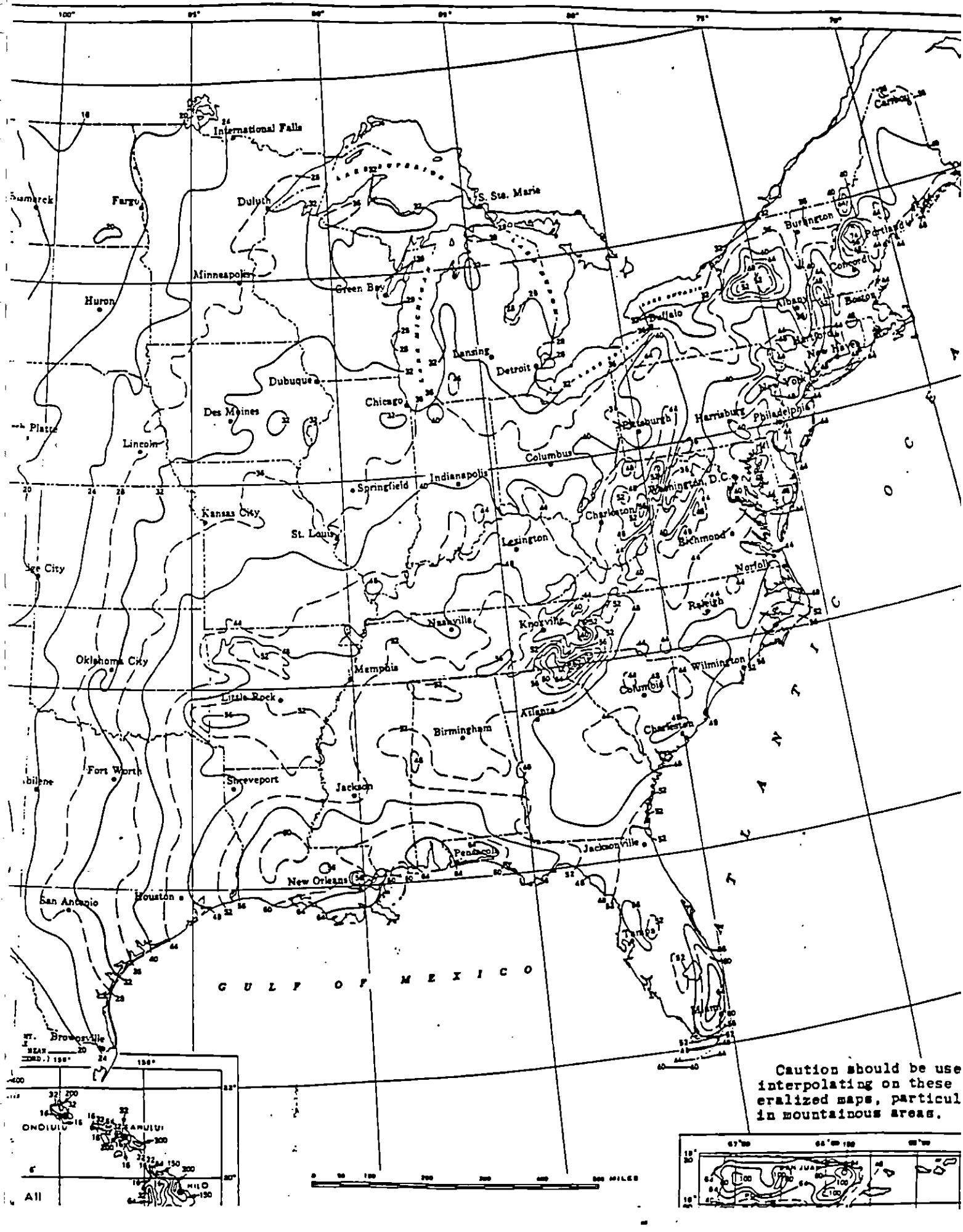
Robert Mills Smith

RMS:pfb

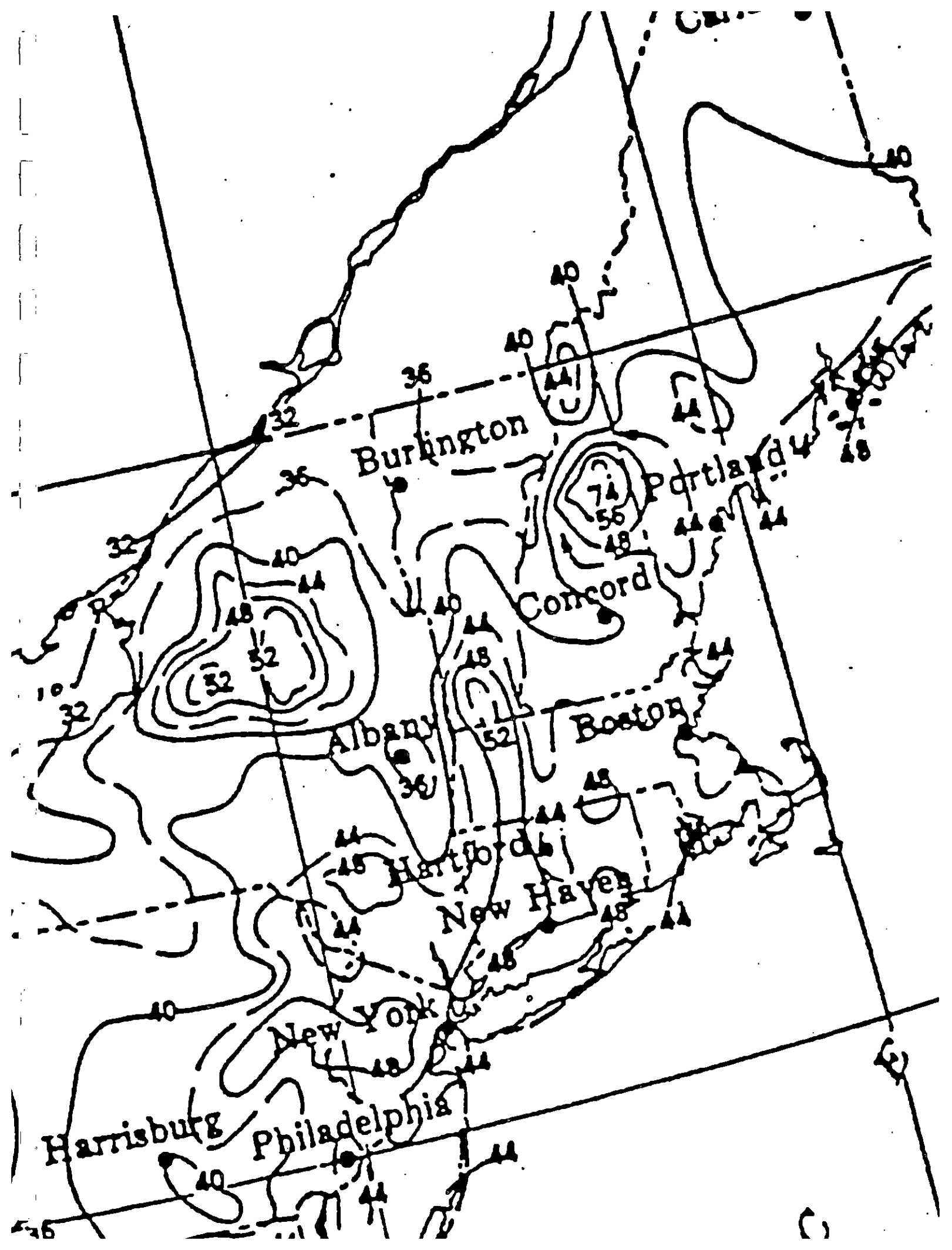
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JAN 30 1989

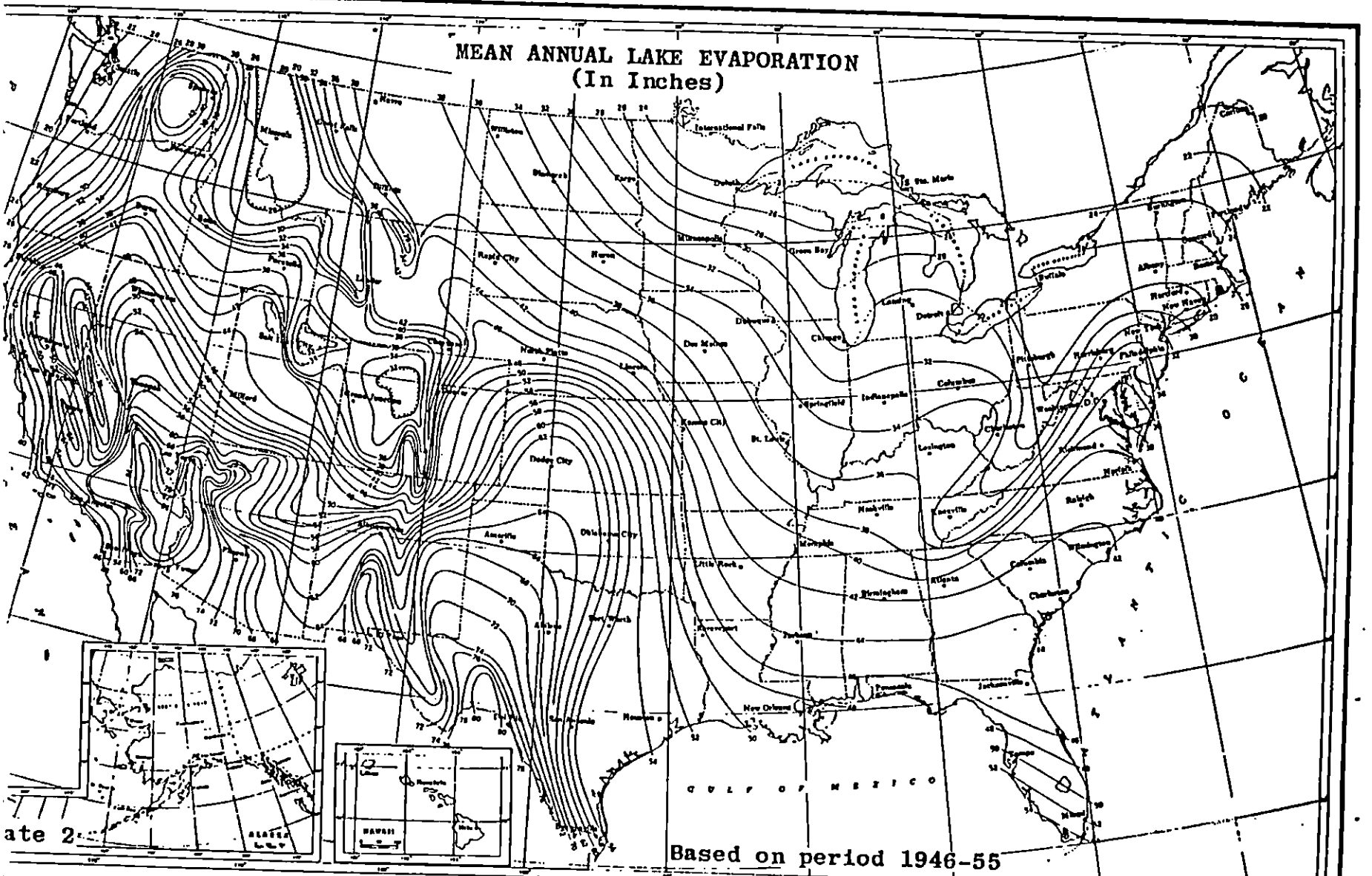
NUAL TOTAL PRECIPITATION (Inches)

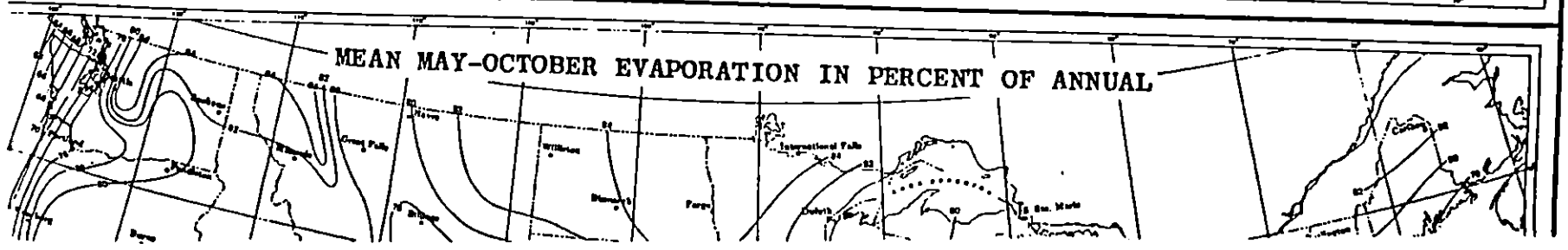
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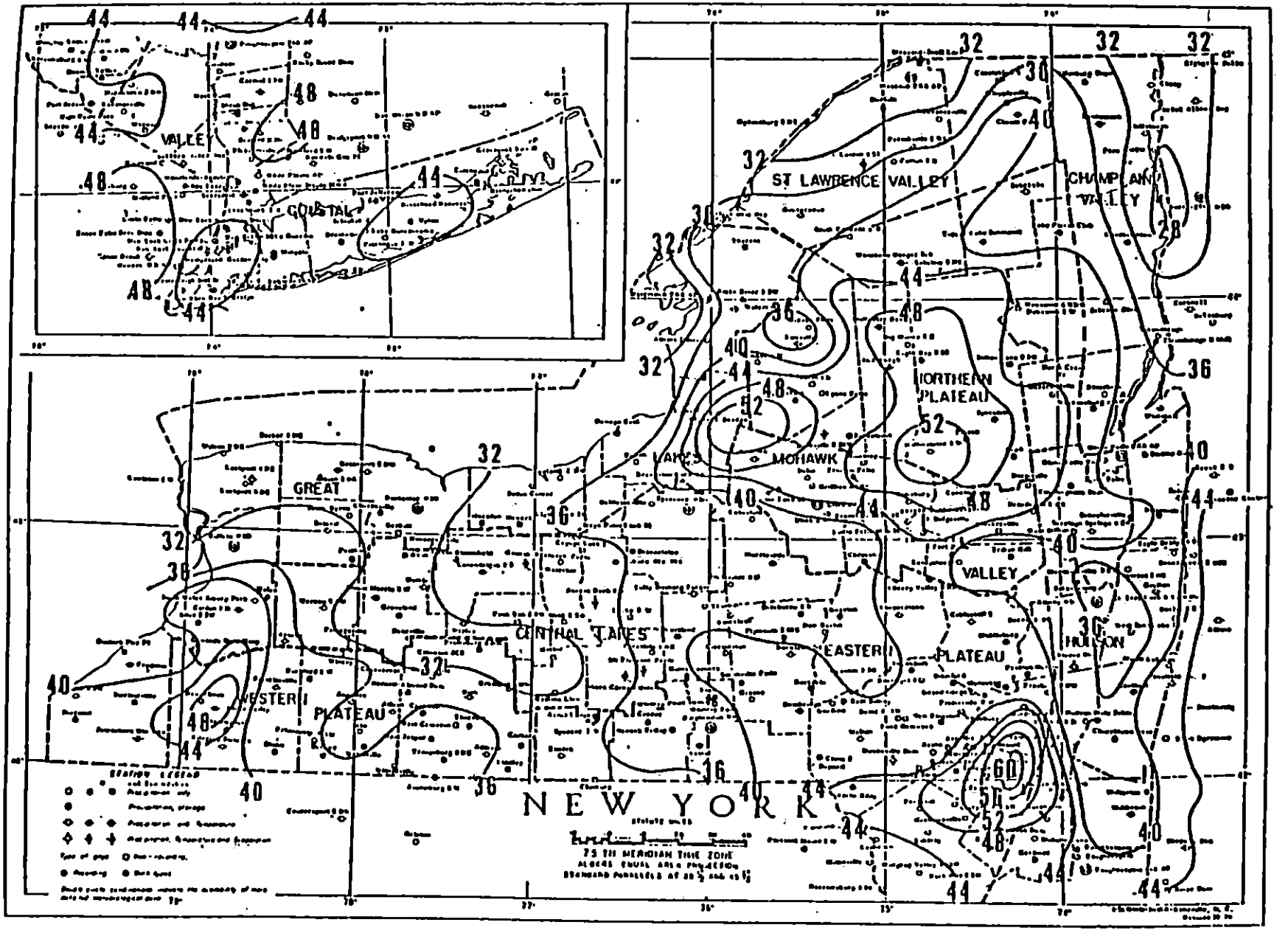
Caution should be use
interpolating on these
eralized maps, particul
in mountainous areas.


