BUREAU OF HAZARDOUS SITE CONTROL
(DISCOVERY → CLASSIFICATION)
SITE RECORDS FOR THIS SITE

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New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

John P. Cahill
Commissioner

DEC - 2 1997

Mr. Juan E. Davila
United States Environmental Protection Agency
Region 2
290 Broadway
New York, New York 10007-1866

Dear Mr. Davila:

Re: November 13, 1997 Inquiry on
Denton Avenue LF

In response to your inquiry dated November 13, 1997, the present policy of the New York State Department of Environmental Conservation does not support listing any municipal landfills on the NPL.

In this particular case, the Denton Avenue Landfill was delisted from the NYS Registry because there was no documentation of hazardous waste disposal. This site is presently under the purview of our Division of Solid and Hazardous Materials (i.e., Solid Waste). They are the appropriate program for determining any additional work to be done by the town in regard to any ATSDR concerns on methane or in a situation where groundwater contamination threatens a supply well.

Please advise me if I may be of further assistance.

Sincerely,

Robert L. Marino
Chief
Site Control Section
Bureau of Hazardous Site Control
Division of Environmental Remediation

cc: R. Becherer

bcc: J. Swartwout
R. Marino
W. Bayer

WB/srh

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

NOV 13 1997

Mr. Robert L. Marino, Chief
Site Control Section
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, NY 12233-7010

Dear Mr. Marino:

Enclosed please find the summary for the Denton Avenue LF site. The USEPA would like to know if the NYSDEC would support inclusion of the site on the National Priority List or if a better alternative can be offered by the state to address the problems at the site. If you have any questions, please do not hesitate to contact me at (212) 637-4341.

Sincerely yours,

Juan E. Davila
Pre-Remedial section

Attachment

cc. John Malleck, SPB:PRS

Site ID No. 130008

FINAL REPORT

EXPANDED SITE INSPECTION

DENTON AVENUE LANDFILL
NEW HYDE PARK,
NASSAU COUNTY, NEW YORK
EPA ID NO. NY981186919

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
26 Federal Plaza
New York, New York 10278

EPA Work Assignment No.	:	057-2JZZ
EPA Region	:	II
Contract No.	:	68-W9-0024
CDM Federal Programs Corporation Document No.	:	7720-057-LR-CGFN
Prepared By	:	CDM Federal Programs Corporation
Site Manager	:	Scott Graber
Telephone Number	:	(212)393-9634
EPA Project Manager	:	Juan Davila
Telephone Number	:	(212) 637-4341
Date Prepared	:	19 May 1995

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

19 May 1995

Ms. Alison Devine
Project Officer
U.S. Environmental Protection Agency
290 Broadway
18th Floor, Room E34
New York, New York 10007-1866

Mr. Juan Davila
Work Assignment Manager
U.S. Environmental Protection Agency
290 Broadway
18th Floor, Room E27
New York, New York 10007-1866

CONTRACT NO.: 68-W9-0024

WORK ASSIGNMENT NO.: 057-2JZZ

DOCUMENT CONTROL NO.: 7720-057-EP-CGFM

SUBJECT: Expanded Site Inspection Final Report
Denton Avenue Landfill Site
New Hyde Park, New York
Pre-Remedial Investigations
Expanded Site Inspection
DCN: 7720-057-LR-CFGN

Dear Ms. Devine and Mr. Davila:

CDM Federal Programs is pleased to submit the final report on the Expanded Site Inspection (ESI) for the Denton Avenue Landfill site in New Hyde Park, New York as part of the reporting for this work assignment. The final report responds to EPA Comments.

111 Fulton Street, Suite 710 New York, NY 10038 212 393-9634

If you have any questions, please call me at (212) 393-9634.

Very Truly Yours,

CDM FEDERAL PROGRAMS CORPORATION

Robert D. Goltz, P.E.
ARCS II Program Manager

cc:: S. Graber, CDM Federal Work Assignment Manager
S. Boone, CDM Federal, NWJY
P. Boyle, CDM Federal, ARCS II Technical Operations Manager (letter only)
V. Petruzzelli, EPA (letter only)
D. Santella, EPA (lettter only)
K. Franklin, Dynamac
Document Control (2 copies)

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

19 May 1995

Mr. Juan Davila
Work Assignment Manager
U.S. Environmental Protection Agency
18th Floor, Room E27
New York, New York 10007-1866

CONTRACT NO.: 68-W9-0024

WORK ASSIGNMENT NO.: 057-2JZZ

DOCUMENT CONTROL NO.: 7720-057-EP-CGFM

SUBJECT: Expanded Site Inspection Final Report
Denton Avenue Landfill Site
New Hyde Park, New York
Pre-Remedial Investigations
Expanded Site Inspection
DCN: 7720-057-LR-CGFN

Dear Mr. Davila:

CDM Federal Programs Corporation (CDM Federal) is pleased to submit the results of the Expanded Site Inspection (ESI) in the final report for the Denton Avenue Landfill site in New Hyde Park, New York as part of the reporting requirements for this work assignment. The attached deliverable represents a revision of the June 14, 1994 submittal of the Revised Draft ESI Report in response to your written comments in a letter dated December 6, 1994.

This revised document is being submitted in three volumes, as follows:

Volume I - Text and Appendices
Volume II - References
Volume III - References (cont'd)

Characterization samples whose analytical results were presented for the first time in the Revised Draft ESI report dated June 14, 1994 (Document Control No. 7720-057-LR-BZCT), were collected in accordance with the Final Site-Specific Implementation Plan (SSIP). There were no significant deviations in sample and quality assurance/quality control procedures as described in the SSIP. The accuracy and precision requirements for the Routine Analytical Services (RAS), Target Compound List (TCL) and Target Analyte List (TAL) parameters are specified in the

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Contract Laboratory Program (CLP) Statements of Work (SOWs). Analytical methods included current revisions of the CLP SOWs for Organic and Inorganic Analytes, document numbers OLM01.8 and ILM02.1 respectively. The completeness of the resulting sample analytical data, (the amount valid data obtained versus the projected amount of valid data, as a percentage), was between 90 and 100 hundred percent and was considered to be within an acceptable range.

As you requested, the HRS Scoring Summary is presented as a separate submittal to you. The document is clearly marked "confidential".

If you require any further information or have any questions regarding this submittal, please contact me at your earliest convenience at 212/393-9634 or Susan Boone at 908/757-9500.

