

CIP
TC
TH
IW
2574

Niagara River Gorge Face/ Bloody Run Creek

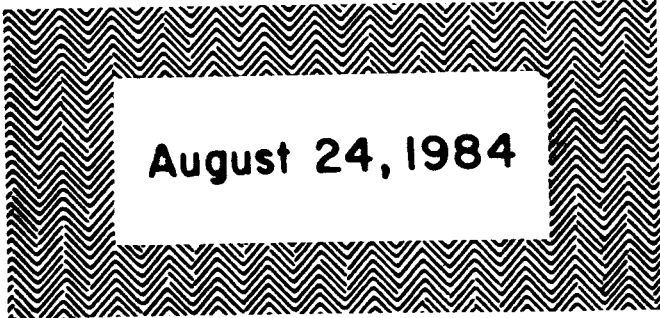
Water Sampling/ Analytical Report

Prepared by: New York State Department of Health
Bureau of Toxic Substance Assessment
Special Studies Section

August 24, 1984

Niagara River Gorge Face/ Bloody Run Creek
Water Sampling/ Analytical Report

Prepared by: New York State Department of Health
Bureau of Toxic Substance Assessment
Special Studies Section



August 24, 1984

Table of Contents

	Page
Acknowledgements	1
Summary	1
Field Operation Sequencing	2
PASNY's Access Road Gorge Face Seeps	2
Bloody Run Creek	3
Gorge Face Control Seep	4
Devil's Hole Seep	4
Sample Integrity - Chain of Custody	5
Sample Collection Procedures	5
Health and Safety	5
 Figure 1 - Landfill Area Map with Sample Locations	
 Figure 2 - Niagara Falls Area Map - Control Seep Locations	
 Table 1 - Gorge Face/Bloody Run Sample Collection Data	
Table 2 - Analytical Data	
Table 3 - Sample Integrity - Shipping Box Access	
 Appendix A - Niagara River Gorge Face/Bloody Run Creek Water Sampling Protocol (July 20, 1984)	
 Appendix B - Laboratory Report	
 Appendix C - Sample Data Sheets	
 Appendix D - Field Photographs	
 Appendix E - DEC'S Geological Field Observations	

Acknowledgements

The Special Studies Section wishes to acknowledge the support of the Power Authority of the State of New York (PASNY) for their assistance in collecting water samples from seeps along the PASNY Lower Access Road of the Niagara River Gorge Face, The New York State Department of Environmental Conservation (NYSDEC) for their geologic evaluation and description of the Niagara River Gorge Face and the staff from the Wadsworth Center for Laboratories and Research and the Bureau of Toxic Substances Assessment for their analysis and interpretation of the analytical data.

Summary

On July 25 and 26, 1984 a Water Sampling Program was conducted by the Special Studies Section of the Bureau of Toxic Substance Assessment (New York State Department of Health), in response to the objectives set forth in the Special Study, Niagara River Gorge Face/Bloody Run Creek, Water Sampling Protocol of July 20, 1984 (Appendix A). Four seep locations along PASNY's lower access road were sampled. To provide background data, other areas of the Niagara River Gorge Face were surveyed. A seep from a control area located approximately two miles from the Hyde Park Landfill was selected and sampled. One additional seep was located in a public walkway area of Devil's Hole State Park and was identified as having an oily sheen and characteristic chemical odor. This site could not be sampled due to the insufficient amount of water, however, a recommendation has been made to collect a soil sample.

Bloody Run Creek was sampled both at the outfall below the PASNY lower access road and before the culvert under University Drive.

The locations and all associated information relating to the Gorge Face seeps that were sampled are presented in Table 1. The analytical data is presented in Table 2 and the laboratory report is presented in Appendix B.

In evaluating potential health risks associated with the Gorge seeps, the exposure potential and the toxicity of the chemicals were considered. A comparison of the drinking water guidelines with the concentration found in the seep samples indicates that the seep water would be unacceptable as drinking water (Guidelines for some of the chemicals have been suggested by the New York State Department of Health, United States Environmental Protection Agency and the National Academy of Sciences). However, the major exposure routes that can be envisioned in this case are occasional direct contact or ingestion of small quantities, rather than routine exposure. Nonetheless, because these results do indicate the presence of chemical contaminants and because, as a general principle, exposure to contaminants of this type should be minimized, measures such as fencing should be taken to limit direct contact.

Field Operation Sequencing

PASNY's Access Road - Gorge Face Seeps

At 8:00 AM on July 25, 1984, Department of Health (DOH) personnel (Mr. Gerald McDonald, Public Health Sanitarian and Mr. William Gilday, Senior Engineering Technician) toured the area of the Gorge Face along PASNY's lower Access Road. The seep sites appeared to be as described in the site description section of the water sampling protocol (Appendix A).

Mr. Gerald Pietraszek, Senior Engineering Geologist of the Department of Environmental Conservation made the geological determinations. A copy of his field observations are presented in Appendix E. He was met at the Hyde Park Landfill Field Office and the sample sequencing was discussed. Mr. Calasanno, Security and Safety Supervisor for PASNY, was then contacted by telephone and a meeting was set up for 9:00 AM in the PASNY parking lot. This meeting involved a discussion of the sample locations, procedures, time frames involved, and a short walk to observe the seeps. Mr. Calasanno stated that a 75 foot hydraulic lift would be made available to gain access to two of the four seeps. His personnel would have to be instructed in collecting the samples since only PASNY personnel were allowed inside their equipment. A starting time of 1:00 PM was set to meet the crew assigned to collect these samples.

The first seep sampled was located 87 feet below the Robert Moses Parkway Bridge on the Northeast side of PASNY's lower Access Road and was labelled as GF-S1. This seep was only 5 feet above the road surface and was sampled by DOH personnel. Some of the sediment had to be scraped away to position the stainless steel dust pan so as to allow the seep water to fill the sample bottles. Information relative to this seep is contained in Table 1 and the sample collection data sheet (Appendix C).

The photograph of this seep (Appendix D) shows a white slimy surface layer and a lower fluffy black sediment layer.

GF-S3 was the next location to be sampled. This was a 6 inch effluent pipe draining the bedrock groundwater behind the retaining wall on the West side of the Robert Moses Parkway and Route 104. It was located adjacent to the Bloody Run concrete box conduit on the west side of the road. The sediment in the plume below the pipe appeared to be similar to that observed at GF-S1. The odor detected at these two sites was similar to that of hydrogen sulfide (H_2S).

During the afternoon of July 25, 1984, GF-S4, 632 feet North of the Bloody Run concrete conduit and GF-S2, 320 feet south of the Bloody Run concrete conduit were sampled with the assistance of PASNY's 75 foot hydraulic lift. Mr. Earl T. Liverman, an Environmental Engineer with PASNY, prior to sample collection at these two steps was given instructions on the sample collection procedures. He was specifically advised of the need to eliminate air head space in the 40 ml vials and quart Mason jars, and the importance of maintaining the acid preservative in the 500 ml bottles. Mr. Liverman's observations of GF-S4 were as follows:

There is algae and moss present on the rocks. About 85% of the water was seeping out from where the sample was collected. No odors were present.

Mr. Livermans's observations of GF-S2 were similar to those recorded for GF-S1 and GF-S3 and were as follows:

The seep was about 2 feet wide and below the seep was a white thin slimy outer layer with 1-3 inches of black sediment which appeared to be fluffy wet organic matter. A hydrogen sulfide odor was detected.

Photographs of PASNY personnel sampling this seep are presented in Appendix D.

Arrangements were made with Mr. Calasanno to gain access to the Bloody Run Outfall on July 26, 1984.

Bloody Run Creek

On the morning of July 26, 1984, Mr. Earl Liverman of PASNY was met outside the Bloody Run Gorge Face fence. He opened the gate lock to gain access to the outfall so samples could be collected. The outfall was a typical 48 inch culvert emptying into a 1 inch deep, 2 foot wide stream flowing over a concrete gutter. Some algae was present on the sides of the gutter. An algae odor with a slight intermittent chemical odor was present. The water appeared to be clear. This sample site was designated as BR-OF.

The next site where samples were to be collected was Bloody Run Creek before the culvert on the south side of University Drive. This sample site was designated as BR-UD.

Access to this site was provided by Mr. Pietraszek of DEC. The fence was opened at a location along University Drive where access had previously been made for the culvert cleaning operation.

The creek water appeared clear and slow running with some algae growing on the rocks. The sediment within the creek and directly adjacent to the creek bank was thick and fluffy and brown to black in color. There was a slight chemical odor detected in the area after some of the sediments had been disturbed. There appeared to be normal amounts of vegetation on the stream banks and mosquitos were present in moderate numbers. A photograph of sample collection at this site is included in Appendix D.

When sampling was completed, Mr. Pietraszek wired closed the access point in the fence.

In addition to the above mentioned Bloody Run Creek sampling locations, the drainage area located adjacent to the northwest corner of the landfill on the south side of New Road was also considered as a sampling location. Upon visual inspection it was determined that an insufficient amount of water was present to collect a sample, therefore, no sample was collected. A very small pool of stagnant water on the south side of New Road in front of the culvert was the only water observed. No odors were detected in this area.

Gorge Face Control Seep

The major part of Thursday, July 26 was spent trying to identify a gorge face seep which could be used as a control. The site previously used as a control seep (EPA, 1981) was located 7000 feet north of Bloody Run. This site was rejected due to its proximity to the Stauffer Chemical Company site north of the Power Vista.

The Whirlpool State Park was considered as an area where the gorge face could be accessed and was thoroughly surveyed for an acceptable control seep. Some seeps were identified, but each had problems including; low flow rate, inaccessibility (too high to reach or too dangerous to get to) and seep origin at an improper geologic strata (too high in the Lockport Dolomite Strata)

Mr. Pietraszek suggested the gorge face in the area of the South Side Interceptor Outfall Pump Station located below Cedar Avenue on the west side of the City of Niagara Falls as a possible control site. This area is approximately two miles south of the Hyde Park Landfill.

A seep was located near the Lockport Dolomite/Rochester Shale interface. The thick bushy moss on the rocks adjacent to the seep gave it the appearance of "clean" water. No odors were observed in the area. This was an acceptable control seep and samples were collected. The distance from the seep when proceeding North to the vertical shaft above the sewage disposal station was estimated to be 1500 feet.

A photograph of a sample being collected at this seep is attached in Appendix D.

Devil's Hole Seep

On the afternoon of July 26, 1984, the pathway down the gorge face at Devil's Hole State Park was surveyed. At a point approximately 60 steps down from the top of the trail's entrance, a wet area was observed on the foot trail (See Figure 1 for approximate location). Closer inspection revealed an oily sheen on the surface water of wet area. There was an insufficient quantity of water present for collection of a sample. A moderate chemical odor, similar to that observed from Hyde Park Landfill lagoon, was associated with this area on the Devil's Hole foot trail.

Since this trail is within a public access way of the Devil's Hole State Park and relatively close to the landfill, a water and/or sediment sample should be taken at this location.

Sample Integrity - Chain of Custody

On Monday, July 23, 1984 sample bottles were obtained from the Center for Laboratories and Research under chain of custody and all bottles were locked in wooden shipping boxes. From the time of departure (July 24, 1984, 9:30 AM) to the time of return to the Empire State Plaza (July 27, 1984, 2:00 PM), the wooden shipping boxes were kept locked unless in use. Whenever the boxes were not in active use, a lead seal was wrapped around the hasp and lock with the seal's numbers recorded in the field log book. Whenever lead seals were broken, the number of the seal was recorded in the field log book. Table 3 contains the box numbers with the unique numbers of the seals used and the dates and times they were put on or taken off with the supporting reasons.

The samples were delivered to the Center for Laboratories and Research under chain of custody and the samples were accessioned by and turned over to laboratory personnel.

