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A Halliburton Company



FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

02-9007-26-SI
REV. NO. 0

**FINAL DRAFT
SITE INSPECTION REPORT
CARBORUNDUM ABRASIVES CO.
WHEATFIELD, NEW YORK**

**PREPARED UNDER
TECHNICAL DIRECTIVE DOCUMENT NO. 02-9007-26
CONTRACT NO. 68-01-7346**

**FOR THE
ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY**

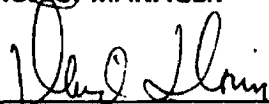
DECEMBER 31, 1990

**NUS CORPORATION
SUPERFUND DIVISION**

SUBMITTED BY:

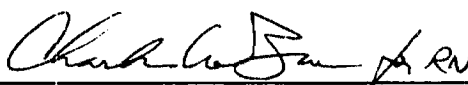


**JOHN A. GOLDEN, JR.
PROJECT MANAGER**



**DAVID FLORIN
SITE MANAGER**

REVIEWED/APPROVED BY:



**RONALD M. NAMAN
FACILITY MANAGER**

SITE SUMMARY AND RECOMMENDATIONS

The Carborundum Abrasives Division located in Wheatfield, Niagara County, NY is an active facility that has been manufacturing sand paper and abrasive grain materials since 1968 (Ref. No. 1). The facility is situated on approximately 60 acres and consists of a main plant building and various small buildings (Ref. No. 3). Employees number approximately 250 (Ref. No. 4). The surrounding area is heavily industrialized; the site is bordered to the west by the Niagara Falls International Airport, to the north by the Niagara Falls Air Force Base and Cayuga Creek, to the east and south are other industrial complexes or nondeveloped areas (Ref. Nos. 3, 16).

There are three areas associated with this site that may be considered waste sources (Ref. No. 3). The first is a 450- by 25-foot clay-capped landfill that was once an open dump used to dispose of phenols and solids from 1968-1976. It is reported that 800-1,600 pounds of phenols and 400 tons of solid resins, floor sweepings, and waste fillers, including calcium carbonate, clays and animal glue were disposed of at this dump (Ref. No. 1). The clay cap was installed in 1982 with the subsequent installation of up to 12 monitoring wells on site (Ref. Nos. 1, 8). Sampling of the groundwater under the site has shown a release of phenolic compounds with concentrations ranging from less than 0.001 mg/l to 0.21 mg/l (Ref. Nos. 5, 6, 7, 8, 9, 34, 35, 36, 37, 38).

The second potential source area is a surface impoundment located 400 feet to the north on an adjacent site owned by the Niagara Frontier Transportation Authority. This 2.75-acre surface impoundment is used by Carborundum as a settling basin for storm and non-contact cooling waters discharged from the facility. A storm sewer connects the surface impoundment to Cayuga Creek located 750 feet to the north. Through past production activities, violations of SPDES permit, and accidental spills such as a December 19, 1978 spill of 6000 gallons of phenols, of which 600 gallons drained into the surface impoundment, there is sufficient evidence to suspect contamination of Cayuga Creek. The discharge to the surface impoundment is monitored by the NYSDEC under the SPDES permit (Ref. No. 2).

The third area of concern at this site is a drum storage area. Carborundum Abrasives is under RCRA generator permit No. NYD000829606. At the time of an NUS reconnaissance, October 9, 1990, the area was in very good condition. All 55-gallon drums were sealed and clearly labeled with no leakage evident. Carborundum states that drums are never stored over a maximum of 90 days and that the maximum number of drums stored is 60 to 80 (Ref. Nos. 3, 4).

The Carborundum Abrasives Division site is situated in an industrial section of Wheatfield, NY; there are no residents within 0.5 mile of the site making the potential soil exposure threat minimal (Ref. No. 3). Surface water intakes located upstream on the Niagara supply the drinking water to the population in the region; there are no drinking water intakes within 15 miles downstream (Ref. Nos. 13, 18, 45). There has been a health advisory against eating any fish taken from Cayuga Creek due to dioxin contamination from an upstream tributary. This health advisory will remain in effect for at least 2 more years (Ref. Nos. 43, 44). The health advisory, in addition to access problems eliminates Cayuga Creek from being considered a fishery. Although there is evidence suggesting that contaminants may have been released to groundwater at the site, the site is not thought to pose a significant threat to groundwater users due to the distance from the site to the groundwater users. Based on the lack of potential targets that would be affected by possible phenol contamination **NO FURTHER REMEDIAL ACTION PLANNED** under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is recommended for the Carborundum Abrasives Division site.

SITE ASSESSMENT REPORT: SITE INSPECTION

PART I: SITE INFORMATION

1. Site Name/Alias Carborundum Abrasives Co.
Street 6600 Walmore Road
City Wheatfield State New York Zip 14304
2. County Niagara County Code 63 Cong. Dist. 32
3. EPA ID No. NYD980507883
4. Block No. 146.00-1 Lot No. 9.2
5. Latitude 43° 6' 25" N Longitude 78° 55' 56" W
USGS Quad. Tonawanda West N.Y.
6. Owner CA Acquisitions Co. Tel. No. (716) 695-8120
Street 6600 Walmore Road
City Wheatfield State New York Zip 14304
7. Operator Carborundum Abrasives Co. Tel. No. (716) 695-8120
Street 6600 Walmore Road
City Wheatfield State New York Zip 14304
8. Type of Ownership
☒ Private ☐ Federal ☐ State
☐ County ☐ Municipal ☐ Unknown ☐ Other _____
9. Owner/Operator Notification on File
☐ RCRA 3001 Date _____ ☐ CERCLA 103c Date _____
☐ None ☒ Unknown
10. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments
RCRA generator	NYD000829606	---	---	---
SPDES	NY-OO1716	5/1/85	5/1/90	Application for renewal pending
11. Site Status
☒ Active ☐ Inactive ☐ Unknown
12. Years of Operation 1968 to Present

13. Identify the types of waste sources (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Sources

Waste Unit No.	Waste Source Type	Facility Name for Unit
1	<u>Landfill</u>	<u>Landfill</u>
2	<u>Surface Impoundment</u>	<u>Impounding Reservoir/Settling Basin</u>
3	<u>Drums</u>	<u>Drum Storage Area</u>

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

On December 19, 1978 a tank on the roof of the plant spilled up to 6,000 gals. of phenol of which approximately 600 gallons drained into the impounding reservoir via a diversion sewer.

Ref. No. 1, 3, 16, 19, 28, 29, 30

14. Information available from

Contact Amy Brochu Agency U.S. EPA Tel. No. (201) 906-6802
Preparer David Florin Agency NUS Corp. Region 2 FIT Date 12/27/90

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit 1 - Landfill

Source Type

<u>X</u>	Landfill	<u> </u>	Contaminated Soil
<u> </u>	Surface Impoundment	<u> </u>	Pile
<u> </u>	Drums	<u> </u>	Land Treatment
<u> </u>	Tanks/Containers	<u> </u>	Other

Description:

This area was once an open dump that was utilized from 1968-76. The landfill is approximately 450' x 25' and has a clay cap. The area is presently heavily overgrown.

Hazardous Waste Quantity

It is estimated that 800-1,600 pounds of phenols and 400 tons of solidified resins, floor sweepings, and waste fillers, including calcium carbonite, clays, and animal glue were disposed of at this landfill during its eight years of operation.

Hazardous Substances/Physical State

The primary hazardous substances at this landfill are phenols which were disposed of in both solid and liquid states.

Ref. No. 1

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit 2 - Impounding Reservoir/Settling Basin

Source Type

☐	Landfill	☐	Contaminated Soil
☒	Surface Impoundment	☐	Pile
☐	Drums	☐	Land Treatment
☐	Tanks/Containers	☐	Other

Description:

Carborundum Abrasives currently utilizes this 2.75 acre impounding reservoir as a settling basin for storm and non contact cooling water discharged from facility. The reservoir is located north of the site on the property of the Niagara Frontier Transportation Authority. The impounding reservoir discharges via a storm sewer to Cayuga Creek located 750 feet to the north.

Hazardous Waste Quantity

The exact waste quantity is unknown. The facility has exceeded its SPDES permitted levels of phenols in the past; additionally an accidental release of approximately 600 gallons of phenols occurred in 1978.

Hazardous Substances/Physical State

Liquid phenols and phenolic resins are the primary hazardous substances.

Ref. No. 2, 3

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit 3 - Drum Storage Area

Source Type

☐	Landfill	☐	Contaminated Soil
☐	Surface Impoundment	☐	Pile
☒	Drums	☐	Land Treatment
☐	Tanks/Containers	☐	Other

Description:

An area located at the eastern side of plant is used as a drum storage area. The site is a bermed, paved area which slopes inwards to prevent any storm water runoff. All drums are in good condition and clearly labelled.

Hazardous Waste Quantity

On the date of the NUS on-site reconnaissance there were three 55-gallon drums stored in area. The Carborundum representative informed NUS personnel that drums are removed within 90 days and that the maximum storage is 60 to 80 drums. Carborundum Abrasives has been issued RCRA generator permit No. NYD000829606.

Hazardous Substances/Physical State

The stored drums on-site contained phenols and phenolic resins.

Ref. Nos. 3, 4, 46

PART III: EXISTING ANALYTICAL DATA

Existing analytical data indicates that a release of phenolic compounds has occurred. There have been a number of sampling site inspections conducted by environmental testing companies. Most of these inspections have focused on phenol contamination at the site. The table below summarizes the data from samples collected from monitoring wells and manholes at the facility.

Sampler	Date	PHENOLS (in mg/l)					
		MW2	MW3	MW4	MW5	MH1	MH2
ACTS Testing Laboratory, Inc.	2/14/84	<.001	<.001	<.001	<.001	-----	-----
ACTS Testing Laboratory, Inc.	5/29/84	<.001	<.001	<.001	<.001	-----	-----
ACTS Testing Laboratory, Inc.	8/9/84	<.001	<.001	<.001	<.001	-----	-----
Advanced Environmental Systems, Inc.	10/11/85	.02	.21	.04	.02	-----	-----
Ecology and Environment, Inc. (samples collected by King Consulting)	6/10/86	.005	.007	.007	<.005	<.005	.006
URS Company, Inc.	6/27/87	.009	.022	.008	.020		
Frontier Technical Associates, Inc.	6/2/89	.040	<.005	.070	.050	.010	.280
	8/8/89	.095	<.005	<.005	.025	.028	.028
	4/14/90		.077		.036		
	9/13/90	.160	.050	.065	.035	.070	-----

Ref. Nos. 5, 6, 7, 8, 9, 34, 35, 36, 37, 38

SITE INSPECTION RESULTS

A site reconnaissance was conducted by NUS Corp. Region 2 FIT on October 6, 1990. Air monitoring instruments measured no readings above background. Personnel did not observe any indication of a release of hazardous materials to environment.

Ref. No. 3

PART IV: HAZARD ASSESSMENT**GROUNDWATER ROUTE**

1. Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence.

There has been a suspected release of phenols to groundwater. This was evidenced by the high levels of phenols detected in on-site monitoring wells from previous investigations. The landfill, past production activities, 1978 phenol spill, and SPDES permit violations by Carborundum Abrasives are a possible source of the contamination.

Ref. Nos. 5, 6, 7, 8, 9

2. Describe the aquifer of concern; include information such as depth, thickness, geologic composition, areas of karst terrain, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.

The Carborundum Abrasives site is located in the northwest region of the Erie-Niagara Basin. This area is characterized by two major aquifer systems, an unconsolidated upper aquifer along with a lower bedrock aquifer. The upper aquifer, approximately 20 feet thick in the site area, consists of unconsolidated clay and silty fill underlain by a silty lacustrine clay. This lacustrine clay is underlain by a discontinuous layer of till. The hydraulic conductivity of the unconsolidated material ranges from 10^{-7} to 10^{-5} cm/s. These units overlie the Lockport Dolomite, a dark grey to brown, massive to thin bedded dolomite. The Lockport Dolomite is estimated to be 150 feet thick in the site area. Due to the lack of a continuous confining layer between the bedrock and unconsolidated surficial deposits, both units are considered to be in hydraulic communication and thus are threatened as a single aquifer. The depth to groundwater at the site is approximately 6 feet below ground surface. Regionally, groundwater flow is to the northeast.

Ref. Nos. 1, 6, 7, 8, 9, 10, 42

3. Is a designated well head protection area within 4 miles of the site?

Well head protection areas have not been designated.

Ref. No. 33

4. What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?

Groundwater in the unconsolidated deposits is encountered at a depth of approximately 6 feet below ground level. Assuming that lagoon or landfill is at least 1' below surface level, the lowest point of waste disposal/storage to groundwater would be approximately 5 feet.

Ref. Nos. 6, 7, 8, 9, 19

5. What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?

The silty clay stratum has a hydraulic conductivity of 10^{-7} to 10^{-9} cm/sec.

Ref. Nos. 1, 11

6. What is the net precipitation for the area?

The net precipitation for the area is 6-8 inches.

Ref. No. 11

7. What is the distance to and depth of the nearest well that is currently used for drinking purposes?

The nearest well is located 1.2 miles east of site. The depth of the well is unknown, although the lithology code is given as "sand and gravel".

Ref. No. 12

8. If a release to groundwater is observed or suspected, determine the number of people that obtain drinking water from wells that are documented or suspected to be located within the contamination boundary of the release.

No wells are suspected to be located within the contamination boundary of the release

Ref. Nos. 1, 12, 13, 45

9. Identify the population served by wells located within 4 miles of the site that draw from the aquifer of concern.

<u>Distance</u>	<u>No. of Wells</u>	<u>Population on Drinking Wells</u>
0 - $\frac{1}{4}$ mi	0	0
$>\frac{1}{4}$ - $\frac{1}{2}$ mi	0	0
$>\frac{1}{2}$ - 1 mi	0	0
>1 - 2 mi	3	9
>2 - 3 mi	7	20
>3 - 4 mi	20 (plus 3 public wells serving 50 persons)	108

Each well (with the exception of the public supply wells) is assumed to serve 2.9 persons.

Ref. Nos. 12, 16, 24, 31, 47

10. Identify uses of groundwater within 4 miles of the site (in.e. private drinking source, municipal source, commercial, irrigation, unuseable).

Groundwater obtained from within a 4-mile radius of the site is used for domestic and public water supply as well as for industrial purposes.

Ref. No. 12

SURFACE WATER ROUTE

11. Describe the likelihood of a release of contaminant(s) to surface water as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence.

A release of phenols to surface water is likely due to the surface impoundment having an overflow pipe which discharges to Cayuga Creek. Past production activities, accidental spills, and discharge in excess of SPDES permit at the facility may have affected Cayuga Creek.

Ref. No. 2, 3, 14, 15, 19

12. Identify the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.

The nearest downslope surface water is Cayuga Creek, located approximately 0.2 mile to the north of the settling impoundment. The facility slope is approximately 0.95%. An overflow pipe discharges from settling impoundment into Cayuga Creek.

Ref. Nos. 2, 3, 14, 15, 16

13. What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.

Distance to nearest downslope surface water is 0.2 mile.

Ref. Nos. 2, 3, 14, 15, 16

14. Determine the floodplain that the site is located within.

The site is located in an area between the 100 and 500 year flood plains.

Ref. No. 17

15. What is the 2-year 24-hour rainfall?

The 2 year 24 hour rainfall for area is 2 to 2.5 inches.

Ref. No. 32

16. Identify drinking water intakes in surface waters within 15 miles downstream of the site. For each intake identify: the distance from the point of surface water entry, population served, and stream flow at the intake location.

<u>Intake</u>	<u>Distance</u>	<u>Population Served</u>	<u>Flow (cfs)</u>

There are no drinking water intakes within 15 miles downstream of the site.

Ref. Nos. 13, 18, 45

17. Identify fisheries that exist within 15 miles downstream of the point of surface water entry. For each fishery specify the following information:

<u>Fishery</u>	<u>Water Body Type</u>	<u>Flow (cfs)</u>
Niagara River	Large river	220,000

Ref. Nos. 20, 21, 22, 23, 43, 44

18. Identify sensitive environments that exist within 15 miles of the point of surface water entry. For each sensitive environment specify the following:

<u>Environment</u>	<u>Water Body Type</u>	<u>Flow (cfs)</u>
Freshwater wetlands	Moderate to large stream	950
Freshwater wetlands	Large river	220,000

Ref. Nos. 20, 22, 23

19. If a release to surface water is observed or suspected, identify any intakes, fisheries, and sensitive environments from question Nos. 16-18 that are or may be located within the contamination boundary of the release.

<u>Intake</u>	<u>Fishery</u>	<u>Environment</u>
		Cayuga Creek freshwater wetlands

Ref. Nos. 20, 22, 23, 43, 44

SOIL EXPOSURE PATHWAY

20. Determine the number of people that occupy residences or attend school or day care on or within 200 feet of the site property.

There are no residences or schools with 200 feet of site.

Ref. Nos. 3, 16

21. Determine the number of people that work on or within 200 feet of the site property.

The number of employees at Carborundum Abrasives Co. is approximately 250.

Ref. No. 4

22. Identify terrestrial sensitive environments on or within 200 feet of the site property.

There are no terrestrial sensitive environments on or within 200 feet of site property.

Ref. Nos. 16, 25

AIR ROUTE

23. Describe the likelihood of release of contaminants to air as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release define the supporting analytical evidence.

The likelihood of release of contaminants to air appears to be small. An October 9, 1990 reconnaissance by NUS detected no readings on the OVA or HNu above background levels.

Ref. No. 3

24. Determine populations that reside within 4 miles of the site.

<u>Distance</u>	<u>Population</u>
0 - $\frac{1}{4}$ mi	0
$>\frac{1}{4}$ - $\frac{1}{2}$ mi	30
$>\frac{1}{2}$ - 1 mi	703
>1 - 2 mi	10,279
>2 - 3 mi	22,107
>3 - 4 mi	15,401

Ref. Nos. 16, 24

25. Identify sensitive environments and wetlands acreage within 0.5 mile of the site.

<u>Sensitive Environment Type</u>	<u>Distance</u>

There are no sensitive environments within 1/2 mile of the site.

Ref. No. 16, 20, 25

26. If a release to air is observed or suspected, determine the number of people that reside or are suspected to reside within the area of air contamination from the release.

Not applicable.

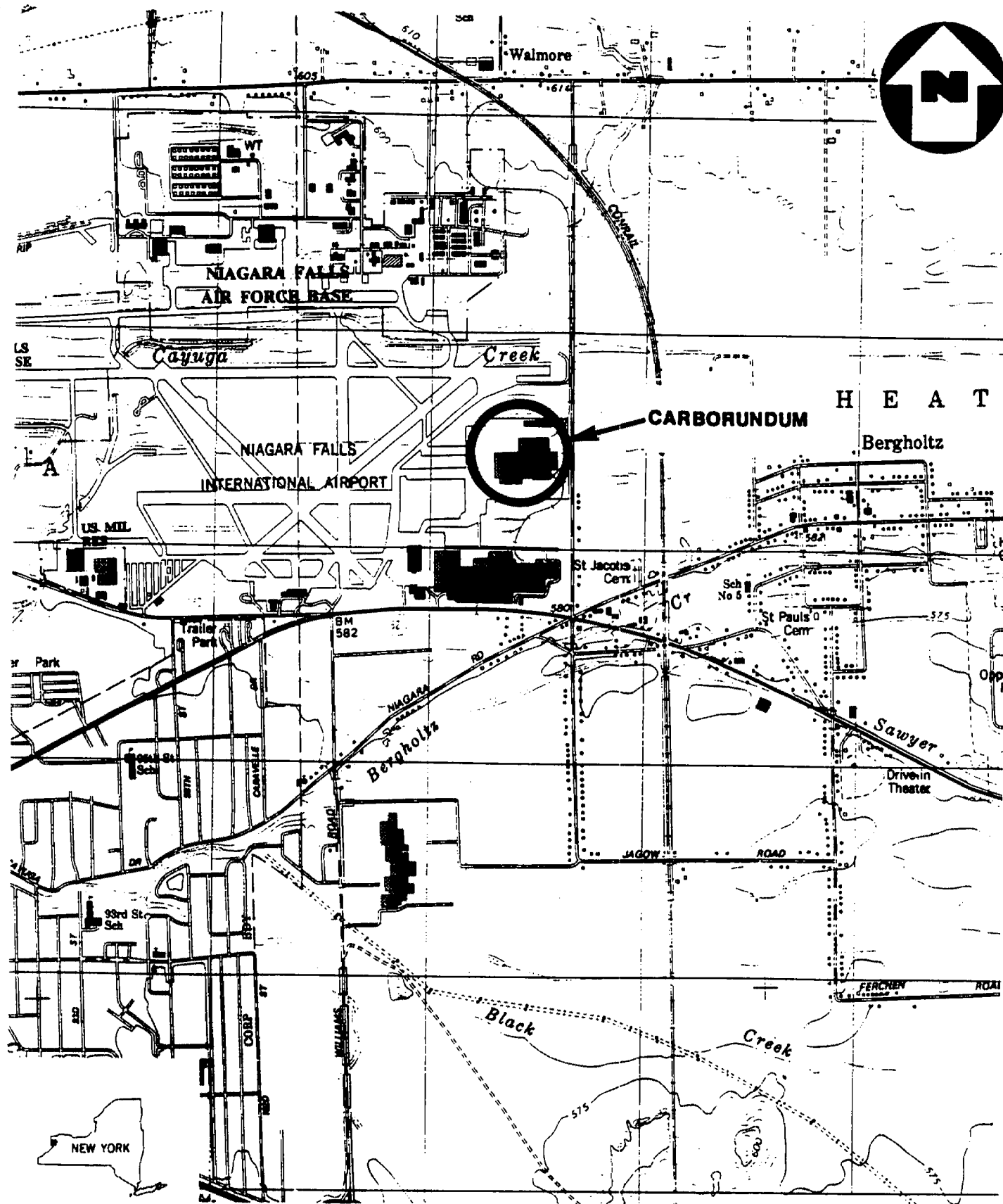
Ref. No.

27. If a release to air is observed or suspected, identify any sensitive environments, listed in question No. 25, that are or may be located within the area of air contamination from the release.

Not applicable.

Ref. No.

ATTACHMENT 1



(QUAD) TONAWANDA WEST, N.Y.

SITE LOCATION MAP
CARBORUNDUM, WHEATFIELD, N.Y.

SCALE : 1" = 2000'

FIGURE 1



TO CAYUGA CREEK



OUTFALLS

GRASS

GRASS

CONCRETE PAVEMENT

GRASS

HANGER

CONCRETE PAVEMENT

ELECTRICAL M.H.

GRASS

LANDFILL SITE

PROPERTY LINE

DRUM
STORAGE
AREA

CARBORUNDUM PLANT

CONCRETE PAVEMENT

GRASS

BOILER HOUSE

GRASS

LEGEND:

- MONITORING WELL LOCATIONS

SITE MAP
CARBORUNDUM ABRASIVES CO.,
WHEATFIELD, N.Y.

(NOT TO SCALE)

FIGURE 2



U2-9001-60-31
Rev. No. 0

CARBORUNDUM ABRASIVES CO.
WHEATFIELD, NEW YORK

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EXHIBIT A: PHOTOGRAPH LOG

EXHIBIT A

PHOTOGRAPH LOG

CARBORUNDUM ABRASIVES CO.
WHEATFIELD, NEW YORK

ON-SITE RECONNAISSANCE: OCTOBER 9, 1990

CARBORUNDUM ABRASIVES CO.
WHEATFIELD, NEW YORK
OCTOBER 9, 1990

PHOTOGRAPH INDEX

ALL PHOTOGRAPHS TAKEN BY JOHN HARRISON

<u>Photo Number</u>	<u>Description</u>	<u>Time</u>
1P-1	Viewing direction north; landfill area.	1135
1P-2	Viewing direction south; landfill area.	1140
1P-3	Viewing direction north; drum storage area.	1150
1P-4	Viewing direction northeast; impounding reservoir.	1200

CARBORUNDUM ABRASIVES CO., WHEATFIELD, NEW YORK



1P-1

October 9, 1990
Viewing direction north; landfill area.

1135



1P-2

October 9, 1990
Viewing direction south; landfill area.

1140

CARBORUNDUM ABRASIVES CO., WHEATFIELD, NEW YORK



1P-3

October 9, 1990
Viewing direction north; drum storage area.

1150



1P-4

October 9, 1990
Viewing direction northeast; impounding reservoir.

1200

ATTACHMENT 2

REFERENCES

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2. Engineering Investigation at Inactive Waste Sites in the State of New York, Phase I Investigations, Fourth Round, Niagara Frontier Transportation Authority, Wheatfield, Niagara County, New York. Recra Environmental, Inc., May 2, 1986.
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5. Report of Landfill Groundwater Monitoring; URS Company, Inc., July 17, 1987.
6. Groundwater Monitoring Report. Frontier Technical Associates, Inc., June 26, 1989.
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10. Walter, R., E. Koszalka, and D. Shavely. New York Groundwater Resources. U. S. Geological Survey Water Supply Paper 2275.
11. Uncontrolled hazardous waste site ranking system, A user's manual, 10CFR, Part 300, Appendix A, 1986.
12. Selected information from wells in groundwater site inventory data base, United States Geologic Survey, Water Resources Division, Request 2231, August 28, 1990, (Four-mile radius map with plotted wells added).
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14. NYS Industrial Inspection and Status Report Form, Carborundum Abrasives Co. New York State Department of Environmental Conservation May 25, 1976.
15. Letter from Lawrence G. Clare, Sr. Sanitary Engineer, NYSDEC, Region 9, to Gerald F. Mc Gee, Facility Engineer, Carborundum Abrasives. June 9, 1976.
16. Four- Mile Vicinity Map based on U.S. Department of the Interior, Geological Survey Topographic Map, 7.5 minute series, "Tonawanda West Quadrangle, N Y", 1980; "Niagara Falls Quadrangle, NY-Ont.", 1980; "Lewiston Quadrangle, NY-Ont.", 1980; "Ransomville Quadrangle, NY ", 1980; "Tonawanda East Quadrangle, NY,". 1980; "Cambria Quadrangle, NY", 1980
17. Federal Emergency Management Agency, Flood Insurance Map of the Town of Wheatfield, New York, Panel 4 of 9, Map revised March 1, 1984.

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19. Telecon Note: Conversation between David Leemhuis, Engineer of Water Program at Region 9, NYSDEC, and David Florin, NUS Corp., September 7, 1990.
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21. Telecon Note: Conversation between Mike Wilkinson, Senior Aquatic Biologist at Region 9, NYSDEC, and David Florin, NUS Corp., November 9, 1990.
22. Telecon Note: Conversation between Donna Kierfz from Water Division, NYSDEC, Region 9, and David Florin, NUS Corp., November 9, 1990.
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30. Telecon Note: Conversation between Willis Retzloff, Tax Assessor or Niagara Town Hall, and David Florin, NUS Corp., September 10, 1990.
31. Telecon Note: Conversation between Mr. Leo Henry, Chief of Tuscora Indian Reservation, and David Florin, NUS Corp., November 28, 1990.
32. Dunne, T. and L.B. Leopold. Water in environmental planning. W.H. Freeman and Company, San Francisco. 1978.
33. Telecon Note: Conversation between Dore LaPosta, Acting Chief of Ground Water Management, U.S. EPA, Region 2, and David Florin, NUS Corp., November 6, 1990.
34. ACTS Testing Labs, Inc., Technical Report 4-0751, Laboratory Analysis from ACTS Testing Labs of sampling conducted on February 14, 1984.

REFERENCES (CONT'D)

35. ACTS Testing Labs, Inc., Technical Report 4-3161, Laboratory Analysis from ACTS Testing Labs of sampling conducted on May 29, 1984.
36. ACTS Testing Labs, Inc., Technical Report 4-4675, Laboratory Analysis from ACTS Testing Labs of sampling conducted on August 6, 1984.
37. Advanced Environmental Systems, Inc., Report AZX, Laboratory Analysis from AES Testing Labs of sampling conducted on October 11, 1985.
38. Ecology and Environment, Inc., Job No. U-3506, Laboratory Analysis from Ecology and Environment, Inc. of sampling by King Consulting conducted on June 10, 1986.
39. New York State Department of Environmental Conservation industrial inspection conducted on May 25, 1976, Permit No. NY0001716.
40. Niagara County Department of Health inspection conducted on September 9, 1982.
41. Niagara County Department of Health inspection conducted on September 22, 1982.
42. LaSala, A.M. Groundwater Resources of the Erie-Niagara basin, New York, State of New York Conservation Department, Water Resources Commission, Basin Planning Report ENB-3, 1968.
43. Telecon Note: Conversation between Mike Wilkinson, Senior Aquatic Biologist at Region 9, NYSDEC, and David Florin, NUS Corp., December 13, 1990.
44. Telecon Note: Conversation between Larry Skinner, Principal Fish and Wildlife Ecologist of NYSDEC Bureau of Environmental Protection, and David Florin, NUS Corp., December 13, 1990.
45. Telecon Note: Conversation between John Burnmaster, Administrative Director of Niagara County Water District, and David Florin, NUS Corp., December 17, 1990.
46. Telecon Note: Conversation between Louis Biolanti, Hazardous Waste Program, NYSDEC, Region 9, and David Florin, NUS Corp., December 21, 1990.
47. Project Note: David Florin, Standard Calculation Sheet, Groundwater Usage, NUS Corp., March 1, 1991.

REFERENCE NO. 1



Preliminary Evaluation Of Chemical Migration To Groundwater and The Niagara River from Selected Waste- Disposal Sites



TONAWANDA AREA

Geology

The Tonawanda study area (pl. 2) consists of unconsolidated deposits of clay, sand, and till of Pleistocene and Holocene age overlying Camillus Shale bedrock of Silurian age.

Bedrock Units.--The Camillus Shale is the only bedrock unit encountered in the area. As described previously, it is a gray, red, and green thin-bedded unit with massive mudstone and also contains beds and lenses of gypsum. Thickness of the shale is estimated to be 400 ft but decreases to the north near the contact with the Lockport Dolomite.

Unconsolidated Deposits.--The unconsolidated units consist of glacial material deposited during the latter part of the Pleistocene epoch and lacustrine material deposited during the early Holocene. The distribution of unconsolidated deposits in the area is shown in figure 5.

The Pleistocene materials are similar to those in the Buffalo area except for a ground-moraine deposit, which consists mainly of lodgment till, silty clay till, and sandy till. This deposit was formed by the transport and deposition of material beneath the southward flowing continental ice sheet (Muller, 1977) and is thus compacted and relatively impermeable.

The northern part of the area contains a Holocene lacustrine deposit consisting primarily of clay with stringers of sand and silt. Most stringers are less than 3 inches thick and are discontinuous throughout the area.

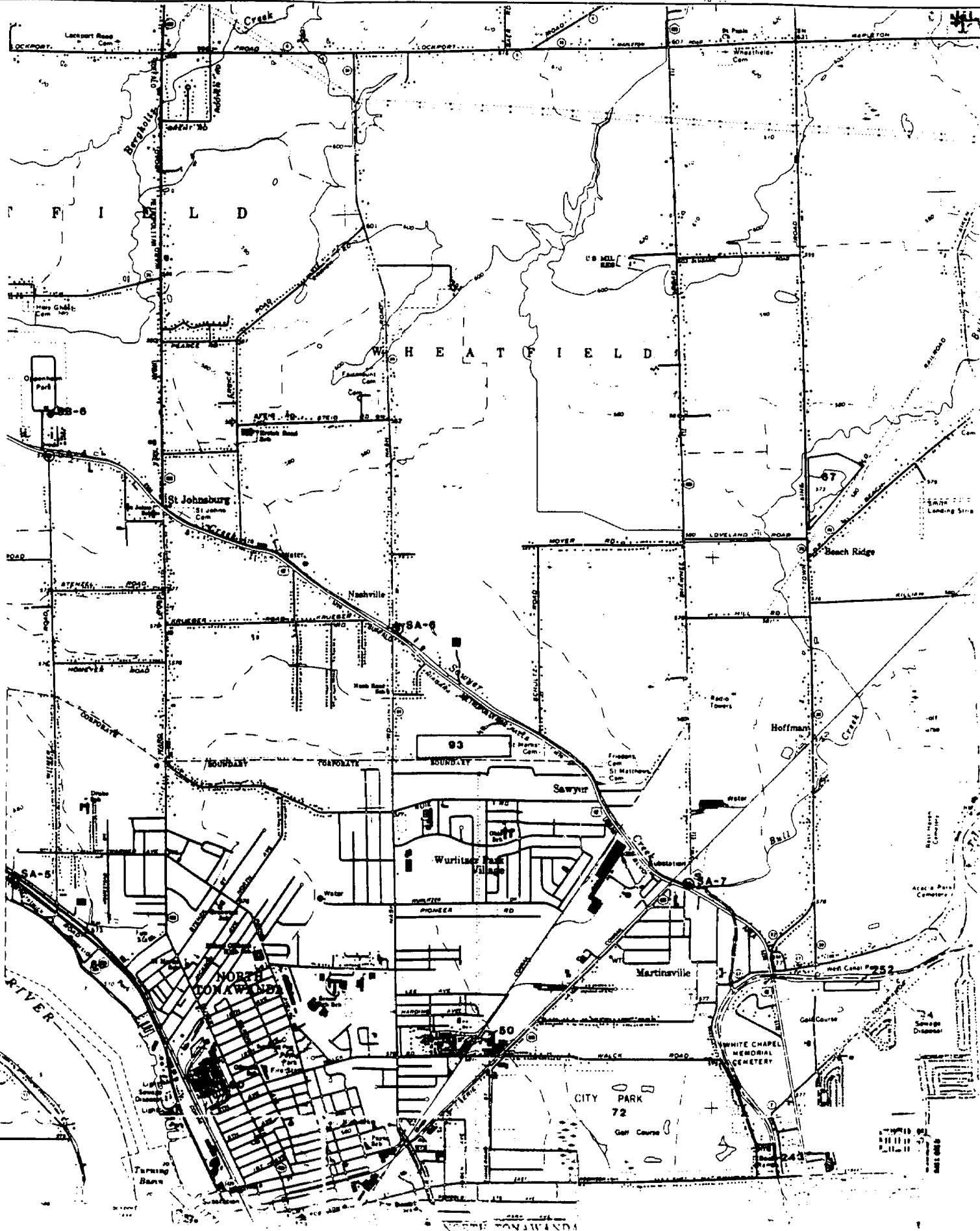
The U.S. Geological Survey drilled five test holes in 1982 to obtain additional data on the subsurface geology of the area. (Locations of these holes, SA-4 through SA-8, are shown on pl. 2.) The geologic logs are as follows:

<u>Boring No.</u>	<u>Depth (ft)</u>	<u>Description</u>
SA-4	0 - 1.5	Topsoil
	1.5 - 6.5	Clay, sand, green
	6.5 - 18.5	Clay, pink
	18.5	Bedrock
SA-5	0 - 6.5	Road fill, rubble
	6.5 - 19.0	Clay, pink
	19.0 - 24.5	Sand
	24.5	Bedrock
SA-6	0 - 3.0	Topsoil, rubble
	3.0 - 28.0	Clay, pink
	28.0 - 44.0	Sand, silty
	44.0	Bedrock
SA-7	0 - 1.5	Topsoil
	1.5 - 16.5	Clay, gray-green
	16.4 - 19.0	Clay, pink
	19.0 - 27.0	Clay, sandy pink
	27.0	Bedrock

PREPARED BY UNITED STATES GEOLOGICAL SURVEY
IN COOPERATION WITH
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

78° 52' 30"

78° 50'



8. CARBORUNDUM, BUILDING 82 (Literature review)

NYSDEC 932048-b

General information and chemical-migration potential.--Building 82 is at Carborundum's Buffalo Avenue Plant in Niagara Falls. The area south of Building 82 is used as a transfer point for general waste products, which include silicon dust and fibers. The waste is sent away for disposal. No geologic, hydrologic, or chemical information is available. The potential for contaminant migration is indeterminable.

9. CARBORUNDUM--ABRASIVE DIVISION (Literature review)

NYSDEC 932007

General information and chemical-migration potential.--The Carborundum-Abrasive Division site, in the town of Wheatfield, was an open dump used during 1968-76 to dispose of 800 to 1,600 pounds of phenols and 400 tons of solidified resins, floor sweepings, and waste fillers, including calcium carbonate, clays, and animal glue. This site has been remediated through the installation of a clay cap, which was joined to the silty clay around the site. The potential for contaminant migration is indeterminable.

Geologic information.--The site consists of clay and silty fill underlain by a silty lacustrine clay, which is in turn underlain by a discontinuous layer of till. These units overlie bedrock of Lockport Dolomite. A geologic cross section is shown in figure C-4.

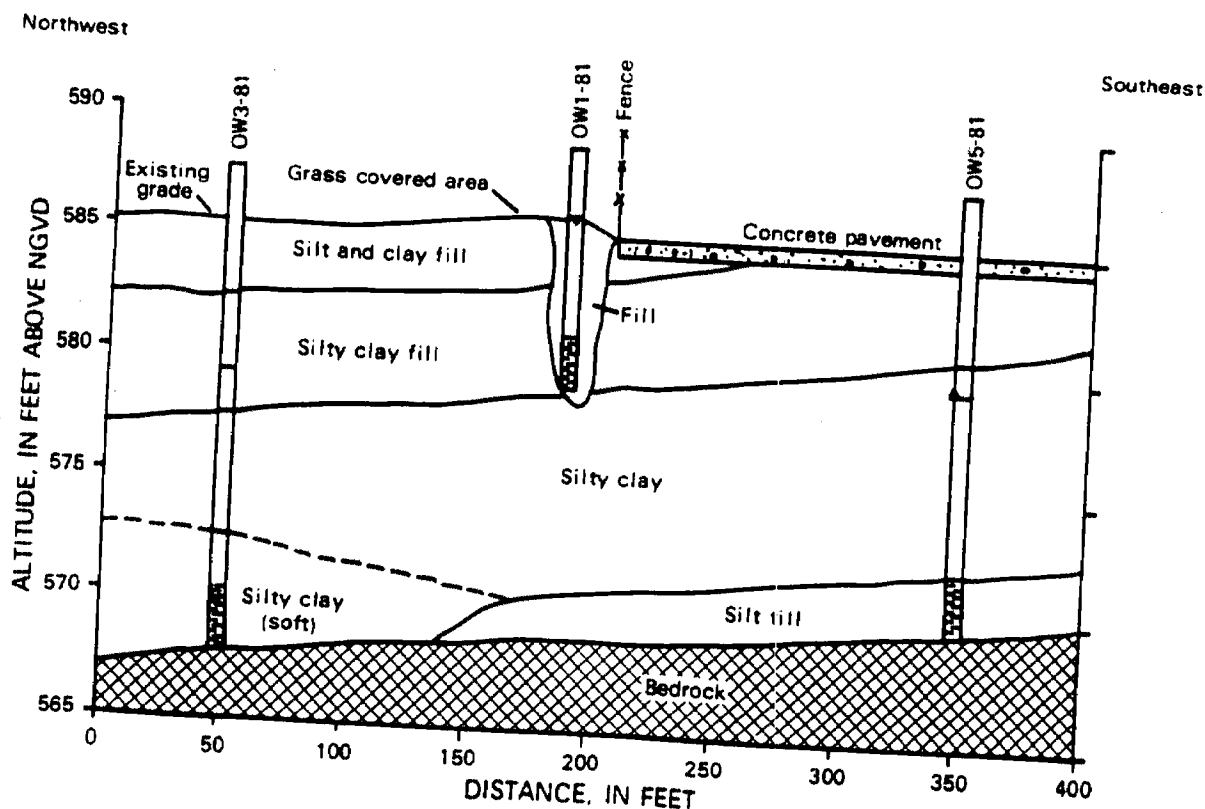


Figure C-4. Geologic cross section of formations underlying Carborundum-Abrasive Division, site 9, Wheatfield. (Modified from Conestoga-Rovers and Assoc., 1981.)

Hydrologic information.--The property owners installed five monitoring wells on the site; locations are shown in figure C-5. Water-level measurements taken in 1981 indicate ground-water flow to be northeastward. The potentiometric contours and direction of ground-water flow are given in fig. C-5.

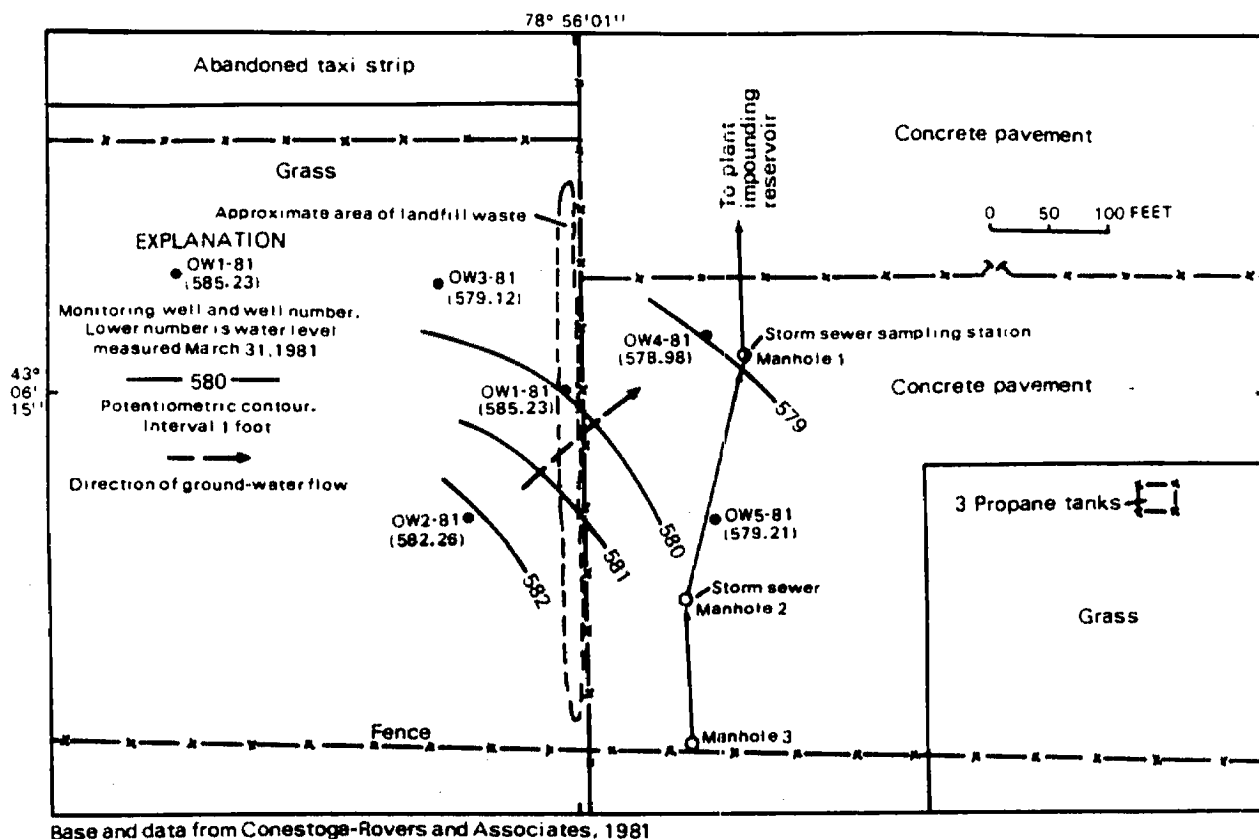


Figure C-5. Potentiometric surface at the overburden-bedrock interface and location of monitoring wells at Carborundum-Abrasive Division, site 9, Wheatfield.

Chemical information.--Advanced Environmental Systems collected eight ground-water samples from each of the five monitoring wells and three manholes five times from February through November 1981 for phenol analysis; results are shown in table C-4.

Source of data.--Conestoga-Rovers and Associates, 1981, Hydrogeologic investigation, Landfill site, Carborundum: Toronto City, 25 p., 1 append.

Table C-4.--Phenol concentrations in ground-water samples from Carborundum Abrasive Division, site 9, Wheatfield, N.Y., 1981.
[Concentrations in µg/L, <1 = detection limit. Blank space indicates no analysis performed.)¹

Sample ²	Date of collection				
	2-17-81	3-4-81	9-15-81	10-6-81	11-24-81
Field Blank	<1	<1	<1		
Manhole 1	250	1	<1	2	3
Manhole 2			<1	14	6
Manhole 3			<1	13	<1
OW-1-81	53,500	50,000	<1	30	<1
OW-2-81	11	7	<1		
OW-3-81	9	8	4	8	1
OW-4-81	17	<1	<1	6	4
OW-5-81	25	24	4	4	2
				5	<1

¹ Data from Advanced Environmental Systems, Inc.
² OW = Observation wells.

10. CARBORUNDUM, GLOBAL PLANT (Literature review)

NYSDEC 932036

General information and chemical-migration potential.--The Carborundum Global Plant, on Hyde Park Boulevard in Niagara Falls, generated sand, fly ash, pallets, incinerator ash and residue until 1962, and scrap containers and products, wood, pulp, and empty drums as waste. Plant wastes were temporarily stored in the northeast corner of the property before onsite incineration or offsite disposal. This site is no longer active, and the incinerator is not used. No geologic, hydrologic or chemical information is available. The potential for chemical migration is indeterminable.

11. CHISHOLM RYDER (USGS field reconnaissance)

NYSDEC 932009

General information and chemical-migration potential.--The Chisholm Ryder site, in the city of Niagara Falls, was used to dispose of unknown quantities of ash, cinders, rubble, grease, oil, metal turnings, and water-soluble coolant.

The potential for vertical contaminant migration may be high because the overburden is shallow. The elevated concentrations of some heavy metals such as zinc and the presence of organic priority pollutants indicate that sampling may have been within the burial area. The potential for contaminant migration is indeterminable because the hydrogeologic data are limited.

REFERENCE NO. 2

ENGINEERING INVESTIGATIONS AT
INACTIVE HAZARDOUS WASTE SITES
IN THE STATE OF NEW YORK
PHASE I INVESTIGATIONS
FOURTH ROUND

Niagara Frontier Transportation Authority
Wheatfield, Niagara County, New York
Site #932090

Prepared For:

Division of Solid and Hazardous Waste
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-0001

Prepared By:

Recra Environmental, Inc.
4248 Ridge Lea Road
Amherst, NY 14226

1.0 EXECUTIVE SUMMARY

The Niagara Frontier Transportation Authority site is a 2.75 acre impounding reservoir located on the Niagara Falls International Airport in the Town of Wheatfield, New York. The site is ~~owned~~ by Carborundum Abrasives located 400 feet south of the site. Carborundum uses the impounding reservoir as a settling basin for storm and non-contact cooling water discharged from their facility. Carborundum manufactures sandpaper and abrasive grain material using raw materials including phenol and phenolic resins.

Water from the impounding reservoir discharges to a storm sewer which runs under airport property and enters Cayuga Creek 750 feet north of the site. This discharge is monitored in conjunction with a SPDES permit. Phenol levels have exceeded permit limits on several occasions. A phenol spill at Carborundum on December 19, 1978 resulted in a contamination problem in the impounding reservoir. Clean-up actions immediately ensued and phenol levels were eventually within permit limits. The U.S. Geological Survey conducted a site investigation in 1982 and found elevated levels of three priority pollutant organics (phthalates) in site soils at concentrations below 40 ppb.

No groundwater quality information is available for the site.

The Phase I effort included a compiling of information gathered from the New York State Department of Environmental Conservation, the Niagara

4.0 SITE ASSESSMENT

4.1 Site History

The Niagara Frontier Transportation Authority (NFTA) site is a 2.75 acre impounding reservoir located on the Niagara Falls International Airport in the Town of Wheatfield, New York (Figures 1 and 2). The site is owned and operated by Carborundum Abrasives located on Walmore Road, Wheatfield, New York. The site is north of the Carborundum building complex on NFTA property. Carborundum has and continues to use the impounding reservoir as a settling basin for storm and non-contact cooling water discharged from their facility (Ref. 2, 16). The facility manufactures sandpaper and abrasive grain material using raw materials including phenol and phenolic resins (Ref. 16).

Water from the impounding reservoir discharges to a storm sewer which runs under airport property and enters Cayuga Creek approximately 750 feet north of the site (Ref. 2). ~~WATER ENTERING INTO THE IMPOUNDING RESERVOIR~~ ~~This discharge~~ is monitored in conjunction with SPDES Permit #NY0001716 (Ref. 16). Monitoring results indicate that permit limitations have been exceeded on a number of occasions, especially for phenol, BOD and solids (Ref. 2, 14). On December 19, 1978, a tank on the roof of the Carborundum plant spilled up to 6000 gallons of phenol (Ref. 2, 12, 13, 14). An estimated 10% of the spill drained to the impounding reservoir via a diversion sewer (Ref. 2, 12). Clean-up measures were immediately undertaken by Carborundum and monitoring conducted on April 25, 1979 indicated phenol levels were below the SPDES permit limits (Ref. 2, 12, 13).

In the unconsolidated deposits, water-bearing zones were encountered during the U.S. Geological Survey drilling in 1982 (Ref. 4). The low permeability of the glacio-lacustrine deposits in the area results in seasonal high water tables developing following wet periods. The direction of groundwater movement in the unconsolidated aquifer is generally toward the major surface water bodies (Ref. 4). Groundwater movement beneath the site probably is directed north towards Cayuga Creek (Ref. 4).

4.4 Previous Sampling and Analyses

4.4.1 Groundwater Quality Data

During the site investigation by the U.S. Geological Survey in 1982, two test borings were advanced. The yield of groundwater from the saturated zone was too low to warrant the installation of monitoring wells (Ref. 4).

No groundwater quality information is known to exist for the site.

4.4.2 Surface Water Quality Data

The discharge ~~from~~ ^{into} the impounding reservoir to Cayuga Creek is monitored for the parameters listed in Carborundum's SPDES Permit #NY-0001716 (Ref. 15). Permit effluent limitations have been exceeded on several occasions for phenol (Ref. 2, 14). Phenol limits have been set at 1.4 pounds per day average in the discharge (Ref. 2, 13). The current SPDES limitations for phenol are 0.005 mg/l (Ref. 15).

5.0 PRELIMINARY APPLICATION OF THE HAZARD RANKING SYSTEM

5.1 Narrative

The Niagara Frontier Transportation Authority site is a 2.75 acre impounding reservoir located within the boundaries of the Niagara Falls International Airport in the Town of Wheatfield, New York (Ref. 1). The site is ~~owned~~ by Carborundum Abrasives, located on Walmore Road, 400 feet south of the site (Ref. 2). Carborundum has and continues to use the impounding reservoir as a settling basin for storm and non-contact cooling water discharged from their facility (Ref. 2, 16). Carborundum manufactures sandpaper and abrasive grain materials using raw materials including phenolic resins (Ref. 16).

Water from the impounding reservoir discharges to a storm sewer which runs under airport property and enters Cayuga Creek approximately 750 feet north of the site (Ref. 1). ~~WATER ENTERING INTO THE IMPOUNDING RESERVOIR~~ This discharge is monitored in conjunction with a SPDES permit (Ref. 16). Permit limitations for phenol (1.4 pounds per day average) have been exceeded on several occasions (Ref. 2, 14). On December 19, 1978, a tank on the roof of the Carborundum plant spilled up to 6000 gallons of phenol of which an estimated 10% drained to the impounding reservoir via a diversion sewer (Ref. 2, 12, 13, 14). Clean-up measures were immediately initiated by Carborundum and monitoring results from April 25, 1979 indicated phenol levels were within the SPDES permit limits (Ref. 2, 12, 13). Niagara County Health Department personnel inspected the site in January 1982 and found no visible signs of contamination (Ref. 2).

REFERENCE NO. 3

NUS CORPORATION

II

0661

CARBORUNDUM
02-9007-26
TDD MANAGER - J. HARRISON
LOGBOOK #0661
OCTOBER 3, 1990

Purpose

- o Serves to document onsite activities and be understandable to an outside reader.
- o Provides the basis for later written reports.
- o Used as an evidentiary document and may be used in legal proceedings.

Distribution

- o Controlled by the project manager and distributed as appropriate to personnel designated by the project manager.

