932009

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATION

Chisholm - Ryder

City of Niagara Falls

Site No. 932009

Niagara County

Prepared for:

New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233

Thomas C. Jorling, *Commissioner*

Division of Hazardous Waste Remediation

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By:

ENGINEERING-SCIENCE

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

CHISHOLM-RYDER SITE
NYS SITE NUMBER 932009
CITY OF NIAGARA FALLS
NIAGARA COUNTY
NEW YORK STATE

PREPARED FOR

DIVISION OF HAZARDOUS WASTE REMEDIATION
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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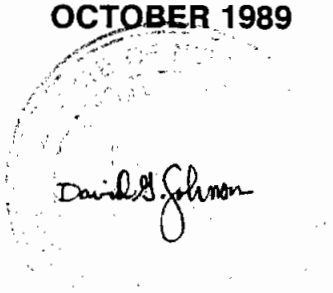

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EXECUTIVE SUMMARY

SITE HISTORY

The Chisholm-Ryder site is located in the City of Niagara Falls, New York (Figure I-1). In 1980, Niagara Falls had a population of 71,384 (Rand McNally, 1981). The Chisholm-Ryder Company, a manufacturer of food harvesting and processing equipment, was located at 3800 Highland Avenue in Niagara Falls, from approximately 1985 to 1986. From the mid 1940s until about 1959, approximately two acres of the 20-acre property was used as a landfill for plant wastes (Figure I-2). Combustible plant refuse was burned and the ash was disposed in the landfill. Other wastes suspected to have been disposed in the landfill were sludges from vapor degreasing and plating operations, boiler ash, coolant fluids, and paint filters. Spent solvents from the painting and degreasing operations and sawdust floor sweepings used to absorb small spills may have also been disposed in the landfill. No detailed waste disposal records for the landfill were kept at the plant (Chisholm-Ryder, 1985).

The landfill site was reportedly closed during the early 1960's. After that time, the landfill site was generally inactive. Occasionally, drums of materials were stored in the landfill area. Fill and construction debris from the New York State Power Authority power project tunnels were disposed in the landfill area (Chisholm-Ryder, 1985).

From the time of the landfill closure until the early 1980's, it is not known what disposal practices were used by Chisholm-Ryder. In the early 1980's when the site operations were reduced, wastes were reportedly removed off-site or recycled (Chisholm-Ryder, 1985).

In December 1986, Chisholm-Ryder sold most of the capital assets associated with the manufacturing of harvesting equipment, including the Chisholm-Ryder name. The property, including the mostly abandoned plant facility and the landfill are still owned by the company formerly called Chisholm-Ryder and now known as 3800 Highland, Inc. During the transaction of December 1986, the property and landfill did not change ownership; rather, the owners changed their company name to 3800 Highland Inc. A separate company known as PreMax, rents a portion of the former Chisholm-Ryder facility. PreMax manufactures letter and number sets stamped out of aluminum. Wastes generated by PreMax are disposed off-site.

Presently, the landfill is closed and the construction debris and fill from the power project excavations serve as cover for the landfill (Chisholm-Ryder, 1985). A Phase I investigation for the landfill site was completed in 1986. That report concluded that a Phase II investigation was necessary to complete a final Hazard Ranking System (HRS) score.

PHASE II INVESTIGATION

The Phase II field investigation included three monitoring well installations, waste and groundwater sampling and analysis, and air monitoring. These field investigation tasks were intended to define the presence of hazardous substances at the Chisholm-Ryder site.

SITE ASSESSMENT

The geologic stratigraphy of the site can be summarized as 4.5 to 10 feet of silty glacial till over dolomite bedrock. Groundwater occurs within the bedrock under water table conditions at depths of 12 to 15 feet below the ground surface and from 2 to 9 feet below the top of bedrock. The three Phase II wells are screened in the upper 10 to 20 feet of bedrock. Groundwater flow in the monitored zone is toward the south-southwest.

There are no natural surface water bodies within the site boundary. The closest natural surface water body is the Niagara River, located about 2,500 feet west of the site.

The City of Niagara Falls and residents in the vicinity of the site are served by a municipal water supply system. The drinking water source is the Niagara River. The intakes are located upstream from the site. There are at least two residences using groundwater as a drinking water supply within three miles of the site (NCDOH, 1988). These residences are anticipated to be connected to the municipal supply in the very near future.

Potential contamination of the environment within the site boundary was evaluated by sampling and analysis of three monitoring wells and two drums containing wastes (Figure I-2). Air monitoring with a Photovac was conducted during the on-site activities. Monitoring for volatile organic compounds (VOCs) did not detect levels above background at any time. Monitoring of the headspace over soil samples and the monitoring wells did not detect the presence of VOCs at levels above background.

The three monitoring wells were sampled during January 1988 and analyzed for Hazardous Substance List (HSL) organic compounds (volatiles and semi-volatiles), metals and total organic halogens (TOX). The Class GA groundwater standard for benzene was exceeded in downgradient well GW-1. No releases of organic compounds to groundwater were in evidence.

Ten HSL metals were detected in the groundwater samples. The concentrations of manganese and chromium in downgradient well GW-2 were in excess of five times the upgradient concentration. This indicates a release potentially attributable to the site.

Two waste samples were collected from deteriorated drums located on the surface of the landfill. The samples were analyzed for extraction procedure (EP) toxicity characteristics and pH. For both samples, the reported concentrations for all parameters were below the referenced maximum levels. Neither sample exhibited the characteristics of EP Toxicity. The pH of both samples were near normal. A pH in the range of 6.0 - 8.0 is generally considered normal.

HAZARD RANKING SYSTEM SCORE

In an attempt to establish the relative risk associated with this site, the Hazard Ranking System (HRS) was applied. As currently used by the NYSDEC, the HRS is employed to aid the evaluation of inactive hazardous waste sites in New York State. This system takes into account the types of wastes at the site, receptors, and transport routes to calculate a numerical score for the site. As stated in 40 CFR Subpart H Section 300.81, the HRS was developed for evaluating the relative potential of uncontrolled hazardous disposal facilities to cause human health or safety problems or ecological and environmental damage. It is assumed by the EPA that a uniform application of the ranking system in each state will permit EPA to identify releases of hazardous substances that pose the greatest hazard to human health and/or the environment.

Under the HRS, three numerical scores are computed for each site to express the relative risk or danger from the site. These scores take into account the population at risk, the potential for contamination of drinking water supplies, for direct human contact, for destruction of sensitive ecological systems and other appropriate factors. The three scores are:

- S_M - reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility by routes involving groundwater, surface water and air. It is composite of separate scores for each of the three routes (S_{GW} = groundwater route score, S_{SW} = surface water route score, and S_A = air route score).
- S_{FE} - reflects the potential for harm from substances that can explode or cause fires.
- S_{DC} - reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

Based on the results of this and previous studies, the HRS scores for the Chisholm-Ryder site have been calculated as follows:

$S_M = 12.45$ $S_{GW} = 20.87$

$S_{FE} = 0$ $S_{SW} = 5.31$

$S_{DC} = 33.33$ $S_A = 0$

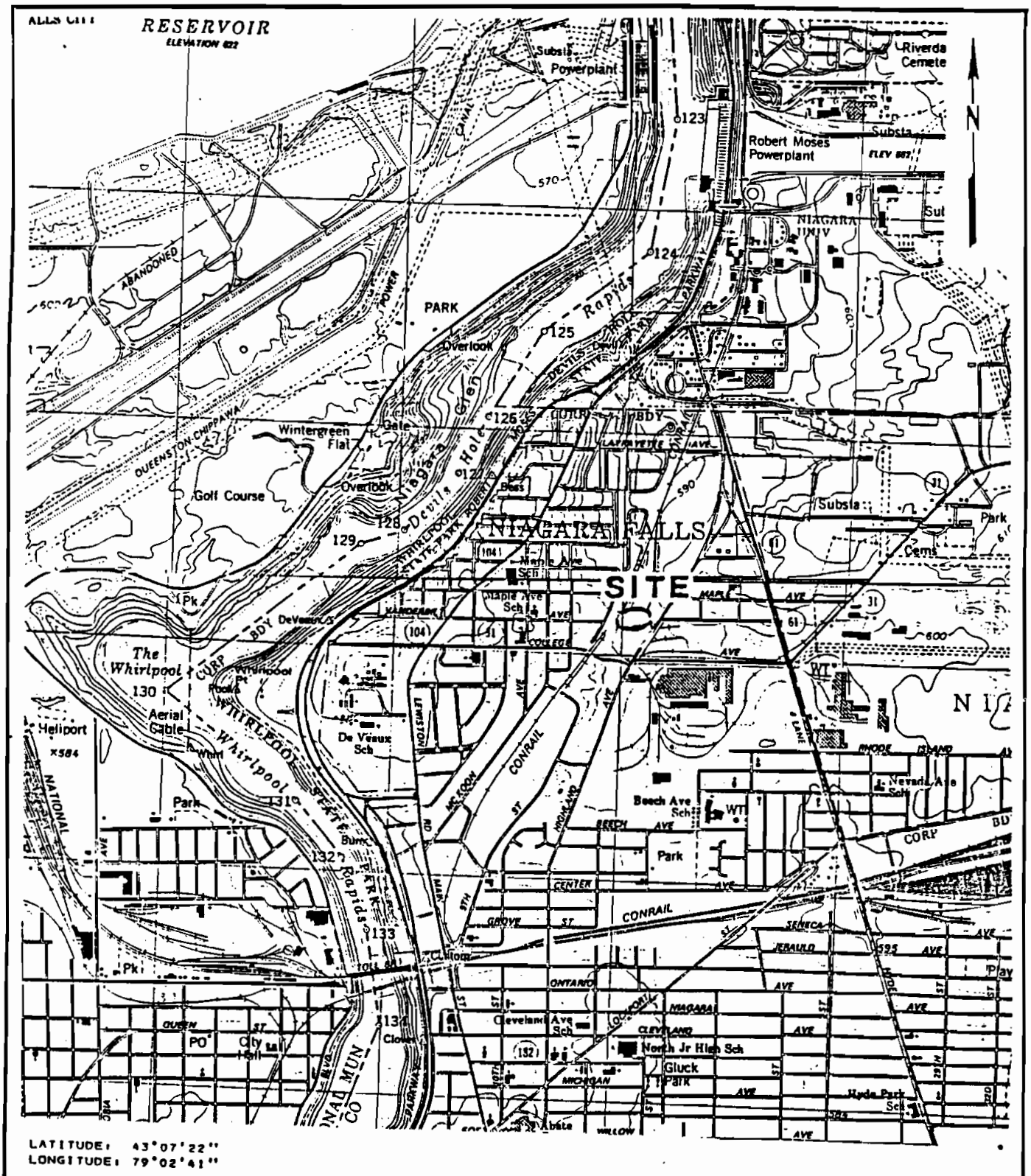
RECOMMENDATIONS

The scope of work for the Phase II investigation at the Chisholm-Ryder site was adequate to address the environmental concerns and develop a final HRS score. The configuration of the monitoring wells provides adequate coverage of the site and provides a sufficient characterization of groundwater quality.

A groundwater release of manganese and chromium potentially attributable to the site was the major finding of this investigation. However, given the fact that groundwater will not be used locally as a drinking water source in the very near future, that release does not appear to pose a

significant public health threat. No action is recommended at this time. The NYSDEC has removed the Chisholm-Ryder site from the inactive hazardous waste site list.

The drums sampled on-site should be removed since the actual composition of the material is unknown; however, testing has indicated it does not exhibit the characteristic of EP Toxicity. Also, a fence around the site may help limit the uncontrolled access and dumping of household refuse which is apparently now taking place.



REFERENCE: U.S.G.S. 7.5' Topographic Map
Niagara Falls, NY-ONT. (1980) and
Lewiston, NY-ONT. (1980) Quadrangles

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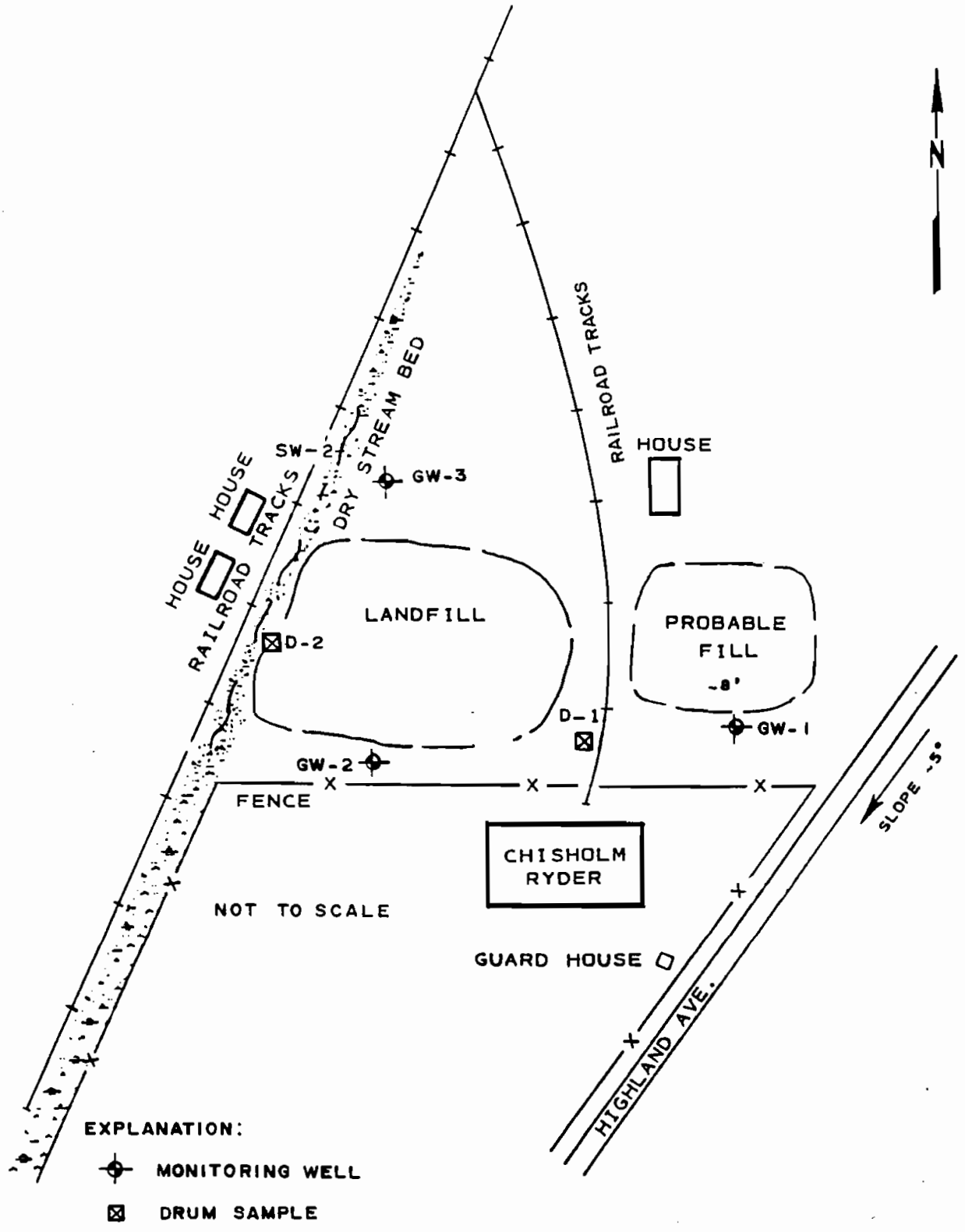
PHASE II REPORT

SITE LOCATION MAP
CHISHOLM-RYDER

FIGURE I-1



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PHASE II REPORT

SITE PLAN
CHISHOLM-RYDER

SECTION II

PURPOSE

The objective of a Phase II investigation is to determine if hazardous wastes have been disposed of in the site, if contaminants exist in the various mediums (air, groundwater, surface water or soils) and whether or not threats to human health or the environment exist. Information gathered relative to the above will allow the Department to reclassify the site or if warranted delist it.

The Chisholm-Ryder landfill is approximately two acres in size, located adjacent to the former Chisholm-Ryder plant facility (presently owned by 3800 Highland, Inc.). The landfill was used from the mid-1940's to 1959 for the disposal of plant wastes. No detailed records exist concerning the quantities of materials disposed on-site. According to plant employees, combustible plant refuse (i.e., wood, trash, etc.) was burned and the ash was buried in the landfill. Other plant wastes suspected of being disposed in the landfill include boiler ash, paint filters and residues, water soluble coolants, vapor degreasing solvents and sludges, and metallic sludges from the plating operation. The disposal of plant wastes in the landfill was discontinued in 1959 when the Chisholm-Ryder plant was temporarily closed. In the 1960's, the site was used to dispose of excavation material (ash, cinder, rubble, brick, etc.) from the construction of power project tunnels (Chisholm-Ryder, 1985).

On two occasions, the U.S. Geological Survey (USGS) collected and analyzed three soil samples from test borings placed around the perimeter of the Chisholm-Ryder landfill. The samples collected on June 30, 1982 were analyzed for heavy metals; the concentrations of zinc in two of the samples were substantially higher than in the background samples. The additional soil samples collected on May 25, 1983 were analyzed for organic compounds. Fourteen priority pollutants and fifteen non-priority pollutants were detected (EPA, 1985). However, the holding times were exceeded for some of the samples collected by the USGS.

In January, 1986, a Phase I investigation for the Chisholm-Ryder site was completed. The Phase I report concluded that additional data was necessary for completion of a final Hazard Ranking System (HRS) score. This Phase II investigation was designed to supplement information previously compiled for the site and assess the presence of hazardous substances and the potential for off-site migration.

SECTION III
SCOPE OF WORK

INTRODUCTION

Field work for the Phase II investigation at the Chisholm-Ryder site began in December, 1987 and was completed in January, 1988. Field work was performed in accordance with a NYSDEC-approved project Quality Assurance/Quality Control Plan and site-specific Health and Safety Plan. The Phase II Work Plan dated April 28, 1986 was approved by NYSDEC prior to commencing the field investigations. The Work Plan was later revised with NYSDEC approval, based on the preliminary findings of the field investigations.

The original Work Plan included three monitoring wells. All three wells were screened in the Lockport Dolomite as planned. Well GW-3 was installed with 20 feet of screen to assure coverage of the water table. None of the proposed leachate, surface water or sediment samples were collected as no leachate or surface water were observed during the Phase II site investigation. Field work was performed in accordance with a NYSDEC-approved project Quality Assurance/Quality Control Plan and site-specific Health and Safety Plan.

PHASE II SITE INVESTIGATION

The scope of the investigation is summarized in Table III-1 and is described below. All field work was performed or supervised by qualified Engineering-Science, Inc. (ES) personnel, using procedures described in Appendix A.

Monitoring Well Installations

Three bedrock monitoring wells were installed around the perimeter of the landfill site during the period from December 14, 1987 to January 13, 1988 by Rochester Drilling Co. Inc. (Figure III-1). Wells were installed upgradient and downgradient of the landfill area (Table III-2). The upgradient well GW-3 is located north of the landfill. Downgradient wells GW-1 and GW-2 monitor the upper bedrock zone southeast and south of the landfill, respectively.

Wells were drilled and constructed in accordance with NYSDEC guidelines. Soil samples were generally collected at intervals of five feet throughout the overburden at each location. The upper 10 to 20 feet of bedrock was cored at each well location, and core samples were collected continuously throughout those depths.

The monitoring wells were constructed with two-inch inside diameter threaded, flush-joint, NSF-approved, PVC pipe and slotted screen. A quartz sandpack was installed around the well screen. A bentonite pellet seal was used to isolate the screen section from above. Water levels in

the wells were measured on at least two dates following installation and well development. Well development generally consisted of removing water by the air-lift method utilizing compressed air. The monitoring wells were capped by a PVC cap and a locking steel protective casing.

Field procedures for the monitoring well installations are presented in Appendix A. Boring logs and well schematics are included in Appendix B.

Waste Sampling and Analysis

Two waste samples were located from crystalline material in deteriorated drums located on and protruding from the ground surface of the landfill. The samples were collected on January 29, 1988, and analyzed for extraction procedure (EP) toxicity and pH by Nanco Labs, Inc. Only one waste sample was originally proposed in the Work Plan. however, since the surface water, sediment and leachate samples proposed in the original work plan could not be collected, the NYSDEC approved an additional waste sample. The additional sample, D-2, was collected from a drum protruding from the surface near the railroad tracks on the west side of the landfill (Figure III-1).

Groundwater Sampling and Analysis

Groundwater samples were collected from each of the three Phase II bedrock monitoring wells on January 29, 1988. these samples were analyzed for HSL organic compounds (volatiles, semi-volatiles), metals, and TOX by Nanco Labs, Inc. In addition, a trip blank and field blank were analyzed for HSL volatiles. Analyses and reporting were performed utilizing applicable NYSDEC Superfund and Contract Laboratory Protocol (CLP) methods. The samples were collected with teflon bailers and dedicated polypropylene line.

Split samples were collected by representatives of the site owner during the groundwater sampling event. Those samples were analyzed by RECRA Environmental, Inc. The results of the split samples have been reviewed by Engineering-Science and were found to be in general agreement with the Phase II groundwater sample results. The GW-1 sample for volatile organic compounds (VOCs) analyzed by Nanco Labs, Inc. exceeded the holding time and the results have, therefore, been rejected. The VOC results for sample GW-1 used in this report were from the split sample (MW-1) analyzed by RECRA Environmental Inc.

Air Survey

A Photovac Total Ionizables Present (TIP-II) photoionization meter was used to screen for volatile organic compounds present in the air. This monitoring was performed as a health and safety measure during on-site field work. Air in the breathing zone (4 to 5 feet above ground) was monitored during drilling and sampling activities. Soil samples were also screened, as was the headspace over each monitoring well, as a preliminary means of determining the presence of organic compounds.

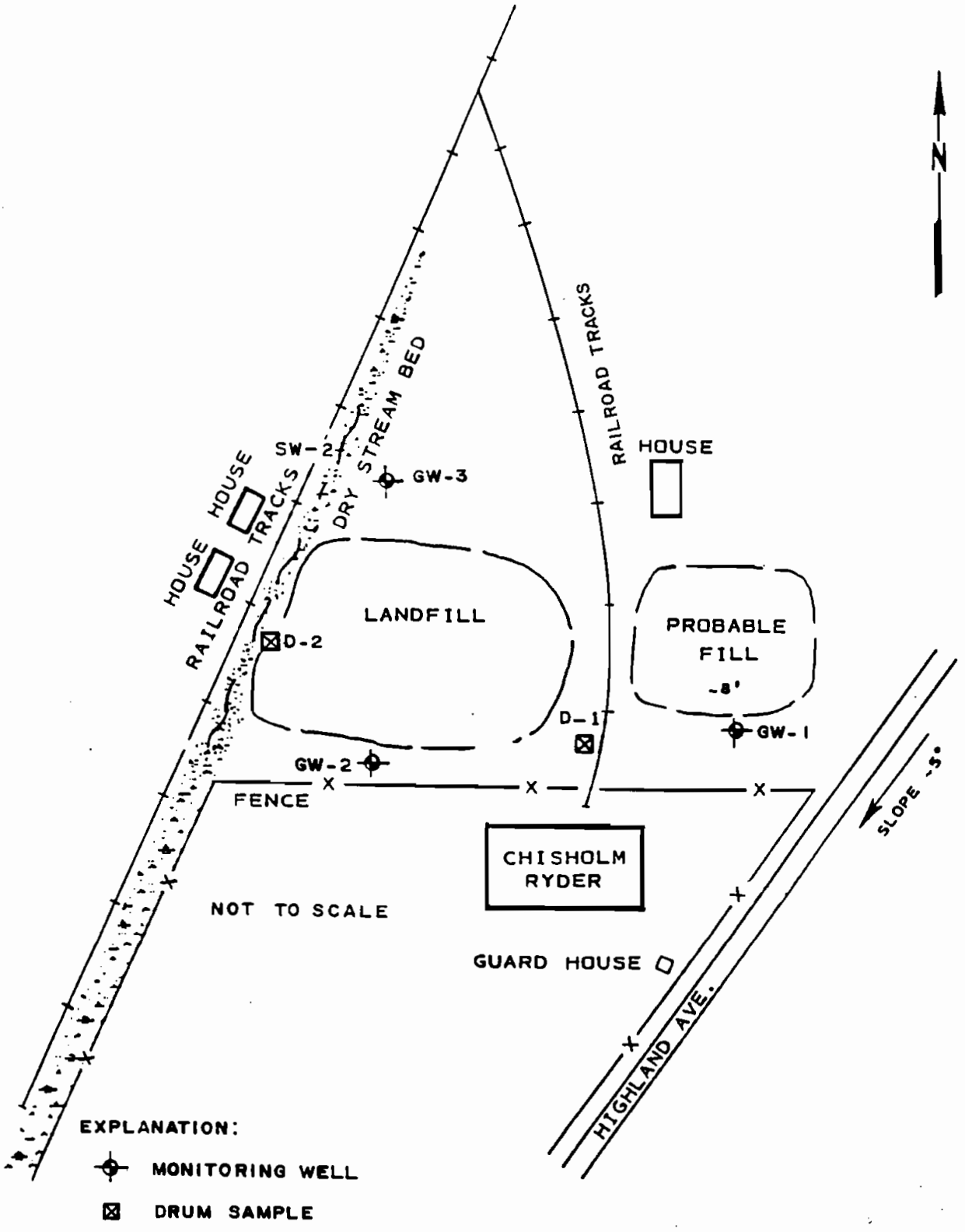
TABLE III-1
SUMMARY OF PHASE II TASKS
CHISHOLM-RYDER SITE

Task	Description of Task
Prepare and Update Work Plan	Reviewed the information in the Phase I report and supplemental data, conducted a site visit, examined aerial photography and prepared the Phase II work plan. Following completion of the site reconnaissance, the work plan was revised as needed.
Conduct Records Search Data Compilation	Reviewed Phase I information and contacted or visited central and local offices of NYSDEC, NYSDOH, County DOH, NYSDOT, etc.).
Site Reconnaissance	Checked locations of monitoring wells, examined terrain for accessibility by drill rigs, determined appropriate locations of sampling points.
Conduct Borings / Install Monitoring Wells	Installed three wells. The well borings were drilled to depths of 18.5 to 24 feet. Wells were constructed with 2-inch PVC pipe.
Soil samples from borings	Soil samples were collected at 5-ft. intervals during drilling and at changes in subsurface lithology. Performed six grain size analyses.
Perform Sampling and Analysis	
Waste Samples	Two waste samples were collected from drums and analyzed for pH and EP Toxicity.
Groundwater samples	Three groundwater samples were collected from drums and analyzed for HSL metals, organics and TOX.
Surface Water Samples	No samples were collected. No surface water was present on-site.
Sediment Samples from Surface Waters	No sediment samples were collected since no surface water was present on-site.

Task	Description of Task
Leachate Samples	No leachate was present on-site.
Air samples	Using a Photovac, the potential presence of volatile organic compounds was monitored during on-site activities.
Conduct Site Assessment	A preliminary site contamination assessment was conducted to complete the final HRS and HRS documentation records.
Report Preparation	Prepared a final report containing significant Phase II information, additional field data, final HRS and HRS documentation records, and site assessments.
Project Management	Project coordination, administration and reporting.

TABLE III-2
MONITORING WELL SPECIFICATIONS
CHISHOLM-RYDER SITE

Well Number	Unit Screened	Location	Depth (ft)	Screen Interval (ft)
GW-1	Bedrock-Lockport Dolomite	Downgradient of landfill	18.5	8.5-18.5
GW-2	Bedrock-Lockport Dolomite	Downgradient of landfill	20	10.0-20.0
GW-3	Bedrock-Lockport Dolomite	Upgradient of landfill	24	4.5-24.0



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PHASE II REPORT

SITE PLAN
CHISHOLM-RYDER

SECTION IV

SITE ASSESSMENT

SITE HISTORY

The Chisholm-Ryder Company, manufacturer of food harvesting and processing equipment, was located at 3800 Highland Avenue, Niagara Falls, New York, from approximately 1885 to 1986 (Figure IV-1). The subject of this Phase II investigation is a two-acre landfill formerly used by the Chisholm-Ryder Company located just north of the plant (Figure IV-2). From the mid 1940's until 1959, approximately two acres of Chisholm-Ryder site was used as a landfill. Following the reported closure of the landfill in the early 1960's, the site was used to dispose of excavation material (i.e., ash, cinders, rubble, brick, etc.) from the construction of the New York State Power Authority power project tunnels. These materials were placed in a low-lying area on-site (NCDOH, 1982 and Chisholm-Ryder, 1985).

The past manufacturing operations at the former Chisholm-Ryder plant include machining, metal fabrication, machinery assembly, parts degreasing, parts painting and metal plating. The wastes generated from these plant activities include general plant refuse, wood, floor sweepings, boiler ash, paint filters and small amounts of paint wastes, metal turnings, water soluble coolants, vapor degreasing solvents and sludge, rinse water and metallic sludges containing tin, cadmium and copper from the plating operations (NYSDEC, 1978).

From the mid-1940's to 1959, when the disposal area was reportedly used, combustible plant refuse was burned on-site and the ash was disposed in the landfill. Other plant wastes suspected of being disposed in the landfill during this time period include sludges generated from the vapor degreasing and plating operations, boiler ash, coolants, and paint filters. Spent solvents from the painting and degreasing operations and sawdust floor sweepings used to adsorb small oil spills may have also been disposed in the on-site landfill. No detailed waste disposal records were kept at the plant (Chisholm-Ryder, 1985).

Following the closure of the landfill site in the 1960s, the inactive site was used to store drummed materials, including speedi-dry with oil, aluminum cuttings, metal turnings, and welding slags. On August 29, 1979, an EPA site inspection discovered several drums in the landfill. These drums contained metal turnings and a partially filled fiber pack container of copper cyanide. The drums were removed from the site following the EPA inspection. The metal turnings were recycled and the copper cyanide was liquified and used in the plant's copper plating process (NYSDEC, 1980).

Little is known of Chisholm-Ryder's waste disposal activities during the 1960's and 1970's. In the early 1980's, the chemical wastes generated by the former Chisholm-Ryder Company were

either recycled or disposed off-site. Presently, the disposal site is closed, and the construction debris and fill from the power plant project excavations serve as cover for the landfill (Chisholm-Ryder, 1985).

In December 1986, Chisholm-Ryder sold most of the capital assets associated with the manufacture of crop harvesting equipment, including the Chisholm-Ryder name. The property, including the plant facilities and the landfill site, are still owned by the company formerly called Chisholm-Ryder, and now known as 3800 Highland, Inc. A separate company known as PreMAx rents a portion of the former Chisholm-Ryder facility. PreMax manufacturers letter and number sets stamped out of aluminum. Wastes generated by PreMax are disposed off-site.

The 3800 Highland, Inc. Company had retained the services of Advanced Environmental to remove wastes left from the former Chisholm-Ryder operations. A hazardous waste manifest from December 10, 1987 indicated waste xylene and spent oil base paint had been removed from the site (3800 Highland, Inc., 1988).

REGIONAL GEOLOGY AND HYDROLOGY

Regional Geology

The Chisholm-Ryder site, located in Niagara Falls, New York is situated within the Erie-Ontario Lowlands physiographic province (NYSMSS, 1966). The landforms of the Erie-Ontario Lowlands owe their shapes to complex erosional and depositional processes of both water and glacial ice. The Niagara Falls area has generally low relief, except for the Niagara Escarpment and the Niagara River gorge (Johnston, 1964). The Niagara Escarpment crosses the area in an east-west line, located about 2.5 miles north of the Chisholm-Ryder site. The escarpment is a 200-foot high cliff at the Niagara River, gradually diminishing to a broad, gently sloping incline to the east.

South of the escarpment is a ground moraine which occupies a low undulating till plain (USDA, 1972). The ground moraine is an unconsolidated glacial till, consisting of boulders, gravel, sand, silt and clay deposited by glacial ice. The average thickness of the ground moraine in Niagara County is 10 to 15 feet.

The bedrock beneath the glacial till in the Niagara Falls area consist of nearly flat-lying sedimentary rocks (Johnston, 1964). The beds of these rocks dip to the south at about 30 feet per mile. The bedrock in the vicinity of the site is the Lockport Dolomite, which is part of the Middle Silurian system, approximately 420 million years old. The Lockport Dolomite is about 150 feet thick, dark-gray to brown, with beds of varying thickness. Locally, the bedrock contains algal reefs ad masses of gypsum.

Regional Hydrology

Groundwater in the Niagara Falls area occurs in both the unconsolidated deposits and in the bedrock (Johnston, 1964). In unconsolidated deposits, such as the glacial till in the site

vicinity, groundwater occurs in spaces between soil grains. In the vicinity of the Chisholm-Ryder site, bedrock is the principal source of groundwater. The Lockport Dolomite is the only important aquifer in the Niagara Falls area (Johnston, 1964). Bedding joints transmit most of the water in this formation. These water-bearing zones occur most commonly in intervals of rock up to one-foot thick containing thin beds 1/4 to 4 inches thick. In the upper part of the Lockport Dolomite, wells yield an average of 31 gallons per minute, adequate for most domestic and small commercial uses.

The City of Niagara Falls municipal water supply source is the west branch of the Niagara River, upstream from the Chisholm-Ryder site (NYSDOH, 1982). All streams in the Niagara Falls area flow into Lake Ontario either directly or by way of the Niagara River.

The Niagara River is located approximately 2,500 feet west of the Chisholm-Ryder site. The New York State surface water classification is "A", protection for drinking water supply.

SITE GEOGRAPHY

Site Topography

The Chisholm-Ryder site is located in the northern portion of the City of Niagara Falls, population 71,384 (Rand McNally, 1981). The Chisholm-Ryder landfill site is situated in the southern end of the 20-acre property. This landfill is bordered on the west by ConRail railroad tracks, across which is a residential area (Figure IV-1). The south side of the landfill is bordered by the former Chisholm-Ryder plant facilities, now known as 3800 Highland, Inc. The east side of the landfill is Highland Avenue. The north end of the triangular landfill parcel, and the entire site property, is bordered by unused land. North of the landfill site, unauthorized dumping of various household wastes, appliances, tires, etc., which are found in piles, has occurred. The nearest residence is located about 200 feet northeast of the landfill parcel. The occupant indicated that they are served by municipal water (Parchue, 1988).

The ground surface at the site is generally level at the south end, but rises gently toward the north. The active ConRail railroad tracks to the west are about 10 feet above the surrounding grade. A small gully occupies the area between the railroad tracks and the landfill. This area is also littered with household refuse, appliances, and deteriorated drums. Some of the drums contain a crystalline material, which was sampled as part of the Phase II field work.

The site lies at an approximate elevation of 600 feet (National Geodetic Vertical Datum of 1929). The corners of the landfill, as marked by the triangular pattern of Phase II wells installed, has ground surface elevations varying by little more than three feet. The dimensions of the landfill, as marked by the well locations, is estimated at 360 feet in an east-west direction at the south end, and 420 feet in a north-south direction.

Access to the landfill site is uncontrolled. The site is accessible along Highland Avenue, the ConRail railroad tracks, and from the north through vacant fields. This is evidenced by the

uncontrolled dumping of household refuse and appliances which litter the north end of the property.

Soils

The site lies within an area mapped as having soils formed in lake-laid clays and silts (USDA, 1972). However, the soils encountered in the three well borings conducted on-site more closely resemble those formed in glacial till. In all three well borings the soil was brown, predominantly silt, with less than 35 percent sand and less than 10 percent gravel. The soil was 10 feet thick in boring GW-2, at the southwest corner of the landfill area. To the east, the soil thinned slightly to 8.5 feet at GW-1. To the north, the soil was only 4.5 feet thick at GW-3 (see boring logs in Appendix B).

SITE HYDROGEOLOGY

The discussions in this subsection are based on information from the Phase II site investigation activities, which included three borings and monitoring well installations. Boring logs and well schematics are in Appendix B of this report. Additional information used to develop an understanding of the on-site hydrogeology included USGS topographic maps, NYS Geological Survey maps and a regional groundwater resource report (Johnston, 1964).

Geology

The locations of the three well borings conducted at the site are shown on Figure IV-2. The subsurface stratigraphy of the site consists of silty glacial till over dolomite bedrock. The thickness of the till varies from 10 feet at the southwest corner of the landfill site to 4.5 feet at the north end. The texture of the till, and the density as reflected by the blow counts while sampling, indicate that this material probably has a low permeability, on the order of 10^{-4} to 10^{-6} cm/sec (Freeze and Cherry, 1979).

The bedrock is the Lockport Dolomite. The bedrock sampled from the well borings was described as gray to dark gray, fine-grained and highly fractured, with rock quality designations (RQD) of 0 to 31.1 percent in the upper 10 feet sampled. The RQD is the percentage of rock sample recovered in pieces 4 inches or more in length. The lower the RQD, the more highly fractured the rock sample is. THe RQD increased substantially in the second core run conducted in GW-3. From 10 to 20 feet below the top of bedrock, the RQD was 72.2 percent as opposed to 31.1 percent at 0 to 10 feet below the top of rock. This is consistent with other descriptions of the Lockport Dolomite for the region (Johnston, 1964).

The presence of frequent horizontal and vertical openings in the upper portion of the bedrock plays a major role in allowing groundwater to enter and move through the bedrock. Observations of the bedrock core samples from the Phase II well borings indicate that groundwater can freely enter the bedrock through the highly fractured upper ten feet.

Groundwater Hydrology

Three monitoring wells were installed in the upper 10 to 20 feet of the Lockport Dolomite. The wells monitor the upper portion of the water table. The purpose of the Phase II well installations was to determine if hazardous substances are present in the upper portion of the Lockport Dolomite aquifer beneath the site. The monitoring well data are presented in Table IV-1. Water level data are presented in Table IV-2.

Based on the water level elevation information from the Phase II wells, the groundwater flow in the upper portion of the Lockport Dolomite aquifer is to the south (Figure IV-3). Although the water level elevations changed slightly between the two measurement dates, the direction of flow was essentially the same.

Based on the southerly flow direction, GW-3 is the upgradient location and GW-1 and GW-2 are downgradient wells. The landfilled area is situated between the upgradient and downgradient wells.

The distance between GW-2 and GW-3 is approximately 435 feet. Using the groundwater elevation difference of 3.2 feet between the two wells on February 17, 1988, the hydraulic gradient is equal to 0.007 ft/ft. Based on the elevation difference of 2.8 feet on January 29, 1988, the hydraulic gradient is 0.006 ft/ft. Groundwater occurs under water table conditions at depths of approximately 12 to 15 feet below ground surface, and at depths of 2 to 9 feet below the top of bedrock.