Sample Collection Procedures

All sample bottles were labelled prior to collecting samples with the following information;

1. sample site location code - from protocol (Appendix A)
2. date
3. time - a single time was used for each sample set.

Procedures described in the protocol (Appendix A) were followed. A brief description of sample collection procedures for each site is given on the completed sample data sheets (Appendix C).

All samples except the 500 ml bottles (for inorganic analysis) were immediately iced and maintained at approximately 4°C until delivered to the laboratory.

Five 1-liter bottles were collected at each of the gorge face seeps for Occidental Chemical Corporation (OCC), as they requested samples from each location.

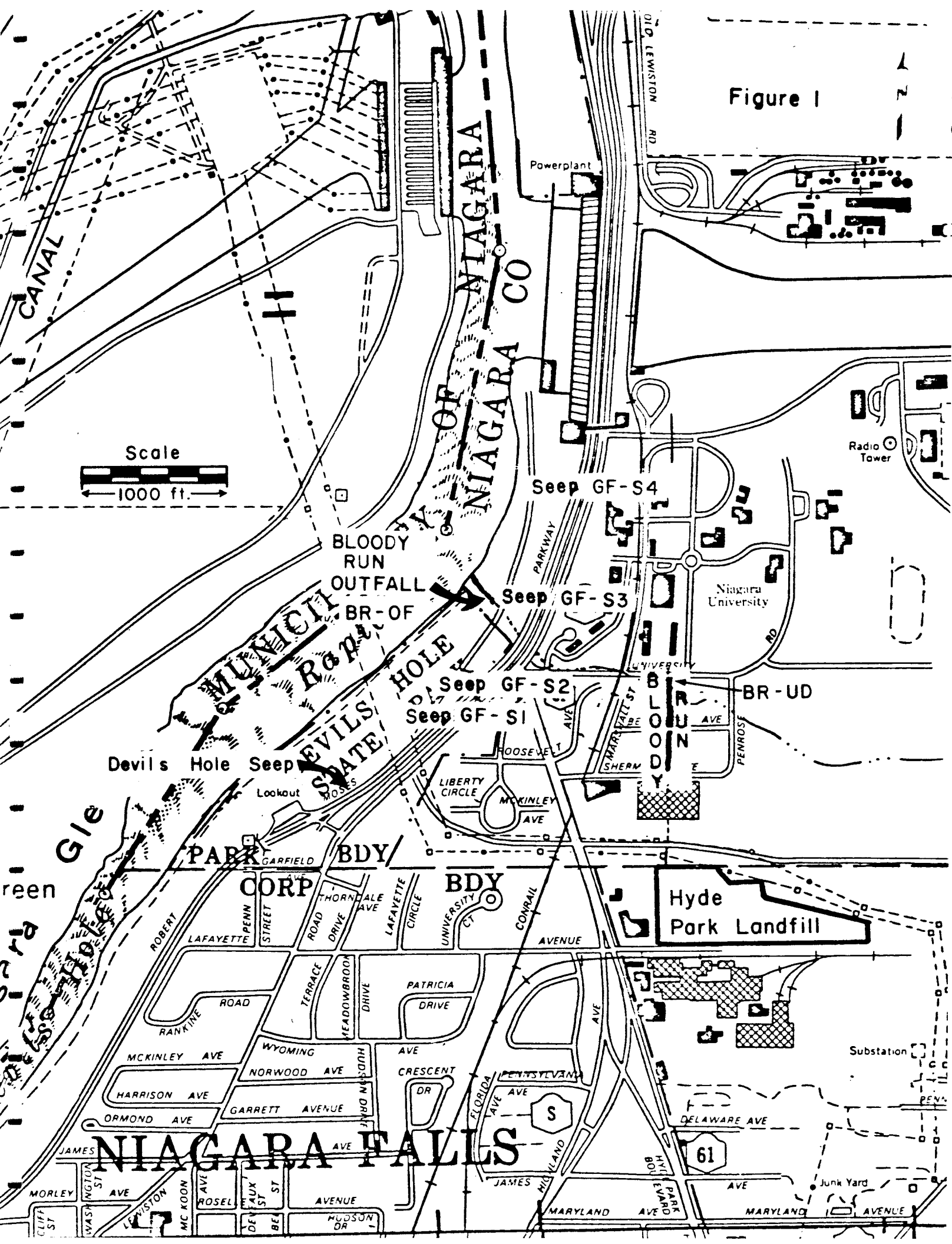
Health and Safety

In general, the following safety apparel was worn while sampling the gorge face seeps along the PASNY's lower Access Road:

1. hard hats
2. safety glasses
3. rain suit
4. rubber boots
5. plastic boot covers (disposable)
6. latex gloves (disposable)

In addition to the above, Tyvek suits were worn under the rain suit while sampling Bloody Run Creek. Used Tyvek suits, plastic boot covers and latex gloves were disposed of at the Hyde Park Landfill (Permission had been previously obtained from OCC personnel). The Bloody Run Outfall is relatively steep and spills over the gorge face. To avoid a potential accident, the plastic boot covers were not worn at Bloody Run Outfall.

Figure 1



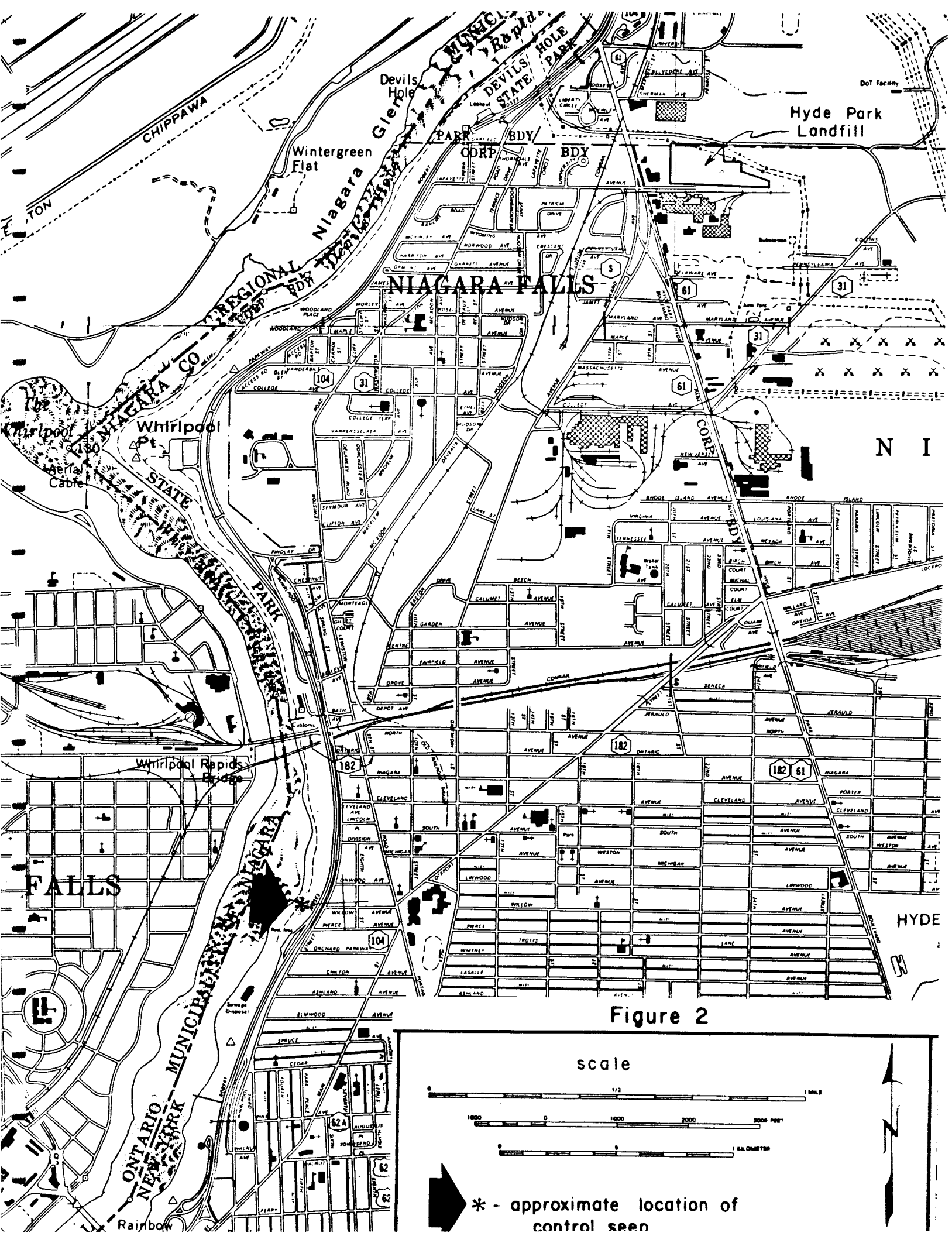


Figure 2

Table 1 Sample Collection Data

Sample location code	Date/Time	Location with fixed reference points	Geologic strata from which seep emanates	Seep dimensions	Visual appearance seep/water	Odor	Approx. flow rate	Distance below source sample was collected
GF-S1	7/25/84 10:30	87 feet below the Robert Moses Parkway Bridge, approx. 5 feet from the northeast side of PASNY's lower Access Road. Seep is approx. 5 feet above the road surface.	Interface of Goat Island and Gasport members of the Lockport Formation.	2 inches wide	Seep plume: quickly fanned out to 4 foot wide area. Sediment was a black, fluffy suspended solid soot like material covered with a white slimy bacteria like film. Water: cloudy, milky	hydrogen sulfide	3-5 lpm (1.3 gpm)	6 inches
*GF-S2	7/25/84 15:00	320 feet south of Bloody Run concrete conduit, approx. 20 feet east of PASNY's lower Access Road. Seep is approx. 52 feet above the road surface.	Contact between Lockport Dolomite and Rochester Shale.	Approx. 2 feet wide	Seep plume: white thin slimy outer layer with 1-3 inches of black, fluffy organic matter sediment. Water: slightly cloudy	hydrogen sulfide	not quantified	8 inches
GF-S3	7/25/84 11:30	Base of retaining wall west side of Robert Moses Parkway. 15 feet south of Bloody Run concrete box conduit.	Just above the Gasport member, the pipe contains the effluent bedrock groundwater drained from behind the concrete retaining wall.	6 inch pipe	Effluent plume: 15 foot wide wet area was brown black mud and muck covered with a white slimy film. Water: clear	hydrogen sulfide	20 lpm	from pipe out-flow
*GF-S4	7/25/84 13:45	632 feet north of the Bloody Run concrete conduit, approx. 40 feet east of PASNY's lower Access Road. Seep is approx. 40 feet above the road surface.	Grimsby, below Thorald Sandstone above Power Glen Shale.	6-10 feet wide	Plume: algae and moss on rocks. 85% of the water was coming from the location where the seep was sampled. Water: clear <i>15 to 80 gpm / 100 ft</i>	none	not quantified	at source
GF-SC	7/26/84 15:00	1,500 feet north northeast of pump station overflow vertical shaft (concrete) along the old railroad bed, approx. 20 feet east of trail. Seep is approx. 15 feet above the trail.	Contact between Lockport Dolomite and Rochester Shale. Vertical fracture in Gasport above seep.	35 feet wide	Seep plume: thick bushy healthy moss present on rocks. Water: clear	none	0.08 lpm for the 7 inch area samples collected from.	8 inches
BR-UD	7/26/84 10:10	South side of University Drive, 4 feet south of culvert opening.	N/A	Creek - 2 feet wide 2-5 inches deep.	Creek was running slow. Sediment was at least 6 inches thick adjacent to creek. Water: clear	slight chemical in sediment	not quantified	N/A
BR-OF	7/26/84 9:15	4 feet below culvert opening on west side of PASNY Access Road. Bloody Run Outfall.	N/A	Outfall about 18 inches wide 1-2 inches deep.	Some algae on sides of stream. Water: clear	Algae and intermittent slight chemical	not quantified	N/A

