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YP-7080 D3136

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

PHASE II INVESTIGATIONS

Hartwell Street Landfill
Site No. 915030
City of Buffalo, Erie County

February 1992

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
Michael J. O'Toole, Jr., P.E., Director

Prepared by:

Ecology and Environment Engineering, P.C.

YP-7080 D3136

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Prepared by:

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1. EXECUTIVE SUMMARY

1.1 SITE DESCRIPTION AND BACKGROUND

The Hartwell Street Landfill site (Site I.D. No. 915030) is located at 1963 Elmwood Avenue in the City of Buffalo, Erie County, New York (see Figure 1-1). The site consists of 2 areas, a 13-acre parcel that was the site of the former Atlas Steel Castings facility and a 5-acre parcel to the north, adjacent to Hartwell Street, that was a low area used for the disposal of construction and demolition debris and excavated soil (see Figure 1-2). Atlas Steel Castings Corporation owned and operated the larger parcel beginning in 1912 and bought the northern 5 acres in 1952.

The site is located in a mixed industrial/commercial/residential area. The site is bordered on the south and east by Frontier Lumber Company property. Frontier Lumber Sales and Storage activities are concentrated to the south, and production activities occur mainly to the east. Hartwell Street, a dead-end, residential street, ends at the landfill border. To the north of Hartwell Street and continuing around the north/northwestern site boundary are commercial enterprises including a filling station, auto repair businesses, and office buildings.

By 1986, Atlas Steel had filed for bankruptcy, and M & T Bank, which held the first mortgage, controlled the property. M & T Bank contracted G & R Salvage to recover machinery and other equipment left at the site. By 1988, the site was allowed to revert to the City of Buffalo, and in 1989, the site was purchased by Roger Pasquarella and Daniel Mele for back taxes.

Currently, the site is being cleared of old buildings and debris with the intent of reselling the property. Future land use plans are unknown. According to the site owner, Region 9 NYSDEC personnel are reportedly aware of recent demolition and removal activities at the site.

Disposal has occurred on both parcels of Atlas Steel property. The material in the smaller 5-acre parcel includes construction and demolition debris and earth fill from plant modifications, used to fill a low area. Debris inside the fence includes wooden pallets and molds, bricks, and metal products. Figure 1-2 is a map of the site.

The dates of landfilling are unknown; however, complaints were received in 1978 and 1979 by the Erie County Department of Environment and Planning regarding disposal and "poor housekeeping practices" at the site. In September 1979, New York State Department of Environmental Conservation (NYSDEC) recommended that Atlas Steel stop waste disposal at the end of Hartwell Street or obtain a valid Part 360 permit. Atlas Steel stopped disposal activities in 1979.

NYSDEC conducted field surveys at the site in 1979 and 1981. In 1982, NYSDEC collected soil and water samples from two areas of standing water at the landfill and one water sample from the sump in the basement of a house adjacent to the landfill. Lead was detected in excess of effluent standards in one water sample from the landfill and in the sample from the basement sump. Soil samples contained concentrations of copper, nickel, and zinc above background levels. On September 16, 1986, NYSDEC representatives inspected transformers at the site showing evidence of spillage. They collected two soil samples and one oil sample. Results showed that the oil contained less than 1 part per billion (ppb) polychlorinated biphenyls (PCBs) and that the soil contained no PCBs. Numerous drums and debris were noted at the site at this time.

On September 16 and 17, 1986, NYSDEC collected two foundry sand samples, one drummed-liquid sample, and one sample of material supposedly spilled from a drum. The foundry sand samples, one representative of drummed sand, and one from large mounds of sand on the property, passed the EP toxicity analysis, but contained trace levels of phenols. The drummed-liquid sample was found to be a hazardous waste by the ignitability characteristic. The spilled-material sample was caustic, but was below hazardous waste levels for corrosivity.

On September 17, 1986, NYSDEC representatives inventoried drums at the site. A total of 660 drums were counted, 250 of which were empty, 200 contained foundry sand, 33 contained pollution-control equipment dust, 23 contained oils and greases, 14 contained a binder-type material, and 140 contained miscellaneous materials such as alcohols, tars, wood preservatives, and unknowns. In the laboratory building on site, some "off-specification and old hazardous chemicals" were found and placed in lab packs according to waste characteristic. These, along with the drum containing the ignitable liquid and three other drums, were placed in a room in the laboratory building. The room was then boarded up and nailed shut.

A fire later occurred in the laboratory building and firemen are believed to have opened the lab packs and pumped water into the drums. A subsequent inspection by NYSDEC found the chemicals scattered around the room. The chemicals were cleaned up, placed in six to eight drums, and stored in the same room in the lab building. An inspection by NYSDEC on July 6, 1989 found that these drums had been opened and the contents scattered, apparently by vandals.

1.2 PHASE II INVESTIGATION

To evaluate the extent of contamination at the site, determine the potential risk to human health and the environment, and accurately calculate a final Hazard Ranking System (HRS) score, a number of investigative tasks were performed at the Hartwell Street Landfill. The Phase II field investigation begun by Ecology and Environment Engineering, P.C. (E & E) in April 1990 included a site reconnaissance, a geophysical survey, and the collection and analysis of surface soil and subsurface soil samples at selected on-site and adjacent property locations.

Prior to the site inspection conducted as part of the site reconnaissance, a detailed record and file search was initiated to review existing data and identify data gaps. A limited air monitoring survey was conducted during the site reconnaissance using a photoionization detector and a flame ionization detector. Two geophysical survey methods were used to optimize the selection of locations of the test borings and to reduce the risks associated with drilling into unknown terrain. The collection and analysis of soil samples were conducted to determine the presence of contaminants and assess their potential for migration.

1.3 SITE ASSESSMENT

The air monitoring surveillance conducted during the site inspection and subsequent field activities indicated the absence of organic vapors above background level throughout the Phase II investigation. Electromagnetic ground conductivity (EM-31) and total earth magnetic field (magnetometer) measurements both yielded anomalous measurements that were interpreted to represent surface and subsurface features at the site.

Surficial deposits at the site consist of lacustrine clay. The bedrock beneath the site is the Camillus Shale, which was encountered in one boring (GW-1) at 57 feet below ground surface (bgs). The Camillus Shale is gray to grayish brown and varies from a thin-bedded shale to a massive mudstone.