Surface Water Hydrology

There are no natural surface water bodies within the site boundaries. The closest natural surface water body is the Niagara River, a Class A stream located approximately 2,500 feet west of the site.

There is an apparent drainage swale along the east side of the ConRail railroad tracks which border the site. This swale was not observed to contain surface water at any time during the Phase II field investigations.

SITE CONTAMINATION ASSESSMENT

Potential contamination of the environment within the site boundary was evaluated by a review of the character and quantity of wastes suspected at the site, chemical analysis of the groundwater and wastes from two drums and a survey of the air quality with a Photovac Tip II photoionization meter. In addition to the results of this Phase II investigation, previous results form USGS soil sampling and analysis were also considered in the site contamination assessment.

Waste Characterization

The Chisholm-Ryder manufacturing operations generated plant wastes including general plant refuse (i.e., wood, trash, floor sweepings), boiler ash, paint filters and small amounts of paint wastes, metal turnings, water soluble coolants, vapor degreasing solvents and sludge, rinse water, and metallic sludges (tin, cadmium, copper) from the plating operations (NYSDEC, 1978). Ash from the burning of plant refuse was known to have been disposed in the landfill. With the exception of metal turnings that were recycled, all other wastes generated at the plant are assumed to have been disposed in the landfill. However, no detailed waste disposal records were maintained by the plant.

In December 1987, prior to the Phase II sampling, Advanced Environmental removed two types of wastes generated by the former Chisholm-Ryder operations (3800 Highland, Inc. 1987). Spent oil base paint and waste xylene were listed on that hazardous waste manifest. It is not known whether these wastes are representative of the types of waste previously disposed in the landfill.

The USGS drilled test borings on-site on June 30, 1982, as part of the Niagara River Toxics Study. The location of the test holes are indicted on the plant site plan (see Figure IV-4). Three soil samples were collected from the test borings and analyzed for heavy metals including cadmium, chromium, copper, iron, lead, mercury and zinc. The concentrations of zinc in samples 2 and 3 were substantially higher than background samples collected from soils not affected by waste disposal practices. The results of the heavy metal analyses are presented in Table IV-3 (USEPA, 1985).

Additional soil samples were collected by the USGS on May 25, 1983 and analyzed for organic compounds. Fourteen priority pollutants were detected, all of which were in concentrations of 60 ug/kg or less. Fifteen organic non-priority pollutants and some unknown hydrocarbons were also detected. It should also be noted that these samples were collected next to the railroad tracks adjacent to the disposal site. Therefore, the organic constituents detected may be attributed to the creosote coating of the railroad ties rather than on-site disposal practices. These analytical results are provided in Appendix C.

The acceptable holding time for organic analyses was exceeded for all of the soil samples collected on May 25, 1983 at the Chisholm-Ryder disposal site. Therefore, the organic compounds identified by that sampling and analysis effort are not of sufficient quality for site evaluation. The concentrations of organic compounds in soil samples can decrease during sampling holding.

It should be also noted that the USGS test borings were placed along the eastern perimeter of the disposal site. Therefore, the waste materials with the potentially highest concentrations of contaminants were probably not sampled because waste disposal reportedly occurred west of that area.

On October 14, 1980 and March 1, 1982, site inspections were conducted by the NYSDEC and Niagara County Health Department, respectively No new signs of waste disposal activities were noted during these site inspections.

HNu meter readings were taken during the site inspection conducted by ES in March, 1985. Measurements for airborne volatile organics did not exceed background levels.

As part of this Phase II investigation, two waste samples were collected from severely corroded drums exposed at the ground surface on January 29, 1988. The locations of the drums are shown on Figure IV-2 and the results for EP Toxicity testing and pH are presented in Table IV-4. The samples collected were a solid, crystalline material.

A solid waste exhibits the characteristic of EP Toxicity if, using the prescribed methods, the extract contains any of the contaminants listed in Table IV-4 at a concentration equal to or greater than the referenced maximum value (Federal Register, 1980). For both drum waste samples, the reported concentrations were below the referenced maximum value. Neither sample exhibited the characteristic of EP Toxicity. The pH of both samples were near normal.

Groundwater Contamination Assessment

This subsection provides a summary of the results of the Phase II investigation groundwater sampling and analysis task. The upgradient sample concentrations are compared to those found downgradient of the site. Concentrations downgradient of the site in excess of three times the upgradient concentration may indicate release from a contaminant source located on-site.

The analytical results have also been compared to applicable New York State standards or guidance values. Standards and guidance values are provided for the applicable groundwater classification. Standards that have been promulgated for groundwater appear in 6 NYCRR Part 703. These regulations also provide authority for the use of guidance values when a standard does not exist for a given water classification. In this case, the standards and guidance values cited are for sources of drinking water. The three bedrock monitoring wells were sampled on January 29, 1988 and analyzed for HSL organics, metals and TOX. Six HSL organic compounds were detected in the groundwater samples (Table IV-5). Three of these, methylene chloride, acetone, and bis(2-ethylhexyl)phthalate were also detected in laboratory blank samples. Therefore, the results for these compounds have been rejected since these compounds are likely due to laboratory contamination and do not exist at the site. Downgradient concentrations of the other organic compounds detected were not substantially in excess of the upgradient concentrations.

Ten HSL metals were detected in the groundwater samples (Table IV-6). The standards for iron and lead and the guidance value for magnesium were exceeded in all samples, including the upgradient sample GW-3. This indicates high background levels of these elements which are not attributable to the site. For chromium and manganese, the downgradient concentration in GW-2 exceeded the upgradient concentration by more than three times. This may indicate a release attributable to the site. The Class GA groundwater standard for manganese was also exceeded in

GW-2. The concentration of chromium in GW-2 (35 ug/l) was less than the maximum contaminant level of 50 ug/l.

Air Quality Monitoring

The air quality monitoring with a Photovac did not indicate the presence of volatile organic compounds (VOCs) at concentrations above background. Monitoring of the headspace over soil samples and monitoring wells did not detect VOCs at concentrations above background.

RECOMMENDATIONS

The scope of work for the Phase II investigation at the Chisholm-Ryder site was adequate to address the environmental concerns and develop a final HRS score. The configuration of the monitoring wells provides adequate coverage of the site and provides a sufficient characterization of groundwater quality.

A groundwater release of manganese and chromium potentially attributable to the site was the major finding of this investigation. However, given the fact that groundwater will not be used locally as a drinking water source in the very near future, that release does not appear to pose a significant public health threat. No action is recommended at this time. The NYSDEC has removed the Chisholm-Ryder site from the inactive hazardous waste site list.

The drums sampled on-site should be removed since the actual composition of the material is unknown; however, testing has indicated it does not exhibit the characteristic of EP Toxicity. Also, a fence around the site may help limit the uncontrolled access and dumping of household refuse which is apparently now taking place.

Table IV-1
Monitoring Well Data
Chisholm-Ryder Site

Well I.D.	Ground Surface Elevation (Feet*)	Top of Bedrock Depth/Elevation (Feet/Feet*)	Top of Well Screen Depth/Elevation (Feet/Feet*)	Bottom of Well Screen Depth/Elevation (Feet/Feet*)
GW-1	495.3	8.5/486.8	8.5/486.8	18.5/476.8
GW-2	494.5	10.0/484.5	10.0/484.5	20.0/474.5
GW-3	497.7	4.5/493.2	4.5/493.2	24.0/473.7

* Above an assumed datum.

Table IV-2
Water Level Data
Chisholm-Ryder Site

Well I.D.	Ground Surface Elevation (Feet*)	Top of PVC Well Pipe Elevation (Feet*)	Well Screen Interval Elevation (Feet*)	Water Level Data			
				Date: 2/17/88		Date: 1/29/88	
				Depth to Water Level (Feet**)	Water Level Elevation (Feet*)	Depth to Water Level (Feet**)	Water Level Elevation (Feet*)
GW-1	495.3	497.7	486.8-476.8	16.0	481.7	16.8	480.9
GW-2	494.5	497.1	484.5-474.5	14.9	482.2	15.5	481.6
GW-3	497.7	500.3	493.2-473.7	14.9	485.4	15.9	484.4

* Based on assumed on-site datum.

** Water level depth from top of PVC.

Table IV-3
Results of USGS Sampling
Chisholm-Ryder Site
(ug/kg)

Inorganic Constituents	Sample Number 1 (2.0)	2 (8.5)	3 (5.0)
Cadmium	1,000	2,000	2,000
Chromium	10,000	2,000	3,000
Copper	5,000	3,000	12,000
Iron	13,000	26,000	1,500,000
Lead	10,000	20,000	50
Mercury	---	---	---
Zinc	2,000	*200,000	*220,000

Analyses of substrate samples collected from Chisholm-Ryder, Niagara Falls, New York on June 30, 1982. Dashes indicate that constituent or compound was not found.

() Depth in feet below ground surface.

* Exceeds concentrations in samples taken from the undisturbed soils in the Niagara Falls area.

TABLE IV-4
CHISHOLM RYDER
DRUM WASTE RESULTS

E.P. TOXICITY TEST	MAXIMUM CONCENTRATION OF CONTAMINANTS (a)	D-1.17	D-2.17
METALS (mg/l)			
Arsenic	5.0	<0.050	<0.050
Barium	100.0	0.508	0.572
Cadmium	1.0	0.211	0.191
Chromium	5.0	0.975	0.786
Lead	5.0	2.670	2.810
Mercury	0.2	<0.0002	<0.0002
Selenium	1.0	<0.075	<0.075
Silver	5.0	<0.010	<0.010
HERBICIDES (ug/l)			
2,4 D	100.0	ND	ND
Silvex	10.0	ND	ND
PESTICIDES (ug/l)			
Lindane	4.0	ND	ND
Endrine	0.2	ND	ND
Methoxychlor	100.0	ND	ND
Toxaphene	5.0	ND	ND
pH		6.8	7.7

FOOTNOTES:

(a) Referenced from; Federal Register, Rules and Regulations, Volume 45 No. 98 (1980).
ND - not detected.

TABLE IV-5
CHISHOLM RYDER
GROUNDWATER SAMPLING RESULTS
HSL ORGANIC COMPOUNDS (ug/L)

COMPOUND (a)	NYS Standard/ Guidance Value (b)	Sample Location GW-3(c)	GW-1	GW-2
Methylene chloride	50 G	R	--	R
Acetone		R	--	R
Carbon Disulfide		R	--	R
Trichloroethene	10	--	--	6.6
Vinyl Acetate		R	--	--
bis(2-Ethylhexyl)Phthalate	4200	1900.0 B	1600.0 B	420.0 JBX

FOOTNOTES:

(a) - Only HSL organic compounds that were detected are presented.
(b) - Referenced from: "Ambient Water Quality Standards and Guidance Values" for Class GA groundwater drinking supply waters, NYSDEC, 9/1/78 as amended through 4/1/87. The value presented is the standard except where noted by "G" in which case it is the guidance value. All units are ug/l.
(c) - Upgradient location.

DATA QUALIFIERS:

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
J - Indicates that the compound meets the identification criteria but the result is less than the specified detection limit but greater than zero.
-- - Indicates that the compound was analyzed for but not detected. Refer to Appendix D for detection limit.
R - Data validation recommends this value be rejected.
X - Data validation recommends this value be considered an estimate.

TABLE IV-6
CHISHOLM RYDER
GROUNDWATER SAMPLING RESULTS
HSL METALS (ug/L)

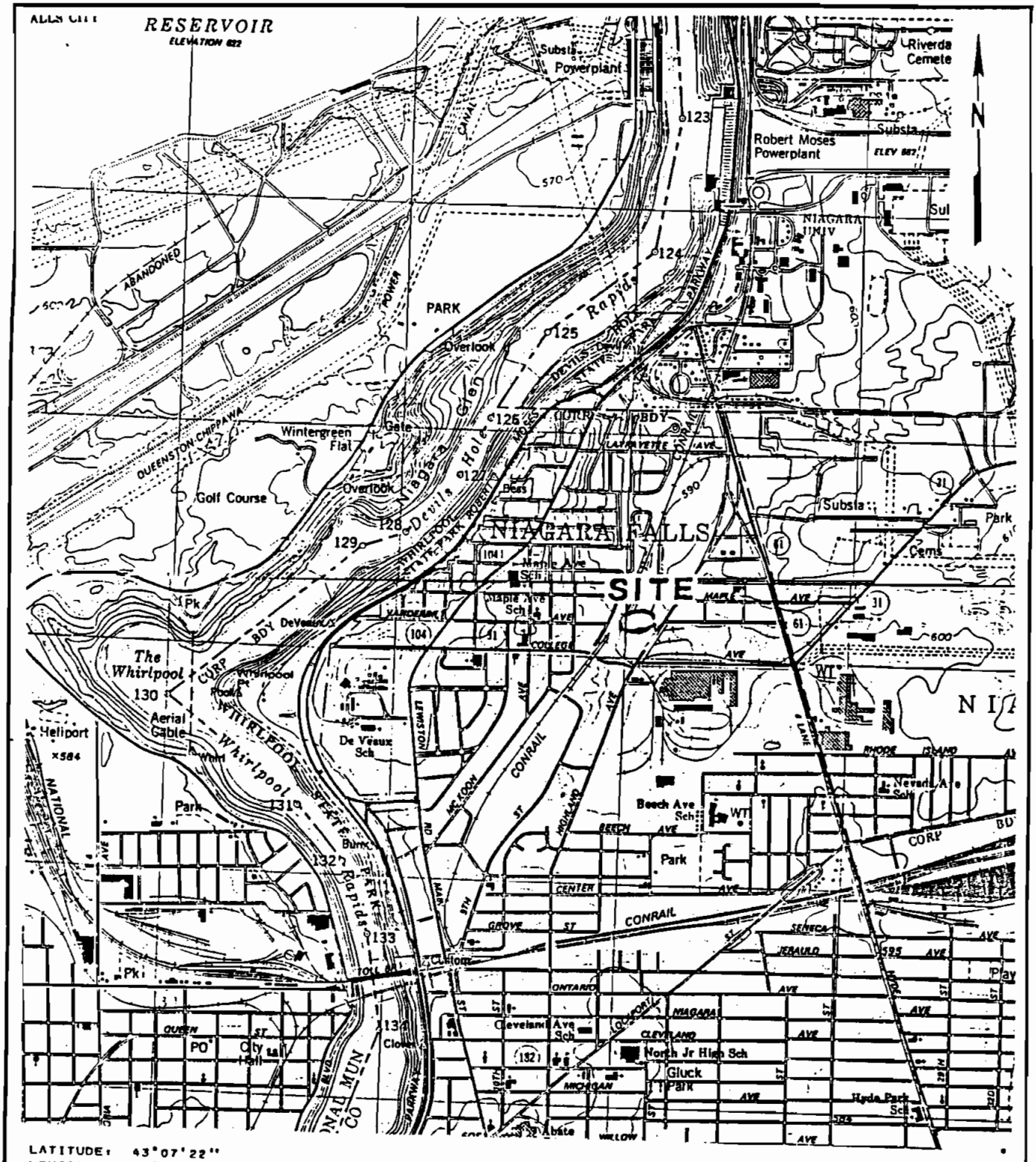
METAL (a)	NYS Standard/ Guidance Value(b)	Sample Location GW-3(c)	GW-1	GW-2
Aluminum		4200.0 X	4100.0 X	8300.0 X
Calcium		193500.0	226300.0	329600.0
Chromium		---	16.0	35.0
Copper	1000	[22.0]	31.0	49.0
Iron	300	5500.0	5800.0	12600.0
Lead	25	71.0 (e)X	42.0 X	85.0 (e)X
Magnesium	35000 G	71900.0	75200.0	137700.0
Manganese	300	240.0	260.0	1200.0
Sodium		15400.0	26600.0	38800.0
Zinc	5000	950.0	1100.0	1700.0
TOX (d)		8	19	16

FOOTNOTES:

(a) - Only HSL metals that were detected are presented. If the result is greater than or equal to the instrument detection limit but less than the contract-required detection limit, the value is reported in brackets (i.e.; [10]).
(b) - Referenced from: "Ambient Water Quality Standards and Guidance Values" for Class GA groundwater drinking supply waters, 6 NYCRR Part 703, NYSDEC, 9/1/78, as amended through 4/1/87. The value presented is the standard except where noted by "G", in which case it is the guidance value.
(c) - Upgradient location.
(d) - TOX = total organic halogens.
(e) - Dilution factor = 10.

DATA QUALIFIERS:

--- - Indicates that the metal was analyzed for but not detected. Refer to Appendix D for detection limit.
X - Data validation recommends this value be considered an estimate.



LATITUDE: 43°07'22"
LONGITUDE: 79°02'41"

REFERENCE: U.S.G.S. 7.5' Topographic Map
Niagara Falls, NY-ONT. (1980) and
Lewiston, NY-ONT. (1980) Quadrangles

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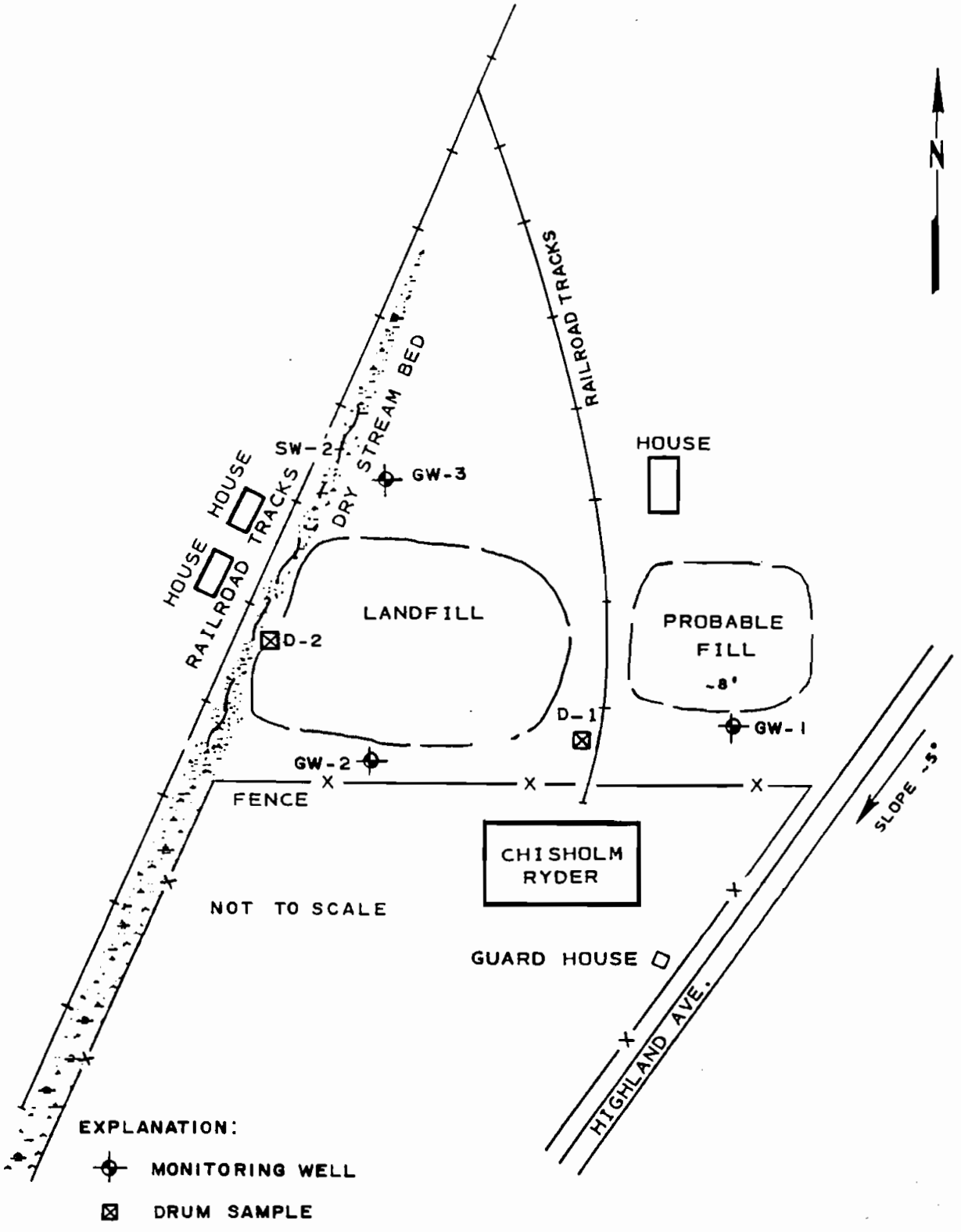
PHASE II REPORT

SITE LOCATION MAP
CHISHOLM-RYDER

FIGURE IV-1



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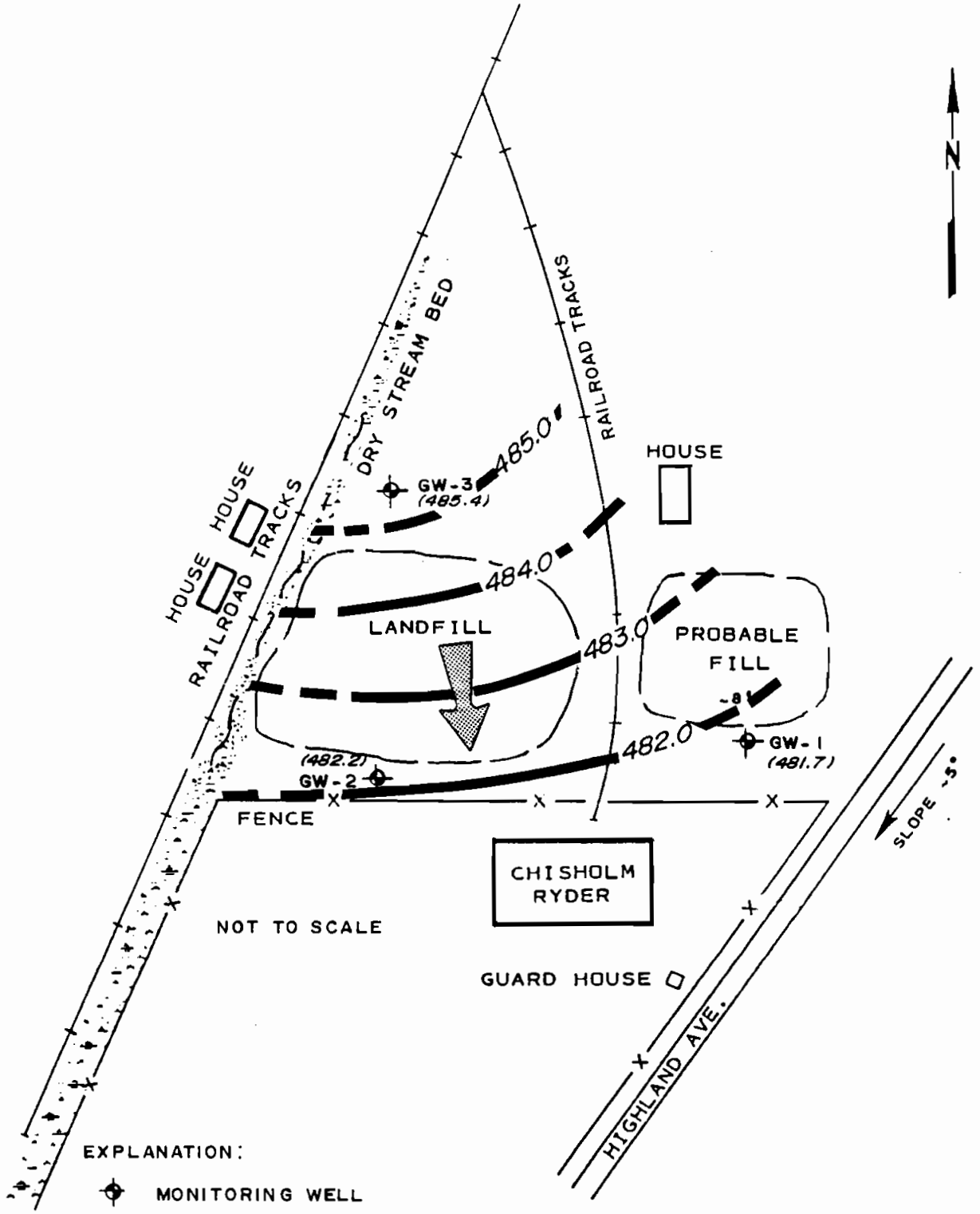
SITE PLAN
CHISHOLM-RYDER



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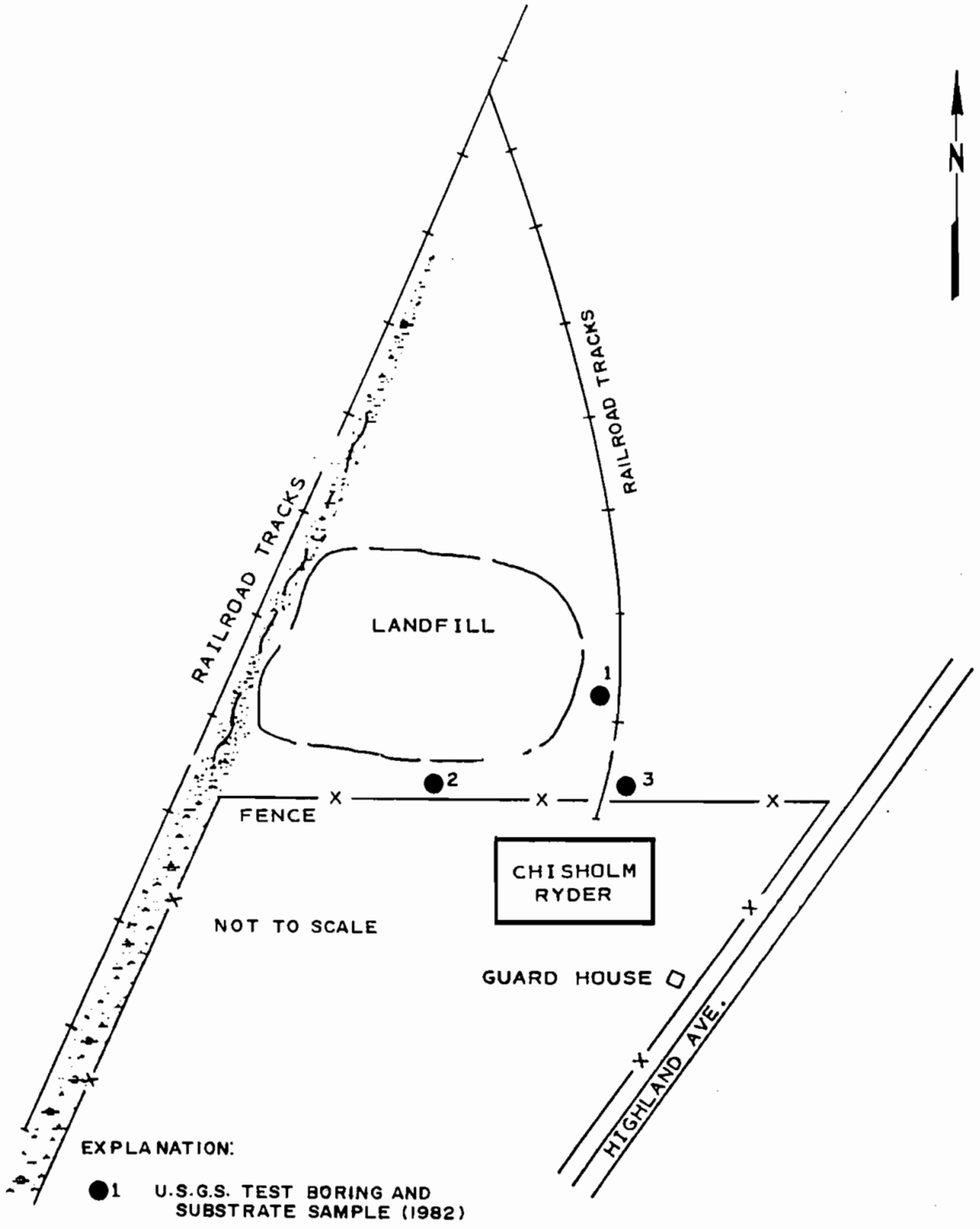
PHASE II REPORT

GROUNDWATER ELEVATION CONTOUR MAP
CHISHOLM-RYDER

FIGURE IV-2



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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

U.S.G.S. SOIL SAMPLE LOCATIONS
CHISHOLM-RYDER

SECTION V
FINAL APPLICATION OF HAZARD RANKING SYSTEM

NARRATIVE SUMMARY

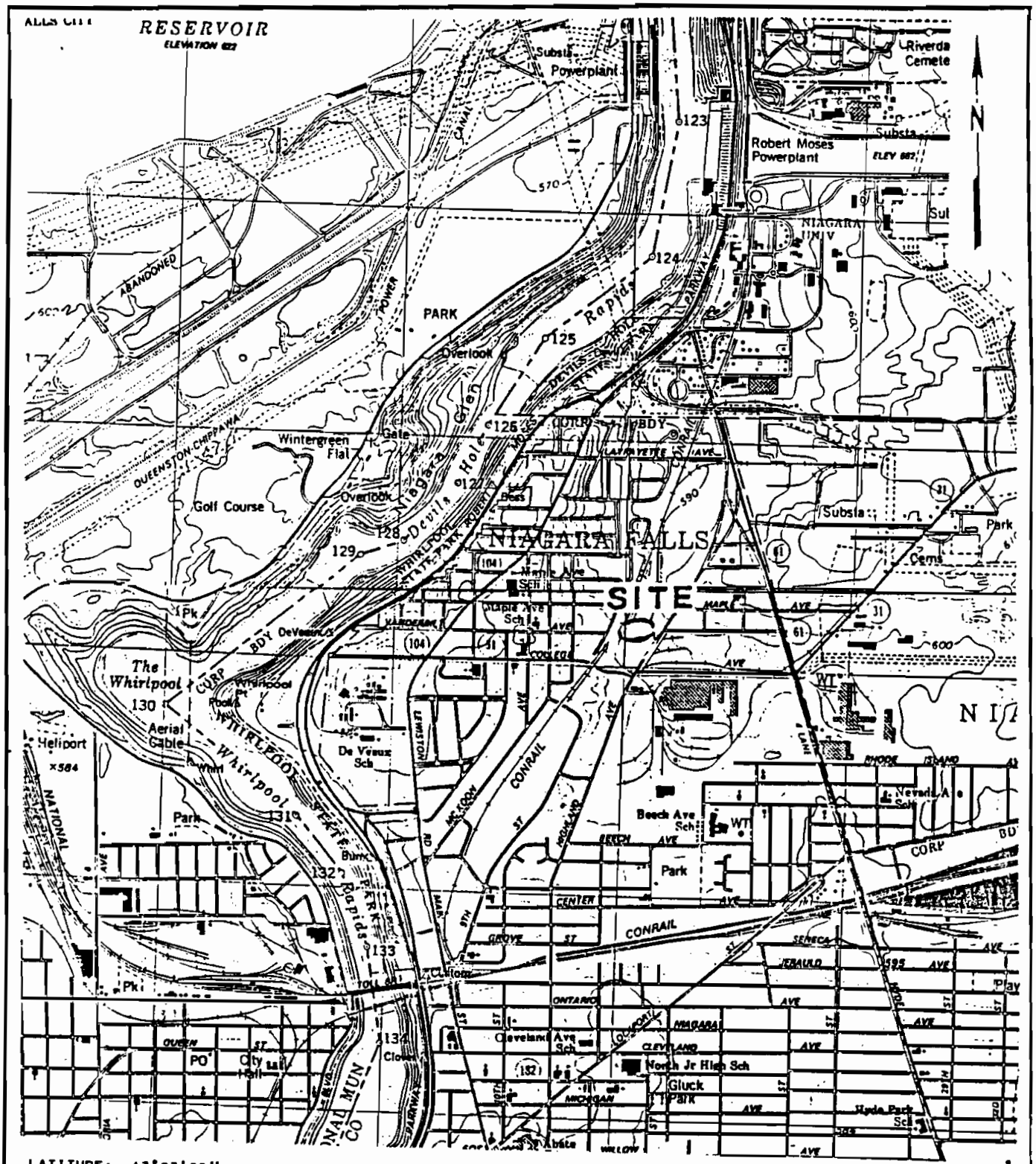
The Chisholm-Ryder site is a two-acre landfill located in the City of Niagara Falls, Niagara County, New York. The site is owned by 3800 Highland, Inc. The Chisholm-Ryder Company formerly manufactured crop harvesting and food processing equipment at the site from 1885 to the mid-1980's. From the 1940's until 1959, the landfill received ash generated by the burning of plant refuse. Other wastes suspected of being disposed on-site include vapor degreasing and plating sludges, boiler ash, coolants, and paint filters. The landfill was reportedly closed in 1960. The cover material consists of soil fill and construction debris.

Sampling and analyses of groundwater and wastes were conducted during the Phase II investigation. The groundwater analysis which included HSL metals and organic compounds detected chromium and manganese contamination attributable to the site. The groundwater results indicated chromium and manganese levels in a downgradient well at more than five times the upgradient concentration. This indicates a release potentially attributable to the site. Two waste samples were analyzed for EP Toxicity. Neither sample exhibited the characteristics of EP Toxicity.

In the site vicinity, residents are served by a municipal water supply, which draws water from the Niagara River. There are no known users of groundwater for drinking water supply within three miles of the site. However, these residences are likely upgradient of the site, and are planned to be connected to the municipal supply in the near future.

There are no surface water bodies on-site. The nearest surface water body is the Niagara River, located 2,500 feet west of the site.

Air monitoring conducted during the Phase II investigation did not detect concentrations of volatile organic compounds above background levels. There have been no major clean-up actions previously recommended or undertaken at this site. No enforcement actions are currently planned. The site is presently inactive.



LATITUDE: 43°07'22"
LONGITUDE: 79°02'41"

SCALE

0 1000 2000 3000 4000 FEET

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SITE LOCATION MAP
CHISHOLM-RYDER

FIGURE V-1

REFERENCE: U.S.G.S. 7.5' Topographic Map
Niagara Falls, NY-ONT. (1980) and
Lewiston, NY-ONT. (1980) Quadrangles

Facility Name: Chisholm-Ryder Date: 6/8/88

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 (3)	2	6	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	8	40	
Total Targets Score			14	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			11,970	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 20.87		

GROUND WATER ROUTE WORK SHEET

Facility Name: Chisholm-Ryder Date: 6/8/88 revised 07/10/89

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 (1) 2 3	1	1	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	0 1 (2) 3	2	4	6	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			10	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	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/ Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			6	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			3420	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 5.31		

SURFACE WATER ROUTE WORK SHEET

Facility Name: Chisholm-Ryder Date: 6/8/88

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

AIR ROUTE WORK SHEET

Facility Name: Chisholm-Ryder Date: 6/8/88

Fire and Explosion Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	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	5	5	
Distance to Nearest Building	0 1 (2) 3	1	2	3	
Distance to Sensitive Environment	(0) 1 2 3	1	0	3	
Land Use	0 1 2 (3)	1	3	3	
Population Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Buildings Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Total Targets Score			20	24	
4 Multiply [1] x [2] x [3]			0	1,440	
5 Divide line [4] by 1,440 and multiply by 100			S_{FE} = 0		

FIRE AND EXPLOSION WORK SHEET

Facility Name: Chisholm-Ryder Date: 6/8/88

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	3	3	8.2
3 Containment	0 (15)	1	15		8.3
4 Waste Characteristics Toxicity	0 1 (2) 3	5	10	15	8.4
5 Targets					8.5
Population Within 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			7,200	21,600	
7 Divide line 6 by 21,600 and multiply by 100			S_{DC} = 33.33		

DIRECT CONTACT WORK SHEET

Facility Name: Chisholm-Ryder Date: 6/8/88 revised 07/10/89

Worksheet for Computing S_M

	S	S^2
Groundwater Route Score (S_{gw})	20.87	435.55
Surface Water Route Score (S_{sw})	5.31	2820
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		463.75
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		21.53
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M$		12.45

WORK SHEET FOR COMPUTING S_M

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: Chisholm-Ryder

LOCATION: 3800 Highland Avenue, Niagara Falls, Niagara County, New York.

GROUND WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (5 maximum): Assigned Value = 45

One upgradient and two downgradient samples of groundwater were collected. Chromium was detected in downgradient well GW-2 but not in upgradient well GW-3 (Nanco Labs, Inc., 1988)

Rationale for attributing the contaminants to the facility:

The downgradient concentration of chromium in GW-2 exceeded the upgradient concentration by more than 5 times.

***

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern Assigned Value = 3

Name/description of aquifer(s) of concern:

Lockport Dolomite - Bedrock (ES, 1988a).

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

14.9 feet (ES, 1988b).

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

Unknown. It is suspected that wastes were disposed on the ground surface and covered with fill material. Assume 0 feet for scoring purposes.

Net Precipitation Assigned Value = 2

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

Mean annual precipitation is 36 inches. (US DOC, 1979).

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

Mean annual lake evaporation is 27 inches.

(USDOC, 1979).

Net precipitation (subtract the above figures):

36 inches - 27 inches = 9 inches net precipitation.

Permeability of Unsaturated Zone — Assigned Value = 1

Soil type in unsaturated zone:

Fill and topsoil underlain by silty glacial till. (ES, 1988a).

Permeability associated with soil type:

The permeability is less than 10^{-4} but greater than 10^{-7} (Freeze and Cherry, 1979).

Physical State — Assigned Value = 3

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

Liquid, solid (NYSDEC, 1987a).

***

3. CONTAINMENT

Containment — Assigned Value = 3

Method(s) of waste or leachate containment evaluated:

Wastes were disposed of in an on-site landfill: drummed wastes were also stored on-site. The landfill has a poor cover which is vegetated with grass and brush; there is no liner or diversion system. (ES Field Investigations, 1987-88; NYSDEC, 1987a, NCDOH, 1982).

Method with highest score:

A score of 3 is assigned based on the fact that the landfill is inadequately covered and has no liner or run-on control system.

4. WASTE CHARACTERISTICS

Toxicity and Persistence — Assigned Value = 18

Compound(s) evaluated:

Chromium in groundwater samples GW-2 and GW-1 (Nanco Labs Inc, 1988).

Compound with highest score:

Chromium can be assigned a score of 18 (EPA, 1984).

Hazardous Waste Quantity — Assigned Value = 1

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):

Ash, cinders, rubble, grease, oil, metal turnings and water soluble coolant have been disposed of on-site in unknown quantities. Chromium and other hazardous substance list compounds were detected in the groundwater samples. (NYSDEC, 1987a; Nanco Labs, 1988).

