2021 Hazardous Waste Scanning Project

File Form Naming Convention.

(*File_Type*).(*Program*).(*Site_Number*).(*YYYY-MM-DD*).(*File_Name*).pdf

Note 1: Each category is separated by a period "."
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Specific File Naming Convention Label:

report.HW.932035.1987-01-01.Phase 1.pdf

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

UNION CARBIDE-CARBON PRODUCTS DIVISION
NIAGARA FALLS, NIAGARA COUNTY, NEW YORK
Site Code:932035

JANUARY 1987

Prepared for:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD, ALBANY, NEW YORK 12233
HENRY G. WILLIAMS, COMMISSIONER

Division of Solid and Hazardous Waste
NORMAN H. NOSENCHUCK, P.E. DIRECTOR

WEHRAN ENGINEERING, P.C.
Middletown & Grand Island, New York

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

UNION CARBIDE REPUBLIC PLANT LANDFILL NIAGARA FALLS, NIAGARA COUNTY, NEW YORK SITE CODE: 932035

Prepared for

DIVISION OF SOLID AND HAZARDOUS WASTE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD
ALBANY, NEW YORK 12233-0001

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WE Project No. 01424339

January 1987

UNION CARBIDE

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

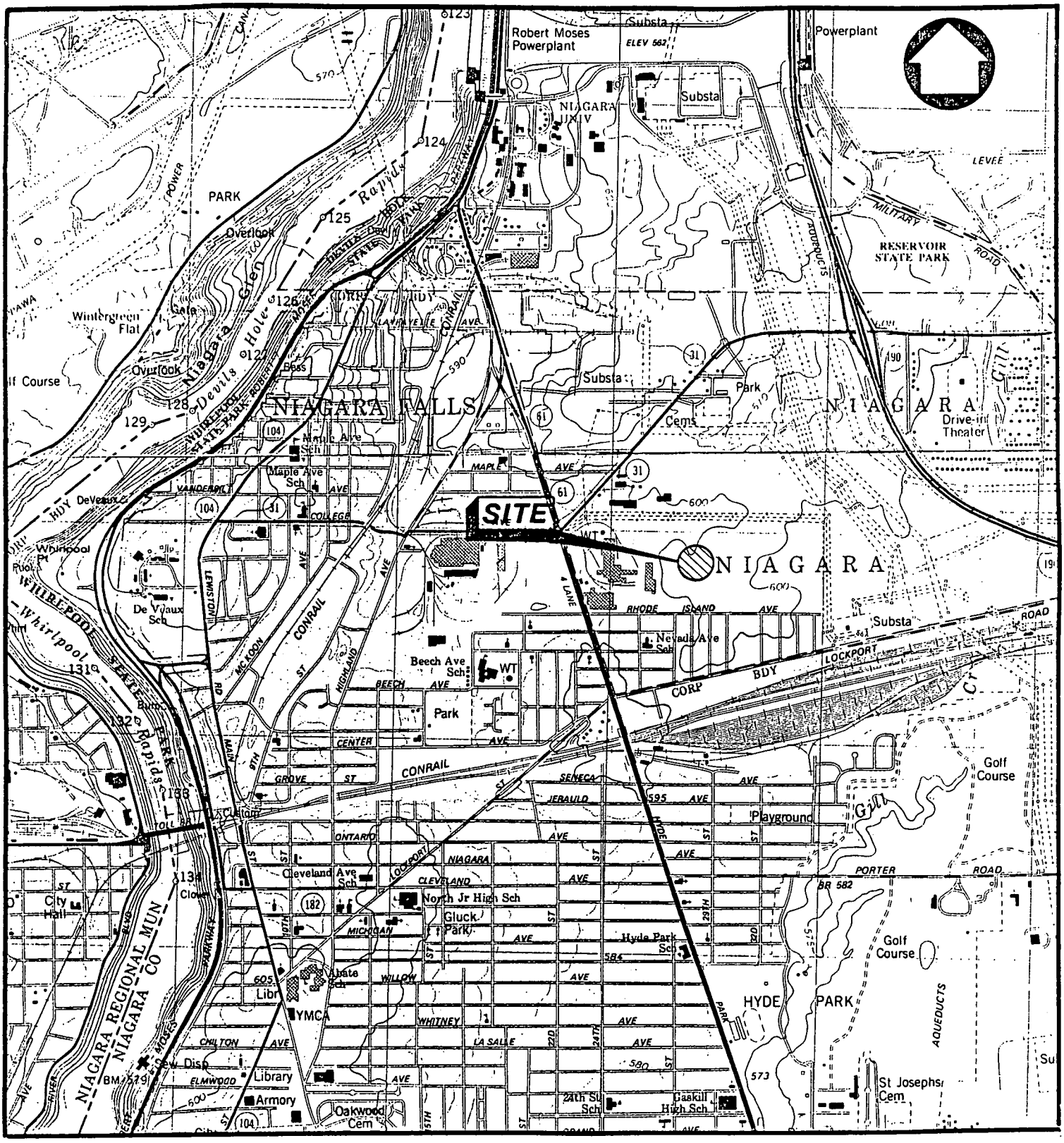
1.0 EXECUTIVE SUMMARY

The Union Carbide Republic Plant Landfill site is a 16-acre active landfill on Hyde Park Boulevard, Niagara Falls, Niagara County, New York. The site is used by Union Carbide to dispose of carbonaceous waste, fire brick and wood pallets generated during their production process. The site is not open to the general public. The site has been active during the period of 1934 through the present. The landfill services the National, Acheson and Republic locations of Union Carbide's Niagara Plant. The Union Carbide Products Division is expected to close the landfill by December 1986 in accordance with Part 360. Carbon and graphite manufacturing occurred at each of these plants. Industrial processes included calcine, mill, mix and forming carbon products, baking and graphitizing carbon products, pitch impregnation and machining of carbon products. Raw materials utilized include anthracite coal, petroleum coke and coal tar pitch.

Wehran Engineering conducted a site visit, which included a walk around the site, noting any disturbed areas, leachate etc.; as well as the use of an HNU photoionizing organic vapor detector to measure the ambient air quality.

The site appeared to be well maintained and organized. The working face is kept to a limited area and the the site is progressively closed and capped as the operation continues. There was no leachate visible and it appears that it would not be a problem due to the type of material disposed of at the site. No organic vapors were detected by the HNU.

The wastes disposed of at this site include carbonaceous dust and scrap, firebrick, waste wood and pallets. Other waste types generated and deposited on the site in the past include coke, pitch, lunch waste, silica sand, coal tars and petroleum tars (see P. Millock - S. Dorr interview, November 15, 1978), machining oils and spent sludges from degreasing (1,1,1-trichloroethane). Water quality data, indicates that phenols, heavy metals, and low levels of halogenated organics exceed New York State groundwater criteria in the till hydrologic zone. Additional investigation is necessary in order to identify the types and concentrations of disposed materials and the potential health and environmental hazards. A Phase II work plan has been proposed to more accurately assess this site. The preliminary HRS score is $S_M = 11.03$.



SCALE: 1" = 2000'

TOPOGRAPHY TAKEN FROM
1980
NIAGARA FALLS, N.Y
LEWISTON, N.Y.

U.S.G.S. QUADRANGLE
7.5 MIN SERIES

MAP LOCATION

FIGURE 1

SITE LOCATION MAP

UNION CARBIDE

LAT. 43°-07'-14" N LONG. 79°-01'-35" W

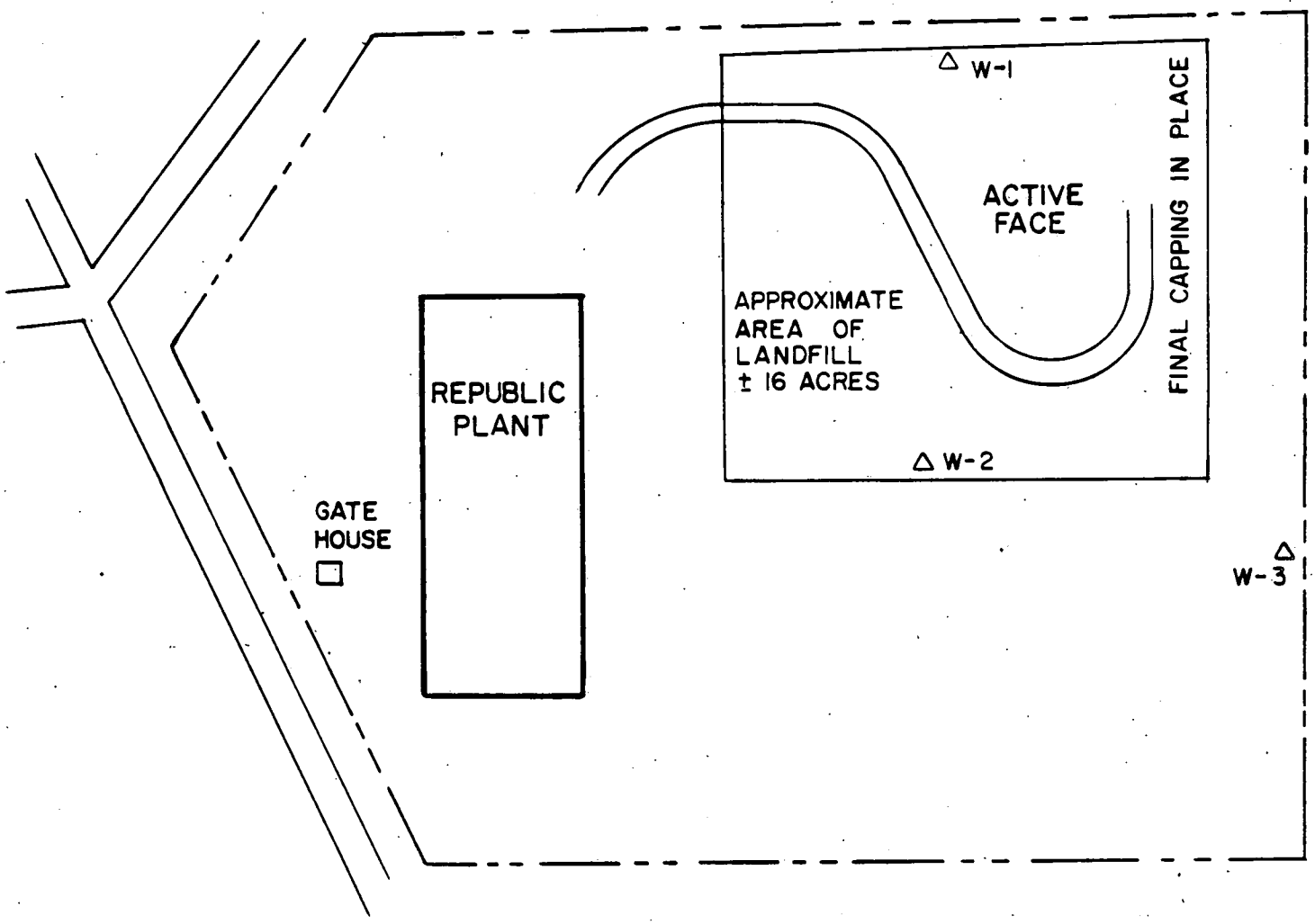


FIGURE 2

SITE SKETCH

UNION CARBIDE REPUBLIC PLANT LANDFILL

2.0 PURPOSE

2.0 PURPOSE

This Phase I investigation was conducted under contract to the New York State Department of Environmental Conservation Superfund Program to evaluate the potential environmental or public health hazard associated with past disposal activities at the Union Carbide Republic Plant Landfill site. Divided into two parts, this initial investigation consisted of a detailed file review of available information and an initial site investigation. The culmination of this phase is the development of a preliminary Hazard Ranking System (HRS) score.

Where information is lacking and a final score cannot be computed, recommendations will be made for a Phase II investigation designed to verify the assumptions made in the preliminary scoring and to collect the additional data needed to complete the site assessment.

3.0 SCOPE OF WORK

3.0 SCOPE OF WORK

To complete the preliminary HRS score for the Union Carbide site, the following scope of work was completed:

- A review of the following:
  - Available information from federal, state, and municipal agencies
  - Published documents from the U.S. Geological Survey, Soil Conservation Service and state agencies for geological, hydrological and topographical data
  - Available files, reports and court cases
- Interviews with individuals having knowledge of the site

Information gathered included well logs, land use data, water usage patterns, critical habitats and endangered species data, meteorological data, hydrological, geological and topographical data, waste characteristics and demographic information.

Following an initial file review a site inspection was conducted. The intent of the inspection was to verify existing file information and to conduct an HNU survey to screen for potential air releases. Items of specific interest in the site investigation were:

- Overall site environmental conditions
- The presence of disturbed areas
- Visual signs of waste materials (drums, sludges, etc.)
- The occurrence of leachate
- Site topography

A detailed analysis was performed on all data collected in preparation of a preliminary HRS score. Where information was lacking and a final HRS

score could not be computed, recommendations were made for a Phase II investigation. This investigation was designed to verify the assumptions made in the preliminary scoring and to collect the additional data needed to complete the site assessment. A summary of agencies contacted, contact person, address and information obtained follows.

SOURCES -- UNION CARBIDE REPUBLIC PLANT LANDFILL
(Page 1)

Name/Address/Phone	Type of Contact	Date	Information Provided
Mr. Robert Abrams, Attorney General New York State Attorney General Department of Law State Capitol, Room 221 Albany, New York 12224 (581) 474-7330	Letter	8-24-84	None available
Dr. David Axelrod, Commissioner New York State Department of Health Tower Building, Empire State Plaza Albany, New York 12237 (518) 474-8427	Letter	8-24-84	None available
Mr. Michael A. Balent Chief Plant Engineer Union Carbide Corporation P.O. Box 887 Niagara Falls, New York 14302	Interview	8-24-84	None available
Mr. Philip Barnes Acting Regional Director NYSDOT, Region 2 207 Genesee Street Utica, New York 13501 (315) 793-2447	Letter	8-24-84	None available
Mr. John Czapor, Environmental Engineer USEPA, Region II 26 Federal Plaza New York, New York 10278 (212) 264-1573	Letter	8-24-84	None available
Mr. Paul Dodd, State Conservationist U.S. Department of Agriculture Soil Conservation Service James M. Hanley Federal Building 100 South Clinton Street Syracuse, New York 13260 (315) 423-5521	Letter	8-24-84	Name and address of local representative
Dr. Robert H. Fakundiny, State Geologist Geological Survey of New York State State Education Department Division of Museum Services Albany, New York 12230 (518) 474-5816	Letter	8-24-84	None available

SOURCES -- UNION CARBIDE REPUBLIC PLANT LANDFILL
(Page 2)

Name/Address/Phone	Type of Contact	Date	Information Provided
Mr. James L. Larocca, Commissioner NYSDOT 1220 Washington Avenue Albany, New York 12232 (518) 457-4422	Letter	8-24-84	None available
Mr. Lawrence A. Martens, District Chief U.S. Department of the Interior U.S. Geological Survey Albany District Office P.O. Box 1350 U.S. Post Office and Court House Albany, New York 12201 (518) 472-3107	Letter	8-24-84	None available
Mr. Peter J. Mollock Interagency Task Force on Hazardous Wastes 80 Wolf Road Albany, New York 12233	Letter		File information regarding correspondence with Union Carbide
Mr. Carl B. Sciple, Division Engineer Army Corps of Engineers New England Division 424 Trapelo Road Waltham, Massachusetts 02154 (617) 894-2400	Letter	8-24-84	None available
Mr. Frederick J. Scullin, Jr. U.S. Department of Justice U.S. Attorney Northern District of New York 369 Federal Building 100 South Clinton Street Syracuse, New York 13260 (315) 423-5165	Letter	8-24-84	None available
Mr. Richard D. Spear, Chief Surveillance & Monitoring Branch USEPA, Region II Woodbridge Avenue Edison, New Jersey 08817 (201) 321-6685	Letter	8-24-84	None available

SOURCES -- UNION CARBIDE REPUBLIC PLANT LANDFILL
(Page 3)

Name/Address/Phone	Type of Contact	Date	Information Provided
Mr. Michael G. Steppon Environmental Coordinator Union Carbide Corporation P.O. Box 887 Niagara Falls, New York 14302	Interview		Maps, permits, operations, disposal of wastes, etc.
Mr. Mike Hopkins Assistant Public Health Engineer Niagara County Health Department 10th and East Falls Street Niagara Falls, New York 14302 (716) 284-3126	Personal Commun.	10/25/8 7/14/86	Groundwater use, quality; Site history
Mr. Larry Claire NYSDEC Region 9 600 Delaware Avenue Buffalo, New York 14202 (716) 847-4551	Personal Commun.	2/28/85	Provided access to Region 9

4.0 SITE ASSESSMENT

4.0 SITE ASSESSMENT

4.1 SITE HISTORY

The Union Carbide Niagara Plant has facilities at three locations: the National Plant - 3625 Highland Avenue, Niagara Falls, New York; the Republic Plant - 3501 Hyde Park Boulevard, Town of Niagara, New York; and the Acheson Plant - 1930 Buffalo Avenue, Niagara Falls, New York, which officially closed October 1982. Carbon and graphite manufacturing occurred at each of these plants. Industrial processes included calcine, mill, mix and forming carbon products, baking carbon products, graphitizing carbon products, pitch impregnation and machining of carbon products. Raw materials used in the process include anthracite coal, petroleum coke and coal tar pitch. The products manufactured at the plants included specialty machined graphite, carbon liners, cathode blocks and electrodes for furnacing.

The Union Carbide Republic Plant Landfill is used exclusively by Union Carbide. The landfill was purchased from Aluminum Co. of America on July 24, 1934 and is anticipated to close operations by December 1986 in accordance with Part 360. The site is presently operating under permits granted by the DEC and the Town of Niagara.

The waste facility at the Republic location presently services the National, Acheson and Republic locations of Union Carbide's Niagara plant. The waste material consisted mainly of carbonaceous material, primarily as dust from dust collectors, and amounts to approximately 6.5 million pounds per year; fire brick wastes contribute 1.25 million pounds per year and wood scrap 1.0 million pounds per year. These materials are collected daily from all three locations and deposited together. Other waste types generated and deposited at the site include coke, pitch, lunch waste, silica sand, coal tars, petroleum tars (see P. Millock - S. Dorr interview, November 15, 1978), machining oils and spent sludges from degreasing (1,1,1-trichloroethane). Approximately 200 gallons per month of oil were collected in 55-gallon drums and taken to the dump or used on roadways in the summer. This practice stopped in 1978.

Since 1978 the only flammable materials to arrive on site have been wood scraps. These flammable materials are mixed with nonflammable

materials or are covered, thus minimizing fires. Union Carbide has a 360 variance from a daily cover requirement. Waste is covered every two weeks. The cover material at one time consisted of aged waste deposited no less than five years previously. A final cover is applied at the completion of each 50-foot lift. Apparently, anywhere from six to 24 inches of material suitable to sustain plant growth has been deposited on the compacted lifts.

As of May 1982 all baghouse dust has been placed into plastic bags prior to placing the waste in the landfill. Site groundwater and surface water monitoring is conducted in conformance with the NYSDEC and Town of Niagara permit requirements. Groundwater results are submitted to the NYSDEC every six months and quarterly to the Town of Niagara.

4.2 SITE TOPOGRAPHY

The site is located in a topographically flat area at an elevation of approximately 600 feet. The landfill itself is mounded approximately 30 feet above grade with an average slope of 30 percent. Surface water to the south and southwest of the site appears to be under perched conditions and does not drain into any other surface water body. The area surrounding the site is primarily residential with some industrial-type buildings. There are five drinking water wells on Pennsylvania Avenue, 2,000 feet north of the site. Most everyone in the area is served by public water taken from the Niagara River.

4.3 SITE HYDROGEOLOGY

The site is underlain by fine grained lake sediments and glacial till, with dolomite bedrock at a depth of approximately 20 feet. Three monitoring wells have been installed in the glacial till in order to monitor the groundwater quality (Figure 2). These wells indicate that the groundwater flow direction is south-southeast with a seasonally high water table at a depth of approximately five feet.

Carbonaceous fill material was described as the surficial material at wells 1 and 2. The original soil consisted of a stone-free clayey and silty lake sediment resting on glacial till. Thickness of the lake sediment at well 3 was

about 10 feet. This lake sediment mantle should be continuous across the total site as indicated in the Niagara County soil survey. However, no lake sediments were described in any of the five bore sites augered at or near well 1. Therefore the originally deposited lake sediment and part of the glacial till material was likely excavated prior to landfilling.

Permeability and infiltration of the carbonaceous fill are extremely high, as demonstrated by the rapid infiltration rate after an intense thunderstorm on September 9, 1979 (as observed by Earth Dimensions, Inc.). This would allow water to move downward in the fill and become perched on the glacial till or lake sediments. Since a portion of the glacial till over the dolomite bedrock was removed from the area near well 1, as noted during the drilling of the most easterly bore site, saturation within the fill may exist by well 1. The extent of this excavated area and this saturated fill cannot be delineated based on the existing surface fill configuration.

Saturation of the fill was not noted at the southerly site (W-2), but based on the original soil drainage characteristics, a natural water table would be present at the fill-soil contact. Water was detected in the glacial till above bedrock.

At well 3, a stone-free clayey and silty lake sediment mantles glacial till. This is similar to the glacial/till sediment sequence indicated in the Niagara County soil survey. A natural perched water table exists near the surface during wetter seasons and water was detected in the thin glacial till.

4.4 SITE CONTAMINATION

The Republic Plant site is presently being monitored on a quarterly basis in accordance with its permit agreements. The monitoring program consists of three wells -- one upgradient, two downgradient -- which are screened in the glacial till which overlies bedrock. The monitoring wells consist of carbon steel riser pipes with a 1-1/2-foot double stainless steel screens. Couplings were sealed with pipe cement.

