

360014
1/92

New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
Bureau of Hazardous Site Control
Additions/Change to Registry Summary of Approvals

Site Name Colonial Sand & Gravel DEC I.D. Number 360014

Current Classification 2a

Activity ☐ Add as Class ☐ Reclassify to ☒ Delist Category D2 ☐ Modify ☐

Approvals.

Regional Hazardous Waste Engineer

Yes ☒ No ☐

NYSDOH

Yes ☒ No ☐ Verbal approval received
signed approval being sent
RMB 1/92

DEE

Yes ☒ No ☐

BHSC: a. Investigation Section

Yes ☒ No ☐

b. Site Control Section

Rodney Murray Date 1/10/92

c. Director

S. A. Smith Date 1/10/92

DHWR Assistant Director

1st Charles R. Waller Date 1/10/92

Letter Sent
1/21/92

For Proposed Class 2a Sites Only:

Anticipated Action: _____

By Whom: _____

Time Frame: _____

• 1991 ~ 92 •

10/23/91

REGISTRY SITE CLASSIFICATION DECISION

1991-92

1. SITE NAME Colonial Sand & Gravel	2. SITE NO 360014	3. TOWN/CITY/VILLAGE Bedford	4. COUNTY Westchester
5. REGION 3	6. CLASSIFICATION Current 2a Proposed <u>02</u> Modify		
7. LOCATION OF SITE (Attach U.S.G.S Topographic Map showing site location)			
a. Quadrangle Mount Kisco		b. Site Latitude N 40 deg. 14' 45"	c. Tax Map Number Longitude E 73 deg. 40' 52"
8. BRIEFLY DESCRIBE THE SITE (Attach site plan showing disposal/sampling locations)			
The site was previously used as a sand and gravel quarry for the production of concrete, which is still batched onsite. To the east, the site is bordered by an asphalt production plant currently operated by Peckham Industries and formerly owned by Westchester Colprovia Corporation. Recently, the site has been extensively regraded.			
a. Area <u>2.5</u> acres b. EPA ID Number <u>NY D9P2531857</u>			
c. Completed () Phase I (X) Phase II () PSA () RI/FS () PA/SI () Other			
9. HAZARDOUS WASTES DISPOSED			
One 70-gallon drum excavated from the C&D waste onsite was shown to contain hazardous was by EPToxicity testing for pH (D002), selenium (D010) and cadmium (D006). This drum has been removed and the contents properly disposed of. There is no evidence that any hazardous waste remains onsite.			
10. ANALYTICAL DATA AVAILABLE			
a. () Air (X) Groundwater (X) Surface Water (X) Soil (X) Waste (X) EPTox () TCLP			
b. Contravention of Standards or Guidance Values			
The information is based on the Phase II Investigation Report (submitted August 1989) and the Addendum to the Phase II Investigation Report (submitted July 1991). With the exception of nitrate and TDS in MW-8 and TDS and pH in MW-1, the only contravention of groundwater standards on the site is in monitoring.... (cont. on attached sheet)			
11. JUSTIFICATION FOR CLASSIFICATION DECISION			
There is no evidence that any hazardous waste remains onsite.			
There is no evidence of any significant threat originating from this site.			
12. SITE IMPACT DATA			
a. Nearest surface water: Distance <u>0</u> ft. Direction _____ Classification _____			
b. Nearest Groundwater: Depth <u>7-20</u> ft. Flow Direction <u>W</u> () Sole Source () Primary () Principal			
c. Nearest water supply: Distance <u>200</u> ft. Direction <u>E</u> Active (X) Yes () No			
d. Nearest building: Distance <u>200</u> ft. Direction <u>E</u> Use <u>Asphalt Production</u>			
e. In State Economic Development Zone? () Y (X) N		i. Controlled site access? () Y (X) N	
f. Crops or livestock on site? () Y (X) N		j. Exposed hazardous waste? () Y (X) N	
g. Documented fish or wildlife mortality? () Y (X) N		k. HRS Score _____	
h. Impact on special status fish or wildlife resource? () Y (X) N		l. For Class 2: Priority Category _____	
13. SITE OWNER'S NAME Multi-Owner Site	14. ADDRESS		15. TELEPHONE NUMBER
16. PREPARER <u>Richard H. Dana</u> 12/13/91 Signature Date Richard H. Dana Chief, Bureau of Technical Services, DEE Name, Title, Organization		17. APPROVED <u>Charles W. Goddard</u> Signature Date Charles W. Goddard Asst. Dir., DHWR Name, Title, Organization	

CONTINUATION FOR REGISTRY SITE CLASSIFICATION DECISION

FOR COLONIAL SAND AND GRAVEL
(SITE NO. 360014)

-
10. ...well MW-3 (lead 256 & 297 ppb; 1,1-dichloroethane 23 & 23 ppb; 1,1,1-trichloroethane 210 & 220 ppb; trichloroethene 200 & 210 ppb; and tetrachloroethene 7 & 7 ppb). This contamination has been determined to be from the adjacent Westchester Colprovia inactive hazardous waste site (#360018).

C&D material onsite (tires, plastic, rebar, bricks, a refrigerator, portions of a pickup, three drums) has not been shown to be a hazardous waste by EPToxicity testing, with the exception of the contents of one of the three drums excavated. The contents of this 70-gallon drum were EPToxic for pH, selenium and cadmium. This drum and its contents have since been removed and disposed of properly. The soil in the area where this drum was removed from the C&D pile, where leakage did occur during removal, showed very low levels of contamination: 5 ppb cadmium, less than 2 ppb selenium, 36 ppb lead, and a pH of 9.24. The amount of leakage is unknown, but could have been as much as 50 gallons. _k

Two C&D samples did show elevated levels of antimony, cadmium, chromium, copper, lead, nickel, and zinc in relation to levels in surrounding soils. These levels may be attributable to the use of industrial fly ash as an additive in concrete.

Surface water samples from the onsite pond were uncontaminated.



STATE OF NEW YORK DEPARTMENT OF HEALTH

Corning Tower

The Governor Nelson A. Rockefeller Empire State Plaza

Albany, New York 12237

Lorna McBarnette
Executive Deputy Commissioner

OFFICE OF PUBLIC HEALTH
Sue Kelly
Executive Deputy Director

January 9, 1992

Mr. Michael O'Toole
NYS Dept. of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, New York 12233

RE: Colonial Sand and Gravel
Site ID #360014
Bedford/Westchester County

Dear Mr. O'Toole:

In response to your request for an expeditious review, my staff has evaluated the attached Registry Site Classification Decision document for the above referenced site. Based on available information, we concur with the proposal to remove the site from the Registry of Inactive Hazardous Waste Sites, and have indicated our approval on the attached document. If you should have any questions, please contact Mr. John Olm, of my staff, at (518) 458-6310.

Sincerely,

G. Anders Carlson, Ph.D.
Director
Bureau of Environmental Exposure
Investigation

JMO/20090113

Attachment

cc: Mr. S. Bates/Mr. J. Olm
Ms. L. Hendricks - WCDOH
Mr. R. Pergadia - DEC, Reg. 3

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

012398

CLASSIFICATION CODE: D2

REGION: 3

SITE CODE: 360014

EPA ID: NYD982531857

NAME OF SITE : Colonial Sand and Gravel

STREET ADDRESS: Harris Road

TOWN/CITY:

COUNTY:

ZIP:

Bedford

Westchester

10506

SITE TYPE: Open Dump- X Structure- Lagoon- Landfill- Treatment Pond-

ESTIMATED SIZE: 2.5 Acres

SITE OWNER/OPERATOR INFORMATION:

CURRENT OWNER NAME....: Nappi Colonial Concrete

CURRENT OWNER ADDRESS.: [REDACTED]

OWNER(S) DURING USE....:

OPERATOR DURING USE....: Colonial Sand & Gravel

OPERATOR ADDRESS.....: Harris Rd., Bedford, NY

PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From Unknown To Present

SITE DESCRIPTION:

The site has been used for sand and gravel operations. According to the owner's environmental consultant, construction debris, household wastes and other wastes of unknown composition, have been disposed of at the site. More than 50 abandoned 55-gallons drums of waste (many of which were corroded) were found. An on-site pond has been used for cement disposal. Wells placed downgradient of the disposal location have shown the presence of benzene and other related compounds.

A DEE consent order has been signed for a responsible party Phase II investigation. A Draft Phase II report has been submitted and additional sampling by the responsible party was requested. The responsible party has completed the additional field work on the Phase II.

The results of the Phase II Investigation has revealed that only one 70-gallon drum excavated from the C&D waste on site was shown to contain hazardous waste. The drum contents failed EP-Toxicity testing for pH (D002), selenium (D010), and cadmium (D006). This drum has been removed and the contents properly disposed of.

There is no evidence that any hazardous waste remains onsite.
There is no evidence of any significant threat attributable to hazardous waste originating from this site.