Burlington
Portland
Concord
Albany
Boston
Hartford
New Haven
New York
Harrisburg
Philadelphia
74
56
52
48
44
40
36
32


MEAN ANNUAL LAKE EVAPORATION
(In Inches)
GULF OF MEXICO
ALASKA
HAWAII
Based on period 1946-55

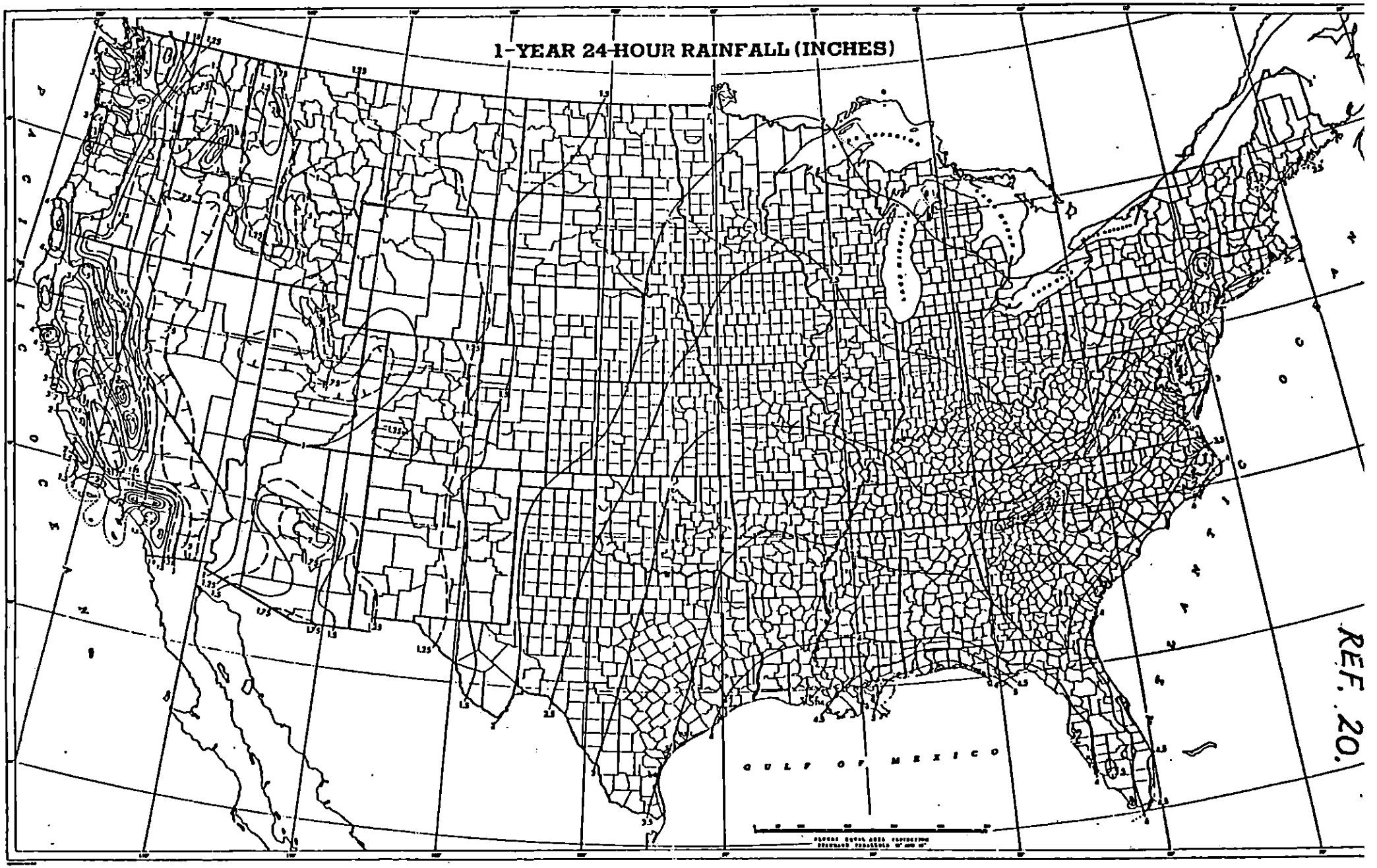

MEAN MAY-OCTOBER EVAPORATION IN PERCENT OF ANNUAL

MEAN ANNUAL PRECIPITATION, INCHES

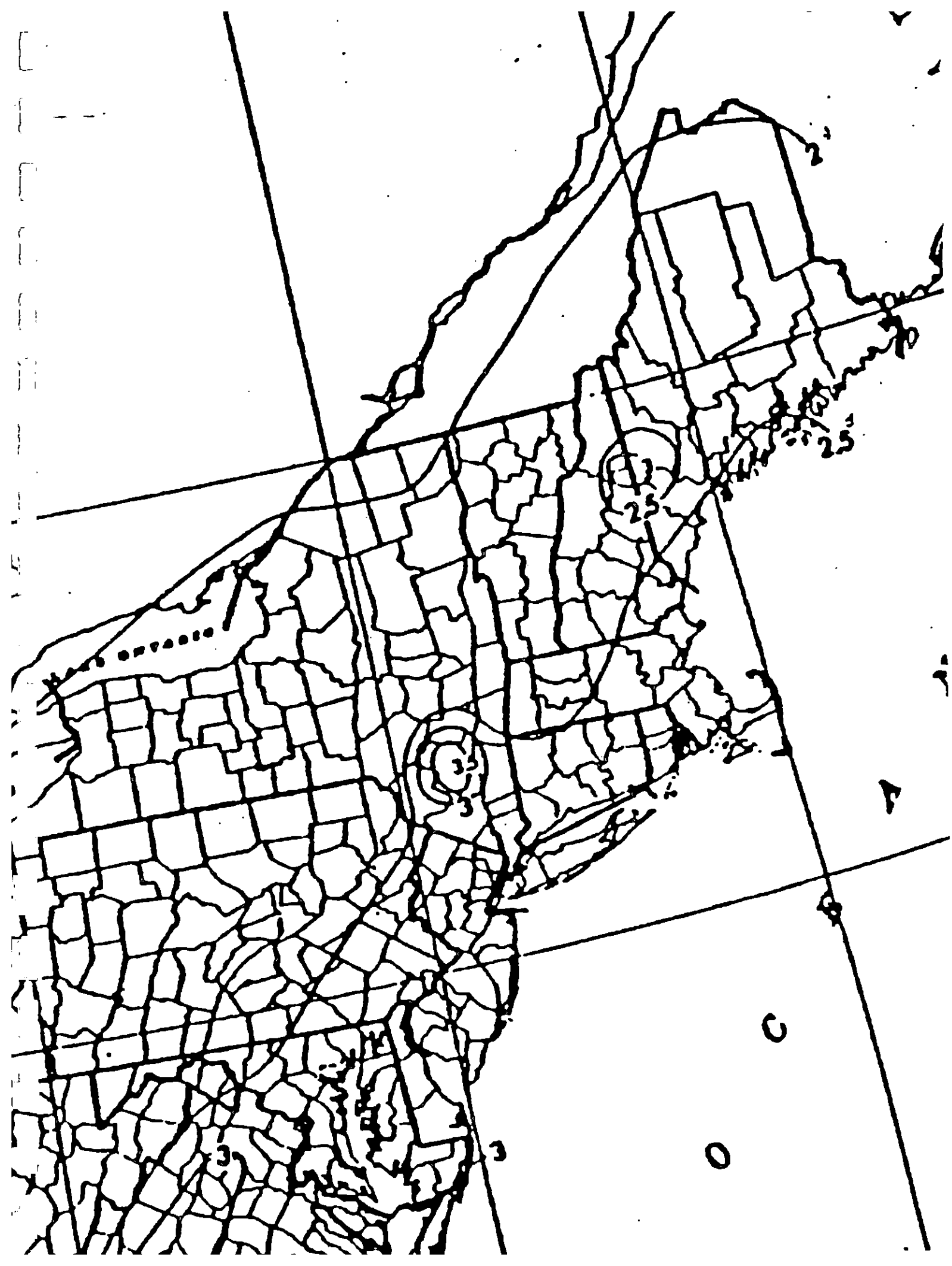


Data are based on the period 1931-55. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps, particularly in mountainous areas.

National Oceanic and Atmospheric Administration, Climates of the States, Vol. 2, p. 719, 1978.



REF. 20.



REF. No. 21

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

LeRoy
Callender
PC

REF. No. 22

PHASE II INVESTIGATION

CANTOR BROTHERS, INC.

VOLUME III

APPENDIX D:

USGS 7.5' SERIES
TOPOGRAPHIC MAPS
FOR
AMITYVILLE
HUNTINGTON
GREENLAWN, &
BAY SHORE WEST
QUADRANGLES
(1979)

(Will be submitted later)

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
INDUSTRIAL WASTE AND HAZARDOUS MATERIALS CONTROL
15 HORSEBLOCK PLACE, FARMINGVILLE, N.Y. 11738
(516) 451-4633

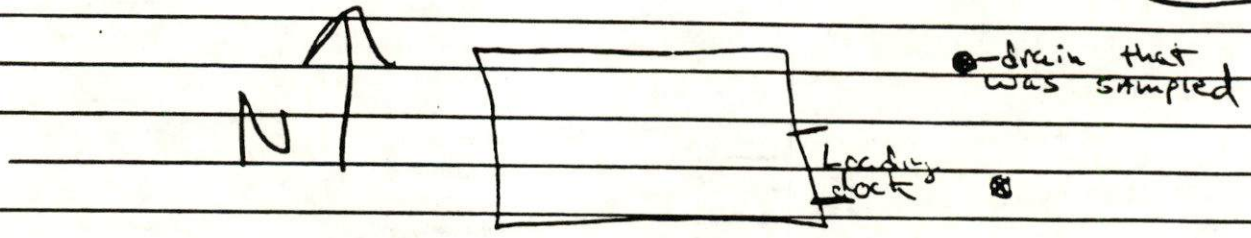
SCDHS
1988d

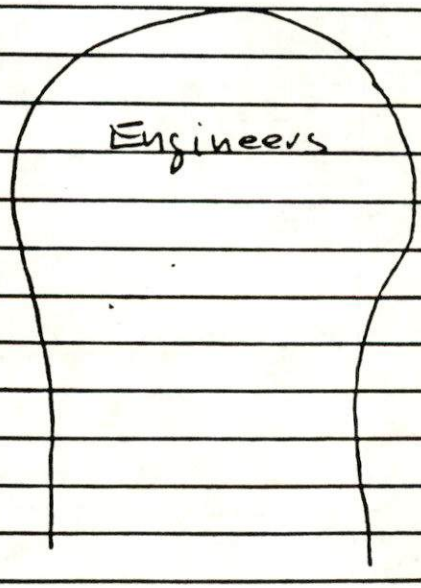
NAME OF FACILITY: Cantor Brothers INC.	OWNER/ OFFICER	PAGE 1 OF 2
COMPANY NAME: "Yankee"	CONTACT	TEL.
PLANT ADDRESS: Engineers Dr.	VILLAGE Farmingdale TOWN Babylon	ZIP 11735
MAILING ADDRESS		

DATE 10/19/88	TIME	SAMPLE ORIG. PERIODIC RE.	WASTE	NO WASTE H&H	SEWAGE SYSTEM	PUBLIC PRIVATE

Sampled storm drain at east side of building near loading dock. Sample was for organic parameters 2 RM-10-19.

Robert P. Morgan





RECEIVED
DEC 21 1988
LEROY GALLENUER, P.C.

REF. #23

EPA 11/3/88

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES 1988 d
DIVISION OF MEDICAL LEGAL INVESTIGATIONS & FORENSIC SCIENCES
PUBLIC & ENVIRONMENTAL HEALTH LABORATORY 2/

ORGANIC & FLASHPOINT ANALYSIS OF INDUSTRIAL & HAZARDOUS MATERIALS

Lab. No. IW- 088032 701
Field No. 2RM-10-19

Date Completed 10-27-88
Method EPA (8240)/EPA 1010/___

Name Cantor Brothers

Remarks Storm drain

Compound	ppb	Compound	ppb
☐ Purgeable Halocarbons1			
Dichlorodifluoromethane		Dibromochloromethane	<40
Chloromethane		Tetrachloroethylene	<40
Vinyl Chloride		Bromoform	<40
Bromomethane		1,1,2,2 Tetrachloroethane	<40
Chloroethane		Benzene	<40
Trichlorofluoromethane		Toluene	<40
2-Chloroethyl vinyl ether		Chlorobenzene	<40
☒ Purgeable Halocarbons2/Aromatics		Ethylbenzene	<40
1,1 Dichloroethylene	<40	Xylene(s)	<40
Methylene Chloride	<40	Styrene	<40
Freon 113	<40	Bromobenzene	<40
1,1 Dichloroethane	<40	Chlorotoluene(s)	<40
cis-1,2 Dichloroethylene	<40	p-Ethyltoluene	<40
Chloroform	<40	1,3,5 Trimethylbenzene	<40
1,2 Dichloroethane	<40	1,2,4 Trimethylbenzene	<40
1,1,1 Trichloroethane	<40	m-Dichlorobenzene	<40
Carbon Tetrachloride	<40	p-Dichlorobenzene	<40
1,2 Dichloropropane	<40	o-Dichlorobenzene	<40
Bromodichloromethane	<40	p-Diethylbenzene	<40
1,1,2 Trichloroethylene	<40	1,2,4,5 Tetramethylbenzene	<40
trans-1,3 Dichloropropene	<40	1,2,4 Trichlorobenzene	<40
cis-1,3 Dichloropropene	—	1,2,3 Trichlorobenzene	<100
1,1,2 Trichloroethane	<40		

Analyst [signature]

☐ Polychlorinated Biphenyls

PCB 1016		PCB 1254	
PCB 1221		PCB 1260	
PCB 1232		PCB 1262	
PCB 1242			
PCB 1248			

Analyst

☐ Flash Point

Pensky-Martens Closed Cup Flash Point ____ °C= ____ °F

Analyst

REF. # 24 SCDHS

FILE IN 1/4 Alum file

SUFFOLK COUNTY DEPARTMENTMENT OF HEALTH SERVICES
INDUSTRIAL WASTE AND HAZARDOUS MATERIALS CONTROL
15 HORSEBLOCK PLACE, FARMINGVILLE, N.Y. 11738
(516) 451-4633

1988a

I.D. NO. 7 0 1

NAME OF FACILITY: Cantor Bros. INC	OWNER/OFFICER: Gen Mgr. Mat Miller	VIOLATIONS NOTED: YES / NO	
COMPANY NAME:	CONTACT: Mat Miller	TEL: 694-6661	
PLANT ADDRESS: Engineer La	VILLAGE: E. Farmingdale TOWN: Babylon	ZIP: 11735	
MAILING ADDRESS:	INSP.	HYDRO.	MAP COORD.
PROPERTY OWNER: Firm owns property.			
DATE: 1/22/88 TIME:	ORIG / PER. / RE / SAMPLE	ART. 7 YES NO	ART. 10 NO	ART. 12 NO: 422	H&H
INDUSTRY: Paint + Thinners -	SPDES OR NPDES PERMIT: YES NO PERMIT NO.				
HEATING SYSTEM - MFG NAME	FUEL TYPE: GAS	FIRING RATE	TANK SIZE		
NUMBER OF DRUMS: INDOORS 3 OUTDOORS	NUMBER OF TANKS: ABOVEGROUND UNDERGROUND	NUMBER OF OPEN PROCESS TANKS	SEWAGE SYSTEM: PUBLIC / PRIVATE		
SCAVENGER: TEL.	PICK UP RECORDS AVAILABLE: YES NO	VOLUME GENERATED			

(1) 55 gal drums stored in ~~Art XII~~ containment area stacked 4 pallets high. 50+ drums of a more viscous contents used in making chalking compounds are indoors but outside of ~~Art XII~~ containment area. Owner claims this above material is non toxic

(2) 2-3 drums outdoors with unknown contents 1/2 full - completely full. must be moved indoors or disposed of in a proper manner. This is a violation of Art ~~XII~~ sec 1215 of the suffolk County Sanitary Code.

(3) See attached updated tank inventory.

INDUSTRIAL WASTES MUST NOT BE DISCHARGED TO THE GROUND OR DISPOSED OF IN A DUMPSTER, BUT MAY ONLY BE TRANSPORTED AND DISPOSED OF BY A LICENSED INDUSTRIAL WASTE SCAVENGER FOR AN APPROVED LIST CONTACT THE N.Y.S. D.E.C. AT 751 - 7900

REINSPECTION SCHEDULED ON OR AFTER 1/24/88 FAILURE TO CORRECT UNSATISFACTORY CONDITIONS BY REINSPECTION DATE MAY RESULT IN A HEARING AND OR FINE.

PERMISSION IS GRANTED BY THIS FACILITY TO THE SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES TO CONDUCT ROUTINE SAMPLING OF CESSPOOLS, STORMDRAINS, AND OTHER DISCHARGE POINTS AT THE FACILITY.

SIGN. OF PERSON REC. REPORT: Matthew J. Miller	TITLE: Gen. Mgr.	INSPECTOR: Robert P. Marcel

8-1442 (7/29) TJK 12/86

NO.	PROCESS	CHEMICALS USED AND APPROXIMATE QUANTITY	DISCHARGE		
			LIQUID	AIR	
				CONTROL TYPE	EP
1	Ware house area	paint products packaged in 5gal containers or less			
2	Packaging area.	40 "working drums of 111 Tri, Paint thinner, lacquer thinner.			
3	ware house area.	≈ 50 drums of chaulking type chemicals - visous - no art XII			

1/25/88 WITHIN CONTAINMENT AREA

2200 GAL DRUM STORAGE REGISTERED.

REF. # 24

SCDHS 1988 a 24

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
Office of Environmental Engineering & Pollution Control
N.Y. State CRR Part 230 and S.C. Sanitary Code Article 12
Gasoline Station Inspection Form

	No.	Street	Comm.	Phone No.
Facility Name: STOR BROS. INC.				
Facility Owner	No.	Street	Comm.	Phone No.
Facility Operator	No.	Street	Comm.	Phone No.
Land Owner	No.	Street	Comm.	Phone No.
Tank Owner	No.	Street	Comm.	Phone No.