No groundwater monitoring wells were installed due to the lack of overburden groundwater and the expected low permeability and thickness of clay at the site. The first water-bearing unit beneath the site is the Camillus Shale.

The sampling program included the collection of seven surface soil samples (including one background sample), four waste samples, two sediment samples, and 17 subsurface soil samples collected from eight borings drilled at the site.

Full Target Compound List (TCL) analysis including volatile and semivolatile organics, pesticides, PCBs, inorganic metals, and cyanide was performed on all surface soils and sediments, 16 of the 17 subsurface soils, and three of the four waste samples. The fourth waste sample and seventeenth subsurface soil sample were submitted for Extraction Procedure (EP) toxicity metals analysis only. Two of the subsurface soil samples submitted for TCL analyses were submitted for EP toxicity metals analysis also.

Analytical results indicate elevated levels of polynuclear aromatic hydrocarbons (PAHs) and several inorganic elements including cadmium, arsenic, iron, lead, antimony, chromium, manganese, silver, and zinc at the site when compared with background levels (see Tables 4-1 through 4-8).

EP toxicity data indicate that the leaching potential of toxic metals at the site is below the maximum allowable concentration.

The nature and extent of contamination is consistent with the urban industrial nature of the site and its use as a disposal area for Atlas Steel Casting plant wastes.

1.4 HAZARD RANKING SYSTEM SCORE

The HRS score was computed to quantify risks associated with the Hartwell Street Landfill site. The HRS is applied to inactive hazardous waste sites in New York State to prioritize those needing additional investigation and remediation. The system evaluates site characteristics, containment measures, waste types, and potential contaminant receptors.

Under the HRS, three numerical scores are computed to express the site's relative risk of damage to the population and the environment. The three scores are described below:

- o S_M reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility via groundwater, surface water, or air. It is a 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).
- o S_{FE} reflects the potential for harm from substances that can explode or cause fires.
- o 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 Hartwell Street Landfill site have been calculated as follows:

$S_M = 2.08$ ($S_{gw} = 0.59$; $S_{sw} = 3.54$; $S_a = 0$)

$S_{FE} = 8.33$

$S_{DC} = 62.50$

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Original-BHSC
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Copy-DOH
Copy-PREPARER

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

ADDITIONS/CHANGES TO REGISTRY OF INACTIVE HAZARDOUS WASTE DISPOSAL SITES

1. Site Name Hartwell Street Landfill	2. Site Number 915030	3. Town Buffalo	4. County Erie County

5. Region 9	6. Classification Current 2a /Proposed D1	7. Activity [ ] Add [ ] Reclassify [X] Delist [ ] Modify ______

8a. Describe location of site (attach USGS topographic map showing site location).
1963 Elmwood Avenue, between Military Road and Delaware Avenue, approximately .5 mile south of Kenmore Avenue.

b. Quadrangle Buffalo NW c. Site latitude 42°57'04" Longitude 78°52'35" d. Tax Map Number 078.53-2-4
078.53-2-5
078.53-2-6

9a. Briefly describe the site (attach site plan showing disposal/sampling locations)
See Figures 1-1 and 1-2

b. Area 13 acres c. EPA ID number NY981562002 d. PA/SI [X] Yes [ ] No

e. Completed: [X] Phase I [X] Phase II [ ] PSA [X] Sampling

10. Briefly list the type and quantity of the hazardous waste and the dates that it was disposed of at this site.
No hazardous waste is documented to have been disposed of at the site.

11a. Summarized sampling data attached

[ ] Air [ ] Groundwater [ ] Surface Water [X] Soil [X] Waste [X] EP Tox [ ] TCLP

b. List contravened parameters and values
See attachment.

12. Site impact data

a. Nearest surface water: Distance 5,800 ft. Direction S Classification C

b. Nearest groundwater: Depth 60-80 ft. Flow direction W [ ] Sole source [ ] Primary [ ] Principal

c. Nearest water supply: Distance 11,000 ft. Direction W Active [X] Yes [ ] No

d. Nearest building: Distance 0 ft. Direction on site Use Storage

e. Crops/livestock on site? [ ] Yes [X] No

f. Exposed hazardous waste? [ ] Yes [X] No

g. Controlled site access? [ ] Yes [X] No

h. Documented fish or wildlife mortality? [ ] Yes [X] No

i. Impact on special status fish or wildlife resource? [ ] Yes [X] No

j. Within a State Economic Development Zone? [ ] Yes [X] No

k. For Class 2A: Code ______ Health model score ______

l. For Class 2: Priority category ______

m. HRS Score Sm=2.08

n. Significant threat [ ] Yes ______ [X] No
[ ] Unknown

13. Site owner's name Roger Pasquarella/Dan Mele	14. Address 157 Comet Street Buffalo 14216	15. Telephone Number (716) 876-8318

16. Preparer
Ralinda Leichner Geologist, Ecology and Environment Engineering P.C.
Name, title, and organization

2/11/92
Date

Ralinda Leichner
Signature

17. Approved
______
Name, title, and organization

______
Date

______
Signature

ATTACHMENT FOR 11B.

Surface Soil

Antimony (15.3 mg/kg), Arsenic (75.2 mg/kg), Cadmium (2.0-54.5 mg/kg), Chromium (1,740 mg/kg), Iron (260,000 and 110,000 mg/kg), Lead (3,070 and 525 mg/kg), Manganese (12,900 mg/kg), Silver (6.7 mg/kg), and zinc (5,720 mg/kg).