HAZARDOUS WASTE DISPOSED:

TYPE	QUANTITY (units)
one drum of hazardous waste which failed EP-Tox testing for pH (D002), selenium (D010), and cadmium (D006).	70 gallons

SITE CODE: 360014

ANALYTICAL DATA AVAILABLE:

Air- Surface Water- Groundwater-X Soil- Sediment-

CONTRAVENTION OF STANDARDS:

Groundwater-X Drinking Water- Surface Water- Air-

LEGAL ACTION:

TYPE...: Consent Order-DEE State- X Federal-
STATUS: Negotiation in Progress- Order Signed- X

REMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-
NATURE OF ACTION:

GEOTECHNICAL INFORMATION:

SOIL TYPE: Sand, gravel, clay and silt
GROUNDWATER DEPTH: 7-20 feet

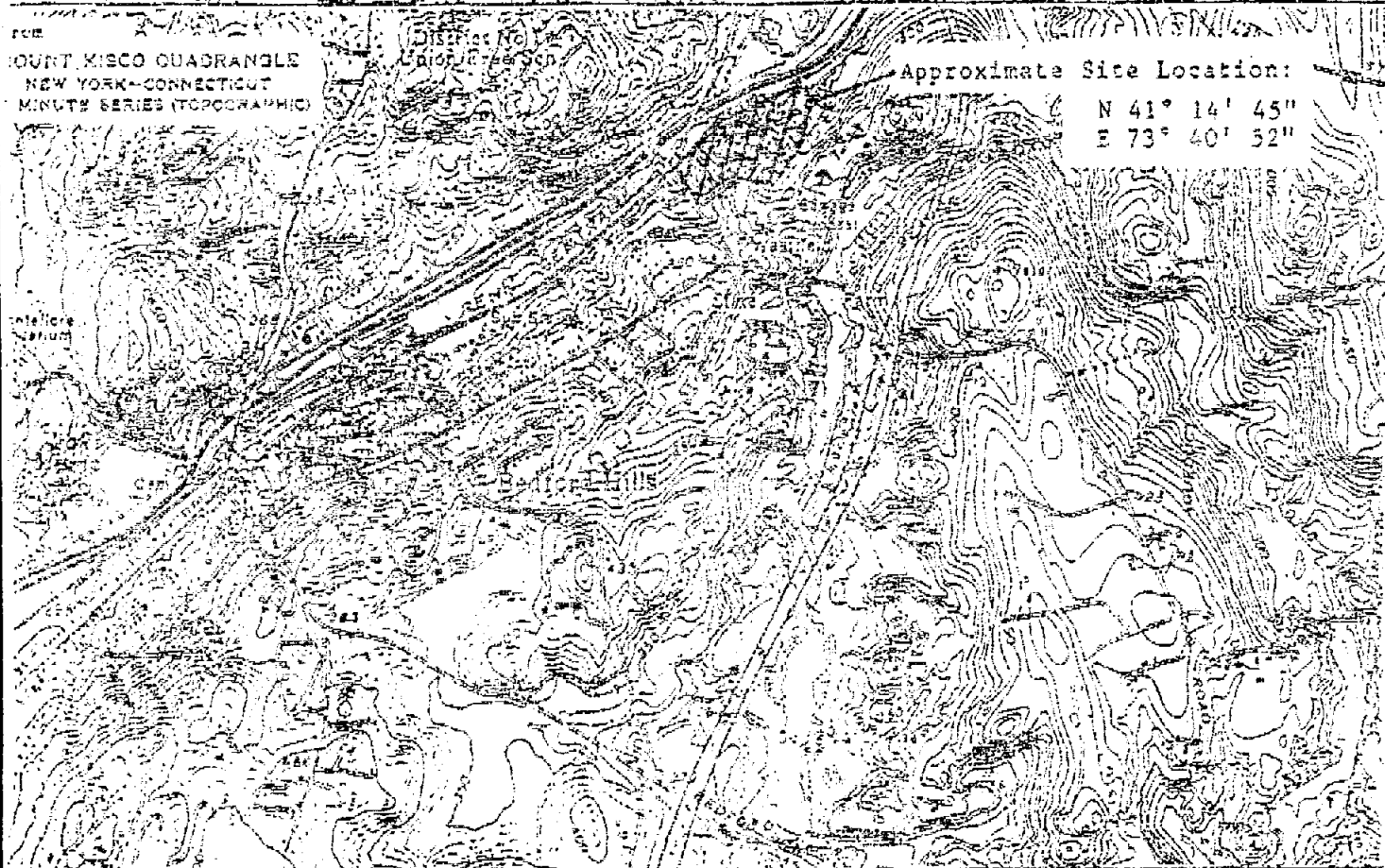
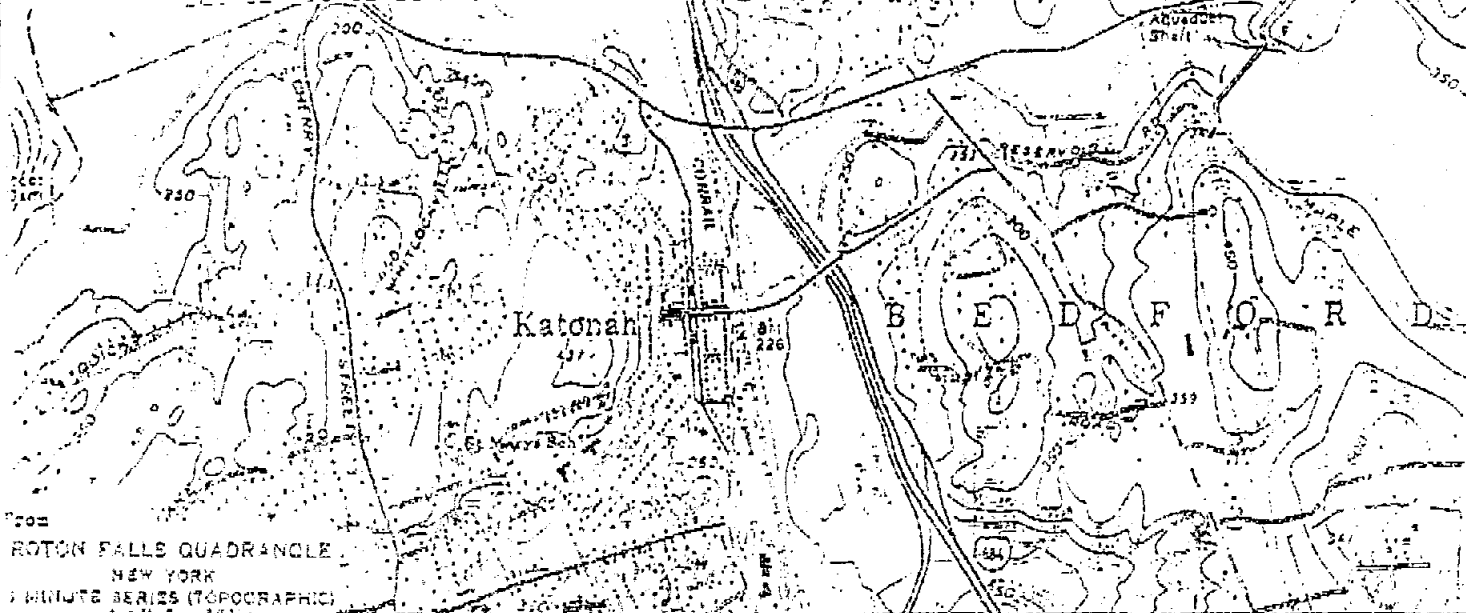
ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Contamination of groundwater has been determined to be from an adjacent site.

There is no evidence that hazardous waste remains at this site.

There are no environmental problems associated with the disposal of hazardous waste at this site.