*Samples collected by PASNY personnel

lpm - liters per minute

Table 2. Niagara River Gorge Face/Seeps/Bloody Run Creek Analytical Data
New York State Department of Health Wadsworth Center for Labs & Research, Albany
All Values in ug/L (ppb)

Chemical Parameter	GF-S1 42912	GF-S2 42915	GF-S3 42914	GF-S4 42911	GF-SC 42913	BR-OF 42910	BR-UD 42909	Field Blank 42916
monochlorobenzene	220	90	190	1 LT	1 LT	1 LT	1 LT	1 LT
1,3-dichlorobenzene	20	10	50	1 LT	1 LT	1 LT	1 LT	1 LT
1,2-dichlorobenzene	20	10	11	1 LT	1 LT	1 LT	1 LT	1 LT
1,4-dichlorobenzene	20	10	14	1 LT	1 LT	1 LT	1 LT	1 LT
1,3,5-trichlorobenzene	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.7	
1,2,4-trichlorobenzene	1	3	2	0.1 LT	0.1 LT	0.1 LT	0.7	
1,2,3-trichlorobenzene	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.2	
1,2,4,5-tetrachlorobenzene	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.9	
1,2,3,4-tetrachlorobenzene	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.7	
pentachlorobenzene	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.3	
hexachlorobenzene	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.7	
alpha-hexachlorocyclohexane	8	5	7	0.1 LT	0.1 LT	0.2	1.5	
beta-hexachlorocyclohexane	6	7	3	0.1 LT	0.1 LT	0.2	.4	
gamma-hexachlorocyclohexane	18	16	12	0.1 LT	0.1 LT	0.2	0.4	
delta-hexachlorocyclohexane	2	2	2	0.1 LT	0.1 LT	0.2	0.4	
o/p-chlorotoluene	34	41	32	1 LT	1 LT	1 LT	1 LT	1 LT
m-chlorotoluene	10	10	10	1 LT	1 LT	1 LT	1 LT	1 LT
p-monochlorobenzotrifluoride	2	5	3	0.1 LT	0.1 LT	0.1 LT	0.6	
m-monochlorobenzotrifluoride	2	2	1	0.1 LT	0.1 LT	0.1 LT	0.1	
o-monochlorobenzotrifluoride	2	4	2	0.1 LT	0.1 LT	0.1 LT	0.4	
2,4,5-trichlorophenol	690	270	140	0.1 LT	0.1 LT	0.1	1	
hexachlorocyclopentadiene (C-56)	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.1 LT	
octachlorocyclopentene (C-58)	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.1	
hexachlorobutadiene (C-46)	2	1	1	0.1 LT	0.1 LT	0.1 LT	0.1	
mirex	1	1	1	0.1 LT	0.1 LT	0.1 LT	0.1 LT	
PCB-1016/1242	3.5 LT	18	a	a	a	0.1 LT	0.7 LT	
PCB-1221	3.5 LT	18	a	a	a	0.1 LT	0.7 LT	
PCB-1248	3.5 LT	18	a	a	a	0.1 LT	0.7 LT	
PCB-1254	3.5 LT	18	a	a	a	0.1 LT	0.7 LT	
PCB-1260	3.5 LT	18	a	a	a	0.1 LT	0.7 LT	
o-chlorobenzoic acid	25,000	8,400	11,000	0.5	1 LT	0.5	0.7	
m-chlorobenzoic acid	3,000	2,200	1,500	1 LT	1 LT	1 LT	1 LT	
p-chlorobenzoic acid	2,100	1,200	1,000	1 LT	1 LT	1 LT	3	1 LT
benzene	200	150	80	1 LT	1 LT	1 LT	1 LT	1 LT
toluene	400	640	140	1 LT	1 LT	1 LT	1 LT	1 LT
p-xylene	40	56	40	1 LT	1 LT	1 LT	1 LT	1 LT
m-xylene	PR-INT	PR-INT	PR-INT	1 LT	1 LT	1 LT	1 LT	1 LT
o-xylene	55	90	48	1 LT	1 LT	1 LT	1 LT	1 LT
trichloroethene	120	110	160	1 LT	4	1 LT	4	1 LT
methylene-chloride	20	130	8	230	1 LT	1 LT	1 LT	1 LT
tetrachloroethene	130	50	76	1 LT	1 LT	1 LT	1 LT	1 LT
ethyl benzene	29	51	27	1 LT	1 LT	1 LT	1 LT	1 LT
chloroform	200	210	120	1 LT	1 LT	2	1 LT	1 LT
arsenic	10	10	10	10	10	10	10	10
chromium	10	10	10	10	10	10	10	10
lead	10	10	10	10	10	10	10	10
copper	0.05 LT	0.05 LT	0.05 LT	0.05 LT	0.05 LT	0.05 LT	0.05 LT	0.05 LT
zinc	0.05 LT	0.05 LT	0.05 LT	0.38	1.3	0.05 LT	0.05 LT	0.05 LT
mercury	0.2 LT	0.2 LT	0.2 LT	0.2 LT	0.2 LT	0.2 LT	0.2 LT	0.2 LT

LT - Less than detection limit stated
a - not analyzed
PR-INT- present but interference precluded quantification

Table 3
Sample Integrity - Shipping Box Access

Box No.	Date	Time	Seal On No.	Seal Broken No.	Reason
A-23	7-24-84	7:00 AM	394		Initial seal
57	7-24-84	7:00 AM	360		Initial seal
56	7-24-84	7:00 AM	369		Initial seal
56	7-25-84	8:40 AM		369	Checked contents
56	6-25-84	8:45 AM	354		Replaced seal
57	7-25-84	8:45 AM		360	Access bottles and add ice packs
A-23	7-25-84	10:00 AM		394	Access bottles
57	7-25-84	6:00 PM	371		New ice packs, sealed overnight
A-23	7-25-84	6:00 PM	376		Sealed overnight
56	7-26-84	8:45 AM		354	Access bottles and add ice packs
A-23	7-26-84	8:45 AM		376	Access bottles
57	7-26-84	6:45 PM		371	Replace ice packs
57	7-26-84	6:50 PM	372		Seal replaced for overnight
56	7-26-84	7:00 PM	375		New ice packs, sealed overnight
A-23	7-26-84	7:00 PM	391		Sealed overnight
56	7-27-84	2:45 PM		375	Accession samples in lab
57	7-27-84	2:45 PM		372	Accession samples in lab
A-23	7-27-84	2:45 PM		391	Accession samples in lab

Appendix A
Protocol

Special Study
Niagara River Gorge Face/Bloody Run Creek
Water Sampling Protocol
July 20, 1984

New York State Department of Health
Bureau of Toxic Substance Assessment
Special Studies Section

Prepared by:

Gerald J. McDonald
Public Health Sanitarian

William M. Gilday
Senior Engineering Technician

Table of Contents

	<u>Page</u>
<u>Objectives</u>	1
<u>Background</u>	1
<u>Site Descriptions</u>	2
Gorge Face	
Bloody Run Creek	
Figure 1 - area map	
<u>Suggested Sampling Locations</u>	2
Gorge Face Seeps	
Bloody Run Creek	
<u>Abbreviations for Sampling Locations</u>	3
<u>Collection Procedures</u>	4
Volatiles	
Semi-volatiles	
Heavy Metals	
Figure 2 - Collection device	
<u>Sample Storage and Shipping</u>	4
<u>Laboratory Analysis</u>	5
<u>Equipment List</u>	
<u>Budget Estimate</u>	
Appendix A - Sampling Data Sheet	
Appendix B - ACC 1 Laboratory Accession Form	
Appendix C - Tox 7 - Chain of Custody Form	

July 23, 1984
Gorge Face Seeps - Bloody Run Creek
Water Sampling Protocol

Objectives

1. To investigate the apparent increase in odors detected in the vicinity of the Hyde Park Landfill and the Niagara River Gorge Face along the PASNY access road northwest of the Landfill.
2. To identify a similarity or distinction between any contaminants present in the Gorge Face seeps, Bloody Run surface water, and the groundwater analysis results reported in Occidental Chemical Corporation's (OCC) Aquifer Survey and Testing Report.
3. To provide an update to the Gorge Face sampling programs conducted in 1981 by Gartner Lee Associates Limited, Arthur D. Little and the U.S. Environmental Protection Agency.

Background

It has been well documented that the various geologic strata within the Lockport Bedrock Zone in the vicinity of the Hyde Park Landfill contain chemicals presumed to be from the landfill. The concentration of these chemicals in the bedrock groundwater varies but, in general, the chemical concentrations are highest in samples collected closest to the landfill and decreasing as the distance from the landfill increases. As part of the Aquifer Survey Program described in the Hyde Park Settlement Agreement, the Occidental Chemical Corporation (OCC) performed various bedrock studies including determination of: bedrock characteristics, water bearing zones, phreatic head, groundwater flow direction and groundwater flow rates.

During the evidentiary hearings held by the U.S. District Court on the Hyde Park Settlement Agreement, there was considerable discussion about the migration of contaminants in the bedrock groundwater to the Niagara Gorge. Although the consensus of the hydrogeologists was that bedrock groundwater flowed in a Northwesterly direction, there was disagreement as to the concentration of chemicals in the groundwater, flow velocities and other bedrock characteristics.

The results of OCC's Aquifer Survey Program have raised concern about the possibility of chemicals from the Hyde Park Landfill travelling some 2,000 feet Northwest of the site to the Niagara Gorge and contaminating the Niagara River. Recently, this concern was heightened by detection of chemical odors near seeps along the Gorge Face in the vicinity of the Bloody Run box culvert. These chemical odors are different than the naturally occurring hydrogen sulfide odors commonly detected in the Lockport Bedrock Zone.

Site Descriptions

1. Gorge Face

The lower access road to the PASNY Power Project lies relatively level as it travels west from its intersection with Hyde Park Boulevard. The grade increases sharply downward as the road turns Northwest and cuts through the bedrock under the Route 104 and Robert Moses Parkway bridge. A seep with an apparant sewage type odor has been noted as being present approximately 85 feet beyond the bridge on the northeast side of the road. After the bridge, the road curves sharply to the north and the grade remains steep for the next 2,000 feet. Approximately 400 feet beyond the bridge, a bedrock groundwater seep is present on the east side of the road. A detectable odor is associated with this seep. Approximately 600 feet further down the road, the Bloody Run outfall is present on the west side of the road. This area is now enclosed within a chain link fence. A seep is present on the east side of the road approximately 40 feet south of the Bloody Run box culvert. As one travels further down the road, another Gorge Face seep is present on the east side approximately 300 feet south of the PASNY turnaround area.

The geologic strata where seeps are emanating should be identifiable with the assistance of an Engineering Geologist. This information will be correlated with analytical data reported in OCC's Aquifer Survey and Testing Report

2. Bloody Run Creek

Bloody Run is a small creek which drains the north and western boundaries of the Hyde Park Landfill and is generally contained in an underground conduit until it emerges on the north side of Grief Brothers. It then flows above ground (except under Sherman Avenue and Belvedere Avenue) until it reaches the culvert on the south side of University Drive. From there, it flows through an underground storm drain and down the upper part of the Gorge Face through a concrete conduit (box culvert) to where it empties out below PASNY's lower access road. This has been referred to as the Bloody Run outfall under Site Description, Section 1 Gorge Face.

Both Bloody Run and the approximate locations of the seeps are presented on the map listed as Figure 1.