Waste

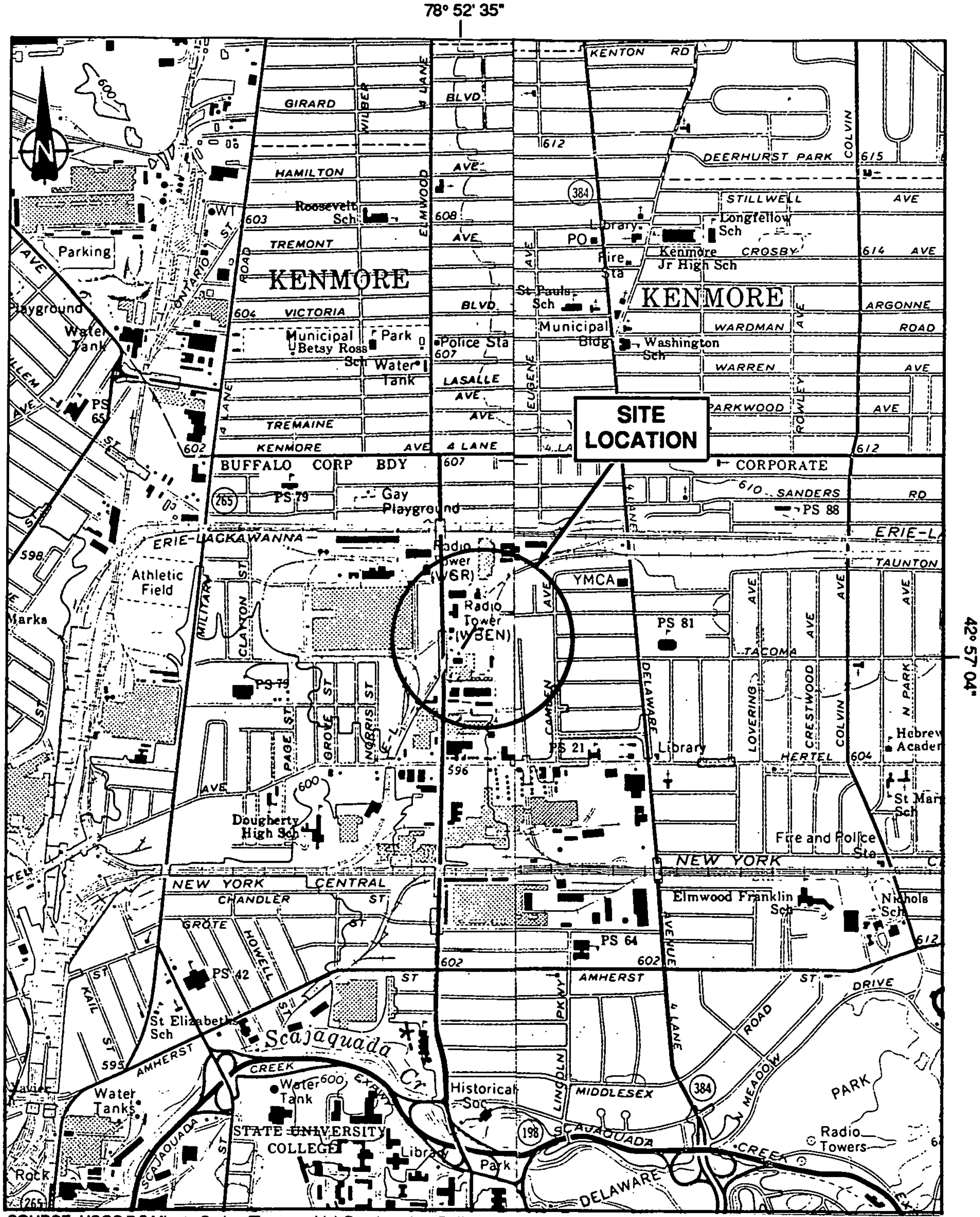
Cadmium (1.7-12.5 mg/kg) and Iron (147,000 mg/kg).

Subsurface Soil

Cadmium (1.4-5.8 mg/kg).

Sediment

Antimony (19.4 mg/kg), Arsenic (109 mg/kg), Cadmium (7.7 and 4.6 mg/kg), and Lead (222 and 979 mg/kg).



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Buffalo NE, N.Y. 1965 and Buffalo NW, N.Y.-Ont. 1965.