ASSESSMENT OF HEALTH PROBLEMS:



Approximate Site Location:

N 41° 14' 45"
E 73° 40' 32"

Location of the
Colonial Sand and Gravel Site
Bedford, New York

PREPARED FOR

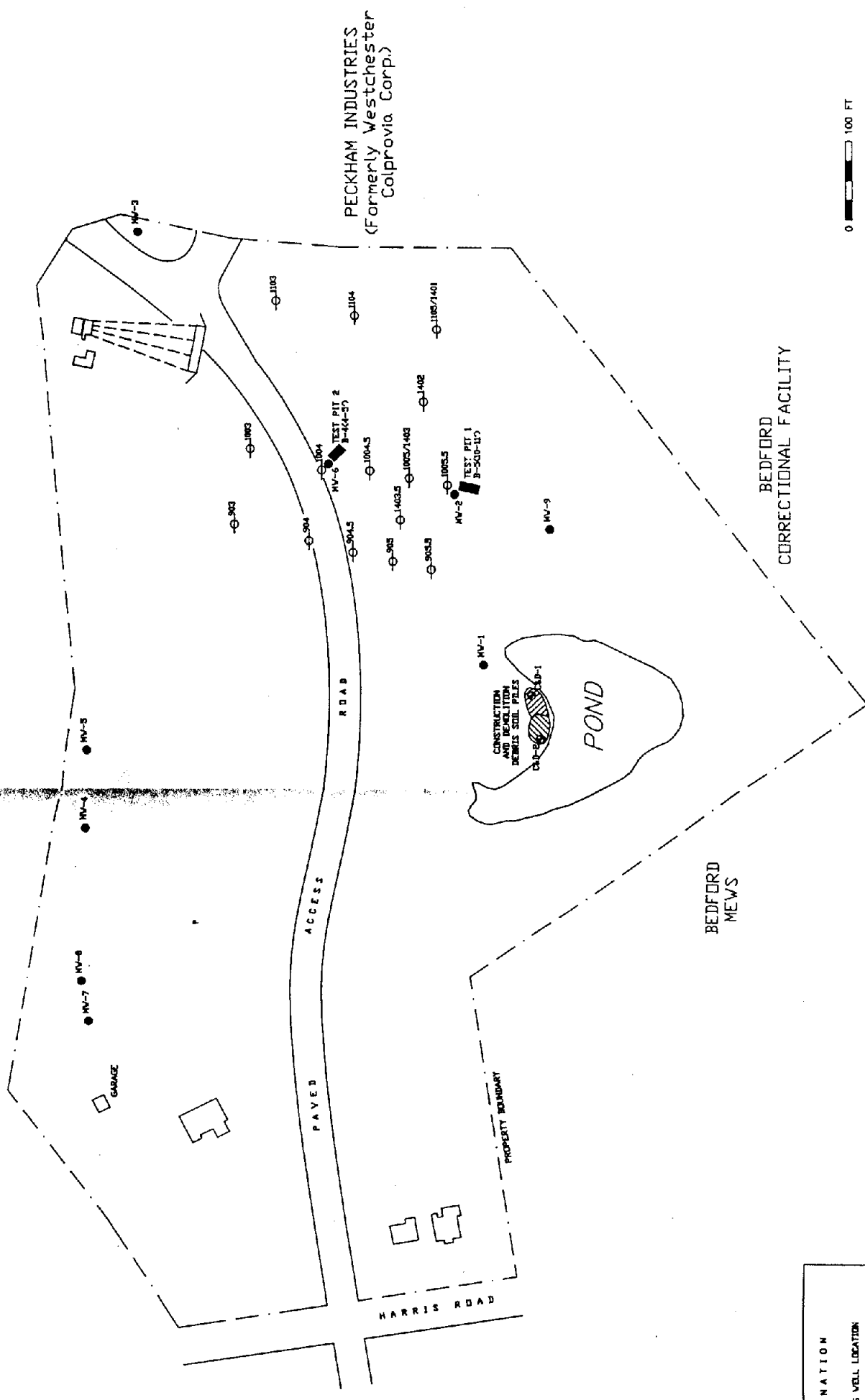
Berle, Kass and Case

Geraghty
& Muller, Inc.

DESIGNED BY M. Findlay
CHECKED BY H. Findlay
APPROVED BY J. Baron

Scale
1" = 1000'
DATE 3/89

FIGURE
1



**GERAGHTY
& MILLER, INC.**
Environmental Services

JULY 19, 1990 TEST PIT AND SOIL SAMPLING LOCATIONS
WITH PHASE I INVESTIGATION ELECTROMAGNETIC SURVEY POINTS

COLONIAL SAND AND GRAVEL
BEDFORD, NEW YORK

FIGURE

Table 1

DRAFTER: GS

APPROVED: NC

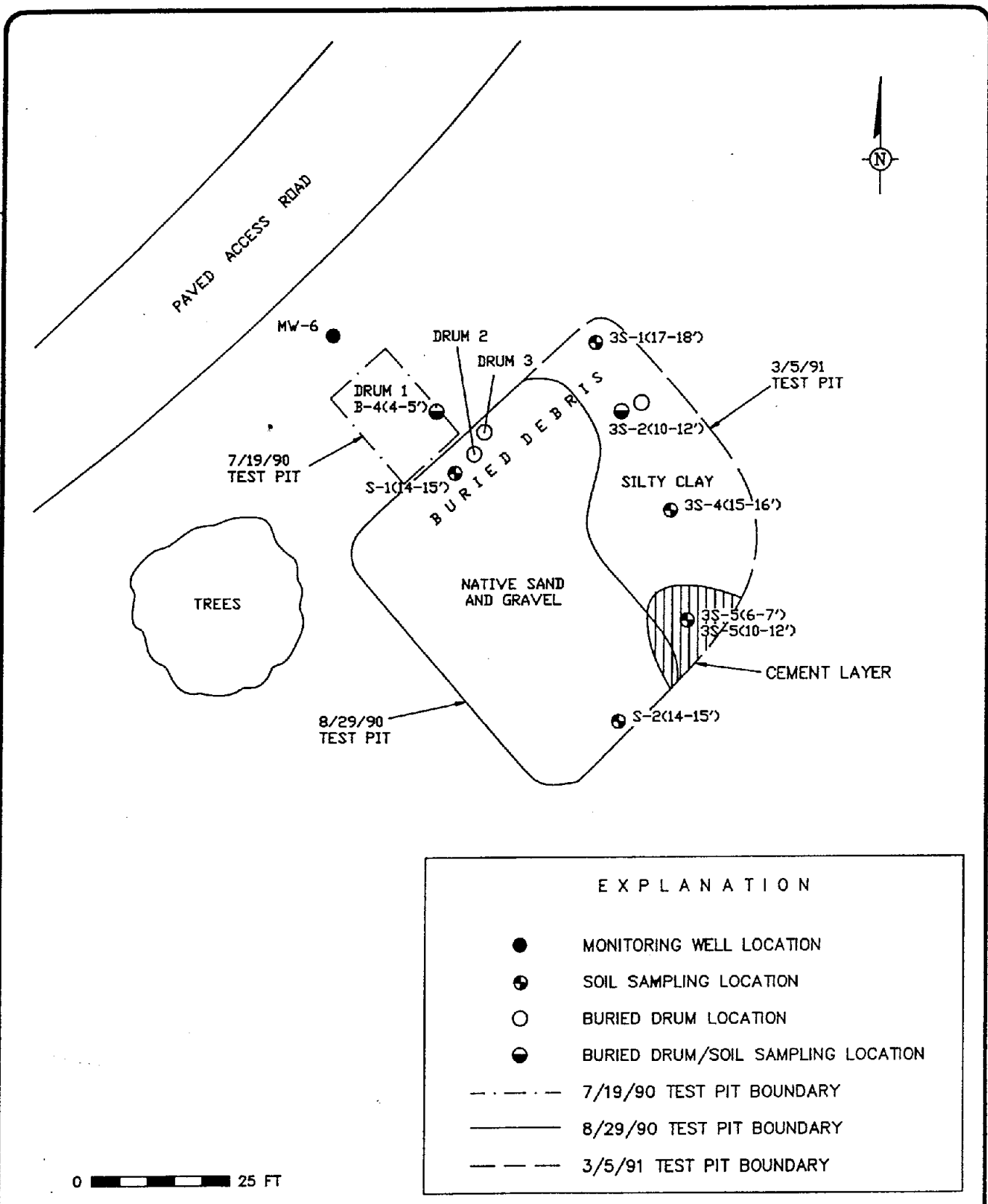
CHECKED: GKS

DRAWING: TESTPITS

FILE NO.: 1414

PRJCT NO.: NJ00802

DWG DATE: 6-6-91



CONFIGURATION OF TEST PITS AND SOIL
SAMPLING LOCATIONS IN THE VICINITY OF
MONITORING WELL MW-6

COLONIAL SAND AND GRAVEL
BEDFORD, NEW YORK

FIGURE

2

Table 7. Field Measurements of Water Samples, Colonial sand and Gravel, Bedford, New York.

	pH (Standard Units).	Temperature (cent.)	Specific Conductance (umhos/cm)
MW-1	11.35	13	2800
MW-2	6.35*	13*	370*
MW-3	4.45*	13*	660*
MW-3 (Dup.)	NT	NT	NT
MW-4	5.55	12	570
MW-5	4.85*	13*	480*
MW-6	6.75	12	240
MW-7	6.05	14	500
MW-8	6.35	14	820
MW-9	5.15*	14*	900*
Pond	6.75*	22*	1850*
Field Blank	6.35	24	70

* - Measurements taken when the instrument could not be calibrated correctly.
 NT - Not tested.

Table 4. Volatile Organics and Total Metals Concentrations in Soils, Colonial Sand and Gravel, Bedford, New York.

