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PHASE I REPORT

ENGINEERING INVESTIGATIONS AND EVALUATIONS AT INACTIVE HAZARDOUS WASTE DISPOSAL SITES

Gratwick Riverside Park
Niagara County, NY

SUBMITTED TO

New York State Department of Environmental Conservation

SUBMITTED BY

ENGINEERING-SCIENCE, INC.
in association with
DAMES & MOORE

JUNE 1983

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SECTION I

EXECUTIVE SUMMARY

Gratwick Riverside Park

Objective

The purpose of this two phase program is to conduct engineering investigations and evaluations at inactive hazardous waste disposal sites in New York State in order to calculate a Hazard Ranking System (HRS) score for each site and estimate the cost of any recommended remedial action. During the initial portion of this investigation (Phase I) all available data and records combined with information collected from a site inspection were reviewed and evaluated to determine the adequacy of existing information for calculating an HRS score. On the basis of this evaluation, a Phase II Work Plan was prepared for collecting additional HRS data (if necessary), evaluating remedial alternatives and preparing a cost estimate for recommended remedial action. The results of this Phase I study for this site are summarized below and detailed in the body of the report.

Site Background

Gratwick Riverside Park is an inactive landfill, located in the City of North Tonawanda, Niagara County between the Niagara River on the west and the now filled Erie Canal channel on the east, paralleling, River Road. The park is located at the river front edge of an urban area and is currently used as a public park, with a picnic shelter and boat docks and launch ramp.

The site was used for disposal of municipal and industrial wastes including phenolic resins and molding compounds.

Groundwater investigations have determined that phenols and heavy metals are leaching from the site. The proximity of the site to the Niagara River presents the potential for surface water contamination.

Assessment

Insufficient data is available for a final HRS scoring. The preliminary

HRS scoring was:

$S_M = 5.82$	$S_A = 0$
$S_{GW} = 6.12$	$S_{FE} = 0$
$S_{SW} = 8.00$	$S_{DC} = 25.00$

The low route scores are partially due to insufficient target information. Both surface and groundwater analytical data were sufficient for scoring, however, air monitoring data is required.

Recommendations

An air monitoring survey with an OVA meter is recommended to determine air quality. The estimated manhours needed to complete Phase II are 158, while the estimated cist is $6,937.

SECTION II

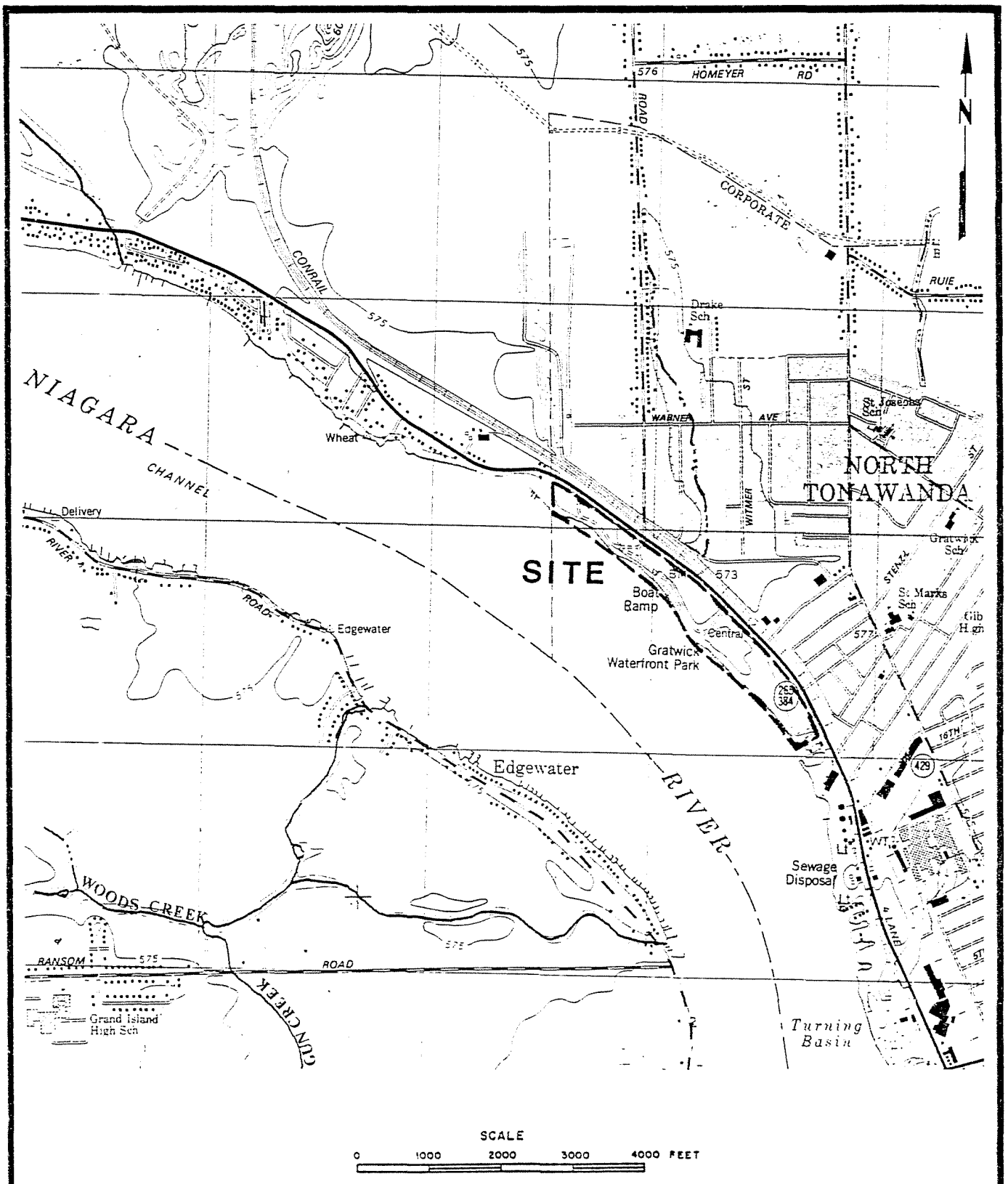
SITE DESCRIPTION

Gratwick Riverside Park

Gratwick Riverside Park is an inactive landfill, located in the City of North Tonawanda, Niagara County (NYS), between the Niagara River on the west and the now-filled former Erie Canal channel on the east, paralleling River Road. The site is rectangular, extending approximately one mile in a NW direction and 0.2 miles in a NE direction. The ground surface is level. Gratwick Riverside Park is located at the riverfront edge of an urban area and is used currently as a public park, with a picnic shelter and boat docks and launch ramp.

The site was used for disposal of municipal and industrial wastes from 1964 to 1968. Waste materials include phenolic resins, phenolic molding compounds, oil and grease.

Groundwater monitoring studies have determined that heavy metals and organics are leaching from the site.



SITE LOCATION MAP
GRATWICK RIVERSIDE PARK

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
TONAWANDA WEST, NY (1980) QUADRANGLE

SECTION III

HRS SCORING

HRS COVER SHEET

Facility name: Gratwick Riverside Park

Location: N. Tonawanda, NY

EPA Region: II

Person(s) in charge of the facility: Niagara-Mohawk Power Corp.

Syracuse, NY 13202

Name of Reviewer: John Kubarewicz/Eileen Gillian Date: May 17, 1983

General description of the facility:

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

Previous landfill currently used as a city park. Hooker-Durez is reported to have disposed of phenolic resins and solvents at this site. Grcundwater has been monitored. Boring logs indicate a sticky clay may provide natural containment. Heavy metals, phenols, and other organics detected.

Scores: S_M = 5.82 (S_{GW} = 6.12 S_{SW} = 8.00 S_a = 0)

S_{FE} = 0

S_{DC} = 25.00

GROUND WATER ROUTE WORK SHEET

Ground Water Route Work Sheet

	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section
1	Observed Release	0 (45)	1	45	45	3.1
	If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2	Route Characteristics					3.2
	Depth to Aquifer of Concern	0 1 2 3	2		6	
	Net Precipitation	0 1 2 3	1		3	
	Permeability of the Unsaturated Zone	0 1 2 3	1		3	
	Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score				15	
3	Containment	0 1 2 3	1		3	3.3
4	Waste Characteristics					3.4
	Toxicity / Persistence	0 3 6 9 12 15 (18)	1	18	18	
	Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
	Total Waste Characteristics Score			26	26	
5	Targets					3.5
	Ground Water Use	0 (1) 2 3	3	3	9	
	Distance to Nearest Well / Population Served	(0) 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	
	Total Targets Score			3	49	
6	If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			3510	57,330	
7	Divide line 6 by 57,330 and multiply by 100			S_{gw} = 6.12		

SURFACE WATER ROUTE WORK SHEET

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)		Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0)	45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2. ←						
2 Route Characteristics						4.2
Facility Slope and Intervening Terrain	(0) 1 2 3		1	0	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3		1	2	3	
Distance to Nearest Surface Water	0 1 2 (3)		2	6	6	
Physical State	0 1 2 (3)		1	3	3	
Total Route Characteristics Score				11	15	
3 Containment	0 1 2 (3)		1	3	3	4.3
4 Waste Characteristics						4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)		1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)		1	8	8	
Total Waste Characteristics Score				26	26	
5 Targets						4.5
Surface Water Use	0 1 (2) 3		3	6	9	
Distance to a Sensitive Environment	(0) 1 2 3		2	0	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40		1	0	40	
Total Targets Score				6	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				5148	64,350	
7 Divide line 6 by 64,350 and multiply by 100				S_{SW} = 8.00		

AIR ROUTE WORK SHEET

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

DIRECT CONTACT WORK SHEET

Direct Contact Work Sheet						
Rating Factor	Assigned Value (Circle One)		Multi-plier	Score	Max. Score	Ref. (Sectic
1 Observed Incident	(0)	45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2 ✓						
2 Accessibility	0 1 2 (3)		1.	3	3	8.2
3 Containment	0	(15)	1	15	15	8.3
4 Waste Characteristics Toxicity	0 1 2 (3)		5	15	15	8.4
5 Targets						8.5
Population Within a 1-Mile Radius	0 1 [2] 3 4 5		4	[8]	20	
Distance to a Critical Habitat	(0) 1 2 3		4	0	12	
Total Targets Score				[8]	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				5400	21,600	
7 Divide line 6 by 21,600 and multiply by 100				SOC = 25.00		

Fire and Explosion Work Sheet

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

WORKSHEET FOR COMPUTING S_M

	S	S^2
Groundwater Route Score (S_{gw})	6.12	37.45
Surface Water Route Score (S_{sw})	8.00	64.00
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		101.45
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		10.07
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73 = S_M =$		5.82

June 28, 1982

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

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

FACILITY NAME: GRATWICK RIVERSIDE PARK

LOCATION: N. TONAWANDA

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

PHENOL, LEAD, MERCURY
VARIOUS ALIPHATIC AND AROMATIC HYDROCARBONS
INCLUDING CHLOROBENZE, BIPHENYLS

Rationale for attributing the contaminants to the facility:

RECRA ANALYSIS OF WELL #13

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern:

PERCH W.T. IN WASTE

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

~6FT

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

~12FT

Net Precipitation

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

40"

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

27"

Net precipitation (subtract the above figures):

13"

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

SAND, SILT, CLAY

Permeability associated with soil type:

$10^{-4} \rightarrow 10^{-3}$

Physical State

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

LIQUID, SOLIDS RESINS

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

DRUMS UNCONTAINED SLAG

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

PHENOLIC RESINS + MOLDING COMPOUNDS
METALLUIGICAL SLAG - LEAD
COPPER
MERCURY
PHENOLS (USGS, 1982)

Compound with highest score:

LEAD, MERCURY 3,3 = 18

Hazardous Waste Quantity

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

25,000 TONS PHENOLIC RESIN
25,000 TONS PHENOLIC MOLDING MATERIAL

Basis of estimating and/or computing waste quantity:

SITE INSPECTION REPORT 8/20/80

* * *

5 TARGETS

Ground Water Use

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

NONE

Distance to Nearest Well

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

UNKNOWN

Distance to above well or building:

UNKNOWN

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

UNKNOWN

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

UNKNOWN

Total population served by ground water within a 3-mile radius:

UNKNOWN

SURFACE WATER ROUTE

1 OBSERVED RELEASE

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

UNKNOWN

Rationale for attributing the contaminants to the facility:

N/A

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

0.83%

Name/description of nearest downslope surface water:

NIAGARA RIVER

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

~1%

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

UNKNOWN

Is the facility completely surrounded by areas of higher elevation?

NO

1-Year 24-Hour Rainfall in Inches

2.1

Distance to Nearest Downslope Surface Water

ADJACENT = 0.01 MILE

Physical State of Waste

LIQUID + SOLID

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

RUSTED DRUMS · VISIBLE AS RIVERBANK ERRODES AWAY

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

PHENOLS
LEAD
MERCURY

(USGS, 1982)

Compound with highest score:

MERCURY 3 3 => 15

Hazardous Waste Quantity

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

25,000 TONS PHENOLIC MOLDING
25,000 TONS PHENOL RESIN

Basis of estimating and/or computing waste quantity:

DEC SITE DOSSIER, CLAIMS 25,000 TONS PHENOLIC RESIN AND 25,000 TONS OF PHENOLIC MOLDING MATERIALS REPORTED TO BE DUMPED BY HOOKER DUREZ

* * *

5 TARGETS

Surface Water Use

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

TRANSPORTATION
COMMERCIAL

Is there tidal influence?

NO

Distance to a Sensitive Environment

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

—

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

NONE

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

NONE

Population Served by Surface Water

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

NONE

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

N/A

Total population served:

N/A

Name/description of nearest of above water bodies:

N/A

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

N/A

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

UNDETECTED

Date and location of detection of contaminants

N/A

Methods used to detect the contaminants:

N/A

Rationale for attributing the contaminants to the site:

N/A

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

N/A

Most incompatible pair of compounds:

N/A

Toxicity

Most toxic compound:

N/A

Hazardous Waste Quantity

Total quantity of hazardous waste:

N/A

Basis of estimating and/or computing waste quantity:

N/A

* * *

3 TARGETS

Population Within 4-Mile Radius

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

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

UNKNOWN

Distance to a Sensitive Environment

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

N/A

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

N/A

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

N/A

Land Use

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

UNKNOWN

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

N/A

Distance to residential area, if 2 miles or less:

UNKNOWN

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

N/A

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

N/A

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

N/A

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER: NY 0000514141

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
GRATWICK RIVERSIDE PARK	RIVER ROAD/WITMER RD

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
NORTH TONAWANDA	NY	14120	NIAGARA	63	36

09 COORDINATES		10. TYPE OF OWNERSHIP (Check one)
LATITUDE	LONGITUDE	☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER: CITY RENTS ☐ G. UNKNOWN
43° 03' 39"	78° 54' 26.8"	

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
4 28 83 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1960 (BEGINNING YEAR) 1968 (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR: SCIENCE ENGINEERING (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR: (Name of firm)
☐ E. STATE ☒ F. STATE CONTRACTOR: DAMES + MOORE (Name of firm) ☐ G. OTHER: (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
JOHN KUBAREWICZ	CHEMICAL ENGINEER	ES	(703) 591-7575
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
ART SEANOR	GEOLOGIST	D+M	(315) 638-3572
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
RICHARD KLOCH SR.	CITY ATTORNEY	N. TONAWANDA	(716) 694-7090
FRANK GRABOWSKI	ENV ANALYST	NIAGARA-MOHAWK	(315) 474-1511
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☐ PERMISSION ☐ WARRANT	15:32	CLEAR, SUNNY

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
JOHN KUBAREWICZ	ES	(703) 591-7575

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
SAME				5 6 83 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: 0000514141

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☒ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS: >50,000

CUBIC YARDS:

NO. OF DRUMS:

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
(OLW)	OILY WASTE	50	TN	+ GREASE
SOL	SOLVENTS			
PSD	PESTICIDES			
(OCC)	OTHER ORGANIC CHEMICALS	50,000	TN	PHENOLS RESINS ORGANICS MOLDING MATERIALS
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	PHENOLS	108-95-2	LF	1-18.5	MG/L
MES	LEAD	999	LF	43-150	PPb
MES	MERCURY	74-39.976	LF	.7	PPB
OCC	HEXADECANOIC ACID	999	LF	x	
OCC	PENTAROSANE	990	LF	y	
OCC	OCTADECANOIC ACID	999	LF	x	
OCC	PENTATRIACONTANE	999	LF	y	
OCC	EICOSANE	999	LF		
OCC	BIPHENOLS	999	LF	11-53	PPb
OCC	BUTYLBENZYL PHTHALATE	999	LF	20	PPb
			*GC/MS SCAN, LIBRARY MATCH OR LESS		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	MERCURY	7439976	FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

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

EPA SITE INSPECTION REPORT 8/28/80
PRELIMARY REPORT "INVESTIGATION OF SELECTION INACTIVE TOXIC LANDFILLS IN CONJUNCTION WITH NIAGARA RIVER STUDY
NYS DEPARTMENT OF HEALTH ANALYSIS 7/16/81

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY 000514141

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: 6/19/79) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
EXTENT UNKNOWN, SAMPLES TAKEN BY RECRA VERIFY CONTAMINATION

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
SAMPLED NO CONTAMMATION, HOWEVER POTENTIAL EXSISTS DUE TO PRIOXIMITY OF RIVER

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
NO ODOR

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☒ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
SITE USED AS PICNIC AREA, BOAT LAUNCH RAMP

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION
LIKELY, BUT NO SAMPLING TO DATE

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY 000514141

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☑ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☑ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☑ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☑ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☑ OBSERVED (DATE: 6/23/81) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
DRUMS AND OTHER WASTES EXPOSED AS RIVER BANK IS ERODED BACK.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
UNKNOWN

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS
WHEAT FIELD NCSWD FEDERAL SUPERFUND SITE IS ACROSS RIVER ROAD FROM THIS SITE, AND MAY CREATE CONTAMINANT PLUME PASSING THROUGH THIS SITE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)
NIAGARA Co. DEPT OF HEALTH, 1981, NIAGARA RIVER STUDY AN INVESTIGATION OF SELECTED TOXIC WASTE DISPOSAL SITES

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: D000514141

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES	N/A			
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☑ F. LANDFILL	UNKNOWN	
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER _____ (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE: 52 (Acres)

07 COMMENTS: SITE IS A CITY PARK, NO VISIBLE WASTES

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☑ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

NONE OBSERVED

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☑ YES ☐ NO

02 COMMENTS: OPEN - CITY PARK

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

SITE VISIT 5-6-83

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 0000514141

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☐	B. ☐	A. ☐	B. ☐	C. ☐	A. _____ (mi)
NON-COMMUNITY	C. ☐	D. ☐	D. ☐	E. ☐	F. ☐	B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER: 0

03 DISTANCE TO NEAREST DRINKING WATER WELL: UNKNOWN (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
6.0 (ft)	SW	_____ (ft)	_____ (gpd)	☐ YES ☐ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

SHALLOW 20 MONITORING WELLS ON SITE

10 RECHARGE AREA	COMMENTS	11 DISCHARGE AREA	COMMENTS
☑ YES ☐ NO	RAINWATER PERCOLATES EASILY INTO GROUND	☑ YES ☐ NO	DISCHARGE MAY OCCUR INTO NIAGARA RIVER

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☑ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☑ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☑ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
NIAGARA RIVER	☐	0.1 (mi)
	☐	_____ (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 1520 NO. OF PERSONS	B. 4940 NO. OF PERSONS	C. 8740 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: 500' (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE	04 DISTANCE TO NEAREST OFF-SITE BUILDING
1500	500' (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D000514141

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☑ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☑ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
~25.0 (ft)	~4.5 (ft)	5.6-7.3

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
13 (in)	2.1 (in)	0.83 %	SW	1.0 %

09 FLOOD POTENTIAL: SITE IS IN >500 YEAR FLOODPLAIN

10: ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi) OTHER: B. 1.1 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

1.1 (mi)

ENDANGERED SPECIES: PEREGRINE FALCON, GOLDEN EAGLE

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL, STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. _____ (mi)	B. _____ (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

SITE IS UNIFORM AND GENTLE SLOPE ADJACENT AND INTO THE NIAGARA RIVER

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

RECRA RESEARCH SOIL BORINGS
USGS TOPOGRAPHIC MAPS

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: D000514141

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☑ GROUND ☐ AERIAL

02 IN CUSTODY OF: D+M OFFICE
(Name of organization or individual)

03 MAPS ☑ YES ☐ NO

04 LOCATION OF MAPS: D+M OFFICE

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

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

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY 000051414

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
NIAGARA MOHAWK		300 ERIE BOULEVARD		SYRACUSE	NY	13202

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
CITY OF N. TONAWANDA		CITY HALL		NORTH TONAWANDA	NY	14120
AMERICAN RADIATON						
STANDARD SANITARY						

IV. REALTY OWNER(S) (If applicable: list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

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

INS TAX RECORDS
USGS

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D000514141

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER	04 SIC CODE
NORTH TONAWANDA		

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE
216 PAYNE AVE	N. TONAWANDA		14120

08 YEARS OF OPERATION	09 NAME OF OWNER
1964 →	

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER	13 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER	04 SIC CODE

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER	13 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	04 SIC CODE

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER	13 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	04 SIC CODE

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER	13 SIC CODE

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	14 CITY	15 STATE	16 ZIP CODE

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

NYSDEC FILE

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY D000514141

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
NO	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
HOOKER-DUREZ	2821	BELL AEROSPACE	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
WALAK RD			

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
NORTH TONAWANDA	NY				

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
SUSPECTED			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

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

SITE HISTORY NYSDEC

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY D000514141

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☑ D. SPILLED MATERIAL REMOVED — 02 DATE 11/81 — 03 AGENCY _____
04 DESCRIPTION
EXPOSED DRUMS WERE REMOVED FROM SHORELINE AND TESTED

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY D000514141

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☑ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
PARTIAL SEAWALL ALONG NIAGARA RIVER, SITE COVERED WITH SOIL+GRASS

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☑ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

1979 - CITY OF N. TONWANDA CONTRACTS RECREA RESEARCH TO INSTALL 4 GROUNDWATER MONITORING WELLS AND SAMPLE
ADDITIONAL WELL INSTALLED AT EAST SIDE OF PARK
1/28/80 - NO DATA

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

DOH NIAGARA CO REP 1981

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: D000514141

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☑ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

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

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D000514141

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
GRATWICK RIVERSIDE PARK	RIVER RD				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
N. TONAWANDA	NY	14120	NIAGARA	63	36
09 COORDINATES LATITUDE: 43° 3' 16" N	LONGITUDE: 78° 53' 53" W				

10 DIRECTIONS TO SITE (Starting from nearest public road)
PUBLIC PARK LOCATED BETWEEN RIVER RD AND NIAGARA RIVER

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)		
NIAGARA MOHAWK CO	300 ERIE BLVD		
03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
SYRACUSE	NY	13202	(315) 474-1511
07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)		
CITY N. TONAWANDA	216 PAYNE AVE		
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
N. TONAWANDA	NY	14120	(716)

13 TYPE OF OWNERSHIP (Check one)
☑ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☑ YES DATE 4 / 28 / 83 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☑ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): ENGINEERING - SCIENCE

02 SITE STATUS (Check one)	03 YEARS OF OPERATION		
☐ A. ACTIVE ☑ B. INACTIVE ☐ C. UNKNOWN	1960 (BEGINNING YEAR)	1968 (ENDING YEAR)	☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
PHENOLS
TOTAL HALOGENATED ORGANICS

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
GROUNDWTR ON SITE FOUND TO CONTAIN PHENOLS, TTHO AND TRACES OF HEAVY METALS, PRIOXIMITY TO RIVER PRESENTS POTENTIAL FOR CONTAMINATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
JOHN KUBAREWICZ	ES	(703) 591-7575