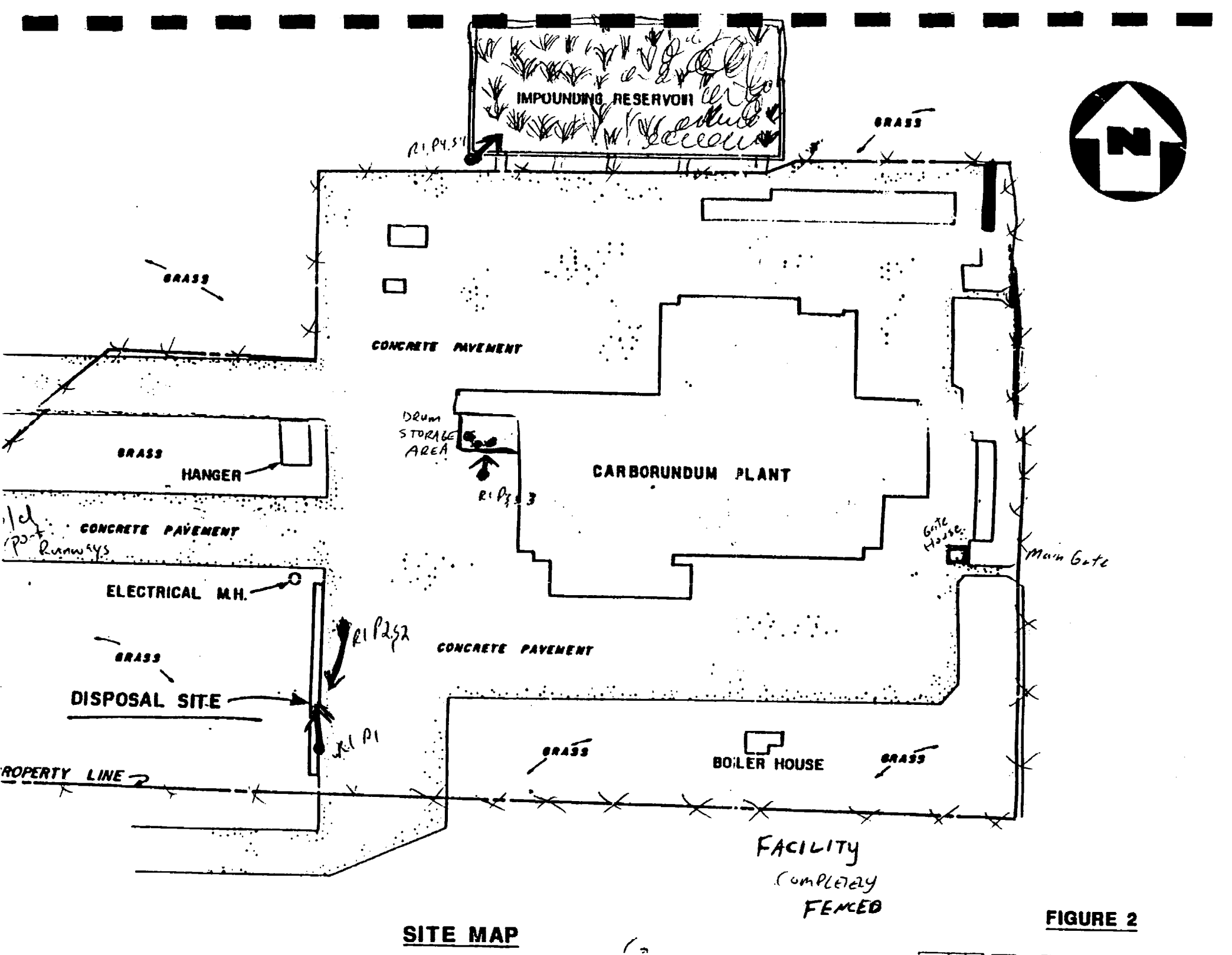
General Procedures

- o Record information in language which is objective and factual.
- o Use ink. Waterproof ink is recommended.
- o Leave first two pages blank. They serve as space for the table of contents to be added when the log book is complete.
- o The first written page identifies the date, time, TDD number, site name, location, NUS personnel and their responsibilities, other non-NUS personnel and observed weather conditions.
- o Start on a new page at the start of each day's field activities. This page should identify date, time, TDD number, site name and location, NUS personnel and their responsibilities, other non-NUS personnel and observed weather conditions.
- o List all persons leaving or entering the site.
- o Information recorded in the log book should be in chronological order.
- o Sign and date each page, log all entries using a 24 hour clock. Entries should be time logged every 15 to 30 minutes.
- o Corrections are to be lined through and initialed. No erroneous notes are to be made illegible.
- o Include a sketch or map of the site which can be used to locate photo or sample locations. Note landmarks, indicate north, and if possible include an approximate scale. Include as many sketches and maps as necessary.

- o A person not present when field activities were being documented should read each completed page, and countersign and date when satisfied that the written notes are understandable.

Specific Field Activities To Be Documented

- o Record the who, what and where of field activities.
- o Indicate sampling and photo locations on a site sketch or map.
- o As part of the chain of custody procedure, recorded in-situ sampling information must include sample number, date, time, sampling personnel, sample type, designation of sample as a grab or composite, and any preservative used.
- o Information for in-situ measurements must include a sample ID number, the date, time, and personnel taking measurements. Pertinent in-situ measurements include but are not limited to pH, temperature, conductivity, flow measurements, continuous air monitoring measurements, and stack gas analysis. If infield calculations are necessary they must be checked and signed by a second team member.
- o Create a photo log to document photos taken in the field. These must include date, time, photographer, sample number, roll number, frame number, photo ID number and description. Indicate if the film is for slides or prints in the column for roll number. Photo ID numbers can be added at the time the photo log is assembled.
- o Record onsite health and safety measures used. Describe observed potential hazards to health and safety. Document the level of protection used, decontamination procedure used and specific decontamination solutions.
- o When sampling is complete, a summary log is to be completed. It must include date, time, sample number, description, field book reference page, and the number and date of the chain of custody from on which the sample is listed. Indicate whether or not the sample was split.
- o Record details regarding relevant information obtained during onsite interviews. Include names of persons interviewed, the interest group represented, their address and phone number.
- o Record any other relevant information which would be difficult to generate at a later date.



10/9/40

2

On-Site Reconnaissance
Carborundum Abrasives Co.
Wheatfield, Niagara Co, N.Y.

TABLE OF CONTENTS

PP 2-7	On-Site Reconnaissance
PP 8	Photograph Log

[Signature] 10/9/40

[Signature] 10-16-40

10/4/90

Carborundum Abrasives Co.
6600 Walpole Rd
Wheatfield, Niagara Co., NY
ON-SITE RECONNAISSANCE

NUS Field Personnel

(JH) John Harrison - SM | H 10/4/90
(DF) Dennis Farter - SSO ~~DF~~ 10/4/90
(CA) Chris Agnew - ~~CA~~ ^{Swathmore} 10/9/90

The work plan and QA/QC requirements have been read and understood by above personnel.

Weather Conditions

Rain, approx 50°, Wind 20 mph from Southeast

Equipment Numbers

(C) HNU - 307140 w/probe 192119
(S) OVA - 307134
Mini-Rad - 428604
Canon Camera - 307128
Canon Camera - 469774

SCBA Numbers

JH - 307172
DF - 192069
CA - 192040

[Signature] 10/9/90

[Signature] 10/9/90

10/9/90

Site Contacts & PersonnelTitle

Gerald F. McBee

Facility Engineer
Carborundum Abrasives Div.Instrument Background Levels

Mini-Rad - 428604 14 cpm

OVA - 307134 0 ppm

HNU - 0 ppm

9⁵⁰ Arrive on Site

The site consists of a large manufacturing building, surrounded by concrete pavement and old airport paved runways. The site is observed to be completely fenced.

10⁰⁰ Awaiting for Mr. McBee at receptionist desk

Talk to Mr. McBee about former and current operations at the facility.

10³⁰ Still in conference with Mr. McBee. Mr. McBee informs

me that the site sits on approximately 60 acres and manufactures sandpaper. The site is observed to be controlled by security.

10⁵⁵ Mr. McBee informs me that all ^{landfill} wells were sampled quarterly or now sampled annually. Mr. McBee makes copies of current sampling results for us. Mr. McBee informs us that 12 ^{additional} monitoring wells were installed to determine possible contamination of storm drain lines.

11⁰⁵ Setting up Decon at abandoned taxi strip near landfill11¹⁵ DF conducts Health & Safety Meeting

John [unclear] [unclear]

William [unclear] [unclear]

10/4/90

1120 DF takes background readings

1125 DF, JH and CA on Level C respirators

1130 Start walk around perimeter of landfill

The landfill is currently heavily vegetated and clay cap is present. The landfill is approx 450' x 25' in size. Mr McGee informs us this dump ~~was~~ ^{went through final closure} ~~terminated~~ in 1982. No signs of visible leachate in this area. No signs of run-off erosion in this location. (clay cap)

1135 R1, P181 Photo viewing north, landfill area
No readings above background on OVA or HNU.

1140 Observe 5 ^{shaded} monitoring wells, wells are 2" diameter and wells 3 and 4 are ^{located} but in a manner which would restrict any boiler sampling. All of these wells are located in the landfill area. These wells are constructed of a steel standpipe with no cap present. It appears no inner casing is present.

1140 R1, P2, S2 Photo viewing South, landfill area

1142 DF, JH and CA ^{Level C} respirators off

1145 Arrive at Drum Storage Area. Mr. McGee informs me that drums are removed 90 days as per generator stipulations. There are currently 3 drums in this area. The drums are in good condition and set in a ^{clearly labeled} ^{for disposal} berm. This area is sloped inward preventing any stormwater runoff. The stored drums contain phenolic resins. No leaks or spills have been ^{previously} reported in this area.

1150 R1, P3, S3 Photo viewing north, drum storage area

No readings above background on OVA or HNU.

10/4/90

Laurie L. Long 10-8-90

10/9/90

- 11:00 ~~DF~~ ^{DF} ~~takers~~ ^{background readings}
- 11:25 DF, CA, and JH on Level C respirators
- 11:55 Arrive at ~~settling basin~~ ^{impounding reservoir} location and phragmites
- The area is swampy and overgrown with bullrushes. There are currently 5 outfalls in operation, which divert stormwater runoff to ~~the~~ ^{the} ~~settling basin~~ ^{impounding reservoir}.
- 12:00 Plot a viewing north-east ~~settling basin~~ ^{impounding reservoir}
- The facility is observed to be relatively flat with facility slope estimated $< 3\%$.
- 12:15 DF, CA, and JH off Level C respirators
- An additional network of ~~13~~ ¹⁶ monitoring wells were installed along sewer lines.
- No readings above background on OVA or HNU.
- The five outfalls enter the reservoir, and an additional outfall ^{stormwater} exits the reservoir and enters Cayuga Creek approx 750' north of the site.
- 12:35 Heading back to Decon

12:00 Breaking down Decon

No residences have been identified within 0.50 mile of the site.

12:55 Left Site

Note: Mr McBee accompanied us throughout the recon. He did not wear PPE. F/T personnel wore Tyvek, latex boots, gloves, safety glasses and Level C respirators where applicable.

In Summary,

The site consists of a large single manufacturing

[Signature]

[Signature]

building, surrounded by concrete pavement and old airport paved runways. The site encompasses approx 60 acres and was observed to be completely fenced. The facility manufactures sandpaper derived products. The site is observed to be relatively flat with facility slope estimated to be $< 3\%$. The landfill area was observed to be heavily vegetated with a clay cap present. The landfill is approx $450' \times 25'$ in size. 5 ^{SH} monitoring wells are observed in this area. ^(see Figure 1) No visible signs of leachate or run-off erosion in this area. Also observed on site was a drum storage area. There were currently 3 drums in this area, however drums are periodically removed within 90 days as per generator status. These drums are set in a bermed paved area, and no leaks or spills have been reported. The ~~settling basin~~ impounding reservoir was additionally observed. This area is swampy and overgrown with bullrushes and phragmites. There are currently 5 outfalls which divert stormwater runoff to this reservoir. The site representative informed us that an additional network of 12 ^{SH} monitoring wells were installed along storm sewer pathways (see Figure 1) to determine any phenolic discharges to the reservoir. In general, the vicinity of the site is industrial/commercial, with the Niagara Falls International Airport bounding the site to the west and north, Bell Aerospace to the south, and open fields to the east. Nearest residences were observed greater than $\frac{1}{2}$ mile from site. No readings above background on the OVA or HNU were obtained throughout the reconnaissance. The impounding reservoir was noted as being 5-10 feet below the rest of the site, and an outfall exits the property and enters Cayuga Creek approx 750' north of the property.

[Signature]
10/4/90

[Signature]
10/6/90

10/9/90

PHOTOGRAPH LOG

CARBORUNDUM ABRASIVES CO.
 WHEATFIELD, NIAGARA CO, NEW YORK
 ON-SITE RECONNAISSANCE
 October 9, 1990

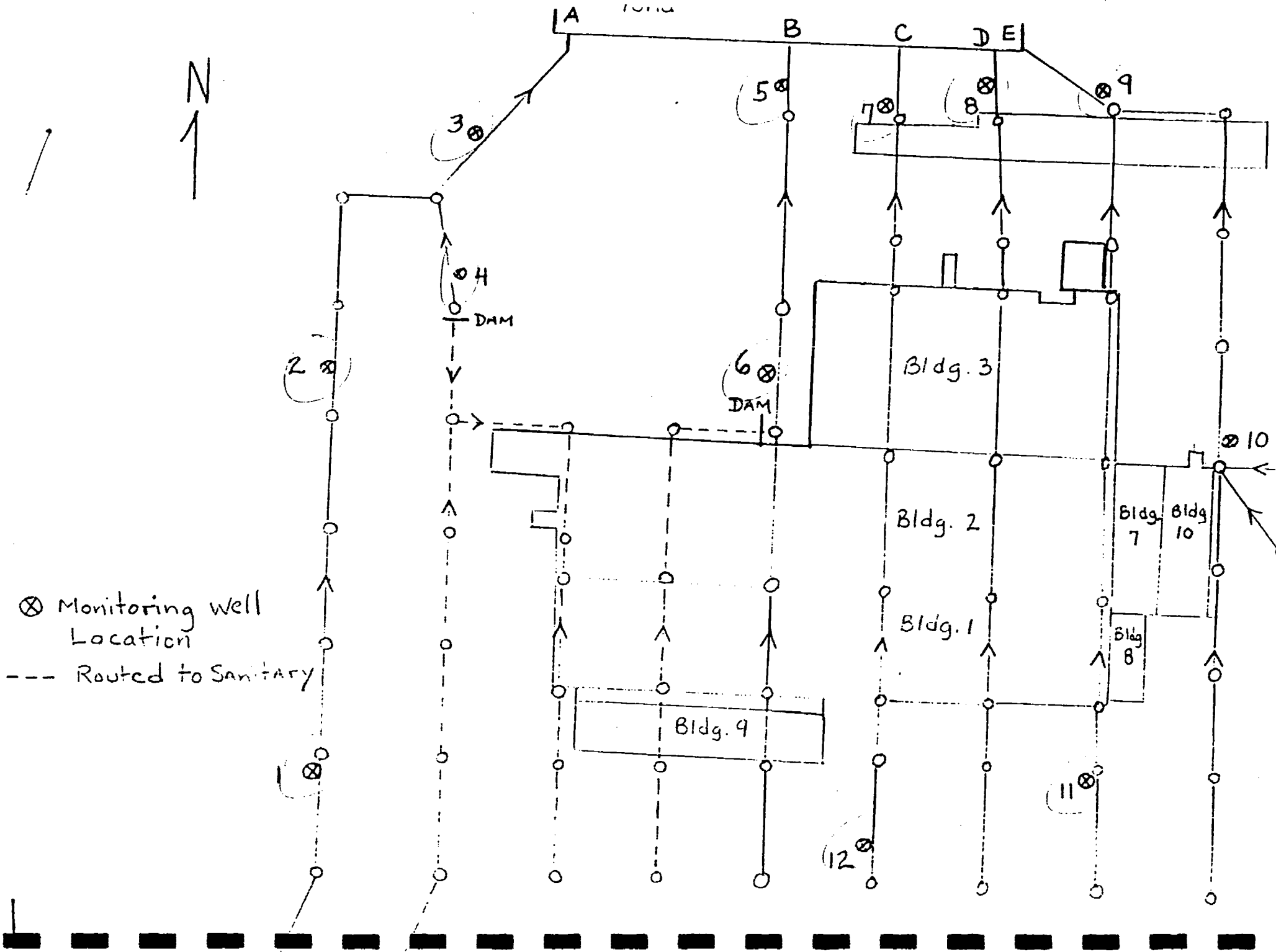
ALL PHOTOGRAPHS TAKEN BY JOHN HARRISON

<u>Number</u>	<u>Description</u>	<u>Time</u>
P1, P151	Viewing direction north, landfill area	1135
P1, P2, 52	Viewing direction south, landfill area	1140
P3, 53	Viewing direction north, drum storage area	1150
P1, P4, 54	Viewing direction northeast, ~~sitting~~ ~~being~~ ~~impounding~~ reservoir	1200

[Signature]
 10/9/90

[Signature]
 10/9/90

Clarkburg



⊗ Monitoring well Location

--- Routed to Sanitary

Carborundum

10/6/40

02-9007-26

REFERENCE NO. 4

CONTROL NO.:

02-9007-26

DATE:

11/9/90

TIME:

1135

DISTRIBUTION:

Carborundum Abrasives Co.

BETWEEN:

Gerald McGee,

Facility
Engineer

OF:

Carborundum Abrasives

PHONE:

(716) 695-8120

AND:

David Florin

(NUS)

DISCUSSION:

Contacted Mr McGee to obtain number of employees at Carborundum Abrasives Facility. Mr McGee informed me that there are approximately 250 employees. I also inquired about the stock piling of drums at site. Mr. McGee stated that Carborundum will store a maximum of 60 to 80 Fifty Five gallon drums before shipping to waste hauler. The time period is usually within 90 days

ACTION ITEMS:

REFERENCE NO. 5

REPORT OF
LANDFILL GROUNDWATER MONITORING
JUNE 1987

PREPARED FOR:

CARBORUNDUM ABRASIVES COMPANY
NIAGARA FALLS, NEW YORK

JULY 17, 1987

PREPARED BY:

URS COMPANY, INC.
570 DELAWARE AVENUE
BUFFALO, NEW YORK 14202

Description

Carborundum Abrasives Company in Niagara Falls, New York is performing annual groundwater and surface water sampling of the facility's onsite landfill. There are four (4) monitoring wells and two (2) manholes that make up the monitoring system. Groundwater samples were obtained from the four monitoring wells on June 24, 1987. No samples were obtained from the manhole sampling points, MH-A and MH-B, because there was no water at either location.

A URS Company technician performed all field purging and sampling tasks. The groundwater monitoring was performed in accordance with the procedures and methods identified in the "RCRA Groundwater Technical Enforcement Document", United States Environmental Protection Agency, September 1986.

Purging Procedures

All four (4) monitoring wells were purged on June 23, 1987 prior to sample collection. Water was evacuated continuously until at least three (3) well volumes were removed or the well went to dryness. Well volumes were computed based on the inside diameter of the well casing and the height of the water column. The well purging procedures are described below:

1. Prior to purging, the depth of the water surface from the top of the well casing was measured using an electronic liquid level sensor. The sensor was thoroughly cleaned with distilled water and allowed to air dry before its use at the next well.
2. Purging was carried out using an ISCO peristaltic pump with dedicated polyethylene tubing.

3. During the well evacuation, the intake opening of the tubing was positioned just below the surface of the water. As the water level dropped, the tubing was lowered as needed to maintain its position just below the water surface. Evacuating water from the top of the water column insures proper flushing of the well.

The Groundwater Surface Elevation for each well can be found in Table 1.

Sampling Procedures

Groundwater samples were obtained from four (4) monitoring wells on June 24, 1987. A water surface elevation was taken prior to sampling using an electronic liquid level sensor that was cleaned with distilled water and allowed to air dry between each use. A dedicated stainless steel bailer equipped with a teflon ball valve and nylon rope was used to collect samples from each monitoring well. Stainless steel bailers were prewashed to prevent contamination of the samples and wells. The following cleaning protocol was used:

- o Scrub with detergent inside and out,
- o Rinse with water,
- o Rinse with nitric acid (25% solution),
- o Rinse with distilled water.

The first volume of water brought to the surface in the bailer was discarded as a further precaution against contamination.

Analytical Results

The pH measurements were taken in the field immediately after each well sample was obtained. Samples were collected, preserved, and immediately transported to ACTS Testing Laboratories. A summary of analytical testing is presented in Table 2.

The laboratory report, chain-of-custody records, and field sampling sheets can be found in the Attachment section.

TABLE 1

CARBORUNDUM ABRASIVES
NIAGARA FALLS, NEW YORK

LANDFILL-GROUNDWATER MONITORING
JUNE 1987

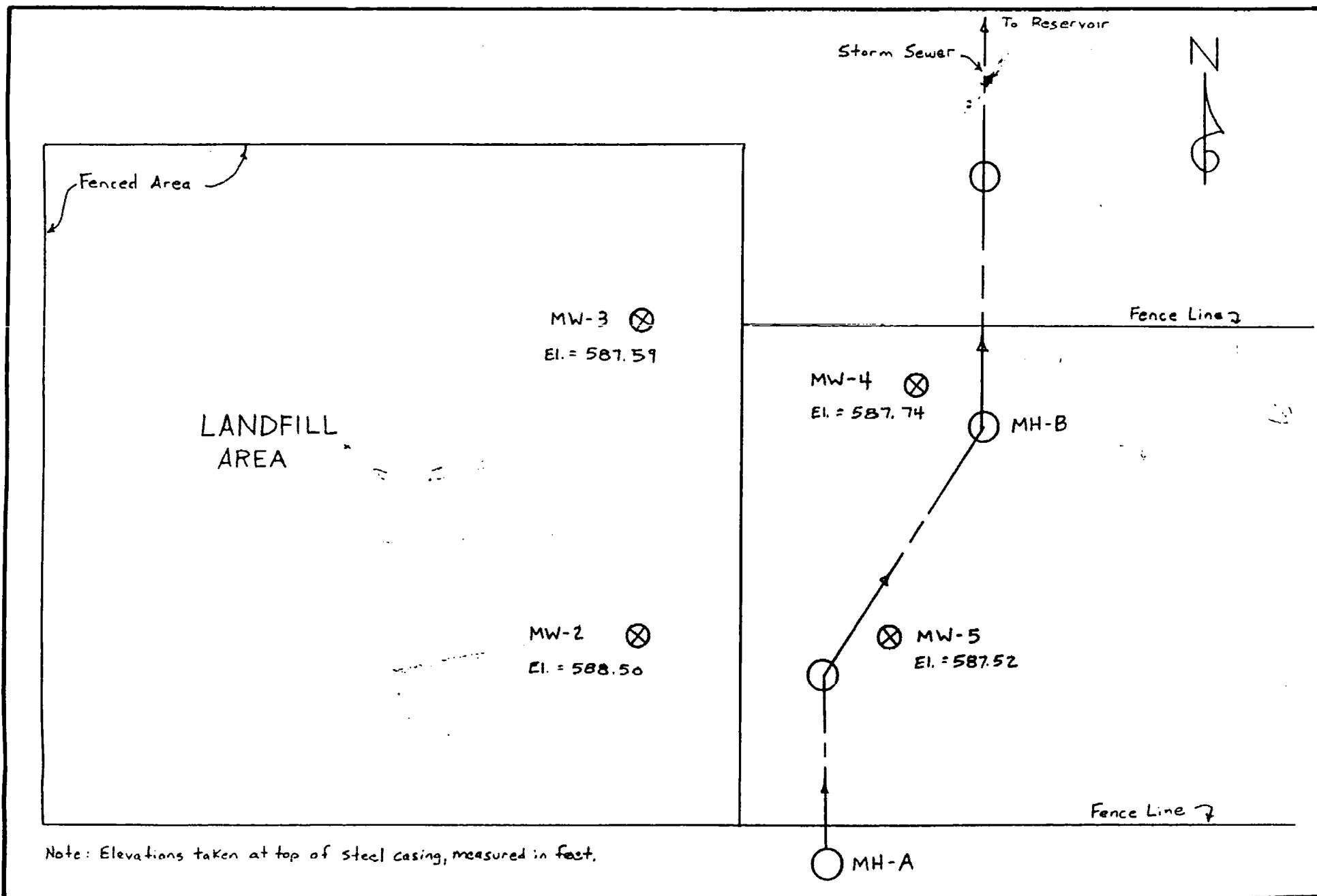
GROUNDWATER SURFACE ELEVATIONS

Monitoring Well	Elev. Top Steel Casing	Groundwater Surface Elevations	
		Before Purge	Before Sample
2	588.50	581.04	580.80
3	587.59	578.89	578.87
4	587.74	578.72	578.72
5	587.52	578.32	578.34

TABLE 2
SUMMARY REPORT OF ANALYTICAL TESTING

Date of Report: 7/17/87	Requested by: Mr. Gerald F. McGee
Code Number: 35110-87-083	Carborundum Abrasives Co.
Laboratory Performing Analysis:	Niagara Falls, New York
ACTS Testing Labs	

Sample Location:	MW-2	MW-3	MW-4	MW-5
Date Purged:	6/23/87	6/23/87	6/23/87	6/23/87
Date Sampled:	6/24/87	6/24/87	6/24/87	6/24/87
Time of Sampling:	9:40 AM	10:10 AM	8:50 AM	9:20 AM
Parameter - mg/l				
pH Units	7.42	7.30	7.36	7.39
Phenols	0.009	0.022	0.008	0.020



URS

URS Company, Inc.
CONSULTING ENGINEERS
NEW YORK NEW JERSEY

CARBORUNDUM ABRASIVES
LANDFILL MONITORING POINTS

Drawn by: MWS

Date: July 1987

REFERENCE NO. 6



FRONTIER TECHNICAL ASSOCIATES INC.

Groundwater Monitoring Report

June 1989

Carborundum Abrasives Company

FTA Report T-369-GW-1

June 26, 1989

Prepared for:

Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, NY 14304-0550
Attn: G. McGee

Prepared by:

Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

Introduction

Frontier Technical Associates, Inc. is under contract to Carborundum Abrasives Company under P.O. 07-RM172255K sample the groundwater from four monitoring wells and the water from two manholes. This monitoring is to be conducted annually in June for pH, water elevation, and phenolics (4AAP). This report contains the results of the June 2, 1989 monitoring.

Monitoring Well Locations

The four wells are located near the southwest corner of the property and surrounding landfill. The location of the wells and manholes is shown in Figure 1.

Groundwater Elevations

Groundwater elevation measurements are obtained electronically (i.e., by noting the length of cable with reference to the established monitoring elevations when the amperage of the circuit changes). Only one-eighth of an inch of cable is in contact with the water to minimize potential cross-contamination between wells. The cable is cleaned, triple rinsed with distilled water, and dried prior to use.

Groundwater elevations were obtained from all wells, and the results are presented in Table 1. In general, the direction of groundwater flow is to the northeast based upon measurements obtained in June 1989.

Sampling Personnel

The groundwater elevation measurements, purging, and sampling was conducted by the following Frontier Technical Associates personnel:

Dr. P. Michael Terlecky, Certified Hydrogeologist
Ms. Julia M. Gessert, Technician

Sampling and Purging Equipment

The wells were purged prior to sampling by an ISCO water pump. Each well has a dedicated length of polyethylene tubing which is inserted into the well. The tubing is connected to two, five-gallon glass bottles in series and then to the pump. Well water elevations are obtained before and after purging. In addition, the volume of water removed during purging is measured and recorded. The well purging data is located in the Appendix to this report. A minimum of three volumes of water from the well casing are removed during purging, or until the well is pumped dry.

Table 1. Groundwater Elevations at Carborundum Abrasives Company - June 2, 1989.

<u>Well No.</u>	<u>Top of Casing Elevation*</u>	<u>Depth to Groundwater</u>	<u>Groundwater Elevation</u>	<u>Volume Purged Prior to Sampling***</u>
OW 2-81	588.50 ft.	6.16 ft.	582.34 ft.	5.0 gal. (dry)
OW 3-81	587.59 ft.**	7.82 ft.	579.77 ft.	2.5 gal. (dry)
OW 4-81	587.74 ft.**	8.00 ft.	579.74 ft.	6.0 gal.
OW 5-81	587.52 ft.	8.27 ft.	579.25 ft.	2.0 gal. (dry)

* Elevations from Conestoga-Rovers Report

** Casing bent--elevation of top of casing may be altered. Sampling obtained by pumping because bailer would not fit down well.

***Three well volumes removed or wells pumped dry.

Samples are obtained from each of the wells by bailing with a precleaned bailer. Bailers are constructed of threaded PVC with a steel clip and polypropylene cord. All tubing, cords, and bailers for each well are stored in separate containers to minimize potential cross-contamination.

Sampling Preservation and Shipping Procedures

Preservation of all samples was conducted in accordance with established USEPA protocols and procedures. The samples for pH were analyzed immediately in the field. The phenolics samples were collected and preserved in accordance with the established EPA method. Proper chain-of-custody control was maintained on all samples. Copies of the chain-of-custody records are found in the Appendix of this report. The preserved samples were delivered to the laboratory within two hours of completion of sampling.

Analytical Laboratories and Methods

Two New York State Certified Laboratories were used in this monitoring program to provide the proper mix of specialties required. The laboratories used by FTA during the sampling program and the pollutant parameters measured by each of the laboratories are summarized below:

1. Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

Laboratory Director: Dr. P. Michael Terlecky
Parameter Analyzed: pH
New York State Certification No. 10475

2. Arvin/Calspan Advanced Technology Center
P.O. Box 400
Buffalo, NY 14225

Laboratory Director: Mr. John Michalovic
Parameter Analyzed: Phenolics (4AAP)
New York State Certification No. 10383

The approved USEPA analytical methods used to measure the pollutants are listed below:

<u>Pollutant</u>	<u>EPA Method No.</u>
pH	150.1
Phenolics (Total)	420.1

A detailed description of these methods can be found in the following two USEPA publications:

1. USEPA, "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Revised March 1984.
2. USEPA, "Test Methods for Evaluating Solid Waste," SW-846, Revised 1984.

Results of Analyses

The results of the analysis of the samples is presented in Table 2. The pH of the samples ranged from 7.00 to 7.29. These pH values are typical for natural waters. Phenolics were present in concentrations ranging from less than detectable (≤ 0.005 mg/l) to 0.070 mg/l in groundwater wells. The two catch basins also exhibited detectable levels of phenols. The pH of the catch basin waters was approximately 7.5.

Notes and Observations

The well casing at OW 3-81 and OW 4-81 were bent in such a manner that the original survey elevations may no longer be accurate. The casings are bent to the degree that a bailer could not be lowered down the well. These wells were sampled using dedicated tubing and a peristaltic pump (ISCO).

The water from each of the wells was "black looking" when purged with a slightly oily appearance.

The samples from the two manholes, MH A9 and MH A10, appeared clear, and the flow in each manhole was medium with approximately two to four inches of water in the channel. A slight amount of foam was observed in each catch basin.

Table 2. Results of Groundwater Monitoring and Manhole Sampling at Carborundum Abrasives Company (June 2, 1989).

<u>Location</u>	<u>pH*</u>	<u>Phenolics Concentration (mg/l)**</u>
Well OW 2-81	7.00	0.040
Well OW 3-81	7.05	<0.005
Well OW 4-81	7.29	0.070
Well OW 5-81	7.25	0.050
Manhole A-9	7.58	0.010
Manhole A-10	7.53	0.280

* FTA ELAP No. 10475

**Calspan ELAP 10383



FRONTIER TECHNICAL ASSOCIATES INC.

CHAIN OF CUSTODY RECORDS

Samples Taken by: Frontier Technical Associates, Inc.
 Address: 8675 Sheridan Drive, Buffalo, NY 14221
 Telephone No.: (716) 634-2293
 Sampling Personnel: J.M. Gessert
 Location of Sampling: C. Groundwater
 Type of Sample: Wastewater Task No. _____
 Analyses to be performed under P.O. No: _____
 Flow: _____

Sample No.	Analytical Parameters	Date of Sampling	Time of Sampling	Type of Sample	Container Type	Sample Volume	Preservation Method
369GW7	phenolics	6/2/89	1:35pm	grab	amber glass	1000ml H ₃ PO ₄ to pH<4, 1g CuSO ₄ /l	
369GW8	phenolics	6/2/89	1:15pm	grab	amber glass	1000ml H ₃ PO ₄ to pH<4, 1g CuSO ₄ /l	
369GW9	phenolics	6/2/89	1:20pm	grab	amber glass	1000ml H ₃ PO ₄ to pH<4, 1g CuSO ₄ /l	
369GW10	phenolics	6/2/89	1:35pm	grab	amber glass	1000ml H ₃ PO ₄ to pH<4, 1g CuSO ₄ /l	
369GW11	phenolics	6/2/89	12:15pm	grab	amber glass	1000ml H ₃ PO ₄ to pH<4, 1g CuSO ₄ /l	
369GW12	phenolics	6/2/89	12:20pm	grab	amber glass	1000ml H ₃ PO ₄ to pH<4, 1g CuSO ₄ /l	

Comments: Wells #3 & #4: samples were obtained by pumping rather than bailer because well casings were tilted making it impossible to get bailers down well.
 OF POSSESSION: * See Field Notes

ny	Name	Signature	Inclusive Dates
	J.M. Gessert	Julia Gessert	6/2/89
LEAFAN	D. Casey	D. Casey	6-2-89
SPAN	TED STEFELSKI	T. Stefelski	6-2-89



FRONTIER TECHNICAL ASSOCIATES INC.

CHAIN OF CUSTODY RECORDS

Samples Taken by: Frontier Technical Associates, Inc.

Address: 8675 Sheridan Drive, Buffalo, NY 14221

Telephone No.: (716) 634-2293

Sampling Personnel: J.M. Gessert

Location of Sampling: C Groundwater

Type of Sample: Wastewater Task No. T-369GW

Analyses to be performed under P.O. No: _____

Flow: _____

Sample No.	Analytical Parameters	Date of Sampling	Time of Sampling	Type of Sample	Container Type	Sample Volume	Preservation Method
#4 369GW1	pH	6/2/89	1:35pm	grab	polyethylene, 500ml		none required
#5 369GW2	pH	6/2/89	1:15pm	grab	polyethylene, 500ml		none required
#2 369GW3	pH	6/2/89	1:20pm	grab	polyethylene, 500ml		none required
#3 369GW4	pH	6/2/89	1:35pm	grab	polyethylene, 500ml		none required
1 369GW5	pH	6/2/89	12:15pm	grab	polyethylene, 500ml		none required
2 369GW6	pH	6/2/89	12:20pm	grab	polyethylene, 500ml		none required

te: MH1 = MHA9 MH2 = MHA10

IN OF POSSESSION:

pany

Name

Signature

Inclusive Dates

J.M. Gessert

Julia Gessert

6/2/89



FRONTIER TECHNICAL ASSOCIATES INC.

June 27, 1989

ET-369

Mr. Gerald McGee
Facility Engineer
Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, NY 14304-0550

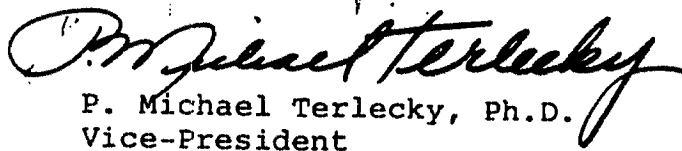
Dear Mr. McGee:

Enclosed, in accordance with the provisions of CAC P.O. 07-RM17255K, are two copies of the Groundwater Monitoring Report for June 1989 prepared by Frontier Technical Associates, Inc. The pH of the samples ranged between 7.0 and 7.58, which is typical of many natural waters. Except for Well OW 3-81, all samples exhibited detectable phenolics concentrations.

Due to the presence of phenolics in the samples retrieved, we would recommend resampling in July or August after a drier period. Western New York has been experiencing an extremely wet Spring in 1989 which could be a factor in mobilizing phenol from the landfill. In addition, samples in the past two years have not exhibited detectable levels of phenolics, but sampling was preceded by drier periods in those years.

If you have any questions, do not hesitate to call me at 634-2293.

Sincerely,


P. Michael Terlecky, Ph.D.
Vice-President

PMT:jh-2630

Enclosures

5

REFERENCE NO. 7



FRONTIER TECHNICAL ASSOCIATES INC.

Groundwater Monitoring Report

August 1989

Carborundum Abrasives Company

FTA Report T-369-GW-2

September 6, 1989

Prepared for:

Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, NY 14304-0550
Attn: G. McGee

Prepared by:

Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

Introduction

Frontier Technical Associates, Inc. is under contract to Carborundum Abrasives Company under P.O. 07-RM172255K sample the groundwater from four monitoring wells and the water from two manholes. This monitoring is to be conducted annually in June for pH, water elevation, and phenolics (4AAP). Due to the detection of phenolics on June 2, 1989, the monitoring was repeated again on August 8, 1989.

Monitoring Well Locations

The four wells are located near the southwest corner of the property and surrounding landfill. The location of the wells and manholes is shown in Figure 1.

Groundwater Elevations

Groundwater elevation measurements are obtained electronically (i.e., by noting the length of cable with reference to the established monitoring elevations when the amperage of the circuit changes). Only one-eighth of an inch of cable is in contact with the water to minimize potential cross-contamination between wells. The cable is cleaned, triple rinsed with distilled water, and dried prior to use.

Groundwater elevations were obtained from all wells, and the results are presented in Table 1. In general, the direction of groundwater flow is to the northeast based upon measurements obtained in August 1989.

Sampling Personnel

The groundwater elevation measurements, purging, and sampling was conducted by the following Frontier Technical Associates personnel:

Julia M. Gessert, Engineering Technician
Kevin Ehrenreich, Engineering Technician

Sampling and Purging Equipment

The wells were purged prior to sampling by an ISCO water pump. Each well has a dedicated length of polyethylene tubing which is inserted into the well. The tubing is connected to two, five-gallon glass bottles in series and then to the pump. Well water elevations are obtained before and after purging. In addition, the volume of water removed during purging is measured and recorded. The well purging data is located in the Appendix to this report. A minimum of three volumes of water from the well casing are removed during purging, or until the well is pumped dry.

ABANDONED TAXI STRIP

GRASS

LEGEND



APPROX. AREA OF
LANDFILLED WASTE



STORM SEWER



STORM SEWER SAMPLING
STATION

OW1-81

OW2-81

OW3-81

OW4-81

OW5-81

MH A-9

MH A-10

MH

TO PLANT
IMPOUNDING RESERVOIR

CONCRETE
PAVEMENT



BLDG.
W9

0' 20' 40' 60' 80' 100'

EXISTING FENCE

BELL PROPERTY

GRASS

FIGURE 1

WELL LOCATIONS
The Carborundum Company

Table 1. Groundwater Elevations at Carborundum Abrasives Company,
August 8, 1989.

<u>Well No.</u>	<u>Top of Casing Elevation*</u>	<u>Depth to Groundwater</u>	<u>Groundwater Elevation</u>	<u>Volume Purged Prior to Sampling***</u>
OW 2-81	588.50 ft.	7.85 ft.	580.65 ft.	2.8 gal. (dry)
OW 3-81	587.59 ft.**	9.10 ft.	578.49 ft.	2.0 gal. (dry)
OW 4-81	587.74 ft.**	9.32 ft.	578.42 ft.	6.0 gal.
OW 5-81	587.52 ft.	9.60 ft.	577.92 ft.	2.25 gal. (dry)

* Elevations from Conestoga-Rovers Report

** Casing bent--elevation of top of casing may be altered. Sampling obtained by pumping because bailer would not fit down well.

***Three well volumes removed or wells pumped dry.

Samples are obtained from each of the wells by bailing with a precleaned bailer. Bailers are constructed of threaded PVC with a steel clip and polypropylene cord. All tubing, cords, and bailers for each well are stored in separate containers to minimize potential cross-contamination.

Sampling Preservation and Shipping Procedures

Preservation of all samples was conducted in accordance with established USEPA protocols and procedures. The samples for pH were analyzed immediately in the field. The phenolics samples were collected and preserved in accordance with the established EPA method. Proper chain-of-custody control was maintained on all samples. Copies of the chain-of-custody records are found in the Appendix of this report. The preserved samples were delivered to the laboratory within two hours of completion of sampling.

Analytical Laboratories and Methods

Two New York State Certified Laboratories were used in this monitoring program to provide the proper mix of specialties required. The laboratories used by FTA during the sampling program and the pollutant parameters measured by each of the laboratories are summarized below:

1. Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

Laboratory Director: Dr. P. Michael Terlecky
Parameter Analyzed: pH
New York State Certification No. 10475

2. Arvin/Calspan Advanced Technology Center
P.O. Box 400
Buffalo, NY 14225

Laboratory Director: Mr. John Michalovic
Parameter Analyzed: Phenolics (4AAP)
New York State Certification No. 10383

The approved USEPA analytical methods used to measure the pollutants are listed below:

<u>Pollutant</u>	<u>EPA Method No.</u>
pH	150.1
Phenolics (Total)	420.1

A detailed description of these methods can be found in the following two USEPA publications:

1. USEPA, "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Revised March 1984.
2. USEPA, "Test Methods for Evaluating Solid Waste," SW-846, Revised 1984.

Results of Analyses

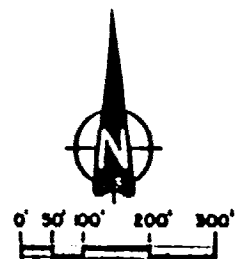
The results of the analysis of the samples is presented in Table 2. The pH of the samples ranged from 6.86 to 7.21. These pH values are typical for natural waters. Overall, the concentration of total phenolics in the monitoring wells was lower than the July sampling with two wells (Nos. 3 and 4) showing no detectable phenol. The average concentration of phenolics detected in the wells was below 0.032 mg/l. The two catch basins exhibited detectable levels of phenols at 0.028 mg/l. The average pH of the catch basin waters was approximately 7.72.

Notes and Observations

The well casing at OW 3-81 and OW 4-81 were bent in such a manner that the original survey elevations may no longer be accurate. The casings are bent to the degree that a bailer could not be lowered down the well. These wells were sampled using dedicated tubing and a peristaltic pump (ISCO).

The water from each of the wells was "black looking" when purged with a slightly oily appearance.

The samples from the two manholes, MH A9 and MH A10, appeared clear, and the flow in each manhole was low with approximately two to four inches of standing water in the channel.



NIAGARA FALLS AIRPORT

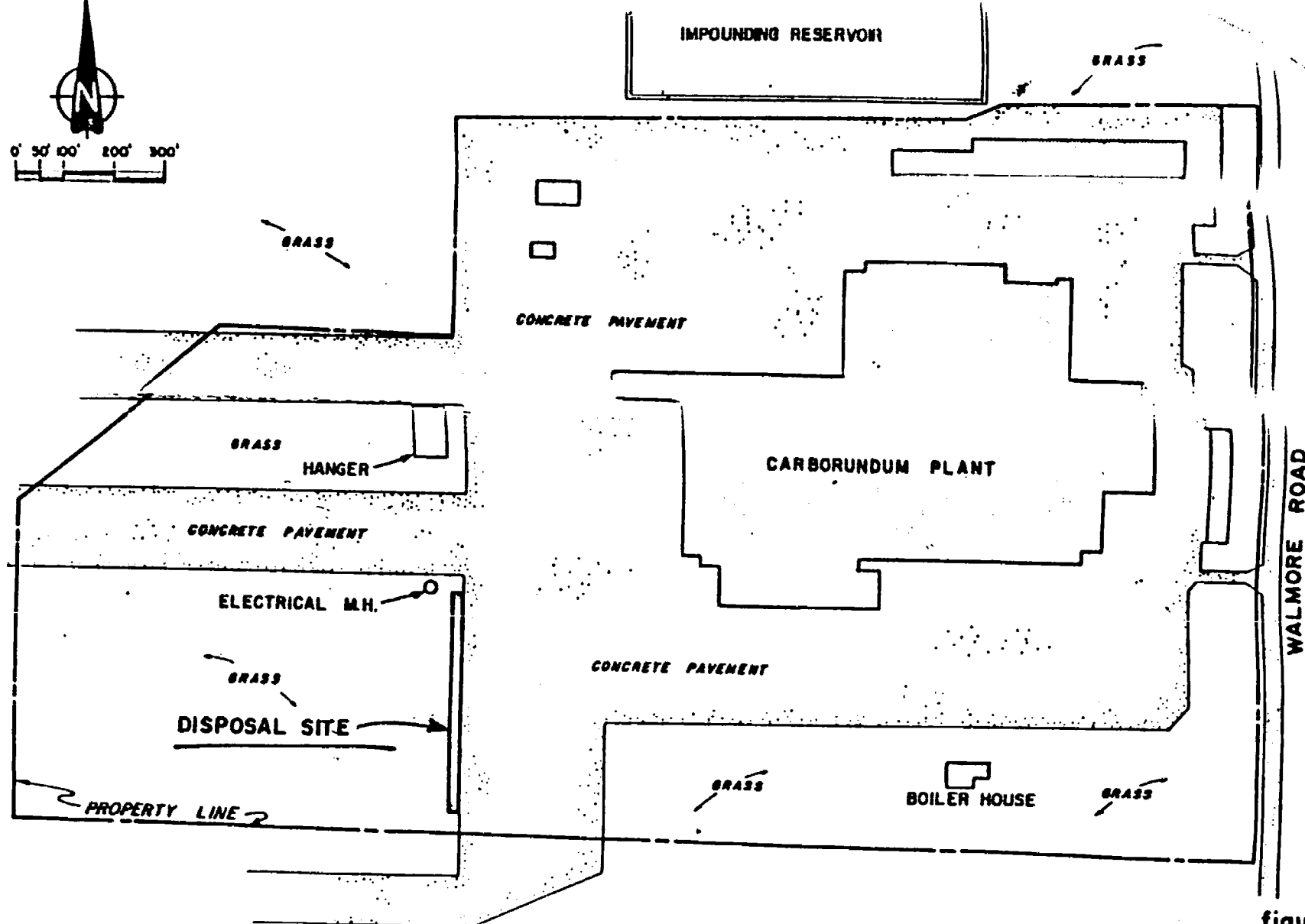


figure 3

BELL AEROSPACE TEXTRON

SITE LOCATION
The Carborundum Company

Table 2. Results of Groundwater Monitoring and Manhole Sampling at Carborundum Abrasives Company, August 8, 1989.

<u>Location</u>	<u>pH*</u>	<u>Phenolics Concentration (mg/l)**</u>
Well OW 2-81	6.86	0.095
Well OW 3-81	6.89	<0.005
Well OW 4-81	6.98	<0.005
Well OW 5-81	7.21	0.025
Manhole A-9	7.59	0.028
Manhole A-10	7.84	0.028

* FTA ELAP No. 10475

**Calspan ELAP 10383

APPENDIX

Calspan Analytical Data
(Samples: 369GW19 - 369GW23)

Chain-of-Custody Forms

Calspan Corporation Environmental Sciences Department

Frontier Technical Associates: Laboratory Report

AUG 89

Lab No. 10383

Facility: PLANT "C"

Sample No.	Parameter	Conc. (mg/l)	Method of Analysis	Date of Analysis	Time of Analysis	Analyst
B 180	PHENOLS	LO.005	EPA 420.1	8/22/89	Rm	TS
C 180	"	0.070	"	"	"	TS
D 180	"	0.068	"	"	"	TS
E 180	"	0.040	"	"	"	TS
F 180	"	0.025	"	"	"	TS
MANHOLE 1 369 GW 23	"	0.028	"	"	"	TS
GROUND 2 369 GW 21	"	0.095	"	"	"	TS
MANHOLE 2 369 GW 24	"	0.028	"	"	"	TS
GROUND 3 369 GW 22	"	LO.005	"	"	"	TS
GROUND 4 369 GW 19	"	LO.005	"	"	"	TS

W. Staszewski

John H. Michalovic
J. Michalovic, Director, Chemistry Laboratory

Calspan Corporation Environmental Sciences Department

Frontier Technical Associates: Laboratory Report

Facility: PLANT "C"

AUG. 89

Lab No. 10383

Sample No.	Parameter	Conc. (mg/l)	Method of Analysis	Date of Analysis	Time of Analysis	Analyst
* GROUND 5 369020	PHENOLS	0.025	EPA 420.1	8/22/89	Am	TS
369040	PHENOLS	10.2	"	"	"	TS
A 185	OIL & GREASE	0.55	EPA 413.1	8/23/89	Am	TS
B 185	"	< 0.5	"	"	"	TS
C 185	"	< 0.5	"	"	"	TS
D 185	"	< 0.5	"	"	"	TS
E 185	"	0.54	"	"	"	TS

J. Staszewski

John G. Michalovic

John G. Michalovic, Director, Chemistry Laboratory



FRONTIER TECHNICAL ASSOCIATES INC.

CHAIN OF CUSTODY RECORDS

Samples Taken by: Frontier Technical Associates, Inc.

Address: 8675 Sheridan Drive, Buffalo, NY 14221

Telephone No.: (716) 634-2293

Sampling Personnel: J.M. Gessert

Location of Sampling: CAC Landfill

Type of Sample: Wastewater

Task No. ET-369GW

Analyses to be performed under P.O. No: _____

Flow: _____

Sample Site	Sample No.	Analytical Parameters	Date of Sampling	Time of Sampling	Type of Sample	Container Type	Sample Volume	Preservation Method
well #4	369GW19	phenolics	8/8/89	11:00am	grab	amber glass	1000ml	H ₃ PO ₄ to pH<4, 1g CuSO ₄
well #5	369GW20	phenolics	8/8/89	12:35pm	grab	amber glass	1000ml	H ₃ PO ₄ to pH<4, 1g CuSO ₄
well #2	369GW21	phenolics	8/8/89	11:15am	grab	amber glass	1000ml	H ₃ PO ₄ to pH<4, 1g CuSO ₄
well #3	369GW22	phenolics	8/8/89	10:25am	grab	amber glass	1000ml	H ₃ PO ₄ to pH<4, 1g CuSO ₄
M.H. #1 (A-9)	369GW23	phenolics	8/8/89	11:45am	grab	amber glass	1000ml	H ₃ PO ₄ to pH<4, 1g CuSO ₄
M.H. #2 (A-10)	369GW24	phenolics	8/8/89	11:30am	grab	amber glass	1000ml	H ₃ PO ₄ to pH<4, 1g CuSO ₄

CHAIN OF POSSESSION:

Company	Name	Signature	Inclusive Dates
FTA	J.M. Gessert	Julia Gessert	8/8-9/89
CALSPAN	G.D. Egan	G.D. Egan	8-9-89
CALSPAN	T. STESZEWSKI	T. Steszewski	8-9-89

AB Y. Fink.
Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, N.Y. 14304
Telephone: 716 / 695-8120

October 24, 1989



Mr. Abul Barkat, P.E.
Regional Engineer, HWR
New York State Department of
Environmental Conservation
600 Delaware Avenue
Buffalo, NY 14202

Re: Carborundum Abrasives Company
Landfill Site #932007

Dear Mr. Barkat:

Enclosed is a copy of the August 1989 subject Re-sampling and Analysis Report. Also enclosed is a copy of Analysis Log Sheets for the Monitoring Well Sampling from 1982 through 1989.

If you have any questions, please call me at Ext. 366.

Yours truly,

A handwritten signature in cursive script, reading "Gerald F. McGee".

Gerald F. McGee
Facility Engineer

GFM:j
Enclosures

cc: D. J. Fink
P. W. Inskeep



FRONTIER TECHNICAL ASSOCIATES INC.

September 6, 1989

ET-369

Mr. Gerald McGee
Facility Engineer
Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, NY 14304-0550

Dear Mr. McGee:

Enclosed, in accordance with the provisions of CAC P.O. 07-RM17255K, are two copies of the Groundwater Monitoring Report for August 1989 prepared by Frontier Technical Associates, Inc. The pH of the samples ranged between 6.86 and 7.21, which is typical of many natural waters.

This sampling was repeated from June because of an extremely wet Spring in 1989 and because phenolics were detected in the groundwater and catch basins. It would appear that this sampling confirms the observation that the abnormal Spring rainfall of 1989 could be a factor in mobilizing phenol from the landfill. The rainfall experienced this year was the highest in 97 years according to the National Weather Service.

If you have any questions, do not hesitate to call me at 634-2293.

Sincerely,

A handwritten signature in black ink, reading 'P. Michael Terlecky', is positioned above the typed name and title.

P. Michael Terlecky, Ph.D.
Vice-President

PMT:jh-2696

Enclosures

REFERENCE NO. 8



FRONTIER TECHNICAL ASSOCIATES INC.

April 23, 1990

ET-446(A)

Mr. Gerald McGee
Facility Engineer
Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, NY 14304-0550

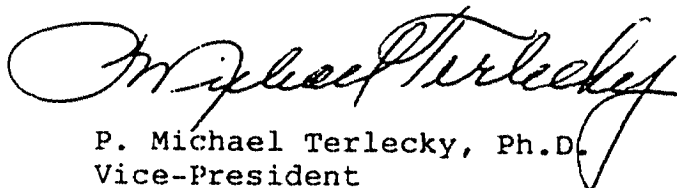
Dear Mr. McGee:

Enclosed are three copies of our final report entitled
"Roof Drain Sampling, Carborundum Abrasives Company
(April 4, 1990)", FTA Report ET-446A-1 dated April 20, 1990.

Based upon the sampling conducted on April 4, 1990, it
would appear that there may be more than one source for the
phenol conveyed to the storm sewers. It would also suggest
that, based upon storm sewer and SPDES sampling, the source
(or sources) may be somewhat intermittent and influenced by
rainfall.

We would suggest repetition of this roof drain
sampling focusing on the areas identified in order to
determine the exact location(s) of the source.

Sincerely,



P. Michael Terlecky, Ph.D.
Vice-President

PMT:jh-2925

Encls.

Rec'd 4/25/90 pm



FRONTIER TECHNICAL ASSOCIATES INC.

GROUNDWATER SAMPLING
CARBORUNDUM ABRASIVES COMPANY
(April 10-12, 1990)

FTA Report ET-446B-2

April 26, 1990

Prepared for:

Carborundum Abrasives Co.
6600 Walmore Road
P.O. Box 350
Niagara Falls, NY 14304

Attn: Mr. Gerald McGee

Prepared by:

P. Michael Terlecky, Ph.D., PHG
Gerard P. Grady
Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

Introduction

A sampling plan designed to examine various sources of discharged water was developed for the Carborundum Abrasives Company plant site in Wheatfield, New York. The purpose of this program was to determine the possible source(s) of phenol in the discharges from each of the storm drain lines (A through E) which occur. As part of this program, 12 monitoring wells were installed, developed, purged, and sampled. Each well is located adjacent to storm drain lines and drilled to a depth just below the bottom of the pipe. The objective was to investigate if the source of phenol in the storm sewers could be infiltration from the ground.

Two samples were used for quality control/quality assurance purposes and included a field duplicate and field blank.

Sample Locations

Twelve sample locations were chosen in consultation between Mr. Gerald McGee of Carborundum Abrasives Company, Dr. P. Michael Terlecky of Frontier Technical Associates, and David Harty, P.E. of Empire Soils Investigations. The criteria which were used to determine these locations included:

1. Proximity to and locations of possible sources.
2. Knowledge of the process(es) and their locations.
3. Knowledge of locations of cooling water and roof drains discharging to the storm sewers.
4. Desire to obtain areal coverage over the main area of the plant producing phenol containing products and associated runoff drainage area.

The locations of the wells are shown in Figure 1, which is a sketch of the well locations relative to the storm sewer lines and main buildings.

Installation of Monitoring Wells

The monitoring wells were installed by Empire Soils Investigations, Inc. between March 29 and April 3, 1990. Development was completed by April 9, 1990. ESI determined monitoring well details such as appropriate well screen slot size, sand size, grouting, development, etc. Frontier Technical Associates, Empire Soils, and Carborundum Abrasives jointly selected monitoring well locations. A separate report on monitoring well installation will be provided to CAC by ESI.