Figure 1-1
SITE LOCATION MAP
HARTWELL STREET LANDFILL

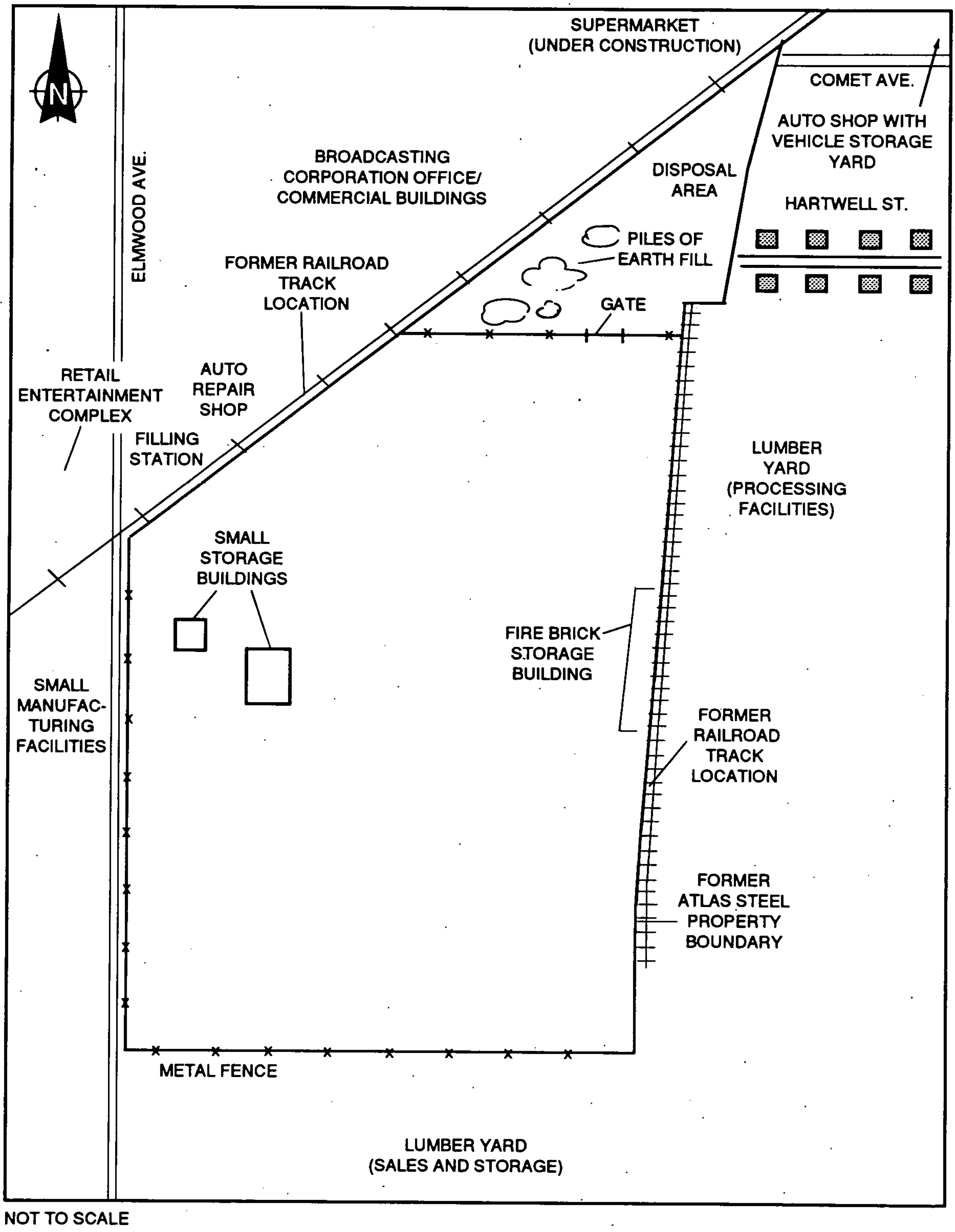


Figure 1-2
HARTWELL STREET LANDFILL SITE MAP

2

2. PURPOSE

This Phase II investigation was conducted under contract to the NYSDEC Division of Hazardous Waste Remediation, Bureau of Hazardous Site Control. The purpose of this Phase II investigation was to determine if hazardous wastes have been disposed of at this site, if contaminants exist in the various media (air, groundwater, surface water, or soil), and whether threats to human health or the environment exist. Information gathered relative to the Hartwell Street Landfill site will allow NYSDEC to reclassify the site or, if warranted, delist it.

The Phase II investigation was designed to supplement existing data for the site and update the HRS score. The Phase I study conducted by Engineering-Science in 1986 did not include any sample collection or analysis. Consequently, soil boring samples for organic, inorganic, and EP toxicity metals analytical parameters were implemented in the Phase II investigation scope of work. Additionally, geophysical surveying for the presence of buried waste and delineation of its boundaries had not been conducted prior to the Phase II study.

3

3. SCOPE OF WORK

3.1 INTRODUCTION

Field work for the Phase II investigation at the Hartwell Street Landfill site began in April 1990 and was largely completed by July 1990. A Quality Assurance Project Plan (QAPP) was submitted to NYSDEC for approval prior to the start of field work. A site-specific health and safety plan was generated and submitted to NYSDEC prior to the commencement of any field activities.

The Scope of Work for the Phase II field investigation at the Hartwell Street Landfill site was prepared by NYSDEC. With minor exceptions, all field activities were performed in accordance with this Scope of Work. Variations from the plan occurred as a result of judgments made in the field, with the concurrence of NYSDEC representatives.

3.2 PHASE II SITE INVESTIGATION

3.2.1 Records Search/Data Compilation

Available information from the state, county, and municipal files was collected and reviewed prior to the initiation of field work. Records from local and state agency files were reviewed to supplement the Phase I report prepared by Engineering-Science in January 1986. The data review allows for the proper completion of the field investigation, site assessment, and calculation of the final HRS score. Specific contacts are listed in Table 3-1.

3.2.2 Site Reconnaissance and Site Safety

On April 16, 1990, E & E personnel conducted a site reconnaissance. The purposes of the site visit were:

- To identify access problems,
- To identify locations for the collection of surface soil and waste samples,
- To conduct a limited air-monitoring study using a photoionization detector,
- To visually inspect boring locations and contact utility companies to determine if underground utilities may impact the drilling program; and
- To identify and approve for use a suitable drilling water supply.

Air monitoring responses above background levels were not observed during the site reconnaissance.

While conducting the site reconnaissance tasks, several logistical items were identified as critical for conducting the Phase II investigation. These included:

- Although the site was officially closed to the public, it was not secure; therefore, equipment used during the investigation would have to be removed from the site each day; and
- An abundance of cultural features (metal fence, overhead power lines, metal debris) present on the site would interfere with surface geophysical survey methods.

A site safety plan was developed that included pertinent emergency phone numbers, a map showing the route to the nearest hospital, and a list of dangers to human health potentially posed by contaminants suspected to be present at the site.

Prior to the beginning of any on-site activities, a site safety meeting was conducted by the site safety officer. Discussions included identification of specific contaminants found on site, potential routes of exposure, air monitoring action levels, and a review of the hospital route and location of the nearest telephone. Also, daily progress and objectives were identified. All on-site personnel signed an attendance sheet, acknowledging their presence and understanding of the topics covered. A site safety plan was available to all personnel on site at all times (see Appendix A).

At the request of NYSDEC, a second site reconnaissance was conducted on September 12, 1991 to document recent changes and on-going activities at the site.

3.2.3 Geophysical Survey

A geophysical investigation was conducted at the Hartwell Street Landfill site on April 17 and June 26, 1990. The geophysical investigation included an EM31 survey (to measure electromagnetic terrain conductivity) and a portable proton magnetometer survey (to measure total earth magnetic field). The objectives of the geophysical methods used were to reduce the risks associated with drilling into unknown terrain and wastes; determine vertical and horizontal anomalies that may represent buried waste boundaries or underground utilities; and optimize the locations of the subsurface soil borings. The geophysical surveys were performed at non-paved locations, and detailed methods and results are presented in the geophysical survey report included in Appendix B.

3.2.4 Surface Soil/Waste Sampling and Analysis

Seven surface soil samples, including one background sample, were collected at the site on July 12, 1990 (see Figure 3-1). Two proposed surface soil samples, S-2 and S-3, were not collected due to demolition work occurring at the site. These samples were to be taken around the Atlas Steel Castings building. Sample S-2 was to be collected from an area of stained soil north of the center of the building near a possible transformer spill. Sample S-3 was to be collected from an area of stained soil northeast of the building. To replace samples S-2 and S-3, samples S-8 and S-9 were collected. S-8 was collected west of a drum area near the S-9 GW-4 location. A composite sample was collected from three to four areas of stained soil around a drum storage area.

Sample S-7, the background sample, was collected from an open field west of the railroad tracks on the east side of a house on Hartwell Street. This sample was used as a basis for comparison with on-site surface soil samples.

All surface soil samples were analyzed for full TCL parameters including volatiles, semivolatiles, pesticides, PCBs, metals, and cyanide.

