VOLUNTARY CLEANUP
SITE ASSESSMENT REPORT

EAC Glendale Site
Glendale, New York

January 7, 1997

Prepared for:

Morgan, Lewis & Bockius, L.L.P.
101 Park Avenue
New York, New York 10173
New York, New York 10173

Prepared by:

ROUX ASSOCIATES, INC.
1377 Motor Parkway
Islandia, New York 11788

CONTENTS

TABLES

FIGURES

APPENDICES

A. Title Search
B. Sanborn Maps
C. ES&E's Reports
D. Soil Mechanics' Letter Reports
E. Roux Associates' Soil-Gas Data
F. Roux Associates' Soil-Quality Data
G. Roux Associates' Ground-Water Quality Data
H. Site Survey Map and Well-Elevation Data

1.0 INTRODUCTION

Roux Associates, Inc. was retained by Morgan, Lewis & Bockius, L.L.P., to provide environmental consulting services on behalf of EAC USA, Inc. (EAC), owner of contiguous properties located at 90-30 Metropolitan Avenue and 73-25 Woodhaven Boulevard, in Glendale (Queens), New York (Site). Ground water beneath the Site, which is currently pending sale and redevelopment as part of a major urban renewal project, has been impacted by an off-site source of chlorinated volatile organic compounds (VOCs), particularly tetrachloroethene (PCE). In order to streamline the sale and redevelopment process, EAC desires to enter into a Voluntary Cleanup Agreement with the New York State Department of Environmental Conservation (NYSDEC), specifically to demonstrate to the NYSDEC that the VOCs detected in ground water at the Site are attributable to an off-site source, and to secure the NYSDEC's concurrence that no further investigation or remedial action is necessary at the Site. This Voluntary Cleanup Site Assessment Report was prepared by Roux Associates on behalf of EAC, as part of EAC's application for a Voluntary Cleanup Agreement.

2.0 SITE DESCRIPTION

The Site is located just southeast of the intersection of Metropolitan Avenue and Woodhaven Boulevard, in the Glendale section of Queens (Figure 1). Based on the United States Geological Survey's (USGS's) Jamaica, New York 7.5-minute quadrangle map, the approximate Universal Transverse Mercator coordinates for the center of the Site are 4,507,036.1 north by 596,380.5 east (zone 18, 1927 datum). The Site is bordered to the north by Metropolitan Avenue; to the east by Trotting Course Lane and an inactive Long Island Rail Road (LIRR) right-of-way; to the west by Woodhaven Boulevard, the Woodhaven Lanes bowling alley, and an Exxon gasoline station; and to the south by two large buildings (one vacant and one occupied by Long Island Fireproof Door, Inc.). The Site is bisected by 73rd Avenue, which runs east-west between Woodhaven Boulevard and Trotting Course Lane (Figure 2).

The Site is located in an area zoned for light industry; however, residential areas are located on the west side of Woodhaven Boulevard and on the east side of the inactive LIRR right-of-way. A regional ground-water quality problem exists in the area of the Site, and both soil and ground-water contamination have been documented in the area immediately south of the Site (AKRF, Inc., 1996a).

As stated earlier in Section 1, the Site comprises two contiguous properties: 90-30 Metropolitan Avenue (Tax Block 3884, Lot 34) and 73-25 Woodhaven Boulevard (Tax Block 3886, Lot 671). Both properties contain a vacant warehouse/office building, with adjacent asphalt-paved parking areas (Figure 2). The Site is serviced with electricity, gas, and water by local utilities, and is connected to the City of New York's municipal sewer system. An active 7,500-gallon fuel oil underground storage tank (UST) is located near the southeast corner of the Metropolitan Avenue building, while an abandoned 5,000-gallon fuel oil UST is located near the southwest portion of the Woodhaven Boulevard building (Figure 2).

Geologically, the Site is located in an inter-morainal portion of Long Island, and is hence underlain by a thick sequence of stratified sand and gravel, with thick layers of clay beginning at depths of approximately 150 feet below land surface. Depth to bedrock beneath the Site is estimated to be approximately 450 feet (U.S. Geological Survey, 1981). Depth to water at the Site ranges between approximately 45 to 50 feet, and ground water beneath the Site flows to the southeast (see Section 5). Several water-supply wells are reportedly located 1.5 to 2 miles southeast of the Site (AKRF, 1996b).

3.0 SITE HISTORY

Sanborn Fire Insurance Maps for the years 1902, 1914, 1936 and 1950 show that the Site was unoccupied except for two dwellings and several outbuildings (including barns, sheds, and a greenhouse), until 1950, when the current Woodhaven Boulevard building was erected. The Metropolitan Avenue building was reportedly erected in 1951 (Environmental Science & Engineering, Inc., 1992). Title searches performed for the two properties constituting the Site indicate that both Site buildings have been used for warehousing and office space by several different tenants since their construction. Owners of the Metropolitan Avenue property include the following:

- Estate of Walter Vanderveer - prior to 1951;
- McKesson & Robbins, Inc. (a/k/a Foremost - McKesson, Inc.) - 1951 to 1977;
- Heidelberg Eastern, Inc. (corporate predecessor of EAC) - 1977 to 1984;
- New York City Industrial Development Agency - 1984 to 1993; and
- EAC - 1993 to present.

Owners of the Woodhaven Boulevard property include the following:

- Frank Brunkhurst Co. - prior to 1950;
- Henry Pope, Inc. - 1950 to 1961;
- Underwood Corporation (a/k/a Olivette Corporation of America) - 1961 to 1971;
- Joseph G. Kearns - 1971 to 1973;
- Catholic Relief Services - U.S. Catholic Conference, Inc. - 1973 to 1984;
- New York City Industrial Development Agency - 1984 to 1993; and
- EAC-1993 to present.

A copy of the title search report is provided in Appendix A.

There is no indication that PCE was ever used at the Site. Based on interviews with Site employees, the only solvent used onsite was kerosene, which was used to clean equipment parts in a "cleaning booth" located in the northeast part of the Metropolitan Avenue building. A floor drain was observed by Roux Associates in the "cleaning booth", discharging to a small (i.e., less than 550 gallons) aboveground storage tank.

The Sanborn maps described above also show that the area around the Site was largely undeveloped until sometime between 1914 and 1936. Numerous residences and several filling stations (with multiple gasoline tanks) first appear to the north, east, and west of the Site in the 1932 and 1936 Sanborn maps. In addition, one of the structures immediately south of the Site (i.e., the building currently occupied by Long Island Fireproof Door, Inc.) first appears in the 1936 Sanborn map, as a Reynolds Metals Company, Inc. facility. Several additional commercial and/or industrial facilities first appear in the vicinity of the Site in the 1950 Sanborn map, as do two additional filling stations at the intersection of Metropolitan Avenue and Woodhaven Boulevard. Copies of the Sanborn Maps are provided in Appendix B.

4.0 REGULATORY HISTORY

A database search conducted for the Site in 1992 by Environmental Science & Engineering, Inc. (ES&E) during a Phase I Site Assessment indicated that the Site had no regulatory history regarding permits for storage, treatment, or disposal of wastes, and no legal documents regarding Site operations (e.g., consent orders) were reported. It is noted that in 1996, a USEPA generator number (NYR000024273) was assigned to the Site for the disposal of four drums of ground water generated during an investigation performed at the Site by another consultant on behalf of a potential buyer. The ground water contained in the drums was contaminated with up to 5,100 micrograms per liter (μg/l) of PCE.