Very Truly Yours,

CDM FEDERAL PROGRAMS CORPORATION

Susan E Boone

for Scott Graber
Work Assignment Manager

Attachment

FINAL
EXPANDED SITE INSPECTION REPORT
DENTON AVENUE LANDFILL
NEW HYDE PARK, NASSAU COUNTY, NEW YORK
EPA ID NO. NYD981186919

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FINAL
EXPANDED SITE INSPECTION REPORT
DENTON AVENUE LANDFILL
NEW HYDE PARK, NASSAU COUNTY, NEW YORK
EPA ID NO. NYD981186919

1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the U.S. Environmental Protection Agency (EPA), Emergency and Remedial Response Division, Region II, tasked CDM Federal Programs Corporation (CDM), under its ARCS II contract, to conduct an Expanded Site Inspection (ESI) at the Denton Avenue Landfill (the site) in New Hyde Park, Nassau County, New York. Dynamac Corporation has assisted in preparing the ESI under subcontract to CDM. The purpose of the ESI was to collect information concerning conditions at the Denton Avenue Landfill sufficient to assess the threat posed to human health and the environment, to determine the need for additional investigation under CERCLA or other authority and to support a site evaluation using the Hazard Ranking System (HRS) for possible inclusion of the site on the National Priorities List. The investigation included reviewing previous information, sampling environmental media and collecting additional nonsampling information.

2.0 SITE DESCRIPTION

The following sections provide the site location, a description of site features and a discussion of the site's operational history and waste characteristics.

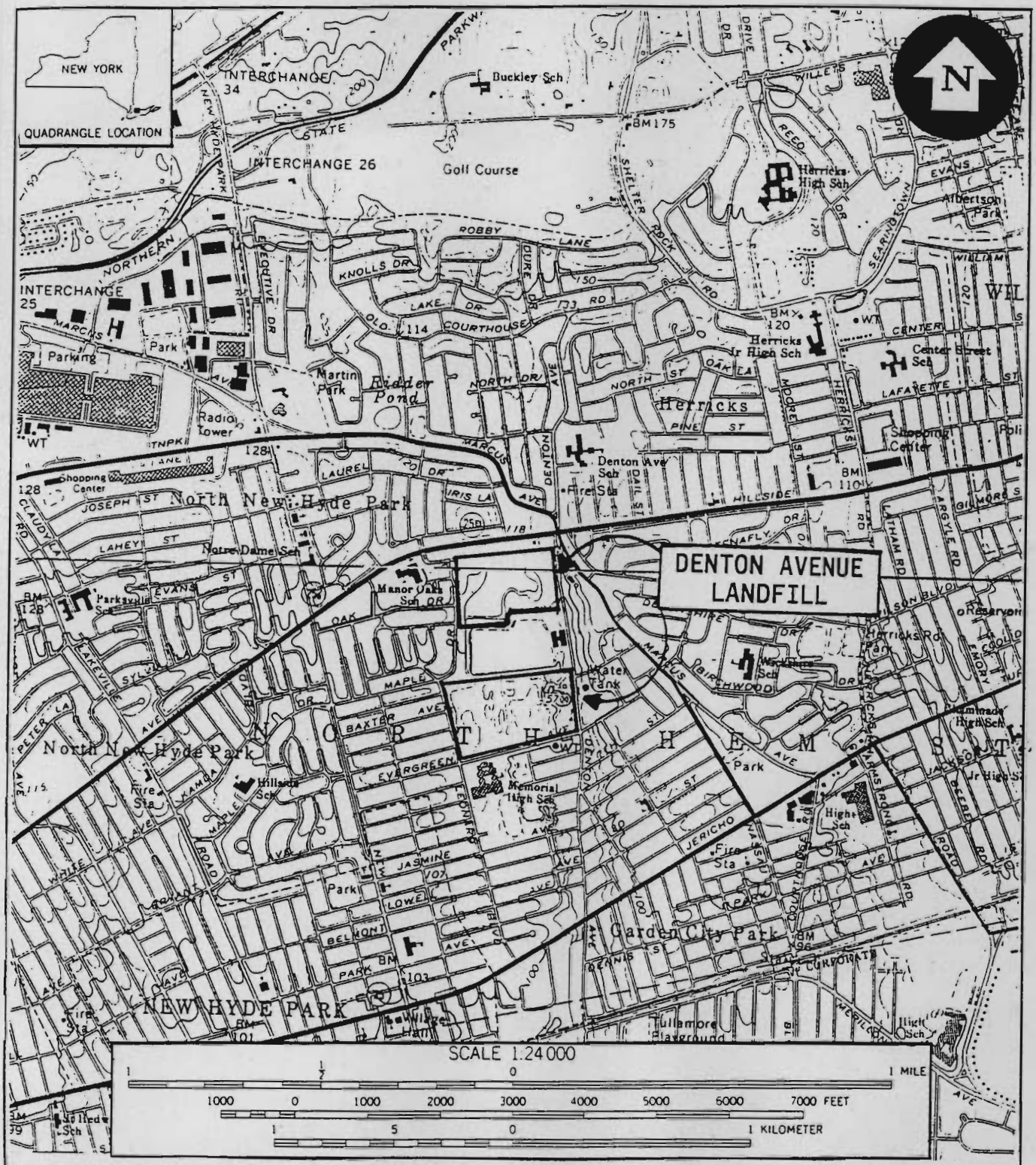
2.1 Location

Denton Avenue Landfill is an inactive municipal landfill located at 40° 44' 48.0" north latitude and 73° 40' 30.0" west longitude in New Hyde Park, Nassau County, New York. The site is bordered

by Hillside Avenue on the north, Denton Avenue on the east, Evergreen Avenue on the south and Leonard Boulevard and Maple Drive on the west (see Figure 1) (Ref. 1).

2.2 Site Description

The Denton Avenue Landfill is surrounded by a combination of residential, commercial and light industrial properties. The site consists of two landfills--a north landfill and a south landfill--each of which is approximately 27 acres in size. The landfills are separated by a county-owned recharge basin. At the time of the ESI, the north landfill, an undeveloped lot largely overgrown with



Source: Base map is a portion of the USGS 7.5 Minute Series Topographic Quadrangle Maps of Lynbrook, New York, 1969 and Sea Cliff, New York, 1968 (Photorevised 1979).

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Environmental Services

Figure 1: Site Location Map
DENTON AVENUE LANDFILL
New Hyde Park, Nassau County, New York

vegetation, was fenced with a locked gate restricting access. A large municipal park and a recreational center are located on the south landfill (see Figure 2) (Refs. 1; 4; 5, pp. 1-1, 1-2; 6, p. 1; 7).