Facility I.D. Number: 472000211 Air Certificates: YES NO Exp. Dte.:

Permits: Tanks Registered: YES NO Reg. Number: 1122 Exp. Date:

Tax No. Dist. Sec. Block Lot Map Quad

Gasoline Annual Throughput: How Determined:

(If annual throughput not available): Date of Last Delivery: Volume (gal):

Super Unleaded: Unleaded: Reg Leaded:

Approximate Frequency of Delivery:

Brand of Fuel Displayed: Fuel Distributor:

Number of nozzles:

Tank ID	Tank Capacity	Type of Fuel	Date Tank Installed	Above/ Below	Type of Controls: 2 Point System	Co-Axial	Submerged Fill	No Controls
12	2000	ORG SOLV.	64	B/U	Removed			
13	10000 ✓	REGULAR	64	B/U				✓
14	10000 ✓	ORG SOLV.	64	B/U				✓
15	3000		64	B/U				✓
16	100	PAINT	64	A/I				✓
17	2000	DRUM STORAGE	85	A/I	N/A			✓
18	5000	REFUEL	64	B/U	Removed			
Add. Tanks								

Inspector: Wolcroft Inspection Date: 1/22/88

REF. # 24 - SCDHS 1988a

4/4

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
Office of Environmental Engineering & Pollut . Control
N.Y. State CRR Part 230 and S.C. Sanitary Code Article 12
Gasoline Station Inspection Form

Facility Name	No.	Street	Comm.	Phone No.
ANTOR BROS. INC.		ENGINEERS LANE	FARMINGDALE	
Facility Owner	No.	Street	Comm.	Phone No.
Facility Operator	No.	Street	Comm.	Phone No.
Land Owner	No.	Street	Comm.	Phone No.
Tank Owner	No.	Street	Comm.	Phone No.

Facility I.D. Number: 4 7 2 0 0 0 2 A 1 1 | Air Certificates: YES NO Exp. Dte.:

Permits: Tanks Registered (YES) NO Reg. Number: | 1 1 2 2 | Exp. Date:

Tax No. Dist. | Sec. | Block | Lot | 1 | Map Quad

Gasoline Annual Throughput: N/A | How Determined:

(If annual throughput not available): Date of Last Delivery: | Volume (gal):

Super Unleaded: | Unleaded: | Reg Leaded:

Approximate Frequency of Delivery:

Brand of Fuel Displayed: | Fuel Distributor:

Number of nozzles:

Tank ID	Tank Capacity	Type of Fuel	Date Tank Installed	Above/ Below	Type of Controls: 2 Point System	Co-Axial	Submerged Fill	No Controls
1	2000 ✓	ORG SOLV.	64	B/U				✓
2	2000 ✓	ORG SOLV.	64	B/U				✓
3	2000 ✓	ORG SOLVENT	64	B/U				✓
4	5000 ✓	KEROSENE	64	B/U				✓
5	5000 ✓	ORG SOLVENT	64	B/U	all remote fills			✓
6	5000 ✓	ORG. SOLV.	64	B/U				✓
7	5000	ORG SOLV.	64	B/U	Removed			
8	3000 ✓	ORG SOLV.	64	B/U				✓
9	2000 ✓	ORG. SOLV.	64	B/U	all remote fills			✓
10	2000 ✓	ORG. SOLV.	64	B/U				✓
11	2000 ✓	ORG. SOLV.	64	B/U				✓

id. anks

Inspection Date: 1 22 88

Inspectors Name: Mowcraft

REF. No. 8

F. METHODOLOGY FOR ESTIMATING POPULATION

A. Population within 3-Mile radius of the site, served by public groundwater supply wells

1. The public water supply systems within a 3-Mile radius of the site are identified from the Atlas of Community Water System Sources. These systems are:

   - East Farmingdale Water District
   - Suffolk County Water Authority
   - South Huntington Water District
   - Dix Hill Water District

2. The total number of wells serving each system is computed, and the number of wells within the 3-Mile radius of the site is counted. The total population served by each system is taken from the Atlas and the population served within the 3-Mile radius is proportioned based on the number of wells within that radius. Thus, the following table is obtained:

ID NO.	MUNICIPAL COMMUNITY	TOTAL NO. OF WELLS	TOTAL POPULATION SERVED	NO. OF WELLS WITHIN 3-MILE RADIUS	EST. POPULATION SERVED WITHIN 3-MILE RADIUS
9	East Farmingdale Water District	2	7,850	2	7,850
28	Suffolk County Water Authority	154	900,000	5	29,221
27	South Huntington Water District	10	51,260	3	15,378
8	Dix Hills Water District	9	30,000	2	6,666
	Total				59,115

B. Population 0-1/4 Mile Radius* 63 large bldgs. x 20 = 1260
10 dwellings x 3.8 = 38

(Estimated) 1298

C. Population 1/4 to 1/2 Mile Radius* 39 large bldgs. x 20 = 780
10 dwellings x 3.8 = 38

(Estimated) 818

D. Population 1/2 to 1 Mile Radius* 136 large bldgs x 20 = 2720
110 dwellings x 3.8 = 418

(Estimated) 3138

Therefore: Population 0-1/4 M 1,298

0-1/2 M 2,116

0-1M 5,454 (add 200 for St. Rose Ind. School)

*Based on USGS Amityville, Huntington, Greenlawn, and Bay Shore West Quadrangles, 7.5 Minutes Series, Topographic, 1979.

E. Population within 2-M Radius

1. No. of Large Bldgs.	621 x 20 =	12,420
2. No. of dwellings	801 x 3.8 =	3,044
1/4 Farmingdale (1/4 x 7,998) =		2,000
1/5 Wyandanch (1/5 x 13,375) =		2,675
		20,139
St. Rose Industrial Sch.		200 (Assumed)
SUNY Agr. & Tech. Inst.		11,747 (L.I. Almanac)
Milton Olive Sch. & High Sch.		800 (Assumed)
		32,886

No. of Buildings within 2-M Radius

No. of building (large & small) withing 2-M Radius 1422 (1+ 2 above)

1/4 Farmingdale (2000: 3.8)	527
1/5 Wyandach (2675: 3.8)	704
	2,653

F. Estimated Population within a 4-Mile Radius

(Based on proportions of Communities located within 4-M Radius)

Community	Population*	Ratio	
Plainview	27,572	2/3	18,381
Bethpage	16,567	1/2	8,284
Farmingdale			7,998
South Farmingdale	15,706	2/3	10,471
North Amityville	13,333	2/3	8,889
North Lindenhurst			11,553
Wyandanch			13,375
Half Hollow Hills	(1,942 Houses x 3.8)		7,380
South Huntington	14,579	1/2	7,290
East Farmingdale			6,134
Deer Park	30,643	1/2	15,322
Melville			11,334
West Babylon	44,695	4/5	35,756
Total			162,167

*Note-Basis of Population Estimate-Long Island Almanac, 1988.

5.G. EPA FORM 2070-13

LeRoy Callender PC



Site Inspection Report

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 State	02 Site Number
NY	N/A

II. SITE NAME AND LOCATION

01 Site Name (Legal, common, or descriptive name of site)	02 Street, Route No., or Specific Location Identifier
Cantor Brothers, Inc.	Engineer's Lane

03 City	04 State	05 Zip Code	06 County	07 County Code	08 Cong. Dist.
Town of Babylon	NY	11735	Suffolk	103	2

09 Coordinates Latitude	Longitude
40° 45' 20.0"	73° 24' 17.0"

10 Type of Ownership (Check one)
[X] A. Private [ ] B. Federal _____ [ ] C. State [ ] D. County
[ ] E. Municipal [ ] F. Other _____ [ ] G. Unknown

III. INSPECTION INFORMATION

01 Date of Inspection	02 Site Status	03 Years of Operation
7 / 19 / 88 (Month Day Year)	[X] Active [ ] Inactive	1975 (Beginning Year) | PRESENT (Ending Year) [ ] Unknown

04 Agency Performing Inspection (Check all that apply)
[ ] A. EPA [ ] B. EPA Contractor _____ (Name of Firm) [ ] C. Municipal [ ] D. Municipal Contractor _____ (Name of Firm)
[ ] E. State [X] F. State Contractor LC/PC (Name of Firm) [ ] G. Other _____ (Specify)

05 Chief Inspector	06 Title	07 Organization	08 Telephone No.
S. Nabavi	Project Engineer	LeRoy Callender, P.C	(212989-2900
09 Other Inspectors	10 Title	11 Organization	12 Telephone No.
			( )
			( )
			( )
			( )
			( )

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
Matthew Miller	Gen. Manager	Cantor Brothers, Inc.	(510694-6666
			( )
			( )
			( )
			( )

17 Access Gained By (Check one)	18 Time of Inspection	19 Weather Conditions
[X] Permission [ ] Warrant	8:30 - 11:00	Hazy, Warm

IV. INFORMATION AVAILABLE FROM

01 Contact	02 Of (Agency/Organization)	03 Telephone No.
A.M. Santino	Suffolk County Dept. of Health Services (SCDHS)	(516 451-4640

04 Person Responsible for Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
S. Nabavi		LC/PC	(212989-2900	7 / 14 / 89 (Month Day Year)

EPA Form 2070-13 (7-81)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 Physical States (Check all that apply)

- [ ] A. Solid
- [ ] B. Powder, Fines
- [ ] C. Sludge
- [ ] D. Other _____ (Specify)
- [ ] E. Slurry
- [X] F. Liquid
- [ ] G. Gas

02 Waste Quantity at Site (Measure of waste quantities must be independent)

Tons 270
Cubic Yards _____
No. of Drums _____

03 Waste Characteristics (Check all that apply)

- [X] A. Toxic
- [ ] B. Corrosive
- [ ] C. Radioactive
- [X] D. Persistent
- [X] E. Soluble
- [ ] F. Infectious
- [X] G. Flammable
- [X] H. Ignitable
- [ ] I. Highly volatile
- [ ] J. Explosive
- [ ] K. Reactive
- [ ] L. Incompatible
- [ ] M. Not applicable

III. WASTE TYPE

Category	Substance Name	01 Gross Amount	02 Unit of Measure	03 Comments
SLU	Sludge			
OLW	Oily waste			
SOL	Solvents	38,000	Gallons	Organic Solvents
PSD	Pesticides			
OCC	Other organic chemicals	17,100	Gallons	Kerosene, Paint Products
IOC	Inorganic chemicals			
ACD	Acids			
BAS	Bases			
MES	Heavy Metals			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 Category	02 Substance Name	03 CAS Number	04 Storage/Disposal Method	05 Concentration	06 Measure of Concentration
SOL	1,1,1-Trichloroethane	71-55-6	Storm Drains	3-19	ppb
SOL	Trichloroethene	79-01-6	<< <<	10-100	ppb
SOL	Tetrachloroethene	127-18-4	<< <<	18-2000	ppb
SOL	1,2-Dichloroethene (total)	540-59-0	<< <<	5-45	ppb
IOC	Arsenic	7440-38-2	<< <<	5-50	ppb

V. FEEDSTOCKS (See Appendix for CAS Numbers)

Category	01 Feedstock Name	02 CAS Number	Category	01 Feedstock Name	02 CAS Number
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SCDHS, 1988-1989; Phase II investigations, 1988.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 State	02 Site Number
NY	N/A

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. Groundwater Contamination
03 Population Potentially Affected 59,115
02 [X] Observed (Date 1/22/88) [ ] Potential [ ] Alleged
04 Narrative Description: 10/6/88, 10/19/88

Sampling of groundwater from Upper Glacial aquifer revealed contamination by organic chemicals, such as Tetrachloroethene, and inorganic chemicals, such as Arsenic

01 [X] B. Surface Water Contamination
03 Population Potentially Affected unknown
02 [ ] Observed (Date) [X] Potential [ ] Alleged
04 Narrative Description:

Hazardous materials discharged into storm drains and onto ground surface have potential for run-off during heavy storms and flooding.

01 [X] C. Contamination of Air
03 Population Potentially Affected
02 [ ] Observed (Date) [ ] Potential [ ] Alleged
04 Narrative Description:

No obnoxious odor, no organic vapors detected with HNu meter.

01 [X] D. Fire/Explosive Conditions
03 Population Potentially Affected 32,886
02 [ ] Observed (Date) [X] Potential [ ] Alleged
04 Narrative Description:

Ignitable and reactive compounds found are Kerosene and 1,1,1 - Trichloroethane; Violations of Town of Babylon Fire Prevention Code have been found at the site.

01 [X] E. Direct Contact
03 Population Potentially Affected 5,454
02 [ ] Observed (Date) [X] Potential [ ] Alleged
04 Narrative Description:

Indoor above ground storage containers have potential for contact.

01 [X] F. Contamination of Soil
03 Area Potentially Affected Unknown (Acres)
02 [ ] Observed (Date) [X] Potential [ ] Alleged
04 Narrative Description:

Soil samples from drilling of monitoring wells showed high concentrations of inorganic chemicals, such as Arsenic, Barium, Lead & Selenium.

01 [X] G. Drinking Water Contamination
03 Population Potentially Affected 59,115
02 [ ] Observed (Date) [X] Potential [ ] Alleged
04 Narrative Description:

Groundwater sources of Magothy aquifer are used for public water supplies. This aquifer is hydraulically connected to Upper Glacial aquifer, which is contaminated.

01 [ ] H. Worker Exposure/Injury
03 Workers Potentially Affected
02 [ ] Observed (Date) [ ] Potential [ ] Alleged
04 Narrative Description:

None Known.

01 [ ] I. Population Exposure/Injury
03 Population Potentially Affected
02 [ ] Observed (Date) [ ] Potential [ ] Alleged
04 Narrative Description:

None Known.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)

01 [ ] J. Damage to Flora — 02 [ ] Observed (Date _____) [ ] Potential [ ] Alleged
04 Narrative Description:

No information available (N/A)

01 [ ] K. Damage to Fauna — 02 [ ] Observed (Date _____) [ ] Potential [ ] Alleged
04 Narrative Description:

N/A

01 [ ] L. Contamination of Food Chain — 02 [ ] Observed (Date _____) [ ] Potential [ ] Alleged
04 Narrative Description:

N/A

01 [x] M. Unstable Containment of Wastes (Spills/Runoff/Standing liquids, Leaking drums) — 02 [ ] Observed (Date _____) [x] Potential [ ] Alleged
03 Population Potentially Affected: Unknown
04 Narrative Description:

55-Gal. drums of hazardous chemicals stored indoors, outside of spill-containment area could potentially result in spills into storm drains.

01 [ ] N. Damage to Offsite Property — 02 [ ] Observed (Date _____) [ ] Potential [ ] Alleged
04 Narrative Description:

N/A

01 [x] O. Contamination of Sewers, Storm/Drains, WWTPs — 02 [ ] Observed (Date 10/19/88) [ ] Potential [ ] Alleged
04 Narrative Description:

Sampling of storm drain east of Factory Area showed high concentrations of 1,2,3, Trichloro benzene

01 [x] P. Illegal/Unauthorized Dumping — 02 [x] Observed (Date 8/26/87) [ ] Potential [ ] Alleged
04 Narrative Description:

An underground storage tank containing hazardous chemicals was abandoned in violation of SCDHS Sanitary Code.

05 Description of Any Other Known, Potential, or Alleged Hazards

None Known

III. TOTAL POPULATION POTENTIALLY AFFECTED: 59,115

IV. COMMENTS

Underground storage tanks on the south side have a history of leaking.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SCDHS files; Phase II investigation results, 1989.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 State	02 Site Number
NY	N/A

II. PERMIT INFORMATION

01 Type of Permit Issued (Check all that apply)	02 Permit Number	03 Date Issued	04 Expiration Date	05 Comments
[ ] A. NPDES				
[ ] B. UIC				
[ ] C. AIR				
[ ] D. RCRA				
[ ] E. RCRA Interim Status				
[ ] F. SPCC Plan				
[ ] G. State (Specify)				
[ ] H. Local (Specify)				
[X] I. Other (Specify)	1122			Tank Registration Number
[ ] J. None				

III. SITE DESCRIPTION

01 Storage Disposal (Check all that apply)	02 Amount	03 Unit of Measure	04 Treatment (Check all that apply)	05 Other
[ ] A. Surface Impoundment			[ ] A. Incineration	[ ] A. Buildings On Site
[ ] B. Piles			[ ] B. Underground Injection	
[X] C. Drums, Above Ground	2,000	Gal.	[ ] C. Chemical/Physical	
[X] D. Tank, Above Ground	100	Gal.	[ ] D. Biological	
[X] E. Tank, Below Ground	52,000	Gal.	[ ] E. Waste Oil Processing	
[ ] F. Landfill			[ ] F. Solvent Recovery	06 Area of Site
[ ] G. Landfarm			[ ] G. Other Recycling Recovery	
[ ] H. Open Dump			[ ] H. Other (Specify)	3.2 Acres
[ ] I. Other (Specify)				

07 Comments

IV. CONTAINMENT

01 Containment of Wastes (Check one)
[ ] A. Adequate, Secure [ ] B. Moderate [X] C. Inadequate, Poor [ ] D. Insecure, Unsound, Dangerous

02 Description of Drums, Diking, Liners, Barriers, etc.
PART OF INDOOR 55-Gal. DRUM STORAGE AREA NOT PROPERLY BERMED.
UNDERGROUND STORAGE TANKS NOT REGULARLY PRESSURE-TESTED TO PREVENT LEAKS.

V. ACCESSIBILITY

01 Waste Easily Accessible: [X] Yes [ ] No
02 Comments:

Contaminated runoff from flooded storm drains after heavy rains is easily accessible.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Phase II site inspection, 1988.

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. DRINKING WATER SUPPLY

01 Type of Drinking Supply (Check as applicable)	Surface	Well	02 Status: Endangered	Affected	Monitored	03 Distance to Site
Community	A. [ ]	B. [X]	A. [X]	B. [ ]	C. [ ]	A 1 (mi)
Non-community	D. [ ]	D. [x]	D. [x]	E. [ ]	F. [ ]	B 0.12 (mi)

III. GROUNDWATER

01 Groundwater Use in Vicinity (Check one)

[x] A. Only Source for Drinking | [ ] B. Drinking (Other sources available) Commercial, Industrial, Irrigation (No other water sources available) | [ ] C. Commercial, Industrial, Irrigation (Limited other sources available) | [ ] D. Not Used, Unuseable

02 Population Served by Groundwater 5,454(0-1mileR) | 03 Distance to Nearest Drinking Water well 1 (mi)

04 Depth to Groundwater	05 Direction of Groundwater Flow	06 Depth to Aquifer of Concern	07 Potential Yield of Aquifer	08 Sole Source Aquifer
40.8 (ft)	southeasterly	0 (ft)	Unknown (gpd)	[X] Yes [ ] No

09 Description of Wells (Including usage, depth, and location relative to population and buildings)
Public and private supply wells within populated areas, used for drinking, industrial and commercial applications. Depth rangesfrom 60' to over 700'.