5.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Several environmental investigations have been performed at the Site over the last four years as part of the property-transfer process. ES&E performed Phase I/Phase II investigations at each of the two Site properties (on behalf of Heidelberg Eastern) in 1992. The results of these investigations were presented in the following December 1992 reports:

- Phase I and Phase II Environmental Assessment of Real Estate, Heidelberg Eastern, Inc., 90-30 Metropolitan Avenue, Glendale, New York.
- Phase I and Phase II Environmental Assessment of Real Estate, Heidelberg Eastern, Inc., 73-25 Woodhaven Boulevard, Glendale, New York.

Copies of these reports are provided in Appendix C.

Soil Mechanics Environmental Services, Inc. (Soil Mechanics) subsequently performed several additional investigations at the Site on behalf of a potential buyer between 1994 and 1996. The results of these investigations were presented in the following letter reports:

Metropolitan Avenue property	Woodhaven Boulevard property
March 24 1995	April 18, 1995
May 5, 1995	October 6, 1995
September 12, 1995	January 26, 1996

Copies of these letter reports are provided in Appendix D.

In 1995, Roux Associates was retained on behalf of EAC to review the data developed by ES&E and Soil Mechanics. Roux Associates subsequently performed additional investigation activities in 1995 and 1996, the results of which were presented to the NYSDEC during an October 9, 1996 meeting at Region II headquarters in Long Island City, and a December 30, 1996 meeting at the NYSDEC offices in Tarrytown.

Summary of Findings

PCE was first detected in ground water beneath the Site in 1992, during the Phase I/Phase II investigations conducted by ES&E. PCE was detected in five of the six monitoring wells installed at the Site by ES&E, at concentrations ranging from 23 to 5,200 µg/L (Table 1). However, no VOCs were detected in any of the soil samples collected for laboratory analysis during installation of the monitoring wells. Moreover, no VOCs were detected in any of the soils screened onsite with a photoionization detector (PID) during well installation.

Subsequent investigations performed at the Site by Soil Mechanics on behalf of a potential buyer confirmed the presence of PCE and its breakdown products (e.g., trichloroethene [TCE] and 1,2-dichloroethene [1,2-DCE]) in ground water beneath the Site, particularly beneath the Metropolitan Avenue property (Table 1). Notably, at three of the four wells located along the upgradient (i.e., western) boundary of the Metropolitan Avenue property (i.e., ME-9, ME-11, and ME-15), PCE concentrations in ground water approached or exceeded 1,000 µg/L, including a concentration of 7,500 µg/L at ME-15. Moreover, no VOCs were detected (using a PID and a 1 part per million [ppm] detection limit) in 184 of the 216 soil samples collected from 18 soil borings located throughout the Site, and PCE was not detected in any of the nine soil samples analyzed at an off-site laboratory. (It is noted that of the 32 reported detections of VOCs, 20 were less than 10 ppm, many occurred in the saturated zone in areas with PCE concentrations in excess of 1,000 µg/L, and half (16) occurred at two soil borings located directly above the "core" of the PCE plume in ground water. As discussed below, Roux Associates collected soil samples at these two locations to confirm the soil gas findings; no VOCs were detected in soil at either location.)

Based on a review of the data developed by ES&E and Soil Mechanics, Roux Associates concluded that the PCE detected in ground water at the Site was attributable to an off-site source. The conclusion was based on the following considerations:

- there is no indication that PCE was ever used at the Site;
- no VOCs were detected in 184 of 216 soil samples collected at the Site and screened with a PID;

- PCE was *never detected* in any of the soil samples collected and analyzed during previous investigations; and
- PCE was detected in *upgradient* monitoring wells at concentration exceeding 1,000 µg/L.

Based on these considerations, and in order to expedite the ongoing property-transfer process, Roux Associates subsequently performed additional subsurface investigation activities at the Site to generate additional data needed to *confirm* that the source of the PCE detected in ground water beneath the Site was located offsite. These investigation activities were conducted between July 1995 and November 1996, and consisted of the following tasks:

- performance of a soil-gas survey;
- collection of soil samples for laboratory analysis;
- collection of ground-water samples or laboratory analysis;
- installation of three additional monitoring wells; and
- measurement of water levels in all existing Site wells (two rounds).

The scope of work and results of each task are described in detail below.

Soil-Gas Survey

Roux Associates contracted Target Environmental Services, (Target) of Columbia, Maryland to conduct a soil-gas survey at the Site. Soil-gas samples were collected beneath the Metropolitan Avenue building, beneath the asphalt-paved parking area west of the Metropolitan Avenue building, and beneath the grass-covered area immediately south of the Metropolitan Avenue building. These areas are shown in Figure 3. Within each area, soil-gas samples were collected at node points spaced evenly at 20-foot intervals. (A total of 114 soil-gas samples were collected from the areas shown in Figure 3.) Target used a hydraulic drill and slide hammer at each

location to penetrate to a depth of four feet below land surface. A stainless-steel probe was then inserted in the hole, and the hole was then sealed at land surface using an inert sealant. Soil gas was then extracted by drawing on a manual syringe, and encapsulated in a pre-evacuated glass vial. Each vial of soil gas was then shipped to Target's corporate laboratory for analysis of selected chlorinated VOCs. Compounds analyzed include the following:

- PCE;
- TCE;
- 1,2-DCE;
- 1,1-dichloroethene;
- 1,1-dichloroethene;
- 1,1,1-trichloroethane;
- 1,1,2- trichloroethane
- methylene chloride;
- carbon tetrachloride; and
- chloroform

The analyses were performed using modified (i.e., for soil gas) U.S. Environmental Protection Agency (USEPA) Method 8010 procedures, which included quality assurance (QA) requirements.

The results of the soil-gas survey are summarized in Figure 4. PCE was detected in only 18 of the 114 soil-gas samples collected at the Site, at concentrations ranging from only 1.01 to 4.81 µg/L. All 18 sampling points at which PCE was detected are located beneath the southern half of the Metropolitan Avenue building, where PCE concentrations in ground water exceed 10,000 µg/L. Accordingly, all soil-gas PCE detections beneath the Metropolitan Avenue building are attributed to volatilization of PCE from the underlying ground-water PCE plume. (As discussed below, this was confirmed through soil sampling at six locations beneath the Metropolitan Avenue building). Soil-gas results are provided in Appendix E.

not included

The soil-gas data were subject to a cursory QA review, which noted the following:

- holding times were met for all soil-gas samples;
- no VOCs were detected in any of the method blanks or field control blanks; and
- three check standards analyzed along with the soil-gas samples confirmed that the analytical instrumentation was operating within normal parameters.

Soil Sampling and Analyses

Soil samples were collected from 11 soil borings drilled at the Metropolitan Avenue building. Soil boring locations are shown in Figure 3, and the rationale for the borings are listed below.

- SB-1: to collect a ground-water sample near the upgradient edge of the Metropolitan Avenue building
- SB-2: to assess soil quality in a previously-unsampled area in which Soil Mechanics indicated they had detected VOCs in soil gas (*this finding was never substantiated*);
- SB-3: to assess soil quality in a previously-unsampled area overlying the core of PCE plume, in which Soil Mechanics also reported that they had detected VOCs in soil gas (*also unsubstantiated*);
- SB-4 and SB-5: to assess soil-quality in the only *potential* source area identified inside the Metropolitan Avenue building (i.e., the "cleaning booth").
- SB-56, 59, 61, and 64: to assess soil quality beneath areas of the Metropolitan Avenue building exhibiting low levels of PCE in soil gas; and
- SB-76 and 99: to confirm the absence of PCE in soil-gas samples collected beneath the northern half of the Metropolitan Avenue building.