Four waste samples were collected at or near various waste piles at the site (see Figure 3-1). Samples W-1 and FS-1 were collected from foundry sand piles on the site. Sample W-2 was collected from a waste pile containing metal, slag, brick, and concrete located just inside the north entrance gate. W-3 was collected from a waste pile in the northeastern portion of the site.

Waste samples W-1, W-2, and W-3 were analyzed for full TCL parameters. Sample FS-1 was analyzed for EP toxicity metals only.

All surface soil and waste samples were collected from 0 to 12 inches below the ground surface using precleaned disposable stainless-steel spoons. Prior to use, the new dedicated sampling equipment was decontaminated using the following procedure:

- Washed with a detergent and water mixture;
- Rinsed with deionized water;
- Rinsed with methanol;
- Rinsed with deionized water; and
- Allowed to air dry.

Surface soil and waste samples collected were screened on site for volatile organic compounds using an HNu photoionization detector. None of these samples exhibited an instrumentation response above background level. Each sample location was marked by a wooden stake to provide identification during the subsequent surveying of the site. Each surface soil and waste sample collected was immediately placed in the appropriate 8-ounce and/or 40-milliliter pre-cleaned, labeled, Teflon-lined screw cap, glass jars. The samples were placed on ice and transported under proper chain-of-custody to E & E's Analytical Services Center (ASC).

3.2.5 Subsurface Soil Sampling and Analysis

Sixteen subsurface soil samples were collected from eight soil borings at the site (see Figure 3-1). Soil boring sample depths and analyses are summarized in Table 3-2.

Groundwater monitoring wells that were proposed at this site were not installed. This decision was reached by NYSDEC and E & E when bedrock was encountered at approximately 57 feet bgs in GW-1 and no groundwater had been encountered in the overburden. Overburden deposits in GW-1 consisted of approximately 51 feet of tight inorganic clay beneath fill material.

Soil samples were collected by split-spoon sampling in conjunction with a standard penetration test as outlined in American Society for Testing and Materials (ASTM) D1586-84. A 2.5-inch by 2.0-inch outer diameter (OD) hardened steel sample barrel and shoe was driven in 2-foot depth intervals by a 140-pound hammer falling 30 inches. Soil sample depths, recoveries, descriptions, and other pertinent information were recorded by the on-site geologist on the subsurface boring logs (see Appendix C).

At each boring location, a small decontamination station was set up consisting of a work table covered with plastic sheeting and a set of three wash tubs placed on plastic sheeting. After the pertinent information was logged, the split-spoon sampler underwent the following decontamination procedure:

- Initial cleaning of all foreign material;
- Trisodium phosphate (TSP) detergent wash;
- Deionized water rinse;
- Pesticide-grade methanol rinse;
- Deionized water rinse; and
- Allowed to air dry.

or

- Initial cleaning of all foreign material; and
- Cleaning with high-pressure steam.

The plastic sheeting on the work table was changed after the completion of each borehole to prevent cross-contamination.

Subsurface soil samples were collected as composites from the depths specified in Table 3-2. All samples except GW-3 (2 feet to 4 feet), were analyzed for full TCL parameters. Samples GW-3 (2 feet to 4 feet), GW-5 (0 feet to 4 feet), and GW-7 (0 feet to 20 feet), were subjected to EP toxicity metals analysis (see Table 3-2).

One sample from each boring was collected for geotechnical testing including grain size analysis for noncohesive samples and Atterburg limits analysis for cohesive samples (see Appendix E).

Samples were transferred from split-spoons with precleaned, dedicated stainless steel spoons to the appropriate 8-ounce and/or 40-milliliter, pre-cleaned, labeled, Teflon-lined screw cap, glass jars. The samples were placed on ice and transported under proper chain-of-custody to E & E's ASC.

3.2.6 Surface Water/Sediment Sampling and Analysis

Two sediment samples, SED-3 and SED-4, were collected on July 12, 1990 from surface water/sediment sampling locations in a perimeter drainage ditch at the site (see Figure 3-1). Surface water was not found in this ditch at the time of sampling. Two other surface water/ sediment sampling locations could not be reached during sampling due to demolition activities at the site. These samples, SW-1 and SW-2, were to be collected from troughs or pits inside the Atlas Steel building.

SED-3 and SED-4 were collected from a drainage ditch along the northern site boundary from the sampling locations that were accessible.

Sediment samples were collected with precleaned, dedicated, stainless steel spoons and placed in the appropriate 8-ounce and/or 40-milliliter precleaned, labeled, Teflon-lined screw cap, glass jars. These samples were placed on ice and transported under proper chain-of-custody to E & E's ASC for full TCL analyses.

Table 3-1

SOURCES CONTACTED FOR THE NYSDEC PHASE II INVESTIGATION AT THE HARTWELL STREET LANDFILL SITE

Erie County Department of Environmental Compliance
95 Franklin Street
Buffalo, New York
Contact: Paul Kranz
Telephone Number: 716/858-6370
Date: April 2, 1990
Information Gathered: Information about files pertaining to NYSDEC sites.

Erie County Department of Environment and Planning
95 Franklin Street
Buffalo, New York
Contact: Michael Alspaugh
Telephone Number: 716/858-6013
Date: March 29, 1990 and April 2, 1990
Information Gathered: Photocopies of aerial photographs dating from 1951 to 1981 for clarification of site chronology, bedrock, water table, historic sites, and floodplain information.

Erie County Water Authority
922 Sturgeon Point Road
Derby, NY 14047
Contact: Mike Martin
Telephone Number: 716/947-4252
Date: April 10, 1990
Information Gathered: Erie County NYSDEC Phase II sites within Erie County's Water Service.

New York State Department of Environmental Conservation
584 Delaware Avenue
Buffalo, New York 14202
Contact: Joseph Sciascia
Telephone Number: 716/847-4585
Date: April 3, 1990
Information Gathered: File search for NYSDEC Phase II report preparation.

New York State Department of Environmental Conservation
Bureau of Hazardous Site Control
50 Wolf Road
Albany, New York 12233
Contact: Mike Ryan and Jane Thapa
Telephone Number: 518/457-9538
Date: April 3-4, 1989
Information Gathered: File search for additional data and NYSDEC Phase I reports.

New York State Department of Environmental Conservation
584 Delaware Avenue
Buffalo, New York 14202
Contact: Jaspal Walia
Telephone Number: 716/847-4585
Date: March 29, 1990 and April 3, 1990
Information Gathered: File search.