Basis of estimating and/or computing waste quantity:

See above comment and references. Since chromium and other hazardous substance list compounds are known to be present, but the exact quantity is unknown, assign the minimal quantity score of 1.

***

5. TARGETS

Ground Water Use — Assigned Value = 2

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

Aquifer is used as a drinking water supply for two residences, but may also have industrial or commercial use. These two residences will be connected to the municipal supply in the very near future (NCDOH, 1988)

Distance to Nearest Well — Assigned Value (matrix) = 8

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

There are two homes located on Delaware Avenue which have wells drawing from the aquifer of concern. (NCDOH, 1988).

Distance to above well or building:

3200 feet (NCDOH, 1988).

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:

Two private residences with 3.8 people estimated per residence = 8 people. (NCDOH, 1988).

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):

None (NCDOH, 1988).

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

8 people.

SURFACE WATER ROUTE

1. OBSERVED RELEASE — Assigned Value = 0

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

Surface water was not sampled or analyzed for contamination. There was no surface water on-site at the time of the Phase II investigation. The nearest surface water is the Niagara River - 2,500 feet west of the site. (ES Field Investigations, 1987-88).

Rationale for attributing the contaminants to the facility:

Not applicable.

***

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain — Assigned Value = 1

Average slope of facility in percent:

< 1% (USGS, 1980).

Name/description of nearest downslope surface water:

Niagara River is the nearest surface water body (USGS, 1980).

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

Approximately 4% (USGS, 1980).

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

No.

Is the facility completely surrounded by areas of higher elevation?

No.

1-Year 24-Hour Rainfall in Inches — Assigned Value = 2

2-2.25 inches. (USDOC, 1963; US Dept. of Commerce Technical Paper No. 40).

Distance to Nearest Downslope Surface Water — Assigned Value = 2

The Niagara River is approximately 2,500 feet downslope from the site. (USGS, 1980).

Physical State of Waste — Assigned Value = 3

Solid and liquid. Score = 3 for liquid. (NYSDEC Inactive Hazardous Waste Disposal Site Report, 1987).

***

3. CONTAINMENT

Containment — Assigned Value = 3

Method(s) of waste or leachate containment evaluated:

Wastes were disposed of in an on-site landfill; drummed wastes were also stored on-site. The landfill has a poor cover which is vegetated with grass and brush. There is no liner or diversion system. (NYSDEC, 1987a; NCDOH, 1982).

Method with highest score:

A score of 3 is assigned based on the fact that the landfill is inadequately covered and has no liner or diversion system. (EPA, 1984).

4. WASTE CHARACTERISTICS

Toxicity and Persistence — Assigned Value = 18

Compound(s) evaluated

Chromium (in samples GW-1, GW-2) (Nanco Labs, Inc., 1988).

Ash, cinders, rubble, grease, oil, metal turnings and water soluble coolant have been disposed of on-site in unknown quantities (Nanco Labs, Inc., 1988; NCDOH, 1982; NYSDEC, 1987a).

Compound with highest score:

Chromium can be assigned a score of 18 (EPA, 1984).

Hazardous Waste Quantity — Assigned Value = 1

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):

Ash, cinders, rubble, grease, oil, metal turnings and water soluble coolant have been disposed of on-site in unknown quantities. Chromium and other hazardous substance list constituents were detected in the groundwater samples (NYSDEC, 1987a; Nanco Labs, 1988).

Basis of estimating and/or computing waste quantity:

See above comment and references. Since chromium and other hazardous substance list constituents are known to be present, but the exact quantity is unknown, assign the minimal quantity score of 1.

***

5. TARGETS

Surface Water Use — Assigned Value = 2

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

Surface water use within 3 miles of the facility includes tourism, scenic value, recreation, and discharge points for power plants. (USGS, 1980; NYSDOH, 1982).

Is there tidal influence?

No. The site is not near the coast. (USGS, 1980).

Distance to a Sensitive Environment — Assigned Value = 0

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

There is no 5-acre coastal wetland within 2 miles of the site. (USGS, 1980).

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

There are no 5-acre minimum wetlands within 1 mile of the site. (NYSDEC, 1987a).

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

There are no federally designated critical habitats of endangered species within the State of New York. (Ozard, 1988).

Population Served by Surface Water — Assigned Value = 0

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:

There are no water-supply intakes within the specified radii of the facility (NYSDOH, 1982).

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

0.0. There are no water-supply intakes within the specified radii of the facility (NYSDOH, 1982).

Total population served:

0.0. There are no water-supply intakes within the specified radii of the facility. (NYSDOH, 1982).

Name/description of nearest of above water bodies:

Not applicable. There are no water-supply intakes within the specified radii of the facility. (NYSDOH, 1982).

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

Not applicable. There are no water-supply intakes within the specified radii of the facility. (NYSDOH, 1982).

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected: Assigned Value = 0

Readings above background were not detected during routine on-site monitoring for organic vapors. (ES Field Investigations, 1987-88).

Date and location of detection of contaminants:

Not applicable. No contaminants were detected.

Methods used to detect the contaminants:

Photovac-Tip.

Rationale for attributing the contaminants to the site:

No hazardous waste present in a form with the potential to impact the air pathway is known to exist on site. (NYSDEC, 1987a; Nanco Labs, 1988).

***

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility Assigned Value = 0

Most reactive compound:

Not applicable. No reactive compounds are known to exist on site. (NYSDEC, 1987a; Nanco Labs, 1988).

Most incompatible pair of compounds:

No incompatible pairs of compounds are known to exist on site. (NYSDEC, 1987a; Nanco Labs, 1988).

Toxicity — Assigned Value = 0

Most toxic compound:

No toxic hazardous waste with the potential to impact the air pathway is known to exist on site. (NYSDEC, 1987a; Nanco Labs, 1988).

Hazardous Waste Quantity — Assigned Value = 0

Total quantity of hazardous waste:

Not applicable; see the comment above.

Basis of estimating and/or computing waste quantity:

Not applicable; see the comment above.

***

3. TARGETS

Population Within 4-Mile Radius — Assigned Value = 21

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

66,222 people live within a 4-mile radius of the site. (US Census Data, 1980).

Distance to a Sensitive Environment — Assigned Value = 0

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

The site is not near the coast (USGS, 1980).

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

There is no 5-acre fresh-water wetland within 1 mile of the site. (NYSDEC, 1987b).

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

There are no federally designated critical habitats of endangered species within the state of New York. (Ozard, 1988).

Land Use — Assigned Value = 3

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

0.0 miles. The site is within a commercial/industrial area. (USGS, 1980).

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

Whirlpool State Park is 1/2 mile from the site. (USGS, 1980).

Distance to residential area, if 2 miles or less:

0.0 miles. Residential areas are adjacent to the site. (USGS, 1980).

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

There is no agricultural land within 1 mile of the site. (USGS, 1980).

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

There is no prime agricultural land within 2 miles of the site. (USGS, 1980).

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

There is no historic or landmark site within view of the site. (US Department of the Interior, National Park Service, 1983; Federal Register, 1983).

FIRE AND EXPLOSION

1. CONTAINMENT — Assigned Value = 1

Hazardous substances present:

No information which indicates that fire and explosion has occurred (or could occur) at the site was discovered during the Phase II study.

Type of containment, if applicable:

***

2. WASTE CHARACTERISTICS

Direct Evidence — Assigned Value = 0

Type of instrument and measurements:

No measurements of the potential for fire and explosion were taken on-site. (ES Field Investigation, 1987-88).

Ignitability — Assigned Value = 0

Compound used:

No ignitable compounds are known to be present on-site. (NYSDEC, 1987a; Nanco Labs, 1988).

Reactivity — Assigned Value = 0

Most reactive compound:

No reactive compounds are known to be present on-site. (NYSDEC, 1987a; Nanco Labs, 1988).

Incompatibility — Assigned Value = 0

Most incompatible pair of compounds:

No incompatible compounds are known to exist on-site. (NYSDEC, 1987a; Nanco Labs, 1988).

Hazardous Waste Quantity — Assigned Value = 0

Total quantity of hazardous substances at the facility:

Ignitable and/or reactive waste is not known to be present on-site. (NYSDEC, 1987a; Nanco Labs, 1988).

Basis of estimating and/or computing waste quantity:

***

3. TARGETS

Distance to Nearest Population — Assigned Value = 5

0.0 mile. A residential area is located adjacent to the site. (USGS, 1980; ES Field Investigations, 1987-88)

Distance to Nearest Building — Assigned Value = 2

The former Chisholm-Ryder Plant building, now used by PreMax, is approximately 200 feet from the landfill. (ES Site Investigation, 1987-88).

Distance to Sensitive Environment — Assigned Value = 0

Distance to wetlands:

There are no wetlands within 1 mile of the site. (NYSDEC, 1987b; USGS, 1980).

Distance to critical habitat:

There are no federally designated critical habitats of endangered species within the State of New York. (Ozard, 1988).

Land Use — Assigned Value = 3

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

0.0 miles. The site is within a commercial/industrial area. (USGS, 1980).

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

Whirlpool State Park is 1/2 mile from the site. (USGS, 1980).

Distance to residential area, if 2 miles or less:

0.0 miles. There is a residential area adjacent to the site. (USGS, 1980).

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

There is no agricultural land within 1 mile of the site. (USGS, 1980).

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

There is no prime agricultural land within 2 miles of the site. (USGS, 1980).

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

There is no historic or landmark site within view of the site. (US Department of the Interior, National Park Service, 1983; Federal Register, 1983).

Population Within 2-Mile Radius — Assigned Value = 5

28,897 people. (US Census, 1980).

Buildings Within 2-Mile Radius — Assigned Value = 5

7605 buildings are within a 2-mile radius of the site. 28,897 people divided by 3.8 people per dwelling = 7605 buildings.

DIRECT CONTACT

1. OBSERVED INCIDENT — Assigned Value = 0

Date, location, and pertinent details of incident:

Based on information revealed during the Phase II study, there is not a confirmed instance in which contact with hazardous substances at the site has caused injury, illness or death to humans or animals. (Phase II Record Search, 1987-88).

***

2. ACCESSIBILITY — Assigned Value = 3

Describe type of barrier(s):

A score of 3 is assigned since barriers do not completely surround the site. (ES Field Investigations, 1987-88).

***

3. CONTAINMENT — Assigned Value = 15

Type of containment, if applicable:

The landfill is inadequately covered with soil material and construction rubble, and rusted drums are located on site. The waste is therefore accessible via direct contact and a score of 15 is assigned. (ES Field Investigations, 1987-88).

***

4. WASTE CHARACTERISTICS

Toxicity — Assigned Value = 2

Compounds evaluated:

Two samples were collected from the drummed wastes on-site in January, 1988 and were evaluated for EP Toxicity. None of the evaluated compounds were detected at concentrations in excess of maximum concentration levels. Samples of the landfilled waste were not taken, but ash and cinders, rubble, grease, oil, metal turnings, and water soluble coolant are known to have been disposed of on site. The U.S. Geological Survey collected 3 soil samples on site and analyzed

them for metals and organic compounds. The concentration of zinc in 2 of the samples (200,000 ug/kg) substantially exceeded the concentration of zinc in undisturbed soils. Organic compounds were not detected in significant concentrations. (Nanco Labs, 1988; EPA, 1985).

Compound with highest score:

Zinc can be assigned a toxicity rating of 2. (Sax, 1984).

5. TARGETS

Population within one-mile radius — Assigned Value = 4

8,972 people. (U.S. Census, 1980).

Distance to critical habitat (of endangered species) — Assigned Value = 0

There are no federally designated critical habitats of endangered species within the State of New York. (Ozard, 1988).

United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington, DC 20460

EPA Form 2070-13
July, 1981

EPA

Potential Hazardous Waste Site

Site Inspection Report

CHISHOLM-RYDER

Site Inspection Report

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D 002106656

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Chisholm-Ryder	3800 Highland Avenue				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Niagara Falls	NY	14305	Niagara		

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
43 07' 22"	79 02' 41"	☒ 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 / 20 / 85* (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1885 (BEGINNING YEAR) present (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR Engineering-Science (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☒ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
S. Robert Steele II	Environmental Scientist	ES	(703) 591-7575
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Eileen Gilligan	Geologist	Dames&Moore	(315)638-2572
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Mr. William Socha	Plant Manager	3800 Highland Avenue Niagra Falls,NY 14305	(716) 285-9186
Mr. Herb Wendt	Maint.Manager	" "	( ) "
Mr. Jay Freeier	Env. Eng.	" "	( ) "
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☐ PERMISSION ☐ WARRANT		

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
George Moreau	Engineering-Science (ES)	815)451-9560

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
George Moreau		ES	315-451-9560	10/7/88 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

* Updated August 27, 1987

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D002106656

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

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

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

TONS _____

CUBIC YARDS unknown

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] 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			Ash from the burning of plant
OLW	OILY WASTE	unknown		refuse was disposed in landfill.
SOL	SOLVENTS			Wastes suspected of being disposed
PSD	PESTICIDES			in landfill include paint wastes,
OCC	OTHER ORGANIC CHEMICALS			plating wastes, degreasing solids,
IOC	INORGANIC CHEMICALS			boiler ash,cinder,rubble,grease,
ACD	ACIDS			oil,metal turnings,water soluble
BAS	BASES			coolant
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
mes	cadmium	7440-43-9	LF	1-2	ppm
mes	chromium	7440-47-3	LF	2-10	ppm
mes	copper	7440-50-8	LF	3-12	ppm
mes	lead	7439-92-1	LF	10-20	ppm
mes	zinc	7440-66-6	LF	2-220	ppm
mes	copper cyanide				

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)

-Niagara County Health Department, Preliminary Investigation and Profile Report, March, 1982.

-EPA 1985,Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from selected waste-disposal sites.

-NYSDEC,1987 Inactive Hazardous Waste Disposal Site Report

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
02 ☒ OBSERVED (DATE: 1988) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 8
04 NARRATIVE DESCRIPTION
One upgradient and two downgradient samples of groundwater were collected and analyzed for organic compounds and metals. Because downgradient concentrations of chromium exceed upgradient concentrations;chromium can be attributed to the facility.

01 ☐ B. SURFACE WATER CONTAMINATION
02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0
04 NARRATIVE DESCRIPTION
Landfill is inadequately covered, and has no liner or diversion system. No leachate or free-flowing water in stream east of the site.

01 ☐ C. CONTAMINATION OF AIR
02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION
Readings above background were not detected during routine on-site monitoring for organic vapors. No hazardous waste with the potential to impact the air pathway is known to exist on site.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION
No information which indicates that fire and explosion has occurred (or could occur) at the site was discovered.

01 ☐ E. DIRECT CONTACT
02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION
The landfill is inadequately covered with fill material. Construction rubble and rusted, leaking drums are located on site. The waste is accessible via direct contact. Barriers do not completely surround site.

01 ☒ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: more than 4 (Acres)
04 NARRATIVE DESCRIPTION
U.S Geological Survey collected and analyzed 3 soils. Zinc in 3 samples exceed background concentration. Several organic constituents (priority and nonpriority pollutants) were detected in low concentrations.

01 ☐ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 8
04 NARRATIVE DESCRIPTION
2 residences within 3 miles of the site use groundwater as a drinking water supply. They will be connected to the municipal supply in the near future.

01 ☐ H. WORKER EXPOSURE/INJURY
02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION
No

01 ☐ I. POPULATION EXPOSURE/INJURY
02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION
No

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

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 name(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

Landfill has a poor cover which is vegatated with grass and brush. The landfill has no liner or diversion system.

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

No

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

No

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

No

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

No

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The drums containing metal turnings, speedy-dry with oil, copper cyanide were removed off site following an EPA Site Inspection conducted in August 1979.

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

Nanco Laboratory
ES Field Investigations, 1987-88
Niagara County Health Department, 1982. Preliminary Investigation and Profile Reports, 1982.
U.S. Geological Survey, Draft, Niagara River Toxics Study, 1983.
Phase II Record Search, 1987-1988.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D002106656

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)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

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

04 TREATMENT (Check all that apply)

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

05 OTHER

- ☒ A. BUILDINGS ON SITE

Approx. 2

06 AREA OF SITE

_____ (Acres)

07 COMMENTS

Vacant land adjacent to Chisholm Ryder plant was used to dispose of combustible plant wastes,(wood, refuse, etc.). Other wastes suspected of being disposed in the landfill include paint wastes, degreasing solvents and sludges, waste plating sludges, and ash.

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.

Plant wastes were placed into the landfill. The landfill site was covered with construction debris and fill excavated from the construction of power project tunnels.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

The inactive landfill is outside the confines of the plant and no fence is in place to restrict unauthorized access.

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

Interview with Chisholm-Ryder employee, Mr. Socha, 3/8/85
Interview with Chisholm-Ryder employee, Mr. Herb Wendt during ES and D&M site inspection, 3/20/85. Confirmed during 1/88.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

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. more than 3 (mi)
B. 0.6 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

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

02 POPULATION SERVED BY GROUND WATER 8

03 DISTANCE TO NEAREST DRINKING WATER WELL 0.6 (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
10-15 (ft)	S-SW	10-15 (ft)	10^{-2}-10 (gpd)	☐ YES ☒ NO

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

Two homes within 3200 feet of the site have residential wells

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS: Unknown	☐ YES ☐ NO	COMMENTS: Unknown

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

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

Niagara River

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Niagara River	☐	.5 (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. 8972 NO. OF PERSONS	B. 28,897 NO. OF PERSONS	C. 51,745 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: 0.0 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE	04 DISTANCE TO NEAREST OFF-SITE BUILDING
7605	0.0 (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)

Site is in industrial section of northern Niagara Falls and is adjacent to an older urban neighborhood

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

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) Lockport Dolomite

☐ 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
4.5-10 (ft)	at least 8 (USGS ~~test borings~~ 1983)	unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
9 (in)	2.0-2.5 (in)	0.0 %	W	about 4 %

09 FLOOD POTENTIAL

less than
SITE IS IN 500 YEAR FLOODPLAIN

10

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

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE
A. less than 2 (mi)

OTHER
B. none within 1 mile radius (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

pauperculus)

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. 0.1 (mi)	B. 0.0 (mi)	C. 72 (mi)	D. more than 1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Disposal site is low mound surrounded by level plant property to the south, and low lying RR tracks to the NE-NW.

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

-ES Field Investigations 1985-88
-USGS Topo Sheets
-letter from John Ozard (NYDEC Wildlife Resource Center) to M. Anatra(ES) 7/28/87
-pers. comm./ J. Farquhar, NYDEC Region 9, Fish & Wildlife
-Hyde Park Landfill Study documents, 1984

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	3	Nanco Laboratory, RD6 Robinson Lane	1988
SURFACE WATER		Wappingers Falls, NY	
WASTE	2	Nanco Laboratory "	1988
AIR			
RUNOFF			
SPILL			
SOIL	6	Unknown; results reported by USGS, 1983	1983
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
organic vapor detection	Photovac Tip and HNU readings taken on site in routine health and safety monitoring. Readings taken on soil samples from well borings, well headspace. No readings above background were detected.

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF Engineering-Science
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Engineering-Science

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

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

ES field investigations, 1985-88
USGS, Draft Niagara River Toxics Study, 1983

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D002106656

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
3800 Highland, Inc.		3800 Highland Avenue		Niagara Falls	NY	14305

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
not applicable						

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

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

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

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

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

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D002106656

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
3800 Highland, Inc.	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
3800 Highland Avenue	

05 CITY	06 STATE	07 ZIP CODE
Niagara Falls	NY	14305

08 YEARS OF OPERATION	09 NAME OF OWNER
1885-present	same

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
not applicable	

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
unknown	

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)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D002106656

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
3800 Highland, Inc.	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
3800 Highland Avenue	

05 CITY	06 STATE	07 ZIP CODE
Niagara Falls	NY	14305

presently, all hazardous wastes generated on-site are either recycled or contract hauled off-site for disposal.

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
none			
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

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
none			
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)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

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

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE 8/77 — 03 AGENCY USEPA
04 DESCRIPTION Drums containing metal turnings, speedy-dry with oil, copper cyanide were removed off site following an EPA Site Inspection conducted in August 1977.

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

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

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

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

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II FAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

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

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

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)*

Site Inspection conducted by ES and D&M, 3/20/85.
Review of NYDEC and USEPA Chisholm-Ryder Site file.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D-002106656

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ( ) YES (X) NO

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

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

NYS, Attorney General's Office
Letter from Vance Bryant (NYDEC Div. Env. Enforcement) to M. Anatra (ES)-7/7/87

HRS REFERENCES*
CHISHOLM-RYDER SITE

1. Nanco Labs, Inc. 1988- Analytical Results for GW-2, GW-3, D-1, D-2.

2. ES, 1988a. Boring logs for wells GW-1, GW-2 and GW-3.

3. ES 1988b. Table IV Chisholm-Ryder Phase II Report.

4. USDOC, 1979. U.S. Department of Commerce, National Climatic Center, Asheville, NC; Climate Atlas of the United States. Figures 4 and 5, 1929.

5. Freeze and Cherry, 1979. Groundwater Prentice-Hall, Inc. Englewood Cliffs, NJ.

6. NYSDEC, 1987a. Inactive Hazardous Waste Disposal Site Report, Chisholm-Ryder Site Code 932009, 1987.

7. NCDOH, 1982. Niagara County Health Department, 1982. Preliminary Investigation and Profile Reports for Twenty-Six Suspected Industrial Disposal Sites in Niagara County, New York. Prepared by Niagara County Health Department, Niagara Falls, New York, March, 1982.

8. EPA, 1984, HRS User's Manual. Table I.

9. NCDOH, 1988. Niagara County Department of Health, Interview with Paul Dicky dated 8/24/88.

10. USGS, 1980; United States Geological Survey. Topographic Maps: Lewiston, NY and Niagara Falls, NY-ONT. (1980), 7.5 minute quadrangles.

11. USDOC, 1963; US Department of Commerce Technical Paper No. 40, 1963.

12. NYSDOH, 1982. New York State Department of Health Atlas of Community Water System Sources.

13. NYSDEC, 1987b. Letter from J. Farquhar NYSDEC Fish and Wildlife Division regarding NYS designated wetlands dated September 2, 1987.

14. Ozard, 1988. John Ozard, NYSDEC Wildlife Resources Center, Telephone Interview, 4/14/88.

15. 1980 US Census Tract Data.

16. US Department of Interior, National Park Service, 1983. "National Register of Historic Places and National Registry of Natural Landmarks."

*All these references were used for HRS Documentation, while some of them were also used as general references.

17. Federal Register, 1983. National Registry of Natural Landmarks. March 1, 1983.

18. EPA, 1985. Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste Disposal Sites. United States Environmental Protection Agency, Great Lakes National Program Office, Chicago, Illinois. EPA-905 14-85-001.

19. SAX, N.I. 1984. Dangerous Properties of Industrial Materials, Sixth Edition. Van Nostrand Reinhold Company, New York; 3124 pp.

GENERAL REFERENCES**
CHISHOLM-RYDER SITE

20. Chisholm-Ryder, 1985. Personal communication with William Socha, Plant Manager on March 8, 1985.

21. Federal Register, 1980. Subpart 261.24 Volume 45 Number 98, May 19, 1980.

22. Johnston, 1964. Ground-Water in the Niagara Falls Area, New York, State of New York Conservation Department Water Resources Commission Bulletin, GW-53.

23. NYSDEC, 1978. Industrial Waste Survey completed on March 21, 1978.

24. NYSDEC, 1980. Memorandum regarding Chisholm-Ryder to Robert Mitrey from Y. Erk dated October 14, 1980.

25. NYSMSS, 1966. New York State Museum and Science Service, "Geology of New York" reprinted 1976.

26. Parchue, 1988. Personal communication with Mrs. Peter Parchue, on January 12, 1988. (copy not provided)

27. Rand McNally, 1981. Worldmaster World Atlas, New Census Edition, Rand McNally, New York.

28. USDA, 1972. U.S. Department of Agriculture, Soil Survey of Niagara County, New York, issued October, 1972.

29. 3800 Highland, Inc., 1988. Personal communication with Don Chapman, Plant Manager on January 12, 1988. (copy not provided)

30. 3800 Highland, Inc., 1987. Uniform Hazardous Waste Manifest, Manifest Document No. 00517 dated December 10, 1987.

**These references were not used for HRS Documentation. See also "HRS REFERENCES" above.

0000003 (1)

INORGANIC ANALYSIS DATA SHEET

FORM I

SMPL NO. : GW-1.17

Lab Name : NANCO LABORATORIES, INC.

Customer Name: Engineering Science

SOW NO. N/A

Lab Receipt Date : 01/30/88

Lab Sample ID: 88-EW-5346

Date Reported: 2/22/88

Location ID: Chrisholm Ryder

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION : LOW ___X___ MEDIUM _____

MATRIX : WATER __X___ SOIL _____ SLUDGE ____OTHER _____

(UG/L) OR MG/KG DRY WEIGHT (CIRCLE ONE)

1.	ALUMINUM	4100.0 P ~	13.	MAGNESIUM	75200.0 P
2.	ANTIMONY	50.0 UP	14.	MANGANESE	260.0 P E
3.	ARSENIC	3.0 UF	15.	MERCURY	0.2 U C.V.
4.	BARIUM	100.0 UP	16.	NICKEL	22.0 UP
5.	BERYLLIUM	0.3 UP	17.	POTASSIUM	4786.0 UP
6.	CADMIUM	4.0 UP ~	18.	SELENIUM	3.0 UF ~
7.	CALCIUM	226300.0 P	19.	SILVER	10.0 UP
8.	CHROMIUM	16.0 P	20.	SODIUM	26600.0 P
9.	COBALT	29.0 UP	21.	THALLIUM	2.0 UF ~
10.	COPPER	31.0 P	22.	VANADIUM	14.0 UP
11.	IRON	5800.0 P E	23.	ZINC	1100.0 P
12.	LEAD	42.0 F ~		PRECENT SOLIDS (%)	N/A
	CYANIDE	NR			

FOOTNOTES : FOR REPORTING RESULTS STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON PAGE 2.

COMMENTS : This sample was a colorless liquid that remained colorless after ICP and furnace digestion procedures.

Dugand

LAB MANAGER

0000001 (1)

INORGANIC ANALYSIS DATA SHEET
FORM I

SMPL NO. : GW-2.17

Lab Name : NANCO LABORATORIES, INC.

Customer Name: Engineering Science

SOW NO. N/A

Lab Receipt Date : 01/30/88

Lab Sample ID: 88-EW-5351

Date Reported: 2/22/88

Location ID: Chrisholm Ryder

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION : LOW __X___ MEDIUM _____

MATRIX : WATER __X___ SOIL _____ SLUDGE ____OTHER _____

(UG/L) OR MG/KG DRY WEIGHT (CIRCLE ONE)

1. ALUMINUM	8300.0 P N	13. MAGNESIUM	137700.0 P
2. ANTIMONY	50.0 UP	14. MANGANESE	1200.0 P E
3. ARSENIC	3.0 UF	15. MERCURY	0.2 U C.V.
4. BARIUM	100.0 UP	16. NICKEL	22.0 UP
5. BERYLLIUM	0.3 UP	17. POTASSIUM	4786.0 UP
6. CADMIUM	4.0 UP N	18. SELENIUM	3.0 UF N
7. CALCIUM	329600.0 P	19. SILVER	10.0 UP
8. CHROMIUM	35.0 P	20. SODIUM	38800.0 P
9. COBALT	29.0 UP	21. THALLIUM	2.0 UF N
10. COPPER	49.0 P	22. VANADIUM	14.0 UP
11. IRON	12600.0 P E	23. ZINC	1700.0 P
12. LEAD	85.0 F N (1:10)	PRECENT SOLIDS (%)	N/A
CYANIDE	NR		

FOOTNOTES : FOR REPORTING RESULTS STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON PAGE 2.

COMMENTS : This sample was a colorless liquid that remained colorless after ICP and furnace digestion procedures. Pb was analyzed at a 1:10 dilution.

LAB MANAGER

0000005

(1)

INORGANIC ANALYSIS DATA SHEET
FORM I

SMPL NO. : GW-3.17

Lab Name : NANCO LABORATORIES, INC.

Customer Name: Engineering Science

SOW NO. N/A

Lab Receipt Date : 01/30/88

Lab Sample ID: 88-EW-5352

Date Reported: 2/22/88

Location ID: Chrisholm Ryder

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION : LOW ___X___ MEDIUM _____

MATRIX : WATER __X___ SOIL _____ SLUDGE ____OTHER _____

(UG/L) OR MG/KG DRY WEIGHT (CIRCLE ONE)

1.	ALUMINUM	4200.0 P N	13.	MAGNESIUM	71900.0 P
2.	ANTIMONY	50.0 UP	14.	MANGANESE	240.0 P E
3.	ARSENIC	3.0 UF	15.	MERCURY	0.2 U C.V.
4.	BARIUM	100.0 UP	16.	NICKEL	22.0 UP
5.	BERYLLIUM	0.3 UP	17.	POTASSIUM	4786.0 UP
6.	CADMIUM	4.0 UP N	18.	SELENIUM	3.0 UF N
7.	CALCIUM	193500.0 P	19.	SILVER	10.0 UP
8.	CHROMIUM	6.0 UP	20.	SODIUM	15400.0 P
9.	COBALT	29.0 UP	21.	THALLIUM	2.0 UF N
10.	COPPER	[22.0]P	22.	VANADIUM	14.0 UP
11.	IRON	5500.0 P E	23.	ZINC	950.0 P
12.	LEAD	71.0 F N (1:10)	PRECENT SOLIDS (%)		N/A
	CYANIDE	NR			

FOOTNOTES : FOR REPORTING RESULTS STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON PAGE 2.

COMMENTS : This sample was a colorless liquid that remained colorless after ICP and furnace digestion procedures. Pb was analyzed at a 1:10 dilution.

LAB MANAGER

(1)

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

ENGINEERING SCIENE

Date Received: 1/30/88
Date Reported: 2/22/88

PESTICIDES & HERBICIDES BY G.C.

Nanco Sample ID: ES 5347 Customer ID: D-1.17

# COMPOUNDS	MCL UG/L	RESULTS SAMP. CONC. UG/L	RESULTS MRL UG/L	Q.C. BLANK & SPIKE BLANK BLANK UG/L	BLANK CONC. ADDED UG/L	BLANK % RECOVERY	Q.C. MATRIX SPIKE UNSPIKED SAMPLE UG/L	MATRIX SPIKE CONC. ADDED UG/L	MATRIX SPIKE % RECOVERY	MATRIX SPIKE DUP. % RECOVERY
HERBICIDES										
1H 2,4 D	100.0	ND	2.0	N.D.	2.0	59	ND	2.0	33	52
2H SILVEX	10.0	ND	1.0	N.D.	2.0	60	ND	2.0	51	52
PESTICIDES										
1P LINDANE	4.0	ND	0.5	N.D.	0.2	90	ND	0.2	90	85
2P ENDRIN	0.2	ND	0.5	N.D.	0.5	95	ND	0.5	122	116
3P METHOXYCHLOR	100.0	ND	1.0	N.D.	8.0	40	ND	8.0	95	114
4P TOXAPHENE	5.0	ND	10.0	N.D.	---	---	ND	---	---	---

N.D. = NOT DETECTED MRL = MINIMUM REPORTING LEVEL MCL = MAXIMUM CONTAMINATION LEVEL

* IN LEACHATE

Due to Matrix Interference, the spike Compounds could not be recovered.

The data used for the recoveries on these reports are from another sample.

00000513

(1)

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

ENGINEERING SCIENE

Date Received: 1/30/88
Date Reported: 2/22/88

PESTICIDES & HERBICIDES BY G.C.

Nanco Sample ID: ES 5348 Customer ID: D-2.17

# COMPOUNDS	MCL UG/L	RESULTS SAMP. CONC. UG/L	RESULTS MRL UG/L	Q.C. BLANK & SPIKE BLANK BLANK UG/L	BLANK CONC. ADDED UG/L	BLANK % RECOVERY	Q.C. MATRIX SPIKE UNSPIKED SAMPLE UG/L	MATRIX SPIKE CONC. ADDED UG/L	MATRIX SPIKE % RECOVERY	MATRIX SPIKE DUP. % RECOVERY
HERBICIDES										
1H 2,4 D	100.0	ND	2.0	N.D.	2.0	59	ND	2.0	33	52
2H SILVEX	10.0	ND	1.0	N.D.	2.0	60	ND	2.0	51	52
PESTICIDES										
1P LINDANE	4.0	ND	0.5	N.D.	0.2	90	ND	0.2	90	85
2P ENDRIN	0.2	ND	0.5	N.D.	0.5	95	ND	0.5	122	116
3P METHOXYCHLOR	100.0	ND	1.0	N.D.	8.0	40	ND	8.0	95	114
4P TOXAPHENE	5.0	ND	10.0	N.D.	---	---	ND	---	---	---

N.D. = NOT DETECTED MRL = MINIMUM REPORTING LEVEL MCL = MAXIMUM CONTAMINATION LEVEL

* IN LEACHATE

Due to Matrix Interference, the Spike Compounds could not be recovered.

The data used for the recoveries on these reports are from another sample.

COC 5C

(D)

****

NANCO LABS, INC.

****

Date Received: 01/30/88
Date Reported: 02/22/88

ENGINEERING SCIENCE

E.P. TOXICITY METALS

Nanco ID: 87-ES-5347 Customer ID: D 1.17

#	COMPOUNDS	RESULTS	UNITS	MCL
1M	ARSENIC	<0.050	MG/L	5.0
2M	BARIUM	0.508	MG/L	100
3M	CADMIUM	0.211	MG/L	1.0
4M	CHROMIUM	0.975	MG/L	5.0
5M	LEAD	2.670	MG/L	5.0
6M	MERCURY	<0.0002	MG/L	0.2
7M	SELENIUM	<0.075	MG/L	1.0
8M	SILVER	<0.010	MG/L	5.0

MCL = MAXIMUM CONTAMINATION LEVEL

000 55

(1)

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NANCO LABS, INC.

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Date Received: 01/30/88
Date Reported: 02/22/88

ENGINEERING SCIENCE

E.P. TOXICITY METALS

Nanco ID: 87-ES-5348 Customer ID: D 2.17

#	COMPOUNDS	RESULTS	UNITS	MCL
1M	ARSENIC	<0.050	MG/L	5.0
2M	BARIUM	0.572	MG/L	100
3M	CADMIUM	0.191	MG/L	1.0
4M	CHROMIUM	0.786	MG/L	5.0
5M	LEAD	2.810	MG/L	5.0
6M	MERCURY	<0.0002	MG/L	0.2
7M	SELENIUM	<0.075	MG/L	1.0
8M	SILVER	<0.010	MG/L	5.0

MCL = MAXIMUM CONTAMINATION LEVEL

DRILLING CONTRACTOR:
Driller: D. MILLER
Inspector: K. ISAKOWER
Rig Type: MOBILE 61
Drilling Method: HSA / CORE 4¼" ID / 2⅞

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME: CHISOLM-RYDER
PROJECT NO.: 5401Z.17

BORING NO.: GW-1 (2)
Sheet: 1 of
Location: NEAR HIGHLAND AVE. BY FENCE

GROUND WATER OBSERVATIONS

Water Level	13.0	13.0
Time	1530	0735
Date	12/15	12/17
Casing Depth	18.5	18.5

Weather:
Date/Time Start: 12/14/87 1430
Date/Time Finish: 12/16/87 0900

Plot Plan: HIGHLAND AVE; GW-1; N; RAIL SPUR; DRY STREAM

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL
0.0	0-2	S-1	2	BROWN SILT, SOME SAND,
	REC=1 6		3	TRACE GRAVEL
			4	
			5	
0	5-7	S-2	14	
	REC=1 10"		17	
			15	
			18	
				ANGER REFUSAL AT 8.5'
0.0	8.5-8.5	C-1		DARK GREY, FINE GRAINED
	REC=1 10'			DOLOMITE. SOME SECONDARY
	RQD: 23%			CALCITE DEPOSITS.
				CORING ENDS - 18.5'

WELL SCHEMATIC: CEMENT/BENTONITE GROUT; BENT. PELLETS; DOLOMITE; #4 Q-ROCK; 2" ID PVC #10 SLOT SCREEN; 7.0; 8.5; 9'; 18.5

Comments:

SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON

Soil Stratigraphy Summary: TILL TO 8.5' OVER DOLOMITE BEDROCK

DRILLING CONTRACTOR:
Driller: D MILLER
Inspector: K. ISAKOWER
Rig Type: MOBILE B1
Drilling Method: 4¼" ID HSA

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME: CHISOLM-RYDER
PROJECT NO.: 54012.17

BORING NO.: GW-2 (2)
Sheet: 1 of
Location: NEAR DRY STREAM BY FENCE

GROUND WATER OBSERVATIONS

Water Level	11		
Time	2:00		
Date	12/22		
Casing Depth	10'		

Weather: Fair
Date/Time Start: 12/16/87 2:00
Date/Time Finish: 12/23/87 9:00

Plot Plan: HIGHLAND AVE; GW2; DRY STREAM

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
2.0	0-2	S-1		BROWN SILT, TRACE SAND AND GRAVEL, AND SOME FILL (NON-SOIL) MATERIAL	Cement / Bentonite Grout; 2" ID PVC Riser	PHOTOVAC: 6.6 ppm in hole at 2' (0.2 ppm in breathing zone)
	REC ≈ 15		9			
			17			
			18			
2.0	5-7	S-2	9			5' - HOLE CROOKED. AUGER PULLED. RIG MOVED 5', NEW HOLE AUGERED
	REC ≈ 12		8			
			20			PHOTOVAC: 1.7 ppm off pulled auger at 5'
			17			
2.0	10-12	S-3	12		Bentonite Pellets; 2" ID PVC Riser	
	REC ≈ 7"		26/3"	2" - DOLOMITE BEDROCK Gray layered fine grained Dolomite small fractures		
	10-20'				Sand; 2" ID PVC #10 slot Screen	Photovac. 2.5 ppm at Water return pipe (0.0 in breathing zone)
	Rec - 18.2'					
	RQD - 10%					
				Coring Ends 20.0'		

SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Boil Stratigraphy Summary: Silty Till to 10' over Dolomite Bedrock

(2)

DRILLING CONTRACTOR:
Driller: D. Miller
Inspector: W.D. Lilley
Type: Mobile 61
Drilling Method: 4¼" IDHSA & NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME: Chisholm Ryder
PROJECT NO.: SY012.19

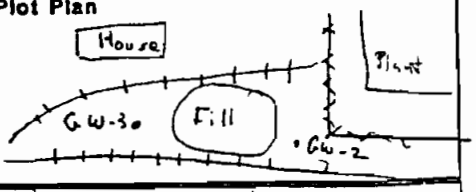
BORING NO.: GW-3
Sheet: 1 of 1
Location: West of Fill between RR tracks behind house.