The range of groundwater quality results from September 1978 to December 1984 are summarized in Table 1. Results indicate that elevated levels (above New York State criteria) of phenols (0.26 ppm), chromium

TABLE 1

RANGE OF GROUNDWATER QUALITY RESULTS FROM MONITORING WELLS 1, 2 AND 3

(Monitoring Dates September 1978 to December 1984)

Parameter	Units of Measure	Sample Identification		
		Well 1	Well 2	Well 3
pH	Standard Units	7.77-8.94	6.83-7.61	7.38-8.23
Specific Conductance (25°C)	umhos/cm	1,200.-1,900.	580-.3,120.	520.-2,100.
Total Coliform	Organisms/100 ml	3.6-750.	<2.-43.	2.0-15.
Biochemical Oxygen Demand (5 day)	mg/l	<2.0-110.	8.0-140.	<2.0-5.0
Chemical Oxygen Demand	mg/l	33.-344.	38.4-180.	6.8-30.
Total Organic Carbon	mg/l	11.-108.	5.5-130.	<1.0-35.
Ammonia	mg N/l	0.63-14.4	<0.5-1.8	<0.1-0.5
Total Kjeldahl Nitrogen	mg N/l	1.1-24.0	0.21-2.8	0.2-0.56
Total Phosphorus	mg P/l	<0.01-5.0	0.024-0.56	<0.02-1.0
Nitrate	mg N/l	<0.02-4.8	0.3-4.5	<0.2-2.7
Nitrite	mg N/l	<0.005-0.19	<0.01-0.19	<0.01
Chloride	mg/l	75.-440.	45.-391.	7.5-22.
Total Residue (103°C)	mg/l	1,100-1,500.	2,480.	440.-952.
Total Recoverable Phenolics	mg/l	0.011-0.235	<0.01-0.260	<0.01-0.053
Sulfate	mg/l	3.9-360.	130.-940.	9.2-650.
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	330.-898.	170.-820.	240.-275
Total Hardness	mg/l as $CaCO_3$	240.-1,260.	295.-1,750.	270.-540.
True Color	Pt-Co Color Units	20.-100.	30.0-50.	50.0-70.
Carbon Chloroform Extraction	mg/l	2.0-26.9	1.6-8.0	<1.0-5.2
Methylene Blue Active Substances	mg/l	<0.1	<0.04-0.08	<0.1
Total Aluminum	mg/l	0.4-56.	0.4-5.0	<0.1-1.2
Total Arsenic	ug/l	<5.-11.4	<5.0	<5.0
Total Chromium	mg/l	0.005-0.09	<0.002-0.012	<0.005
Hexavalent Chromium	mg/l	<0.001-0.09	<0.002-0.008	<0.005
Total Copper	mg/l	0.010-0.783	<0.003-0.05	<0.003-0.042
Total Calcium	mg/l	3.5-110.	17.-275.	14.-55.
Total Iron	mg/l	3.0-280.	9.3-114.	0.27-70.
Total Lead	mg/l	0.02-0.72	<0.02-<0.04	<0.04
Total Mercury	ug/l	0.82-36.6	<0.4-2.6	<0.7-<1.0
Total Potassium	mg/l	2.2-110.	4.5-54.	3.8-6.0
Total Silver	mg/l	<0.003-0.052	<0.003-0.016	<0.005
Total Sodium	mg/l	16.0-3,500.	17.-197.	14.-75.
Halogenated Organic Scan (ECD)	ug/l as Chlorine; Lindane Standard	1.3-21.0	0.7-8.8	1.0-22.0

(0.09 ppm), lead (0.72 ppm) and mercury (36.6 ppb), plus other parameters, occur in the three monitoring wells. According to Mike Hopkins of the Niagara County Health Department, the levels of heavy metals in these wells are typical of the Niagara Falls area. A leach test performed on a composited waste sample indicates that the waste could be a substantial source of the phenols (Tables 2 and 3).

Well logs for monitoring wells 1 and 2 indicate that these wells were installed through the waste. The water quality of these wells could be directly affected by this practice. The effect on the water quality is compounded by the fact that the waste material is highly permeable and that perched water tables typically occur. The downgradient well (well 3) was not installed through the waste. Water quality data from this well indicates that contamination has occurred, suggesting that there is a potential for subsurface migration of contaminants off site. The installation of the monitoring wells is not in accordance with Chapter 4 of USEPA's Guidance Manual for the Classification of Solid Waste Disposal Facilities.

The file data and reports state that nonhazardous carbonaceous waste has been disposed of at this site. However, water quality data indicates that phenols, heavy metals and low levels of halogenated organics have contaminated the till hydrologic zone. Additional investigation needs to be done to identify the types and concentrations of disposed materials.

TABLE 2

RESULTS OF LEACH TEST ON COMPOSITED WASTE SAMPLES
ANALYSES OF SOLIDS FRACTION

Parameter	Unit of Measure	Leach Test
Carbon - Chloroform Extractable	mg/g (dry)	20.9
Phenol	ug/g (dry)	2.6
pH	Standard Units	8.02
Chemical Oxygen Demand	mg/g (dry)	439
Chloride (Water Soluble)	ug/g (dry)	73.8
Fluoride (Water Soluble)	ug/g (dry)	0.002
Cyanide (Free - Water Soluble)	ug/g (dry)	<1.0
Total Grease & Oils	mg/g (dry)	6.66
Hydrocarbon Grease & Oils	mg/g (dry)	4.95
Polar Grease & Oils	mg/g (dry)	1.45
Total Chlorinated Hydrocarbons	ug/g (dry) as Chlorine; Lindane Standard	29.6
Hexavalent Chromium (Water Soluble)	ug/g (dry)	<0.040
Total Aluminum	ug/g (dry)	819
Total Arsenic	ug/g (dry)	0.029
Total Cadmium	ug/g (dry)	0.30
Total Chromium	ug/g (dry)	10.6
Total Copper	ug/g (dry)	33.7
Total Iron	ug/g (dry)	253
Total Lead	ug/g (dry)	10.5
Total Mercury	ug/g (dry)	<0.020
Total Nickel	ug/g (dry)	24.0
Total Selenium	ug/g (dry)	<0.003
Total Zinc	ug/g (dry)	19.2
Total Solids	percent	98.8

TABLE 3

RESULTS OF LEACH TEST ON COMPOSITED WASTE SAMPLES
LEACHING TEST ON SOLIDS FRACTION

Parameter	Unit of Measure	Leach Test
Carbon - Chloroform Extractable	mg/l	<2.0
Phenol	mg/l	0.110
Total Organic Carbon	mg/l	<1.0
pH	Standard Units	8.02
Chemical Oxygen Demand	mg/l	16.2
Chloride	mg/l	18.2
Fluoride	mg/l	0.569
Cyanide (Free)	mg/l	<0.3
Total Grease & Oils	mg/l	<1.0
Hydrocarbon Grease & Oils	mg/l	<1.0
Polar Grease & Oils	mg/l	<1.0
Total Chlorinated Hydrocarbons	ug/l as Chlorine; Lindane Standard	3.70
Hexavalent Chromium	mg/l	<0.01
Soluble Aluminum	mg/l	<0.03
Soluble Arsenic	ug/l	<3.5
Soluble Cadmium	mg/l	<0.003
Soluble Chromium	mg/l	<0.003
Soluble Copper	mg/l	0.005
Soluble Iron	mg/l	<0.01
Soluble Lead	mg/l	<0.02
Soluble Mercury	ug/l	<0.5
Soluble Nickel	mg/l	<0.02
Soluble Selenium	ug/l	<2.5
Soluble Zinc	mg/l	0.007

5.0 PRELIMINARY APPLICATION OF THE HAZARD RANKING SYSTEM

5.0 PRELIMINARY APPLICATION OF THE HAZARD RANKING SYSTEM

5.1 NARRATIVE SUMMARY

The Union Carbide Republic Plant Landfill site is a 16-acre active landfill on Hyde Park Boulevard, Niagara Falls, Niagara County, New York. The site is used exclusively by Union Carbide to dispose of carbonaceous and packaging wastes generated during their production process from the National, Acheson and Republic plants. The site was purchased by Union Carbide on July 24, 1934 from Aluminum Co. of America and has been active since that time. The site is currently permitted by the DEC and the Town of Niagara as a non-hazardous active landfill. The Union Carbide Products Division is expected to close the landfill by December 1986 in accordance with Part 360.

The wastes disposed of at this site include carbonaceous dust and scrap, firebrick, waste wood and pallets. Other waste types generated and deposited on the site in the past included coke, pitch, lunch waste, silica sand, coal tars and petroleum tars (see P. Millock - S. Dorr interview, November 15, 1978), machining oils and spent sludges from degreasing (1,1,1-trichloroethane).

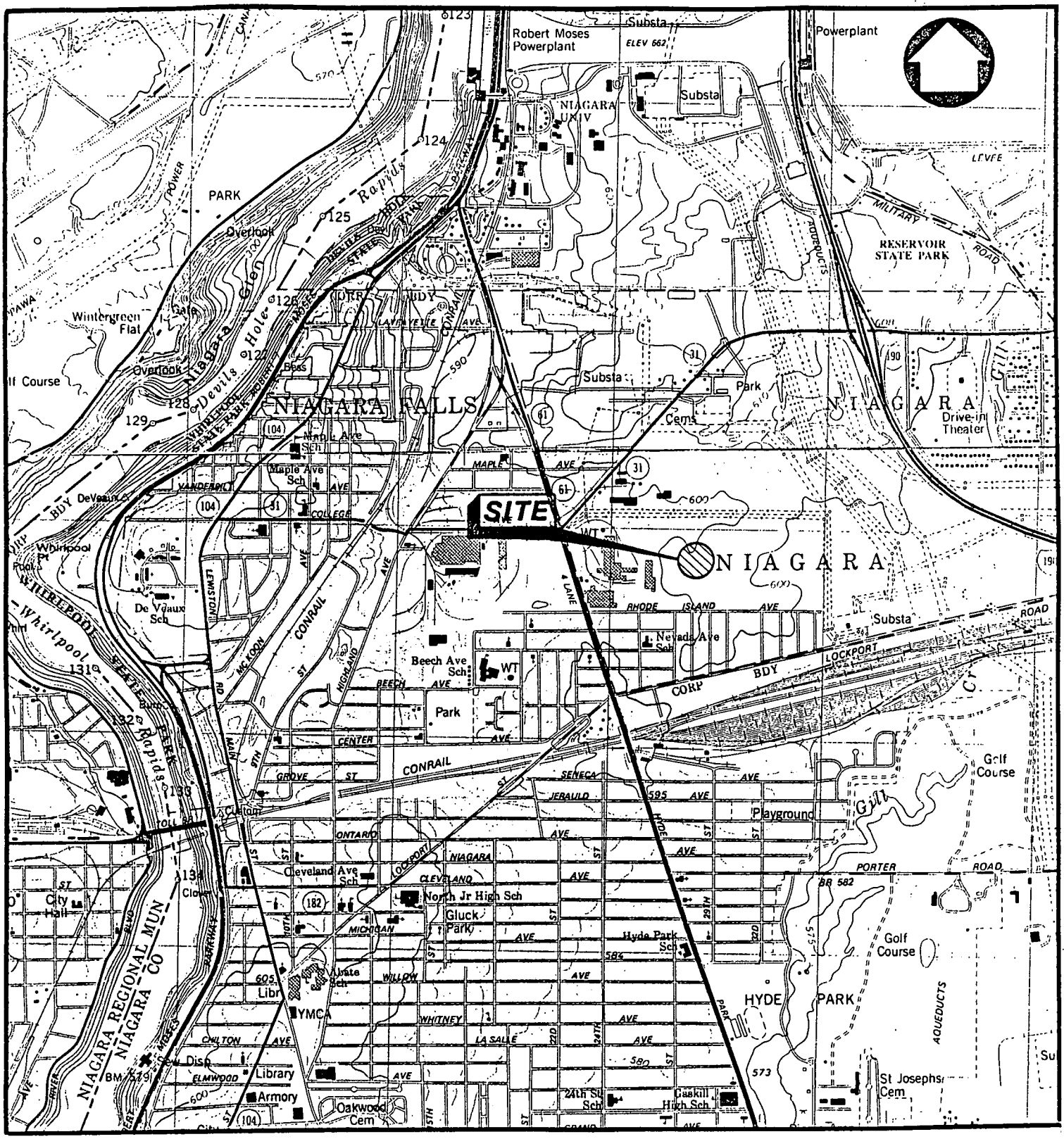
The site is currently monitored on a quarterly basis by the extraction of groundwater samples from three monitoring wells installed around the perimeter of the site. Two of these wells have been completed through the waste. Water quality data indicates that phenols, heavy metals and low levels of halogenated organics exceed New York State groundwater criteria in the till hydrologic zone. Additional investigation is necessary in order to identify the types and concentrations of disposed materials. The E.P. toxicity tests and leachate tests performed on the waste materials indicate that all levels are within acceptable limits, with the exception of phenols, which are approximately 100 times the groundwater standard.

A site visit indicated that the site is well managed; however, there have been documented dust incidents as reported by the Niagara County Health Department during the period 1981-1982. Final cover and seeding are taking place as directed in their operations permit. The site is bordered on the

south-southeast by a residential area. The waste types currently disposed of do not produce any odors and carbonaceous dust is bagged to prevent blowing. The area is generally served by public water, although private drinking water wells exist 2,000 feet north of the site.

The overall site appearance and conditions are very good.

LOCATION



SCALE: 1" 2000'

TOPOGRAPHY TAKEN FROM

1980

NIAGARA FALLS, N.Y

LEWISTON, N.Y.

U.S.G.S. QUADRANGLE

7.5 MIN SERIES

MAP LOCATION

FIGURE 1

SITE LOCATION MAP

UNION CARBIDE

LAT. 43°07'-14" N LONG. 79°01'-35" W

HRS WORKSHEETS

Facility Name: Union Carbide

Location: Hyde Park Boulevard, Niagara Falls, New York

EPA Region: Region 9

Person(s) in Charge of the Facility: Michael G. Steffan
Environmental Coordinator

Name of Reviewer: Timothy R. Roeper **Date:** March 27, 1985

General Description of the Facility:

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

The Union Carbide Republic Plant Landfill, located in Niagara Falls, is a 16-acre active landfill which only accepts carbonaceous and packaging wastes from Union Carbide. The site is presently permitted and has approved operations, monitoring and closure plans. No hazardous waste was reported to have been disposed of at this site.

Scores: $S_M = 11.03$ ($S_{gw} = 19.09$ $S_{sw} = 0$ $S_a = 0$)

$S_{FE} = 0$

$S_{DC} = 0$

GROUND WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 (3)	2	6	6	
Net Precipitation	0 1 (2) 3	1	2	3	
Permeability of the Unsaturated Zone	0 (1) 2 3	1	1	3	
Physical State	0 1 2 3	1	3	3	
Total Route Characteristics Score			12	15	
3 Containment	0 1 2 3	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					3.5
Ground Water Use	0 1 (2) 3	3	6	9	
Distance to Nearest Well/Population Served	0 4 6 8 (10) 12 16 18 20 24 30 32 35 40	1	10	40	
Total Targets Score			16	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			10,944	57.330	
7 Divide line 6 by 57.330 and multiply by 100	S_{gw} = 19.09				

SURFACE WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 (3)	2	6	6	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			11	15	
3 Containment	0 1 2 (3)	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					4.5
Surface Water Use	0 1 2 3	3	0	9	
Distance to a Sensitive Environment	0 1 2-3	2	0	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			0	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			0	64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{SW} = 0				

AIR ROUTE WORK SHEET

	Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 45	1	0	45	5.1
	Date and Location: 3/27/85					
	Sampling Protocol: HNU photoionizing detector					
	If line 1 is 0, the S = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2	Waste Characteristics					5.2
	Reactivity and Incompatibility	0 1 2 3	1		3	
	Toxicity	0 1 2 3	3		9	
	Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
		Total Waste Characteristics Score			20	
3	Targets					5.3
	Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
	Distance to Sensitive Environment	0 1 2 3	2		6	
	Land Use	0 1 2 3	1		3	
		Total Targets Score			39	
4	Multiply 1 x 2 x 3				35,100	
5	Divide line 4 by 35,100 and multiply by 100 S_a = 0					

	S	S^2
Groundwater Route Score (S_{gw})	19.09	364.43
Surface Water Route Score (S_{sw})	0	0
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		364.43
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		19.09
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73$		S_M = 11.03

WORKSHEET FOR COMPUTING S_M

Insufficient Data to Score

FIRE AND EXPLOSION WORK SHEET

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

DIRECT CONTACT WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	0 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	(0) 1 2 3	1	0	3	8.2
3 Containment	0 (15)	1	15	15	8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 (4) 5	4	16	20	
Distance to a Critical Habitat	0 1 2 3	4	0	12	
Total Targets Score			16	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			0	21,600	
7 Divide line 6 by 21,600 and multiply by 100	S_{DC} = 0				

HRS DOCUMENTATION RECORDS

June 28, 1982

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

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

FACILITY NAME: Union Carbide

LOCATION: Hyde Park Boulevard, Niagara Falls, New York

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

No observed release; upgradient well installed through waste.

Source: Union Carbide documentation, April 12, 1985

Rationale for attributing the contaminants to the facility:

Not applicable

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

10 to 15 feet clayey lake sediments underlain by 1 to 10 feet dense loamy glacial till. Unconsolidated material underlain by Lockport dolomite with an average yield of 124 gpm. Average depth to bedrock 16 feet, average depth to water table 30 feet. Water table of concern is the unconsolidated material.

Source: Water Resources of the Buffalo-Niagara Falls Region, USGS Circular 173
Soil and Boring Log Reports, Earth Dimensions, Inc.
Mike Hopkins, Niagara County Health Department

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

Highest seasonal water table is approximately 8 feet below ground surface in the vicinity of the site.

Source: Union Carbide documentation, April 12, 1985
Monitoring Well Reports, 1978-1984

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

12.5 feet

Score = 3

Source: Soils and Boring Log Reports, Earth Dimensions, Inc.

Net Precipitation

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

36 inches

Source: National Oceanic and Atmospheric Administration, Climates of the States, Vol. II, 1978

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

24 inches

Source: HRS Users Manual (HW-10), USEPA, 1984

Net precipitation (subtract the above figures):

12 inches

Score = 2

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Glacial lake sediments, thinly laminated silt and clay

Source: Soils and Boring Log Reports, Earth Dimensions, Inc.

Permeability associated with soil type:

$10^{-5} - 10^{-7}$ cm/sec

Score = 1

Source: HRS Users Manual (HW-10), USEPA, 1984

Physical State

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

Solids, dust, sludges, liquids.

Score = 3

Source: Wehran Engineering site visit, March 27, 1985
Union Carbide documentation, April 1985
Letter dated February 9, 1977, Dorr to Quackenbush
Community Right-to-Know, Volume III, April 1, 1985, p. 214
Dorr-Millock Interview, November 15, 1978

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Low permeability glacial lake sediments and/or glacial till underlie the site. No collection system is present.

Source: Soils and Boring Log Reports, Earth Dimensions, Inc.

Method with highest score:

No liner or collection system

Score = 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

1,1,1-Trichloroethane - 12
Phenols - 12
Chromium - 18
Lead - 18
Mercury - 18

Source: Union Carbide Well Monitoring and Leach Test Reports
Community Right-to-Know, Volume III, April 1, 1985, p. 214

Compound with highest score:

Heavy Metals 18

Source: EPA Hazard Ranking System Waste Characteristic Values, Table 1

Hazardous Waste Quantity

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

Total solid waste present is approximately 125,000 tons; however, the percentage of hazardous waste is unknown. For scoring purposes, a minimum quantity will be assumed.

Score = 1

Basis of estimating and/or computing waste quantity:

According to Mike Hopkins of the Niagara County Health Department, no hazardous waste has ever been disposed of at this site. However, water quality data and leach tests on the waste indicate the presence of heavy metals and phenols.

Source: Union Carbide documentation, April 1, 1985

5 TARGETS

Ground Water Use

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

Drinking water with alternate source available.

Score = 2

Source: Mike Hopkins, Assistant Public Health Engineering, Niagara County, December 18, 1985; July 14, 1986

Distance to Nearest Well

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

North of the landfill

Distance to above well or building:

2,000 feet

Score = 4

Source: Mike Hopkins, Assistant Public Health Engineering, Niagara County, December 18, 1985; July 14, 1986

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

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

There are 5 private drinking water wells north of the site, of which most are hard dug and completed in the unconsolidated material and bedrock interface.

Source: Mike Hopkins, Assistant Public Health Engineering, Niagara County, December 18, 1985; July 14, 1986
NYS Atlas of Community Water Supply Systems, 1982

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

No known irrigation in a 3-mile radius

Source: Wehran Engineering site visit, March 27, 1985

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

5 homes x 3.8 = 19 people

Score = 1

Matrix score = 10

Source: Mike Hopkins, Assistant Public Health Engineering, Niagara County, December 18, 1985; July 14, 1986

SURFACE WATER ROUTE

1 OBSERVED RELEASE

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

No significant contamination detected

Score = 0

Rationale for attributing the contaminants to the facility:

Not applicable

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Side slopes approx. 30%

Source: Union Carbide documentation - Site Map, 1983

Name/description of nearest downslope surface water:

Wet ponded area (most likely perched water) south and east of the landfill. This ponded area only occurs during wet periods.

Source: Wehran Engineering site visit, March 27, 1985
Union Carbide documentation, March 31, 1978

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

2-3%

Matrix score = 0

Source: USGS Quadrangles, Niagara Falls, Lewiston

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

No

Source: USGS Quadrangles, Niagara Falls, Lewiston
Wehran Engineering site visit, March 27, 1985

Is the facility completely surrounded by areas of higher elevation?

No

Source: USGS Quadrangles, Niagara Falls, Lewiston

1-Year 24-Hour Rainfall in Inches

Approx. 2.3 inches

Score = 2

Source: HRS Users Manual (HW-10), USEPA, 1984

Distance to Nearest Downslope Surface Water

Approx. 400 feet from active portion of landfill

Score = 3

Source: Wehran Engineering site visit, March 27, 1985
USGS Quadrangles, Niagara Falls, Lewiston

Physical State of Waste

Solids, dust, sludges, liquids

Score = 3

Source: Wehran Engineering site visit, March 27, 1985
Union Carbide documentation, April 1985
Letter dated February 9, 1977, Dorr to Quackenbush
Community Right-to-Know, Volume III, April 1, 1985, p. 214
Dorr-Millock Interview, November 15, 1978

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Currently the site is progressively being closed with a final cover and seed being applied. However, past operations consisted of applying aged waste as a final cover.

Source: Union Carbide documentation, April 1982 and March 31, 1978

Method with highest score:

Landfill not adequately covered

Score = 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

1,1,1-Trichloroethane - 12
Phenols - 12
Heavy Metals - 18

Source: Water quality results from wells 1, 2 and 3, and from leach test on waste, Union Carbide documentation
Community Right-to-Know, Volume III, April 1, 1985, p. 214

Compound with highest score:

Heavy Metals

Score = 18

Source: EPA Hazard Ranking System Waste Characteristics Values, Table 1

Hazardous Waste Quantity

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

Total solid waste present is approximately 125,000 tons; however, the percentage of hazardous waste is unknown. For scoring purposes, a minimum quantity will be assumed.