Soil borings SB-1 through 5 were drilled by Aquifer Drilling & Testing, Inc. (ADT) of Long Island City, New York, using either a Geoprobe™ or hand-driven split spoons, while the remaining soil boring were drilled by Roux Associates using a hand auger. The following soil samples were collected from these 11 borings:

- SB-1: 5 to 7 feet and 10 to 12 feet
- SB-2: 5 to 7 feet and 10 to 12 feet
- SB-3: 5 to 7 feet
- SB-4: 3.5 to 4 feet
- SB-5: 2.5 to 3 feet
- SB-56: 1 to 2 feet
- SB-59: 1 to 2 feet
- SB-61: 1 to 2 feet
- SB-64: 1 to 2 feet
- SB-76: 1 to 2 feet
- SB-99: 1 to 2 feet

All samples were screened for VOCs using a PID, and all samples except those from SB-1 were submitted to an analytical laboratory for analysis of chlorinated VOCs. Samples for SB-2 through SB-5 were submitted to Eco-Test Laboratories (Eco-Test) of Babylon, New York, for analysis using USEPA Method 601, while the remaining samples were submitted to Accredited Laboratories of Carteret, New Jersey for analysis using USEPA Method 8010. Method 601 was selected for SB-2 through SB-5 to maintain consistency with Soil Mechanics' investigations, a procedure necessitated by the ongoing property-transfer process. Method 8010 was selected for the remaining samples in anticipation of possible future validation of the data. No soil samples from boring SB-1 were submitted for laboratory analysis since this boring was drilled solely in an attempt to obtain a ground-water sample (which, it turned out, could not be collected due to Geoprobe™ refusal).

No VOCs were detected in any of the 11 soil samples collected by Roux Associates at the locations shown in Figure 3, including locations where VOCs were reported in soil gas by Soil Mechanics and by Target. (Detection limits ranged from 5 to 10 micrograms per kilogram.) Laboratory reports for the soil samples collected during Roux Associates' subsurface investigation are provided in Appendix F.

Roux Associates also performed a cursory validation of the data for Soil Borings SB-56, SB-59, SB-61, SB-64, SB-76, and SB-99. Results include the following:

- holding times were met for all soil samples;
- no VOCs were detected in the field blank or the trip blank; and
- percent recoveries and relative percent differences reported for the matrix spike and matrix spike duplicate analyses were within the method-specified limits.

Ground-Water Sampling

Roux Associates collected ground-water samples from ten existing monitoring wells in the southern two-thirds of the Metropolitan Avenue property and the northeastern portion of the Woodhaven Boulevard property. Wells sampled by Roux Associates include the following:

- ME-1;
- ME-4;

- ME-6;
- ME-7;
- ME-8;
- ME-9;
- ME-11;
- WH-3
- WH-5
- WMW-6

Well ME-3 was also included in the list of wells to be sampled; however, this could not be located at the time.

Each well was purged immediately prior to the sampling by pumping or bailing at least three times the amount of standing water in each well. Ground-water samples were collected using disposable polyethylene bailers, and submitted to Eco-Test for analyses of chlorinated hydrocarbons using USEPA Method 601. (Again, Method 601 was selected to maintain consistency with Soil Mechanics' sampling procedures.)

Several VOCs were detected in ground water in the southern two thirds of the Metropolitan Avenue property, as well as in the northeast portion of the Woodhaven Boulevard property during Roux Associates' investigation (Table 1). The VOC detected, their frequency of detection, the maximum concentration detected, and the location of the maximum concentration detected are shown in the table below.

Compound Detected	Frequency of Detection	Maximum Concentration Detected (µg/L)	Location of Maximum Detection
PCE	8 of 10	26,000	ME-8
TCE	6 of 10	19	ME-8
1,2-DCE	5 of 10	30	ME-8
1,1,1-TCA	3 of 10	8	ME-4
Chloroform	1 of 10	1	ME-8

As shown in the table above, PCE was the primary VOC detected in ground water at the Site, both in terms of frequency of detection and concentrations detected. The maximum concentration of four of the five VOCs detected (including PCE) occurred at well ME-8, located south of the Metropolitan Avenue building. However, four of the five wells located west (upgradient) of the

Metropolitan Avenue building (i.e., ME-1, ME-7, ME-9, and ME-11) contained PCE concentrations in excess of 1,000 µg/L. These data confirm the ground-water data developed by ES&E and Soil Mechanics. Laboratory reports for the ground-water samples collected during Roux Associates' investigation are provided in Appendix G.

Well Installation

Three new monitoring wells (WH-11,12, and 13) were installed by ADT (under Roux Associates' supervision) along the south side of 73rd Avenue (Figure 3), to provide additional water-level data for the area south of the PCE "hot spot" in ground water. Each new well was constructed of 2-inch PVC, with 10-foot screened zones extending approximately 7 feet below the water table. Following installation, each new well was developed to ensure hydraulic connection with the surrounding aquifer.

Measurement of Water Levels

Water levels were measured in all existing Site wells on two occasions to confirm the southeastward ground-water flow direction indicated by published references (e.g., U.S. Geologic Survey, 1986) and by ES&E's drilling records (ES&E, 1992). Water levels were measured to the nearest 0.01 foot using an electronic water-level indicator. Locations and top-of-casing elevations for all of the wells were re-surveyed by Sidney B. Bowne & Son, L.L.P, a licensed land surveyor. Survey data are provided in Appendix H.

The water-level data developed by Roux Associates are shown in Table 2 and Figures 6 and 7. The data from both water-level gauging rounds confirm the generally-southeastward ground-water flow direction indicated by published references (e.g., U.S. Geological Survey, 1986) and by ES&E's drilling records (ES&E).

Conclusions

Based on the findings of ES&E's and Soil Mechanics' investigations, as well as Roux Associates' additional investigation activities, Roux Associates strongly believes that it has confirmed that the PCE detected in ground water beneath the Site is attributable to an off-site source. This opinion is based on the following considerations, in addition to those listed previously (on pages 8 and 9):

- PCE was not detected in 96 out of the 114 soil-gas samples collected at the Site by Roux Associates, and was detected only at trace levels (less than 5 µg/L) in the remaining 18 samples (attributed to volatilization of PCE from the underlying ground-water PCE plume).
- concentrations of PCE were not detected in any of the soil samples collected from various locations throughout the Site by Roux Associates, ES&E, and Soil Mechanics;
- water-level data developed by Roux Associates confirm a southeast ground-water flow direction; and
- concentrations of PCE detected in ground water near the upgradient (northwestern) edge of the Site consistently exceeded 1,000 µg/L and range as high as 7,500 µg/L.

As was discussed at the December 30, 1996 meeting at the NYSDEC's office in Tarrytown, the data suggest that the adjacent Woodhaven Lanes bowling alley may be the source of the PCE in ground water beneath the Site. This opinion is based on the fact that the bowling alley is located directly upgradient of the axis of the PCE plume beneath the Site, and based on Roux Associates' understanding that it is common industry practice to use significant quantities of solvents for cleaning operations at bowling alleys.

6.0 INTENDED FUTURE USE AND REDEVELOPMENT OF SITE

The Site is currently pending sale and redevelopment as part of a major urban renewal project that includes the Site and several adjacent properties. It is our understanding that the buyer plans to redevelop the Site for several major retail chain stores.

7.0 PROPOSED ACTION

The findings of numerous investigations conducted at the Site confirm that the PCE detected in ground water at the Site is attributable to an off-site source. Therefore, no further investigation or remedial action is necessary at the Site.