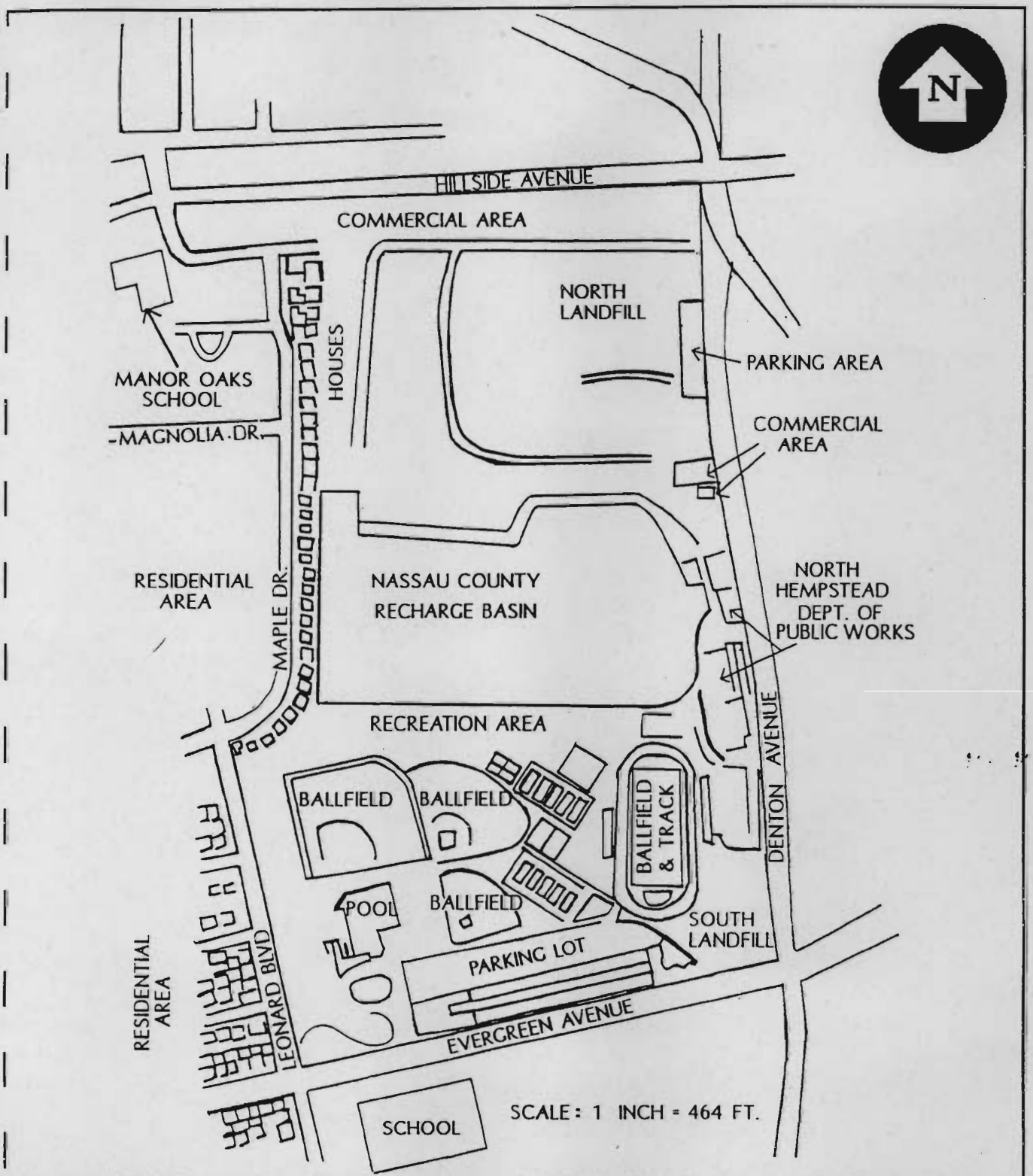
The normal annual total precipitation for this area is 48 inches, and the mean annual lake evaporation is 31 inches, resulting in a net precipitation of 17 inches (Ref. 2, pp. 43, 63). The 2-year, 24-hour rainfall is 35 inches (Ref. 3, p. 95).

2.3 Operational History and Waste Characteristics

Wastes reportedly disposed at both the north and south landfills included municipal refuse and raw garbage. Incidents of miscellaneous dumping may have also occurred at the site. It is unknown whether hazardous wastes have been disposed at the landfills. Neither landfill was lined prior to waste disposal. According to available information, the recharge basin was never used for waste disposal (Refs. 5, p. 1-1; 6, p. 1; 7).

The town of North Hempstead established the south landfill in the early 1950s on approximately 27 acres of land purchased from the Flatlands Sand and Gravel Company. The original purchase also reportedly included an incinerator located onsite; therefore, incineration and disposal of unknown wastes were apparently already occurring onsite. An additional incinerator was built in 1953. The incinerators were reportedly located on the east side of the property, at or near the current location of the North Hempstead Department of Public Works (see Figure 2). The south landfill was excavated to a depth of approximately 45 feet below grade. An estimated 350 to 400 tons of municipal refuse were accepted daily at the landfill, and the majority of the waste was incinerated prior to disposal in the unlined fill area. Available information indicates that raw garbage was also disposed. In 1963, the south landfill was brought to grade and subsequently closed. Sometime after its closure, the south landfill received a cover; however, there is no information concerning the thickness and composition of the cover. The recreational facilities subsequently constructed at the south landfill have reportedly experienced several incidents of structural damage due to settling of the fill (Refs. 4; 5, p. 1-1; 6, pp. 1, 8).

The north landfill was reported to be approximately the same size as the south landfill and was also previously used for sand and gravel mining, evidently by the Colonial Sand and Stone Company. The north landfill was believed to have been excavated to a depth of 40 feet below grade and was also unlined (Refs. 4, p. 2; 6, p. 8; 7).



Source: This sketch was traced from an aerial photograph of the New Hyde Park area obtained from the Nassau County Planning Commission.

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Figure 2: Site Layout Map
DENTON AVENUE LANDFILL
New Hyde Park, Nassau County, New York

The north landfill accepted raw garbage and incinerator ash from 1963 until 1966 and reportedly only incinerator ash from 1966 until 1974. Following closure, a large portion of the north landfill was covered with a partially clayey fill material obtained from excavation activity for extensions to the nearby Northern State Parkway. In some areas, the cover was reported to be between 3 and 5 feet thick (Refs. 4, p. 2; 6, p. 8; 7). Methane vents were installed at the north landfill after reports of methane migration into nearby homes. However, subsequent methane problems evidently continued to occur, including fires and methane readings in the range of 7 to 10 percent. In 1978, a portion of the north landfill was apparently being used as a driving range (Refs. 8; 9; 10; 11).

After closure of the north landfill, the two onsite incinerators continued to operate. The resulting ash was transported to another landfill for disposal until revised air standards forced closure of the incinerators in 1977. In the same year, development of the recreational and athletic facilities began at the south landfill (Refs. 4; 6, pp. 8, 9; 12).

Denton Avenue Landfill was part of a study conducted in 1980 by the Nassau County Department of Health (NCDOH) during which several landfills in Nassau County were monitored for the presence of vinyl chloride in air. Exact sample locations were not provided in available file material; however, no vinyl chloride was detected in any of nine air samples collected onsite (Ref. 13).

In late 1982, with funding from the New York State Department of Health, ERM-Northeast, Inc. installed and sampled five monitoring wells at and near the site as part of a study conducted on behalf of the NCDOH. No background well was included in this study. Analytical results of samples collected from the wells indicated the presence of phthalates in three wells (Refs. 15; 16; 17, pp. 1-1, 1-2, 7-1, 7-3).