GROUND WATER OBSERVATIONS

Water Level			
Time			
Date			
Casing Depth			

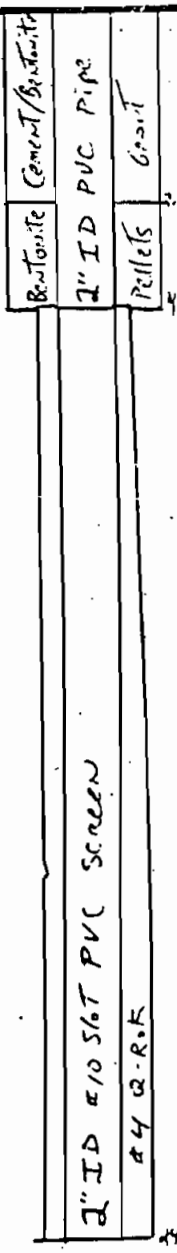
Weather: Cloudy
Date/Time Start: 12/22/87 2:00
Date/Time Finish: 1/12/88 11:00 am

Plot Plan



Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL
0.0	0-2	S-1	2	Brown Silt, Trace Fine sand.
	SS		3	Trace Fine Gravel (moist) (Stiff)
	Rec 14		3	
			5	
				4.5 Refusal
	4.5-14.5	C-1	RUN: 10.0	GRAY fine grained dolomite, moderately weathered, frequent horizontal fractures. Secondary calcite crystallization in solution pits. Becoming highly weathered at 19.5 feet.
			Rec 7.7	
			RQD = 31.1%	
	14.5-24.5	C-2	RUN: 10.0	
			Rec = 7.0	
			RQD = 72.2%	
				24.5'
				Coring ends at 24.5'

WELL SCHEMATIC



Comments

Refusal at 3' hole relocated 5' west.

Cored with water from municipal supply source at plant. Cored 4.5-24.5 feet. Reamed hole with 3 7/8" bit to 24.5 feet. Hole open to 24 feet at time of well installation.

ST - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

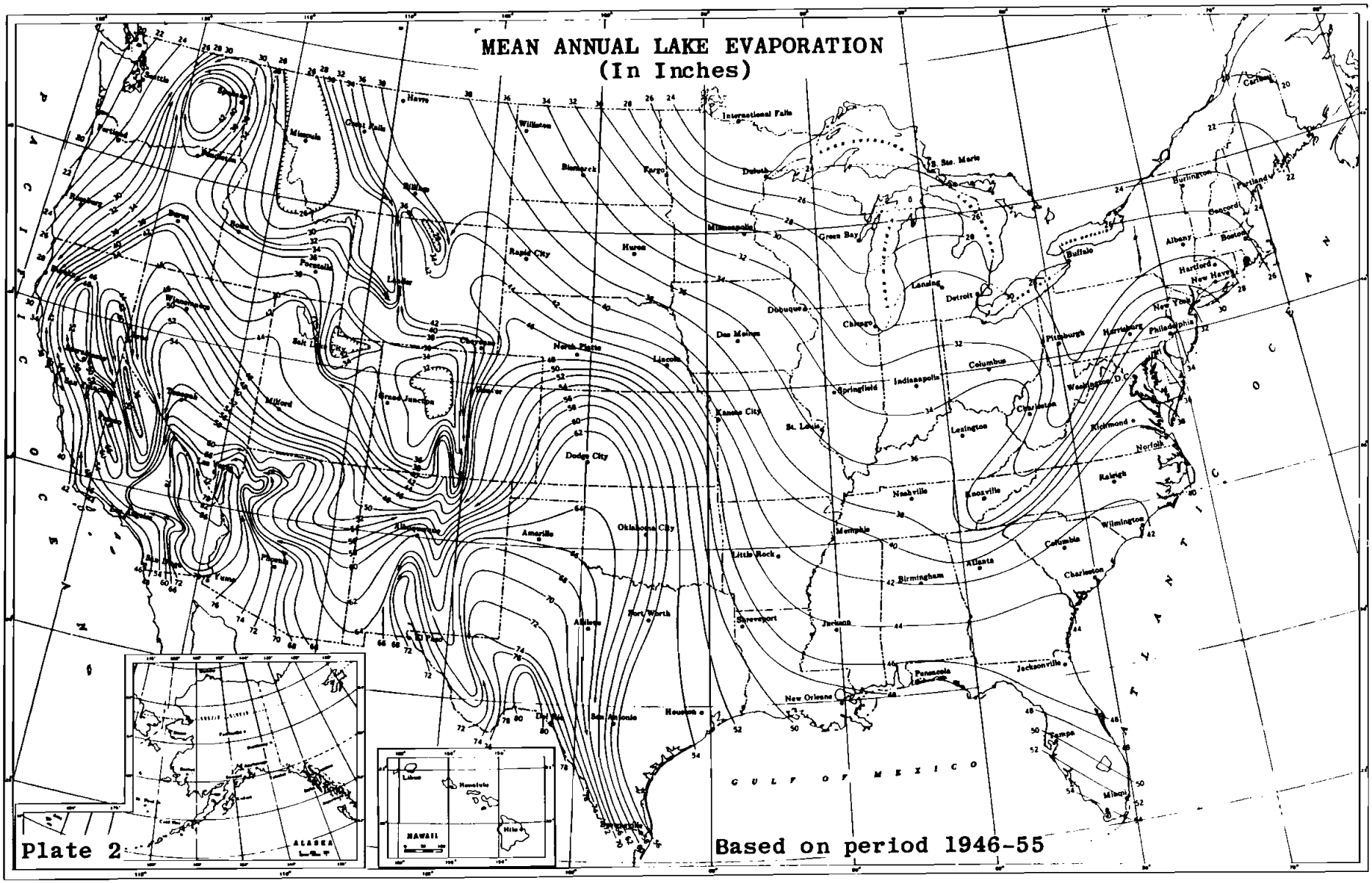
Soil Stratigraphy Summary

Table IV-2
Water Level Data
Chisholm-Ryder Site

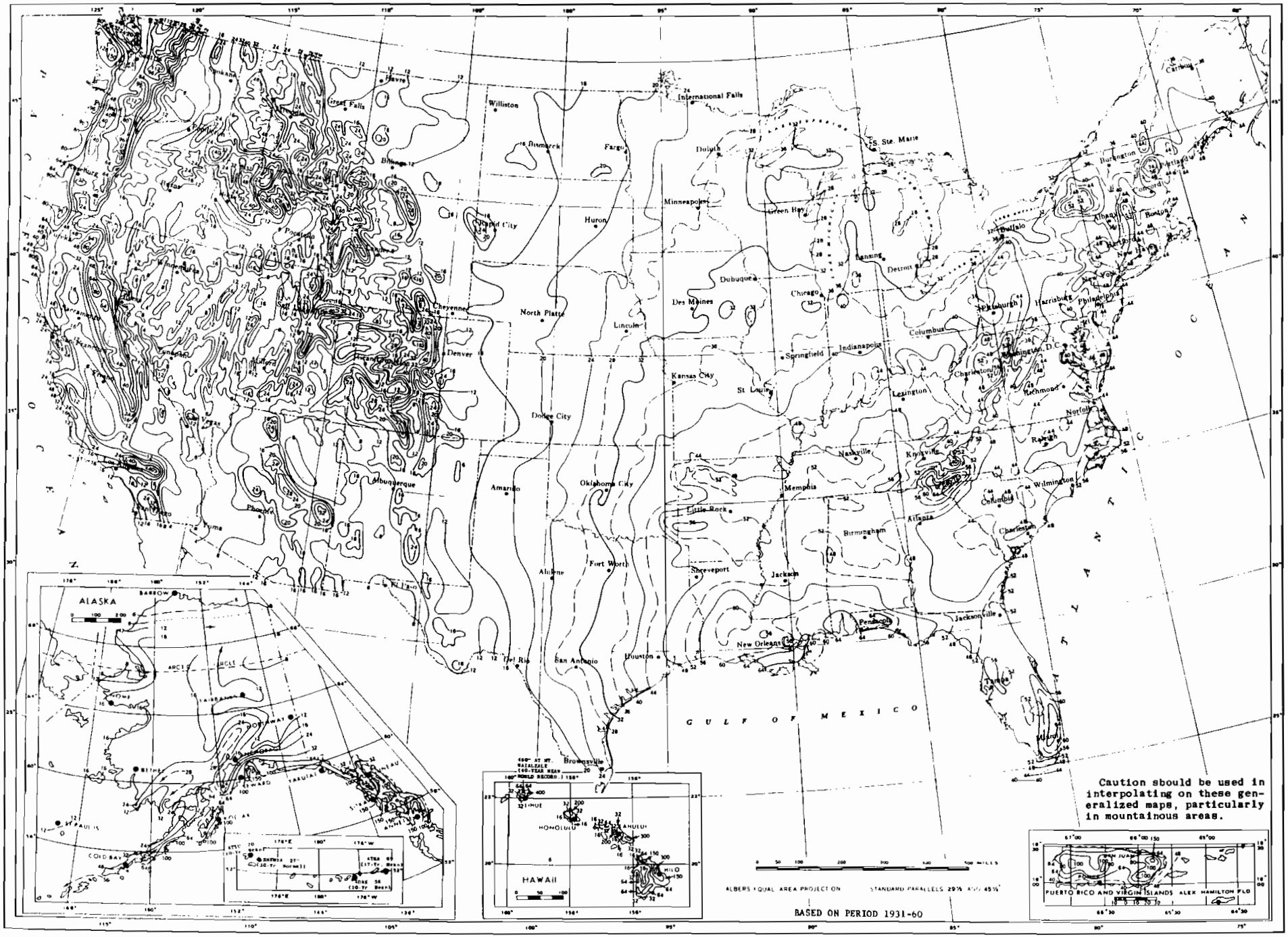
Well I.D.	Ground Surface Elevation (Feet*)	Top of PVC Well Pipe Elevation (Feet*)	Well Screen Interval Elevation (Feet*)	Water Level Data			
				Date: 2/17/88		Date: 1/29/88	
				Depth to Water Level (Feet**)	Water Level Elevation (Feet*)	Depth to Water Level (Feet**)	Water Level Elevation (Feet*)
GW-1	495.3	497.7	486.8-476.8	16.0	481.7	16.8	480.9
GW-2	494.5	497.1	484.5-474.5	14.9	482.2	15.5	481.6
GW-3	497.7	500.3	493.2-473.7	14.9	485.4	15.9	484.4

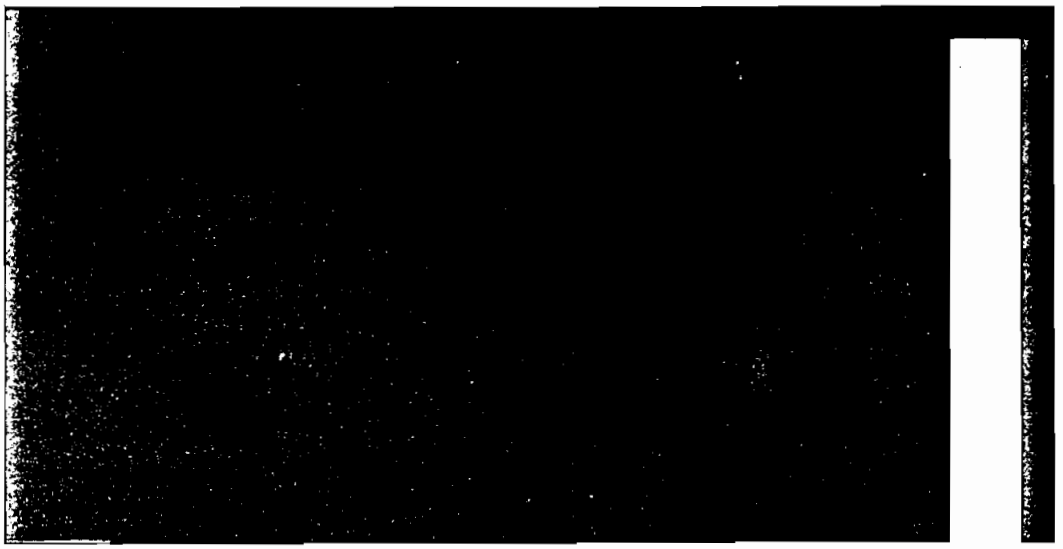
* Based on assumed on-site datum.

** Water level depth from top of PVC.


MEAN ANNUAL LAKE EVAPORATION
(In Inches)
Plate 2
Based on period 1946-55
ALASKA
HAWAII
GULF OF MEXICO
PACIFIC OCEAN
ATLANTIC OCEAN

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)





R. Allan Freeze

Department of Geological Sciences
University of British Columbia
Vancouver, British Columbia

John A. Cherry

Department of Earth Sciences
University of Waterloo
Waterloo, Ontario

GROUNDWATER

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

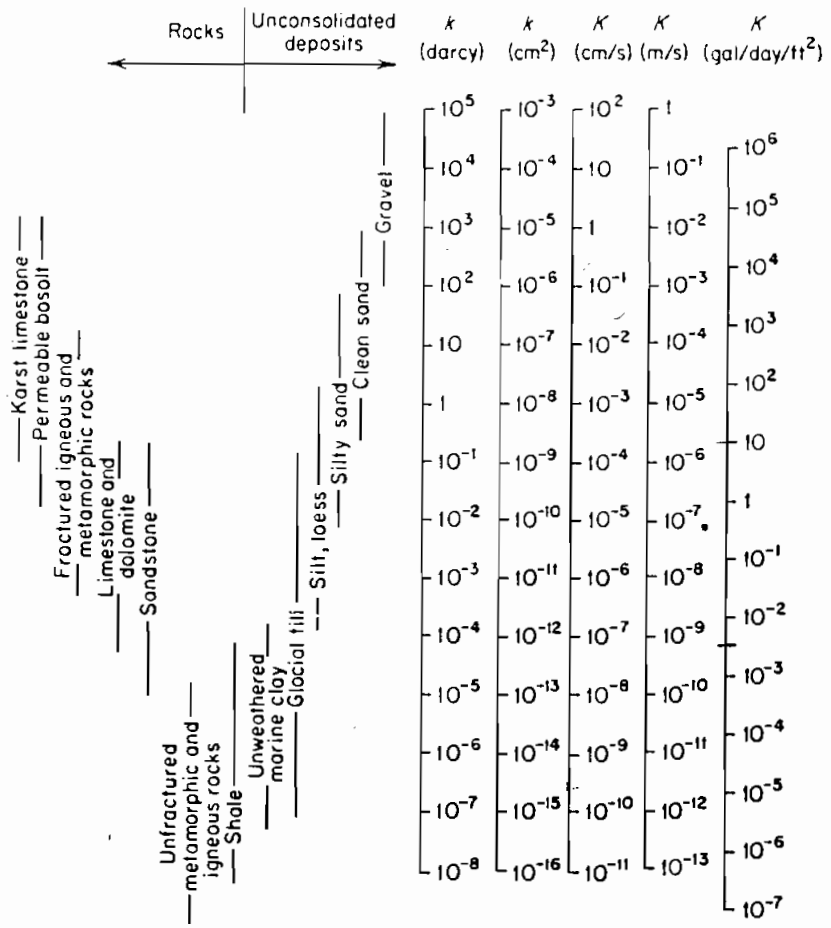


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, k*			Hydraulic conductivity, K		
	cm^2	ft^2	darcy	m/s	ft/s	gal/day/ft^2
cm^2	1	1.08×10^{-3}	1.01×10^{8}	9.80×10^{2}	3.22×10^{3}	1.85×10^{9}
ft^2	9.29×10^{2}	1	9.42×10^{10}	9.11×10^{5}	2.99×10^{6}	1.71×10^{12}
darcy	9.87×10^{-9}	1.06×10^{-11}	1	9.66×10^{-6}	3.17×10^{-5}	1.82×10^{1}
m/s	1.02×10^{-3}	1.10×10^{-6}	1.04×10^{5}	1	3.28	2.12×10^{6}
ft/s	3.11×10^{-4}	3.35×10^{-7}	3.15×10^{4}	3.05×10^{-1}	1	5.74×10^{5}
gal/day/ft^2	5.42×10^{-10}	5.83×10^{-13}	5.49×10^{-2}	4.72×10^{-7}	1.74×10^{-6}	1

*To obtain k in ft^2, multiply k in cm^2 by 1.08×10^{-3}.

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

(6)

CLASSIFICATION CODE: 2a REGION: 9 SITE CODE: 932009
EPA ID: NYD002106656

NAME OF SITE : Chisholm Ryder
STREET ADDRESS: College Avenue at Highland Avenue
TOWN/CITY: COUNTY: ZIP:
Niagara Falls Niagara

SITE TYPE: Open Dump-X Structure- Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: 2 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Chisholm Ryder Co. Inc.
CURRENT OWNER ADDRESS.: 3800 Highland Ave., Niagara Falls, NY
OWNER(S) DURING USE...: Chisholm Ryder Company, Inc.
OPERATOR DURING USE...:
OPERATOR ADDRESS.....:
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From Unknown To Unknown

SITE DESCRIPTION:
This site has been used for the disposal of oil and absorbent floor sweepings. The sweepings were generally deposited in drums and fibrepacks. Ash and cinders from a former coal fired boiler and other rubble were deposited on this site. The cover is poor and overgrown with weeds and brush. The USGS sampled this site in 1982 & 83, taking 3 test borings. The heavy metal analysis shows zinc above background levels. Fourteen of the organic priority pollutants were detected, all at relatively low concentrations. Also, some unknown hydrocarbons were detected. A Phase I state superfund investigation was completed in June of 1985. A Phase II investigation for this site is underway.

HAZARDOUS WASTE DISPOSED: TYPE	Confirmed-X	Suspected- QUANTITY (units)
Ash and Cinders		Unknown
Rubble		
Grease & Oil		
Metal Turnings		
Water Soluble Coolant		
Hydrocarbons		

(6)

ANALYTICAL DATA AVAILABLE:
Air- Surface Water- Groundwater- Soil-X Sediment- None-X

CONTRAVENTION OF STANDARDS:
Groundwater- Drinking Water- Surface Water- Air-

LEGAL ACTION:

TYPE..: None State- Federal-
STATUS: Negotiation in Progress- Order Signed-

REMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-
NATURE OF ACTION: None

GEOTECHNICAL INFORMATION:
SOIL TYPE: Topsoil/Silty clay with some gravel
GROUNDWATER DEPTH: Unknown

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

There is a potential for gradual migration of contaminants from the site. Further investigation is warranted.

ASSESSMENT OF HEALTH PROBLEMS:

Medium	Contaminants Available	Migration Potential	Potentially Exposed Population	Need for Investigation
Air	Likely	Highly Likely	Yes	High
Surface Soil	Likely	Highly Likely	Yes	High
Groundwater	Likely	Unlikely	Yes	Medium
Surface Water	Likely	Highly Likely	Yes	High

Health Department Site Inspection Date : 7/85

MUNICIPAL WASTE ID: 32-S-09

Chisholm-Ryder

(7)

PRELIMINARY INVESTIGATION AND PROFILE REPORTS FOR TWENTY-SIX SUSPECTED INDUSTRIAL DISPOSAL SITES IN NIAGARA COUNTY, NEW YORK.

PREPARED BY

NIAGARA COUNTY HEALTH DEPARTMENT
10TH & E. FALLS STREETS
NIAGARA FALLS, NEW YORK 14302

MARCH, 1982

NAME

CHISHOLM - RYDER (DEC #932009)

LOCATION

The Chisholm - Ryder Plant is located on the northwest corner of College Avenue and Highland Avenue in Niagara Falls, NY. The suspected disposal site is a three acre area located north of the plant fence along the west side of the railroad siding.

OWNERSHIP

The property is owned by the Chisholm - Ryder Co., Inc., College Avenue at Highland Avenue, Niagara Falls,NY 14305. Correspondence should be sent to the attention of Mr. William Socha, Plant Manager.

HISTORY

The Chisholm - Ryder Plant manufactures agricultural harvesting equipment. Company officials report that Chisholm - Ryder does not or has not operated a disposal site either on or off-site.

An area north of the plant area was filled at an unknown time, possibly prior to 1960. The area was reportedly filled with building materials, stone and clay. A. Cerrone, Inc. of 4625 Witmer Road was the contractor. According to a Chisholm - Ryder employee, this project was undertaken to protect the railroad siding from flooding.

Since this time, the area has apparently been used for informal dumping of waste materials.. Several 55 gallon drums filled with ash and similiar materials are visible in this area. A 50 pound fibre pack labeled "copper cyanide" was found here in 1979. The pack was then removed by the company for reuse.

An inspection of this site was made on March 1, 1982 by Health Department personnel. At this time the only signs of waste disposal were the exposed drums and scattered refuse mentioned above. The fill deposited by A. Cerrone, Inc. showed no visible sign of contamination and was covered with grass and sparce brush. According to Mr. Edward Marric of Chisholm - Ryder the exposed material has been there for atleast nine years and that no material has been dumped there to his knowledge during this period.

EXAMINATION OF AERIAL PHOTOGRAPHS

A review of USDA aerial photography taken in 1958, 1966 and 1978 shows no evidence of any disposal activities or major changes in the land form in this area.

RESULTS OF PREVIOUS SAMPLING

There is no record of any previous sampling being done at this location.

SOILS/GEOLOGY

A detailed soil survey for the area is unavailable. The filled area is suspected to contain a large percentage of rubble, stone and other coarse material. There is no available boring data from this area.

Reportedly the filled area was originally a low swampy area. Local flooding may have occurred prior to filling.

The bedrock is expected to be Lockport Dolomite. The depth to the Dolomite is unknown.

GROUNDWATER

The depth to groundwater and the direction of flow have not been determined. The general flow pattern for this region suggests that groundwater may flow southwest to west into the lower river gorge.

The nearest known drinking water wells are about one mile northeast of the site. Public water is available throughout a three mile radius. It is not known if any industrial wells are located in this area.

SURFACE WATER

The nearest surface water is the Niagara River, 3,000 feet northwest of the site. There are no drinking water intakes within three miles downstream of this location.

The landfill area is not believed to be susceptible to flooding. There are no wetlands within one mile.

AIR

The nearest residence is estimated to be 200 feet from the filled area. Approximately 3,000 people are estimated as living within a one mile radius. The area to the east and southeast is industrial. The areas north and northeast of the site are residential.

The potential for air emissions is assumed to be small provided the wastes present are the types described by the Inter Agency Task Force.

FIRE AND EXPLOSION

The potential for fire or explosion is unknown. The nearest building is the Chisholm - Ryder Plant, 100 feet away. Over 10,000 people and several thousand buildings are located within a two mile radius.

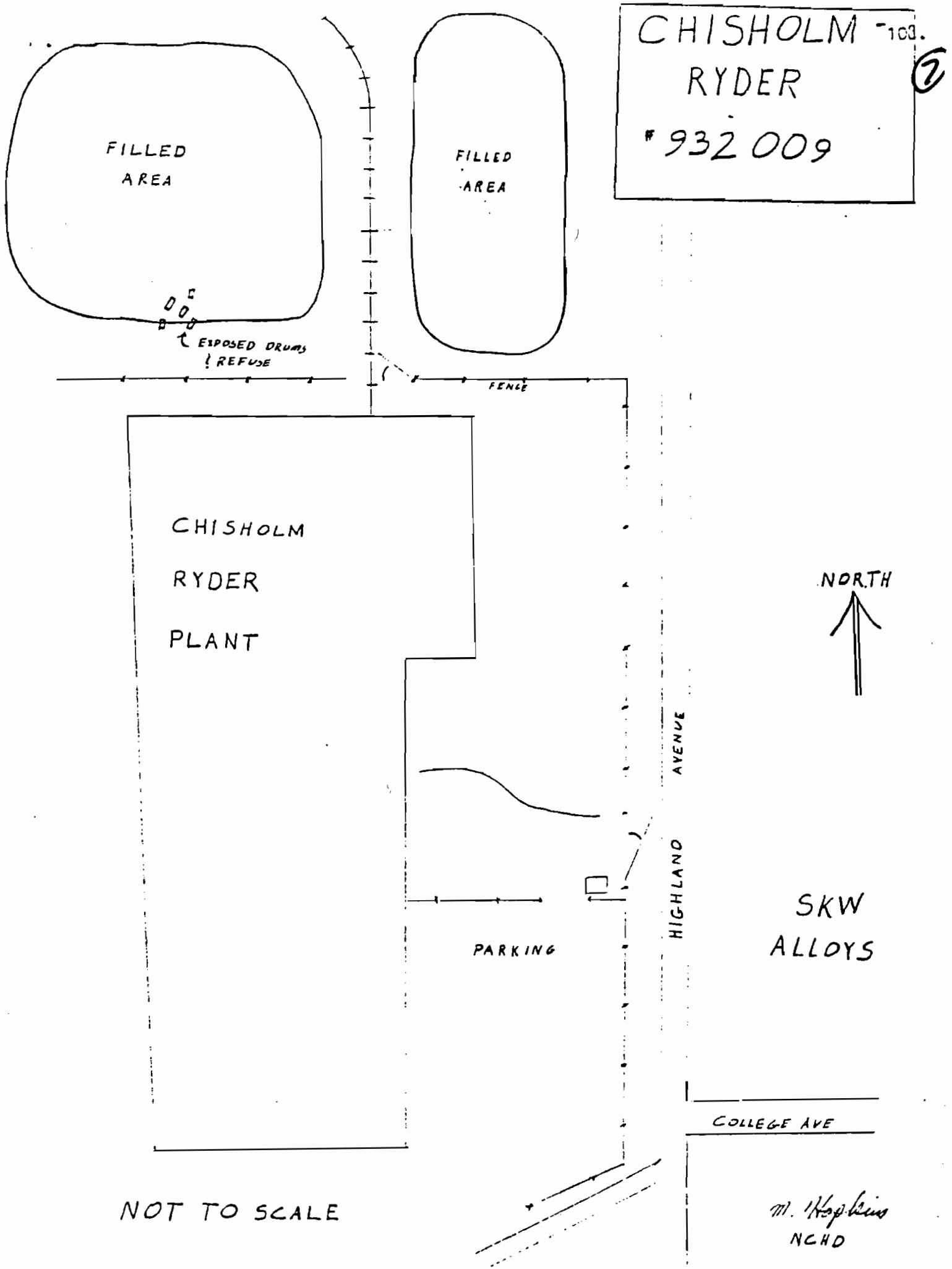
DIRECT CONTACT

Access to this site is not restricted by fences or other means. Some waste materials are exposed.

CONCLUSIONS

Sampling and observation holes are needed to verify that the mounded area contains only clean fill. Access for drilling equipment may be difficult.

The exposed drums and refuse should be removed.


CHISHOLM -103.
RYDER
#932009
FILLED AREA
FILLED AREA
EXPOSED DRUMS & REFUSE
FENCE
CHISHOLM RYDER PLANT
NORTH
HIGHLAND AVENUE
PARKING
SKW ALLOYS
COLLEGE AVE
NOT TO SCALE
M. Hopkins
NCHD

Gary Christopher (8)

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

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

United States
Environmental Protection
Agency

1984

TABLE 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

(9)

ES ENGINEERING-SCIENCE
INTERVIEW FORM

Interviewee/Code Paul Dicky /

Title-Position Niagara County Department of Health

Address Main Post Office Box 428 10th & E. Falls St.

City Niagara Falls State NY Zip 14302

Phone (716) 284-3124 Residence Period ____ to ____

Location Niagara Falls Interviewer George Moreau

Date/Time August 24 88'/ 3:45 pm

Subject: Chisholm-Ryder site - Groundwater Use

Remarks:

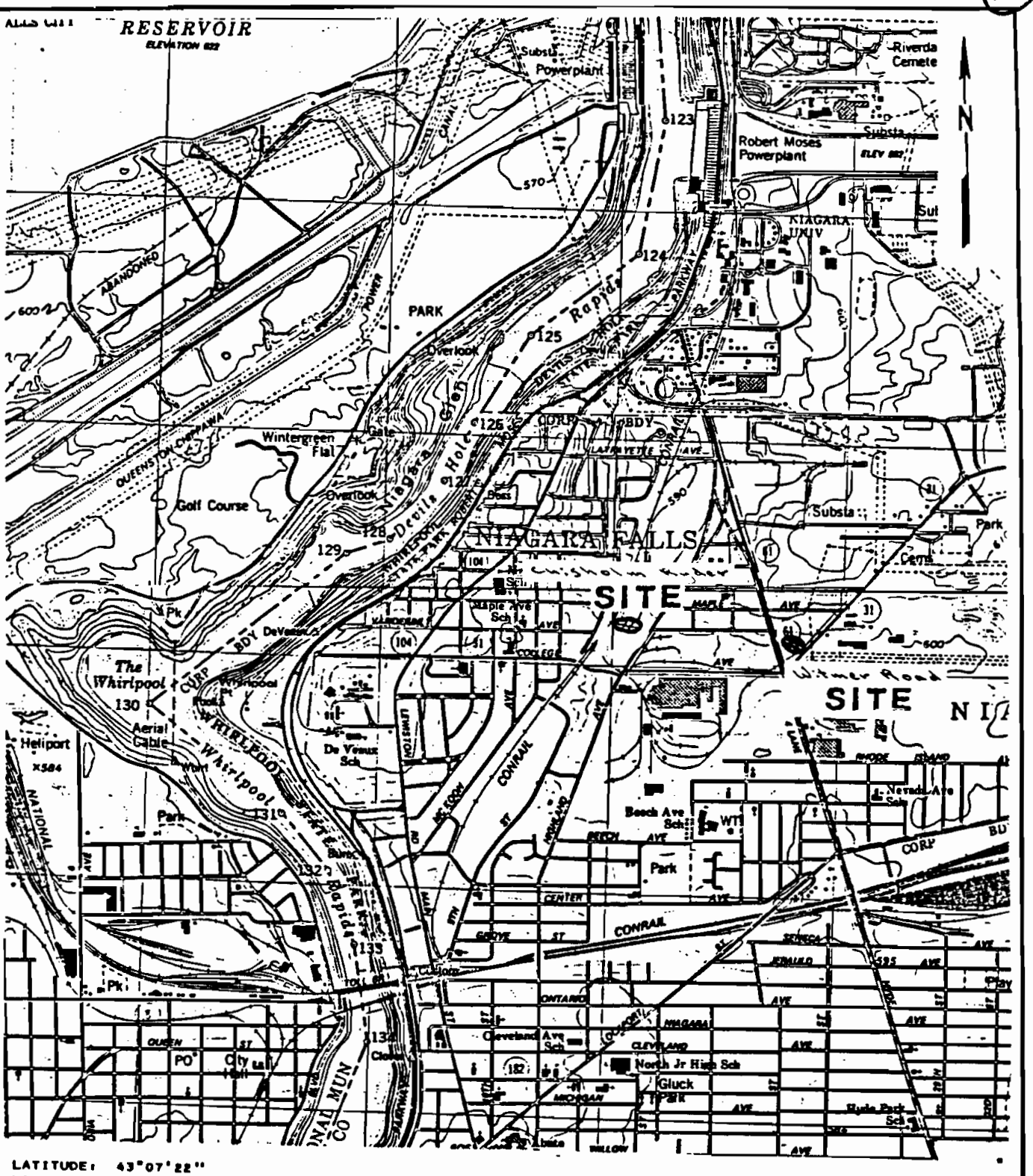
- The homes on Pensylvania Ave ~~and Delaware Ave~~ which previously were on private wells are now connected to the municipal supply.
- The nearest well drawing from the Aquifer of concern ~~is the~~ Olin Chemical company cooling process well (non-contact) which ~~is located about 2.7 miles from the Chisholm-Ryder site.~~ ARE TWO HOMES ON DELAWARE AVE. which ARE located Approximately 3200 FEET EAST FROM THE CHISHOLM-Ryder Site. THESE HOMES ARE ANTICIPATED TO BE HOOKED INTO THE MUNICIPAL water system IN the near future.

I agree with the above summary of the interview: Paul Dicky

Signature: ____

Comments: ____

REF. (10)



LATITUDE: 43°07'22"
LONGITUDE: 79°02'41"

SCALE
0 1000 2000 3000 4000 FEET

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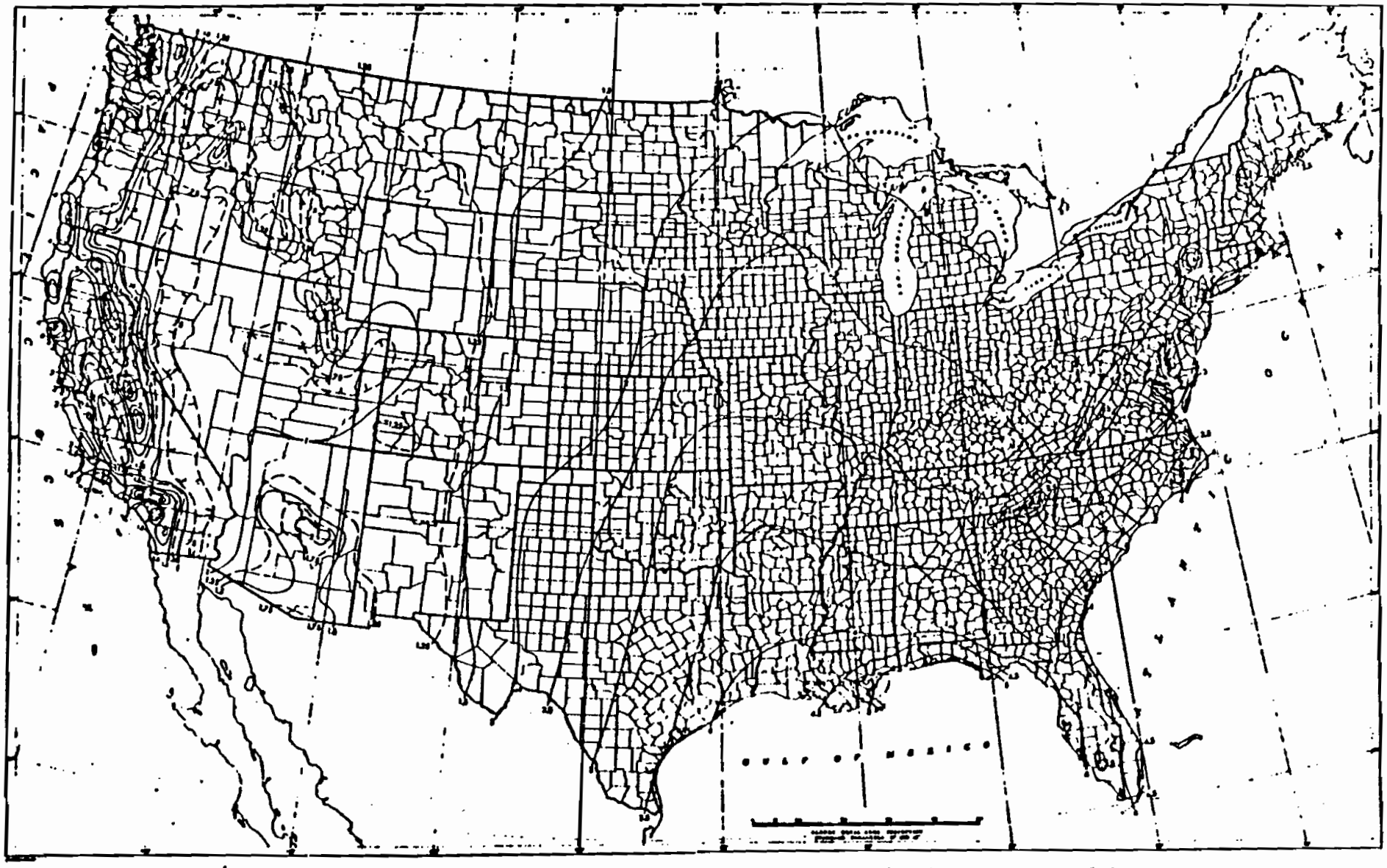
IN ASSOCIATION WITH
DAMES & MOORE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE I REPORT

SITE LOCATION MAP
CHISHOLM RYDER

FIGURE I-1

REFERENCE: U.S.G.S. 7.5' Topographic Map
Niagara Falls, NY-ONT. (1980) and
Lewiston, NY-ONT. (1980) Quadrangles



Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

FIGURE 8
1-YEAR 24-HOUR RAINFALL
(INCHES)

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE
DEPARTMENT OF HEALTH

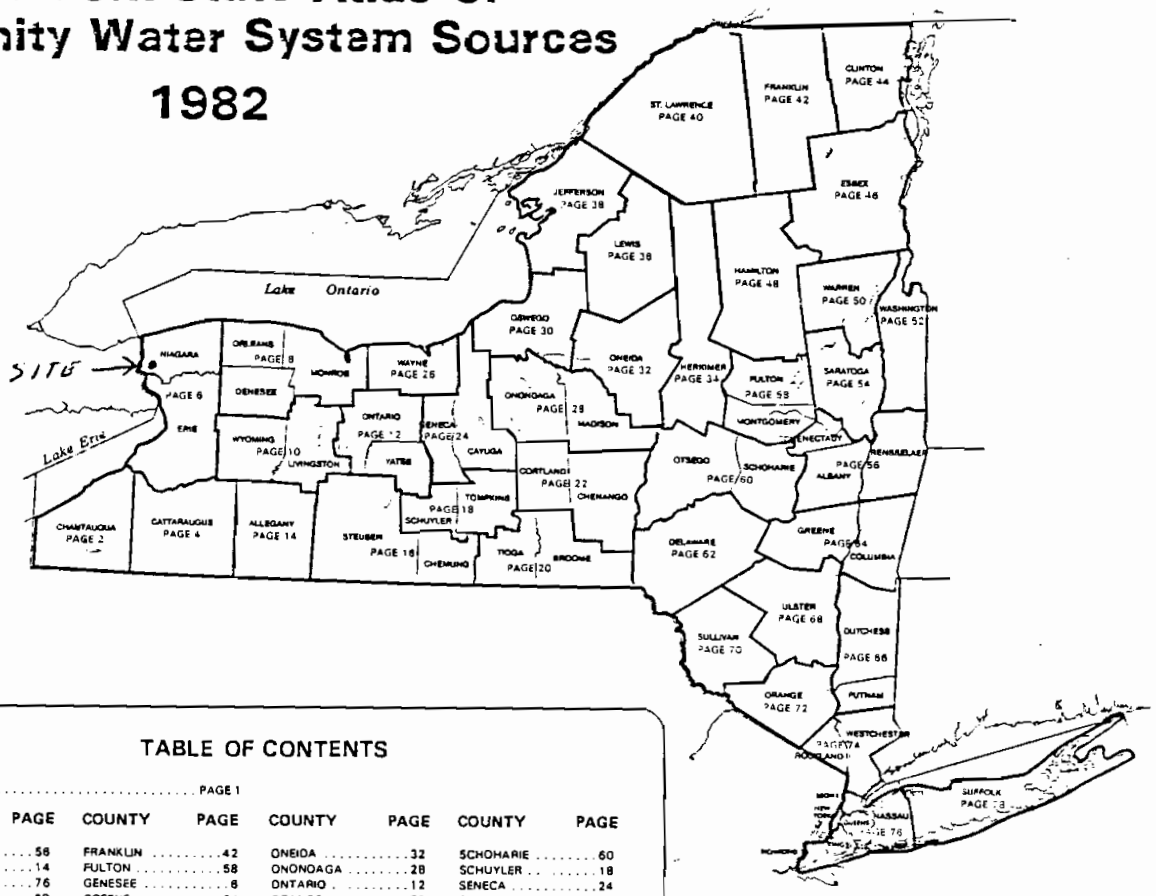


TABLE OF CONTENTS

LEGEND

BOUNDARIES AND PLACES

International
State
County
Town
Indian Reservation
City
Village
Unincorporated Place
Federal Reservation
Built-up Area (Over 25,000 population including any contiguous city or village)

CLASSIFICATION OF POPULATED PLACES

100,000 or more ..... YONKERS
50,000 to 100,000 ..... Levittown
12,500 to 50,000 ..... Poughkeepsie
2,500 to 12,500 ..... Hampton Bays
250 to 2,500 .....
250 or less .....