Score = 1

Basis of estimating and/or computing waste quantity:

According to Mike Hopkins of the Niagara County Health Department, no hazardous waste has ever been disposed of at this site. However, water quality data and leach tests on the waste indicate the presence of heavy metals and phenols.

Source: Union Carbide documentation, April 1, 1985

5 TARGETS

Surface Water Use

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

Ponded surface water does not appear to drain into any other stream or source of surface water

Score = 0

Source: Wehran Engineering site visit
USGS Quadrangles, Niagara Falls, Lewiston

Is there tidal influence?

No

Distance to a Sensitive Environment

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

No coastal wetlands

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

No freshwater wetlands within the area

Source: USGS Quadrangles, Niagara Falls, Lewiston

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

None present

Source: NYSDEC Endangered Species Unit

Population Served by Surface Water

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

Surface water within the area is not used; ponded water does not appear to drain into any other body

Score = 0

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

None known

Source: Wehran Engineering site visit, March 27, 1985
USGS Quadrangles, Niagara Falls, Lewiston

Total population served:

Not applicable

Name/description of nearest of above water bodies:

Not applicable

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

Not applicable

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

No contaminants were detected

Date and location of detection of contaminants:

March 27, 1985
On site

Methods used to detect the contaminants:

HNU photoionizing organic vapor detector

Rationale for attributing the contaminants to the site:

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable

Most incompatible pair of compounds:

Not applicable

Toxicity

Most toxic compound:

Not applicable

Hazardous Waste Quantity

Total quantity of hazardous waste:

Not applicable

Basis of estimating and/or computing waste quantity:

Not applicable

3 TARGETS

Population Within 4-Mile Radius

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

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

Not applicable

Distance to a Sensitive Environment

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

Not applicable

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

Not applicable

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

Not applicable

Land Use

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

Not applicable

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

Not applicable

Distance to residential area, if 2 miles or less:

Not applicable

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

Not applicable

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

Not applicable

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

Not applicable

FIRE AND EXPLOSION

1 CONTAINMENT

Hazardous substances present:

To score the fire and explosion hazard mode either a state or local fire marshall must have certified that the facility presents a significant fire or explosion threat to the public or to a sensitive environment, or there must be a demonstrated threat based on field observations (e.g. combustible gas indicator readings). The available records give no indication that either one of these tasks has been done. Further, the available data do not suggest any imminent threat of fire and explosion at this site. Therefore the route score cannot be completed.

Type of containment, if applicable:

Not applicable

2 WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

Not applicable

Ignitability

Compound used:

Not applicable

Reactivity

Most reactive compound:

Not applicable

Incompatibility

Most incompatible pair of compounds:

Not applicable

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Not applicable

Basis of estimating and/or computing waste quantity:

Not applicable

3 TARGETS

Distance to Nearest Population

Not applicable

Distance to Nearest Building

Not applicable

Distance to Sensitive Environment

Distance to wetlands:

Not applicable

Distance to critical habitat

Not applicable

Land Use

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

Not applicable

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

Not applicable

Distance to residential area, if 2 miles or less:

Not applicable

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

Not applicable

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

Not applicable

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

Not applicable

Population Within 2-Mile Radius

Not applicable

Buildings Within 2-Mile Radius

Not applicable

DIRECT CONTACT

1 OBSERVED INCIDENT

Date, location, and pertinent details of incident:

There are no records in the file to indicate that an observed direct contact incident has occurred.

Score = 0

2 ACCESSIBILITY

Describe type of barrier(s):

Site is fenced and guarded

Score = 0

Source: Wehran Engineering site visit, March 27, 1985

3 CONTAINMENT

Type of containment, if applicable:

Part of site was covered with aged waste materials.

Score = 15

Source: Union Carbide documentation, April 1, 1985

4 WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Phenols - 3
Chromium - 3
Lead - 3
Mercury - 3
1,1,1-Trichloroethane - 2

Source: Union Carbide Well Monitoring and Leach Tests Reports
Community Right-to-Know, Volume III, April 1, 1985, p. 214

Compound with highest score:

Phenols and Heavy Metals

Score = 3

5 TARGETS

Population within one-mile radius

Estimated 1 3,500

Score = 4

Source: House Count, USGS Quadrangles, Niagara Falls, New York, Lewiston, New York
1980 Census of Population

Distance to critical habitat (of endangered species)

None present

Score = 0

Source: NYSDEC Endangered Species Unit, Delmar, NY

TELEPHONE CONVERSATION MEMORANDUM

CLIENT NYSDEC PROJ. No. 04339 EX

PROJECT Phase I Round 3 Union Carbide DATE 7/14/86

TIME 11:30

CALL TO/FROM Mr. Mke Hopkins REPRESENTING Niagara County Health

PHONE No. 716-284-3126

SUMMARY OF CONVERSATION:

Union Carbide is closing the Niagara Falls Plant, clsoure started summer of 1986.

Verified site location

Verified the existence of five private drinking water wells 2,000 feet north of the site. Most of these wells are dug down to the top of bedrock 20-30 feet deep. Wells are showing signs of contamination. this contamination is not lekely a result of Union Carbide. There are at least two other potential sources.

Great Lakes Chemical does not have an industrial well.

Results indicate that heavy metals levels in the groundwater exceed New York State criteria, but most levels are typical of groundwater witin the area. For scoring the HRS, mike Hopkins agrees that New York State criteria should be used with the above understanding. Will send some typical water data from the area.

Will send site inspection forms

Believe there has been no hazardous waste disposed of at this site.

COPIES TO: _____

BY: Terry Haelen

Terry Haelen

WEHRAN ENGINEERING
CONSULTING ENGINEERS

DEC
PUBLICATION

"COMMUNITY RIGHT-TO-KNOW"

VOLUME III

PAST HAZARDOUS WASTE DISPOSAL PRACTICES

January 1952 - December 1981

Appendices I - P

APRIL 1, 1985

New York State/Department of Environmental Conservation

SITE DESCRIPTION: OLIN CORP,102ND ST SITE ,BUFFALO AVE,NIAGARA FALLS,NY — SITE CODE: 9-32-031

WASTE DESCRIPTION	QUANTITY	U	L	S	D	GENERATOR NAME	ID
CONFIDENTIALITY REQUESTED						NOURY CHEMICAL CORP.	GC914928
CONFIDENTIALITY REQUESTED						NOURY CHEMICAL CORP.	GC914928

TRANSPORTERS - RESPONDING WITH QUESTIONNAIRE	ID NUMBER
NOURY CHEMICAL CORP,2153 LOCKPORT-OLCOTT	T0901886

SITE DESCRIPTION: OLIN CORP,102ND ST SITE ,BUFFALO AVE,NIAGARA FALLS,NY — SITE CODE: 9-32-031

WASTE DESCRIPTION	QUANTITY	U	L	S	D	GENERATOR NAME	ID
UNKNOWN			X	X	X	OLIN CORP. CHEMICALS GROUP (NIAGA	G0914876

SITE DESCRIPTION: ** UNION CARBIDE *LANDFILL(REPUBLIC),3501 HYDE PARK BLVD,N.F — SITE CODE: 9-32-035

WASTE DESCRIPTION	QUANTITY	U	L	S	D	GENERATOR NAME	ID
HALOWAX 1006	0.16	T	-	X	-	UNION CARBIDE CORP	GX900288
SPENT SLUDGES FROM DEGREASING (1,1,1-TRICHLOROETHANE)	0.02	T	X	X	-	UNION CARBIDE CORP	GX900288
UNKNOWN			-	-	-	UNION CARBIDE CORP.(CARBON PRODUC	G0914874
UNKNOWN			-	-	-	UNION CARBIDE CORP.(CARBON PRODUC	G0914875

SITE DESCRIPTION: OLIN CORP,C-2 WELL,2400 BUFFALO AVE,NIAGARA FALLS,NY — SITE CODE: 9-32-037

WASTE DESCRIPTION	QUANTITY	U	L	S	D	GENERATOR NAME	ID
C-2 END LIQUOR 30% SULFURIC ACID,5-10% NACL,60-65%H2O	130,000.00	T	X	-	-	OLIN CORP. CHEMICALS GROUP (NIAGA	G0914876

SITE DESCRIPTION: OLIN CORPORATION-OVERFLOW WATER POND,BUFF AVE,NIAG FALLS NY — SITE CODE: 9-32-038

WASTE DESCRIPTION	QUANTITY	U	L	S	D	GENERATOR NAME	ID
HYDROGEN BLOWER SEAL WATER			-	-	-	OLIN CORP. CHEMICALS GROUP (NIAGA	G0914876

November 9, 1976

Mr. S.C. Dorr
Chief Plant Engineer
Union Carbide Corporation
Carbon Products Division
P.O. Box 887
Niagara Falls, New York 14302

Dear Mr. Dorr:

This is to confirm that we will be meeting on November 15, 1976 at 1:00 p.m. at your office to discuss the questionnaire and the questions that I raised in my letter to you.

Very truly yours,

Peter J. Millock

PJM/ksk

INTERVIEW COVER SHEET

P. Millock
Interviewer

Person Interviewed: S. Derr, W. Haller

Address:

Telephone:

Referred By:

Date/Time of Interview: Nov. 15, 1978 1:00 P.M.

Nature of Interview: Telephone: Office:

Field (specify): Union Carbide – Carbon Products Office

Others Present:

Present Affiliation: UC-CP

Past Affiliation: UC-CP

Principal Subject of Interview: UC-CP disposal activities

Waste Generators Discussed: UC-CP

Disposal Sites Discussed: Republic Plant site
Newco

Other Contacts Suggested:

Additional Action Appropriate:

Confidentiality: All: None: Some (specify) ✓
(Note stamp on completed questionnaire)

Dorr
Haller
Millock

Meeting 11/15/78

1. Newco — No dumping there by UC-CP & J was another div.
2. Republic plant — 1930 to present
3. Do widicle — NOT dumped at Republic site
   * Coal Tars > in solid form
   * Petrol. Tars have been dumped.
   Wd have to have heat very high to change to liquid
4. Machining oils — were dumped on dump roads
   stopped doing that
   Now sold to oil people.
   Booth Oil (Tonawanda)
   How long — several years now going to Booth oil
5. Phenols: can't explain high reading at Republic Dump site

hk. w/ Banaszak

6. Reviewed what I will do with info; no prob. w/ confiden. of general info. disclosure
7. Cat. wastes are hauled off site and not to Republic.
8. The haulers listed on guest. haul to Rep. site from the 3 plants

DRAFT

MAR 4 1985

Table I is the listing of EPA Hazard Ranking System (HRS) Waste Characteristics Values (Toxicity/Persistence matrix) used by the NPL quality assurance team. These rating factor values are based on the criteria specified in the HRS (toxicity rating assigned to each substance in Sax, Dangerous Properties of Industrial Chemicals, 4th, 5th and 6th editions). The listing shows the matrix values for ground water and surface water and the toxicity value for air. The values shown are "post multiplier" for use on the HRS worksheets. Changes to this list are made, albeit infrequently, as a result of response to public comment and changes in the reference material. Questions should be directed to the NPL quality assurance team via Mr. Steve Caldwell, EPA Headquarters, (202) 475-8103.

TABLE I

EPA Hazard Ranking System Waste Characteristics Values
(Toxicity/Persistence Matrix)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Acenapthene	9	3
Acetaldehyde	6	6
Acetic Acid	6	6
Acetone	6	6
2-Acetylaminoflourene	18	9
Aldrin	18	9
Ammonia	9	9
Aniline	12	9
Anthracene	15	9
Arsenic	18	9
Arsenic Acid	18	9
Arsenic Trioxide	18	9
Asbestos	15	9
Barium	18	9
Benzene	12	9
Benzidine	18	9
Benzoapyrene	18	9
Benzopyrene, NOS	18	9
Beryllium & Compounds NOS	18	9
Beryllium Dust, NOS	18	9
Bis (2-Chloroethyl) Ether	15	9
Bis (2-Ethylhexyl Phthalate	12	3
Bromodichloromethane	15	6
Bromoform	15	6
Bromomethane	15	9
Cadmium	18	9
Carbon Tetrachloride	18	9
Chlordane	18	9
Chlorobenzene	12	6
Chloroform	18	6
3-Chlorophenol	12	6
4-Chlorophenol	15	9
2-Chlorophenol	12	6
Chromium	18	9
Chromium, Hexavalent (Cr^{+6})	18	9

Table I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Chromium, Trivalent (Cr^{+3})	15	6
Copper & Compounds, NOS	18	9
Creosote	15	6
Cresols	9	6
4-Cresol	12	9
Cupric chloride	18	9
Cyanides (soluble salts), NOS	12	9
Cyclohexane	12	6
DDE	18	9
DDT	18	9
Diaminotoluene	18	6
Dibromochloromethane	15	6
1, 2-Dibromo, 3-chloropropane	18	9
Di-N-Butyl-Phthalate	18	6
1, 4-Dichlorobenzene	15	6
Dichlorobenzene, NOS	18	6
1, 1-Dichloroethane	12	6
1, 2-Dichloroethane	12	9
1, 1-Dichloroethene	15	9
1, 2-cis-Dichloro-ethylene	12	3
1, 2-trans-Dichloro-ethylene	12	3
Dichloroethylene, NOS	12	3
2, 4-Dichlorophenol	18	6
2, 4-Dichlorophenoxyacetic Acid	18	9
Dicyclopentadiene	18	9
Dieldrin	18	9
2, 4-Dinitrotoluene	15	9
Dioxin	18	9
Endosulfan	18	9
Endrin	18	9
Ethylbenzene	9	6
Ethylene Dibromide	18	9
Ethylene Glycol	9	6
Ethyl Ether	15	3
Ethylmethacrylate	12	6

Table I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Fluorine	18	9
Formaldehyde	9	9
Formic Acid	9	6
Heptachlor	18	9
Hexachlorobenzene	15	6
Hexachlorobutadiene	18	9
Hexachlorocyclohexane, NOS	18	9
Hexachlorocyclopentadiene	18	9
Hydrochloric Acid	9	6
Hydrogen Sulfide	18	9
Indene	12	6
Iron & Compounds, NOS	18	9
Isophorone	12	6
Isopropyl Ether	9	3
Kelthane	15	6
Kepone	18	9
Lead	18	9
Lindane	18	9
Magnesium & Compounds, NOS	15	6
Manganese & Compounds, NOS	18	9
Mercury	18	9
Mercury Chloride	18	9
Methoxychlor	15	6
4, 4-Methylene-Bis-(2-Chloroaniline)	18	9
Methylene Chloride	12	6
Methyl Ethyl Ketone	6	6
Methyl Isobutyl Ketone	12	6
4-Methyl-2-Nitroaniline	12	9
Methyl Parathion	9	9
2-Methylpyridine	12	6
Mirex	18	9

Table I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Naphthalene	9	6
Nickel & Compounds, NOS	18	9
Nitric Acid	9	9
Nitroaniline, NOS	18	9
Nitrogen Compounds, NOS	12	0
Nitroguanidine	12	9
Nitrophenol, NOS	15	9
m-Nitrophenol	15	
o-Nitrophenol	12	
p-Nitrophenol	15	
Nitrosodiphenylamine	12	6
Parathion	9	9
Pentachlorophenol (PCP)	18	9
Pesticides, NOS	18	9
Phenanthrene	15	9
Phenol	12	9
Phosgene	9	9
Polybrominated Biphenyl (PBB), NOS	18	9
Polychlorinated Biphenyls (PCB), NOS	18	9
Potassium Chromate	18	9
Radium & Compounds, NOS	18	9
Radon & Compounds, NOS	15	9
RDX (Cyclonite)	15	
2, 4-D, Salts & Esters	18	9
Selenium	15	9
Sevin (Carbaryl)	18	9
Sodium Cyanide	12	9
Styrene	9	6
Sulfate	9	0
Sulfuric Acid	9	9
2, 4, 5-T	18	9
1, 1, 2, 2-Tetrachloroethane	18	9
Tetrachloroethane, NOS	18	9
1, 1, 2, 2-Tetrachloroethene	12	6

Table I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Tetraethyl Lead	18	9
Tetrahydrofuran	15	6
Thorium & Compounds, NOS	18	9
Toluene	9	6
TNT	12	
Toxaphene	18	9
Tribromomethane	18	9
1, 2, 4-Trichlorobenzene	15	6
1, 3, 5-Trichlorobenzene	15	6
1, 1, 1-Trichloroethane	12	6
1, 1, 2-Trichloroethane	15	6
Trichloroethane, NOS	15	6
Trichloroethene	12	6
1, 1, 1-Trichloropropane	12	6
1, 1, 2-Trichloropropane	12	6
1, 2, 2-Trichloropropane	12	6
1, 2, 3-Trichloropropane	15	9
Uranium & Compounds, NOS	18	9
Varsol	12	6
Vinyl Chloride	15	9
Xylene	9	6
Zinc & Compounds, NOS	18	9
Zinc Cyanide	18	9

November 9, 1978

Mr. S.C. Dorr
Chief Plant Engineer
Union Carbide Corporation
Carbon Products Division
P.O. Box 667
Niagara Falls, New York 14302

Dear Mr. Dorr:

This is to confirm that we will be meeting on November 15, 1978 at 1:00 p.m. at your office to discuss the questionnaire and the questions that I raised in my letter to you.

Very truly yours,

Peter J. Hillock

PJH/ksk

1. Newco — No dumping; was another div.
(there by HC-CP)
2. Republic plant — 1930 to present
3. Dowicide — NOT dumped at Republic site
Coal Tars } in solid form
Petrol. Tars } have been dumped.
Wd have to have
heat very high
to change to liquid
4. Machining oils — were dumped on dump roads
stopped doing that
Now sold to oil
people:
Booth Oil (Tonawanda)
How long — ~~couple of~~ several
years now
going to Booth oil
5. Phenols: can't explain
ck. w/ Banaszak — high reading at Republic Dump site
6. Reviewed what I will do with
info; no prob. w/ confiden.
of general info. disclosure
7. Cat. wastes are hauled off
site and not to Republic.
8. The haulers listed on quest.
haul to Rep. site from
the 3 plants

UNION CARBIDE CORPORATION
CARBON PRODUCTS DIVISION
P.O. BOX 992, NIAGARA FALLS, N.Y. 14302

SOLID WASTE MANAGEMENT FACILITY

NO. 932503

UNION CARBIDE CORPORATION
CARBON PRODUCTS DIVISION
NIAGARA FALLS, NEW YORK

Republic Location
Town of Niagara, New York

I hereby certify that the detailed engineering plans and report for the Republic Solid Waste Management Facility have been prepared in a professional manner and in accordance with Part 360 Solid Waste Management Facility and Content Guidelines for plans and specifications issued by New York State Department of Environmental Conservation.

Signed:

James T. Kendrick Jr.

Date: March 31, 1978

5.0 SITE ANALYSIS OF PROPOSED PROJECT

5.1 Waste Facility Location

The Solid Waste Management Facility is located behind the Republic location about 1/2 mile east of Hyde Park Blvd. and within the Town of Niagara zoning limits classified as a heavy industrial type area. The designated area for the waste facility is 16.48 acres and no more than 30 ft. above the existing grade. The entire facility is within the plant's legal boundaries which is surrounded by an 8 ft. high chain link fence. The Niagara Mohawk Power Company owns land bordering the north and east areas of the perimeter, residential property borders the south, with a small section in the southwest corner to Carborundum Company, and the remaining west section is frontage on Hyde Park Blvd.

5.2 Sub-Surface Conditions

Sub-surface conditions include bedrock and the seasonal water table with no underground utilities or sub-surface structures under the water disposal area. Bedrock can be located approximately 25-30 ft. below the foot of the facility and the ground water table between 5 and 15 ft. below grade depending on the season.

5.3 Transportation System

The major route used by company vehicles to bring the waste to the facility is all the primary roads and have capacities of approximately 300 lbs./sq.in. These are, Buffalo Avenue, Packard Road, Hyde Park Boulevard and College Avenue. The access road into the waste facility is only graded earth, but sufficient enough to support the vehicles with a small amount of traffic. On an average work day, the access road may be traveled about 6 times by a company service vehicle. During dry periods, the graded access road will be treated to prevent excessive dusting.

5.4 Surface Water

Any surface water in the area is from wet periods and mostly stagnant accumulations in low lying areas. Rainfall almost immediately percolates through the waste pile into the grade, but because of the water repelling nature of the carbonaceous material, little or no pick-up is encountered when water leaches through. Because of this characteristic leachate contamination is no problem. An estimate on leachate per year is approximately 8.0 million gals./year.

5.5 Monitoring Area

The ground water monitoring area is a simple trench excavated by a back hoe and protectively covered. It is located about half-way and to the south of the waste pile as shown on drawing AX-1A-15. Since

6.0 Operation (cont'd)

6.4 Special Handling

All materials deposited are odorless, but the carbonaceous materials at times can be dusty. When this occurs, a special area in each lift will be used to maintain the fugitive dust. The special area will be a hole or trench in the lift being worked, depending on wind direction for the location of the trench, in which the dusty material will be deposited and immediately covered.

In general, all solid wastes will be delivered in either a lift trailer, dump truck, or dumpster depending on the material and collection point. Upon arrival at the service area, the operator will take the load to the working lift and deposit it. The machine operator then will distribute the load on the lift. After every two weeks of operation, the working lift will be covered with cover material from the next area to be worked. When an entire lift is completed, it will be prepared with final cover in preparation for seeding.

7.0 MARKET ANALYSIS

At present, the only marketable material is the carbonaceous dust. The higher quality dust can be sold for limited applications. Unfortunately, technology is not developed enough to market the material in quantities large enough to make the business profitable. Trials are being conducted with the hope off possibly reducing the carbonaceous material presently deposited in the waste facility.

* 8.0 COVER MATERIAL

8.1 Daily Cover

Because of the size of the operation and availability of good material, daily cover is not done. (A copy of the Variance Form 47-19-5 on Cover Material is in Appendix B-3.)

8.2 Cover Material

The material consists of aged waste deposited no less than 5 years previous. This particular "aged waste" is dust free and can support minimal plant life. Depending upon the amount of waste deposited, the working lift will be covered with this material no less than once every two weeks.