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
			( )	5 / 18 / 83 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY D000514141

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)
☐ A. SOLID ☐ E. SLURRY
☐ B. POWDER, FINES ☐ F. LIQUID
☐ C. SLUDGE ☐ G. GAS
☐ D. OTHER _____ (Specify)

02 WASTE QUANTITY AT SITE
(Measures of waste quantities must be independent)
TONS >50,000
CUBIC YARDS _____
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)
☑ A. TOXIC ☐ E. SOLUBLE ☐ I. HIGHLY VOLATILE
☐ B. CORROSIVE ☐ F. INFECTIOUS ☐ J. EXPLOSIVE
☐ C. RADIOACTIVE ☐ G. FLAMMABLE ☐ K. REACTIVE
☐ D. PERSISTENT ☐ H. IGNITABLE ☐ L. INCOMPATIBLE
☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
(OLW)	OILY WASTE	50	TN	+GREASE
SOL	SOLVENTS			
PSD	PESTICIDES			
(OCC)	OTHER ORGANIC CHEMICALS	50,000	TN	PHENOLS RESINS
IOC	INORGANIC CHEMICALS			ORGANICS MOLDING MATERIALS
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	PHENOLS	108-95-2	LF	1-18.5	MG/L
MES	LEAD	999	LF	43-150	PPB
MES	MERCURY	74-39.976	LF	.7	PPB
OCC	HEXADECANOIC ACID	999	LF	X	
OCC	PENTAROSANE	990	LF	X	
OCC	OCTADECANOIC ACID	999	LF	X	
OCC	PENTATRIACONTANE	999	LF	X	
OCC	EICOSANE	999	LF	X	
OCC	BIPHENYLS	999	LF	11-53	PPB
OCC	BUTYLBENZYL PHTHALATE	999	LF	20	PPB
			* GC/MS SCAN, LIBRARY MATCH OR LESS		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	MERCURY	7434-976	FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

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

EPA SITE INSPECTION REPORT 8/28/80
PRELIMARY REPORT "INVESTIGATION OF SELECTION INACTIVE TOXIC LANDFILLS IN CONJUNCTION WITH NIAGARA RIVER STUDY
NYS DEPARTMENT OF HEALTH ANALYSIS 7/16/81

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY D000514141

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☑ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: 6/19/79) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
EXTENT UNKNOWN, SAMPLES TAKEN BY RECRA VERIFY CONTAMINATION

01 ☑ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
SAMPLED NO CONTAMINATION, HOWEVER POTENTAL EXSISTS DUE TO PRIOXIMITY OF RIVER

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
NO ODOR

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☑ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
SITE USED AS PICNIC AREA, BOAT LAUNCH RAMP

01 ☑ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION
LIKELY, BUT NO SAMPLING TO DATE

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY D000514141

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: DRUMS AND OTHER WASTES IS ERODED BACK
04 NARRATIVE DESCRIPTION EXPOSED AS RIVER BANK

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
UNKNOWN

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS
WHEAT FIELD NCSWO FEDERAL SUPERFUND SITE IS ACROSS RIVER ROAD FROM THIS SITE, AND MAY CREATE CONTAMINANT PLUME PASSING THROUGH THIS SITE

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)
NIAGARA CO. DEPT OF HEALTH, 1981, NIAPARA RIVER STUDY AN INVESTIGATION OF SELECTED TOXIC WASTE DISPOSAL SITES

EPA FORM 2070-12 (7-81)

SECTION IV

SITE HISTORY

Gratwick Riverside Park

The site was used as a dump site between 1962 and 1968. The initial use of the site appears to be as a disposal area for metallurgical slag. From well records, the slag layers appear to be 11 to 12 feet deep, with the top of the slag roughly level with the river level. The generator of this slag has not been ascertained at this time (Niagara County Health Department, 1981).

The site was used by the City of North Tonawanda for disposal of municipal and industrial wastes from 1964 to 1968. During this period, open burning was practiced, accounting for the cinders present in the soils. It is not known whether any industrial wastes were burned.

According to the Interagency Task Force on Hazardous Wastes, Bell Aerospace Textron used the site from 1962 to 1966 to dispose of scrap wood, plaster molds, small quantities of scrap adhesives and laboratory chemicals. Hooker-Durez reportedly disposed of 25,000 tons of phenolic resins, 25,000 tons of phenolic molding compounds, 50 tons of oil and grease and 50,000 tons of rubbish from 1960 to 1968. Niagara County Health Department files indicate that other firms have used this site, although other types and quantities of waste material is unknown.

The Interagency Task Force on Hazardous Waste identified this site in March 1979. Later, in June 1979, the City of North Tonawanda engaged RECRA Research to investigate the site (RECRA Research, 1979). Chemical analyses of well water samples showed dangerous phenol and total halogenated organic levels. In summer 1982, USGS installed an additional well; chemical analyses showed high metal, phenol, and other organic contamination (USGS, 1982).

SECTION V

SUMMARY OF AVAILABLE DATA

Gratwick Riverside Park

Regional Geology and Hydrology

The site is located in the Erie-Ontario lowlands physiographic province. The bedrock of this region is predominantly limestone, dolostone, and shale. Most of the rocks are deep aquifers with regional flow to the south.

In the recent past, most of New York State, including the site, has been repeatedly covered by a series of continental ice sheets. The activity of the glacier widened preexisting valleys and deposited widespread accumulations of till. The melting of ice, ending approximately 12,000 years ago, produced large volumes of meltwater; this water subsequently shaped channels and deposited thick accumulations of stratified, granular sediments.

As glacial ice retreated from the region, meltwater formed lakes in front of the ice margin. This region is covered by lake sediments, the most recent being from Lake Iroquois (a larger predecessor to Lake Ontario) and from Lake Tonawanda (an elongate lake which occupied an east-west valley and drained north into Lake Iroquois). The sediments consist of blanket sands and beach ridges which are occasionally underlain by lacustrine silts and clays (indicating quiet, deeper water deposition).

Granular deposits in this region frequently act as shallow aquifers, whereas lacustrine clays, as well as tills, often inhibit groundwater movement. However, fine-grained, water-lain sediments, such as silts and clays, frequently contain horizontal laminations and sand seams. These internal features facilitate lateral groundwater movement through otherwise low permeability materials.

Site Geology

The geology of the site is known from five borings (USGS, 1982 and Niagara Co. DOH, 1981). Boring logs indicate that the site is "made land"; uppermost natural soils occur at depths corresponding to approximately 12 feet below river level. These soils consist of fine sand, silt, and clay, and overlie Camillus shale bedrock at a depth of approximately 30 to 40 feet. Above the natural soil are a variety of municipal and industrial wastes.

Site Hydrology

Groundwater on the site has been studied by means of five observation wells. There is no surface water on the site. According to the Niagara County Department of Health (1981), a shallow aquifer exists within the waste material at a depth of approximately six feet. Groundwater appears to be moving to the southwest into the Niagara River.

Sampling and Analysis

A groundwater monitoring study was contracted by the City of North Tonawanda in 1979 (RECRA Research, 1979). The study included three sites, Gratwick Riverside Park, Holiday Park, and Botanical Gardens. Only sections of the study could be located at the Region 9 DEC. A complete copy promised by the City of North Tonawanda did not arrive in time to be included in this report. From the available information, it appears that five monitoring wells were constructed at Gratwick-Riverside Park, although data is only available for four wells. The actual location of these wells is unclear since two differently marked well location maps were found in NYSDEC and NYSDOH files (Figures V-1 and V-2).

The groundwater study results are included in Table V-1 which summarizes the available data. During Phase I (July 1979) phenols and total halogenated organics were detected in groundwater samples. A subsequent analysis was performed using gas chromatography/mass spectrometry (GC/MS) to identify the organics. From these analyses (Appendix A), it was determined that a variety of halogenated organics,

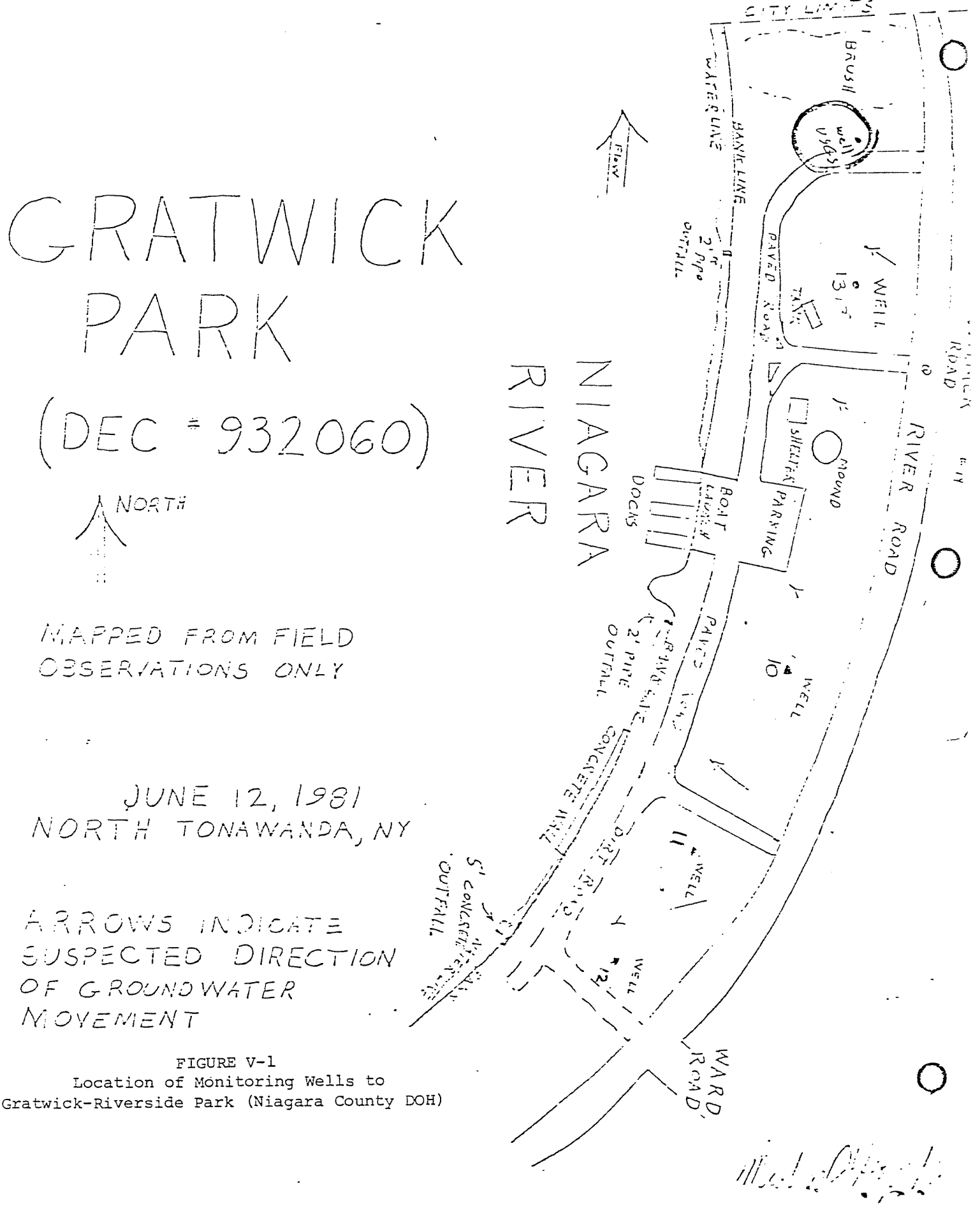


FIGURE V-1
Location of Monitoring Wells to
Gratwick-Riverside Park (Niagara County DOH)

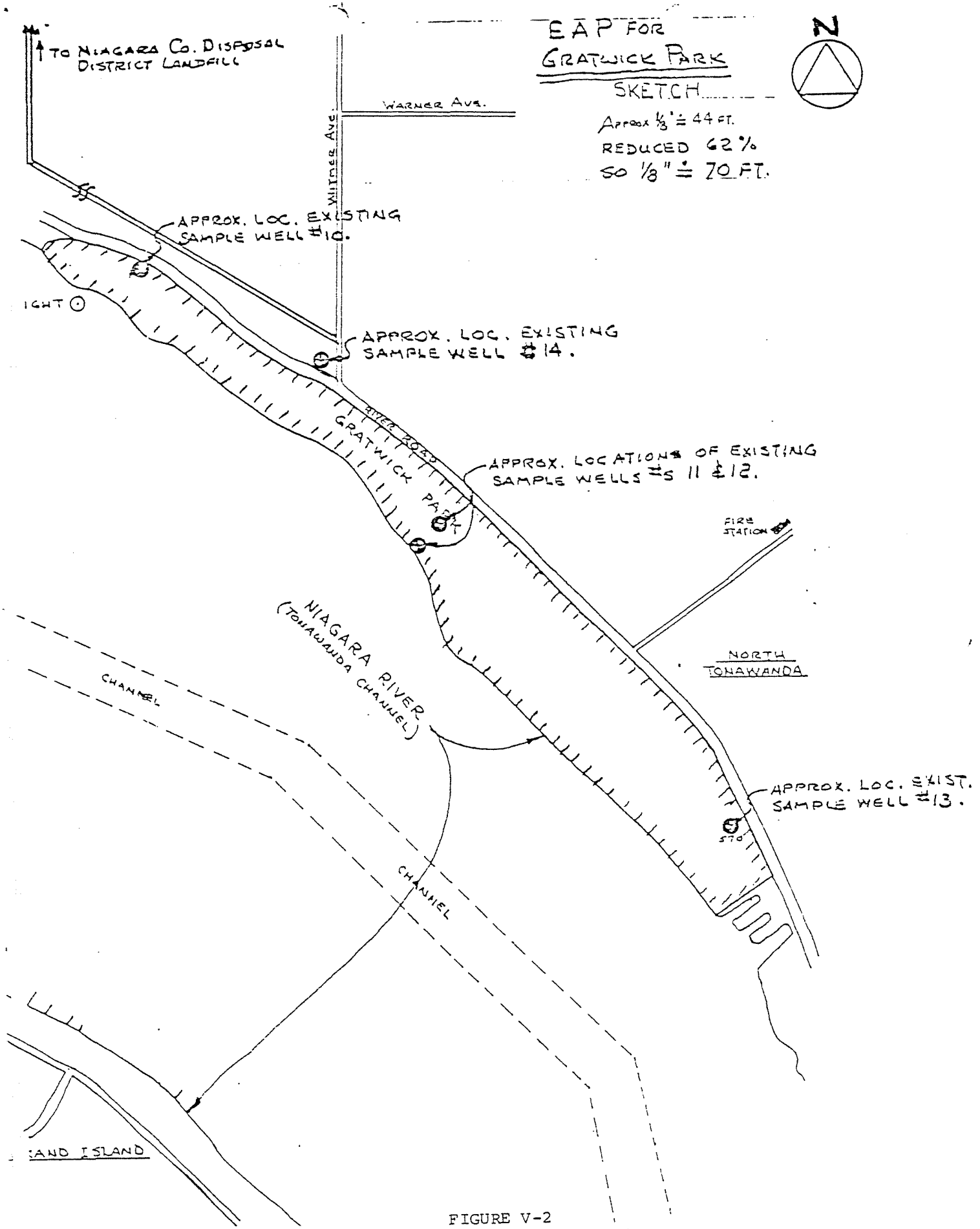


FIGURE V-2
Location of Monitoring Wells
Gratwick Riverside Park (NYSDEC)

TABLE V-1

SUMMARY OF ANALYTICAL RESULTS
GRATWICK-RIVERSIDE PARK (1979-1981)

Sample Well	Phenols (ppm)	THO[1] (ppb)	Phenols[2] (ppm)	THO[3] (ppb)	Lead[2] (ppm)
10	9.10	11.5	3	35	-
11	4.60	2.78	3	BSL	-
12	1.08	0.12	0.2	4	-
13	18.5	22.8	17	18	-

[1] RECRA, 1979 sampled 6/11/79

[2] NYSDOH, 1981 sampled 8/12/81

[3] NYSDOH, 1981 sampled 7/16/81

polynuclear aromatics, oxygenated hydrocarbons, and substituted aromatics were present. The cited report mentioned that two surface water samples taken in the Niagara River at the nearshore area to the Park were also analyzed by GC/MS with negative results. The results of these analyses could not be located.

Table V-1 also contains samples taken by the NYSDOH in 1981. As shown, phenol (0.2-17 ppm) and THO (1.8-35 ppb) were detected.

As part of their ongoing study, the USGS sampled groundwater at five locations (USGS, 1982-83). These locations are obviously the previously mentioned five wells. However, the actual location of each sampling point was not included with the information obtained from NYSDEC files. Analyses of these samples found low levels of mercury, cadmium and numerous organic compounds including bi-phenyls in the groundwater.

SECTION VI

ASSESSMENT OF ADEQUACY OF DATA

Site: Gratwick Riverside Park

HRS Data Requirement	Comments on Data
Observed Release	
Ground Water	Data available, adequate for HRS evaluation.
Surface Water	Data available, adequate for HRS evaluation.
Air	No available data, field data collection recommended.
Route Characteristics	
Ground Water	Data available, adequate for HRS evaluation.
Surface Water	Data available, adequate for HRS evaluation.
Air	Data available, adequate for HRS evaluation.
Containment	Information available, adequate for HRS evaluation.
Waste Characteristics	Information available, adequate for HRS evaluation.
Targets	Insufficient information; more data collection recommended.
Observed Incident	Information available revealed no report of incident. No further investigation recommended.
Accessibility	Adequate information available.

SECTION VII

PHASE II WORK PLAN

Site: Gratwick Riverside Park

Objectives

The objectives of the Phase II activities are:

- To collect additional field data necessary to complete the HRS scoring.
- To perform a conceptual evaluation of remedial alternatives and estimate budgetary costs for the most likely alternative.
- To prepare a site investigation report.

The additional field data required to complete the HRS are defined as follows:

Air - An air monitoring survey with an OVA meter is recommended to check the air quality above the surface of this site.

TASK DESCRIPTION

The proposed Phase II tasks are described in Table VII-1.

COST ESTIMATE

The estimated manhours required for the Phase II project are presented in Table VII-2 and the estimated project costs by tasks are presented in Table VII-3. The cost for performing the Phase II project is $6,937.

TABLE VII-1
PHASE II WORK PLAN - TASK DESCRIPTION
Site: Gratwick Riverside Park

Tasks		Description of Task
TASK		
II-A	Update Work Plan	Review the information in the Phase I report, conduct a site visit, and revise the Phase II work plan.
II-B	Conduct Geophysical studies	No further studies necessary.
II-C	Conduct Boring/Install Install Monitoring Wells	No further installation of monitoring wells necessary.
II-D	Construct Test Pits/ Auger Holes	No further construction of test pits/auger holes necessary.
II-E	Perform Sampling and Analysis	
	Soil samples from borings	No further sampling necessary.
	Soil samples from surface soils	No further sampling necessary.
	Soil samples from test pits and auger holes	No further sampling necessary.
	Sediment samples from surface water	No further sampling necessary.
	Ground-water samples	No further sampling necessary.
	Surface water samples	No further sampling necessary.
	Air samples	Using the OVA, determine the presence of organics.
	Waste samples	No further sampling necessary.
II-F	Calculate Final HRS	Based on the field data collected in Tasks IIB - IIE, complete the HRS form.
II-G	Conduct Site Assessment	Prepare final report containing Phase I report, additional field data, final HRS and HRS documentation records, and site assessments. The site assessment will consist of a conceptual evaluation of alternatives and a preliminary cost estimate of the most probable alternative.
II-H	Project Management	Project coordination, administration and reporting.

TABLE VII-2
PERSONNEL RESOURCES BY TASK
PHASE II HRS SITE INVESTIGATION (SITE: GRATWICK RIVERSIDE PARK)

TASK DESCRIPTION	TEAM MEMBERS, MANHOURS													
	PIC	TRB	PM	DPM	PCM	BAN	HSM	FTL	FT	RAAL	RAAT	SS	TOTAL HOURS	TOTAL $
II-A UPDATE WORK PLAN	1		4	1			1	2		6		8	23	376.8
II-B CONDUCT GEOPHYSICAL STUDIES													0	0
II-C CONDUCT BORING/INSTALL MONITORING WELLS													0	0
II-D CONSTRUCT TEST PITS/AUGER HOLES													0	0
II-E PERFORM SAMPLING AND ANALYSIS														
SOIL SAMPLES FROM BORINGS													0	0
SOIL SAMPLES FROM SURFACE SOILS													0	0
SOIL SAMPLES FROM TEST PITS AND AUGER HOLES													0	0
SEDIMENT SAMPLES FROM SURFCE WATER													0	0
GROUND-WATER SAMPLES													0	0
SURFACE WATER SAMPLES													0	0
AIR SAMPLES			1					1	8			2	12	133.66
WASTE SAMPLES													0	0
II-F CALCULATE FINAL HRS			2	2				2	6			8	20	262.7
II-G CONDUCT SITE ASSESSMENT	1	2	4	2				4	8	6	24	32	83	1029.44
II-H PROJECT MANAGEMENT	2		6	2			2					8	20	369.16
TOTALS	4	2	17	7	0	0	3	9	22	12	24	58	158	2171.76

TABLE VII-3
COST ESTIMATE BREAKDOWN BY TASK
PHASE II HRS SITE INVESTIGATION (SITE: GRATWICK RIVERSIDE PARK)

TASK DESCRIPTION	DIRECT LABOR HOURS	DIRECT LABOR COST	OTHER DIRECT COSTS (ODC), $ LAB ANALYSIS	TRAVEL AND SUBSISTANCE	SUPPLIES	EQUIP. CHARGES	SUBCON-TRACTORS	MISC.	SUBTOTAL ODC	TOTAL ($)
II-A UPDATE WORK PLAN	23	376.8		100	50	50		25	225	601.8
II-B CONDUCT GEOPHYSICAL STUDIES									0	0
II-C CONDUCT BORING/INSTALL MONITORING WELLS									0	0
II-D CONSTRUCT TEST PITS/AUGER HOLES									0	0
II-E PERFORM SAMPLING AND ANALYSIS										
SOIL SAMPLES FROM BORINGS									0	0
SOIL SAMPLES FROM SURFACE SOILS									0	0
SOIL SAMPLES FROM TEST PITS AND AUGER HOLES									0	0
SEDIMENT SAMPLES FROM SURFACE WATER									0	0
GROUND-WATER SAMPLES									0	0
SURFACE WATER SAMPLES									0	0
AIR SAMPLES	12	133.66		85	25	15		5	130	263.66
WASTE SAMPLES									0	0
II-F CALCULATE FINAL HRS	20	262.7			50	50		25	125	387.7
II-G CONDUCT SITE ASSESSMENT	83	1029.44			100	200		75	375	1404.44
II-H PROJECT MANAGEMENT	20	369.16		150	150	50		50	400	769.16
TOTALS	158	2171.76	0	335	375	365	0	180	1255	3426.76

OVERHEAD =	3101.27
SUBTOTAL =	6528.00
FEE =	408.66
TOTAL PROJECT COST =	6936.69

APPENDIX A

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APPENDIX A

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Gratwick Riverside Park

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USGS (1982-1983) Analysis of Groundwater samples.

NEW YORK STATE GEOLOGICAL ASSOCIATION

38th Annual Meeting

April 29 - May 1, 1966

GUIDEBOOK

Geology of Western New York

Edward J. Buehler, Editor

Department of Geological Sciences
State University of New York at Buffalo

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and

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Editors

Department of Geological Sciences
State University of New York at Buffalo

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Published by the New York State Geological Association. Guidebook available from the executive secretary: M.P. Wolf, Geology Department, Gittleson Hall, Hofstra University, Hempstead, New York 11550.

k Dobbs
February 14, 1980

Hazardous Waste Site Dossier

I. Site Name

Gratwick Park (also known as Gratwick-Riverside Park) River Road, North Tonawanda, N.Y.