Suggested sampling locations are as follows:

1. The seeps located along the Gorge Face are accessible from PASNY's lower access road. The final sample locations will be selected in the field with guidance of the Engineering Geologist. Sample location descriptions to be noted in the field are (see Appendix A):

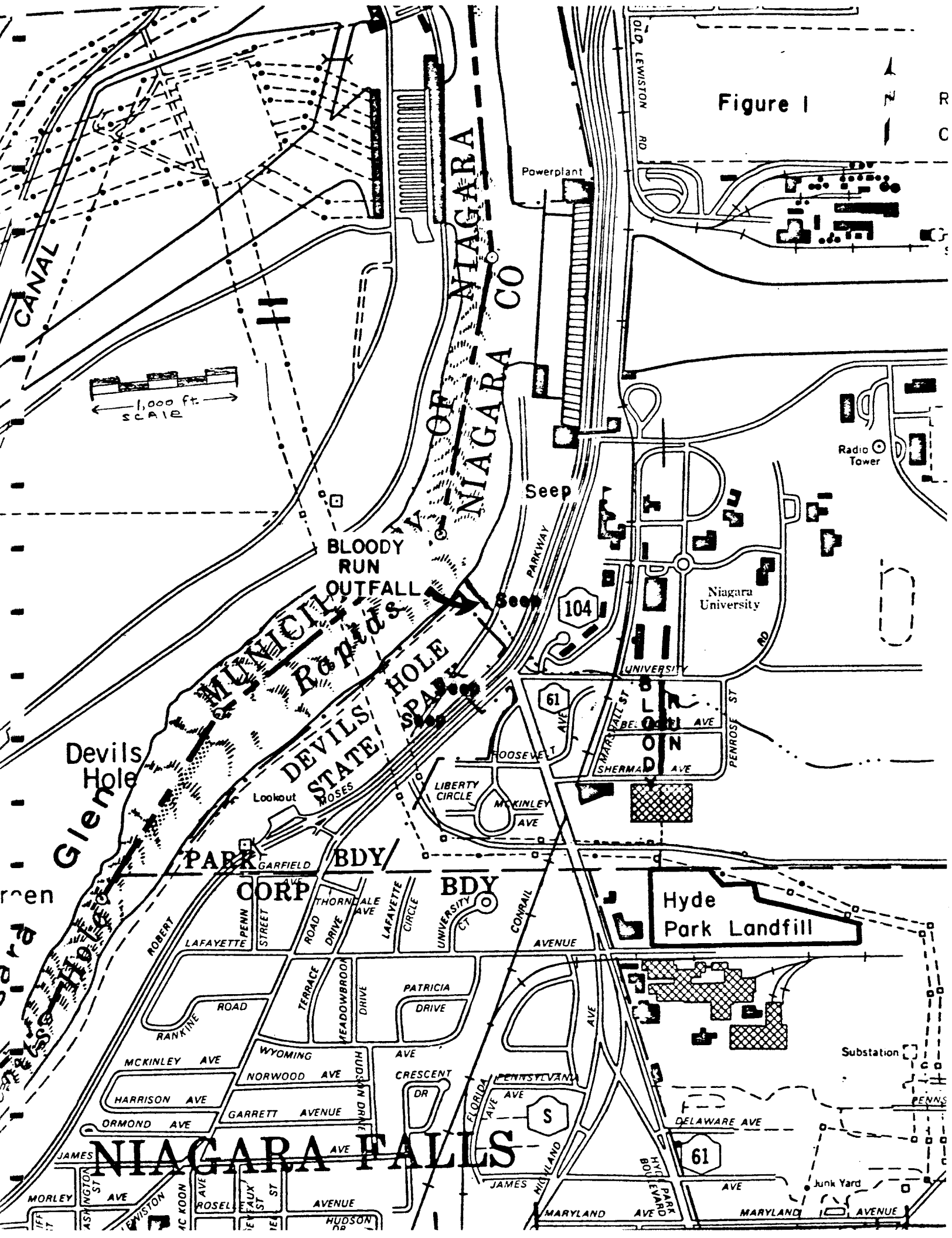


Figure 1

R
C

1,000 ft.
SCALE

Powerplant

Radio
Tower

Seep

Niagara
University

BLOODY
RUN
OUTFALL

DEVILS
HOLE
STATE
PARK

Devils
Hole

PARK
CORP

BDY

Hyde
Park Landfill

Substation

Junk Yard

NIAGARA FALLS

- a) location of seep referencing fixed points,
 - b) geologic formation from which seep appears to originate,
 - c) vertical and horizontal dimensions of seep,
 - d) distance below seep where sample was actually collected,
 - e) odors noted at seep location,
 - f) visual appearance of water, and
 - g) approximate flow rate of seep, (if possible).
2. If possible the Engineering Geologist will identify a Gorge Face seep which is not influenced by the Hyde Park Landfill. This will be used as a control.
 3. Bloody Run Creek, 1) near the NW corner of the landfill, 2) before the culvert at University Drive and 3) at the outfall below the PASNY lower access road. Items to be noted at the given sample locations are as follows:
 - a) visual appearance of water, and
 - b) odor

Abbreviations for sample locations:

BR -- HP	Bloody Run Near Landfill (NW corner)
BR -- UD	Bloody Run @ University Drive
BR -- OF	Bloody Run @ outfall
GF -- S1	Gorge Face seep, approximately 85 feet northwest of the bridge on the northeast side of the road
GF -- S2	Seep, approximately 480 feet south of the Bloody Run fence on the east side of the road
GF -- S3	Seep 40 feet south of the Bloody Run outfall on the east side of the road
GF -- S4	Seep located approximately 300 feet south of the PASNY turn around on the east side of the road
GF -- S5,6...	Additional seeps as determined in the field
GF -- SC	Gorge face seep that is away from the influence of the Hyde Park Landfill, to be used as a control

Collection Procedures

Sample bottles and collection aid devices will be provided by the Center for Laboratories and Research. They will be cleaned and prepared in accordance with accepted laboratory procedures. All sample bottles will be labelled in the field with the following information: site abbreviation, date and time. Clean latex gloves will be used for collection of samples to prevent possible cross contamination.

40 ml vials are to be used for volatile analyses. The water to be sampled should be collected directly into the vial at a point closest to the source to minimize any undue volatilization. These should then be capped excluding all air and immediately iced. Four vials will be required from each location. Hexane washed aluminum foil squares or stainless steel dust pans (Figure 2) will be available to aid in collecting samples from the face of the gorge.

One quart Mason jars are to be used for collecting samples for semi-volatile analyses. A collection device such as another clean jar may be used to facilitate the filling of these sample bottles. After bottles are filled, they should be capped excluding all air and immediately iced. Two bottles will be required from each sample location.

One 500 ml bottle which contains an acid preservative will be used for collecting samples for heavy metals analysis from each site. Care will be taken not to spill the acid preservative. These samples need not be iced.

Arrangements are being made with PASNY to provide a hydraulic lift to facilitate collecting the samples on the Gorge Face.

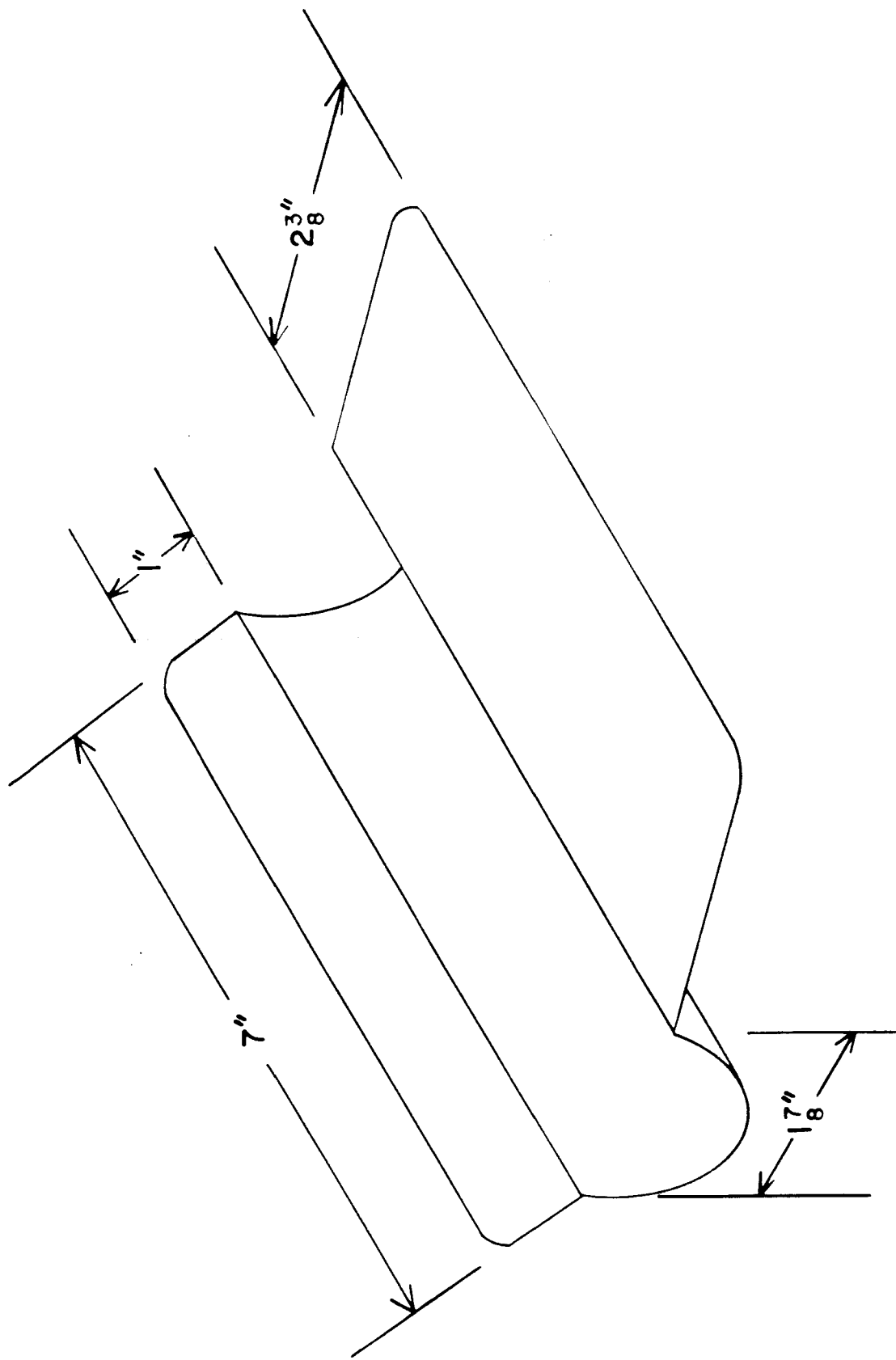
Sample Storage and Shipping

Immediately after collection, sample bottles should be wiped down with paper towels. Samples for volatile and semi-volatile analysis are to be stored at 40C. Wooden shipping boxes with frozen ice packs will be used for this purpose. Ice packs will be replaced if samples are held more than 24 hours. 40 ml vials will not be placed directly next to frozen ice packs as they will freeze.

Samples are to be maintained under chain of custody by use of the proper TOX 7 COC form and accepted chain of custody procedures. Samples will be delivered by state personnel to:

NYS Department of Health
Center for Labs & Research
Loading Dock J
Empire State Plaza
Albany, NY 12237
Attn: Dr. A. Richards
Room D-519

Figure 2 - Stainless Steel Dustpan



Laboratory Analysis

The three sets of samples, two for organic analysis and one for inorganic analysis will be accessioned by laboratory personnel. All analyses should follow the Standard Quality Assurance procedures for trace pollutant analysis of environmental samples.

Organic Samples

Volatiles and semi-volatiles (base/neutrals, acids and pesticides) in the samples will be quantitated using a detection limit nearing 0.1 ppb, but no greater than 1.0 ppb. Hyde Park QA/QC program analytical protocols will be used where applicable. Only the samples in which compounds are present at concentrations compatible with concentrations for mass spectrometry will be submitted for such verification.