In June 1987, EA Science and Technology prepared a Final Phase I Investigation Report for Denton Avenue Landfill on behalf of the New York State Department of Environmental Conservation (NYSDEC). The Phase I Investigation provided an assessment of existing information, but did not include the collection of new analytical data. The HRS assessment resulted in a preliminary migration score value (representing the migration of contaminants) which was the highest attainable for the site. EA Science and Technology recommended that the horizontal and vertical extent of

groundwater contamination be evaluated (Ref. 5). In 1989, based on this assessment, NYSDEC identified the need for a Phase II Investigation, but determined that the Phase II Investigation be placed on hold pending the results of a Site Inspection (SI) then planned by EPA Region II (Ref. 27).

NUS Corporation (NUS), the EPA Region II Field Investigation Team, conducted an SI at Denton Avenue Landfill on June 14 and 15, 1989. NUS collected groundwater samples from two of the five existing landfill wells and three nearby public supply wells, surface soil samples from eight onsite locations and surface water and sediment samples from the recharge basin and from an area of ponded water at the north landfill. No background samples were designated. Analysis of groundwater samples indicated the presence of two volatile organic compounds (VOCs) and numerous inorganic constituents; VOCs are reportedly present in groundwater throughout Nassau County. The soil samples were found to contain numerous inorganic constituents, polynuclear aromatic hydrocarbons (PAHs) (two samples), pesticides (one sample) and polychlorinated biphenyls (PCBs) (three samples). The surface water and sediment samples contained numerous inorganic constituents, and the sediment sample collected from the area of ponded water contained one PCB (Ref. 6, pp. 18, 35-40).

In December 1991, NYSDEC notified the town of North Hempstead that Denton Avenue Landfill had been deleted from the Registry of Inactive Hazardous Waste Disposal Sites in New York State (Refs. 28; 29). This action remanded the site to the NYSDEC Division of Solid Waste, which subsequently found that the cover emplaced in 1974 (over the north landfill) met closure requirements in effect at that time. NYSDEC also strongly advised the town to have any plans for development of the property reviewed and certified by a professional engineer with expertise in landfill design and closure. NYSDEC also recommended provisions for controlling methane gas migration and maintaining cap integrity (Ref. 28).

In August 1992, the Agency for Toxic Substances and Disease Registry (ATSDR) completed a data review and health consultation on Denton Avenue Landfill. This included reviewing excerpts from the 1989 SI report and commenting on the threat to public health and the appropriateness of commercial development (Ref. 30, p. 1). ATSDR concluded that levels of surface soil contaminants did not indicate a health concern. However, ATSDR stated that contaminants in surface water runoff

toward the recharge basin may pose a threat to public health if they enter the aquifer used by municipal water supplies, and that levels of lead in groundwater may constitute a health concern, depending on municipal suppliers' capabilities for analysis and treatment. Finally, ATSDR stated that "the biggest, most immediate threat is the methane and organics that may be migrating from the landfill into the ambient air and into enclosed spaces (buildings)." ATSDR identified an immediate need to conduct ambient and indoor air sampling and to assess the fire and explosion threat (Ref. 30, p. 3).

In January and February 1993, ERM-Northeast, Inc., conducted sampling at the north landfill to support a qualitative risk assessment on behalf of the town of North Hempstead. The town was planning the sale of approximately 14 acres of the north landfill for the development of a privately operated golf driving range. During the 1993 sampling, 22 soil gas samples and 1 ambient air sample were collected. Results of the sampling indicated that over half of the soil gas samples contained methane at levels exceeding the lower explosive limit. Two of the soil gas samples and the ambient air sample were analyzed for VOCs, none of which were detected in the ambient air sample; however, both soil gas samples contained measurable levels of VOCs. The risk assessment report states that, although most of the driving range area to be developed will be either paved, covered by buildings or vegetated, a risk of fire and explosion may be posed by the accumulation of landfill gases in enclosed areas such as manholes or buildings. The report also states that the town of North Hempstead plans to implement preventive measures prior to development (Ref. 14). On October 1, 1993, the town of North Hempstead transferred ownership of 16 acres of the landfill property to an unidentified party for the purpose of developing a golf driving range (Ref. 32).

3.0 SOURCE SAMPLING

The following sections describe sample locations and analytical results for source samples collected during this ESI. Based on directives from EPA, the scope of source sampling included the collection of only subsurface samples from the north landfill. Appendix A provides field log notes for all field activities conducted as part of this ESI.

3.1 Sample Locations

Table 1 presents sample codes, locations and descriptions for all samples collected during the ESI. Eleven subsurface soil samples were collected from five onsite boreholes which were advanced through fill material to characterize the source. Two background subsurface samples (DAL-SB0-01 and DAL-SB0-02) were collected from a borehole advanced through native soil just east of the north landfill. Sample locations are shown in Figure 3. Appendix B provides logs of the soil borings completed during this ESI.

TABLE 1
DENTON AVENUE LANDFILL
NEW HYDE PARK, NASSAU COUNTY, NEW YORK

Sample Codes, Locations and Descriptions

SAMPLE CODE	SAMPLE TYPE	COLLECTION DATE/TIME		LOCATION/DESCRIPTION
DAL-SB0-01	Subsurface soil, shallow interval (Background).	07/19/93	10:55 a.m.	Borehole located east of north landfill in parking lot. Depth, 28-30 feet bls.
DAL-SB0-02	Subsurface soil, deep interval (Background).	07/19/93	11:45 a.m.	Same location as DAL-SB0-01. Depth, 46-48 feet bls.
DAL-SB1-01	Subsurface, shallow interval.	07/21/93	3:30 p.m.	Borehole located in northeast portion of north landfill. Depth, 24-36 feet bls.
DA-SB1-02	Subsurface, deep interval.	07/21/93	5:00 p.m.	Same locations as DAL-SB1-01. Depth, 38-40 feet bls.
DAL-SB2-01	Subsurface, shallow interval.	07/21/93	9:00 p.m.	Borehole located in southeast portion of north landfill. Depth, 26-30 feet bls.
DAL-SB2-02	Subsurface, deep interval.	07/21/93	10:30 a.m.	Same location as DAL:-SB2-01. Depth, 40-42 feet bls.
DAL-SB3-01	Subsurface, shallow interval.	07/19/93	5:20 p.m.	Borehole located in central portion of north landfill. Depth, 18-32 feet bls.
DAL-SB3-02	Subsurface, deep interval.	07/20/93	12:00 NOON	Same location as DAL-SB3-01. Depth, 46-51 feet bls.
DAL-SB4-01	Subsurface, shallow interval.	07/22/93	11:30 a.m.	Borehole located in northwest portion of north landfill. Depth, 24-30 feet bls.
DAL-SB4-02	Subsurface, deep interval.	07/22/93	2:15 p.m.	Same location as DAL-SB4-01. Depth, 50-52 feet bls.
DAL-SB4-03	Subsurface, deep interval.	07/22/93	3:30 p.m.	Duplicate of DAL-SB4-02. Depth, 50-52 feet bls.
DAL-SB5-01	Subsurface, shallow interval.	07/23/93	9:45 a.m.	Borehole located in southwest portion of north landfill. Depth, 24-28 feet bls.
DAL-SB5-02	Subsurface, deep interval.	07/23/93	12:00 NOON	Same location as DAL-SB5-01. Depth, 39-46 feet bls.
DAL-MW-00	Groundwater, new well (Background).*	07/27/93	9:30 a.m.	Monitoring well located east of north landfill. Casing length, 87.6 feet. Screen length, 10 feet.