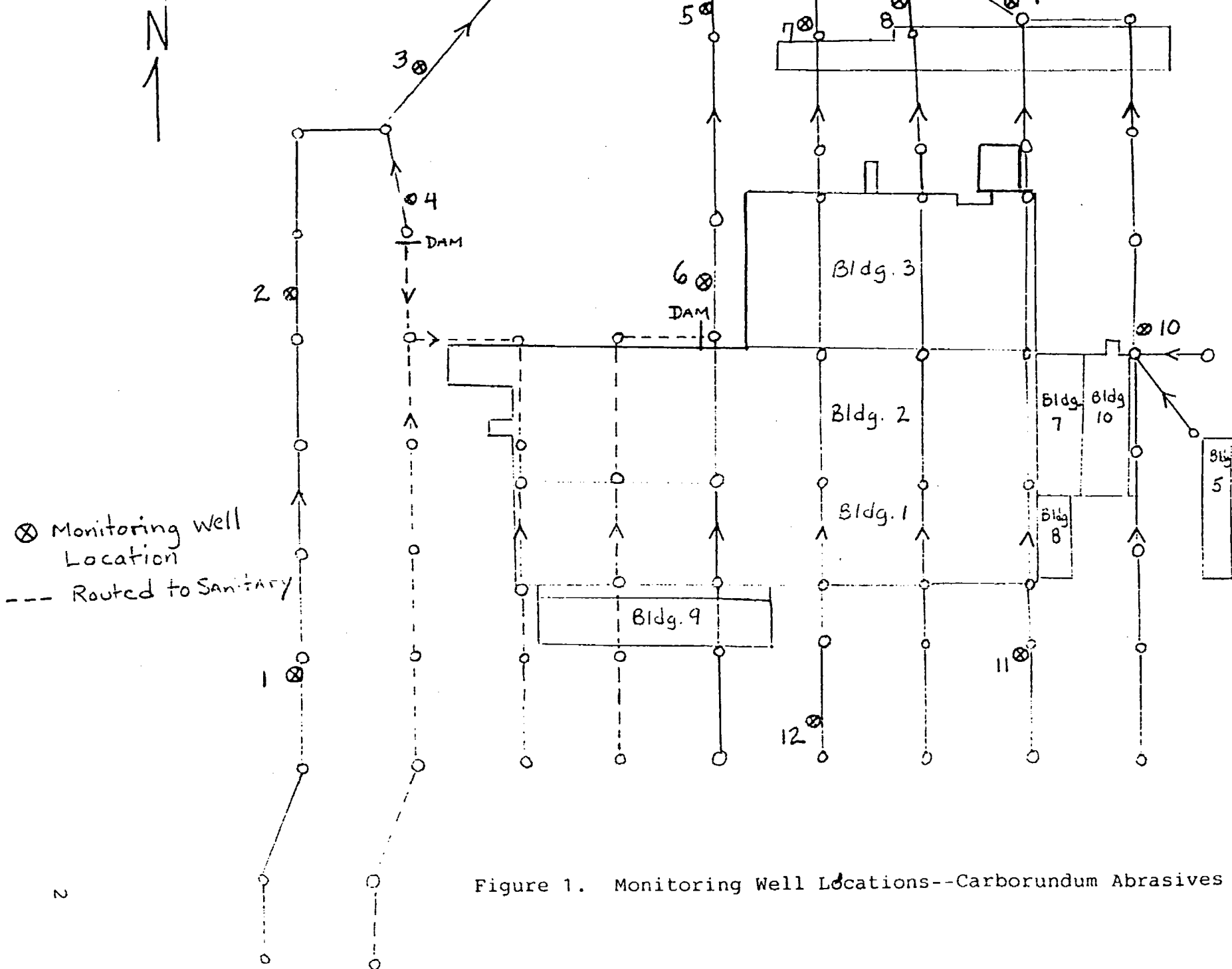


Figure 1. Monitoring Well Locations--Carborundum Abrasives Co.

Each monitoring well was installed adjacent and as close as possible to the storm lines which are being investigated. In each case, preliminary verbal communication from ESI indicated that there was no gravel fill installed together with the concrete sewer pipes, therefore, native soils (silty-clay) were apparently used for backfill. FTA inspection of the cuttings left near some of the wells indicated this to be the case. Each well was drilled to a depth slightly deeper than the known elevation of the bottom of the storm sewer pipes (approximately one-half foot). Table A-1, contained in the Appendix, lists the elevations of the ground surface, top of the riser pipe, bottom of the well, and actual well depths.

Each well was installed by auguring a six-inch hole to a depth approximately 0.5 feet past the desired depth and backfilling with 2Q sand (Buffalo Sandblasting-supplied). A two-inch diameter PVC well casing with a 2.5 foot length of slotted PVC well screen with 0.010-inch slots was used. The 2Q sand was backfilled around the casing and sealed with bentonite pellets. Above the bentonite, grout was installed to prevent surface water from percolating into the sampling zone and to stabilize the casing. Each riser pipe was fitted with a locking cap inside a gate box which is flush with the concrete surface.

Methods Employed

The water level in each well was measured on April 10, 1990 by Frontier Technical Associates. If the well was dry, an attempt was made to measure the water level again on April 11 and 12. In two instances, the wells were dry after being checked for three consecutive days (Wells 4 and 10). Other wells exhibited a small amount of water which was below the bottom of the adjacent storm sewer.

Each well was purged to the required volume or to dryness. Table 1 is a summary of the well purging data.

On April 11, 1990 the following wells had recovered sufficiently to allow sampling:

<u>Well</u>	<u>Sample</u>
Well 3	446102
Well 5	446104, 446112 (Field Dupl.)
Well 6	446105
Well 9	446108

Table 1. Well Purging Data--Carborundum Abrasives Co. (4/10/90).

<u>Well No.</u>	<u>Required Purge Vol. (gal.)*</u>	<u>Actual Purge Vol. (gal.)</u>
1	0.1	0.2 (dry)
2	dry	0.1 (dry)
3	1.0	1.5
4	dry	dry
5	1.4	1.9
6	0.4	0.8
7	2.4	1.7 (dry)
8	1.0	0.4 (dry)
9	0.25	0.5 (dry)
10	dry	dry
11	0.04	dry
12	0.12	0.2 (dry)

*Calculated as at least three times the volume of water present in the casing.

NOTE: Wells listed as "dry" for actual purge volume were dry on 4/10, 4/11, and 4/12.

On April 12, the wells which had not been sampled were rechecked. Only one additional well had a groundwater level sufficient to allow sampling:

<u>Well</u>	<u>Sample</u>
Well 12	446111

The following wells remained dry or had insufficient water to allow analysis for phenol:

Well 1	Well 8
Well 2	Well 10
Well 4	Well 11

Each sample was collected in a 1,000 ml amber glass bottle, stabilized with sulfuric acid, and stored in an ice chest at 4°C. Samples were transported to the laboratory for analysis by the 4-aminoantipyrine method (4AAP), EPA Method 420.1. The actual laboratory report and chain-of-custody forms are contained in the Appendix.

All bailers, tubing, etc. were dedicated to each well to eliminate the possibility of cross-contamination.

The method detection level was 0.005 mg/l. The laboratory also analyzed a known standard and reported their recoveries along with the analyses (90 to 104%).

The results of the additional QA/QC sample analyses are listed below:

	<u>Phenol Concentration (mg/l)</u>	
	<u>Split 1</u>	<u>Split 2</u>
Field Duplicate	0.036	0.055
	<u>Result</u>	<u>Expected Value</u>
Field Blank	0.012	<0.005

Based upon past experience with the 4AAP method, the field duplicate analysis appeared to be within the expected range of the method and ability to split. However, the results of analysis of a blank at a level of 0.012 mg/l was not expected because the same distilled water source was checked one week previous, and a level of <0.005 mg/l was reported (not detected) by the same laboratory. In addition, all equipment was cleaned and sealed prior to use in the

field. In our previous report on roof drain sampling, however, we noted a trip blank level of 0.010 mg/l total phenol and a field blank of <0.005 mg/l. These two blanks also used the same water source as reported here previously.

We do not believe that the equipment or distilled water is contaminated. Rather, we believe that the 4AAP method itself for analysis of total phenolics may be the chief source of this variation. Unfortunately, the cost of analysis of the phenol by GS/MS methods is many times greater than the cost of the 4AAP method.

Results

Table 2 is a summary of the analytical results of the monitoring well sampling for total phenolics. Six wells could not be sampled because, after purging, they did not recover over a 48-hour period sufficiently to enable an adequate sample volume for analysis (at least 500 ml; 1,000 ml is actually required for analysis and QA/QC). Two wells in that group (Wells 4 and 10) did not have water at anytime on April 10, 11, and 12.

The sampling date was preceded by a wet period as indicated in Table 3 which lists precipitation for April 1 through April 15. On the day when groundwater levels were measured, in fact, the official Buffalo Airport reading was 1.66 inches of precipitation. Spring in western New York typically is reflected in groundwater levels which are at or near yearly high values.

Table 4 is a compilation of ground surface and well riser elevations, well water elevations, pipe invert elevations and total phenolics concentrations. In seven out of twelve cases, water levels were absent or below the bottom of the nearby storm sewer pipes.

Examination of SPDES flow data for the period March 1989 through April 1990 indicates an average flow for the entire period for each of the lines as follows (28 observations):

<u>Line</u>	<u>Avg. Flow (GPD)</u>
A	20,700
B	38,400
C	47,200
D	15,300
E	<u>29,300</u>
Total:	150,900

Table 2. Phenol Sampling and Analysis Results.

<u>Well No.</u>	<u>Sample No.</u>	<u>Phenol Conc. (mg/l)</u>
1	-----	Dry
2	-----	Dry
3	446102	0.077
4	-----	Dry
5	446104, 446112*	0.036, 0.055*
6	446105	0.055
7	446106	0.062
8	-----	Dry
9	446108	0.22
10	-----	Dry
11	-----	Dry
12	446111	0.067

*Field Duplicate

NOTE: Wells were purged and a 24-hour period was allowed for recharge. Water levels in wells listed as "dry" had not recovered sufficiently to allow sampling.

Table 3. Total Daily Precipitation - April 1-15, 1990 (National Weather Service--Buffalo Airport, 4/25/90).

<u>Date</u>	<u>Precipitation (inches)</u>
04/01/90	0.04
04/02/90	0.35
04/03/90	0.15
04/04/90	0.91
04/05/90	0.17
04/06/90	Trace
04/07/90	0.01
04/08/90	0
04/09/90	Trace
04/10/90	1.66
04/11/90	0.19
04/12/90	0.01
04/13/90	0
04/14/90	0.28
04/15/90	Trace

Table 4. Well Installation Elevations (Feet Above Mean Sea Level*) and Storm Sewer Pipe Elevations.

<u>Well No.</u>	<u>Ground Surface</u>	<u>Top of Well Riser</u>	<u>Water Elev. (4/10/90)</u>	<u>Pipe Elevation**</u>	<u>Difference</u>	<u>Phenol Concentration (mg/l)</u>
1	585.0	584.4	580.12	580.91	- 0.79	dry
2	585.1	584.3	579.04	579.91	- 0.87	dry
3	584.1	583.6	578.3	577.81	+ 0.5	0.077
4	584.0	583.7	dry (<576.5)	578.11	- 1.61	dry
5	584.0	583.7	579.12	577.81	+ 1.3	0.036/0.055
6	584.4	584.0	578.23	577.91	+ 0.32	0.055
7	584.3	583.9	581.5	577.91	+ 3.59	0.062
8	583.9	583.5	578.05	577.86	+ 0.19	dry
9	584.1	583.6	576.65	577.89	- 1.24	0.22
10	584.2	584.0	dry (<577.9)	579.81	- 1.91	dry
11	583.8	583.5	579.68	581.44	- 1.73	dry
12	583.7	583.3	579.97	581.86	- 1.89	0.067

* Elevations taken from benchmark on the south door jam at the top of the concrete foundation at the Receiving Dept. for Building W-1 (equivalent to CAC plant datum of 106).

**Elevations at pipe bottom (Plot Plan, Sheet 102, CAC supplied).

The "A" and "D" lines do not receive significant input of cooling waters and typically exhibit the lowest flows, however an evaluation of possible infiltration might be obtained from periods when no rainfall has been experienced. For periods such as this, values ranging from 0 to 1,000-2,000 GPD might be typical for the "A" line whereas the "D" line may have low flow periods of 2,000 to 3,000 GPD. Although these flows when taken as a whole may appear high, the levels of phenol in adjacent soils and the large amount of runoff water discharged overall would result in significant dilution most of the time.

Although groundwater infiltration cannot be discounted entirely, available data on groundwater levels and phenol concentrations suggest only a minor contribution. These contributions would not explain the concentrations observed in the B, D, and E lines. Rather, roof drain sampling (Report ET-446A-1) would suggest that the bulk of the follow-up investigation in the near term should focus on the plant roof drains input and possible emission sources to determine the source or sources and possible alternative control approaches.

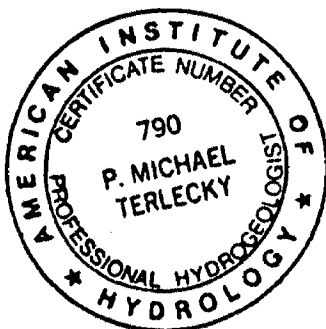
Certification

This report was prepared in accordance with the request of Carborundum Abrasives Company to address the potential for possible phenol infiltration to the storm sewer system. This groundwater sampling effort had limited objectives and did not include an engineering evaluation of the actual water infiltration into the storm sewers. Monitoring well locations were chosen based upon proximity to storm sewers, known processes, previous phenol concentrations in storm sewer discharges, and areal coverage. Observations were limited to a three-day period, and thus opinions and data collected are representative of that period. FTA did not perform well installation, development, or laboratory sample analysis. Wherever the word "phenol" is used, it should be interpreted as "total phenolics" by the 4AAP method.

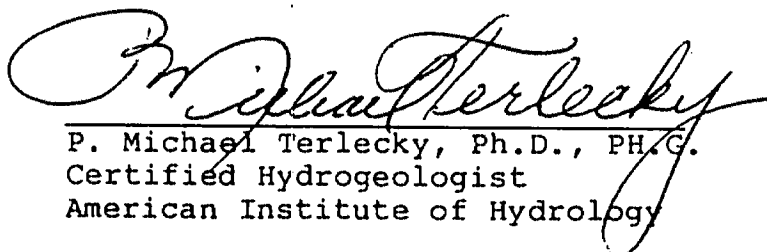
The study was a limited study conducted in accordance with generally accepted practices for similar studies and employed the same care and skill normally associated with studies of this nature.

The opinions and conclusions reached are not scientific certainty but are probabilities based upon professional judgment and limited data.

No quantitative evaluation of the reliability of the data supplied by the independent laboratory was conducted. However, it is believed that based upon the QA/QC data supplied and other analyses provided by the laboratory, these analyses are representative of the care and skill normally expected for analyses of this type. In addition, the laboratory is NYDOH--ELAP certified (#10833).



4-26-90
Date


P. Michael Terlecky, Ph.D., P.H.G.
Certified Hydrogeologist
American Institute of Hydrology

APPENDIX

Elevation Data for Groundwater Wells

Laboratory Report

Table A-1. Elevation Data for Groundwater Wells (Elevation Data for Ground Surface and Riser Supplied from Empire Soils, 4/23/90).

<u>Well No.</u>	<u>Elevation Above MSL (ft)</u>			<u>Well Depth (ft)</u>
	<u>Ground Surface</u>	<u>Riser</u>	<u>Bottom</u>	
1	585.0	584.4	580.0	5.0
2	585.1	584.3	579.1	6.0
3	584.1	583.6	576.2	7.9
4	584.0	583.7	576.5	7.5
5	584.0	583.7	576.0	8.0
6	584.4	584.0	577.4	7.0
7	584.3	583.9	576.3	8.0
8	583.9	583.5	575.9	8.0
9	584.1	583.6	576.1	8.0
10	584.2	584.0	578.4	5.8
11	583.8	583.5	579.6	4.2
12	583.7	583.3	579.7	4.0



HUNTINGDON ANALYTICAL SERVICES
Division of EMPIRE SOILS INVESTIGATIONS INC.
PO Box 250 Middleport New York 14105
Tel: (716) 735-3400 FAX (716) 735-3653

Environmental Analytical Report For:

FRONTIER TECHNICAL ASSOCIATES, INC.

FTA Purchase Order #1089

HAS Ref. #90-511

April 19, 1990

HAS

HUNTINGDON ANALYTICAL SERVICES
ELAP #10833
ENVIRONMENTAL REPORT

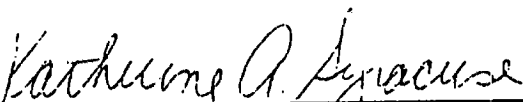
HAS Reference Numbers: #90-511

April 19, 1990

Statement of Work Performed

I hereby declare that the work was performed under my supervision according to the procedures outlined by the following references and that this report provides a correct and faithful record of the results obtained.

- 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency, "Test Methods of Evaluating Solid Waste - Physical/Chemical Methods," Office of Solid Waste and Emergency Response, SW-846, 2nd Edition and 3rd Edition.
- New York State Department of Health, Analytical Toxicology Laboratory Handbook, August 1982.



Katherine A. Syracuse
Lab Director, Environmental

REPORT CODE LEGEND:

<DL - Less than detection limit
ND - Not detected
NA - Not applicable
INP - Information not provided
MB - Method Blank

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

Inorganic Wet Chemical Analyses

Analyte: Total Phenolics

EPA Method No.: 420.1

Sample Date	HAS Sample #90-	Client I.D.	Date Prepared	Date Analyzed	Method Detection Limit	Result	Units	QC in %
04/11/90	511-001	446102	04/16/90	04/17/90	0.005	0.077	mg/l	*90
04/11/90	511-002	446104	04/16/90	04/17/90	0.005	0.036	mg/l	*104
04/11/90	511-003	446105	04/16/90	04/17/90	0.005	0.055	mg/l	*90
04/11/90	511-004	446106	04/16/90	04/17/90	0.005	0.062	mg/l	*104
04/11/90	511-005	446108	04/16/90	04/17/90	0.005	0.22	mg/l	*90
04/12/90	511-006	446111	04/16/90	04/17/90	0.005	0.067	mg/l	*90
04/11/90	511-007	446112	04/16/90	04/17/90	0.005	0.055	mg/l	*90
04/12/90	511-008	446113	04/16/90	04/17/90	0.005	0.012	mg/l	*104

*A known standard of the analyte of interest was analyzed along with this sample with the percent recovery indicated above.

WILKINSON ANALYTICAL SERVICES - CHAIN-OF-CUSTODY RECORD AND ANALYTICAL REQUEST FORM

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Page

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Client Name Frontier Technical Associates
8675 Sheridan Drive
Buffalo New York 14221

Client Contact Dr. P. Michael Terlecky
 Phone (716) 634-2258

HAS Quote # _____

P.O. # _____

Object No.:		Project/Site Name:		Container Size & Type						Analysis Requested/ Remarks		
ET-446		TNT C										
Sample (Signature):		HAS Ref. #		No. of								
Denny M. M. M.		90-511		Con-								
Sample		Sample HAS		Containers								
Lab.	Date	Time	Comp.	Grab	Location	Seq. #						
4/6/00				x			✓					(HAAP) EPA Method 420.1 (Phenolics)
4/6/01				x			✓					
4/6/02	4/10/90	12:15		x	Well #5	001	✓					
4/6/03				x			✓					
4/6/04	4/11/90	1:35		x	Well #5	002	✓					
4/6/05	4/11/90	1:10		x	Well #6	003	✓					
4/6/06	4/11/90	2:10		x	Well #7	004	✓					
4/6/07				x			✓					
4/6/08	4/11/90	2:45		x	Well #9	005	✓					
4/6/09				x			✓					
4/6/10				x			✓					
4/6/11	4/12/90	11:15-11:53		x	Well #12	006	✓					
4/6/12	4/11/90	1:35	Field dug	x	Well #5	007	✓					
4/6/13	4/12/90	10:13	Field dug	x	Well #1	008	✓					

(HAAP) EPA Method 420.1 (Phenolics)

Relinquished by: [Signature] Date/Time: 4/11/90 12:00 Received by: [Signature]
 Relinquished by: [Signature] Date/Time: 4/12/90 15:50 Received by: [Signature]
 Relinquished by: _____ Date/Time: _____ Received by: _____

REFERENCE NO. 9



FRONTIER TECHNICAL ASSOCIATES INC.

Groundwater Monitoring Report

September 1990

Carborundum Abrasives Company

FTA Report ET-369-GW-3

October 1, 1990

Prepared for:

Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, NY 14304-0550
Attn: G. McGee

Prepared by:

Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

Introduction

Frontier Technical Associates, Inc., in accordance with Carborundum Abrasives Company P.O. 07-RM172255K (as amended), sampled the groundwater from four monitoring wells and the water from two manholes at Carborundum Abrasives Company (CAC). This monitoring was conducted to meet an annual requirement of the NYDEC for pH, water elevation, and phenolics (4AAP). This report contains the results of the September 13, 1990 monitoring episode.

Monitoring Well Locations

The four wells are located near the southwest corner of the property and surrounding landfill. The location of the wells and manholes is shown in Figure 1.

Groundwater Elevations

Groundwater elevation measurements are obtained electronically (i.e., by noting the length of cable with reference to the established monitoring elevations when the amperage of the circuit changes). Only approximately one-eighth of an inch of cable is in contact with the water to minimize potential cross-contamination between wells. The cable is cleaned, triple rinsed with distilled water, and dried prior to use.

Groundwater elevations were obtained from all wells, and the results are presented in Table 1. In general, the direction of groundwater flow is to the northeast based upon measurements obtained in September 1990. This agrees with previous measurements over the past several years.

Sampling Personnel

The groundwater elevation measurements, purging, and sampling was conducted by the following Frontier Technical Associates personnel: .

Dr. P. Michael Terlecky, Certified Hydrogeologist
Mr. Jerry Grady, Engineering Technician

Sampling and Purging Equipment

The wells were purged prior to sampling by an ISCO water pump. Each well has a dedicated length of polyethylene tubing which is inserted into the well. The tubing is connected to a pump which pumps the water to a five-gallon glass bottle. Well water elevations are obtained before and after purging. In addition, the volume of water removed during purging is measured and recorded.

2

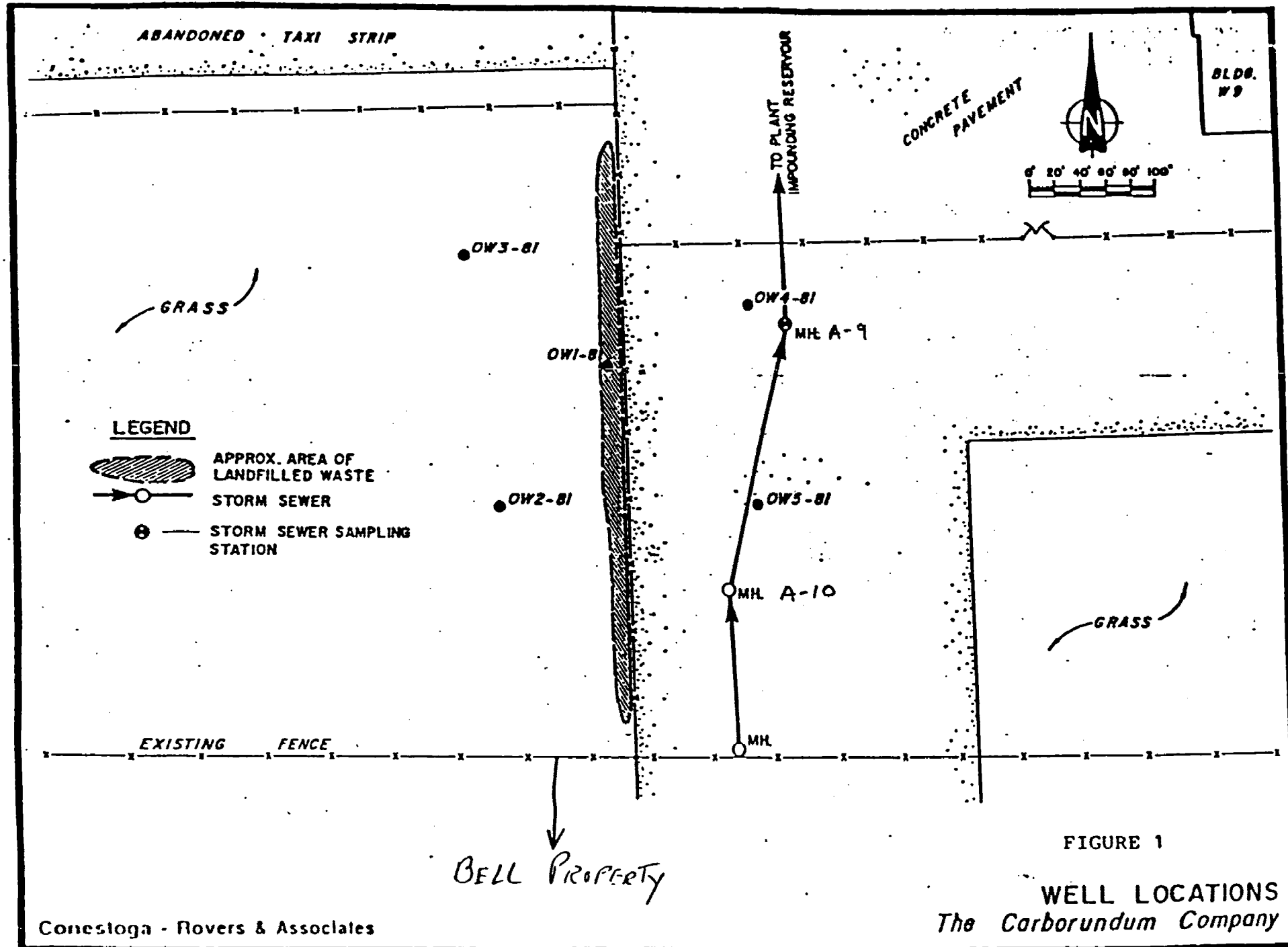


Table 1. Groundwater Elevations at Carborundum Abrasives Company, September 13, 1990.

<u>Well No.</u>	<u>Top of Casing Elevation*</u>	<u>Depth to Groundwater</u>	<u>Groundwater Elevation</u>	<u>Volume Purged Prior to Sampling***</u>
OW 2-81	588.50 ft.	9.00 ft.	579.50 ft.	2.0 gal. (dry)
OW 3-81	587.59 ft.**	8.77 ft.	578.82 ft.	2.0 gal. (dry)
OW 4-81	587.74 ft.**	9.90 ft.	577.84 ft.	2.2 gal. (dry)
OW 5-81	587.52 ft.	9.29 ft.	578.23 ft.	1.4 gal. (dry)

* Elevations from Conestoga-Rovers Report

** Casing bent--elevation of top of casing may be altered.

***Three well volumes removed or wells pumped dry (see Appendix).

NOTE: All elevations measured as feet above mean sea level (ft. > MSL).

The well purging data is located in the Appendix to this report. A minimum of three volumes of water from the well casing are removed during purging, or until the well is pumped dry which applied in all cases during this sampling episode.

Sampling Preservation and Shipping Procedures

Preservation of all samples was conducted in accordance with established USEPA protocols and procedures. The samples for pH were analyzed immediately upon return to the laboratory. The phenolics samples were collected and preserved in accordance with the established EPA method (H_2SO_4 to pH <2). Proper chain-of-custody control was maintained on all samples. Copies of the chain-of-custody records are found in the Appendix of this report. The preserved samples were stored at 4°C and then delivered to the laboratory for analysis.

Analytical Laboratories and Methods

Two New York State Certified Laboratories were used in this monitoring program to provide the proper mix of specialties required. The laboratories used by FTA during the sampling program and the pollutant parameters measured by each of the laboratories are summarized below:

1. Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

Laboratory Director: Dr. P. Michael Terlecky
Parameter Analyzed: pH
New York State ELAP Certification No. 10475

2. Arvin/Calspan Advanced Technology Center
P.O. Box 400
Buffalo, NY 14225

Laboratory Director: Mr. John Michalovic
Parameter Analyzed: Phenolics (4AAP)
New York State ELAP Certification No. 10383

The approved USEPA analytical methods used to measure the pollutants are listed below:

<u>Pollutant</u>	<u>EPA Method No.</u>
pH	150.1
Phenolics (Total)	420.1

A detailed description of these methods can be found in the following two USEPA publications:

1. USEPA, "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Revised March 1984.
2. USEPA, "Test Methods for Evaluating Solid Waste," SW-846, Revised 1984.

Results of Analyses

The results of the analysis of the samples is presented in Table 2. The pH of the samples ranged from 6.47 to 7.08. The pH of catch basin A-9 was 7.08. There was no flow at catch basin A-10 on September 13, 1990 or on three other observation dates in September. Total phenolics concentrations ranged from 0.035 mg/l to 0.160 mg/l for the wells while a concentration of 0.070 mg/l was present at manhole A-9.

Notes and Observations

The well casings at OW 3-81 and OW 4-81 were bent in such a manner that the original survey elevations may no longer be accurate. The casings are bent to the degree that a bailer could not be lowered down the well. All wells were then sampled using dedicated tubing and a peristaltic pump.

The water from each of the wells contained black particles when purged.

A sample from the manhole (MH A9) appeared clear, and the flow was slight and almost imperceptible with approximately two to four inches of standing water in the channel. Manhole A-10 was dry and no sample could be obtained. CAC was notified immediately.

At this writing, original copies of the laboratory data were not received from the laboratory. However, the data were telephoned to FTA on September 28, 1990 (T. Steszewski to Dr. P. M. Terlecky) for use in this report. Copies of the laboratory report will be forwarded when received.

Table 2. Results of Groundwater Monitoring and Manhole Sampling at Carborundum Abrasives Company, September 13, 1990.

<u>Location</u>	<u>pH*</u>	<u>Phenolics Concentration (mg/l)**</u>
Well OW 2-81	6.88	0.160
Well OW 3-81	7.05	0.050
Well OW 4-81	6.83	0.065
Well OW 5-81	6.47	0.035
Manhole A-9	7.08	0.070
Manhole A-10	----	----

--- No flow at this location.

* FTA ELAP No. 10475

** Calspan ELAP 10383

APPENDIX

Well Purging Report
Chain-of-Custody Records
Analytical Report



FRONTIER TECHNICAL ASSOCIATES INC.

WELL PURGING REPORT

Facility: Carborundum Abrasives Company

Address: 6600 Walmore Road, Niagara Falls, NY 14304-0550

FTA Personnel: P. M. Terlecky, Jerry Grady

Purging Method: Peristaltic Pump Date: 9/13/90

<u>Well No.</u>	<u>Sample No.</u>	<u>Time (Begin)</u>	<u>Time (End)</u>	<u>Calculated Purge Vol.* (gallons)</u>	<u>Actual Purge Vol. (gallons)</u>
OW2-81	102	12:30 pm	12:38 pm	4.8	2.0 (dry)
OW3-81	103	11:51 am	11:56 am	5.10	2.0 (dry)
OW4-81	104	11:07 am	11:12 am	3.83	2.2 (dry)
OW5-81	105	11:18 am	11:26 am	4.75	1.4 (dry)

* Calculated purge volume equals 3 X well volume based upon groundwater elevation measured prior to purging. These wells recover very slowly after purging and adequate sample volume is sometimes difficult to obtain within one hour.



FRONTIER TECHNICAL ASSOCIATES INC.

CHAIN OF CUSTODY RECORDS

Samples Taken by: Frontier Technical Associates, Inc.

Address: 8675 Sheridan Drive, Buffalo, NY 14221

Telephone No.: (716) 634-2293

Sampling Personnel: J. Grady

Location of Sampling: Plant C Wells

Type of Sample: ... Task No. Et-369

Analyses to be performed under P.O. No. ...

Flow: ...

Sample Site	Sample No.	Analytical Parameters	Date of Sampling	Time of Sampling	Type of Sample	Container Type	Sample Volume	Preservation Method
A-9	101A	pH	9/13/90	11:30	grab	polyethylene	500ml	none
QW2-81	102A	pH	9/13/90	11:17	grab	polyethylene	500ml	none
QW3-81	103A	pH	9/13/90	12:10	grab	polyethylene	500ml	none
QW4-81	104A	pH	9/13/90	11:10	grab	polyethylene	500ml	none
QW5-81	105A	pH	9/13/90	11:40	grab	polyethylene	500ml	none

Comments: ...

CHAIN OF POSSESSION:

Company

Name

Signature

Inclusive Dates

FTA

Jerry Grady

Jerry Grady

9/13/90



FRONTIER TECHNICAL ASSOCIATES INC.

CHAIN OF CUSTODY RECORDS

Samples Taken by: Frontier Technical Associates, Inc.

Address: 8675 Sheridan Drive, Buffalo, NY 14221

Telephone No.: (716) 634-2293

Sampling Personnel: J. Grady

Location of Sampling: Plant C wells

Type of Sample: Wastewater

Task No. FT-369

Analyses to be performed under P.O. No. _____

Flow: _____

Sample Site	Sample No.	Analytical Parameters	Date of Sampling	Time of Sampling	Type of Sample	Container Type	Sample Volume	Preservation Method
A-9	101	Phenols	9/13/90	11:30	grab	glass	1000ml	H ₂ SO ₄ to pH < 2
OW3-81	102	Phenols	9/13/90	1:17	grab	glass	1000ml	H ₂ SO ₄ to pH < 2
OW3-81	103	Phenols	9/13/90	1:17	grab	glass	1000ml	H ₂ SO ₄ to pH < 2
OW4-81	104	phenols	9/13/90	11:20	grab	glass	1000ml	H ₂ SO ₄ to pH < 2
OW5-81	105	Phenols	9/13/90	12:23	grab	glass	1000ml	H ₂ SO ₄ to pH < 2

Comments: _____

CHAIN OF POSSESSION:

Company

Name

Signature

Inclusive Dates

FTA

Kerry Grady

Kerry Grady

9/13-14/90

REFERENCE NO. 10

NEW YORK

Ground-Water Resources

More than 6 million of New York's 17.5 million residents rely on ground water for drinking supplies. Of those who depend on ground water, more than one-half live on Long Island where ground-water withdrawals for all uses total 486 million gallons per day (Mgal/d). A total of 487 Mgal/d is withdrawn in Upstate counties. Ground-water withdrawals for various uses and related statistics are given in table 1.

For ease of discussion, New York's ground-water resources are separated into two regions—Long Island and Upstate. In this summary, Upstate New York is considered to include all counties north of the Counties of Bronx, New York (Manhattan), and Richmond (Staten Island).

GENERAL SETTING

Upstate New York is located in several physiographic provinces (fig. 1)—the Adirondack, the New England, the St. Lawrence Valley, the Appalachian Plateaus, the Valley and Ridge, the Piedmont, and the Central Lowland. Crystalline rocks dominate the Adirondack and New England provinces. Carbonate rocks are present in outcrop fringes (escarpments) along the northern and eastern edges of the Appalachian Plateaus province, in isolated areas of the St. Lawrence Valley province and in eastern New York. Shale, the most extensive bedrock unit, is present in the Appalachian Plateaus, western Central Lowland, and Valley and Ridge provinces. Sandstone is present in the Piedmont, St. Lawrence Valley, and eastern Central Lowland provinces.

Bedrock in Upstate New York is covered with glacial deposits of till and stratified drift of variable thickness. The till mantles the uplands and small tributary valleys and usually is found beneath stratified drift in the larger valleys. Stratified drift (partly reworked by modern streams) forms the floors of large valleys and flat plains or terraces where bedrock relief is low. The stratified drift includes lacustrine and beach deposits of clay, silt, and sand and meltwater deposits of sand and gravel. The sand and gravel deposits form the principal aquifer systems of Upstate New York (fig. 1).

Recharge to Upstate New York's ground-water systems is derived from precipitation. Average annual precipitation ranges from 32 inches (in.) in the Central Lowland and St. Lawrence Valley provinces to more than 50 in. in the Adirondack and Catskill (eastern Appalachian Plateaus province) regions. In most of Upstate New York the amount of recharge ranges from 1 to 50 percent of the precipitation; however, in the areas of the stratified-drift valley-fill aquifer, the recharge can be considerably greater because of the runoff from surrounding hills (Heath, 1964).

Long Island lies in the Coastal Plain province (fig. 1) and is underlain by drift, principally stratified sand and gravel. Recharge to the Long Island ground-water system is derived solely from precipitation. Average precipitation is 43 in. per year (Cohen and others, 1968). Although recharge rates may differ according to land use, about 50 percent of the precipitation reaches the water table. Some of this ground water flows to the deeper aquifers.

Table 1. Ground-water facts for New York

[Withdrawal data rounded to two significant figures and may not add to totals because of independent rounding. Mgal/d = million gallons per day; gal/d = gallons per day. Sources: New York State Department of Environmental Conservation, 1982; New York State Department of Health, 1981; Solley, Chase and Mann, 1983]

Population served by ground water, 1980	
Number (thousands) - - - - -	6,133
Percentage of total population - - - - -	35
From public water-supply systems:	
Number (thousands) - - - - -	3,919
Percentage of total population - - - - -	22
From rural self-supplied systems:	
Number (thousands) - - - - -	2,214
Percentage of total population - - - - -	13
Freshwater withdrawals, 1980	
Surface water and ground water, total (Mgal/d) - - - - -	7,900
Ground water only (Mgal/d) - - - - -	970
Percentage of total - - - - -	12
Percentage of total excluding withdrawals for thermoelectric power - - - - -	28
Category of use	
Public-supply withdrawals:	
Ground water (Mgal/d) - - - - -	500
Percentage of total ground water - - - - -	51
Percentage of total public supply - - - - -	23
Per capita (gal/d) - - - - -	127
Rural-supply withdrawals:	
Domestic:	
Ground water (Mgal/d) - - - - -	170
Percentage of total ground water - - - - -	18
Percentage of total rural domestic - - - - -	89
Per capita (gal/d) - - - - -	75
Livestock:	
Ground water (Mgal/d) - - - - -	37
Percentage of total ground water - - - - -	4
Percentage of total livestock - - - - -	65
Industrial self-supplied withdrawals:	
Ground water (Mgal/d) - - - - -	250
Percentage of total ground water - - - - -	25
Percentage of total industrial self-supplied:	
Including withdrawals for thermoelectric power - - - - -	4
Excluding withdrawals for thermoelectric power - - - - -	11
Irrigation withdrawals:	
Ground water (Mgal/d) - - - - -	21
Percentage of total ground water - - - - -	2
Percentage of total irrigation - - - - -	46

PRINCIPAL AQUIFERS

UPSTATE

Principal aquifers in Upstate New York consist of unconsolidated glacial stratified-drift and valley-fill deposits and consolidated clastic and carbonate sedimentary rocks, some of which have been metamorphosed. The principal aquifers are described below and in table 2; their areal distribution is shown in figure 1.

Table 2. Aquifer and well characteristics in New York
 (Ft = feet; gal/min = gallons per minute. Sources: Reports of the U.S. Geological Survey)

Table 2. Aquifers of New York State (Sources: Reports of the U.S. Geological Survey)

[Ft = feet; gal/min = gallons per minute.]

Aquifer name and description	Well characteristics			Remarks
	Depth (ft)	Yield (gal/min)		
	Common range	Common range	May exceed	
Upstate				
Stratified-drift-Lacustrine and ice-contact deposit aquifers: Sand and gravel. Unconfined.	10 - 300	10 - 50	100	In most areas, deposits consist entirely of sand. Excessive iron concentrations.
Valley-fill deposit aquifers: Sand and gravel. Generally confined.	3 - 200	100 - 1,000	3,000	Glacial outwash and alluvium interbedded with clay and silt in many valleys are most productive water-bearing material in New York. Locally excessive iron or manganese concentrations.
Carbonate-rock aquifers: Limestone, dolomite, and marble. Unconfined in most areas.	10 - 300	50 - 150	200	Carbonate rocks are most productive bedrock unit in State. Water from this unit usually hard and contains hydrogen sulfide gas in some areas. From Niagara Falls to vicinity of Syracuse and in St. Lawrence valley, deep wells yield slightly salty water and, in places, water with a sulfate concentration that may exceed 300 mg/L.
Sandstone aquifers: Includes both sandstone and conglomerate. Confined in most areas.	3 - 500	50 - 100	100	Sandstone is the second most productive bedrock unit in New York. Water commonly slightly hard and has excessive iron concentration locally.
Long Island				
Upper glacial aquifer (includes Jameco and Port Washington aquifers): Outwash deposits (mostly between and south of terminal moraines but also interlayered with till) consist of quartzose sand, fine to very coarse, and gravel, pebble to boulder sized. Unconfined.	50 - 500	50 - 1,000	1,500	Main source of drinking water in central and eastern Suffolk County. Contains high concentration of nitrates and organic compounds in western Long Island. Saline water problems in extreme eastern end of Long Island.
Magothy aquifer: Sand, fine to medium, clayey in part; interbedded with lenses and layers of coarse sand and sandy and solid clay. Gravel is common in basal 50 to 200 ft.	150 - 1,100	50 - 1,200	2,000	Supplies most of the ground water for public-supplied drinking water in Queens, Nassau, and western Suffolk Counties. Saline water in North and South Forks and near Jamaica Bay.
Lloyd aquifer: Sand, fine to coarse, and gravel, commonly with clayey matrix; some lenses and layers of solid and silty clay; locally contains thin lignite layers and iron concretions.	150 - 1,100	50 - 1,000	1,200	Main source of drinking water for northwest shore of Long Island barrier islands to south. Saline water in North and South Forks and extreme west end of barrier islands.

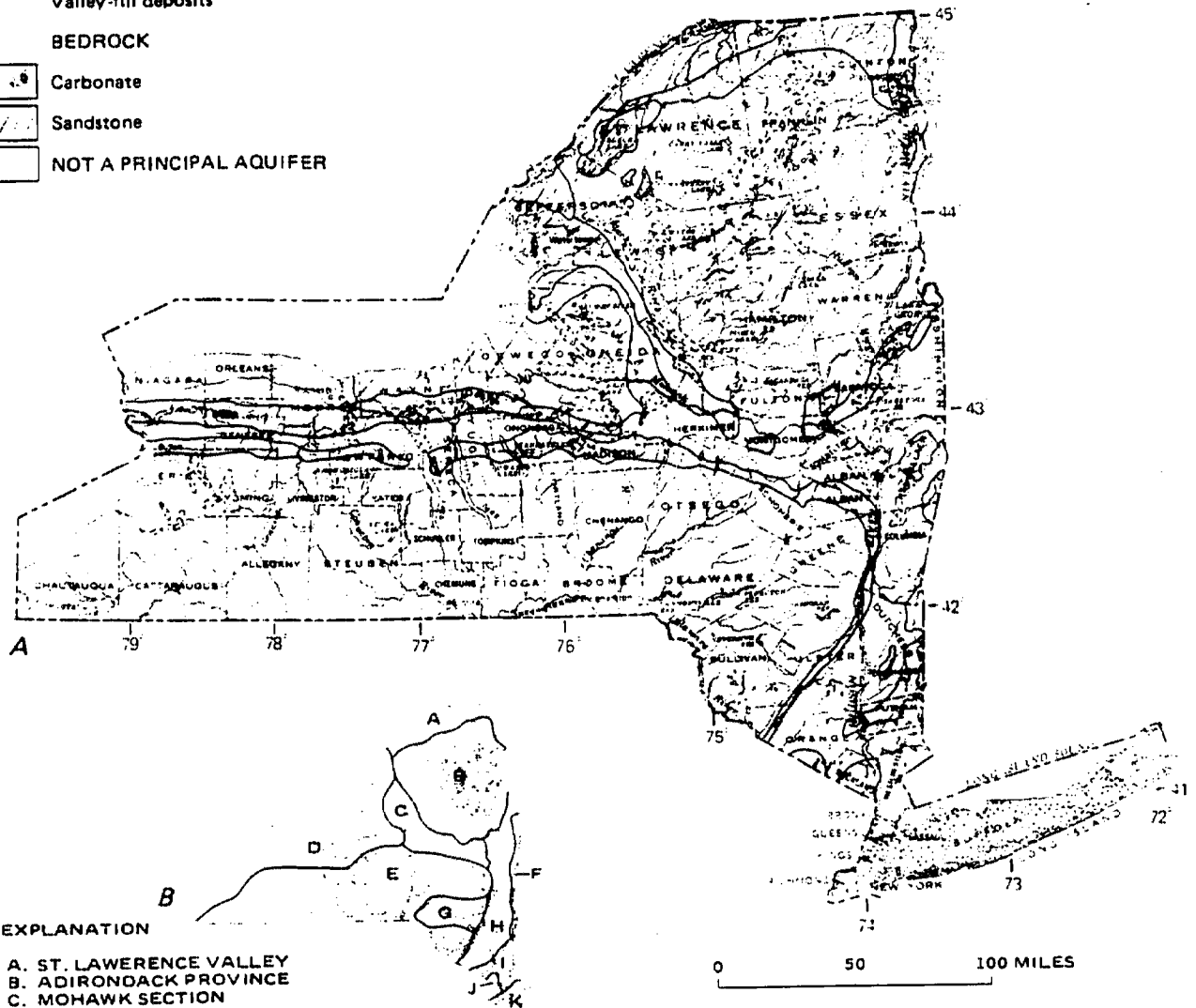
Stratified-Drift Aquifers

Stratified-drift deposits of thick sand and gravel (valley fill) underlie flood plains and terraces along the larger streams and occupy preglacial or glacial valleys that lack perennial streams. The distinguishing feature of the valley-fill aquifers is their linearity and close proximity to contiguous streams (fig. 1). Many valley-fill aquifers are overlain, and thus confined locally, by fine-grained sediments. Induced infiltration from streams commonly occurs where pumped wells are close to the streams (Waller and Finch, 1982). Elsewhere, particularly in the northern one-half of New York, glacial lake and beach sands on uplands also contain significant aquifers.

The stratified drift forms unconfined, shallow aquifers that are susceptible to contamination from surface sources. Quality of water in the stratified drift generally is excellent and suitable for human consumption and most other uses; however, water in some areas contains excessive iron [as high as 0.33 milligrams per liter (mg/L)] and manganese (as high as 0.14 mg/L) concentrations that require treatment in some areas. In some aquifers, water is saline at relatively shallow depth between Buffalo and Syracuse as a result of ground-water dissolution of gypsum and halite beds. Toxic waste contamination has been reported in some valley-fill deposits, and 36 public water-supply wells have been closed as of January 1984 because of organic contamination (L. J. He-

EXPLANATION

- STRATIFIED DRIFT**
- Lacustrine and ice-contact deposits;
upper glacial and unconsolidated
deposits on Long Island
- Valley-fill deposits
- BEDROCK**
- Carbonate
- Sandstone
- NOT A PRINCIPAL AQUIFER



EXPLANATION

- A. ST. LAWRENCE VALLEY
B. ADIRONDACK PROVINCE
C. MOHAWK SECTION
D. CENTRAL LOWLAND
E. APPALACHIAN PLATEAUS
F. TACONIC AND GREEN MOUNTAIN SECTIONS
G. CATSKILL SECTION
H. VALLEY AND RIDGE PROVINCE
I. NEW ENGLAND PROVINCE
J. PIEDMONT PROVINCE
K. COASTAL PLAIN

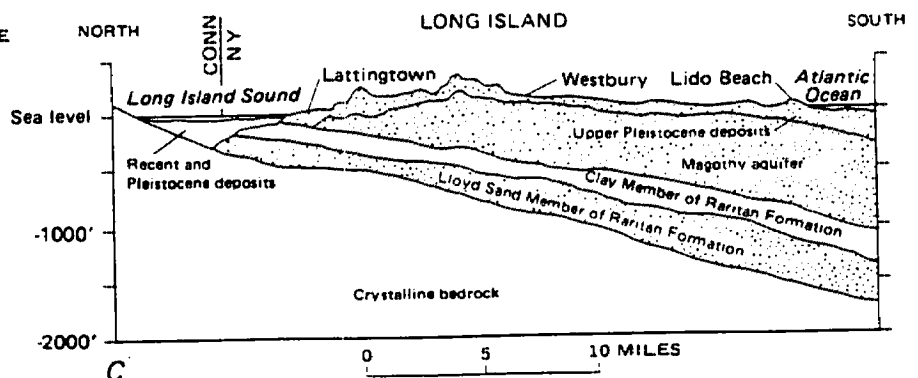


Figure 1. Principal aquifers in New York. A, Geographic distribution. B, Physiographic diagram and divisions. C, Generalized north-south geologic section, Long Island). (See table 2 for more detailed description of the aquifers. Sources: A, Heath, 1964; Kantrowitz and Snively, 1982. B, Fenneman, 1938; Raisz, 1954. C, Cohen and others, 1968.)

ting, New York State Department of Health, written commun., 1984).

Carbonate and Sandstone Bedrock Aquifers

Bedrock forms significant aquifers only in the sandstones of the Piedmont and St. Lawrence Valley provinces and in the carbonates, as shown in figure 1. Quality of water generally is suitable for most uses, but a median hardness exceeding 700 mg/L as calcium carbonate is a problem in the carbonate aquifers. Saline water is present at shallow depth in the western one-half of the State.

LONG ISLAND

The principal aquifers of Long Island consist of unconsolidated clastic sediment; they are the upper glacial aquifer of Pleistocene age and the Magothy and Lloyd aquifers of Cretaceous age. These aquifers are continuous throughout Long Island (fig. 1) except along the north shore and northern Kings County, where the formations making up the Magothy and Lloyd have been eroded by glaciation. The aquifers are described below and in table 2; only the upper glacial aquifer is shown in figure 1.

Upper Glacial Aquifer

The upper glacial aquifer consists of the saturated upper part of the highly permeable Pleistocene and Holocene deposits. Saltwater encroachment is a current problem on the islands and peninsulas of eastern Suffolk County and is a potential problem along all of Long Island's shores. Septic systems and agricultural and lawn fertilizers locally have resulted in elevated chloride (300 mg/L) and nitrate-nitrogen (22 mg/L) concentrations (Katz and others, 1977), and pesticides, industrial wastes, and landfill leachate (Kimmel and Braids, 1980) have contributed to pollution of the aquifer.

Magothy Aquifer

The Magothy aquifer consists of the Cretaceous Magothy Formation and the Matawan Group, undifferentiated. The Magothy aquifer and overlying upper glacial aquifer are connected hydraulically except in the south, where they are separated by a confining unit. Saltwater encroachment in this aquifer is a problem in southern coastal areas of Nassau and Queens Counties and at the eastern end of Long Island. Contamination by organic chemicals is a current and potential problem in many parts of the island.

Lloyd Aquifer

The Lloyd aquifer consists of the Lloyd Sand Member of the Raritan Formation. The aquifer is separated from the overlying Magothy aquifer by a thick, fine-grained, confining unit in the Raritan Formation (fig. 1). Saltwater encroachment either already occurs or is a potential problem in the eastern one-half of Suffolk County and in parts of the barrier islands of Nassau County.

GROUND-WATER WITHDRAWALS AND WATER-LEVEL TRENDS

Major areas of ground-water withdrawals and trends in ground-water levels in New York State are indicated in figure 2; the withdrawals are compiled by county and include only those pumping centers that withdraw more than 10 Mgal/d. Pumping centers are plotted at the major pumping-center site or, where major pumping centers are not present, at the center of the county.

UPSTATE

Of the counties that withdraw more than 10 Mgal/d in Upstate New York (New York State Department of Health, 1981), all but two (Orange and Dutchess) draw most of their water from valley-fill aquifers. Orange and Dutchess Counties withdraw more water from bedrock than from valley fill and also have the smallest public supply use of the nine major ground-water users of the Upstate New York counties.

Water levels in the Upstate aquifers respond to withdrawals at nearby pumping centers, but because the withdrawals are relatively low and induced recharge from streams is relatively large, water-level declines are minimal. Two of the hydrographs for Upstate New York (locations 5 and 9, fig. 2) indicate that long-term water-level declines have not occurred. The hydrograph for location 12 reflects a decline in water levels until 1968 when recovery began.

LONG ISLAND

Since the late 1930's, withdrawals for public-supply and industrial uses have increased steadily. Withdrawals for farm use and irrigation are minimal. In general, pumping centers are distributed evenly throughout the four Long Island counties except for major pumping centers that have been developed in each of the three major aquifers in Queens County.

The Long Island hydrographs in figure 2 (location 3) reflect the response of three aquifers to withdrawals in Queens County. The water-level recovery in the Lloyd and Magothy aquifers has resulted from a reduction in pumpage and from the recharge of aquifers with cooling water, decisions implemented to counteract saltwater encroachment. Water-level changes in the two eastern counties of Long Island, Nassau and Suffolk, generally reflect changes in amounts of precipitation rather than changes in pumping.

GROUND-WATER MANAGEMENT

The two State agencies with responsibilities most directly related to ground-water management are the New York State Department of Health (DOH) and the New York State Department of Environmental Conservation (DEC).

Under the Public Health Law and Part 5 of the State Sanitary Code, DOH ensures that public water-supply systems are operated properly and maintained to ensure a safe and adequate supply. The program involves regulation, periodic monitoring of water quality, inspection of systems, emergency response to problems of supply or quality, laboratory services, and establishment of drinking-water standards.

DEC is responsible for administering the State's environmental-quality and natural-resource programs, including those relating to the control of water pollution and management of water resources. Major elements of the DEC's water program that are integral to ground-water management include water-resources planning, ambient water-quality standards and classification of ground water, and water-discharge permits and programs that provide for the development, operation, and maintenance of municipal wastewater facilities. The DEC established a system of ground-water classifications and standards in 1967; the most recent revision was in 1978. Also, the New York State Pollutant Discharge Elimination System Program, which regulates point-source municipal, industrial, and commercial wastewater discharges, including those to the subsurface, is administered by the DEC. The State Public Water Supply Permit Program, administered by DEC, requires that new ground-water withdrawals for public supply be approved by both DEC and DOH. On Long Island, where groundwater quantity is a major issue, the DEC administers a well-permit program that has regulatory control of all major withdrawals.