10 Recharge Area		11 Discharge Area	
[X] Yes	Comments: Site located in Zone II of deep recharge area (Suffolk County San. Code-Article 7)	[X] Yes	Comments: Storm drains, into groundwater aquifer
[ ] No		[ ] No	

IV. SURFACE WATER

01 Surface Water (Check one)

[ ] A. Reservoir Recreation Drinking Water Source | [ ] B. Irrigation Economically Important Resources | [ ] C. Commercial, Industrial | [X] D. Not Currently Used

02 Affected/Potentially Affected Bodies of Water

Name:	Affected	Distance to Site
None Known	[ ]	(mi)
	[ ]	(mi)
	[ ]	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 Total Population Within

One (1) Mile of Site	Two (2) Miles of Site	Three (3) Miles of Site
A. 5,454 No. of Persons	B. 32,886 No. of Persons	C. 59,115 No. of Persons

02 Distance to Nearest Population: 0 (mi)

03 Number of Buildings Within Two (2) Miles of Site: 2,653

04 Distance to Nearest Off-Site Building: Approx. 25' (est)

05 Population Within Vicinity of Site (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area) The site is located in an industrial area among other commercial & industrial facilities. Large cemeteries, parks and residential areas surround the site.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 State	02 Site Number
NY	N/A

VI. ENVIRONMENTAL INFORMATION

01 Permeability of Unsaturated Zone (Check one)

[ ] A. 10^{-6} - 10^{-8} cm/sec [ ] B. 10^{-4} - 10^{-6} cm/sec [ ] C. 10^{-4} - 10^{-3} cm/sec [X] D. Greater Than 10^{-3} cm/sec

02 Permeability of Bedrock (Check one)

[X] A. Impermeable (Less than 10^{-6} cm/sec) [ ] B. Relatively Impermeable (10^{-4} - 10^{-6} cm/sec) [ ] C. Relatively Permeable (10^{-2} - 10^{-4} cm/sec) [ ] D. Very Permeable (Greater than 10^{-2} cm/sec)

03 Depth to Bedrock	04 Depth of Contaminated Soil Zone	05 Soil pH
1,300 (ft)	15 (ft)	6.7

06 Net Precipitation	07 One Year 24-Hour Rainfall	08 Slope: Site Slope	Direction of Site Slope	Terrain Average Slope
15 (in)	2.7 (in)	0.14 %	S,W	<1 %

09 Flood Potential
Site is in More than 100 Year Floodplain

10
[ ] Site is on Barrier Island, Coastal High Hazard Area, Riverine Floodway

11 Distance to Wetlands (5 acre minimum)

ESTUARINE	OTHER
A. 7.6 (mi)	B. 0.95 (mi)

12 Distance to Critical Habitat (of endangered species)

_____ (mi)

Endangered Species: None within 1 mile of site.

13 Land Use in Vicinity

Distance to:

A. COMMERCIAL/INDUSTRIAL	B. RESIDENTIAL AREA; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	C. AGRICULTURAL LANDS: PRIME AG LAND	D. AGRICULTURAL LANDS: AG LAND
0 (mi)	1.5 (mi)	1-2 (mi)	½ - 1 (mi)

14 Description of Site in Relation to Surrounding Topography

The site is located on relatively flat terrain.
Area surrounding the site is almost entirely developed and paved.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Phase II Investigation, 1988, USDOC, Climatic Atlas, 1979: USGS Topo Maps, 1979; NYSDEC Region I.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 State	02 Site Number
NY	N/A

II. SAMPLES TAKEN

Sample Type	01 Number of Samples Taken	02 Samples Sent to	03 Estimated Date Results Available
Groundwater	6	H2M Labs, Inc.	
Surface Water			
Waste			
Air			
Runoff			
Spill			
Soil	4	H2M Labs, Inc.	
Vegetation			
Other Sediment	3	H2M Labs, Inc.	

III. FIELD MEASUREMENTS TAKEN

01 Type	02 Comments
HNu	Air survey with HNu photoionization detector
pH	pH of Ground-water samples
Temperature	Temperature of Ground-Water samples
Conductivity	Conductivity of Ground-Water samples

IV. PHOTOGRAPHS AND MAPS

01 Type [x] Ground [ ] Aerial

02 In Custody of LeRoy Callender, P.C. - New York Office
(Name of organization or individual)

03 Maps [x] Yes [ ] No

04 Location of Maps: LeRoy Callender, P.C. - New York Office

V. OTHER FIELD DATA COLLECTED (Provide narrative description of sampling activities)

Magnetometer Survey.
Boring logs, development time, recharge time, and static water level measurement for GW-Series wells.
Topographic survey.
Sampling of ground water and soil from monitoring wells.
Sampling of sediment from Storm Drains.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Phase II Investigation, 1988.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 Name: Cantor Brothers, Inc.	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.): Engineers Lane	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City: Farmingdale	06 State: NY	07 Zip Code: 11735	12 City	13 State	14 Zip Code
01 Name	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City	06 State	07 Zip Code	12 City	13 State	14 Zip Code
01 Name	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City	06 State	07 Zip Code	12 City	13 State	14 Zip Code
01 Name	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City	06 State	07 Zip Code	12 City	13 State	14 Zip Code

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable, list most recent first)		
01 Name	02 D+B Number		01 Name	02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	
05 City	06 State	07 Zip Code	05 City	06 State	07 Zip Code
01 Name	02 D+B Number		01 Name	02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	
05 City	06 State	07 Zip Code	05 City	06 State	07 Zip Code
01 Name	02 D+B Number		01 Name	02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	
05 City	06 State	07 Zip Code	05 City	06 State	07 Zip Code

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SCDHS; Phase II Investigation, 1988.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. CURRENT OPERATOR (Provide if different from owner)			OPERATOR'S PARENT COMPANY (If applicable)		
01 Name: Cantor Brothers, Inc.	02 D+B Number		10 Name	11 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.): Engineers Lane	04 SIC Code		12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code	
05 City: Farmingdale	06 State: NY	07 Zip Code: 11735	14 City	15 State	16 Zip Code
08 Years of Operation: 14	09 Name of Owner				

III. PREVIOUS OPERATOR(s) (List most recent first; provide only if different from owner)			PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)		
01 Name	02 D+B Number		10 Name	11 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code	
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				
01 Name	02 D+B Number		10 Name	11 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code	
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				
01 Name	02 D+B Number		10 Name	11 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code	
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SCDHS files.

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. ON-SITE GENERATOR

01 Name	02 D+B Number
Same owner/operator	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code
05 City	06 State / 07 Zip Code

III. OFF-SITE GENERATOR(S)

01 Name	02 D+B Number	01 Name	02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code
05 City	06 State / 07 Zip Code	05 City	06 State / 07 Zip Code
01 Name	02 D+B Number	01 Name	02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code
05 City	06 State / 07 Zip Code	05 City	06 State / 07 Zip Code

IV. TRANSPORTER(S)

01 Name	02 D+B Number	01 Name	02 D+B Number
Marine Pollution Control, Inc			
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code
375 Dunton Ave.			
05 City / 06 State / 07 Zip Code		05 City / 06 State / 07 Zip Code	
East Patchogue / N.Y. / 11772			
01 Name	02 D+B Number	01 Name	02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code
05 City / 06 State / 07 Zip Code		05 City / 06 State / 07 Zip Code	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SCDHS files (6/9/83 Site Inpection Report).

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. PAST RESPONSE ACTIVITIES

01 [ ] A. Water Supply Closed — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] B. Temporary Water Supply Provided — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] C. Permanent Water Supply Provided — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] D. Spilled Material Removed — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] E. Contaminated Soil Removed — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] F. Waste Repackaged — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] G. Waste Disposed Elsewhere — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] H. On Site Burial — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] I. In Situ Chemical Treatment — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] J. In Situ Biological Treatment — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] K. In Situ Physical Treatment — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] L. Encapsulation — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] M. Emergency Waste Treatment — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] N. Cutoff Walls — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] O. Emergency Diking/Surface Water Diversion — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] P. Cutoff Trenches/Sump — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] Q. Subsurface Cutoff Wall — 02 Date _____ — 03 Agency _____
04 Description:

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 State	02 Site Number
NY	N/A

II. PAST RESPONSE ACTIVITIES (Cont.)

01 [ ] R. Barrier Walls Constructed — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] S. Capping/Covering — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] T. Bulk Tankage Repaired — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] U. Grout Curtain Constructed — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] V. Bottom Sealed — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] W. Gas Control — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] X. Fire Control — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] Y. Leachate Treatment — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] Z. Area Evacuated — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] 1. Access to Site Restricted — 02 Date _____ — 03 Agency _____
04 Description:

01 [ ] 2. Population Relocated — 02 Date _____ — 03 Agency _____
04 Description:

01 [X] 3. Other Remedial Activities — 02 Date 12/2/82 — 03 Agency _____
04 Description:
Waste scavanged - creosote residue, acrylic latex caulking waste water, by Marine Polution Control, Inc. transported to Town of Babylon Landfill.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SCDHS files.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART II - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 State: NY	02 Site Number: N/A

II. ENFORCEMENT INFORMATION

01 Past Regulatory/Enforcement Action [X] Yes [ ] No

02 Description of Federal, State, Local Regulatory/Enforcement Action

SCDH's letter dated 7/13/83 to Cantor Brothers, Inc. cited numerous violations of Article 12 of the Suffolk County Sanitary Code during the period from 5/5/80 to 6/9/83, and set-up a preliminary hearing to resolve the cited violations.

In September 1984, SCDHS installed five (5) monitoring wells on the south boundary of Cantor Brothers, Inc. site and conducted periodic sampling of groundwater from these wells. SCDHS's letters dated September 13 & September 14, 1984 to Cantor Brothers shows the results of analysis of the groundwater samples, and notifies Cantor Brothers of violations of the N.Y.S. Environmental Conservation Law and/or Suffolk County Sanitary Code.

On May 24, 1988, SCDHS sent a proposed Order on Consent to Cantor Brothers, Inc. concerning their failure to properly abandon an underground storage facility for toxic or hazardous materials. On 5/26/88 Cantor Brothers, Inc. responded to the Order of Consent No. IW 88-42 described above, and agreed to be bound by its terms and conditions. Cantor Brothers, Inc. paid SCDHS a $250 fine for the violation cited in the Consent Order.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SCDHS files

Inactive Hazardous Waste Disposal Sites Surrounding Cantor Brothers, Inc. (which are being investigated by NYSDEC)*

Name	City-Town-Village	County	HRS	ID#	Classf. Code	1986 Registry Page #
1. U.S. Electro-plating Corp.	West Babylon	Suffolk	-	1-52-027	3	1-115
2. Fairchild Republic Aircraft	Farmingdale	"	-	1-52-004	2a	1-69
3. Tronic Plating Co., Inc.	"	"	45.14	1-52-028	2	1-117
4. Preferred Plating	"	"	35.06	1-52-030	2	1-121
5. Kenmark Textiles (Sasquahana Textile)	"	"	31.72	1-52-032	2	1-125
6. Astro Electro-plating, Inc.	"	"	-	1-52-036	2	1-133
7. 110 Sand Co.	Farmingdale, NY	"	-	1-52-100	2a	1-225
8. Louis Sorrentino Property	"	"	-	1-52-111	2a	1-245
9. Hazardous Waste Disposal	"	"	-	1-52-113	2a	1-249
10. Target Rock Corp.	"	"	-	1-52-119	2a	1-261
11. West Babylon Industrial Area	West Babylon	"	-	1-52-025	2	1-111
12. Spectrum Finishing Corp.	"	"	-	1-52-029	2a	1-119
13. Babylon Landfill	"	"	-	1-52-039	2	1-139
14. NTU Circuits, Inc.	"	"	-	1-52-086	2a	1-199
15. Jameco Industries, Inc.	Wyandanch	Suffolk	-	1-52-006	2a	1-73
16. Ron Lyn, Inc.	"	"	-	1-52-112	2a	1-247
17. Cardwell Condenser Corp.	Lindenhurst	"	-	1-52-035	2a	1-131

Inactive Hazardous Waste Sites - continued

Name	City-Town-Village	County	HRS	ID#	Classf. Code	1986 Registry Page #
18.Southern Container Corp.	Deer Park	Suffolk	-	1-52-019	2a	1-99
19.SMS Instruments, Inc.	"	"	-	1-52-026	2	1-113
20.Commercial Envelope Mfg.-Co. Inc.	"	"	-	1-52-103	2a	1-231
21.C.T.I. Metal Finishing (T&S Metal Fin.)	"	"	-	1-52-115	2a	1-253
22.Radiator Center, Inc.	(Islip)Deer Park	"	-	1-52-107	2a	1-239
23.I.W. Industries, Inc.	Melville	"	-	1-52-102	2	1-229
24.McGovern Sod Farm	"	"	-	1-52-120	2a	1-263

*Source: Inactive Hazardous Waste Disposal Sites In New York State, Site List by Counties; Volume 1. Nassau .Suffolk December 1986; A Joint Report of the N.Y.S.D.E.C. and N.Y.S.D.O.H., pp. G1-2, G1-3, G1-4, G1-5, & G1-6.

APPENDICES

LeRoy Callender PC

APPENDIX A

LeRoy
Callender
PC

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID AND HAZARDOUS WASTE
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 3 REGION: 1 SITE CODE: 152021
EPA ID: NYD980768717

NAME OF SITE : Cantor Bros., Inc.
STREET ADDRESS: Engineers Lane
TOWN/CITY: COUNTY: ZIP:
Farmingdale Suffolk 11735

SITE TYPE: Open Dump- Structure-X Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: 3.2 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Firm owns property
CURRENT OWNER ADDRESS.: Engineers Lane, Farmingdale, NY 11735
OWNER(S) DURING USE...: Cantor Bros., Inc.
OPERATOR DURING USE...: Cantor Bros., Inc.
OPERATOR ADDRESS.....: Engineers Lane, Farmingdale, NY 11735
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1975 To Present

SITE DESCRIPTION:
Cantor Brothers is an active chemical repacking and handling facility which has been in operation since at least 1975. Organic solvents, paint thinners and fuel oils have been observed leaking from drums and storage tanks on site.
Phase I investigation and Phase II investigation have been performed.

HAZARDOUS WASTE DISPOSED: TYPE	Confirmed-X	Suspected- QUANTITY (units)
Organic solvents, fuel oils, paint thinners		Unknown

APPENDIX A

ANALYTICAL DATA AVAILABLE:
Air- Surface Water- Groundwater-X Soil-X Sediment-X None-

CONTRAVENTION OF STANDARDS:
Groundwater-X Drinking Water- X Surface Water- Air-

LEGAL ACTION:

TYPE..: Order on Consent State-X Federal-
STATUS: Negotiation in Progress- Order Signed-X

REMEDIAL ACTION:

Proposed-X Under design- In Progress- Completed-
NATURE OF ACTION: RI/FS

GEOTECHNICAL INFORMATION:
SOIL TYPE: Sand, gravel
GROUNDWATER DEPTH: 39 feet

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Organic solvents, and fuel oil leaked from drums and underground tanks and allegedly contaminated groundwater and soils on site. Chemicals discharged into a storm drain on site.

ASSESSMENT OF HEALTH PROBLEMS:

Medium	Contaminants Available	Migration Potential	Potentially Exposed Population	Need for Investiga-
Air	Likely	Likely	Yes	High
Surface Soil	Likely	Likely	Yes	High
Groundwater	Likely	Highly Likely	Yes	High
Surface Water	Likely	Unlikely	No	Low

Health Department Site Inspection Date : 1/88

MUNICIPAL WASTE ID:

APPENDIX A

47-15-11 (10/83)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID AND HAZARDOUS WASTE
INACTIVE HAZARDOUS WASTE
DISPOSAL SITE REPORT

Priority Code: 3 **Site Code:** 152021

Name of Site: Cantor Brothers, Inc. **Region:** 1

Street Address: 50 Engineers Lane

Town/City: Farmingdale, N.Y. **County:** Suffolk

Name of Current Owner of Site: Firm owns property

Address of Current Owner of Site: Engineers Lane, Farmingdale, N.Y.

Type of Site: [ ] Open Dump [X] Structure [ ] Lagoon
[ ] Landfill [ ] Treatment Pond

Estimated Size: 3.2 acre(s)

Site Description: Cantor Brothers is an active chemical re-packing and handling facility which has been in operation since at least 1975. Organic solvents and fuel oils have been observed leaking from drums and underground storage tanks on site.

Phase I and II investigations have been performed.

Hazardous Waste Disposed: [X] Confirmed [ ] Suspected

Type and Quantity of Hazardous Wastes Disposed:

Type	Quantity (Pounds, Drums, Tons, Gallons)
Organic solvents	38,000 Gallons (Est.)
Fuel oils	15,000 Gallons (Est.)

APPENDIX A

Time Period Site was Used for Hazardous Waste Disposal:

_____, 19 75 To Present, X

Owner(s) During Period of Use: Cantor Brothers, Inc.

Site Operator During Period of Use: Cantor Brothers, Inc.

Address of Site Operator: Engineers Lane, Farmingdale, N.Y.

Analytical Data Available: [ ] Air [ ] Surface Water [X] Groundwater
[X] Soil [X] Sediment [ ] None

Contravention of Standards: [X] Groundwater [X] Drinking Water
[ ] Surface Water [ ] Air

Soil Type: Sand and Gravel

Depth to Groundwater Table: 39 feet

Legal Action: Type: Order on Consent [X] State [ ] Federal

Status: [ ] In Progress [X] Completed

Remedial Action: [X] Proposed [ ] Under Design
[ ] In Progress [ ] Completed

Nature of Action: RI/FS

Assessment of Environmental Problems: Contamination of groundwater by organic solvents and fuel oils has been observed.