II. Background to Investigation and Source of Initial Referral

EPA learned of the site through the work on the Interagency Task Force on hazardous wastes study, and through their draft report, dated March 1979.

III. Site Description

This inactive 25 acre site, owned by the city of North Tonawanda, N.Y., is currently used as a park. (It is also known as Veterans park). Some sections are used as a re-storage area for wood chips, forestry products and fire wood for the use of residents.

It is located between River Road and the Niagara River. The widest point is 600-700 feet. The site was used from 1960 to 1968. Durez hauled approximately 25,000 tons of solid phenolic resin, 25,000 tons of solid phenolic molding compound, nearby 50 tons of oil and grease drippings, 50,000 tons of rubbish (wood, paper and garbage) and an unknown quantity of solvents to this site. Niagara Mohawk power corporation, (NMPC) also indicated that approximately 650 tons of liquid phenol tar from the durez plant of Hooker Chemieals and Plastics Corporation were disposed of at Gratwick park in North Tonawanda pursuant to an agreement between (NMPC) the owner ot the site, and Hooker. some municipal refuse was also received.

IV. Allegations of "Imminent Hazard" Pollution

Recra Research Inc., Tonawanda, N.Y., has verefied contamination of the groundwater beyond potable water standards. Recra analyzed samples from three monitoring wells on the site, and found phenols ranging from 1.08 mg/L to 18.5 mg/L. Potable water standards for phenols is 1 mg/L.

The levels for total halogenatcd organics ranged from 0.12 to 22.8 ug/L (see attachment 1). I asked Mel Larsen and Dr. Esther Rende, Region II Toxic Program, for drinking water standards for total halogenated organics. Dr. Rende referred me to Dr. Kris Khanna, office of Drinking Water Standards, Washington D.C., re: drinking water standards for total halogenated organics. He stated that there are no standards for tot al halogenated organics expressed as, ug/L as chlorine; lindane standard. The mixture is run and if lindane is detected the mixture is separated, and analyzed for lindane. The standard for potable water for lindane is 0.004 mg/L. New York State Department of Environmental Conservation (D.E.C.), and the city of North Tonawanda, N.Y., have discussed the possibility of phenols leaching out of the landfill and into the Niagara River. The D.E.C. does not know whether an imprevious boundary was ever installed along the Niagara River's edge.

The city of North Tonawanda, has a public water supply. The D.E.C., and the Niagara County, Health Department, state that there are no private wells in the area.

V. Current Involvement

The city of North Tonawanda, N.Y., engaged Recra Research Inc., to install monitoring wells and analyze the ground water samples. Recra installed four monitoring wells. (see figure 1) . Samples were collected June 11, 1979, the analyses report was submitted on July 6, 1979. (see attachment 1). John C. Mc Mahon Regional Engineer D.E.C., reviewed the report. He informed the city of North Tonawanda, that the

following results warrant identification, of the constituents that, contribute to the phenol, and total halogenated organics:

Monitoring Wells	phenol mg/L	Total halogenated organics ug/L
well- no. 10	9.10	11.5
well- no. 11	4.60	2.78

(see attachment 1)

D.E.C. recommended that the program be expanded to determine the direction of migration from the park. Recra Research Inc., recommends that additional analyses be performed on these samples to fully characterize the halogenated fraction.
The analytical procedure is a screening technique, some nonhalogenated materials, may be carried through the procedure, and analyzed, as halogenated compounds. There is no indication of a remedial program, or whether one is planned. D.E.C. recommended that the city of North Tonawanda install an additional monitoring well on the east side of the park near the Niagara River. It will be used to determine the elevation and direction of ground water flow. The D.E.C., has requested that analyses be performed to determine levels of the various parameters.

Up Date: D.E.C., stated 1/28/80, that a monitoring well had been installed on the east side of the park near the Niagara River. They have not received any data concerning the monitoring well.

VI. Recommendations

EPA make a site visit. EPA collect samples for phenols, and total halogenated organics, and analyze same to determine levels.

Check back within six months with D.E.C., on data from the newly installed monitoring well.
re: Groundwater flow, elevation, and levels of parameters from the site.

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 2 | SITE NUMBER (To be assigned by HQ): NY 3E

This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information entered on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries or on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II (Preliminary Assessment). File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: DITTMER PARK
B. STREET (or other identifier): RIVER RD.
C. CITY: N. TONAWANDA
D. STATE: NY
E. ZIP CODE:
F. COUNTY NAME:

OWNER/OPERATOR (If known)
A. NAME: T. OF NO TONAWANDA
B. TELEPHONE NUMBER:

TYPE OF OWNERSHIP
[ ] 1. FEDERAL [ ] 2. STATE [ ] 3. COUNTY [X] 4. MUNICIPAL [ ] 5. PRIVATE [ ] 6. UNKNOWN

SITE DESCRIPTION
PUBLIC PARK - LOCATED BETWEEN RIVER RD & NIAGARA RIVE
[illegible] TONS PHENOLIC RESIN & MOLDING COMPDS - 650 TONS LIQUID PHENOL

IDENTIFICATION
A. HOW IDENTIFIED (i.e., citizen's complaints, OSHA citations, etc.): HAZARDOUS WASTE EMERGENCY TASK FORCE ON
B. DATE IDENTIFIED (mo., day, & yr.): MAR 1979

PRINCIPAL STATE CONTACT
A. NAME: ~~JEF~~ JOHN BEECHER
B. TELEPHONE NUMBER: 716 - 842 - 4311

II. PRELIMINARY ASSESSMENT (complete this section last)

APPARENT SERIOUSNESS OF PROBLEM
[ ] 1. HIGH [ ] 2. MEDIUM [ ] 3. LOW [ ] 4. NONE [ ] 5. UNKNOWN

RECOMMENDATION
[ ] NO ACTION NEEDED (no hazard)
[X] 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
[ ] 3. SITE INSPECTION NEEDED
TENTATIVELY SCHEDULED FOR:
WILL BE PERFORMED BY:
[ ] 4. SITE INSPECTION NEEDED (low priority)

PREPARER INFORMATION
A. NAME: ALEX DOBBS
B. TELEPHONE NUMBER: 212 - 264 - 1573
C. DATE (mo., day, & yr.): 2/26/80

III. SITE INFORMATION

STATUS
[ ] 1. ACTIVE (Those sites which are being used for management, storage, or disposal of wastes on a routine basis, even if intermittent)
[X] 2. INACTIVE (Those sites which no longer receive wastes.)
[ ] 3. OTHER (specify): (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

OPERATOR ON SITE?
[ ] 1. NO [ ] 2. YES (specify appropriate Individual SIC Code): _____

AREA OF SITE (In acres): 5

IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE (deg.—min.—sec.):
2. LONGITUDE (deg.—min.—sec.):

ARE BUILDINGS ON THE SITE?
[ ] 1. NO [X] 2. YES (specify): ABOVE GROUND PILE

(77)

VIII. PAST REGULATORY ACTIONS

IX. INSPECTION ACTIVITY (past or ongoing)

A. NONE [ ] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTION	2. DATE OF PAST ACTION (mo., day, & yr.)	3. REPRESENTATIVE (EPA/State)	4. DESCRIPTION

X. REMEDIAL ACTIVITY (past or ongoing)

A. NONE [ ] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTION	2. DATE OF PAST ACTION (mo., day, & yr.)	3. REPRESENTATIVE (EPA/State)	4. DESCRIPTION

Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.

~~P. Counterman~~

GPK
FYI
Gratwick - Riverside
Park file
cc
niagara
Reg 9

584 Delaware Avenue, Buffalo, New York 14202

October 15, 1980

Mr. Richard Clock
City Attorney's Office
North Tonawanda City Hall
216 Payne Avenue
North Tonawanda, New York 14120

Dear Mr. Clock:

Please be advised that the Department has not received any information if and when the City of North Tonawanda will be undertaking any additional hydro-geological investigation for the landfills located in various parts of the City, particularly the Botanical Gardens and the Gratwich Park area.

Please do not hesitate to call this office at 716/842-4311 if you have any questions regarding this matter.

Very truly yours,

Robert Mitrey by Yavuz Erk

Robert J. Mitrey, P.E.
Associate Sanitary Engineer

YE?
RJM:las

cc: P. Counterman

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION: II | STATE: NY

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335), 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET (or other identifier)		
GRATWICK PARK	RIVER ROAD / WITMER RD		
C. CITY	D. STATE	E. ZIP CODE	F. COUNTY NAME
NORTH TONAWANDA	NY	14120	NIAGARA

SITE OPERATOR INFORMATION

A. NAME		B. TELEPHONE NUMBER	
CITY of NORTH TONAWANDA		716-694-4340	
C. STREET	D. CITY	E. STATE	F. ZIP CODE
City Hall	NORTH TONAWANDA	N.Y.	—

OWNER INFORMATION (if different from operator of site)

A. NAME		B. TELEPHONE NUMBER	
Niagara-Mohawk Power Corp.		716-856-2424	
C. CITY	D. STATE	E. ZIP CODE	
Buffalo, N.Y.	N.Y.	—	

G. SITE DESCRIPTION
Filled AREA Between River Road and Niagara River (see notes)

H. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☒ 4. MUNICIPAL ☒ 5. PRIVATE (BUSINESS)
RENTS or LEASE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.)	B. APPARENT SERIOUSNESS OF PROBLEM
	☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE

PREPARER INFORMATION

A. NAME	B. TELEPHONE NUMBER	C. DATE (mo., day, & yr.)
L.R. MORIARTY	8-473-6841	8-28-80

III. INSPECTION INFORMATION

PRINCIPAL INSPECTOR INFORMATION

A. NAME	B. TITLE	
L.R. MORIARTY	SANITARY ENGINEER	
C. ORGANIZATION	D. TELEPHONE NO. (area code & no.)	
US-EPA-II-SLA-RPSB	8-473-6841	

INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
RICK TYGERT	N.Y.S. Dept of ENV. CONSERV.	716-847-4311

SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
NONE —	NO CONTACT	WITH CITY OR
	Niagara Mohawk	

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
ELIEZ PEREZ	716-695-1600	WALCK Rd., No. Tow, N.Y.	PAINTS, SOLVENTS 50,000 TONS
CITY OF NO. TONAWANDA	716-694-4340	City Hall, No. Tonawanda	RUBBISH 50,000 TONS

II. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
UNKNOWN			

III. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS
N/A		

A. DATE OF INSPECTION (mo., day, & yr.)	B. TIME OF INSPECTION	C. ACCESS GAINED BY: (credentials must be shown in all cases)
8/12/80	2:00 PM	☐ 1. PERMISSION ☐ 2. WARRANT ☒ with Pec

D. WEATHER (describe)
HOT - CLEAR - SUNNY

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. PILL			
g. SOIL			
h. VEGETATION			
i. OTHER (specify)			

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS
None		

From Page 2

IV. SAMPLING INFORMATION (continued)

... OF PHOTOS
... ND ☐ b. AERIAL
... ED?

2. PHOTOS IN CUSTODY OF: Being sent with Report

5. SPECIFY LOCATION OF MAPS: Yes — see attachment

... COORDINATES
... TUDE (deg.-min.-sec.): 43° - 3' - 16" N.
2. LONGITUDE (deg.-min.-sec.): 78° 53' 53" W

V. SITE INFORMATION

... STATUS

☐ 1. ACTIVE (Those industrial or ... cipal sites which are being used ... treatment, storage, or disposal ... continuing basis, even if infre- ...)

☒ 2. INACTIVE (Those sites which no longer receive wastes.)

☐ 3. OTHER (specify): (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

... GENERATOR ON SITE?
1. ... O ☐ 2. YES (specify generator's four-digit SIC Code):

... EA OF SITE (in acres): — 50 to 60 Ac.

D. ARE THERE BUILDINGS ON THE SITE? ☐ 1. NO ☒ 2. YES (specify): office

VI. CHARACTERIZATION OF SITE ACTIVITY

... the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	S...		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	B...		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

... SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this form.

☐ 1. STORAGE ☐ 2. INCINERATION ☒ 3. LANDFILL ☐ 4. SURFACE IMPOUNDMENT ☐ 5. DEEP WELL

☐ 6. CHEM/BIO/PHYS TREATMENT ☐ 7. LANDFARM ☐ 8. OPEN DUMP ☐ 9. TRANSPORTER ☐ 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

... WASTE TYPE
☐ 1. LIQUID ☒ 2. SOLID ☐ 3. SLUDGE ☐ 4. GAS

... WASTE CHARACTERISTICS
☐ 1. CORROSIVE ☐ 2. IGNITABLE ☐ 3. RADIOACTIVE ☐ 4. HIGHLY VOLATILE
☐ 5. TOXIC ☐ 6. REACTIVE ☐ 7. INERT ☐ 8. FLAMMABLE
☐ 9. OTHER (specify): ~~...~~ HISTORY indicate phenols present.

... WASTE CATEGORIES
A. ... records of wastes available? Specify items such as manifests, inventories, etc. below.

No

Estimate the amount (and unit of measure) of waste by category, mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT 50 Tons	AMOUNT	AMOUNT 50	AMOUNT	AMOUNT 50
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE Tons	UNIT OF MEASURE	UNIT OF MEASURE Tons
(1) PAINT, PIGMENTS	X (1) OILY WASTES	(1) HALOGENATED SOLVENTS	(1) ACIDS	(1) FLYASH	X (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	X (2) OTHER (specify): Grease	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	X (4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify)
			(6) CYANIDE	(6) OTHER (specify):	
			X (7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Phenols	X								50 Tons	

VIII. HAZARD DESCRIPTION

POTENTIAL EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

A. HUMAN HEALTH HAZARDS

None - Phenols may or do leach into the Niagara River.

Continue On Page 5

C. WORKER INJURY/EXPOSURE

N/A - Used for recreation area + boat launching

D. WORKER INJURY/EXPOSURE

N/A same as B

D. CONTAMINATION OF WATER SUPPLY

Public water Supply

E. CONTAMINATION OF FOOD CHAIN

N/A

F. CONTAMINATION OF GROUND WATER

EXTENT UNKNOWN

G. CONTAMINATION OF SURFACE WATER

No

CALIFORNIA

None - See photos for seagull roosting

WELL

None

CONTAMINATION OF AIR

None

REMEDIABLE DOORS

None

CONTAMINATION OF SOIL

Moderate Risk

PROPERTY DAMAGE

None

None

LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

None

SEWER, STORM DRAIN PROBLEMS

None

CORROSION PROBLEMS

None

INADEQUATE SECURITY

N/A

INCOMPATIBLE WASTES

N/A

Continue On Reverse

VIII. HAZARD DESCRIPTION (continued)

one

IX. POPULATION DIRECTLY AFFECTED BY SITE

POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
AR S	150-200 (est)	125-175	AC-50	1/4mile
ART S	50 (est)	50	10	1/4mile
EAS	Unknown	Unknown	None	*
AS	300 to 500/day	300 to 500/day	one	on site

X. WATER AND HYDROLOGICAL DATA

NDWATER (specify unit) LU River level	B. DIRECTION OF FLOW South	C. GROUNDWATER USE IN VICINITY Ind use
OI AQUIFER	E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure) Public Water	F. DIRECTION TO DRINKING WATER SUPPLY South

NG ATER SUPPLY

NIT CTIONS* ☒ 3. COMMUNITY (specify town): South Tonawanda > 15 CONNECTIONS

ATE ☐ 4. WELL

Continue On Page 9

hie Road Boundens Site.

XIV. PERMIT INFORMATION

...ed by the site and provide the related information.

...ation)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X') 1. YES	2. NO	3. UNKNOWN
...e known		– old dump, completed					
covered and used as a							
recreation area							

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☐ YES (summarize in this space)

...e working with Texas To get connections to prevent seepage into the Niagara River but no legal actions pending.

Based on the information in Sections III through XV, fill out the Tentative Disposition (*Section II*) information on the first page of this form.

SITE USED AS A RECREATIONAL AREA.

(50,000 TONS of RUBBISH)

GROUND IT IS

SURFACE WATER ALLOW WATER IN AND OUT OF THE FILL

RUN OFF AREA - PONDING NEAR RIVER IN

(Typo) AREAS EXISTS - BUT SUSPECT RIVER LEVEL THROUGH RIP-RAP

SOD - TREES

GROUND SEEPAGE

TAKEN PLACE

YEARS AGO.

K.R.M. 8/28/80

NAME OF LANDFILL

GRATWICK - RIVERSIDE PARK (DEC #932060)

LOCATION

River Road, North Tonawanda, New York

Gratwick Park is located between the Niagara River and River Road, extending from the city limits southeast to a point south of the Ward Road intersection. The extent of the disposal area within the park is unknown, but it is suspected that most or all of the area was used.

OWNERSHIP

The site is currently owned by the Niagara Mohawk Power Corporation.

HISTORY

The initial use of this site appears to be as a disposal area for metallurgical slag. From well records, the slag layers appear to be 11 to 12 feet deep, with the top of the slag roughly level with the river level. This suggests that the slag was placed into the river directly, most likely by expanding the shoreline into the river. The location of the original shoreline has not been determined. The generator of this slag has not been ascertained at this time.

The site was used by the City of North Tonawanda for disposal of municipal and industrial wastes from 1964 to 1968. During this period, open burning was practiced, accounting for the cinders present in the soils. Well records show cinders and rubbish to extend from 2 feet below the surface to about 6 feet. It is not known whether any industrial wastes were burned. The site was reported 75 percent covered and graded in 1969.

According to the Interagency Task Force On Hazardous Wastes, Bell Aerospace Textron used the site from 1962 to 1966 to dispose of scrap wood, plaster molds, small quantities of scrap adhesives and laboratory chemicals. Hooker-Durez reportedly disposed of 25,000 tons of phenolic resins, 25,000 tons of phenolic molding compounds, 50 tons of oil and grease and 50,000 tons of rubbish from 1960 to 1968. A 1964 New York State Health Department inspection report lists Hooker-Durez and Rapid Disposal as users of the site. The type or quantity of material disposed of at this site by Rapid Disposal is unknown. Niagara County Health Department files indicate tha other firms may have used this site.

The site is now used as a park with a picnic shelter, s and a boat launch ramp.

INVESTIGATION

A preliminary site visit was made on June 12, 1981 by Mr. M.E. Hopkins of the Niagara County Health Department and Mr. M. Eisenhower of the City of North Tonawanda Engineer's Office. At this time, the locations of four sampling wells in Gratwick Park and one well east of River Road were located. The locations of these wells are shown on the attached drawing. The

INVESTIGATION (continued)

surface of the park showed uneven settling over most of its surface.

A second visit was made by Mr. M.E. Hopkins on June 23. At this time, it was noted that the river edge contained numerous steel drums and remnants of drums, some containing a hardened slag-like substance. Also found were numerous hard, glass-like black or yellow to amber-brown nodules of unknown material, several of which were over one foot in diameter. Much of the river-front had been riprapped with concrete debris and a concrete wall was built along approximately 100 yards of riverfront. A five-foot sewer outfall was found at a point west of the foot of Ward Road. There was approximately one foot of water in the outfall, which was flowing into the river. Two 12 inch corrugated galvanized steel pipes were found emptying to the river. The northern most pipe was dry at this time. The pipe immediately south of the boat launch ramp was approximately one-third clogged with gravel and sediment, apparently washed in from the river. This pipe contained a small amount of water, which did not appear to be flowing and was suspected to be river water.

SOILS

Soil data was extracted from well boring records for the four sampling wells placed by RECRA Research in June, 1979. The general profile appears to be 1.5 to 2 feet of clayey-silt over about 4 feet of mixed cinders, garbage and wood over 7 to 9 feet of partially cemented slag, over about 2 feet of sand abruptly changing to clay at about 18 feet. It was noted that the slag material and possibly part of the cinder-garbage mix are below river level. The records state that the samples taken from these two layers are slightly to strongly odorous. It was noticed that pockets of the surface have settled as much as 2 feet relative to the surrounding surface.

GROUNDWATER

A perched water table in unconsolidated material is present. The water table rose to about six feet from the surface in all wells (June 5, 1979) according to well records. This perched aquifer flows generally southeasterly toward the river, except between wells 10 and 11 where the flow appears to flow southwesterly to the river, according to RECRA. The method of determining the direction of movement is not known. No information was obtained regarding bedrock or deeper aquifers.

CONCLUSIONS

The potential for migration of toxic substances to the river is high due to the proximity of the site to the river. The confirmed presence of hazardous materials and the direction of groundwater flow toward the river. It was noted that RECRA Research, Inc. found detectable quantities of aliphatic and aromatic hydrocarbons and phenols in groundwater in 1979.

SAMPLING

This department sampled water from each of the 4 wells for THO, heavy metals and phenol. It was noted that all samples were discolored

SAMPLING (continued)

and odorous. The odor was strongest in well #10. The odors in wells #13, #10 and #11 were organic in character. The odor in well #12 was similar to a garbage odor.

RECOMMENDATIONS

The site should be monitored and inspected periodically. The sampling wells appear adequate, but should be maintained. The exposed drums along the river front should be removed.