TRANSPORTATION

Highways
Divided Highways
Full Control of Access
Partial or No Control of Access
Undivided Highway
Interchange
Touring Route (State, U.S., Interstate) or State Parkway
Touring Route Markers
State; U.S.; Interstate

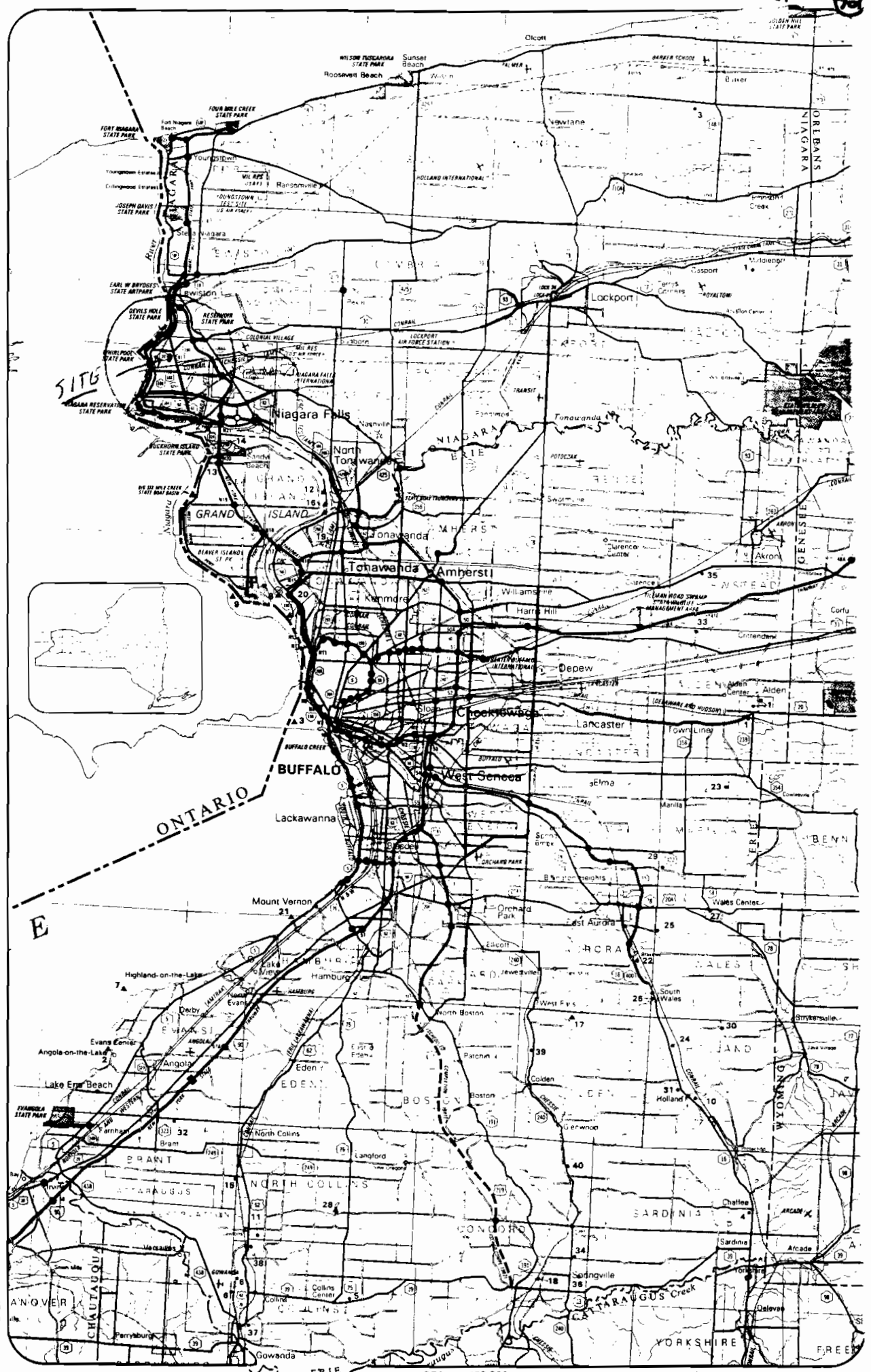
Railroads
Operating Line
Service Discontinued
Operator
Owner (If Other than Operator)
Company Having Trackage Rights

Airports (Open to the Public, Military)
Runway under 4000'
Runway over 4000'

Rest Areas
Food, Gas, Rest Rooms
Rest Rooms
Gas, Rest Rooms
Parking Only

RECREATION FACILITIES

State or National Recreation Area
State Campground
State Boat Launching Site
State Canal Park
State Fish Hatchery
Other State Recreation Site



SCALE 1:250,000

ERIE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
	Akron Village (See No 1 Wyoming Co, Page 10).	3640	
1	Alden Village.	3460.	.Wells
2	Angola Village.	8500.	.Lake Erie
3	Buffalo City Division of Water.	357870.	.Lake Erie
4	Caffee Water Company.	210.	.Wells
5	Collins Water District #3.	704.	.Wells
6	Collins Water Districts #1 and #2.	1384.	.Wells
7	Erie County Water Authority (Sturgeon Point Intake).	375000.	.Lake Erie
8	Erie County Water Authority (Van DeWater Intake).	NA.	.Niagara River - East Branch
9	Grand Island Water District #2.	9390.	.Niagara River
10	Holland Water District.	1670.	.Wells
11	Lawtons Water Company.	138.	.Wells
12	Lockport City (Niagara Co).		Niagara River - East Branch
13	Niagara County Water District (Niagara Co).		Niagara River - West Branch
14	Niagara Falls City (Niagara Co).		.Niagara River - West Branch
15	North Collins Village.	1500.	.Wells
16	North Tonawanda City (Niagara Co).		.Niagara River - West Branch
17	Orchard Park Village.	3671.	.Pipe Creek Reservoir
18	Springville Village.	4169.	.Wells
19	Tonawanda City.	18538.	.Niagara River - East Branch
20	Tonawanda Water District #1.	91269.	.Niagara River
21	Wanakah Water Company.	10750.	.Lake Erie
Non Municipal Community			
22	Aurura Mobile Park.	125.	.Wells
23	Bush Gardens Mobile Home Park.	270.	.Wells
24	Circle B Trailer Court.	50.	.Wells
25	Circle Court Mobile Park.	125.	.Wells
26	Creekside Mobile Home Park.	120.	.Wells
27	Donnelly's Mobile Home Court.	99.	.Wells
28	Gowanda State Hospital.	NA.	.Clear Lake
29	Hillside Estates.	160.	.Wells
30	Hunters Creek Mobile Home Park.	150.	.Wells
31	Knox Apartments.	NA.	.Wells
32	Maple Grove Trailer Court.	72.	.Wells
33	Millgrove Mobile Park.	100.	.Wells
34	Perkins Trailer Park.	75.	.Wells
35	Quarry Hill Estates.	400.	.Wells
36	Springville Mobile Park.	114.	.Wells
37	Springwood Mobile Village.	132.	.Wells
38	Taylors Grove Trailer Park.	39.	.Wells
39	Valley View Mobile Court.	42.	.Wells
40	Villager Apartments.	NA.	.Wells

NIAGARA COUNTY

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

Chisholm Ryder (13)

New York State Department of Environmental Conservation
FISH AND WILDLIFE DIVISION - REGION 9
600 Delaware Avenue, Buffalo, New York 14202-1073
(716) 847-4550

Thomas C. Jorling
Commissioner

September 2, 1987

Ms. Elizabeth M. Dobson
Engineering-Science
290 Elwood Davis Road
Liverpool, New York 13088

Dear Ms. Dobson:

This letter will serve as verification that I traced NYS designated wetland boundaries on the accompanying maps. The boundaries shown are from official Department of Environmental Conservation Maps promulgated on September 10, 1986 (Erie County) and December 5, 1984 (Niagara County).

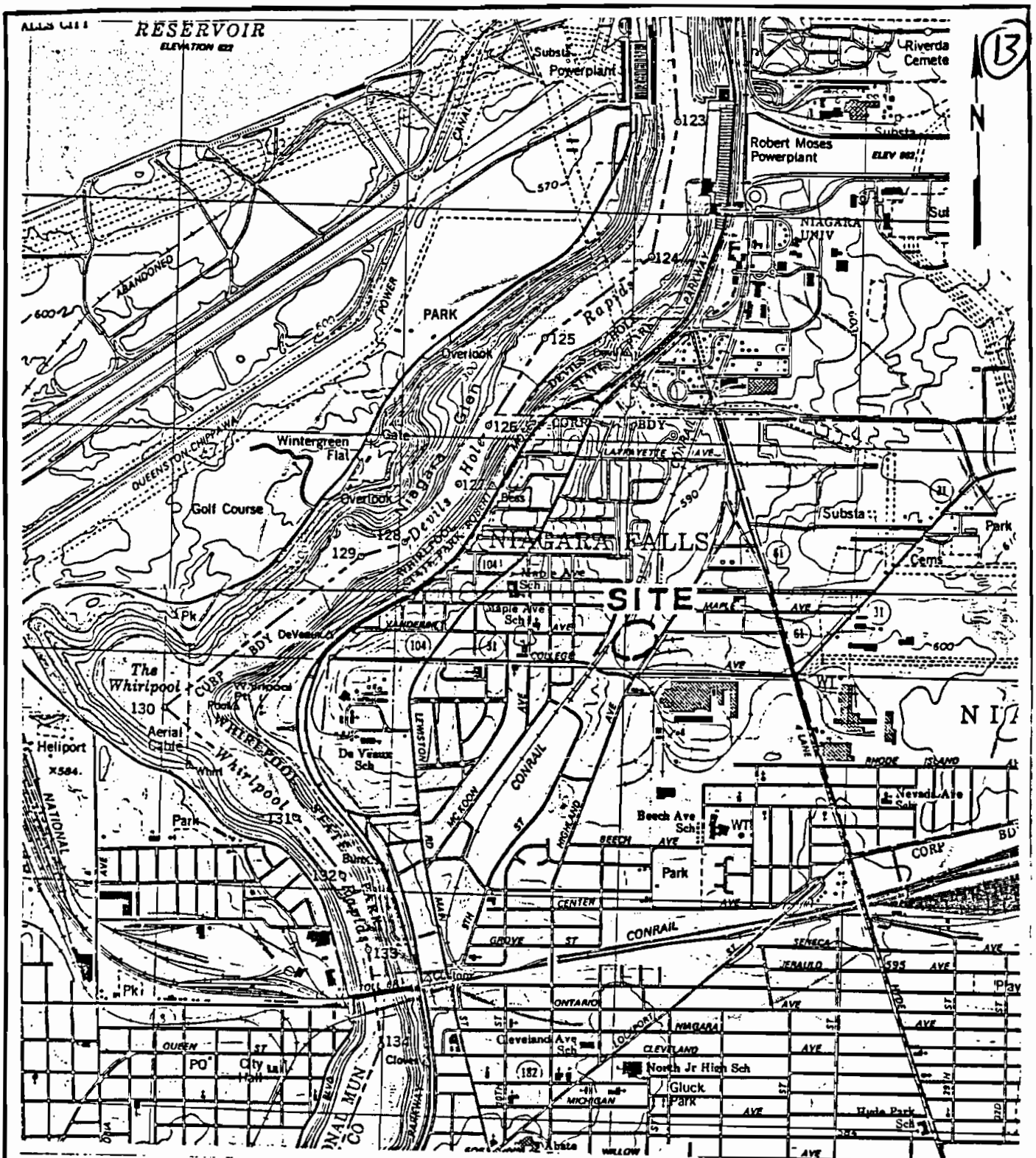
Very truly yours,

James F. Farquhar III
Fish and Wildlife Division

JFF:slm

cc: Mr. Gordon R. Batcheller

Enclosures



LATITUDE: 43°07'22"
LONGITUDE: 79°02'41"

Niagra County

SCALE
0 1000 2000 3000 4000 FEET

ENGINEERING-SCIENCE, INC.
IN ASSOCIATION WITH
DAMES & MOORE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE I REPORT

SITE LOCATION MAP
CHISHOLM RYDER

REFERENCE: U.S.G.S. 7.5' Topographic Map
Niagara Falls, NY-ONT. (1980) and
Lewiston, NY-ONT. (1979) Quadrangles

(4)

INTERVIEW FORM

INTERVIEWEE/CODE John W. Ozard /

TITLE - POSITION Senior Wildlife Biologist

ADDRESS WRC New York State DEC

CITY Delmar STATE NY ZIP 12054

PHONE (518) 439-7488 . RESIDENCE PERIOD ____ TO ____

LOCATION phone conversation INTERVIEWER W. Bradford

DATE/TIME 4/14/88 / 11:00 AM

SUBJECT: Critical habitats in New York state.

REMARKS: There are no federally designated critical habitats of endangered species located within New York state.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW: John W. Ozard

SIGNATURE: John W. OZARD

COMMENTS:

US CENSUS DATA, 1980

US Census Data used in the HRS scoring was obtained from various County Planning Offices. This data was not obtained from a report. The raw census data combined with County Planning Maps was used to estimate the population within 1, 2, 3, and 4 miles of the Phase II site being investigated. Because of the voluminous amount of data used, the data are not provided.

(16)

NATIONAL REGISTER OF HISTORIC PLACES

ANNUAL LISTING OF PROPERTIES

JANUARY 1979 THROUGH DECEMBER 1982

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

JULY 1983

(17)

federal register

Tuesday
March 1, 1983

Part III

Department of the Interior

National Park Service

National Registry of Natural Landmarks

United States
Environmental Protection
Agency

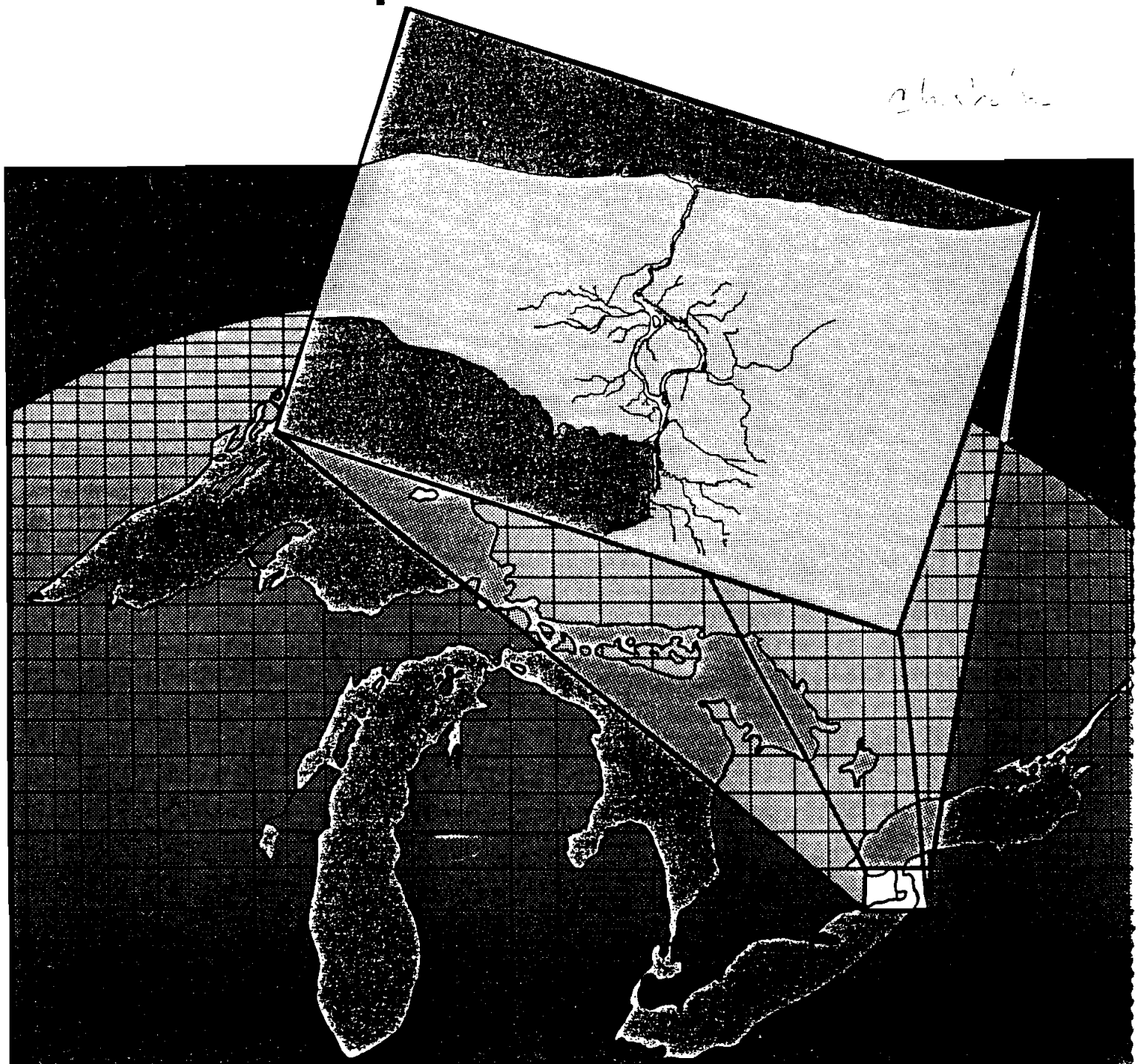
Great Lakes National
Program Office
536 South Clark Street
Chicago, Illinois 60605

EPA-905/4-85-001
March 1985

(18)

EPA

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



(18)

Geologic information.--The site consists of fill overlying a veneer of ground-moraine material that overlies bedrock of Lockport Dolomite. The U.S. Geological Survey drilled three test holes on the site in 1982; the locations are shown in figure C-6. The geologic logs are as follows:

Boring no.	Depth (ft)	Description
1	0 - 1.5	Black organic soil.
	1.5 - 2.0	Same, impenetrable materials, possibly bedrock at 2 ft.
		SAMPLE: 2 ft.
2	0 - 3.5	Reddish brown topsoil.
	3.5 - 5.0	Silt (?), tan, friable, some gravel, dry, sandy.
	5.0 - 6.5	Silt or clay, reddish, dry, some gravel.
	6.5 - 8.5	Same, impenetrable material, possibly bedrock at 8.5 ft.
		SAMPLE: 8.5 ft.
3	0 - 1.0	Black organic topsoil.
	1.0 - 5.0	Clay, sandy, reddish, gravelly.
		SAMPLE: 5 ft.

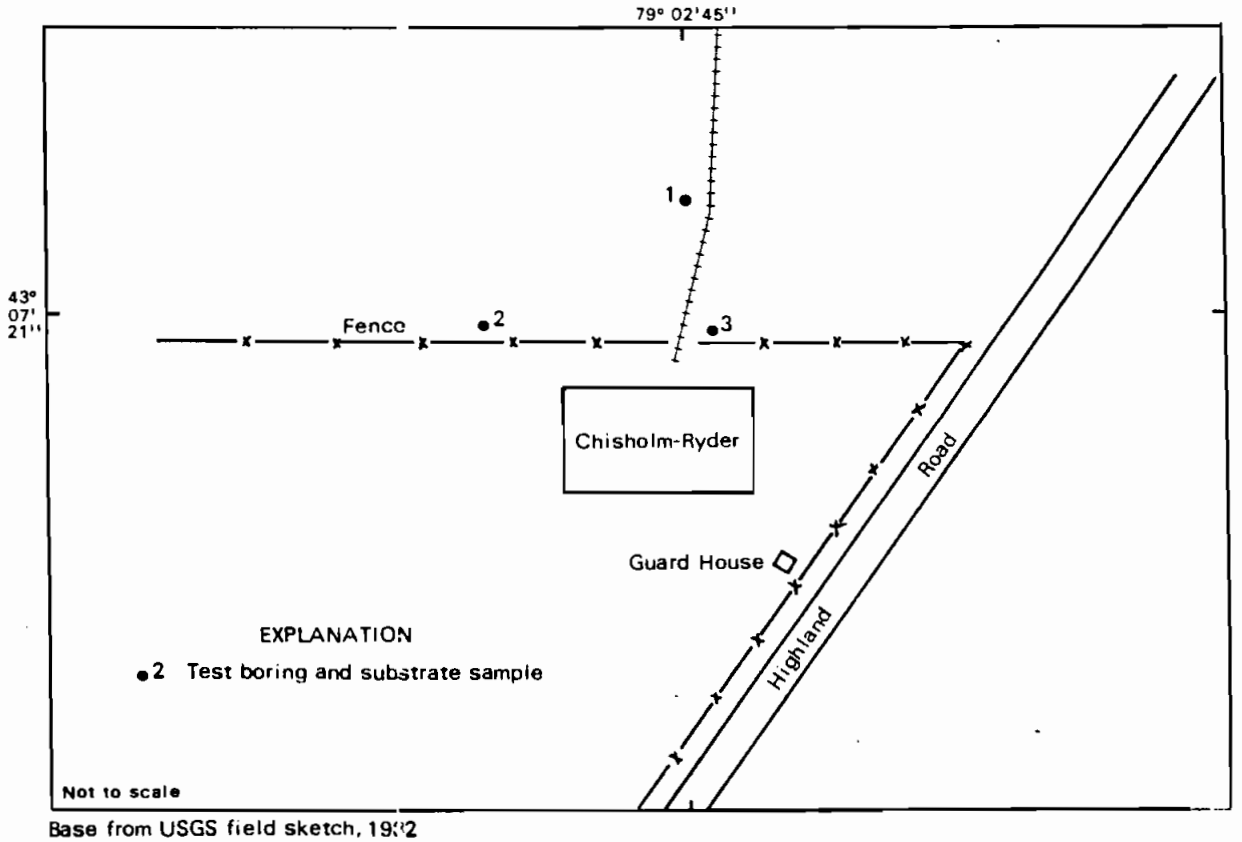


Figure C-6. Location of sampling holes at Chisholm Ryder, site 11, Niagara Falls.

Hydrologic information.--Ground water was not encountered and is probably confined to fractures in the underlying bedrock.

Chemical information.--The U.S. Geological Survey collected three soil samples for cadmium, chromium, copper, iron, lead, mercury, zinc, and organic-compound analyses; results are shown in table C-5. The concentrations of zinc in samples 2 and 3 are substantially higher than in samples collected in undisturbed soils not affected by hazardous-waste-disposal practices. The samples contained 14 organic priority pollutants, 15 organic nonpriority pollutants, and some unknown hydrocarbons.

Table C-5.--Analyses of substrate samples from Chisholm Ryder, site 11, Niagara Falls, N.Y.
[Locations shown in fig. C-6. Concentrations are in µg/kg; dashes indicate that constituent or compound was not found, LT indicates it was found but below the quantifiable detection limit.]

	Sample number and depth below land surface (ft)		
	1	2	3
First sampling (06-30-82)	(2.0)	(8.5)	(5.0)
Inorganic constituents			
Cadmium	1,000	2,000	2,000
Chromium	10,000	2,000	3,000
Copper	5,000	3,000	12,000
Iron	13,000	26,000	1,500,000
Lead	10,000	20,000	50
Mercury	--	--	--
Zinc	2,000	200,000†	220,000†
	Sample number and depth below land surface (ft)		
	1A	2A	3A
Second sampling (05-25-83)	(2.0)	(8.5)	(5.0)
Organic compounds			
Priority pollutants			
Toluene	--	--	3.3**
Trichloroethene	--	--	4.8**
Phenol	--	--	*
Fluoranthene	*	*	*

[1] Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semiquantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analysts.

† Exceeds concentrations in samples taken from undisturbed soils in the Niagara Falls area. Undisturbed soils not analyzed for iron.

* Compounds detected but not quantified; holding time exceeded before GC/MS acid- and base-neutral extractable compounds were extracted.

** Surrogate recoveries were outside the acceptance limits.

19

Dangerous Properties of Industrial Materials

Sixth Edition

N. Irving Sax

(19)

Z

ZAMIA DEBILIS

NIOSH #: ZG 4600000

Dried, ground-up zamia tubers were used (85CVA2 5,197,70)

TOXICITY DATA: 3 CODEN:
orl-rat TDLo:650 gm/kg/77W-C:ETA 85CVA2 5,197,70

THR: An exper ETA.

ZEARALENONE

CAS RN: 17924924 NIOSH #: DM 2550000
mf: $C_{18}H_{22}O_5$; mw: 318.40

l-form: crystals. mp: 164°-165°. sol in aqu alkali, ether, benzene, alc; almost insol in water. dl-form: crystals. mp: 187°-189°.

SYNS:
6-(10-HYDROXY-6-OXO-TRANS-1-UNDECENYL)-BETA-RESORCYCLIC ACID-N-LACTONE
NCI-C50226

TOXICITY DATA: 3 CODEN:
dnr-bcs 2500 mg/L IRLCDZ 7,204,79
skn-gpg 50 mg/24H SEV JANCA2 57,1121,74
mrc-bcs 100 ug/disc CNREA8 36,445,76
orl-rat TDLo:10 mg/kg (6-15D preg) BECTA6 15,678,76
orl-rat TDLo:100 mg/kg (6-15D preg) BECTA6 15,678,76

Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. Reported in EPA TSCA Inventory, 1980.

THR: SEV skn irr in gpg. An exper TER. MUT data. Possible CARC.

ZETAR EMULSION

A shampoo containing coal tar derivatives (TOLED5 3,325,79)

NIOSH #: ZG 7250000

SYN: ZET

TOXICITY DATA: CODEN:
mma-sat 10 ug/plate TOLED5 3,325,79

THR: MUT data.

ZINC

CAS RN: 7440-66-6 NIOSH #: ZG 8600000
af: Zn; aw: 65.37

Bluish-white, lustrous metal. mp: 419.8°; bp: 908°; d: 7.14 @ 25°; vap. press: 1 mm @ 487°.

SYNS:
BLUE POWDER
C.I. 77945
C.I. PIGMENT BLACK 16
GRANULAR ZINC
ZINC DUST
ZINC POWDER

SKIN AND EYE IRRITATION DATA: 2 CODEN:
skn-hmn 300 ug/3D-I:MLD 85DKA8 -,127,77

TOXICITY DATA: CODEN:
ihl-hmn TCLo:124 mg/M³/50M:PUL AHYGAJ 72,358,10

Toxicology Review: QURBAW 7(1),75,74; ADTEAS 5,51,72; FOREAE 7,313,42; KOTTAM 11(11),1300,7; AMTODM 3,209,77.

"NIOSH Manual of Analytical Methods" VOL 5 173# NIAMAM*. Reported in EPA TSCA Inventory, 1980. Meets Criteria for Proposed OSHA Medical Records Rule FEREAC 47,30420,82.

THR: A hmn skn irr and PUL. See also zinc compounds. Pure zinc powder, dust, fume is relatively non-tox to humans via irr or ihl. The difficulty arises from oxidation of zinc fumes prior to ihal or presence of impurities such as Cd, Sb, As, Pb.

Fire Hazard: Mod, in the form of dust when exposed to heat or flame.

Spontaneous Heating: No.

Explosion Hazard: In the form of dust when reacted with acids.

Incomp: NH_4NO_3; BaO_2; $Ba(NO_3)_2$; Cd; CS_2; chlorates; Cl_2, ClF_3; CrO_3; (ethyl acetoacetate + tribromoneopentyl alcohol); F_2; hydrazine mononitrate; hydroxylamine; $Pb(N_3)_2$; (Mg + $Ba(NO_3)_2$ + BaO_2); $MnCl_2$; HNO_3; performic acid; $KClO_3$; KNO_3; K_2O_2; Se; $NaClO_3$; Na_2O_2; S; Te; H_2O; $(NH_4)_2S$; As_2O_3; CS_2; $CaCl_2$; NaOH; chlorinated rubber; catalytic metals; halocarbons; o-nitroanisole; nitrobenzene; non-metals; oxidants; paint primer base; pentacarbonyliron; transition metal halides; seleninyl bromide.

To Fight Fire: Special mixtures of dry chemical.

For further information see Vol. 1, No. 7 of *DPIM Report.*

ZINC ACETATE

CAS RN: 557346 NIOSH #: AK 1500000
mf: $C_4H_6O_4 \cdot Zn$; mw: 183.47

Astringent taste, d: 1.735; mp: 237°. Very sol in water; somewhat sol in alc. Crystals.

INTERVIEW FORM

INTERVIEWEE/CODE Mr William Socha /

TITLE - POSITION Chisholm Ryder Co., Plant manager

ADDRESS 3800 Highland Avenue

CITY Niagara Falls STATE NY ZIP 14305

PHONE (716) 285-9186 RESIDENCE PERIOD 1940 TO 1985

LOCATION Telephone Interview INTERVIEWER S. Robert STEELE II

DATE/TIME 8 March 1985 / 9^00 Am

SUBJECT: Chisholm Ryder Inactive disposal area.

REMARKS: The Chisholm Ryder Co. has been engaged in the manufacturing of agricultural equipment at the above listed address since approximately 1885. Chisholm Ryder owns the vacant land (approx. 20 acres) located north of the plant site. This land was used during the 1940's (WWII) for a government housing project. Excavation debris including ash, cinders rubble, brick, ect from the construction of power project tunnels, were disposed in a low lying area of the site. Of the approx 20 acre site, 4 acres were used for the disposal of these materials. In August, 1982 a 50 pound drum of copper cyanide and a drum containing metal shavings were found on the vacant lot. Chisholm Ryder Removed these materials and presently the site is not used and all wastes materials at the plant are transported off-site for recycling or disposal. NO other chemical waste were disposed on-site.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE:

COMMENTS:

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that is creates a hazard.

(3) It is an ignitable compressed gas as defined in 49 CFR 173.300 and as determined by the test methods described in that regulation or equivalent test methods approved by the Administrator under §§ 260.20 and 260.21.

(4) It is an oxidizer as defined in 49 CFR 173.151.

(b) A solid waste that exhibits the characteristic of ignitability, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D001.

§ 261.22 Characteristic of corrosivity.

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using either the test method specified in the "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" [2] (also described in "Methods for Analysis of Water and Wastes" EPA 600/4–79–020, March 1979), or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21.

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM–01–69 [3] as standardized in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21.

(b) A solid waste that exhibits the characteristic of corrosivity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D002.

[2] This document is available from Solid Waste Information, U.S. Environmental Protection Agency, 26 W. St. Clair Street, Cincinnati, Ohio 45268.

[3] The NACE Standard is available from the National Association of Corrosion Engineers, P.O. Box 986, Katy, Texas 77450.

§ 261.23 Characteristic of reactivity.

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has *any* of the following properties:

(1) It is normally unstable and readily undergoes violent change without detonating.

(2) It reacts violently with water.

(3) It forms potentially explosive mixtures with water.

(4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D003.

§ 261.24 Characteristic of EP Toxicity.

(a) A solid waste exhibits the characteristic of EP toxicity if, using the test methods described in Appendix II or equivalent methods approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21, the extract from a representative sample of the waste contains any of the contaminants listed in Table I at a concentration equal to or greater than the respective value given in that Table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering, is considered to be the extract for the purposes of this section.

(b) A solid waste that exhibits the characteristic of EP toxicity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number specified in Table I which corresponds to the toxic contaminant causing it to be hazardous.

Table I.—Maximum Concentration of Contaminants for Characteristic of EP Toxicity—Continued

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D004	Arsenic	5.0
D005	Barium	100.0
D006	Cadmium	1.0
D007	Chromium	5.0
D008	Lead	5.0
D009	Mercury	0.2
D010	Selenium	1.0
D011	Silver	5.0
D012	Endrin (1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5,8-dimethano naphthalene.	0.02
D013	Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer.	0.4
D014	Methoxychlor (1,1,1-Trichloro-2,2-bis [p-methoxyphenyl]ethane).	10.0
D015	Toxaphene ($C_{10}H_{10}Cl_8$, Technical chlorinated camphene, 67–69 percent chlorine).	0.5
D018	2,4-D, (2,4-Dichlorophenoxyacetic acid).	10.0
D017	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid).	1.0

Subpart D—Lists of Hazardous Wastes

§ 261.30 General.

(a) A solid waste is a hazardous waste if it is listed in this Subpart, unless it has been excluded from this list under §§ 260.20 and 260.22.

(b) The Administrator will indicate his basis for listing the classes or types of wastes listed in this Subpart by employing one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
EP Toxic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)

Appendix VII identifies the constituent which caused the Administrator to list the waste as an EP Toxic Waste (E) or Toxic Waste (T) in §§ 261.31 and 261.32.

(c) Each hazardous waste listed in this Subpart is assigned an EPA Hazardous Waste Number which precedes the name of the waste. This number must be used in complying with the notification requirements of Section 3010 of the Act and certain recordkeeping and reporting requirements under Parts 262 through 265 and Part 122 of this Chapter.

(d) Certain of the hazardous wastes listed in § 261.31 or § 261.32 have exclusion limits that refer to § 261.5(c)(5).

(22)

GROUND WATER IN THE NIAGARA FALLS AREA, NEW YORK

With Emphasis on the Water-Bearing Characteristics of the Bedrock

BY

RICHARD H. JOHNSTON

GEOLOGIST

U.S. GEOLOGICAL SURVEY

STATE OF NEW YORK

CONSERVATION DEPARTMENT

WATER RESOURCES COMMISSION

BULLETIN GW-53

1964

MORCAV

(22)

GROUND WATER IN THE NIAGARA FALLS AREA, NEW YORK

With Emphasis on the Water-Bearing Characteristics of the Bedrock

By

Richard H. Johnston

... ABSTRACT

The Niagara Falls area encompasses 550 square miles in the extreme northwestern corner of New York. The area is one of very low relief except for the Niagara escarpment and the gorge of the Niagara River. A thin cover of Pleistocene unconsolidated deposits overlies the bedrock throughout most of the area. These deposits consist of three types: (1) glacial till, (2) lake deposits, and (3) a few small sand and gravel deposits. The bedrock consists of nearly flat-lying sedimentary rocks of Paleozoic age. The southern one-third of the area is underlain by the Lockport Dolomite (Silurian) and the northern two-thirds of the area by the Queenston Shale (Ordovician). Between these is a small area along the gorge and escarpment which is underlain by a series of thin limestones, shales, and sandstones.

The Lockport Dolomite is the only important aquifer in the Niagara Falls area. Ground water occurs in it in three types of openings: (1) bedding joints which constitute at least seven important water-bearing zones, (2) vertical joints, and (3) small cavities from which gypsum has been dissolved. Of these, the bedding joints are the most important and transmit nearly all the water moving through the formation. The character of the three types of water-bearing openings results in two distinct sets of ground-water conditions: (1) a moderately permeable zone at the top of rock, generally 10 to 15 feet thick, characterized by both vertical joints and bedding joints that have been widened by solution of dolomite and by small cavities formed by solution of gypsum, and (2) the remainder of the formation consisting of seven permeable zones (composed of bedding joints) surrounded by essentially impermeable rock. In the upper part of rock, either artesian or water-table conditions may exist locally. However, in the lower part of rock, the seven water-bearing zones act as separate and distinct artesian aquifers. Recharge to the water-bearing zones apparently occurs directly at the outcrop of the bedding joints composing the zones rather than by downward movement of water through vertical joints. Ground water in the Lockport, characteristically a calcium sulfate or calcium bicarbonate water, is very hard and moderately mineralized. A highly mineralized water, characterized by higher concentrations of sodium and chloride than those measured in typical Lockport water, occurs in the lowest two zones of the formation.

The chief use of ground water in the Niagara Falls area is for small domestic and farm supplies in the rural sections. Small to moderate supplies of ground water (5 to 150 gallons per minute) may be obtained throughout the area underlain by the Lockport Dolomite. Large supplies of ground water (exceeding 2,000 gallons per minute in some wells) have been obtained from the Lockport within a small area adjacent to the Niagara River where conditions are favorable for river infiltration. Throughout the remainder of the area, which is underlain mostly by the Queenston Shale, the development of even the very small supplies needed for domestic and farm use is difficult.

Data tabulated in this report include 316 well and spring records, graphical logs of 58 wells and test borings, and chemical analyses of 83 ground-water samples.

Appointment Made / / by
Site or Phone Visit 12/7/76 by DMQ
Follow-up / / by
Form Completed / / by
Comments: Food Processing Equip (24) Mach. Harvesting Machines

Company Name Chisholm Ryder & Inc. (23)
Address College & Highland Ave.
Niagara Falls, N.Y. 14305
County Niagara Phone 716 - [illegible] - 9186
SIC Codes 1. 3523 3.
2. 3523 4.

3 FORM COMP. 3-21-78

New York State Industrial Waste Survey
Department of Environmental Conservation
Division of Solid Waste Management
50 Wolf Road, Albany, N.Y. 12233 Telephone: (518) 457-6605

I. General Information

1. Company Name Chisholm - Ryder Co. Inc.
Mailing Address College & Highland Ave Niagara Falls NY. 14305
Street City State Zip

Plant Location X Same as above

Street City State Zip

2. If Subsidiary, Name of Parent Company

3. Individual Responsible for Plant Operations Mr. William Archer
Name
Plant Mgr 716 - 285 - 9186
Title Phone

4. Individual Providing Information Jane
Name
Title Phone

5. Department of Environmental Conservation Interviewer Dan Quackenbush

6. Standard Industrial Classification (SIC) Codes for Principal Products

Group Name	SIC Code (4 Digit)	Approximate % of X Production / / Value Added
a. Farm Machinery & Equip.	3523	
b. Food Products Mach.	3551	3 100
c.		
d.		