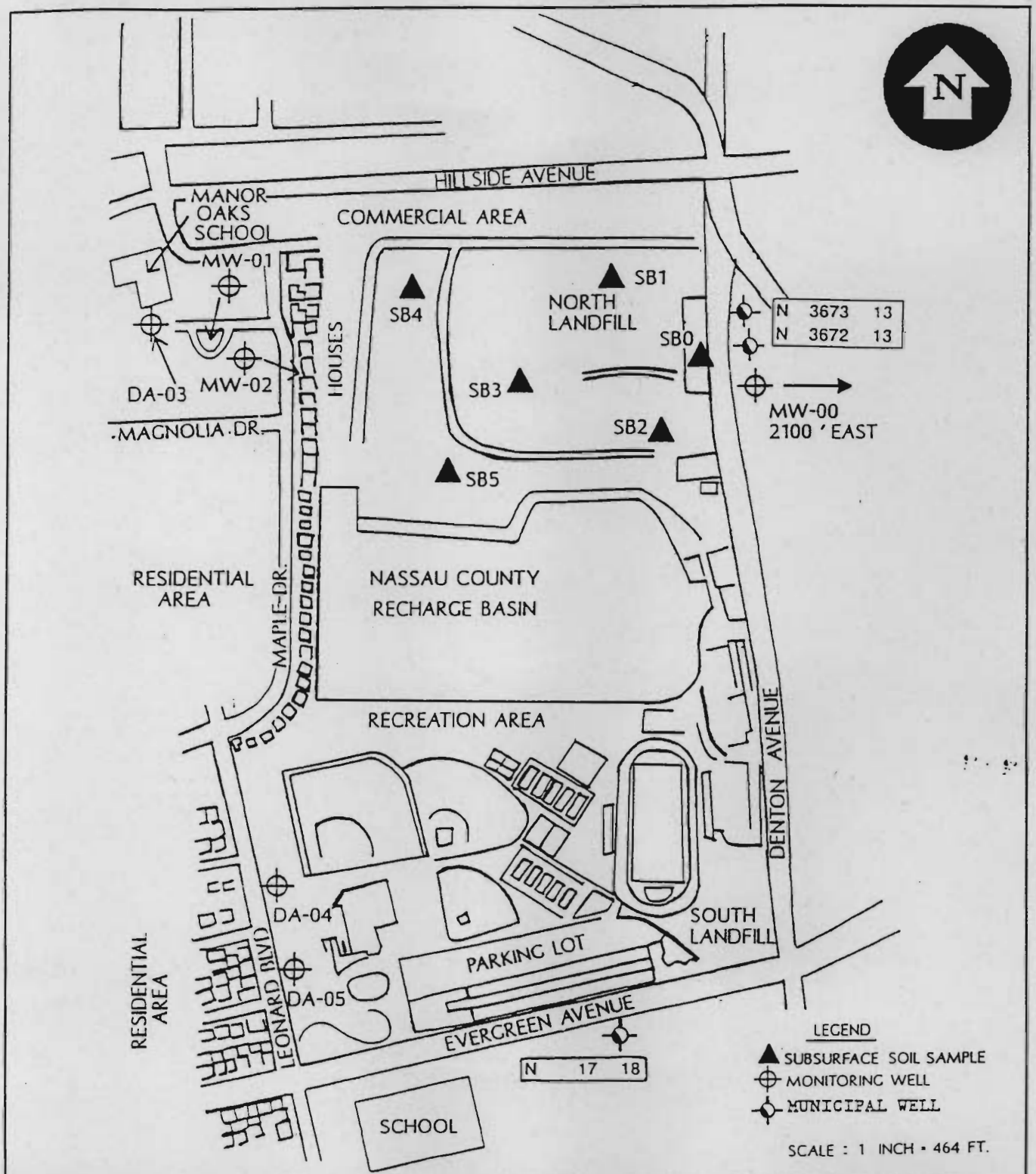
Note: Footnotes for Table 1 are located at the end of the table on page 9.

TABLE 1, Concluded
DENTON AVENUE LANDFILL
NEW HYDE PARK, NASSAU COUNTY, NEW YORK

Sample Codes, Locations and Descriptions

SAMPLE CODE	SAMPLE TYPE	COLLECTION DATE/TIME		LOCATION/DESCRIPTION
DAL-MW-01	Groundwater, new well.*	07/27/93	12:00 NOON	Monitoring well located at western edge of north landfill. Casing length, 89.2 feet. Screen length, 10 feet.
DAL-MW-02	Groundwater, new well.*	07/27/93	2:30 p.m.	Monitoring well located at western edge of north landfill. Casing length, 86.4 feet. Screen length, 10 feet.
DAL-MW-03	Groundwater, new well.*	07/27/93	10:30 a.m.	Duplicate of DAL-MW-00.
PRE-DA-03	Groundwater, existing well.* (collected before development).**	07/26/93	3:30 p.m.	Monitoring well located west of north landfill, near school. Casing length, 90 feet. Screen length, 10 feet.
DAL-DA-03	Groundwater, existing well (collected after development).**	07/26/93	5:00 p.m.	Same location/description as PRE-DA-03.
PRE-DA-04	Groundwater, existing well (collected before development).**	07/26/93	10:30 a.m.	Monitoring well located at western edge of south landfill. Casing length, 85 feet. Screen length, 10 feet.
DAL-DA-04	Groundwater, existing well (collected after development).**	07/26/93	12:00 NOON	Same location/description as PRE-DA-04.
PRE-DA-05	Groundwater, existing well (collected before development).**	07/26/93	1:30 p.m.	Monitoring well located at western edge of south landfill. Casing length, 104 feet. Screen length, 10 feet.
DAL-DA-05	Groundwater, existing well (collected after development).**	07/26/93	2:20 p.m.	Same location/description as PRE-DA-05.

bls = Below land surface
* New wells = Casing, 4-inch diameter polyvinyl chloride Schedule 40.
Screen, 4-inch diameter stainless steel, 0.010 slot size.
** Existing wells = Casing, 2-inch diameter steel.
Screen, 2-inch diameter stainless steel, 0.020 slot size.



Source: This sketch was traced from an aerial photograph of the New Hyde Park area obtained from the Nassau County Planning Commission.

DYNAMAC CORPORATION
Environmental Services

Figure 3 : Sample Location Map
DENTON AVENUE LANDFILL
New Hyde Park, Nassau County, New York

In general, subsurface samples were collected at one "shallow" interval and one "deep" interval from each borehole, yielding 12 samples. The thirteenth sample was a duplicate from the deep interval at one borehole. Ranges of the shallow samples were from 18 to 36 feet below land surface (bls), and ranges of the deep samples were from 38 to 52 feet bls.