UNION CARBIDE CORPORATION
CARBON PRODUCTS DIVISION
P.O. BOX 887, NIAGARA FALLS, N.Y. 14302

February 9, 1977

Mr. Daniel Quackenbush
Dept. of Environmental Conservation
Division of Solid Waste Management
50 Wolf Road
Albany, New York 12233

Dear Mr. Quackenbush:

Per request during our recent meeting, we advise that approximately 100 gallons/month of oil are collected in 55 gallon drums and taken to the dump or used on roadways in the summer.

Very truly yours,

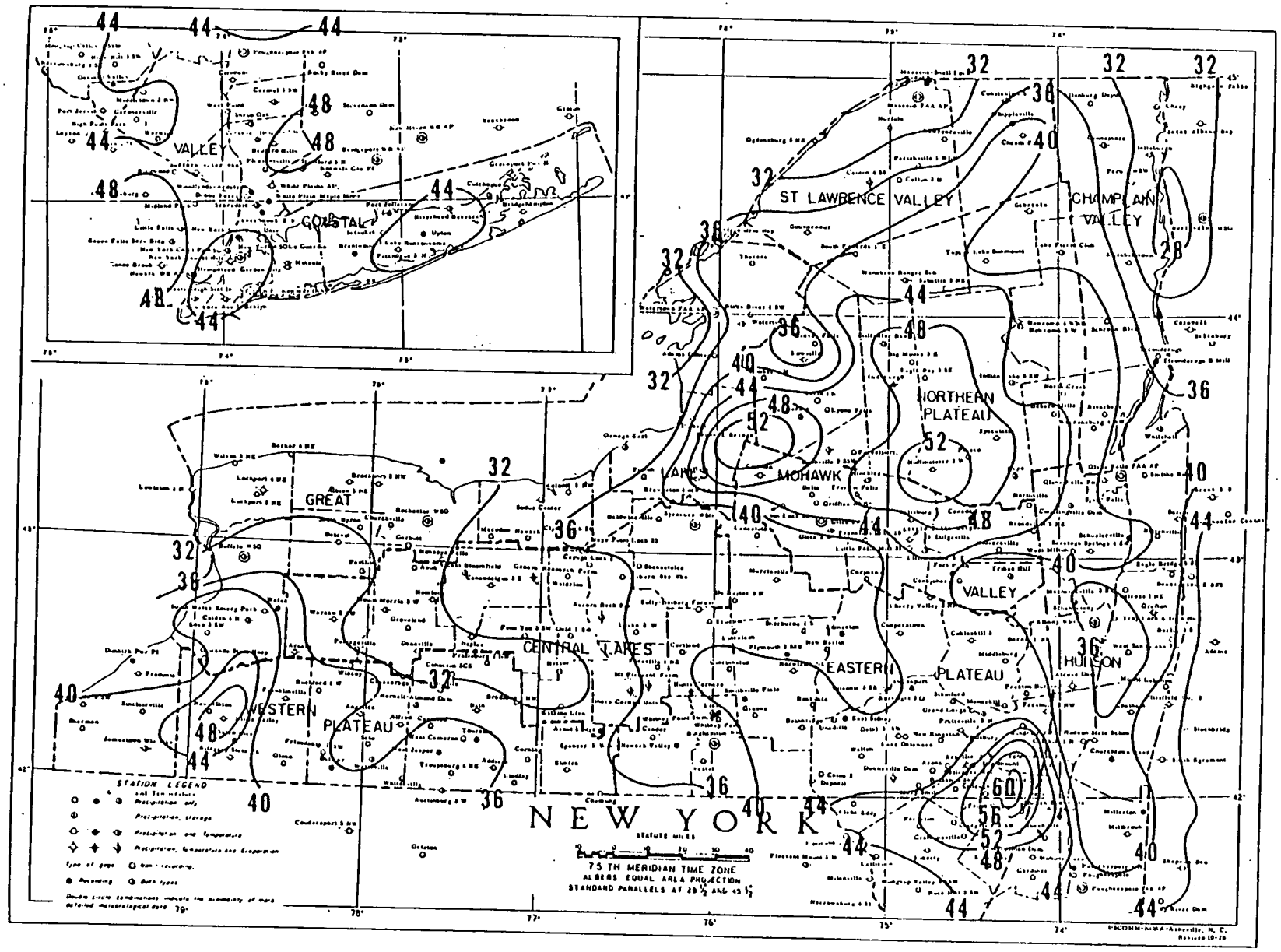
S.C. Dorr

S.C.Dorr
baf

Chief Plant Engineer

CC: Mr. R.A.Hardison
UCC-CPD, Parma

MEAN ANNUAL PRECIPITATION, INCHES



Data are based on the period 1931-55. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps, particularly in mountainous areas.

National Oceanic and Atmospheric Administration, Climates of the States, Vol. 2, p. 719, 1978.

TELEPHONE CONVERSATION MEMORANDUM

10/24/85 1600

CLIENT NYSDEC / UNION CARBIDE

PROJECT UNION CARBIDE

PROJ. No. _____

DATE _____

TIME _____

CALL TO/FROM _____ REPRESENTING _____

PHONE No. _____

SUMMARY OF CONVERSATION: TO: MIKE HOPKINS ASSISTANT PUBLIC HEALTH ENGINEER

- BEDROCK: LOCKPORT DOLOMITE 110-140 FT THICK
- 4-9 SEPARATE WATER BEARING ZONES
- SURFICIAL CLAY OVER GLACIAL TILLS 10-30 FT THICK
- QUITE IMPERMEABLE 10^{-6} TO 10^{-7} CM/SEC
- VIRTUALLY NO GROUNDWATER USE IN NIAGARA RIVER NIAGARA RIVER PROVIDES SOLE SOURCE FROM GRAND ISLAND INTAKES
- OLIN CHEMICAL AND GREAT LAKES CARBON ARE G.W. USERS PROBABLY FOR COOLING
- OLIN WELL PROBABLY PENETRATES MOST OF THE SEPARATE WATER PRODUCING ZONES W/ 12" WELL, GREAT VOLUME
- NOT MUCH DATA REPORTABLE ON STATICS OR YIELDS

COPIES TO: _____

BY: _____

WEHRAN ENGINEERING
CONSULTING ENGINEERS

UNION CARBIDE CORPORATION P.O. BOX 887, NIAGARA FALLS, NY 14302
CARBON PRODUCTS DIVISION

November 4, 1985

Wehran Engineering
666 East Main Street
Middletown, New York 10940

Attn: Mr. T. Haehen

Dear Mr. Haehen:

With reference to your phone request for additional copies or the right to photostat portions of our submission to Mr. T.R.Reoper of your office, we attach four (4) bound and stamped copies of Sections 2, 3, 4 and 5, as were included in the 4/2/85 report.

We understand these copies are to be used in your Ranking/Scoring process for the New York State Department of Environmental Conservation.

If you have any further questions, or need other information, do not hesitate to call.

Very truly yours,

M A Balent

M.A.Balent, P.E.
Chief Plant Engineer
baf

Attach.

ANALYTICAL RESULTS

UNION CARBIDE-CARBON DIVISION
GROUNDWATER WELL MONITORING

Report Date: 10/12/78
Sample Dates: 9/21-25/78

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION NORTH WELL	SOUTH WELL
Carbon Chloroform Extract	mg/l	<2.5	<2.5
Soluble Aluminum	mg/l	1.36	1.60
Soluble Silver	mg/l	<0.003	<0.003
Soluble Calcium	mg/l	3.5	32
Soluble Total Chromium	mg/l	0.006	0.012
Soluble Hexavalent Chromium	mg/l	<0.01	<0.01
Soluble Potassium	mg/l	67	20.2
Soluble Sodium	mg/l	248	197
Soluble Lead	mg/l	0.02	0.02
Soluble Arsenic	µg/l	<3.5	<3.5
Soluble Mercury	µg/l	0.82	0.82
Soluble Copper	mg/l	0.014	0.014
Total Iron	mg/l	103	114

COMMENTS: Samples were collected by Recra personnel. Due to low recharge rates, samples were collected on both 9/21/78 and 9/25/78 from the North Well. Insufficient volume of sample was available for Chemical Oxygen Demand analyses from the both wells and Total Coliforms from the South Well. Due to the formation of a severe emulsion, Methylene Blue Active substances could not be determined for the North Well sample. Values reported as "less than" indicate the working detection limit for those sample analyses. The Biochemical Oxygen Demand being greater than the Total Organic Carbon from the South Well sample is believed to be a function of the suspended solids content of this sample.

FOR RECRA RESEARCH, INC. Robert K Wyeth

DATE 10-13-78

RECRA RESEARCH, INC.
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH
111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION - CARBON DIVISION
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
LEACH TEST

Report Date: 10/12/78
Sample Date: 8/22-24/78

PARAMETER	UNIT OF MEASURE	SAMPLE IDENTIFICATION CARBON COMPOSITE - MEAN OF DUPLICATE TESTS
Carbon - Chloroform Extractable	mg/l	<2.0
Phenol	mg/l	0.110
Total Organic Carbon	mg/l	<1.0
pH	Standard Units	8.02
Chemical Oxygen Demand	mg/l	16.2
Chloride	mg/l	18.2
Fluoride	mg/l	0.569
Cyanide (Free)	mg/l	<0.5
Total Grease & Oils	mg/l	<1.0
Hydrocarbon Grease & Oils	mg/l	<1.0
Polar Grease & Oils	mg/l	<1.0
Total Chlorinated Hydrocarbons	µg/l as Chlorine, Lindane Standard	3.70
Hexavalent Chromium	mg/l	<0.01
Soluble Aluminum	mg/l	<0.03
Soluble Arsenic	µg/l	<3.5
Soluble Cadmium	mg/l	<0.003
Soluble Chromium	mg/l	<0.003
Soluble Copper	mg/l	0.005
Soluble Iron	mg/l	<0.01
Soluble Lead	mg/l	<0.02
Soluble Mercury	µg/l	<0.5
Soluble Nickel	mg/l	<0.02
Soluble Selenium	µg/l	<2.5
Soluble Zinc	mg/l	0.007

10 TIMES GROUND WATER STDS

COMMENTS: Samples of the carbon material were collected by Recra personnel on 8/22, 8/23 and 8/24/1978. These samples were composited and analyzed in duplicate.

For Recra Research, Inc. Robert V. Lutz

Date 10-13-78

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

ANALYTICAL RESULTS

UNION CARBIDE-CARBON DIVISION
GROUNDWATER WELL MONITORING

Report Date: 10/12/78
Sample Dates: 9/21/78 - 9/25/78

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION NORTH WELL	SOUTH WELL
Biochemical Oxygen Demand	mg/l	13.5	79.5
Chemical Oxygen Demand	mg/l	-	-
Conductivity	umhos/cm	1,430	2,920
pH	Standard Units	8.94	7.42
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	563	529
Chloride	mg/l	382	391
Hardness	mg/l as $CaCO_3$	240	295
Color	Pt-Co Units	68	45
Total Solids	mg/l	2,720	2,910
Ammonia	mg N/l	4.42	0.23
Total Kjeldahl Nitrogen	mg N/l	7.38	0.21
Nitrate	mg N/l	2.7	2.5
Nitrite	mg N/l	<0.005	0.041
Total Phosphorus	mg P/l	<0.01	0.024
Sulfate	mg/l	360	940
Phenol	mg/l	0.235	0.238
Total Organic Carbon	mg/l	108	50
Methylene Blue Active Substances	mg/l	-	0.08
Total Coliforms	MPN/100mls	5,400	-

FOR RECRA RESEARCH, INC. Robert K Lynch

DATE 10-13-78

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

WELL MONITORING REPORTS

FIRST QUARTER 1979 thru FOURTH QUARTER 1979

UNION CARBIDE-CARBON DIVISION

RESTRICTED

Report Date: 4/23/79
Sample Date: 3/29/79

SURFACE AND GROUNDWATER

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION			
		W1	W2	W3	SP1
Ammonia	mg/l	0.63	1.8	0.47	0.52
Nitrite	mg/l	< 0.01	< 0.01	< 0.01	<0.01
Nitrate	mg/l	2.0	4.5	1.0	0.20
Biochemical Oxygen Demand (5 Day)	mg/l	37.5	<50	< 50	5
Chemical Oxygen Demand	mg/l	344	38.4	< 10	68.7
Total Kjeldahl Nitrogen	mg/l	1.1	-	0.56	-
Total Phosphorus	mg/l	1.1	0.25	0.04	0.25
Sulfate	mg/l	7.8	700	650	150
Methylene Blue Active Substances	mg/l	<0.4	<0.4	<0.4	< 0.4
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	330	820	275	240
Total Solids (103°C)	mg/l	1,870	-	1,360	-
Color	Pt-Co Color Units	-	-	70	75
Total Hardness	mg/l as $CaCO_3$	1,260	1,630	940	400
Chloride	mg/l	260	180	22	20
Total Coliform	MPN/100mls	430	< 30	≥24,000	40
Total Organic Carbon	mg/l	93	16.7	9.0	23.1
Phenols	mg/l	0.09	0.01	< 0.01	0.01
pH	Standard Units	7.84	6.83	7.38	7.19
Conductance	umhos/cm	1,540	1,370	2,100	692
Carbon Chloroform Extraction	mg/l	10.8	-	-	3.3
Total Chlorinated Hydrocarbons	ug/l as Chlorine; Lindane Standard	2.1	0.7	1.0	0.8
Total Aluminum	mg/l	52	5.0	1.2	0.1
Total Arsenic	ug/l	11.4	< 1.7	< 1.7	<1.7
Total Chromium	mg/l	0.088	0.008	< 0.003	<0.003
Total Copper	mg/l	0.635	0.028	0.008	0.014
Total Lead	mg/l	0.60	<0.02	<0.02	<0.02
Total Mercury	ug/l	36.6	< 0.7	< 0.7	<0.7
Total Iron	mg/l	170	33	8.8	1.0
Total Potassium	mg/l	70	6.5	5.5	8.3
Total Sodium	mg/l	200	68	30	8.3
Total Calcium	mg/l	66	17	55	28
Total Silver	mg/l	0.011	< 0.003	<0.003	0.005

COMMENTS: Samples were collected by Recra personnel on 3/29/79. All analyses were performed according to U.S. Environmental Protection Agency methodologies except where noted. Due to an overestimation of BOD content, Samples W2 and W3 were inappropriately diluted, therefore yielding the reported detection limits. Sample W1 and W2 could not be quantified for color since their colors were not comparible to the platinum-cobalt standards. Carbon Chloroform Extraction could not be analyzed on Samples W2 and W3 due to breakage of sample containers. Chromatograms used to quantify TCH show the possible presence of Polychlorinated Biphenyls. Values reported as "less than" indicate the working detection limits for the particular sample/parameter. Samples SP1 and W2 did not have all analyses performed due to lack of sufficient volume.

FOR RECRA RESEARCH, INC. [signature]

DATE 4/23/79

RECRA RESEARCH, INC. 111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH

ANALYTICAL RESULTS

UNION CARBIDE-CARBON DIVISION

Report Date: 5/29/79
Sample Date: 4/30/79

GROUND WATER

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION WELL #1
Ammonia	mg/l	10.0
Nitrite	mg/l	< 0.01
Nitrate	mg/l	4.8
Biochemical Oxygen Demand (5 Day)	mg/l	13
Chemical Oxygen Demand	mg/l	71.8
Total Kjeldahl Nitrogen	mg/l	7.7
Total Phosphorus	mg/l	5.0
Sulfate	mg/l	<1
Methylene Blue Active Substances	mg/l	-
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	780
Total Solids (103°C)	mg/l	1,570
Color	Pt-Co Color Units	100
Total Hardness	mg/l as $CaCO_3$	920
Chloride	mg/l	190
Total Coliform	MPN/100mls	750
Total Organic Carbon	mg/l	26.1
Phenols	mg/l	< 0.01
pH	Standard Units	8.13
Conductance	µmhos/cm	1,480
Carbon Chloroform Extraction	mg/l	26.9
Total Chlorinated Hydrocarbons	µg/l as Chlorine; Lindane Standard	6.5
Total Aluminum	mg/l	7.4
Total Arsenic	µg/l	6.4
Total Chromium	mg/l	0.026
Total Copper	mg/l	0.103
Total Lead	mg/l	0.07
Total Mercury	µg/l	17
Total Iron	mg/l	6.5
Total Potassium	mg/l	110
Total Sodium	mg/l	160
Total Calcium	mg/l	46
Total Silver	mg/l	< 0.003

COMMENTS: Samples were collected by Recra personnel on 4/30/79. All analyses were performed according to U. S. Environmental Protection Agency methodologies. Values reported as "less than" indicate the working detection limits for a particular sample/parameter. Methylene Blue Active Substances could not be quantified due to the formation of a severe emulsion during extraction. The discrepancy between TKN and Ammonia is believed to be the result of an electrode interference, caused by coating of the membrane. The TKN value is probably more reliable since the interference may be removed during distillation.

FOR RECRA RESEARCH, INC.

DATE 6/20/79

RECRA RESEARCH, INC. 111 Wales Avenue/Tonawanda, New York 14150/(716) 692-7620
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION - REPUBLIC PLANT
SEMI-ANNUAL WELL MONITORING

Report Date: 12/27/79
Sample Date: 11/21/79

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION		
		W-I	W-II	W-III
pH	Standard Units	8.52	7.91	7.93
Conductance	µmhos/cm	1,310	3,120	1,340
Total Coliform	MPN/100 mls	2	< 2	2
Biochemical Oxygen Demand (5day)	mg/l	22	8	5
Chemical Oxygen Demand	mg/l	160	174	30
Total Organic Carbon	mg/l	70	130	35
Ammonia	mgN/l	14.4	< 0.5	0.5
Total Kjeldahl Nitrogen	mgN/l	24.0	2.8	2.0
Total Phosphorus	mgP/l	0.62	0.56	0.06
Nitrate	mgN/l	< 0.2	0.3	< 0.2
Nitrite	mgN/l	< 0.01	< 0.01	< 0.01
Chloride	mg/l	145	121	14
Total Residue (103°C)	mg/l	1,500	2,480	952
Total Recoverable Phenolics	mg/l	0.080	0.040	< 0.010
Sulfate	mg/l	6.0	750	400
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	898	804	260
Total Hardness	mg/l as $CaCO_3$	775	1,750	540
Color	Pt-Co Color Units	---	---	---

COMMENTS: Samples were collected by Recra personnel on 11/21/79. Comments pertain to data on one or both pages of this report. Values reported as "less than" indicate the working detection limit for the particular sample or parameter. The above samples could not be quantified for color since their colors were not comparible to the platinum-cobalt standards. All analyses were performed according to U. S. Environmental Protection Agency methodology with the exception of Carbon Chloroform Extraction (CCE).

FOR RECRA RESEARCH, INC. J. Phoenix

DATE 12/26/79

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION - REPUBLIC PLANT
SEMI-ANNUAL WELL MONITORING

Report Date: 12/27/79
Sample Date: 11/21/79

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION		
		W-I	W-II	W-III
Carbon Chloroform Extract	mg/l	2.0	1.6	< 1.0
Methylene Blue Active Substances	mg LAS/l	< 0.4	< 0.4	< 0.4
Total Aluminum	mg/l	56	0.6	< 0.1
Total Arsenic	µg/l	5.3	< 1.4	< 1.4
Total Chromium	mg/l	0.090	< 0.002	< 0.002
Hexavalent Chromium	mg/l	0.090	< 0.002	< 0.002
Total Copper	mg/l	0.783	< 0.003	< 0.003
Total Calcium	mg/l	99	275	14
Total Iron	mg/l	280	11.7	0.27
Total Lead	mg/l	0.72	0.03	< 0.02
Total Mercury	µg/l	13	< 0.4	< 1.0
Total Potassium	mg/l	66	6.4	4.2
Total Silver	mg/l	0.052	< 0.005	< 0.005
Total Sodium	mg/l	180	85	75
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	1.80	1.47	1.54

COMMENTS: The CCE procedure employed, is a modification of the procedure found in Standard Methods for the Examination of Water and Wastewater, 14th Edition. Specific modifications to the procedure were submitted previously with the original proposal. Differences in detectability for a given parameter are a function of varying sample volumes taken for analysis. Halogenated organic scan results are used for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the response factor of Lindane but do not imply either the presence or absence of Lindane itself. Halogenated organic scan results do not include volatile organic constituents.

FOR RECRA RESEARCH, INC. J. Phillips

DATE 12/28/79

WELL MONITORING REPORTS

FIRST QUARTER 1980 thru FOURTH QUARTER 1980

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION - REPUBLIC PLANT
SEMI-ANNUAL WELL MONITORING

Report Date: 7/31/80
Dates Received: 5/28/80 and 6/9/80

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-I	W-II	W-III
pH 6.5-8.5	Standard Units	O.K. 8.10	7.61 O.K.	7.94 O.K. 6.5-8.5
Conductance	µmhos/cm	1,520	2,200	890
Total Coliform	MPN/100 mls	<2	<2	<2
Biochemical Oxygen Demand (5-day)	mg/l	110	140	<2
Chemical Oxygen Demand	mg/l	67	180	<10
Total Organic Carbon	mg/l	19	72	24
Ammonia	mg N/l	9.1	<1	<0.5
Total Kjeldahl Nitrogen	mg N/l	-	<1	<0.50
Total Phosphorus	mg P/l	<0.02	<0.02	0.03
Nitrate 20 mg/l	mg N/l	O.K. 0.45	4.1 O.K.	0.17 O.K. 10.0 mg/l
Nitrite	mg N/l	<0.01	<0.01	<0.01
Chloride 500 mg/l	mg/l	O.K. 103	109 O.K.	9.3 O.K. 250 mg/l
Total Residue (103°C)	mg/l	1,400	4,600	700
Total Recoverable Phenolics	mg/l	0.025	0.26	0.053 0.001 mg/l
Sulfate 500 mg/l	mg/l	O.K. 11	830 mg.	260 O.K.
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	770	560	280

COMMENTS: Sample W-III was collected by Recra personnel on 5/28/80. W-I and W-II were not collected until 6/9/80 due to their slow recharging rate. Comments pertain to data on one or both pages of this report. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Differences in detectability for a specific parameter are due to varying sample volumes taken for analysis.

FOR RECRA RESEARCH, INC. Karen L. Marchese

DATE 7/31/80

W-1 GREATER
11
15 W-2 GREATER.