Following is a listing of chemicals which will be considered for analysis:

Volatile Parameters

benzene
toluene
xylene
trichloroethylene
methylene chloride
tetrachloroethylene
ethyl benzene
chloroform

Semi-Volatile Parameters

monochlorobenzene
dichlorobenzenes
trichlorobenzenes
tetrachlorobenzenes
pentachlorobenzene
hexachlorobenzene
hexachlorocyclohexanes (HCH's)
monochlorotoluenes
monochlorobenzotrifluorides
2,4,5-trichlorophenol
hexachlorocyclopentadiene (C-56)
octachlorocyclopentene (C-58)
hexachlorobutadiene (C-46)
mirex
PCB - 1016/1242
PCB - 1221
PCB - 1248
PCB - 1254
PCB - 1260
chlorobenzoic acids
chlrendic acids

Inorganic Samples

Samples will be processed as necessary; where particulate matter causes sufficient interference, a standard digestion procedure should be performed. Analysis should include the following parameters for each sample at the appropriate detection level:

Metal

Arsenic (As)
Chromium (Cr)
Copper (Cu)
Lead (Pb)
Zinc (Zn)
Mercury (Hg)

Sensitivity

10 ppb
10 ppb
50 ppb
10 ppb
50 ppb
0.4 ppb

Equipment List

1	set of field blanks
40	40 ml vials
10	500 ml bottles with acid added as preservative
20	quart Mason jars
10	bottles to be used for "filling", laboratory cleaned
	hexane washed aluminum foil sheets
10	stainless steel dustpans
3	shipping boxes, large
3	locks
12	ice packs
2	rain suits
6	Tyvek suits
1 box	disposable latex gloves
2	hard hats
2	safety glasses
16 pair	plastic booties
2 pair	rubber boots
2	respirators, organic vapor/acid gas
4	biohazard disposal bags
2	boxes utility wipes
1	first aid kit
2	face shields
1	eyewash unit (portable)
1	handwash bucket
20	TOX 5 forms (request for analysis, Appendix B)
5	TOX 7 forms (chain of custody, Appendix C)
1	hydraulic lift (PASNY)
1	35 mm camera, flash and telephoto lens
1	Record book, Columnar #56-131

Sample Data Sheet

Location Abbreviation _____

Weather Conditions _____

Date _____ Time _____

Personnel involved;
Name, Affiliation, RoleWinds _____
Temperature _____

Location of seep (use fixed points for reference) _____

Geologic strata from which seep emanates _____

Horizontal dimensions of seep _____

Vertical height from road _____ or elevation _____

Sample bottles used/filling procedure _____

Visual appearance of seep _____

of water _____

Odor present _____

Additional notes _____

REQUEST FOR ANALYSIS

FOR LABORATORY USE ONLY	LAB ACCESSION NO. _____	SAMPLE REC'D	____	____	____	____
	TEST PATTERN _____	YEAR	MONTH	DAY	MILITARY HOUR 00-24	

PLEASE PRINT ALL INFORMATION LEGIBLY IN INK

PROGRAM CODE	____	PROGRAM NAME	_____
A. SOURCE NUMBER	____	COUNTY	_____
B. DRAINAGE BASIN	____	NEW YORK GAZETTEER NO	____
LATITUDE	4	"N	LONGITUDE
			7
			"W
Z DIRECTION, ALTITUDE OR DEPTH, INCLUDE UNITS	____		
LOCATION (CITY, TOWN OR VILLAGE), WATERSHED, NAME OF INDUSTRY, TREATMENT PLANT, OR WATER SUPPLY NAME OF LAKE, RIVER OR STREAM			

EXACT DESCRIPTION OF SITE, NAME OF RESIDENT, STREET ADDRESS, PRECISE SAMPLING POINT			

TIME OF SAMPLING	GRAB/COMPOSITE FINISH	____	____
	COMPOSITE START	____	____
TYPE OF SAMPLE (SELECT FROM LIST)		DESCRIPTION: _____	
COMPLAINTS, OBSERVATIONS, REASONS FOR SUBMISSION (DO NOT CHECK IF ROUTINE SURVEILLANCE)			
☐ ILLNESS (A) ☐ TURBIDITY (C) ☐ NATURAL DISASTER (E) ☐ NEW EQUIP. OR PROC. (G) ☐ INTERRUPTION IN CHLORINATION (I)			
☐ TASTE/ODOR (B) ☐ COLOR (D) ☐ FISHKILL (F) ☐ EQUIP FAILURE (H) ☐ OTHER (J)			
REPORT RESULTS	CO	RO	LPHE
TO (NO. OF COPIES)	FED	INFO	LAB
SUBMITTED BY	____		
ADDITIONAL INFORMATION REGARDING THIS SAMPLE _____			

SANITARY BACTERIOLOGY

- ☐ TOTAL COLIFORMS MF
CHLORINATED POTABLE WATER
☐ TOTAL COLIFORMS MF & SPC
UNCHLORINATED POTABLE WATER
☐ TOTAL & FECAL COLIFORMS MF
NONPOTABLE SURFACE WATER
☐ TOTAL COLIFORMS MPN & SPC
POTABLE WATER
☐ TOTAL & FECAL COLIFORMS MPN
CHLORINATED WASTE WATER
☐ OTHER _____

ORGANIC CHEMISTRY

- ☐ INSECTICIDES HERBICIDES PART 5
☐ PCB'S
☐ TRIHALOMETHANES (THM-501)
☐ PURGEABLE HALOCARBONS (EPA601)
☐ PURGEABLE AROMATICS (EPA602)
☐ PURGEABLE COMPOUNDS (EPA503.1)
☐ PRIORITY POLLUTANTS —
PURGEABLES (EPA624)
☐ PRIORITY POLLUTANTS — BASE
NEUTRALS, ACIDS, PESTICIDES (EPA625)
☐ PETROLEUM PRODUCTS
☐ OTHER _____

INORGANIC CHEMISTRY

- ☐ POTABLE WATER OCSS-I
☐ FLUORIDE
☐ NITRATE
☐ TRACE METALS SPECIFY _____
☐ WQSN
☐ PRIMARY STP
☐ SECONDARY STP
☐ OTHER _____

NEW YORK STATE DEPARTMENT OF HEALTH
CENTER FOR LABORATORIES AND RESEARCH
ALBANY, N.Y. 12201

Appendix C

CHAIN OF CUSTODY RECORD

Must be completed for samples which might be used
for enforcement proceedings or litigation.

SAMPLE ID (LAB USE ONLY)	FIELD REFERENCE NO.	DATE/TIME COLLECTED	SAMPLE COLLECTION POINT	TYPE: WATER, AIR SOIL, ETC.

SPECIFY METHOD OF PRESERVATION

- ☐ NaOH
☐ Cool, 4°C
☐ Acidification (specify)
☐ Other (specify)

TRANSPORTING SAMPLES

DURING TRANSPORT OF THE SAMPLE FROM SAMPLING SITE TO
LABORATORY, THE CHAIN OF CUSTODY MUST BE UNBROKEN.
GENERALLY THIS WILL REQUIRE THAT THE SAMPLE BE DELIVERED
BY THE SAMPLE COLLECTOR OF HIS DESIGNATED REPRESENTATIVE
WHO WILL SIGN FOR THE RECEIPT, INTEGRITY AND TRANSFER
OF THE SAMPLE DURING SHIPMENT. IF INTEGRITY OF SAMPLE
IS QUESTIONED, DESCRIBE PROBLEM ON REVERSE SIDE OF THIS
FORM.

CUSTODY OF SAMPLES

	NAME	AFFILIATION	DATE	TIME
1. Sample Container Prepared by				
2. Received by				
3. Received by				
4. Sample Collected by				
5. Sample Received by				
6. Sample Received by				
7. Sample Received by				
8. Sample Received by				
9. Sample Received by				
10. Sample Rec'd Lab by				
11. Sample Accessioned by				

Appendix B
Laboratory Report

NIAGARA RIVER
GORGE FACE SAMPLES

NY STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABS & RESEARCH
ALBANY

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ALBANY, NEW YORK 12201

August 16, 1984

To: Dr. N. Kim
From: Dr. K. Aldous *lwa*
Subject: Niagara River Gorge Face Samples

Seven samples collected along the gorge face and from water flowing in the Bloody Run Creek were analyzed for the target compounds listed in Attachment I.

Table 1 gives a brief description of the sampling locations and identifying codes. A field blank for volatile analysis was also analyzed.

Analysis

Volatile analysis was performed using EPA methods 601 and 503.1. Samples were also extracted for acid and base/neutral priority pollutants and were analyzed by gas chromatography with electron capture detection. Samples #42911 and #42914 were also analyzed by GC/MS to identify major non-target compounds. The isomers of chlorobenzoic acid were determined by converting the acids into the methyl esters prior to gas chromatographic separation.

Results

Table 2 lists the available data obtained by GC/ECD analysis. Samples #42912, #42914 and #42915 appear to be the most contaminated having similar levels of compounds present. The GC/MS data, while having higher detection limits, shows sample #42914 to contain a higher level of contamination than #42911 and the attached Reconstructed Ion Chromatograms (RIC) are annotated to indicate other compounds identified. The D-10 Anthracene and dibutylchloroendate are internal standard and surrogate spike compounds not native to the samples. The notation PR-INT in Table 2 for m-Xylene indicates that the m-Xylene was present but could not be accurately quantitated due to interfering peaks. The volatile blank sample showed no detected target analytes.

KA/dm

Attachment 1

Hyde Park: Gorge Face and Bloody Run Sampling Program

Volatile Parameters

benzene

toluene

xylene

trichloroethylene

methylene chloride

tetrachloroethylene

ethyl benzene

chloroform

Semi-Volatile Parameters

monochlorobenzene

dichlorobenzenes

trichlorobenzenes

tetrachlorobenzenes

pentachlorobenzene

hexachlorobenzene

hexachlorocyclohexanes (HCH's)

monochlorotoluenes

monochlorobenzotrifluorides

2,4,5 trichlorophenol

hexachlorocyclopentadiene (C-56)

octachlorocyclopentene (C-58)

hexachlorobutadiene (C-46)

Mirex

PCB - 1016/1242

PCB - 1221

PCB - 1248

PCB - 1254

PCB - 1260

chlorobenzoic acid

Table 1.

<u>Accession #</u>	<u>Field Code</u>	<u>Description</u>
42909	BF-UP	4' before culvert
42910	BF-GF	Culvert access road
42911	GF-S4	632' north of culvert
42912	GF-S1	87' below bridge
42913	GF-SC	1500' NNE of pump station
42914	GF-S3	15' S of conduit
42915	GF-S1	320' S of conduit
42916	Field blank for volatiles	

Table 2.