8.0 REFERENCES

AKRF, Inc., 1996a. Home Depot, Rego Park, New York - Voluntary Cleanup Site Assessment Report.

AKRF, Inc., 1996b. Home Depot, Rego Park, New York- Voluntary Cleanup Supplementary Site Assessment Report.

Environmental Science & Engineering, Inc., 1992. Phase I and Phase II Environmental Assessment of Real Estate, Heidelberg Eastern, Inc., 90-30 Metropolitan Avenue, Glendale, New York.

U.S. Geological Survey, 1981 . Reconnaissance of the Ground-Water Resources of Kings and Queens Counties, New York. U.S. Geological Survey Open File Report 81-1186

U.S. Geological Survey, 1986. The Water Table Aquifer on Long Island, New York, in March-April 1984. U.S. Geological Survey Water Resources Investigations Report 86-4189.

Respectfully submitted,

ROUX ASSOCIATES, INC.

Lawrence McTiernan
Senior Hydrogeologist/
Project Manager

Joseph D. Duminuco
Principal Hydrogeologist/
Project Principal

Table 1. Concentrations of Tetrachloroethene (PCE) in Ground Water, EAC Glendale Site, Glendale, New York.

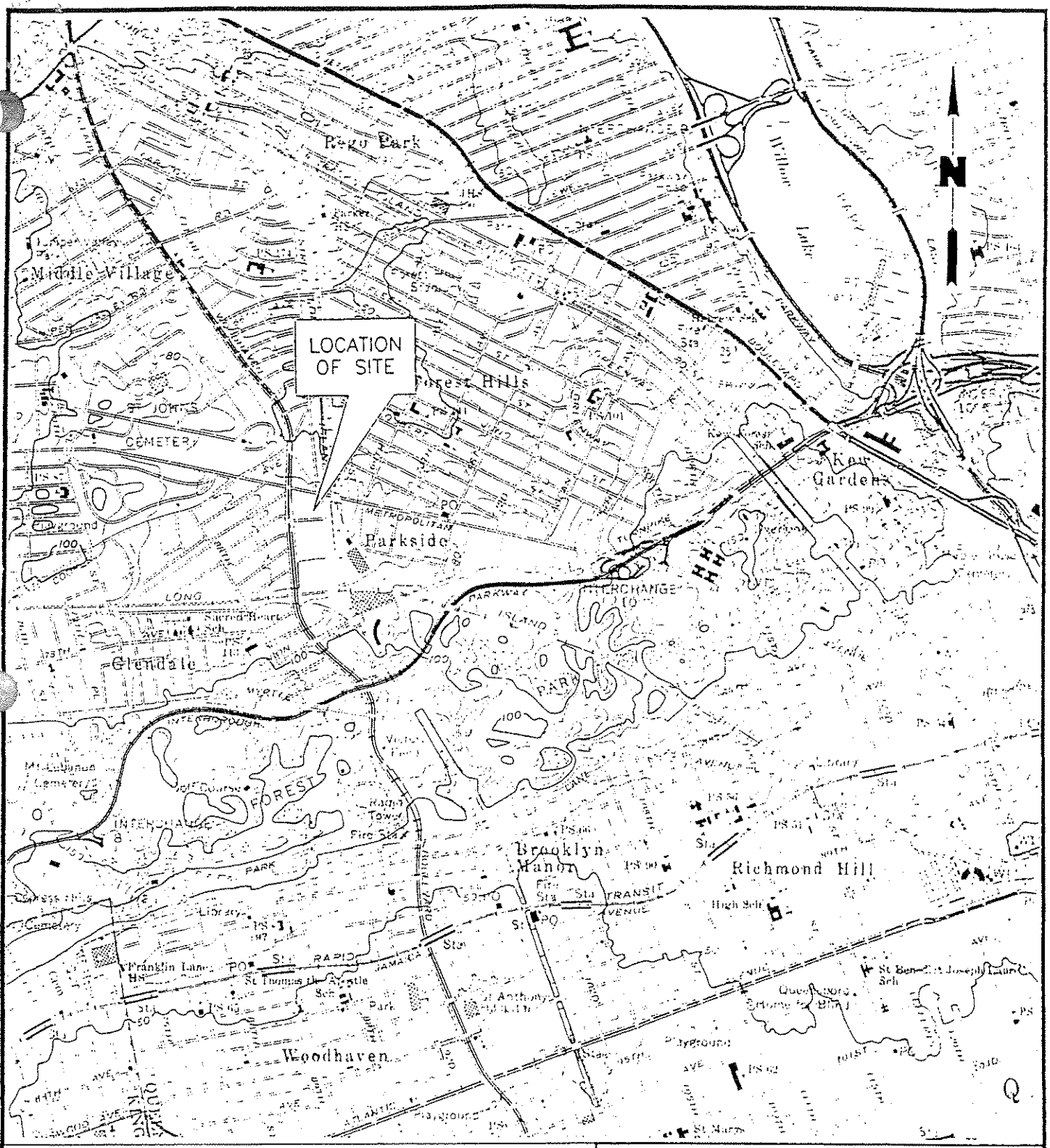
Well Designation	Concentration of PCE Detected in Ground Water, in Micrograms per Liter						
	ES&E	Soil Mechanics				Roux Associates	Maximum Concentration
	Dec-92	Dec-94	Apr-95	Aug-95	Sep-95	Jul-95	Detected
ME-1	5,200					2,200	5,200
ME-2	23						23
ME-3	95						95
ME-4		ND				ND	ND
ME-5		3					3
ME-6		39				11	39
ME-7		17,000				13,000	17,000
ME-8			33,000			26,000	33,000
ME-9			920			2,200	2,200
ME-10			8				8
ME-11			2,200			2,500	2,500
ME-12			ND				ND
ME-13				13,000			13,000
ME-14				15,000			15,000
ME-15				7,500			7,500
ME-16				2,500			2,500
WH-1	550						550
WH-2	ND						ND
WH-3	160					9	160
WH-4		ND					ND
WH-5		ND				ND	ND
WMW-6					50	710	710
WMW-7					2		2
WMW-8					5		5
WMW-9					2,200		2,200
WMW-10					380		380

ES&E - Environmental Science & Engineering, Inc.
ND - Not detected

Table 2. Water-Level Elevations, EAC Glendale Site, Glendale, New York.

Well Designation	Measuring Point Elevation (feet above Queens-borough vertical datum)	July 27, 1995		November 11, 1996	
		Depth to Water (feet below measuring point)	Water-Level Elevation (feet above Queens-borough vertical datum)	Depth to Water (feet below measuring point)	Water-Level Elevation (feet above Queens-borough vertical datum)
ME-1	60.14	45.55	14.59	44.51	15.63
ME-2	58.40	43.70	14.70	42.60	15.80
ME-3	59.02	NM	--	43.55	15.47
ME-4	58.60	44.05	14.55	43.03	15.57
ME-5	57.67	43.07	14.60	42.02	15.65
ME-6	58.76	44.10	14.66	43.03	15.73
ME-7	59.56	44.99	14.57	43.92	15.64
ME-8	59.56	44.97	14.59	44.00	15.56
ME-9	58.97	44.35	14.62	43.28	15.69
ME-10	58.22	43.57	14.65	42.46	15.76
ME-11	59.54	44.91	14.63	43.86	15.68
ME-12	57.62	43.97	13.65	41.90	15.72
ME-13	59.64	NM	--	44.04	15.60
ME-14	59.54	NM	--	43.89	15.65
ME-15	59.51	NM	--	43.81	15.70
ME-16	59.14	NM	--	43.46	15.68
WH-1	59.21	44.64	14.57	43.62	15.59
WH-2	58.94	46.10	12.84	45.06	13.88
WH-3	58.25	43.89	14.36	42.91	15.34
WH-4	59.22	44.98	14.24	43.89	15.33
WH-5	58.50	45.65	12.85	44.63	13.87
WMW-6	58.36	43.99	14.37	43.02	15.34
WMW-7	59.00	NM	--	45.07	13.93
WMW-8	58.49	NM	--	43.03	15.46
WMW-9	59.02	NM	--	43.35	15.67
WMW-10	59.20	NM	--	43.71	15.49
WH-11	59.07	NM	--	43.51	15.56
WH-12	59.52	NM	--	43.96	15.56
WH-13	58.89	NM	--	43.35	15.54