7. Processes Used at Plant
a. Plating
b. Degreasing
c. Chemical
d. Fabrication
e. Machining

8. Products
a. Food processing equipment
b. Mechanical Harvesting Mach
c.
d.
e.

(23)

Chemicals used in manufacturing or produced ... products:

a. Chlorothane VG (Dow Chem.)
b. H2O Soluble Cutting Oil (Wynn)
c. Epoxy - Paints
d. Cu, Sn Plating Solutions
e. CN's of Caustic, and acid
f.
g.
h.
i.
j.

a. On Site Waste Water Treatment /_/Yes /✓/No

b. On Site Waste Water Treatment by July 1977 /_/Yes /✓/No

c. On Site Waste Water Treatment by July 1983 /_/Yes /✓/No

d. Industrial Sewer Discharge /✓/Yes /_/No Name of Sewage Treatment Plant Niagara Falls

e. SPDES No. ______ NPDES No. ______

. a. Air Pollution Control Devices /✓/Yes /_/No Types Paint Spray filters

b. To Be Built /_/Yes /_/No by _/_/_

c. Air 100 Emission Point Registration Numbers ______

. a. Number of manufacturing employees 60 b. Manufacturing Floor Space ? sq.ft.

. Attach a plat or sketch of the facility showing the location of on-site process waste storage (if available).

. Attach flow diagrams of chemical processes including waste flow outputs (if available).

. In-house waste treatment capabilities: ______

. Is there a currently used or abandoned landfill, dump or lagoon on plant property? /✓/Yes /_/No

. Industrial wastes produced or expected to be produced by plant.

1) Rinse H2O's from plating operation — sewer discharge
(1) 2) Waste Oils - H2O Soluble Coolant
3) Metal turnings — accumulated then sold to scrap dealer
(1) 4) Vapor degreasing solvent reclaimer sludge
(2) 5) paint filters
6)
7)
8)

. Comments: Waste H2O-Solubles, degreaser sludge, & metal turnings are deposited on site. After accumulation metal turnings go to scrap dealer. Information pertinent to Part III of questionnaire ~~was~~ is not well developed

. Waste Characterization and Management Practice
(use separate form for each waste stream)

1. Waste Stream No. 1,1a (from Form I, Number 17)

2. Description of process producing waste Machining of metal utilize H2O - Soluble Coolant ; cleaned out once /yr. ; vapor degreaser utilizes Dow's Trichloroethane VG and this is distilled for reclamation

3. Brief characterization of waste (1) Sour Coolant oil ; (1a) greasy sludges of dirt, & grime

4. Time period for which data are representative current to

5. a. Annual waste production (1) 150 (1a) 20 / /tons/yr. /✓/gal./yr.

b. Daily waste production / /tons/day / /gal./day

c. Frequency of waste production: / /seasonal /✓/occasional / /continual

/ /other (specify)

6. Waste Composition

a. Average percent solids (1) low (1a) high % b. pH range __ to __

c. Physical state: /✓/liquid, / /slurry, /✓/sludge, / /solid,

/ /other (specify)

d. Component	Average Concentration	/ /wet weight / /dry weight
1. (1) H_2O Soluble Coolant - Winn's		/ /wt.% / /ppm
2. metal fines		/ /wt.% / /ppm
3. (1a) grease, dirt, oil		/ /wt.% / /ppm
4.		/ /wt.% / /ppm
5.		/ /wt.% / /ppm
6.		/ /wt.% / /ppm
7.		/ /wt.% / /ppm
8.		/ /wt.% / /ppm
9.		/ /wt.% / /ppm
10.		/ /wt.% / /ppm

e. Analysis of composition is / /theoretical / /laboratory /✓/estimate
(attach copy of laboratory analysis if available)

f. Projected / /increase, / /decrease in volume from base year: _____% by July 1977;

_____% by July 1983.

g. Hazardous properties of waste: / /flammable / /toxic / /reactive / /explosive
/ /corrosive / /other (specify) ? Coolant is bio degradable

7. On Site Storage

a. Method: /✓/drum, 5 bucket / /roll-off container, / /tank, / /lagoon, / /other(specify) _____

b. Typical length of time waste stored 0 / /days, / /weeks, / /months

c. Typical volume of waste stored @ 1-2 @ 150 gals / /tons, /✓/gallons

d. Is storage site diked? / /Yes /✓/No

e. Surface drainage collection / /Yes /✓/No

8. Transportation

a. Waste hauled off site by / /you / /others

b. Name of waste hauler _____

Address _____
Street City

_____ ( )
State Zip Code Phone

9. Treatment and Disposal

a. Treatment or disposal: /✓/on site / /off site

b. Waste is / /reclaimed / /treated / /land disposed / /incinerated
/✓/other (specify) dumped

c. Off site facility receiving waste

Name of Facility _____

Facility Operator _____

Facility Location _____
Street City

_____ ( )
State Zip Code Phone

Note: Metal turnings deposited in backyard have coolant oil on them. This drains off metal fine and goes to ground.

F. Waste Characterization and Management Practices

*(Use separate form for each waste stream)

1. Waste Stream No. 2 (From Form I, Number 17)

2. Description of process producing waste Paint Spray Booth filters

3. Brief characterization of waste Paint Spray filters with Epoxy paint impinged upon them

4. Time period for which data are representative _____ to _____

5. a. Annual waste production 2400 (0.6 TPY) ☐/tons/yr. ☐/gal./yr. ft²/yr (Secure by rough gues

b. Daily waste production N/A. ☐/tons/day ☐/gal./day

c. Frequency of waste production: ☐/seasonal ☐/occasional ☐/continual

☐/other (specify) 1 q 3 mm

2400 ft²/yr × 1 ft/2 ft² = 1200 ft³/yr = 0.6 TN³/4

6. Waste Composition

a. Average percent solids ____% b. pH range __ to __

c. Physical state: ☐/liquid, ☐/slurry, ☐/sludge, ☒/solid,

☐/other (specify) _____

d. Component	Average Concentration	☐/wet weight ☐/dry weight	
1. filter		☐/wt.%	☐/ppm
2. Epoxy Paint		☐/wt.%	☐/ppm
3.		☐/wt.%	☐/ppm
4.		☐/wt.%	☐/ppm
5.		☐/wt.%	☐/ppm
6.		☐/wt.%	☐/ppm
7.		☐/wt.%	☐/ppm
8.		☐/wt.%	☐/ppm
9.		☐/wt.%	☐/ppm
10.		☐/wt.%	☐/ppm

e. Analysis of composition is [ ] theoretical [ ] laboratory [✓] estimate
(attach copy of laboratory analysis if available)

f. Projected [ ] increase, [ ] decrease in volume from base year: _____ by July 1977;
_____% by July 1983.

g. Hazardous properties of waste: [ ] flammable [✓] toxic [ ] reactive [ ] explosive
[ ] corrosive [ ] other (specify) _____

7. On Site Storage

a. Method: [ ] drum, [✓] roll-off container, [ ] tank, [ ] lagoon, [ ] other (specify) _____

b. Typical length of time waste stored 2-3 [✓] days, [ ] weeks, [ ] months

c. Typical volume of waste stored 600 ft³ [ ] tons, [ ] gallons

d. Is storage site diked? [ ] Yes [✓] No

e. Surface drainage collection [ ] Yes [✓] No

8. Transportation

a. Waste hauled off site by [ ] you [✓] others

b. Name of waste hauler Modern Disposal

Address _____ Mount City
Street City

Ny. ( )
State Zip Code Phone

9. Treatment and Disposal

a. Treatment or disposal: [ ] on site [✓] off site

b. Waste is [ ] reclaimed [ ] treated [✓] land disposed [ ] incinerated
[ ] other (specify) _____

c. Off site facility receiving waste

Name of Facility _____

Facility Operator _____

Facility Location _____
Street City

( )
State Zip Code Phone

(24)

NS (12/75)

New York State Department of Environmental Conservation

MEMORANDUM

TO: R. Mitrey
FROM: Y. Erk Y. Erk
SUBJECT: Chisholm Ryder Inspection

DATE: October 14, 1980

The writer inspected the plant on October 6, 1980. During the inspection, Mr. Socha, the plant manager, was present. The disposal site located north of the plant was used in the past for dumping iron fillings from the plant operation. The plant has been producing canning equipment and it has an electroplating vatt for copper plating. This operation is minor in scale and the management is considering to close it down soon. Electroplating solution is made of copper cyanide and no electroplating sludge is produced after the operation.

Mr. Socha informed the writer that the 50 pounds of copper cyanide drum, which was found during the last year's inspection, was reused and he promised to send a letter in this effect to the Department explaining the situation.

→ rec'd 10/31/80

Aluminum and steel scrap from the plant operation are sold to a third party for metal recovery. At the present, the plant is not generating any other wastes. Based on the inspection and the information gathered, no further action is necessary for the disposal site.

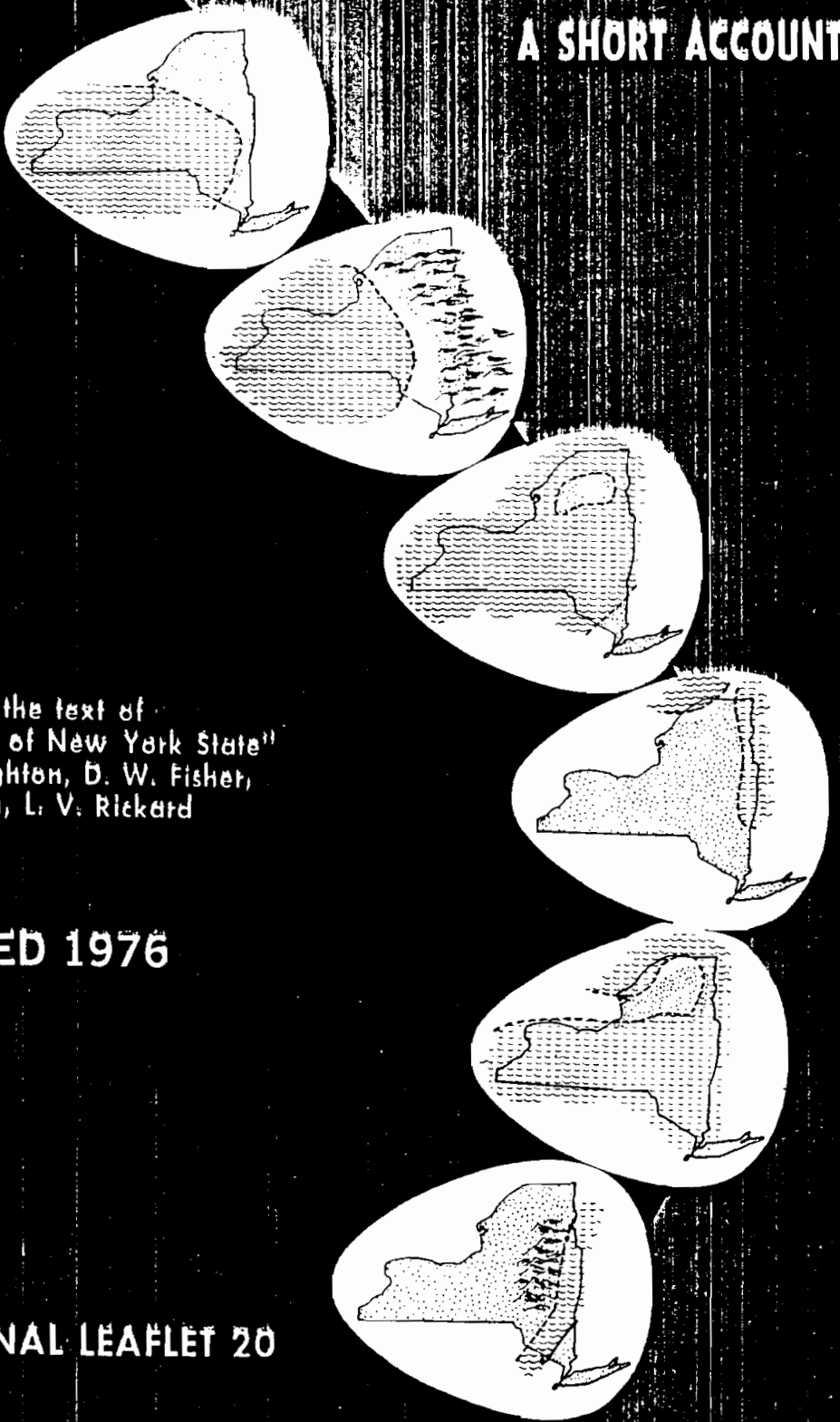
YE:mkf

1. YE 11 OK
2. File -

Geology of New York

(25)

A SHORT ACCOUNT



adapted from the text of
"Geologic Map of New York State"
by J. G. Broughton, D. W. Fisher,
Y. W. Isachsen, L. V. Rickard

REPRINTED 1976

EDUCATIONAL LEAFLET 20

THE UNIVERSITY OF THE STATE OF NEW YORK / THE STATE EDUCATION DEPARTMENT
NEW YORK STATE MUSEUM AND SCIENCE SERVICE / ALBANY, 1966

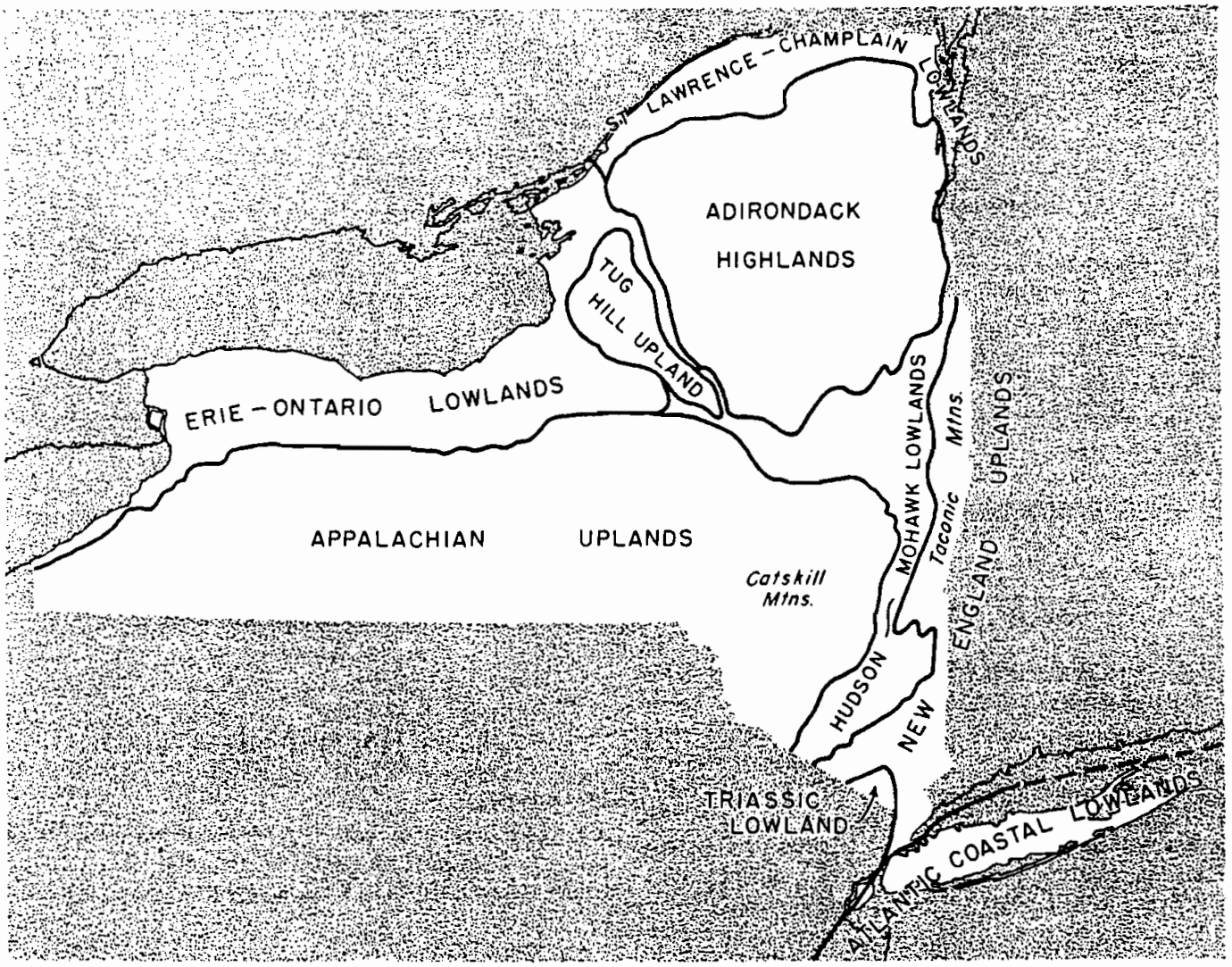


FIGURE 19. Physiographic provinces of New York, based on relief and geology (Modified after G. B. Cressey, 1952)

Cenozoic Era

PHYSIOGRAPHIC PROVINCES AND TERTIARY HISTORY

The physiographic provinces of New York are shown in figure 19. Modern landscapes of the State were shaped largely during the Cenozoic Era, the most recent 65 million years of geologic history. Although the overall features later would be modified and blurred by glaciation, the broad outlines of modern mountain, valley, and plain first were carved by the unrelenting rush of water to the earlier Cenozoic seas.

The long sequence of erosion presumably began with the arching of the Jurassic Fall Zone erosion surface in mid-Cretaceous time. As its eastern flank dipped beneath the encroaching Atlantic Ocean to receive Coastal Plain deposits, the axis domed sufficiently to initiate the sculpture of the Appalachians and Adirondacks. Few, if any of today's land forms can be traced so far back, however. Most researchers believe that all the exposed remnants of the dissected Fall Zone surface were obliterated by subsequent erosion.

South of New York, at least a partial record of Tertiary geology persists in the Coastal Plain deposits. In addition to a sedimentary record, datable igneous intrusions cut rocks of varying degrees of deformation in the western states. But in New York, no such tangible evidence of Cenozoic events exists. The Coastal Plains sediments derived from the long-continued degradation of New York and New England now rest on the Continental

Shelf, beneath many fathoms of water. Because of a relatively recent tilting of the coastline about a northwest-southeast axis near New York City, the Coastal Plain has been raised south of New York; east and north of the city, all but the Long Island Cretaceous has been depressed below sea level.

Since exposed Tertiary sedimentary deposits are absent in New York, its geological history must be reconstructed from the only data available, the present physiographic features of the State. In an area as small as New York, where climate does not vary significantly, land forms have been determined primarily by geology. Characteristic differences between the physiographic provinces have resulted from the ways in which rocks of differing lithologies and structures have reacted to the erosional force of the Cenozoic. Thus, while many authorities have classified New York's physiographic provinces in various ways, all are more or less in agreement as to the outlines of the major provinces; they differ mainly in the names applied to the provinces. Those used here were proposed by George B. Cressey (1952, personal communication, J.G. B.). From north to south, the physiographic provinces of New York are:

St. Lawrence-Champlain Lowlands

New York's northernmost province includes the St. Lawrence River Valley (northeast of the Thousand Islands), the low hills south of the river valley, and the Lake Champlain Valley (figure 19). The underlying rocks —Cambrian and Ordovician sandstones, dolomites, and limestones—dip gently away from the Adirondacks. Relief is approximately 100 feet. Streams draining the northern and eastern slopes of the Adirondacks flow across the province. The shoreline of Lake Champlain is largely controlled by north-south and east-west faults which have chopped the Paleozoic sandstones and carbonates into large blocks.

Adirondack Highlands

The highest mountains in New York occur in the Adirondack Highlands, especially in the High Peaks region; the High Peaks, in the east-central part of the province, are underlain by anorthosite, which is highly resistant to erosion. Two peaks—Mt. Marcy and Mt. Algonquin—are over 5,000 feet in elevation, and many exceed 4,000 feet. Average relief in the Adirondack Highlands is 2,000 feet. North, west, and south of the High Peaks area, elevations decrease gradually; east to the Champlain Lowland, the slope is more abrupt.

The Adirondacks are transected by long, northeast-southwest lineaments, representing shear zones or major faults. The lineaments frequently control drainage and the shape of land forms. Many lakes follow geologic contacts, or are confined to valleys along weak metasedimentary rocks. Because glacial deposits have clogged the normal radial drainage, lower areas are dotted with lakes, ponds, and swamps.

Tug Hill Upland

The Tug Hill, an isolated upland in the eastern part of the Erie-Ontario Lowlands, is probably the most desolate area of the State. Elevation is 1,800 to 2,000 feet, and relief is very low. The Tug Hill results from a resistant cap rock of Oswego Sandstone (an Ordovician sedimentary quartzite), resting on a thick series of sandy shales. These, in turn, overlie Trenton and Black River limestones, which form a flight of rock terraces along the west side of the Black River Valley. The low slope of the cap rock and the thin cover of glacial deposits have caused poor drainage and many swamps.

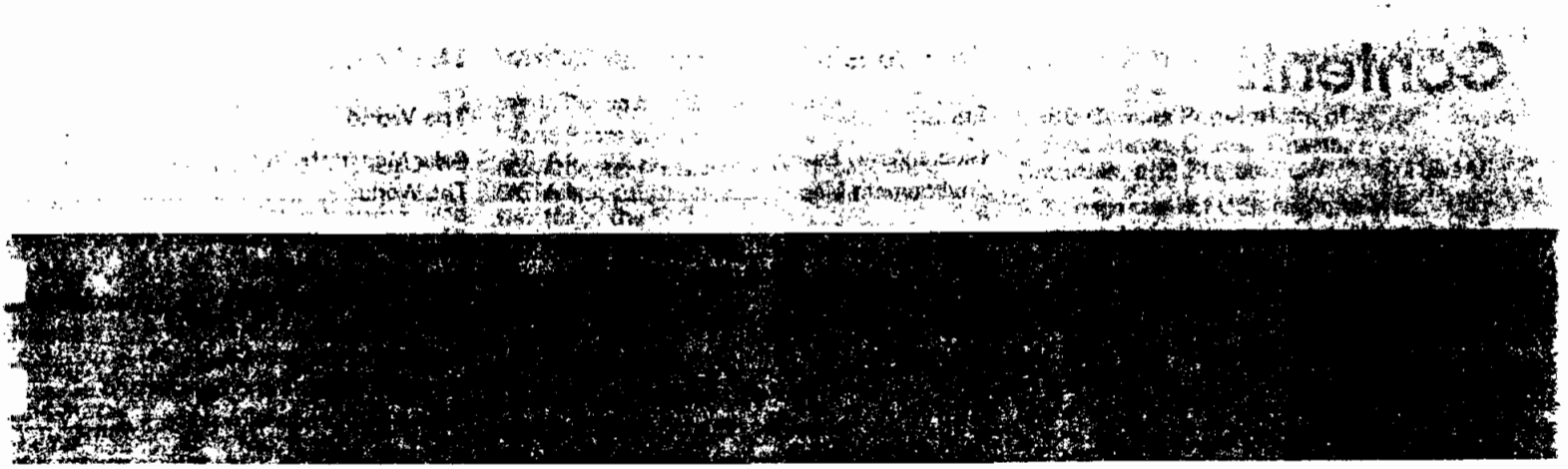
Erie-Ontario Lowlands

This province encompasses the relatively low, flat areas lying south of Lake Erie and Lake Ontario and extending up the Black River Valley. From the lake levels of 570 feet and 244 feet, respectively, the land rises gently eastward and southward. The maximum elevation (1,000-1,500 feet) occurs along the Portage Escarpment, the boundary with the Appalachian Uplands to the south. Particularly in the Ontario Lowland, east-west escarpments are formed by the Onondaga Limestone and Lockport Dolomite. (The Lockport is the cap rock of Niagara Falls and the falls of the Genesee River at Rochester.) The simple erosional topography has been modified substantially by glacial deposition of drumlin fields, recessional moraines, and shoreline deposits.

Hudson-Mohawk Lowlands

The general topography of the Hudson-Mohawk Lowlands resulted from erosion along outcrop belts of weak rocks. In the Mohawk Lowlands, the outcrop belts lie between the Adirondacks and the Helderberg Escarpment; for the Hudson, they lie between the Catskills and the metamorphosed shale hills of the Taconics. Most of the province has low elevation and relief. It is underlain primarily by Ordovician shales which have been exposed by the southward and westward stripping off of Silurian and Devonian limestones.

(27)



World Atlas

CENSUS EDITION

RAND McNALLY & COMPANY
Chicago / New York / San Francisco

(27)

Colonie A-S-T 8,869
Colton 450
Commack N.Y. 24,300
Congers N.Y. 5,000
Conklin BING 1,900
Constantia SYR 900
Cooperstown 2,342
Copake 700
Copenhagen 656
Copiague N.Y. 21,000
Coram N.Y. 5,400
Corfu BUF- 689
Corinth 2,702
Corning ELM- 12,953
Cornwall on the Hudson NWBG 3,164
Cortland 20,138
Cozeackie 2,788
Croghan 703
Croton-on-Hudson N.Y. 6,889
Crown Point 900
Cuba 1,739
Cutchogue 1,000
Dalton 500
Dannemora 3,770
Dansville 4,979
Deer Park N.Y. 33,400
Delanson A-S-T 448
Delevan 1,113
Delhi 3,374
Delmar A-S-T 8,900
Depew BUF- 19,819
Deposit 1,897
Derby BUF- 1,200
De Ruyter 542
De Witt SYR 10,032
Dexter WATN 1,053
Dix Hills N.Y. 10,500
Dobbs Ferry N.Y. 10,053
Downsville 950
Dryden ITH 1,761
Dundee 1,556
Dunkirk 15,310
Earlville 985
East Aurora BUF- 8,603
Eastchester N.Y. 22,600
East Glenville A-S-T 11,800
East Half Hollow Hills N.Y. 9,691
East Hampton 1,886
East Hills N.Y. 7,160
East Islip N.Y. 13,700
East Marion 900
East Meadow N.Y. 47,300
East Northport N.Y. 22,200
East Patchogue N.Y. 8,300
Eastport N.Y. 1,308
East Randolph 655
East Rochester ROCH 7,596
East Rockaway N.Y. 10,917
East Vestal BING 5,300
Eden BUF- 3,000
Edmeston 600
Edwards 561
Elba 750
Elizabethtown 659
Ellenville 4,405
Ellicottville 713
ELMIRA ELM- 35,327
Elmira Heights ELM- 4,279
Elmont N.Y. 30,000
Elsmere A-S-T 5,500
Elwood N.Y. 15,400
Endicott BING 14,457
Endwell BING 15,999
Erie ITH 500
Evans Mills 651
Fair Haven 976
Fairmount SYR 6,700
Fairport ROCH 5,970
Fairview POK 8,517
Falconer JMST 2,778
Farmingdale N.Y. 7,946
Farmingville N.Y. 5,700
Fillmore 563
Fishkill POK 1,555
Floral Park N.Y. 16,805
Florida MIDD 1,947
Flower Hill N.Y. 4,558
Fonda A-S-T 1,006
Forestville 804
Fort Ann GLFLS 509
Fort Covington 1,200
Fort Edward GLFLS 3,561
Fort Plain 2,555
Frankfort UT-R 2,995
Franklin 440
Franklin Square N.Y. 32,600
Franklinville 1,667
Fredonia 11,126
Freeport N.Y. 38,272
Freeville ITH 449
Frewsburg JMST 2,000
Friendship 1,265
Fulton SYR 13,312
Galeville SYR 5,600
Gang Mills ELM- 1,258
Garden City N.Y. 22,927
Garden City Park N.Y. 5,200
Garrison N.Y. 650
Gasport LOCK 950
Gates ROCH 29,756
Geneseo 6,746
Geneva 15,133
Ghent 800
Gilbertsville 455
Glasco KNGST 1,189
Glen Cove N.Y. 24,618
Glenham POK 2,720
Glen Head N.Y. 6,600
GLENS FALLS GLFLS 15,897
Gloversville 17,836
Gorham 600
Goshen MIDD 4,874
Gouverneur 4,285
Gowanda 2,713
Grand Gorge 800
Granville 2,696
Great Neck (P.O.) N.Y. 5,604
Great Neck N.Y. 9,188
Great Neck Estates N.Y. 2,936

Greece ROCH 63,700
Greene 1,747
Green Island A-S-T 2,896
Greenlawn N.Y. 6,600
Greenport 2,273
Greenville N.Y. 5,500
Greenwich 1,955
Greenwood 450
Greenwood Lake N.Y. 2,809
Groton 2,313
Hadley 500
Haines Falls 700
Half Hollow Hills N.Y. 12,800
Hamburg BUF- 10,582
Hamilton 3,725
Hammondsport 1,065
Hampton Bays 3,550
Hannibal SYR 680
Harrison N.Y. 23,046
Harrisville 937
Hartsdale N.Y. 12,226
Hartwick 800
Hastings-on-Hudson N.Y. 8,573
Hauppauge N.Y. 14,200
Haverstraw N.Y. 8,800
Hawthorne N.Y. 4,900
Hamlock ROCH 500
Hempstead N.Y. 40,404
Henrietta ROCH 1,200
Herkimer UT-R 8,383
Harmon 490
Heuvelton 777
Hewlett N.Y. 6,880
Hicksville N.Y. 50,000
Highland POK 2,184
Highland Falls 4,187
Hillcrest N.Y. 5,357
Hilton ROCH 4,151
Hobart 473
Holbrook N.Y. 12,800
Holland BUF- 1,000
Holland Patent UT-R 534
Holley ROCH 1,682
Homer 3,635
Honeoye Falls ROCH 2,410
Hoosick Falls 3,609
Hopewell Junction POK 2,055
Hornell 10,234
Horseheads ELM- 7,348
Houghton 1,820
Hudson 7,886
Hudson Falls GLFLS 7,419
Huntington N.Y. 12,801
Huntington Bay N.Y. 3,943
Huntington Station N.Y. 30,300
Hurley KNGST 4,081
Hurleyville 500
Hyde Park POK 2,805
Ilion UT-R 9,190
Indian Lake 450
Interlaken 885
Inwood N.Y. 8,200
Irondequoit ROCH 57,648
Irvington N.Y. 5,774
Island Park N.Y. 4,847
Islip N.Y. 12,100
Islip Terrace N.Y. 5,200
ITHACA ITH 28,732
JAMESTOWN JMST 35,775
Jasper 450
Jay 500
Jeffersonville 554
Jericho N.Y. 14,200
Johnson City BING 17,126
Johnstown 9,360
Jordan SYR 1,371
Keene 450
Keeseville 2,025
Kenmore BUF- 18,474
Kennedy 500
Kerhonkson 1,243
Kinderhook A-S-T 1,377
Kings Point N.Y. 5,234
KINGSTON KNGST 24,481
Lackawanna BUF- 22,701
Lacona 582
LaFargeville 500
Lake Delta UT-R 2,400
Lake Erie Beach BUF- 3,500
Lake George 1,047
Lake Grove N.Y. 9,692
Lake Katrine KNGST 1,092
Lake Luzerne 1,000
Lake Placid 2,490
Lake Ronkonkoma N.Y. 9,600
Lake View BUF- 4,600
Lakeville ROCH 950
Lakewood JMST 3,941
Lancaster BUF- 13,056
Larchmont N.Y. 6,306
Larchmont North N.Y. 11,500
Latham A-S-T 8,000
Lawrence N.Y. 6,175
Leicester 462
Leonardsville 500
La Roy 4,900
Levittown N.Y. 65,400
Lewiston BUF- 3,326
Liberty 4,293
Lima ROCH 2,025
Limestone 466
Lindenhurst N.Y. 26,919
Little Falls 6,158
Little Valley 1,203
Livingston Manor 1,522
Livonia ROCH 1,238
Lloyd Harbor N.Y. 3,405
Locke 500
LOCKPORT LOCK 24,844
Locust Grove N.Y. 11,648
Long Beach N.Y. 34,073
Long Lake 500
Loudonville A-S-T 9,000
Lowville 3,364
Lyndonville 916
Lyon Mountain 950
Lyons 4,160
Lyons Falls 755
Macedon ROCH 1,400

McGraw 1,188
Machias 700
Madrid 600
Mahopac N.Y. 5,265
Maine BING 700
Malone 7,668
Malverne N.Y. 9,262
Mamaroneck N.Y. 17,815
Manchester ROCH 1,698
Manhasset N.Y. 8,530
Manlius SYR 5,241
Mannsville 431
Manorhaven N.Y. 5,384
Marathon 1,046
Margaretville 755
Marion ROCH 950
Marlboro NWBG 1,580
Massapequa N.Y. 27,500
Massapequa Park N.Y. 19,779
Massena 12,851
Mastic N.Y. 5,200
Mastic Beach N.Y. 5,200
Mattituck N.Y. 1,200
Mattydale SYR 6,292
Maytield 944
Mayville 1,626
Mechanicville A-S-T 5,500
Medford N.Y. 5,000
Medina 8,392
Melville N.Y. 8,550
Menands A-S-T 4,012
Merrick N.Y. 26,400
Mexico 1,621
Middleburg 1,358
Middle Granville 800
Middleport LOCK 1,995
MIDDLETOWN MIDD 21,454
Middleville 647
Milford 514
Millbrook POK 1,343
Millerton 1,013
Mineola N.Y. 20,757
Minetto 900
Mineville 1,000
Mohawk UT-R 2,956
Monroe N.Y. 5,996
Monsey N.Y. 7,400
Montauk 1,300
Montgomery NWBG 2,316
Monticello 6,306
Montour Falls 1,791
Moores 549
Moravia 1,562
Morich 500
Morris 881
Morrisonville 1,500
Morristown 461
Morrisville 2,707
Mountain Dale 1,200
Mount Kisco N.Y. 8,025
Mount Morris 3,039
Mount Upton 500
Mount Vernon N.Y. 66,713
Munnsville 499
Nanuet N.Y. 8,300
Napanoch 800
Naples 1,225
Narrowsburg 700
Nassau A-S-T 1,285
Nassau Shorse N.Y. 5,500
Natural Bridge 650
Nedrow SYR 3,000
Nesconset N.Y. 8,300
Newark 10,017
Newark Valley BING 1,190
New Baltimore 700
New Berlin 1,392
NEWBURGH NWBG 23,438
New Cassel N.Y. 8,817
New City N.Y. 30,800
Newcomb 800
Newfane LOCK 2,700
New Hyde Park N.Y. 9,801
New Lebanon 800
New Paltz 4,941
Newport 746
New Rochelle N.Y. 70,794
Newton Falls 560
New Windsor NWBG 6,803
New Woodstock SYR 450
NEW YORK N.Y. 7,071,030
Niagara Falls BUF- 71,384
Nichols BING 613
Niskayuna A-S-T 17,471
Norfolk 1,379
North Amityville N.Y. 11,936
North Babylon N.Y. 23,000
North Bellmore N.Y. 23,800
North Collins SUF- 1,496
North Creek 950
Northeast Henrietta ROCH 12,000
North Great River N.Y. 12,400
North Lindenhurst N.Y. 11,400
North Massapequa N.Y. 23,100
North Merrick N.Y. 13,650
North New Hyde Park N.Y. 18,100
North Norwich 500
North Patchogue N.Y. 8,000
Northport N.Y. 7,651
North Rose 700
North Syracuse SYR 7,970
North Tarrytown N.Y. 7,994
North Tonawanda BUF- 35,760
North Valley Stream N.Y. 14,881
Northville 1,304
North Wantagh N.Y. 15,117
Norwich 8,082
Norwood 1,902
Nunda 1,169
Nyack N.Y. 6,428
Oakdale N.Y. 7,800
Oakfield 1,791
Oceanside N.Y. 36,400
Odessa 613
Ogdensburg 12,375
Olcott LOCK 1,650
Old Bethpage N.Y. 7,180
Old Forge 950
Olean 18,207

Oneida 10,810
Oneonta 14,933
Ontario ROCH 750
Orchard Park BUF- 3,871
Orient 800
Oriskany UT-R 1,680
Oriskany Falls UT-R 802
Ossining N.Y. 20,196
Oswego 19,793
Otego 1,089
Ovid 866
Owego BING 4,364
Oxford 1,755
Oyster Bay N.Y. 7,200
Painted Post ELM- 2,196
Palmyra ROCH 3,729
Panama 511
Parish SYR 535
Parksville 500
Patchogue N.Y. 11,291
Patterson N.Y. 950
Pavilion 550
Pawling POK 1,996
Pearl River N.Y. 17,145
Peconic 800
Peekskill N.Y. 18,236
Pelham N.Y. 6,848
Pelham Manor N.Y. 8,130
Pentield ROCH 9,800
Penn Yan 5,242
Perry 4,198
Peru 1,300
Petersburg 500
Phelps 2,004
Philadelphia 855
Philmont 1,539
Phoenicia 700
Phoenix SYR 2,357
Pine Bush NWBG 1,200
Pine Island MIDD 950
Plainview N.Y. 32,300
Platteburgh 21,057
Pleasant Valley POK 1,372
Pleasantville N.Y. 8,749
Poland 553
Port Byron AUB 1,400
Port Chester N.Y. 23,565
Port Dickinson BING 1,974
Port Ewen KNGST 2,600
Port Henry 1,450
Port Jefferson N.Y. 6,731
Port Jefferson Station N.Y. 7,500
Port Jervis 8,699
Portland 600
Port Leyden 740
Portville 1,136
Port Washington N.Y. 15,923
Potsdam 10,635
Potterville 600
POUGHKEEPSIE POK 29,757
Pratteburg 750
Prattsville 500
Pulaski 2,415
Randolph 1,398
Ransomville BUF- 1,500
Ravena A-S-T 3,091
Raymondville 600
Red Creek 645
Red Hook 1,892
Redwood 600
Remsen UT-R 621
Rensselaer A-S-T 9,047
Rhinebeck POK 2,542
Richburg 494
Richfield Springs 1,561
Richmondville 792
Ridgemont ROCH 6,500
Ripley 1,000
Riverhead 7,400
ROCHESTER ROCH 241,741
Rockville Centre N.Y. 25,405
Roosaleville A-S-T 5,476
Rome UT-R 43,826
Ronkonkoma N.Y. 20,200
Roosevelt N.Y. 15,000
Roslyn Heights N.Y. 7,270
Rotterdam A-S-T 24,800
Round Lake A-S-T 791
Rouses Point 2,266
Roxbury 700
Rushford 500
Rushville 548
Rye N.Y. 15,083
Sackets Harbor 1,017
Sag Harbor 2,561
St. James N.Y. 11,000
St. Johnsville 2,019
St. Regis Falls 950
Salamanca 6,890
Salem 959
Sandy Creek 765
San Remo N.Y. 8,700
Saranac Lake 5,578
Saratoga Springs A-S-T 23,906
Saugerties KNGST 3,862
Savannah 636
Savona ELM- 932
Sayville N.Y. 15,300
Scarsdale N.Y. 17,650
Schaghticoke A-S-T 877
Schenectady A-S-T 67,972
Schenevus 625
Schoharie 1,016
Schroon Lake 1,000
Schuylerville 1,256
Scotia A-S-T 7,280
Scottsville ROCH 1,789
Sea Cliff N.Y. 5,384
Seaford N.Y. 17,150
Selden N.Y. 24,100
Seneca Falls 7,465
Shandaken 500
Shelter Island 1,000
Sherburne 1,561
Sherman 775
Sherrill 2,830
Shirley N.Y. 8,200
Shortsville ROCH 1,669
Sidney 4,861