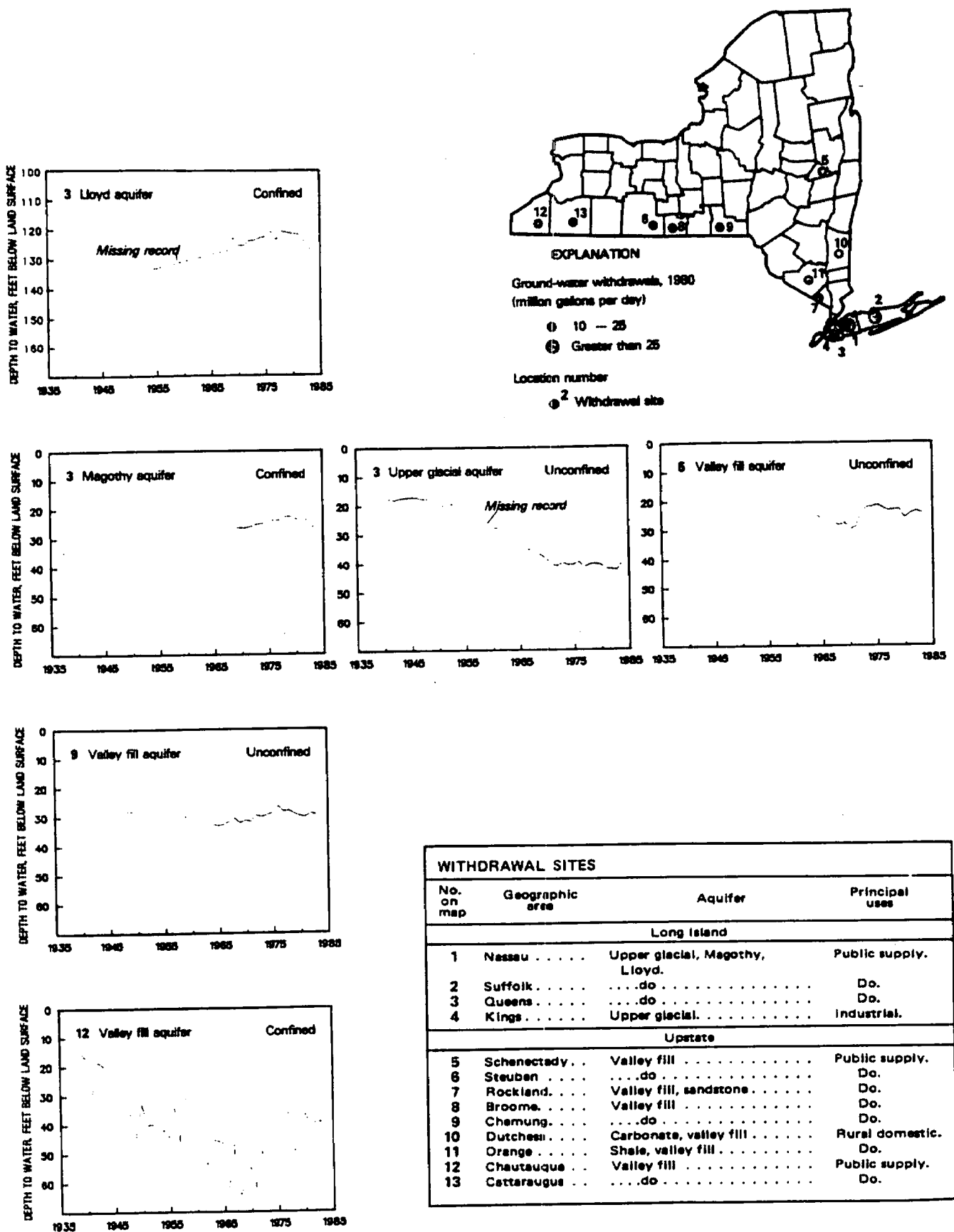


Figure 2. Areal distribution of major ground-water withdrawals and graphs of greatest depth to water in selected wells in New York. (Sources: Withdrawal and water-level data from U.S. Geological Survey files.)

The Long Island aquifer system has been designated as a "sole-source" aquifer by the U.S. Environmental Protection Agency. In addition to the DEC and DOH, several local agencies on Long Island implement major parts of the overall program to manage and protect the ground water. Local agencies with major regulatory responsibilities include the Nassau, Suffolk, and New York City Departments of Health. Other local agencies with important ground-water-related activities include the Long Island Regional Planning Board, the Suffolk County Water Authority, the Nassau County Department of Public Works, and the New York City Department of Environmental Protection.

Under Section 208 of the Clean Water Act, the DEC recently has prepared Ground-water Management Programs for both Long Island and Upstate New York. All of the previously mentioned local agencies were major participants in developing the program on Long Island.

In addition to the above agencies, two interstate river-basin commissions—the Delaware River Basin and the Susquehanna River Basin Commission—share limited ground-water management responsibility with the State.

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Prepared by Roger M. Waller, Edward J. Koszalka and Deborah S. Snively

For further information contact District Chief, U.S. Geological Survey, P.O. Box 1669, Albany, NY 12201

REFERENCE NO. 11

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual (HW-10)

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

United States
Environmental Protection
Agency

1984

TABLE 2
PERMEABILITY OF GEOLOGIC MATERIALS*

Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestones, dolomites, and sandstones; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestones, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestones and dolomite	$>10^{-3}$ cm/sec	3

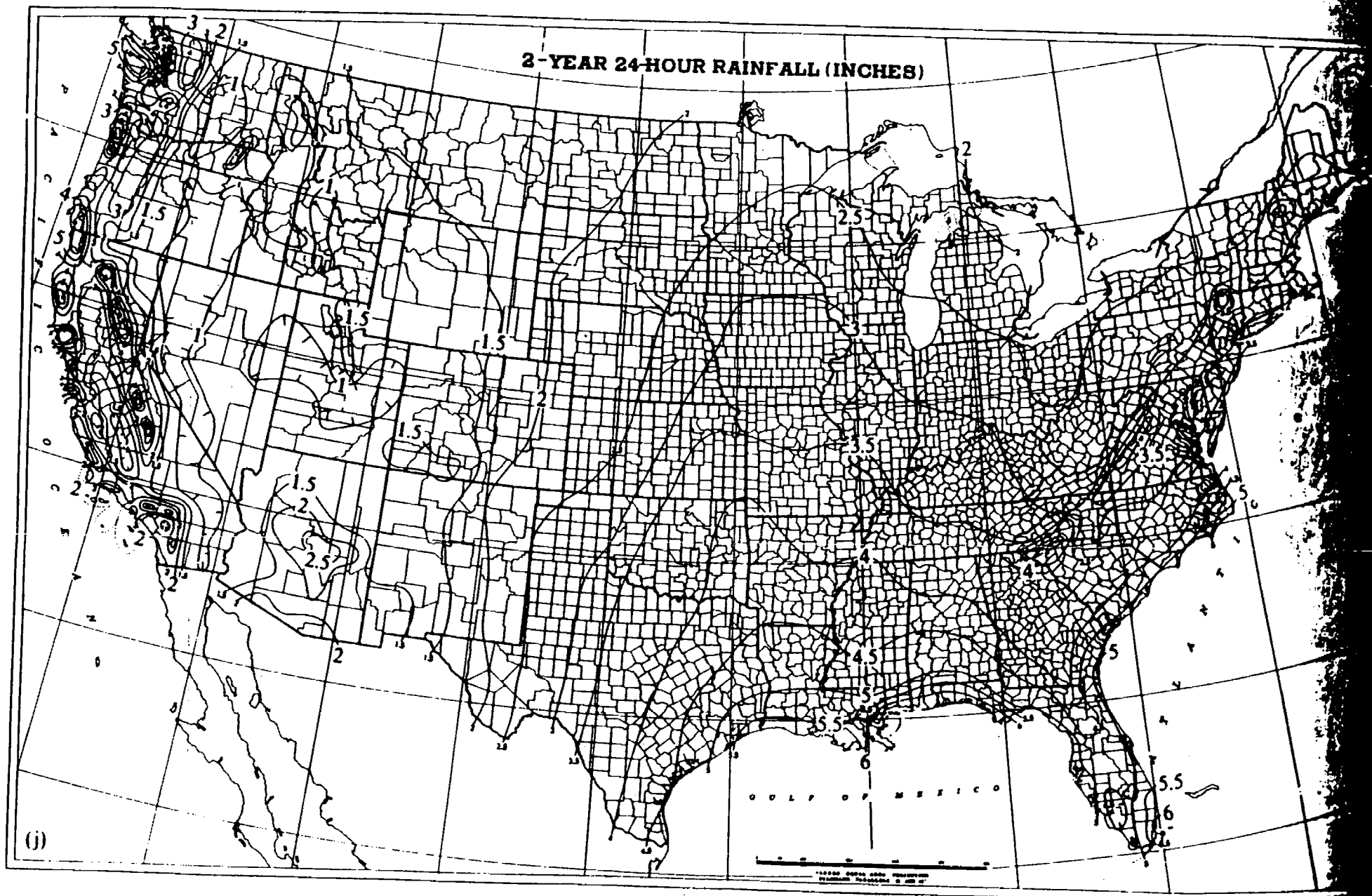
*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWiest ed., Academic Press, New York, 1969

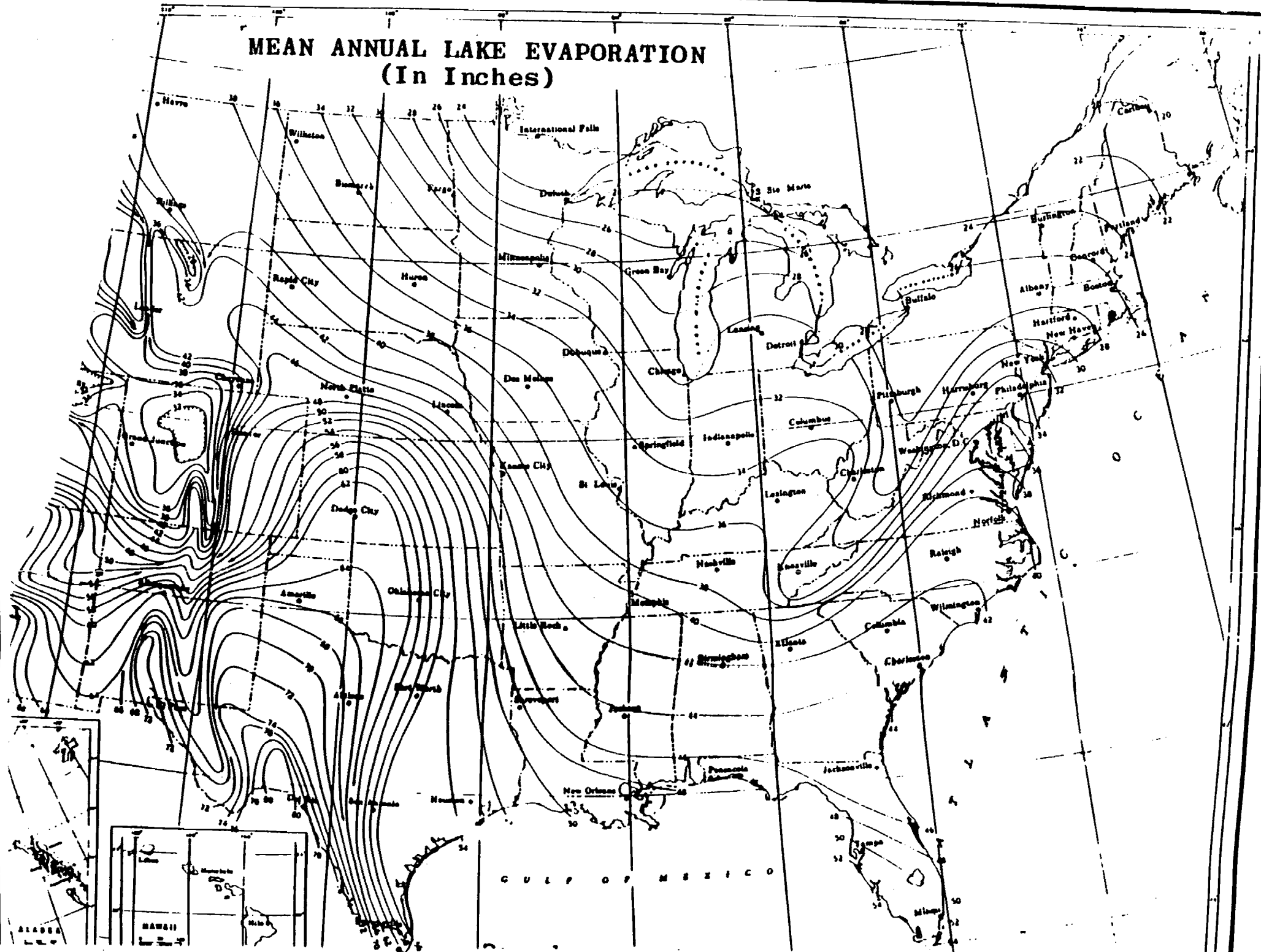
Frazer, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

(i)

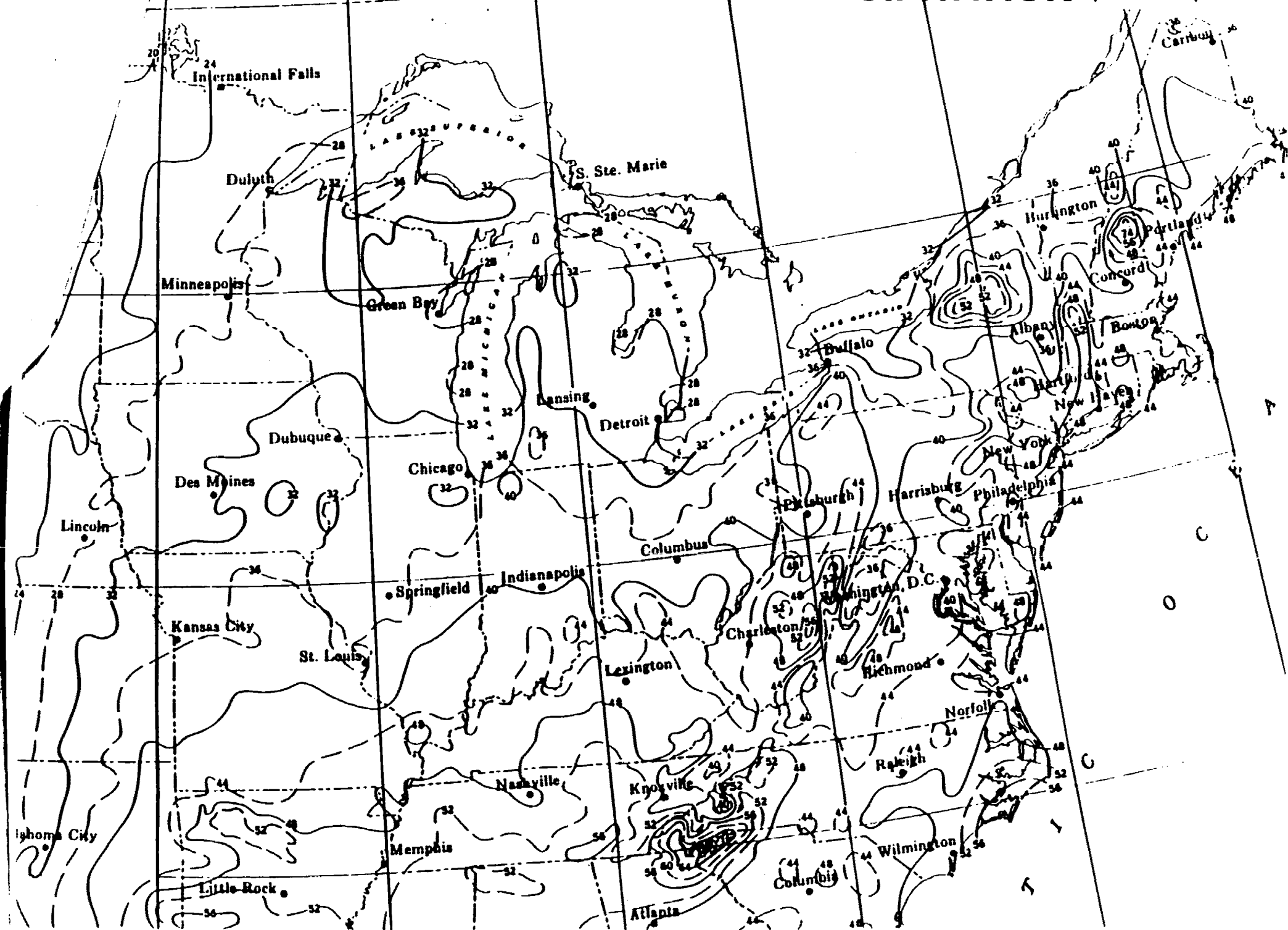
2-YEAR 24-HOUR RAINFALL (INCHES)



MEAN ANNUAL LAKE EVAPORATION (In Inches)



NORMAL ANNUAL TOTAL PRECIPITATION (Inches)



REFERENCE NO. 12

6.7.1.2 DEPTH TO BOTTOM OF UNIT
(LGBOT/C92 - CHAR X(8) in 47-54):

Enter the depth to the bottom of this lithologic unit, in feet below land surface. This field should be specified for all units except the last one in the hole.

6.7.1.3 UNIT IDENTIFIER
(LGAQFR/C93 - MANDATORY SECONDARY-KEY CHAR X(8) in 55-62):

Enter the eight-character code identifying the lithologic unit (see App. F in the WATSTORE User's Guide). (The terms BASEMENT and BEDROCK will be accepted as legal values.) The unit identifier is mandatory.

6.7.1.4 LITHOLOGY
(LGLITH/C96 - SECONDARY-KEY CHAR X(4) in 63-66):

Enter the code indicating the principal lithology of this unit. The codes are:

Rock Term -----	Abbreviation -----
Alluvium	ALVM
Anhydrite	ANDR
Anorthosite	ANRS
Arkose	ARKS
Basalt	BSLT
Bentonite	BNTN
Boulders	BLDR
Boulders and sand	BLSD
Boulders, silt, and clay	BLSC
Breccia	BRCC
Calcite	CLCT
Caliche (hard pan)	CLCH
Chalk	CHLK
Chert	CHRT
Clay	CLAY
Clay, some sand	CLSD
Claystone	CLSN
Coal	COAL
Cobbles	COBB

National Water Information System
Ground-Water File

Cobbles and sand	COSD
Cobbles, silt, and clay	COSC
Colluvium	CLVM
Conglomerate	CGLM
Coquina	CQUN
Diabase	DIBS
Diorite	DORT
Dolomite	DLMT
Drift	DRFT
Evaporite	EVPR
Gabbro	GBBR
Glacial (undifferentiated)	GLCL
Gneiss	GNSS
Granite	GRNT
Granite, gneiss	GRGN
Gravel	GRVL
Gravel and clay	GRCL
Gravel, cemented	GRCM
Gravel, sand, and silt	GRDS
Gravel, silt and clay	GRSC
Graywacke	GRCK
Greenstone	GNST
Gypsum	GPSM
Hard pan	HRDP
Igneous (undifferentiated)	IGNS
Lignite	LGNT
Limestone	LMSN
Limestone and Dolomite	LMDM
Loam	LOAM
Loess	LOSS
Marble	MRBL
Marl	MARL
Marlstone	MRLS
Metamorphis (undifferentiated)	MMPC
Muck	MUCK
Mud	MUD
Mudstone	MDSN
Other	OTHR
Outwash	OTSH
Overburden	OBDN
Peat	PEAT
Quartzite	QRTZ
Residium	RSDM
Rhyolite	RYLT
Rock	ROCK
Rubble	RBBL
Sand	SAND
Sand and clay	SDCL

National Water Information System
Ground-Water File

Sand and gravel	SDGL
Sand and silt	SDST
Sand, gravel, and clay	SGVC
Sand, some clay	SNCL
Sandstone	SNDS
Sandstone and shale	SDSL
Saprolite	SPRL
Schist	SCST
Sedimentary (undifferentiated)	SDMN
Serpentine	SRPN
Shale	SHLE
Silt	SILT
Silt and clay	STCL
Siltstone	SLSN
Slate	SLTE
Soil	SOIL
Syenite	SYNT
Till	TILL
Travertine	TRVR
Tuff	TUFF
Volcanic (undifferentiated)	VLCC

6.7.1.5 CONTRIBUTING UNIT
(LGCONT/C304 - CHAR X in 67):

Enter the following code to indicate whether the unit is to be considered the principal aquifer. If this field is left blank, the edit program will value this component with a default of "U" and will print a warning message to that effect.

P - Principal contributing aquifer (only one per site)
S - Secondary contributing aquifer
N - Contributes no water
U - Unknown contribution

If C93 (aquifer code in geohydrology file) exists and C304 (contributing unit) is equal to "P", then C714 (aquifer code) is set equal to C93.

6.7.1.6 RESERVED FOR FUTURE USE (LGRESV - CHAR X(10) in 68-77):

NEW YORK

CENOZOIC

CENOZOIC ERATHEM..... 100CNZC

QUATERNARY

QUATERNARY SYSTEM..... 110QRNR

HOLOCENE

ALLUVIUM..... 111ALVM
 BAY-BOTTOM DEPOSITS..... 111BBTM
 BEACH (SHORE) DEPOSITS..... 111BECN
 DUNE (AEOLIAN) DEPOSITS..... 111DUNE
 FILL..... 111FILL
 HOLOCENE SERIES..... 111HLCN
 LAKE DEPOSITS..... 111LAKE
 SALT-MAKSH DEPOSITS..... 111SLMR
 TERRACE DEPOSITS..... 111TRRC

PLEISTOCENE

GLACIAL DELTA DEPOSITS..... 112GLCD
 GLACIAL AQUIFER, UPPER..... 112GLCLU
 GARDINERS CLAY..... 112GRDR
 HARBOR HILL DRIFT..... 112HBHD
 HARBOR HILL OUTWASH..... 112HBHO
 HARBOR HILL TILL..... 112HBHT
 HARBOR HILL GROUND MORaine..... 112HHGM
 HARBOR HILL TERMINAL MORaine..... 112HHTM
 ICE-CONTACT DEPOSITS..... 112ICNC
 JAMECO AQUIFER..... 112JMCO
 KAME TERRACE DEPOSITS..... 112KMTC
 LAKE DEPOSITS..... 112LAKE
 OUTWASH..... 112OTSH
 RONKONKOMA GROUND MORaine..... 112RKGM
 RONKONKOMA DRIFT..... 112RKKO
 RONKONKOMA OUTWASH..... 112RKKO
 RONKONKOMA TILL..... 112RKKT
 RONKONKOMA TERMINAL MORaine..... 112RKTm
 SAND..... 112SAND
 SAND AND GRAVEL..... 112SDGV
 SMITHTOWN CLAY..... 112SMTN
 TILL..... 112TILL
 20-FOOT CLAY..... 1122OCL

TERTIARY

PLIOCENE

MANNETTO GRAVEL..... 121MNNT

MESOZOIC

MESOZOIC ERATHEM..... 200MSZC

CRETACEOUS

CRETACEOUS SYSTEM..... 210CRCS

UPPER CRETACEOUS

UPPER CRETACEOUS SERIES..... 211CRCSU
LLOYD AQUIFER..... 211LLYD
MAGOTHY AQUIFER..... 211MGTY
MONMOUTH GREENSAND..... 211MMGD
MATAWAN GROUP-MAGOTHY FORMATION..... 211MNMG
MONMOUTH GROUP..... 211MNMT
MATAWAN FORMATION..... 211MTWN
RAKITAN FORMATION..... 211RRTN

TRIASSIC

TRIASSIC SYSTEM..... 230TRSC

UPPER TRIASSIC

BRUNSWICK FORMATION..... 231BRCK
NEWARK GROUP..... 231NWRK
PALISADE DIABASE..... 231PLSD
STOCKTON FORMATION..... 231STCN
UPPER TRIASSIC SERIES..... 231TRSCU

PALEOZOIC

PALEOZOIC ERATHEM..... 300PLZC

PENNSYLVANIAN

PENNSYLVANIAN SYSTEM..... 320PSLV

MIDDLE PENNSYLVANIAN

POTTSVILLE FORMATION..... 324PSVL

MISSISSIPPIAN

MISSISSIPPIAN SYSTEM..... 330MSSP

LOWER MISSISSIPPIAN

POCONO GROUP..... 337POCN

DEVONIAN

DEVONIAN SYSTEM..... 340DVNN

UPPER DEVONIAN

CANADAWAY GROUP.....	341CNDY
CONEWANGO GROUP.....	341CNGG
CONNEAUT GROUP.....	341CNNT
UPPER DEVONIAN SERIES.....	341DVNNU
GENESEE FORMATION.....	341GENS
JAVA-WEST FALLS FORMATION.....	341JVWF
SONYEA FORMATION.....	341SONY

MIDDLE DEVONIAN

MIDDLE DEVONIAN SERIES.....	344DVNNM
ESOPUS SHALE.....	344ESPS
HAMILTON GROUP.....	344HMLN
ONONDAGA LIMESTONE.....	344ONDG
TULLY LIMESTONE.....	344TLLY

LOWER DEVONIAN

LOWER DEVONIAN SERIES.....	347DVNNL
HELDERBERG GROUP.....	347HDBG
ORISKANY SANDSTONE.....	347ORSK

SILURIAN

GREEN POND CONGLOMERATE.....	350GRPD
SILURIAN SYSTEM.....	350SLRN

UPPER SILURIAN

AKRON-COBLESVILLE-BERTIE FORMATIONS, UNDIFFERENTIATED.....	351ACBB
AKRON DOLOMITE.....	351AKRN
BINNEWATER SANDSTONE.....	351BNTH
BERTIE LIMESTONE.....	351BRTI
COBLESKILL LIMESTONE.....	351CBLK
CAMILLUS SHALE.....	351CMLS
LONGWOOD SHALE.....	351LNGD
SALINA GROUP.....	351SLIN
UPPER SILURIAN SERIES.....	351SLRNU
SYRACUSE SALT.....	351SRCS
VERNON SHALE.....	351VRNN

MIDDLE SILURIAN

CLINTON GROUP.....	354CLMN
MIDDLE SILURIAN SERIES.....	354SLRNM
SHAWANGUNK CONGLOMERATE.....	354SNGK

NIAGARAN

LOCKPORT DOLOMITE.....	355LCKP

LOWER SILURIAN

ALBION GROUP.....	357ALBN

LOWER SILURIAN SERIES.....	357SLRNL
ORDOVICIAN	
ORDOVICIAN SYSTEM.....	3600DVC
UPPER ORDOVICIAN	
LORRAINE SHALE.....	361LRN
UPPER ORDOVICIAN SERIES.....	3610DVCU
OSWEGO SANDSTONE.....	3610SWG
QUEENSTON SHALE.....	361QNSN
UTICA SHALE.....	361UTIC
MIDDLE ORDOVICIAN	
BERKSHIRE SCHIST.....	364BRKR
CHAZY GROUP.....	364CHZY
CANAJOHARIE SHALE.....	364CNJR
NORMANSKILL FORMATION.....	364NMKL
MIDDLE ORDOVICIAN SERIES.....	3640DVCM
SNAKE HILL FORMATION.....	364SKHL
TRENTON-BLACK RIVER GROUP.....	364TBRV
TRENTON GROUP.....	364TRNN
WALLOOMSAC SLATE.....	364WLMC
LOWER ORDOVICIAN	
BEEKMANTOWN GROUP.....	367BKMN
LOWER ORDOVICIAN SERIES.....	3670DVCL
POULTNEY SLATE.....	367PLTN
TRIBES HILL LIMESTONE.....	367TBHL
CAMBRIAN	
CAMBRIAN SYSTEM.....	370CMBR
UPPER CAMBRIAN	
MIDDLE CAMBRIAN SERIES.....	371CMBRM
UPPER CAMBRIAN SERIES.....	371CMBRU
LITTLE FALLS DOLOMITE.....	371LLFL
POTSDAM SANDSTONE.....	371PSDM
TACONIC SEQUENCE.....	371TCSQ
THERESA DOLOMITE.....	371THRS
MIDDLE CAMBRIAN	
MIDDLE CAMBRIAN SERIES.....	374CMBRM
STOCKBRIDGE GROUP.....	374SKRG
LOWER CAMBRIAN	
BULL SLATE.....	377BULL
LOWER CAMBRIAN SERIES.....	377CMBRU
DALTON FORMATION.....	377DLTN

ELIZAVILLE AND BERKSHIRE FORMATIONS.....	377E2VB
NASSAU FORMATION.....	377NSSU
POUGHQUAY QUARTZITE.....	377PGUY
SCHODACK FORMATION.....	377SCCK
STISSING DOLOMITE.....	377SSNG

PRECAMBRIAN

BASEMENT COMPLEX.....	400BCPX
PRECAMBRIAN ERATHEN.....	400PCMB

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85															

Figure 1. The number of *Phragmites* and *Spartina* plants per square meter in the marshes of the Tidal River, 1997–2000. The number of plants per square meter was calculated by dividing the number of plants by the area of the quadrat. The number of plants per square meter was calculated by dividing the number of plants by the area of the quadrat. The number of plants per square meter was calculated by dividing the number of plants by the area of the quadrat.

[illegible]

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Using Daspooler Environment: PRO
Print Request Attributes: PRO
Spool Options: -FTN
Total Size: 17 Records

Pathname: <ADMIN1>DISTRICT.USERS>MPHILLIPS>GWSI>NUS>NUS.CAR3
File Last Modified: 90-08-23.13:11:02.Tue

Spooled: 90-08-28.13:11:12.Tue
Started: 90-08-28.13:11:12.Tue

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	STATIC WATER LEVEL (FEET)	TOP OF OPEN INTERVAL (FEET)	BOTTOM OF OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- OLOGY CODE
430302	0785649	---	--	--	--	--	BEDROCK	--
430314	0735352	GRATWICK RIVERSIDE	--	--	--	--	--	--
430327	0785750	---	--	--	--	--	BEDROCK	--
430328	0735607	---	--	--	--	--	BEDROCK	--
430329	0785416	---	--	--	--	--	--	--
430330	0785421	---	--	--	--	--	BEDROCK	--
430330	0785803	---	--	--	--	--	BEDROCK	--
430332	0785756	---	--	--	--	--	BEDROCK	--
430333	0785819	---	--	--	--	--	--	--
430333	0785819	---	--	--	--	--	351VRNN	SHLE
430334	0785749	---	--	--	--	--	BEDROCK	--
430336	0735742	---	--	--	--	--	BEDROCK	--
430337	0785738	---	--	--	--	--	BEDROCK	--
430339	0785728	---	--	--	--	--	BEDROCK	--
430340	0785723	---	--	--	--	--	BEDROCK	--
430341	0785717	---	--	--	--	--	BEDROCK	--
430342	0785711	---	--	--	--	--	BEDROCK	--
430343	0735640	---	--	--	--	--	BEDROCK	--
430343	0785643	---	--	--	--	--	--	--
430343	0785643	---	--	--	--	--	351VRNN	SHLE
430343	0785647	---	--	--	--	--	BEDROCK	--
430343	0785834	---	--	--	--	--	--	--
430343	0785834	---	--	--	--	--	BEDROCK	--
430344	0785653	---	--	--	--	--	BEDROCK	--
430344	0785705	---	--	--	--	--	BEDROCK	--
430345	0785700	---	--	--	--	--	BEDROCK	--
430354	0785423	NIAGARA COUNTY SEWAGE DISPOSAL	--	--	--	--	--	--
430404	0785520	---	331	--	--	--	351VRNN	SHLE
		---		--	--	--	355OKOR	DLMT
		---		--	--	--	355ERAM	DLMT
		---		--	--	--	355GTIL	DLMT
		---		--	--	--	355GSPT	LMSN
		---		--	--	--	355OCEW	DLMT
		---		--	--	--	354ROCH	SHLE
		---		--	--	--	354IRON	LMSN
		---		--	--	--	BEDROCK	SHLE
		---		--	--	--	354RYNL	LMSN
		---		--	--	--	357NEAG	SHLE
430405	0785521	---	--	--	--	--	BEDROCK	--
430405	0785529	---	--	--	--	--	BEDROCK	--

PRIMARY
US

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	OF WATER	OTHER IDENTIFIER
430302	0795649	--	U	--
430314	0795352	--	-	--
430327	0795750	--	U	--
430328	0785807	--	U	--
430329	0785416	--	-	GRATWICK PK 07
430330	0785421	--	U	--
430330	0795803	--	U	--
430332	0795756	--	U	--
430333	0795819	--	U	NR3
430333	0785319	--	U	NR3
430334	0795749	--	U	--
430336	0795742	--	U	--
430337	0795738	--	U	--
430339	0785728	--	U	--
430340	0785723	--	U	--
430341	0795717	--	U	--
430342	0785711	--	U	--
430343	0785640	--	U	--
430343	0795643	--	U	NR1
430343	0785643	--	U	NR1
430343	0785647	--	U	--
430343	0795834	--	U	NR2
430343	0795834	--	-	NR2
430344	0785653	--	U	--
430344	0785705	--	U	--
430345	0795700	--	U	--
430354	0785423	--	-	--
430404	0795520	--	U	WHEATFIELD-2
		--		--
		--		--
		--		--
		--		--
		--		--
		--		--
		--		--
		--		--
		--		--
430405	0785521	--	U	--
430405	0795529	--	U	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	TIC WATER LEVEL (FEET)	OP OPEN INTERVAL (FEET)	BO OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- OLOGY CODE
430409	0785612	--	--	--	--	--	BEDROCK	--
430411	0785602	--	--	--	--	--	BEDROCK	--
430413	0785321	--	--	--	--	--	BEDROCK	--
430413	0785527	--	--	--	--	--	BEDROCK	--
430416	0785320	--	--	--	--	--	BEDROCK	--
430416	0785401	--	--	--	--	--	BEDROCK	--
430416	0785643	NIAGARA RIVER SITE (BELD)	--	--	--	--	--	--
430418	0785518	--	--	--	--	--	BEDROCK	--
430418	0785929	--	--	--	--	--	BEDROCK	--
430420	0785615	--	--	--	--	--	BEDROCK	--
430420	0785643	CAYUGA ISLAND	--	--	--	--	--	--
430421	0785832	--	--	--	--	--	BEDROCK	--
430422	0785929	--	--	--	--	--	BEDROCK	--
430423	0785644	--	--	--	--	--	BEDROCK	--
430423	0785652	--	--	--	--	--	BEDROCK	--
430424	0785635	--	--	--	--	--	BEDROCK	--
430426	0785930	--	--	--	--	--	BEDROCK	--
430427	0785927	--	--	--	--	--	BEDROCK	--
430429	0785655	--	--	--	--	--	BEDROCK	--
430429	0785751	--	--	--	--	--	BEDROCK	--
430431	0785702	--	--	--	--	--	BEDROCK	--
430432	0785746	--	--	--	--	--	BEDROCK	--
430433	0785626	--	--	--	--	--	BEDROCK	--
430433	0785712	--	--	--	--	--	--	--
430434	0785750	DAIRY WENDT	--	--	--	--	355LCKP	--
430439	0785159	NIAGARA FALLS BLVD.	--	--	--	--	--	--
430439	0785722	--	--	--	--	--	BEDROCK	--
430440	0785202	--	--	--	--	--	BEDROCK	--
430441	0785151	--	--	--	--	--	BEDROCK	--
430442	0785720	--	--	--	--	--	BEDROCK	--
430442	0785735	--	--	--	--	--	BEDROCK	--
430443	0785634	--	--	--	--	--	--	--
430443	0785634	--	--	--	--	--	--	--
430443	0785742	--	--	--	--	--	BEDROCK	--
430444	0785755	--	--	--	--	--	BEDROCK	--
430445	0785712	--	--	--	--	--	BEDROCK	--
430445	0785811	--	--	--	--	--	BEDROCK	--
430447	0785523	--	--	--	--	--	BEDROCK	--
430447	0785929	--	--	--	--	--	BEDROCK	--
430448	0785153	--	--	--	--	--	BEDROCK	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	PRIMARY USE OF WATER	OTHER IDENTIFIER
430409	0735612	--	U	--
430411	0735402	--	U	--
430413	0735321	--	U	--
430413	0785527	--	U	--
430416	0785320	--	U	--
430416	0735401	--	U	--
430416	0785643	--	-	--
430418	0785518	--	U	--
430418	0735928	--	U	--
430420	0735615	--	U	--
430420	0735343	--	-	--
430421	0735332	--	U	--
430422	0785929	--	U	--
430423	0785644	--	U	--
430423	0785652	--	U	--
430424	0735635	--	U	--
430426	0785930	--	U	--
430427	0785927	--	U	--
430429	0785655	--	U	--
430429	0735751	--	U	--
430431	0785702	--	U	GRIFFON PARK 6
430432	0735746	--	U	--
430433	0785626	--	U	--
430433	0735712	--	-	GRIFFON PARK 95
430434	0785750 ①	100	C	304-357-01
430439	0785159	--	-	NIAG F BLVD 2
430439	0735722	--	U	--
430440	0735202	--	-	--
430441	0785151	--	-	--
430442	0735720	--	U	--
430442	0785735	--	U	--
430443	0785634	--	U	--
430443	0735634	--	U	--
430443	0735742	--	U	--
430444	0735755	--	U	--
430445	0735712	--	U	--
430445	0735311	--	U	--
430447	0785523	--	U	--
430447	0735620	--	U	--
430448	0785153	--	-	--

LATITUDE (DEGREES)		LONGITUDE (DEGREES)		OWNER		DEPTH DRILLED (FEET)	WATER LEVEL (FEET)	IC OPEN INTERVAL (FEET)	OP OPEN INTERVAL (FEET)	BOT OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- OLOGY CODE
430448	0785515	--	--	--	--	--	--	--	--	--	BEDROCK	--
430448	0785626	--	--	--	--	--	--	--	--	--	BEDROCK	--
430448	0785851	--	--	--	--	--	--	--	--	--	BEDROCK	--
430449	0785658	--	--	--	--	--	--	--	--	--	BEDROCK	--
430452	0785521	--	--	--	--	--	--	--	--	--	BEDROCK	--
430455	0785731	--	--	--	--	--	--	--	--	--	BEDROCK	--
430501	0785946	--	--	--	--	--	--	--	--	--	BEDROCK	--
430503	0785710	--	--	--	--	--	--	--	--	--	BEDROCK	--
430506	0785303	--	--	--	--	--	--	--	--	--	BEDROCK	--
430507	0785319	LENKE F.	--	--	--	--	--	--	--	--	110QRNR	--
430507	0785945	U.S. Geological Survey	--	--	--	25	--	--	23	25	355LCKP	--
430508	0785623	--	--	--	--	--	--	--	--	--	110QRNR	--
430510	0785320	--	--	--	--	--	--	--	--	--	355LCKP	DLMT
430511	0785721	--	--	--	--	--	--	--	--	--	BEDROCK	--
430513	0785649	--	--	--	--	--	--	--	--	--	BEDROCK	--
430519	0785942	--	--	--	--	--	--	--	--	--	--	--
430520	0785155	--	--	--	--	--	--	--	--	--	BEDROCK	--
430520	0785941	U.S. Geological Survey	--	--	--	24	--	--	22	24	110QRNR	--
430522	0785423	--	--	--	--	--	--	--	--	--	355LCKP	DLMT
430522	0785916	--	--	--	--	--	--	--	--	--	--	--
430523	0785942	GREAT LAKES CARSON	--	--	--	--	--	--	--	--	BEDROCK	--
430524	0785656	--	--	--	--	--	--	--	--	--	--	--
430524	0785656	--	--	--	--	--	--	--	--	--	BEDROCK	--
430527	0785406	--	--	--	--	--	--	--	--	--	BEDROCK	--
430528	0785407	--	--	--	--	--	--	--	--	--	--	--
430528	0785619	--	--	--	--	--	--	--	--	--	BEDROCK	--
430531	0785746	--	--	--	--	--	--	--	--	--	BEDROCK	--
430533	0785237	--	--	--	--	--	--	--	--	--	BEDROCK	--
430536	0785255	--	--	--	--	--	--	--	--	--	BEDROCK	--
430538	0785403	OPPENHEIM PARK	--	--	--	--	--	--	--	--	--	--
430539	0785232	--	--	--	--	--	--	--	--	--	BEDROCK	--
430544	0785200	--	--	--	--	438	--	--	--	--	355OKOR	DLMT
		--	--	--	--	--	--	--	--	--	355ERAM	DLMT
		--	--	--	--	--	--	--	--	--	355GTIL	DLMT
		--	--	--	--	--	--	--	--	--	355GSPT	LMSN
		--	--	--	--	--	--	--	--	--	355OCEW	DLMT
		--	--	--	--	--	--	--	--	--	354ROCH	SHLE
		--	--	--	--	--	--	--	--	--	354IRON	LMSN

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	USE OF WATER	OTHER IDENTIFIER
430448	0735515	--	U	--
430448	0735626	--	U	--
430448	0735351	--	U	--
430449	0735658	--	U	--
430452	0735521	--	U	--
430455	0735731	--	U	--
430501	0735946	--	U	--
430503	0735710	--	U	--
430506	0735303	--	U	--
430507	0735319	--	S	--
430507	0735945	3.0	U	NF-32-3
430508	0735623	--	U	--
430510	0735320	--	U	--
430511	0735721	--	U	--
430513	0735649	--	U	--
430519	0735942	--	-	NF 32-7 61ST
430520	0735155	--	-	--
430520	0735941	2.0	U	NF-32-7
430522	0735423	--	-	--
430522	0735916	--	U	I190-162 #05
430523	0735942	--	-	--
430524	0735656	--	U	GR L CARBON #22
430527	0735406	--	U	--
430528	0735407	--	-	--
430528	0735619	--	U	WHITMER RD #03
430531	0735746	--	U	--
430535	0735237	--	U	--
430536	0735255	--	U	--
430538	0735403	--	-	--
430539	0735232	--	U	--
430544	0735200	--	U	WHEATFIELD-1
		--		--
		--		--
		--		--
		--		--
		--		--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	STATIC WATER LEVEL (FEET)	TOP OF CAP INTERVAL (FEET)	BOTTOM OF CAP INTERVAL (FEET)	AQUIFER CODE	LITH OLOGY CODE
430544	0785200	--	438	--	--	--	3EDROCK	SHLE
		--		--	--	--	354RYNL	LMSN
		--		--	--	--	357NEAG	SHLE
		--		--	--	--	8EDROCK	SNDS
		--		--	--	--	357THLD	SNDS
		--		--	--	--	357GRMS	SNDS
		--		--	--	--	357PWRG	SHLE
		--		--	--	--	357WRPL	SNDS
		--		--	--	--	361QNSN	SHLE
430544	0735754	--	--	--	--	--	8EDROCK	--
430546	0785507	MOLL N.	--	--	--	--	112SDGV	SDGL
430547	0735303	--	--	--	--	--	355LCKP	--
430548	0785514	MOLL N.	--	--	--	--	8EDROCK	--
430549	0785520	--	--	--	--	--	355LCKP	--
		--		--	--	--	8EDROCK	--
430551	0785256	--	--	--	--	--	3EDROCK	--
430553	0735753	--	--	--	--	--	8EDROCK	--
430555	0785255	--	--	--	--	--	8EDROCK	--
430556	0785742	--	--	--	--	--	8EDROCK	--
430557	0785321	LICHT R.	--	--	--	--	355LCKP	--
430557	0785633	--	--	--	--	--	8EDROCK	--
430557	0785634	--	--	--	--	--	--	--
430557	0785656	--	--	--	--	--	8EDROCK	--
430558	0785625	--	--	--	--	--	3EDROCK	--
430559	0785708	--	--	--	--	--	8EDROCK	--
430601	0785552	--	--	--	--	--	3EDROCK	--
430602	0785719	--	--	--	--	--	8EDROCK	--
430603	0785519	--	--	--	--	--	8EDROCK	--
430604	0785540	BELL AEROSPACE/TEXTRON	15.0	--	8.0	13.0	110QRNR	--
430604	0785741	--	--	--	--	--	8EDROCK	--
430604	0785753	--	--	--	--	--	3EDROCK	--
430606	0785539	BELL AEROSPACE/TEXTRON	25.3	--	17.5	23.0	110QRNR	--
		--		--	--	--	355LCKP	DLMT
430606	0785545	BELL AEROSPACE/TEXTRON	25.6	--	17	22	110QRNR	SDMN
		--		--	--	--	355LCKP	DLMT
430606	0785325	--	--	--	--	--	8EDROCK	--
430606	0790005	--	--	--	--	--	8EDROCK	--
430607	0785539	BELL AEROSPACE/TEXTRON	15.0	--	3.0	13.0	110QRNR	--
430607	0785311	--	--	--	--	--	8EDROCK	--
430609	0735343	LASS E.	--	--	--	--	355LCKP	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	USE OF WATER	OTHER IDENTIFIER
430544	0785200	--	U	--
		--		--
		--		--
		--		--
		--		--
		--		--
430544	0785754	--	U	--
430546	0785507 ②	15.0	H	305-355-02
		--		--
430547	0785808	--	U	--
430548	0785514 ③	--	H	305-355-01
430549	0785520	--	U	--
430551	0785256	--	U	--
430553	0785753	--	U	--
430555	0785255	--	U	--
430556	0785742	--	U	--
430557	0785321 ④	--	H	305-353-02
430557	0785633	--	U	--
430557	0785634	--	-	ARPT TRIANGLE 4
430557	0785656	--	U	--
430558	0785625	--	U	--
430559	0785708	--	U	--
430601	0785552	--	U	--
430602	0785719	--	U	--
430603	0785519	--	U	--
430604	0785540	--	U	8-18
430604	0785741	--	U	--
430604	0785753	--	U	--
430606	0785539	--	U	8A-13
		--		--
430606	0785545	--	U	8A-14
		--		--
430606	0785825	--	U	--
430606	0790005	--	U	--
430607	0785539	--	U	8-17
430607	0785911	--	U	--
430609	0785343	--	H	306-853-01

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	WATER LEVEL (FEET)	TOP OPEN INTERVAL (FEET)	BO OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- OLOGY CODE
430609	0785543	BELL AEROSPACE/TEXTRON	26.7	--	13.0	23.0	110QRNR	SDMN
430610	0785344	--	--	--	--	--	355LCKP	DLMT
430611	0785753	--	--	--	--	--	BEDROCK	--
430612	0785542	BELL AEROSPACE/TEXTRON	26.0	--	19.0	24.0	3EDROCK	--
							110QRNR	SDMN
430613	0735436	JAEGER R.	--	--	--	--	355LCKP	DLMT
							112SDGV	SOGL
430614	0785353	--	--	--	--	--	BEDROCK	--
430615	0785938	--	--	--	--	--	BEDROCK	--
430620	0785726	--	--	--	--	--	BEDROCK	--
430620	0785400	--	--	--	--	--	BEDROCK	--
430621	0785527	--	--	--	--	--	BEDROCK	--
430622	0785922	--	--	--	--	--	BEDROCK	--
430624	0785844	--	--	--	--	--	BEDROCK	--
430624	0785942	--	--	--	--	--	BEDROCK	--
430627	0735956	--	--	--	--	--	BEDROCK	--
430628	0785907	--	--	--	--	--	BEDROCK	--
430635	0735912	--	--	--	--	--	BEDROCK	--
430636	0785552	--	--	--	--	--	BEDROCK	--
430637	0785853	--	--	--	--	--	BEDROCK	--
430639	0735922	TONI L.	--	--	--	--	355LCKP	--
							--	--
430640	0785942	HAGGERTY	--	--	--	--	355LCKP	--
							BEDROCK	--
430641	0735802	--	--	--	--	--	BEDROCK	--
430642	0785912	--	--	--	--	--	BEDROCK	--
430642	0790016	--	--	--	--	--	--	--
430644	0785933	--	--	--	--	--	BEDROCK	--
430645	0785650	--	--	--	--	--	BEDROCK	--
430645	0785238	--	--	--	--	--	BEDROCK	--
430646	0785923	--	--	--	--	--	BEDROCK	--
430647	0785702	--	--	--	--	--	BEDROCK	--
430647	0735603	--	--	--	--	--	BEDROCK	--
430649	0735926	--	--	--	--	--	BEDROCK	--
430651	0735825	--	--	--	--	--	BEDROCK	--
430654	0785702	--	--	--	--	--	BEDROCK	--
430656	0735610	--	--	--	--	--	BEDROCK	--
430656	0785926	SWEARENGEN C.	--	--	--	--	355LCKP	--
							--	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	PRIMARY USE OF WATER	OTHER IDENTIFIER
430609	0785543	--	U	8-15
430610	0785344	--	U	--
430611	0785753	--	U	--
430612	0785542	--	U	6-16
430613	0785436	20.0 (5)	H	305-854-01
430614	0785853	--	U	--
430615	0735938	--	U	--
430620	0785726	--	U	--
430620	0785900	--	U	--
430621	0785527	--	U	--
430622	0785922	--	U	--
430624	0785844	--	U	--
430624	0785942	--	U	--
430627	0735956	--	U	--
430628	0735907	--	U	--
430635	0785912	--	U	--
430636	0785552	--	U	--
430637	0785853	--	U	--
430639	0785922	-- (6)	H	PR 43 306-859-03
430640	0785942	-- (7)	H	PR 18 306-859-04
430641	0785802	--	U	--
430642	0785919	--	U	--
430642	0790016	--	-	NEW ROAD 87
430644	0785933	--	U	--
430645	0785650	--	U	--
430645	0785838	--	U	--
430646	0785923	--	U	--
430647	0785702	--	U	--
430647	0785303	--	U	--
430649	0785926	--	U	--
430651	0785825	--	U	--
430654	0785762	--	U	--
430656	0785610	--	U	--
430656	0785926	-- (8)	H	299 306-259-01

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	STATIC WATER LEVEL (FEET)	TOP OF OPEN INTERVAL (FEET)	BOTTOM OF OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- OLOGY CODE
430657	0785646	NICK W.	--	--	--	--	BEDROCK	--
430657	0785902		--	--	--	--	355LCKP	--
430653	0785546		--	--	--	--	--	--
430656	0735634		--	--	--	--	9EDROCK	--
			--	--	--	--	BEDROCK	--
430658	0785743		373	--	--	--	110QRNR	--
			--	--	--	--	355OKOR	DLMT
			--	--	--	--	355ERAM	DLMT
			--	--	--	--	355GTIL	DLMT
			--	--	--	--	355GSPT	LMSN
			--	--	--	--	355DCEW	DLMT
			--	--	--	--	354ROCH	SHLE
			--	--	--	--	354IRON	LMSN
			--	--	--	--	BEDROCK	SHLE
			--	--	--	--	354RYNL	LMSN
			--	--	--	--	357NEAG	SHLE
			--	--	--	--	357THLD	SNDS
			--	--	--	--	357GRMS	SNDS
			--	--	--	--	357PWRG	SHLE
			--	--	--	--	357WRPL	SNDS
430658	0735935		--	--	--	--	361QNSN	SHLE
430659	0785307		--	--	--	--	BEDROCK	--
430659	0785656		--	--	--	--	BEDROCK	--
430659	0785613		--	--	--	--	BEDROCK	--
			--	--	--	--	BEDROCK	--
430701	0785922	PATTERSON J.	--	--	--	--	BEDROCK	--
430701	0785936		--	--	--	--	355LCKP	--
430705	0735802		--	--	--	--	--	--
430705	0785832		--	--	--	--	BEDROCK	--
			--	--	--	--	BEDROCK	--
430705	0785941		--	--	--	--	BEDROCK	--
430706	0785900		--	--	--	--	BEDROCK	--
430707	0785616		--	--	--	--	BEDROCK	--
430707	0785650		--	--	--	--	BEDROCK	--
430708	0785815		--	--	--	--	BEDROCK	--
430708	0785914	NUZUM A. W.	--	--	--	--	BEDROCK	--
430709	0790019		--	--	--	--	355LCKP	--
			--	--	--	--	--	--
430710	0785640		--	--	--	--	BEDROCK	--
430712	0735751		--	--	--	--	BEDROCK	--
			--	--	--	--	BEDROCK	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	USE OF WATER	OTHER IDENTIFIER
430657	0785646	--	U	--
430657	0785908 (9)	--	H	276
		--		306-359-02
430658	0785546	--	U	--
430658	0785634	--	U	--
430658	0785743	--	U	NIAGARA-1
		--		--
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		--		--
430658	0785935	--	U	--
430659	0785307	--	U	--
430659	0785656	--	U	--
430659	0785813	--	U	--
430701	0785922	--	U	--
430701	0785936 (10)	--	H	259
		--		307-359-04
430705	0785302	--	U	--
430705	0785332	--	U	--
430705	0785941	--	U	--
430706	0785900	--	U	--
430707	0785616	--	U	--
430707	0785650	--	U	--
430708	0785815	--	U	--
430703	0785914	--	U	--
430709	0790019 (11)	10.0	C	3
		--		307-900-06
430710	0785640	--	U	--
430712	0785751	--	U	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	STATIC WATER LEVEL (FEET)	TOP OPEN INTERVAL (FEET)	BO OPEN INTERVAL (FEET)	OF	AQUIFER CODE	LITH OLOGY CODE
430714	0735114	--	--	--	--	--		BEDROCK	--
430715	0735947	--	--	--	--	--		BEDROCK	--
430716	0735357	--	--	--	--	--		BEDROCK	--
430716	0735852	--	--	--	--	--		BEDROCK	--
430717	0735832	--	--	--	--	--		BEDROCK	--
430718	0735210	--	--	--	--	--		BEDROCK	--
430718	0735706	--	--	--	--	--		BEDROCK	--
430718	0735808	--	--	--	--	--		BEDROCK	--
430718	0735908	--	--	--	--	--		BEDROCK	--
430718	0735955	--	--	--	--	--		BEDROCK	--
430719	0735326	--	--	--	--	--		BEDROCK	--
430719	0735526	--	--	--	--	--		BEDROCK	--
430719	0735543	--	--	--	--	--		BEDROCK	--
430719	0735659	--	--	--	--	--		BEDROCK	--
430719	0790003	--	--	--	--	--		BEDROCK	--
430720	0735626	--	--	--	--	--		BEDROCK	--
430725	0735112	--	--	--	--	--		BEDROCK	--
430725	0790001	--	--	--	--	--		BEDROCK	--
430726	0735307	--	--	--	--	--		BEDROCK	--
430727	0790002	ROAD SCHOL MILITARY	--	--	--	--		355LCKP	--
430728	0735932	--	--	--	--	--		--	--
430730	0790011	CORA L.	--	--	--	--		BEDROCK	--
430732	0785306	--	--	--	--	--		355LCKP	--
430732	0785306	--	--	--	--	--		--	--
430732	0785306	--	--	--	--	--		BEDROCK	--
430732	0735700	--	--	--	--	--		BEDROCK	--
430733	0735324	--	--	--	--	--		BEDROCK	--
430733	0790000	--	--	--	--	--		BEDROCK	--
430735	0735307	--	--	--	--	--		BEDROCK	--
430735	0735951	LOZAN W.	--	--	--	--		355LCKP	--
430735	0735959	--	--	--	--	--		--	--
430735	0790001	SCHUL E.	--	--	--	--		BEDROCK	--
430741	0735305	--	--	--	--	--		355LCKP	--
430741	0735305	--	--	--	--	--		--	--
430741	0735305	--	--	--	--	--		BEDROCK	--
430744	0735137	--	--	--	--	--		BEDROCK	--
430745	0735517	--	--	--	--	--		BEDROCK	--
430745	0735352	--	--	--	--	--		BEDROCK	--
430747	0735306	--	--	--	--	--		BEDROCK	--
430751	0735952	--	--	--	--	--		355LCKP	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	PRIMARY USE OF WATER	OTHER IDENTIFIER
430714	0785114	--	-	--
430715	0785947	--	U	--
430716	0785357	--	U	--
430716	0785852	--	U	--
430717	0785832	--	U	--
430713	0785210	--	-	--
430718	0785706	--	U	--
430718	0785808	--	U	--
430718	0785905	--	U	--
430718	0785955	--	U	--
430719	0785326	--	U	--
430719	0785526	--	U	--
430719	0785543	--	U	--
430719	0785658	--	U	--
430719	0790003	--	U	--
430720	0785626	--	U	--
430725	0785112	--	-	--
430725	0790001	--	U	--
430726	0785307	--	U	--
430727	0790002	--	N	124
		--		307-900-09
430728	0785832	--	U	--
430730	0790011	--	H	121
		--		307-900-09
430732	0785306	--	U	--
430732	0785700	--	U	--
430733	0785324	--	U	--
430733	0790000	--	U	--
430735	0785307	--	U	--
430735	0785951	50.0	H	342
		--		307-959-03
430735	0785959	--	-	--
430735	0790001	--	H	343
		--		307-900-07
430741	0785305	--	U	--
430744	0785137	--	-	--
430745	0785817	--	U	--
430745	0785852	--	U	--
430747	0785306	--	U	--
430751	0785952	14.0	U	OH 119