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

L REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

ACCESSION NO: 04659 YR/MO/DAY/HR SAMPLE REC'D: 81/07/20/11

PORTING LAB: 10 EHC ALBANY
RAM: 650 SOLID WASTES
ATION (SOURCE) NO:
AINAGE BASIN: 01 NY GAZETTEER NO: 3103 COUNTY: NIAGARA
DINATES: DEG ' "N, DEG ' "W
ION NAME INCL SUBM'SHED: GRATWICK RIVERSIDE PARKSITE T. N.TONAWANDA

T SAMPLING POINT: RECRA MONITERING WELL #10
OF SAMPLE: 25 GROUND WATER
/DAY/HR OF SAMPLING: FROM 00/00 TO 07/16/11
PORT SENT TO: CO (1) RO (1) LPHE (1) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
9701	CADMIUM,TOTAL	MG/L	0.02	_T
501	CHROMIUM,TOTAL	MG/L	0.1	_T
101	LEAD,TOTAL	MG/L	0.1	_T
0309	MERCURY, TOTAL	MCG/_	0.4	_T
801	NICKEL,TOTAL	MG/L	0.05	

TE PRINTED: 8/05/81

MR.G.DAVID KNOWLES,BUR.OF SOLID WASTES
NYS DEPT.OF ENVIRONMENTAL CONSERVATION
ROOM 401, 50 WOLF ROAD

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

FINAL REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

ACCESSION NO: 04660 YR/MO/DAY/HR SAMPLE REC'D: 81/07/20/11

REPORTING LAB: 10 EHC ALBANY
PROGRAM: 650 SOLID WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 01 NY GAZETTEER NO: 3103 COUNTY: NIAGARA
COORDINATES: DEG ' "N DEG ' "W
COMMON NAME INCL SUBWATERSHED: GRATWICK RIVERSIDE PARKSITE T. N. TONAWANDA

EXACT SAMPLING POINT: RECRA MONITERING WELL #11
TYPE OF SAMPLE: 25 GROUND WATER
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 07/16/11
REPORT SENT TO: CO (1) RO (1) ALPHE (1) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
09701	CADMIUM, TOTAL	MG/L	0.02	LT
01301	CHROMIUM, TOTAL	MG/L	0.1	LT
01051	LEAD, TOTAL	MG/L	0.1	LT
00509	MERCURY, TOTAL	MCG/L	0.4	LT
01301	NICKEL, TOTAL	MG/L	0.05	LT

REPORT PRINTED: 8/05/81

R. G. DAVID KNOWLES, DIR. OF SOLID WASTES
NYS DEPT. OF ENVIRONMENTAL CONSERVATION
ROOM 401, 50 WOLF ROAD
ALBANY, N.Y. 12233

SUBMITTED BY: P BUECHL

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

ACCESSION NO: 04662 YR/MO/DAY/HR SAMPLE REC'D: 81/07/20/11

EPORTING LAB: 10 EHC ALBANY
OGRAM: 650 SOLID WASTES
S ATION (SOURCE) NO:
DRAINAGE BASIN: 01 NY GAZETTEER NO: 3103 COUNTY: NIAGARA
OORDINATES: DEG ' "N, DEG ' "W
S NMON NAME INCL SUBW'SHED: GRATWICK RIVERSIDE PARKSITE N.TONAWANDA

EXACT SAMPLING POINT: RECRA MONITERING WELL #12
T PE OF SAMPLE: 25 GROUND WATER
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 07/16/11
REPORT SENT TO: CO (1) RO (1) LPHE (1) LHO (0) FED (0) CHEM (1)

PARAMETER		UNIT	RESULT	NOTATION
109701	CADMIUM,TOTAL	MG/L	0.02	_T
1 9801	CHROMIUM,TOTAL	MG/L	0.1	_T
110101	LEAD,TOTAL	MG/L	0.1	_T
0.0009	MERCURY, TOTAL	MCG/_	0.4	_T
1 2301	NICKEL,TOTAL	MG/L	0.05	_T

DATE PRINTED: 8/05/81

MR.G.DAVID KNOWLES,SUP.OF SOLID WASTES
NYS DEPT.OF ENVIRONMENTAL CONSERVATION
ROOM 401, 50 WOLF ROAD
ALBANY,N.Y. 12233

SUBMITTED BY: P.BJECHL

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER
FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

SESSION NO: 04658 YR/MO/DAY/HR SAMPLE REC'D: 81/07/20/11

TESTING LAB: 10 EHC ALBANY
PROG: 650 SOLID WASTES
LOCATION (SOURCE) NO:
WATER BASIN: 01 NY GAZETTEER NO: 3103 COUNTY: NIAGARA
COORDINATES: DEG ' "N, DEG ' "W
LOCATION NAME INCL SUBW'SHED: GRATWICK RIVERSIDE PARKSITE T. NORTH TONAWANDA
DESC OF SAMPLING POINT: RECRA. MONITERING WELL #13
TYPE OF SAMPLE: 25 GROUND WATER
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 07/16/11
REPORT SENT TO: CO (1) RO (1) LPHE (1) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
01701	CADMIUM, TOTAL	MG/L	0.02	_T
01801	CHROMIUM, TOTAL	MG/L	0.1	_T
1 1	LEAD, TOTAL	MG/L	0.1	
.0309	MERCURY, TOTAL	MCG/_	0.4	_T
801	NICKEL, TOTAL	MG/L	0.06	

TE PRINTED: 8/05/81

G.DAVID KNOWLES, BUR. OF SOLID WASTES
NYS DEPT. OF ENVIRONMENTAL CONSERVATION
ROOM 401, 50 WOLF ROAD
ALBANY, N.Y. 12233

SUBMITTED BY: P.BUECHL

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

FINAL REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

B ACCESSION NO: 00654 YR/MO/DAY/HR SAMPLE REC'D: 81/08/12/13

REPORTING LAB: 50 EHC FIELD LAB
PROGRAM: 650 SOLID WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 01 NY GAZETTEER NO: 3103 COUNTY: NIAGARA
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: GRATWICK PARK SITE RIVER RD NO TONAWANDA
932060
EXACT SAMPLING POINT: RECRA MONITORING WELL 10
TYPE OF SAMPLE: 25 GROUND WATER
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 08/12/10
REPORT SENT TO: CU (1) RO (2) LPHE (2) LHO (0) FED (0) CHEM (1)

PARAMETER		UNIT	RESULT	NOTATION
0?2701	PHENOLS	MG/L	3.7	

DATE PRINTED: 9/08/81

MR.G.DAVID KNOWLES,BUR.OF SOLID WASTES
NYS DEPT.OF ENVIRONMENTAL CONSERVATION
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ALBANY,N.Y. 12233

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

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RESULTS OF EXAMINATION
(PAGE 1 OF 1)

ACCESSION NO: 00655 YR/MO/DAY/HR SAMPLE REC'D: 81/08/12/13

REPORTING LAB: 50 ENC FIELD LAB
PROGRAM: 650 SOLID WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 01 NY GAZETTEER NO: 3103 COUNTY: NIAGARA
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: GRATWICK PARK SITE RIVER RD NO TONAWANDA
932060
PROJECT SAMPLING POINT: RECRA MONITORING WELL 11
TYPE OF SAMPLE: 25 GROUND WATER
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 08/12/10
REPORT SENT TO: CO (1) RO (2) LPHE (2) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
0 701	PHENOLS	MG/L	2.9	

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R.G.DAVID KNOWLES,BUR.OF SOLID WASTES
NYS DEPT.OF ENVIRONMENTAL CONSERVATION
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ALBANY,N.Y. 12233

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

FINAL REPORT FINAL REPORT FINAL REPORT

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

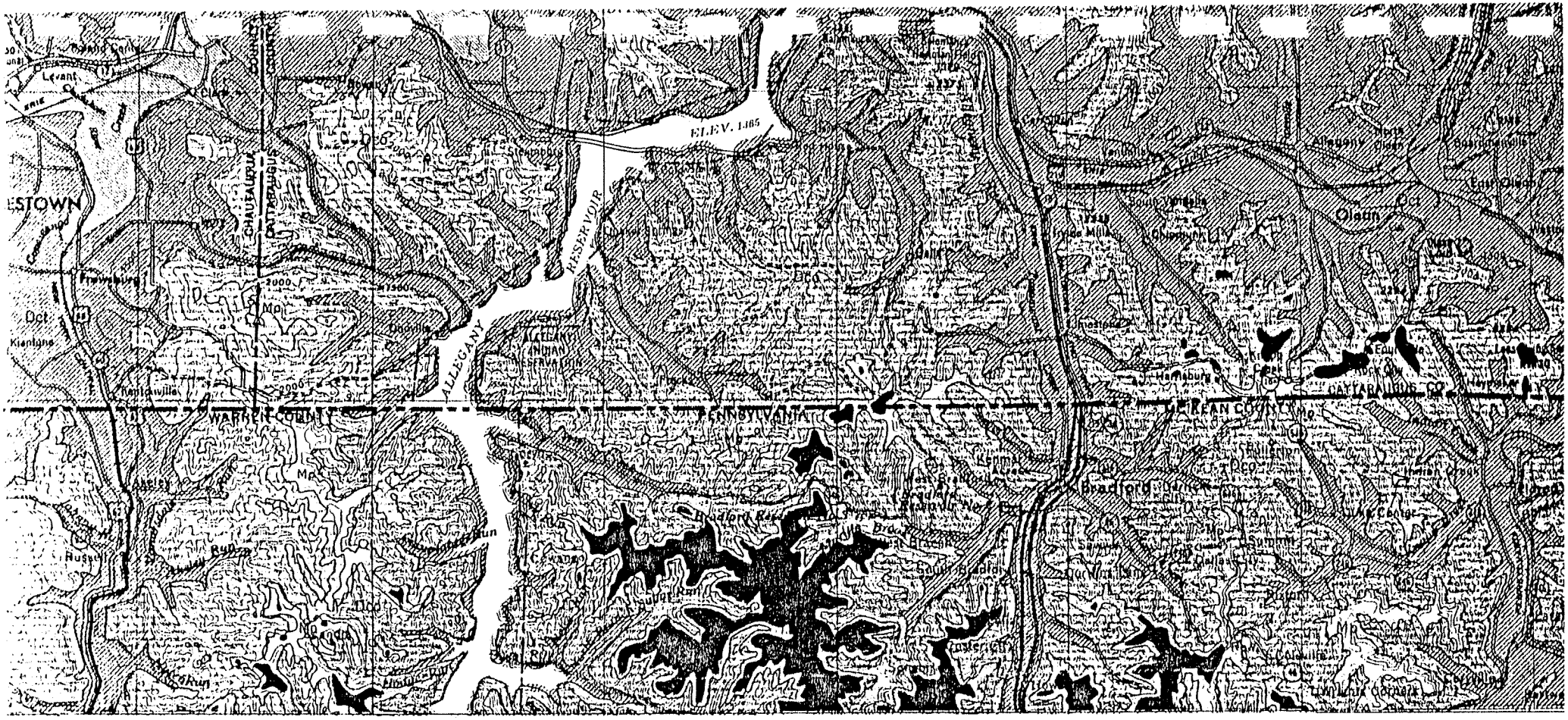
LAB ACCESSION NO: 00653 YR/MO/DAY/HR SAMPLE RECD: 81/08/12/13

REPORTING LAB: 51 EHC FIELD LAB
PROGRAM: 650 SOLID WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 01 NY GAZETTEER NO: 3103 COUNTY: NIAGARA
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBWATERSHED: GRATWICK PARK SITE RIVER RD NO TONAWANDA
932060
EXACT SAMPLING POINT: RECRA MONITORING WELL 13
TYPE OF SAMPLE: 25 GROUND WATER
YR/MO/DAY/HR OF SAMPLING: FROM 00/00 TO 08/12/11
REPORT SENT TO: CO (1) RO (2) LPHE (2) LHO (0) FED (0) CHEM (1)

PARAMETER		UNIT	RESULT	NOTATION
02701	PHENOLS	MG/L	17.	

DATE PRINTED: 9/08/81

...,G.DAVID KNOWLES,BUR.OF SOLID WASTES
NYS DEPT.OF ENVIRONMENTAL CONSERVATION
ROOM 401, 50 WOLF ROAD
ALBANY,N.Y. 12233



GEOLOGIC MAP OF NEW YORK

1970

Niagara Sheet

Scale 1:250,000

5 0 5 10 15 Statute Miles 20

5 0 5 10 15 20 25 Kilometers 30

CONTOUR INTERVAL 100 FEET

part of a report entitled Groundwater Investigation City of North Tonawanda RECRA Research, 1979

g: chromatographic scan for chlorinated organics, using a Coulson's
:ly : conductivity detector, was run on these latter two samples to
:: t the GC/MS data. Both samples were found to contain less than 1
s Chlorine, based upon Lindane as the standard.

e relative abundance listed in Tables I - VII are determined according
: eights, relative to the most abundant peak in the RIC. These are
i (proportional) to the on-column concentration of the constituents
but are not to be misinterpreted as an attempt at specific quantifica-

N:

e Botanical Gardens (Well #6, 6/11/79) sample was found to contain low
of chlorinated compounds. This was not unexpected because of the pre-
. rted Total Halogenated Organics (THO) concentration of 19.1 ug/l,
as obtained from the same sample. Note that oxygenated hydrocarbons,
:.us hydrocarbons and polynuclear aromatics also respond to the Elec-
ure Detector (ECD) used in the THO analysis.

Gratwick-Riverside Park samples (Well #10 and Well #13) had no detect-
nts of halogenated compounds. As with Well #6, little or no halo-
compounds were expected because of low THO concentration and the presence
r ECD responsive compounds.

oliday Park (Well #4) and Botanical Gardens (Well #6, 9/6/79) samples
ed detectable amounts of chlorinated organics. Again, note the presence
ECD sensitive compounds.

NC

TABLE II

CITY OF NORTH TONAWANDA
GAS CHROMATOGRAPHY/MASS SPECTROMETRY ANALYSIS
SEARCH FOR HALOGENATED COMPOUNDS

Sample Date: 6/11/79

Report Date: 10/15/79

GRATWICK-RIVERSIDE PARK WELL #10

NCE	NBS LIBRARY CHOICE	COMMENT
	1,3-dimethylbenzene	confirmed as an alkyl substituted aromatic hydrocarbon
ow	(1-methylethyl)-benzene	confirmed as an alkyl substituted aromatic hydrocarbon
ow	1,2,4-trimethylbenzene	confirmed as an alkyl substituted aromatic hydrocarbon
	2,5-dimethylnonane	confirmed as an aliphatic hydrocarbon
ow	azulene	confirmed as a polynuclear aromatic hydrocarbon
	2,2,3,4-tetramethylpentane	confirmed as an aliphatic hydrocarbon
ow	2-methylnaphthalene	confirmed as a polynuclear aromatic hydrocarbon
ow	decosane	confirmed as an aliphatic hydrocarbon
ow	2,7-dimethyloctane	confirmed as an aliphatic hydrocarbon
ow	2-butyltetrahydrothiophene	insufficient spectral data for manual evaluation
ow	dodecylphenol	insufficient spectral data for manual evaluation
ow	octadecane	confirmed as an aliphatic hydrocarbon
	eicosane	confirmed as an aliphatic hydrocarbon

Continued . . . .

TABLE 1
(Continued)

CITY OF NORTH TONAWANDA
GAS CHROMATOGRAPHY/MASS SPECTROMETRY ANALYSIS
SEARCH FOR HALOGENATED COMPOUNDS

Sample Date: 6/11/79

Report Date: 10/15/79

GRATWICK-RIVERSIDE PARK WELL #10

ANCE	NBS LIBRARY CHOICE	COMMENT
	eicosane	confirmed as an aliphatic hydrocarbon
	octadecane	confirmed as an aliphatic hydrocarbon
	eicosane	confirmed as an aliphatic hydrocarbon
	heneicosane	confirmed as an aliphatic hydrocarbon
m	hexadecanoic acid	confirmed as an oxygenated aliphatic hydrocarbon
	pentacosane	confirmed as an aliphatic hydrocarbon
m	pentacosane	confrimed as an aliphatic hydrocarbon
y high	octadecanoic acid	confirmed as an oxygenated aliphatic hydrocarbon
	pentatriacontane	confirmed as an aliphatic hydrocarbon
m	11-decyldocosane	confirmed as an aliphatic hydrocarbon
	pentacosane	confrimed as an aliphatic hydrocarbon
	hexatriacone	confirmed as an aliphatic hydrocarbon
y low	hexatriacone	confirmed as an aliphatic hydrocarbon

FOR RECRA RESEARCH, INC. George M. Bailis

DATE 15 October 1979

CH NC.

TABLE III

CITY OF NORTH TONAWANDA
GAS CHROMATOGRAPHY/MASS SPECTROMETRY ANALYSIS
SEARCH FOR HALOGENATED COMPOUNDS

Sample Date: 6/11/79

Report Date: 10/15/79

GRATWICK-RIVERSIDE PARK WELL #13

E ICE	NBS LIBRARY CHOICE	COMMENT
	undecane	confirmed as an aliphatic hydrocarbon
	2,3,5-trimethylpyridine	confirmed as a nitrogenous hydrocarbon
..w	naphthalene	confirmed as a polynuclear aromatic hydrocarbon
w	octadecane	confrimed as an aliphatic hydrocarbon
	tridecane	confirmed as an aliphatic hydrocarbon
	pentacosane	confirmed as an aliphatic hydrocarbon
	tridecane	confrimed as an aliphatic hydrocarbon
	hexatriacontane	confirmed as an aliphatic hydrocarbon
	pentacosane	confirmed as an aliphatic hydrocarbon
	hexadecanoic acid	confirmed as an oxygenated aliphatic hydrocarbon
	eicosane	confirmed as an aliphatic hydrocarbon
	eicosane	confirmed as an aliphatic hydrocarbon
	octadecanoic acid, butylester	confirmed as an oxygenated aliphatic hydrocarbon
h..gh	pentacosane	confirmed as an aliphatic hydrocarbon
	pentacosane	confirmed as an aliphatic hydrocarbon
	pentacosane	confirmed as an aliphatic hydrocarbon
	eicosane	confirmed as an aliphatic hydrocarbon
	11-decyldocosane	confirmed as an aliphatic hydrocarbon
	tetratetracontane	confirmed as an aliphatic hydrocarbon

FOR RECRA RESEARCH, INC. George M. Bukis

DATE 15 October 1979

I. DISCUSSION AND COMMENT (CONTD.)

Chromatography/Mass Spectrometry (GC/MS).

Initial analysis of the basement seepage sample demonstrated elevated concentrations for both the total phenols and the halogenated organic scan. (Table 10). Results were elevated in terms of accepted ground water standards and normally encountered background conditions. Halogenated organic scan results are used for screening purposes only and are not designed for qualification or quantification of specific organic compounds. In addition, compounds other than halogenated organics will respond to the gas chromatographic detector utilized in this analysis. Hence a positive response on this test is not confirmation of the presence of halogenated organics. To fully characterize the compounds that comprised the halogenated organic scan result, the sample was analyzed by GC/MS. As a result of GC/MS analysis the sample was found to contain two polynuclear aromatic hydrocarbons, one alkyl substituted aromatic hydrocarbon, and numerous aliphatic hydrocarbons. There was some indication that the polynuclear aromatics could be the priority pollutants naphthalene and anthracene. The majority of the constituents identified were aliphatic hydrocarbons (Table 11). The complete GC/MS report can be found in Appendix C.

Gratwick-Riverside Park (Wells 10, 13 and 14)

Concentrations for total halogenated organic scan analyses of ground water samples from wells 10 and 13 collected under Phase I of this study (July 6, 1979 Report) although not alarmingly high, were elevated above concentrations normally encountered. As a consequence, a characterization of the compounds comprising this reported value was undertaken utilizing Gas Chromatography/Mass Spectrometry (GC/MS) analysis. In addition to these analyses, wells 10 and 13 as well as newly constructed well 14 were sampled and analyzed according to Schedules A and C of the Analytical Program. Surface waters (SP-1 and SP-2) were also

CUSSION AND COMMENT (CONTD.)

pled from the nearshore area (Niagara River) of Gratwick-Riverside Park .

GC/MS analyses of the June 11, 1979 samples (Wells 10 and 13) indicated detectable amount of halogenated constituents. Both samples did however, contain polynuclear aromatics, oxygenated hydrocarbons, substituted aromatics, and aliphatic hydrocarbons. In addition, well 13 was found to contain one trogenous hydrocarbon. The constituents of well 10 and well 13 are listed in Tables 12 and 13 respectively. These non-halogenated compounds are believed account for the previously reported total halogenated organic concentrations. The GC/MS report detailing these analyses can be found in Appendix B.

Additional analytical work performed on samples from wells 10 and 13 strated elevated concentrations for several of the parameters examined (Table 14).

Conductivity, pH, chloride, total phenol and the halogenated organic scan re elevated relative to existing ground water standards and expected background concentrations for both well 10 and 13. In addition, total organic carbon s elevated for well 13. The halogenated organic scan (1,100µg/1) and total phenol (63.1 mg/1) concentrations were particularly elevated for well 13. Previous analytical results for these two parameters were 28.8µg/1 and 18.5 mg/1 respectively.

GC/MS characterization of the November 29, 1979 well 10 sample for halogenated constituents indicated that the sample contained primarily aliphatic ydrocarbons. Halogenated compounds were not detected for this sample. Gas chromatographic analysis of this sample utilizing a chlorine specific detector confirmed this GC/MS analysis (Table 14). GC/MS analysis for the presence of henolic compounds demonstrated the presence of phenol and a mono-and a di-alkyl phenol isomer. The complete GC/MS report for this sample can be found in

VII. DISCUSSION AND COMMENT (CONTD.)

Appendix D.

GC/MS characterization of the November 29, 1979 Well 13 sample for halogenated constituents demonstrated the presence of chlorinated materials. Chlorobenzene isomers, as well as alkylated aromatics and oxygenated biphenyls were detected. Also identified without the use of an internal standard was the presence of dibenzodioxin isomers. The presence of dibenzodioxin was substantiated by the presence of various biphenyl compounds occurring as oxygenated and/or chlorinated derivatives. These latter compounds belong to a group of constituents which are precursors to dibenzodioxin molecules. Table 15 provides a detailed list of all compounds identified. Chlorine specific gas chromatographic analyses confirmed the presence of chlorinated compounds in this sample (340 µg/l; Table 14). GC/MS analysis for phenolic compounds confirmed the presence of phenol and alkyl and chlorinated derivatives of phenol (Table 15). The GC/MS report detailing the above analyses can be found in Appendix D.

As a result of the elevated value obtained for the halogenated organic scan for the November 29, 1979 sample (1100µg/l) well 13 was resampled on two additional occasions, December 26, 1979 and January 10, 1980. Values obtained for the halogenated organic scan on each of these dates was 17.4µg/l and 38.6µg/l respectively. (Tables 16 and 17). The 17.4µg/l halogenated organic scan value is considered somewhat suspect because of the fact that during sample preparation, some of the material crystallized out of solution and would not redissolve in the extract solvent. Analysis of the soil boring logs indicates that Well 13 was screened at the interface of fill materials and the natural soils. Consequently, it is felt that the variability in halogenated organic scan results for the various sampling dates is probably due to the positioning of the well point.

DISCUSSION AND COMMENTS: (CONTD.)

Variability in halogenated organic scan results is also a function of the solids contained in the sample. Analysis of both the November 29, 1979 and January 9, 1980 samples for soluble chlorinated organics demonstrates that a significant portion of the chlorinated organics recorded for the samples is associated with contained solids (Table 18). From the data it is quite apparent that Well 13 is screened in an area containing chlorinated Waste materials and that solubilization of this material into associated ground water is occurring.

Analysis of samples from Well 14 demonstrated low concentrations for both the halogenated organic scan and the chlorinated organic scan. (Table 14). Gas Chromatography/Mass Spectrometry (GC/MS) analysis of this sample indicated the absence of halogenated compounds and the fact that sample constituents contributing to the halogenated organic scan were primarily aliphatic hydrocarbons.

The absence of contaminants in well 14 coupled with the fact that it is located upgradient of Gratwick-Riverside Park tends to demonstrate that the source of constituents identified in ground water samples from wells at Gratwick-Riverside Park is materials disposed of at the site. Given this data plus the fact that ground water flow in this area is towards the Niagara River, the potential exists for constituents identified in ground waters tested at the site to be discharged into the River. Analysis of surface waters (SP-1 and SP-2; Table 19) in the nearshore area of the Park, however did not demonstrate elevated concentration for parameters examined. Because of current and dilution effects in the River, this data does not totally preclude the possibility for the discharge of identified ground water constituents into the Niagara River.

Response to New York State Department of Environmental Conservation Comments

In response to the New York State Department of Environmental Conservation

TABLE 12

CITY OF NORTH TONAWANDA
GAS CHROMATOGRAPHY/MASS SPECTROMETRY ANALYSIS
SEARCH FOR HALOGENATED COMPOUNDS

Sample Date: 6/11/79

Report Date: 10/15/79

GRATWICK-RIVERSIDE PARK WELL #10

AN #	ABUNDANCE	NBS LIBRARY CHOICE	COMMENT
6	low	1,3-dimethylbenzene	confirmed as an alkyl substituted aromatic hydrocarbon
4	very low	(1-methylethyl)-benzene	confirmed as an alkyl substituted aromatic hydrocarbon
5	very low	1,2,4-trimethylbenzene	confirmed as an alkyl substituted aromatic hydrocarbon
1	low	2,5-dimethylnonane	confirmed as an aliphatic hydrocarbon
36	very low	azulene	confirmed as a polynuclear aromatic hydrocarbon
29	very low	2,2,3,4-tetramethylpentane	confirmed as an aliphatic hydrocarbon
9	very low	2-methylnaphthalene	confirmed as a polynuclear aromatic hydrocarbon
3	very low	decosane	confirmed as an aliphatic hydrocarbon
77	very low	2,7-dimethyloctane	confirmed as an aliphatic hydrocarbon
38	very low	2-butyltetrahydrothiophene	insufficient spectral data for manual evaluation
10	very low	dodecylphenol	insufficient spectral data for manual evaluation
7	very low	octadecane	confirmed as an aliphatic hydrocarbon
7	low	eicosane	confirmed as an aliphatic hydrocarbon

Continued . . . .