Assessment of Health Problems: Contamination of groundwater may potentially affect the drinking water wells of the surrounding communities.

Person(s) Completing This Form:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION		NEW YORK STATE DEPARTMENT OF HEALTH	
Name:	Sirous H. Nabavi	Name:	
Title:	Project Eng., LeRoy Callender, P.C.	Title:	
Name:		Name:	
Title:		Title:	
Date:	January 1989	Date:	

APPENDIX A

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

ROUX

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON, NEW YORK 11743 516 673-7200 FAX # 516 673-7216

July 27, 1988

Mr. Sirous Nabavi, PE
LeRoy Callender PC Consulting Engineers
236 West 26th Street
New York, NY 10001

Re: NYSDEC Phase II Investigations
Site #152021 Magnetometer Survey

Dear Mr. Nabavi:

A magnetometer survey was conducted at the Cantor Brothers site on July 25, 1988 at the proposed well locations, shown on the attached figures, to detect buried ferromagnetic objects which might be encountered during drilling activities.

The Schonstedt Model GA-52B flux-gate magnetometer which was used provides a continuous audio signal which increases from the idling frequency of 40 H_z as surface and/or subsurface ferromagnetic material is approached.

The well locations are designated in the Phase II Work Plan furnished by the NYSDEC. At each proposed well location, an area of approximately 300 square feet was screened in detail with the magnetometer. If no detections of ferromagnetic material were made within the survey area, the location center was marked with red spray paint indicating the proposed well number. If detections were made, the surrounding area was screened until a clear location was found. Before leaving the location, two distances from the location center to permanent site reference points were made and recorded to the nearest foot in case the paint indicator becomes obliterated.

Distances from proposed well location centers to permanent site reference points are shown on the attached figures.

APPENDIX A

In addition to the original work plan well locations, four alternate well locations were screened. These alternate locations were chosen during a site visit by representatives of LeRoy Callender PC Consulting Engineers, in conjunction with Mr. Mathew Miller representing Cantor Brothers.

Please call if you have questions regarding the survey.

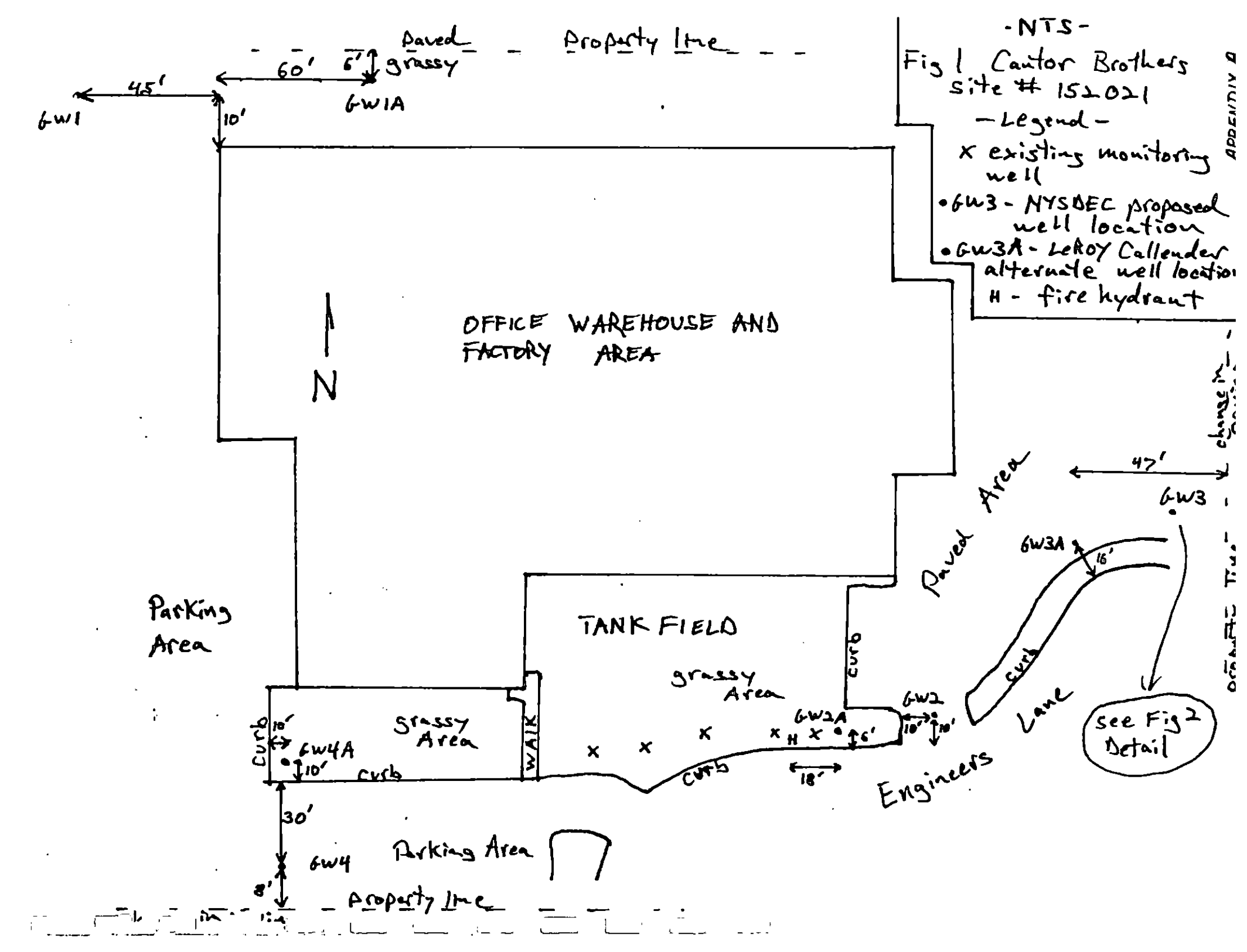
Sincerely,

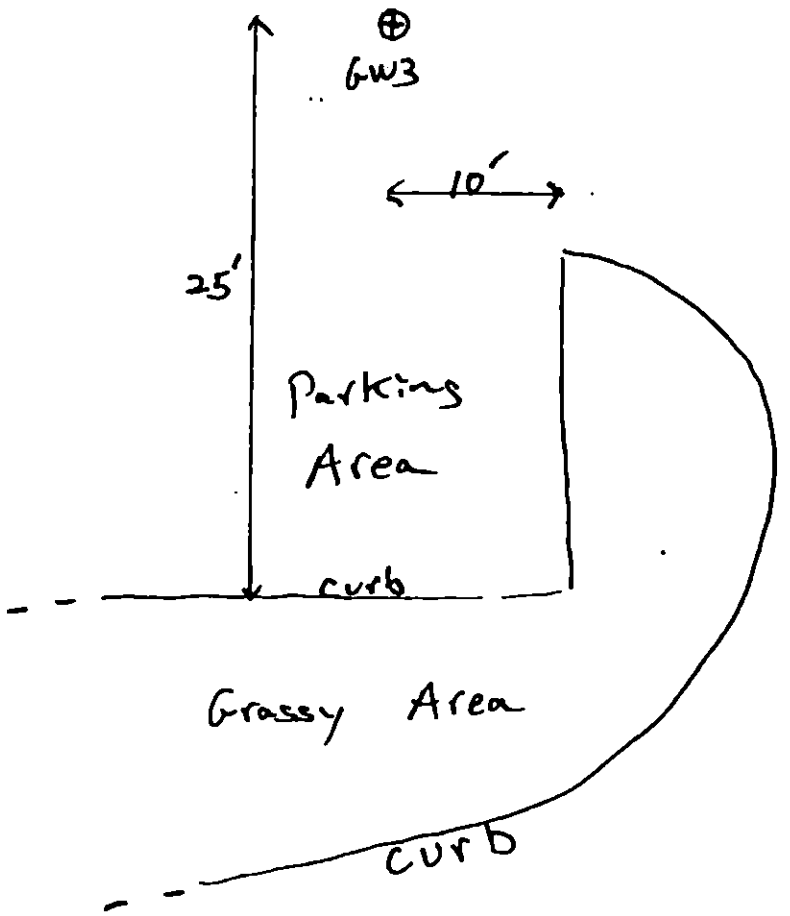
Peter C. Breen
Hydrogeologist

PCB:g

Encl.

cc: Gibbs & Hill


-NTS-
Fig 1 Cantor Brothers site # 152021
-Legend-
x existing monitoring well
• GW3 - NYSDEC proposed well location
• GW3A - LeRoy Callender alternate well location
H - fire hydrant
Property line
Paved
grassy
60'
5'
45'
10'
GW1
GW1A
OFFICE WAREHOUSE AND FACTORY AREA
N
Parking Area
TANK FIELD
grassy Area
curb
Paved Area
47'
GW3
GW3A
16'
curb
GW2
GW2A
10'
5'
10'
Lane
see Fig 2 Detail
Engineers
curb
10'
GW4A
10'
curb
Grassy Area
WALK
curb
18'
30'
GW4
Parking Area
8'
Property line





- NTS -

Cantor Brothers
Magnetometer Survey
Site Location Detail
GW-3

Figure 2

APPENDIX A

LeRoy
Callender
PC

236 West 26 Street
New York, NY 10001
212 989 2900

Consulting Engineers

485B U.S. Route 1 South
Iselin, NJ 08830
201 750 8955

675 Delaware Avenue
Buffalo, NY 14202
716 886 2694

Eastern Investigation Section
Bureau of Hazardous Site Control
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation

August 30, 1988

Attn: Mr. Lawrence J. Alden
Assistant Sanitary Engineer

RE: Job #86-279
Phase II Investigations of
Inactive Hazardous Waste Sites
Cantor Brothers-DEC I.D. # 152021
Suffolk County, New York
Revised Work Plan Update

Dear Mr. Alden:

Please find, herewith enclosed, a revised copy of our Work Plan Update for the subject site, which has been revised based on your comments, passed on to us by Gibbs & Hill, Plus theirs. A copy of the original work plan is also attached.

We hope that the revised Work Plan update meets with your approval.

We anticipate that the drilling operations could begin on the above site on or about September 12, 1988.

Very truly yours,

Sirous H. Nabavi

Sirous H. Nabavi, P.E.
Project Engineer

cc:Mr. Norman Hinsey, Gibbs & Hill

SHN:lb

LeRoy
Callender
PC

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PHASE II INVESTIGATION
WORK PLAN UPDATE *

CANTOR BROTHERS
NYSDEC I.D. NO. 152021
SUFFOLK COUNTY, NEW YORK

(Revised : August 30, 1988)
* * *

PART I:	SITE RECONNAISSANCE REPORT
PART II:	MAGNETOMETER SURVEY REPORT
PART III:	SITE HEALTH & SAFETY PLAN & NYSDEC QUESTIONNAIRE
PART IV:	SAMPLING PROTOCOL (TABLES 2 & 3 OF THE WORK PLAN)
PART V:	TELEPHONE CONVERSATION RECORD (Permission for use of Plant water as source of potable water.)

* Presented as an addendum to the original work plan.

Cal ter
PC

PART I

SITE RECONNAISSANCE REPORT

CANTOR BROTHERS, INC. SITE

NYSDEC I.D. NO. 152021

SUFFOLK COUNTY, NEW YORK

1. DATE: July 19, 1988
2. Time: 9:00 - 12:00 a.m.
3. Present: Sirous H. Nabavi, P.E. & LeRoy Callender, P.C. Consulting Engineers; Mr. Mathew Miller, General Manager, Cantor Brothers, Inc.

4. Contact Person: Mr. Mathew Miller, General Manager, Cantor Brothers, Inc. Tel. No. (516) 694-6666

5. General Site Access:

The site is generally accessible from the west side and east side parking lots. Trucks can drive in, around, and out of the paved driving lanes of the site, and there seems to be no problem for access by the drilling rig, (see Figure 1).

6. Adjoining Site Owners

All monitoring wells are located within the boundaries of the site, and none of the adjoining sites would be affected.

7. Site Changes Since DEC Site Reconnaissance

The following changes have occurred since the DEC site reconnaissance dated 11/6/85:

-Underground fuel tank #16 on the west side has been removed from the site (Figure 1);

-Three underground tanks (#4,#7,& #15) in front of the Factory Area (Figure 1) have been removed.

8. Recommended Relocation of Monitoring Wells

Table 1 gives the recommended relocation of the four monitoring wells to be drilled on Cantor Brothers site, and the reasons for the change of locations. Figure 1 is an owner-provided scaled site plan, which shows the original locations of all the monitoring wells as well as the recommended relocations.

The altenative locations have been included in the Magnetometer Survey (Part II).

9. Drilling Rig Access to Recommended Well Locations

Direction for access to Site: 495 East to Route 110. South on Route 110; East on New Highway; left onto Central Ave; Left on Engineers Lane

GW-1 : Access to the relocated GW-1 would be possible both from the west side or the east side parking areas and truck lanes.

GW-2 : Directly accessible from Engineers Lane.

GW-3 : Accessible from the east side parking area.

GW-4 : Accessible from the west side parking lot.

10. Useable Potable Water Source

Location

Internal plumbing system of the plant. Potable water available from sink faucets, by hose.

Contact Person

Mr. Mathew Miller, General Manager, Cantor Brothers, Inc. Tel. # (516) 694-6666
(See Telephone Conversation Record, Part V.)

11. Placement of drilling Cuttings

Drilling cuttings and water from monitoring wells will be placed in drums and left on site. Drums shall be U.S. DOT approved 17-H (soil) or 17-E (water) 55 Gal. steel drums with ring and bolt.

12. Changes to Site Sketch

See Figure 1

13. Recommended Relocaton of Sampling Locations

None. Soil/Sediment sampling locations remain unchanged, (See Figure 1).

14. Other Relevant Information

The drainage catch basins are covered with heavy metallic gratings which have to be lifted before sampling. These gratings would have to be loosened with a crow bar before they can be lifted.

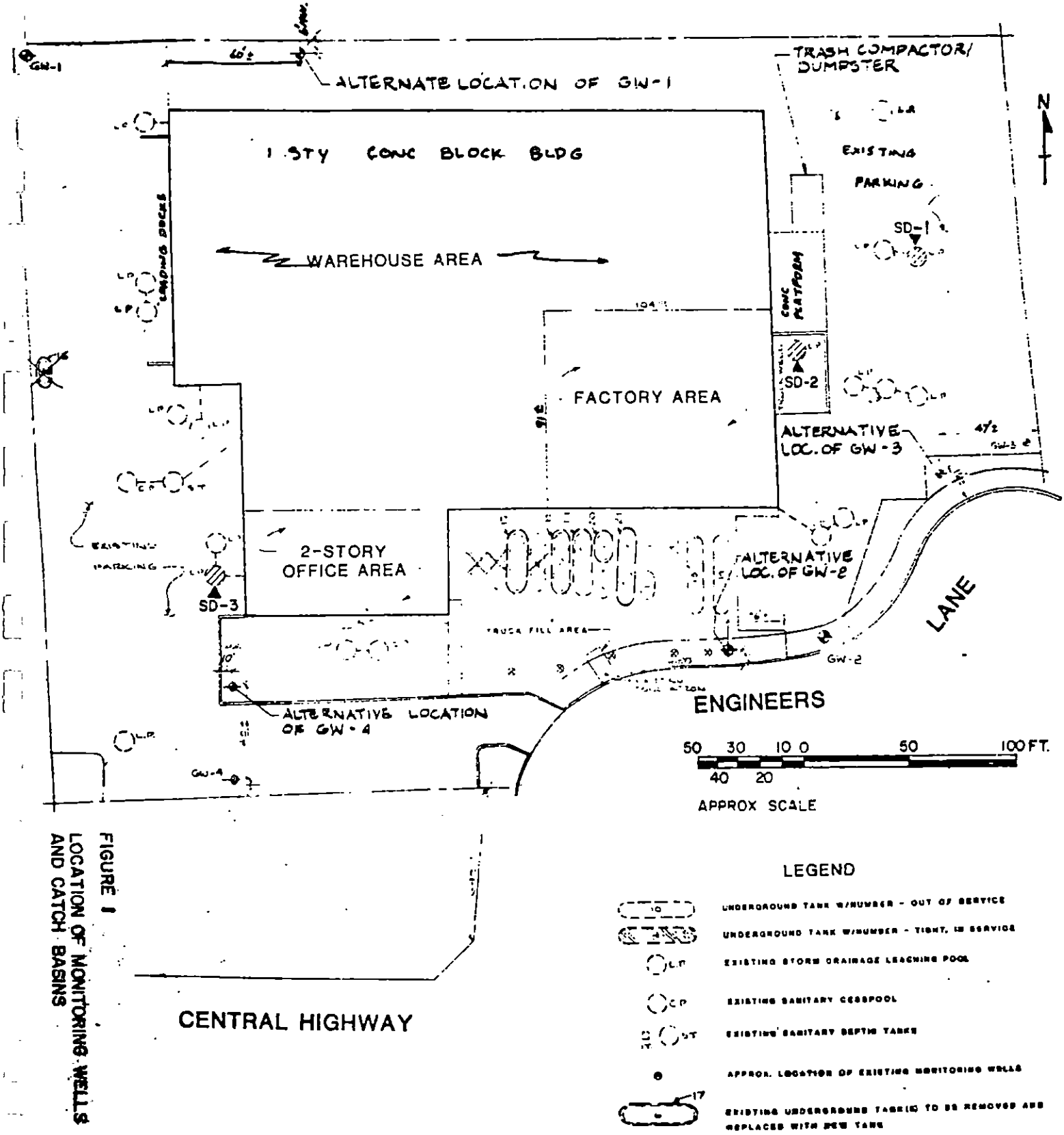


FIGURE 1
LOCATION OF MONITORING WELLS AND CATCH BASINS

TABLE I
ALTERNATIVE MONITORING WELL LOCATIONS
CANTOR BROTHERS
(See Figure 1)

Well no.	Original Location	Proposed Alternative Location	Reason for Change of Location
#1	Northwest corner of site site	Approximately 120' east of original location	- original location is occupied by a lot of junk tires and trash - more accessible to the drilling rig and equipment
#2	Southeast of Factory Area, approx. 20' east of existing fire hydrant	Fire hydrant location corrected. Alternative well location approx. 26' West of entrance ramp to east parking lot.	- original location was in the middle of ramp. - moved closer to underground tanks

TABLE I (CONT'D)
ALTERNATIVE MONITORING WELL LOCATIONS
CANTOR BROTHERS
(See Figure 1)

Well no.	Original Location	Proposed Alternative Location	Reason for Change of Location
#3	Southeast corner of site.	Approx. 47' west of the east property line.	-original location was too close to east property line -moved closer to Factory Area, which might be a source of groundwater contamination.
#4	Southwest parking lot.	Approx. 40' to the north of original location, and inside the grassed area.	-moved out of the parking lot, which is normally crowded with cars. -moved closer to SD-3, which might be a source of groundwater contamination.