Concentrations in Microgram Per Liter

Semi-Volatile Analytes	42909	42910	42911	42912	42913	42914	42915	42916
monochlorobenzene	1 LT	1 LT	1 LT	220	1 LT	190	90	1 LT
1,3-dichlorobenzene	1 LT	1 LT	1 LT	20 LT	1 LT	50	10 LT	1 LT
1,2-dichlorobenzene	1 LT	1 LT	1 LT	20 LT	1 LT	11	10 LT	1 LT
1,4-dichlorobenzene	1 LT	1 LT	1 LT	20 LT	1 LT	14	10 LT	1 LT
1,3,5-trichlorobenzene	0.7	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1 LT	
1,2,4-trichlorobenzene	0.7	0.1 LT	0.1 LT	1	0.1 LT	2	3	
1,2,3-trichlorobenzene	0.2	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1	
1,2,4,5-tetrachlorobenzene	0.9	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1 LT	
1,2,3,4-tetrachlorobenzene	0.7	0.1	0.1 LT	1 LT	0.1 LT	1 LT	1 LT	
pentachlorobenzene	0.3	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1 LT	
hexachlorobenzene	0.7	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1 LT	
α -hexachlorocyclohexane	1.5	0.2	0.1 LT	8	0.1 LT	7	5	
β -hexachlorocyclohexane	.4	0.2	0.1 LT	6	0.1 LT	3	7	
γ -hexachlorocyclohexane	0.4	0.2	0.1 LT	18	0.1 LT	12	16	
Δ -hexachlorocyclohexane	0.4	0.2	0.1 LT	2	0.1 LT	2	2	
o/p-chlorotoluene	1 LT	1 LT	1 LT	34	1 LT	32	41	1 LT
m-chlorotoluene	1 LT	1 LT	1 LT	10 LT	1 LT	10 LT	10 LT	1 LT
p-monochlorobenzotrifluoride	0.6	0.1 LT	0.1 LT	2	0.1 LT	3	5	
m-monochlorobenzotrifluoride	0.1	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	2	
o-monochlorobenzotrifluoride	0.4	0.1 LT	0.1 LT	2	0.1 LT	2	4	
2,4,5-trichlorophenol	1	0.1	0.1 LT	690	0.1 LT	140	270	
hexachlorocyclopentadiene (C-56)	0.1 LT	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1 LT	
octachlorocyclopentene (C-58)	0.1 LT	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1 LT	
hexachlorobutadiene (C-46)	0.1	0.1 LT	0.1 LT	2	0.1 LT	1 LT	1 LT	

42909 42910 42911 42912 42913 42914 42915 42916

Mirex	0.1 LT	0.1 LT	0.1 LT	1 LT	0.1 LT	1 LT	1 LT
PCB-1016/1242	0.7 LT	0.1 LT		3.5 LT			18 LT
PCB-1221	0.7 LT	0.1 LT		3.5 LT			18 LT
PCB-1248	0.7 LT	0.1 LT		3.5 LT			18 LT
PCB-1254	0.7 LT	0.1 LT		3.5 LT			18 LT
PCB-1260	0.7 LT	0.1 LT		3.5 LT			18 LT
o-chlorobenzoic acid	0.7	0.5	0.5	25,000	1 LT	11,000	8,400
m-chlorobenzoic acid	1 LT	1 LT	1 LT	3,000	1 LT	1,500	2,200
p-chlorobenzoic acid	1 LT	1 LT	1 LT	2,100	1 LT	1,000	1,200

Volatile Analytes

Benzene	3	1 LT	1 LT	200	1 LT	80	150	1 LT
Toluene	1 LT	1 LT	1 LT	400	1 LT	140	640	1 LT
p-Xylene	1 LT	1 LT	1 LT	40	1 LT	40	56	1 LT
m-Xylene	1 LT	1 LT	1 LT	PR. INT	1 LT	PR. INT	PR. INT	1 LT
o-Xylene	1 LT	1 LT	1 LT	55	1 LT	48	90	1 LT
Trichloroethene	4	1 LT	1 LT	120	4	160	110	1 LT
Methylene Chloride	1 LT	1 LT	230	20 LT	1 LT	8	130	1 LT
Tetrachloroethene	1 LT	1 LT	1 LT	130	1 LT	76	50	1 LT
Ethyl Benzene	1 LT	1 LT	1 LT	29	1 LT	27	51	1 LT
Chloroform	1 LT	2	1 LT	200	1 LT	120	210	1 LT

Table 3

Sample #42911 - Fig 1 Acid Fraction

Compounds Identified:

Bidioxolane (3 isomers)
Propenyl Dioxolane (3 isomers)
Methyl Ethyl Dioxolane (3 isomers)
Ethoxy Propane (2 isomers)
Trimethyl Ethyl Phenol
Diethoxy Ethane
Nitric Acid, Nonyl Ester (2 isomers)

Sample #42914 - Fig 3 Acid Fraction

Compounds Identified:

Chlorobenzoic Acid (2 isomers)
Dibutyl Chlorendate
Ethyl Dioxolane
Ethoxy Propane
Propenyl Dioxolane (2 isomers)
Ethoxy Butane
Phenol
2-chlorophenol
2,4-dichlorophenol
Trichlorophenol
Benzoic Acid

Sample #42914 - Fig 4 Base/Neutral Fraction

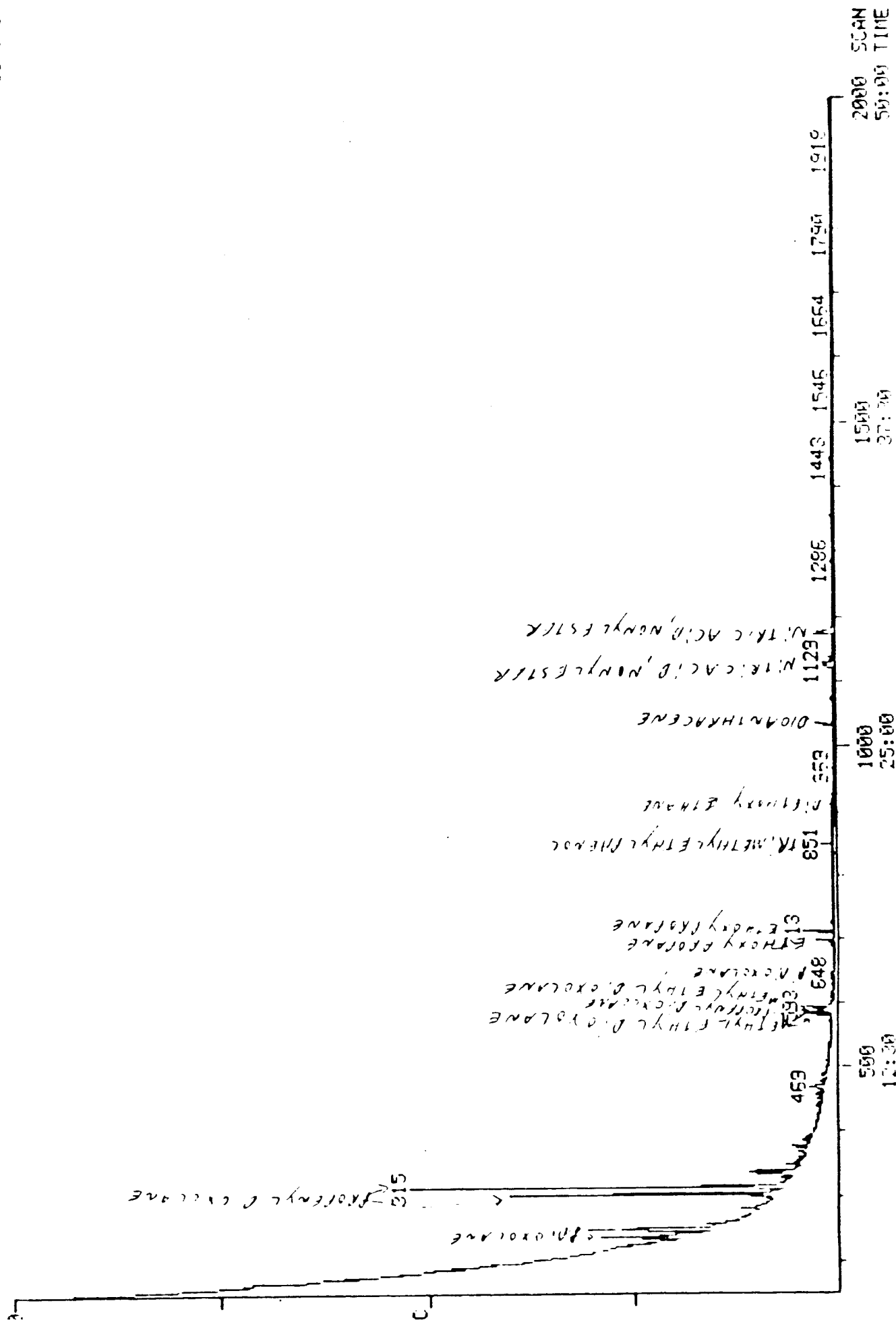
Compounds Identified:

Chlorobenzene
Methyl Propanol
Ethyl Benzene
Dimethyl Benzene
Tetrachloroethylene
Methyl Cyclohexanol
Phenol
Chloromethyl Benzene
Trifluoromethyl Benzenamine
Methyl Benzaldehyde
Phosphoric Acid, Triethyl Ester
Ethyl Benzamide
Sulfur, Mol.
Chlorobenzene Methanol
Chloromethyl Benzenemethanol
Dichlorobenzene (2 isomers)
Trichlorobenzene