3.2 Analytical Results

Appendix C contains data summary tables for all analytical data generated during the ESI. Tables C-1 and C-2 of Appendix C present the organic and inorganic analytical results, respectively, for the subsurface samples. Similarly, tables C-5 and C-6 of Appendix C present analytical results of field blank samples. Appendix D provides raw analytical data for samples collected during the ESI. The concentration of an analyte is considered elevated if the concentration is greater than three times the concentration in the background sample or greater than or equal to the minimum quantitation limit if not detected in the background sample: Please note that this definition also describes the HRS criteria for "observed release." However, since this section describes samples from the source (the landfill), the term observed release does not apply. Instead, the contaminants present at elevated levels are considered to be the contaminants which characterize the source. The minimum quantitation limits are represented in the data summary tables by concentrations presented with "U" qualifiers. Elevated concentrations of the following analytes were detected in subsurface soil samples: 2-butanone (four samples), chlorobenzene (two samples), ethylbenzene (three samples), toluene (one sample), xylenes (total) (two samples), naphthalene (four samples), acenaphthene (two samples), fluorene (three samples), phenanthrene (five samples), anthracene (three samples), di-n-butyl phthalate (two samples), fluoranthene (three samples), pyrene (three samples), butyl benzyl phthalate (two samples), benzo(a)anthracene (three samples), chrysene (three samples), benzo(b)fluoranthene (three samples), benzo(k)fluoranthene (three samples), benzo(a)pyrene (three samples), benzo(ghi)perylene (two samples), indeno(1,2,3-cd)pyrene (two samples), di-n-octyl phthalate (one sample), 4,4'-DDE (three samples), 4,4'-DDD (eight samples), alpha-chlordane (four samples), gamma-chlordane (five samples), PCB-1242 (two samples), PCB-1248 (two samples), PCB-1260 (two samples), antimony (five samples), arsenic (eight samples), barium (nine samples), chromium (four samples), copper (five samples), lead (eight samples), manganese (seven samples), mercury (seven samples), nickel (eight samples), silver (three samples), vanadium (seven samples), zinc (eight samples) and cyanide (three samples).

3.3 Conclusions

Elevated levels of PAHs, pesticides, PCBs and numerous inorganic constituents are associated with subsurface materials at the north landfill. With the exception of a few PAHs and a few inorganic constituents, more analytes were detected at elevated levels in a greater number of shallow interval samples than deep interval samples. One possible contributing factor may be that some of the deep interval samples could have contained material from below the actual waste, thereby causing some dilution of contaminants in the composited matrix. Although each deep sampling interval was terminated at the visually observed lowest point of non-native material, some visual indications may have reflected contaminant migration (i.e., discoloration) as opposed to waste deposit.

4.0 GROUNDWATER MIGRATION PATHWAY

4.1 Hydrogeology

Denton Avenue Landfill is located in the Atlantic Coastal Plain physiographic province in New Hyde Park, Nassau County, New York (Ref. 18, p. 5). The Atlantic Coastal Plain physiographic province in this area is subdivided into three morphologic units: the headlands, the Harbor Hill terminal moraine and the glacial outwash plain (Ref. 18, p. 5). The site is located in the glacial outwash plain which consists of sand and gravel and slopes southward from an altitude of approximately 140 feet above mean sea level (msl) to 80 feet above msl (Ref. 18, p. 6, plate 8). Elevations in the area range from approximately 50 feet above msl to 370 feet above msl. The elevation at the landfill ranges from approximately 60 feet to 100 feet above msl (Ref. 1). The normal annual total precipitation for this area is 48 inches, and the mean annual lake evaporation is 31 inches, resulting in a net annual precipitation of 17 inches (Ref. 2, pp. 43, 63).

Geologic units which underlie the site include, in descending stratigraphic order: outwash plain deposits, undifferentiated Pleistocene deposits, the Magothy Formation, the clay member of the Raritan Formation, the Lloyd Sand Member of the Raritan Formation and crystalline bedrock (Ref. 18, plates 1, 5, 6, 8). The outwash plain deposits describe glacial deposits of upper Pleistocene age in the area of the site. These deposits, which range from approximately 10 feet to 60 feet thick in the area of the site, consist of stratified drift, till and some clay and silt of lacustrine origin (Ref. 18,

p. 22, plate 6). The estimated hydraulic conductivity defined by similar materials is from 1 x 10^{-10} to 2 x 10^{-3} centimeters per second (cm/sec) (Ref. 31). The undifferentiated Pleistocene deposits consist of sand and gravel and are approximately 85 feet thick in the area (Ref. 18, pp. 17-18). Estimated hydraulic conductivity ranges from 9 x 10^{-5} to 3 cm/sec (Ref. 31). The Magothy Formation underlies the undifferentiated Pleistocene deposits and consists chiefly of fine micaceous sand, sandy clay and clay. This formation is approximately 300 feet thick in the area (Ref. 18, pp. 16-17, plate 6). The range of estimated hydraulic conductivity for materials in this formation is from 1 x 10^{-9} to 5 x 10^{-2} cm/sec (Ref. 31). The clay member of the Raritan Formation consists of relatively impermeable solid and silty clay and is approximately 150 thick in the area of the site (Ref. 18, pp. 15-16, plate 6). This material is expected to have an estimated hydraulic conductivity of 1 x 10^{-9} to 1 x 10^{-5} cm/sec (Ref. 31). The Lloyd Sand Member of the Raritan Formation consists of sand and gravel with a clayey matrix. The Lloyd Sand Member ranges from 150 to 200 feet in thickness (Ref. 18, p.15, plate 6). Estimated hydraulic conductivity associated with these materials may range from 4.7 x 10^{-7} to 5 x 10^{-2} cm/sec (Ref. 31). Precambrian crystalline basement rock underlies the Lloyd Sand Member of the Raritan Formation. The Precambrian crystalline bedrock is generally biotite gneiss which may be intruded by granite or pegmatite (Ref. 18, p. 10).

Regional groundwater flow is generally to the west and west-southwest (Ref. 18, pp. 37-39). Hydrologic units underlying the site include the shallow unconfined aquifer (Upper Glacial aquifer), the principal aquifer (Magothy aquifer) and the deep confined aquifer (Lloyd aquifer) (Refs. 18, p. 29; 19, pp. E13, E19, E21). The shallow unconfined aquifer consists of permeable deposits that lie below the main water table and is a source of potable water in the sand and gravel deposits in the glacial outwash plain. Recharge for the shallow unconfined aquifer is from precipitation which falls in the area (Ref. 18, pp. 30-31). The water is produced under unconfined conditions at a rate of approximately 2.5 gallons per minute (gpm) (Ref. 19, p. E13). The principal aquifer, the chief source of potable water in the study area, underlies the shallow unconfined aquifer and is composed of deposits which overlie the Magothy Formation. The principal aquifer is approximately 300 feet thick in the area of the site (Ref. 18, pp. 31-32). The water in the principal aquifer is produced under water-table conditions at a rate of approximately 3.2 gpm (Ref. 19, p. E19). The clay member of the Raritan Formation hydraulically separates the principal aquifer from the deep confined aquifer in the area (Ref. 18, p. 32). The deep confined aquifer consists of the Lloyd Sand Member of the Raritan Formation near the site and underlies the clay member of the Raritan Formation (Ref.