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	WATER LEVEL (FEET)	TOP OPEN INTERVAL (FEET)	BO OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- OLOGY CODE
430751	0785952	--	--	--	--	--	--	--
430752	0735320	--	--	--	--	--	BEDROCK	--
430752	0785936	--	--	--	--	--	BEDROCK	--
430753	0785305	--	--	--	--	--	BEDROCK	--
430753	0785755	--	--	--	--	--	BEDROCK	--
430753	0785915	--	--	--	--	--	BEDROCK	--
430754	0795130	--	--	--	--	--	BEDROCK	--
430754	0795902	--	--	--	--	--	BEDROCK	--
430757	0735230	--	--	--	--	--	BEDROCK	--
430759	0795144	--	27	--	--	--	BEDROCK	--
430803	0785200	--	32	--	--	--	BEDROCK	--
430803	0785952	WILLIAMS J.	--	--	--	--	355LCKP	--
430805	0735913	--	--	--	--	--	355LCKP	--
430805	0785954	POWER CORP NIAGA MOHAWK	--	--	--	--	355LCKP	--
430806	0735349	--	--	--	--	--	BEDROCK	--
430806	0735756	--	--	--	--	--	BEDROCK	--
430808	0785951	POWER CORP NIAGA MOHAWK	--	--	--	--	112TILL	TILL
430810	0785909	--	--	--	--	--	BEDROCK	--
430810	0735913	--	--	--	--	--	BEDROCK	--
430810	0735916	PASNY	--	--	--	--	355LCKP	--
430810	0735916	PASNY	--	--	--	--	112TILL	TILL
430811	0785321	--	--	--	--	--	BEDROCK	--
430811	0735721	WITTCOPP A.	--	--	--	--	BEDROCK	--
430813	0795305	--	--	--	--	--	355LCKP	--
430814	0735659	--	--	--	--	--	BEDROCK	--
430814	0785707	--	--	--	--	--	BEDROCK	--
430814	0735752	SCHOLEFIEL F.	--	--	--	--	BEDROCK	--
430815	0735913	PASNY	--	--	--	--	355LCKP	--
430816	0735208	HOLLAND W.	--	--	--	--	355LCKP	--
430821	0785232	VILL SCHOL COLONIAL	--	--	--	--	355LCKP	--
430822	0795810	HEATH E.	--	--	--	--	355LCKP	--
430823	0795835	--	--	--	--	--	BEDROCK	--
430824	0785512	--	--	--	--	--	BEDROCK	--
430824	0795627	MASLEY N.	--	--	--	--	355LCKP	--

PRIMA
USE

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	OF WATER	OTHER IDENTIFIER
430751	0785952	--	U	307-359-01
430752	0785320	--	U	--
430752	0785936	--	U	--
430753	0785305	--	U	--
430753	0785755	--	U	--
430753	0785915	--	U	--
430754	0785130	--	-	--
430754	0785802	--	U	--
430757	0785230	--	-	--
430759	0785144	15	-	--
430803	0785200	--	-	--
430803	0785952 (16)	25.0	H	OW 129 308-859-13
430805	0785913	51.0	U	OW 129 308-359-11
430805	0785954	19.0	U	OW 106 308-359-06
430806	0785349	--	U	--
430806	0785756	--	U	8-28
430808	0785951	--	U	OW 118A
430810	0785909	--	U	308-359-05
430810	0785913	47.0	U	OW 128 308-359-10
430810	0785916	--	U	OW 123A
430811	0785321	--	U	308-859-09
430811	0785721 (17)	--	H	8-1 308-357-02
430813	0785303	--	U	8A-2-1
430814	0785659	--	U	--
430814	0785707	--	U	8-19
430814	0785753 (18)	--	H	308-357-01
430815	0785913	11.0	U	OW 127 308-359-08
430816	0785808 (19)	--	H	308-859-03
430821	0785038 (20)	20.0	N	308-358-01
430822	0785110 (21)	--	H	308-358-02
430823	0785835	--	U	--
430824	0785512	--	U	--
430824	0785627 (22)	--	H	308-356-01

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	STATIC WATER LEVEL (FEET)	TOP OPEN INTERVAL (FEET)	SC OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- CLOGY CODE
430825	0755522	--	--	--	--	--	BEDROCK	--
430826	0755529	--	--	--	--	--	BEDROCK	--
430827	0755315	--	--	--	--	--	BEDROCK	--
430827	0755315	BUSTEL W.	--	--	--	--	355LCKP	--
430830	0755513	--	--	--	--	--	BEDROCK	--
430830	0755523	--	--	--	--	--	BEDROCK	--
430831	0735812	POWER CORP NIAGA MOHAWK	--	--	--	--	355LCKP	--
430834	0755523	--	--	--	--	--	BEDROCK	--
430834	0755534	--	--	--	--	--	355OKOR	DLMT
		--		--	--	--	355ERAM	DLMT
		--		--	--	--	355GTIL	DLMT
		--		--	--	--	355GSPT	DLMT
		--		--	--	--	355DCEW	DLMT
		--		--	--	--	354ROCH	SHLE
		--		--	--	--	354IRON	LMSN
		--		--	--	--	BEDROCK	SHLE
		--		--	--	--	354RYNL	LMSN
430836	0735304	--	--	--	--	--	357NEAG	SHLE
		--		--	--	--	BEDROCK	--
430836	0755342	--	--	--	--	--	BEDROCK	--
430836	0755431	--	--	--	--	--	BEDROCK	--
430836	0735439	--	--	--	--	--	BEDROCK	--
430836	0735503	--	--	--	--	--	BEDROCK	--
430837	0755450	KROENING W.	--	--	--	--	355LCKP	--
430837	0755453	--	--	--	--	--	BEDROCK	--
430839	0755819	WAGNER P.	--	--	--	--	355LCKP	--
430839	0755824	--	--	--	--	--	BEDROCK	--
430841	0755247	--	--	--	--	--	BEDROCK	--
430843	0755328	--	--	--	--	--	BEDROCK	--
430844	0735605	--	--	--	--	--	BEDROCK	--
430845	0735303	--	--	--	--	--	BEDROCK	--
430846	0755341	WALKER H.	--	--	--	--	355LCKP	--
430847	0755254	--	--	--	--	--	BEDROCK	--
430848	0755828	PASNY	--	--	--	--	355LCKP	--
430849	0755225	Niagara Community College, Sanborn, NY	89.0	--	--	--	--	--
		--		--	--	--	355OKOR	DLMT
		--		--	--	--	355ERAM	DLMT
		--		--	--	--	355GTIL	DLMT
		--		--	--	--	355GSPT	LMSN

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	USE OF WATER	OTHER IDENTIFIER
430825	0785522	--	U	--
430826	0785522	--	U	--
430827	0795315	--	U	--
430827	0785316 (23)	--	H	308-853-01
430830	0785513	--	U	--
430830	0785523	--	U	--
430831	0785312 (24)	45.0	H	OW 173
		--		308-858-05
430834	0795523	--	U	--
430834	0785534	--	U	LEWISTON-2
		--		--
		--		--
		--		--
		--		--
		--		--
		--		--
		--		--
430836	0785304	--	U	--
430836	0785342	--	U	B-2
430836	0785431	--	U	--
430836	0785439	--	U	--
430836	0785508	--	U	B-4
430837	0785450 (25)	--	H	308-854-01
430837	0785458	--	U	--
430839	0785819 (26)	20.0	H	308-858-04
430839	0785924	--	U	--
430841	0785242	--	U	--
430843	0785328	--	U	--
430844	0785605	35	U	--
430845	0785305	--	U	L33
430846	0785341 (27)	25.0	H	308-853-04
430847	0785254	--	U	--
430848	0785626	30.0	U	OW 193
		--		308-352-06
430849	0785225	--	U	OW-2
		--		--
		--		--
		--		--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	OWNER	DEPTH DRILLED (FEET)	WATER LEVEL (FEET)	TO OPEN INTERVAL (FEET)	OPEN INTERVAL (FEET)	AQUIFER CODE	LITH- OLOGY CODE
430850	0785236	--	--	--	--	--	BEDROCK	--
430852	0785341	GOODHEART J.	--	--	--	--	355LCKP	--
430857	0785834	PASNY	--	--	--	--	355LCKP	--
430905	0785833	PASNY	--	--	--	--	355LCKP	--
430907	0785839	PASNY	--	--	--	--	355LCKP	--
430908	0785601	--	--	--	--	--	BEDROCK	--
430909	0785419	--	--	--	--	--	BEDROCK	--
430909	0785236	--	--	--	--	--	BEDROCK	--
430909	0785837	PLEASANT E. MT.	--	--	--	--	355LCKP	--
430911	0785438	--	--	--	--	--	BEDROCK	--
430911	0785825	HENRY H.	--	--	--	--	355LCKP	--
430912	0785810	--	--	--	--	--	BEDROCK	--
430915	0785605	LIGANMARI J.	--	--	--	--	355LCKP	--
430919	0785341	--	--	--	--	--	BEDROCK	--
430922	0785514	--	--	--	--	--	BEDROCK	--
430922	0785607	--	--	--	--	--	BEDROCK	--
430922	0785755	HENRY L.	--	--	--	--	355LCKP	--
430930	0785706	--	--	--	--	--	BEDROCK	--
430931	0785719	FARNHAM B.	--	--	--	--	355LCKP	--
430933	0785700	--	--	--	--	--	BEDROCK	--
430936	0785517	--	--	--	--	--	BEDROCK	--
430938	0785633	--	--	--	--	--	BEDROCK	--
430940	0785626	PRINTUP M.	--	--	--	--	355LCKP	--
430942	0785618	--	--	--	--	--	BEDROCK	--
430942	0785640	PRINTUP V.	--	--	--	--	355LCKP	--
430944	0785643	--	--	--	--	--	BEDROCK	--
430947	0785632	PRINTUP V.	--	--	--	--	355LCKP	--
430947	0785640	PRINTUP V.	--	--	--	--	355LCKP	--
430948	0785640	--	--	--	--	--	BEDROCK	--

LATITUDE (DEGREES)	LONGITUDE (DEGREES)	DISCHARGE (GPM)	USE OF WATER	OTHER IDENTIFIER
430850	0785236	--	U	--
430852	0785341	15.0 (28)	H	308-853-03
430857	0785834	30.0	U	OW 209
		--		308-353-07
430905	0785838	14.0	U	OW 206
		--		309-353-03
430907	0785839	20.0	U	OW 205
		--		309-358-04
430908	0785601	--	U	--
430909	0785419	--	U	--
430909	0785836	--	U	--
430909	0785837	25.0 (31)	H	309-858-02
430911	0785438	--	U	--
430911	0785825	-- (30)	H	309-358-01
430912	0785810	--	U	--
430915	0785605	20.0 (32)	H	309-856-05
430919	0785341	--	U	--
430922	0785514	--	U	--
430922	0785607	--	U	--
430922	0785755	-- (33)	H	309-357-01
430930	0785706	2.5	U	--
430931	0785710	4.00 (34)	H	309-857-02
430933	0785700	--	U	--
430936	0785517	--	U	--
430938	0785638	--	U	--
430940	0785626	13.0 (35)	H	309-356-01
430942	0785618	--	U	--
430942	0785640	1.00 (36)	P	309-856-04
430944	0785643	12	U	--
430947	0785632	20.0 (37)	P	309-856-05
430947	0785640	14.0 (38)	P	309-356-03
430948	0785640	--	U	--

REFERENCE NO. 13

CONTROL NO.:

02-9007-26

DATE:

9/7/90

TIME:

9:00 AM

DISTRIBUTION:

Carbonandum - Abrasives Division
Wheatfield, NY

BETWEEN:

Mr Woody

Water
Superintendent

OF:

Wheatfield
Water
Supply

PHONE:

716/643-4262

AND:

David Florin

(NUS)

DISCUSSION:

Contacted Mr Woody to inquire on the water supply of Wheatfield and surrounding area. Mr Woody stated that most residents receive water from Niagara County Water that is taken from the Niagara at East Branch on Grand Island. Although most residents obtain their water through the Niagara County Water, there are some residents who may take well water.

ACTION ITEMS:

REFERENCE NO. 14

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYS INDUSTRIAL INSPECTION
AND
STATUS REPORT FORM

Company Name : CARBORUNDUM COMPANY
* Permit No. : NY0001716
Location : WILKENTFIELD (T) NIAGARA COUNTY
Mailing Address : COATED ABRASIVES DIV.
P.O. Box 477
NIAGARA FALLS, N.Y.
14302
Date of Inspection: MAY 25, 1976
Date(s) of Previous Inspection(s): - NONE -
Previous Inspector(s):
Receiving Waters: CAYUGA CREEK
W.Q. Classification: D
Weather Condition: CLOUDY 60°F

Company Representative(s), Title (s):

JERRY MCGEE - PLANT ENGINEER

Number of Discharges Reported: 1

Number of Discharges Observed: 1 } one discharge from lagoon. 7 discharges from plant property to the lagoon

Action Taken or Planned on Unreported Discharges:

* No permit issued. Draft permit prepared May 3, 1976

(1) PROCESS

- (1) ABRASIVE PRODUCTS OF PAPER & CLOTH
(2) MANUFACTURE OF RESINS
(a) Industrial Process: 75,000 LBS AVE, 13600 LBS (AVE) ABRASIVES
(b) Reported Production: AVERAGE THE SAME. SOME VARIATION WITH MARKET
(c) Current Production: + 25%
(d) Rated Production: PAPER-CLOTH-FIBER, ABRASIVE GRAMS - ANIMAL GLUES
(e) Raw Materials Used: PHENOLIC RESINS
(f) What process modification, expansions, etc. have been made that would either increase or decrease raw waste loads, water usage, etc. that have not been previously reported:
NONE - UPDATED APPLICATION TO D.I.R 3/17/76

- (g) Industrial process flow diagram indicating wastewater sources (attach copy if on file and verify with company):
Process waste water is discharged to the Niagara Falls (N.Y.) sanitary sewage system after settling.
(h) Continuity of Operation: Batch Semi-Continuous
X Continuous

(2) EFFLUENT LIMITATIONS VIOLATIONS (Based upon Self-Monitoring Data)

Discharge No.	Parameter	Permit Limitation	Reported Discharge	Date/Period of Violation

N/A NO PERMIT ISSUED TO DATE

(2.1) EFFLUENT DISCHARGE NO. 001

- (a) Wastewater Flow: UNKNOWN - VARIES FROM 0.07 TO .163 MGD
 (b) Measuring Device used for Flow: NONE
 (c) Wastewater Characteristics: NON CONTACT COOLING WATER, BOILER & COOLING TOWER
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company): NONE
 WATER DISCHARGES TO AN ~ 2 ACRE LAGOON - OVERFLOW ENTERS STORM SEWER
 ~ 6200' TO CREEK

- (e) Appearance of Effluent(s):
- | | | | |
|----------------------|--------|-------------|------|
| (1) visible oil | NO | (5) color | LESS |
| (2) foam | NO | (6) temper- | |
| (3) floating solids | NO | ature | 62 |
| (4) Suspended Solids | NO | (7) Odor | YES |
| (1) visible oil | NO | (8) other | |
| (2) foam | NO | (6) color | LESS |
| (3) floating solids | NO | (7) temper- | 54 |
| (4) turbidity | SLIGHT | (8) odor | NO |
| (5) sludge deposits | | (9) other | |
- (f) Appearance of Receiving waters:
 SLIGHT SWEET SMELL TO LAGOON, POSSIBLY A PAVEMENT TYPE SMELL OR POSSIBLY A FLOOR CLEANER
 RECEIVING STREAM ACCESSIBLE
 ~ 1 MILE UPSTREAM

(2.2) EFFLUENT DISCHARGE NO.

- (a) Wastewater Flow:
 (b) Measuring Device used for Flow:
 (c) Wastewater Characteristics:
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company):

Picture Taken:

- (e) Appearance of Effluent(s):
- | | | | |
|----------------------|--|-------------|--|
| (1) visible oil | | (4) color | |
| (2) foam | | (6) temper- | |
| (3) floating solids | | ature | |
| (4) suspended solids | | (7) odor | |
| (1) visible oil | | (8) other | |
| (2) foam | | (6) color | |
| (3) floating solids | | (7) temper- | |
| (4) turbidity | | ature | |
| (5) sludge deposits | | (8) odor | |
| | | (9) other | |
- (f) Appearance of Receiving waters:

(2.3) EFFLUENT DISCHARGE NO.

- (a) Wastewater Flow:
 (b) Measuring Device used for Flow:
 (c) Wastewater Characteristics:
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company):

- (e) Appearance of Effluent(s):
- | | | | |
|----------------------|--|-------------|--|
| (1) visible oil | | (5) color | |
| (2) foam | | (6) temper- | |
| (3) floating solids | | ature | |
| (4) suspended solids | | (7) odor | |
| (1) visible oil | | (8) other | |
| (2) foam | | (6) color | |
| (3) floating solids | | (7) temper- | |
| (4) turbidity | | ature | |
| | | (8) odor | |
- (f) Appearance of Receiving waters:

(3) COMPLIANCE

- (a) Is company complying with schedule of compliance? *N/A*
- (b) What is the current projection of the company regarding compliance with future dates in Compliance Schedule? *NO PERMIT ISSUED*
- (c) Is company complying with any additional compliance requirements such as a special report submittal to the proper regulatory agency?
- (d) Has company notified the proper regulatory agency of any non-compliance with permit conditions?
- *(e) Has company requested modification of any permit conditions other than permit sampling schedules?
- *(f) Are any modifications appropriate?

(4) SELF-MONITORING PROGRAM

- (a) Does quantity of reported self-monitoring data and signing official comply with requirements of permit?
N/A NO PERMIT ISSUED
- (b) What is the apparent quality of plant records that are required under the conditions of the permit?
- (c) If net values are applicable, is the surface water intake sampled and analyzed?
- (d) Is there any additional monitoring being performed by the plant that has not been reported? If yes, what parameters and frequency is involved and what conclusions can be drawn from data?
- (e) Do sampling locations appear to be adequate to obtain representative samples?
FOOT APPEARS ADEQUATE
- (f) Has company identified effluent sampling point used for each discharge pipe by providing a sketch of flow diagram?
- (g) How frequently and accurately is continuous monitoring equipment calibrated, and how well is the equipment maintained?

NO FLOW AT CURRENT

- $n/2$

- ANALYSIS WOULD BE DONE BY THE CARBONUMIN CO. RESEARCH & DEVELOPMENT LAB AT NIAGARA FALLS

- COMPANY REVIEWING DRAFT PERMIT

- (5) MISCELLANEOUS

- yes

Aldrin	_____
Dieldren	_____
Benzidine	_____
Cadmium	_____
Cyanide	_____
DDD (TDE)	_____

DDE

DDT'

Endrin

Mercury

Polychlorinated biphenyls

Toxaplane

* Sludge and sludges from settling tank receiving wastewater from the phorbic add operation are removed to a land fill site on the property. Effluent to the city or system.

SATISFACTORY EXCEPT FOR ONE PLANT NUMBER

- (e) Is there any discharge of unreported contaminated storm runoff?
NO
- (f) Is the treatment system maintained in good working order and operated efficiently?
N/A
- (g) What alternate power supply provisions exist for waste treatment facilities?
If none, what happens to the wastewater when there is a power failure?
- (h) Have all bypasses of waste treatment facilities been eliminated?
If not, why? If not, is flow monitoring installed in bypass?
- (i) Are there any obvious air emission, noise, radiation, pesticides, or solid wastes problems at the plant?
What are they?
yes - solid waste problem
If yes, send copy of this report to the appropriate personnel.
Nassau County Health Dept. solid waste engineer will inspect site and advise Company of required corrective action. DCE Regional solid waste engineer also advised. Condition plant
- (j) Does plant require a Spill Prevention Control Countermeasure Plan?
YES
- NOTE: SPCC plan is required if the permittee stores more than:
1. 1,320 gallons of oil above ground;
 2. 660 gallons of oil in a single container above ground;
 3. 42,000 gallons of oil underground.
- If so, is the plant approved by a licensed P.E.?
YES

SUMMARY AND RECOMMENDATIONSViolations and/or Problems

Unauthorized land fill site on the property.

Recommended Action

To be inspected by the
Nassau County Health Dept
& appropriate action taken

Comments

The Lagoon is not on Carborundum property. The lagoon is owned by the Nassau Counties Transportation Authority. There are 7 storm sewers from the Carborundum property entering the south side of the lagoon and one storm sewer draining the runway enters the north side of the lagoon.

There appears to be discharge from an unacceptable land fill site on the property, entering the storm sewer system discharging into the lagoon.

The company is checking on the feasibility of re-routing, boiler/cooling tower blowdown, zeolite and lime soda ash watersoftener back wash etc. to the City sanitary system.

See letter to Company dated June 9, 1976

Inspector Signature:

Paul E. FierstName: PAUL E. FIERSTTitle: SENIOR SANIT. ENG.Date: MAY 25, 1976

REFERENCE NO. 15

584 Delaware Ave., Buffalo, NY 14202

June 9, 1976

Peter A.A. Berli
XXXXXXXXXX

W.M. Friedman, P.E.
Acting Regional Director

Carborundum Company
Coated Abrasives Division
P.O. Box 477
Niagara Falls, New York 14302

Attn: Mr. Gerald F. McGee
Senior Maintenance Engineer

re: Plant Inspection of May 25, 1976

Gentlemen:

Your facility was inspected on May 25, 1976 by Mr. James Devald of the Niagara County Health Department and Mr. Paul Foersch of this office.

A copy of the draft SPDES permit No. NY 0001716 was given you for your company's comments.

The following items were noted during the inspection that will require corrective action:

1. The impounding reservoir that receives the company's storm water and cooling water had a brownish scum on the surface at the leeward end. There was an odor from the water at the discharge conduit and a slight phenol odor from the reservoir. An immediate investigation shall be undertaken to determine the source of the apparent contaminants in the reservoir.

2. The on site landfilling of the settling pond sludges and scums is unacceptable. There is evidence of these contaminants getting into the storm sewer system and then to the reservoir.

You will be contacted by the Niagara County Health Department regarding the proper operation or cessation and clean up of the landfill area.

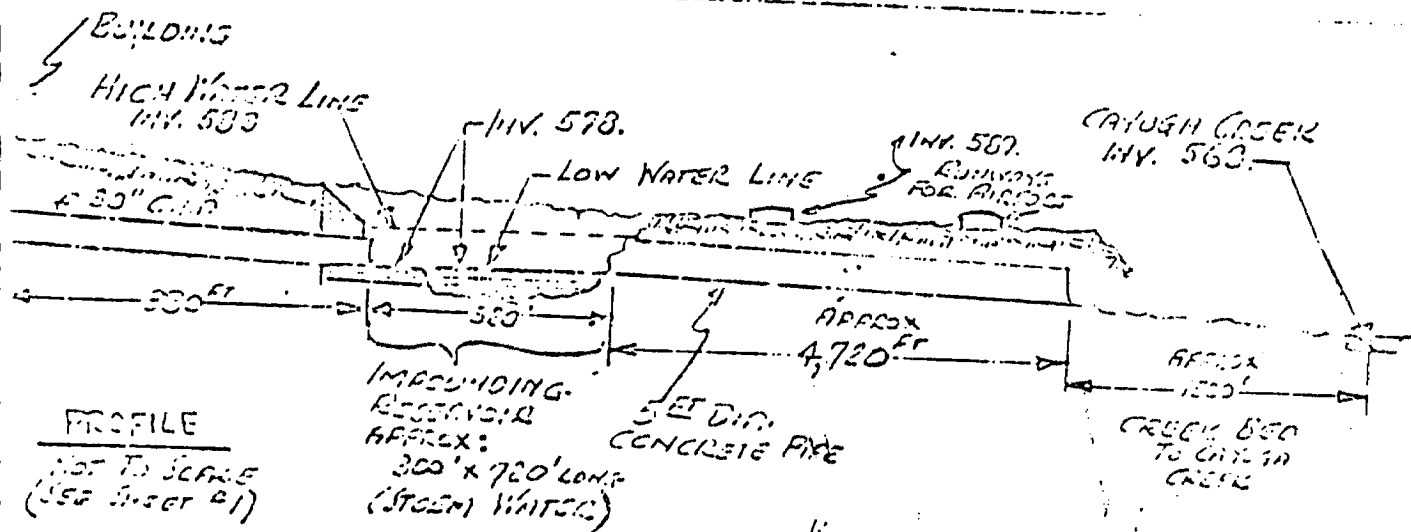
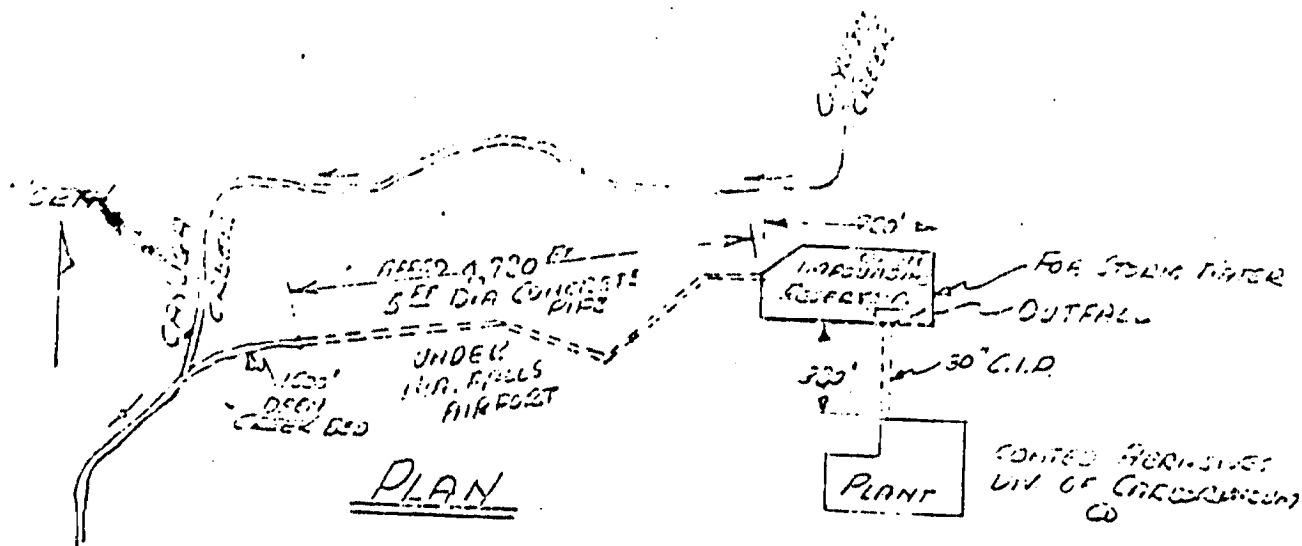
The Niagara County Health Department will be at your plant sometime during the week of June 7th to obtain samples of the reservoir effluent.

If you have any further questions and/or comments, please contact Mr. Paul Foersch of this office at 842-5041.

Very truly yours,

Lawrence G. Clara, P.E.
Sr. Sanitary Engineer

PEF/lb
cc: Niagara County Health Dept.



EXISTING DISCHARGE

IN: CAYUGA CREEK

AT: COATED PIGS-SHED DIVISION

COUNTY OF: NIAGARA, STATE - NEW YORK

APPLICATION BY: THE CARBORUNDUM CO

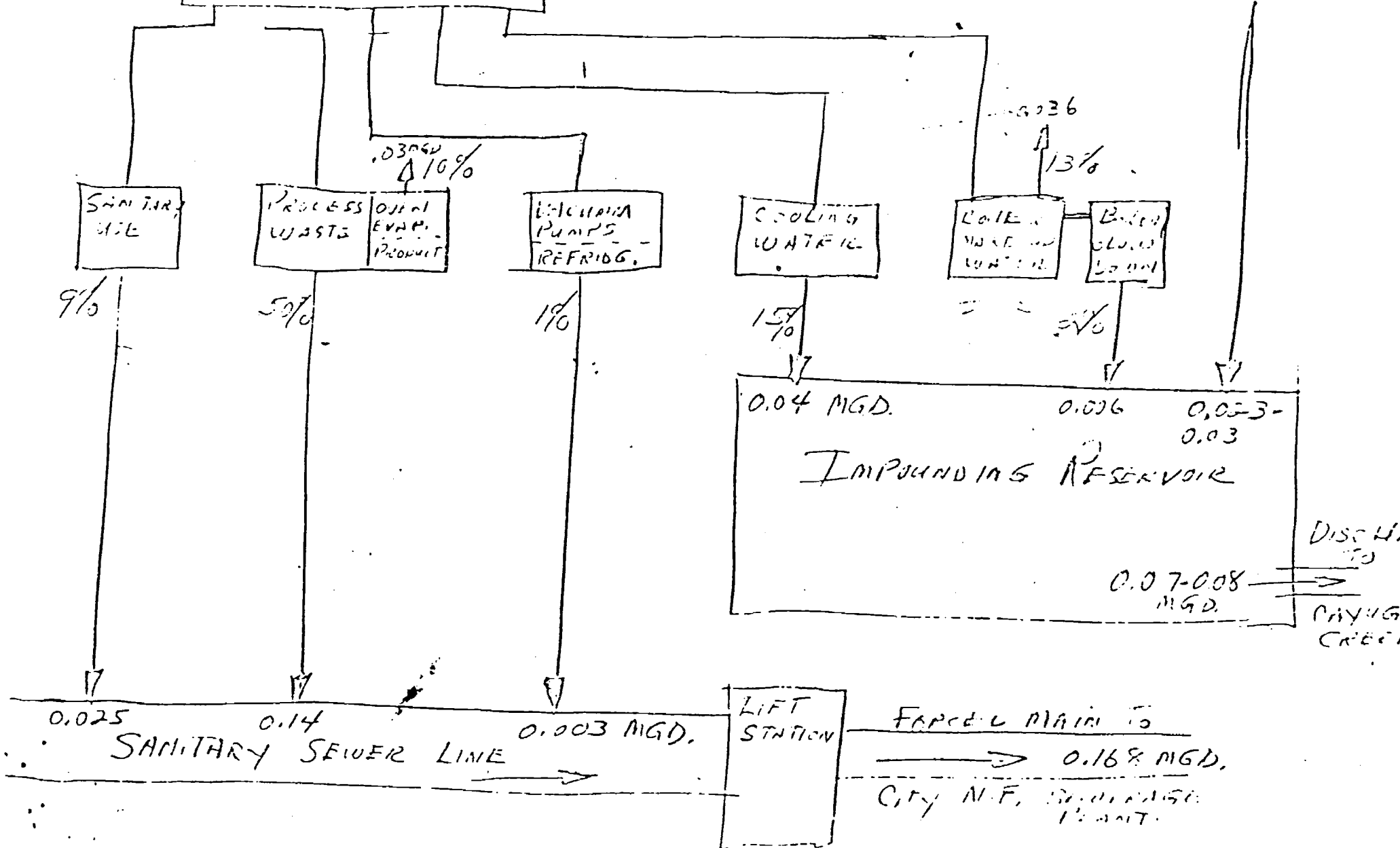
APPLICATION NO. - 000890

SHEET 2 OF 2 DEC. 1971

5/10/10
Jm.

PURCHASED WATER
FROM
CITY OF N. HAVEN, CT.
1975 - 0.278MGD.

STORM
WATER
(RAIN - SEWER)



RESIN PLANT

26 PRODUCTS

(CONT. ON
NEXT PAGE)

PHENOLICS

LIQUID
RESIN

SOLID
RESIN

RAW MAT'L.

PHENOL
FORMALIN
BARIUM HYDROXIDE
SODIUM HYDROXIDE
ETHYLENE GLYCOL
FURFURAL
DYE
ETHYLENE DIAMINE
THIO-UREA
SILICACOL

RAW MAT'L

PHENOL
FORMALIN
H₂SO₄
NaOH
ANILINE

REACTOR

REACTOR

PANNING

CRUSHING

PULVERIZING

PACKAGING

PACKAGING

SETTLING
BASIN

EFFLUENT TO
SANITARY SEWER

SLUDGE

LANDFILL

(CONT. ON
NEXT PAGE)

VARNISH

RAW MAT'L.
OITICIA OIL
PARAPHENYL PHENOLIC
H. SOL
DOWANOL EB
NEV. CHEM 100

REACTOR

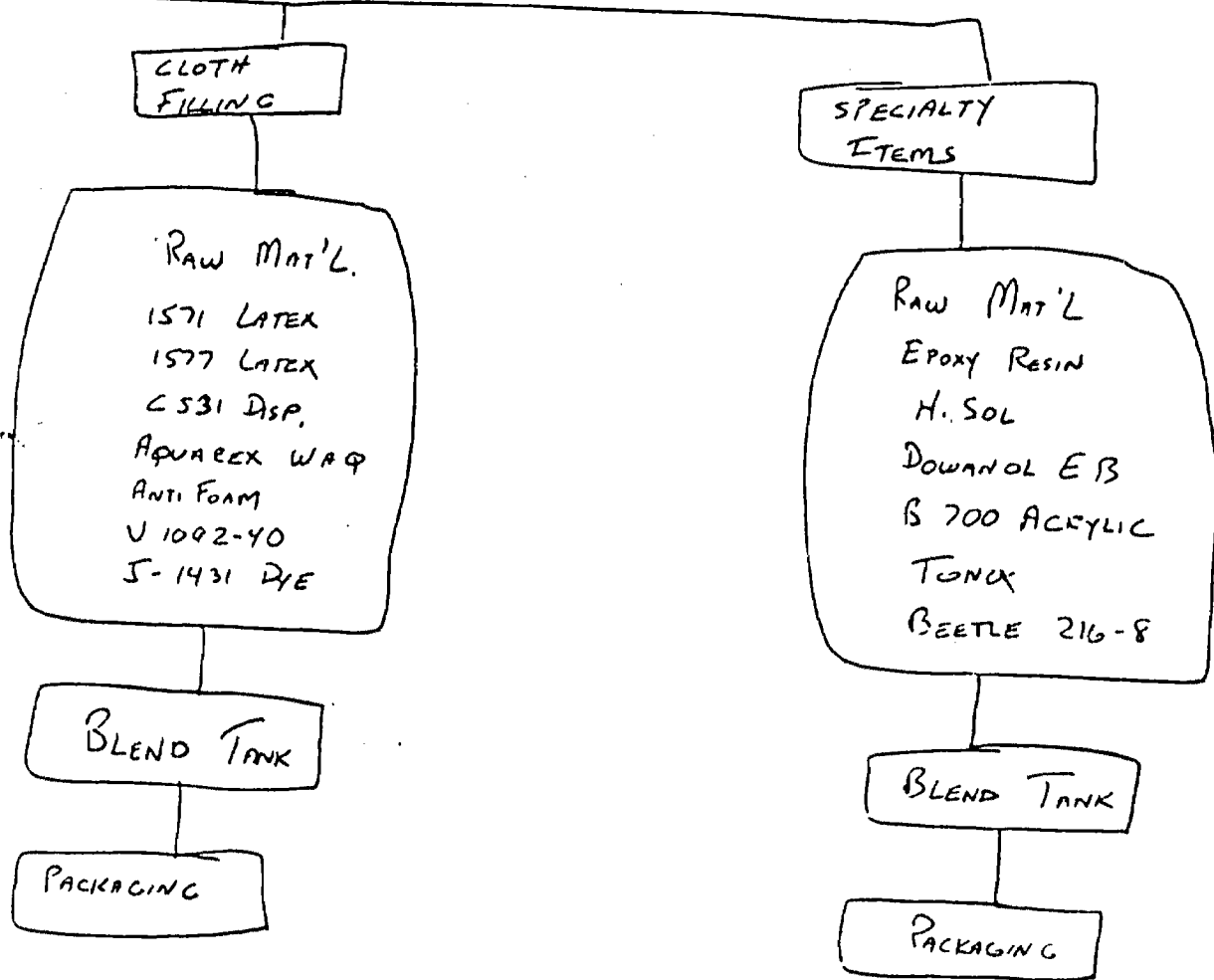
PACKAGING

UREA

RAW MAT'L.
UREA
UF-85 CONC.
FURFURAL ALCOHOL

REACTOR

PACKAGING



REFERENCE NO. 16

REFERENCE NO. 17

REFERENCE NO. 18

An outline map of New York State is positioned on the left side of the cover, with the title text overlaid on it.

New York State Atlas of Community Water System Sources 1982

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

NIAGARA COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
	Lockport City (See No 12, Erie Co).	25000	
1	Middleport Village.	.2000.	.Wells (Springs)
	Niagara County Water District (See No 13, Erie Co).	.48	
2	Niagara Falls City (See also No 14 Erie Co).	77384.	.Niagara River - East Branch
	North Tonawanda City (See No 16 Erie Co).	36000	
Non-Municipal Community			
3	Country Estates Mobile Village.	.28.	.Wells

ERIE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
	Akron Village (See No 1 Wyoming Co, Page 10).	3640	
1	Alden Village.	3460.	Wells
2	Angola Village.	8500.	Lake Erie
3	Buffalo City Division of Water.	357870.	Lake Erie
4	Coffee Water Company.	210.	Wells
5	Collins Water District #3.	704.	Wells
6	Collins Water Districts #1 and #2.	1384.	Wells
7	Erie County Water Authority (Sturgeon Point Intake).	375000.	Lake Erie
8	Erie County Water Authority (Van DeWater Intake).	NA.	Niagara River - East Branch
9	Grand Island Water District #2.	9390.	Niagara River
10	Holland Water District.	1670.	Wells
11	Lawtons Water Company.	138.	Wells
12	Lockport City (Niagara Co).		Niagara River - East Branch
13	Niagara County Water District (Niagara Co).		Niagara River - West Branch
14	Niagara Falls City (Niagara Co).		Niagara River - West Branch
15	North Collins Village.	1500.	Wells
16	North Tonawanda City (Niagara Co).		Niagara River - West Branch
17	Orchard Park Village.	3671.	Pipe Creek Reservoir
18	Springville Village.	4169.	Wells
19	Tonawanda City.	18538.	Niagara River - East Branch
20	Tonawanda Water District #1.	91269.	Niagara River
21	Wanakah Water Company.	10750.	Lake Erie

Non-Municipal Community			
22	Aurora Mobile Park.	125.	Wells
23	Bush Gardens Mobile Home Park.	270.	Wells
24	Circle B Trailer Court.	50.	Wells
25	Circle Court Mobile Park.	125.	Wells
26	Creekside Mobile Home Park.	120.	Wells
27	Donnelly's Mobile Home Court.	99.	Wells
28	Gowanda State Hospital.	NA.	Clear Lake
29	Hillside Estates.	160.	Wells
30	Hunters Creek Mobile Home Park.	150.	Wells
31	Knox Apartments.	NA.	Wells
32	Maple Grove Trailer Court.	72.	Wells
33	Millgrove Mobile Park.	100.	Wells
34	Perkins Trailer Park.	75.	Wells
35	Quarry Hill Estates.	400.	Wells
36	Springville Mobile Park.	114.	Wells
37	Springwood Mobile Village.	132.	Wells
38	Taylor's Grove Trailer Park.	39.	Wells
39	Valley View Mobile Court.	42.	Wells
40	Villager Apartments.	NA.	Wells

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

This is a detailed black and white map of the Buffalo, New York area. The map shows the Niagara River flowing from the top left towards the center, with Niagara Falls located just south of the river. The city of Buffalo is prominently featured in the center, with a dense network of streets and a complex railway system. Surrounding Buffalo are various towns and villages, including Tonawanda, Cheektowake, and Tonawanda. The map also shows the surrounding counties, including Erie, Cheektowake, and Tonawanda. A scale bar at the bottom indicates a scale of 1:250,000, and a north arrow is located in the bottom right corner. The map is labeled with numerous place names, including Buffalo, Tonawanda, Cheektowake, and Tonawanda.

REFERENCE NO. 19

CONTROL NO.:

02-9007-26

DATE:

9/7/90

TIME:

11:20 AM

DISTRIBUTION:

Carborundum - Abrasives Division
Wheatfield, N.Y.

BETWEEN:

David Leemhuis, Engineer at
Water Program

OF:

NYSDEC
Region 9
Buffalo

PHONE:

(716) 847-4600

AND:

David Florin

(NUS)

DISCUSSION:

Called Mr. Leemhuis concerning SPEDES permit and general update on Carborundum side. Mr. Leemhuis informed me that Carborundum has a SPEDES NY-001716 permit that was issued 5/1/85 to 5/1/90. The company is currently under consideration for renewal. Mr. Leemhuis stated that while the company has had past problems with phenol discharges a permit will probably be granted. He believes that the landfill was probably capped effectively but the whole area may be contaminated due to past production activities. Contamination is ultimately flowing into impounding basin, which is probably not lined. Impounding reservoir is actually a swamp with plenty of bulrushes, frogs, etc. The

ACTION ITEMS:

Page 1 of 2

2 of 2

CONTROL NO.:

02-9007-26

DATE:

9/7/90

TIME:

11:20 AM

DISTRIBUTION:

Carborundum - Abrasives Division
Wheatfield, N.Y.

BETWEEN:

David Leenhuis, Engineer at
Water Program

OF:

NYSDEC
Region 9
Buffalo

PHONE:

(716) 847-4600

AND:

(NUS)

DISCUSSION:

depth of the lagoon does not exceed
"ankle deep". The plant is currently
operating and employs anywhere from
50 - 200 people.

ACTION ITEMS:

page 2 of 2

REFERENCE NO. 20

REFERENCE NO. 21

CONTROL NO.:

02-9007-26

DATE:

11/9/90

TIME:

1156

DISTRIBUTION:

Carborundum Abrasives Co.

BETWEEN:

Mike Wilkinson

Senior
Aquatic
Biologist

OF:

Region 9
NYSDEC

PHONE:

(761) 847-4600

AND:

David Florin

(NUS)

DISCUSSION:

Contacted the NYSDEC Region 9 to obtain fishery information on the Niagara river. Mr. Wilkinson informed me that the upper Niagara is a major Fishery of trout and salmon. Species that inhabit the Niagara include: rainbow trout, brown trout, lake trout, Coho trout, Shinook trout, Atlantic Salmon and Pink salmon. Some species naturally reproduce in waterway, but many are stocked. The upper Niagara (from falls to Lake Ontario) is considered to be in top 10 of most fished water by the New York State Angler Survey, April 1990. Magnitude of Fishery may be considerably larger since Canadian Fishermen are not taken into consideration.

ACTION ITEMS:

REFERENCE NO. 22

CONTROL NO.:

02-9007-26

DATE:

11/9/90

TIME:

1407

DISTRIBUTION:

Carborundum - Abrasives Div

BETWEEN:

Donna Kierfz, Water Dept

OF:

NYSDEC
Region 9 Buffalo

PHONE:

(716) 847-4600

AND:

David Florin

(NUS)

DISCUSSION:

Contacted Region 9, NYS DEC to obtain flow rate information on Niagara river. Ms. Kierfz informed me that the flow of the Niagara river averages 220,000 cfs.

ACTION ITEMS:

REFERENCE NO. 23

CONTROL NO.:

02-9007-26

DATE:

11/9/90

TIME:

1414

DISTRIBUTION:

Carbonium - Abrasives

BETWEEN:

Ed Gustek

Water
Dept

OF:

US Corp of
Engineers, Buffalo

PHONE:

716 1876-5454

AND:

David Florin

(NUS)

DISCUSSION:

Contacted Corp of Engineers to obtain flow rate of Cayuga Creek. Mr. Gustek informed me that the peak discharge in a ten year period was 950 cfs at a point just past the Niagara city boundary.

ACTION ITEMS:

REFERENCE NO. 24

GRAPHICAL EXPOSURE MODELING SYSTEM
(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION

Task No. 3-2

Contract No. 68023970

Project Officer: Russell Kinerson

Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION
8401 Corporate Drive
Landover, Maryland 20785

Submitted: December 1, 1986

CARBORUNDUM-ABRASIVES DIVISION

LATITUDE 43: 6:25 LONGITUDE 78:55:56 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	10279	22107	15401	47787
RING TOTALS	0	0	0	10279	22107	15401	47787
I		30.4	703				48,520

CARBORUNDUM-ABRASIVES DIVISION

LATITUDE 43: 6:25 LONGITUDE 78:55:56 1980 HOUSING

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	3662	7516	5169	16347
RING TOTALS	0	0	0	3662	7516	5169	16347
	0	8	185				16,540

House Count | Population*

0-.4 km	0	0
.4-.8	8	30.4
.8-1.6	185	185

REFERENCE NO. 25

CONTROL NO.:

02-9007-26

DATE:

11/8/90

TIME:

1637

DISTRIBUTION:

Carborundum - Abrasives

BETWEEN:

Ken Roblee, Senior Wildlife Biologist

OF:

Region 9, Buffalo
NYSDEC

PHONE:

716 847-4600

AND:

David Florin

(NUS)

DISCUSSION:

Contacted Region 9, NYSDEC to obtain information on threatened or endangered fauna or flora within four mile radius of site. Mr. Roblee informed me that there are no rare species listed in the area under the Natural Heritage map or Significant Habitat map. Mr. Roblee also stated that there are areas of wetlands in the area but are not known to support any endangered or threatened species.

ACTION ITEMS:

REFERENCE NO. 26



POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

NYA 480507853

REGION	SITE NUMBER (to be assigned by HQ)
II	000002080

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and 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 Carborundum		B. STREET (or other identifier) Walmore Road	
C. CITY Wheatfield	D. STATE NY	E. ZIP CODE 14302	F. COUNTY NAME Niagara
G. OWNER/OPERATOR (if known) 1. NAME Gerald F. McGee		2. TELEPHONE NUMBER	
H. TYPE OF OWNERSHIP ☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN			
I. SITE DESCRIPTION The site contains two separate waste disposal areas. A concrete slab storage site for off-spec products and abrasive sludges and an open dump containing solidified resins, floor sweepings, waste fillers (ca. Co., clays, animal glue with phenol) that has been graded and covered. (Infillative)			
J. HOW IDENTIFIED (i.e., citizen's complaints, OSHA citations, etc.) NYS-DEC		K. DATE IDENTIFIED (mo., day, & yr.) 4/16/80	
L. PRINCIPAL STATE CONTACT 1. NAME Peter Buechi		2. TELEPHONE NUMBER (716) 842-5826	

II. PRELIMINARY ASSESSMENT (complete this section last)

A. APPARENT SERIOUSNESS OF PROBLEM ☐ 1. HIGH ☒ 2. MEDIUM ☐ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN	
B. RECOMMENDATION ☐ 1. NO ACTION NEEDED (no hazard) ☐ 2. IMMEDIATE SITE INSPECTION NEEDED a. TENTATIVELY SCHEDULED FOR: _____ b. WILL BE PERFORMED BY: _____ ☒ 3. SITE INSPECTION NEEDED a. TENTATIVELY SCHEDULED FOR: _____ b. WILL BE PERFORMED BY: _____ NYSDEC ☐ 4. SITE INSPECTION NEEDED (low priority)	

C. PREPARER INFORMATION		
1. NAME Raymond Basso	2. TELEPHONE NUMBER (212) 264-1574	3. DATE (mo., day, & yr.) 11/17/81

III. SITE INFORMATION

A. SITE STATUS ☒ 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.) ☒ 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.)	
B. IS GENERATOR ON SITE? ☐ 1. NO ☒ 2. YES (specify generator's four-digit SIC Code): _____	
C. AREA OF SITE (in acres)	D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES 1. LATITUDE (deg.-min.-sec.) 2. LONGITUDE (deg.-min.-sec.)
E. ARE THERE BUILDINGS ON THE SITE? ☐ 1. NO ☒ 2. YES (specify): _____	

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

phenols

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

limited monitoring well analysis for phenolics shows contamination at bedrock overburden interface. High phenol value in storm sewers indicate that phenolic resins are being washed into nearby catch basin

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			runoff from active storage site
8. CONTAMINATION OF SURFACE WATER	X			runoff from active storage site
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL	X			
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS	X			high phenol value in storm sewers
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER (specify):				



POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION

 REGION II SITE NUMBER NY000002080

NOTE: The initial identification of a potential site or incident should not be interpreted as a finding of illegal activity or confirmation that an actual health or environmental threat exists. All identified sites will be assessed under the EPA's Hazardous Waste Site Enforcement and Response System to determine if a hazardous waste problem actually exists.

A. SITE NAME <u>CARBORUNDUM - ABRASIVE DIVISION</u>		B. STREET (or other identifier) <u>WALMORE ROAD</u>	
C. CITY <u>WHEATFIELD</u>		D. STATE <u>N.Y.</u>	E. ZIP CODE
G. OWNER/OPERATOR (if known) 1. NAME <u>CARBORUNDUM</u>		F. COUNTY NAME <u>NIAGARA</u>	
H. TYPE OF OWNERSHIP (if known) ☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN		2. TELEPHONE NUMBER	

I. SITE DESCRIPTION
INACTIVE, OPEN DUMP - ACTIVE LIFE FROM 1968 TO 1976.
THIS SITE HAS BEEN GRADED AND COVERED

J. HOW IDENTIFIED (i.e., citizen's complaints, OSHA citations, etc.) <u>HAZARDOUS WASTE DISPOSAL SITES IN NEW YORK STATE (LIST OF 6/1980)</u>	K. DATE IDENTIFIED (mo., day, & yr.) <u>4/16/80</u>

L. SUMMARY OF POTENTIAL OR KNOWN PROBLEM

SUSPECTED HAZARDOUS WASTES:
PHENOLS - 800-1600 LBS. PARTIALLY SOLIDIFIED AND SOLIDIFIED RESINS,
CALCIUM CARBONATE & OTHER FILLERS, CLAYS, ANIMAL GLUE WITH
FREE PHENOLS - } TOTAL
FLOOR SLEEPINGS. } 400 TONS

ENVIRONMENTAL PROBLEMS: NO SIGNIFICANT QUANTITIES OF TOXIC MATERIALS HAVE BEEN DISPOSED OF AT THIS SITE.

HEALTH PROBLEMS: NO APPARENT HEALTH HAZARD

M. PREPARER INFORMATION		
1. NAME <u>GEORGE B. RADAN</u>	2. TELEPHONE NUMBER <u>212 264-1576</u>	3. DATE (mo., day, & yr.) <u>11/12/80</u>

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

- ☐ 1. NPDES PERMIT ☐ 2. SPCC PLAN ☒ 3. STATE PERMIT (specify): SPDES
☐ 4. AIR PERMITS ☐ 5. LOCAL PERMIT ☐ 6. RCRA TRANSPORTER
☐ 7. RCRA STORER ☐ 8. RCRA TREATER ☐ 9. RCRA DISPOSER
☐ 10. OTHER (specify): _____

B. IN COMPLIANCE?

- ☒ 1. YES ☐ 2. NO ☐ 3. UNKNOWN

4. WITH RESPECT TO (list regulation name & number): _____

VIII. PAST REGULATORY ACTIONS

- ☐ A. NONE ☐ B. YES (summarize below)

IX. INSPECTION ACTIVITY (past or on-going)

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

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

X. REMEDIAL ACTIVITY (past or on-going)

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

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

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

REFERENCE NO. 27

STATUS REPORT FORM

Action Taken or Planned on Unreported Discharges:

92-15-1 (7/75)

(2.1) EFFLUENT DISCHARGE NO. 001

- (a) Wastewater Flow: 0.2 MGD
 (b) Measuring Device used for Flow: GURLEY METER
 (c) Wastewater Characteristics: NON-CONTACT COOLING WATER
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company): NONE

(e) Appearance of Effluent(s):

(1) visible oil	NO	(5) color	Brown
(2) foam	NO	(6) Temperature	
(3) floating solids	NO	(7) Odor	NO
(4) Suspended Solids	YES	(8) other	
(1) visible oil	NO	(6) color	Brown
(2) foam	NO	(7) temperature	
(3) floating solids	NO	(8) odor	NO
(4) turbidity	YES	(9) other	
(5) sludge deposits	NO		

NIAGARA RIVER WATER IS BROWN & TURBID
 ALONG THE SHORE FROM RECENT PRECIPITATION
 & WINDY. COOLING WATER IS TAKEN FROM THE
 RIVER & THE

EFFLUENT HAS
 SAME APPEARANCE AS THE RIVER.