W-1 - 3-N.G. (IRON, ALUMINUM, LEAD)
W-2 - 3-N.G. (IRON, ALUMINUM, SULFATE)
W-3 - 1-N.G. (IRON)

RECRA RESEARCH INC.
I.D.#517

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION - REPUBLIC PLANT
SEMI-ANNUAL WELL MONITORING

NY STATE GA WATERS — CLASS GA (DISCHARGE) WATER.

Report Date: 7/31/80
Dates Received: 5/28/80 and 6/9/80

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-I	W-II	W-III
Total Hardness	mg/l as $CaCO_3$	560	1,680	480
True Color	Pt-Co Color Units	27	50	0
Carbon Chloroform Extract	mg/l	3.1	8.0	5.2
Methylene Blue Active Substances 1.0 mg/l	mg LAS/l	<0.1 O.K.	<0.2 O.K.	<0.1 O.K. 0.5 mg/l
Total Aluminum 2.0 mg/l	mg/l	4.6 N.G.	3.1 N.G.	1.4 O.K.
Total Arsenic 0.05 mg/l	µg/l	10 O.K.	<2 O.K.	<1 O.K. 0.025 mg/l
Total Chromium	mg/l	0.008	<0.003	<0.003
Hexavalent Chromium 0.10 mg/l	mg/l	-	-	- 0.05 mg/l
Total Copper 1.0 mg/l	mg/l	O.K. 0.043	0.008 O.K.	0.007 O.K. 1.0 mg/l
Total Calcium	mg/l	28	100	39
Total Iron 0.6 mg/l	mg/l	27 mg.	80 mg.	6.4 N.G. 0.3 mg/l
Total Lead 0.05 mg/l	mg/l	0.07 mg.	<0.02 O.K.	<0.02 O.K. 0.025 mg/l
Total Mercury 0.0004 mg/l	µg/l	3.0 O.K.	2.9 O.K.	<1 O.K. 0.002 mg/l
Total Potassium	mg/l	64	7.9	4.1
Total Silver 0.10 mg/l	mg/l	O.K. <0.005	<0.005 O.K.	<0.005 O.K. 0.05 mg/l
Total Sodium	mg/l	200	100	66
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	4.6	8.8	0.81

COMMENTS: All analyses were performed according to U.S. Environmental Protection Agency methodology with the exception of Carbon Chloroform Extraction (CCE). The CCE procedure employed is a modification of the procedure found in Standard Methods for the Examination of Water and Wastewater, 14th Edition. Total Kjeldahl Nitrogen could not be determined on Sample W-I due to interfering substances. Hexavalent chromium analysis was not determined on these samples due to their low total chromium concentration.

Halogenated Organic Scan (ECD) analyses were performed using an electron capture detector. Results of these scans are for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane, but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan (ECD) results generally do not include volatile organic constituents.

FOR RECRA RESEARCH, INC. Karen E. Massaro

DATE 7/31/80

RECRA RESEARCH INC

I.D. #517

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION
SEMI-ANNUAL WELL MONITORING

Report Date: 1/2/81
Sample Date: 11/17/80

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-I
Groundwater Elevation	Feet Below Top of Casing	12'7"
pH	Standard Units	8.33
Conductance (25°C)	µmhos/cm	2,150
Total Coliform	Colonies/100 mls	0
Biochemical Oxygen Demand (5 day)	mg/l	6
Chemical Oxygen Demand	mg/l	48
Total Organic Carbon	mg/l	210
Ammonia	mg N/l	28
Total Kjeldahl Nitrogen	mg N/l	-
Total Phosphorus	mg P/l	0.45
Nitrate	mg N/l	0.32
Nitrite	mg N/l	<0.01
Chloride	mg/l	85
Total Residue (103°C)	mg/l	1,200
Total Recoverable Phenolics	mg/l	0.03
Sulfate	mg/l	3.0
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	850
Total Hardness	mg/l as $CaCO_3$	540
Color	Pt-Co Color Units	35

COMMENTS: Sample was collected by Recra personnel on 11/17/80. Comments pertain to data on one or both pages of this report. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Analyses were performed according to U.S. Environmental Protection Agency methodologies where applicable. Total Kjeldahl Nitrogen could not be determined due to the suspected presence of interfering substances. Wells W-2 and W-3 were 20'2" and 15'2", respectively, to the bottom of each well from the top of casing.

FOR RECRA RESEARCH, INC. R. V. Finn

DATE 1/9/81

RECRA RESEARCH INC

I.D. #1083

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION
SEMI-ANNUAL WELL MONITORING

Report Date: 12/31/80
Sample Date: 11/17/80

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-I
Carbon Chloroform Extract	mg/l	<1
Methylene Blue Active Substances	mg/l	<0.1
Total Aluminum	mg/l	0.3
Total Arsenic	µg/l	8.0
Total Chromium	mg/l	<0.005
Hexavalent Chromium	mg/l	-
Total Copper	mg/l	0.006
Total Calcium	mg/l	110
Total Iron	mg/l	1.9
Total Lead	mg/l	0.03
Total Mercury	µg/l	<2
Total Potassium	mg/l	330
Total Silver	mg/l	<0.005
Total Sodium	mg/l	3,500
Halogenated Organic Scan (ECD)	µg/l as Chlorine; Lindane Standard	0.91

COMMENTS: Halogenated Organic Scan (ECD) analyses were performed using an electron capture detector. Results of these scans are for screening purposes only and are not designed for quantification or qualification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane, but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan (ECD) results generally do not include volatile organic constituents.

FOR RECRA RESEARCH, INC. R. V. Finn

DATE 1/9/81

RECRA RESEARCH, INC
I.D. #1083

WELL MONITORING REPORTS

FIRST QUARTER 1981 thru FOURTH QUARTER 1981

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION
SEMI-ANNUAL WELL MONITORING

Report Date: 7/6/81
Sample Date: 6/9/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION		
		W-I	W-II	W-III
Groundwater Elevation	Feet Below Top of Casing	9'4"	18'10"	9'7"
pH	Standard Units	7.77	7.13	7.90
Specific Conductance (25°C)	µmhos/cm	1,730	1,050	540
Total Coliform	Colonies/100 ml	<3	9	15
Biochemical Oxygen Demand (5 day)	mg/l	<5	<5	<5
Chemical Oxygen Demand	mg/l	41	32	6.8
Total Organic Carbon	mg/l	16	13	3.1
Ammonia	mg N/l	-	<0.5	<0.5
Total Kjeldahl Nitrogen	mg N/l	2.4	<0.5	<0.5
Total Phosphorus	mg P/l	<0.02	<0.02	<0.02
Nitrate	mg N/l	<0.1	<0.1	<0.1
Nitrite	mg N/l	0.016	<0.01	<0.01
Chloride	mg/l	87	83	5.8
Total Residue (103°C)	mg/l	1,100	960	440
Total Recoverable Phenolics	mg/l	<0.01	<0.01	<0.01
Sulfate	mg/l	35	330	120
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	890	170	240
Total Hardness	mg/l as $CaCO_3$	630	550	270
Color	Pt-Co Color Units	40	17.5	30
Carbon Chloroform Extraction	mg/l	14	<2	<1
Methylene Blue Active Substances	mg/l	<0.03	0.058	<0.2

(Continued)

ANALYTICAL RESULTS (cont'd.)

UNION CARBIDE CORPORATION
SEMI-ANNUAL WELL MONITORING

Report Date: 7/6/81
Sample Date: 6/9/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-I	W-II	W-III
Total Aluminum	mg/l	<0.2	<0.2	<0.2
Total Arsenic	μg/l	6.1	<5	<5
Total Chromium	mg/l	<0.005	<0.005	<0.005
Hexavalent Chromium	mg/l	<0.005	<0.005	<0.005
Total Copper	mg/l	0.054	0.050	0.042
Total Calcium	mg/l	32	70	42
Total Iron	mg/l	16	9.3	70
Total Lead	mg/l	<0.03	<0.03	<0.03
Total Mercury	μg/l	<3	<3	<3
Total Potassium	mg/l	2.2	54	6.0
Total Silver	mg/l	0.015	0.016	<0.005
Total Sodium	mg/l	47	51	14
Halogenated Organic Scan (ECD)	μg/l as Chlorine; Lindane Standard	21	-	22

COMMENTS: Samples were collected by Recra personnel on 6/9/81. Comments pertain to data on one or both pages of this report. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Analyses were performed according to U.S. Environmental Protection Agency methodologies where applicable. Halogenated Organic Scan (ECD) analysis for Sample W-II could not be performed due to insufficient sample volume. Halogenated Organic Scan (ECD) analyses were performed using an electron capture detector. Results of these scans are for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane, but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan (ECD) results generally do not include volatile organic constituents. Results of the Halogenated Organic Scan (ECD) analyses indicated that the major contribution to the high values was from peaks (compounds) with gas chromatographic retention times of less than two minutes. The ammonia value for W-I could not be determined due to suspected interferences.

FOR RECRA RESEARCH, INC. [signature]

DATE 7/6/81

RECRA RESEARCH INC.
I.D. #81-452

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION
SEMI-ANNUAL WELL MONITORING

Report Date: 1/7/82
Sample Date: 12/9/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION		
		W-1	W-2	W-3
Groundwater Elevation	Feet Below Top of Casing	9'7"	18'10"	5'6"
pH	Standard Units	8.63	7.32	8.23
Specific Conductance (25°C)	µmhos/cm	1,250	580	560
Total Coliform	Organisms/100 ml	3.6	43	9.1
Biochemical Oxygen Demand (5 day)	mg/l	<2	-	<2
Chemical Oxygen Demand	mg/l	33	-	8
Total Organic Carbon	mg/l	11	-	<1
Ammonia	mg N/l	10	-	<0.1
Total Kjeldahl Nitrogen	mg N/l	9	-	0.2
Total Phosphorus	mg P/l	0.16	-	<0.02
Nitrate	mg N/l	0.47	2.7	2.7
Nitrite	mg N/l	0.19	0.19	<0.01
Chloride	mg/l	75	45	7.5
Total Residue (103°C)	mg/l	1,100	-	600
Total Recoverable Phenolics	mg/l	0.012	<0.01	<0.01
Sulfate	mg/l	3.9	130	110
Alkalinity (pH 4.5)	mg/l as $CaCO_3$	660	190	240
Total Hardness	mg/l as $CaCO_3$	410	-	270
True Color	Pt-Co Color Units	20	30	50
Carbon Chloroform Extraction	mg/l	-	-	-
Methylene Blue Active Substances	mg/l	<0.1	-	<0.1

(Continued)

I.D. [illegible]-1130

ANALYTICAL RESULTS (cont'd.)

UNION CARBIDE CORPORATION
SEMI-ANNUAL WELL MONITORING

Report Date: 1/7/82
Sample Date: 12/9/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-1	W-2	W-3
Total Aluminum	mg/l	0.4	0.4	0.4
Total Arsenic	µg/l	<5	<5	<5
Total Chromium	mg/l	<0.005	<0.005	<0.005
Hexavalent Chromium	mg/l	<0.005	<0.005	<0.005
Total Copper	mg/l	0.010	<0.01	<0.01
Total Calcium	mg/l	10	50	28
Total Iron	mg/l	3.0	29	3.0
Total Lead	mg/l	0.05	<0.04	<0.04
Total Mercury	µg/l	<1	2.6	<1
Total Potassium	mg/l	59	4.5	3.8
Total Silver	mg/l	<0.005	<0.005	<0.005
Total Sodium	mg/l	170	17	61
Halogenated Organic Scan (ECD)	µg/l as Chlorine; Lindane Standard	1.3	-	1.1

COMMENTS: Samples were collected by Recra personnel on 12/9/81. Comments pertain to data on one or both pages of this report. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Analyses were performed according to U.S. Environmental Protection Agency methodologies where applicable. Many analyses for Sample W-2 could not be performed due to insufficient sample volume. Halogenated Organic Scan (ECD) analyses were performed using an electron capture detector. Results of these scans are for screening purposes only and are not designed for qualification or quantification of any specific organic compound. Results are calculated based upon the chlorine content and response factor of Lindane, but do not imply either the presence or absence of Lindane itself. Halogenated Organic Scan (ECD) results generally do not include volatile organic constituents. Carbon Chloroform Extraction results will follow shortly.

FOR RECRA RESEARCH, INC. ______________________

DATE 1/8/82

RECRA RESEARCH INC.
I.D. [illegible]-1130

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION
SEMI-ANNUAL WELL MONITORING

Report Date: 1/13/82
Sample Date: 12/9/81

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-1	W-2	W-3
Carbon Chloroform Extraction	mg/l	7.2	-	<2

COMMENTS: The Carbon Chloroform Extraction analysis for Sample W-2 could not be performed due to insufficient sample volume. The value reported as "less than" (<) indicates the working detection limit for the particular sample and/or parameter.

FOR RECRA RESEARCH, INC. R. V. Finn

DATE 1/13/82

RECRA RESEARCH, INC.
I.D. #81-1130

WELL MONITORING REPORTS

FIRST QUARTER 1982 thru FOURTH QUARTER 1982

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION
CARBON PRODUCTS DIVISION

Report Date: 3/18/82
Dates Received: 3/4 & 8/82

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)		
		W-1 (3/4/82)	W-2 (3/4/82)	W-3 (3/8/82)
Total Residue (103°C)	mg/l	1,100	-	530
Conductance (25°C)	umhos/cm	1,220	-	530
Total Phosphorus	mg P/l	0.07	-	<0.01
Sulfate	mg/l	8.4	-	82
Chloride	mg/l	440	-	8.8
Total Recoverable Phenolics	mg/l	<0.01	-	<0.01
Total Mercury	ug/l	<0.9	-	<0.9
Total Iron	mg/l	3.2	-	29
Biochemical Oxygen Demand (5 day)	mg/l	<10	<5	<5
Total Organic Carbon	mg/l	11	5.5	35

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. Values reported as less than (<) indicate the working detection limit for the particular sample or parameter. Due to the small volume available from Well-2, many analyses could not be performed.

FOR RECRA RESEARCH, INC. R. V. Zinn

DATE 3/18/82

RECRA RESEARCH, INC.
P.O. #82-108

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION
CARBON PRODUCTS DIVISION

Report Date: 6/22/82
Dates Received: 5/28 & 6/3/82

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)		
		W-1 (5/28 & 6/3/82)	W-2 (5/28/82)	W-3 (5/28 & 6/3/82)
Total Residue (103°C)	mg/l	1,400	3,700	350
Conductance (25°C)	µmhos/cm	1,400	470	520
Total Phosphorus	mg P/l	1.6	0.74	0.03
Sulfate	mg/l	12	69	74
Chloride	mg/l	95	170	6.7
Total Recoverable Phenolics	mg/l	0.090	-	<0.1
Total Mercury	µg/l	8.0	11	<0.5
Total Iron	mg/l	230	2,100	22
Biochemical Oxygen Demand (5 day)	mg/l	<5	-	<5
Total Organic Carbon	mg/l	17	15	5

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Due to the small volume available from Well-2, some analyses could not be performed. Wells W-1 and W-3 were sampled on two days to obtain enough volume for all parameters.

FOR RECRA RESEARCH, INC. R. V. Zinn

DATE 6/22/82

RECRA RESEARCH INC.
I.D. #82-558

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION

Report Date: 9/30/82
Date Received: 9/17/82

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-1 (9/17/82)
Total Residue (103°C)	mg/l	960
Specific Conductance (25°C)	µmhos/cm	1,470
Total Phosphorus	mg/l	<0.02
Sulfate	mg/l	6.7
Chloride	mg/l	110
Total Recoverable Phenolics	mg/l	<0.01
Total Organic Carbon	mg/l	31
Biochemical Oxygen Demand (5 day)	mg/l	4.0
Total Mercury	mg/l	<0.001
Total Iron	mg/l	2.6

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Wells W-2 and W-3 were dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES R. V Finn

DATE 9/30/82

RECRA ENVIRONMENTAL LABORATORIES

I.D. #82-419

ANALYTICAL RESULTS

UNION CARBIDE CORPORATION

Report Date: 12/20/82

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1 (12/3/82)	W-3 (12/6/82)
Total Residue (103°C)	mg/l	975	860
Specific Conductance (25°C)	umhos/cm	1,200	1,080
Total Phosphorus	mg/l	<0.02	<0.02
Sulfate	mg/l	<1	180
Chloride	mg/l	100	11
Total Recoverable Phenolics	mg/l	<0.01	<0.01
Total Organic Carbon	mg/l	15	4.0
Biochemical Oxygen Demand (5 day)	mg/l	8	<4
Total Mercury	mg/l	<0.0008	<0.0008
Total Iron	mg/l	26	35

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Sampling Point W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 12/21/82

WELL MONITORING REPORTS

FIRST QUARTER 1983 thru FOURTH QUARTER 1983

ANALYTICAL RESULTS

UNION CARBIDE REPUBLIC PLANT

Report Date: 3/30/83
Date Received: 3/16/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-1 (3/16/83)	W-3 (3/16/83)
Water Level	Feet from top of well casing	8.58	4.67
Biochemical Oxygen Demand (5 day)	mg/l	<5	<2
Total Residue (103°C)	mg/l	1,100	2,200
Specific Conductance (25°C)	umhos/cm	1,440	555
Total Phosphorus	mg P/l	0.65	1.1
Chloride	mg/l	85	<2
Total Iron	mg/l	25	140
Total Mercury	mg/l	<0.0008	<0.0008
Total Recoverable Phenolics	mg/l	0.011	<0.01

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. The values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Well W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES R. U. Finn

DATE 3/30/83

RECRA ENVIRONMENTAL LABORATORIES

ANALYTICAL RESULTS

UNION CARBIDE REPUBLIC PLANT

Report Date: 6/29/83
Date Received: 6/14/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-1 (6/14/83)	W-3 (6/14/83)
Water Level	Feet from top of well casing	9.00	10.25
Biochemical Oxygen Demand (5 day)	mg/l	7.3	<2
Total Residue (103°C)	mg/l	960	500
Specific Conductance (25°C)	µmhos/cm	1,500	550
Total Phosphorus	mg P/l	0.062	0.048
Chloride	mg/l	82	3.7
Total Iron	mg/l	18	28
Total Mercury	mg/l	<0.0006	<0.0006
Total Recoverable Phenolics	mg/l	<0.01	<0.01

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. The values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Well W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Fin

DATE 6/29/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-318

ANALYTICAL RESULTS

UNION CARBIDE REPUBLIC PLANT

Report Date: 10/27/83
Date Received: 10/3/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-1 (10/3/83)
Water Level	Feet from top of well casing	9.16
Biochemical Oxygen Demand (5 day)	mg/l	5
Total Residue (103°C)	mg/l	820
Specific Conductance (25°C)	µmhos/cm	1,150
Total Phosphorus	mg P/l	0.11
Chloride	mg/l	80
Total Iron	mg/l	1.16
Total Mercury	mg/l	<0.0005
Total Recoverable Phenolics	mg/l	<0.01

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. The values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Wells W-2 and W-3 were dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/27/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-994

ANALYTICAL RESULTS

UNION CARBIDE REPUBLIC PLANT

Report Date: 12/16/83
Date Received: 12/2/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1 (12/2/83)	W-3 (12/2/83)
Water Level	Feet from top of well casing	12.66	2.75
Biochemical Oxygen Demand (5 day)	mg/l	<2	<2
Total Residue (103°C)	mg/l	950	500
Specific Conductance (25°C)	µmhos/cm	1,440	580
Total Phosphorus	mg P/l	0.33	0.78
Chloride	mg/l	93	5.4
Total Iron	mg/l	2.6	16
Total Mercury	mg/l	<0.001	<0.001
Total Recoverable Phenolics	mg/l	0.011	0.050
Sulfate	mg/l	19	9.2

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. The values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Well W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES D. V. Zinn

DATE 12/16/83

RECRA ENVIRONMENTAL LABORATORIES

E.O. #SC-1278

WELL MONITORING REPORTS

FIRST QUARTER 1984 thru THIRD QUARTER 1984*

* Fourth Quarter Report due by 1/10/85

ANALYTICAL RESULTS

UNION CARBIDE REPUBLIC PLANT

Report Date: 3/30/84
Date Received: 3/14/84

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1 (3/14/84)	W-3 (3/14/84)
Water Level	Feet from top of well casing	7.92	3.92
Biochemical Oxygen Demand (5 day)	mg/l	2.2	<2
Chloride	mg/l	78	3.9
Sulfate	mg/l	13	43
Specific Conductance (25°C)	µmhos/cm	1,150	440
Total Residue (103°C)	mg/l	1,070	392
Total Phosphorus	mgP/l	0.27	<0.05
Total Recoverable Phenolics	mg/l	0.012	<0.01
Total Iron	mg/l	32	19
Total Mercury	mg/l	<0.001	<0.001

COMMENTS:

Analyses were performed according to U.S. Environmental Protection Agency methodologies. Values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Well W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES D. W. Fain

DATE 3/30/84

RECRA ENVIRONMENTAL LABORATORIES
L.E. #84-237

ANALYTICAL RESULTS

UNION CARBIDE - REPUBLIC PLANT

Report Date: 6/22/84
Date Received: 6/8/84

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1 (6/8/84)	W-3 (6/8/84)
Water Level	feet from top of well casing	8.00	7.25
Biochemical Oxygen Demand (5 Day)	mg/l	13	9.6
Chloride	mg/l	100	2.4
Sulfate	mg/l	1.2	45
Specific Conductance (25°C)	µmhos/cm	1,900	680
Total Residue (103°C)	mg/l	1,070	383
Total Phosphorus	mg P/l	0.44	<0.05
Total Recoverable Phenolics	mg/l	<0.01	<0.01
Total Iron	mg/l	6.4	5.3
Total Mercury	mg/l	<0.001	<0.001

COMMENTS: Analyses were performed according to U.S. Environmental Protection Agency methodologies. The values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Well W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES _____

DATE _____

RECRA ENVIRONMENTAL LABORATORIES
I.D. #84-[illegible]

ANALYTICAL RESULTS

UNION CARBIDE - REPUBLIC PLANT

Report Date: 9/18/84
Date Received: 8/30/84

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1 (8/30/84)	W-3 (8/30/84)
Water Level	Feet from top of well casing	11.62	13.17
Biochemical Oxygen Demand (5 Day)	mg/l	<5	<5
Chloride	mg/l	93	<1
Sulfate	mg/l	8.0	97
Specific Conductance (25°C)	µmhos/cm	1,200	540
Total Residue (103°C)	mg/l	1,050	518
Total Phosphorus	mg P/l	0.32	0.07
Total Recoverable Phenolics	mg/l	<0.01	<0.01
Total Iron	mg/l	12	20
Total Mercury	mg/l	<0.001	<0.001

COMMENTS:

Analyses were performed according to U.S. Environmental Protection Agency methodologies. The values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Well W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES _____

DATE 9/18/84

RECRA ENVIRONMENTAL LABORATORIES

L.D. [illegible]-878

ANALYTICAL RESULTS

UNION CARBIDE-REPUBLIC PLANT

Report Date: 12/21/84
Date Received: 12/4-5/84

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1 (12/5/84)	W-3 (12/4/84)
Biochemical Oxygen Demand (5 Day)	mg/l	<2	<2
Chloride	mg/l	<1	2.6
Sulfate	mg/l	8.8	121
Specific Conductance (25°C)	µmhos/cm	1,400	740
Total Residue (103°C)	mg/l	1,010	518
Total Phosphorus	mg P/l	0.24	<0.05
Total Recoverable Phenolics	mg/l	<0.01	<0.01
Total Iron	mg/l	1.5	3.3
Total Mercury	mg/l	<0.0005	<0.0005

COMMENTS:

Analyses were performed according to U.S. Environmental Protection Agency methodologies. The values reported as "less than" (<) indicate the working detection limit for the particular sample or parameter. Well W-2 was dry and could not be sampled.