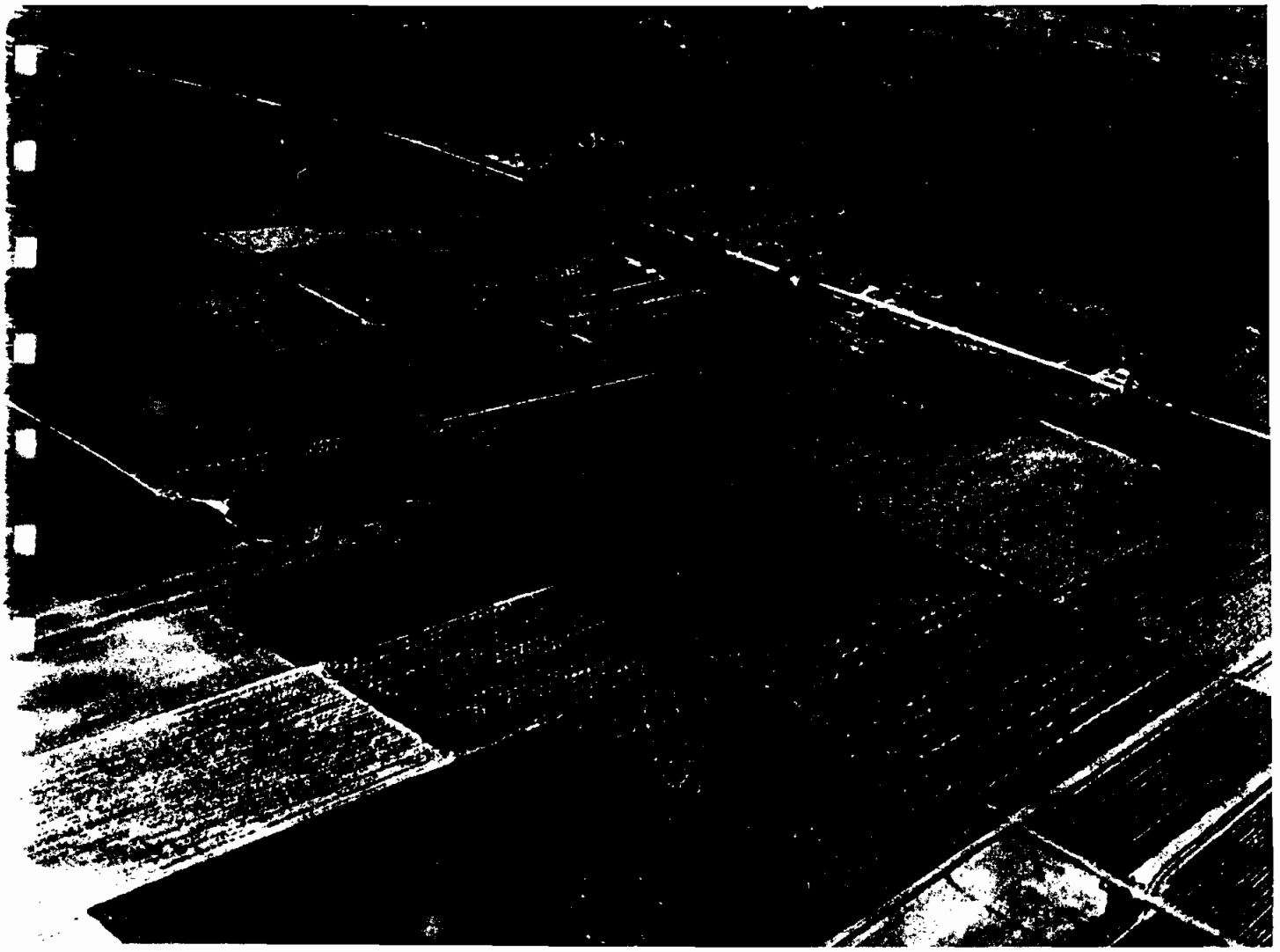
Sidney Center 600
Silver Creek BUF- 3,088
Silver Springs 801
Sinclairville 772
Skaneateles SYR 2,789
Sloan BUF- 4,529
Slaatsburg N.Y. 3,154
Smithtown N.Y. 23,000
Sodus ROCH 1,790
Sodus Point 1,334
Solvay SYR 7,140
Sound Beach N.Y. 5,400
Southampton 4,000
South Bethlehem A-S-T 500
South Corning ELM- 1,185
South Dayton 661
South Fallsburg 1,590
South Farmingdale N.Y. 20,500
South Glens Falls GLFLS 3,714
South Huntington N.Y. 9,115
South New Berlin 450
South Nyack N.Y. 3,802
Southold 2,030
South Otselic 450
Southport ELM- 8,700
South Stony Brook N.Y. 15,329
South Valley Stream N.Y. 6,800
South Westbury N.Y. 10,700
Spencer 863
Spencerport ROCH 3,424
Spring Valley N.Y. 20,537
Springville 4,285
Springwater 500
Staatsburg POK 950
Stamford 1,240
Stillwater A-S-T 1,572
Stony Brook N.Y. 6,800
Stony Creek 450
Stony Point N.Y. 8,270
Stottville 1,300
Suffern N.Y. 10,794
Sylvan Beach UT-R 1,243
Syosset N.Y. 10,200
SYRACUSE SYR 170,105
Tappan N.Y. 8,100
Terrytown N.Y. 10,848
Terryville N.Y. 5,900
Theresa 827
Thornwood N.Y. 5,400
Three Mile Bay 800
Ticonderoga 2,938
Tillson KNGST 1,300
Tivoli KNGST 711
Tomkins Cove N.Y. 700
Tonawanda BUF- 18,893
Town of Tonawanda BUF- 78,100
Troy A-S-T 56,638
Trumansburg ITH 1,722
Tuckahoe N.Y. 8,076
Tully SYR 1,049
Tupper Lake 4,478
Unadilla 1,367
Uniondale N.Y. 24,500
Union Springs AUB 1,201
University Gardens N.Y. 5,400
UTICA UT-R 75,632
Valatie A-S-T 1,492
Valhalle N.Y. 6,800
Valley Cottage N.Y. 9,007
Valley Stream N.Y. 35,789
Van Etten 559
Vestal BING 6,000
Vestal Center BING 900
Victor ROCH 2,370
Waddington 980
Wading River 2,500
Walden NWBG 5,659
Wallkill NWBG 1,849
Walton 3,329
Wampsville 569
Wantagh N.Y. 22,300
Wappingers Falls POK 5,110
Warranaburg 2,743
Warsaw 3,819
Warwick N.Y. 4,320
Waterford A-S-T 2,405
Waterloo 5,303
WATERTOWN WATN 27,881
Watervile UT-R 1,672
Watervliet A-S-T 11,354
Watkins Glen 2,440
Waverly 4,738
Wayland 1,846
Webster ROCH 5,499
Weedsport SYR 1,952
Wellsburg ELM- 647
Wellsville 5,789
West Amityville N.Y. 6,470
West Babylon N.Y. 32,500
West Bay Shore N.Y. 8,600
Westbury N.Y. 13,871
West Carthage 1,824
West Chazy 700
West Elmira ELM- 5,901
Westfield 3,445
West Haverstraw N.Y. 9,181
West Hempstead N.Y. 26,500
West Huntington N.Y. 8,170
West Islip N.Y. 21,500
Westmere A-S-T 5,500
West Point 8,000
Westport 613
West Sayville N.Y. 5,000
West Seneca BUF- 51,210
Westvale SYR 7,300
West Webster ROCH 10,800
West Winfield 979
Whitehall 3,241
White Plains N.Y. 46,999
Whitesboro UT-R 4,450
Whitesville 600
Whitney Point BING 1,093
Willard 700
Williamson ROCH 1,991
Williamsville BUF- 6,017
Williston Park N.Y. 8,216
Willsboro 950
Wilmington 500
Wilson LOCK 1,259

~ Rand McNally estimate (not reported in census)
▲ Population of entire township or town including rural area
● Independent city. Population not included in county total

(28)

SOIL SURVEY OF

Niagara County, New York



United States Department of Agriculture
Soil Conservation Service
In cooperation with
Cornell University Agricultural Experiment Station

Issued October 1972

Terminal moraines have a general east-west trend and were formed when the ice stagnated for a long period. They are more likely to contain gravel than other glacial till deposits. The two principal terminal moraines in Niagara County are the Barre Moraine and the Rochester-Albion Moraine. The Barre Moraine parallels the escarpment and is dominantly water-worked glacial till. The Rochester-Albion Moraine is between the Barge Canal and the escarpment. It contains much sand, silt, and gravel.

The largest outwash deposit is located in a 1- to 2-mile belt that extends 3 miles westward and 5 miles eastward from the village of Olcott. This deposit is 1 to 10 feet thick. The coarser gravel is in the southern part of the belt. Another small outwash area is in the city of North Tonawanda near the Niagara River.

The principal beach deposit is the Iroquois beach ridge. This ridge stretches nearly all the way across the county and provides the road base for the Ridge Road. Some lesser beaches are located north of Ridge Road. The most recognizable of these are in the Newfane beach area. Outwash and beach deposits provide the best source of gravel in the county. They also contain the best soils for crops grown for an early market.

Physiography and Drainage

Niagara County lies in the eastern lake section of the Central Lowland physiographic province (8). This section is divided into the Erie, Huron, and Ontario Plains. The county occupies part of the Huron and Ontario Plains. The Ontario Plain extends from the shore of Lake Ontario to the foot of the Niagara Escarpment, and the Huron Plain from the crest of the escarpment southward beyond the county line.

The Niagara Escarpment consists of a steep northward slope, along which perpendicular bluffs are exposed in places. The crest has an elevation of slightly more than 600 feet. It is steeper and narrower in the western part. Its width ranges from only a few rods at Lewiston to nearly 2 miles in the eastern part. North of the 400-foot contour line, the nearly level lake plain slopes at the rate of 20 feet a mile toward the lake, which is 8 miles from the escarpment. The surface of the lake is 246 feet above sea level, and the lakeshore is nearly everywhere bordered by low bluffs 15 to 60 feet high. The land surface is fairly uniform, but it is dissected in a few places by shallow valleys of minor streams. The minor irregularities of relief have a northeast-southwest trend. This is chiefly indicated by the courses of the streams, most of which flow northeastward.

A low but well-marked, fairly sinuous ridge runs along the inner margin of the Ontario Plain. In some places this ridge is close to the base of the escarpment, and in others it is more than 4 miles north of it. The ridge rises 10 to 30 feet above the level of the surrounding land. It extends in a general westerly direction from Johnson Creek and the eastern part of the county to Ridge Road, where it turns south-westward and continues to Wrights Corners. The ridge is not well developed across the valley of Eighteenmile Creek, but it reappears near Warrens Corners and extends westward to the base of the escarpment east of Lewiston. Although low and in places inconspicuous, the ridge is an important topographic feature, as it is traversed by a main highway, United States Highway No. 104, or the Ridge Road, and is everywhere thickly settled. It represents an old beach ridge formed by a predecessor of Lake Ontario (5), and a well-worn Indian trail followed it before the arrival of white men.

For the last few miles of their courses, the larger streams flowing into Lake Ontario descend through narrow gorges 10 to 30 feet deep. About 4 miles above its mouth, Eighteenmile Creek flows through a gorge that is 70 feet deep and one-eighth mile wide and has precipitous walls in places. The broad, shallow valley of the Niagara River crosses the Ontario Plain on the west.

About half the area of the county is occupied by the Huron Plain. The central part of this plain extends from Wolcottsville westward past North Tonawanda. It is nearly level and slopes gently westward from an altitude of 600 feet or more on the east to 570 feet along the Niagara River. The evenness of most of the surface is broken in places by low, narrow, irregular ridges that have a northeast-southwest direction. These irregular ridges range from 1.4 to nearly 2 miles in length and rise 20 to 50 feet above the general land surface. West of Lockport a long, narrow ridge that is roughly parallel to the Niagara Escarpment lies along the northern margin of the plain. This ridge rises 20 to 40 feet above the plain and reaches an altitude of 660 feet at one or two points near Pekin and of 680 feet about 2 miles east of Dysinger. East of Lockport the surface is more or less irregular, and there are several low ridges that have a general east-west trend.

The general elevation of the Huron Plain is 600 feet. Elevation ranges from 575 feet at the mouth of Tonawanda Creek to a maximum of 680 feet near Dysinger. The elevation at Lockport is 600 feet, which also is the elevation at Niagara Falls. The elevation of the Ontario Plain at the base of the escarpment ranges from 400 feet at Lewiston to 500 feet at the point where the escarpment leaves the county on the east.

Drainage of the Ontario Plain is northward into Lake Ontario. The streams have crooked channels, which meander through comparatively narrow flood plains that are not deeply cut. Within the plain there are several broad, level or slightly depressed basinlike areas that have poorly developed outlets. The drainage of these and of numerous other level areas has been attempted by ditching, but most of the ditches are too small for efficient drainage, and many are choked with weeds and shrubs. Many of the soils of the lake plain are somewhat poorly drained to poorly drained.

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID AND HAZARDOUS WASTE

(30)

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Please print or type.

Form Approved. OMB No. 2050-0039. Expires 9-30-88

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Department of Transportation (518) 457-7362.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. Small Quantity - EXEMPT 0 0 5 1 7 — Manifest Document No.

2. Page 1 of

Information in the shaded areas is not required by Federal Law.

GENERATOR

3. Generator's Name and Mailing Address
3800 HIGHLAND AVENUE
COLLEGE & HIGHLAND AVENUE
NIAGARA FALLS, NY 14305

4. Generator's Phone (716) 285-0188

5. Transporter 1 (Company Name)
ADVANCE ENVIRONMENTAL

6. US EPA ID Number
N Y D 9 8 2 1 8 1 5 1 3

7. Transporter 2 (Company Name)

8. US EPA ID Number

9. Designated Facility Name and Site Address
ENVIROTEK
4000 RIVER ROAD
TONAWANDA, NY 14150

10. US EPA ID Number
N Y D 0 3 8 6 4 1 6 0 1

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. WASTE PAINT RELATED MATERIAL COMBUSTIBLE LIQUID NA1268	0 0 4	D M	0 1 8 3 2	P
b. WASTE XYLENE FLAMMABLE LIQUID UN1307	0 0 3	D M	0 1 3 7 4	P
c.				
d.				

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and ar classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmer regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economicall practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to huma health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste managemen method that is available to me and that I can afford.

Printed/Typed Name: DON CHAPMAN — Signature: Don Chapman — Mo. 1 Day 21 Ye 8

TRANSPORTER

17. Transporter 1 (Acknowledgement of Receipt of Materials)

Printed/Typed Name: DICK MARTINEAU ~~MIKE LEBARRON~~ — Signature: Richard Martineau — Mo. 1 Day 21 Ye 88

18. Tranaporter 2 (Acknowledgement or Receipt of Materials)

Printed/Typed Name — Signature — Mo. Day Ye

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: ~~PETER~~ KELLER — Signature: Peter Keller — Mo. 1 Day 21 Ye 88

EPA Form 8700-22 (Rev. 9-86) Previous edition is obsolete.

COPY 3—Generator—mailed by TSD facility

APPENDIX A

PHASE II FIELD PROCEDURES

APPENDIX A

PHASE II FIELD PROCEDURES

These procedures have been utilized by Engineering Science and NYSDEC field personnel during the Phase II field investigations. These procedures are taken from the NYSDEC approved "Quality Assurance Project Plan for the Phase II Engineering Investigations and Evaluations at Inactive Hazardous Waste Disposal Sites", dated June, 1987/

The following procedures are contained in this appendix: drilling overburden and bedrock, monitoring well installations, well development, and sampling program, including groundwater sampling, waste sampling, and air monitoring.

DRILLING OVERBURDEN AND BEDROCK

The procedures utilized in drilling overburden and bedrock were taken from "Guidelines for Exploratory Boring, Monitoring Wells installation, and Documentation of these Activities", as promulgated by NYSDEC. These procedures, as found in the project Work Plan and Quality Assurance Plan, were modified in the field with NYSDEC approval, in response to site-specific conditions encountered.

Prior to beginning each well boring, the downhole drilling equipment and tools were steam cleaned. During the progress of the work, the downhole equipment and tools were generally placed on wooden pallet or on sheets of plastic to limit cross contamination.

Drilling was accomplished with a Mobile B-61 truck mounted drilling rig. Generally, the overburden was drilled with 4 1/4 inch inside diameter hollow stem augers. In general, soil samples were collected at intervals of five feet and visually classified in terms of moisture content, color, texture, density and structure. The soil samples were screened with a Photovac Tip-II to determine the presence of certain volatile organic compounds. The soil cuttings were also monitored with the Photovac. Since no readings in excess of 5 (ppm) above background were recorded, the soil materials were left on the ground surface.

Bedrock was cored and sampled utilizing an Nx core barrel and clean water from a municipal supply. The core was placed in wooden boxes and classified in terms of lithology, color, structure, and competence.

MONITORING WELL INSTALLATION

All wells were constructed of tow inch inside diameter PVC riser pipe and .010 inch slotted screen. Depending on the location, well screens were 10 to 19.5 feet in length. All well materials were steam cleaned prior to insertion in the borehole.

Once the PVC well materials were set in place through the augers, quartz sand backfill was placed around the well screen to the top of the screen. A two foot thick bentonite seal was placed above the sand pack to isolate the screened zone. Above the bentonite seal, a cement/bentonite grout was placed up to ground surface.

A vented PVC cap was placed on the well pipe, and the well was secured with the installation of a locking 4 inch inside diameter steel protective casing.

WELL DEVELOPMENT

Once the well installation was complete, the well materials were allowed to set up for a period of approximately 12 hours or more. Each well was then developed by removing water until the water was less than 100 Jackson Tubidity units, or was visually sediment-free.

Development methods included bailing and air lift pumping. For the air lift method, the discharge of the air line was first monitored with a Photovac to ensure readings were not above background. An oil separating device was placed on the discharge line of the compressor. The air line was steam cleaned prior to placement in the well. Once the air line was in place just above the screened section, the air pressure was increased until the water could be lifted out of the top of the well casing. Under both development methods, the wells were periodically surged to aid in removing sediment.

SAMPLING PROGRAM

The sampling program at the Chisholm-Ryder site consisted of groundwater, and waste sampling. Samples were collected in accordance with the Quality Assurance Project Plan. In addition to the media sampled, two types of blanks were collected. A trip blank consisting of organic free water was prepared by the laboratory and accompanied the sample bottle shipment. This blank provides a measure of the impact of bottle preparation procedures and shipment on the samples. The trip blank was analyzed for volatile organic compounds. A field blank was also collected by pouring organic free water provided by the laboratory or a commercial distributor over the sampling equipment as a measure of the field decontamination procedures. The field blank was analyzed for volatile organic compounds.

Prior to sampling at each location, the sampling equipment was decontaminated by successively rinsing with detergent (Alconox) water, methanol, and distilled water. After collection of the water samples, field tests were performed on an additional sample to determine pH, temperature and specific conductivity. Field sampling records are presented in Appendix C.

Groundwater Sampling

Prior to collecting the groundwater samples, the static water level in the well was recorded from the top of the PVC casing, and at least three well volumes of water were removed with a teflon bailer. The sample bottles were then filled using the same teflon bailer. Dedicated polypropylene or polyethylene rope was used to bail each well.

Waste Sampling

Two waste samples were collected from corroded drums, and sample bottles were filled with a long handled stainless steel spoon.

AIR QUALITY MONITORING

Air quality monitoring for certain organic compounds with a Photovac Tip-II photoionization meter was implemented during the geophysical surveys, drilling and well installations and sampling events. Monitoring was generally performed as a health and safety measure. The intake of the instrument was held at head height for 30 seconds and the reading was recorded. During drilling, the split spoon soil samples were held within several inches of the intake to test for organic vapors emanating from the soil samples. The air in the completed well was monitored by placing the intake over the well opening and removing the PVC cap. The intake was then placed into the well opening and readings were noted.

APPENDIX B

GEOLOGIC DATA

DRILLING CONTRACTOR:
Driller: D. MILLER
Inspector: K. ISAKOWER
Rig Type: MOBILE 61
Drilling Method: HSA / CORE 4¼"ID / 2⅞

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME: CHISOLM-RYDER
PROJECT NO.: 54012.17

BORING NO.: GW-1
Sheet: 1 of 1
Location: NEAR HIGHLAND AVE. BY FENCE

GROUND WATER OBSERVATIONS

Water Level	13.0	13.0	
Time	1530	0735	
Date	12/15	12/17	
Casing Depth	18.5	18.5	

Weather:
Date/Time Start: 12/14/87 1430
Date/Time Finish: 12/16/87 0900

Plot Plan: HIGHLAND AVE., GW1, N, RAIL SPUR, DRY STREAM

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0.0	0-2	S-1	2	BROWN SILT, SOME SAND, TRACE GRAVEL	CEMENT/BENTONITE GROUT	
	REC = 6		3			
			4			
			5			
0	5-7	S-2	14		BENT. PELLETS 7.0	
	REC = 10"		17			
			15			
			18			
				AUGER REFUSAL AT 8.5'	8.5	
0.0	8.5-18.5	C-1		DARK GREY, FINE GRAINED DOLOMITE. SOME SECONDARY CALCITE DEPOSITS.	DOLOMITE / #4 Q-ROCK; 2" ID PVC #10 SLOT SCREEN 9'	
	REC = 10'					
	RQD = 23%					
				CORING ENDS - 18.5'	18.5	

SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON

Soil Stratigraphy Summary: TILL TO 8.5' OVER DOLOMITE BEDROCK

DRILLING CONTRACTOR:
Driller: D MILLER
Inspector: K. ISAKOWER
Rig Type: MOBILE 61
Drilling Method: 4¼" ID HSA

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME: CHISOLM-RYDER
PROJECT NO.: S4012.17

BORING NO.: GW-2
Sheet: 1 of
Location: NEAR DRY STREAM BY FENCE

GROUND WATER OBSERVATIONS

Water Level	11	
Time	12:00	
Date	12/22	
Sounding Depth	10'	

Weather: Fair
Date/Time Start: 12/16/87 2:00
Date/Time Finish: 12/23/87 9:00

Plot Plan: HIGHLAND AVE, GW-2, DRY STREAM

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
2.0	0-2	S-1		BROWN SILT, TRACE SAND AND GRAVEL, AND SOME FILL (NON-SOIL) MATERIAL	Cement/Bentonite Grout; 2" ID PVC Riser	PHOTOVAC: 6.6 ppm in hole at 2' (0.2 ppm in breathing zone)
	REC# 15		9			
			17			
			18			
	5-7	S-2	9			5' - HOLE CROOKED. AUGER PULLED. RIG MOVED 5', NEW HOLE AUGERED
2.0	REC# 12		8			PHOTOVAC: 1.7 ppm off pulled auger at 5'
			20			
			17			
2.0	10-12	S-3	12		Bentonite Pellets; 2" ID PVC #10 slot Screen; Sand; 2" ID PVC	
	REC# 7"		26/3"	2" - DOLOMITE BEDROCK Gray layered fine grained Dolomite small fractures		Photovac. 2.5 ppm at water return pipe (0.0 in breathing zone)
	10-20'					
	Rec - 18.2'					
	RQD - 10%					
				Coring Ends 20.0'		

8'
10'
20'

SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON

Soil Stratigraphy Summary: Silty Till to 10' over Dolomite Bedrock

DRILLING CONTRACTOR:
Driller: D. Miller
Inspector: W.D. Lilley
Type: Mobile 61
Drilling Method: 4¼" ID HSA + NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME: Chisholm Ryder
PROJECT NO.: SY012.17

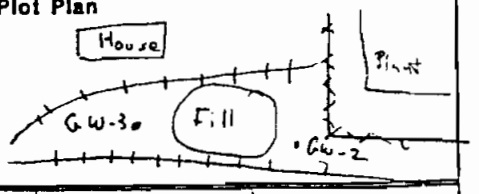
BORING NO.: GW-3
Sheet: 1 of 1
Location: West of fill between RR tracks behind house.

GROUND WATER OBSERVATIONS

Water Level			
Time			
Date			
Casing Depth			

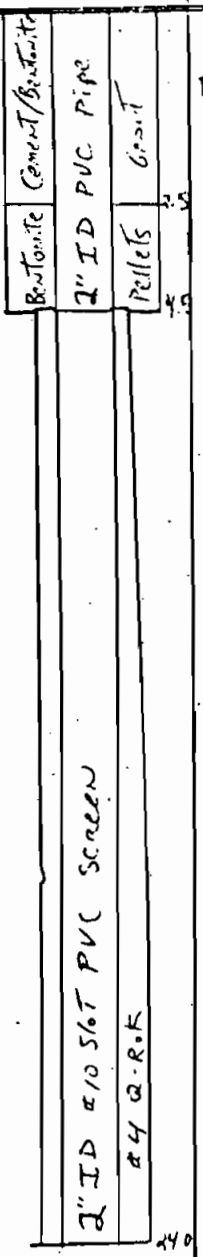
Weather: Cloudy
Date/Time Start: 12/22/87 2:00
Date/Time Finish: 1/12/88 11:00 am

Plot Plan



Hotovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL
0.0	0-2	S-1	2	Brown Silt, Trace Fine sand.
	SS		3	Trace Fine Gravel (moist) (Stiff)
	Rec 14		3	
			5	
				4.5 Refusal
	4.5-14.5	C-1	RUN: 10.0	GRAY FINE grained dolomite, moderately weathered, frequent horizontal fractures. Secondary calcite crystallization in solution pits. Becoming highly weathered AT 19.5 feet.
			Rec 7.7	
			RQD = 31.1%	
	14.5-24.5	C-2	RUN: 10.0	
			Rec = 9.0	
			RQD = 72.2%	
				24.5'
				Coring ends at 24.5'

WELL SCHEMATIC



Comments

Refusal at 3' hole relocated 5' west.

Cored with water from municipal supply source AT plant. Cored 4.5-24.5 feet. Reamed hole with 3 7/8" bit To 24.5 feet. Hole open To 24 feet AT Time of well installation

ST - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary

APPENDIX C

LABORATORY ANALYTICAL DATA

Previous Sampling Results

Wastes Results

Groundwater Results

Field Sampling Records

Each group noted above is organized by sample number. Results are listed in the following order: volatile organics, semi-volatile organics, pesticide/PCBs, metals and TOX. Organic data qualifiers can be found at the bottom of each Form I, page 1 (volatile compounds). Inorganic data qualifiers are listed following this cover page.

APPENDIX C

LABORATORY ANALYTICAL DATA

Previous Sampling Results

Wastes Results

Groundwater Results

Field Sampling Records

Each group noted above is organized by sample number. Results are listed in the following order: volatile organics, semi-volatile organics, metals and TOX. Organic data qualifiers can be found at the bottom of each Form I, page 1 (volatile compounds). Inorganic data qualifiers are listed following this cover page.

0000062

Lab Name: NANCO LABORATORIES, INC.
Lab Address: Robinson Lane, RD 6
Wappingers Falls, New York

DATE REPORTED: 2/22/88

VALUE - IF THE RESULT IS A VALUE GREATER THAN OR EQUAL TO THE INSTRUMENT DETECTION LIMIT BUT LESS THAN THE CONTRACT-REQUIRED DECTECTION LIMIT, THE VALUE IS REPORTED IN BRACKETS (i.e., [10]. THE ANALYTICAL METHOD USED IS INDICATED WITH P (FOR ICP), A (FOR FLAME AA) OR F (FOR FURNACE AA).

U - INDICATES ELEMENT WAS ANALYZED FOR BUT NOT DETECTED. REPORTED WITH THE INSTRUMENT DETECTION LIMIT VALUE (e.g., 10 U).

E - INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO THE PRESENCE OF INTERFERENCE.

S - INDICATES A VALUE DETERMINED BY METHOD OF STANDARD ADDITION.

N - INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS.

* - INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS.

+ - INDICATES THE CORRELATION COEFFICIENT FOR METHOD OF STANDARD ADDITION IS LESS THAN 0.995

M - INDICATES DUPLICATE INJECTION RESULTS EXCEEDED CONTROL LIMITS.

P - INDICATES ICP ANALYSIS

F - INDICATES FURNACE ANALYSIS

[] - INDICATES SAMPLE VALUE IS BETWEEN IDL AND CRDL

COMMENTS :

Previous Sampling Results

REF-23

11. CHISHOLM RYDER (USGS field reconnaissance) NYSDEC 932009

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

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

Geologic information.--The site consists of fill overlying a veneer of ground-moraine material that overlies bedrock of Lockport Dolomite. The U.S. Geological Survey drilled three test holes on the site in 1982; the locations are shown in figure C-6. The geologic logs are as follows:

Boring no.	Depth (ft)	Description
1	0 - 1.5	Black organic soil.
	1.5 - 2.0	Same, impenetrable materials, possibly bedrock at 2 ft.
		SAMPLE: 2 ft.
2	0 - 3.5	Reddish brown topsoil.
	3.5 - 5.0	Silt (?), tan, friable, some gravel, dry, sandy.
	5.0 - 6.5	Silt or clay, reddish, dry, some gravel.
	6.5 - 8.5	Same, impenetrable material, possibly bedrock at 8.5 ft.
		SAMPLE: 8.5 ft.
3	0 - 1.0	Black organic topsoil.
	1.0 - 5.0	Clay, sandy, reddish, gravelly.
		SAMPLE: 5 ft.

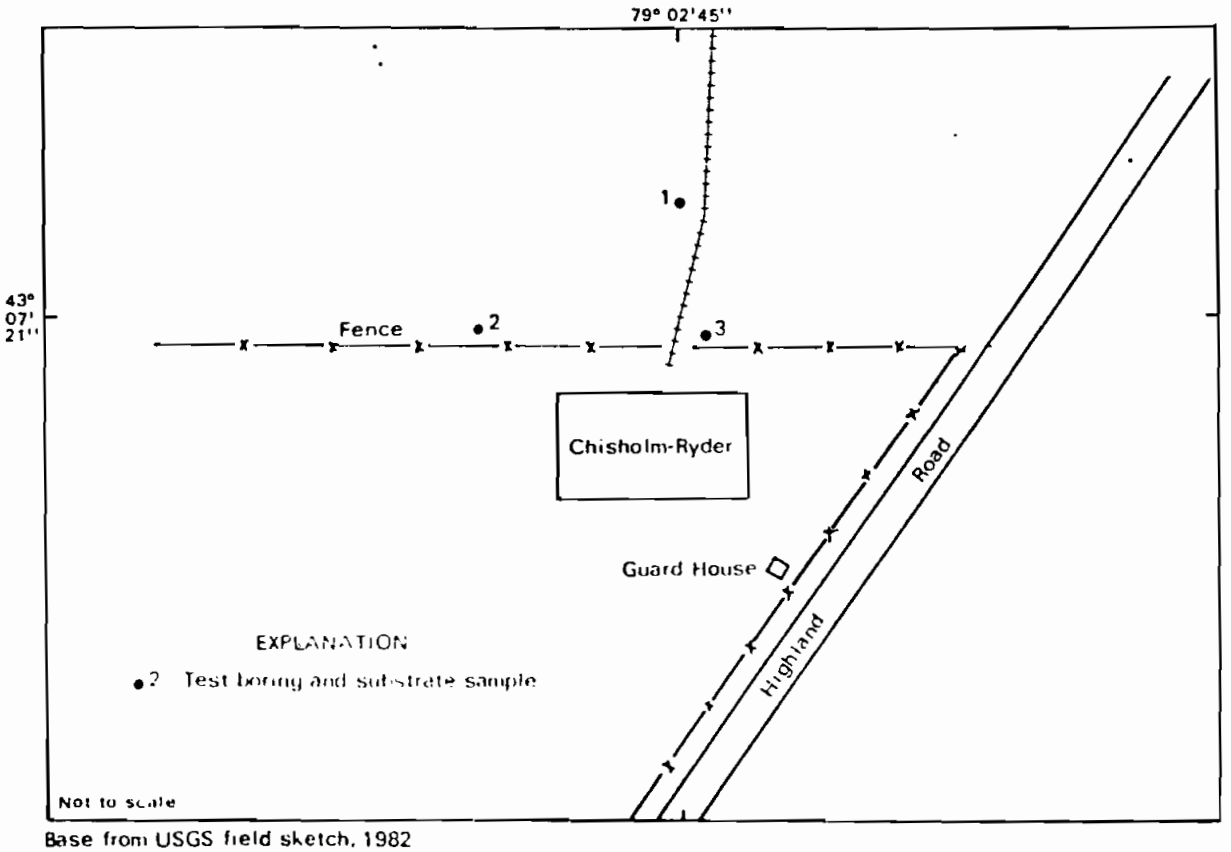


Figure C-6. Location of sampling holes at Chisholm Ryder, site 11, Niagara Falls.

Hydrologic information.--Ground water was not encountered and is probably confined to fractures in the underlying bedrock.

Chemical information.--The U.S. Geological Survey collected three soil samples for cadmium, chromium, copper, iron, lead, mercury, zinc, and organic-compound analyses; results are shown in table C-5. The concentrations of zinc in samples 2 and 3 are substantially higher than in samples collected in undisturbed soils not affected by hazardous-waste-disposal practices. The samples contained 14 organic priority pollutants, 15 organic nonpriority pollutants, and some unknown hydrocarbons.

Table C-5.--Analyses of substrate samples from Chisholm Ryder, site 11, Niagara Falls, N.Y.
[Locations shown in fig. C-6. Concentrations are in µg/kg; dashes indicate that constituent or compound was not found, LT indicates it was found but below the quantifiable detection limit.]

	Sample number and depth below land surface (ft)		
	1	2	3
First sampling (06-30-82)	(2.0)	(8.5)	(5.0)
Inorganic constituents			
Cadmium	1,000	2,000	2,000
Chromium	10,000	2,000	3,000
Copper	5,000	3,000	12,000
Iron	13,000	26,000	1,500,000
Lead	10,000	20,000	50
Mercury	--	--	--
Zinc	2,000	200,000†	220,000†
	Sample number and depth below land surface (ft)		
	1A	2A	3A
Second sampling (05-25-83)	(2.0)	(8.5)	(5.0)
Organic compounds			
Priority pollutants			
Toluene	--	--	3.3**
Trichloroethene	--	--	4.8**
Phenol	--	--	*
Fluoranthene	*	*	*

[1] Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semiquantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analysts.

† Exceeds concentrations in samples taken from undisturbed soils in the Niagara Falls area. Undisturbed soils not analyzed for iron.

* Compounds detected but not quantified; holding time exceeded before GC/MS acid- and base-neutral extractable compounds were extracted.

** Surrogate recoveries were outside the acceptance limits.

Table C-5.--Analyses of substrate samples from Chisholm Ryder, site 11, Niagara Falls, N.Y. (continued)
[Locations shown in fig. C-6. Concentrations are in µg/kg; dashes indicate that constituent or compound was not found, LT indicates it was found but below the quantifiable detection limit.]

	Sample number and depth below land surface (ft)		
	1A	2A	3A
Second sampling (05-25-83)	(2.0)	(8.5)	(5.0)
Organic compounds (continued)			
Priority pollutants (continued)			
Naphthalene	*	--	*
Di-n-butyl phthalate	*	--	*
Bis(2-ethylhexyl) phthalate	*	--	--
Benzo(a)pyrene	--	--	*
Benzo(a)anthracene	--	*	--
Benzo(b)fluoranthene and benzo(k)fluoranthene	*	*	*
Acenaphthylene	--	--	*
Benzo(ghi)perylene	--	--	*
Indeno(1,2,3-cd)pyrene	--	--	*
Pyrene	--	*	*
Nonpriority pollutants			
Carbon disulfide	--	--	43.7**
O-xylene	--	--	9.6**
Benzoic acid	--	--	*
Dibenzofuran	--	--	*
2-methylnaphthalene	*	--	*
Trans-2-chloro-cyclohexanol[1]	*	--	
Dibutyl-dodecanedioate[1]	*	--	
Di-isooctyl phthalate[1]	*	--	
Trichlorofluoromethane[1]	--	--	*
Tetrahydrofuran[1]	--	--	*
Cyclohexane[1]	--	--	*
Methylcyclohexane[1]	--	--	*
1,1,3-Trimethylcyclopentane[1]	--	--	*
Cis-1,2-Dimethylcyclohexane[1]	--	--	*
1,1,3-Trimethylcyclohexane[1]	--	--	*
(1-Methylethyl)-cyclohexane[1]	--	--	*
1,3- and 1,4-Dimethylbenzene[1]	--	--	*
Unknown hydrocarbons[1]	*	--	*

Waste Results

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NANCO LABS, INC.

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QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

ENGINEERING SCIENE

Date Received: 1/30/88
Date Reported: 2/22/88

PESTICIDES & HERBICIDES BY G.C.

Nanco Sample ID: ES 5347 Customer ID: D-1.17

# COMPOUNDS	MCL UG/L	RESULTS SAMP. CONC. UG/L	RESULTS MRL UG/L	Q.C. BLANK & SPIKE BLANK BLANK UG/L	BLANK CONC. ADDED UG/L	BLANK % RECOVERY	Q.C. MATRIX SPIKE UNSPIKED SAMPLE UG/L	MATRIX SPIKE CONC. ADDED UG/L	MATRIX SPIKE % RECOVERY	MATRIX SPIKE DUP. % RECOVERY
HERBICIDES										
1H 2,4 D	100.0	ND	2.0	N.D.	2.0	59	ND	2.0	33	52
2H SILVEX	10.0	ND	1.0	N.D.	2.0	60	ND	2.0	51	52
PESTICIDES										
1P LINDANE	4.0	ND	0.5	N.D.	0.2	90	ND	0.2	90	85
2P ENDRIN	0.2	ND	0.5	N.D.	0.5	95	ND	0.5	122	116
3P METHOXYCHLOR	100.0	ND	1.0	N.D.	8.0	40	ND	8.0	95	114
4P TOXAPHENE	5.0	ND	10.0	N.D.	---	---	ND	---	---	---

N.D. = NOT DETECTED MRL = MINIMUM REPORTING LEVEL MCL = MAXIMUM CONTAMINATION LEVEL

* IN LEACHATE

Due to Matrix Interference, the spike Compounds could not be recovered.