(f) Appearance of Receiving waters:

(2.2) EFFLUENT DISCHARGE NO. 002

- (a) Wastewater Flow: 2.0 MGD
 (b) Measuring Device used for Flow: GURLEY METER
 (c) Wastewater Characteristics: NON-CONTACT COOLING WATER
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company): NONE

Picture Taken:

(e) Appearance of Effluent(s):

(1) visible oil	NO	(5) color	Brown
(2) foam	NO	(6) Temperature	
(3) floating solids	NO	(7) Odor	NO
(4) suspended solids	YES	(8) other	
(1) visible oil		(6) color	
(2) foam		(7) temperature	
(3) floating solids		(8) odor	
(4) turbidity		(9) other	
(5) sludge deposits			

(f) Appearance of Receiving waters:

(2.3) EFFLUENT DISCHARGE NO. 003

- (a) Wastewater Flow: 1.0 MGD
 (b) Measuring Device used for Flow: GURLEY METER
 (c) Wastewater Characteristics: BACK WASH WATER FROM RIVER WATER INTAKE SCREENS
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company): NONE

(SOLIDS TO A LANDFILL.)

(e) Appearance of Effluent(s):

(1) visible oil	NO	(5) color	Brown
(2) foam	NO	(6) Temperature	
(3) floating solids	NO	(7) Odor	NO
(4) suspended solids	YES	(8) other	

(f) Appearance of Receiving waters:

(1) visible oil		(6) color	
(2) foam		(7) temperature	

(2.1) EFFLUENT DISCHARGE NO. 004

- (a) Wastewater Flow: 2.5 MGD
 (b) Measuring Device used for Flow: PARSHALL FLOWMETER (TRI-AD SCIENCES)
 (c) Wastewater Characteristics: WASHING & GRADING OF ABRASIVE GRITS
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company):

SETTLING BASINS

- (e) Appearance of Effluent(s): (1) visible oil NO (5) color WHITIS
 (2) foam NO (6) Temper-
 (3) floating solids NO ature 55°
 (4) Suspended Solids YES (7) Odor NONE
 (f) Appearance of Receiving waters: (1) visible oil --- (6) color ---
 (2) foam --- (7) temper-
 (3) floating solids --- ature ---
 (4) turbidity --- (8) odor ---
 (5) sludge deposits --- (9) other ---

(2.2) EFFLUENT DISCHARGE NO.

- (a) Wastewater Flow: _____
 (b) Measuring Device used for Flow: _____
 (c) Wastewater Characteristics: _____
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company): _____

Picture Taken:

- (e) Appearance of Effluent(s): (1) visible oil --- (5) color ---
 (2) foam --- (6) temper-
 (3) floating solids --- ature ---
 (4) suspended solids --- (7) odor ---
 (f) Appearance of Receiving waters: (1) visible oil --- (6) color ---
 (2) foam --- (7) temper-
 (3) floating solids --- ature ---
 (4) turbidity --- (8) odor ---
 (5) sludge deposits --- (9) other ---

(2.3) EFFLUENT DISCHARGE NO.

- (a) Wastewater Flow: _____
 (b) Measuring Device used for Flow: _____
 (c) Wastewater Characteristics: _____
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company): _____

- (e) Appearance of Effluent(s): (1) visible oil --- (5) color ---
 (2) foam --- (6) temper-
 (3) floating solids --- ature ---
 (4) suspended solids --- (7) odor ---
 (f) Appearance of Receiving waters: (1) visible oil --- (6) color ---
 (2) foam --- (7) temper-
 (3) floating solids --- ature ---
 (4) turbidity --- (8) odor ---

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Page 3 of 6

Inspection & Status

Permit No.

NY 0001376

(3) COMPLIANCE

- (a) Is company complying with schedule of compliance? *NO COMPLIANCE*
- (b) What is the current projection of the company regarding compliance with future dates in Compliance Schedule? *SCHEDULE IN PERMIT*
NEW EFFLUENT LIMITS WILL BE DETERMINED FOR OUTFALL #004 AFTER DISCHARGE TO STP SEE ITEM A.2 PAGE 4 OF PERMIT.
- (c) Is company complying with any additional compliance requirements such as a special report submittal to the proper regulatory agency? *N/A*
- (d) Has company notified the proper regulatory agency of any non-compliance with permit conditions? *N/A AS COMPANY HAS NO COMPLIANCE*
SCHEDULE PERSONS FOR NON-COMPLIANCE OF SELF-MONITORING DATA SUBMITTED WITH SELF-MONITORING REPORTS
- *(e) Has company requested modification of any permit conditions other than permit sampling schedules? *NO*
- *(f) Are any modifications appropriate?

(4) SELF-MONITORING PROGRAM

- (a) Does quantity of reported self-monitoring data and signing official comply with requirements of permit? *NO*
YES
- (b) What is the apparent quality of plant records that are required under the conditions of the permit?
SATISFACTORY
- (c) If net values are applicable, is the surface water intake sampled and analyzed? *YES*
- (d) Is there any additional monitoring being performed by the plant that has not been reported? If yes, what parameters and frequency is involved and what conclusions can be drawn from data?
NO
- (e) Do sampling locations appear to be adequate to obtain representative samples? *SATISFACTORY*
- (f) Has company identified effluent sampling point used for each discharge pipe by providing a sketch of flow diagram?
YES
- (g) How frequently and accurately is continuous monitoring

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Page 4 of 6

Inspection & Status

Permit No:

NY 0001376

In your judgement, do sampling procedures, frequency and type of sample typify plant's daily discharge (i.e. are maximum production periods, batch discharges, etc. reflected in monitoring data)? *SATISFACTORY*

- (i) Does plant perform its own analysis? *YES*
If not, what laboratory is analysis contracted to?
If yes, what is the appearance of plant's laboratory?

SATISFACTORY

- (j) Do all sampling and analytical methods conform to the guidelines published pursuant to Section 304(g) of 1977 FWPCA?

YES

- (k) Has plant requested modification to permit sampling schedules?

NO

- (l) Are modifications appropriated? *NO*

(5) MISCELLANEOUS

- (a) Did the permit application truly represent conditions at the plant site? *FLOOR DUST & GRIT GETS INTO NON CONTACT COOLING WATER FROM GEAR TRENCH*

- (b) Are any of the following toxic pollutants or compounds containing them, being discharged that would require modification of the permit: No ☒ Yes ☐ (Check those Applicable)

Aldrin _____
Dieldren _____
Benzidine _____
Cadmium _____
Cyanide _____
DDD (TDE) _____

DDE _____
DDT _____
Endrin _____
Mercury _____
Polychlorinated biphenyls _____
Toxaplane _____

If yes, what modifications are necessary?

- (c) Is sludge being generated at plant? *YES*
If yes, is plant reporting on its disposal? *NO* (*PERMIT VIOLATION PART II ITEM A6*)
If sludge disposal is at plant site, is there any visual evidence or hazards associated with entry of pollutants into surface or ground waters? *NO*
If not at plant, where is the disposal site, and is it acceptable to regulatory agencies?

SETTLING FROM ABRASIVE GRITS ARE RECYCLED

INTAKE WATER SCREENINGS ETC. NIAGARA COUNTY LAND FILL

- (d) What is the appearance of plant grounds?

MINOR - ACCUMULATION OF DUST & GRIT ON GROUND

(ALSO SOLIDS REMOVED FROM INSULATION FIBER PLANT WASTE

(e) Is there any discharge of unreported contaminated storm runoff?
NO

(f) Is the treatment system maintained in good working order and operated efficiently? YES SETTLING BASINS ONLY

(g) What alternate power supply provisions exist for waste treatment facilities? N/A - TWO LOOP FEED SYSTEM

If none, what happens to the wastewater when there is a power failure? IF BOTH SOURCES OF POWER ARE LOST ALL OPERATIONS INCLUDING DISCHARGE OF WASTE WATER WOULD CEASE.

(h) Have all bypasses of waste treatment facilities been eliminated? YES

If not, why? If not, is flow monitoring installed in bypass?

(i) Are there any obvious air emission, noise, radiation, pesticides, or solid wastes problems at the plant? What are they? YES NONE - NEW AIR SCRUBBER INSTALLED AT BOILER

If yes, send copy of this report to the appropriate personnel. NOISE SCHEDULED FOR TEST MID-MAY.

BUILDING #86 (ALLO.) FURNACES HAS INTERMITTENT BAG COLLECTOR ALLOWING A 5-10 MINUTE BY PASS Plan? YES

NOTE: SPCC plan is required if the permittee stores more than:

1. 1,320 gallons of oil above ground;
2. 660 gallons of oil in a single container above ground;
3. 42,000 gallons of oil underground.

If so, is the plant approved by a licensed P.E.?

YES

LEACH HOUR. FACILITY UPGRADING REQUESTED BY NCHD AIR POLLUTION UNIT. COMPANY HAS OBTAINED AN APPROPRIATION FOR A CONTINUOUS OPERATING DUST COLLECTOR

SUMMARY AND RECOMMENDATIONSViolations and/or ProblemsRecommended Action

- 1) HIGH SUSPENDED SOLIDS IN OUTFALL #004 — MORE FREQUENT CLEANING OF SETTLING BASINS & IMPROVED HOUSEKEEPING SHOULD DECREASE THE DISCHARGE OF S.S. COMPANY IS EVALUATING THE USE OF A LAMELLA SETTLER
- 2) COMPANY IS NOT REPORTING ON SOLID WASTE DISPOSAL — COMPANY WILL REPORT ON DISPOSAL STARTING IN MAY
- 3) ~~Settling basins after furnace room discharge~~

Comments

COMPANY WILL BE INSTALLING A LAMELLA SETTLER WITHIN THE NEXT 6 MONTHS TO REMOVE SOLIDS FROM THE SILICON CARBIDE AREA PRIOR TO DISCHARGE TO CITY DIVERSION SEWER. IF IT FUNCTIONS AS EXPECTED, ADDITIONAL UNITS WILL BE INSTALLED TO REMOVE SOLIDS DISCHARGING TO OUTFALL #004.

THE INSULATION FIBER PLANT EXPECTS TO RECYCLE THEIR WASTE WATER IN THE NEAR FUTURE

SEE ATTACHED LETTER TO THE COMPANY.

Inspector Signature: Paul E. FierschName: PAUL E. FIERSCHETitle: SENIOR SANIT. ENGINEERDate: May 7, 1976

HAZARDOUS WASTE DISPOSAL SITES
REPORT FORMAT

Appendix C
47-15-11(2/80)

Priority Code: F (Appendix C)
Site Code: 093200712
Name of Site: Carborundum - Abrasive Div Region: 9
County: Niagara Town/City: Wheatfield
Street Address: Walmore Rd.

Status of Site Narrative:

This is a storage site on a concrete slab
for off-spec product and abrasive sludges
prior to disposal off site.

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

Estimated Size _____ Acres

Hazardous Wastes Disposed? Confirmed ☐ Suspected ☐

*Type and Quantity of Hazardous Wastes:

TYPE	QUANTITY (Pounds, drums, tons, gallons)
<u>None</u>	

*Use additional sheets if more space is needed.

Name of Current Owner of Site:
Address of Current Owner of Site:

47-15-11(2/80)

0932007-2

Time Period Site Was Used for Hazardous Waste Disposal:

_____, 19____ To _____, 1980

Is site Active ☒ Inactive ☐

(Site is inactive if hazardous wastes were disposed of at this site and site was closed prior to August 25, 1979)

Types of Samples: Air ☐ Groundwater ☐ None ☒
Surface Water ☐ Soil ☐

Remedial Action: Proposed ☐ Under Design ☐
In Progress ☐ Completed ☐

Nature of Action:

Status of Legal Action: _____ State ☐ Federal ☐

Permits Issued: Federal ☐ Local Government ☐ SPDES ☐
Solid Waste ☐ Mined Land ☐ Wetlands ☐ Other ☐

Assessment of Environmental Problems:

Not a disposal site

Assessment of Health Problems:

No apparent health hazard

Persons Completing this Form:

New York State Department of Environmental Conservation

Date _____

New York State Department of Health

Date _____

REFERENCE NO. 28

LEVEL: REG 1)
 SELECTION: REGION, STATE, SITE NAME
 SEQUENCE: ALL
 EVENTS: ALL

U.S. EPA SUPERFUND PROGRAM

** C E R C L I S **

LIST-8: SITE/EVENT LISTING

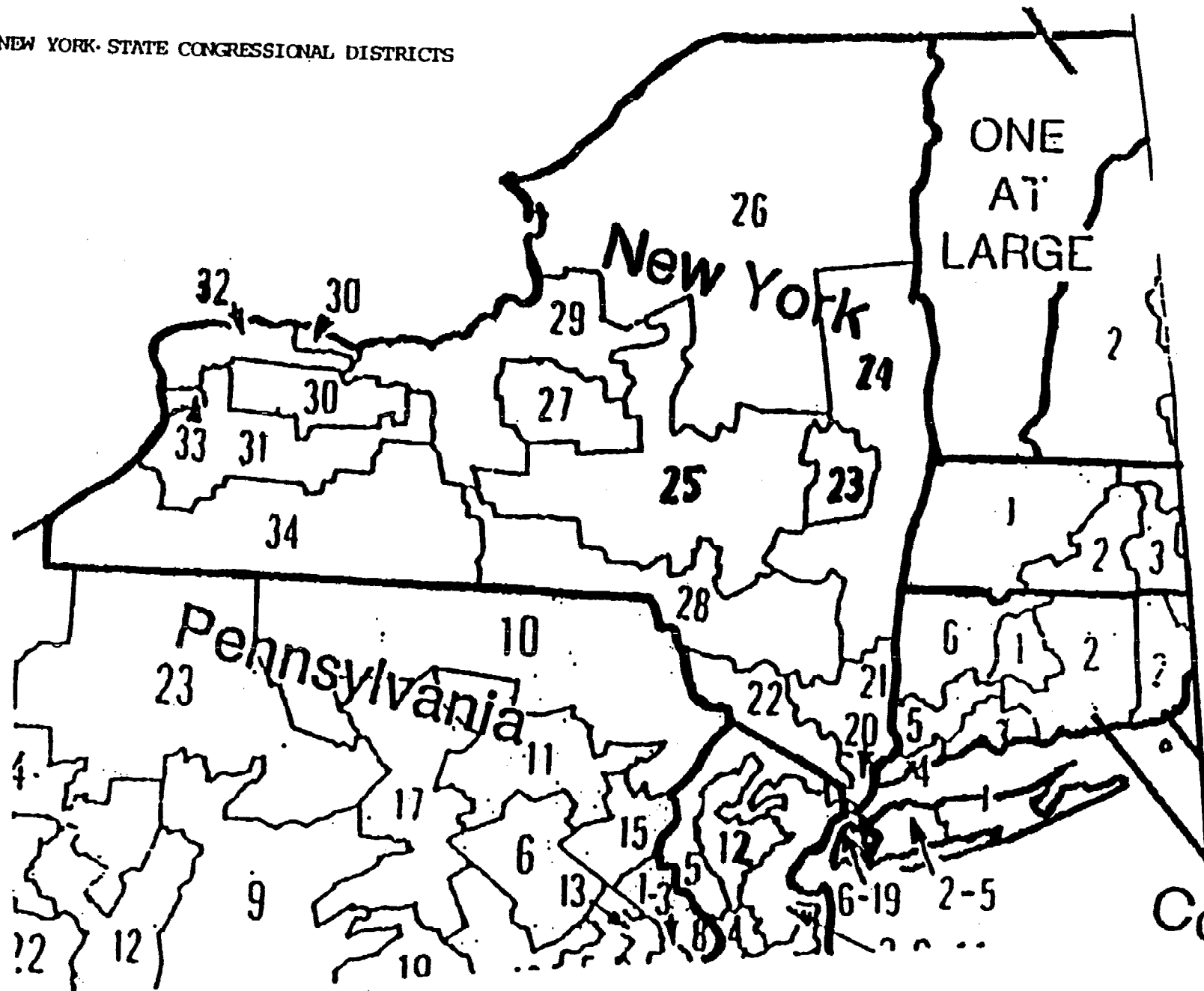
PAGE: 233
 RUN DATE: 08/09/90
 RUN TIME: 11:48:57

VERSION: 1

EPA ID NO.	SITE NAME STREET CITY COUNTY CODE AND NAME	STATE ZIP CONG DIST.	NFA. FLAG	OPRBLE UNIT	EVENT TYPE	ACTUAL START DATE	ACTUAL COMPL DATE	CURRENT EVENT LEAD
MYD980507842	CANAJOHARIE LF CARLISLE RD CANAJOHARIE 057 MONTGOMERY	NY 13317		00	DS1 PA1	06/15/87	04/01/80 06/18/87	EPA (FUND) EPA (FUND)
MYD986886190	CANASTOTA LANDFILL OLD ERIE CANAL AND BEEBE BRIDG TOWN OF LENOX 053 MADISON	NY 13032		00	DS1 PA1		11/01/89 12/01/89	STATE(FUND) STATE(FUND)
NYD009802380	CANNY TRUCKING 6-18 SPRING FOREST AVENUE BINGHAMPTON 007 BROOME	NY 13905		00	RV1	09/30/88	01/25/89	EPA (FUND)
NYD001367150	CANTOR BROTHERS INC ENGINEERS LANE FARMINGDALE 059 NASSAU	NY 11735		00	DS1 PA1 S11	09/01/84 09/01/84 09/01/83	09/01/84 09/01/84 09/01/83	STATE(FUND) STATE(FUND) STATE(FUND)
NYD002076222	CAPITAL DIST TOOL & DIE CO INC 22 PAINE ST GREEN ISLAND 083 RENSSELAER	NY 12183	NFA	00	DS1 PA1	06/15/87	05/01/81 06/18/87	EPA (FUND) EPA (FUND)
NYD000513366	CARBORUNDUM HYDE PARK BLVD NIAGARA FALLS 063 NIAGARA	NY 14301	NFA	00	DS1 PA1		04/01/80 12/30/87	EPA (FUND) EPA (FUND)
MYD980507867	CARBORUNDUM SOUTH OF BLD B9 NIAGARA FALLS 063 NIAGARA	NY 14301	NFA	00	DS1 PA1		04/16/80 12/21/87	STATE(FUND) STATE(FUND)
MYD980507883	CARBORUNDUM WALMORE RD WHEATFIELD 029 ERIE	NY 14150		00	DS1 PA1		04/01/80 11/01/81	EPA (FUND) EPA (FUND)

REFERENCE NO. 29

NEW YORK STATE CONGRESSIONAL DISTRICTS



Congressional District Identification—Continued
Table 1A. COUNTY SUBDIVISIONS—Continued

[illegible]

REFERENCE NO. 30

NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO.:

02-9007-26

DATE:

9/10/90

TIME:

11:50 AM

DISTRIBUTION:

Carborundum - Abrasives Division
Wheatfield, NY

BETWEEN:

Mr Willis Retzlaff Tax Assessor

OF:

Niagara Town Hall

PHONE:

(716) 694-6440

AND:

David Florin

(NUS)

DISCUSSION:

Contacted Tax office of Niagara to obtain block and lot number of Carborundum in Wheatfield. Informed that block # is 1 and lot # 9.2 (section 146.00). Mr Retzlaff informed me that Howard Koepper sold the company on August 4, 1983 to CA Acquisitions Co. CA Acquisitions Co. is the present owner while Carborundum - Abrasives Division is listed as the operator.

ACTION ITEMS:

REFERENCE NO. 31

CONTROL NO.:

02-9007-26

DATE:

11/28/90

TIME:

1422

DISTRIBUTION:

Carborundum Abrasives

BETWEEN:

Mr Leo Henry, Chief

OF:

Tuscarora
Indian Reservation

PHONE:

716 297-4990

AND:

David Florin

(NUS)

DISCUSSION:

Mr Leo Henry contacted me in response to a message I had left on answering machine earlier in day. I asked Mr Henry how many people were serviced by B public supply wells located in a trailer park inside the reservation. Mr Henry was familiar with the wells and informed me that those three wells serviced 50 trailers. Most of the trailers housed single people; Mr Henry stated that there could not be more than 100 people in park, an approximation of 50 was realistic.

D.F.

ACTION ITEMS:

REFERENCE NO. 32

WATER *in Environmental Planning*

Thomas Dunne

University of Washington

Luna B. Leopold

University of California, Berkeley



W. H. Freeman and Company
San Francisco

Water

Thomas

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The photograph on the dust jacket, taken near Williams, Colusa County, California, shows a valley typical of the Coast Range. The sinuous ephemeral stream is incised in the alluvium forming the valley flat. The dark areas in the swales and low spots are those producing saturated overland flow. Hortonian overland flow is probably the main runoff-producing process on the steep hillslopes.
Photograph on dust jacket is copyrighted by William A. Garnett.

Library of Congress Cataloging in Publication Data

Dunne, Thomas, 1943-
Water in environmental planning.

Includes bibliographies and indexes.

1. Environmental engineering. 2. Regional planning.
3. Hydrology. I. Leopold, Luna Bergere, 1915- joint author. II. Title.

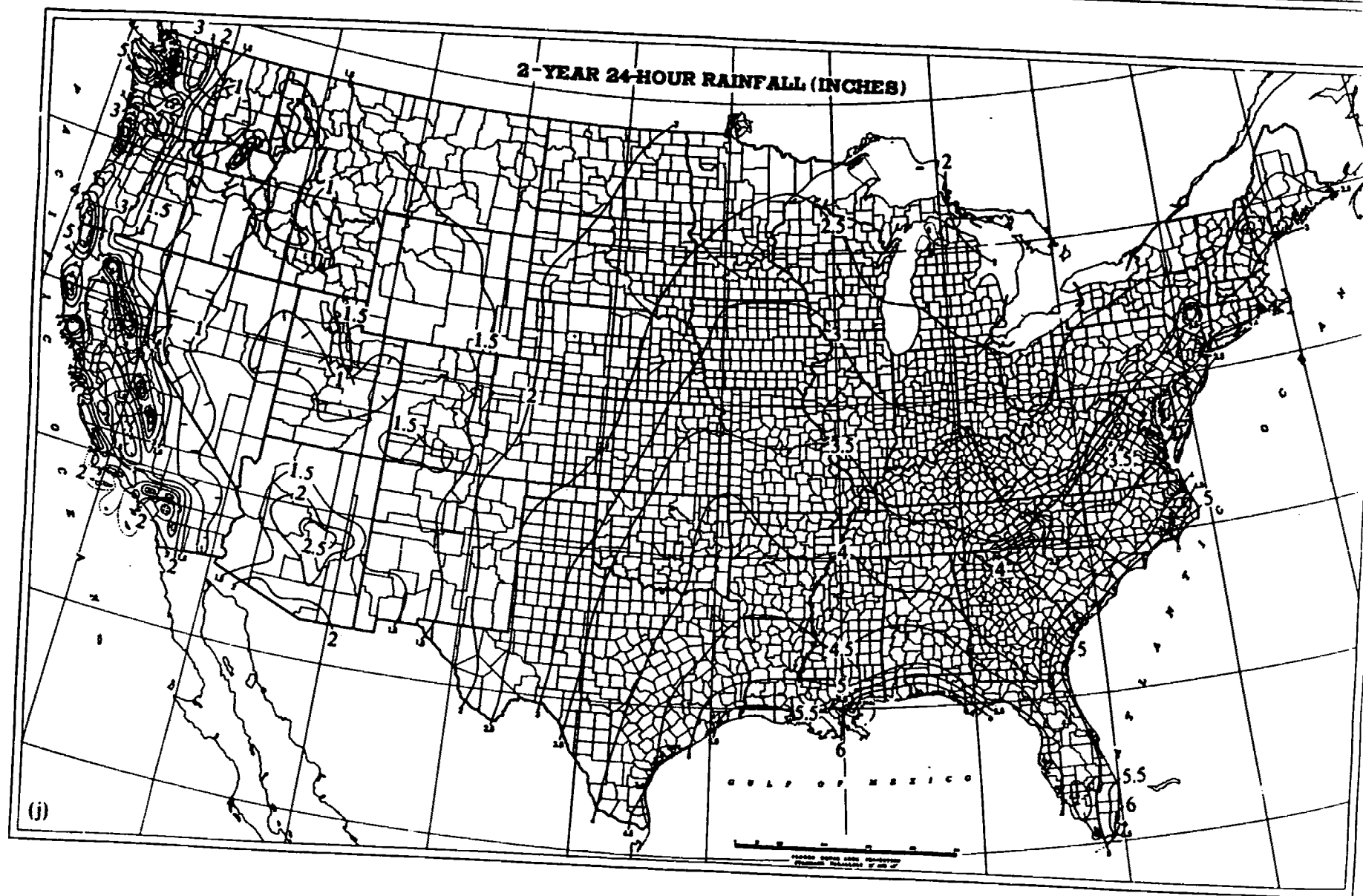
TD160.D85 333.9'1 78-8013
ISBN 0-7167-0079-4

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Printed in the United States of America

3 4 5 6 7 8 9



REFERENCE NO. 33

CONTROL NO.:

02-9008-52

DATE:

11/6/90

TIME:

1152

DISTRIBUTION:

Orange County Sanitary Landfill

BETWEEN:

Dore LaPosta, Acting Chief
Ground Water Management

OF:

USEPA, Region 2

PHONE:

(212) 264-5635

AND:

David Florin

(NUS)

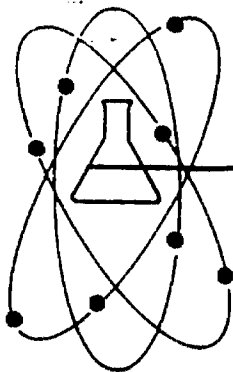
DISCUSSION:

Contacted the EPA in order to obtain information on well head protection areas in Orange County, N.Y. Ms. LaPosta stated that there is presently a great deal of confusion surrounding this issue due to differences in Federal and state guidelines. It seems that the EPA had initially sanctioned the NYS guidelines for well head protection but then withdrew support in favor of Federal regulations. The plan proposed by NYS is to base protection on the aquifer while the EPA plans to issue protection guidelines on each ground water intake. The zone of well head protection under the proposed EPA plan will be dependent on the hydrogeology of the particular site in question. The NYS plan is presently state unapproved (New Jersey just approved a state plan). Ms. LaPosta ended telephone conversation by stating that any request for information on well head protective zones in NYS

ACTION ITEMS:

should be directed to Kevin Roberts or Al Tidrow at the NYSDEC in Albany.

REFERENCE NO. 34



ACTS TESTING LABS, INC.

3900 Broadway • Buffalo, N.Y. 14227-1192 • (716) 684-3300

TECHNICAL REPORT 4-0751

March 8, 1984

Mr. Gerald McGree
CARBORUNDUM ABRASIVES COMPANY

OBJECT:

Analysis of four landfill monitoring well samples for various parameters. The samples were collected on February 14, 1984 by ACTS Testing Labs personnel from Carborundum Coated Abrasives Division, Walmore Road, Niagara Falls, New York.

RESULTS:

<u>Sample</u>	<u>pH Units</u>	<u>Phenols</u>	<u>Water Elevation*</u>
Well OW-2-81	6.99	LT 0.001	581.00 feet
Well OW-3-81	6.78	LT 0.001	580.42 feet
Well OW-4-81	7.00	LT 0.001	580.62 feet
Well OW-5-81	7.11	LT 0.001	580.60 feet

LT = Less Than

mg/l = Milligrams Per Liter

* - Water elevation was determined by subtracting the depth to water before purging from the height, measured in feet above sea level, at the top of each well.

EXPERIMENTAL:

All analyses were performed according to "Standard Methods for the Examination of Water and Wastewater," 15th Edition, 1980.

ACTS TESTING LABS, INC.

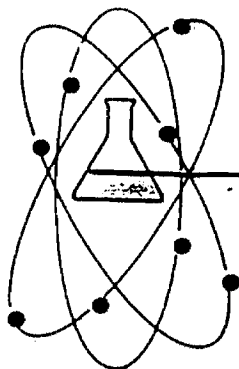
Thomas Knickerbocker
Thomas Knickerbocker
Environmental Laboratory
Coordinator

sd

ACTS TESTING LABS, INC.

Daniel P. Murtha
Daniel P. Murtha, Ph.D.
Director

REFERENCE NO. 35



ACTS TESTING LABS, INC.

3900 Broadway • Buffalo, N.Y. 14227-1192 • (716) 684-3300

TECHNICAL REPORT 4-3161

June 14, 1984

Mr. Gerald McGee
CARBORUNDUM ABRASIVES COMPANY

OBJECT:

Analysis of four landfill monitoring well samples for various parameters. The samples were collected on May 29, 1984 by ACTS Testing Labs personnel from Carborundum Coated Abrasives Division, Walmore Road, Niagara Falls, New York.

RESULTS:

<u>Sample</u>	<u>pH Units</u>	<u>Phenols</u>	<u>Water Elevation*</u>
Well OW-2-81	6.87	LT 0.001 mg/l	582.00 feet
Well OW-3-01	6.99	LT 0.001 mg/l	579.26 feet
Well OW-4-81	7.04	LT 0.001 mg/l	579.44 feet
Well OW-5-81	7.14	LT 0.001 mg/l	579.10 feet

LT = Less Than

mg/l = Milligrams Per Liter

* - Water elevation was determined by subtracting the depth to water before purging from the height, measured in feet above sea level, at the top of each well.

EXPERIMENTAL:

All analyses were performed according to "Standard Methods for the Examination of Water and Wastewater," 15th Edition, 1980.

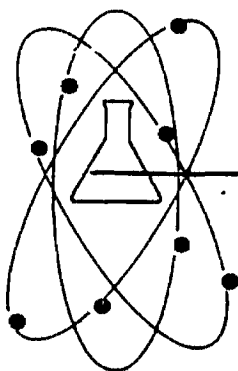
ACTS TESTING LABS, INC.

Richard A. Fudeman
Analyst

ACTS TESTING LABS, INC.

Daniel P. Murtha, Ph.D.
Laboratory Director

REFERENCE NO. 36



ACTS TESTING LABS, INC.

3900 Broadway • Buffalo, N.Y. 14227-1192 • (716) 684-3300

TECHNICAL REPORT 4-4675

August 20, 1984

Mr. Gerald McGee
CARBORUNDUM ABRASIVES COMPANY

OBJECT:

Analysis of four landfill monitoring well samples for various parameters. The samples were collected on August 6, 1984 by ACTS Testing Labs personnel from Carborundum Coated Abrasives Division, Walmore Road, Niagara Falls, New York.

RESULTS:

<u>Sample*</u>	<u>pH Units</u>	<u>Phenols</u>	<u>Water Elevation*</u>
Well OW-2-81	6.92	LT 0.001 mg/l	580.08 feet
Well OW-3-81	6.79	LT 0.001 mg/l	578.42 feet
Well OW-4-81	6.95	LT 0.001 mg/l	577.99 feet
Well OW-5-81	6.90	LT 0.001 mg/l	577.94 feet

LT = Less Than

mg/l - milligrams per liter

* Samples could not be collected from Manhole #1 Storm Sewer or Manhole #3 Storm Sewer since there was no flow.

**Water elevation was determined by subtracting the depth to water before purging from the height, measured in feet above sea level, at the top of each well.

EXPERIMENTAL:

All analyses were performed according to "Standard Methods for the Examination of Water and Wastewater", 15th Edition, 1980.

ACTS TESTING LABS, INC.

Thomas Knickerbocker
Thomas Knickerbocker
Environmental Laboratory
Coordinator

ACTS TESTING LABS, INC.

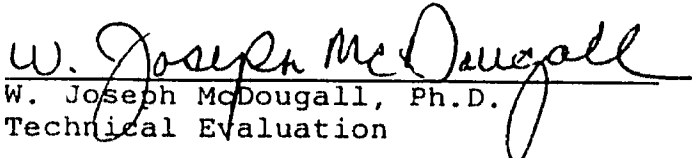
Daniel P. Murtha
Daniel P. Murtha, Ph.D.
Laboratory Director

REFERENCE NO. 37

CAC LANDFILL MONITORING WELLS

Report Prepared For
CARBORUNDUM ABRASIVES COMPANY

By
ADVANCED ENVIRONMENTAL SYSTEMS, INC.


W. Joseph McDougall, Ph.D.
Technical Evaluation

November 25, 1985
AES Report AZX

ANALYTICAL/METHODOLOGIES

The method numbers for each procedure are listed in the second column of the tabulated results. The source for each method is listed as a reference number in the third column. The source(s) for the Analytical Methodologies are:

- 1 - EPA 600/D-80-021, "Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations", Federal Register 44(233), December 3, 1979.
- 2 - EPA 600/D-80-022, "Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations, Correction", Federal Register 44(244), December 18, 1979.
- 3 - EPA 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", (1983)
- 4 - EPA 600/4-79-057, "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater", (1982)
- 5 - EPA-SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", second edition (1982)
- 6 - "Standard Methods for the Examination of Water and Wastewater", 15th Edition, (1980)
- 7 - New York State Institute of Toxicology Analytical Handbook, October 1982
- 8 - NIOSH Manual of Analytical Methods, second edition 1977
- 9 - "The Analysis of Polychlorinated Biphenyls in Transformer Fluid and Waste Oil", EPA Environmental Monitoring and Support Laboratory, draft, June 24, 1980.
- 10 - "Approved Analytical Procedures for Determining the Content of Constituents Banned from Landburial", (New York State D.E.C., Division of Solid and Hazardous Waste), Jan. 1985.
- 11 - EPA 600/4-81-055, "Interim Methods for the Sampling and Analysis of Priority Pollutants in Sediments and Fish Tissue", Revised Jan. 7, 1983.
- 12 - "Determination of Formaldehyde in the Atmosphere", Environmental Health Center, Div. of Laboratories and Research, N.Y.S. Dept. of Health APC-29.
- 13 - "Chemical Soil Tests", Cornell University Agricultural Experiment Station, N.Y.S. College of Agricultural, Ithaca, N.Y. Bulletin 960, Revised Oct. 1965.
- 14 - "Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter", American Society for Testing and Materials, Philadelphia, Pa., Designation: D 240-64 (Reapproved 1973).

CARBORUNDUM ABRASIVES COMPANY

GROUNDWATER ELEVATIONS

MEASURED

October 11, 1985

<u>WELL</u>	<u>T/C ELEVATION</u>	<u>TAPE MEASURE</u>	<u>GROUNDWATER ELEVATION</u>	<u>pH</u>
002	588.50	10.62	577.88	7.37
003	587.59	10.10	577.49	7.11
004	587.74	10.3	577.44	7.31
005	587.52	10.56	576.96	7.27

ADVANCED ENVIRONMENTAL SYSTEMS, INC.
LABORATORY REPORT

=====

TYPE OF ANALYSIS: RESULTS - WET CHEMISTRY
UNITS OF MEASURE: MILLIGRAMS/LITER, OR PPM
CLIENT: CARBORUNDUM A.E.S. JOB CODE AZX

ANALYSIS	METHOD	REF	DETERMINABLE LIMITS	SAMPLE IDENTIFICATION			
				3036 02 10/11/85	3037 03 10/11/85	3038 04 10/11/85	3039 05 10/11/85

TOTAL RECOVERABLE PHENOLS	420.2	3	0.02	0.02	0.21	0.04	0.02

Marlene C. Moyer

MARLENE C. MOYER
WET CHEMISTRY SUPERVISOR

ADVANCED ENVIRONMENTAL SYSTEMS, INC.
LABORATORY REPORT

=====

TYPE OF ANALYSIS: WET CHEMISTRY DUPLICATE
UNITS OF MEASURE: MILLIGRAMS/LITER, OR PPM
CLIENT: CARBORUNDUM A.E.S. JOB CODE AZX

ANALYSIS	SAMPLE	ORIGINAL CONC.	DUPL. CONC.	AVERAGE CONC.	RANGE	REL. % DIFF.
PHENOLS	3036	0.02	0.02	0.02	0	0
PHENOLS	3037	0.22	0.20	0.21	0.02	9.5
PHENOLS	3038	0.04	0.04	0.04	0	0
PHENOLS	3039	0.02	0.02	0.02	0	0

Relative Percent Difference =
Range/Average X 100

ADVANCED ENVIRONMENTAL SYSTEMS, INC.
LABORATORY REPORT

=====

TYPE OF ANALYSIS: TEST CONTROL WET CHEMISTRY
UNITS OF MEASURE: MILLIGRAMS/LITER, OR PPM
CLIENT: CARBORUNDUM A.E.S. JOB CODE AZX

ANALYSIS	TYPE	ORIGINAL CONC.	ADDED CONC.	EXPECTED CONC.	REPORTED CONC.	PERCENT RECOVERY
PHENOLS	EPA	0.30	---	0.30	0.28	92.2

REFERENCE NO. 38

July 11, 1986

Mr. Jerry McGee
Carborundum Abrasives Company
6600 Walmore Road
P.O. Box 350
Niagara Falls, New York 14304

Dear Mr. McGee:

Included are the results of the analyses performed on the 24-hour composite and various grab samples collected June 9 thru 10, 1986 from the Process/Sanitary sewer discharge manhole at the plant boiler house location. The composite sample was collected from 7:30 am 6/9/86 thru 7:30 am 6/10/86. Grab samples were collected at these times with an intermediate sample taken at 7:00 pm 6/9/86.

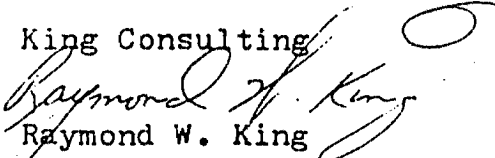
Also included in this package are the results from grab samples collected from the landfill wells and manhole locations on the Carborundum property. These landfill well and manhole samples were collected to satisfy the annual June monitoring requirements for the landfill.

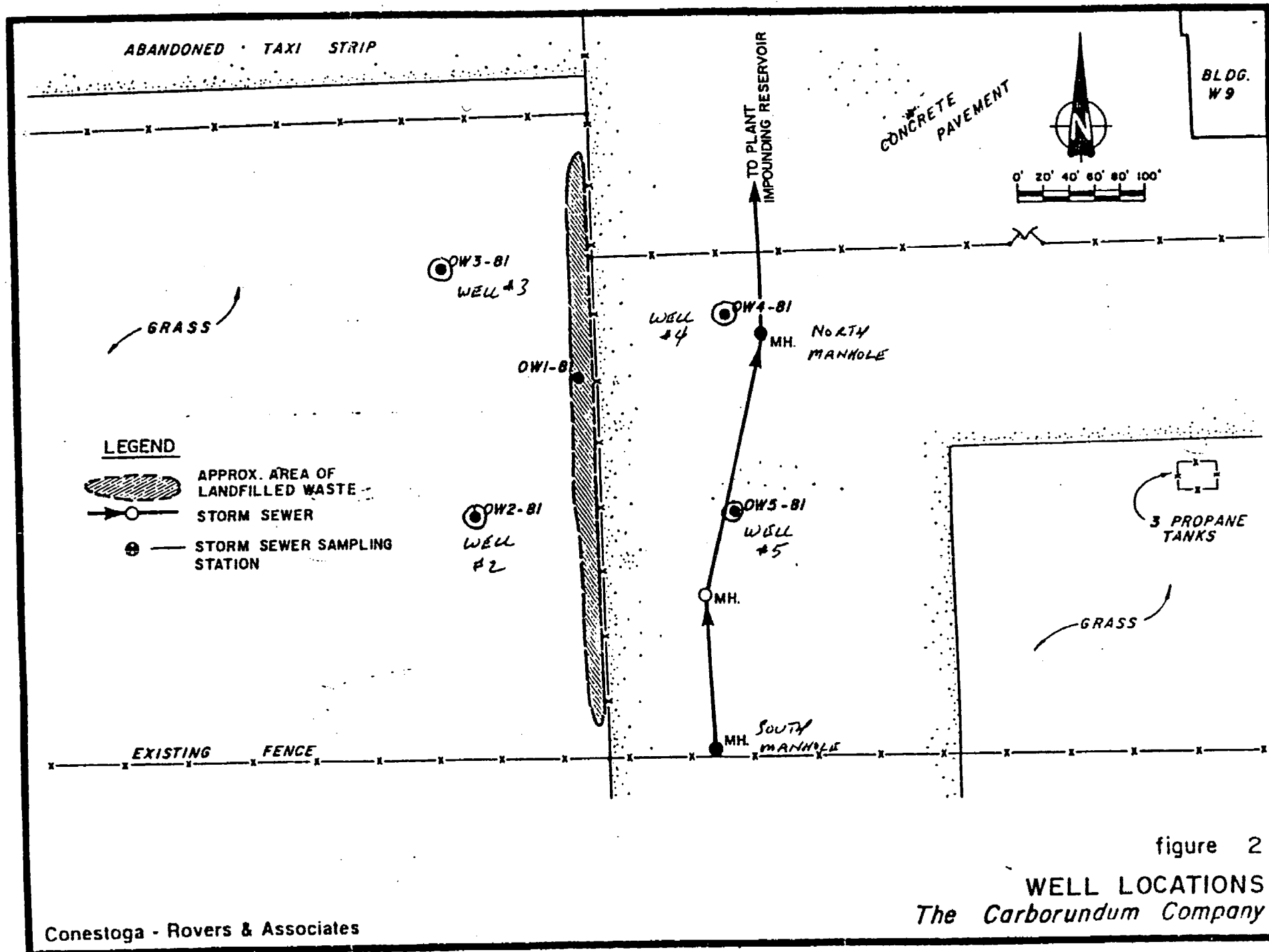
The samples were collected by Mr. Raymond W. King of King Consulting of Buffalo, New York and the chemical analyses were performed by the NYS/DOH Certified laboratory of Ecology and Environment, Inc. of Buffalo, New York under the direction of Mr. Gary Hahn.

The 4 landfill wells were sampled after removing 3 entire volumns of water over a 36 hour time period. The 2 manholes were sampled at the same time as the wells. There existed a very low flow rate in the 2 manholes during the entire sampling and monitoring process. Elevations for the 4 landfill monitoring wells were measured from the top of the metal well casings.

If you have any questions concerning the sampling procedures involved, analytical results or methods, or any other aspect of this program, please feel free to contact me.

Sincerely,

King Consulting

Raymond W. King



Carborundum Abrasives Company

June 1986

Landfill Wells and Manholes

	Well #2	Well #3	Well #4	Well #5	North Storm Manhloe	South Storm Manhole	
pH, s.u.	6.9	7.00	7.15	7.0	7.90	7.85	
Phenols, mg/l	0.005	0.007	0.007	< 0.005	< 0.005	0.006	
Elevation	1st 2nd 3rd 4th	6' 9" 6' 9" 6' 9" 7' 5½"	8' 8½" 8' 8½" 8' 8½" 8' 9½"	9' 0" 9' 0" 9' 0" 9' ½"	9' 2½" 9' 2½" 9' 2½" 9' 3"	----- ----- ----- -----	
Landfill well draw dates and times.	1st- 6/9/86 8:30 am		2nd- 6/9/86 7:30 pm		3rd- 6/10/86 8:00 am		SAMPLING 4th-6/10/ 7:00 p



ecology and environment, inc.
International Specialists in the Environment

LABORATORY REPORT
FOR
KING CONSULTING

Job No:	U-3506	Sampled By:	Client			
Sample Date:	6/10/86	Delivered By:	Client			
Date Received:	6/11/86					
Sample Type:	Water					
E & E Lab Number	86- 4446	4447	4448	4449	4450	4451
Sample Identity	Well #2	Well #3	Well #4	Well #5	North Storm Manhole	South Storm Manhole
pH, S.U.	6.9	7.00	7.15	7.0	7.90	7.85
Phenols, mg/L	0.005	0.007	0.007	<0.005	<0.005	0.006

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.

Supervising Analyst

Date:

Ray Hahn / RS
June 25, 1986



ecology and environment, inc.

ANALYTICAL SERVICES CENTER, P.O. BOX D, BUFFALO, NEW YORK 14225, TEL. 716-631-0360
International Specialists in the Environment

June 25, 1986

Mr. Raymond King
King Consulting
32 Philadelphia Street
Buffalo, New York 14207

Dear Mr. King:

Attached is the laboratory report of the analysis conducted on six samples received at the Analytical Services Center on June 11, 1986. Analysis was performed according to the procedures set forth in "Methods for the Chemical Analysis and Water and Wastes", EPA-600/4-79-020, March 1983.

The accuracy of all analyses depends upon the representative nature of the sample and reliability of collection procedures as well as the accuracy of the laboratory analysis of the sample as submitted. Ecology and Environment, Inc.'s activity and its representations with respect to these samples presented to it.

All samples, on which this report is based, will be retained by E & E for a period of 30 days from the date of this report, unless otherwise instructed by the client. If additional storage of samples is requested by the client, a storage fee of \$1.00/sample container per month will be charged for each sample, with such charges accruing until destruction of the samples is authorized by the client.

Very truly yours,

Gary Hahn, Manager
Analytical Services Center

djr
enclosure

U-3506

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

Analysis	E & E Laboratory No. 86-	Original Analysis	Replicate Analysis	Relative Percent Difference RPD
pH	4451	7.85	7.85	0
Phenols	4403*	100	99	1.0

*This sample is the 24-hour composite sample which was analyzed in the same batch as this sample to meet a minimum of 10% QC.

REFERENCE NO. 39

NYS INDUSTRIAL INSPECTION

AND

STATUS REPORT FORM

Company Name : CARBORUNDUM COMPANY
 Permit No. : NY0001716
 Location : WILKENTFIELD (T) NIAGARA COUNTY
 Mailing Address : COATED ABRASIVES DIV.
 P.O. Box 477
 NIAGARA FALLS, N.Y.
 14302

Date of Inspection: MAY 25, 1976
 Date(s) of Previous Inspection(s): NONE
 Previous Inspector(s):
 Receiving Waters: CAYUGA CREEK
 W.Q. Classification: D
 Weather Condition: CLOUDY 60°F

Company Representative(s), Title (s):

JERRY MCGEE - PLANT ENGINEER

Number of Discharges Reported: 1 } one discharge from lagoon. 7 discharges from
 Number of Discharges Observed: 1 } plant property to the lagoon
 Action Taken or Planned on Unreported Discharges:

* No permit issued. Draft permit prepared May 3, 1976

(1) PROCESS

(1) ABRASIVE PRODUCTS OF PAPER & CLOTH

- (a) Industrial Process: (2) MANUFACTURE OF RESINS
 (b) Reported Production: 75,000 LBS AVE, 13,000 LBS (AVE) ADHESIVES
 (c) Current Production: AVERAGE THE SAME. SOME VARIATION WITH MARKET
 (d) Rated Production: + 25%
 (e) Raw Materials Used: PAPER-CLOTH-FIBER, ABRASIVE GRAMS - ANIMAL GLUES
 (f) What process modification, expansions, etc. have been made
 that would either increase or decrease raw waste loads, water
 usage, etc. that have not been previously reported:

NONE - UPDATED APPLICATION TO E.I.R. 3/17/76

- (g) Industrial process flow diagram indicating wastewater sources
 (attach copy if on file and verify with company):

Process waste water is discharged to the Niagara Fall (c) sanitary
 sewage system after settling.

- (h) Continuity of Operation: Batch Semi-Continuous
X Continuous

(2) EFFLUENT LIMITATIONS VIOLATIONS (Based upon Self-Monitoring Data)

Discharge No.	Parameter	Permit Limitation	Reported Discharge	Date/Period of Violation

N/A NO PERMIT ISSUED TO DATE

(2.1) EFFLUENT DISCHARGE NO. 004

- (a) Wastewater Flow: UNKNOWN - VARIES FROM 0.07 TO .163 MGD
 (b) Measuring Device used for Flow: NONE
 (c) Wastewater Characteristics: NON CONTACT COOLING WATER, BOILER & CYCLONE TOWER
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company): NONE

WATER DISCHARGES TO AN ~ 2 ACRE LAGOON - OVERFLOW ENTERS STORM SEWER
 ~ 6200' TO CREEK

- (e) Appearance of Effluent(s):
- | | | | |
|---------------------|----|-------------|------|
| (1) visible oil | NO | (5) color | LESS |
| (2) foam | NO | (6) temper- | |
| (3) floating solids | NO | ature | 62 |
| (4) Suspended | | (7) Odor | YES |
| Solids | NO | (8) other | |

SLIGHT SWEET SMELL TO
 LAGOON, POSSIBLY A PLEASANT
 TYPE SMELL OR POSSIBLY A
 FLOOR CLEANER

- (f) Appearance of Receiving
 waters:

RECEIVING STREAM ACCESSIBLE
 ~ 1 MILE UPSTREAM

(1) visible oil	NO	(6) color	LESS
(2) foam	NO	(7) temper-	
(3) floating solids	NO	ature	54
(4) turbidity	SLIGHT	(8) odor	NO
(5) sludge deposits		(9) other	

(2.2) EFFLUENT DISCHARGE NO.

- (a) Wastewater Flow:
 (b) Measuring Device used for Flow:
 (c) Wastewater Characteristics:
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company):

Picture Taken:

- (e) Appearance of Effluent(s):
- | | | | |
|---------------------|-------|-------------|-------|
| (1) visible oil | _____ | (5) color | _____ |
| (2) foam | _____ | (6) temper- | _____ |
| (3) floating solids | _____ | ature | _____ |
| (4) suspended | _____ | (7) odor | _____ |
| solids | _____ | (8) other | _____ |

- (f) Appearance of Receiving
 waters:

(1) visible oil	_____	(6) color	_____
(2) foam	_____	(7) temper-	_____
(3) floating solids	_____	ature	_____
(4) turbidity	_____	(8) odor	_____
(5) sludge deposits	_____	(9) other	_____

(2.3) EFFLUENT DISCHARGE NO.

- (a) Wastewater Flow:
 (b) Measuring Device used for Flow:
 (c) Wastewater Characteristics:
 (d) Type of treatment units and treatment sequence sketch (attach copy if on file and verify with company):

- (e) Appearance of Effluent(s):
- | | | | |
|---------------------|-------|-------------|-------|
| (1) visible oil | _____ | (5) color | _____ |
| (2) foam | _____ | (6) temper- | _____ |
| (3) floating solids | _____ | ature | _____ |
| (4) suspended | _____ | (7) odor | _____ |
| solids | _____ | (8) other | _____ |

- (f) Appearance of Receiving
 waters:

(1) visible oil	_____	(6) color	_____
(2) foam	_____	(7) temper-	_____
(3) floating solids	_____	ature	_____
(4) turbidity	_____	(8) odor	_____
(5) sludge deposits	_____	(9) other	_____

(3). COMPLIANCE

- (a) Is company complying with schedule of compliance? *N/A*
- (b) What is the current projection of the company regarding compliance with future dates in Compliance Schedule? *NO PERMIT ISSUED*
- (c) Is company complying with any additional compliance requirements such as a special report submittal to the proper regulatory agency?
- (d) Has company notified the proper regulatory agency of any non-compliance with permit conditions?
- *(e) Has company requested modification of any permit conditions other than permit sampling schedules?
- *(f) Are any modifications appropriate?

(4). SELF-MONITORING PROGRAM

- (a) Does quantity of reported self-monitoring data and signing official comply with requirements of permit?
N/A NO PERMIT ISSUED
- (b) What is the apparent quality of plant records that are required under the conditions of the permit?
- (c) If net values are applicable, is the surface water intake sampled and analyzed?
- (d) Is there any additional monitoring being performed by the plant that has not been reported? If yes, what parameters and frequency is involved and what conclusions can be drawn from data?
- (e) Do sampling locations appear to be adequate to obtain representative samples?
DOO APPEARS ADEQUATE
- (f) Has company identified effluent sampling point used for each discharge pipe by providing a sketch of flow diagram?
- (g) How frequently and accurately is continuous monitoring equipment calibrated, and how well is the equipment maintained?

NO FLOW M. MONITORING EQUIPMENT

- (7) In your judgement, do sampling procedures, frequency and type of sample typify plant's daily discharge (i.e. are maximum production periods, batch discharges, etc. reflected in monitoring data)? *N/A*

- (i) Does plant perform its own analysis?

If not, what laboratory is analysis contracted to?

If yes, what is the appearance of plant's laboratory?

ANALYSIS WOULD BE DONE BY THE CARBORUNDUM CO. RESEARCH & DEVELOPMENT LAB AT NIAGARA FALLS

- (j) Do all sampling and analytical methods conform to the guidelines published pursuant to Section 304(g) of 1972 FWPCA?

- (k) Has plant requested modification to permit sampling schedules?

COMPANY REVIEWING DRAFT PERMIT

- (l) Are modifications appropriated?

(5) MISCELLANEOUS

- (a) Did the permit application truly represent conditions at the plant site? *yes*

- (b) Are any of the following toxic pollutants or compounds containing them, being discharged that would require modification of the permit: No X Yes _____ (Check those Applicable)

Aldrin _____
Dieldren _____
Benzidine _____
Cadmium _____
Cyanide _____
DDD (TDE) _____

DDE _____
DDT _____
Endrin _____
Mercury _____
Polychlorinated biphenyls _____
Toxaplane _____

If yes, what modifications are necessary?

- (c) Is sludge being generated at plant? *one settling tank from the size of operation. Was kept in tank. No more sludge as needed.*

If yes, is plant reporting on its disposal? *NO NO TREATMENT FACILITY*

If sludge disposal is at plant site, is there any visual evidence or hazards associated with entry of pollutants into surface or ground waters? *Yes **

If not at plant, where is the disposal site, and is it acceptable to regulatory agencies?

** Sludge and sludges from settling tank receiving wastewater from the plant's add operation are removed to a land fill site on the property. Effluent to the city sewer system.*

- (d) What is the appearance of plant grounds?