Volatile Organic Compounds	B-1(2-4')	B-2(4-6')	B-3(0-2')	B-4(6.5-8')	RJDEP** Guidelines
Acetone (ug/kg)	96	63	13	160	...
Tentatively Identified Compounds (ug/kg)		ND			
2-Ethyl-1-hexanol	410J		270J		
Unknown	940J		7.13		
Total Metals**					
	B-1(2-4')	B-2(4-6')	B-3(0-2')	B-4(6.5-8')	RJDEP** Guidelines
Antimony (mg/kg)	ND	ND N	ND N	ND N	
Arsenic (mg/kg)	17.50 B,S	7.80 N*	2.60 B*	4.10	20
Beryllium (mg/kg)	0.58 B	0.69 B	0.50 B	1.20 B	
Cadmium (mg/kg)	ND	ND	ND	ND	3
Chromium (mg/kg)	28.70 *	5.90 *	6.30 *	31.20 *	100
Copper (mg/kg)	28.00	15.00	10.50	91.20	170
Lead (mg/kg)	13.00 N,S	10.20 N,S	5.80 N	20.50	250
Mercury (mg/kg)	ND	ND	ND	ND	1
Nickel (mg/kg)	23.70	ND	ND	43.70	100
Selenium (mg/kg)	ND N,W	0.39 B,N,W	ND N,W	ND B,W	4
Silver (mg/kg)	ND N	ND N	ND N	2.90 B,N	5
Sodium (mg/kg)	407.00 B	281.00 B	208.00 B	410.0 B	
Thallium (mg/kg)	ND	ND	ND	ND	
Zinc (mg/kg)	30.50	28.40*	27.50*	109.00	350

** - New Jersey Department of Environmental Protection Guidelines for Soils Cleanup Under the Environmental Cleanup Responsibility Act (ECRA).

*** - 1000 ug/kg total volatiles.

N - Matrix spike sample not within control range.

B - Concentration is less than the CRDL but greater than the IDL.

W - Furnace/AA spike analysis is out of control while the sample absorbance is less than 50% of spike absorbance.

S - Determined by the method of standard additions.

* - Matrix spike duplicate analysis not within control range.

ND - Not detected.

J - Estimated concentration.

Table 3. Water-Level Data for the Colonial Sand and Gravel and Westchester Colprovia Sites, Bedford, New York

Well No.	Surveyed* Elevation Top of Casing	July 7, 1989		August 6, 1989		August 22, 1989	
		Depth to Water (Feet)	Water-Level Elevation*	Depth to Water (Feet)	Water-Level Elevation*	Depth to Water (Feet)	Water-Level Elevation*
<u>Colonial Sand & Gravel Wells</u>							
MW-1	188.56	8.47	180.09	9.74	178.82	9.00	178.76
MW-2	181.43	13.51	167.92	15.12	166.31	15.05	166.38
MW-3	181.64	17.98	163.66	19.38	162.26	19.34	162.30
MW-4	217.21	49.46	167.75	50.63	166.58	50.65	166.56
MW-5	209.06	42.03	167.03	43.24	165.82	43.25	165.81
MW-6	177.11	11.25	165.86	12.65	164.46	12.62	164.49
MW-7	231.81	62.18	169.63	63.30	168.51	63.42	168.39
MW-8	230.06	60.78	169.28	61.83	168.23	62.01	168.05
MW-9	200.64	3.09	197.55	7.12	193.52	4.83	195.81
<u>Westchester Colprovia Wells</u>							
W-1	220.44	16.43	204.01	16.64	203.80	16.54	203.90
W-2	185.29	..	..	3.17	182.12	..	..
W-3	190.84	29.66	161.18	29.74	161.10	29.63	161.21
W-4	190.10	30.65	159.45	30.70	159.40	30.60	159.50
W-5	213.18	33.38	179.80	37.31	175.07	37.93	175.25
W-7	180.94	16.57	164.37	16.23	164.71	16.12	164.82
W-8	173.82	10.81	163.01	10.90	162.92	10.86	162.96
W-9	203.98	37.67	166.11	38.58	165.40	38.79	165.19
W-10	173.61	10.62	162.99	10.73	162.88	10.66	162.95
W-11	172.06	8.24	163.02	8.41	163.65	8.36	163.70

* - Feet above mean sea level.

.. - Not available.

Table 2. Selected Information for Water Supply Wells Penetrating the Sand and Gravel Aquifer Within One Mile of the Colonial Sand and Gravel Site, Bedford, New York.

Well No.	Owner	Date Completed	Approximate Surface Elevation*	Total Depth (Feet)	Reported Yield (gpm)	Remarks
P-1	Town of Bedford	-	220	44	100	
P-2	Town of Bedford	-	210	32	400	Water contaminated with 50-100 ppb tetrachloroethylene; no longer in use.
P-3	Town of Bedford	8/79	265	72	300	
P-4	Town of Bedford	4/85	-	45-50	-	
P-5	Town of Bedford	4/85	-	45-50	-	
P-6	Village of Mt. Kisco	9/50	306	53	150	
P-7	Village of Mt. Kisco	9/50	300	58	70	
P-8	Village of Mt. Kisco	9/50	300	166	70	
C-1	Colonial Sand and Gravel	-	169	10	500	
C-2	Westchester Colprovia	-	159	-	-	
M-1	Bedford Correctional Facility	-	278	45-50	300	Well field consists of seven wells.
M-2	Bedford Correctional Facility	-	279	45-50	350	Well field consists of two wells.
M-3	Montefiore Hospital	-	315	24-35	12-42	Well field consists of seven wells.
D-1	G.D. Scott	5/51	428	9	-	

* Feet above mean sea level.

Table 1. Monitoring Well Construction Details, Colonial Sand and Gravel, Bedford, New York

Well No.	Surveyed		Stick-Up (feet)	Total Depth (Feet Below Grade)	Screened Interval (Feet Below Grade)	Screen Length (Feet)	Well Diameter (Inches)	Slot Size (Inches)	Screen and Riser Material	Geologic Deposit Screened	Date Installed
	Elevation Top of Casing										
MW-1	188.56		2.7	23	7.6-22.6	15	2	0.010	PVC	Unconsolidated	12/86
MW-2	181.43		2.7	16	6-16	10	2	0.010	PVC	Unconsolidated	12/86
MW-3	181.64		2.9	29.4	9.4-29.4	20	2	0.010	PVC	Unconsolidated	12/86
MW-4	217.21		1.90	60	4.8-50	10	4	0.010	PVC	Unconsolidated	5/89
MW-5	209.06		1.20	52	40-50	10	4	0.010	PVC	Unconsolidated	5/89
MW-6	177.11		1.34	22	9-19	10	4	0.010	PVC	Unconsolidated	5/89
MW-7	231.81		1.55	70	59-69	10	4	0.010	PVC	Unconsolidated	6/89
MW-8	230.06		1.50	70	59-69	10	4	0.010	PVC	Unconsolidated	6/89
MW-9	200.64		1.50	16.3	6.5-16.3**	NA	3 7/8	NA	Steel***	Bedrock	6/89

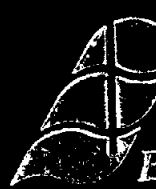
NA - Not applicable.

* - Feet above mean sea level.

** - Open hole interval.

*** - Surface casing material.

**ADDENDUM TO THE PHASE II
INVESTIGATION REPORT
COLONIAL SAND AND GRAVEL
BEDFORD, NEW YORK
SITE NO. 360014**

 **GERAGHTY
& MILLER, INC.**
Environmental Services

July 2, 1991

VIA FEDERAL EXPRESS

Richard H. Dana, C.P.G.
Chief, Bureau of Technical Services
Division of Environmental Enforcement
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, New York 12233-5500



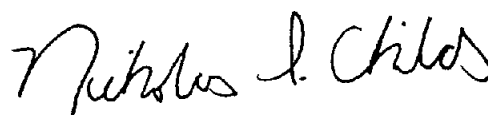
Subject: Colonial Sand and Gravel, NYSDEC ID No. 360014

Dear Mr. Dana:

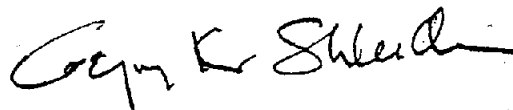
As requested, enclosed are seven copies of the Addendum to the Colonial Sand and Gravel Phase II Investigation Report. If you have any questions or require additional information please call.

Sincerely,

GERAGHTY & MILLER, INC.



Nicholas I. Childs
Senior Scientist



Gregory K. Shkuda, Ph.D.
Senior Project Advisor

cc: Nappi w/enclosure
Warren w/enclosure
Schonberger w/enclosure

DANA72.LTR

ADDENDUM TO THE PHASE II
INVESTIGATION REPORT
COLONIAL SAND AND GRAVEL
BEDFORD, NEW YORK
SITE NO. 360014



July 1, 1991

Geraghty & Miller, Inc. appreciates the opportunity to work for Berle, Kass & Case at the Bedford, New York site. If you have any questions or comments concerning this report, please contact one of the individuals listed below.

Respectfully submitted,

GERAGHTY & MILLER, INC.

A handwritten signature in cursive script, reading "Nicholas I. Childs".