LeRoy
Callender
PC

PHASE II INVESTIGATION

SITE HEALTH & SAFETY PLAN

CANTOR BROTHERS, INC.

NYSDEC I. D. No. 152021

SUFFOLK COUNTY, NEW YORK

LeRoy
Callender
PC

SITE HEALTH & SAFETY PLAN

CANTOR BROTHERS, INC.

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2.	SUMMARY OF THE WORK PLAN	2
3.	ANTICIPATED HAZARDOUS CHEMICALS, AND HAZARDS AND RISKS INVOLVED DURING WORK PLAN ACTIVITIES	3
4.	KEY PERSONNEL AND ALTERNATES FOR SITE SAFETY AND PROTECTION OF PUBLIC.	5
5.	LEVELS OF PROTECTION TO BE WORN BY PERSONNEL	6
6.	GENERAL SAFETY RULES AND EQUIPMENT	7
7.	SUPPORT AREA, WORKING ZONES, CONTAMINATION REDUCTION, AND DECONTAMINATION AREAS	8
8.	EMERGENCIES	9
9.	MORNING SAFETY MEETING	10

LeRoy
Callender
PC

PHASE II INVESTIGATION

SITE HEALTH & SAFETY PLAN

CANTOR BROTHERS, INC.

NYSDEC I. D. NO. 152021

SUFFOLK COUNTY, NEW YORK

I. PURPOSE OF THE PLAN

The purpose of the site health and safety plan is to establish requirements for protecting the health and safety of all persons working at the above-named site during drilling and installation of monitoring wells, and sampling of groundwater, soil, and catch basins, as called for in the work plan.

The plan contains health and safety requirements for routine (but hazardous) work plan activities and also for unexpected site emergencies.

This document shall be read and understood in conjunction with the following references, which will be kept on the site at all times.

Exhibit 1, Generic Work Plan-State superfund Program Phase II Investigations

Exhibit 3, Guidelines for Exploratory Boring, Monitoring Well Installations, and Documentation of these activities

Updated Work Plan

II. SUMMARY OF THE WORK PLAN

At the Cantor Brothers Site, a total of four (4) borings will be drilled, in which monitoring well equipment will be installed, and from which samples of groundwater and soil will be collected. In addition, samples of soil, or sediment (depending on conditions at the time) will be collected from three (3) surface water drainage catch basins. Air monitoring around the monitoring well locations,and around catch basins will also be conducted, and air samples will be collected from each sampling point, if conditions warrant it (Figure 1).

III. ANTICIPATED HAZARDOUS CHEMICALS, AND HAZARDS AND RISKS INVOLVED DURING WORK PLAN ACTIVITIES.

1. The following hazardous chemicals might be found in groundwater & soil samples from the four monitoring wells:

-Benzene
-Toluene
-M-Xylene
-O-Xylene
-P-Xylene
-Ethyl Benzene
-Tetrachloroethylene
-1,1,2 Trichloroethylene
-1,1,1 Trichloroethane
-Cis Dichloroethylene

The following chemicals might be found in the soil (or sediment) samples collected from the surface water catch basins SD-1, SD-2, amd SD-3 marked on the work plan:

-1,1,1 Trichloroethane
-1,1,2 Trichloroethylene
-Methylene Chloride
-Benzene
-Toluene

Some of the above-named chemicals, such as Benzene and Toluene are highly toxic, and some of the others, like Xylene and Ethyl Benzene are strongly toxic. However, concentrations are expected to be extremly low, not to create a highly toxic situation.

2. Some of the hazardous chemicals named in paragraph 1 above can cause serious health hazards, and working personnel must be protected against these hazards. For instance, Benzene or toluene entail the following health hazards, if high concentrations occur:

-May be poisonous if inhaled or absorbed through skin.
-Vapors may cause dizziness or suffocation.
-Contact may irritate or burn skin and eyes.
-Fire may produce irritating or poisonous gases.
-Runoff from fire control or dilution water may cause pollution.

However, high concentrations of neither chemical is anticipated to occur.

3. Potential fire or explosion hazard

The following hazards are present whenever benzene or toluene are present in high concentrations:

-Flammable/combustible material; may be ignited by heat, sparks or flames.
-Vapors may travel to a source or ignition and flash back.
-However, high concentrations of neither chemical is anticipated to occur.
-Container may explode in heat of fire.
-Vapor explosion hazard indoors, outdoors, or in sewers.
-Runoff to sewers may create fire or explosion hazard.

However, high concentrations of neither chemical is expected to occur at this site.

IV. Key personnel and alternates for site safety and protection of public.

LeRoy Callender/P.C.: Safety Engineer: S. Nabavi
LeRoy Callender/P.C.: Alternate: L. Naraysingh

MPC Drilling Co. Manager: J. Goff
MPC Drilling Co. Alternate: Joe Kaufman

V. Levels of Protection to be worn by personnel

It is essentially important for the drilling crew, the consultant's representatives, and for all other personnel working on this site to observe strict health and safety rules and take appropriate precautions during the entire drilling and sampling operations.

It is presently anticipated that Level D protective gear will be required for all personnel during work plan activities.

If, during the investigation, it is determined that the level of protection should be upgraded, the consultant's safety officer designee shall be ready to employ the appropriate protective gear and equipment. In such cases, the higher level of protection adopted will be recorded in the Log Book.

Protective gear must be cleaned or disposed of properly at the end of each working day. Contaminated clothing and shoes must be isolated and removed from the site.

VI. General Safety Rules and Equipment

1. There will be no eating, drinking, or smoking in the working or contamination reduction zones.

2. All personnel must pass through the contamination reduction zone to enter or exit the working zones.

3. An abundant supply of clean water must be provided in the contamination reduction and decontamination areas. (Figure 2).

4. Where practical, all tools/equipment will be sprak proof, explosion resistant, and/or bonded and grounded.

5. Fire extinguishers will be on-site for use on equipment or small fires only.

6. An adequately stocked first-aid kit will be on-scene at all times during operational hours.

VII. Support area, working zones, contamination reduction, and decontamination areas

Figure 2 delineates the following zones and areas on the Cantor Brothers Site:

Working zones-taped-off areas around Monitoring wells no. 1,2,3,& 4, and around Catch Basins SD-1, SD-2, & SD-3.

Contamination Reduction Zone-Where personnel and equipment will be thoroughly cleaned before and after the daily drilling and sampling activties, and whenever equipment and personnel are moved from one working zone to another.

Decontamination and support zone. This will be the main staging area for the entire work plan operations. All clean tools, equipment, sampling containers, protective gear and other instruments, gauges, appliances and facilities will be kept covered or enclosed throught the entire work plan activities.

All above mentioned areas will be taped-off by barricade tapes throughout the period of their use, and unauthorized persons will be kept off these areas.

VIII-Emergencies

Three types of emergency situations may be anticipated at this site:

a- Emergency fires at the drilling locations
b- Emergency personnel health hazards as a result of contact with hazardous material.
c- Emergency physical accidents or injuries caused by drilling equipment, mechanical hazards, or similar causes.

A- Emergency fires are expected to be of a small scale, which can be extinguished with a portable dry chemical fire extinguisher, which should be provided as part of the support equipment.

Unexpected large fires, although not anticipated, must be reported immediately to the local fire department. [Tel. No. (516) 226-9546].

B- In case of contact with hazardous materials (See para. III) immediately flush eyes with clean running water for at least 15 minutes. Wash skin with soap and water. If hazards or injuries incurred are serious, call an ambulance, or take the victim to the hospital (See last page of NYSDEC Questionnaire, Part III.). Remove and isolate contaminated clothing and shoes at the site.

IX. Morning Safety Meeting

A morning safety meeting will be conducted for all site personnel and they will sign a daily attendance sheet indicating they have read the site health and safety plan and will comply. The health and safety procedures, and the day's planned operations should be discussed.

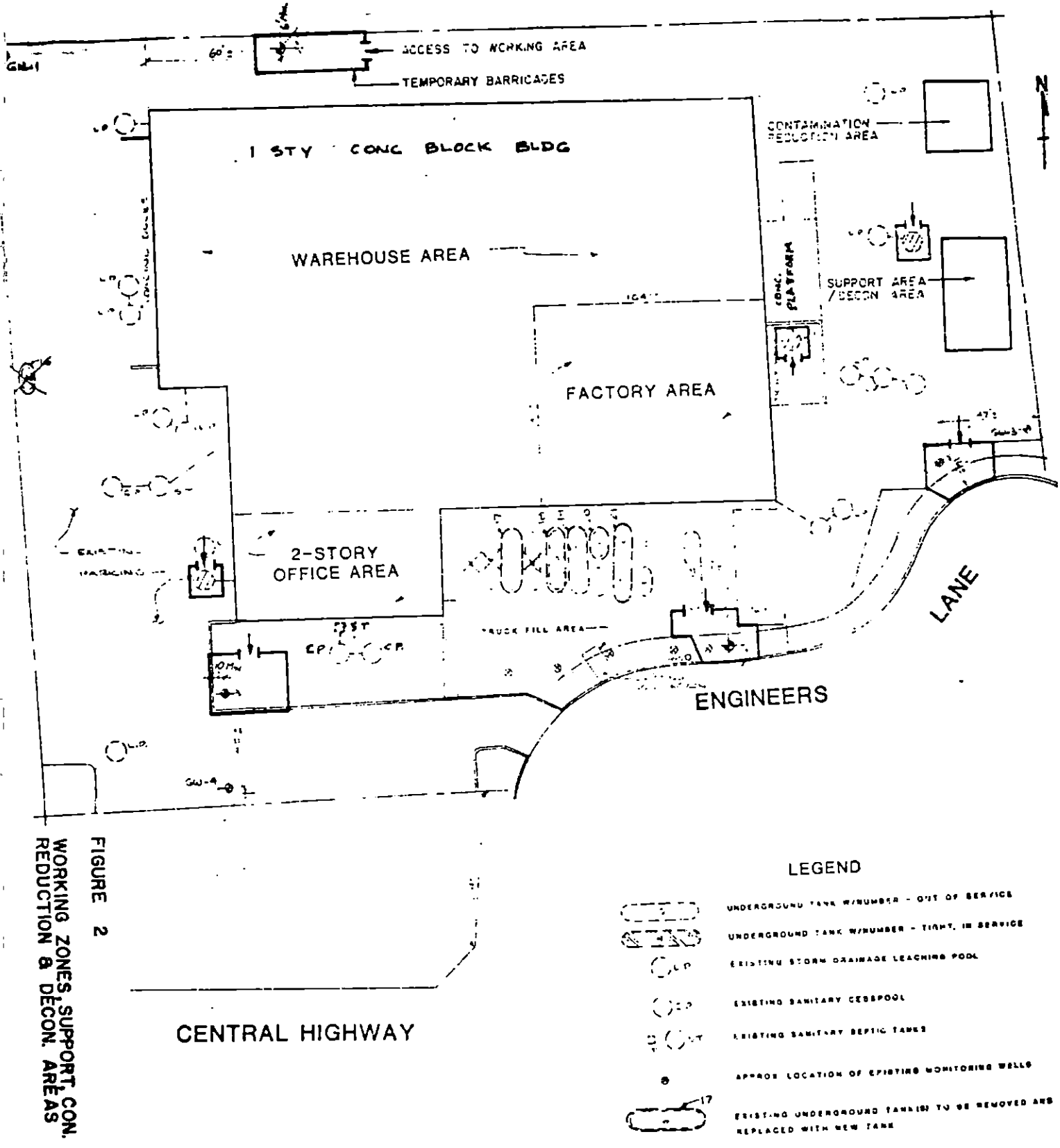


FIGURE 2
WORKING ZONES, SUPPORT, CON. REDUCTION & DECON. AREAS

LeRoy
Callender
PC

SITE SAFETY PLAN

A. GENERAL INFORMATION

SITE: Cantor Brothers, Inc. N.Y. I.D. No. 152021

LOCATION: East Farmingdale Suffolk County CONTACT: Mr. Mathew Miller (516) 694-6666

PLAN PREPARED BY: LeRoy Callender, P.C. DATE: Aug. 22, 1988

APPROVED BY:

BUREAU SAFETY OFFICER: _____ DATE: _____

SECTION CHIEF: _____ DATE: _____

WORK SCOPE: To drill monitoring wells and collect soil, ground water, and sediment samples at the site for Inactive H.W. Site Investigation.

PROPOSED DATE OF INVESTIGATION: 9/6/1988 (Starting Date)

BACKGROUND REVIEW: Complete: X Preliminary: _____

OVERALL HAZARD: Serious: _____ Moderate: _____

Low: X Unknown: _____

B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): Liquid X Solid _____ Sludge _____ Gas _____

CHARACTERISTIC(S): Corrosive ___ Ignitable ___ Radioactive ___

Volatile X Toxic X Reactive ___

Unknown ___ Other ___

FACILITY FUNCTION: An active chemical repacker, handling petroleum distillate solvents, paint thinners

Principal Disposal Method (type and location): Most of the waste is transported out of the site. Some of the underground tanks might be leaking.

Unusual Features (dike integrity, power lines, terrain, etc.) The site is located within an industrial park area, and overhead power lines and telephone lines pass over some parts of site.

Status: (active, inactive, unknown) active

RECOMMENEDED LEVEL OF PROTECTION: Level D Protection is recommended.

*Modifications: If during the drilling of monitoring wells the level of Protection has to be upgraded, the State will be notified immediately

Monitoring Equipment and Materials: H Nu air monitoring equipment will be used

DECONTAMINATION AND DISPOSAL:

Decontamination Procedure: (1) level to be utilized

_____ Level A - Segretated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, boot cover removal, outer glove removal, suit/safety boot wash, suit safety boot rinse, (Tank Change), safety boot removal, suit and hard hat removal, inner glove wash, inner glove removal, inner clothig removal, field wash, redress.

_____ Level B - Segretated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, outer glove removal, suit/safety boot wash, suit/SCBA/boot/glove/ rise, (Tank Change) safety boot removal, (splash suit removal) SCBA backpack removal, inner glove wash, inner glove rinse, facepiece removal, inner glove removal, inner clothing removal, field wash, redress.

_____ Level C - Segregated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, boot cove removal, outer glove removal, suit/safety boot rinse (Canister or Mask Change), safety boot removal, splash suit removal, inner glove wash, inner glove rinse, facepiece removal, inner glove removal, inner clothing removal, field wash, redress.

X Level D - Segregated equipment drop, boot and glove wash, boot and glove rinse.*

_____ *Modifications (specify)_____

* If modified in the field, be sure to attach statement to file copy upon return to office.

LeRoy
Callender
PC

History: (Worker or non-worker injury; complaints from public; previous agency action): None

HAZARDOUS/TOXIC MATERIAL (known or suspected, contaminted media or in storage container, etc.)
Petroleum distillate solvents, paint thinners, creosote and caulking compounds. Benzene, toluene, and xylene are suspected of being released into ground water.

HAZARD ASSESSMENT (toxic and pharmacologic effects, reactivity, stability, flammabiliy, and operational concerns, sampling, decontaminating, etc.)
Benzene and toluene are highly toxic. Past releases of hazardous wastes to groundwater will be investigated.

C. SITE SAFETY WORK PLAN

PERIMETER ESTABLISHMENT: Map/Sketch attached Site Plan attached
Site secured? No

Perimeter Identified? Yes Zone(s) of Contamination Identified? No

PROPOSED ON-SITE ACTIVITIES: Four (4) monitoring wells will be drilled, soil or sediment samples will be obtained from three (3) catch basins. Groundwater and soil samples will be collected from each monitoring well. (See the original work plan).

LeRoy Callender PC

D. PERSONNEL & RESPONSIBILITIES

D.E.C.
1. Representative to be designated later
2.
3.
4.
5.
6.
7.
8.

OTHER
1. LeRoy Callender, P.C. : S. NABAVI, Safety Engineer
2. " " " : L. NARRAYSINGH, Alternate
3. Marine Pollution Control: J. GOFF, Manager
4. " " " : Joe KAUFMAN, Alternate
5.

LeRoy
Callender
PC

E. EMERGENCY PLANNING

HOSPITAL: Brunswick Hospital in Amityville, (516) 789-7000

AMBULANCE: Call 911

POLICE:

FIRE: East Farmingdale Fire Dept. (516) 226-9546

POISON CONTROL CENTER:

RADIO:

TELEPHONE:

WATER SUPPLY: East Farmingdale Water District. (516) 249-4211

D.E.C. REGIONAL CONTACT: Mr. Robert Schneck, Reg. I (516) 751-790

ROUTE TO HOSPITAL

Directions to Brunswick Hospital: Drive south to Central Ave., turn right, bearing west. Drive to New Highway, and turn left. Drive south on New Highway, and make the second right turn to Milbar Blvd. Drive west on Milbar Blvd. to Route 110. Turn left on Route 110, which would be due south. Drive 3-4 miles on Route 110 to the Hospital.