NM - Not measured (well not yet installed or not located)



SOURCE: JAMAICA QUADRANGLE, NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHIC)

Title:

SITE LOCATION MAP

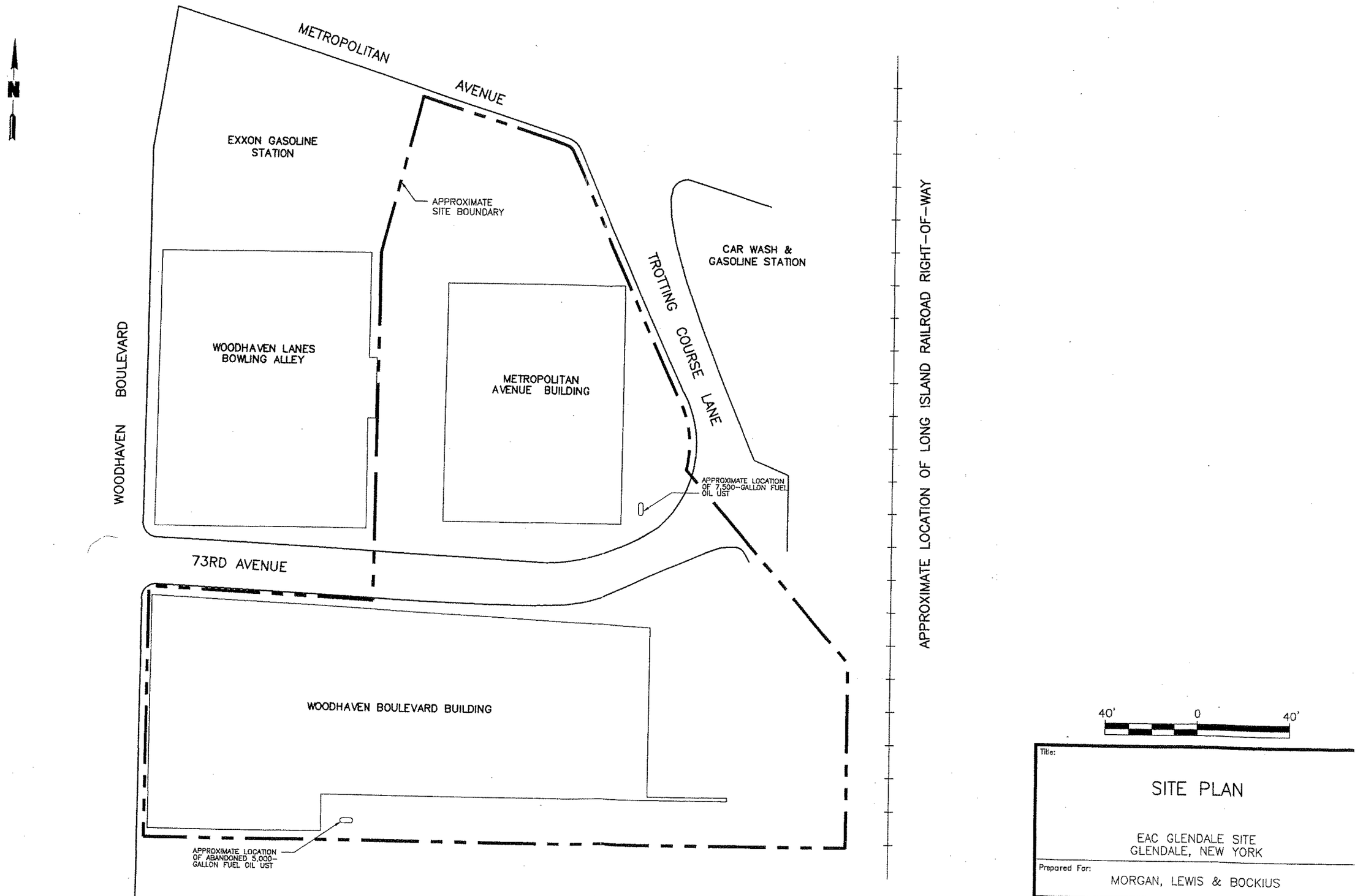
EAC GLENDALE SITE
GLENDALE, NEW YORK

Prepared For:

MORGAN, LEWIS & BOCKIUS

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: L.M.	Date: 10/95	FIGURE
Prepared by: R.K.	Scale: N.T.S.	
Project Mgr: L.M.	Revision:	1
File No: 15204Y	Project: 15204Y	



Title:

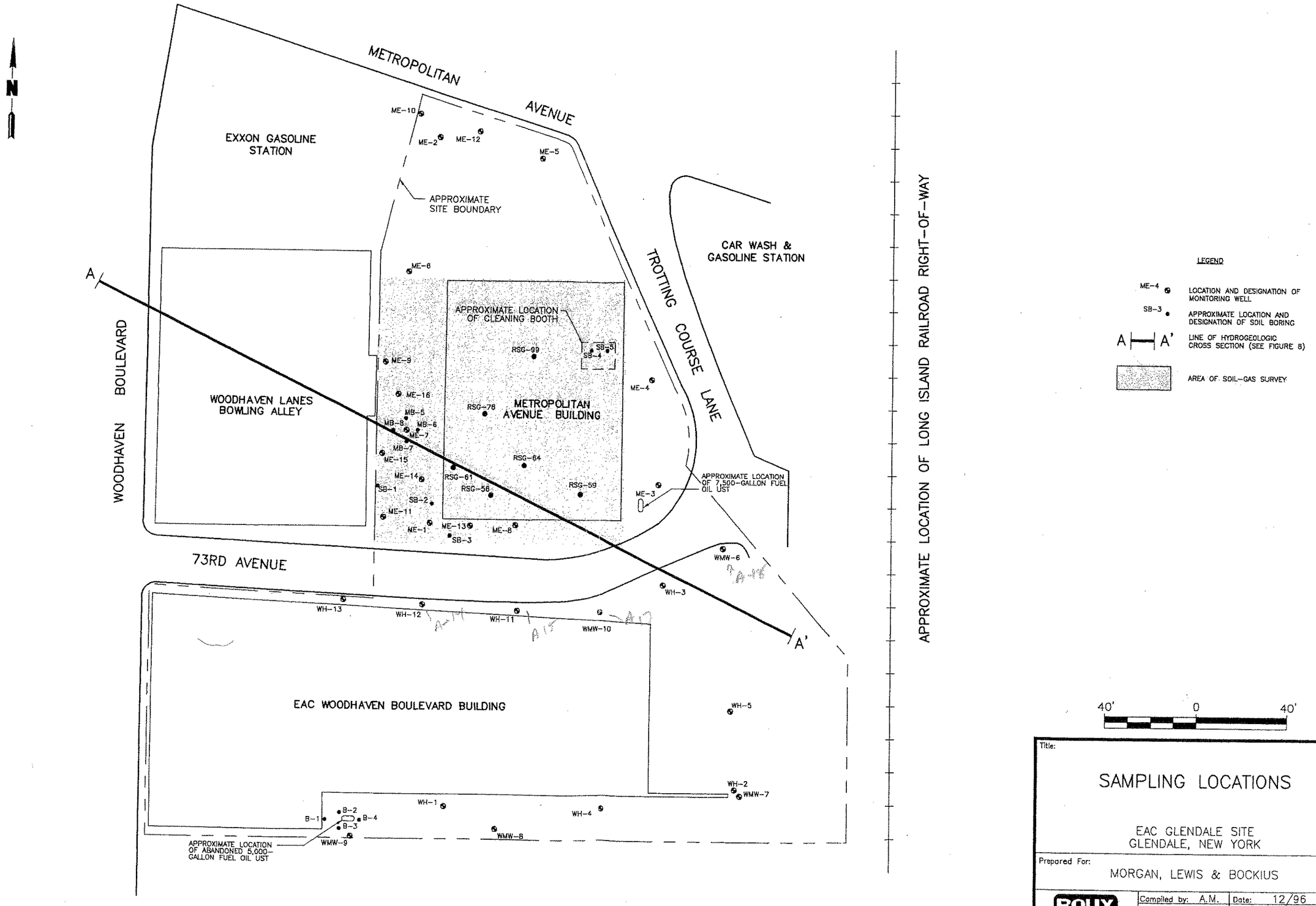
SITE PLAN

EAC GLENDALE SITE
GLENDALE, NEW YORK

Prepared For:
MORGAN, LEWIS & BOCKIUS

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: A.M.	Date: 12/96	FIGURE
Prepared by: R.K.	Scale: As Shown	2
Project Mgr: L.M.	Status: FINAL	
File No: 04106012	Project: 15204Y	



Title:

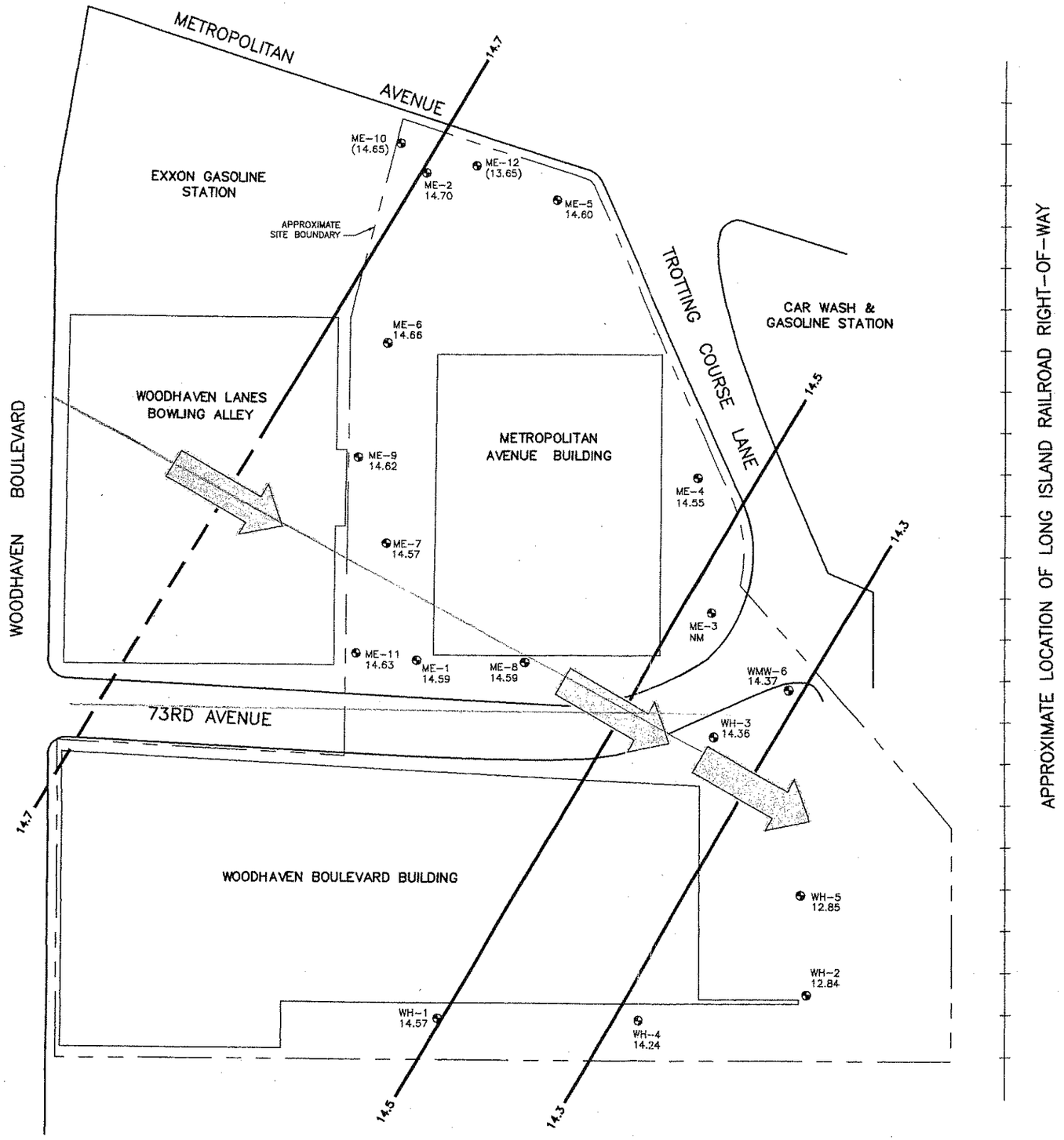
SAMPLING LOCATIONS

EAC GLENDALE SITE
GLENDALE, NEW YORK

Prepared For:
MORGAN, LEWIS & BOCKIUS

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: A.M.	Date: 12/96	FIGURE
Prepared by: R.K.	Scale: As Shown	3
Project Mgr: L.M.	Status: FINAL	
File No: 04106013	Project: 15204Y	



LEGEND

WMW-6 14.37 — LOCATION AND DESIGNATION OF MONITORING WELL; GROUND-WATER ELEVATION, IN FEET ABOVE QUEENSBOROUGH VERTICAL DATUM

NM — NOT MEASURED

14.3 — LINE OF EQUAL GROUND-WATER ELEVATIONS, IN FEET ABOVE QUEENSBOROUGH VERTICAL DATUM (DASHED WHERE INFERRED)

GENERALIZED DIRECTION OF GROUND-WATER FLOW

NOTES:

1. ONLY THOSE WELLS WHICH EXISTED AT THE SITE IN JULY 1995 ARE SHOWN.
2. DATA SHOWN IN PARANTHESES ARE CONSIDERED ANOMALOUS, AND WERE NOT USED TO CONSTRUCT GROUND-WATER FLOW CONTOURS.