SATISFACTORY EXCEPT FOR ON PLANT LANDFILL

- (e) Is there any discharge of unreported contaminated storm runoff?
NO
- (f) Is the treatment system maintained in good working order and operated efficiently?
N/A
- (g) What alternate power supply provisions exist for waste treatment facilities?
If none, what happens to the wastewater when there is a power failure?
- (h) Have all bypasses of waste treatment facilities been eliminated:
If not, why? If not, is flow monitoring installed in bypass?
- (i) Are there any obvious air emission, noise, radiation, pesticides, or solid wastes problems at the plant?
What are they?
yes - solid waste problem
If yes, send copy of this report to the appropriate personnel.
Albany County Health Dept. Solid waste engineer will inspect site and advise Company of required corrective action. DEC Regional solid waste engineer also advised.
- (j) Does plant require a Spill Prevention Control Countermeasure Plan?
YES
- NOTE: SPCC plan is required if the permittee stores more than:
1. 1,320 gallons of oil above ground;
 2. 660 gallons of oil in a single container above ground;
 3. 42,000 gallons of oil underground.
- If so, is the plant approved by a licensed P.E.?
YES

SUMMARY AND RECOMMENDATIONSViolations and/or Problems

Unauthorized land fill site on the property.

Recommended Action

To be completed by the
Madison County Health Dept
for appropriate action taken

Comments

The lagoon is not on Carbonendums property. The lagoon is owned by the Madison County Transportation Authority. There are 7 storm sewers from the Carbonendum property entering the south side of the lagoon and one storm sewer draining the runway enters the north side of the lagoon.

There appears to be discharge from an unacceptable land fill site on the property, entering the storm sewer system discharging into the lagoon.

The company is checking on the feasibility of re-routing, boiler/cooling tower blowdown, zeolite and lime soda ash watersoftener back wash etc. to the city sanitary system.

See letter to Company dated June 9, 1976

Inspector Signature:

Paul E. Fierisch

Name:

PAUL E. FIERISCH

Title:

SENIOR SANIT. ENG.

Date:

MAY 25, 1976

REFERENCE NO. 40

NIAGARA COUNTY DEPARTMENT OF HEALTH

Code Activity
 Code Location
 Service Request No.
 Date Received Complaint 2/2/82

Service Request Inspect remedial work at Carbonation Catal Abrasive Landfill
 Originator of Complaint P. Buechi (NYDEC Rep) Address 600 Delaware Buffalo
 Owner Carbonation Corp; Catal Abrasives Div. Address Delaware Rd, Wheatfield
 Occupant Inactive landfill site Address behind plant

Date	Hours	REPORT OF INVESTIGATION
2/2/82	2:30	The worker, M. Hopkins, met with Gerald McGee at the Carbonation Plant, (Delaware Rd) to inspect the remedial work being done on the inactive landfill area. The inspection was made at the request of Peter Buechi, DEC Agent. The landfill site was found at the west end of a concrete pad (apparently a former airport taxiway), approximately 500' west of the Carbonation Plant. The area to the west is open field. A chain link fence borders the landfill on the east. Apparently, this area was excavated and backfilled with waste including sandbags and some free plastic is a possibility. The area is currently at grade. Scuffs on the adjacent concrete pad were apparently caused by temporary storage of wastes prior to land filling. The landfill has been closed at least 5 years. The contractor is Murphy Technology. The project to cap the landfill will involve placing 4' 3" clay cap on the LII, compacted to 10" in 6" lifts. Round 10" around all edges and to perimeter and working. The key will be completed by the end of today. The clay work is estimated to take 2 days and finish work 2 or 3 days. At this time the key was 3/4 excavated wastes were seen in pockets along the eastern fence line, however because of the adjacent pavement, water was not expected to extend beyond the fence line. No waste seen were a gray "putty" material and metal scrap (included).

Date Abated By

NIAGARA COUNTY DEPARTMENT OF HEALTH

Code Activity

Code Location

Service Request No.

Date Received Complaint

Service Request

Coated Abrasive

Originator of Complaint

Address

Owner

Address

Occupant

Address

Date

Hours

REPORT OF INVESTIGATION

at least one steel drum comment). Soils exposed were silty sand
clayey silt to the depth excavated.

A 15' section of 4" iron pipe was encountered in the top
area west of OW-51. The pipe was first thought to be an
abandoned utility line. The monitor suggested that the line be used
while the back hoe was still working here. It was found to be fine
at both ends and was removed so as not to act as a conductor
for leachate leaving the capped area. I informed the back hoe
operator that it was acceptable to leave the extracted pipe on
site until cover it with the clay during the capping operation.
I advised Mr. McGee that any other pipes or found should
be removed or plugged to prevent such pipes from being acting
as drains to the landfill.

The operator said that the key should be finished today
except for the north end where access will be needed for clay
working equipment. Clay placement & compaction will begin tomorrow.

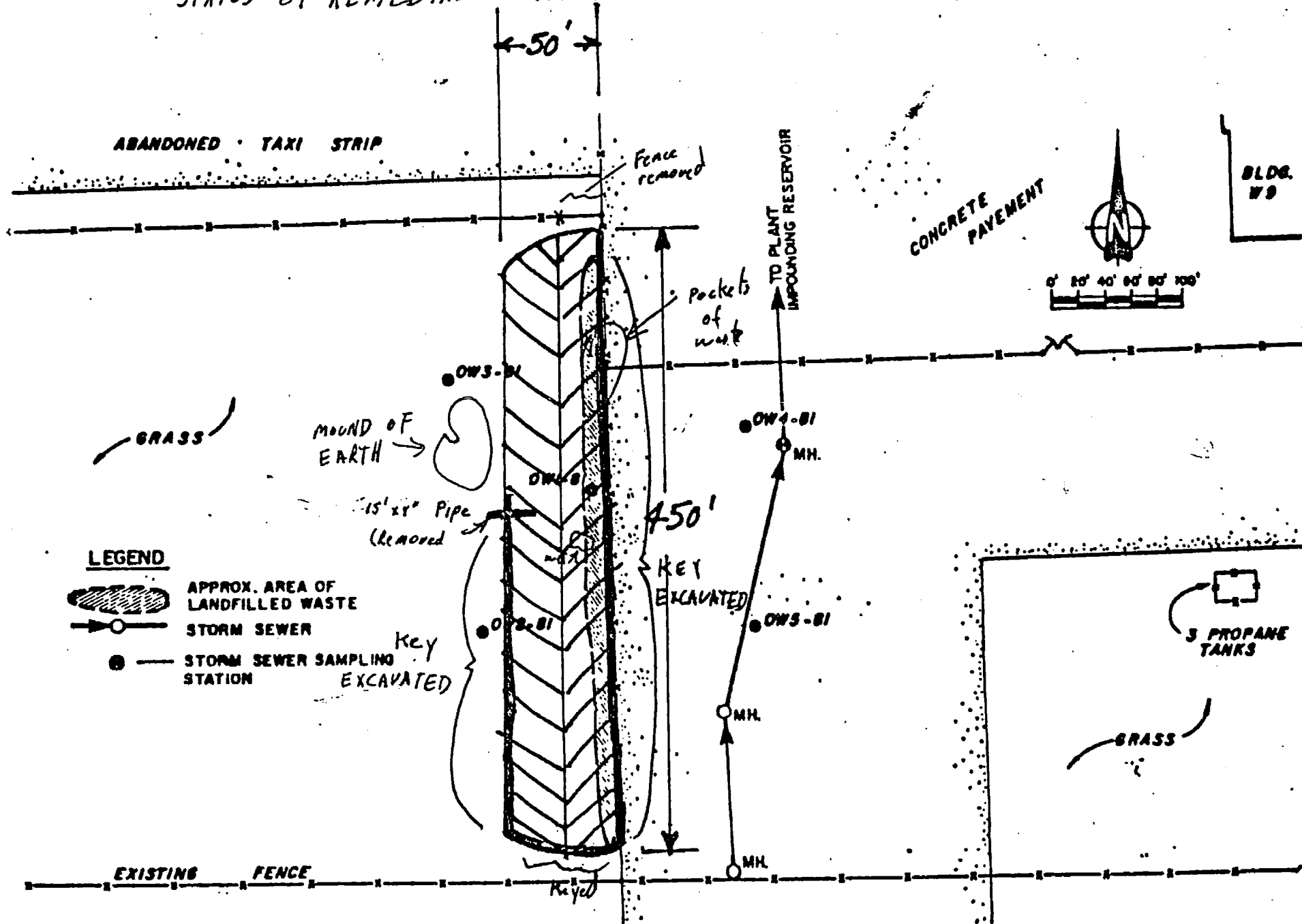
I told Mr. McGee that someone would be out tomorrow
to continue monitoring the work.

M. Stephen

Date Abated

By

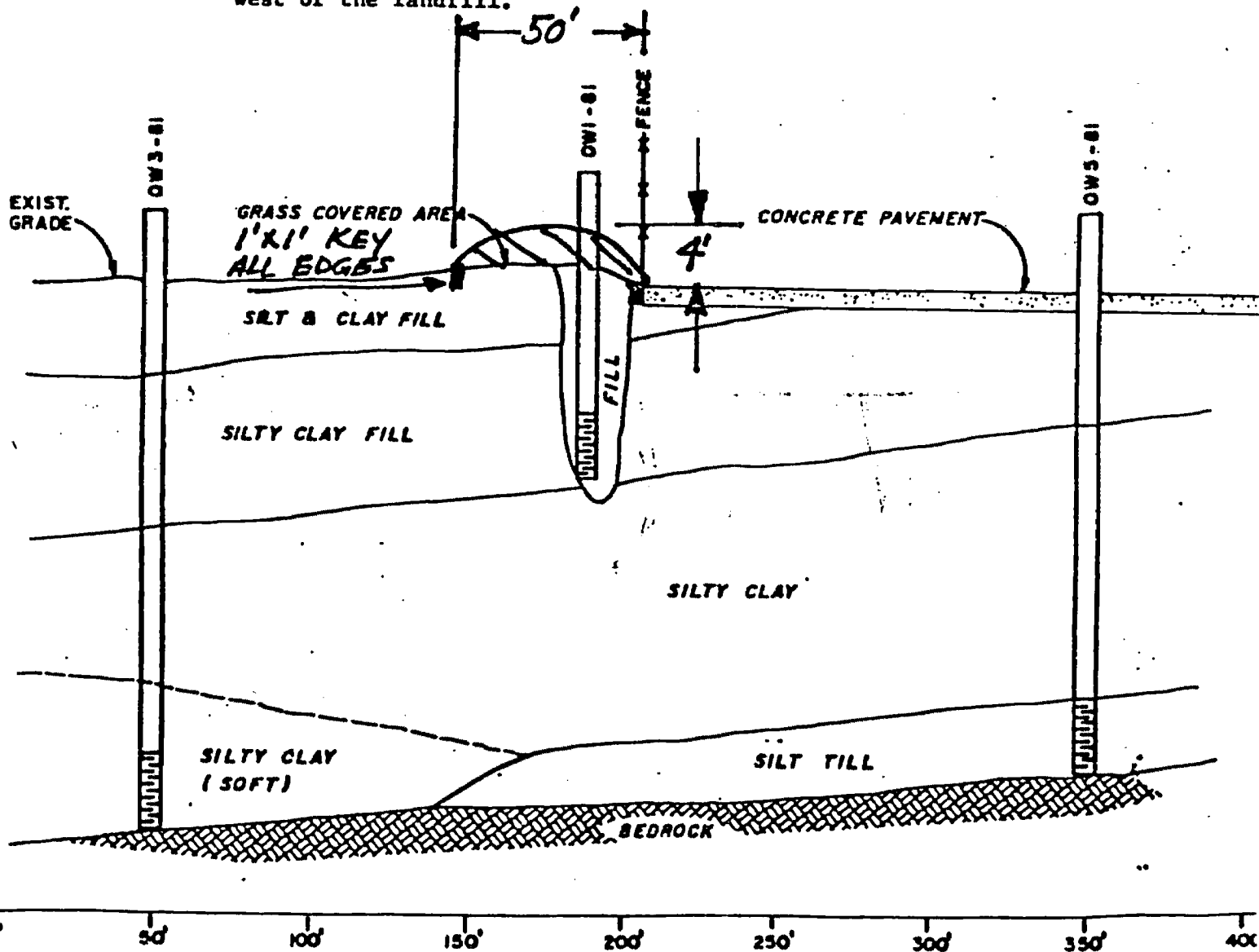
STATUS OF REMEDIAL WORK AT CARBORUNDUM (9/9/82)



ATTACHMENT NO. 112182

Landfill Site - Cover Specifications

1. The landfill cell (20 ft. x 400 ft.) is to be covered with a three (3) foot clay cover (50 ft. x 450 ft.) having a maximum permeability of 10^{-7} cm/sec. The cover is to be sheep-foot rolled at six (6) inch lifts, adequately sloped to provide drainage and must be keyed into the underlying silty clay material, see sketch. Contractor is to verify permeability by having two (2) Shelby tube tests performed from random locations selected by Carborundum engineer. The clay cover is to extend fifty (50) feet west from the edge of the existing concrete pad. A six (6) inch layer of uncleaned sand or sandy loam soil is to be placed over the clay cap, then six (6) inches of top soil and seeded to prevent erosion.
2. Upon completion of work, contractor must submit a dimensioned, as built drawing and permeability report.
3. The work is to include leveling off the existing two mounds of dirt west of the landfill.



REFERENCE NO. 41

NIAGARA COUNTY DEPARTMENT OF HEALTH

Code Activity

Code Location

Service Request No.

Date Received Complaint 9/22/1

Service Request Monitor landfill closure Inspection #3

Originator of Complaint NCHD via DEC Address

Owner Coastal Abrasive Address W. L. R. Rd., Wheatfield

Occupant Inactive landfill #932007 Address rear of plant

Date	Hours	REPORT OF INVESTIGATION
9/22	9:55 AM	The writer, M Hopkins, met with Gary McGee at the Coastal Abrasive Plant. An inspection of the landfill followed. Problems were encountered during the capping operation since this writer's last inspection. Apparently the compacting of the clay caused seepage to occur along the trenchline at the east end of the project. The seepage contained obvious waste materials (resins). The seepage indicated that some wastes were located beyond the eastern toe. To correct this situation, the fence and 10' of pavement were removed, a second key constructed 10' east of the previous key and the cap was extended over this area. This corrective action appears to be adequate to this writer. It was noted that the waste pad was in place prior to the disposal activities and therefore by extending the 10' over the pavement, it almost certainly extends beyond the limit of the wastes. A sketch is attached. At this time the clay work is complete, pending initial results of permeability testing. The clay is firm, although the surface is soft due to wet conditions. The clay appears to be the "pink" type typical of this area. The sampling for permeability will be performed soon (possibly today) by Empire State. It is possible that the current wet conditions will postpone this sampling. Curran has specified that compaction tests be done as well as permeability. The samples will be obtained by Shelby Tube.

Date Abated

By

19 - - -

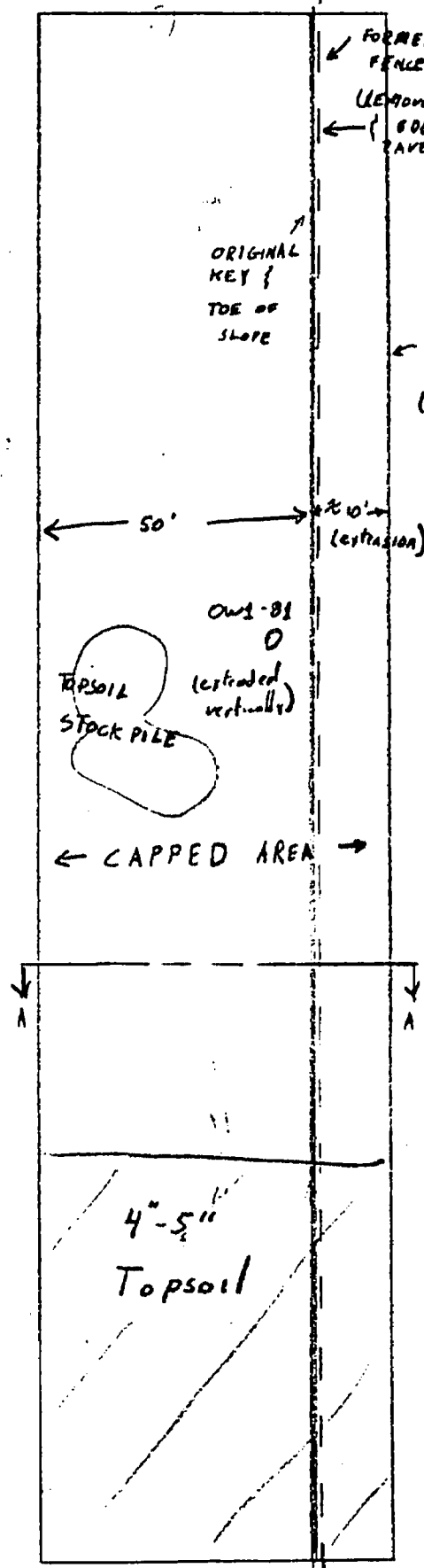
Date Received Complaint

Occupant Address

By

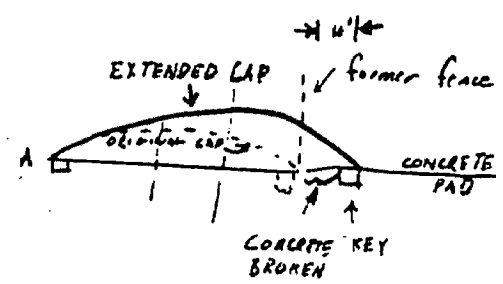
CARBORUNDUM LANDFILL CAP as of 9/22/82

GRASS



← extended toe
of slope
(New key)

CONCRETE
PAVEMENT



North
↑

SKETCH ONLY
NOT TO SCALE

M. Hoffman
9/22/82

EXISTING FENCE

REFERENCE NO. 42

by

C. Lucivar Chico

in cooperation with

**STATE OF NEW YORK
CONSERVATION DEPARTMENT
WATER RESOURCES COMMISSION**

1968

INTRODUCTION

PURPOSE AND SCOPE

This report presents the results of an investigation by the U.S. Geological Survey conducted for the Erie-Niagara Basin Regional Water Resources Planning Board. The area of study, called "Erie-Niagara basin" in this report, extends from the Cattaraugus Creek basin on the south to the Tonawanda Creek basin on the north, and includes Grand Island as shown in figure 1.

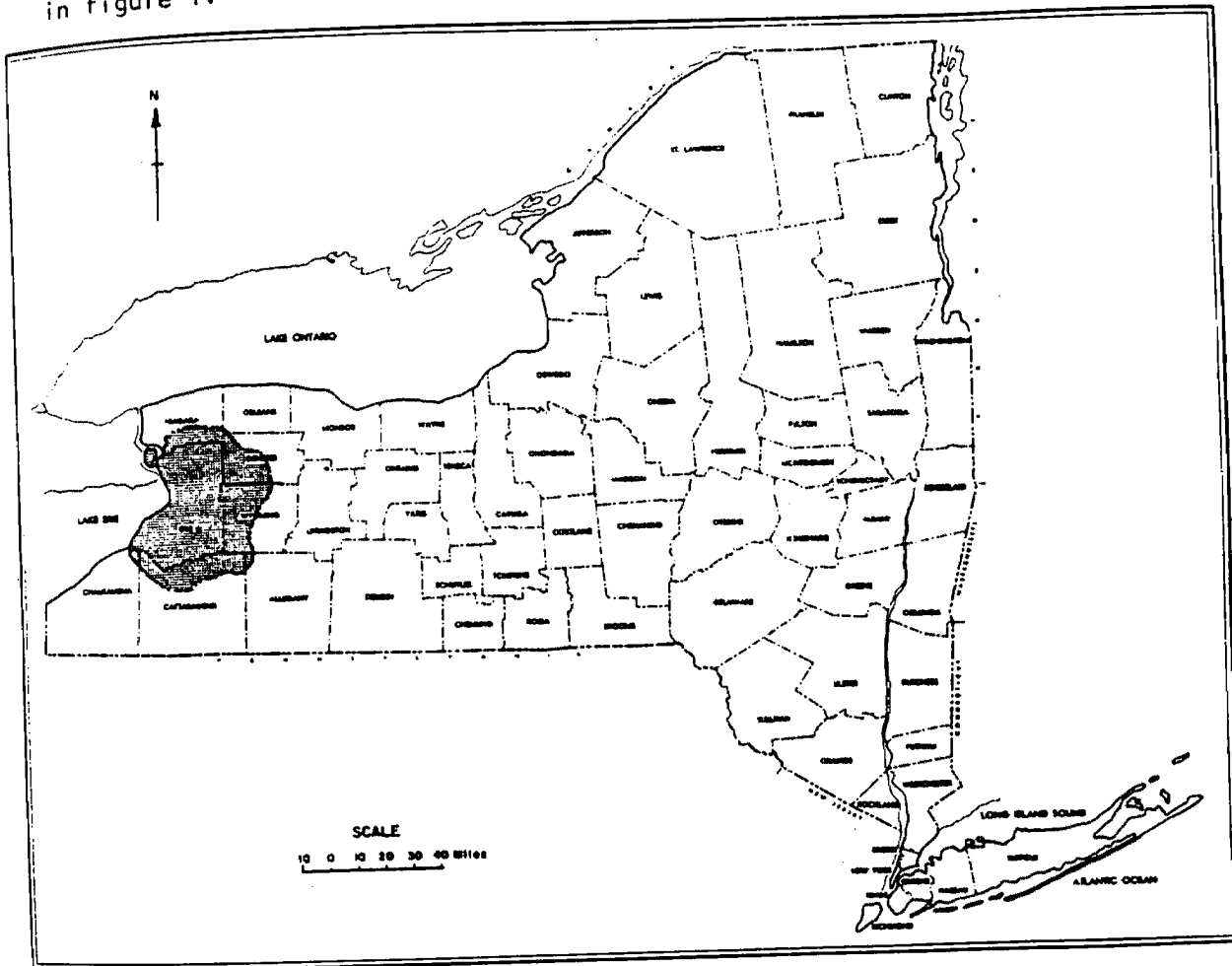


Figure 1.--Location map of the Erie-Niagara basin.

GEOLOGY AND TOPOGRAPHY

The Erie-Niagara basin is underlain by layers of sedimentary bedrock which are largely covered with unconsolidated deposits. Descriptions of the various bedrock units are given in figure 2. The bedrock consists mainly of shale, limestone, and dolomite; the Camillus Shale contains a large amount of interbedded gypsum. All the bedrock units were built up by fine-grained sediments deposited in ancient seas during the Silurian and Devonian Periods and, therefore, are bedded or layered. The dip of the rocks (inclination of the bedding planes) is gently southward at from 20 to 60 feet per mile, but the average dip is between 30 and 40 feet per mile. The dip is so gentle that it is hardly perceptible in outcrops.

The unconsolidated deposits are mostly glacial deposits formed during Pleistocene time about 10,000-15,000 years ago when an ice sheet covered the area. The glacial deposits consist of: (1) till, which is a nonsorted mixture of clay, silt, sand, and stones deposited directly from the ice sheet; (2) lake deposits, which are bedded clay, silt, and sand that settled out in lakes fed by the melting ice; and (3) sand and gravel deposits, which were laid down in glacial streams. The glacial sand and gravel deposits are of both the ice-contact and outwash types, as will be explained later in the report. The glacial deposits generally are less than 50 feet thick in the northern part of the basin. They are considerably thicker in some valleys in the southern part and reach a maximum known thickness of 600 feet near Chaffee. Other unconsolidated deposits are alluvium formed by streams in Recent times and swamp deposits formed by accumulation of decayed plant matter in poorly drained areas.

Relief of the present land surface is due to preglacial erosion of the bedrock and subsequent topographic modification by glaciation. In contrast to the southward dip of the rocks, the land surface rises to the south largely because preglacial erosion was more vigorous in the northern part of the basin. The shale in the southern part of the basin is somewhat more resistant to erosion than the rocks in the northern part of the basin but not significantly so. Figure 3 shows the relationship of the topography and rock structure and delineates the two topographic provinces of the basin: the Erie-Ontario Lowlands and the Appalachian Uplands. The rocks crop out in belts which trend generally east-west. The bedrock geologic map, plate 2, shows that the outcrop belts bend around to the southwest near Lake Erie. They assume this direction mainly because relatively intense erosion in the Erie-Ontario Lowland near Lake Erie has exposed the rock at lower elevations than farther east. The Lockport Dolomite and the Onondaga Limestone, because they are relatively resistant to erosion, form low ridges in the northern part of the basin. Tonawanda, Murder, and Ellicott Creeks descend the escarpment of the Onondaga at falls and cataracts.

In the hilly southern half of the basin (the Appalachian Uplands), preglacial valleys, deepened by glacial erosion, are cut into the shale. The valleys are partly filled with glacial deposits so that some of the present streams flow 200 to 600 feet above the bedrock floors of the valleys as shown in figure 3.

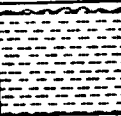
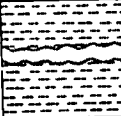
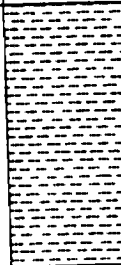
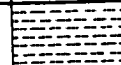
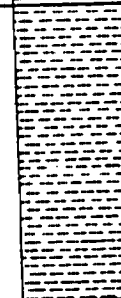
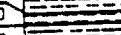
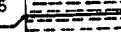
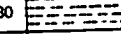
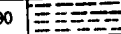
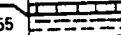
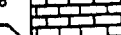
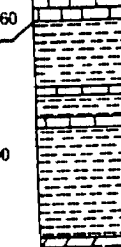
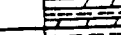
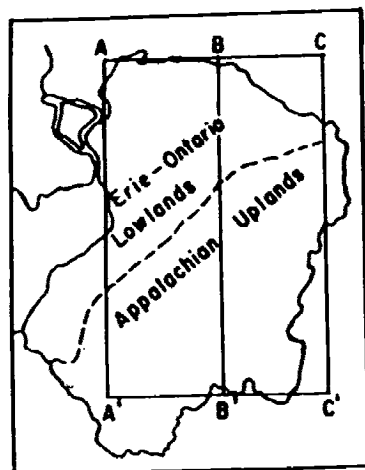
System	Series	Group	Formation	Thickness in feet	Section		
Devonian	Upper	Conneaut Group of Chadwick (1934)		500		Shale, siltstone, and fine-grained sandstone. Top is missing in area.	
		Canadaway Group of Chadwick (1933)	Undivided	600		Gray shale and siltstone, interbedded. (section broken to save space)	
			Perrysburg	400-450		Gray to black shale and gray siltstone containing many zones of calcareous concretions. Lower 100 feet of formation is olive-gray to black shale and interbedded gray shale containing shaly concretions and pyrite.	
			Java	90-115		Greenish-gray to black shale and some interbedded limestone and zones of calcareous nodules. Small masses of pyrite occur in the lower part.	
		West Falls	400-520		Black and gray shale and light-gray siltstone and sandstone. The lower part is petrolierous. Throughout the formation are numerous zones of calcareous concretions, some of which contain pyrite and marcasite.		
			Sonyea	45-85		Olive-gray to black shale.	
			Genesee	10-20		Dark-gray to black shale and dark-gray limestone. Beds of nodular pyrite are at base.	
			Moscow Shale	12-55		Gray, soft shale.	
		Hamilton	Ludlowville Shale	65-130		Gray, soft, fissile shale and limestone beds at top and bottom.	
			Skaneateles Shale	60-90		Olive-gray, gray and black, fissile shale and some calcareous beds and pyrite. Gray limestone, about 10 feet thick is at the base.	
	Marcellus Shale		30-55		Black, dense fissile shale.		
	Onondaga Limestone		108		Gray limestone and cherty limestone.		
	Middle	Unconformity	Akron Dolomite	8		Greenish-gray and buff fine-grained dolomite.	
			Bertie Limestone	50-60		Gray and brown dolomite and some interbedded shale.	
		Salina	Camillus Shale	400		Gray, red, and green thin-bedded shale and massive mudstone. Gypsum occurs in beds and lenses as much as 5 feet thick. Subsurface information indicates dolomite (or perhaps, more correctly, magnesian lime mudrock) is interbedded with the shale (shown schematically in section). South of the outcrop area, at depth, the formation contains thick salt beds.	
				Lockport Dolomite	150		Dark-gray to brown, massive to thin-bedded dolomite, locally containing algal reef and gypsum nodules. At the base are light-gray limestone (Gasport Limestone Member) and gray shaly dolomite (DeCew Limestone Member).
		Niagara	Clinton	Rochester Shale	60		Dark-gray calcareous shale.

Figure 2.--Bedrock units of the Erie-Niagara basin.

EXPLANATION



Sketch map showing the location of sections A-A, B-B, and C-C' in the Erie-Niagara basin.

Unconsolidated deposits (shown only in major valleys)	Bertie Limestone and Akron Dolomite
Connecticut Group of Chadwick (1934)	Camillus Shale
Canadaway Group of Chadwick (1933)	Lockport Dolomite
Java and West Falls Formations	Rochester Shale and older rocks
Genesee and Sonyea Formations	
Hamilton Group	
Onondaga Limestone	

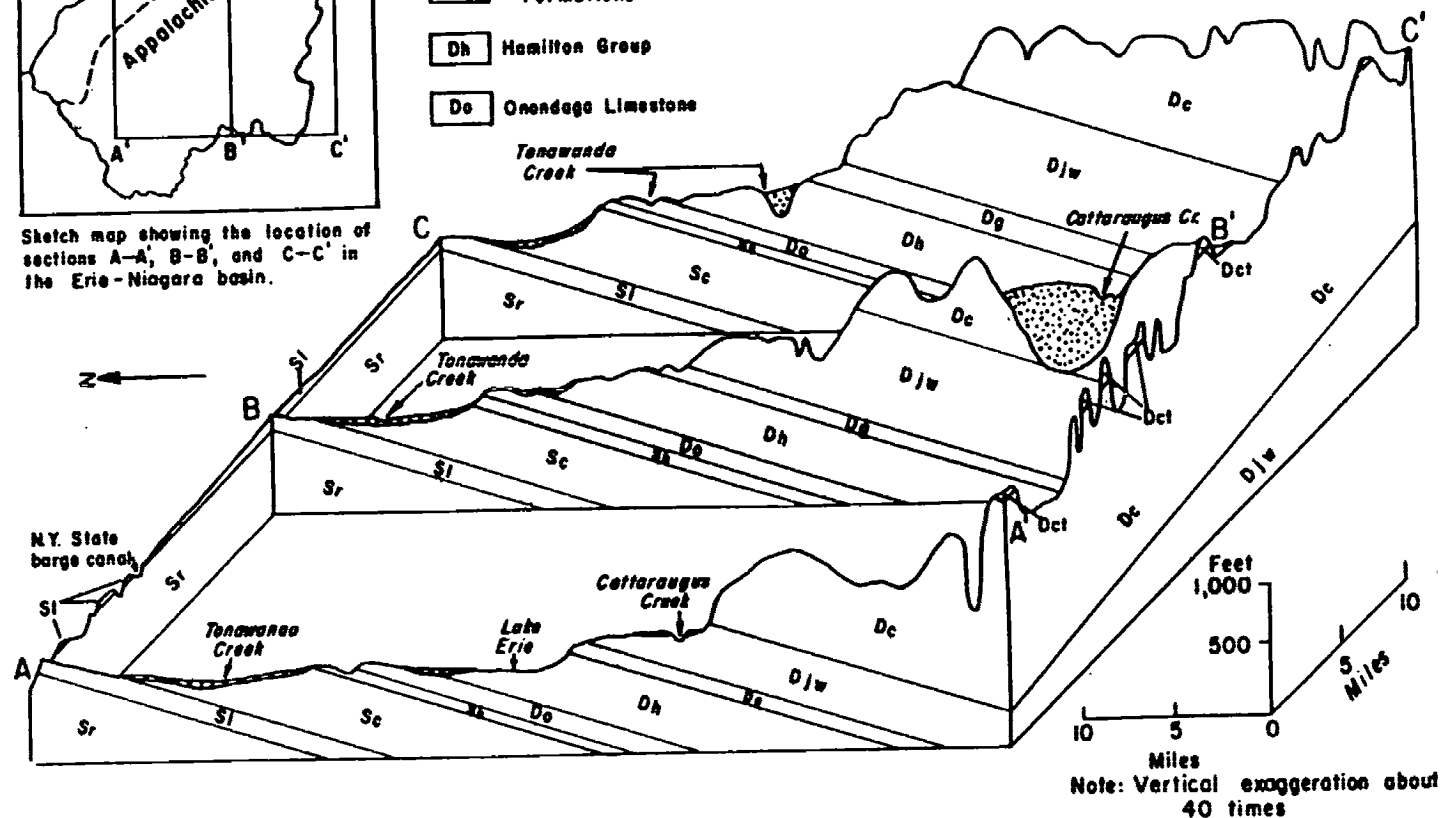


Figure 3.--Fence diagram of part of the Erie-Niagara basin.

REFERENCE NO. 43

CONTROL NO.

DATE

TIME

02-9007-26

12/13/90

1635

DISTRIBUTION

Carborundum Abrasives

BETWEEN

Mike Wilkinson,

Senior
Aquatic
Biologist

OF

Region 9
Buffalo

PHONE

NYSDEC

17161847-4600

AND

David Florin

(NUS)

DISCUSSION

Contacted Region 9, NYSDEC to obtain information on Fisheries in the Cayuga Creek. Mr. Wilkinson informed me that he simply did not know about the amount of fishing done on the Cayuga - there was not data. However due to the Creek being heavily urbanized, lack of access to river, and lack of expectation of catching desirable species the creek is probably not fished at all. Mr. Wilkinson also stated that there has been a health advisory by the NYS Dept. of Health not to eat any fish out of Creek. The creek contains many bait fish species such as shiners, some pan species such as pumpkinseed, bullhead, bluegill, and some game fish such as pike and bass.

ACTION ITEMS:

DJ

REFERENCE NO. 44

CONTROL NO:

62-9007-26

DATE:

12/13/90

TIME:

1716

DISTRIBUTION:

Carborundum Abrasives

BETWEEN:

Larry Skinner Principle Fish
and Wildlife
Ecologist

OF:

NYSDEC
Bureau of Environmental

PHONE:

(518) 457-6178

AND:

David Florin

DISCUSSION:

Contacted the Bureau of Environmental Protection, the NYSDEC dept. that oversees the contamination program to obtain information on the health advisory on fishing in the Cayuga Creek. Mr. Skinner informed me that the NYS Dept of Health has issued a health advisory that states no fish should be eaten from Cayuga Creek. The primary reason is due to dioxin contamination believed to originate from Love Canal. Love Canal is a tributary of Cayuga Creek. The advisory has been in effect for the past three years. The entire length of the Cayuga is under the advisory. The advisory will be in

ACTION ITEMS:

Place until fish samples fall under minimum levels. To date the tissue samples are still high. The Dept of Health will lift ban only when samples do not exceed limits for a period of two years.

REFERENCE NO. 45

CONTROL NO:

02-9007-26

DATE:

12/17/90

TIME:

1139

DISTRIBUTION:

Carborundum Abrasives

BETWEEN:

John Burnmaster, Director

Administrative OF:

Niagara County
Water District

PHONE:

(716) 434-8835

AND:

David Florin

DISCUSSION:

Contacted the Niagara County Water District to obtain information on drinking water supply for Wheatfield area. Mr. Burnmaster informed me that the populations of Niagara and surrounding communities are all on surface water. When asked about the population in a 4 mile radius from Wallmore road and Cayuga Creek, Mr. Burnmaster stated that surface water taken from intakes located on the west fork of Niagara or Chippawa channel supplies the population. Mr. Burnmaster also stated that most if not all drinking water intakes for the entire region are located south of Navy Island on the Chippawa channel. All

ACTION ITEMS:

intakes located on the Tonawanda channel and the Niagara downstream of Navy Island are used for industrial purposes.

REFERENCE NO. 46

NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO:

02-9007-26

DATE:

12/21/98

TIME:

1109

DISTRIBUTION:

Carborundum Abrasives

BETWEEN:

Louis Biolante, Hazardous Waste
Program

OF:

NYSD&C
Region 9

PHONE:

(716) 847-4585

AND:

David Loren

DISCUSSION:

Contacted Hazardous Waste Program
to obtain RCRA permit number for
Carborundum Abrasives. Mr. Biolante
stated that Carborundum has been
issued RCRA permit # NYD 000829606
as a generator. Mr. Biolante informed
me that there is no expiration
date for this permit and was
unable to find date of issuance.

[Signature]

ACTION ITEMS:

REFERENCE NO. 47

CLIENT: Carborandum Abrasives	FILE NO.: JDP# 02-7007-26	BY: David Florin	PAGE 1 OF 1
SUBJECT: Calculation of groundwater usage		CHECKED BY: 8	DATE: 3/1/91

Population in 4 mile radius = 48,520
Housing in 4 mile radius = 16,540

$$\frac{48,520 \text{ persons}}{16,540 \text{ houses}} = 2.9 \text{ persons per house}$$

<u>Distance</u>	<u>No. of Wells</u>		<u>Population on Well</u>
0 - 1/4 mile	0	$\times 2.9$	0
1/4 - 1/2 mile	0	$\times 2.9$	0
1/2 - 1 mile	0	$\times 2.9$	0
1 - 2 mile	3	$\times 2.9$	9
2 - 3 mile	7	$\times 2.9$	20
3 - 4 mile	20	$\times 2.9$	58

In addition, in the 3-4 mile radius there are 3 public supply wells that service 50 people. Therefore the total population served by wells in the 3-4 mile ring is $58 + 50$ for a total of 108.

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Carborundum Abrasives
Wheatfield, N.Y.

PA Scoresheets

PRELIMINARY ASSESSMENT

Rev. No. 0

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NOV 06 1990

CERCLIS IDENTIFICATION NUMBER

STATE

SITE NUMBER

N.Y.

NYD 980 507883

SITE LOCATION

SITE NAME: Legal, common or descriptive name of site

Carborundum Abrasives

STREET ADDRESS, ROUTE or SPECIFIC LOCATION IDENTIFIER

6600 Walmore Road

CITY

Wheat Field

STATE

N.Y.

ZIP CODE

14304

TELEPHONE

(716) 695-8120

COORDINATES: LATITUDE and LONGITUDE

43° 6' 25" N 78° 55' 56" W

TOWNSHIP, RANGE, and SECTION

OWNER/OPERATOR IDENTIFICATION

OWNER

CA Acquisitions Co.

OPERATOR

Carborundum Abrasives

OWNER ADDRESS

6600 Walmore Road

OPERATOR ADDRESS

6600 Walmore Road

CITY

Wheat Field

CITY

Wheat Field

STATE

N.Y.

ZIP CODE

14304

TELEPHONE

(716) 695-8120

STATE

N.Y.

ZIP CODE

14304

TELEPHONE

(716) 695-8120

TYPE OF OWNERSHIP

☒

PRIVATE

☐

FEDERAL: Agency name _____

☐

STATE

☐

COUNTY

☐

MUNICIPAL

☐

OTHER: _____

☐

NOT SPECIFIED

OWNER/OPERATOR NOTIFICATION ON FILE

☐

NONE

☐

CERCLA 103 C, UNCONTROLLED WASTE SITE

DATE: _____

☐

RCRA 3001

DATE: _____

SITE STATUS

☒

ACTIVE

☐

INACTIVE

☐

UNKNOWN

YEARS OF OPERATION

BEGINNING YEAR: 1968ENDING YEAR: present☐ UNKNOWN

APPROXIMATE SIZE OF SITE

60 acres

+ 2.75 acre surface
impoundment located
on Airport side

SITE EVALUATION

AGENCY / ORGANIZATION

NYS Corporation

INVESTIGATOR

CONTACT

ADDRESS

1090 King Georges Post Road

TELEPHONE

(201) 225-6160

DATE

December 17, 1990

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INSTRUCTIONS FOR SCORESHEETS

Introduction

These scoresheets require you to record information collected during the PA, indicate references used, select values ("scores") for factors, calculate pathway scores and a site score, and conclude with a site recommendation. You are encouraged to write notes on the scoresheets and especially on the Criteria Lists. On pages with a reference column, indicate a number corresponding to attached sources of information or pages containing rationale for hypotheses; attach to the scoresheets a numbered list of these references. Evaluate all four pathways. Complete and submit all Criteria Lists, scoresheets, and tables. Show calculations, as appropriate. Do not enter values or scores in shaded areas of the scoresheets.

General Information

Site Description and Operational History: Provide a brief description of the site and its operating history. State the site name, owner/operator, type of facility and operations, size of property, active or nonactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note also if these activities are documented or alleged. Identify probable source types and prior spills. Summarize highlights of previous investigations.

Probable Contaminants of Concern: List hazardous substances you think may have been stored, handled, or disposed of at this site, based on your knowledge of site operations. The purpose of identifying probable substances of concern is to consider the mobility of wastes to hypothesize whether a release has occurred. Identify the sources to which the substances may be related. Summarize any analytical data that may exist concerning contamination detected onsite or impacting targets, as a result of previous investigations performed on the site.

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Site Name:

Carborundum Abrasives

Date:

12/17/90

02-9007-26-SI

Rev. No. 0

GENERAL INFORMATION

Site Description and Operational History:

The Carborundum Abrasives located in Wheatfield, Niagara County, NY, is an active facility that has been manufacturing sand and abrasive grain materials since 1968. The facility is situated on approximately 60 acres and is comprised of a plant building, boiler house, hanger, tank area and other various small buildings. The surrounding area is heavily industrialized; the site is bordered to the west by the Niagara Falls International Airport, to the north by the Niagara Falls Air Force Base and Cayuga Creek, to the east and south are other industrial complexes or unused developed areas. Employees number around 250.

There are three areas associated with this site that may be considered possible hazardous waste sites: (1) a 450' x 25' clay-capped landfill that was once an open dump used to dispose of phenols and solids from 1968-1976 (2) a 2.75 acre surface impoundment located 400' to the north on adjacent Niagara airport site; this impoundment is used by Carborundum as a settling basin for storm and non-contact cooling water discharged from facility. Past production activities, violation of SPDES, and accidental spills may have led to contamination of this surface impoundment that has a sewer pipe to Cayuga Creek (3) A drum storage area that is in good condition.

Probable Contaminants of Concern:

(Previous investigations; analytical data)

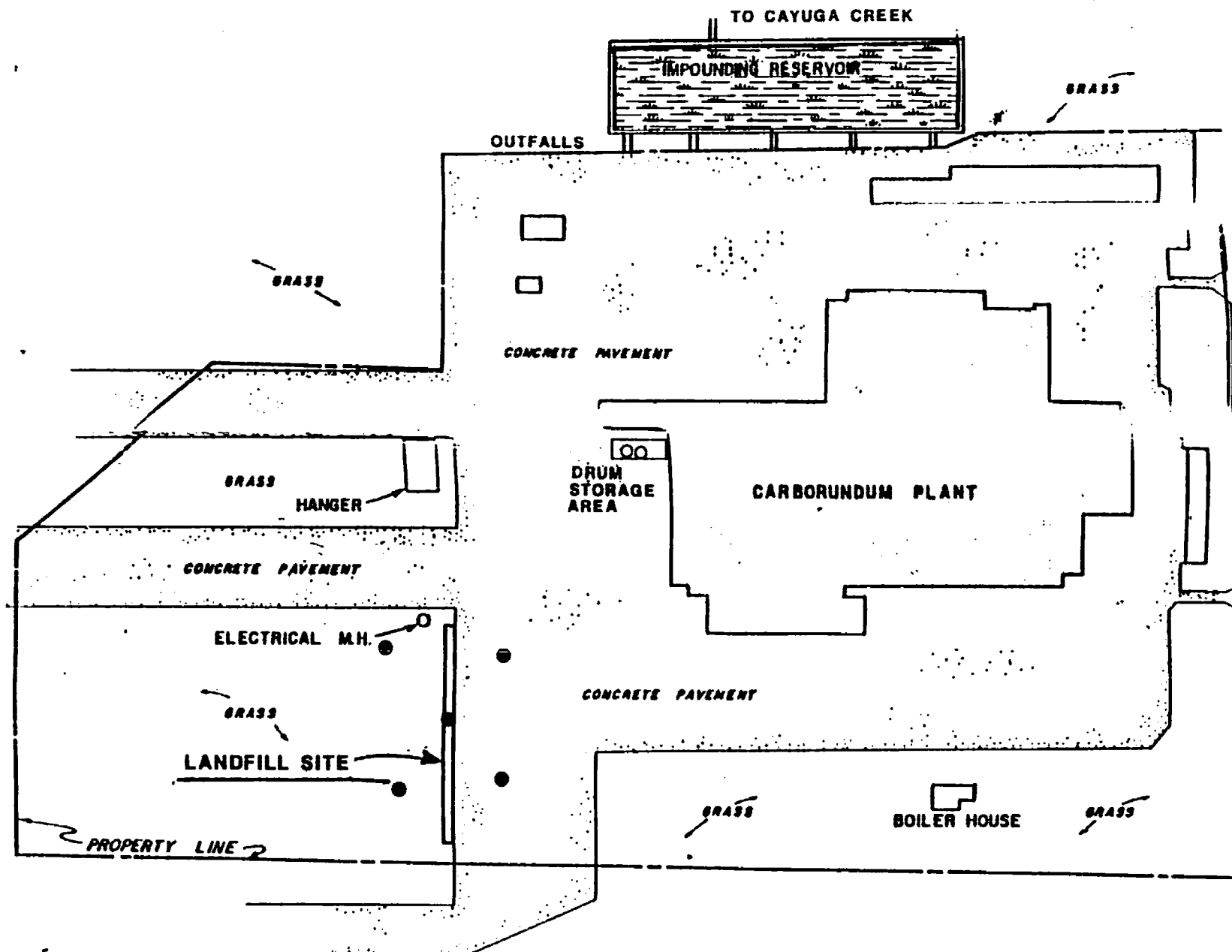
Phenolic compounds are the contaminants of concern at this site. The dump was used to dispose of 800-1600 pounds of phenols and 400 tons of solidified resins, floor sweepings, and waste fillers including calcium carbonate, clays, and animal glue. The reservoir is documented to have received phenolic contamination.

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Site Sketch: Prepare a sketch of the site. Indicate all pertinent features of the site and nearby environs, including: sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, drainage patterns, water bodies, vegetation, wells, sensitive environments, etc.



LEGEND:

- MONITORING WELL LOCATIONS

SITE MAP

CARBORUNDUM ABRASIVES CO.,
WHEATFIELD, N.Y.

(NOT TO SCALE)

FIGURE 2



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Site Name:

Date:

02-5007-20-31
REV. No. 0 3
Carborundum
Abrasive's

GENERAL INFORMATION (continued)

12/17/90

Site Sketch:

(Show all pertinent features; indicate sources and closest targets)

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Source Descriptions: Identify and describe all sources (for example, surface impoundments, landfills, underground tanks, drums, piles, areas of contaminated soil, etc.) at the site. Provide source dimensions and the best available waste quantity information. Indicate if there are any containment structures present (are the sources poorly contained?).

SOURCE TYPE DEFINITIONS

Landfill: a man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: a natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) which was designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges that were not backfilled or otherwise covered; depression may be wet with exposed liquid, or dry if deposited liquid has evaporated, volatilized or leached; structures that may be more specifically described as lagoon pond, aeration pit, settling pond, tailings pond, sludge pit, etc. A surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled) is also considered a surface impoundment.

Drums: a portable container, designed to hold a standard 55-gallon volume of wastes.

Tanks and Non-Drum Containers: any device other than drums, designed to contain an accumulation of waste, that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: an area or volume of soil onto which hazardous substances are suspected to have been spilled, spread, disposed, or deposited.

Pile: any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are: **Chemical Waste Pile:** a pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks; **Scrap Metal or Junk Pile:** a pile consisting primarily of scrap metal or discarded durable goods such as appliances, automobiles, auto parts, batteries, etc., composed of materials suspected to contain or have contained hazardous substances; **Tailings Pile:** a pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation; and **Trash Pile:** a pile consisting primarily of paper, garbage, or discarded non-durable goods which are suspected to contain or have contained hazardous substances.

Land Treatment: landfarming or other land treatment method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Waste Characteristics: Evaluate hazardous waste quantity for all sources at the site to determine the Waste Characteristics factor category score (WC).

Use PA Table 1a (page 5) to determine the WC score for sites with only one source. If more than one source is present, you will need to calculate an intermediate waste quantity value (WQ) for each source using a divisor then sum the WQ values to determine the total WQ for the site (see instructions opposite Table 1, page 5). Use PA Table 1b (page 5) to determine the WC score.

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Site Name: Carbonium (Rev. No. 0 4)

Date: Abrasives

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GENERAL INFORMATION (continued)

12/17/90

Source Descriptions:

- ① Landfill - 450' x 25' - clay capped in 1982; received 800-1600 pounds of phenols and 400 tons of solidified resins
- ② Surface Impoundment - 2.75 acre, approximately 1' deep
- ③ Drums - 60-80 maximum; 90 day turnover (55 gallon drums)

Waste Characteristics (WC) Calculations:

(See PA Table 1, page 5)

Multiple Source Site

① Landfill: $450' \times 25' = 11250 \text{ sq ft}$

$$\frac{11250}{3,400} = 3.31$$

② Surface Impoundment

$$2.75 \text{ acres} \times \frac{43,560 \text{ ft}^2}{\text{acre}}$$

$$\frac{119,790 \text{ ft}^2}{13} = 9214$$

③ Drums

maximum of 80

$$\frac{80}{10} = 8$$

$$\text{WQ Total} = 9225.92$$

WC =

32

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Determining the Waste Characteristics (WC) Score: WC, based on waste quantity, may be determined by one or all of four measures called "tiers": constituent quantity, wastestream quantity, source volume, and source area. PA Table 1a (page 5) is structured according to these tiers. The amount and level of detail of information available to you determine which tier(s) you can use for each source. For each source, evaluate waste quantity for as many of the tiers as you have information to support, and select the result that gives you the highest WC score. For any one source or for all sources at a site, if no information is available regarding waste quantity, assign a WC score of 18 (minimum).

PA Table 1a has 6 columns: column 1 indicates the quantity tier; column 2 lists source types for the four tiers; columns 3, 4, and 5 provide ranges of waste amount for sites with only one source, which correspond to WC scores at the tops of the columns (18, 32, or 100); column 6 provides formulas to obtain source waste quantity (WQ) values at sites with multiple sources.

To determine WC for sites with only one source:

1. *Identify source type (see definitions).*
2. *Examine all waste quantity data available.*
3. *Estimate the mass and/or dimensions of each source.*
4. *Determine which quantity tiers you can use based on available source information.*
5. *Convert source measurements to appropriate units for each tier you can evaluate for the source.*
6. *Identify the range into which the total quantity falls for each tier evaluated (PA Table 1a).*
7. *Determine the highest WC score obtained for any tier (18, 32, or 100, at top of PA Table 1a columns 3, 4, and 5, respectively).*
8. *Use this WC score for all pathways.**

To determine WC for sites with multiple sources:

1. *Identify each source type (see definitions).*
2. *Examine all waste quantity data available for each source.*
3. *Estimate the mass and/or dimensions of each source.*
4. *Determine which quantity tiers you can use for each source based on the available information.*
5. *Convert the measurements to the appropriate units for each tier you can evaluate for each source.*
6. *For each source, use the formulas in column 6 of PA Table 1a to determine the WQ value for each tier that can be evaluated. The highest WQ value obtained for any tier is the WQ value for the source.*
7. *Sum the WQ values for all sources to get the site WQ total.*
8. *Use the site WQ total from step 7 to assign the WC score from PA Table 1b.*
9. *Use this WC score for all pathways.**

* The WC score is considered in all four pathways. However, if there are primary targets for ground water, surface water, or air migration pathways, assign the determined WC or a score of 32, whichever is great as the WC score for that pathway.

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Site Name: *Carbonium*
Date:Rev. No. 05
Abraives

12/17/90

PA TABLE 1: WASTE CHARACTERISTICS (WC) SCORES**PA Table 1a: WC Scores for Single Source Sites and Formulas for Multiple Source Sites**

TIER	SOURCE TYPE	SINGLE SOURCE SITES (assigned WC scores)			MULTIPLE SOURCE SITES
		WC = 18	WC = 32	WC = 100	
CONSTITUENCY	N/A	≤ 100 lbs	> 100 to 10,000 lbs	> 10,000 lbs	lbs + 1
WASTEWATER	N/A	≤ 500,000 lbs	> 500,000 to 50 million lbs	> 50 million lbs	lbs + 5,000
VOLUME	Landfill	≤ 6.75 million ft ³ ≤ 250,000 yd ³	> 6.75 million ft ³ to 675 million ft ³ > 250,000 to 25 million yd ³	> 675 million ft ³ > 25 million yd ³	ft ³ + 67,500 yd ³ + 2,500
	Surface impoundment	≤ 6,750 ft ³ ≤ 250 yd ³	> 6,750 ft ³ to 675,000 ft ³ > 250 to 25,000 yd ³	> 675,000 ft ³ > 25,000 yd ³	ft ³ + 67.5 yd ³ + 2.5
	Drums	≤ 1,000 drums	> 1,000 to 100,000 drums	> 100,000 drums	drums + 10
	Tanks and non-drum containers	≤ 50,000 gallons	> 50,000 to 5 million gallons	> 5 million gallons	gallons + 500
	Contaminated soil	≤ 6.75 million ft ³ ≤ 250,000 yd ³	> 6.75 million ft ³ to 675 million ft ³ > 250,000 to 25 million yd ³	> 675 million ft ³ > 25 million yd ³	ft ³ + 67,500 yd ³ + 2,500
AREA	Pile	≤ 6,750 ft ² ≤ 250 yd ²	> 6,750 ft ² to 675,000 ft ² > 250 to 25,000 yd ²	> 675,000 ft ² > 25,000 yd ²	ft ² + 67.5 yd ² + 2.5
	Landfill	≤ 340,000 ft ² ≤ 7.8 acres	> 340,000 to 34 million ft ² > 7.8 to 780 acres	> 34 million ft ² > 780 acres	ft ² + 3,400 acres + 0.078
	Surface impoundment	≤ 1,300 ft ² ≤ 0.029 acres	> 1,300 to 130,000 ft ² > 0.029 to 2.9 acres	> 130,000 ft ² > 2.9 acres	ft ² + 13 acres + 0.00029
	Contaminated soil	≤ 3.4 million ft ² ≤ 78 acres	> 3.4 million to 340 million ft ² > 78 to 7,800 acres	> 340 million ft ² > 7,800 acres	ft ² + 34,000 acres + 0.78
	Pile*	≤ 1,300 ft ² ≤ 0.029 acres	> 1,300 to 130,000 ft ² > 0.029 to 2.9 acres	> 130,000 ft ² > 2.9 acres	ft ² + 13 acres + 0.00029
	Land treatment	≤ 27,000 ft ² ≤ 0.62 acres	> 27,000 to 2.7 million ft ² > 0.62 to 62 acres	> 2.7 million ft ² > 62 acres	ft ² + 270 acres + 0.0062

1 ton = 2,000 lbs = 1 yd³ = 4 drums = 200 gallons

* Use area of land surface under pile, not surface area of pile.