TABLE 12
(Continued)

CITY OF NORTH TONAWANDA
GAS CHROMATOGRAPHY/MASS SPECTROMETRY ANALYSIS
SEARCH FOR HALOGENATED COMPOUNDS

Sample Date: 6/11/79

Report Date: 10/15/79

GRATWICK-RIVERSIDE PARK WELL #10

BUNDANCE	NBS LIBRARY CHOICE	COMMENT
o	eicosane	confirmed as an aliphatic hydrocarbon
ow	octadecane	confirmed as an aliphatic hydrocarbon
o	eicosane	confirmed as an aliphatic hydrocarbon
o··	heneicosane	confirmed as an aliphatic hydrocarbon
edium	hexadecanoic acid	confirmed as an oxygenated aliphatic hydrocarbon
ow	pentacosane	confirmed as an aliphatic hydrocarbon
e ium	pentacosane	confrimed as an aliphatic hydrocarbon
ery high	octadecanoic acid	confirmed as an oxygenated aliphatic hydrocarbon
igh	pentatriacontane	confirmed as an aliphatic hydrocarbon
e ium	11-decyldocosane	confirmed as an aliphatic hydrocarbon
o··	pentacosane	confrimed as an aliphatic hydrocarbon
ow	hexatriacone	confirmed as an aliphatic hydrocarbon
e y low	hexatriacone	confirmed as an aliphatic hydrocarbon

FOR RECRA RESEARCH, INC. George M. Bilic

DATE 15 October 1979

RECRA INC

TABLE 13

CITY OF NORTH TONAWANDA
GAS CHROMATOGRAPHY/MASS SPECTROMETRY ANALYSIS
SEARCH FOR HALOGENATED COMPOUNDS

Sample Date: 6/11/79

Report Date: 10/15/79

GRATWICK-RIVERSIDE PARK WELL #13

ABUNDANCE	NBS LIBRARY CHOICE	COMMENT
ow	undecane	confirmed as an aliphatic hydrocarbon
ow	2,3,5-trimethylpyridine	confirmed as a nitrogenous hydrocarbon
ery low	naphthalene	confirmed as a polynuclear aromatic hydrocarbon
very low	octadecane	confrimed as an aliphatic hydrocarbon
low	tridecane	confirmed as an aliphatic hydrocarbon
low	pentacosane	confirmed as an aliphatic hydrocarbon
low	tridecane	confrimed as an aliphatic hydrocarbon
low	hexatriacontane	confirmed as an aliphatic hydrocarbon
low	pentacosane	confirmed as an aliphatic hydrocarbon
low	hexadecanoic acid	confirmed as an oxygenated aliphatic hydrocarbon
medium	eicosane	confirmed as an aliphatic hydrocarbon
high	eicosane	confirmed as an aliphatic hydrocarbon
low	octadecanoic acid, butylester	confirmed as an oxygenated aliphatic hydrocarbon
very high	pentacosane	confirmed as an aliphatic hydrocarbon
high	pentacosane	confirmed as an aliphatic hydrocarbon
medium	pentacosane	confirmed as an aliphatic hydrocarbon
low	eicosane	confirmed as an aliphatic hydrocarbon
low	11-decyldocosane	confirmed as an aliphatic hydrocarbon
low	tetratetracontane	confirmed as an aliphatic hydrocarbon

FOR RECRA RESEARCH, INC. George M. Bilis

DATE 15 October 1979

TABLE 14

ANALYTICAL RESULTS

CITY OF NORTH TONAWANDA

Report Date: 12/19/79

Sample Dates: 11/29/79
12/3/79
12/4/79

GROUND WATER SAMPLES

...ER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)				
		W-10 (11/29/79)	W-13 (11/29/79)	W-15 (12/3/79)	W-16 (11/29/79)	W-14 (12/4/79)
-	Standard Units	11.70	10.28	7.77	7.55	-
t...vity	µmhos/cm	2,690	2,020	660	860	-
d...	mg/l	390	47.5	18.1	47.0	-
ic Carbon	mg/l	32.2	378	19	24.0	-
...l nol	mg/l	1.26	63.1	0.003	0.007	-
...ated c Scan	µg/l as Chlorine; Lindane Standard	2.7	1,100	2.5	2.7	<0.05
... c Scan	µg/l as Chlorine; Lindane Standard	<1.0	340	-	-	<1.0

3. Samples were collected and labelled by Recra personnel and received for analysis on 11/29/79, 12/3/79 and 12/4/79. All analyses were performed according to U. S. Environmental Protection Agency methodologies. Values reported as "less than" indicate the working detection limit for the particular sample/parameter. All requested analyses are reported.

FOR RECRA RESEARCH, INC. Robert K. Wyeth

DATE 12/21/79

...H, INC.

TABLE 15

CITY OF NORTH TONAWANDA
GC/MS CHARACTERIZATION OF SAMPLE #W13

Date Received: 12/04/79
Report Date: 12/20/79

BUNDANCE	NBS LIBRARY CHOICE	COMMENT
ɔ	2,2,4,6,6-pentamethylheptane	confirmed as an aliphatic hydrocarbon
ɔw	1,3,5-trichlorobenzene	confirmed as a trichlorobenzene isomer
ɔ'	1,2,4-trichlorobenzene	confirmed as a trichlorobenzene isomer
ɔw	1,2,3,4-tetrachlorobenzene	confirmed as a tetrachlorobenzene isomer
ɔ'	10-methyleicosane	confirmed as an aliphatic hydrocarbon
ɔw	1,2,3,4-tetrachlorobenzene	confirmed as a tetrachlorobenzene isomer
ɔ'	phenol	confirmed as phenol
ɔw	2-methylphenol	confirmed as a methylphenol isomer
ɔ'	1,1'-biphenyl	confirmed as biphenyl
ɔ.	1,1'-oxybisbenzene	interpreted as oxygenated biphenyl
ɔw	2,5-dimethylphenol	confirmed as a dimethylphenol isomer
ɔ	eicosane	confirmed as an aliphatic hydrocarbon
w	2,3-dimethylphenol	confirmed as a dimethylphenol isomer
w	3,4-dimethylphenol	confirmed as a dimethylphenol isomer
w	4-(1-methylethyl)phenol	confirmed as an alkylated phenol isomer
w	dibenzofuran	confirmed on the basis of library fit
w	4-chlorophenol	confirmed as a chlorophenol isomer
w	hexatriacontane	confirmed as an aliphatic hydrocarbon
w	1-hexadecanol	confirmed as an oxygenated aliphatic hydrocarbon
w	2-methyl-2-pentene	confirmed as an aliphatic hydrocarbon
w	sec-butylethylbenzene	confirmed as an alkyl substituted benzene isomer
ɔy high	\1,1-biphenyl\-2-ol	confirmed as an oxygenated biphenyl
w	dipentylphthalate	confirmed as an alkyl substituted phthalate

Continued . . . .

TABLE 15
(Continued)

CITY OF NORTH TONAWANDA
GC/MS CHARACTERIZATION OF SAMPLE #W13

Date Received: 12/04/79
Report Date: 12/20/79

DANCE	NBS LIBRARY CHOICE	COMMENT
w	5-propyltridecane	confirmed as an aliphatic hydrocarbon
low	1-chloro-2-phenoxy-benzene	possibly a chloroxy biphenyl
ery high	\1,1'-biphenyl\-4-ol	confirmed as an oxygenated biphenyl
um	dibenzo B,E 1,4 dioxin	confirmed in the absence of a standard
w	\1,1'-biphenyl\-4-ol,4'-chloro	confirmed in the absence of a standard
	dibenzo\B,E\\1,4\dioxin	confirmed as an isomer in the absence of a standard
dium	dibenzo\B,E\\1,4\dioxin	confirmed as an isomer in the absence of a standard
ow	1,3-dimethylbenzene	confirmed as an alkyl substituted aromatic hydrocarbon
edium	decane	confirmed as an aliphatic hydrocarbon
	7-methyltridecane	confirmed as an aliphatic hydrocarbon
	1-ethyl-2-methylbenzene	confirmed as an alkyl substituted benzene isomer
	1-ethyl-4-methyl	confirmed as an alkyl substituted benzene isomer
ium	1,2,3-trimethylbenzene	confirmed as an alkyl substituted benzene isomer
ow	1,4-dichlorobenzene	confirmed as a dichlorobenzene isomer
	pentachlorobenzene	confirmed in the absence of a standard
ow	c-BHC	confirmed in the absence of a standard

FOR RECRA RESEARCH, INC. George M. Burke

DATE 20 December 1979

TABLE 16

ANALYTICAL RESULTS

CITY OF NORTH TONAWANDA

Report Date: 1/12/80
Sample Date: 12/26/79

GROUND WATER SAMPLE

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-13
Conductivity	umhos/cm	745
Chloride	mg/l	372
Halogenated Organic Scan	ug/l as Chlorine; Lindane Standard	17.4

COMMENTS: Samples were collected by Recra personnel and received on 12/26/79. All analyses were performed according to U. S. Environmental Protection Agency methodologies. During Halogenated organic scan preparation, solvent insoluble crystallization occurred in the concentration procedure. Halogenated organic scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated organic scan results do not include volatile organic constituents.

FOR RECRA RESEARCH, INC. Robert K Lyeth

DATE 1/14/80

RECRA RESEARCH INC.

ANALYTICAL RESULTS

CITY OF NORTH TONAWANDA

Report Date: 1/12/80
Sample Date: 1/10/80

GROUND WATER SAMPLE

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-13
Recoverable Phenols	mg/l	50.0
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	38.6
Soluble Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	4.2
Chlorinated Organic Scan	µg/l as Chlorine; Lindane Standard	6.6

COMMENTS: Samples were collected by Recra personnel and received on 1/10/80. Analyses were performed according to U. S. Environmental Protection Agency methodologies. Sample was found to contain suspended materials. These materials, based upon their solubility in extraction solvent, were believed to be suspended organic constituents. Halogenated and Chlorinated organic scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated and Chlorinated organic scan results do not include volatile organic constituents. Soluble Halogenated organic scan results are based upon analysis of the sample after 0.45 µm filtration.

FOR RECRA RESEARCH, INC. Ralph K. Wyeth

DATE 1/14/80

RECRA INC.

TABLE 18

SAMPLE IDENTIFICATION	SAMPLE DATE	CHLORINATED ORGANIC SCAN*(µg/l as CHLORINE, LINDANE STANDARD)	SOLUBLE CHLORINATED ORGANIC SCAN** (µg/l as CHLORINE, LINDANE STANDARD)
W-13	11/29/79	340.0	94.0
W-13	1/10/80	6.6	3.0

* Unfiltered Sample
** Sample Filtered Through 0.45µm Membrane Filters

TABLE 2

ANALYTICAL RESULTS
CITY OF NORTH TONAWANDA

Report Date: 7/6/79
Sample Date: 6/11/79

GROUND WATER ANALYSES

SAMPLE IDENTIFICATION NUMBER	SAMPLE LOCATION	PARAMETER (UNITS OF MEASURE) PHENOL (mg/l)	TOTAL HALOGENATED ORGANICS (µg/l AS CHLORIDE; LINDANE STANDARD)
8	Turner Farm	< 0.01	0.58
9	Forbes Street	0.02	3.93
10	Gratwick - Riverside Park	9.10	11.5
11	Gratwick - Riverside Park	4.60	2.78
12	Gratwick - Riverside Park	1.08	0.12
13	Gratwick - Riverside Park	18.5	22.8

COMMENTS: (Continued from Page 1 of 2). Generally the peaks found in the THO chromatograms were indicative of early eluting, low to medium molecular weight compounds. Possible compounds include substituted phenolics. Not all compounds in the chromatographs may necessarily be halogenated. Non-halogenated materials may be carried through the procedure and analyzed as halogenated compounds. Preliminary review of THO results indicate the possible presence of PCB's in the samples from the Botanical Gardens and Turner Farm. It is recommended that further analyses be undertaken to investigate the possibility of PCB's in these samples.

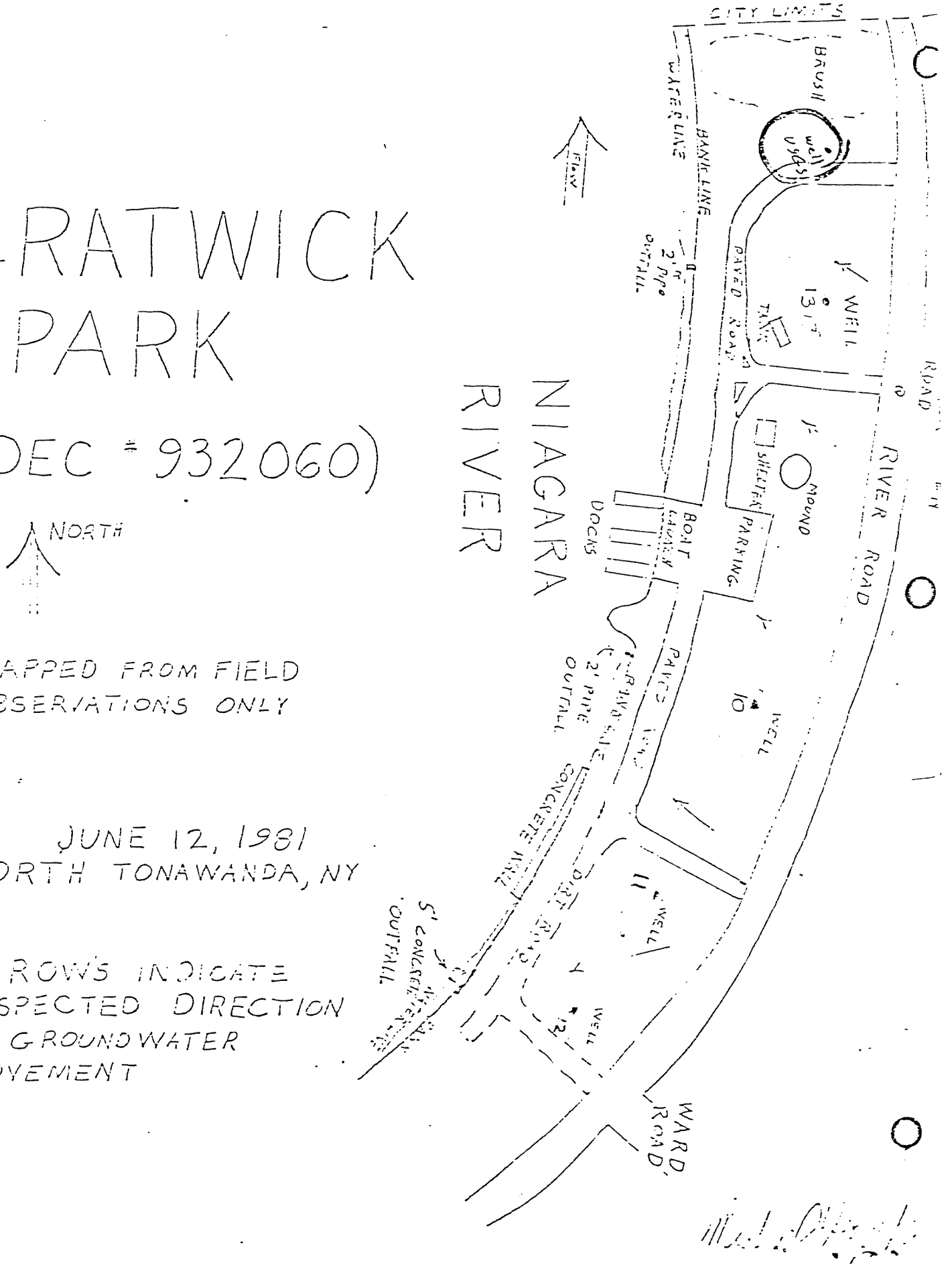
FOR RECRA RESEARCH, INC. R. W. Knight

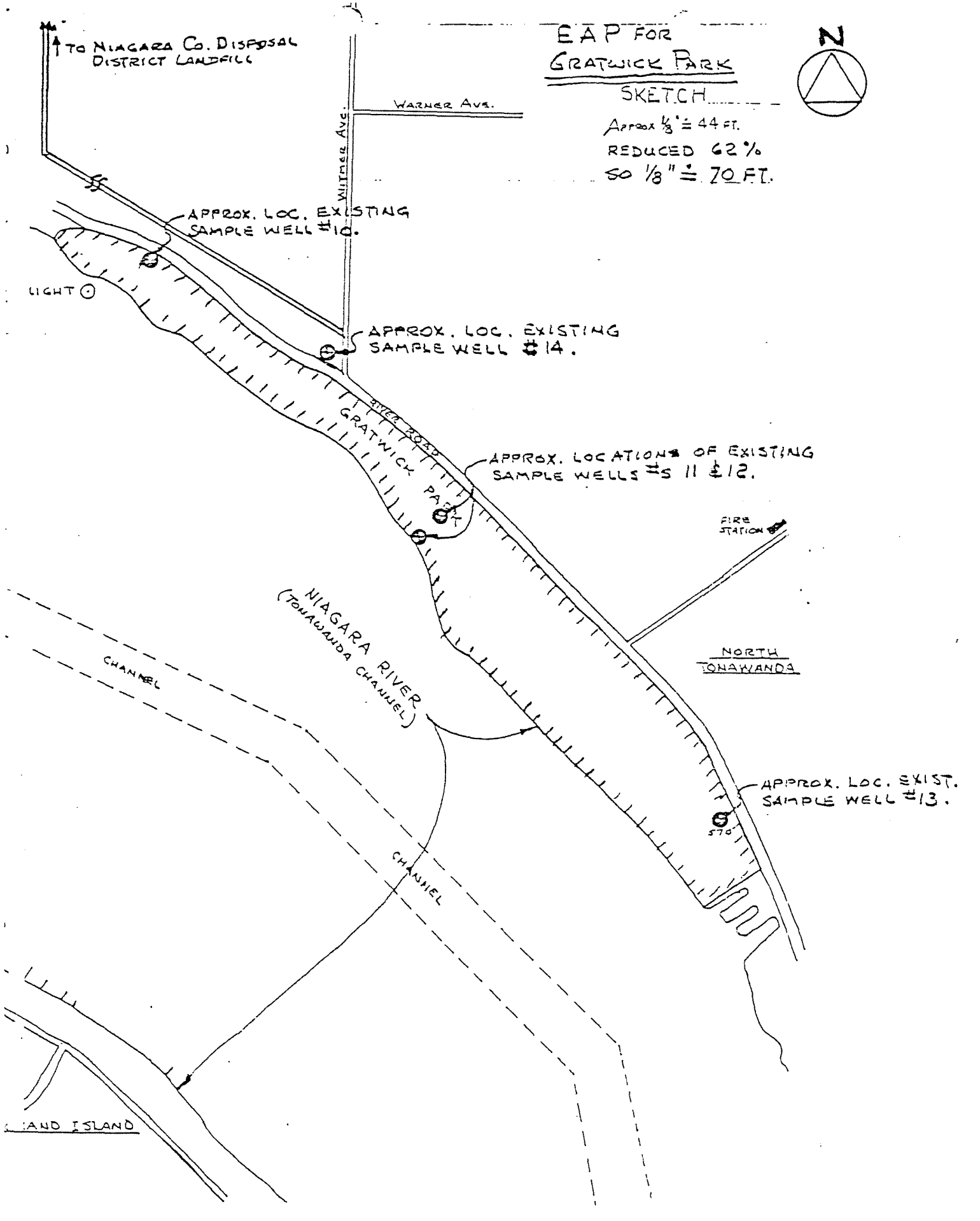
DATE 7/6/79

RECRA RESEARCH, INC. 111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620

GRATWICK PARK

(DEC # 932060)




EAP FOR
GRATWICK PARK
SKETCH
Approx 1/8" = 44 FT.
REDUCED 62%
so 1/8" = 70 FT.
N
TO NIAGARA CO. DISPOSAL DISTRICT LANDFILL
WARNER AVE.
WITMER AVE.
APPROX. LOC. EXISTING SAMPLE WELL #10.
LIGHT
APPROX. LOC. EXISTING SAMPLE WELL #14.
RIVER ROAD
GRATWICK PARK
APPROX. LOCATIONS OF EXISTING SAMPLE WELLS #5 11 & 12.
FIRE STATION
NIAGARA RIVER (TONAWANDA CHANNEL)
CHANNEL
NORTH TONAWANDA
APPROX. LOC. EXIST. SAMPLE WELL #13.
570
CHANNEL
AND ISLAND

DIMENSIONS, INC.

Test Borings and Logs
[illegible] Center Street • [illegible], New York [illegible] • (716) [illegible]

[illegible] 10 SURF. ELEV. _____

CT Monitoring Well installation
City of North Tonawanda
Recra Research, Inc.

LOCATION 200 ft. SW of River Rd., approximately 1000 ft. SE of [illegible] Rd.

DATE STARTED 6/1/79 COMPLETED 6/1/79

BLOWS ON SAMPLER					DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	0"/6"	6"/12"	12"/24"	N			
2	2	3	3		Moist black silt loam (CLAYEY-SILT) fill, slightly plastic 1.5		Soil fill to 1.5 ft. over mostly slag fill to 10.5 ft. over original soil consisting of a thin mantle of sand over clayey lake sediments.
6	3	2	2		Moist mixed black (SANDY-SILT), fill with chunks of wood, slag fragments becoming alternating layers of mostly slag, below six feet, slag is loose.	2 in. carbon steel pipe / Bentonite	Moderate odors noted in samples #3 - 6.
4	4	7	12				Split spoon sample advanced below 14.0 to 16.0 ft. to secure sample #9.
							9.0
							10.0
14	2	2	1		10.5		
					Wet black loamy medium size sand (SAND), loose 11.0	Well Screen / Sand pack	
2	1	2	1		Extremely moist brown SILTY-CLAY, thinly laminated clays, firm becoming soft with depth, plastic, sticky		12.0
					14.0		
					Boring completed to 14.0 feet.		Water table six ft. below surface at completion.

NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

[illegible] SHEET 1 OF 1

DIMENSIONS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

11 SURF. ELEV.

PROJECT Monitoring well installation
City of North Tonawanda

LOCATION 80 ft. East northeast of storm sewer outlet at southern end of park.

CLIENT Rivera Research, Inc.

DATE STARTED 6/1/79 COMPLETED 6/4/79

BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
3 3 2	Moist black cinders, silt size, very friable	2 inch carbon steel pipe	Strong odors noted in samples #2-5, moderate odors in samples #6-9.
2 2 2	4.0		
4 5 2	Moist partially decomposed paper		
	5.5		
2 2	Wet black highly decomposed organic material, soft		Sample #4 crosses abrupt boundary.
	7.0		
21 23 5	Wet gray and dark gray slag, angular size gravel, partially cemented in place	Bentonite seal	Cinder, partially decomposed paper and other organic debris and partially cemented slag to 18.5 ft. over clayey lake sediments.
4 3 4			
5 5 10 10			
6 8 9		Sand pack	15.5
4 3 2 2			17.5

NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb WT FALLING 30 " PER BLOW.

DIMENSIONS, INC.

Test Borings and Logs
707 Center Street • East Aurora, New York 14052 • (716) 652-1717

11, continued

SURF. ELEV. _____

Monitoring well installation
City of North Tonawanda

LOCATION 80 ft. East northeast of storm sewer outlet at southern end of park

Recra Research, Inc.

DATE STARTED 6/1/79 COMPLETED 6/4/79

BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	Partially cemented slag 18.5	Well Screen / Sand pack	17.5
1	Wet grayish pink SILTY-CLAY, thinly laminated clays, soft, plastic, sticky 21.0		19.5
	Boring completed at 21.0 feet.		Sample #9 crosses abrupt boundary. A one inch thick wet black very fine sandy loam (SILTY-SAND) lense rested on top of the SILTY-CLAY.
			2 foot stickup
			Water table 6 ft. below surface at completion.

= NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

SHEET 2 OF 2

DIENNSIONS, INC.