RANGE: G 1,2000 LABEL: H 0, 4.0 DIAM: A 0, 1.0 BASE: U 20, 3

CALI: 9313FC #3

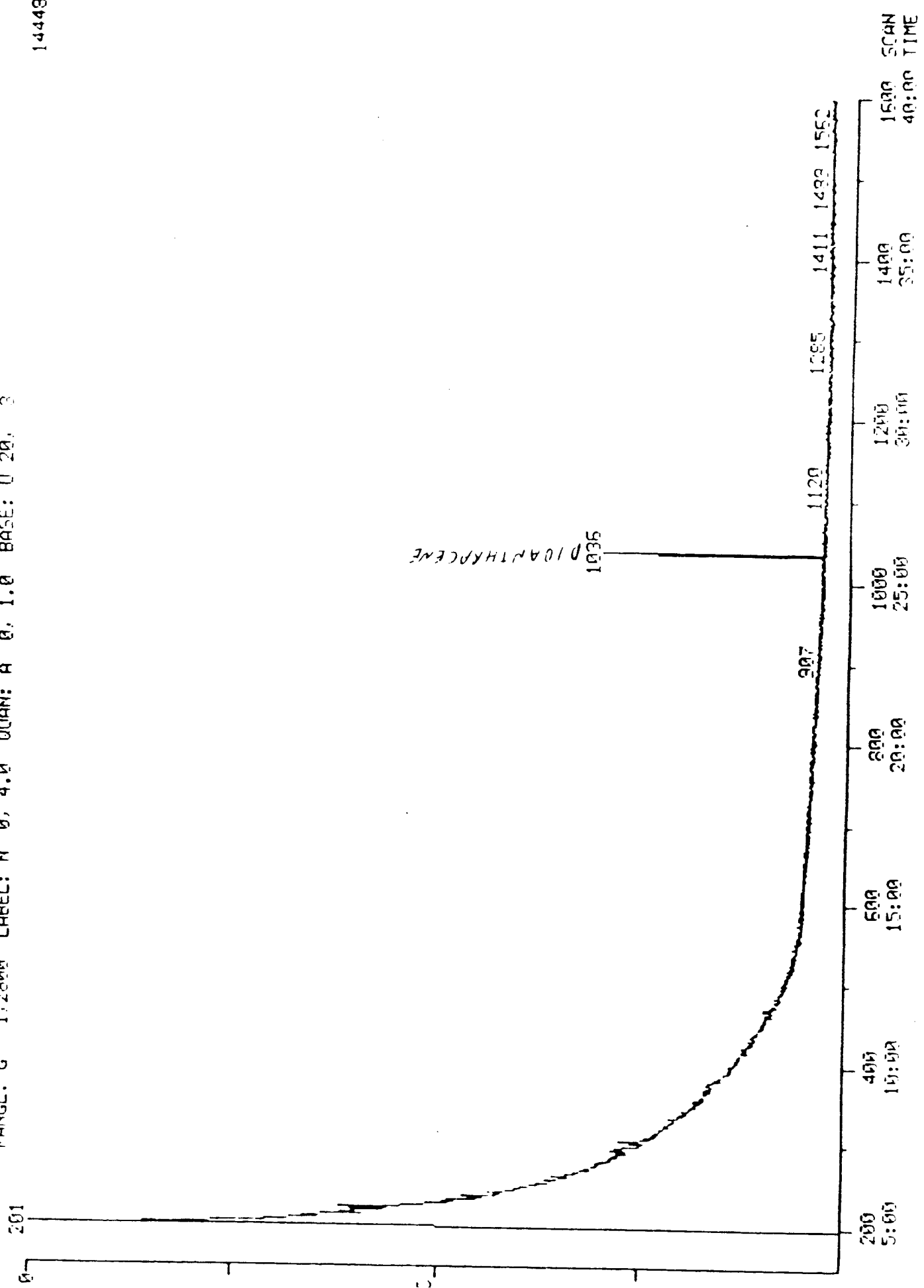
114548



SCANS 150 TO 1600

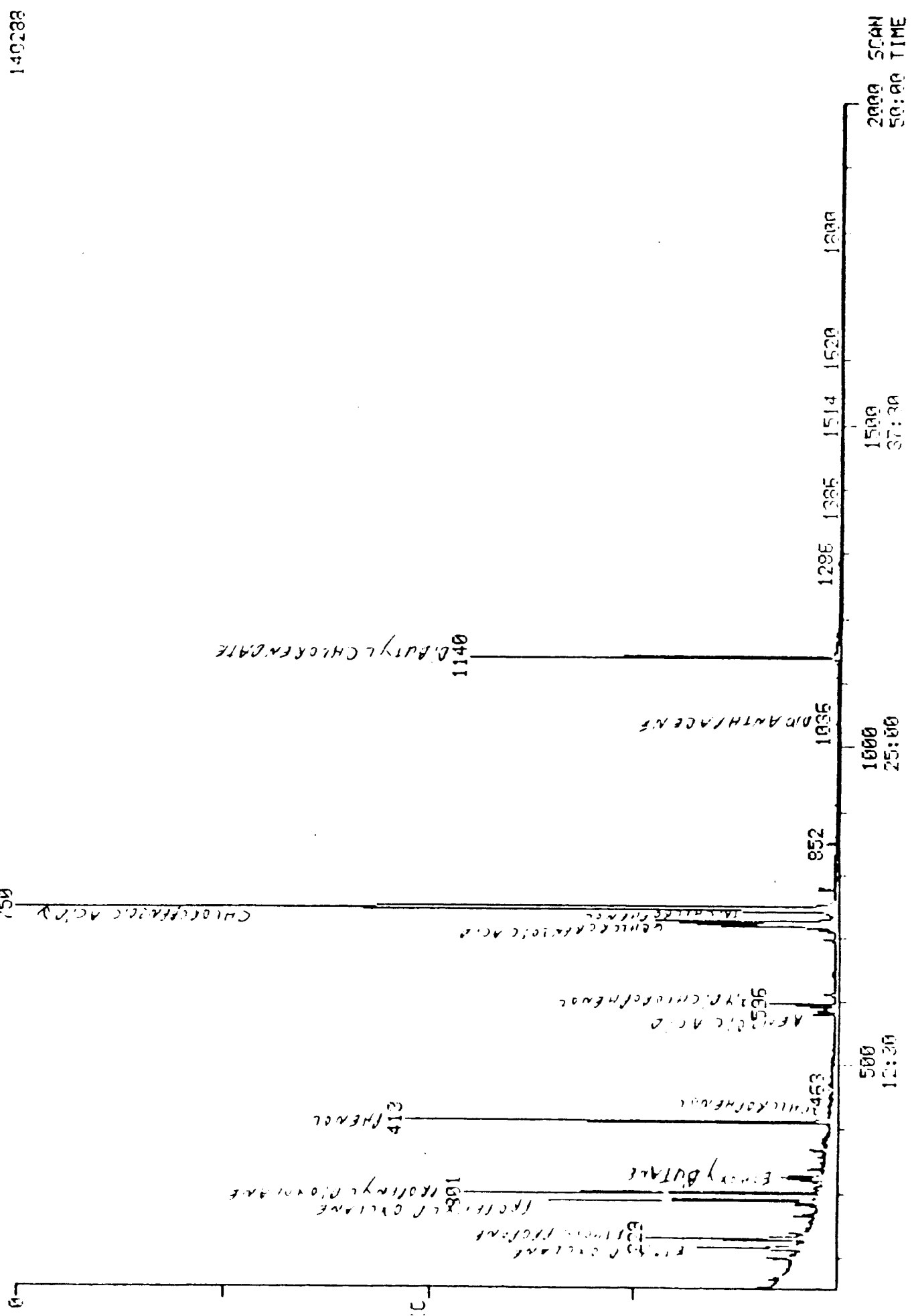
08/13/84 19:55:00
SAMPLE: BASE SAMPLE#42911 B4582 W/DI0A020PPM IUL INJ
PAGE: 6 1.2800 LABEL: N 0, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3

14448



03/13/24 15:44:00
 SAMPLE: 1UL ACID SAMPLE#42314 B4582 W/D10A020PPM
 RANGE: G 1,2000 LABEL: N 0, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
 DATA 008130 #1
 CALI: 0013FC #3

140288



03/13/24 21:03:00
 SAMPLE: BASE SAMPLE#42314 B4532 W/D10A020PPM 1L INJ
 RANGE: G 1.2300 LABEL: N 0, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3

53952



Appendix C
Sample Data Sheets

Sample Data Sheet

Location Abbreviation GF-S1

Weather Conditions _____

SUNNY, CLEAR

Date 7-25-84 Time 10:30

Personnel involved;
Name, Affiliation, Role

Winds slight breeze from E
Temperature 75°

(DCH) Gerry McDonald - collected samples

(DCH) Bill Gilday - Took notes, photographer

(DEC) GERRY Pietraszak - Engineering Geologist,
Jim Christoffel - observer, photographer

(CCC) MATT Barmasse - present to receive split samples for CCC

Location of seep (use fixed points for reference) 87' below bridge (NW)
on the NE side of the road.

Geologic strata from which seep emanates interface of Goat Island
and Gasport plane.

Horizontal dimensions of seep ORIGINATES AT 2 inch crevice and fans out quickly
TO 4 feet. FANS TO 6 feet AT road side ditch.

Vertical height from road 4 feet or elevation _____

Sample bottles used/filling procedure stainless steel dustpan used to fill

(4) 40 ml. vials and (1) 500 ml vial. (2) 1 quart MASON JARS and

(5) 1 liter bottles also required the use of clean 2 quart "filler" jar

Visual appearance of seep Area covered with a whitish slimy film
of water cloudy, milky

Odor present H₂S

Additional notes the sediment below the seep was black, very
fluffy and mobile when disturbed. This black suspended solid
appeared as a soot like material and was covered with a thin whitish
slimy appearing, bacteria like film.

Approx. flow rate 3-5 lpm

photographs Roll #1 slides #3-6

Samples collected Approx. 6 inches below source

Sample Data Sheet

Location Abbreviation GF-S2

Weather Conditions _____

SUNNY - CLEAR

Date 7-25-84 Time 15:00

Personnel involved;
Name, Affiliation, Role

Winds Light NW
Temperature 80°

(ASNY) EAL LIVERMAN - collected samples from hydraulic lift bucket
(DCH) Gerry McDonald - field notes, photographer / Bill Gilday - flagman
(DEC) Tom Christoffel - observed & photographer / Gerry Pietraszak - Engineer
(CCC) MATT BARMASSE - present to receive split samples for CCC. Geologist

Location of seep (use fixed points for reference) 320 feet South of
E of Bloody Run concrete conduit, 20 feet east of
roadside & 52 feet up (verticle)

Geologic strata from which seep emanates contact between Lockport
dolomite & Rochester Shale

Horizontal dimensions of seep Approx 2 feet

Vertical height from road 52 feet or elevation _____

Sample bottles used/filling procedure stainless steel dustpan used
as a filling device. (4) 40 ml vials, (1) 500 ml bottle,
(2) 1 quart MASON JARS and (5) 1 liter bottles

Visual appearance of seep white thin slimy outer layer with 1-3 inches of black
of water slightly cloudy sediment below

Odor present H₂S

Additional notes Mr Liverman's description of the seep area
appeared very similar to that observed at GF-S1. "Fluffy
wet organic matter"

flow rate not quantifiable
photographs - roll #1 slides #18-22
Samples collected 8 inches below source

Sample Data Sheet

Location Abbreviation GF-S3

Weather Conditions _____

Sunny - Clear

Date 7-25-54 Time 11:30

Personnel involved;
Name, Affiliation, Role

Winds CALM

Temperature 75°

(DCH) GARRY McDonald - collected samples, photographs

(DCH) BILL Gilday - notes, photographs

(DEC) Tom Christoffe - observed / GERRY Pietraszak - Engineering Geologist

(CCC) MATT BARRASSE - present to receive split samples for CCC

Location of seep (use fixed points for reference) Base of retaining wall (west)
for Robert Moses Parkway. 15 feet south of Bloody Run
concrete box conduit.

Geologic strata from which seep emanates just above Gasport member. The
pipe drains bedrock groundwater from under Rt. 104 & the RMP.

Horizontal dimensions of seep 6" pipe

Vertical height from road 20 ft below RMP or elevation _____

Sample bottles used/filling procedure (4) 40 ml. vials and (1) 500

ml vial filled direct. Clean "filler" jar was used to
facilitate filling (2) 1 qt. Mason jars and (5) 1 liter bottles.

Visual appearance of seep muck & mire below drain
of water clear

Odor present H₂S

Additional notes the 6 in^h drains, located about 15 feet apart, form
a 15 foot wide swamp. ^{It appeared} dark brown with some black mud, & a white
film was present.

Approx Flow rate - 20 lpm.

photographs - roll # 1 slides # 7-13

samples collected directly from bedrock drain effluent

Sample Data Sheet

Location Abbreviation GF-S4

Weather Conditions _____

SUNNY - CLEAR

Date 7-25-84 Time 13:45

Personnel involved;
Name, Affiliation, Role

Winds light NW
Temperature 85°

(FSNY) Earl Liverman - collected samples from hydraulic lift bucket.
(DLH) GERRY McDonald - field notes, photographer / Bill Gilday - flag man
(JEC) Tom Christoffer - observed / Gerry Pietraszak - Engineering Geologist
(CCC) MATT BARMASSE - present to receive split samples for CCC.

Location of seep (use fixed points for reference) 632 feet north of
& Bloody Run culvert. 40 feet East of roadside &
40 feet up (vertical)

Geologic strata from which seep emanates Grimsby below Therald
Sandstone Above Power Glenn Shale

Horizontal dimensions of seep Avg. - 10 ft.

Vertical height from road 40 feet or elevation _____

Sample bottles used/filling procedure STAINLESS steel dustpan used
as a filling device. (4) 40 ml vials, (1) 500 ml bottle
(2) 1 qt. Mason jars AND (5) 1 liter jars.

Visual appearance of seep Algae & Moss on rocks
of water clear

Odor present none

Additional notes 85% of water was coming from the seep
which was emanating from the location where the sample
was taken.

Flow rate not quantifiable
photographs - roll #1 slides # 14-17

Sample Data Sheet

Location Abbreviation GF-SC

Weather Conditions _____

OVERCAST

Date 7-26-87 Time 15:00

Personnel involved;
Name, Affiliation, Role

Winds CALM
Temperature 80°

(DCH) GERRY McDonald - sample collection, notes, photographs

(UCH) Bill Gilday - sample collection, photographs

(DEC) GERRY Pietraszk - Engineering Geologist, notes, sample collection

(CCC) MATT BARMASSE - sample collection CCC

Location of seep (use fixed points for reference) 1500 feet NNE of
pump station overflow verticle shaft along old railroad bed.
20 feet east of trail and 15 feet up.