PA Table 1b: WC Scores for Multiple Source Sites

WQ Total	WC Score
> 0 to 100	18
> 100 to 10,000	32
> 10,000	100

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GROUND WATER PATHWAY

Ground Water Use Description: Provide information on ground water use in the vicinity. Present the general stratigraphy, aquifers used, and distribution of private and municipal wells.

Calculations of Ground Water Drinking Water Populations: Provide populations from private wells and municipal supply systems in each distance ring. Show apportionment calculations for blended supply systems.

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Site Name: Carborundum Abrasives Rev. No. 0 **6**
Date: 12/17/90

NOV 06 1990

GROUND WATER PATHWAY
GROUND WATER USE DESCRIPTION

Describe Ground Water Use Within 4-miles of the Site:

(Provide generalized stratigraphy; information on aquifers, municipal, and or private wells)

The Carborundum Abrasives site is located in the northwest region of the Erie - Niagara basin. This region is characterized by two major aquifer systems. An aquifer of unconsolidated deposits overlay a bedrock aquifer of shale, limestone, and dolomite. The dip of the bedrock averages 30 to 40 Feet per mile southward. Although the bedrock is carbonate the terrain is not considered Karst. A description of stratigraphy from well data shows that top soil is from surface to 0-1.5'; clay, pink from 1.5' to 16.5'; clay, pink some gravel 16.5' to 20' and bedrock at 20'. The bedrock of Lockport Dolomite is shown to be approximately 150' thick followed by Rochester Shale bedrock layer that extends for 60' further down. Groundwater is 6' to 15' below surface and flows in a northeast direction.

The region's population is on surface water for drinking water needs. The USGS data base of 3 public supply, 35 domestic, and 4 industrial within a 4 mile radius of site.

Show calculations of ground water drinking water populations:

	# of wells	population on well
0 - 1/4 mile	0	—
1/4 - 1/2	0	—
1/2 - 1	0	—
> 1-2	3	9
> 2-3	7	20
> 3-4	23 (3 public supply)	83

population at 4 mile radius
housing " " = 2.9 persons

Public supply wells supply 50 persons

This USGS data base is not entirely complete but the population of the region is dependent on surface water for drinking - these wells may be auxiliary.

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GROUND WATER PATHWAY

Pathway Characteristics

Answer the questions at the top of the page. Refer to the Ground Water Pathway Criteria List (page 7) to hypothesize whether you suspect that hazardous substances associated with the site have been released to ground water (GW). Record the depth to the aquifer (in feet): the difference between the deepest depth of waste deposited and the shallowest depth of the top of the aquifer at or as near as possible to the site. Note whether the site is in karst terrain (characterized by abrupt ridges, sink holes, caverns, springs, disappearing streams). State the distance (in feet) from any source to the nearest well used for drinking water.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Ground Water Pathway Criteria List (page 7). Remember to use only Column A for this pathway if you score a suspected release to ground water, and do not evaluate factor 2.
2. **No Suspected Release:** If you do not suspect a release, determine the GW LR score based on depth to aquifer or whether the site is in an area of karst terrain. If you do not suspect a release to ground water remember to use only Column B to score this pathway.

Targets (T)

Evaluates the threat to populations who obtain their drinking water from GW supplies. To apportion population: served by blended drinking-water supply systems, determine the percentage of population served by each well within the 4-mile target distance limit based on its production.

3. **Primary Target Population:** Populations served by any drinking-water wells that you suspect have been exposed to hazardous substances released from the site. Use professional judgment guided by the Ground Water Pathway Criteria List (page 7) to make this determination. In the space provided, enter the population served by any wells you suspect have been exposed to hazardous substances from the site. If only the number of residences is known, use the average county residents per household (rounded to the next integer) to determine population served. Multiply the population by 10 to determine the Primary Target Population score. Note that if you do not suspect a release, there is no Primary Target Population.
4. **Secondary Target Population:** Populations served by any drinking-water wells within four miles of the site that you do not suspect have been exposed to hazardous substances should be evaluated on PA Table 2a or 2b (used for wells drawing from karst aquifers) (page 9). Circle the assigned value for the population in each distance ring and enter it in the column on the far right side of the table. Sum the far right column and enter the total as the Secondary Target Population factor score.
5. **Nearest Well** represents the threat posed to the well that is most likely to be exposed to hazardous substances. If you have identified a Primary Target Population, enter 50. Otherwise, obtain the Nearest Well value from PA Table 2a or 2b for the closest distance category with a drinking-water well population.
6. **Wellhead Protection Area (WHPA):** WHPAs are special areas designated by States for protection under Section 1428 of the Safe Drinking Water Act. Local/State and EPA Regional water officials can provide information regarding the location of WHPAs.
7. **Resources:** Score automatically assigned. Do not override; do not investigate resources.

Target Scoring Instructions: Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release). Note that if there are no drinking-water wells within the target distance limit, the total targets score for either Column A or Column B will be 5 (automatically assigned for resources).

Waste Characteristics (WC)

8. **Waste Characteristics score** is assigned from page 4. However, if any Primary Target has been identified for GW, assign the higher of the score calculated on page 4 or a score of 32.

Ground Water Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

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GROUND WATER PATHWAY SCORESHEET

Site Name: Yarberundum

Date: 12/17/90

02-9007-20-21
Form No. 0 8

Pathway Characteristics	
Do you suspect a release (see Ground Water Pathway Criteria List, page 7)?	Yes ☒ No ☐
Is the site located in karst terrain?	Yes ☐ No ☒
Depth to aquifer:	<u>6-15</u> ft
Distance to the nearest drinking-water well:	<u>6000</u> ft

* may not be used for drinking

LIKELIHOOD OF RELEASE

	A Suspected Release	B No Suspected Release
1. SUSPECTED RELEASE: If you suspect a release to ground water (see page 7), assign a score of 550, and use only column A for this pathway.	550	
2. NO SUSPECTED RELEASE: If you do not suspect a release to ground water, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Use only column B for this pathway.		
LR =	550	

References

5, 6, 7, 8, 9
37, 38

TARGETS

3. PRIMARY TARGET POPULATION: Determine the number of people served by drinking water from wells that you suspect have been exposed to hazardous substances from the site (see Ground Water Pathway Criteria List, page 7). _____ people x 10 =	0	
4. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water from wells that you do NOT suspect have been exposed to hazardous substances from the site, and assign the total population score from PA Table 2. Are any wells part of a blended system? Yes ☐ No ☒ If yes, attach a page to show apportionment calculations.	3	
5. NEAREST WELL: If you have identified any Primary Targets for ground water, assign a score of 50; otherwise, assign the highest Nearest Well score from PA Table 2. If no drinking-water wells exist within 4 miles, assign a score of zero.	5	
6. WELLHEAD PROTECTION AREA (WHPA): Assign a score of 20 if any portion of a designated WHPA is within 1/4 mile of the site; assign 5 if from 1/4 to 4 miles.	—	
7. RESOURCES: A score of 5 is assigned.	5	5
T =	13	

12, 13, 18, 19
45

12, 31, 46

12

33

WASTE CHARACTERISTICS

8. A. If you have identified any Primary Targets for ground water, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	(100 or 32)	
B. If you have NOT identified any Primary Targets for ground water, assign the waste characteristics score calculated on page 4.	(100, 32, or 18)	(100, 32, or 18)
	32	
WC =	32	

GROUND WATER PATHWAY SCORE:

LR x T x WC
82,500

(subject to a maximum of 100)

2.77

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Site Name:
 Date: Carbonadium
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 12/17/90

PA TABLE 2: VALUES FOR SECONDARY GROUND WATER TARGET POPULATIONS

PA Table 2a: Non-Karst Aquifers

Distance from Site	Population	Nearest Well (choose highest)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	
0 to ¼ mile	0	20	1	2	5	16	52	163	521	1,633	5,214	16,325	0
> ¼ to ½ mile	0	18	1	1	3	10	32	101	323	1,012	3,233	10,121	0
> ½ to 1 mile	0	9	1	1	2	5	17	52	167	522	1,668	5,224	0
> 1 to 2 miles	9	5	1	1	1	3	9	29	94	294	939	2,938	1
> 2 to 3 miles	20	3	1	1	1	2	7	21	68	212	678	2,122	1
> 3 to 4 miles	117/108	2	1	1	1	1	4	13	42	131	417	1,306	1
Nearest Well =		5	Score =										3

PA Table 2b: Karst Aquifers

Distance from Site	Population	Nearest Well (use 20 for karst)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	
0 to ¼ mile		20	1	2	5	16	52	163	521	1,633	5,214	16,325	
> ¼ to ½ mile		20	1	1	3	10	32	101	323	1,012	3,233	10,121	
> ½ to 1 mile		20	1	1	3	8	26	82	261	816	2,607	8,162	
> 1 to 2 miles		20	1	1	3	8	26	82	261	816	2,607	8,162	
> 2 to 3 miles		20	1	1	3	8	26	82	261	816	2,607	8,162	
> 3 to 4 miles		20	1	1	3	8	26	82	261	816	2,607	8,162	
Nearest Well =			Score =										

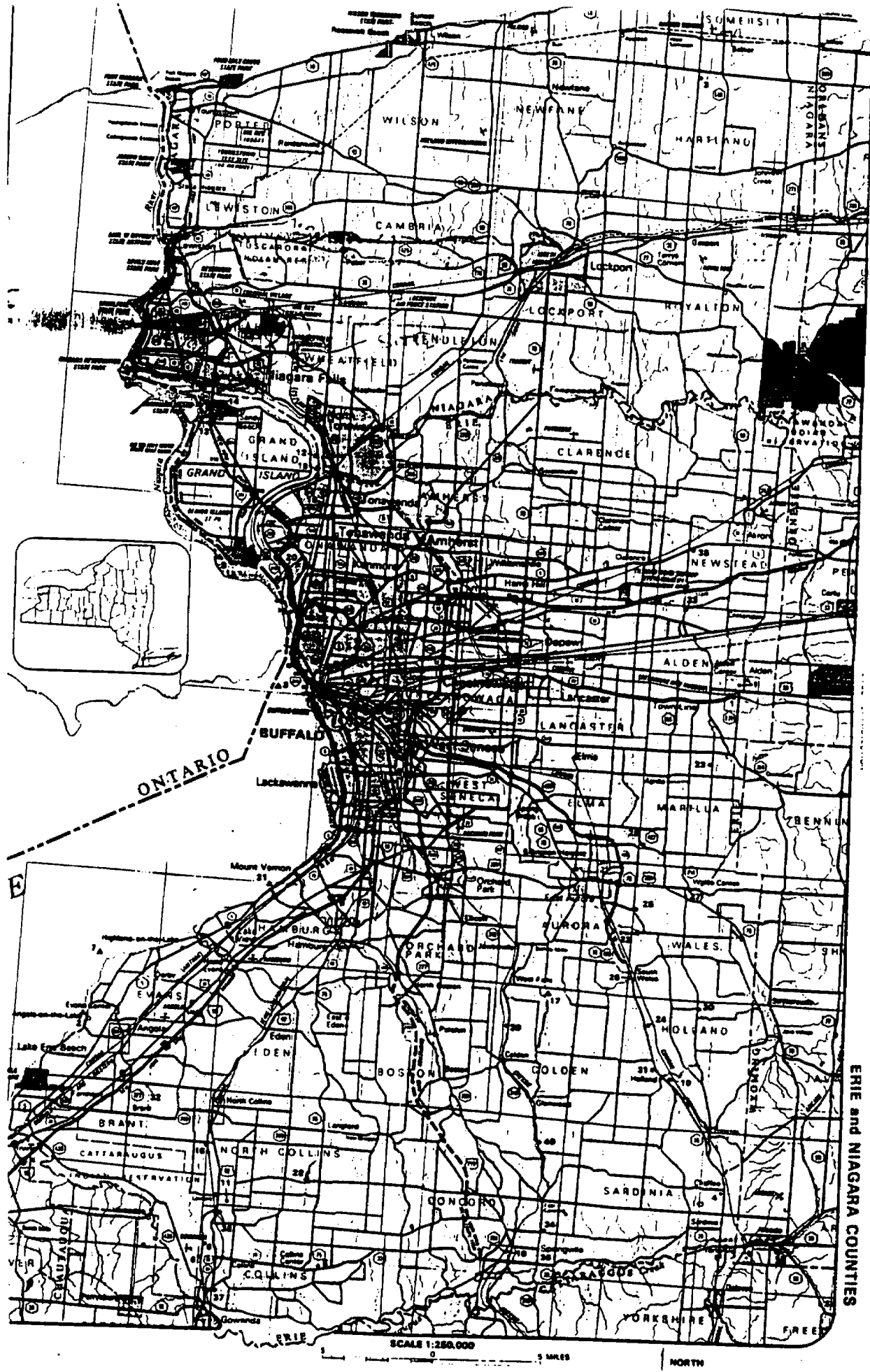
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SURFACE WATER PATHWAY

Migration Route Sketch: Sketch the surface water migration pathway illustrating the drainage route and identifying water bodies, the probable point of entry, flows, and targets.



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Carborundum Rev. No. 070

Date:

Abrasives

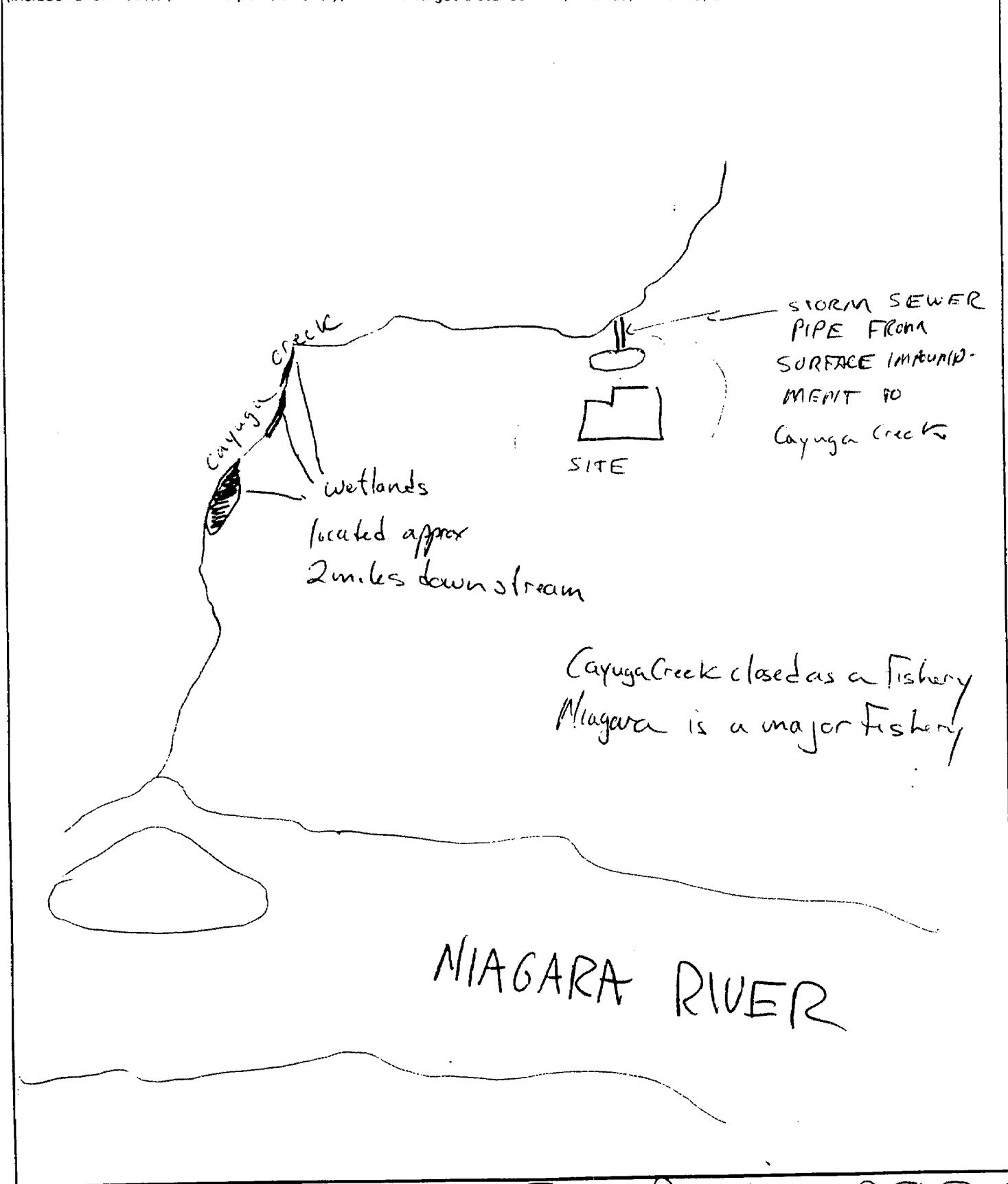
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SURFACE WATER PATHWAY
MIGRATION ROUTE SKETCH

12/17/90

Provide a Sketch of the Surface Water Migration Route:

(include runoff route, probable point of entry, 15-mile target distance limit, intakes, fisheries, and sensitive environments)



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SURFACE WATER PATHWAY CRITERIA LIST

Site Name: CarborundumDate: 12/17/90Rev. No. 01

This chart provides guidelines to assist you in hypothesizing the presence of a suspected release and identifying primary targets. It is expected that not all of this information will be available during the PA. Also, these criteria are not all-inclusive; list any other criteria you use to hypothesize a suspected release or to identify primary targets. This chart will record your professional judgment in evaluating these factors.

The "Suspected Release" section of the chart guides you through evaluation of some site, source, and pathway conditions to help hypothesize whether a release from the site is likely. If a release is suspected, use the "Primary Targets" section to guide you through evaluation of some conditions that will help identify targets likely to be exposed to hazardous substances. You may use this section of the chart more than once, depending on the number of targets you feel may be considered "primary." In the "Primary Targets" section on this sheet, record the responses for the target that you feel has the highest probability of being exposed to hazardous substances.

Check the boxes to indicate a "yes", "no", or "unknown" answer to each question. If you check the "Suspected Release" box as "yes", make sure that you assign a Likelihood of Release value of 550 for the pathway.

SURFACE WATER PATHWAY			
SUSPECTED RELEASE			PRIMARY TARGETS
Y	N	U	
☒	☐	☐	Is surface water nearby?
☐	☒	☐	Is waste quantity particularly large?
☐	☒	☐	Is the drainage area large?
☒	☐	☐	Is precipitation heavy or infiltration rate low?
☒	☐	☐	Are sources poorly contained or prone to runoff or flooding?
☒	☐	☐	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
☐	☒	☐	Is vegetation stressed along the probable runoff path?
☐	☒	☐	Are suspected contaminants highly persistent in surface water?
☐	☐	☒	Are sediments/water unnaturally discolored?
☐	☒	☐	Is wildlife unnaturally absent?
☒	☐	☐	Has deposition of waste into surface water been observed?
☐	☐	☒	Is ground water discharge to surface water likely?
☒	☐	☐	Is there any circumstantial evidence of surface water contamination?
☒	☐	☐	Other criteria? <u>Violation of SPDES</u>
☒	☐	☐	SUSPECTED RELEASE?
☐	☒	☐	Is any target nearby? If yes:
			☐ Drinking-water intake
			☐ Fishery
			☐ Sensitive environment
☒	☐	☐	Has an intake, fishery, or recreational area been closed?
☐	☐	☒	Is there any circumstantial evidence of surface water contamination at or downstream of a target?
☐	☒	☐	Does any target warrant sampling? If yes:
			☐ Drinking-water intake
			☐ Fishery
			☐ Sensitive environment
☐	☐	☐	Other criteria? _____
☐	☒	☐	PRIMARY INTAKE(S) IDENTIFIED?
☐	☒	☐	PRIMARY FISHERY IDENTIFIED?
☐	☒	☐	PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED?

Summarize the rationale for suspected release (attach an additional page if necessary):

Previous investigations have detected elevated phenol levels in surface impoundment that has direct overflow to Cayuga Creek. Carborundum has been involved in SPDES discharge in past.

Summarize the rationale for Primary Targets (attach an additional page if necessary):

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SURFACE WATER PATHWAY

Pathway Characteristics

The surface water pathway includes three threats: Drinking Water Threat, Human Food Chain Threat, and Environmental Threat. Answer the questions at the top of the page. Refer to the Surface Water Pathway Criteria List (page 11) to hypothesize whether you suspect hazardous substances have been released to surface water. Enter the distance to surface water (the shortest overland drainage distance from a source to a surface water body). State the floodplain in which the site is located (e.g., 100-yr, 200-yr). If the site is located in more than one floodplain, use the most frequent flooding event. Identify surface water uses for the 15-mile surface water migration path.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Surface Water Pathway Criteria List (page 11). Remember to use only Column A for this pathway if you score a suspected release to surface water, and do not evaluate factor 2.
2. **No Suspected Release:** Determine score based on the shortest overland drainage distance from a source to a surface water body. If distance to surface water is greater than 2,500 feet, determine this score based on flood frequency. Remember to use only Column B to score this pathway if you do not suspect that hazardous substances have been released.

Drinking Water Threat Targets (T)

3. List all drinking-water intakes on downstream surface water bodies within the 15-mile target distance limit. Provide the intake name, the type of water body on which the intake is located, the flow of the water body, and the number of people served by the intake (apportion the population if part of a blended system).
4. **Primary Target Population:** Evaluate any populations served by drinking-water intakes that you suspect have been exposed to hazardous substances released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. In the space provided, enter the population served by all intakes you suspect have been exposed to hazardous substances, and multiply by 10 to derive the Primary Target Population score. Remember, if you do not suspect a release, there is no Primary Target Population.
5. **Secondary Target Population:** On PA Table 3 (page 13), evaluate any populations served by drinking-water intakes that you do not suspect have been exposed to hazardous substances. Enter the population served by intakes for each flow category. Circle the assigned population value and enter it in the far right column. Sum the population values and enter the total as the Secondary Target Population score.

Gauging station data for most surface water bodies should be available from USGS or other sources. In the absence of gauging station data, see PA Table 4 (page 13) for a listing of surface water body types and associated flow categories. The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that the flow category "mixing zone of quiet flowing rivers" can be used for rivers with flow of at least 10 cfs, but only for intakes within 3 miles of the probable point of entry.

6. **Nearest Intake score** represents the threat posed to the drinking-water intake that is most likely to be exposed to hazardous substances. If you have identified a Primary Target Population, assign a score of 1. Otherwise assign the score determined from PA Table 3 (page 13) for the lowest-flowing water body on which there is an intake.

7. **Resources:** Score automatically assigned. Do not override; do not investigate resources.

Target Scoring Instructions: Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

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Carbondale Rev. No. 02

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12/17/90

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SURFACE WATER PATHWAY

LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics

Do you suspect a release (see Surface Water Pathway Criteria List, page 11)?

Yes ☒ No

Distance to surface water:

750 ft

Flood Frequency:

100 yrs

What is the downstream distance to the nearest drinking-water intake? _____ miles

nearest fishery? 5 miles nearest sensitive environment? 2 miles

LIKELIHOOD OF RELEASE

1. **SUSPECTED RELEASE:** If you suspect a release to surface water (see page 11), assign a score of 550, and use only column A for this pathway.
2. **NO SUSPECTED RELEASE:** If you do not suspect a release to surface water, and the distance to surface water is 2,500 feet or less, assign a score of 500; otherwise, assign a score from the table below. Use only column B for this pathway.

Floodplain	Score
Site in annual or 10-yr floodplain	500
Site in 100-yr floodplain	400
Site in 500-yr floodplain	300
Site outside 500-yr floodplain	100

LR =

DRINKING WATER THREAT TARGETS

3. Determine the water body types, flows (if applicable), and number of people served by all drinking-water intakes within the 15-mile target distance limit. If there are no drinking-water intakes within the target distance limit, assign a total Targets score of 5 at the bottom of this page (Resources only) and proceed to page 14.

Intake Name	Water Body Type	Flow	People Served
		cfs	
		cfs	
		cfs	

4. **PRIMARY TARGET POPULATION:** If you suspect any drinking-water intake listed above has been exposed to hazardous substances from the site (see Surface Water Pathway Criteria List, page 11), list the intake name(s) and calculate the factor score based on the number of people served.

people x 10 =

5. **SECONDARY TARGET POPULATION:** Determine the Secondary Target Population score from PA Table 3 based on the populations using drinking-water from intakes that you do NOT suspect have been exposed to hazardous substances from the site.

Are any intakes part of a blended system? Yes No

If yes, attach a page to show apportionment calculations.

- 6. NEAREST INTAKE:** If you have identified any Primary Targets for the drinking water threat (Factor 4), assign a score of 50; otherwise, assign the Nearest Intake score from PA Table 3. If no drinking-water intake exists within the 15-mile target distance limit, assign a score of zero.

- 7. RESOURCES:** A score of 5 is assigned.

5

5

1

References

2.19

13, 18

13.18

13, 18

T **200**

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Site Name: *Carbonadium*
 Date: *Alorasicus*
12/17/90

PA TABLE 3: VALUES FOR SECONDARY SURFACE WATER TARGET POPULATIONS

Surface Water Body Flow Characteristics (see PA Table 4)	Population	Nearest Intake (choose highest)	Population Served by Intakes Within Flow Category											Population Value
			1 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	
< 10 cfs	_____	20	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,246	_____
10 to 100 cfs	_____	2	1	1	2	5	16	52	163	521	1,633	5,214	16,325	_____
> 100 to 1,000 cfs	_____	1	0	0	1	1	2	5	16	52	163	521	1,633	_____
> 1,000 to 10,000 cfs	_____	0	0	0	0	0	1	1	2	5	16	52	163	_____
> 10,000 cfs or Great Lakes	_____	0	0	0	0	0	0	0	1	1	2	5	16	_____
3-mile Mixing Zone	_____	10	1	3	8	26	82	261	816	2,607	8,162	26,068	81,663	_____
Nearest Intake = _____			Score = _____											

PA TABLE 4: SURFACE WATER TYPE / FLOW CHARACTERISTICS WITH DILUTION WEIGHTS FOR SECONDARY SURFACE WATER SENSITIVE ENVIRONMENTS

Type of Surface Water Body		Dilution Weight
Water Body Type	OR Flow Characteristics	
minimal stream	flow less than 10 cfs	1
small to moderate stream	flow 10 to 100 cfs	0.1
moderate to large stream	flow greater than 100 to 1,000 cfs	N/A
large stream to river	flow greater than 1,000 to 10,000 cfs	N/A
large river	flow greater than 10,000 cfs	N/A
3-mile mixing zone of quiet flowing streams or rivers	flow 10 cfs or greater	N/A
coastal tidal water (harbors, sounds, bays, etc.), ocean, or Great Lakes	N/A	N/A

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SURFACE WATER PATHWAY HUMAN FOOD CHAIN THREAT

Likelihood of Release (LR)

LR is the same for all threats in the Surface Water Pathway. Enter the LR score determined on page 12.

Human Food Chain Threat Targets (T)

8. The only human food chain targets are fisheries. A fishery is "any area of a surface water body from which food chain species are taken or could be taken for human consumption on a subsistence, sporting, or commercial basis." Food chain organisms include fish, shellfish, crustaceans, amphibians, and amphibious reptiles. Fisheries are delineated by changes in surface water body type (i.e., streams and rivers, lakes, coastal tidal waters, and oceans/Great Lakes) and whenever the flow characteristics of a stream or river change. In the space provided, identify all fisheries within the 15-mile target distance limit. Indicate the surface water body type and stream flow for each fishery. Gauging station data should be available for most surface water bodies from USGS or other sources. In the absence of gauging station data, see PA Table 4 (page 13) for a listing of surface water body types and associated flow categories. The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that, if there are no fisheries within the 15-mile target distance limit, the Human Food Chain Threat Targets score is zero; and you should proceed to the Environmental Threat evaluation

9. **Primary Fisheries** are any fisheries within the 15-mile target distance limit that you suspect have been exposed to hazardous substances released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any Primary Fisheries, enter 300 as the Primary Fisheries factor score, and do not evaluate Secondary Fisheries. Note that if you do not suspect a release, there are no Primary Fisheries.

10. **Secondary Fisheries:** Evaluate fisheries that you do not suspect have been exposed to hazardous substances. Determine the lowest flow for which you have identified a Secondary Fishery. Use this flow to select the Secondary Fisheries score from the table. Enter the score into either Column A or Column B.

Target Scoring Instructions: Sum the target scores in Column A (Suspected Release) or Column B (Not Suspected Release).

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Site Name: Carbonate Rev. No. 0 14
Date: 12/17/90

SURFACE WATER PATHWAY (continued) HUMAN FOOD CHAIN THREAT SCORESHEET

	A	B	References
LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	
Enter the Surface Water Likelihood of Release score from page 12.	(550) <u>550</u>	(500, 400, 300 or 100)	

HUMAN FOOD CHAIN THREAT TARGETS

8. Determine the water body types and flows (if applicable) for all fisheries within the 15-mile target distance limit. If there are no fisheries within the target distance limit, assign a Targets score of 0 at the bottom of this page and proceed to page 15.

Fishery Name	Water Body Type	Flow
<u>Niagara River</u>	<u>Large River</u>	<u>10,001-22,000 cfs</u>
		cfs
		cfs
		cfs
		cfs

9. PRIMARY FISHERIES: If you suspect any fishery listed above has been exposed to hazardous substances from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate Factor 10. List the Primary Fisheries:

10. SECONDARY FISHERIES: If you have not identified any Primary Fisheries, assign a Secondary Fisheries score from the table below using the LOWEST flow at any fishery within the 15-mile target distance limit.

Lowest Flow	Secondary Fisheries Score
< 10 cfs	210
10 to 100 cfs	30
> 100 cfs, coastal tidal waters, oceans, or Great Lakes	12

T =

(300 or 0)	(210, 30, 12 or 0)
<u>12</u>	<u>12</u>
(300, 210, 30, 12 or 0)	(210, 30, 12 or 0)
<u>12</u>	

21, 22, 43, 44

21, 22

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SURFACE WATER PATHWAY ENVIRONMENTAL THREAT

Likelihood of Release (LR)

LR is the same for all threats in the Surface Water Pathway. Enter the LR score determined on page 12.

Environmental Threat Targets (T)

11. There are many different types of Environmental Targets. Refer to PA Table 5 (page 16) for a listing of sensitive environments that are evaluated for the Surface Water Pathway Environmental Threat. In the space provided, identify all sensitive environments located within the 15-mile target distance limit. Indicate the surface water body type and flow at each sensitive environment. Gauging station data for most surface water bodies should be available from USGS or other sources. In the absence of gauging station data, see PA Table 4 (page 13) for a listing of surface water body types and associated flow categories. The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that, if there are no sensitive environments within the 15-mile target distance limit, the Environmental Targets score is zero; and you should proceed to the Waste Characteristics evaluation.

12. **Primary Sensitive Environments** are surface water sensitive environments within the 15-mile target distance limit that you suspect have been exposed to hazardous substances released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any Primary Sensitive Environments, enter 300 as the Primary Sensitive Environments factor score, and do not evaluate Secondary Sensitive Environments. Note that if you do not suspect a release, there are no Primary Sensitive Environments.

13. **Secondary Sensitive Environments** are surface water sensitive environments that you do not suspect have been exposed to hazardous substances. If you have identified Secondary Sensitive Environments, evaluate them based on flow by the following process: if there are any Secondary Sensitive Environments on surface water bodies with flows of 100 cfs or less, list them in the table. Use PA Table 4 (page 13) to determine the appropriate dilution weight(s).

Use PA Tables 5 and 6 (page 16) to determine the appropriate value for sensitive environment type. When measuring length of wetlands that are located on both sides of a surface water body, sum the frontage areas. For sensitive environments that fall into more than one of the categories listed in PA Table 5, sum the value for each type to determine the environment value. For example, a wetland of 1.5 miles total length (value of 50) that is also a critical habitat for a Federally endangered species (value of 100) would receive an environment value of 150.

For each sensitive environment, multiply the dilution weight by the environment type/length of wetlands value and record the product in the far right column. Sum the values in the far right column and enter the total as the Secondary Sensitive Environments score. Do not evaluate any other Secondary Sensitive Environments. However, if all Secondary Sensitive Environments are on surface water bodies with flows of greater than 100 cfs, assign a Secondary Sensitive Environments score of 10.

Target Scoring Instructions: Sum the target scores in Column A (Suspected Release) or Column B (N Suspected Release).

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Site Name: Carbonadium Rev. No. 15
Date: 12/17/90

SURFACE WATER PATHWAY (continued) ENVIRONMENTAL THREAT SCORESHEET

A	B
Suspected Release	No Suspected Release
(150)	(500, 400, 300 or 100)
550	

LIKELIHOOD OF RELEASE

Enter the Surface Water Likelihood of Release score from page 12.

LR =

ENVIRONMENTAL THREAT TARGETS

11. Determine the water body types and flows (if applicable) for all surface water sensitive environments within the 15-mile target distance limit (see PA Tables 4 and 5). If there are no sensitive environments within the 15-mile target distance limit, assign a Targets score of 0 at the bottom of this page, and proceed to page 17.

Environment Name	Water Body Type	Flow
Freshwater wetlands	Cayuga Creek	100-1000 cfs
Freshwater wetlands	Mugger River	220,000 cfs
		cfs
		cfs
		cfs

12. PRIMARY SENSITIVE ENVIRONMENTS: If you suspect any sensitive environment listed above has been exposed to hazardous substances from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate Factor 13. List the Primary Sensitive Environments:

_____, _____
_____, _____

13. SECONDARY SENSITIVE ENVIRONMENTS:

- A. For Secondary Sensitive Environments on surface water bodies with flows of 100 cfs or less, assign scores as follows, and do not evaluate part B of this factor:

Flow	Dilution Weight (PA Table 4)	Environment Type and Value (PA Tables 5 and 6)	Total
cfs	x	==	
cfs	x	==	
cfs	x	==	
cfs	x	==	
cfs	x	==	

Sum =

- B. If NO Secondary Sensitive Environments are located on surface water bodies with flows of 100 cfs or less, assign a score of 10.

T =

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22,23,20

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Rev. No. 06

Site Name:
Date:

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PA TABLE 5: SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

Sensitive Environment	Assigned Value
Critical habitat for Federally designated endangered or threatened species	100
Marine Sanctuary	
National Park	
Designated Federal Wilderness Area	
Ecologically important areas identified under the Coastal Zone Wilderness Act	
Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act	
Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)	
National Monument	
National Seashore Recreation Area	
National Lakeshore Recreation Area	
Habitat known to be used by Federally designated or proposed endangered or threatened species	75
National Preserve	
National or State Wildlife Refuge	
Unit of Coastal Barrier Resources System	
Federal land designated for the protection of natural ecosystems	
Administratively Proposed Federal Wilderness Area	
Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay or estuary	
Migratory pathways and feeding areas critical for the maintenance of anadromous fish species in a river system	
Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding	
National river reach designated as recreational	
Habitat known to be used by State designated endangered or threatened species	50
Habitat known to be used by a species under review as to its Federal endangered or threatened status	
Coastal Barrier (partially developed)	
Federally designated Scenic or Wild River	
State land designated for wildlife or game management	25
State designated Scenic or Wild River	
State designated Natural Area	
Particular areas, relatively small in size, important to maintenance of unique biotic communities	
State designated areas for the protection/maintenance of aquatic life under the Clean Water Act	5
Wetlands	See PA Table 6 (Surface Water Pathway) or PA Table 9 (Air Pathway)

PA TABLE 6: SURFACE WATER
WETLANDS FRONTAGE VALUES

Total Length of Wetlands	Assigned Value
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

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SURFACE WATER PATHWAY WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE

Waste Characteristics (WC)

14. Waste Characteristics score is assigned from page 4. However, if any Primary Target has been identified for any surface water threat, assign the higher of the score calculated on page 4 or a score of 32.

Surface Water Pathway Threat Scores

Fill in the matrix with the appropriate scores from the previous pages. To calculate the score for each threat: multiply the scores for LR, T and WC, divide the product by 82,500, and round the result to the nearest integer. The Drinking Water Threat and Human Food Chain Threat are subject to a maximum of 100. The Environmental Threat is subject to a maximum of 80. Enter the rounded threat scores into the right side of the table.

Surface Water Pathway Score

Sum the individual threat scores to determine the Surface Water Pathway Score. If the sum is greater than 100, assign 100.

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Site Name:

Date:

Carbonium
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Rev. No. 017

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SURFACE WATER PATHWAY (concluded) WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS	A	B
	Suspected Release (100 or 32)	No Suspected Release (100, 32, or 18)
14. A. If you have identified ANY Primary Targets for surface water (pages 12, 14, or 15), assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.		
B. If you have NOT identified any Primary Targets for surface water, assign the waste characteristics score calculated on page 4.	32	
WC =	32	

SURFACE WATER PATHWAY THREAT SCORES

Threat	Likelihood of Release (LR) Score (from page 12)	Targets (T) Score	Pathway Waste Characteristics (WC) Score (determined above)	Threat Score $LR \times T \times WC$ / 82,500
Drinking Water	550	5	32	(subject to a maximum of 100) 1.07
Human Food Chain	550	12	32	(subject to a maximum of 100) 2.56
Environmental	550	10	32	(subject to a maximum of 80) 2.13

SURFACE WATER PATHWAY SCORE
(Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

(subject to a maximum of 100)
5.76

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SOIL EXPOSURE PATHWAY CRITERIA LIST

Rev. No. 018
 Site Name: Carborundum Abrasives
 Date: 12/17/90

This chart provides guidelines to assist you in hypothesizing the presence of a resident population. It is expected that not all of this information will be available during the PA. Also, these criteria are not all-inclusive; list any other criteria you use to hypothesize resident populations. This chart will record your professional judgment in evaluating this factor.

Use the resident population section to guide you through evaluation of some site and source conditions that will help identify targets likely to be exposed to hazardous substances. You may use this section of the chart more than once, depending on the number of nearby people you feel may be considered part of a resident population. Record the responses for the resident population target that you feel has the highest probability of being exposed to hazardous substances.

Check the boxes to indicate a "yes", "no", or "unknown" answer to each question.

SOIL EXPOSURE PATHWAY				
SUSPECTED CONTAMINATION	RESIDENT POPULATION			
	Y es	N o	UNKNOWN	
<i>Surficial contamination is assumed.</i>	☐	☒	☐	Are there residences, schools, or day care facilities on or within 200 feet of areas of suspected contamination?
	☐	☒	☐	Are residences, schools, or day care facilities located on adjacent land previously owned or leased by the site owner/operator?
	☐	☒	☐	Is there an overland migration route that might spread hazardous substances near residences, schools, or day care facilities?
	☐	☒	☐	Are there any reports of adverse health effects from onsite or adjacent residents or students, exclusive of apparent drinking water or air contamination problems?
	☐	☒	☐	Does any offsite property warrant sampling?
	☐	☒	☐	Other criteria? _____
	☐	☒	☐	RESIDENT POPULATION IDENTIFIED?

Summarize the rationale for resident population (attach an additional page if necessary):

There are no residents within 1/4 mile of site

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SOIL EXPOSURE PATHWAY

Pathway Characteristics

Answer the questions at the top of the page. Identify people who are most likely to be regularly exposed to contamination at the site because they work at the facility or reside or attend school or day care on or within 200 feet of an area of suspected contamination. If the site is active, estimate the number of full or part-time workers at this facility. Note that evaluation of targets is based on current site conditions.

Likelihood of Exposure (LE)

1. Suspected Contamination: The PA always assumes that surficial contamination exists. Do not override this assumption. Surficial contamination often exists even if wastes have been "removed" or are believed to be buried below the surface. A 550 is automatically assigned for this factor; only Column A can be scored for this pathway.

Resident Population Threat Targets (T)

2. Resident Population corresponds to "primary targets" for the migration pathways. Determine if there are people living or attending school or day care on or within 200 feet of areas of suspected contamination. Use professional judgment guided by the Soil Exposure Pathway Criteria List (page 18) to make this determination. Record the number of people identified as Resident Population. Multiply this population by 10 to determine the Resident Population factor score.

3. Resident Individual: If you have identified a Resident Population, assign a score of 50. Otherwise, assign a score of 0.

4. Workers: Estimate the number of full and part-time workers regularly present at this facility and at other facilities where contamination is suspected. Assign a score for the workers factor from the table.

5. Terrestrial Sensitive Environments: In the table provided, list each Terrestrial Sensitive Environment located on areas of suspected contamination. Use PA Table 7 (page 20) to assign a value for each sensitive environment. Sum the values of all the terrestrial sensitive environments and assign the total as the factor score.

6. Resources: Score automatically assigned. Do not override; do not investigate resources.

Target Scoring Instructions: Sum the target scores in Column A.

Waste Characteristics (WC)

7. Enter the WC score determined on page 4. There is no exception for this pathway.

Soil Exposure Pathway Score: Calculate the Resident Population Threat Score by multiplying the scores for T, and WC, and dividing the product by 82,500. Round the threat score to the nearest integer. If the result is greater than 100, assign 100. The Nearby Population Threat Score is always 2 for the PA; do not override this score. Add these 2 points to the calculated Resident Population Threat Score to determine the Exposure Pathway Score, subject to a maximum of 100.

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Site Name: Carbonylurea
Date: 12/17/90

Rev. No. 019

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics	
Do any people live on or within 200 ft of areas of suspected contamination?	Yes ☐ No ☒
Do any people attend school or day care on or within 200 ft of areas of suspected contamination?	Yes ☐ No ☒
Is the facility active? Yes ☒ No ☐ If yes, estimate the number of workers: <u>250</u>	

LIKELIHOOD OF EXPOSURE

	A Suspected Contamination	B No Suspected Contamination	References
1. SUSPECTED CONTAMINATION: Surficial contamination is assumed. A score of 550 is assigned.	(550) 550		

LE =

RESIDENT POPULATION THREAT TARGETS

2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of suspected contamination (see Soil Exposure Pathway Criteria List, page 18).

_____ people x 10 =

3. RESIDENT INDIVIDUAL: If you have identified any Resident Population (Factor 2), assign a score of 50; otherwise, assign a score of 0.

4. WORKERS: Assign a score from the following table based on the total number of workers at the facility and nearby facilities with suspected contamination:

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
> 1,000	15

5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value from PA Table 7 for each terrestrial sensitive environment that is located on an area of suspected contamination:

Terrestrial Sensitive Environment Type	Value
_____	_____
_____	_____

Sum =

6. RESOURCES: A score of 5 is assigned.

T =

WASTE CHARACTERISTICS

7. Assign the waste characteristics score calculated on page 4.

WC =

RESIDENT POPULATION THREAT SCORE:

$$\frac{LE \times T \times WC}{82,500}$$

NEARBY POPULATION THREAT SCORE:

Assign a score of 2

SOIL EXPOSURE PATHWAY SCORE:

Resident Population Threat + Nearby Population Threat

(subject to a maximum of 100)

3.2

2

(subject to a maximum of 100)

5.20

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Site Name: *Carborundum* 20
Date: *Abrasives*

12/17/90

PA TABLE 7: SOIL EXPOSURE PATHWAY
TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

<i>Terrestrial Sensitive Environment</i>	<i>Assigned Value</i>
Terrestrial critical habitat for Federally designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument	100
Terrestrial habitat known to be used by Federally designated or proposed threatened or endangered species National Preserve (terrestrial) National or State terrestrial Wildlife Refuge Federal land designated for protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	75
Terrestrial habitat used by State designated endangered or threatened species Terrestrial habitat used by species under review for Federally designated endangered or threatened status	50
State lands designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

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AIR PATHWAY CRITERIA LIST

02-5007-20-51
Rev. No. 0 21
Site Name: Carbonadium
Date: Abrasives
12/17/90

This chart provides guidelines to assist you in hypothesizing the presence of a suspected release. It is expected that not all of this information will be available during the PA. Also, these criteria are not all-inclusive; list any other criteria you use to hypothesize a suspected release. This chart will record your professional judgment in evaluating this factor.

The "Suspected Release" section of the chart guides you through evaluation of some conditions to help hypothesize whether a release from the site is likely. For the Air Pathway, if a release is suspected, "Primary Targets" are any residents, workers, students, or sensitive environments within ¼ mile of the site.

Check the boxes to indicate a "yes", "no", or "unknown" answer to each question. If you check the "Suspected Release" box as "yes", make sure that you assign a Likelihood of Release value of 550 for the pathway.

AIR PATHWAY			
SUSPECTED RELEASE			PRIMARY TARGETS
Y E S	N O	U N K N O W N	
☒	☐	☐	<i>If you suspect a release to air, evaluate all populations and sensitive environments within ¼ mile (including those onsite) as Primary Targets.</i>
	☒	☐	
	☒	☐	
	☒	☐	
	☒	☐	
	☒	☐	
☐	☒	☐	
SUSPECTED RELEASE?			

Summarize the rationale for suspected release (attach an additional page if necessary):

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Pathway Characteristics

Answer the questions at the top of the page. Refer to the Air Pathway Criteria List (page 21) to hypothesize whether you suspect hazardous substances have been released from the site to the air. Due to dispersion, releases to air are not as persistent as releases to water migration pathways and are much more difficult to detect. Develop hypotheses concerning the release of hazardous substances to air based on "real time" considerations. Record the distance (in feet) from any source to the nearest regularly occupied building.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Air Pathway Criteria List (page 21). Remember to use only Column A for this pathway if you score a Suspected Release, and proceed to the target evaluation section.
2. **No Suspected Release:** If you do not score a Suspected Release, enter 500. Remember to use only Column B to score this pathway if you do not suspect hazardous substances are being released.

Targets (T)

3. **Primary Target Population** are those people subject to exposure from a suspected air release of hazardous substances from the site. Use professional judgment, guided by the Air Pathway Criteria List (page 21), to make this determination. Note that if you do not suspect a release, there are no primary population targets. If you score a Suspected Release, record the residential, student, and worker population located on or within 1/4-mile of the site. Multiply this number of people by 10; enter the factor score in Column A.
4. **Secondary Target Population** are those people in distance categories not suspected to be subject to exposure from airborne hazardous substances. Determine the number of residents, students, and workers, and enter the summed population in PA Table 8 (page 23) for each distance category. Circle the population value for the distance category and record the value in the far right column of the table. Sum these values and enter the total as the factor score.
5. **Nearest Individual** represents the threat posed to the person most likely to be exposed to hazardous substances released from the site. If you have identified any Primary Population, enter 50. Otherwise, assign the score from the "Nearest Individual" column of PA Table 8 (page 23), for the nearest distance ring in which you have identified a Secondary Population.
6. **Primary Sensitive Environments:** List the sensitive environments (on or within 1/4 mile of the site) subject to exposure from a suspected air release of hazardous substances from the site. Assign values for sensitive environment type (from PA Table 5, page 16) and/or wetland acreage (from PA Table 9, page 23). Sum the values and enter the total as the factor score.
7. **Secondary Sensitive Environments:** On PA Table 10 (page 23), list the sensitive environments that are in distance categories within 1/4 mile not suspected to be subject to exposure from airborne hazardous substances. Assign a value for each environment (PA Tables 5 and 9). Record the value for each Secondary Sensitive Environment on PA Table 10 (page 23), and multiply by the distance weight for that distance category. Sum the products, and enter the total as the factor score.
8. **Resources:** Score automatically assigned. Do not override; do not investigate resources.

Target Scoring Instructions: Sum the target scores in Column A (Suspected Release) or Column B (If Suspected Release).

Waste Characteristics (WC)

9. **Waste Characteristics** score is assigned from page 4. However, if any Primary Target has been identified for the air pathway, assign the higher of the score calculated on page 4 or a score of 32.

Air Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

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Site Name: Carbonaceous Abrasives Rev. 11/0 22
Date: 12/17/90

AIR PATHWAY SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Air Pathway Criteria List, page 21)?	Yes ☐ No ☒
Distance to the nearest individual:	<u>(Worker)</u> <u>100</u> ft

LIKELIHOOD OF RELEASE

	A Suspected Release (500)	B No Suspected Release (500)	References
1. SUSPECTED RELEASE: If you suspect a release to air (see page 21), assign a score of 550, and use only column A for this pathway.			
2. NO SUSPECTED RELEASE: If you do not suspect a release to air, assign a score of 500, and use only column B for this pathway.		500	3
LR =		500	

TARGETS

3. PRIMARY TARGET POPULATION: Determine the number of people subject to exposure from a release of hazardous substances through the air (see Air Pathway Criteria List, page 21). _____ people x 10 =											
4. SECONDARY TARGET POPULATION: Determine the number of people within the 4-mile target distance limit, and assign the total population score from PA Table 8.		31	16, 24								
5. NEAREST INDIVIDUAL: If you have identified any Primary Targets for the air pathway, assign a score of 50; otherwise, assign the highest Nearest Individual score from PA Table 8.	(50, 20, 7, 2, 1, or 0)	(20, 7, 2, 1, or 0)	4								
6. PRIMARY SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (PA Table 5) and wetland acreage values (PA Table 9) for environments subject to exposure from air hazardous substances (see Air Pathway Criteria List, page 21).											
<table border="1"><thead><tr><th>Sensitive Environment Type</th><th>Value</th></tr></thead><tbody><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></tbody></table>	Sensitive Environment Type	Value									
Sensitive Environment Type	Value										
Sum =											
7. SECONDARY SENSITIVE ENVIRONMENTS: Use PA Table 10 to determine the score for secondary sensitive environments.		0	20, 25								
8. RESOURCES: A score of 5 is assigned.	(5)	(5)									
	5	5									
T =		56									

WASTE CHARACTERISTICS

9. A. If you have identified any Primary Targets for the air pathway, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	(100 or 32)	
B. If you have NOT identified any Primary Targets for the air pathway, assign the waste characteristics score calculated on page 4.	(100, 32, or 18)	(100, 32, or 18)
		32
WC =		32

AIR PATHWAY SCORE:

LR x T x WC

82,500

(Subject to a maximum of 100)

10.86

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Site Name: Carborundum
 Date: ABRAZIVES

12/17/90

PA TABLE 8: VALUES FOR SECONDARY AIR TARGET POPULATIONS

Distance from Site	Population	Nearest Individual (choose highest)	Population Within Distance Category												Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	
Onsite	<u>250</u>	<u>20</u>	1	2	5	<u>16</u>	52	163	521	1,633	5,214	16,325	52,136	163,246	<u>16</u>
> 0 to 1/4 mile	<u>0</u>	20	1	1	1	4	13	41	130	408	1,303	4,081	13,034	40,811	<u>1</u>
> 1/4 to 1/2 mile	<u>30</u>	2	0	<u>0</u>	1	1	3	9	28	88	282	882	2,815	8,815	<u>0</u>
> 1/2 to 1 mile	<u>703</u>	1	0	0	0	1	<u>1</u>	3	8	26	83	261	834	2,612	<u>1</u>
> 1 to 2 miles	<u>10,279</u>	0	0	0	0	0	1	1	3	<u>8</u>	27	83	266	833	<u>8</u>
> 2 to 3 miles	<u>22,167</u>	0	0	0	0	0	1	1	1	<u>4</u>	12	38	120	376	<u>4</u>
> 3 to 4 miles	<u>15,401</u>	0	0	0	0	0	0	1	1	<u>2</u>	7	23	73	229	<u>2</u>
Nearest Individual =		<u>20</u>													Score = <u>31</u>

PA TABLE 9: AIR PATHWAY VALUES FOR WETLAND AREA

Wetland Area	Assigned Value
Less than 1 acre	0
1 to 50 acres	25
Greater than 50 to 100 acres	75
Greater than 100 to 150 acres	125
Greater than 150 to 200 acres	175
Greater than 200 to 300 acres	250
Greater than 300 to 400 acres	350
Greater than 400 to 500 acres	450
Greater than 500 acres	500

PA TABLE 10: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY SECONDARY SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from PA Table 5 or 9)	Product
Onsite	0.10	x	
		x	
		x	
0-1/4 mi	0.025	x	
		x	
		x	
1/4-1/2mi	0.0054	x	
		x	
		x	
		x	
Total Environments Score =			

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SITE SCORE CALCULATION

In the column labeled S, record the Ground Water Pathway score, the Surface Water Pathway score, the S Exposure Pathway score, and the Air Pathway score. Square each pathway score and record the result in the S² column. Sum the squared pathway scores. Divide the sum by 4, and take the square root of the result to obtain the Site Score.

Recommendation

Provide a recommendation for site disposition in accordance with EPA guidelines.

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Site Name: *Carbonate* *24*
 Date: *Abrasives*
12/17/90

SITE SCORE CALCULATION

	S	S ²
GROUND WATER PATHWAY SCORE (S _{gw}):	<i>2.77</i>	<i>7.67</i>
SURFACE WATER PATHWAY SCORE (S _{sw}):	<i>5.76</i>	<i>33.18</i>
SOIL EXPOSURE PATHWAY SCORE (S _{se}):	<i>5.20</i>	<i>27.04</i>
AIR PATHWAY SCORE (S _a):	<i>10.86</i>	<i>117.95</i>
SITE SCORE:	$\sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_{se}^2 + S_a^2}{4}} =$	
	<i>6.82</i>	

RECOMMENDATION

No Further Remedial Action Planned

SUMMARY

	YES	NO
1. Is there a high possibility of a threat to nearby drinking water wells by migration of hazardous substances in ground water?	☐	☒
A. If yes, identify the wells recommended for sampling during the SI.		
B. If yes, how many people are served by these threatened wells? _____		
2. Are any of the following suspected to have been exposed to hazardous substances through surface water migration from the site?		
A. Drinking water intake	☐	☒
B. Fishery	☐	☒
C. Sensitive environment: wetland, critical habitat, others	☐	☒
D. If yes, identify the targets recommended for sampling during the SI.		
3. Do people reside or attend school or day care on or within 200 ft of any area of suspected contamination?	☐	☒
4. Are there public health concerns at this site that are not addressed by PA scoring considerations? If yes, explain:	☐	☒

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