City of Buffalo
Water Division
Porter Avenue
Buffalo, New York
Contact: Staff
Telephone Number: 716/851-4710
Date: April 10, 1990
Information Gathered: Water intakes for the City of Buffalo.

[UZ]YP7080:D3136/6038/23

Table 3-1 (Cont.)

New York State Department of Environmental Conservation
Information Services/Significant Habitat Unit
Wildlife Resources Center
700 Troy-Schenectady Road
Albany, New York 12110
Contact: Burrell Buffington
Telephone Number: 518/783-3932
Date: April 10, 1990
Information Gathered: Information on designated critical habitats with respect to NYSDEC Phase II sites.

New York State Department of Health
584 Delaware Avenue
Buffalo, New York 14202
Contact: Cameron O'Conner
Telephone Number: 716/847-4365
Date: March 24, 1989
Information Gathered: File search for NYSDEC Phase II report preparation.

New York State Department of Health
Bureau of Environmental Exposure
2 University Place
Room 205
Albany, New York 12203
Contact: Jeff Chiarenzelli
Telephone Number: 518/458-5310
Information Gathered: Viewed site inspection reports for NYSDEC Phase I sites.

[UZ]YP7080:D3136/6038/23

Table 3-2

SUBSURFACE SOIL BORINGS

			Analyses Performed	
Boring Number	Total Depth (feet)	Sample Depths* (feet)	Full TCL**	EP Toxicity
GW-1	57	0-20	x	
		20-40	x	
GW-2	26	0-4	x	
		4-26	x	
GW-3	40	0-20	x	
		20-40	x	
		2-4		x
GW-4	40	0-20	x	
		20-40	x	
GW-5	26	0-4	x	x
		4-26	x	
GW-6	26	0-4	x	
		4-26	x	
GW-7	40	0-20	x	x
		20-40	x	
GW-8	26	0-4	x	
		4-26	x	

02[UZ]YP7080:D3136/6039/24

*Samples were composites of the stated interval.
**Includes volatiles, semivolatiles, pesticides, PCBs, metals, and cyanide.

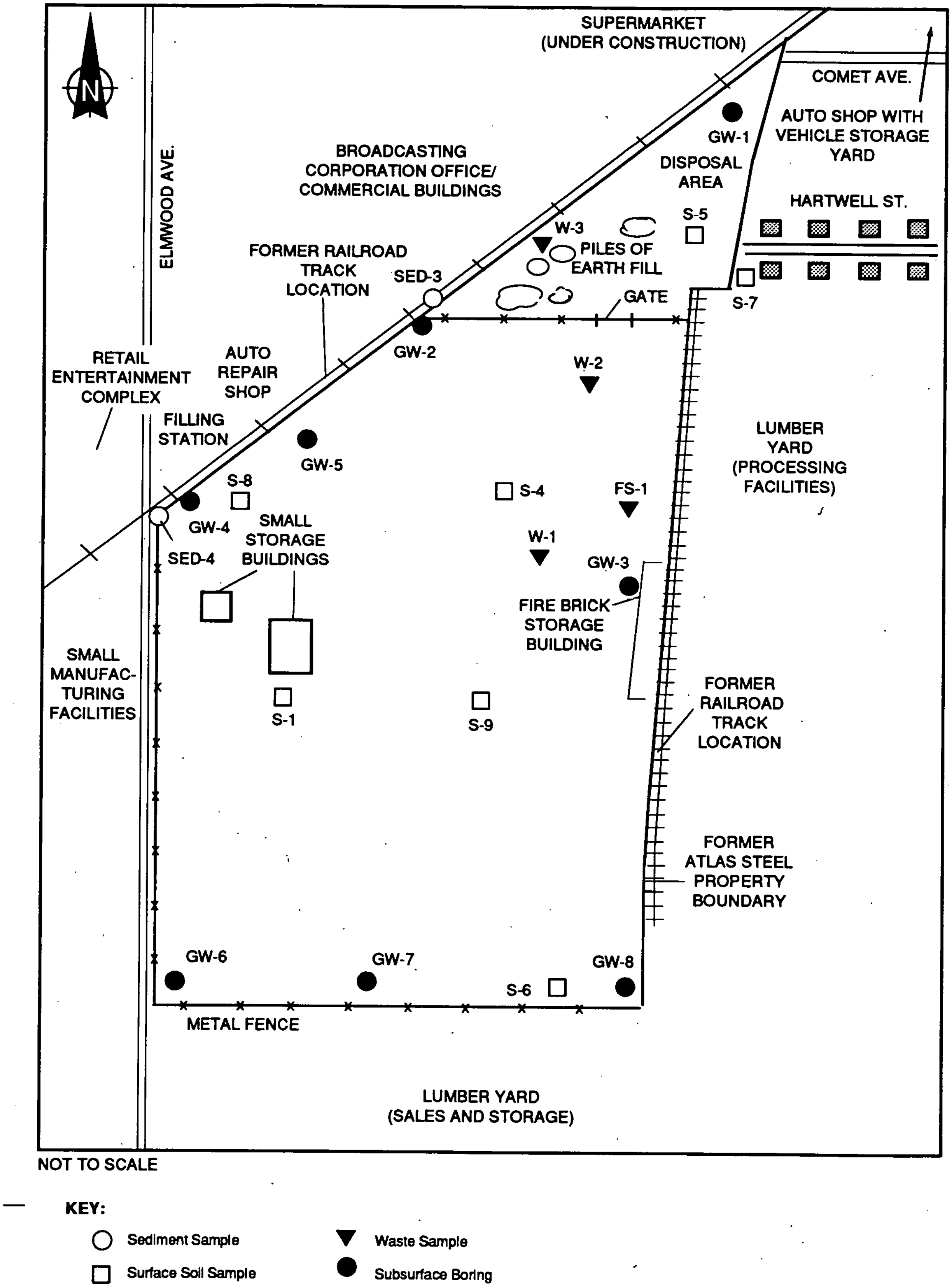


Figure 3-1
SAMPLING LOCATIONS
HARTWELL STREET LANDFILL SITE

4

4. SITE ASSESSMENT

4.1 SITE HISTORY

The 18-acre Hartwell Street Landfill site is located at 1963 Elmwood Avenue in the City of Buffalo. Atlas Steel Castings Corporation owned and operated 13 acres of the site as a steel manufacturing facility from 1912 to 1986. Atlas Steel purchased an additional 5-acre parcel to the north of the facility in 1952.