18, p. 32). The deep confined aquifer is approximately 150 feet to 200 feet thick in the area (Ref. 18, plate 6). The water in the deep confined aquifer is produced under artesian conditions at a rate of approximately 2.1 gpm (Ref. 19, p. E21). The principal aquifer and the deep confined aquifer are recharged entirely by downward percolation of water from the shallow unconfined aquifer through the more permeable zones within confining clay bodies (Ref. 18, p. 35). The absence of carbonate rock units near the site characterizes this area as a nonkarstic setting (Ref. 18, pp. 10-28, plates 5, 6).

For the purposes of this evaluation, the aquifers being considered include the interconnected Upper Glacial and Magothy aquifers. The Lloyd aquifer is not included based on the fact that the Raritan Formation confining unit hydrologically separates it from the overlying aquifers. No other aquifer discontinuities have been identified. The average depth to the water table as measured in monitoring wells sampled during the ESI (see Section 4.4) is approximately 62 feet. As previously discussed, wastes were deposited at the landfill into excavations approximately 40 to 45 feet below original grade. The original elevation of the landfilled areas was assumed to be relatively equivalent to that of surrounding areas where monitoring wells were later placed. This assumption yields an interval of approximately 17 to 22 feet between the bottom of wastes and the top of the water table.

4.2 Targets

Potable water within the 4-mile radius of the landfill is supplied by several municipal water companies which obtain drinking water from wells completed in the Upper Glacial or Magothy aquifers. Three municipal wells are located within one-quarter mile of the landfill and are illustrated on Figure 3. Two of the three wells are maintained by the Garden City Park Water District and are located just east of the north landfill. The remaining well is maintained by the Jamaica Water Supply Company and is located just south of the south landfill (Refs. 1; 20, p. 2; 21; 22; 23). Although some municipal wells within 4 miles are completed in the Lloyd aquifer, these wells are not included in this evaluation due to the presence of the confining Raritan Formation, as previously discussed. The estimated population relying on groundwater for drinking water was determined by multiplying the number of connections each water company serves by the 1990 U.S. Bureau of the Census persons per household factors of 2.94 for Nassau County and 2.67 for Queens County, New York

(Refs. 1; 20, p. 3; 24). The estimated population obtaining drinking water from wells located within the 4-mile radius of the landfill is presented in Table 2.

TABLE 2
DENTON AVENUE LANDFILL
NEW HYDE PARK, NASSAU COUNTY, NEW YORK

Population Using Groundwater Within 4 Miles

DISTANCE INTERVAL	NUMBER OF WELLS	SYSTEM NUMBER	PERSONS/WELL IN SYSTEM	POPULATION SERVED*	TOTAL POPULATION IN DISTANCE INTERVAL
0 - 0.25 mile	2	13	1,749	3,498	
	1	18N	3,704	3,707	7,205
0.25 - 0.50 mile	1	13	1,749	1,749	1,749
0.50 - 1 mile	4	12	1,749	6,996	
	2	18N	3,707	7,414	14,410
1 - 2 miles	1	1	2,355	2,355	
	5	12	1,966	9,830	
	4	13	1,749	6,996	
	5	18N	3,707	18,535	
	5	25	1,619	8,095	
	3	27	2,666	7,998	
	2	44	1,764	3,528	57,337
2 - 3 miles	4	1	2,355	9,420	
	4	10	3,020	12,080	
	2	12	1,966	3,932	
	4	18N	3,707	14,828	
	7	25	1,619	11,333	
	3	27	2,666	7,998	
	2	34	1,924	3,848	
	1	37	2,111	2,111	
	2	44	1,764	3,528	69,078
3 - 4 miles	6	5	1,723	10,338	
	4	6	2,046	8,184	
	1	10	3,020	3,020	
	2	12	1,966	3,932	
	7	16	2,904	20,328	
	4	18Q	2,308	9,232	
	6	18N	3,707	22,242	
	2	25	1,619	3,238	
	1	30	853	853	
	5	36	185	925	
	3	37	2,111	6,333	
	2	41	2,823	5,646	
	9	43N	2,460	22,140	116,411
				TOTAL	266,190

* Population = number of wells x number of persons per well in system.

No use of groundwater for any of the following purposes has been identified within 4 miles of the landfill (Ref. 33):

- Irrigation of commercial food or forage crops;
- Watering of commercial livestock;
- Ingredient in commercial food preparation;
- Supply for commercial aquaculture; or
- Supply for a water recreation area (not drinking water).

There are no federally or State-designated Wellhead Protection Areas in Nassau or Queens Counties, New York (Ref. 34).

4.3 Sample Locations

Groundwater samples were collected from six offsite monitoring wells during the ESI. Of the five existing landfill wells installed in 1982, only the following three could be located for sampling: DA-03 located west of the north landfill and DA-04 and DA-05 located west of the south landfill. CDM installed, developed and sampled three new monitoring wells as part of the ESI. At the direction of EPA, the focus of the source sampling during this ESI was the north landfill. Therefore, two of the new wells were installed on the western border of the north landfill. One additional new well was installed offsite to the east of the north landfill to characterize background conditions. Preliminary samples (PRE-DA-03, PRE-DA-04 and PRE-DA-05) were collected from the three existing monitoring wells prior to complete well development in order to reflect static conditions inside the well casings. The preliminary sampling was conducted because during initial inspection and water level measurement, quantities of organic material with an associated distinct odor were encountered inside the well casings. A duplicate sample (DAL-MW-03) was collected from one monitoring well. Two trip blanks (DAL-MW-TB and DAL-MW-TB1) and two field blanks (DAL-MW-FB1 and DAL-MW-FB2) were collected for quality assurance/quality control purposes. None of the groundwater samples were filtered after collection. Table 1 presents sample codes, locations and descriptions, as well as details concerning construction and depths of the new and existing monitoring wells. Table 3 presents field measurements for the groundwater samples. Sample

locations are shown in Figure 3. Appendix E presents logs of the three new monitoring wells installed; logs of the existing wells are shown in Reference 17.