Nicholas I. Childs
Senior Scientist

A handwritten signature in cursive script, reading "Gregory K. Shkuda".

Gregory K. Shkuda
Senior Associate

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TABLES

1. RCRA Characteristics of Soil and Liquid Samples Collected During July and August 1990, Colonial Sand and Gravel, Bedford, New York.
2. Summary of Volatile Organic Compounds Detected in Soil and Liquid Samples Collected Between July 1990 and March 1991, Colonial Sand and Gravel, Bedford, New York.

TABLES (cont.)

3. Analytical Results for Priority Pollutant Metals in Soil Samples Collected Between July 1990 and March 1991, Colonial Sand and Gravel, Bedford, New York.
4. Reported Average and Range of Concentrations for Inorganic Elements in Eastern United States Soils.

FIGURES

1. July 19, 1990 Test Pit and Soil Sampling Locations with Phase I Investigation Electromagnetic Survey Points.
2. Configuration of Test Pits and Soil Sampling Locations in the Vicinity of Monitoring Well MW-6.

**ADDENDUM TO THE PHASE II
INVESTIGATION REPORT
COLONIAL SAND AND GRAVEL
BEDFORD, NEW YORK
SITE NO. 360014**

EXECUTIVE SUMMARY

At the request of the New York State Department of Environmental Conservation (NYSDEC), Geraghty & Miller performed an addendum to the Phase II investigation of the Colonial Sand and Gravel facility in Bedford, New York. The addendum consisted of four additional tasks: (1) the sampling of drums stored near the garage, (2) test excavation and soil sampling in the former drum storage area near Monitoring Well MW-2, (3) sampling of the construction and demolition debris soil piles located near the pond, and (4) test excavation and soil sampling in the vicinity of a geophysical anomaly discovered near Well MW-6. With the exception of Task 1, which could not be performed since the drums stored at the garage were empty, this work was completed on July 19, 1990. However, because a 55-gallon drum and other buried debris were discovered adjacent to Well MW-6, additional work was requested by the NYSDEC to determine if any more buried drums might be present. This work, which involved excavating an area within a 60-ft radius of where the drum was discovered, was initiated on August 29, 1990. Following the excavation of two more buried drums, the NYSDEC requested that further digging be suspended to allow time to re-evaluate the scope of work. After a work plan addendum was submitted to the NYSDEC in November 1990, the excavation was eventually completed on March 5, 1991.

Data collected during the addendum to the Colonial Sand and Gravel Phase II investigation do not indicate that any significant environmental impacts have occurred at the site. Furthermore, the only evidence of hazardous waste contamination discovered during the Phase I and Phase II investigations was the trichloroethene detected in Monitoring Well MW-3, which has been attributed to an off-site source (Westchester Colprovia Corporation). Therefore, Geraghty & Miller believes that the Colonial Sand and Gravel site does not pose a threat to public health or the environment and should be removed from the New York State List of Inactive Hazardous Waste Sites.

**ADDENDUM TO THE PHASE II
INVESTIGATION REPORT
COLONIAL SAND AND GRAVEL
BEDFORD, NEW YORK
SITE NO. 360014**

INTRODUCTION

Geraghty & Miller, Inc. prepared this addendum to the Colonial Sand & Gravel Phase II Investigation Report for the law firm of Berle, Kass & Case. Berle, Kass & Case represents the Nappi Colonial Concrete Company, which owns Colonial Sand & Gravel. The Phase II Investigation Report, which was prepared to fulfill the requirements of an Order on Consent (consent order) signed by the New York State Department of Environmental Conservation (NYSDEC) and the Nappi Colonial Concrete Company, was submitted to the NYSDEC on August 23, 1989. Although Geraghty & Miller concluded that there were no on-site sources of hazardous waste contamination, the NYSDEC required that additional investigative work be performed before they could formally approve the report and determine that the requirements of the consent order had been met. The results of this additional work, which was performed by Geraghty & Miller between July 1990 and March 1991, are described below.

BACKGROUND

The Colonial Sand and Gravel site is located in the Town of Bedford, Westchester County, New York. The property was previously used as a sand and gravel quarry for the production of concrete, which is still batched onsite. To the east, Colonial Sand and Gravel is bordered by an asphalt production plant currently operated by Peckham Industries and formerly owned by Westchester Colprovia Corporation.

During a 1986 site assessment, Geraghty & Miller installed three monitoring wells (MW-1 through MW-3) at the Colonial Sand & Gravel site (see Figure 1). Trichloroethene (TCE) was detected in one of these wells, MW-3, located along the Colonial Sand & Gravel/

Westchester Colprovia property line. Subsequent data collected by Geraghty & Miller for Colonial Sand and Gravel and Malcolm Pirnie for Westchester Colprovia determined that the TCE contamination originated on Westchester Colprovia property. This conclusion was based on the distribution of TCE in monitoring wells at the two sites and the westerly ground-water flow direction in the vicinity of MW-3.

Following these studies, the NYSDEC signed a consent order with Westchester Colprovia to remediate the TCE-contaminated ground water. In addition, Colonial Sand and Gravel was placed on the New York State List of Inactive Hazardous Waste Sites. Colonial Sand & Gravel was listed as a Class 2A site, a designation assigned to sites whose environmental impact cannot be determined from existing data. As a result, the NYSDEC also signed a consent order with the Nappi Colonial Concrete Company to perform a Phase II investigation of the Colonial Sand & Gravel site. The purpose of the investigation was to determine if there were any on-site sources of hazardous waste contamination.

Prior to preparing a Phase II investigation work plan, Geraghty & Miller performed an environmental audit, a soil-gas survey, and a geophysical survey during May through July 1988 to help identify areas of environmental concern that might require further study. The results of this work, which has subsequently been called the Phase I investigation, were presented to the NYSDEC in an August 1988 report entitled, the "Progress Report for the Colonial Sand and Gravel Site, Bedford, New York, Site No. 360014". Volatile organic compounds (VOCs) were not detected in the soil gas survey and evidence of hazardous waste storage or disposal was not discovered. However, several electromagnetic anomalies were detected in the geophysical survey and subsequent test excavation of those areas revealed the presence of buried scrap metal. Geraghty & Miller also found assorted construction and demolition debris near the pond in the southeastern corner of the property and determined that waste cement, concrete, and cement-zepTM rinsate had been disposed of in that area (cement-zepTM is a hydrochloric acid solution that was used to clean cement trucks).

The Phase II investigation was conducted during May and June 1989. As part of the investigation, six new monitoring wells (MW-4 through MW-9) were installed and four soil borings were drilled. In addition, ground-water samples were collected from the six new and three existing monitoring wells, a surface-water sample was collected from the pond where the construction and demolition debris was found, and short term pumping tests were performed on Wells MW-4 and MW-6. The results of the study were submitted to the NYSDEC in an August 1989 report entitled, "Phase II Investigation Report, Colonial Sand and Gravel, Bedford, New York, Site No. 360014". Geraghty & Miller concluded in the report that the only evidence of hazardous waste contamination at the site was the TCE detected in Monitoring Well MW-3, which had previously been attributed to Westchester Colprovia.

ADDITIONAL SAMPLING

After reviewing the Phase II Investigation report, the NYSDEC determined that additional sampling was necessary before they could formally approve the report and determine that Nappi Colonial Concrete Company had fulfilled the requirements of the consent order. As described in a May 1, 1990 letter from Berle, Kass & Case to Lou Evans, Esq. of the NYSDEC, four additional sampling tasks were agreed upon:

- 1) The collection of aqueous samples from the drums stored near the garage, provided they contained more than 1 inch of liquid.
- 2) The collection of one soil sample in the area where approximately 50 drums were stored in 1986, just south of monitoring well MW-2.
- 3) The collection of two soil samples from the construction and demolition material located near the pond in the southeastern corner of the property.

- 4) The collection of one soil sample in the vicinity of Monitoring Well MW-6 to investigate a geophysical anomaly between Stations 1004 and 1004.5.

Details of the sampling methodology were specified in a May 22, 1990 letter from Geraghty & Miller to Chris Anderson of the NYSDEC. In this letter, Geraghty & Miller proposed to drill soil borings to collect the samples for Tasks 2 and 4. However, after consultation with the NYSDEC, it was agreed that the samples would be collected from test pits rather than soil borings. Work on the four sampling tasks was subsequently initiated on July 19, 1990.

TASK 1

The drums which were formerly stored near the garage were empty and were therefore not sampled.

TASK 2

On July 19, 1990, an 8-ft by 22-ft test pit was dug with a backhoe in the area where drums had been stored in 1986, just south of Monitoring Well MW-2 (see Figure 1). Initially, two soil piles along the eastern edge of the test pit were excavated, revealing a buried concrete slab and a gravel-filled, 55-gallon drum which appeared to have been used as a traffic guide post. Both the drum and soil piles were scanned for volatile organic vapors with a photoionization detector (PID) and none were detected. In addition, no soil staining or odors were evident.