Research of available tax maps dating as far back as 1916 show the Hartwell Street Landfill site as a vacant lot prior to its purchase by Atlas Steel Castings Corporation in 1952. Atlas Steel Castings Corporation was formed in 1911 and began operations on the adjoining property in 1912. The original melt process for castings involved the use of an oil-fired hearth furnace and was upgraded with the introduction of an electric arc furnace shortly after the end of World War I. From 1949 until the closing of the facility, the melting process utilized electric arc furnaces exclusively. Typical casting production processes were used to make specialty castings consisting of carbon and low alloy steel, with products ranging in size from one pound to seven tons. Materials used for alloy content included molybdenum, nickel, chrome, and vanadium. Products varied from small screw devices for meat grinders, to large castings for Navy ships, to castings used in the rolling mill operations of large steel producers.

Sand used in the casting molds was the largest waste stream component. During the mid-1970's, approximately 100 tons of the 150 tons of sand used per week were being disposed. Typical metal casting requires the use of additives for the chemical bonding of the sand used in the casting molds, and thus the sand cannot be reclaimed after a molding process is completed. In 1978, the company introduced a new vacuum molding method that utilizes dry sand containing no additives, thus allowing for reuse of the material. However, conventional casting methods, which required the use of additives, were continued for some products. The actual reduction in the quantity of waste sand owed to the introduction of the vacuum method is unknown.

When production at the facility ceased, several buildings remained on site, with the foundry and its adjoining buildings being the dominant structures. Smaller structures on the property were used principally for storage of patterns and other equipment.

By 1986, Atlas Steel had filed for bankruptcy and M&T Bank, which held the first mortgage, controlled the property. Between 1986 and 1988, M&T contracted with G&R Salvage to recover machinery and other equipment left at the site. By 1988, the site had reverted to the City of Buffalo, and in 1989, the site was purchased by Roger Pasquarella and Daniel Mele for back taxes.

Disposal has occurred in several areas at the site, on both parcels of Atlas Steel property. The material on the smaller, 5-acre parcel includes construction and demolition debris and earth fill from plant modifications, used to fill in a low-lying swampy area. Debris inside the fence includes wooden pallets and molds, bricks, and metal products. One of the former buildings contained three pits that at one time contained oily water, a weak basic solution, and oil. Following recent demolition activities, only one pit was observed, which contained oily water and debris. A large quantity of foundry sand (estimated at several thousand cubic yards) was present at the site in open mounds. Recent grading of the site surface has smoothed the mounds. No foundry sand is known to have been removed from the site. A small mound of sand, away from the area of the former mounds, is currently awaiting removal. Previous sampling results found some of the sand to contain a water-soluble sodium silicate bonding agent and some contains greater than 1 ppb phenols. The bonding agent is a skin and eye irritant, but is nonhazardous based on laboratory analysis.

The dates of landfilling are unknown; however, complaints were received in 1978 and 1979 by the Erie County Department of Environment and planning regarding disposal and "poor housekeeping practices" at the site. In September, 1979, NYSDEC recommended that Atlas Steel stop waste disposal at the end of Hartwell Street or obtain a valid Part 360 permit. Atlas Steel stopped disposal activities in 1979.

NYSDEC conducted field surveys at the site in 1979 and 1981. In 1982, NYSDEC collected soil and water samples from two areas of standing water at the landfill and one water sample from the sump in the basement of a house adjacent to the landfill. Lead was detected in excess of effluent standards in one water sample from the landfill and in the sample from the basement sump. The water samples also contained detectable levels of chromium, copper, zinc, and TOC. Soil samples contained "fairly high amounts" of copper, nickel, and zinc and detectable amounts of chromium, lead, and silver.

In September 1986, NYSDEC received information regarding transformers possibly located at the Atlas Steel facility. On September 16, 1986, NYSDEC representatives located these transformers in an area with evidence of spillage. They collected two soil samples and one oil sample. Results showed the oil to contain less than 1 ppb PCBs and the soil to contain no PCBs. Numerous drums and debris were noted at the site at this time.

On September 16 and 17, 1986, NYSDEC collected two foundry sand samples, one drummed-liquid sample, and one sample of material supposedly spilled from a drum. The foundry sands, one representative of drummed sand and one from large mounds of sand on the property, passed the EP toxicity analysis, but contained trace levels of phenols. The drummed-liquid sample was a hazardous waste by the ignitability characteristic. The spilled-material sample was caustic, but was below hazardous waste levels for corrosivity. Also at this time, three large oil tanks were found partially buried in an area of stained soil. One of the tanks was full and the other two contained bottom sludges. The contents were thought to be fuel oil. These tanks were not observed during the site reconnaissance conducted as part of this investigation.

On September 17, 1986, NYSDEC representatives inventoried drums at the site. A total of 660 drums were counted, of which 250 were empty, 200 contained foundry sand, 33 contained pollution-control equipment dust, (including sand, steel dust, and iron oxide) 23 contained oils and greases, 14 contained a binder-type material, and 140 contained miscellaneous materials such as alcohols, tars, wood preservatives, and unknowns. Also during the drum inventory, a total of nine transformers were located at the site. Two of these transformers had tags identifying them as containing PCBs. In the laboratory in the laboratory building on site, some "off-specification and old hazardous chemicals" were found and placed in lab packs according to waste characteristic. These, along with the formerly tested drum of ignitable material and three other drums, were placed in a room in the laboratory building. The room was then boarded up and nailed shut.

A fire later occurred in the laboratory building and firemen are believed to have opened the lab packs and pumped water into the drums. A subsequent inspection by NYSDEC found the chemicals scattered around the room. The chemicals were cleaned up, placed in six to eight drums, and stored in the same room in the lab building. An inspection by NYSDEC on July 6, 1989 found that these drums had been opened and the contents scattered, apparently by vandals.

A recent problem at the site investigated by NYSDEC on December 13, 1989 involves the burning of painted wood molds by site workers inside one of the buildings. NYSDEC received a complaint from a nearby industry regarding smoke and strong odors from the site. An inspection showed the source of the odors to be a core-baking oven in which painted wood molds were being burned. The paint was subsequently determined to contain lead and NYSDEC was concerned about the proper disposal of ash that resulted from burning.