Test B[illegible] and Logs
787 Center Str[illegible] • East Amher[illegible], New York 1405[illegible] • (716) 6[illegible]-[illegible]

: 12 SURF. ELEV.

JECT : Monitoring well installation — LOCATION 400 ft. NW of Well #11, 290 ft. of Niagara River.
City of North Tonawanda

E R Recra Research, Inc. DATE STARTED 6/5/79 COMPLETED 6/5/79

BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
3 2 3 1	Moist dark brown and grayish brown CLAYEY-SILT fill, friable, slightly plastic — 2.0	2 inch carbon steel pipe	Slight odor from samples #3-6, moderate odor fro samples #7-9.
3 4 3 1	Moist brown and black mixed cinder, household metal garbage, wood fragments	Bentonite	Mixed fill to 6.0 ft. over cemented slag to 10.5 ft. over partially cemented slag to 15.5 ft. over water sorted sands to 18.5 ft. over clayey lake sediment.
4 3 3 3	SOIL CONTACT — 6.0		
50/3"	Moist cemented gray slag — 10.5		Sample #8 crosses abrupt boundary.
40 10 4 6			
12 8 9 10	Wet dark gray and black partially cemented slag		
6 6 7 2	— 15.5		
4 2 2	Wet dark gray loamy fine sand (SAND), loose — 16.0	Sand	

NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW

[illegible] D[illegible] W. O[illegible] Soil Scientist SHEET 1 OF 2

DAMES & MOORE, INC.
Test Borings and Logs
797 Cleveland Street • East Aurora, New York 14052 • (716) 652-1717

13 SURF. ELEV. _____

Monitoring well installation
City of North Tonawanda
-Recra Research, Inc.

LOCATION Gratwick - Riverside Park
150 ft. northwest of flagpole

DATE STARTED 6/5/79 COMPLETED 6/5/79

BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
3 3 5	Moist dark brown (CLAYEY-SILT) fill, friable		
	2.0		
7 6 4 3			Samples #2-4 & 7 had a moderate odor, samples #5 & 6 had strong odors.
6 6 5	Moist black cinders, with household metal garbage		
6 6 5			Soil fill to 2.0 ft. over mixed fill to 8.0 ft. over partially cemented slag to 15.0 ft. over very dense loamy glacial till.
	8.0		
7 9 11 12		2 inch carbon steel pipe	Bentonite
14 13 14 16	Wet partially cemented dark gray and black slag		
4 10 40 37			12.0
			14.0
4 10 40 37			
	15.0		
	Moist reddish brown loam (SAND-SILT-CLAY) with 10-15% subangular dolomitic gravel, extremely firm, massive soil structure	Well screen	Sand pack
34 42 100			16.6
	17.8		

Boring completed at 17.8 feet.

NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT. FALLING 30 " PER BLOW.

[illegible] BORINGS, INC.

Test Borings and Logs
797 Center Street • East Aurora, New York 14052 • (716) 655 1717

[illegible]ed

SURF. ELEV. _____

[illegible] well installation
[illegible] at North Tonawanda
Keere Research, Inc.

LOCATION 400 ft. NW of Well #11, 290 ft. of Niagara River.

DATE STARTED 6/5/79 COMPLETED 6/5/79

BLOWS ON SAMPLER	DESCRIPTION & CLASSIFICATION		WELL	WATER TABLE & REMARKS
1	Wet SAND, continued	18.5	Well Screen / Sand pack	Water table 6.5 ft. below surface.
	Wet grayish pink SILTY-CLAY, finely laminated clays, soft, sticky	20.0		

Sample #10 may have been contaminated from above through the sampling method.

Split spoon was overdriven below 20 ft. to secure sample #10 of the soft SILTY-CLAY.

Well stick-up was 3 ft. above surface.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 6 " WITH 300 lb. WT FALLING 30 " PER BLOW.

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

October 9, 1981

U.S. EPA, Region 2
Superfund, 26 Federal Plaza
Sites Notification
New York, NY 10278

Dear Sir:

SUBJECT: Superfund - Notification
Gratwick-Riverside Park Site

As required by Section 103(C) of the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), enclosed please find a completed notification form (EPA Form 8900-1) for the above cited facility.

The New York State Dept. of Environmental Conservation reported this site in their "First Annual Report of Hazardous Waste Disposal Sites in New York State-June 1980". (Copies of the specific report data sheets are attached for your information.) However, since Niagara Mohawk Power Corporation was recently notified by the Niagara County Health Dept. that Hooker Durez may have disposed of phenolic waste material at this site between 1960 and 1968, we believe additional Superfund notification may be warranted.

Niagara Mohawk purchased the Gratwick-Riverside Park land in 1957 (11 acres) and in 1959 (42 acres). We have no information or records indicating waste dumping on the land over the period 1957 to 1964. In 1964 Niagara Mohawk leased the entire site to the City of North Tonawanda for recreation and park purposes. If there was dumping after 1964, it would have been while the City was in control of the land and it would have been without Niagara Mohawk Power Corporation's knowledge and/or consent.

Sincerely,

John M. Toennies
Environmental Affairs Director

JMT:jw:FJG
Attachments

from: Preliminary Report
An Investigation of Selected Inactive
Toxic Landfills in Conjunction with the
Niagara River Study.
August 1981 USGS

NAME OF LANDFILL

GRATWICK - RIVERSIDE PARK (DEC #932060)

LOCATION

River Road, North Tonawanda, New York

Gratwick Park is located between the Niagara River and River Road, extending from the city limits southeast to a point south of the Ward Road intersection. The extent of the disposal area within the park is unknown, but it is suspected that most or all of the area was used.

OWNERSHIP

The site is currently owned by the Niagara Mohawk Power Corporation.

HISTORY

The initial use of this site appears to be as a disposal area for metallurgical slag. From well records, the slag layers appear to be 11 to 12 feet deep, with the top of the slag roughly level with the river level. This suggests that the slag was placed into the river directly, most likely by expanding the shoreline into the river. The location of the original shoreline has not been determined. The generator of this slag has not been ascertained at this time.

The site was used by the City of North Tonawanda for disposal of municipal and industrial wastes from 1964 to 1968. During this period, open burning was practiced, accounting for the cinders present in the soils. Well records show cinders and rubbish to extend from 2 feet below the surface to about 6 feet. It is not known whether any industrial wastes were burned. The site was reported 75 percent covered and graded in 1969.

According to the Interagency Task Force On Hazardous Wastes, Bell Aerospace Textron used the site from 1962 to 1966 to dispose of scrap wood, plaster molds, small quantities of scrap adhesives and laboratory chemicals. Hooker-Durez reportedly disposed of 25,000 tons of phenolic resins, 25,000 tons of phenolic molding compounds, 50 tons of oil and grease and 50,000 tons of rubbish from 1960 to 1968. A 1964 New York State Health Department inspection report lists Hooker-Durez and Rapid Disposal as users of the site. The type or quantity of material disposed of at this site by Rapid Disposal is unknown. Niagara County Health Department files indicate tha other firms may have used this site.

The site is now used as a park with a picnic shelter, s and a boat launch ramp.

INVESTIGATION

A preliminary site visit was made on June 12, 1981 by Mr. M.E. Hopkins of the Niagara County Health Department and Mr. M. Eisenhower of the City of North Tonawanda Engineer's Office. At this time, the locations of four sampling wells in Gratwick Park and one well east of River Road were located. The locations of these wells are shown on the attached drawing. The

INVESTIGATION (continued)

surface of the park showed uneven settling over most of its surface.

A second visit was made by Mr. M.E. Hopkins on June 23. At this time, it was noted that the river edge contained numerous steel drums and remnants of drums, some containing a hardened slag-like substance. Also found were numerous hard, glass-like black or yellow to amber-brown nodules of unknown material, several of which were over one foot in diameter. Much of the river-front had been riprapped with concrete debris and a concrete wall was built along approximately 100 yards of riverfront. A five-foot sewer outfall was found at a point west of the foot of Ward Road. There was approximately one foot of water in the outfall, which was flowing into the river. Two 12 inch corrugated galvanized steel pipes were found emptying to the river. The northern most pipe was dry at this time. The pipe immediately south of the boat launch ramp was approximately one-third clogged with gravel and sediment, apparently washed in from the river. This pipe contained a small amount of water, which did not appear to be flowing and was suspected to be river water.

SOILS

Soil data was extracted from well boring records for the four sampling wells placed by RECRA Research in June, 1979. The general profile appears to be 1.5 to 2 feet of clayey-silt over about 4 feet of mixed cinders, garbage and wood over 7 to 9 feet of partially cemented slag, over about 2 feet of sand abruptly changing to clay at about 18 feet. It was noted that the slag material and possibly part of the cinder-garbage mix are below river level. The records state that the samples taken from these two layers are slightly to strongly odorous. It was noticed that pockets of the surface have settled as much as 2 feet relative to the surrounding surface.

GROUNDWATER

A perched water table in unconsolidated material is present. The water table rose to about six feet from the surface in all wells (June 5, 1979) according to well records. This perched aquifer flows generally south-easterly toward the river, except between wells 10 and 11 where the flow appears to flow southwesterly to the river, according to RECRA. The method of determining the direction of movement is not known. No information was obtained regarding bedrock or deeper aquifers..

CONCLUSIONS

The potential for migration of toxic substances to the river is high due to the proximity of the site to the river. The confirmed presence of hazardous materials and the direction of groundwater flow toward the river. It was noted that RECRA Research, Inc. found detectable quantities of aliphatic and aromatic hydrocarbons and phenols in groundwater in 1979.

SAMPLING

This department sampled water from each of the 4 wells for THO, heavy metals and phenol. It was noted that all samples were discolored

SAMPLING (continued)

and odorous. The odor was strongest in well #10. The odors in wells #13, #10 and #11 were organic in character. The odor in well #12 was similar to a garbage odor.

RECOMMENDATIONS

The site should be monitored and inspected periodically. The sampling wells appear adequate, but should be maintained. The exposed drums along the river front should be removed.

SUMMARY OF SAMPLES TAKEN

SAMPLE #	LOCATION	TYPE	PARAMETER	DATE	NEAREST HOUR
1	Gratwick # 13	Well	Metals	7/16/81	11:00
2	Gratwick # 10	Well	Metals	7/16/81	11:00
3	Gratwick # 11	Well	Metals	7/16/81	11:00
4	Gratwick # 12	Well	Metals	7/16/81	11:00
5	Gratwick # 13	Well	THO	7/16/81	11:00
6	Gratwick # 10	Well	THO	7/16/81	11:00
7	Gratwick # 11	Well	THO	7/16/81	11:00
8	Gratwick # 12	Well	THO	7/16/81	11:00
9	Nia. Sanitation	Well	Metals	7/16/81	1:00
10	Nia. Sanitation	Well	THO	7/16/81	1:00
11	Zimmerman	Well	THO	7/16/81	12:00
12	Old Falls	Well	THO	7/16/81	12:00
13	Artpark	Leachate	Metals	7/17/81	12:00
14	Artpark	Leachate	THO	7/17/81	12:00
15	PASNY	Soil	Metals	7/21/81	10:00
16	PASNY	Soil	THO	7/21/81	10:00
17	Nia. Sanitation	Soil	Metals	7/24/81	12:00
18	Nia. Sanitation	Soil	THO	7/24/81	12:00
19	Nia. Sanitation	Soil	Metals	7/24/81	12:00
20	Nia. Sanitation	Soil	THO	7/24/81	12:00
21	Walck Road	Soil	THO	7/24/81	12:00
22	Gratwick # 13	Well	Phenol	8/12/81	10:00
23	Gratwick # 10	Well	Phenol	8/12/81	10:00
24	Gratwick # 11	Well	Phenol	8/12/81	10:00
25	Gratwick # 12	Well	Phenol	8/12/81	10:00
26	Zimmerman	Well	Phenol	8/12/81	11:00
27	Old Falls	Well	Phenol	8/12/81	11:00
28	Nia. Sanitation	Well	Phenol	8/12/81	12:00
29	Olin-Industrial Welding	Soil	THO, TOC Lindane	9/07/81	12:00

ANALYTICAL RESULTS FOR SAMPLES TAKEN AT GRATWICK - RIVERSIDE PARK

WELL # 10

Sample # 2	Sampled 11:00	7/16/81
Cadmium, total	L.T. 0.02 MG/L	
Chromium, total	L.T. 0.1 MG/L	
Lead, total	L.T. 0.1 MG/L	
Mercury, total	L.T. 0.4 MCG/L	
Nickle, total	0.05 MG/L	
Sample # 6	Sampled 11:00	7/16/81
THO	35 MCG/L	
Sample #24	Sampled 10:00	8/12/81
Phenol	3 MG/L	

WELL # 11

Sample # 3	Sampled 11:00	7/16/81
Cadmium, total	L.T. 0.02 MG/L	
Chromium, total	L.T. 0.1 MG/L	
Lead, total	L.T. 0.1 MG/L	
Mercury, total	L.T. 0.4 MCG/L	
Nickle, total	L.T. 0.05 MG/L	
Sample # 7	Sampled 11:00	7/16/81
THO	Less than 1 MCG/L	
Sample # 25	Sampled 10:00	8/12/81
Phenol	3 MG/L	

WELL # 12

Sample # 4	Sampled 11:00	7/16/81
Cadmium, total	L.T. 0.02 MG/L	
Chromium, total	L.T. 0.1 MG/L	
Lead, total	L.T. 0.1 MG/L	
Mercury, total	L.T. 0.4 MCG/L	
Nickle, total	L.T. 0.05 MG/L	
Sample # 8	Sampled 11:00	7/16/81
THO	4 MCG/L	
Sample # 26	Sampled 10:00	8/12/81
Phenols	0.2 MG/L	

GRATWICK - RIVERSIDE PARK (continued)

WELL # T3

Sample # 1	Sampled 11:00		7/16/81
Cadmium, total	L.T.	0.02 MG/L	
Chromium, total	L.T.	0.1 MG/L	
Lead, total		0.1 MG/L	
Mercury, total	L.T.	0.4 MCG/L	
Nickle, total		0.05 MG/L	
Sample # 5	Sampled 11:00		7/16/81
THO	18 MCG/L		
Sample # 22	Sampled 10:00		8/12/81
Phenols	17 MG/L		

RESULTS OF SAMPLES TAKEN AT NIAGARA SANITATION SITE

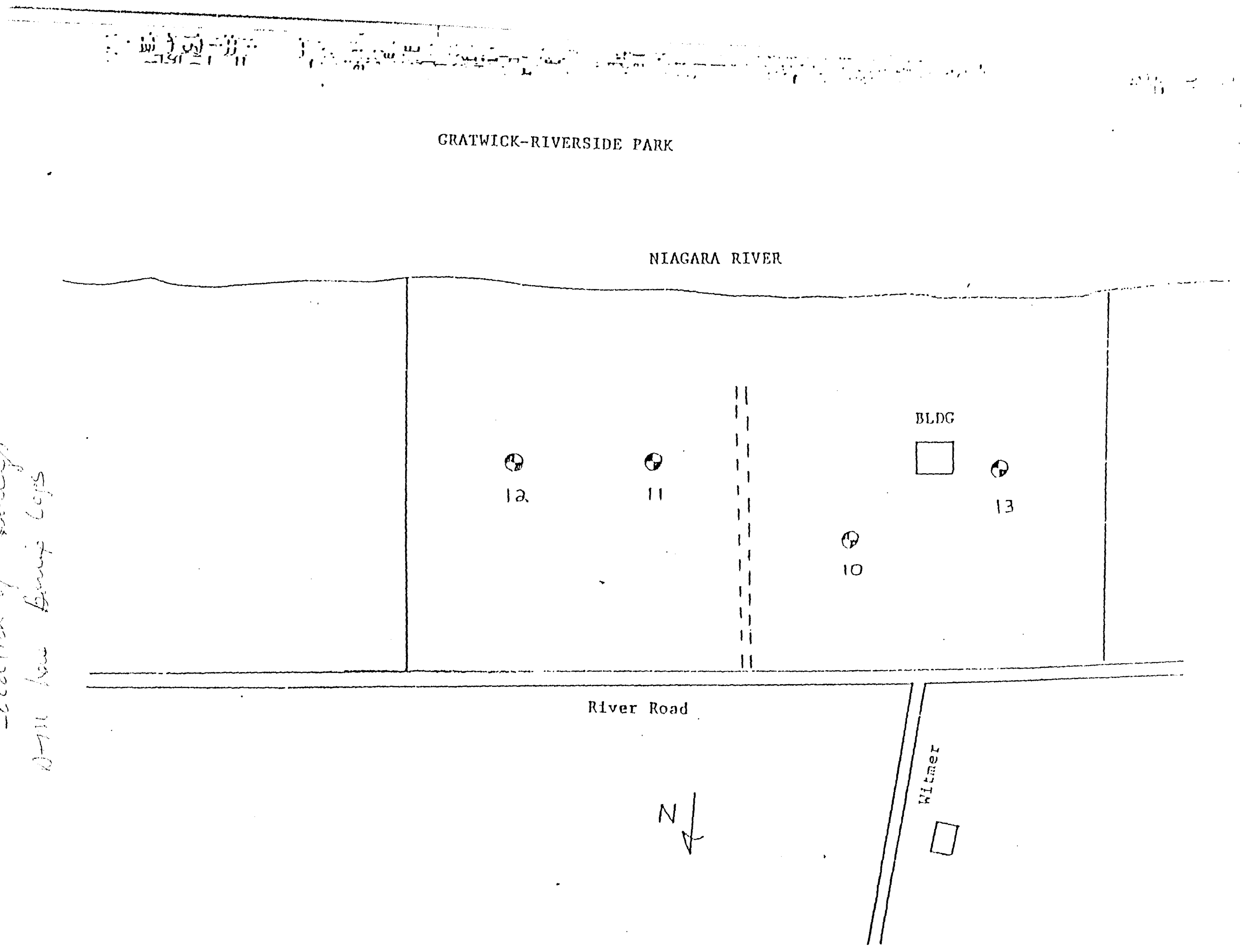
WELL SAMPLES

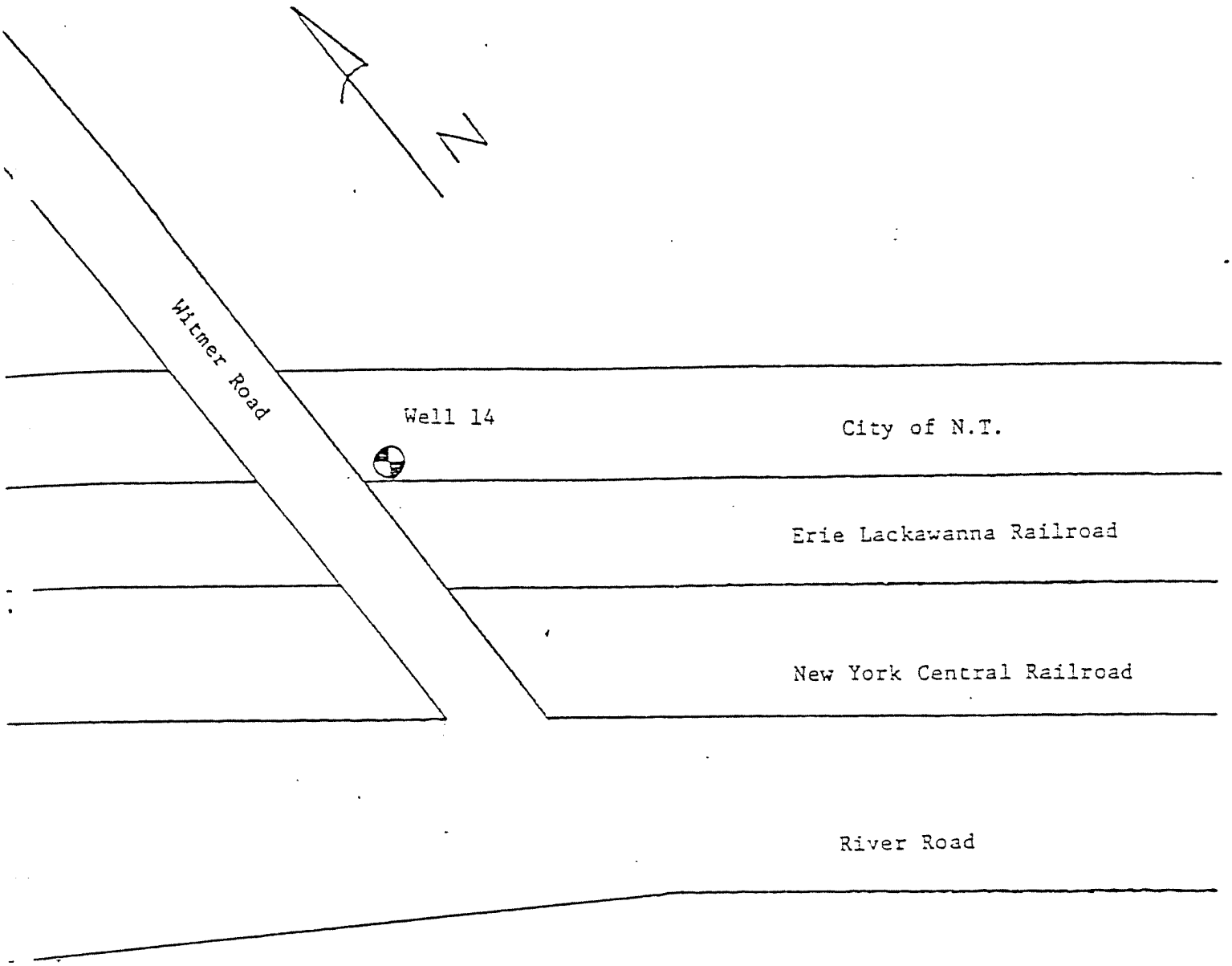
Sample # 9	Sampled 1:00		7/16/81
Cadmium, total	L.T.	0.02 MG/L	
Chromium, total	L.T.	0.1 MG/L	
Lead, total		0.2 MG/L	
Mercury, total	L.T.	0.4 MCG/L	
Nickle, total		0.12 MG/L	
Sample # 10	Sampled 1:00		7/16/81
THO	4 MCG/L		
Sample # 28	Sampled 12:00		8/12/81
Phenol		0.008 MG/L	

SOIL SAMPLES

Samples # 17,18,19 & 20 all Sampled 10:00 7/24/81
Samples # 17 & 18 Metals - Results not yet available
Sample # 19 L.T. 10 PPB THO
Sample # 20 L.T. 10 PPB THO

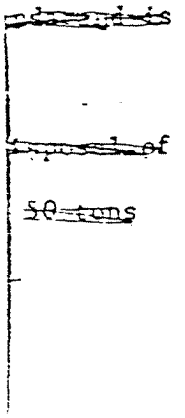
Location of Borings
D-11 has Boring Logs




N
Witmer Road
Well 14
City of N.T.
Erie Lackawanna Railroad
New York Central Railroad
River Road

USGS [illegible]

68. GRATWICK-RIVERSIDE PARK #932060



[illegible] overlies a bedrock of Camillus Shale. The depth to bedrock is approximately 25 ft. One test boring was drilled on the site and its location is shown on figure 1 (number 1). The geologic description of the boring is as follows:

Well No.	Depth (ft)	Description
1	0 - 4.5	Topsoil, fill, dark.
	4.5 - 5.5	Debris, pottery, tile.
	5.5 - 9.0	Soil, dark, black, wet.
	9.0 - 11.5	Gravel, very little or no return, bricks.
	11.5 - 16.0	No returns.
	16.0 - 21.5	Clay, sandy, gravel, wet, hard drilling.

Hydrologic Information

Water levels measured in the installed well and from four existing wells on the property indicate that ground water is encountered approximately 6 ft below land surface. The apparent ground-water flow direction is southwesterly toward the Niagara River.