TABLE 2*
PHASE II WORK PLAN - SAMPLING SUMMARY
CANTOR BROTHERS

Designation	Location Rationale	Aquifer Screened	Approx. Boring Depth (ft)	Length of Screen (ft)
Soil				
S-1	Catch basin			
S-2	Catch basin			
S-3	Catch basin			
Groundwater				
GW-1*	Upgradient	Upper Glacial	50	10
GW-2	Downgradient	Upper Glacial	50	10
GW-3	Downgradient	Upper Glacial	50	10
GW-4	Downgradient	Upper Glacial	50	10
Surface Water				
None				
Sediment				
None				
Leachate				
None				
Borings				
SS-1	If necessary			
SS-2	If necessary			
SS-3	If necessary			
SS-4	If necessary			
Air				
Use a FID or PID to determine the presence of organics				

NOTE: Locations, aquifer screened, approximate boring depth, length of screen (ft) listed are based on existing data and are the basis of the cost estimate. These criteria may change based on the results of the geophysical surveys and/or field conditions.

* The four (4) monitoring wells will be drilled and sampled consecutively, i.e., #1, #2, #3, #4.

TABLE 3
NYSDEC - CHEMICAL ANALYSES - CANTOR BROTHERS

Type of Sample	Type of Analyses(1) HSL(2) Metals	HSL(3) Volatiles	HSL(4) Semi-Volatiles	HSL(5) Pesticides/ PCBs	Matrix Spike/ Duplicate (6)
Groundwater(7)	5	5	5	5	1/1
Surface Water	---	---	---	---	---
Sediment	---	---	---	---	---
Soil	7	7	7	7	1/1
Leachate	---	---	---	---	---
Drums	---	---	---	---	---
Waste	---	---	---	---	---
Trip Blank	---	1	---	---	---
Field Blank	1	1	1	1	---

(1) Complete identification per NYSDEC Generic Work Plan, Section 3(b)(ii)(B). Field pH, conductivity and temperature measurements will be conducted on all water samples.

(2) HSL Metals - Preparation and analysis of the 15 Task 1 and 9 Task 2 inorganic compounds using the specified CLP methods.

(3) HSL Volatiles - Preparation and analysis using the CLP specified GC/MS method for HSL purgeable organics plus a library search for and the quantification of any additional non-HSL compounds (the CLP requires the library search only for the 10 non-HSL compounds of largest apparent concentration).

(4) HSL Semi-Volatiles - Preparation and Analysis using the CLP specified GC/MS method for HSL Extractable Base/Neutral and Acid Organic compounds plus a library search for and the quantification of any additional non-HSL compounds (the CLP requires the library search only for the 20 non-HSL compounds of largest apparent concentration).

(5) HSL Pesticides/PCB's - Preparation and pre-extraction of the HSL organochloride pesticides and polychlorinated biphenyls using the CLP specified GC-ECD method.

(6) Superfund and Contract Laboratory Protocol, January 1985, requires at least one spiked sample analysis and one duplicate sample analysis from each group of samples of a similar matrix type for each case of samples or for each 20 samples received, whichever is more frequent.

(7) The reason for one (1) additional groundwater sample is that a duplicate groundwater sample must be obtained from a monitoring well chosen at random (or some other medium if wells are not available). That duplicate sample must not be identified as a duplicate to the laboratory, but must be assigned an identifier similar to other groundwater samples. The Bureau requires the blind analysis of a duplicate sample for each site by the laboratory to confirm the integrity of all sampling and analytical activities.

--- Designates that no samples are to be analyzed.

LeRoy
Callender
PC

TELEPHONE CONVERSATION RECORD

CONTRACT NO. G+H PROJ. No. 5583 DATE: August 25, 1988

OUR JOB NO. 86-279(II) TIME: 2:00 p.m.

C.C TO:

CALL BY: S. Nabavi (NAME) OF LeRoy Callender, P.C. (212) 989-2900

CALL TO: Mr. M. Miller, Gen. Manager (NAME) OF Cantor Brothers, Inc. (COMPANY) (516) 694-6666

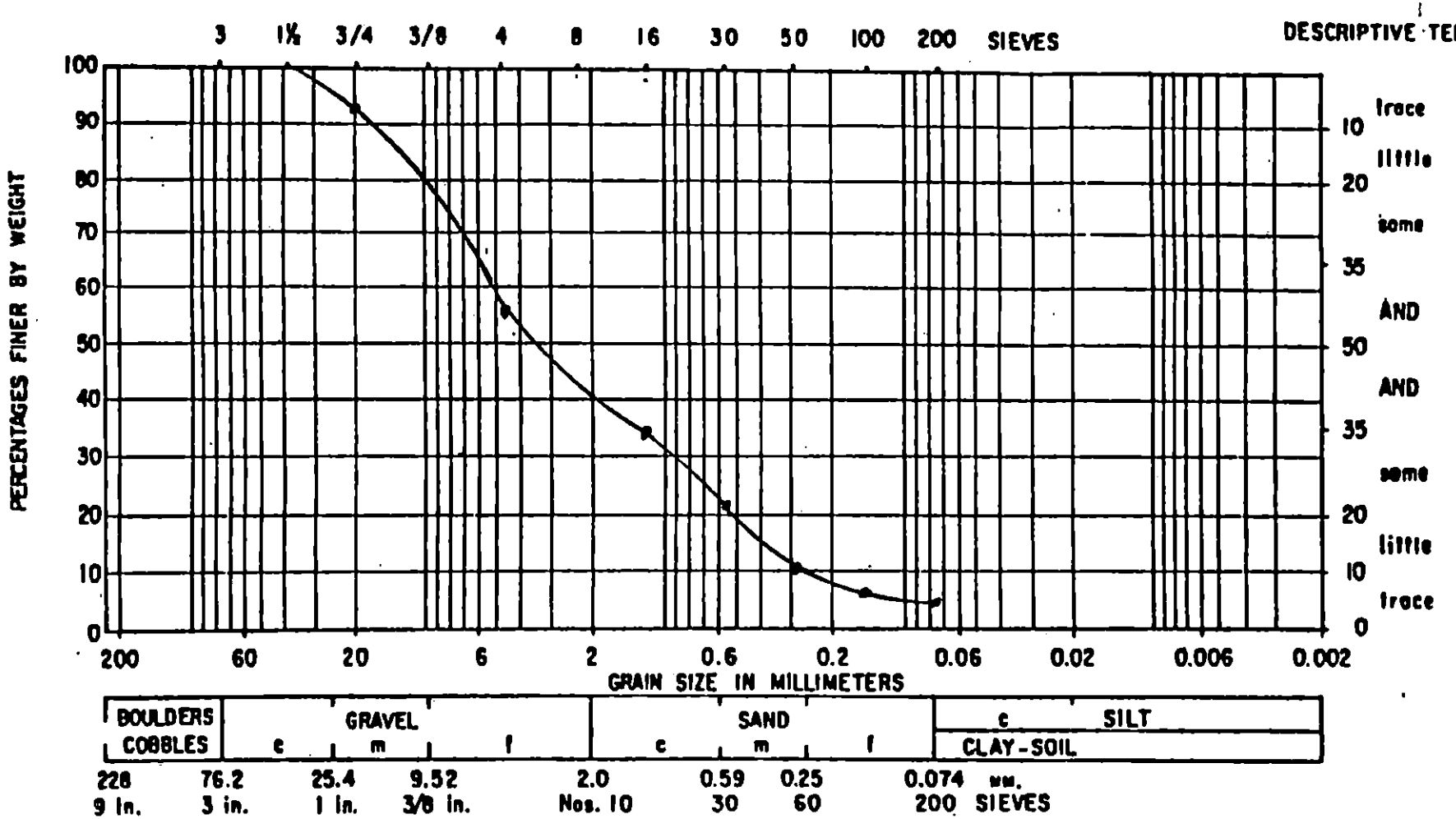
SUBJECT DISCUSSED: Availability of potable water from the Plant for use by the drilling subcontractor.

SUMMARY OF DISCUSSION, DECISIONS AND COMMITMENTS:

According to Mr. Miller, the plumbing system inside the plant provides potable water for domestic and sanitary purposes. This water supply would be available for drilling operations, provided the necessary hoses and hose bibs, etc. are supplied by the driller.

S. Nabavi
AUTHORIZED SIGNATURE

GRAIN SIZE ANALYSIS



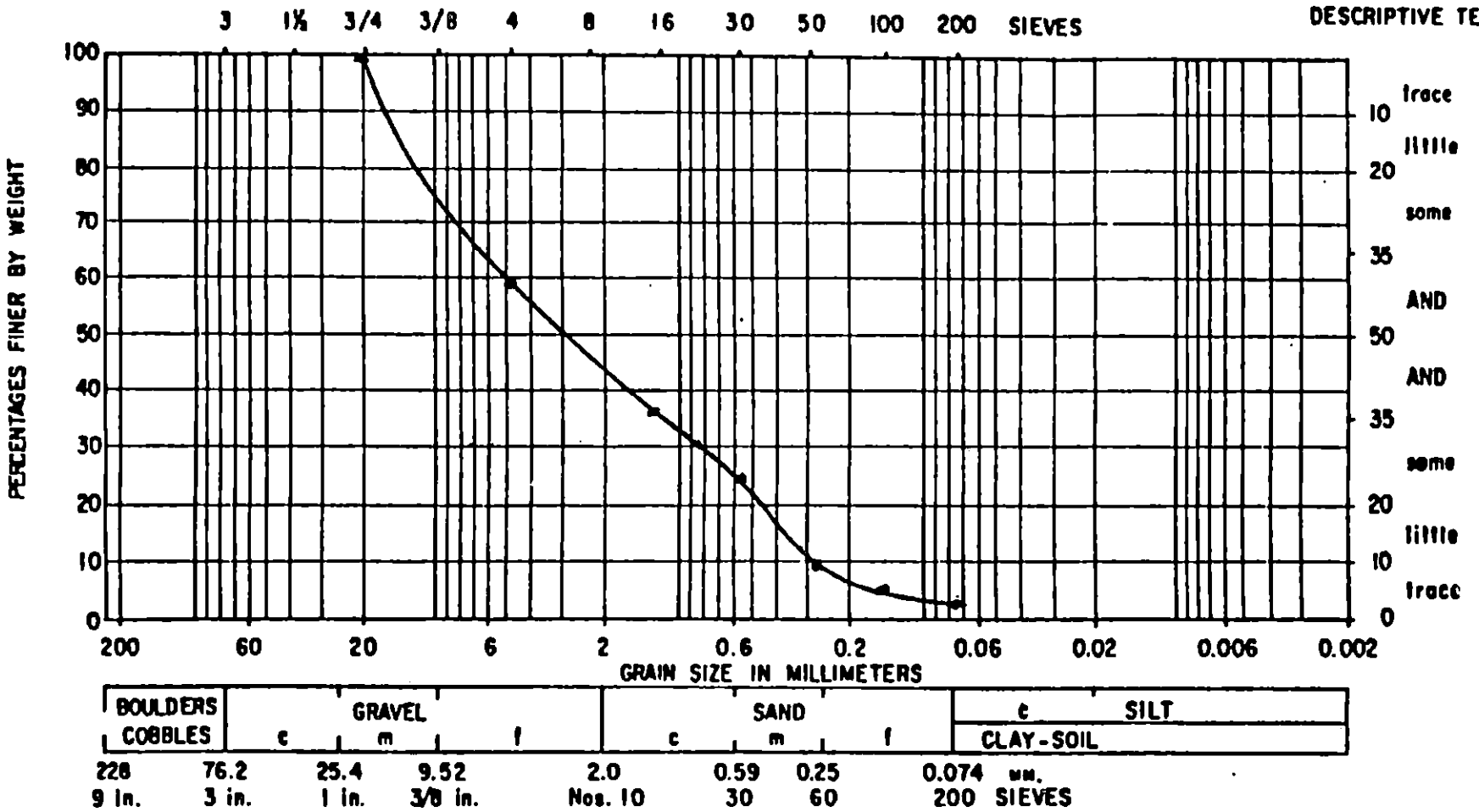
Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW #4, Depth 36'

APPENDIX B

GRAIN SIZE ANALYSIS



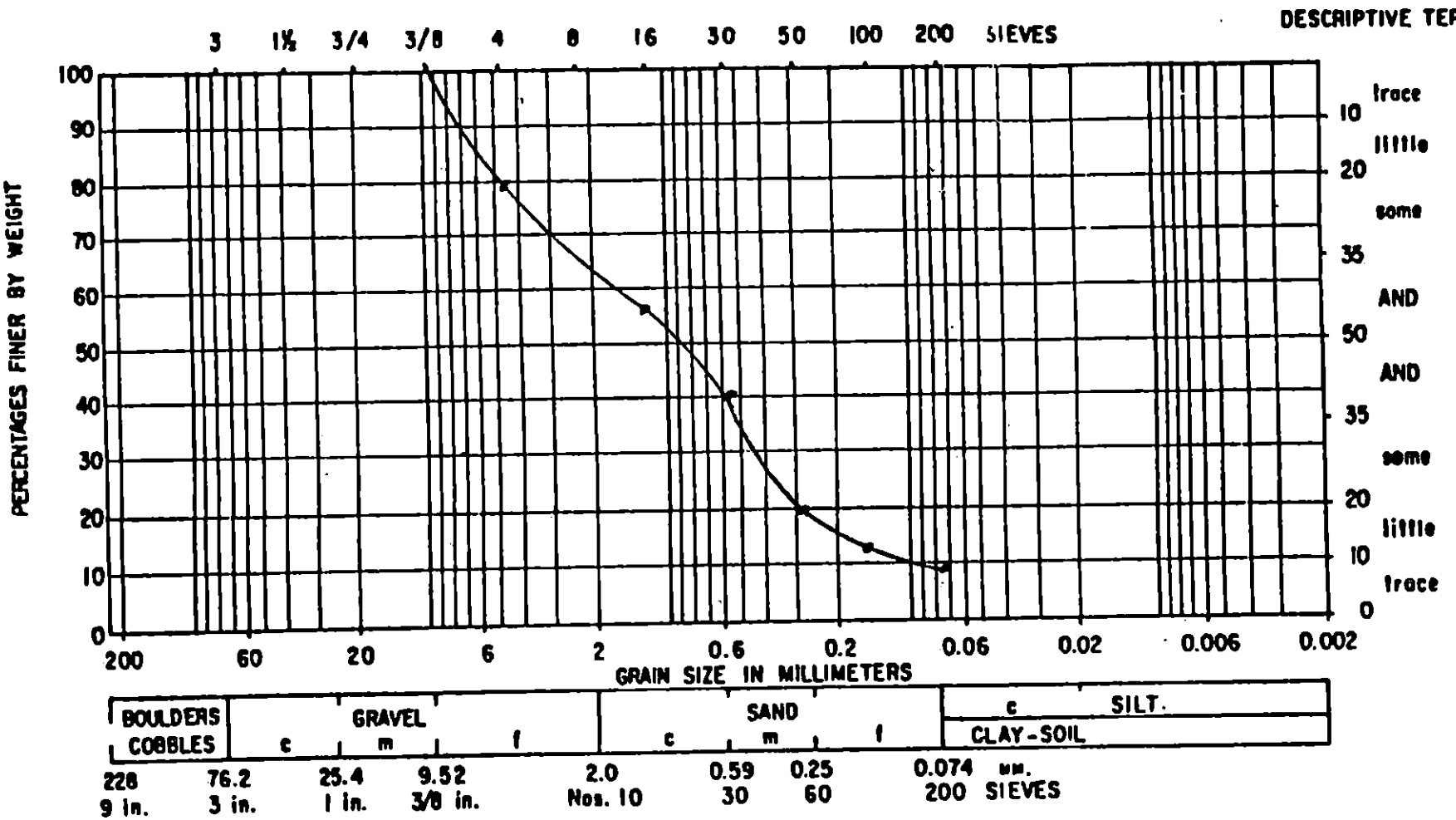
Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW #1, Depth 46'