The data used for the recoveries on these reports are from another sample.

000 5C

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NANCO LABS, INC.

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Date Received: 01/30/88
Date Reported: 02/22/88

ENGINEERING SCIENCE

E.P. TOXICITY METALS

Nanco ID: 87-ES-5347 Customer ID: D 1.17

#	COMPOUNDS	RESULTS	UNITS	MCL
1M	ARSENIC	<0.050	MG/L	5.0
2M	BARIUM	0.508	MG/L	100
3M	CADMIUM	0.211	MG/L	1.0
4M	CHROMIUM	0.975	MG/L	5.0
5M	LEAD	2.670	MG/L	5.0
6M	MERCURY	<0.0002	MG/L	0.2
7M	SELENIUM	<0.075	MG/L	1.0
8M	SILVER	<0.010	MG/L	5.0

MCL = MAXIMUM CONTAMINATION LEVEL

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NANCO LABS, INC.

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QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

ENGINEERING SCIENE

Date Received: 1/30/88
Date Reported: 2/22/88

PESTICIDES & HERBICIDES BY G.C.

Nanco Sample ID: ES 5348 Customer ID: D-2.17

# COMPOUNDS	MCL UG/L	RESULTS SAMP. CONC. UG/L	RESULTS MRL UG/L	Q.C. BLANK & SPIKE BLANK BLANK UG/L	BLANK CONC. ADDED UG/L	BLANK % RECOVERY	Q.C. MATRIX SPIKE UNSPIKED SAMPLE UG/L	MATRIX SPIKE CONC. ADDED UG/L	MATRIX SPIKE % RECOVERY	MATRIX SPIKE DUP. % RECOVERY
HERBICIDES										
1H 2,4 D	100.0	ND	2.0	N.D.	2.0	59	ND	2.0	33	52
2H SILVEX	10.0	ND	1.0	N.D.	2.0	60	ND	2.0	51	52
PESTICIDES										
1P LINDANE	4.0	ND	0.5	N.D.	0.2	90	ND	0.2	90	85
2P ENDRIN	0.2	ND	0.5	N.D.	0.5	95	ND	0.5	122	116
3P METHOXYCHLOR	100.0	ND	1.0	N.D.	8.0	40	ND	8.0	95	114
4P TOXAPHENE	5.0	ND	10.0	N.D.	---	---	ND	---	---	---

N.D. = NOT DETECTED MRL = MINIMUM REPORTING LEVEL MCL = MAXIMUM CONTAMINATION LEVEL

* IN LEACHATE

Due to Matrix Interference, the Spike Compounds could not be recovered.

The data used for the recoveries on these reports are from another sample.

C00 55

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NANCO LABS, INC.

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Date Received: 01/30/88
Date Reported: 02/22/88

ENGINEERING SCIENCE

E.P. TOXICITY METALS

Nanco ID: 87-ES-5348 Customer ID: D 2.17

#	COMPOUNDS	RESULTS	UNITS	MCL
1M	ARSENIC	<0.050	MG/L	5.0
2M	BARIUM	0.572	MG/L	100
3M	CADMIUM	0.191	MG/L	1.0
4M	CHROMIUM	0.786	MG/L	5.0
5M	LEAD	2.810	MG/L	5.0
6M	MERCURY	<0.0002	MG/L	0.2
7M	SELENIUM	<0.075	MG/L	1.0
8M	SILVER	<0.010	MG/L	5.0

MCL = MAXIMUM CONTAMINATION LEVEL

90
00000617

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NANCO LABS, INC.

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Date Received: 01/30/88

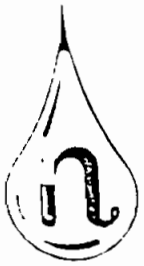
Engineering Science

Date Reported: 02/22/88

pH DATA

	pH units
PARAMETERS	RESULTS
88-ES-5347	6.8
88-ES-5348	7.7

Groundwater Results



SAMPLE DATA

GW-L17__

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
GW-1.17

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:> H0102
Sample Matrix: WATER
Data Release Authorized By: Kathleen M. Killip

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: CHISHOLM RYDER
Date Sample Received: 1-30-88

VOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 2-9-88
Date Analyzed:2-9-88
Conc/Dil Factor: 1 pH: 6.8
Percent Moisture: N/A

CAS Number		(ug/l) or ug/Kg (Circle One)	CAS Number		(ug/l) or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U	79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
74-83-9	Bromomethane	10.0 U	78-87-5	1,2-Dichloropropane	5.0 U
75-01-4	Vinyl Chloride	10.0 U	10061-02-6	Trans-1,3-Dichloropropene	5.0 U
75-00-3	Chloroethane	10.0 U	79-01-6	Trichloroethene	5.0 U
75-09-2	Methylene Chloride	30.0 B	124-48-1	Dibromochloromethane	5.0 U
67-64-1	Acetone	69.0 B	79-00-5	1,1,2-Trichloroethane	5.0 U
75-15-0	Carbon Disulfide	5.0 U	71-43-2	Benzene	2.2 J
75-35-4	1,1-Dichloroethene	5.0 U	10061-01-5	cis-1,3-Dichloropropene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U	110-75-8	2-Chloroethylvinylether	10.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U	75-25-2	Bromoform	5.0 U
67-66-3	Chloroform	5.0 U	591-78-6	2-Hexanone	10.0 U
107-06-2	1,2-Dichloroethane	5.0 U	108-10-1	4-Methyl-2-Pentanone	10.0 U
78-93-3	2-Butanone	10.0 U	127-18-4	Tetrachloroethene	5.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U	108-88-3	Toluene	2.4 J
56-23-5	Carbon Tetrachloride	5.0 U	108-90-7	Chlorobenzene	5.0 U
108-05-4	Vinyl Acetate	10.0 U	100-41-4	Ethylbenzene	5.0 U
75-27-4	Bromodichloromethane	5.0 U	100-42-5	Styrene	5.0 U
				Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

If the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

AQUEOUS MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

COMPOUND (Units of Measure = µg/l)	SAMPLE IDENTIFICATION (DATE) MW-1 (1/29/88)
Acetone	<10
Benzene	<4.4
Bromodichloromethane	<2.2
Bromoform	<4.7
Bromomethane	<10
2-Butanone	<10
Carbon disulfide	<5.0
Carbon tetrachloride	<2.8
Chlorobenzene	<6.0
Chloroethane	<10
2-Chloroethylvinyl ether	<10
Chloroform	<1.6
Chloromethane	<10
Dibromochloromethane	<3.1
1,1-Dichloroethane	<4.7
1,2-Dichloroethane	<2.8
1,1-Dichloroethylene	<2.8
trans-1,2-Dichloroethylene	<1.6
1,2-Dichloropropane	<6.0
cis-1,3-Dichloropropene	<5.0
trans-1,3-Dichloropropene	<5.0
Ethylbenzene	<7.2
2-Hexanone	<10
Methylene chloride	<2.8
4-Methyl-2-pentanone	<10
Styrene	<5.0
1,1,2,2-Tetrachloroethane	<6.9
Tetrachloroethylene	<4.1
Toluene	<6.0
1,1,1-Trichloroethane	<3.8
1,1,2-Trichloroethane	<5.0
Trichloroethylene	<1.9
Vinyl acetate	<10
Vinyl chloride	<10
Total Xylenes	<5.0

Note: MW-1 = GW-1

I.D. #88-135

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

SAMPLE NO.
GW-1.17

SEMIVOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 02/01/88
Date Analyzed: 02/11/88
Conc/Dil Factor:----------> 2
Percent Moisture: N/A

GPC Cleanup: Yes___ No X
Separatory Funnel Extraction: Yes X
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		(ug/l) or ug/Kg (Circle One)
108-95-2	Phenol	660.0 U
111-44-4	bis(-2-Chloroethyl)Ether	660.0 U
95-57-8	2-Chlorophenol	660.0 U
541-73-1	1,3-Dichlorobenzene	660.0 U
106-46-7	1,4-Dichlorobenzene	660.0 U
100-51-6	Benzyl Alcohol	660.0 U
95-50-1	1,2-Dichlorobenzene	660.0 U
95-48-7	2-Methylphenol	660.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	660.0 U
106-44-5	4-Methylphenol	660.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	660.0 U
67-72-1	Hexachloroethane	660.0 U
98-95-3	Nitrobenzene	660.0 U
78-59-1	Isophorone	660.0 U
88-75-5	2-Nitrophenol	660.0 U
105-67-9	2,4-Dimethylphenol	660.0 U
65-85-0	Benzoic Acid	3200.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	660.0 U
120-83-2	2,4-Dichlorophenol	660.0 U
120-82-1	1,2,4-Trichlorobenzene	660.0 U
91-20-3	Naphthalene	660.0 U
106-47-8	4-Chloroaniline	660.0 U
87-68-3	Hexachlorobutadiene	660.0 U
59-50-7	4-Chloro-3-Methylphenol	660.0 U
91-57-6	2-Methylnaphthalene	660.0 U
77-47-4	Hexachlorocyclopentadiene	660.0 U
88-06-2	2,4,6-Trichlorophenol	660.0 U
95-95-4	2,4,5-Trichlorophenol	3200.0 U
91-58-7	2-Chloronaphthalene	660.0 U
88-74-4	2-Nitroaniline	3200.0 U
131-11-3	Dimethyl Phthalate	660.0 U
208-96-8	Acenaphthylene	660.0 U
99-09-2	3-Nitroaniline	3200.0 U

CAS Number		(ug/l) or ug/Kg (Circle One)
83-32-9	Acenaphthene	660.0 U
51-28-5	2,4-Dinitrophenol	3200.0 U
100-02-7	4-Nitrophenol	3200.0 U
132-64-9	Dibenzofuran	660.0 U
121-14-2	2,4-Dinitrotoluene	660.0 U
606-20-2	2,6-Dinitrotoluene	660.0 U
84-66-2	Diethylphthalate	660.0 U
7005-72-3	4-Chlorophenyl-phenylether	660.0 U
86-73-7	Fluorene	660.0 U
100-01-6	4-Nitroaniline	3200.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3200.0 U
86-30-6	N-Nitrosodiphenylamine (1)	660.0 U
101-55-3	4-Bromophenyl-phenylether	660.0 U
118-74-1	Hexachlorobenzene	660.0 U
87-86-5	Pentachlorophenol	3200.0 U
85-01-8	Phenanthrene	660.0 U
120-12-7	Anthracene	660.0 U
84-74-2	Di-n-Butylphthalate	660.0 U
206-44-0	Fluoranthene	660.0 U
129-00-0	Pyrene	660.0 U
85-68-7	Butylbenzylphthalate	660.0 U
91-94-1	3,3'-Dichlorobenzidine	1320.0 U
56-55-3	Benzo(a)Anthracene	660.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	1600.0 B
218-01-9	Chrysene	660.0 U
117-84-0	Di-n-Octyl Phthalate	660.0 U
205-99-2	Benzo(b)Fluoranthene	660.0 U
207-08-9	Benzo(k)Fluoranthene	660.0 U
50-32-8	Benzo(a)Pyrene	660.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	660.0 U
53-70-3	Dibenz(a,h)Anthracene	660.0 U
191-24-2	Benzo(g,h,i)Perylene	660.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET

(PAGE 4)

SAMPLE NUMBER

GW-1.17

LABORATORY NAME :NANCO LABS.INC.

CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/Kg)
1	-----	NONE FOUND	VOA	-----	-----
2					
3					
4	-----	UNKNOWN	BNA	1334	19.0 J
5	-----	UNKNOWN	BNA	1420	145.0 J
6	-----	UNKNOWN	BNA	1532	20.0 J
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

NANCO LABS, INC.

0000208

Reporting Date: 2/2/88

Results of analysis on ~~Drinking~~ TOX water sample received 1/30/88

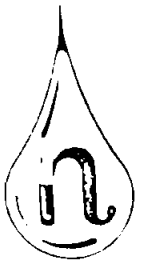
PLE ID :

NCO ID: 88- EW5346

ARAMETERS	RESULTS	UNITS
TOX	19	ug/l

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR



SAMPLE DATA

GW-2.17

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
GW-2.17

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:> G0283
Sample Matrix: WATER
Data Release Authorized By: Kathleen M. Kelly

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: CHISHOLM RYDER
Date Sample Received: 1-30-88

VOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 2-3-88
Date Analyzed:2-3-88
Conc/Dil Factor: 1 pH: 6.8
Percent Moisture: N/A

CAS Number		(ug/l) or ug/Kg (Circle One)	CAS Number		(ug/l) or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U	79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
74-83-9	Bromomethane	10.0 U	78-87-5	1,2-Dichloropropane	5.0 U
75-01-4	Vinyl Chloride	10.0 U	10061-02-6	Trans-1,3-Dichloropropene	5.0 U
75-00-3	Chloroethane	10.0 U	79-01-6	Trichloroethene	6.6
75-09-2	Methylene Chloride	11.0 B	124-48-1	Dibromochloromethane	5.0 U
67-64-1	Acetone	8.8 B	79-00-5	1,1,2-Trichloroethane	5.0 U
75-15-0	Carbon Disulfide	2.9 J	71-43-2	Benzene	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U	10061-01-5	cis-1,3-Dichloropropene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U	110-75-8	2-Chloroethylvinylether	10.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U	75-25-2	Bromoform	5.0 U
67-66-3	Chloroform	5.0 U	591-78-6	2-Hexanone	10.0 U
107-06-2	1,2-Dichloroethane	5.0 U	108-10-1	4-Methyl-2-Pentanone	10.0 U
78-93-3	2-Butanone	10.0 U	127-18-4	Tetrachloroethene	5.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U	108-88-3	Toluene	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U	108-90-7	Chlorobenzene	5.0 U
108-05-4	Vinyl Acetate	10.0 U	100-41-4	Ethylbenzene	5.0 U
75-27-4	Bromodichloromethane	5.0 U	100-42-5	Styrene	5.0 U
				Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

If the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

SAMPLE NO.
GW-2.17

SEMIVOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 02/01/88
Date Analyzed: 02/11/88
Conc/Dil Factor:----------> 2
Percent Moisture: N/A

GPC Cleanup: Yes___ No_X_
Separatory Funnel Extraction: Yes____
Continuous Liquid - Liquid Extraction: Yes__

CAS Number		(ug/l) or ug/Kg (Circle One)
108-95-2	Phenol	660.0 U
111-44-4	bis(-2-Chloroethyl)Ether	660.0 U
95-57-8	2-Chlorophenol	660.0 U
541-73-1	1,3-Dichlorobenzene	660.0 U
106-46-7	1,4-Dichlorobenzene	660.0 U
100-51-6	Benzyl Alcohol	660.0 U
95-50-1	1,2-Dichlorobenzene	660.0 U
95-48-7	2-Methylphenol	660.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	660.0 U
106-44-5	4-Methylphenol	660.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	660.0 U
67-72-1	Hexachloroethane	660.0 U
98-95-3	Nitrobenzene	660.0 U
78-59-1	Isophorone	660.0 U
88-75-5	2-Nitrophenol	660.0 U
105-67-9	2,4-Dimethylphenol	660.0 U
65-85-0	Benzoic Acid	3200.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	660.0 U
120-83-2	2,4-Dichlorophenol	660.0 U
120-82-1	1,2,4-Trichlorobenzene	660.0 U
91-20-3	Naphthalene	660.0 U
106-47-8	4-Chloroaniline	660.0 U
87-68-3	Hexachlorobutadiene	660.0 U
59-50-7	4-Chloro-3-Methylphenol	660.0 U
91-57-6	2-Methylnaphthalene	660.0 U
77-47-4	Hexachlorocyclopentadiene	660.0 U
88-06-2	2,4,6-Trichlorophenol	660.0 U
95-95-4	2,4,5-Trichlorophenol	3200.0 U
91-58-7	2-Chloronaphthalene	660.0 U
88-74-4	2-Nitroaniline	3200.0 U
131-11-3	Dimethyl Phthalate	660.0 U
208-96-8	Acenaphthylene	660.0 U
99-09-2	3-Nitroaniline	3200.0 U

CAS Number		(ug/l) or ug/Kg (Circle One)
83-32-9	Acenaphthene	660.0 U
51-28-5	2,4-Dinitrophenol	3200.0 U
100-02-7	4-Nitrophenol	3200.0 U
132-64-9	Dibenzofuran	660.0 U
121-14-2	2,4-Dinitrotoluene	660.0 U
606-20-2	2,6-Dinitrotoluene	660.0 U
84-66-2	Diethylphthalate	660.0 U
7005-72-3	4-Chlorophenyl-phenylether	660.0 U
86-73-7	Fluorene	660.0 U
100-01-6	4-Nitroaniline	3200.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3200.0 U
86-30-6	N-Nitrosodiphenylamine (1)	660.0 U
101-55-3	4-Bromophenyl-phenylether	660.0 U
118-74-1	Hexachlorobenzene	660.0 U
87-86-5	Pentachlorophenol	3200.0 U
85-01-8	Phenanthrene	660.0 U
120-12-7	Anthracene	660.0 U
84-74-2	Di-n-Butylphthalate	660.0 U
206-44-0	Fluoranthene	660.0 U
129-00-0	Pyrene	660.0 U
85-68-7	Butylbenzylphthalate	660.0 U
91-94-1	3,3'-Dichlorobenzidine	1320.0 U
56-55-3	Benzo(a)Anthracene	660.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	420.0 JB
218-01-9	Chrysene	660.0 U
117-84-0	Di-n-Octyl Phthalate	660.0 U
205-99-2	Benzo(b)Fluoranthene	660.0 U
207-08-9	Benzo(k)Fluoranthene	660.0 U
50-32-8	Benzo(a)Pyrene	660.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	660.0 U
53-70-3	Dibenz(a,h)Anthracene	660.0 U
191-24-2	Benzo(g,h,i)Perylene	660.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
GW-2.17

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/Kg)
1	------	UNKNOWN AMINE	VOA	25	110.0 J
2	------	UNKNOWN AMINE	VOA	99	44.0 JB
3					
4					
5	-----	NONE FOUND	BNA	-----	---------
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

INORGANIC ANALYSIS DATA SHEET
FORM I

0000001

SMPL NO. : GW-2.17

Lab Name : NANCO LABORATORIES, INC.

Customer Name: Engineering Science

SOW NO. N/A

Lab Receipt Date : 01/30/88

Lab Sample ID: 88-EW-5351

Date Reported: 2/22/88

Location ID: Chrisholm Ryder

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION : LOW __X__ MEDIUM _____

MATRIX : WATER __X___ SOIL _____ SLUDGE ____OTHER _____

(UG/L) OR MG/KG DRY WEIGHT (CIRCLE ONE)

1.	ALUMINUM	8300.0 P N	13.	MAGNESIUM	137700.0 P
2.	ANTIMONY	50.0 UP	14.	MANGANESE	1200.0 P E
3.	ARSENIC	3.0 UF	15.	MERCURY	0.2 U C.V.
4.	BARIUM	100.0 UP	16.	NICKEL	22.0 UP
5.	BERYLLIUM	0.3 UP	17.	POTASSIUM	4786.0 UP
6.	CADMIUM	4.0 UP N	18.	SELENIUM	3.0 UF N
7.	CALCIUM	329600.0 P	19.	SILVER	10.0 UP
8.	CHROMIUM	35.0 P	20.	SODIUM	38800.0 P
9.	COBALT	29.0 UP	21.	THALLIUM	2.0 UF N
10.	COPPER	49.0 P	22.	VANADIUM	14.0 UP
11.	IRON	12600.0 P E	23.	ZINC	1700.0 P
12.	LEAD	85.0 F N (1:10)	PRECENT SOLIDS (%)		N/A
	CYANIDE	NR			

FOOTNOTES : FOR REPORTING RESULTS STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON PAGE 2.

COMMENTS : This sample was a colorless liquid that remained colorless after ICP and furnace digestion procedures. Pb was analyzed at a 1:10 dilution.

LAB MANAGER

NAECO LABS, INC.

0000209

Reporting Date: 2/2/88

Results of analysis on ~~Drinking Water~~ TOX sample received 1/30/88

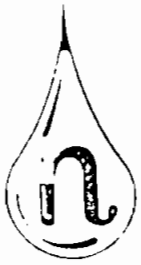
IPLE ID :

NECO ID: 88- EW5351

ARAMETERS	RESULTS	UNITS
TOX	16	ug/l

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GRIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR



SAMPLE DATA

GW-317

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
GW-3.17

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:> G0284
Sample Matrix: WATER
Data Release Authorized By: Kathleen M. Kelly

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: CHISHOLM RYDER
Date Sample Received: 1-30-88

VOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 2-3-88
Date Analyzed:2-3-88
Conc/Dil Factor: 1 pH: 7.2
Percent Moisture: N/A

CAS Number		(ug/l) or ug/Kg (Circle One)	CAS Number		(ug/l) or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U	79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
74-83-9	Bromomethane	10.0 U	78-87-5	1,2-Dichloropropane	5.0 U
75-01-4	Vinyl Chloride	10.0 U	10061-02-6	Trans-1,3-Dichloropropene	5.0 U
75-00-3	Chloroethane	10.0 U	79-01-6	Trichloroethene	5.0 U
75-09-2	Methylene Chloride	4.3 JB	124-48-1	Dibromochloromethane	5.0 U
67-64-1	Acetone	5.3 JB	79-00-5	1,1,2-Trichloroethane	5.0 U
75-15-0	Carbon Disulfide	2.6 J	71-43-2	Benzene	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U	10061-01-5	cis-1,3-Dichloropropene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U	110-75-8	2-Chloroethylvinylether	10.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U	75-25-2	Bromoform	5.0 U
67-66-3	Chloroform	5.0 U	591-78-6	2-Hexanone	10.0 U
107-06-2	1,2-Dichloroethane	5.0 U	108-10-1	4-Methyl-2-Pentanone	10.0 U
78-93-3	2-Butanone	10.0 U	127-18-4	Tetrachloroethene	5.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U	108-88-3	Toluene	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U	108-90-7	Chlorobenzene	5.0 U
108-05-4	Vinyl Acetate	26.0	100-41-4	Ethylbenzene	5.0 U
75-27-4	Bromodichloromethane	5.0 U	100-42-5	Styrene	5.0 U
				Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

.f the result is a value greater than or equal to the detection limit, report the value.

U

.ndicates compound was analyzed for but not detected. Report :he minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should ·ead U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

ndicates an estimated value.This flag is used either when :stimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data ·ndicates the presence of a compound that meets the identification :riteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

SAMPLE NO.
GW-3.17

SEMIVOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 02/01/88
Date Analyzed: 02/12/88
Conc/Dil Factor:----------> 2
Percent Moisture: N/A

GPC Cleanup: Yes___ No X
Separatory Funnel Extraction: Yes X
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		(ug/l) or ug/Kg (Circle One)
108-95-2	Phenol	660.0 U
111-44-4	bis(-2-Chloroethyl)Ether	660.0 U
95-57-8	2-Chlorophenol	660.0 U
541-73-1	1,3-Dichlorobenzene	660.0 U
106-46-7	1,4-Dichlorobenzene	660.0 U
100-51-6	Benzyl Alcohol	660.0 U
95-50-1	1,2-Dichlorobenzene	660.0 U
95-48-7	2-Methylphenol	660.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	660.0 U
106-44-5	4-Methylphenol	660.0 U
621-64-7	N-Nitroso-Oi-n-Propylamine	660.0 U
67-72-1	Hexachloroethane	660.0 U
98-95-3	Nitrobenzene	660.0 U
78-59-1	Isophorone	660.0 U
88-75-5	2-Nitrophenol	660.0 U
105-67-9	2,4-Dimethylphenol	660.0 U
65-85-0	Benzoic Acid	3200.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	660.0 U
120-83-2	2,4-Dichlorophenol	660.0 U
120-82-1	1,2,4-Trichlorobenzene	660.0 U
91-20-3	Naphthalene	660.0 U
106-47-8	4-Chloroaniline	660.0 U
87-68-3	Hexachlorobutadiene	660.0 U
59-50-7	4-Chloro-3-Methylphenol	660.0 U
91-57-6	2-Methylnaphthalene	660.0 U
77-47-4	Hexachlorocyclopentadiene	660.0 U
88-06-2	2,4,6-Trichlorophenol	660.0 U
95-95-4	2,4,5-Trichlorophenol	3200.0 U
91-58-7	2-Chloronaphthalene	660.0 U
88-74-4	2-Nitroaniline	3200.0 U
131-11-3	Dimethyl Phthalate	660.0 U
208-96-8	Acenaphthylene	660.0 U
99-09-2	3-Nitroaniline	3200.0 U

CAS Number		(ug/l) or ug/Kg (Circle One)
83-32-9	Acenaphthene	660.0 U
51-28-5	2,4-Dinitrophenol	3200.0 U
100-02-7	4-Nitrophenol	3200.0 U
132-64-9	Dibenzofuran	660.0 U
121-14-2	2,4-Dinitrotoluene	660.0 U
606-20-2	2,6-Dinitrotoluene	660.0 U
84-66-2	Diethylphthalate	660.0 U
7005-72-3	4-Chlorophenyl-phenylether	660.0 U
86-73-7	Fluorene	660.0 U
100-01-6	4-Nitroaniline	3200.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3200.0 U
86-30-6	N-Nitrosodiphenylamine (1)	660.0 U
101-55-3	4-Bromophenyl-phenylether	660.0 U
118-74-1	Hexachlorobenzene	660.0 U
87-86-5	Pentachlorophenol	3200.0 U
85-01-8	Phenanthrene	660.0 U
120-12-7	Anthracene	660.0 U
84-74-2	Di-n-Butylphthalate	660.0 U
206-44-0	Fluoranthene	660.0 U
129-00-0	Pyrene	660.0 U
85-68-7	Butylbenzylphthalate	660.0 U
91-94-1	3,3'-Dichlorobenzidine	1320.0 U
56-55-3	Benzo(a)Anthracene	660.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	1900.0 B
218-01-9	Chrysene	660.0 U
117-84-0	Di-n-Octyl Phthalate	660.0 U
205-99-2	Benzo(b)Fluoranthene	660.0 U
207-08-9	Benzo(k)Fluoranthene	660.0 U
50-32-8	Benzo(a)Pyrene	660.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	660.0 U
53-70-3	Dibenz(a,h)Anthracene	660.0 U
191-24-2	Benzo(g,h,i)Perylene	660.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET

(PAGE 4)

SAMPLE NUMBER

GW-3.17

LABORATORY NAME :NANCO LABS.INC.

CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/Kg)
1	-----	NONE FOUND	VOA	---	-----
2					
3					
4	-----	UNKNOWN	BNA	1421	96.0 J
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

INORGANIC ANALYSIS DATA SHEET

FORM I

SMPL NO. : GW-3.17

Lab Name : NANCO LABORATORIES, INC.

Customer Name: Engineering Science

SOW NO. N/A

Lab Receipt Date : 01/30/88

Lab Sample ID: 88-EW-5352

Date Reported: 2/22/88

Location ID: Chrisholm Ryder

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION : LOW __X__ MEDIUM _____

MATRIX : WATER __X__ SOIL _____ SLUDGE ____ OTHER _____

(UG/L) OR MG/KG DRY WEIGHT (CIRCLE ONE)

1.	ALUMINUM	4200.0 P N	13.	MAGNESIUM	71900.0 P
2.	ANTIMONY	50.0 UP	14.	MANGANESE	240.0 P E
3.	ARSENIC	3.0 UF	15.	MERCURY	0.2 U C.V.
4.	BARIUM	100.0 UP	16.	NICKEL	22.0 UP
5.	BERYLLIUM	0.3 UP	17.	POTASSIUM	4786.0 UP
6.	CADMIUM	4.0 UP N	18.	SELENIUM	3.0 UF N
7.	CALCIUM	193500.0 P	19.	SILVER	10.0 UP
8.	CHROMIUM	6.0 UP	20.	SODIUM	15400.0 P
9.	COBALT	29.0 UP	21.	THALLIUM	2.0 UF N
10.	COPPER	[22.0]P	22.	VANADIUM	14.0 UP
11.	IRON	5500.0 P E	23.	ZINC	950.0 P
12.	LEAD	71.0 F N (1:10)	PRECENT SOLIDS (%)		N/A
	CYANIDE	NR			

FOOTNOTES : FOR REPORTING RESULTS STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON PAGE 2.

COMMENTS : This sample was a colorless liquid that remained colorless after ICP and furnace digestion procedures. Pb was analyzed at a 1:10 dilution.

LAB MANAGER

NANCO LABS, INC.

0000210

Reporting Date: 2/2/88

Results of analysis on ~~Drinking Water~~ TOX sample received 1/30/88

PLE ID :

NANCO ID: 88- EW 5352

PARAMETERS	RESULTS	UNITS
TOX	8	ug/l

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SAMPLE DATA

TRIP BLANK

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
TRIP BLANK

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:> G0282
Sample Matrix: WATER
Data Release Authorized By: Kathleen M. Kelly

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: CHISHOLM RYDER
Date Sample Received: 1-30-88

VOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 2-3-88
Date Analyzed:2-3-88
Conc/Dil Factor: 1 pH: 9.5
Percent Moisture: N/A

CAS Number		(ug/l) or ug/Kg (Circle One)	CAS Number		(ug/l) or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U	79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
74-83-9	Bromomethane	10.0 U	78-87-5	1,2-Dichloropropane	5.0 U
75-01-4	Vinyl Chloride	10.0 U	10061-02-6	Trans-1,3-Dichloropropene	5.0 U
75-00-3	Chloroethane	10.0 U	79-01-6	Trichloroethene	5.0 U
75-09-2	Methylene Chloride	11.0 B	124-48-1	Dibromochloromethane	5.0 U
67-64-1	Acetone	14.0 B	79-00-5	1,1,2-Trichloroethane	5.0 U
75-15-0	Carbon Disulfide	2.6 JB	71-43-2	Benzene	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U	10061-01-5	cis-1,3-Dichloropropene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U	110-75-8	2-Chloroethylvinylether	10.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U	75-25-2	Bromoform	5.0 U
67-66-3	Chloroform	5.0 U	591-78-6	2-Hexanone	10.0 U
107-06-2	1,2-Dichloroethane	5.0 U	108-10-1	4-Methyl-2-Pentanone	10.0 U
78-93-3	2-Butanone	120.0	127-18-4	Tetrachloroethene	5.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U	108-88-3	Toluene	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U	108-90-7	Chlorobenzene	5.0 U
108-05-4	Vinyl Acetate	10.0 U	100-41-4	Ethylbenzene	5.0 U
75-27-4	Bromodichloromethane	5.0 U	100-42-5	Styrene	5.0 U
				Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

If the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANICS ANALYSIS DATA SHEET

(PAGE 4)

SAMPLE NUMBER

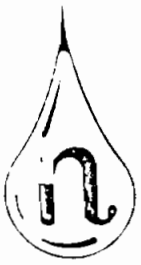
TRIP BLANK

LABORATORY NAME :NANCO LABS.INC.

CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/Kg)
1	------	NONE FOUND	VOA	------	----------
2					
3					
4	-----	NOT REQUIRED	BNA	------	----------
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					



SAMPLE DATA

FIELD BLANK

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
FIELD BLANK

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:> G0281
Sample Matrix: WATER
Data Release Authorized By: Kathleen M. Kelly

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: CHISHOLM RYDER
Date Sample Received: 1-30-88

VOLATILE COMPOUNDS

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 2-3-88
Date Analyzed:2-3-88
Conc/Dil Factor: 1 pH: 9.5
Percent Moisture: N/A

CAS Number		(ug/l) or ug/Kg (Circle One)	CAS Number		(ug/l) or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U	79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
74-83-9	Bromomethane	10.0 U	78-87-5	1,2-Dichloropropane	5.0 U
75-01-4	Vinyl Chloride	10.0 U	10061-02-6	Trans-1,3-Dichloropropene	5.0 U
75-00-3	Chloroethane	10.0 U	79-01-6	Trichloroethene	5.0 U
75-09-2	Methylene Chloride	8.1 B	124-48-1	Dibromochloromethane	5.0 U
67-64-1	Acetone	11.0 B	79-00-5	1,1,2-Trichloroethane	5.0 U
75-15-0	Carbon Disulfide	2.3 J	71-43-2	Benzene	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U	10061-01-5	cis-1,3-Dichloropropene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U	110-75-8	2-Chloroethylvinylether	10.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U	75-25-2	Bromoform	5.0 U
67-66-3	Chloroform	5.0 U	591-78-6	2-Hexanone	10.0 U
107-06-2	1,2-Dichloroethane	5.0 U	108-10-1	4-Methyl-2-Pentanone	10.0 U
78-93-3	2-Butanone	19.0	127-18-4	Tetrachloroethene	5.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U	108-88-3	Toluene	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U	108-90-7	Chlorobenzene	5.0 U
108-05-4	Vinyl Acetate	10.0 U	100-41-4	Ethylbenzene	5.0 U
75-27-4	Bromodichloromethane	5.0 U	100-42-5	Styrene	5.0 U
				Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

If the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

ndicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification riteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
FIELD BLANK

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE - CHISHOLM RYDER

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/Kg)
1	------	UNKNOWN	VOA	22	39.0 J
2	------	UNKNOWN AMINE	VOA	96	9.0 JB
3	109999	FURAN,TETRAHYDRO	VOA	125	4.0 J
4	------	UNKNOWN	VOA	327	7.0 J
5					
6					
7	------	NOT REQUIRED	BNA	------	---------
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

Field Sampling Records

FIELD SAMPLING RECORD

Site Chisholm-Ryder NYSDEC Site No. 932009 Date: 01/29/88
Well GW-1-17

Samplers: David Cameron of Engineering-Science
Mark Townsend of " "

Initial Static Water Level. . . . . 16.8 TD = 185'
(from top of well PVC casing)

Evacuation:
Using: Submersible ____ Centrifugal ____
Airlift ____ Positive Displacement ____
Bailed ✓ 6 Times

Well Volume Calculation:
2" Casing: 4.1 ft. of water x .16 = 0.7 gals.
3" Casing: ____ ft. of water x .36 = ____ gals.
4" Casing: ____ ft. of water x .65 = ____ gals.

Depth to intake from top of protective well casing ____
Volume of Water removed 2.1 Gals. (> 3 Well Volumes)

Sampling: Time 1440 ___ a.m. X p.m.

		No. of Bottles Filled	I.D. No.	Analyses
Bailer Type:	Stainless Steel			
	Teflon	X		
	From Pos. Dis. Pump Discharge Tube			
	Other ____			
Trip Blank				
Field Blank - (Wash)/Atmospheric. .(circle one)		3		Volatiles
Ground-water Sample		15		see below

Physical Appearance and Odor Cloudy - no odor

Refrigerate: Date 1/1/1 Time ____

Field Tests:

Temperature (C°/°F)	NA	
pH	NA	
Spec. Conduc (umhos/cm)	NA	

TIP Readings
Background = NA
well = NA

Weather ____

Comments Stickup = 2.4

Analyses: Volatiles; semi volatiles, PCB's, Pest.; TOX; Metals, Matrix spikes, and Matrix Spike duplicates

FIELD SAMPLING RECORD

Site Chisholm - Ryder NYSDEC Site No. 932009 Date: 01/29/88
Well GW-2-17

Samplers: David Cameron of ES
Mark Townsend of ES

Initial Static Water Level. . . . . 15.45 TD = 20'
(from top of well PVC casing)

Evacuation:
Using: Submersible _____ Centrifugal _____
Airlift _____ Positive Displacement _____
Bailed X 13 Times

Well Volume Calculation:
2" Casing: 7.25 ft. of water x .16 = 1.12 gals.
3" Casing: _____ ft. of water x .36 = _____ gals.
4" Casing: _____ ft. of water x .65 = _____ gals.

Depth to intake from top of protective well casing _____
Volume of Water removed 3.4 Gals. (> 3 Well Volumes)

Sampling: Time 1120 ✓ a.m. ____ p.m.

Bailer Type:
Stainless Steel
Teflon X
From Pos. Dis. Pump Discharge Tube
Other _____

	No. of Bottles Filled	I.D. No.	Analyses
Trip Blank			
Field Blank - Wash/Atmospheric. (circle one)			
Ground-water Sample	6		see below

Physical Appearance and Odor _____

Refrigerate: Date 1/1/1 Time _____

Field Tests:
Temperature (C°/°F) NA
pH NA
Spec. Conduc (umhos/cm) NA

TIP readings
background - 0.2
well 2.5

Weather _____

Comments Stickup = 2.5

Analyses: Volatiles; Semivolatiles, Pest, PCB's; TOX, and Metals

FIELD SAMPLING RECORD

Site Chisholm Ryder NYSDEC Site No. 932009 Date: 1/29/88
Well GW-3.17

Samplers: David Cameron of ES
Clark Townsend of ES

Initial Static Water Level. 15.9
(from top of well PVC casing)

TD=24'

Evacuation:
Using: Submersible _____ Centrifugal _____
Airlift _____ Positive Displacement _____
Bailed 6 19 Times

Well Volume Calculation:
2" Casing: 10.6 ft. of water x .16 = 1.70 gals.
3" Casing: _____ ft. of water x .36 = _____ gals.
4" Casing: _____ ft. of water x .65 = _____ gals.

Depth to intake from top of protective well casing _____
Volume of Water removed 5.1 Gals. (> 3 Well Volumes)

Sampling: Time 1200 ___ a.m. ✓ p.m.

Bailer Type: Stainless Steel _____
Teflon X
From Pos. Dis. Pump Discharge Tube _____
Other _____ _____

	No. of Bottles Filled	I.D. No.	Analyses
Trip Blank			
Field Blank - Wash/Atmospheric. .(circle one)			
Ground-water Sample	6		see below

Physical Appearance and Odor Cloudy - no odor

Refrigerate: Date 1/1/1 Time _____

Field Tests:
Temperature (C°/°F) NA
pH NA
Spec. Conduc (umhos/cm) NA

TIP readings
Background -0.3
well 6.2

Weather _____

Comments Stickup = 2.5
Analyses: Volatiles; Semivolatiles, Pest, PCB's; TOX; Metals