Table 1.—Analyses of ground-water samples from Gratwick Riverside Park, Tonawanda, New York—continued

	Sample Number				
	1[7]	2[7]	3	4	5
Organic Compounds[2] (continued)					
4-(1,1-Dimethylethyl)-phenol[5]	–	–	–	–	14.7
1,4-Dimethyl-7-(1-methylethyl) azulene[5]	–	–	–	–	1.0[8]
2-ethylnexyl phthalate	8	–	–	–	–
Tetrachloroethene [5]	–	–	1[8]	–	–
Ethylbenzene [5]	–	–	6	–	–
1,2-Dimethylbenzene[5]	–	–	3[8]	–	–
1,3-Dimethylbenzene[5]	–	–	3[8]	–	–
1-Ethyl-3-methylbenzene[5]	–	–	3[8]	–	–
1-Ethyl-4-methylbenzene[5]	–	–	1[8]	–	–
1,2,3-Trimethylbenzene [5]	–	–	5	–	–
P-cresol	–	–	18	–	–
1-Ethyl-2-methylbenzene[5]	–	–	3[8]	–	–
Dihydro-5-methyl-5-phenyl-2(3H)-furanone [5]	–	–	1[8]	–	–
a,a,-Dimethylbenzene-methanol [5]	–	–	3[8]	–	–
2,4-Dimethylphenol	–	–	5	–	–
1,2,3,4-Tetramethylbenzene[5]	–	–	<5	–	–
3,4-Dimethylphenol [5]	–	–	15	–	–
2,3-Dihydro-4-methyl-4-indene [5]	–	–	<5	–	–
2-Ethylphenol	–	–	<5	–	–
2,3-Dimethylphenol [5]	–	–	3[8]	–	–
2-[2-(2-Butoxyethoxy)-ethoxy]ethanol [5]	–	–	<5	–	–
1,4-Dihydro-1,4-methano-naphthalene [5]	–	–	2[8]	–	–
1-Methylnaphthalene[5]	–	–	2[8]	–	–
5-(1,1-Dimethylethyl-butanethioate [5]	–	–	<5	–	–

1 Sample type: gw=ground water, sw=surface water, and s=substrate.
2 Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.
3 Cu(D): analysis done by direct aspiration because of high iron concentration.
4 Identity determined by library match; no standard available. Concentration results are semiquantitative and are based on the response factor of the internal standard.
5 Identity based on less than library match; identification seemed reasonable. As for footnote 4, concentration results are semiquantitative.
6 Volatile found in GC/ms extractions. Concentration results probably less than actual.
7 Low surrogate recoveries.
8 Estimated value less than detection limit.

from: open-file USGS study 1982-83

Table 1.—Analyses of ground-water samples from Gratwick Riverside Park, Tonawanda, New York

	Sample Number				
	1[7]	2[7]	3	4	5
Date collected	062882	062882	062882	062882	062882
Depth (ft)	15.3	15.0	11.7	19.4	19.2
Sample Type[1]	gw	gw	gw	gw	gw
pH	11.4	10.6	10.8	10.0	11.2
Conductivity (uMHOS)	2110	1650	2450	504	1780
Temperature (°C)	10.0	12.0	12.0	13.0	13.0
Inorganic Constituents[2]					
Antimony	1	10	1	1	1
Arsenic	3	1	<1	1	<1
Cadmium	3	<1	–	<1	<1
Chromium	56	25	12	22	10
Copper	8300	6400	4400	15000	3100
Iron	100	150	64	140	43
Lead	0.7	<0.1	<0.1	0.1	0.7
Mercury	<1	5	3	20	5
Nickel					
Selenium					
Zinc					
Flouride					
Sulfide					546[5]
Cyanide					
Molecular sulfur					
Organic Compounds[2]					
1-(2-butoxyethoxy) ethanol[4]	85	–	–[4][8]	– 5.2	– 4.6[8]
[1-1'-biphenyl]-2-ol[4]	32	–	–	–	–
[1-1'-biphenyl]-3-ol[4]	11	53	–	5.0	–
[1-1'-biphenyl]-4-ol[5]	5.2	35	–	–	–
2-dibenzofuranol[4]	8.8	15	–	–	–
1-chloro-3-phenoxybenzene[5]	–	2.8[8]	–	–	–
4-chloro[1,1'-biphenyl]-4-ol[5]	–	1.3[8]	–	–	–

1 Sample type: gw=ground water, sw=surface water, and s=substrate.
2 Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.
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Table 1.--Analyses of ground-water samples from Gratwick Riverside Park, Tonawanda, New York—continued

	Sample Number				
	1[7]	2[7]	3	4	5
Organic Compounds[2] (continued)					
1-chloro-4-phenoxybenzene[5]	–	<5	–	–	–
Phenol	–	–	97	1914	13.7
Napthalene	–	–	–	50.3	–
O-cresol	–	–	–	1.8[8]	–
3-(1,1-dimethylethyl)-phenol[5]	–	–	–	31.2	–
1-H-indole[5]	–	–	–	2.7[8]	–
1,6-dimethyl-4-(1-methylethyl) napthalene[5]	–	–	–	1.1[8]	–
2-[(4-hydroxyphenyl)methyl] phenol[5]	–	–	–	3.8[8]	–
4,4'-methylenebisphenol[5]	–	–	–	4.5[8]	–
Butylbenzylphthalate	–	–	–	20.9	–
m-cresol	–	–	370	–	194
Dibenzo[B,E][1,4]dioxin[5]	13	160	–	–	–
1,1'-(1,2-ethanediyl)bis [3,4-dimethyl]benzene[5]	4.4[8]	–	–	–	–
2-butoxyethyl butylphthalate[5]	7.4	–	–	–	–
Di-n-butylphthalate[5]	1.3[8]	–	–	–	–
1,6-hexanediol[5]	–	3.4[8]	–	–	–
1-1'-oxybisbenzene[4]	–	6.2	–	–	–
1-(1,1'-dimethylethyl) benzene[5]	–	<5	–	–	–
3,8-dimethylundeane[5]	–	2.5	–	–	–
Dibenzofluran[5]	–	3.2	–	–	–
[1-1'-biphenyl]-2-ol[4]		44	–	–	–
2-phenoxylphenol[4]	–	4.8	–	–	–
3-ethyl-3-methyl hexane[5]	–	1.3	–	–	–
4-phenoxylphenol[4]	–	16	–	–	–

1 Sample type: gw=ground water, sw=surface water, and s=substrate.
2 Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.
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1,4-Dimethyl-7-(1-methylethyl) azulene[5]	–	–	–	–	1.0[8]
2-ethylhexyl phthalate	8	–	–	–	–
Tetrachloroethene [5]	–	–	1[8]	–	–
Ethylbenzene [5]	–	–	6	–	–
1,2-Dimethylbenzene[5]	–	–	3[8]	–	–
1,3-Dimethylbenzene[5]	–	–	3[8]	–	–
1-Ethyl-3-methylbenzene[5]	–	–	3[8]	–	–
1-Ethyl-4-methylbenzene[5]	–	–	1[8]	–	–
1,2,3-Trimethylbenzene [5]	–	–	5	–	–
P-cresol	–	–	18	–	–
1-Ethyl-2-methylbenzene[5]	–	–	3[8]	–	–
Dihydro-5-methyl-5-phenyl-2(3H)-furanone [5]	–	–	1[8]	–	–
a,a,-Dimethylbenzene-methanol [5]	–	–	3[8]	–	–
2,4-Dimethylphenol	–	–	5	–	–
1,2,3,4-Tetramethylbenzene[5]	–	–	<5	–	–
3,4-Dimethylphenol [5]	–	–	15	–	–
2,3-Dihydro-4-methyl-4-indene [5]	–	–	<5	–	–
2-Ethylphenol	–	–	<5	–	–
2,3-Dimethylphenol [5]	–	–	3[8]	–	–
2-[2-(2-Butoxyethoxy)-ethoxy]ethanol [5]	–	–	<5	–	–
1,4-Dihydro-1,4-methano-naphthalene [5]	–	–	2[8]	–	–
1-Methylnaphthalene[5]	–	–	2[8]	–	–
5-(1,1-Dimethylethyl-butanethioate [5]	–	–	<5	–	–

1 Sample type: gw=ground water, sw=surface water, and s=substrate.
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APPENDIX B

NYS REGISTRY FORM

HAZARDOUS WASTE DISPOSAL SITES REPORT
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Code: _____

Site Code: 932060

Name of Site: Gratwick - Riverside Park Region: 9

County: Niagara Town/City North Tonawanda

Street Address River Road

Status of Site Narrative:

Used by Hooker Durez and Bell Aerospace.

Although recent analysis of groundwater samples indicate that materials containing phenolic and halogenated compounds are leaching into the groundwater in low concentrations, similar analysis of near shore Niagara River found no incidence of elevated concentrations.

Periodic analysis of groundwater and river water is recommended.

Type of Site: Open Dump ☐ Treatment Pond(s) ☐ Number of Ponds _____
Landfill ☒ Lagoon(s) ☐ Number of Lagoons _____
Structure ☐

Estimated Size 52 Acres

Hazardous Wastes Disposed? Confirmed ☒ Suspected ☐

*Type and Quantity of Hazardous Wastes:

TYPE	QUANTITY (Pounds, drums, tons, gallons)
phenoloc resin	25,000 tons
phenolic molding cpd	25,000 tons
oil and grease	50 tons
rubbish	50,000 tons

* Use additional sheets if more space is needed.

APPENDIX C

GENERIC HEALTH AND SAFETY PLAN

APPENDIX C

HEALTH AND SAFETY PLAN OUTLINE

I. PURPOSE

The purpose of this plan is to assign responsibilities, establish personnel protection standards, mandatory operating procedures, and provide for contingencies that may arise while operations are being conducted at the site.

II. APPLICABILITY

The provisions of the plan are mandatory for all on-site investigation personnel and personnel under contract while initial site reconnaissance and/or preliminary investigation activities are being conducted at the site. These activities include investigation, sampling, and monitoring undertaken on the site or at any off-site areas which may be affected by contamination from the site.

III. RESPONSIBILITY

1. Principal Investigator (PI)
   a. The PI shall direct on-site investigation efforts for each discipline. At the site, the PI, assisted by the Team Safety Officer, has the primary responsibility for:

      1) Assuring that appropriate personnel protection equipment is available and properly utilized by all on-site personnel and subcontractor personnel.
      2) Assuring that personnel are aware of the provisions of this plan, are instructed in the work practices necessary to

ensure safety, and in planned procedures for dealing with emergencies (Provisions, Work Practices and Emergency Procedures) appropriate to this investigation.

3) Assuring that personnel are aware of the potential hazards associated with site operations.
4) Supervising the monitoring of safety performance by all personel to ensure that required work practices are employed.
5) Correcting any work practices or conditions that may result in injury to personnel or exposure to hazardous substances.

HEALTH AND SAFETY PRELIMINARY SITE INVESTIGATION

Based on the appropriate listed field activity plans, as well as other site information (such as waste types and chemistry) as learned from the data collecting and analysis, the Principal Investigator/Team Safety Officer will develop an appropriate health and safety plan for the site.

Planning for Site Entry

In order to determine whether it is safe for the investigative team to proceed with the study and/or to determine what appropriate level of protective clothing and equipment should be used, the nature and extent of the on-site hazards will be assessed prior to site inspection. An on-site reconnaissance utilizing appropriate monitoring equipiment will check for:

- exposivity
- atmospheric concentrations of hazardous vapors, bases, fumes, and dusts
- oxygen deficiencies
- physical hazards posed by site features/topography

If during the initial site reconnaissance, the monitoring equipment detects evidence of fire or explosion potential or high levels of radiation, further entry into the site will not be allowed. The site inspection will be delayed until such problems can be resolved appropriately.

The initial site reconnaissance will be performed by team personnel equipped with the level of protective clothing and any additional gear

that is required for their safe entry to the site. In order to provide sufficient lead time to "fine tune" safety and data gathering plans, this initial site reconaissance should be performed at least one week before the scheduled site investigation.

Based on this information regarding the associated conditions, a detailed plan providing for the safety of field personnel and the public will be developed in accordance with EPA and OSHA and regulations and USAF operating procedures. This plan may address such factors as (dependent on specific site/waste conditions):

- Types of exposures to hazardous materials (e.g., inhalation, skin absorption, ingestion, and eye contact), and the potential effects of each exposure pathway for each hazardous waste.
- High risk areas (surface contamination, exposed containers, or areas containing concentrations of chemical vapor, oxygen deficiency, explosive or flammable potential or radioactivity).
- Required protective and related equipment and procedures to adequately protect field personnel from perceived hazards on site.
- Decontamination procedures.
- Procedures for the prevention of accidental releases of hazardous substances to the air, soil, or surface water and procedures for implementation of proper contingency plans if such releases do occur.
- Procedures for the proper disposal of hazardous wastes generated in the course of the site inspection.
- Equipment and procedures for handling special site inspection conditions (e.g., prolonged operations, weather extremes, etc.).
- Emergency procedures.
- Arrangements with local hospitals and other local authorities.

The site-specific safety plan should be sufficient to provide the site inspection team with all applicable information assure health and safety. However, additional procedures may need to be considered and developed given site-specific conditions identified both before and during the site inspection.

Site Entry and Field Activities

Three sequential stages are identified to constitute the field activities:

- Initial setup
- Exploration and sampling
- Demobilization

Initial Setup

The main functions in this step are to secure entry and establish safety criteria. All operations will be managed from a central point, including:

- General supervision of area activities
- Decontamination process coordination
- Field communication
- Safety and medical coordination
- Equipment staging
- Recordkeeping
- Other functions as required

Exploration and Sampling

During this stage most field activities will be performed by pairs or small groups of team members. These tasks will include the following:

- Observation of visible spills, leachate seeps, etc., and sampling water and/or soils at these areas.
- Photography.
- Geophysical surveys (Electromagnetic or Metal Detection).
- Electrical resistivity measurements to detect ground-water contamination.
- Soil sampling using hand-operated equipment and drilling rigs.
- Ground-water sampling and water level measurements from existing wells.
- Surface water sampling.

Demobilization

This is the final stage of field activities in which field personnel will:

- Decontaminate used equipment.
- Transfer equipment and samples obtained to the decontamination staging area.
- Undergo personnel decontamination procedures.
- Load all equipment and samples on to the project vehicle(s).

The PI will supervise all the above steps through its conclusion. Field team members should not depart until all subcontractors personnel and equipment have left the site.

APPENDIX D

GENERAL FIELD PROCEDURES

APPENDIX D

General Field Procedures

Installation of Groundwater Quality Monitoring Wells

To investigate the groundwater quality within the aquifer of concern, groundwater monitoring wells will be installed. To accomplish the purposes of the monitoring wells a series of separate field procedures have been prepared. These include:

A - Drilling Procedures
B - Monitoring Well Construction Procedures
C - Water Sampling Procedures

The field program will be under the overall direction of the geologist in charge. Detailed supervision of the field work will be the responsibility of the field geologist. In particular, the field geologist will have the following responsibilities.

- Supervision of all drilling work and well construction
- Maintenance of the boring log for each boring
- Collection, labeling, and identification of formation samples, including rock cores.
- Conducting in cooperation with the driller, required in situ falling head tests and pumping tests.
- Performance of the water sampling program.
- Maintenance of pertinent notes in his/her field notebook and on daily field memos.

Health and safety procedures as set forth by the site Health and Safety Plan will be adhered to for all field operations.

A. Drilling Procedures

General Procedures

A qualified drilling subcontractor will be selected to provide all the equipment materials and skilled labor necessary to advance the test borings to the depths specified by the field geologist.

Order of Drilling Wells: All wells will be drilled in numerical sequence from what is considered the upgradient location (least contaminated) to the downgradient (most contaminated) with the upgradient boring being labeled "B-1".

Method of Drilling: Minimum of 4" ID hollow stem augers. If formational materials preclude the use of augers rotary drilling methods will be employed (e.g. for coring of bedrock).

Formational Sampling: Samples will be collected at a minimum of every 5 feet in the borings and at each lithographic change noted. A D&M sampler will be used to obtain one sample from each major layer in each boring. Other samples will be obtained with a standard split spoon sampler. Bedrock will be sampled continuously by coring with an NX double tube core barrel. All sampling equipment will be thoroughly cleaned after obtaining each sample.

The cleaning method employed will be dependent upon the type of contaminant suspected to be present at that location.

Measurements: The depth to the water level in each boring being drilled should be measured each morning and just prior to installation of any monitoring devices into a boring. The depth of the boring should be measured and recorded on the boring log upon reaching final depth.

Decontamination Requirements

All downhole equipment and above hole equipment that may come in contact with subsurface materials will be steam cleaned at the drilling location prior to initiating any drilling and between each boring and at the conclusion of the drilling program. The steam cleaning rinse water will be allowed to discharge to the ground surface at the well site. Care will be taken to assure this water does not come in contact with any surface water source.

Site Cleanup

All drill cuttings remaining after well installation will be removed for proper disposal.

All debris, paper, etc. will be removed and all depressions resulting from drilling operations will be filled in.

Drilling Procedures for Bedrock Boring

1. Sample formation every 5 feet and at every major lithologic change.

2. Drill and sample the unconsolidated formations until bedrock is encountered.

3. Ream the hole to at least 6 inches in diameter.

4. Make ready an appropriate length of steel casing by cleaning.

5. Place enough volclay pellets in the hole to make a layer of about one-foot thickness at the bottom of the boring.

6. Place the steel casing in the hole, and bottom it snugly into the bentonite. Once the casing is set, it should not be lifted until the completion of the well.

7. Circulate the drilling fluid; drill a few inches below the bottom of the volclay layer and circulate for a few minutes to clean the boring of most of the bentonite. Clean out this part of the boring by circulating clean water.

8. Drill into the bedrock the required depth using the NX double-tube core barrel.

9. Store the rock cores in specially constructed wooden rock-core boxes, for inspection and description by the field geologist.

10. Measure water level in boring.

11. Construct well in the boring

Drilling Procedures for Soil Borings

1. Sample formation every 5 feet and at every major lithologic change.

2. Drill to the depth estimated.

3. Measure water level in boring.

4. Construct well in boring.

Procedure for Abandoning a Boring

A cement slurry containing about 5 lbs. bentonite and one bag of cement per 8 to 10 gallons of water should be pumped into the hole to the ground surface.

B. MONITORING WELL CONSTRUCTION PROCEDURES

General Specifications and Procedures

Casing and Well Screen:	2-inch I.D. Schedule 40 PVC with flush screw joints or 2-inch I.D. stainless steel with flush screw joints.
Screen Slot Size:	Based upon materials encountered in boring.
Storage of Casing and Screen:	The casing and screen lengths will not be stored directly on the ground. The well string shall be prepared on a clean plastic sheet spread out over level ground.
Cleaning of Casing and Screen:	Casing and screen shall be cleaned before installing in the boring.
Bottom Cap and Blank Casing:	A length of blank casing of about two feet complete with a bottom cap shall be placed below the well screen in all cases.
Gravel Pack:	The gravel pack material will be 90 percent by weight larger than the screen size and should have a uniformity coefficient of 2.5 or less.
Placement of the Gravel Pack:	The gravel pack should be emplaced so that it extends to three feet above the top of the well screen. This should be confirmed by measuring down the annular space with a weighted tape or with a measured small-diameter pipe. The volume of gravel pack material emplaced should be compared with the volume computed as required, based on the screen diameter and length. The gravel pack may be poured directly down the annular space provided the well is pressurized and an upward flow of pure water is maintained in the annular space by introducing the water at a low rate through the well casing which would enter the annular space through the well screen openings.

Bentonite Seal: A bentonite seal shall be placed in the annular space above the gravel pack in each well by emplacing 1/4-inch diameter volclay pellets in the annular space during which time the low flow rate up the annular space in maintained. This bentonite seal should be at least 2 feet thick. The bentonite shall be compacted with a donut shaped weight that slides over the well casing.

Well Development: Each well should be developed for about 30 minutes to one hour using an air-lift surging method. Appropriate piping should be assembled for the discharge water so as to discharge it and dispose of it in a manner to limit contamination of the surrounding area. The discharge during development should be estimated by using a 5-gallon bucket and a stop watch. In the course of development, if a well turns out to have a very low specific capacity, it may prove necessary to add some clean water in order to remove as many fines as possible from the vicinity of the well screen. Development should be continued until all but a trace amount of fines and suspended solids appear in the discharge water. Following development, the air line hose or pipe and associated fittings should be thoroughly cleaned and then rinsed.

Grouting Annular Space: A bentonite-cement grout (5 lbs. bentonite and one bag of cement to 8-10 gallons of water) will be pumped into the annular space to fill the space from the top of the volclay bentonite seal to the ground surface.

Protective Casing: A length of 6-inch I.D. steel casing with a lockable cap should be placed over the well casing in each case to protect it. It should be set about one foot into the bentonite cement grout in the annular space, and should stick up above ground about 2 to 3 feet.

Well Labeling: The full number of each monitoring well should be painted on the protective casing and cap.

Surveying: A level survey will be performed in which the elevation of the top of the inside casing of each well will be determined 0.01 ft. and the reference point marked.

The Construction site makes it impossible to prescribe one single Deep or Shallow well construction configuration. Therefore a generic well construction configuration for both deep and shallow wells has been developed.

Deep Well Construction

1. Place well screen so as to screen entire thickness of lower sand and gravel layer (if it exists), unless the layer exceeds 20 feet in thickness; the well screen should extend about two feet into the top of bedrock.

2. If a clay layer immediately overlies the bedrock and the overlying surficial sand and gravel is less than 30 feet, place the screen in only the upper five feet of bedrock.

3. If no significant clay/lacustrine layer exists and if the surficial sand and gravel layer is greater than 20 feet thick place screen in lower 15 to 20 feet of the sand and gravel layer, extending also two feet into bedrock.

4. If no significant clay/lacustrine layer exists and if the surficial sand and gravel layer is less than 20 feet in thickness screen entire saturated thickness, in addition to about 5 feet above the summer static water level and about two feet into the underlying bedrock.

5. After installation of the well screen and casing, and the gravel pack, emplace volclay pellets to form a 2 to 4 foot thick seal in the annular space above the gravel pack. Use 1/4-inch diameter pellets and maintain a low flow rate up the annular space during emplacement so as to insure that they settle in place evenly around the annular space. Measure the depth to the top of the seal.

6. Using a bentonite-cement grout (described in the foregoing section), pump grout into the annular space so as to grout up to the top of the clay layer.

7. Jack the 6-inch casing out of the hole.

8. Develop the well and complete it as described under the foregoing section.

Shallow Well Construction

1. Place the well screen so that it extends from the top of any clay layer (if it exists) to about 5 feet above the summer static water level, unless the saturated thickness is greater than 20 feet, in which case the screen should be placed opposite the upper 20 feet of the saturated part of the unit, extending as well about 5 feet above the summer static water level. In the case of shallower wells less than 20 feet deep, place screen from bottom of hole to within 5 feet of land surface. For very shallow water table, the top of screen should be two feet above the estimated high water table or no closer than two feet to the land surface.

2. Emplace the volclay pellets as described above for the deep wells. A one-foot thick bentonite seal should be adequate.

3. Develop and complete the well as described under General Specifications Procedures.

C. GROUNDWATER SAMPLING PROCEDURES

Following the installation of the well, individual groundwater samples will be collected according to the procedures included below from each well for analyses. These samples will be collected using a positive displacement sampling device made entirely from stainless steel and teflon. This procedure will permit us to collect a sample that is more representative of the aquifer water and to limit the possibility of degassing and volatilization. The well storage water will be evacuated with a submersible pump or air lift system whereby the air is not permitted to come in direct contact with the aquifer. The

sampling pump will be cleaned between wells by immersion into a solvent, followed by a distilled deionized water rinse. A quantity of each of these will be pumped through the pump and teflon tubing.