APPENDIX B

GRAIN SIZE ANALYSIS



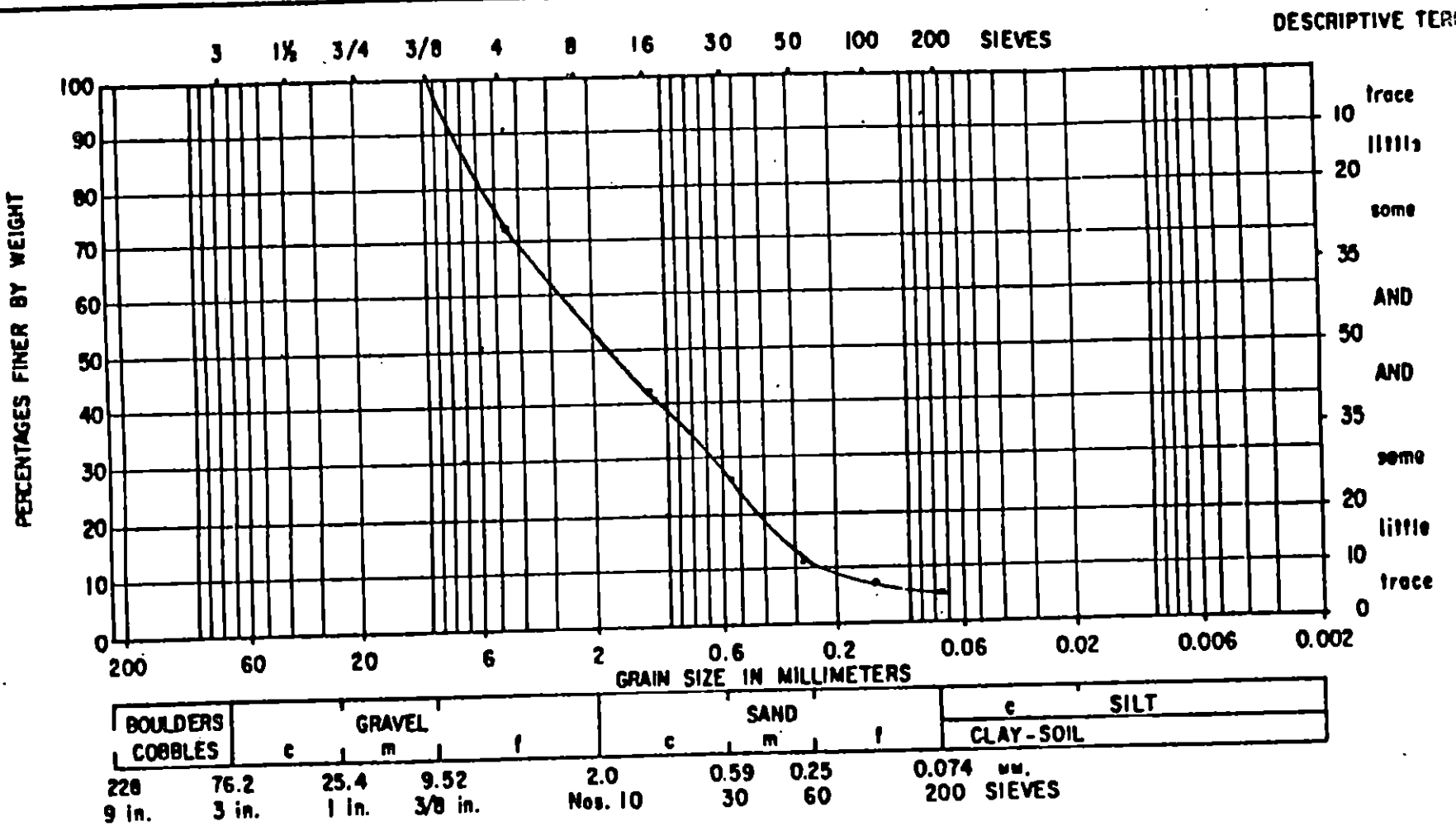
Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW #3 Depth 36'

APPENDIX B

GRAIN SIZE ANALYSIS



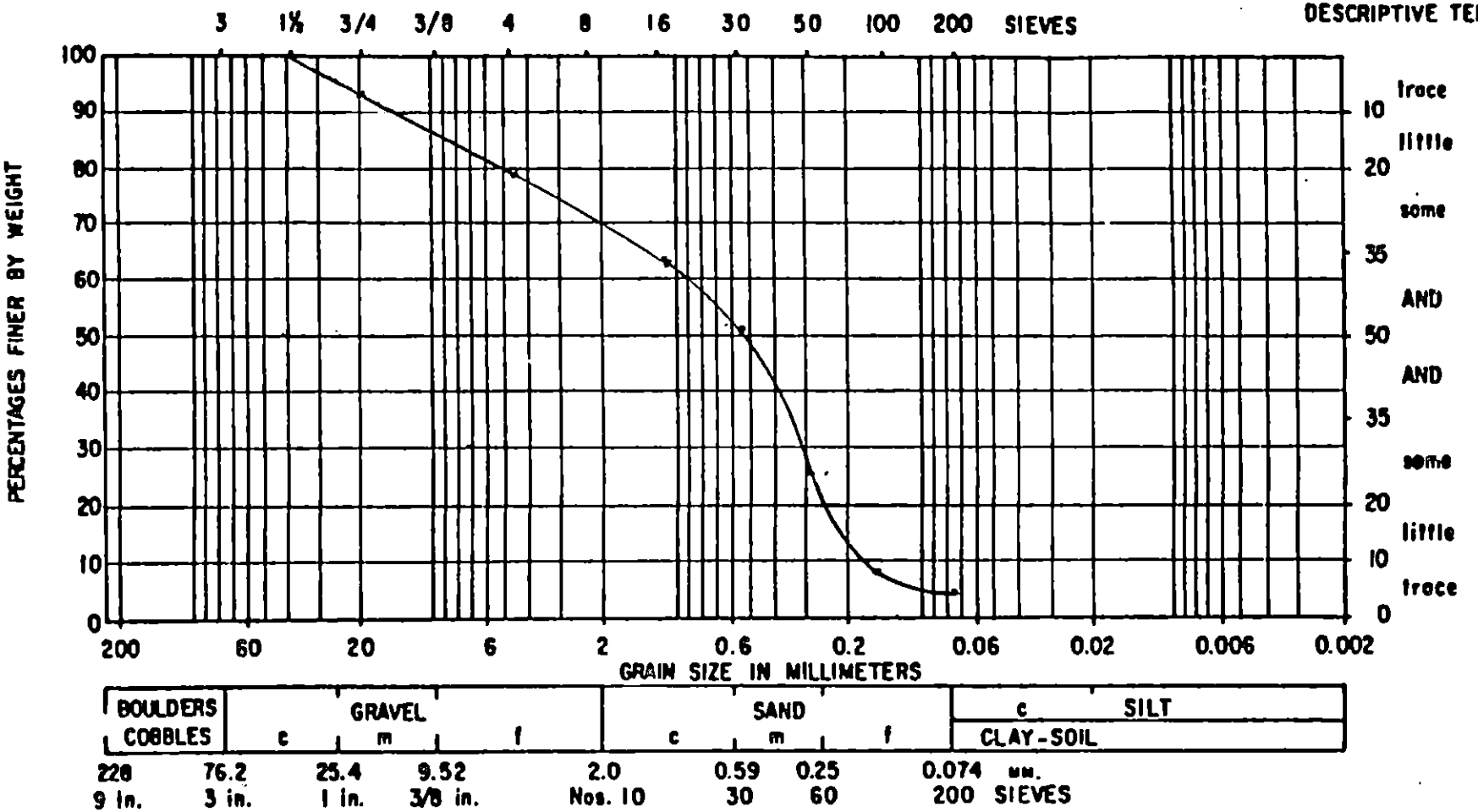
Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW # 2 Depth 46'

APPENDIX B

GRAIN SIZE ANALYSIS



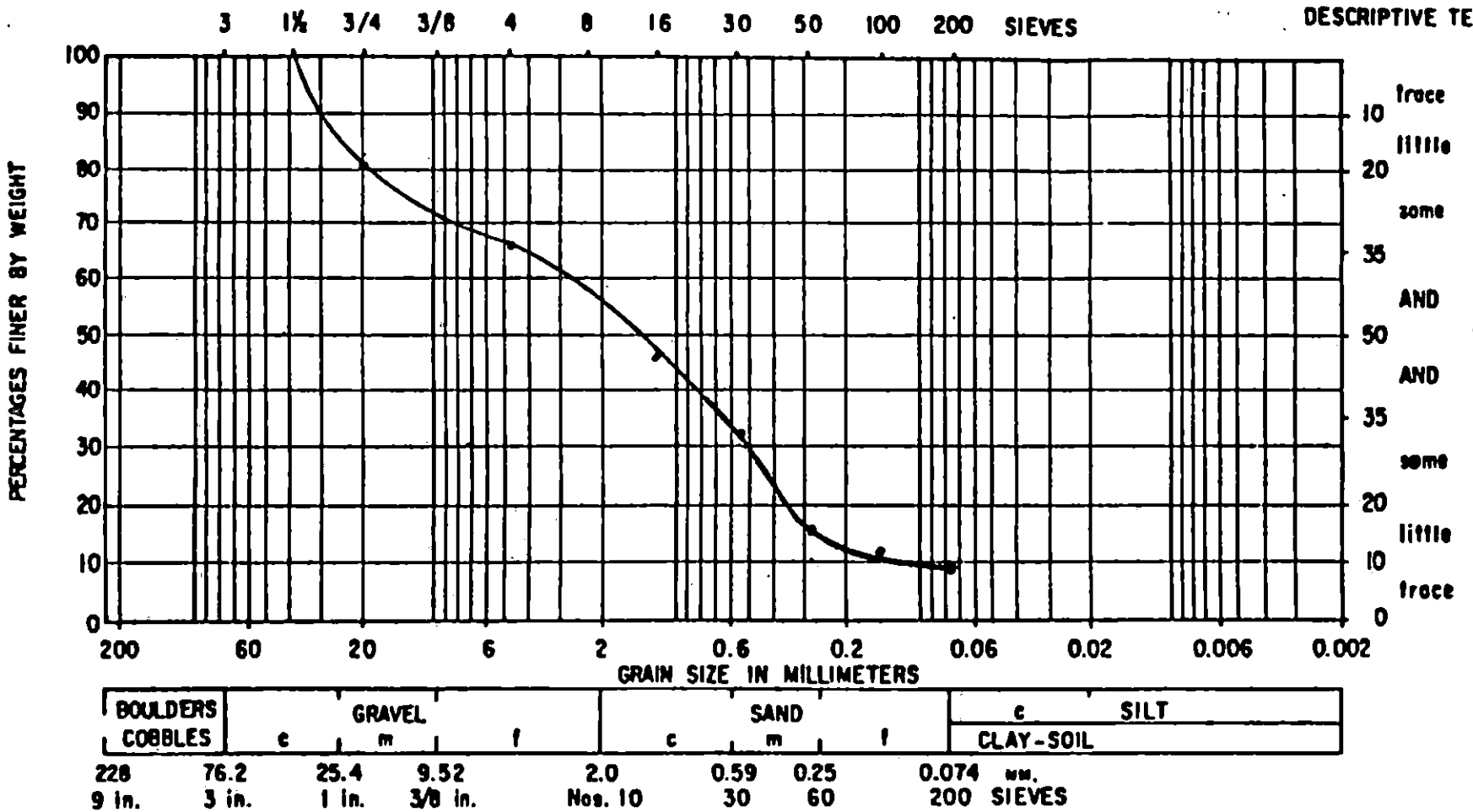
Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW #2 Depth 31'

APPENDIX B

GRAIN SIZE ANALYSIS



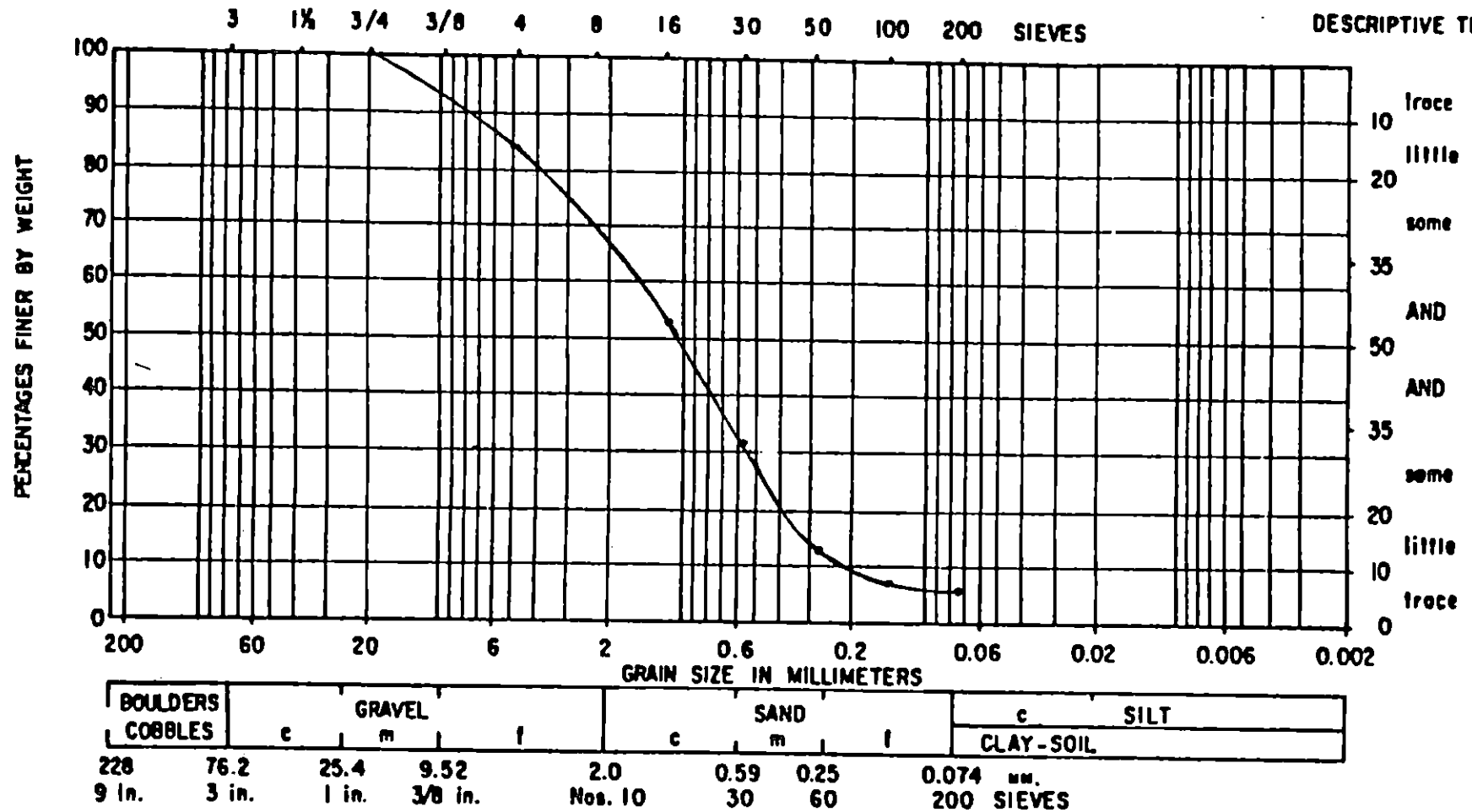
Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW #2 (relocated) Depth 41'

APPENDIX B

GRAIN SIZE ANALYSIS



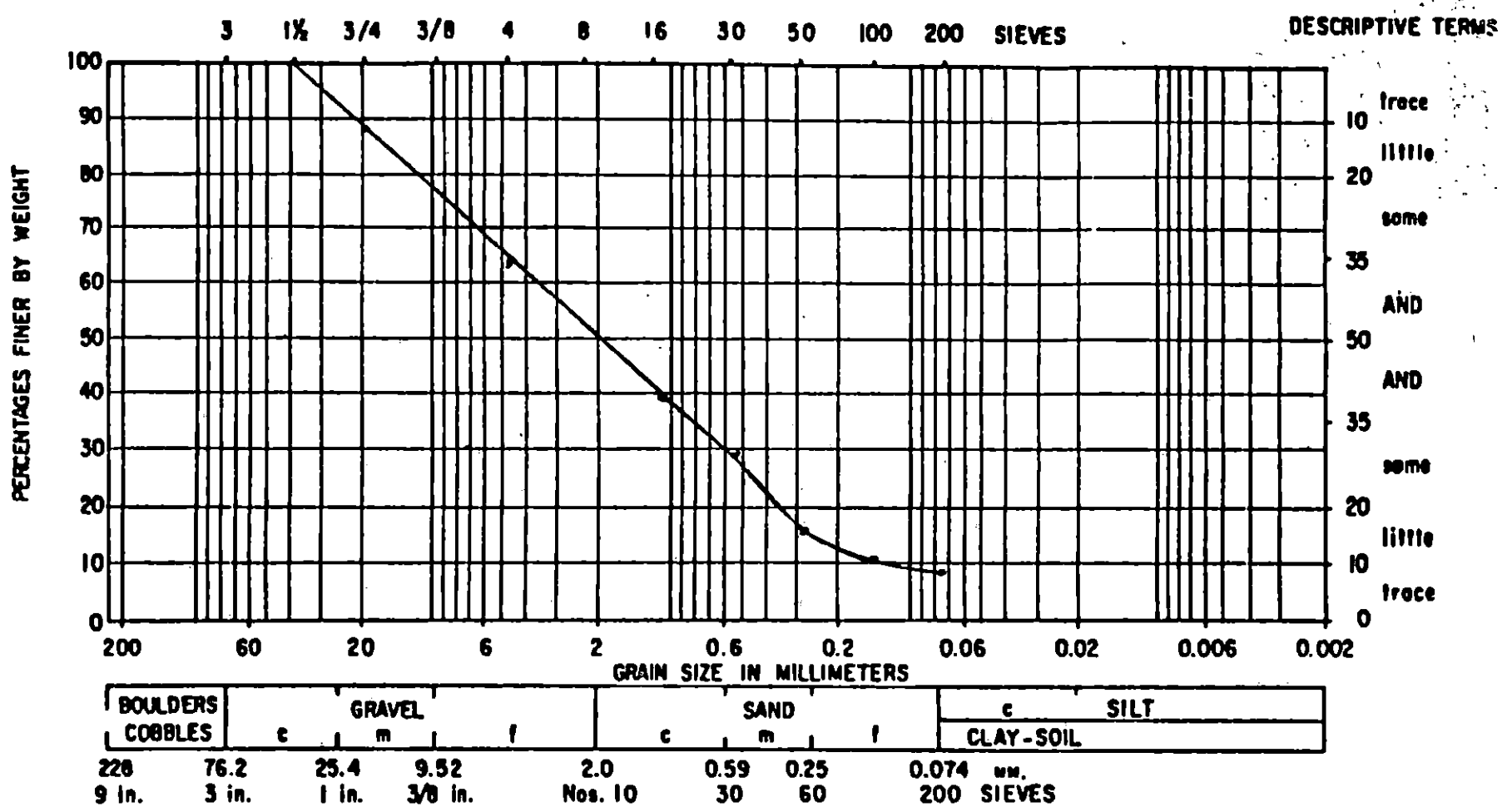
Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW #1 · Depth 31'

APPENDIX B

GRAIN SIZE ANALYSIS



Project: Cantor Brothers

Location: Site ID #152021 Phase II Investigation

Sample: MW #4 Depth 46'

APPENDIX B