FOR RECRA ENVIRONMENTAL LABORATORIES D. V. Zinn

DATE 12/21/84

RECRA ENVIRONMENTAL LABORATORIES

I.D. #84-1212

BORING LOG

and

SOILS REPORT

SOILS REPORT

WELLS #1 & #2

1978

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

SOILS REPORT - WELL INSTALLATION

Union Carbide Corporation - Niagara Falls

Two monitoring wells were installed on the Union Carbide Corporation's landfill site in the City of Niagara Falls. The approximate placement sites were located on site by Mr. James Foreman of Union Carbide.

Soil descriptions were written at the well sites based on the split spoon samples that were taken of every major soil horizon or at every five foot increments in the thicker soil horizons. The split spoon samples were advanced through the hollow stem augers.

The most southerly well was installed September 9 with the northerly well installed September 16, 1978. The continued collapsing of the bore hole for the north end well forced the installation of a 2 inch inside diameter well instead of a 4 inch inside diameter that was installed in the southern site.

Carbonaceous fill material was described as the surficial material at both locations. The original soil consisted of a stone free clayey and silty lake sediment resting on glacial till. Thickness of the lake sediment at the southerly well site was about 10 feet. This lake sediment mantle should be continuous across the total site as indicated in the Niagara County soil survey. No lake sediments were described or observed in any of the five bore sites augered at or near the northern well location. Therefore the original lake sediment and part of the glacial till material was excavated prior to land filling industrial wastes.

Permeability and infiltration of the carbonaceous fill are extremely high as observed by the water intake after an intense thunder storm September 9. This would allow water to move downward in the fill and perch on the glacial lake or till sediments. The glacial till over the dolomite bedrock was removed from the area near the northern well site as noted during the drilling of most easterly bore site. In essence, an internal pond exists within the fill by the north well.

Continued on page 2...

The extent of this excavated area can not be delineated based on the existing surface fill configuration.

No perched water table was noted at the southerly site, but based on the original soil drainage characteristics, a natural perched water table would be present at the fill-soil contact from October through April most years. Water was detected in the glacial till in the till above bedrock, yet soil coloration would not suggest this moisture regime in this zone.

Prepared by,

Donald W. Owens
Soil Scientist

3I78
D.O/dew

9/16/78

EARTH DIMENSIONS, INC.

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

3178 HOLE NO. 1 SURF. ELEV.

PROJECT Union Carbide Corporation
Niagara Falls, New York

LOCATION North side of property
Hyde Park Boulevard

CLIENT RECRA Research, Inc.

DATE STARTED 9/8/78 COMPLETED 9/8/7

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
		125	29	24		53	Slightly moist brown silt loam (CLAYEY-SILT) width 10 to 15% subaugular gravel, firm, nonplastic with fiberous wood.	2 to 4 inch black po dery carbonaceous ca on surface.
							Slightly moist grayish black carbonaceous fill ranging from powder to augular shunks, firm, nonplastic with intermixed fiberous wood, yellowish brick and glass.	Carbonaceous fill ma terial to 12.5 feet over dense glacial till to 19 feet over dolometic bedrock.
5		5	15	17		32		
	2							
							--------Clear transition to ---	water seeped rapidly into hole at 9.7 fee
10		5	5	7		12	wet blackish fill material with intermixed carbonaceous wood and brick chunks, loose	
	3							
		12	24	17		41	Moist light reddish brown dense coarse silt loam (SANDY-SILT) width 15% subaugular dolometic gravel, very firm, nonplastic	
	4							
15		15	21	25		46		
	5							
								water at 9.5 feet be low surface at compl tion.

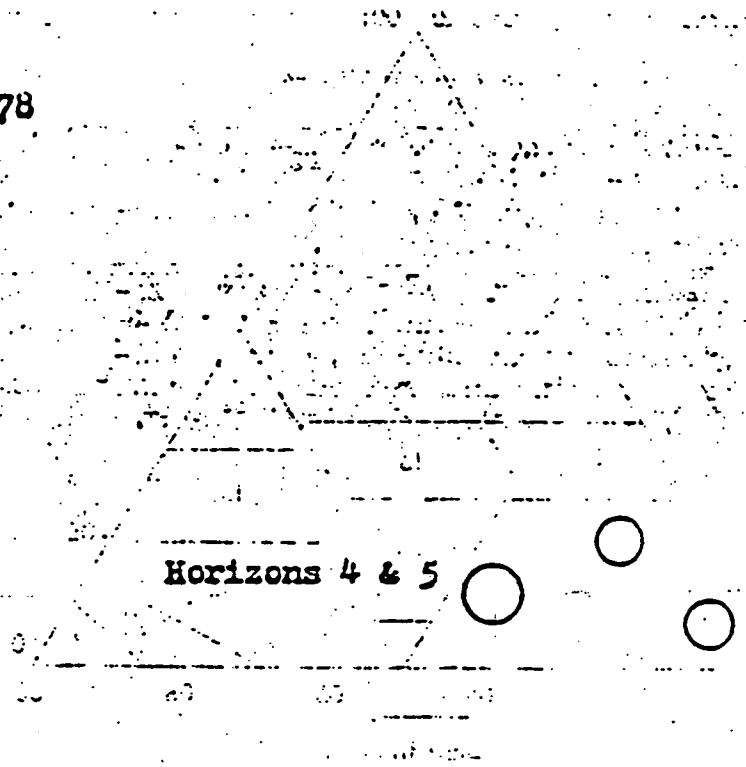
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Lenhardt & Owens

SHEET 1 OF 2

HOLE #1

3178



DIMENSIONS, INC.

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

3178 HOLE NO. 1 Continued SURF. ELEV. _____

PROJECT Union Carbide Corporation, Niagara Falls, New York LOCATION North side of property, Hyde Park Boulevard

CLIENT RECRA Research Inc. DATE STARTED 9/9/78 COMPLETED 9/9/78

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
							(Same horizon as described on previous page)	
20							Gray microcrystalline dolomite bedrock	
							Sampling discontinued at 20.5 feet.	PIPE NOTES Used two 10.5 foot sections of carbon steel pipe with one-4 inch coupling, sealed with pipe dope. Well end packed with 1½ feet of greater than 1.5 mm well graded coarse sand and gravel below pipe and 1½ feet above pipe end. End of pipe double screened with 0.5 mm stainless steel screening. Bentonite used between 6 and 18½ foot depths to seal vertical water movement along outside of pipe. The top 6 feet was back filled with SILT-CLAY lake sediment considering the porous nature of the carbonaceous fi at this depth. Bottom of pipe 18.3 fe below surface. Pipe protruding 2.8 feet above surface.

dew N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Owens & Lenhardt SHEET 2 OF 2

THE FOLLOWING IMAGE(S) ARE THE BEST COPY AVAILABLE

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InStream, LLC

EARTH DIMENSIONS, INC.

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

3178 HOLE NO. 2 SURF. ELEV.

PROJECT Union Carbide Corporation
Niagara Falls, New York
CLIENT RECRA Research, Inc.

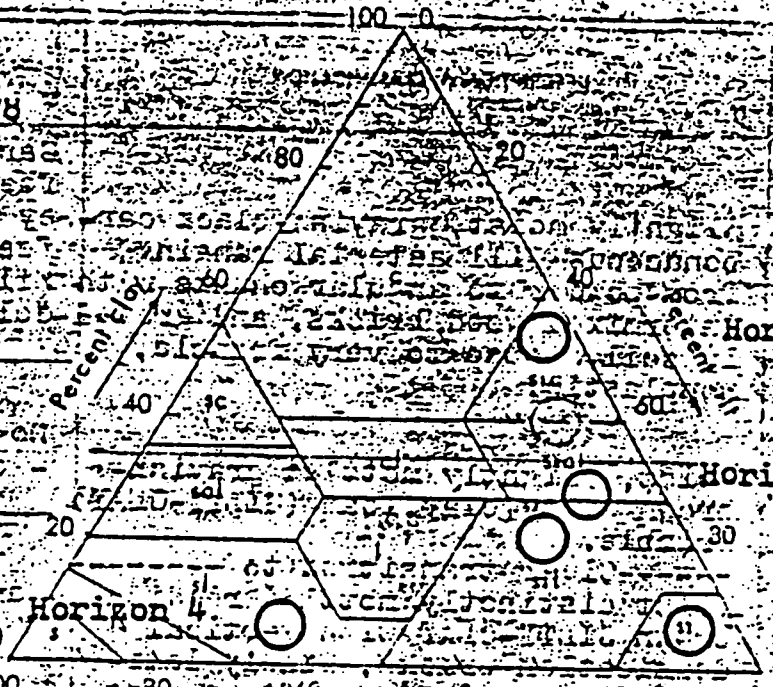
LOCATION South side of fill area
Near Hyde Park Blvd.
DATE STARTED 9/9/78 COMPLETED 9/9/7

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	1	7	7	10		17	Slightly moist, grayish-black carbonaceous fill material ranging — from powder to angular chunks with intermixed wood, bricks, and gravelly soil, loose to very friable, nonplastic.	Carbonaceous fill to 4 feet over silty and cl ey lake sediments to 1 feet over sandy glacia till to 19.8 feet over dolomitic bedrock
5	2	9	17	21		38	Moist, highly mottled grayish-brown silty clay loam (SILTY-CLAY) friable. ------Clear transition to ------- Moist distinctly mottled reddish-brown SILTY-CLAY with vertical dessication cracks, finely laminated structure, very firm, plastic, -------grades downwards to-------	No water observed at f - original soil contac Sample #2 spans contac
10	3	13	15	18		33	Moist to extremely moist, brown heavy silt loam (CLAYEY-SILT) with very thin, very fine sandy lenses, finely laminated, firm, slightly plastic.	
15	4	12	20	22		42	Extremely moist to wet reddish-brown sandy loam (SILTY-SAND) w/ 10 to 15% predominantly fine and medium subangular dolometic gravel, firm, nonplastic	Water at 13.5 feet bel surface at completion.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Lenhardt & Owens

HOLE #2



Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes. (Adapted from Soil Survey Staff, 1951.)

EARTH DIMENSIONS, INC.

Test Borings and Logs
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178

HOLE NO. 2 Continued

SURF. ELEV. _____

PROJECT Union Carbide Corporation
Niagara Falls, New York

LOCATION South side of fill area
Near Hyde Park Blvd.

CLIENT RECRA Research, Inc.

DATE STARTED 9/9/78 COMPLETED 9/9/7

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
							(Same horizon as described on previous page)	
20	5	120					Gray, microcrystalline dolomite bedrock	
							Sampling discontinued at 20.1 feet	

PIPE NOTES
Used one 10.0 feet ar
two 5.0 feet sections
of carbon steel pipe
with 2-4 inch couplin
sealed with pipe dope
Well end packed with
1 foot of greater tha
1.5 mm well graded
coarse sand and grave
below pipe and 1½ fee
above pipe end. End
of pipe double screen
with 0.5 mm stainless
steel screening. Ben
tonite used to plug t
surface. One foot of
pipe protruded above
surface.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Lenhardt & Owens

SHEET 2 OF 2

SOILS REPORT

WELL #3

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
797 Center Street • East Aurora, New York 14052 • (716) 655-1717

SOILS REPORT - WELL #3 INSTALLATION

Union Carbide Corporation - Niagara Falls

One additional monitoring well was installed on the Union Carbide Corporation's property southeast of the present landfill site in Niagara Falls. Last September, two monitoring wells were placed in the landfill.

Large boulders were encountered at the original placement site for well #3. This site was selected by Mr. James Foreman of Union Carbide. Six borings were augered in an attempt to reach bedrock. The extremely hard cherty dolomitic and granitic boulders were encountered at the following depths:

Bore number	Depth to hard boulders *
1	11.2
2	9.0
3	5.2
4	5.1
5	5.8
6	5.1

* Feet below surface.

Based on the difficulties encountered at the original placement site, permission was given to move the location further to the southeast to avoid the bouldery glacial till. This did not compromise the intended purpose of this well, to monitor the internal water table some distance from the landfill.

A stone-free clayey and silty lake sediment mantles glacial till at the original and relocated bored sites. This is similar to the glacial sediment sequence indicated in the Niagara County soil survey. The lake sediment was thinner and containing less clay at the original placement site than at the relocated site. A natural perched water table exists near the surface during wetter seasons. Water was detected in the thin glacial till yet soil coloration would not suggest this moisture regime in this zone. Two borings about 10 feet apart at the relocated well site revealed that the soil sequence was within inches at both sites.

Prepared by
Donald W. Owens, Soil Scientist

DWO/dew
6C79

EARTH DIMENSIONS, INC.

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HOLE NO. 3 SURF. ELEV.

6G79 PROJECT Union Carbide Corporation
Niagara Falls, New York
CLIENT Recra Research, Inc.

LOCATION Southeastern portion of site, a
proximately 120 ft. north of south fence
100 ft. west of east fence.
DATE STARTED 3/20/79 COMPLETED 3/20/7

DEPTH (feet)	SAMPLE NO.	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	DESCRIPTION & CLASSIFICATION	Well	WATER TABLE & REMARKS
							Moist dark grayish brown heavy silt loam (CLAYEY-SILT) topsoil, friable, slightly sticky 0.5		Clayey lake sediments to 13.4 ft. over very dense loamy glacial till to 14.0 ft. over dolomitic rock.
	1	14	12	18		30			
5	2	13	19	26		45	Moist distinctly mottled reddish brown SILTY-CLAY with vertical gray desiccation cracks and very thin coarse silt and very fine sand lenses, extremely firm (stiff), plastic, sticky		PIPE NOTES: 15 ft of 2 in. ID carbon steel pipe install with 2 ft. stickup above surface, bentonite with clay cuttings placed fr surface to 8.0 ft. depth, gravel between 8.0 and 14.1 depths.
10	3	10	11	15		26	- - - - grading downward to - - - - 10.0 Moist grading to extremely moist brown SILTY-CLAY, thinly laminated clays with very thin silt lenses, very firm grading to firm, plastic, sticky		
							13.4		
		120					Extremely moist reddish brown gravelly sandy loam (SILTY-SAND) with 15-20% subrounded dark gray dolomitic gravel, very firm in place, massive soil structure, nonplastic 14.0		
							Gray microcrystalline dolomite 14.1		
							Description discontinued at 14.1 ft.		Water table was 13. ft. below surface at completion.

2" carbon steel pipe with bottom 1½' slotted and screened
Bentonite with clay cuttings
Gravel
8.0

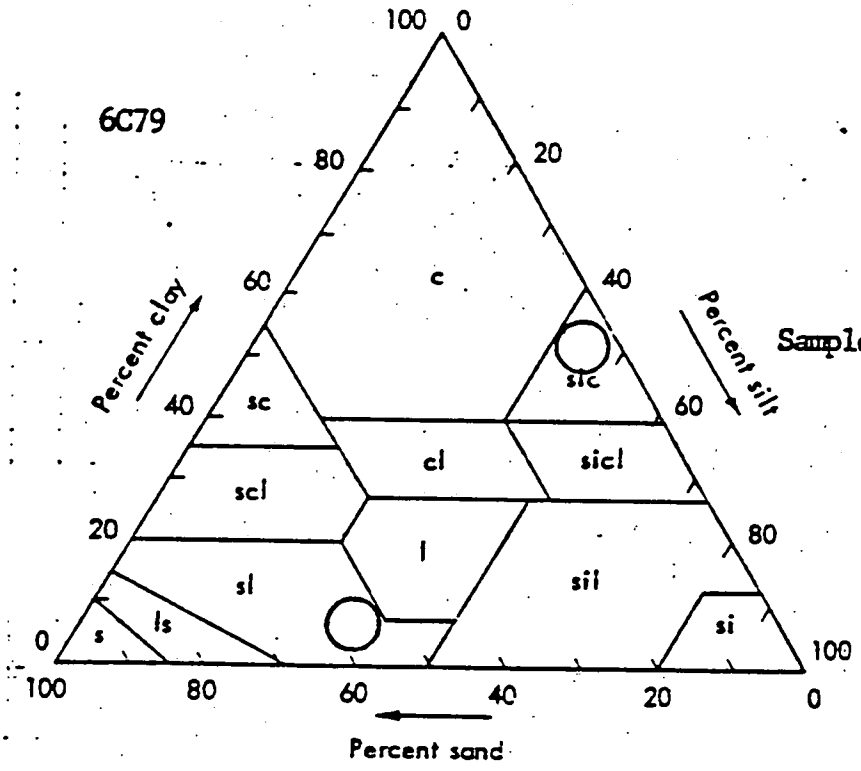
N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Steven J. Pitt, Soil Scientist

SHEET 1 OF 1

Well #3:

6C79



Samples #1-3

Glacial till

c	Clay	scl	Sandy clay loam
si	Silt	sicl	Silty clay loam
s	Sand	cl	Clay loam
l	Loam	sil	Silt loam
sc	Sandy clay	sl	Sandy loam
sic	Silty clay	ls	Loamy sand

Textural triangle showing the percentages of clay (less than 0.002 mm), silt (0.002-0.05 mm), and sand (0.05-2.0 mm) in the basic soil textural classes (adapted from Soil Survey Staff, 1951).

EP TOXICITY & LEACHATE

PROCEDURE

DRAFT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
TOXICANT EXTRACTION PROCEDURE

(A) EQUIPMENT

(I) An agitator which while preventing stratification of sample and extraction fluid, also insures that all sample surfaces are continuously brought into contact with well-mixed extraction fluid.

(II) Equipment suitable for maintaining the pH of the extraction medium at a selected value.

(B) PROCEDURE

(I) Take a representative sample (minimum size 100 gms) of the waste to be tested. Separate sample into liquid and solid phases. The solid phase is defined as that fraction which does not pass through a 0.4–0.5 micron filter medium under the influence of either pressure, vacuum, or centrifugal force. Reserve the liquid fraction under refrigeration 1-5°C (34-41°F) for further use.

(II) The solid portion of the sample, resulting from the separation procedure above or the waste itself (if it is already dry), shall be prepared either by grinding to pass through a 9.5mm (3/8") standard sieve or by subjecting it to the structural integrity procedure.

(III) Add the solid material from paragraph II to 16 times its weight of deionized water. This water should include any water used during transfer operations. Begin agitation and extract the solid for 24 $\pm$ 0.5 hours. Adjust the solution to pH 5 and maintain that pH during the course of the extraction using 0.5N acetic acid. If more than 4 ml of acid, for each gm of solid would be required to maintain the pH at 5, then once 4 ml per gram of solid has been added, complete the 24 hour extraction without adding any additional acid. Maintain the sample between 20-30° (68-86°F) during extraction.

(IV) At the end of the 24 hour extraction period, separate the sample into solid and liquid phases as in paragraph I. Adjust the liquid phase with deionized water so that its volume is 20 times that occupied by a quantity of water at 4°C equal in weight to the initial sample of solid (e.g., for an initial sample of 1g, dilute to 20ml). Combine this liquid with the original liquid phase of the waste. This combined liquid, including any precipitate which later forms from it, is the Toxicant Extraction Procedure extract.

(ii) Analysis - Analyses conducted shall be made in accordance with EPA approved methodologies.

RECRA RESEARCH, INC. 111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

LEACHING POTENTIAL TEST

TESTING PROCEDURE:

The following procedure shall be used to evaluate a waste for its potential to readily leach deleterious substances. Triplicate samples of the wastes shall be analyzed to obtain representative results.

1. A representative sample of the waste shall be taken according to ASTM Standard Methods.

2. Any free liquid contained in the sample shall be removed by decanting or filtering. Such free liquid shall be analyzed in accordance with 3 below and the solid material in accordance with 4 and 5 below.

3. A qualitative and quantitative analysis of the free liquid shall be preformed in accordance with accepted standard methods. Suspended particulate matter shall be removed before analyses by filtering the supernatant solution through a 0.45 micron glass filter.

4. A qualitative and quantitative analysis of a representative portion of the solid fraction shall be performed by standard methods.

5. The following procedure shall be used on the residual solid material.

   a. A 250 gram sample of the residual solid shall be mixed with one liter of distilled or deionized water.

   b. The mixture shall be agitated for 48 hours by shaking or slow stirring.

   c. The sample container shall be stoppered and the sample allowed to settle for at least three days.

   d. The supernatant water shall be decanted and filtered through a 0.45 micron glass filter.

   e. A qualitative and quantitative analysis of the supernatant shall be performed in accordance with accepted standard methods.

RECRA RESEARCH, INC. 111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH

LEACH TESTING

LEACHING POTENTIAL TEST REPORT

A. SAMPLING PROCEDURES:
Samples of the waste material were collected by personnel of Recra Research, Inc. on 8/22, 8/23, and 8/24 1978. These samples were composited and analyzed in duplicate.