As a part of our ongoing QA program, field blanks, consisting of distilled deionized water from the discharge of the pump following cleaning will be taken between selected wells to monitor the effectiveness of the cleaning procedures. Two typed of trip blanks will also be taken. The first type consists of a sample bottle filled with distilled, deionized water that will be capped and accompany the samples at all times. The second type will consist of a sample bottle filled with distilled, deionized water and set aside open to the atmosphere, during the sampling of the wells. The purpose of these trip blanks is to evaluate the potential for atmospheric contamination, and to assure that proper sample bottle preparation and handling techniques have been employed.

The samples collected from these sampling efforts will be analyzed for indicator parameters identified during the Phase I.

WATER SAMPLING PROCEDURES.

1. Open well and trip blank and record initial static water levels.

2. Wash down pump:

- For organics use hexane followed by methanol and finally distilled water

- Collect wash solvents and rinse in a bucket, etc. (a 5 gal. container w/ a large funnel works well)

- Wash pump inside and outside

3. Install pump in well: Use stainless steel pump and teflon tubing

- Each well should have its own tubing. Tubing should be cleaned and thoroughly rinsed between sampling events.

- Pump should have a check valve, preventing water having been in internal contact with the pump and the tubing from draining back into the well.

4. Pump at least two exchanges of water

- Care should be taken so as not to over pump, whereby excessive concentrations are drawn into the well. The number of exchanges pumped should be based upon the soil typed, flow patterns and aquifer properties of each well.

5. Take a sample:

- From pump discharge: Insert discharge tube to bottom of jar. Withdraw tube ahead of the sample so that aeration and turbulence is minimized.

- Some samples must be filtered in the field. This should be done prior to filling the sample container.

- For volatile organics samples should not be taken from the pump discharge. Aeration from the pump will destroy organic volatiles.

6. Immediately perform field tests such as temperature, pH, specific conductivity and D.O.

7. Refrigerate samples at $4^{o}C$.

8. Cap well and trip blank.

9. Wash all equipment.

NOTES: - The sampling procedures should reflect the sample parameters. Those parameters subject to change with changes in pH, D.O. may need to be sampled using stainless steel bailers.

- Some sample parameters require filtering in the field.

- For accountability and traceability of the samples, two forms are included which are examples of what we presently use.

EQUIPMENT BLANKS:

- Wash pump with solvents, collecting solvent rinse. Care must be taken in the selection of solvents, so damage to the pump will not occur. Rinse with distilled water.

- Take a sample of "clean" water,

- Turn on pump, sample first "slug" of water from the pump

- Pump volume equivalent to amount typically pumped from the well. DO NOT recirculate the water.

- Take sample from pump at end of pumping period

- Refrigerate samples.

APPENDIX E

QUALITY ASSURANCE

APPENDIX E

OUTLINE OF QUALITY ASSURANCE PROCEDURES

1.0 GROUND-WATER SAMPLING

1.1 General Requirements

(a) Obtain representative ground-water quality samples
  (1) Wells located properly
  (2) Sampling zone defined
  (3) Well constructed properly
  (4) Well developed properly
(b) Select sampling method in accordance with analyses of interest and well characteristics, see Figure B.1.
(c) Sampling procedures should not materially alter sample, see Figure B.2.
(d) Storage/shipment procedure must not alter sample

1.2 Procedures for Monitoring Well Development

(a) Perform prior to each sampling effort
(b) Measure water level
(c) Determine volume of water stored in casing
(d) Remove three to five volumes of water from well
  (1) Bail
  (2) Pump
(e) Insure that device does not introduce contaminants into well
(f) Measure water level recovery
(g) Sample after complete recovery
(h) Perform in-situ tests
  (1) Flow direction & velocity (Flow Meter®)
  (2) Quality (Hydrolab®)
  (3) Permeability
(i) Insure that in-place testing does not contaminate well prior to sample acquisition

1.3 Sampler Construction Material

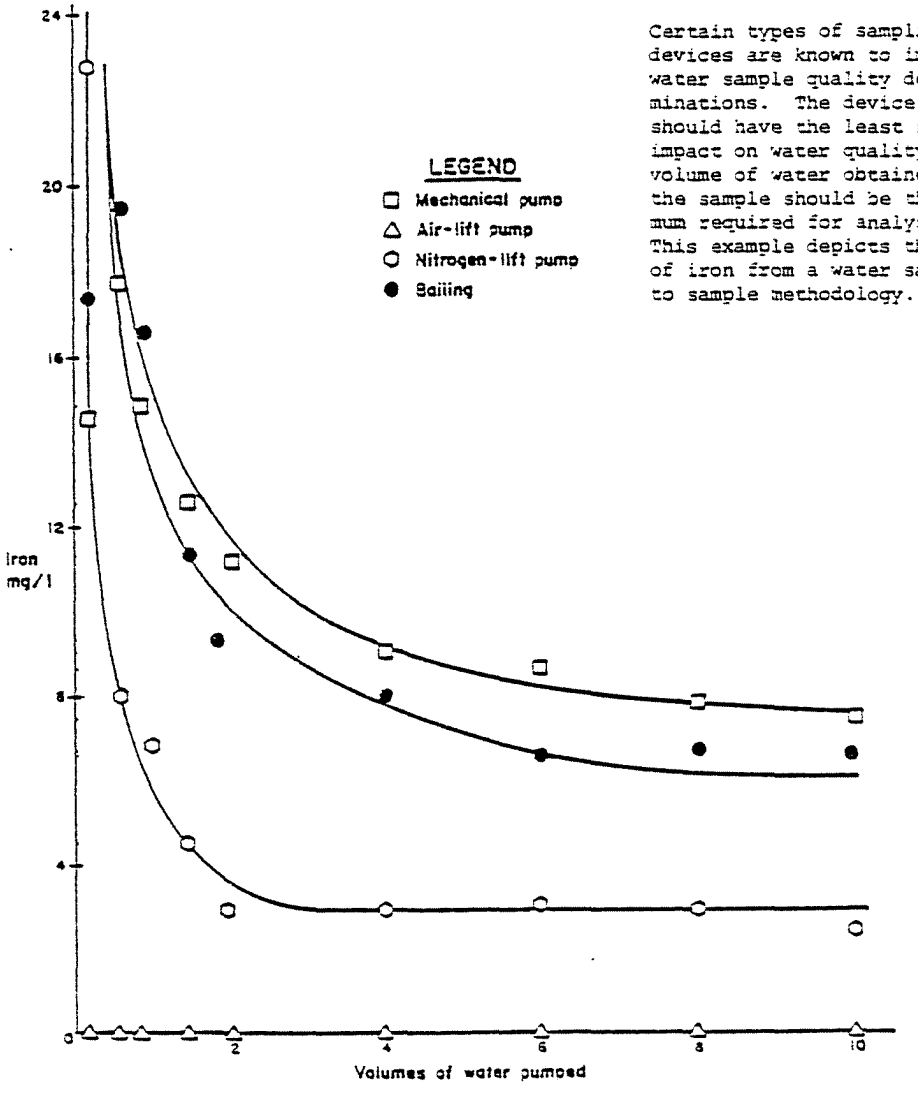
A major point to consider is the type of contaminants anticipated in the ground-water system. A sampling device should be constructed of inert materials that will not alter the trace concentrations of chemical parameters. Sampler construction materials are listed in order of preference.

Sampler Construction Materials:

(a) Glass®
(b) Teflon®

FIGURE E.1

Effects of Various Sampling Methodologies on Water Quality



Certain types of sampling devices are known to impact water sample quality determinations. The device selected should have the least negative impact on water quality. The volume of water obtained for the sample should be the minimum required for analysis. This example depicts the loss of iron from a water sample due to sample methodology.

SOURCE: "Monitoring Well Sampling and Preservation Techniques," Proceedings of the Sixth Annual Research Symposium / Disposal of Hazardous Waste, March, 1980.

FIGURE E.2

SAMPLING EQUIPMENT SELECTION

Diameter Casing	Bailer	Peristaltic Pump	Vaccum Pump	Airlift	Diaphragm "Trash" Pump	Submersible Diaphragm Pump	Submersible Electric Pump	Submersible Electric Pump w/Packer
1.25-inch								
Water level <20 ft.		X	X	X	X			
Water level >20 ft.				X				
2-inch								
Water level <20 ft.	X	X	X	X	X	X	X	
Water level >20 ft.	X			X		X	X	
4-inch								
Water level <20 ft.	X	X	X	X	X	X	X	X
Water level >20 ft.	X			X		X	X	X
6-inch								
Water level <20 ft.				X	X		X	X
Water level >20 ft.				X			X	X
8-inch								
Water level <20 ft.				X	X		X	X
Water level >20 ft.				X			X	X

(c) Stainless Steel
(d) PVC
(e) Other dense plastics

Note: Do not use rubber or synthetic rubber such as that used in packers or older bladder pumps.

1.4 Sampling

1.4.1 Typical Ground-Water Sampling Devices

(a) Bailers
  Kemmerer
  Tube
(b) Suction Lift Pump
  Peristaltic
  Hand operated diaphragm
(c) Submersible Pump
(d) Air-lift Device
(e) Tomson Pump (all glass)
(f) Gas Operated Bladder Pump
(g) Gas Driven Piston Pump
(h) Specialized Organic Material Samplers
  Grab Sampler
  Continuous Sampler
  Microbiological Sampler
  Soil-Water Sampler

Detailed discussion of the above listed sampling devices is given in the Manual of Ground-Water Sampling Procedures, pp. 45-54.

1.4.4 Specialized Organic Material Samplers

(a) Grab Sampler (at well head) for non-volatile organics may be used with peristaltic pumps (ground-water depth 20 ft)® or non-contaminating submersible pumps. A Teflon bailer may be used for volatile organic sample acquisition.

(b) Continuous Sampler (at well head) uses a peristaltic pump (shallow conditions) or a non-contaminating submersible pump to force a continuous stream of water through a fixing column using selected adsorbents to concentrate organic materials.

(c) Microbiological Sampler (at well head) uses a vacuum pumping system to draw water samples from shallow depths. Samples to be tested for microbial agents may be collected in a flask; samples to be tested for viruses of pathogenic bacteria may be collected on filters installed in the system.

(d) Soil-Water Sampler (unsaturated zone) can be used to obtain small unsaturated zone samples drawn through a collection trap in shallow applications.

A detailed discussion of these devices and their utilization is presented in the Manual of Ground-Water Sampling Procedures, pp 53-60.

1.5 Field Tests and Sample Preservation

1.5.1 Field Testing

Many parameters are relatively stable. Others such as pH, temperature, etc., will begin to alter immediately upon collection. In order to mitigate this unwanted modification of water quality, testing of sensitive parameters must be performed in the field. Testing may be performed at the well head following sample removal or in-situ by use of a Hydrolab® or similar down-hole device.

Samples requiring more complicated analysis procedures must be preserved and transported to a laboratory. Preservation must be performed in the field, contingent upon analytical parameters of interest. Laboratory analyses should be performed as soon as possible in accordance with EPA Guidelines.

1.5.2 Sample Preservation

1.5.2.1 General typical preservatives currently employed, actions and applications are given:

Preservative	Action	Applicable to:
$HgCl_2$	Bacterial Inhibitor	Nitrogen forms, phosphorus forms
Acid (HNO_3)	Metals solvent, prevents precipitation	Metals
Acid (H_2SO_4)	Bacterial Inhibitor	Organic samples (COD, oil and grease, organic carbon)
	Salt formation with organic bases	Ammonia, amines
Alkali (NaOH)	Salt formation with volatile compounds	Cyanides, organic acids

Preservative	Action	Applicable to:
Refrigeration	Bacterial Inhibitor	Acidity - alkalinity, organic materials, BOD, color, odor, organic P, organic N, carbon, etc., biological organism (coliform, etc.)

1.5.2.2 Organic Parameters

The general method of preserving samples for organic analysis is to exclude air, pack in ice, and transport promptly. Specific recommendations are furnished in the Manual of Ground Water Sampling Procedures, p. 62.

1.5.2.3 Microbiological Parameters

Due to the complicated nature of this type of sampling, reference is made to the Manual of Ground-Water Sampling Procedures, p. 62.

1.5.2.4 Sampling and Preservation Requirements

The following Table B.1, presented from the Manual of Ground-Water Quality Sampling Procedures, pp 63-66, is included to provide specific collection and preservation data in accordance with the analyses of interest. It may be quickly observed that numerous variations occur in volume of sample required per test, type of container, preservative, and holding time. Preservation techniques must be chosen to be consistent with the selected analyses.

TABLE E.1.

RECOMMENDATION FOR SAMPLING AND PRESERVATION OF SAMPLES ACCORDING TO MEASUREMENT[a]

Measurement	Vol. Req. (ml)	Container[b]	Preservative	Holding Time[c]
Physical Properties				
Color	50	P, G	Cool, 4°C	24 Hrs.[d]
Conductance	100	P, G	Cool, 4°C	24 Hrs.[d]
Hardness	100	P, G	Cool, 4°C HNO_3 to pH<2	6 Mos.[e]
Odor	200	G only	Cool, 4°C	24 Hrs.
pH	25	P, G	Det. on site	6 Hrs.
Residue				
Filterable	100	P, G	Cool, 4°C	7 Days
Non-Filterable	100	P, G	Cool, 4°C	7 Days
Total	100	P, G	Cool, 4°C	7 Days
Volatile	40	P, G	Cool, 4°C	7 Days
Settleable Matter	1000	P, G	None Req.	24 Hrs.
Temperature	1000	P, G	Det. on site	No Holding
Turbidity	100	P, G	Cool, 4°C	7 Days
Metals				
Dissolved	200	P, G	Filter on site HNO_3 to pH<2	6 Mos.[e]
Suspended	200		Filter on site	6 Mos.
Total	100	P, G	HNO_3 to pH<2	6 Mos.[e]
Mercury				
Dissolved	100	P, G	Filter on site HNO_3 to pH<2	38 Days (Glass) 13 Days (Hard Plastics)
Total	100	P, G	HNO_3 to pH<2	38 Days (Glass) 13 Days (Hard Plastic)

TABLE E.1 (Continued)

Measurement	Vol. Req. (ml)	Container[b]	Preservative	Holding Time[c]
Inorganics, Non-Metallics				
Acidity	100	P, G	None Req.	24 Hrs.
Alkalinity	100	P, G	Cool, 4°C	24 Hrs.
Bromide	100	P, G	Cool, 4°C	24 Hrs.
Chloride	50	P, G	None Req.	7 Days
Chlorine	200	P, G	Det. on site	No Holding
Cyanides	500	P, G	Cool, 4°C	24 Hrs.
			NaOH to pH 12	
Fluoride	300	P, G	None Req.	7 Days
Iodide	100	P, G	Cool, 4°C	24 Hrs.
Nitrogen				
Ammonia	400	P, G	Cool, 4°C	24 Hrs.
			H_2SO_4 to pH<2	
Kjeldahl, Total	500	P, G	Cool, 4°C	24 Hrs.[f]
			H_2SO_4 to pH<2	
Nitrate plus Nitrite	100	P, G	Cool, 4°C	24 Hrs.[f]
			H_2SO_4 to pH 2	
Nitrate	100	P, G	Cool, 4°C	24 Hrs.
Nitrite	50	P, G	Cool, 4°C	48 Hrs.
Dissolved Oxygen				
Probe	300	G only	Det. on site	No Holding
Winkler	300	G only	Fix on site	4-8 Hrs.
Phosphorus	50	P, G	Filter on site	24 Hrs.
Ortho-phosphate, Dissolved			Cool, 4°C	
Hydrolyzable	50	P, G	Cool, 4°C	24 Hrs.[f]
			H_2SO_4 to pH<2	
Total	50	P, G	Cool, 4°C	24 Hrs.[f]
			H_2SO_4 to pH<2	

TABLE E.1 (Continued)

Measurement	Vol. Req. (ml)	Container[b]	Preservative	Holding Time[c]
Total, Dissolved	50	P, G	Filter on site Cool, 4°C H_2SO_4 to pH<2	24 Hrs.[f]
Silica	50	P only	Cool, 4°C	7 Days
Sulfate	50	P, G	Cool, 4°C	7 Days
Sulfide	500	P, G	2 ml zinc acetate	24 Hrs.
Sulfite	50	P, G	Det. on site	No Holding
Routine Organics				
BOD	1000	P, G	Cool, 4°C	24 Hrs.
COD	50	P, G	H_2SO_4 to pH<2	7 Days[f]
Oil & Grease	1000	G only	Cool, 4°C H_2SO_4 or HCL to pH<2	24 Hrs.
Organic Carbon	25	P, G	Cool, 4°C H_2SO_4 or HCL to pH<2	24 Hrs.
Phenolics	500	G only	Cool, 4°C H_3PO_4 to pH<4 1.0 g $CuSO_4$/l	24 Hrs.
MBAS	250	P, G	Cool, 4°C	24 Hrs.
NTA	50	P, G	Cool, 4°C	24 Hrs.

a. A general discussion on sampling of water and industrial wastewater may be found in ASTM, Part 31, p. 72-82 (1976) Method D-3370.

b. Plastic (P) or Glass (G). For metals polyethylene with a polypropylene cap (no liner) is preferred.

c. It should be pointed out that holding times listed above are recommended for properly preserved samples based on currently available data. It is recognized that for some sample types, extension of these times may be possible while for other

types, these times may be too long. Where shipping regulations prevent the use of the proper preservation technique or the holding time is exceeded, such as the case of a 24-hr composite, the final reported data for these samples should indicate the specific variance procedures.

d. If the sample is stabilized by cooling, it should be warmed to 25°C for reading, or temperature correction made and results reported at 25°C.

e. Where HNO_3 cannot be used because of shipping restrictions, the sample may be initially preserved by icing and immediately shipped to the laboratory. Upon receipt in the laboratory, the sample must be acidified to a pH <2 with HNO_3 (normally 3 ml 1:1 HNO_3/liter is sufficient). At the time of analysis, the sample container should be thoroughly rinsed with 1:1 HNO_3 and the washings added to the sample (volume correction may be required).

f. Data obtained from National Enforcement Investigations Center-Denver, Colorado, support a four-week holding time for this parameter in Sewerage Systems. (SIC 4952).

2.0 SAMPLING SUBSURFACE SOLIDS (Earth Materials)

2.1 General

The sampling and testing of earth materials may be necessary to augment a ground-water quality study as contamination typically occurs in the unsaturated zone first, before entering the saturated zone. Several reasons exist for solids testing:

(a) Study effects of alteration
(b) Determine actual extent of contamination - not just in saturated zones
(c) Obtain accurate evaluation of microbial populations that may alter pollutants
(d) Solids provide best samples of aquifer microorganisms (samples obtained from saturated zone).

2.2 Sampling Procedures

Sampling of subsurface solids may be conducted by split spoon by Standard Penetration Test (ASTM D-1586-67) equipped with non-contaminating soil sample retainer or by undisturbed methods (ASTM D-1587-67). In any event, sampling, sample extrusion, preservation, shipment and testing must be accomplished in a sterile environment.

Due to the complex nature of the task, the possibility of introducing cross-contamination and the difficulty involved in sample processing, reference is made to the Manual of Ground-Water Sampling Procedures, pp. 72-79, which provides detailed guidelines for soil sample handling.

3.0 SAMPLE RECORDS AND CHAIN-OF-CUSTODY

3.1 General

The maintenance of complete sample records is critical to the monitoring process. The following is a basic guideline for development of sample records and chain-of-custody procedures:

3.2 Sample Records

(a) Sample description--type (ground water, surface water), volume;

(b) Sample source--well number, location;

(c) Sampler's identity--chain of evidence should be maintained; each time transfer of a sample occurs, a record including signatures of parties involved in transfer should be made. (This procedures has legal significance.);

(d) Time and date of sampling;

(e) Significant weather conditions;

(f) Sample laboratory number;

(g) Pertinent well data--depth, depth to water surface, pumping schedule, and method;

(h) Sampling method--vacuum, bailer, pressure;

(i) Preservatives, (if any)--type and number (e.g., NaOH for cyanide, H_3PO and $CuSO_4$ for phenols, etc.);

(j) Sample containers--type, size, and number (e.g., three liter glass-stoppered bottles, one gallon screw-cap bottle, etc.);

(k) Reason for sampling--initial sampling of new landfill, annual sampling, quarterly sampling, special problem sampling in conjunction with contaminant discovered in nearby domestic well, etc.;

(l) Appearance of sample--color, turbidity, sediment, oil on surface, etc.;

(m) Any other information which appears to be significant--(e.g., sampled in conjunction with state, county, local regulatory authorities; samples for specific conductance value only; sampled for key indicator analysis; sampled for extended analysis; resampled following engineering corrective action, etc.);

(n) Name and location of laboratory performing analysis;

(o) Sample temperature upon sampling;

(p) Thermal preservaton--(e.g., transportation in ice chest);

(q) Analytical determinations (if any) performed in the field at the time of sampling and results obtained--(e.g., pH, temperature, dissolved oxygen, and specific conductance, etc.);

(r) Analyst's identity and affiliation.

3.3 Chain-of-Custody

(a) As few people as possible should handle the sample.

(b) Samples should be obtained by using standard field sampling techniques, if available.

(c) The chain-of-custody records should be attached to the sample container at the time the sample is collected, and should contain the following information: sample number, date and time taken, source of the sample (include type of sample and name of firm), the preservative and analysis required, name of person taking sample, and the name of witness. The prefilled side of the card should be signed, timed, and dated by the person sampling. The sample container should then be sealed, containing the regulatory agency's designation, date, and sampler's signature. The seal should cover the string or wire tie of the chain of custody record, so that the record or tag cannot be removed and the container cannot be opened without breaking the seal. The tags and seals should be filled out in legible handwriting. When transferring the possession of samples, the transferee should sign and record the date and time on the chain-of-custody record. Custody transfers, if made to a sample custodian in the field, should be recorded for each individual sample. To prevent undue proliferation of custody records, the number of custodians in the chain of possession should be as few as possible. If samples are delivered to the laboratory when appropriate personnel are not there to receive them, the samples should be locked in a designated area within the laboratory so that no one can tamper with them.

(d) Blank samples should be collected in containers, with and without preservatives, so that the laboratory analysis can be performed to show that there was no container contamination.

(e) A field book or log should be used to record field measurements and other pertinent information necessary to refresh the sampler's memory in the event he later becomes a witness in an enforcement proceeding. A separate set of field notebooks should be maintained for each survey and stored in a safe place where they can be protected and accounted for at all times. A standard format should be established to minimize field entries and should include the types of information listed above. The entries should then be signed by the field sampler. The responsibility for preparing and retaining field notebooks during and after the survey should be assigned to a survey coordinator or his designated representative.

(f) The field sampler is responsible for the care and custody of the samples collected until properly dispatched to the receiving laboratory or turned over to an assigned custodian. He must assure that each container is in his physical possession or in his view at all times or stored in a locked place where no one can tamper with it.

(g) Photographs can be taken to establish exactly where the particular samples were obtained. Written documentation on the back of the photograph should include the signature of the photographer, the time, date, and site location.

(h) Each laboratory should have a sample custodian to maintain a permanent log book in which he records for each sample the person delivering the sample, the person receiving the sample, date and time received, source of sample, sample number, method of transmittal to the lab, and a number assigned to each sample by the laboratory. A standardized format should be established for log-book entries. The custodian should insure that heat-sensitive or light-sensitive samples or other sample materials having unusual physical characteristics or requiring special handling are properly stored and maintained. Distribution of samples to laboratory personnel who are to perform analyses should be made only by the custodian. The custodian should enter into the log the laboratory sample number, time, date, and the signature of the person to whom the samples were given. Laboratory personnel should examine the seal on the container prior to opening and should be prepared to testify that their examination of the containers indicated that it had not been tampered with or opened.