Below land surface, the excavated soil consisted of medium to coarse sand with a trace of silt and medium to coarse gravel. Additional debris was not discovered and the soil was found to be free of any staining or unusual odors. In addition, the soil and ambient air were scanned with a PID, and no volatile organic vapors were detected. Bedrock was

reached at a depth of 11 feet below land surface (ft bls), at which point the test pit was terminated. Ground water was not encountered.

One soil sample was collected at a depth of 10 to 11 ft bls (B-5 [10-11']) and analyzed by NET Atlantic, Inc., Cambridge Division (formerly Cambridge Analytical Associates) for Target Compound List volatile organic compounds (TCL VOCs) and priority pollutant metals.

TASK 3

On July 19, 1990, soil samples were collected from two soil piles located amid the construction and demolition debris near the pond in the southeastern corner of the property (see Figure 1). Each sample was composited from three different areas on the soil pile to obtain a representative sample. The samples were submitted to NET for TCL VOC and priority pollutant metal analyses.

TASK 4

Phase 1 - July 1990

On July 19, 1990, a 12-ft by 19-ft test pit was dug with a backhoe adjacent to Monitoring Well MW-6 (see Figure 2). The excavation was terminated at the water table, which was reached at a depth of approximately 12 ft bls. Soil in the western portion of the test pit consisted of fill material from about 0 to 2 ft bls and native soil from about 2 to 12 ft bls. Both the fill and native soil consisted of fine to coarse sand with a trace of silt. No staining or odors were observed in either soil horizon and volatile organic vapors were not detected by the PID.

In the eastern portion of the test pit, fill material and assorted debris, including tires, wood, brick, and one 55-gallon drum, were excavated between 0 and 8 ft bls. The fill was

darker along the northeastern wall of the pit, from a depth of approximately 2 to 5 ft bls. From 8 to 12 ft bls, the soil consisted of native fine to coarse sand with a trace of silt.

The 55-gallon drum found in the eastern portion of the pit was removed and placed on plastic sheeting. Despite containing some holes, the drum was still approximately one-quarter to one-third full of liquid. PID measurements of the drum and surrounding soil were at background levels and no staining or odors were evident. A sample of the soil immediately beneath the drum (B-4 [4-5']) was submitted to NET and analyzed for TCL VOCs and priority pollutant metals.

On July 20, 1990, the drum was put in an over-pack container and placed on plastic sheeting. Soil was excavated from the area where the drum contents had leaked and was also placed on plastic. Samples of the drum contents (Drum 1) and saturated soil (SOIL) were submitted to NET for analysis for RCRA characteristics and TCL VOCs.

Phase 2 - August 1990

To determine if there were any additional drums buried in the vicinity of Monitoring Well MW-6, a more extensive test pit was dug on August 29, 1990 (see Figure 2). As requested by the NYSDEC, an area within a 60-foot radius of where the buried drum had been found in July was excavated, except to the north and west of Well MW-6, where some large trees and a paved road obstructed further excavation. The pit was terminated at a depth of approximately 15 ft bls, where the water table was encountered.

In the northwestern portion of the test pit, fill material and debris, consisting of tires, plastic, rebar, bricks, a refrigerator, portions of a pick-up truck, and two 55-gallon drums (designated by Geraghty & Miller as Drums 2 and 3), were discovered between 0 and 9 ft bls. Native soil, consisting of sand and gravel with a trace of fine sand, was encountered between 9 and 15 ft bls. A soil sample was collected immediately above the water table

along the northwestern wall of the pit (S-1 [14-15']) and analyzed by NET for TCL VOCs and priority pollutant metals.

The southeastern portion of the test pit was free of buried debris, and excavated soil consisted entirely of sand and gravel. A soil sample was collected immediately above the water table along the southeastern wall of the pit (S-2 [14-15']) and submitted to NET for TCL VOC and priority pollutant metal analyses.

In addition to soil samples, Geraghty & Miller also collected samples of the contents of each drum. Drum 2, which appeared to have been crushed prior to or during burial, contained a small amount of liquid which was sampled for TCL VOCs and RCRA characteristics. Drum 3 was approximately one-quarter to one-third full of liquid when it was crushed by the backhoe while digging the test pit. The drum, liquid, and saturated soil were excavated and placed on plastic sheeting. A sample of the solid residue in the drum (Drum 3) was submitted to NET and analyzed for TCL VOCs and RCRA characteristics.

After Drum 3 was excavated, the NYSDEC field engineer requested that work be suspended to allow the NYSDEC time to re-evaluate the scope of work. The NYSDEC also requested that Geraghty & Miller sample the surface soil immediately below the plastic where the excavated drums were placed to determine if any leakage from the drums had occurred. This sample (Surface-1 [0-0.5']) was submitted to NET for TCL VOC and priority pollutant metal analysis.

Phase 3 - March 1991

Following the submittal of a workplan addendum in November 1990, work resumed on March 5, 1991. The area shown on Figure 2 was excavated to the water table. In the northern portion of the test pit, fill material and buried debris, consisting of a crushed 30-gallon metal container, a crushed and eroded 55-gallon drum, a truck bumper guard, and a 55-gallon drum filled with concrete, was discovered between 0 and 10 ft bls. From about

10 ft bls to the water table at 18 ft bls, excavated soil consisted of medium sand with a trace of fine to coarse sand and silt. Volatile organic vapors were not detected by the PID in the debris or surrounding soil, and no soil staining or odors were evident.

Soil in the middle and southern portions of the test pit also consisted predominantly of medium sand; however, at a depth of 15 ft bls, a gray silty clay and perched water were encountered. Although the clay had an odor, no volatile organic vapors were detected with the PID and no staining was evident. In the far southern end of the excavation, a 2-inch thick, sloping cement layer was encountered at a depth of approximately 7 ft bls. The curvature of the layer resembled that of a sloping shoreline; therefore, it may have been deposited along the shore of the former pond in this area.

After consultation with the NYSDEC field engineer, soil samples were collected for laboratory analysis at the following locations:

- Immediately above the water table in the northern portion of the excavation (Sample 3S-1 [17-18'])
- Immediately below where the concrete-filled drum was found (Sample 3S-2 [10-12'])
- Immediately above the water table in the middle portion of the excavation where the gray silty clay was encountered (Sample 3S-4 [15-16'])
- Immediately above the thin layer of cement (Sample 3S-5 [6-7'])
- Immediately below the thin layer of cement (Sample 3S-5 [10-12'])

Due to scheduling problems, NET could not analyze the samples collected in March. With the approval of the NYSDEC, Enseco-Erco performed the analyses according to the

protocols specified in the Phase II Investigation Quality Assurance Project Plan (QAPP). Samples were analyzed for TCL VOCs and priority pollutant metals.

SAMPLING PROCEDURE

Soil and drum contents were sampled and analyzed according to the procedures specified in the Phase II Investigation Work Plan Addendum and the Phase II Investigation QAPP. Soil samples were collected using either a decontaminated stainless steel trowel or sterilized plastic trowel. The stainless steel trowel was decontaminated according to the following step-by-step procedure: (1) tap water plus laboratory-grade detergent wash; (2) tap water rinse; (3) 10% nitric acid rinse; (4) distilled water rinse; (5) pesticide-grade acetone rinse; (6) air dry. Samples of drum contents were collected either directly from the drums or using a sterilized disposable TeflonTM bailer. Following collection, the samples were placed in ice-filled, insulated coolers and shipped to the laboratory via overnight courier using strict chain-of-custody procedures.

RESULTS

SAMPLING OF DRUM CONTENTS

The RCRA characteristics of samples collected from drums excavated in the vicinity of Well MW-6 are summarized in Table 1 (results are not available for Drum 2 since the sample bottle broke during shipment). The contents of the drums were found to be non-hazardous, with the exception of the sample from Drum 1, which failed because of its high pH (13.38).

Volatile organic analytical results are summarized in Table 2. Toluene was detected in the sample of liquid from Drum 1 at a concentration of 5,700 micrograms per liter (ug/L) and acetone was detected in the liquid sample from Drum 2 at an estimated concentration of 6 ug/L. Although toluene was the only VOC detected in the Drum 2 sample, other VOCs

may be present at concentrations below the 5000 ug/L detection limit, which resulted from a sample dilution performed by the laboratory.

In the sample of solid residue from Drum 3, methylene chloride (240 ug/L), acetone (21 ug/L), and toluene (12 ug/L) were detected. The acetone and toluene concentrations are estimated since the values are below the method detection limit. In addition, the toluene detected in the Drum 3 sample is probably attributable to laboratory contamination, since it was also detected in the associated method blank.

SOIL SAMPLING

The RCRA characteristics of the saturated soil associated with Drum 1 are summarized in Table 1. This soil was found to be non-hazardous.