TABLE 3
DENTON AVENUE LANDFILL
NEW HYDE PARK, NASSAU COUNTY, NEW YORK

Groundwater Samples - Field Measurements

SAMPLE CODE	TOTAL DEPTH (FEET BLS)	DEPTH TO WATER TABLE (FEET BLS)	TEMPERATURE (° C)	pH	CONDUCTIVITY (UMHOS)
DAL-DA-03	97.3	72.2	18.5	6.71	195
DAL-DA-04	96.3	60.3	18.0	6.40	150
DAL-DA-05	NR	NR	18.2	7.15	310
DAL-MW-00	97.6	62.3	15.4	5.62	230
DAL-MW-01	99.2	72.4	17.4	6.57	420
DAL-MW-02	96.4	67.7	11.2	6.68	250
DAL-MW-03	97.6	62.3	15.4	5.62	230
PRE-DA-03	97.3	72.2	NR	NR	NR
PRE-DA-04	96.3	60.3	NR	NR	NR
PRE-DA-05	NR	NR	NR	NR	NR

BLS = Below land surface
NR = Not recorded
UMHOS = Micromhos

4.4 Analytical Results

Tables C-3 and C-4 of Appendix C present organic and inorganic analytical results, respectively, of groundwater samples collected during this ESI, and tables C-5 and C-6 present analytical results of field blank samples. Table C-7 presents the analytical results of the trip blanks. Appendix D contains analytical data sheets for all samples collected. The minimum quantitation limits are represented in the data summary tables by concentrations presented with "U" qualifiers. The concentration of an analyte is considered elevated if the concentration is greater than three times the concentration in the background sample or greater than or equal to the minimum quantitation limit if not detected in the background sample.

Several inorganic analytes which were detected at elevated concentrations in source (subsurface soil) samples were also detected at elevated concentrations in groundwater samples (i.e., concentrations which meet observed release criteria). The groundwater sample (DAL-DA-03) collected from a

monitoring well located west of the north landfill contained elevated concentrations of lead and manganese. Elevated concentrations of manganese were detected in groundwater samples (DAL-MW-01 and DAL-MW-02) collected from two other monitoring wells located west of the north landfill. The groundwater sample (DAL-DA-04) collected from a monitoring well located west of the south landfill contained elevated concentrations of lead, manganese, nickel and zinc. The groundwater sample (DAL-DA-05) collected from another monitoring well located west of the south landfill contained elevated concentrations of antimony, copper, nickel and zinc. No organic analytes were detected at elevated concentrations in any of the groundwater samples. No groundwater samples were collected from drinking water wells.

4.5 Conclusions

It is significant to note that duplicate samples were collected from the background well, DAL-MW-00, during the ESI. The inorganic analytical results of these samples correlated closely when compared to each other (see Appendix C, Table C-2).

Several inorganic analytes which were detected at elevated concentrations in source (subsurface soil) samples were also detected at elevated concentrations in groundwater samples collected from monitoring wells. Therefore, an observed release of source-related contaminants to groundwater has occurred. Table 4 illustrates the correlation between the primary groundwater release contaminants and the subsurface soil analytical results. The table lists all of the subsurface soil samples collected during the ESI and indicates the groundwater release contaminants that were detected at elevated levels in each soil sample.

TABLE 4
DENTON AVENUE LANDFILL
NEW HYDE PARK, NASSAU COUNTY, NEW YORK

Groundwater Release Contaminants at Elevated Levels in Soil

SOIL SAMPLE CODE	CONTAMINANTS
SB1	
Shallow	Lead, nickel, zinc
Deep	Manganese, nickel, zinc
SB2	
Shallow	Lead, nickel, zinc
Deep	Lead, manganese, nickel, zinc
SB3	
Shallow	Lead, nickel, zinc
Deep	Lead, manganese, nickel, zinc
SB4	
Shallow	Lead, zinc
Deep	(None)
SB5	
Shallow	Lead, manganese, zinc
Deep	Lead, manganese, nickel, zinc

5.0 SURFACE WATER PATHWAY

5.1 Hydrology

Surface water runoff from the north landfill either collects in a small gully on the east side of the landfill and drains into the recharge basin or drains directly into the basin. Similarly, runoff from the south landfill may drain directly into the basin or is channeled to a storm drain which eventually drains into the recharge basin between the two landfills (Refs. 7; 11).

5.2 Targets

The only perennial surface water body identified as being affected by runoff from the site is the recharge basin located between the north and south landfills. The basin has no identified uses such as fishing or drinking water (Ref. 7).

5.3 Sample Locations

No surface water or sediment samples were collected during the ESI.

6.0 SOIL EXPOSURE AND AIR PATHWAYS

6.1 Physical Conditions

The presence or thickness of a cover over the south landfill is unknown. Since this area is currently a municipal recreation area, it is fully accessible to the public. The north landfill reportedly received a cover having a thickness in some areas between 3 and 5 feet. At the time of the ESI, the north landfill was fenced with a locked gate at the entrance; however, the north landfill has recently been developed as a golf driving range.

6.2 Soil and Air Targets

Demographic information presented below was collected to evaluate the air migration and soil exposure pathways. Possible impacts of airborne contamination were assessed using residential population, workers, schools and sensitive environments within 4 miles of the site. Similarly, potential effects of exposure to surficial contamination at the site were evaluated using accessibility of the site and human and environmental populations onsite and within a 1-mile travel distance.

The currently inactive landfill is located in a commercial, residential and recreational area of New Hyde Park, New York. The landfill is bordered on the north by a commercial area, on the south by Evergreen Avenue, on the west by residential areas and on the east by Denton Avenue. The nearest residences to both the north and south landfills are located approximately 50 feet to the west (Ref. 1). The residential population within a 4-mile radius of the landfill was obtained from the EPA Graphical Exposure Modeling System (GEMS) data base and is distributed as shown below (Ref. 25). Due to inaccuracies inherent to the data retrieval methodology of GEMS, no population was reported by GEMS within one-quarter mile of the landfills. Although residences are present within this distance they are not illustrated individually on the topographic map of the area and could not be quantified.

Radial Distance	Population
0 - 0.25 mile	0
0.25 - 0.50 mile	4,559
0.50 - 1 mile	17,605
1 - 2 miles	61,529
2 - 3 miles	104,299
3 - 4 miles	147,757
Total	335,749

Several federally designated endangered and/or threatened species may inhabit this part of New York; however, no specific habitats within 4 miles of the landfill have been identified (Ref. 26).

6.3 Soil Sample Locations

No surface soil samples were collected during the ESI.

6.4 Air Monitoring

Portable air monitoring instruments, (e.g., an organic vapor analyzer, a photoionization detector and a lower explosive limit meter) were in use during the ESI for health and safety purposes. No formal air monitoring program was conducted.

7.0 SUMMARY AND CONCLUSIONS

Elevated levels of several inorganic constituents were detected in both groundwater samples (observed release) and subsurface soil samples collected as part of the ESI. Elevated levels of numerous PAHs, pesticides and PCBs were also detected in the subsurface soil samples collected during the ESI. Methane and VOCs were detected in soil gas samples collected at the north landfill during the 1993 risk assessment which ERM-Northeast, Inc., conducted. The surface water pathway does not appear to be a primary concern at the site due to the lack of documented uses associated with the recharge basin. The north landfill, which reportedly has a cover 3 to 5 feet thick, is