40' 0 40'

Title:

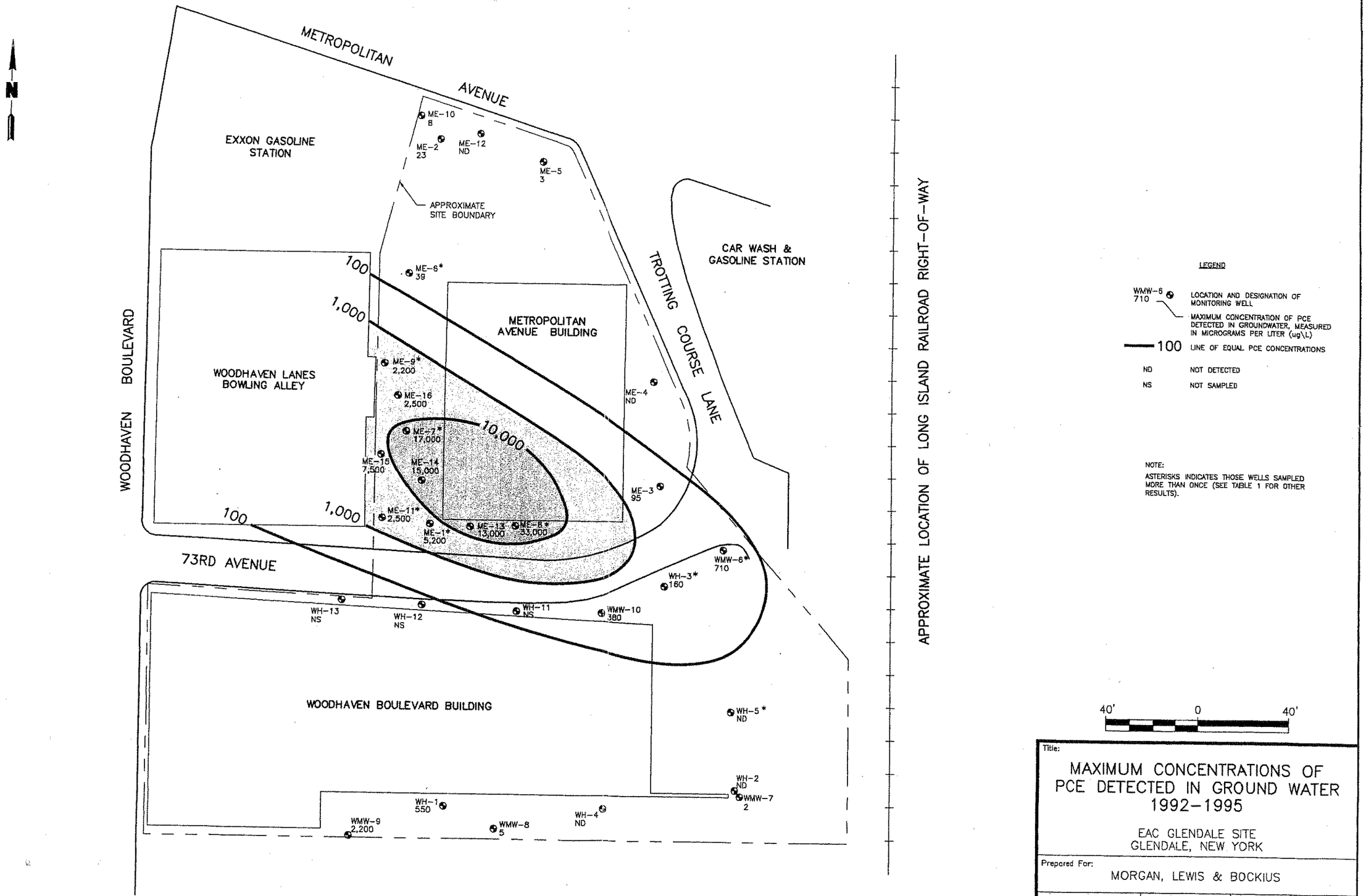
WATER-LEVEL ELEVATIONS AND GENERALIZED GROUND-WATER FLOW DIRECTION JULY 27, 1995

EAC GLENDALE SITE
GLENDALE, NEW YORK

Prepared For:
MORGAN, LEWIS & BOCKIUS

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: A.M.	Date: 12/96	FIGURE
Prepared by: R.K.	Scale: As Shown	5
Project Mgr: L.M.	Status: FINAL	
File No: 04106015	Project: 15204Y	



LEGEND

WMW-6 710 — LOCATION AND DESIGNATION OF MONITORING WELL; MAXIMUM CONCENTRATION OF PCE DETECTED IN GROUNDWATER, MEASURED IN MICROGRAMS PER LITER (ug\L)

100 — LINE OF EQUAL PCE CONCENTRATIONS

ND — NOT DETECTED

NS — NOT SAMPLED

NOTE:
ASTERISKS INDICATES THOSE WELLS SAMPLED MORE THAN ONCE (SEE TABLE 1 FOR OTHER RESULTS).

40' 0 40'

Title:

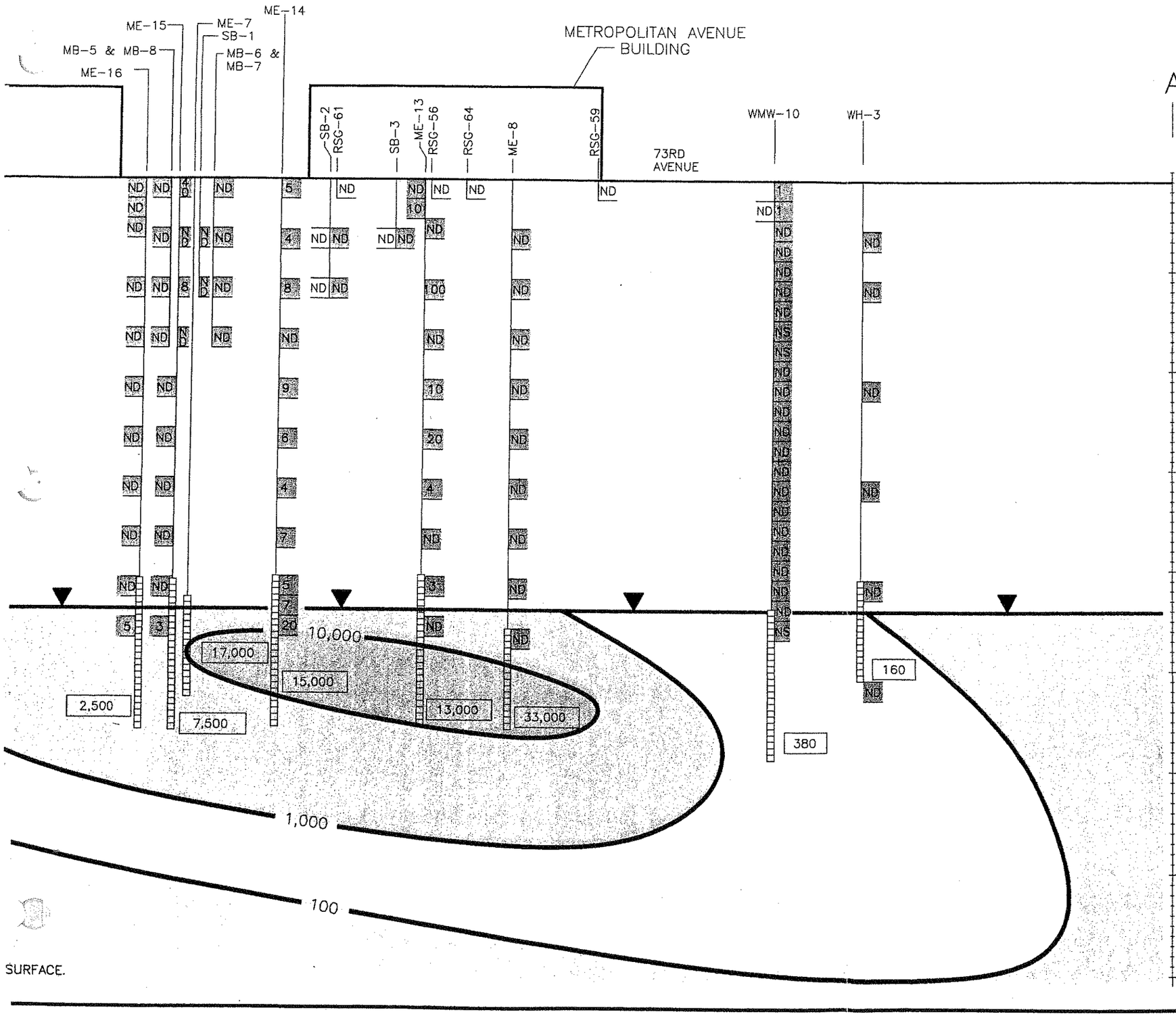
MAXIMUM CONCENTRATIONS OF PCE DETECTED IN GROUND WATER 1992–1995

EAC GLENDALE SITE
GLENDALE, NEW YORK

Prepared For:
MORGAN, LEWIS & BOCKIUS

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: A.M.	Date: 12/96	FIGURE
Prepared by: R.K.	Scale: As Shown	7
Project Mgr: L.M.	Status: FINAL	
File No: 04106017	Project: 15204Y	