Volatile organic analytical results are summarized in Table 2. The only VOCs detected in the July soil samples were methylene chloride, acetone, 1,1-dichloroethene, 1,1,1-trichloroethane, and toluene. All five compounds were detected at concentrations below their respective method detection limits. In the August soil samples, the only VOCs detected were methylene chloride, acetone, and toluene. Of these, only acetone was detected at a concentration above the method detection limit (11 ug/L). In March, the only VOCs detected in soil samples were methylene chloride, acetone, carbon disulfide, and 2-butanone, and only methylene chloride was detected at a concentration above the method detection limit.

Since methylene chloride and 2-butanone were also detected in the method blank (a quality control sample run by the laboratory), the appearance of these compounds in the March soil samples was probably the result of laboratory contamination. Similarly, 1,1-dichloroethene was detected in the method blank associated with the July soil samples and, therefore, may have been introduced into the sample during laboratory analysis. The

detection of acetone in the soil samples may be related to the decontamination procedure, since acetone was used to clean the stainless steel trowel between samples.

Metals data for the soil samples are summarized in Table 3. With the exception of the surface samples (C&D-1, C&D-2, and Surface-1), metals concentrations were fairly uniform and compared favorably with the average and range of concentrations reported by Shacklette and Boerngen for soils in the eastern United States (Shacklette and Boerngen, 1984) [see Table 4]. In Sample Surface-1, lead (45 milligrams per kilogram [mg/kg]) and zinc (240 mg/kg) were detected at elevated concentrations in comparison with the subsurface soil samples, but were still within the ranges reported by Shacklette and Boerngen. Since this sample was collected directly beneath where the excavated drums were stored, it is likely that the metals content of the sample was derived from the decaying drums and that the sample is not indicative of overall surficial soil quality in the area. In Samples C&D-1 and C&D-2, antimony, cadmium, chromium, copper, lead, nickel, and zinc were detected at higher concentrations than in other samples; however, only the antimony concentration was not within the range reported by Shacklette and Boerngen. In general, metals concentrations were higher in Sample C&D-1 than in Sample C&D-2.

CONCLUSIONS

TASK 1

As mentioned previously, the drums formerly stored near the garage were empty and were therefore not sampled.

TASK 2

Although buried debris was discovered in two soil piles in the former drum storage area, none was found in the test pit. Volatile organic vapors were not detected by the PID in either the soil piles or test pit and laboratory analysis of a soil sample collected

immediately above the water table in the test pit revealed only trace concentrations of acetone and 1,1-dichloroethene. Since 1,1-dichloroethene was also detected in the associated method blank, it is likely that this contamination was introduced during laboratory analysis. The acetone detected in the sample probably resulted from the use of this compound to decontaminate the sampling trowel. Therefore, based on field observations and the analytical results, Geraghty & Miller believes that drum storage in this area has not had an impact on soil or ground-water quality.

TASK 3

With the exception of trace concentrations of methylene chloride and 1,1-dichloroethene, which can be attributed to laboratory contamination, VOCs were not detected in the samples collected from the construction and demolition debris soil piles. However, metals in the soil pile samples, particularly antimony, cadmium, chromium, copper, lead, nickel, and zinc, were detected at elevated concentrations in comparison with the subsurface samples collected in Tasks 2 and 4.

While collecting these samples, it was noted that the soil piles were partially indurated and were penetrated by the stainless-steel trowel with great difficulty. In addition, the soil contained a large percentage of angular fine gravel, which was consistently distributed throughout the soil matrix. These observations suggest that the soil piles contained a significant amount of concrete, a likely occurrence since excess concrete was disposed of in the vicinity of the pond during prior site operations.

Concrete is artificial stone generally composed of a mixture of cement (a powder composed of tri-calcium silicates and aluminates with small amounts of magnesium, iron, and gypsum), sand, stone (limestone, clay, shale, or blast-furnace slag), water, and industrial flyash for texture. The incorporation of industrial flyash into concrete has been documented by Adriano (1980), Langley (1989), and Munn (1989), amongst others. The ash is added because it is less costly than other textural additives and because incorporation into concrete

provides an environmentally sound means of disposal. Since metals are not driven off during incineration, they accumulate in the ash and are accordingly transferred to concrete. Consequently, Geraghty & Miller believes that the elevated metals concentrations detected in the soil pile samples are attributable to the high percentage of crushed concrete incorporated into the soil matrix.

During the Phase II investigation, three borings (B-1, B-2 and B-3) were drilled in the vicinity of the pond. Metals concentrations in samples from these borings were within the typical ranges reported by Shacklette and Boerngen for soils in the eastern United States and were much lower than the metals concentrations detected in the soil pile samples. In addition, metals contamination was not detected in the ground-water sample collected from Monitoring Well MW-1 during the Phase II investigation. Therefore, since subsurface soil and ground-water in the area do not exhibit evidence of metals contamination, Geraghty & Miller believes that it is unlikely that the metals contamination detected in the soil piles poses a threat to the environment.

TASK 4

The location of the buried drums and other debris in the vicinity of Monitoring Well MW-6 is consistent with the location of an anomaly detected during the electromagnetic survey performed during the Phase I investigation. The anomaly was detected roughly midway between stations 1004 and 1004.5. As illustrated on Figure 1, this is the approximate area where the subsurface debris was discovered and coincides with the presumed location of the former pond. Geraghty & Miller believes that the clay and sloping cement layer discovered in the March 1991 test pit may be remnants of this former pond and that the debris discovered in the vicinity of Monitoring Well MW-6 was buried when the pond was filled in.

Although the contents of Drums 1 and 3 exhibited VOC contamination, the contaminants detected (methylene chloride, acetone, and toluene) were found only at trace

concentrations in the eight subsurface soil samples collected in this area. In addition, VOC contamination was not detected in Monitoring Well MW-6 during the Phase II investigation. Similarly, although the pH of the liquid from Drum 1 (13.38) was higher than the RCRA standard of 12.5, pH measurements of ground-water samples collected from Monitoring Well MW-6 during the Phase II investigation were either neutral or just slightly basic (field: 6.75, laboratory: 8.47). Therefore, Geraghty & Miller believes that the drums disposed of in this area have not had a significant impact on soil or ground-water quality.

RECOMMENDATIONS

Data collected during the Phase I and II investigations and during this addendum to the Phase II investigation do not indicate that any significant environmental impacts have occurred at the site that are attributable to on-site sources. Since Geraghty & Miller believes that the Colonial Sand and Gravel site does not pose a threat to public health or the environment, we recommend that no further investigative work be performed and that the site be removed from the New York State List of Inactive Hazardous Waste Sites.

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Table 1. RCRA Characteristics of Soil and Liquid Samples Collected During July and August 1990,
Colonial Sand and Gravel, Bedford, New York.

Sample Identification: Concentration Units:	—July 20, 1990 Sampling—		—August 29, 1990 Sampling—		Hazardous Waste Definition/ Maximum Concentration (mg/L)
	Drum 1 (SD-1) (mg/L)	SOIL (mg/L)	Drum 2 (mg/L)	Drum 3 (mg/L)	
Parameter					
Corrosivity (pH units)	13.38 *	9.24	(1)	10.99	<2 or >12.5
Ignitability	Non-Ignitable	Non-Ignitable	(1)	Non-Ignitable	Flashpoint <60° C
Reactivity	Non-Reactive	Non-Reactive	(1)	Non-Reactive	See 40 CFR Part 261.23
<u>EP Toxicity:</u>					
Arsenic	1.2	<0.003	<0.10	0.13	5.0
Barium	1.1	0.21	0.52	1.7	100.0
Cadmium	1.7	0.005	<0.0050	0.0059	1.0
Chromium	1.6	<0.010	<0.050	<0.050	5.0
Lead	1.9	0.036	<0.10	<0.10	5.0
Mercury	<0.002	<0.0002	<0.0002	<0.0002	0.2
Selenium	1.1	<0.002	<0.10	<0.10	1.0
Silver	<0.080	<0.008	<0.0080	<0.0080	5.0
Endrin	<0.006	<0.006	(1)	<0.006	0.02
Lindane	<0.006	<0.006	(1)	<0.006	0.4
Methoxychlor	<0.006	<0.006	(1)	<0.006	10.0
Toxaphene	<0.06	<0.06	(1)	<0.06	0.5
2,4-D	<0.1	<0.1	(1)	<0.1	10.0
2,4,5-T (Silvex)	<0.1	<0.1	(1)	<0.1	1.0

* Exceeds maximum pH of 12.5.

(1) Not analyzed; sample bottle broke during shipment.

Table 2. Summary of Volatile Organic Compounds Detected in Soil and Liquid Samples Collected Between July 1990 and March 1991, Colonial Sand and Gravel, Bedford, New York.