B. ANALYSES OF LIQUID FRACTION:
No free liquid was associated with the sample.

C. ANALYSES OF SOLIDS FRACTION:

PARAMETER	UNIT OF MEASURE	SAMPLE IDENTIFICATION COMPOSITE - MEAN OF DUPLICATE TESTS
Carbon - Chloroform Extractable	mg/g (dry)	20.9
Phenol	µg/g (dry)	2.6
pH	Standard Units	8.02
Chemical Oxygen Demand	mg/g (dry)	439
Chloride (Water Soluble)	µg/g (dry)	73.8
Fluoride (Water Soluble)	µg/g (dry)	0.002
Cyanide (Free - Water Soluble)	µg/g (dry)	<1.0
Total Grease & Oils	mg/g (dry)	6.66
Hydrocarbon Grease & Oils	mg/g (dry)	4.95
Polar Grease & Oils	mg/g (dry)	1.45
Total Chlorinated Hydrocarbons	µg/g (dry) as Chlorine; Lindane Standard	29.6
Hexavalent Chromium (Water Soluble)	µg/g (dry)	<0.040
Total Aluminum	µg/g (dry)	819
Total Arsenic	µg/g (dry)	0.029
Total Cadmium	µg/g (dry)	0.30
Total Chromium	µg/g (dry)	10.6

Continued . . . .

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TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH

C. ANALYSES OF SOLIDS FRACTION: (continued)

PARAMETER	UNIT OF MEASURE	SAMPLE IDENTIFICATION COMPOSITE - MEAN OF DUPLICATE TESTS
Total Copper	µg/g (dry)	33.7
Total Iron	µg/g (dry)	253
Total Lead	µg/g (dry)	10.5
Total Mercury	µg/g (dry)	<0.020
Total Nickel	µg/g (dry)	24.0
Total Selenium	µg/g (dry)	<0.003
Total Zinc	µg/g (dry)	19.2
Total Solids	%	98.8

COMMENTS: Samples of waste carbon were collected on 8/22, 8/23, and 8/24/78 by Recra personnel. The waste samples were composited and analyzed in duplicate. The mean of the analyses are presented. Hexavalent Chromium, Chloride, Fluoride, Cyanide (free) and pH were measured as water soluble. The composited waste carbon was mixed in a 1:4 ratio with deionized water, shaken, filtered and analyzed. The reported water soluble results are blank corrected. Total Halogenated Organic analyses are screening tests not intended for qualification or quantification of any particular constituent.

D. LEACHING TESTS ON SOLIDS FRACTION:

PARAMETER	UNIT OF MEASURE	SAMPLE IDENTIFICATION COMPOSITE - MEAN OF DUPLICATE TESTS
Carbon - Chloroform Extractable	mg/l	<2.0
Phenol	mg/l	0.110
Total Organic Carbon	mg/l	<1.0
pH	Standard Units	8.02
Chemical Oxygen Demand	mg/l	16.2
Chloride	mg/l	18.2

Continued . . . .

D. LEACHING TEST ON SOLIDS FRACTION: (continued)

PARAMETER	UNIT OF MEASURE	COMPOSITE - MEAN OF DUPLICATE TESTS
Fluoride	mg/l	0.569
Cyanide (free)	mg/l	<0.3
Total Grease & Oils	mg/l	<1.0
Hydrocarbons Grease & Oils	mg/l	<1.0
Polar Grease & Oils	mg/l	<1.0
Total Chlorinated Hydrocarbons	µg/l as Chlorine, Lindane Standard	3.70
Hexavalent Chromium	mg/l	<0.01
Soluble Aluminum	mg/l	<0.03
Soluble Arsenic	µg/l	<3.5
Soluble Cadmium	mg/l	<0.003
Soluble Chromium	mg/l	<0.003
Soluble Copper	mg/l	0.005
Soluble Iron	mg/l	<0.01
Soluble Lead	mg/l	<0.02
Soluble Mercury	µg/l	<0.5
Soluble Nickel	mg/l	<0.02
Soluble Selenium	µg/l	<2.5
Soluble Zinc	mg/l	0.007

ROBERT K. WYETH
LABORATORY DIRECTOR

RECRA RESEARCH, INC.

RECRA RESEARCH, INC.
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH
111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620

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October 31, 1978

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Mr. James E. Foreman, III
Union Carbide Corporation
Carbon Products Division
P. O. Box 887
Niagara Falls, New York 14302

Re: Application for Treatment or Disposal of an Industrial or Hazardous Waste Stream (Form 47-19-7) and Leaching Potential Test Report (Form 47-15-6)

Dear Jim:

Please find enclosed the above referenced forms which are completed and awaiting your signature. Dr. K. C. Malinowski will be meeting with Mr. Banaszak of the New York State Department of Environmental Conservation, Region 9 on Wednesday, November 1, 1978 to present these signed forms and answer any questions pertaining to procedures and/or results.

If you have any questions, please contact the undersigned.

Yours very truly,

RECRA RESEARCH, INC.

Jim Stellrecht

C. James Stellrecht
Technical Representative

CJS:dm

RECRA RESEARCH, INC. 111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH

ANALYTICAL RESULTS
UNION CARBIDE CORPORATION - CARBON DIVISION
WASTE CARBON ANALYSES

Sample Date: 8/22-24/78
Report Date: 10/31/78

Parameter	Units of Measure	Sample Identification Carbon Composite-Mean of Duplicate tes
Carbon Chloroform Extract	mg/g (dry)	20.9
Phenol	µg/g (dry)	2.6
Chemical Oxygen Demand	mg/g (dry)	439
pH	Standard Units	8.02
Hexavalent Chromium (Water Soluble)	µg/g (dry)	<0.040
Chloride (Water Soluble)	µg/g (dry)	73.8
)ioride (Water Soluble)	µg/g (dry)	0.002
Cyanide (Free-Water Soluble)	µg/g (dry)	<1.0
Total Grease & Oil	mg/g (dry)	6.66
Hydrocarbon Grease & Oil	mg/g (dry)	4.95
Polar Grease & Oil	mg/g (dry)	1.45
Total Solids	%	98.8
Total Alumimum	µg/g (dry)	819

Continued

RECRA RESEARCH, INC.
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH
111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620

Parameter	Units of Measure	Sample Identification Carbon Composite-Mean of Duplicate tes
Total Arsenic	µg/g (dry)	0.029
Total Cadmium	µg/g (dry)	0.30
Total Chromium	µg/g (dry)	10.6
Total Copper	µg/g (dry)	33.7
Total Iron	µg/g (dry)	253
Total Lead	µg/g (dry)	10.5
Total Mercury	µg/g (dry)	< 0.020
Total Nickel	µg/g (dry)	24.0
Total Selenium	µg/g (dry)	< 0.003
Total Zinc	µg/g (dry)	19.2
Total Halogenated Organics	µg/g (dry) as Chlorine; Lindane Standard	29.6

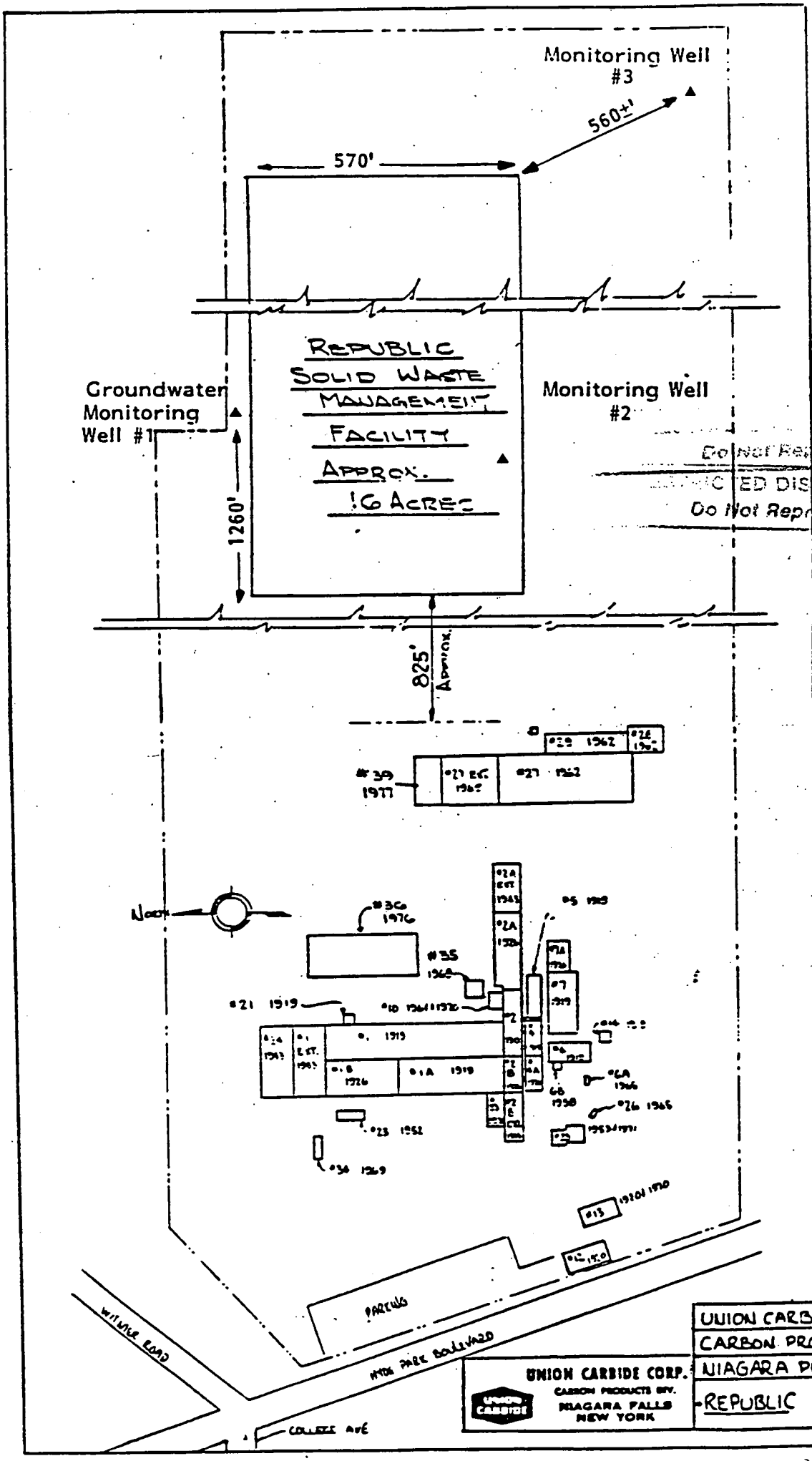
MENTS: Samples of waste carbon were collected on 8/22, 8/23 and 8/24/78 by Recra Personnel. The waste samples were composited and analyzed in duplicate. The mean of the analyses are presented. Hexavalent chromium, chloride, fluroide, cyanide (Free) and pH were measured as water soluble. The composited waste carbon was mixed in a 1:4 ratio with deionized water, shaken, filtered and analyzed. The reported water soluble results are blank corrected. Total Halogenated organic analyses are screening tests not intended for qualification or quantification of any particular constituent.

For Recra Research, Inc. Robert K Lyttle

Date: 10/31/78

RECRA RESEARCH, INC.
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH
111 Wales Avenue / Tonawanda, New York 14150 / (716) 692-7620

LANDFILL an
GROUND WAT
MONITORIN
WELLS



UNION CARBIDE CORP.
CARBON PRODUCTS DIV.
NIAGARA FALLS
NEW YORK

UNION CARBIDE CORP.
CARBON PRODUCTS DIV
NIAGARA PLANT
REPUBLIC LOCATION

UNION CARBIDE CORPORATION P.O. BOX 887, NIAGARA FALLS, NY 14302
CARBON PRODUCTS DIVISION

April 30, 1984

New York State
Dept. of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Attn: Mr. Joel W. Benjamin

Re: Notice of Incomplete Application
Waste Transporter Permits

Dear Mr. Benjamin:

Per our discussion, I enclose the results of the agreed-upon EP toxic analysis performed on representative samples of our carbon/water slurry located at Union Carbide Corporation, Carbon Products Division, Niagara Plant, National and Republic Locations.

The enclosed analysis will indicate to your office that the carbon/water slurry mentioned as Item #13 of your Notice of Incomplete Application, is a non-hazardous material (copy enclosed), and can be handled by our past permitted trucks to our permitted Solid Waste Facility.

In addition, the results of this testing will not require the Hazardous Waste Transportation financial security requirements as mentioned as Item #12 of your same notice.

We trust that we have answered all your questions and that your office will now forward our Industrial Transporter Permits (four trucks) as soon as possible.

Should there be any questions regarding any portion of the submittal, please call my office at (716) 278-3718.

Very truly yours,

Michael G. Steffan

M.G.Steffan
baf

Environmental Coordinator

CC: Mr. M.A.Balent

Mr. Robert Mitrey
New York State, Dept. of Environmental Conservation
Region 9
600 Delaware Avenue, Buffalo, N.Y., 14202

NOTICE OF INCOMPLETE APPLICATION

"1 3

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

RECEIVED
ENGINEERING DEPT.
OCT 12 1983
U.C.C.C.P.D.
NIAGARA PLANT

Henry G. Williams
Commissioner

Union Carbide Corp.
P.O. Box 887
Niagara Falls, N.Y. 14302

Dear Applicant:

We have received your application for a Waste Transporter Permit. Upon review of the application, it was determined that the following information was either missing or inaccurate. Please note that the items checked below are in need of attention before the application can be considered complete.

- [ ] 1. Information concerning your business address and/or the location of where your vehicles are garaged is either missing or incomplete. Please note, a post office box is not an acceptable address for vehicle location.
- [ ] 2. Information concerning vehicles is missing/incomplete.
- [ ] 3. The check for the permit fee was missing/insufficient. The basic fee is $25 for one vehicle plus $5 for each additional vehicle used.
- [ ] 4. Information concerning the physical and chemical characteristics of the waste handled is missing/incomplete.
- [ ] 5. Location and manner of disposal information is missing/incomplete.
- [ ] 6. Location and manner of disposal is not acceptable.
- [ ] 7. Applicant MUST sign and date the application.
- [ ] 8. Signatures from the owner or operator of receiving stations for ______ site(s) were missing.
- [ ] 9. Annual report forms were missing/incomplete. Blank forms are attached.
- [ ] 10. The Industrial Waste Collector Permit Form Continuation (SW-14) was missing/incomplete. Blank forms are attached.
- [ ] 11. Names and addresses for all waste generators for the calendar year 19__ must be provided.
- [x] 12. Proof of insurance is missing or inadequate. Refer to attachment.
- [ ] 13. Other If material is not hazardous, please submit analysis. (Slurry) - EP Toxic -

RESTRICTED DO NOT ...

We would appreciate your prompt attention to the above mentioned items. Should there by any questions, please contact us at (518) 457-3254.

Sincerely,

Joel W. Benjamin

Bureau of Hazardous Waste Operations
Division of Solid and Hazardous Waste

ANALYSIS OF FOUR CARBON SLURRY SAMPLES

AS REQUIRED FOR PERMIT NO. 32N03

Report Prepared For

UNION CARBIDE CORPORATION

CARON PRODUCTS DIVISION

by

ADVANCED ENVIRONMENTAL SYSTEMS, INC.

Prepared by:

December 5, 1983

AES - Report AFE

Diane M. Costantino - GC Division

Leonard Borzynski - Metals Division

W. Joseph McDougall - Quality Control Verification

SCOPE OF WORK

This work was performed to fulfill the requirements of New York State Department of Environmental Conservation, Bureau of Hazardous Waste Operations, Division of Solid and Hazardous Waste. The DEC has required analysis of carbon slurries generated at the Union Carbide Corporation, Carbon Products Division, Niagara Plant, to determine if the waste material exceeds any of the maximum concentrations of contaminants characteristic of Extraction Procedure (EP) Toxicity[1]. This test has been required for the Republic Solid Waste Management Permit No. 32N03.

SAMPLE COLLECTION

A composite sample of carbon slurry was collected from four (4) sumps, or basins, by William Knight on October 31, 1983. Each of the four basins; SBN1, SBR1, SBR2, and SBR3, were divided into an imaginary three-dimensional grid[2] of sampling points and then six (6) sampling points were selected from a table of random numbers[3]. Twenty-four (24) samples were collected with a stainless steel Bacon Bomb and delivered into a 500 ml glass container with a Teflon-lined lid.

The nature of the settled material and the sampling apparatus was such that sampling at the imaginary grid intersects was approximate at best.

The composite sample was transported directly to the AES laboratory.

---

[1] Federal Register, Vol. 45, No. 98, Monday, May 19, 1980

[2] Sampling Guidelines - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 2nd Edition, US EPA 1982

[3] Table Z - Courtesy of Rand Corporation

ANALYTICAL METHODOLGY

Since the material was homogeneous, the sample was stirred by hand, and a representative >100 gram aliquot was removed for extraction.

Analyses were performed in strict accordance with methods described in "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods", SW-846, 2nd Edition, US EPA 1982.

The method of standard additions was used in the analysis of metals.

RESULTS

Table 1. EP Toxicity Analysis for Metals[1]
(Expressed as milligrams per liter, or ppm)

Analysis	SBN1	SBR1	SBR2	SBR3
Arsenic	0.026	0.026	0.021	0.022
Barium	<5.0[2]	<5.0	<5.0	<5.0
Cadmium	<0.5	<0.5	<0.5	<0.5
Chromium	<1.0	<1.0	<1.0	<1.0
Lead	<2.5	<2.5	<2.5	<2.5
Mercury	<0.001	<0.001	<0.001	<0.001
Selenium	<0.05	<0.05	<0.05	<0.05
Silver	<1.0	<1.0	<1.0	<1.0

[1] Analyses were performed by method of standard additions

[2] (<) Less than reportable limits. This is a function of the detection limit of the analysis and the dilution factor associated with the method of standard additions.

RESULTS

Table 2. EP Toxicity Analysis for Pesticides and Herbicides ((Expressed as micrograms per liter, or ppb)

Analysis	SBN1	SBR1	SBR2	SBP3
Lindane	<0.01 (<0.01) [1]	<0.01	<0.01	<0.01
Endrin	<0.01 (<0.01) [1]	<0.01	<0.01	<0.01
Methoxychlor	<0.10 (<0.10) [1]	<0.10	<0.10	<0.10
Toxaphene	<0.81 (<0.81) [1]	<0.81	<0.81	<0.81
2,4D	<0.10	<0.10	<0.10	<0.10 (<0.10)
2,4,5TP (Silvex)	<0.01	<0.01	<0.01	<0.01 (<0.01) [1]

[1] Duplicate Analysis

Table 3. Results of EPA Test Standards for Metals
(Expressed as milligrams per liter, or ppm)

Analysis	Type	Original Concen.	Added Concen.	Expected Concen.	Reported Concen.	Acceptable 95% Confidence Limits
Arsenic	EPA	0.060	-	0.060	0.056	0.037 - 0.076
Barium	EPA	10.0	-	10.0	10.5	9.4 - 11.4
Cadmium	EPA	1.30	-	1.30	1.37	0.95 - 1.51
Chromium	EPA	2.50	-	2.50	2.79	1.96 - 2.88
Lead	EPA	0.80	-	0.80	0.77	0.65 - 0.96
Mercury	EPA	0.0035	-	0.0035	0.0020	0.0016 - 0.0050
Selenium	EPA	0.030	-	0.030	0.031	0.022 - 0.035

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QUALITY ASSURANCE

Table 4. Results of EPA Test Standards for Pesticides and Herbicides (Expressed as micrograms per liter, or ppb)

Analysis	Type	Original Concen.	Added Concen.	Expected Concen.	Reported Concen.	Percent Recovery
Toxaphene (Pesticide)	EPA	4.50	-	4.50	4.93	109.6%
2,4,5TP (Herbicide)	EPA	7.00	-	7.00	0.01	None[1]

[1] Quality Control Note: Herbicide quality assurance samples fell below the recovery control limits. It is a common occurance that herbicides are lost during sample extraction.

e of Facility Republic - Solid Waste Management Facility Registration No. 32503

ress 3501 Hyde Park Blvd., Town of Niagara, N.Y. Phone No.

List all industrial wastes which you currently receive, or which you expect to receive. Generic waste types (such as acids containing phenols or heavy metals, carcinogenic organics, paint sludges, halogenated solvents or cyanides) are adequate as long as the description is of sufficient detail to permit evaluation of the proposed treatment and disposal method.

Wastes currently handled

	Type of Waste	Quantity*	Physical State**	Treatment or Disposal Method
1)	Carbonaceous materials	6.5 million lbs.	Solid	Land fill
2)	Firebrick	1.25 "	"	" "
3)	Wood	1.0 "	"	" "
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				

Wastes you expect to receive

	Type of Waste	Expected Quantity*	Physical State**	Treatment or Disposal Method
1)	Same as above - item #1			
2)				
3)				
4)				
5)				

or gallons per year
solid; sludge

REPUBLIC SOLID WASTE MANAGEMENT FACILITY

INTRODUCTION

This updated Operational Plan is a further supplement to the original plans and specifications submitted by Union Carbide Corporation to the New York State Department of Environmental Conservation on April 3, 1978 and August 11, 1981.

The original plans and specifications were approved and Permit Number 2020 was issued by the NYS DEC with certain Special Conditions. On August 11, 1981 a Permit Renewal Application was submitted by Union Carbide Corporation with updated plans and was approved as Permit Number 32N03 with Special Conditions.

The wastes that are being disposed of are:

Carbonaceous materials	=	4.50 million lbs./yr.
Firebrick	=	.92 million lbs./yr.
Wood	=	.66 million lbs./yr.
		6.08 million lbs./yr.

Based upon a bulk density of about 50 lbs./cu.ft., the total volume of wastes equates to 4250 cubic yards per year.

PHYSICAL SITE

The site is located east of Hyde Park Boulevard, Town of Niagara, Niagara County, New York. The site is part of the Republic production facility of Union Carbide Corporation. This site has been used for waste disposal for over 40 years. West of the landfill is the production facility, north is a Niagara Mohawk Power Corporation power transmission right-of-way, east is a Niagara Mohawk power transmission right-of-way and south is a residential area. The residential area is separated from the landfill by a distance of about 400 feet of which about 100 feet is presently treed along the eastern 700 feet.

The prevailing winds are from the southwest.

EPA FORMS 2070-12 AND 2070-13

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 932035

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Union Carbide Republic Plant Landfill	Hyde Park Boulevard

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Niagara Falls	NY	14302	Niagara		

09 COORDINATES — LATITUDE: 43° 07' 14 0" | LONGITUDE: 0 79° 01' 35 0"

10 DIRECTIONS TO SITE (Starting from nearest public road)

Hyde Park Boulevard, just south of the intersection of Witmer Road and College Ave.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
Union Carbide	P.O. Box 887

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Niagara Falls	NY	14302	(716) 278-3718

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Union Carbide	P.O. Box 887

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Niagara Falls	NY	14302	(716) 278-3718

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

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

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES ☐ NO DATE 3 / 27 / 85 (MONTH DAY YEAR)

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☒ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): Wehran Engineering

02 SITE STATUS (Check one)
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1934 (BEGINNING YEAR) | Present (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Carbonaceous waste, firebrick, wood pallets

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Possible leaching of phenols from carbonaceous waste.