Geologic strata from which seep emanates Contact between Lockport Dolomite
and Rochester Shale. verticle fracture in Gasport above seep

Horizontal dimensions of seep 35 feet

Vertical height from road 15 ft above trail or elevation _____

Sample bottles used/filling procedure STAINLESS steel dustpans
used to channel drips from a 7 inch wide area into
sample bottles. 4-5 drip spots included. Flow rate approx 0.02 gpm

Visual appearance of seep thick, bushy, healthy appearing moss present
of water clear

Odor present NONE

Additional notes the Gorge FACE AREA WAS ACCESSED BY PARKING
NEAR the Gorge FACE Interceptor Pump Station Below Cedar St.
Bottles used; (4) 40 ml vials, (1) 500 ml bottle, (2) 1 quart
mason jar & (5) 1 l bottles for CCC

Approx. Flow rate - 0.08 gpm

photographs - roll #2 - slides 1-10

SAMPLES collected approx 8" below source

Sample Data Sheet

Location Abbreviation BR - OF

Weather Conditions _____

Date 7-26-84 Time 9:15

SUNNY, WARM, clouds
To the North

Personnel involved;
Name, Affiliation, Role

Winds CALM
Temperature 75°

(DOH) GERRY McDonald - sampling

(D.H.) Bill Aldrey - photographs & notes

(DEC) GERRY Pietrasak - Engineering Geologist, photographs, notes

(PASNY) EARL Liverman - Access

Location of seep (use fixed points for reference) 4 feet below culvert
opening on west side of PASNY ACCESS ROAD -
Bloody Run - outfall

Geologic strata from which seep emanates N/A

Horizontal dimensions of seep N/A

Vertical height from road 10 ft. below or elevation _____

Sample bottles used/filling procedure Stainless Steel dustpan used to
facillitate filling all bottles. (4) 40ml vials, (1) 500ml bottle.
(2) 1 qt. MASON Jars required use of 1/2 qt. filling jar.

Visual appearance of seep some algae on sides of stream
of water clear

Odor present algae & slight chemical

Additional notes _____

photographs - roll #1 slides 24-30

SAMPLES collected approx 4 feet below culvert.

Sample Data Sheet

Location Abbreviation BR-UD

Weather Conditions _____

Partly cloudy

Date 7-26-84 Time 10:10

Personnel involved;
Name, Affiliation, Role

Winds slight breeze N
Temperature 70°-75°

(DOH) GERRY McDONALD - sampling / Bill Gilday - photographs & notes

(DEC) GERRY Pietraszak, made fence access, photographs & notes

(CCC) RATT FARMASSE observed

Location of ~~seep~~ (use fixed points for reference) south side of Laversy
Drive, 4 feet south of culvert opening

Geologic strata from which seep emanates N/A

Horizontal dimensions of seep N/A

Vertical height from road 10 feet below or elevation _____

Sample bottles used/filling procedure (4) 40 ml vials & (1) 500 ml

bottle filled directly. $\frac{1}{2}$ qt. Mason used to fill
(2) 1 qt. Mason jars.

Visual appearance of seep _____
of water clear

Odor present slight chemical - in area

Additional notes creek was slow running, sediment was
at least 6" thick adjacent to creek.

photographs roll #1 - slides #31-36

Samples collected 4 feet south of culvert opening

Appendix D
Photographs



GF-S1 above; water emanating from a 2 inch crevice at top. White slimy outer layer disturbed to reveal the fluffy black sediment below



GF-S2 above; sample location being accessed by PASNY personnel with the aid of a 75 foot hydraulic lift truck



GF-S2 left; sampling collection by PASNY personnel



GF-SC above; sample collection at
the control seep located approximately
2 miles from the Hyde Park Landfill

BR-UD below; sample collection at
Bloody Run Creek



Appendix E
DEC's Geological Field Observations



New York State Department of Environmental Conservation

MEMORANDUM

TO: Dr. G. Anders Carlson, Bureau of Toxic Substance Assessment
FROM: Mr. Gerald Pietraszek, Region 9 *GFP*
SUBJECT: Niagara River, Gorge Face/Bloody Run Creek Seep and Creek Water Sampling
DATE: August 15, 1984

Enclosed find my descriptions of the sampling locations used during the Niagara River, Gorge Face/Bloody Run Creek seep and creek water sampling program conducted on July 25-26, 1984. A total of seven (7) locations are described (GF-S1, GF-S2, GF-S3, GF-S4, GF-SC, BR-UD, BR-OF).

One location of note is GF-S3. The water at this location may have a partial origin of exfiltration from the Bloody Run culvert under the Robert Moses Parkway and Route 104. The retaining wall is built on top of the Gasport member of the Lockport Dolomite formation.

Construction practice for such a structure will definitely allow bedrock groundwater to flow through a porous backfill to exterior drains such as the one sampled. Therefore, in examining data from this location keep in mind that the water sampled may be a combination of actual bedrock seepage and possible Bloody Run leakage.

Quantification of percent of contribution is not available.

If you or your staff have questions regarding the sample locations, please feel free to call me at 716/847-4590.

GFP:cag
Enc.

cc: Mr. Peter Buechi, w/enc.

RECEIVED
AUG 21 1984
TOXIC SUBSTANCE ASSESSMENT

GF-S1

Sample date: July 25, 1984

Sampled by: Gerald McDonald, Department of Health

Location:

PASNY lower access road, east gorge wall, 87 feet northwest as measured along east edge of pavement from a vertical line extending down from the northwest corner of the Robert Moses Parkway overpass to the east edge of pavement. 9.2 feet off east edge of pavement; 4.0 feet above east edge of pavement.

Sample Point:

Lockport Dolomite formation, contact between Goat Island member and Gasport member, approximately 2.0 feet down into the Gasport at a fracture which extends through the full thickness of the Lockport formation.

Fracture strike - northeast-southwest

Fracture dip - vertical

Fracture width - 1-2 inches at gorge face.

Seep Quality:

Water - cloudy, whitish, strong H₂S odor.

Sediment - below seep is black, fluffy septic-like appearance, approximately 1 inch thick, covered by a thin white semi-viscous film.

Flow rate - approximately 1-2 gpm.

Samples Collected:

Department of Health: 4 - 40 ml clear
2 - 1 qt. clear
1 - 500 ml plastic

Occidental: 5 - 1 l amber

GF-S2

Sample date: July 25, 1984

Sampled by: Earl Liverman (PASNY) for Department of Health

Location:

PASNY lower access road, east gorge wall, 320 feet south (upgradient) from centerline of the Bloody Run concrete conduit as measured along the east edge of pavement. 20± feet east of edge of pavement; 53 feet above east edge of pavement.

Sample Point:

Contact of Lockport Dolomite and Rochester Shale. Horizontal seep area approximately 2.0 feet wide. Sample collected approximately 8 inches below seep as it flowed over the Rochester Shale.

Seep Quality:

Water - slightly cloudy, strong H₂S odor.

Sediment - on rock surface is black organic (septic-like) with white semi-viscous film covering it. Very easily disturbed when touched.

Flow rate - approximately 5-10 gpm.

Samples Collected:

Department of Health: 4 - 40 ml clear
2 - 1 qt. clear
1 - 500 ml plastic

Occidental: 5 - 1 l amber

NOTE: A 75' cherry picker was provided by PASNY to reach the seep. Due to liability insurance Earl Liverman, Environmental Engineer for PASNY, did the actual sampling at this site.

GF-S3

Sample date: July 25, 1984

Sampled by: Gerald McDonald, Department of Health

Location:

Concrete retaining wall at Bloody Run concrete conduit, approximately 25 feet west of the Robert Moses Parkway, at mile marker 957A, 5401, 4005.

Sample Point:

Six inch wall drain from behind the south wingwall of the above retaining wall, 25 feet south of the centerline of Bloody Run concrete conduit, 25 feet north from south end of said wingwall, up 0.5 feet from ground line.

Elevation of drain corresponds to contact of Goat Island and Gasport members of the Lockport Dolomite formation. The retaining wall is built on top of the Gasport member.

Water Quality:

Clear, strong H₂S odor. Grass area below drain is covered with black-brown septic-like organic material which is covered by a white semi-viscous film

Flow Rate:

4-5 gpm

Samples Collected:

Department of Health: 4 - 40 ml clear
2 - 1 qt. clear
1 - 500 ml plastic

Occidental: 5 - 1 l amber

GF-S4

Sample date: July 25, 1984

Sampled by: Earl Liverman (PASNY) for Department of Health

Location:

PASNY lower access road, east gorge wall, 632' north (downgradient) of centerline of Bloody Run concrete conduit, as measured along east edge of pavement. 40± feet east of edge of pavement; 40± feet up from edge of pavement.

Sample Point:

Midway through the Grimbsy sandstone/siltstone formation. At this location Grimbsy is 60± feet thick and lies below the Thorold sandstone and above the Power Glen shale. Sample point is approximately 120± feet below the Lockport/Rochester contact.

Water Source:

Estimate from Earl Liverman (Environmental Engineer) and Bill Green (operator) for PASNY - 15% flow from a horizontal bedding joint within the Irondequoit Limestone/Reynales Limestone-Dolomite; wet area approximately 48 inches wide - 85% from a horizontal bedding joint midway through the Grimbsy; wet area approximately 10 feet wide.

Seep Quality:

Clear, no odor.

Green moss and algae on rock face.

Flow Rate:

No estimate - low flow.

Samples Collected:

Department of Health: 4 - 40 ml clear
2 - 1 qt. clear
1 - 500 ml plastic

Occidental: 5 - 1 l amber

NOTE: A 75 foot cherry picker was provided by PASNY to reach the seep. Due to liability insurance, Earl Liverman, Environmental Engineer for PASNY, did the actual sampling at this site.

GF-SC

Sample date: July 26, 1984

Sampled by: Gerald McDonald, William Gilday, Gerald Pietraszek, Matt Barmasse

Location:

Sample area is approximately 1/2 mile south of Whirlpool Bridge, on the east gorge wall, 1500 feet north-northeast of the vertical concrete overflow shaft which connects the Gorge Interceptor pump station to the Southside Interceptor outfall, along the old railroad bed. The Gorge Interceptor pump station is located at the foot of Cedar Street.

Sample Point:

Contact between the Lockport Dolomite and Rochester Shale, from a horizontal seep approximately 35 feet wide, at a vertical fracture which extends the full thickness of the Lockport.

Lateral offset - 20 feet east of old railroad bed.

Vertical offset - 15 feet above old railroad bed.

Seep Quality:

Water - clear, no odor, no stains.

Lush green moss approximately 1-2 inches thick with some calcium deposits near the rock.

Flow Rate:

Approximately .02 l/min or 1 l/10-12 min. at point of highest flow.

Samples Collected:

Department of Health: 4 - 40 ml clear
2 - 1 qt. clear
1 - 500 ml plastic

Occidental: 5 - 1 l amber

BR-UD

Sample date: July 26, 1984

Sampled by: Gerald McDonald, Department of Health

Location:

Bloody Run Creek, south side of University Drive, at inlet culvert which goes under University Drive.

Sample Point:

Four foot diameter pool at inlet to culvert pipe going north-northwest under University Drive.

Water Quality:

Clear, no odor.

Flow Rate:

Not estimated, water was 2 feet wide, 2-5 inches deep, slow running.

Samples Collected:

Department of Health: 4 - 40 ml clear
2 - 1 qt. clear
1 - 500 ml plastic

No splits with OCC.

BR-OF

Sample date: July 26, 1984

Sampled by: Gerald McDonald, Department of Health

Location:

Bloody Run outfall (BR-OF). PASNY lower access road, west side of road at Bloody Run outlet headwall.

Sample Point:

Mid stream in concrete Gutter section at the outlet headwall, approximately 3.0 feet from the headwall.

Water Quality:

Clear, very slight chemical odor, more pronounced algae odor.

Flow Rate:

Not estimated.

Samples Collected:

Department of Health: 4 - 40 ml clear
2 - 1 qt. clear
1 - 500 ml plastic

No splits with OCC.