Parameter	July 19, 1990 Sampling					July 20, 1991 Sampling		
	Sample Identification:		Replicate		Field Blank	Trip Blank		Trip Blank
	B-4 (4-5')	B-5 (10-11')	C & D-1	C & D-2		7/19/90	7/19/90	
Concentration Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Methylene chloride	<5	<5	<5	<5	1 BJ	<5000	<5	135
Acetone	<11	2 J	<11	<10	8 BJ	<5000	<5	<5
1,1-Dichloroethane	3 BJ	3 BJ	3 BJ	<5	<5	<5000	<5	<5
1,1,1-Trichloroethane	2 JY	<5	<5	<5	<5	<5000	<5	<5
Toluene	1 J	<5	<5	<5	<5	5700	<5	<5

J Estimated concentration.
 B Compound was also detected in the associated method blank.
 Y Value edited within the laboratory's internal data system.
 ug/kg Micrograms per kilogram.
 ug/L Micrograms per liter.

Table 2. Summary of Volatile Organic Compounds Detected in Soil and Liquid Samples Collected Between July 1990 and March 1991, Colonial Sand and Gravel, Bedford, New York.

Parameter	August 29, 1990 Sampling				
	Sample Identification:	S-1	S-2	Surface-1	Trip
	Concentration Units:	(14-15') (ug/kg)	(14-15') (ug/kg)	(0-0.5') (ug/kg)	Blank 8/29/90 (ug/L)
Methylene chloride		<5	<5	<5	<5
Acetone		11	<10	3 J	<10
Toluene		<5	<5	<5	<5

J Estimated concentration.

B Compound was also detected in the associated method blank.

Y Value edited within the laboratory's internal data system.

ug/kg Micrograms per kilogram.

ug/L Micrograms per liter.

Table 2. Summary of Volatile Organic Compounds Detected in Soil and Liquid Samples Collected Between July 1990 and March 1991, Colonial Sand and Gravel, Bedford, New York.

March 5, 1991 Sampling

Parameter	Sample Identification:		3S-2		3S-4		3S-5		3S-5		Field		Trip	
	Concentration Units:		(17-18') (ug/kg)		(10-12') (ug/kg)		(15-16') (ug/kg)		(6-7') (ug/kg)		(10-12') (ug/kg)		Blank 3/5/91 (ug/L)	
Methylene chloride	7 B		9 B		28 B		4 BJ		8 B		5		10	
Acetone	<12		3 J		<52		5 J		11 J		15 B		12 B	
Carbon disulfide	<6		<6		<26		<5		2 J		<5		ND	
1,2-Dichloroethane	<6		<6		<26		<5		<6		<5		1 J	
2-Butanone	4 BJ		3 BJ		9 BJ		9 BJ		5 BJ		<5		ND	

J Estimated concentration.
 B Compound was also detected in the associated method blank.
 Y Value edited within the laboratory's internal data system.
 ug/kg Micrograms per kilogram.
 ug/L Micrograms per liter.

Table 3. Analytical Results for Priority Pollutant Metals in Soil Samples Collected Between July 1990 and March 1991,
Colonial Sand and Gravel, Bedford, New York.

Sample Identification:	July 19, 1990 Sampling				Field Blank 7/19/90
	B-4 (4-5')	B-5 (10-11')	C & D-1	C & D-2	
Concentration Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)
Parameter					
Antimony	< 12.70 N	< 12.50 N	26.70 N	17.60 N	< 60.00
Arsenic	3.00 SN*	1.10 BN*W	3.60 N*	2.40 N*	< 3.00 W
Beryllium	0.30 B	0.28 B	0.45 B	0.46 B	< 1.00
Cadmium	3.90 N*	4.20 N*	12.00 N*	7.80 N*	< 5.00
Chromium	15.30 *	16.10 *	824.00 *	117.00 *	< 50.00
Copper	21.00 *	24.80 *	257.00 *	91.10 *	15.80 B
Lead	18.50	15.00	60.20	45.90	3.50 B
Mercury	< 0.10	< 0.10	< 0.11	< 0.10	< 0.20
Nickel	16.10 N*E	18.00 N*E	214.00 N*E	55.50 N*E	< 15.00
Selenium	< 0.42	< 0.42 W	< 0.43 W	0.45 B	< 2.00 W
Silver	1.80 BN*	< 1.70 N*	2.60 N*	2.40 N*	< 8.00
Sodium	197.0 B	105.0 B	184.0 B	241.0 B	3160.00 B
Thallium	< 0.85	< 0.84	< 0.86	< 0.83	< 4.00
Zinc	60.90 E	41.00 E	105.00 E	149.00 E	24.10

B Reported value is less than the contract required detection limit.

E Estimated concentration.

* Duplicate analysis not within control limits.

N Spike sample not within control limits.

W Postdigested spike not within control limits.

S Reported value determined by the method of standard additions.

NA Not analyzed.

mg/kg Milligrams per kilogram.

ug/L Micrograms per liter.

Table 3. Analytical Results for Priority Pollutant Metals in Soil Samples Collected Between July 1990 and March 1991.
Colonial Sand and Gravel, Bedford, New York.

August 29, 1990 Sampling			
Sample Identification:	S-1 (14-15')	S-2 (14-15')	Surface-1 (0-0.5')
Concentration Units:	(mg/kg)	(mg/kg)	(mg/kg)
Parameter			
Antimony	<1.7	<2.2	<1.8
Arsenic	1.1	1.6	4.5 *
Beryllium	<0.21	0.38	0.58
Cadmium	2.2	4.1	4.8
Chromium	<11	18	31
Copper	14	31	26
Lead	5.3	7.4	45
Mercury	<0.10	<0.15	<0.11
Nickel	14	24	29
Selenium	<0.42	<0.57	<0.46
Silver	<1.7	2.5	3.1
Sodium	NA	NA	NA
Thallium	<0.83	<1.1	<0.92
Zinc	18	39	240

B Reported value is less than the contract required detection limit.

E Estimated concentration.

* Duplicate analysis not within control limits.

N Spike sample not within control limits.

W Postdigested spike not within control limits.

S Reported value determined by the method of standard additions.

NA Not analyzed.

mg/kg Milligrams per kilogram.

ug/L Micrograms per liter.

Table 3. Analytical Results for Priority Pollutant Metals in Soil Samples Collected Between July 1990 and March 1991,
Colonial Sand and Gravel, Bedford, New York.

Sample Identification:	March 5, 1991 Sampling					Field Blank 3/5/91 (ug/L)
	3S-1 (17-18") (mg/kg)	3S-2 (10-12") (mg/kg)	3S-4 (15-16") (mg/kg)	3S-5 (6-7") (mg/kg)	3S-5 (10-12") (mg/kg)	
Concentration Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)
Parameter						
Antimony	<7.3	8.3 BN	<6.9 N	11.5 BN	<7.8 N	<30.0
Arsenic	0.72 B	2.8	1.7 B	1.6 B	3.8	<2.0
Beryllium	0.30 B	0.86 B	0.33 B	0.35 B	0.50 B	<1.0
Cadmium	<0.97	<1.0	<0.93	<0.87	<1.0	<4.0
Chromium	23.7 *	39.3 *	16.1 *	11.1 *	20.7 *	<3.0
Copper	22.1	56.1	25.5	27.3	43.0	<4.0
Lead	2.7	14.0	8.7	7.9	18.5	<2.0
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2
Nickel	18.4	35.9	15.6	13.0	22.1	<28.0
Selenium	<0.50 W	<0.53 W	<0.46 W	<0.44	<0.52 W	<2.0
Silver	<0.73	<0.78	<0.69	<0.65	<0.78	<3.0
Sodium	123 B	348 B	171 B	237 B	336 B	3920 B
Thallium	<0.62	<0.66 W	<0.58	<0.55 W	<0.65	<2.5 W
Zinc	35.4 *	84.9 *	41.3 *	28.3 *	47.4 *	18.7 B

B Reported value is less than the contract required detection limit.
 E Estimated concentration.
 * Duplicate analysis not within control limits.
 N Spike sample not within control limits.
 W Postdigested spike not within control limits.
 S Reported value determined by the method of standard additions.
 NA Not analyzed.
 mg/kg Milligrams per kilogram.
 ug/L Micrograms per liter.

Table 4. Reported Average and Range of Concentrations for
Inorganic Elements in Eastern United States Soils

Element	Average (mg/kg)	Range (mg/kg)
Aluminum	33,000	700->100,000
Antimony	0.52	<1-8.8
Arsenic	4.8	<0.1-73
Barium	290	10-1500
Beryllium	0.55	<1-7
Calcium	3,400	100-280,000
Chromium	33	1-1,000
Cobalt	5.9	<3-70
Copper	13	<1-700
Iron	14,000	100->100,000
Lead	14	<10-300
Magnesium	2,100	50-50,000
Manganese	260	<2-7,000
Mercury	0.081	<0.01-3.4
Nickel	11	<5-700
Potassium	12,000	50-37,000
Selenium	0.3	<0.1-3.9
Sodium	2,500	<500-50,000
Thallium (Smith & Carson, 1977)		0.02-2.8
Vanadium	43	<7-300
Zinc	40	<5-2,900

Reference: Shacklette and Boerngen, 1984, except as noted.