EXPLANATION

ND — CONCENTRATION OF TETRACHLOROETHENE (PCE) DETECTED IN SOIL SAMPLE COLLECTED AT DEPTH INTERVAL SHOWN AND ANALYZED AT OFF-SITE LABORATORY, MEASURED IN MICROGRAMS PER KILOGRAM (ug/Kg).

ND — CONCENTRATION OF TOTAL VOLATILE ORGANIC COMPOUNDS (VOCs) IN SOIL SAMPLE COLLECTED AT DEPTH INTERVAL SHOWN AND SCREENED ON-SITE WITH PHOTOIONIZATION DETECTOR, MEASURED IN PARTS PER MILLION (PPM).

WATER TABLE

SCREENED ZONE

160 — MAXIMUM CONCENTRATION OF PCE DETECTED IN GROUND WATER DURING PREVIOUS INVESTIGATIONS, MEASURED IN MICROGRAMS PER LITER (ug/L).

1,000 — INFERRED LINE OF EQUAL PCE CONCENTRATIONS

ND — NOT DETECTED

NS — NOT SAMPLED

NOTE: SEE FIGURE 2 FOR LOCATION OF CROSS SECTION

40' 0 40'

Title:

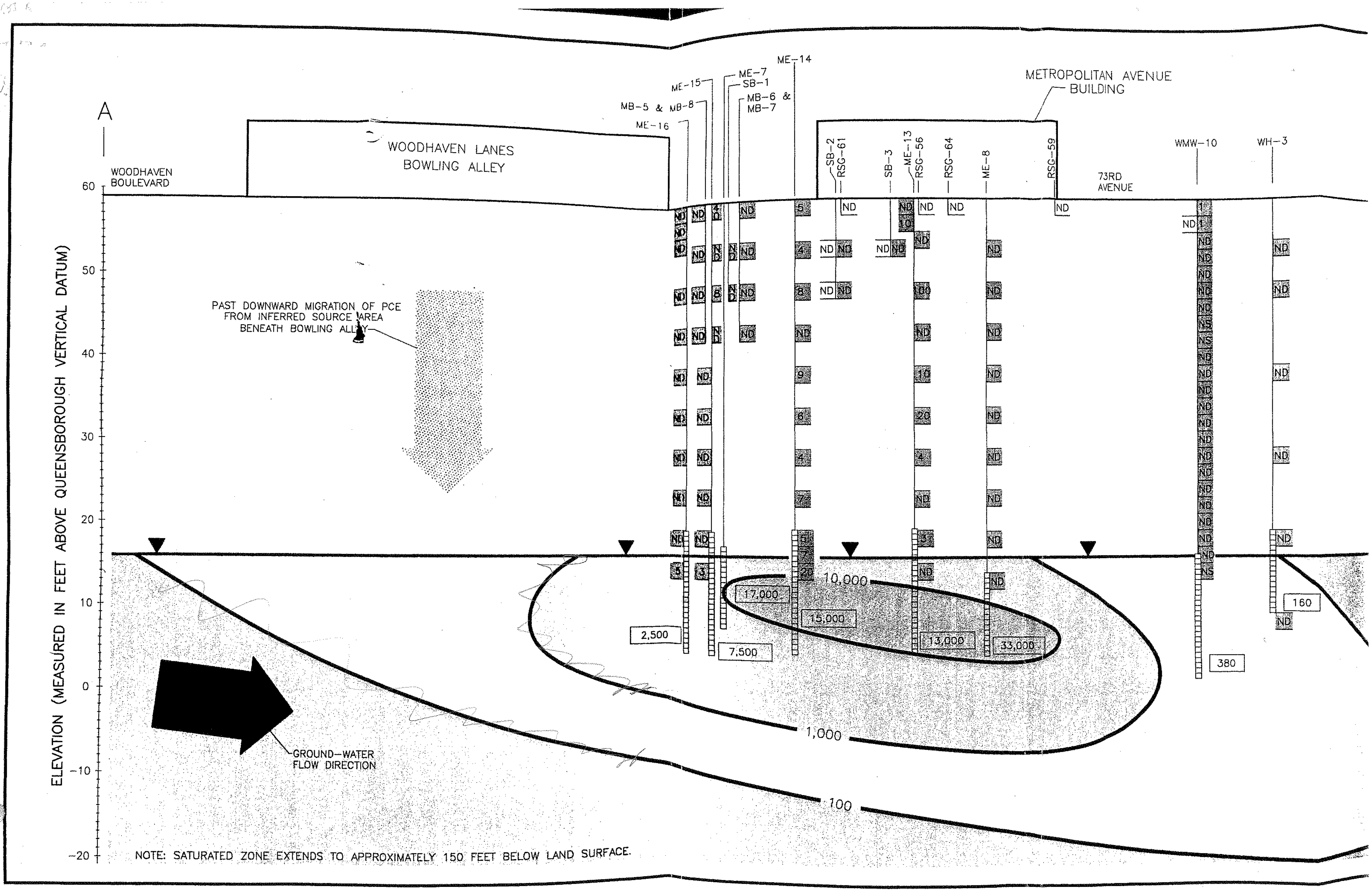
HYDROGEOLOGIC CROSS SECTION A-A'

EAC GLENDALE SITE
GLENDALE, NEW YORK

Prepared For:
MORGAN, LEWIS & BOCKIUS

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: A.M.	Date: 12/96	FIGURE
Prepared by: R.K.	Scale: AS SHOWN	8
Project Mgr: L.M.	Revision: FINAL	
File No: 04106018	Project: 15204Y	



A
WOODHAVEN BOULEVARD
WOODHAVEN LANES BOWLING ALLEY
METROPOLITAN AVENUE BUILDING
73RD AVENUE
ME-14
ME-15
ME-7
SB-1
MB-6 & MB-7
MB-5 & MB-8
ME-16
SB-2
RSG-61
SB-3
ME-13
RSG-56
RSG-64
ME-8
RSG-59
WMW-10
WH-3
ELEVATION (MEASURED IN FEET ABOVE QUEENSBOROUGH VERTICAL DATUM)
PAST DOWNWARD MIGRATION OF PCE FROM INFERRED SOURCE AREA BENEATH BOWLING ALLEY
GROUND-WATER FLOW DIRECTION
10,000
1,000
100
17,000
15,000
13,000
33,000
2,500
7,500
160
380
NOTE: SATURATED ZONE EXTENDS TO APPROXIMATELY 150 FEET BELOW LAND SURFACE.