V. PRIORITY ASSESSMENT

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

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
		( )

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Tim Roeper		Wehran Engineering	(914) 343-0660	___/___/___ (MONTH DAY YEAR)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [X] B. POWDER, FINES
- [ ] C. SLUDGE
- [X] E. SLURRY
- [ ] F. LIQUID
- [ ] G. GAS
- [ ] D. OTHER _____ (Specify)

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

TONS: 125,000 tons
CUBIC YARDS: _____
NO. OF DRUMS: _____

03 WASTE CHARACTERISTICS (Check all that apply)

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

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	8,800		oil collected in drums or spread on road
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	phenols	108-95-2			
	heavy metals				
	oil				
	coal tars				
	petroleum tars				
	1,1,1-trichloroethane				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

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

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling results)

File information provided by Union Carbide
Community Right-to-Know, Volume III, April 1, 1985, p. 214
Interview, Dorr-Millock, 11/15/78

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 932035

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☒ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

3 on-site monitoring wells show contamination

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

Unused pond adjacent to landfill.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

HNU did not detect any air release

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

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Site fenced and guarded.

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 16 (Acres) — 04 NARRATIVE DESCRIPTION

Waste disposed in landfill, no liner.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 19 — 04 NARRATIVE DESCRIPTION

Groundwater used for industrial and private drink water.
Surface water intake upstream of site.

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

None reported.

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

None reported.

EPA

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

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY | 932035

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

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

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

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

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Drum of oil alleged to be buried, no observed release.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
None reported.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
None reported.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
All waste dumping controlled by Union Carbide.

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

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)
Site visit
Interview
Water quality data
DEC Files
Information described by Union Carbide

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Union Carbide Republic Plant Landfill	Hyde Park Boulevard

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Niagara Falls	NY	14302	Niagara		

09 COORDINATES LATITUDE	LONGITUDE
43° 07' 14"	079 01' 35"

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
3 / 27 / 85 (MONTH DAY YEAR)	☒ ACTIVE ☐ INACTIVE	1934 (BEGINNING YEAR) Present (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☒ F. STATE CONTRACTOR Wehran Engineering (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Timothy R. Roeper	Geologist	Wehran Engineering	(914)343-0660
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Kevin J. Burns	Geologist	Wehran Engineering	(914)343-0660
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Michael Balent	Plant Engineer	P.O. Box 887, Niagara Falls, NY	(716) 278-3541
Michael Steffan	Environmental Engineer	P.O. Box 887, Niagara Falls, NY	(716) 278-3718
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	11:00 a.m.	Clear, Sunny

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Dennis Fenn	Wehran Engineering	(914)343-0660

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Timothy R. Roeper		Wehran Engineering	(914)343-0660	3 / 27 / 85 (MONTH DAY YEAR)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

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

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

- TONS: 4250 tons/yr
- CUBIC YARDS:
- NO. OF DRUMS:

03 WASTE CHARACTERISTICS (Check all that apply)

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

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	8,800 gals.		oil collected in drums or spread on roac
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	phenols	108-95-2			
	heavy metals				
	oil				
	coal tars				
	petroleum tars				
	1,1,1-trichloroethane				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

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

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

Union Carbide operations plan
Community Right-to-Know, Volume III, April 1, 1985, p. 214
Interview, Dorr-Millock, 11/15/78

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 932035

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION
02 ☒ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
3 on-site monitoring wells show contamination

01 ☐ B. SURFACE WATER CONTAMINATION
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
Unused pond adjacent to landfill.

01 ☐ C. CONTAMINATION OF AIR
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
HNU did not detect any air release

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

01 ☐ E. DIRECT CONTACT
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
Site fenced and guarded.

01 ☒ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 16 (Acres)
04 NARRATIVE DESCRIPTION
Waste disposed in landfill, no liner.

01 ☐ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 19
04 NARRATIVE DESCRIPTION
Groundwater used for industrial and private drink water.
Surface water intake upstream of site.

01 ☐ H. WORKER EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
None reported.

01 ☐ I. POPULATION EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
None reported.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

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

Unknown

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

Unknown

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

Unknown

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Drum of oil alleged to be buried, no observed release.

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

None reported.

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

None reported.

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

All waste dumping controlled by Union Carbide.

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

Unknown

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

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

Site visit
Interview
Water quality data
DEC Files
Information described by Union Carbide

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☒ G. STATE (Specify) NYSDEC	32N03			
☒ H. LOCAL (Specify) Town of Niagara	12473	12/31/81		Currently being renewed
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	4250	tons/yr.
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)
- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER
- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE
16 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

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

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

Site is completely fenced and guarded 24-hrs. a day
Underlying material is of low permeability
Final cover is being applied, in past cover consisted of aged waste.
55-gallon drums of oil were landfilled.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO

02 COMMENTS

See above comments.

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

Site visit
Union Carbide operations plan and permit applications

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 932035

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☒	E. ☐	F. ☐

03 DISTANCE TO SITE
A. 2,000 ft (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

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

02 POPULATION SERVED BY GROUND WATER: 19

03 DISTANCE TO NEAREST DRINKING WATER WELL: 2,000 ft (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
approx. 8.0 (ft)	S-SE	approx. 10' (ft)	_____ (gpd)	☐ YES ☐ NO

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

3 on-site monitoring wells.
5 shallow private drinking water wells complexed in the overburden

10 RECHARGE AREA		11 DISCHARGE AREA	
☒ YES ☐ NO	COMMENTS	☐ YES ☐ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

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

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
ponded area adjacent to landfill	☐	adjacent (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. _____ NO. OF PERSONS	B. _____ NO. OF PERSONS	C. >10,000 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: approx. 1/4 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: unknown

04 DISTANCE TO NEAREST OFF-SITE BUILDING: approx. 1/4 (mi)

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

Residential area south of site, housing development

EPA

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

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: 932035

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

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

02 PERMEABILITY OF BEDROCK (Check one)

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

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
approx. 20' (ft)	12.5 (ft)		

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
12 (in)	approx. 2.3 (in)	approx.30 %		1-2 %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

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

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

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

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is surrounded by relatively flat low lying terrain which is primarily used for residential development. The site is approximately 30' higher than the surrounding area.

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

Site visit
Union Carbide

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	2-3 samples quarterly	RECRA Environmental laboratories	Present
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Air	HNU photionzing organic vapor detector, Wehran site visit March 27, 1985

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS: USGS Quads Niagara Falls, Lewiston, Ramsonville

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

None

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

Site visit—Wehran Engineering 3/27/85
USGS Quadrangles

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. CURRENT OWNER(S) | **PARENT COMPANY** *(If applicable)*

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER
Union Carbide			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE
P.O. Box 887			

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
Niagara Falls	NY	14302			

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) *(List most recent first)* | **IV. REALTY OWNER(S)** *(If applicable; list most recent first)*

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Aluminum Co. of America			

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

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

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

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

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

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

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

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

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

Union Carbide

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
Union Carbide	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
P.O. Box 887	

05 CITY	06 STATE	07 ZIP CODE
Niagara Falls	NY	14302

08 YEARS OF OPERATION	09 NAME OF OWNER
1934-Present	

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

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

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

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

Union Carbide Permit Application

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	932035

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
Union Carbide	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
P.O. Box 887	

05 CITY	06 STATE	07 ZIP CODE
Niagara Falls	NY	14302

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Union Carbide			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
P.O. Box 887			
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
Niagara Falls	NY 14302		
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Union Carbide			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
P.O. Box 887			
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
Niagara Falls	NY 14302		
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

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

Union Carbide permit application

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 932035

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

01 ☒ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
55-gal drums of oil

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
drums of oil and carbonaceous waste landfill.

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None Known

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None Known

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None Known

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Landfill Covered

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Unknown

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 932035

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
No

01 ☒ S. CAPPING/COVERING | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
Capping of site is progressing on an ongoing basis

01 ☐ T. BULK TANKAGE REPAIRED | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ U. GROUT CURTAIN CONSTRUCTED | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ V. BOTTOM SEALED | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ W. GAS CONTROL | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
None

01 ☐ Z. AREA EVACUATED | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ 1. ACCESS TO SITE RESTRICTED | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
Site is fenced and guarded 24-hours/day

01 ☐ 2. POPULATION RELOCATED | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ 3. OTHER REMEDIAL ACTIVITIES | 02 DATE _____ | 03 AGENCY _____
04 DESCRIPTION

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

Union Carbide Operations Plan

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	932035

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☐ NO

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

The site is in complience with Part 360 regulations

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

6.0 ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

6.0 ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

6.1 GROUNDWATER ROUTE

The information obtained from the boring logs, the site visit and Union Carbide's permit applications indicate that nonhazardous carbonaceous wastes have been disposed of at this site. However, water quality data indicates that phenols, heavy metals and low levels of halogenated organics have contaminated the till hydrological zone. Two of the three monitoring wells on site have been completed through the waste material (wells 1 and 2). Well 1 is supposedly the upgradient well. This suggests that leachate is seeping down the well, or that the well is not truly upgradient, or that another source of contamination is migrating through the till hydrological zone. The contamination of well 1 may also be a result of groundwater mounding within the waste pile, which may create localized changes in groundwater flow and increase contact time with the waste.

Groundwater resources are virtually unused in the Niagara area. The Niagara River provides water for both drinking water supply and industrial use. There are a few industries using groundwater for industrial purposes and five private wells 2,000 feet north of the site. Very little information was obtained on groundwater quality or on the potential for groundwater use in the future. A Phase II investigation is proposed to further characterize the site as follows:

- Identify the types, quantity and concentration of disposed materials.
- Determine the hydraulic characteristics of the till and bedrock hydrologic zones
- Determine the potential for groundwater use
- Assess the reliability of the existing monitoring wells
- Determine the degree of groundwater contamination

6.2 SURFACE WATER ROUTE

The surface water route score (S_{SW}) is 0. The information used to obtain this route score was sufficient. The surface water in the area is not used, and the site is being properly covered and capped in order to limit surface water runoff. The water supply for the Niagara area is obtained from the Niagara River, from the Grand Island intakes. These intakes are upstream of the site.

6.3 AIR ROUTE

During the Phase I site visit, an HNU photoionizing organic vapor detector was used to measure the ambient air quality. The HNU did not detect any volatiles in the air so the air route score is therefore 0.

6.4 FIRE AND EXPLOSION

To score the fire and explosion hazard mode either a state or local fire marshall must have certified that the facility presents a significant fire or explosion threat to the public or to a sensitive environment, or there must be a demonstrated threat based on field observations (e.g. combustible gas indicator readings). The available records give no indication that either one of these tasks has been done. Further, the available data do not suggest any imminent threat of fire and explosion at this site. Therefore the route score cannot be completed.

6.5 DIRECT CONTACT ROUTE

The direct contact route score is 0. The score is derived from the fact that the site is completely fenced and guarded. However, elevated levels of phenols are present, suggesting that a potential hazard exists. Furthermore, part of the site was covered with aged waste material. It is suggested that the quality and the hazard of the cover material be assessed.

6.6 CONCLUSIONS

In review of the accumulated information, it appears that there may be a threat to the environment from elevated readings of phenols. Since this

threat is inconclusive at this time, a Phase II investigation is recommended. However, if the proposed Phase II work plan is not accepted, it is highly recommended that the monitoring well program and water quality analysis be continued on a monthly basis and that the HSL be analyzed at least yearly. In addition to continued monitoring and compliance with all operating permits, it is essential that a new upgradient well be located further from the refuse pile, possibly off site. This would eliminate any effect of a localized change in groundwater flow due to mounding within the waste pile and would also aid in determining the degree of groundwater contamination and its source.

7.0 PHASE II WORK PLAN

7.0 PHASE II WORK PLAN

INTRODUCTION AND OBJECTIVES

During the Phase I investigation, it was determined that the Union Carbide Republic Plant Landfill poses a potential threat to the groundwater, a virtually unused resource. This Phase II work plan is designed to further characterize the site as follows:

- Identify the types and concentrations of allegedly disposed materials
- Assess the reliability of the existing monitoring wells
- Further identify subsurface hydrogeologic conditions at the site
- Determine the degree of groundwater contamination in the vicinity of the site
- Evaluate whether or not contamination from the site poses any environmental or health concerns
- Determine the potential for groundwater use and groundwater quality
- Evaluate the adequacy of the cover material
- Provide a Preliminary Hazard Ranking System (HRS) score
- Provide NYSDEC with a preliminary remedial cost estimate.

Procedures to be utilized for sampling and analysis, as well as health and safety, will be conducted in conformance with the consultant's generic procedures submitted to NYSDEC prior to initiation of work under this contract.

WORK PLAN

To accomplish the above mentioned objectives, the following tasks and subtasks are recommended:

Task 1 - Preparation of Site-Specific Work Plans

Wehran will prepare and submit for NYSDEC approval revised work plans for those sites NYSDEC recommends for Phase II investigation. These plans will include site-specific:

- Scope of work
- Health and safety plan
- Sampling and analytical plan
- Detailed cost estimate

All plans will conform with the contractor's previously submitted established procedures.

Task 2 - Identify, Obtain and Evaluate Additional Data

To consider the possible cost for future remedial investigations, it will be necessary to collect and evaluate additional information relating to the area surrounding the Union Carbide site, including but not limited to:

- Available regional water supply sources
- Boring logs, if available, for all wells in the immediate area
- Potential for future groundwater use
- Waste materials disposed of

Task 3 - Hydrogeologic Investigation

Data Evaluation

The information obtained in Task 2 will be used to aid in the location of test borings and monitoring wells.

Test Borings

In order to define the hydrogeology beneath the subject site, three deep bedrock borings to approximately 50 feet will be drilled under the continuous supervision of Wehran Engineering. In addition, at two of these three

locations two shallow overburden borings will be drilled to an approximate depth of 20 feet. Split-spoon samples will be collected at standard five-foot intervals in accordance with the procedures of the Standard Penetration Test. Soils will be visually classified in the field for grain size (according to the Unified Classification System) and lithology. Representative portions of each sample will be stored in moisture-tight jars at the office of Wehran Engineering in Middletown, New York, for future reference. In addition, it is anticipated that three samples will be analyzed in the laboratory for grain size, Atterberg limits, and hydrometer.

If a confining layer or other strata determined to be of particular significance to the migration of contamination is encountered, additional investigations will be conducted. These additional investigations will be performed as an extra, subject to NYSDEC approval, and may include the collection of undisturbed soil samples using Shelby tubes, continuous split-spoon sampling, and laboratory permeability testing.

Monitoring Well Installation

Monitoring wells will be installed in each of the five borings. All wells will be constructed using two-inch diameter, Schedule 40, threaded flush-joint PVC pipe and fifteen-foot long factory slotted PVC screens. The screened interval will be determined in the field according to the hydrologic conditions encountered. A sand pack will be placed around each screen to prohibit clogging of the screen openings. A bentonite pellet seal will be placed at the top of the sand to isolate it from upper soil zones. The annular space will be filled to the surface with a bentonite-cement grout using the "Tremie" method. A steel casing with a protective lock will then be cemented in place to prevent vandalism.

Survey Well Locations and Elevation

A survey will be conducted to determine the relative elevations of both ground surface and "top of casing" at each boring location. The location of each well will also be determined with sufficient accuracy for plotting on a site map.

In Situ Permeability Determinations

A variable head borehole test will be conducted in order to measure the in situ permeability of the soils at each monitoring well location. This test will involve recording the recovery of water level after bailing. Prior to the procedure, the static water level will be measured and recorded to facilitate a determination of groundwater flow direction.

Groundwater Sample Collection

Groundwater samples will be collected for analysis from each of the five wells using the following procedure.

- The static water level in each well will be measured and recorded.
- Each well will be purged of at least three well volumes of water using a separate teflon bailer for each well. Each bailer will be cleaned in the laboratory prior to use.
- Samples will be collected from each well by the use of the above-mentioned bailer. Each sample will then be placed in the appropriate container, stored on ice, and transported to the lab in accordance with standard chain-of-custody protocol.

The samples will be analyzed for the Hazardous Substances List (HSL), Priority Pollutant Heavy Metals and water quality indicator parameters including: COD, pH, conductivity, chlorides, TSS, TDS, and iron.

The following assumptions have been made in the development of this scope of services and the associated costs:

- All drilling locations are accessible to a truck-mounted drilling rig as determined by the drilling subcontractor
- The soils do not contain excessive amounts of cobbles or boulders
- It is anticipated that three wells will be approximately 50 feet deep, two wells will be approximately 20 feet deep, and that ten normal, eight-hour days would be required for their installation.

Geophysical Survey

A terrain conductivity or earth resistivity survey will be conducted in order to obtain additional subsurface information. Both of these geophysical methods evaluate changes in the earth's resistance/conductance to an induced electrical current which may reflect changes in stratigraphy and/or groundwater quality. The survey would be implemented in areas of the site deemed appropriate based on existing geologic and water quality data.

Task 4 - Waste Characteristics Investigation

In order to determine the potential health and environmental threat posed by this site, and to determine if the phenols which have been found in the groundwater originate from the waste, a waste characteristics investigation is recommended. To achieve these objectives, continuous split-spoon samples will be collected from three borings within the disposed waste area. A composite sample from each boring will be collected. The depth of the borings will be limited to five feet above the water table and will be based on the existing and proposed monitoring wells. These waste samples will be analyzed for HSL and Priority Pollutant Heavy Metals.

Task 5 - Quantitative Air Monitoring

Throughout all Phase II activities conducted at the site, air monitoring will be performed using the HNU Systems Photoionizer and an O_2/LEL meter, both upwind and downwind of the site. If consistent, unusually high values are observed (five to ten ppm above background) with the HNU, a more quantitative air analysis would be requested as an extra, subject to NYSDEC approval.

Task 6 - Laboratory Analysis

During the field investigation the following samples will be collected for analysis by a subcontractor laboratory:

- Seven water samples (five wells, one field blank, one trip blank) for HSL, Priority Pollutant Heavy Metals and water quality indicator parameters
- Three waste samples for HSL and Priority Pollutant Heavy Metals

Task 7 - Preliminary Remedial Cost Estimate

The consultant will consider the possible cost of future remedial investigations, engineering plans and specifications, and the physical remediation anticipated for the site. A range of possible remedial costs will be developed using best engineering judgment and previous experience with possible feasible remedial schemes. This task is not intended to perform a cost-effectiveness analysis of feasible remedial alternatives but rather to provide a cost range estimate adequate for budget reporting purposes.

Task 8 - Phase II Report Preparation

Under this task, the engineer will compile a final report for the site. This report will contain the following:

- Phase II information developed under Tasks 1 through 7
- Final Site Assessment
- Final HRS score

Extras

This work plan has been developed based upon available site information as contained in the Phase I report. If conditions encountered during the Phase II investigation indicate the need for additional services or extras such as difficult drilling, poor access, etc., not included within the original scope of work, the costs will be negotiated with the NYSDEC. Such extra services will be performed on a time and materials basis with prior authorization by the NYSDEC project officer.

NYSDEC SUPERFUND INVESTIGATIONS
PHASE II - TOTAL PROJECT COST SUMMARY[1]
SITE: UNION CARBIDE REPUBLIC PLANT LANDFILL

Wehran's Labor and Expenses	$ 53,000.00
Subcontractors:	
Driller	49,000.00
Laboratory	20,000.00
TOTAL ESTIMATED COST	$ 122,000.00*

[1]This cost estimate does not include any provisions for inflation and salary adjustments and can be considered current for approximately three months.

*Note: This cost estimate has been developed for budgeting purposes only. Should this site be selected for Phase II investigation, Wehran will develop a detailed cost estimate for NYSDEC approval.

NEW YORK STATE REGISTRY FORMS

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

Code: _____

Site Code: 932035

Name of Site: Union Carbide Republic Plant Region: 9

County: Niagara Town/City Niagara Falls

Street Address Hyde Park Boulevard

Status of Site Narrative:

The Union Carbide Republic Plant site is a 16-acre active landfill on Hyde Park Boulevard, Niagara Falls, Niagara County, New York. The site is used exclusively by Union Carbide to dispose of carbonaceous and packaging wastes generated during their production process from the National, Acheson and Republic plants. The estimated life of the site is approximately 40 years at the current disposal rate of 3,500 tons/year.

Other waste types generated and deposited on the site in the past included coke, pitch, lunch waste, silica sand, coal tars, petroleum tars, and machining oils.

The site is currently monitored on a quarterly basis by the extraction of groundwater samples from three monitoring wells installed around the perimeter of the site.

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

Estimated Size 16 Acres

Hazardous Wastes Disposed? Confirmed ☐ Suspected ☒

*Type and Quantity of Hazardous Wastes:

TYPE	QUANTITY (Pounds, drums, tons, gallons)
Phenols	Unknown
Heavy metals	Unknown
Oil	8,800 gals
Coal tars	Unknown
Petroleum tars	Unknown

* Use additional sheets if more space is needed.

Name of Current Owner of Site: Union Carbide Republic Plant

Address of Current Owner of Site: Hyde Park

Time Period Site Was Used for Hazardous Waste Disposal:

, 1934 To Present , 1985

Is site Active [X] 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 [X] None [ ]
Surface Water [ ] Soil [ ]

Remedial Action: Proposed [ ] Under Design [ ]
In Progress [X] Completed [ ]
Nature of Action: Final cover is being applied

Status of Legal Action: Site is in complience with Part 360 regulations. State [X] Federal [ ]

Permits Issued: Federal [ ] Local Government [X] SPDES [ ]
Solid Waste [ ] Mined Land [ ] Wetlands [ ] Other [ ]

Assessment of Environmental Problems:

The file data and reports state that nonhazardous carbonaceous waste has been disposed of at this site. However, water quality data indicates that phenols, heavy metals and low levels of halogenated organics have contaminated the till hydrologic zone. Additional investigation is necessary in order to identify the types and concentrations of disposed materials.

Assessment of Health Problems:

Persons Completing this Form:

Terrance Haelen	Wehran Engineering
New York State Department of Environmental Conservation	New York State Department of Health
Date November 1985