Current site activities are concentrated on the steel plant property and involve the demolition of older buildings and debris removal. According to the site owner, Region 9 NYSDEC personnel have been kept informed of on-going activities and have been involved in ensuring that proper demolition, removal, and disposal practices are carried out. Buildings remaining on site include two small storage buildings in the western portion of the site and a fire brick storage building along the eastern property boundary. The site owner is awaiting NYSDEC approval for the removal of a small amount of debris remaining at the site, including crushed empty drums, foundry sand, bricks, and miscellaneous metal debris. No transformers were observed at the site during the recent site reconnaissance, however details of removal were not available.

4.2 REGIONAL GEOLOGY AND HYDROGEOLOGY

Erie County lies within the Erie-Niagara basin and the Erie-Ontario lowland physiographic province. The overburden in the county consists mainly of glacial till, an unconsolidated, poorly sorted mix of clay, silt, and/or sand. It forms a thin mantle over the bedrock and exhibits low permeability. The region between the Onondaga Escarpment to the north and the hilly areas to the south also received lacustrine clay and silt deposits during late Pleistocene time from the larger ancestral stages of Lake Erie. These deposits exhibit very low permeabilities. As the ancestral lakes retreated, sandy beach sediments were also deposited in this region. These deposits, by their nature, have relatively high permeabilities.

The bedrock in the region is exclusively sedimentary. The shale, limestone, and dolomite units dip gently southward approximately 40 feet per mile. Although the bedrock dips southward, the land surface is flat or actually increases in elevation to the south. Therefore, the farther south the location, the younger the underlying bedrock.

Up to 32 distinct bedrock members have been identified in Erie County (see Figure 4-1). The oldest unit, Silurian in age, underlying the northern part of the county is the Camillus Shale. This member, which is 30 to 100 feet thick, contains significant reserves of groundwater in cavities formed by the dissolution of gypsum.

Several limestone members also of Silurian age overlie the Camillus Shale. The Bertie Limestone, approximately 50 feet thick, overlies the Camillus Shale and is in turn overlain by the Akron Dolomite, which is about 8 feet thick. Little record of late Silurian or early Devonian history is preserved in Western New York. However, the Middle and Late Devonian record is well preserved beginning with the Onondaga Limestone unconformably overlying the Akron Dolomite. The unit comprises three distinct members that cummulatively are approximately 140 feet thick.

The Marcellus Shale member overlies the limestone units. This dense, black, fissile shale is approximately 30 to 55 feet thick. This shale, unlike the Camillus Shale, is impermeable. It confines the limestone and Camillus Shale aquifers below.

The Skaneateles Formation overlies the Marcellus Shale. This 60- to 90-foot-thick formation is represented by the Stafford Limestone and Levanna Shale. The black, fissile shale is expected to be impermeable and will therefore confine groundwater found in the lower limestone units.

Overlying the Skaneateles is the Ludlowville Formation represented by the Centerfield Limestone, Ledyard Shale, Wanakah Shale, and Tichenor Limestone members. The shale members contain numerous limestone beds. The Ludlowville Formation is followed by the Moscow Formation represented by the Kashong Shale and Windom Shale. The Moscow Formation is followed by 2,500 feet of upper Devonian rocks in southwestern New York State consisting of the Genesee, Sonyea, West Falls, Java, Canadaway, Chadakoin, and Cattaraugus formations. These consist almost exclusively of shale members. The Canadaway Formation is by far the thickest (up to 1,000 feet) and underlies the southern third of Erie County.

Significant amounts of groundwater occur only in the overburden and in the lower bedrock units. The Camillus Shale contains numerous cavities formed by the dissolution of gypsum and is thus a very productive aquifer. The Onondaga, Akron, and Bertie dolomites and limestones contain water in bedding joints widened by dissolution. Vertical fractures in the limestone provide hydraulic connections among the many bedding planes.

Very little groundwater is found in the formations above the limestone unit. These formations, principally shale, are impermeable. Some water transmission occurs in small fractures in the bedrock, but no wells of significant yield are found in these units. Groundwater in these regions is obtained mainly from glacial overburden deposits (LaSala 1968).

4.3 SITE GEOGRAPHY

The Hartwell Landfill site is a triangular piece of property adjoining the northern boundary of the original 13-acre Atlas Steel Castings Corporation property. The site's southern and eastern borders roughly form a 90-degree angle, and the third side is delineated by an abandoned raised railroad right-of-way running southwest to northeast.

Though owned by the former Atlas Steel since 1952, the landfill site remains separated from the larger parcel of land by a metal fence running east-west along their common border. Hartwell Street, a dead-end residential street, ends at the eastern border of the landfill, which is barricaded by a guardrail. Likewise, an unpaved portion of Comet Avenue runs up to the landfill area along this same border, just north of Hartwell Street. An automotive shop, which rebuilds alternators and other automobile parts, lies at this end of Comet Avenue, with an attendant vehicle storage yard directly abutting the landfill site. Other small commercial operations similarly line this end of Comet Avenue.

Along the landfill site's third boundary, opposite the abandoned railroad right-of-way, are a group of office/commercial buildings belonging to a local broadcasting corporation. Several satellite dishes are concentrated at the rear of one of these buildings with vehicle storage lots also on the property. The lot where the satellite dishes are located was previously owned by the Crucible Steel Company of America. However, it appears that the building that formerly occupied this site was demolished and replaced to complement the property's present use. Immediately to the south of this group of buildings is a small filling station with automotive repair and painting service. Junked vehicles apparently associated with this enterprise sit alongside and on top of the abandoned right-of-way. This section of the right-of-way also forms the north-northwest boundary of the larger portion of the former Atlas Steel Property.

The larger (approximately 13 acres) portion of the former Atlas Steel property is bordered to the east and south by land either owned or utilized by a lumber company, which has been in existence at least since 1940. It appears that actual production activities at this company, such as milling, painting, varnishing, and other wood preservation processes, have occurred principally (though not necessarily exclusively) on the land bordering to the south. A metal fence runs along this southern boundary line, stopping at the southeast corner of the Atlas Steel property. An abandoned grade-level railroad right-of-way delineates the eastern boundary of the property, and runs in a north-south direction. There is no physical barrier along this eastern boundary, which is used as a lumber storage yard along the entire length up to the residential properties on the south side of Hartwell Street. Farther to the east, this extensive lumber storage yard is adjoined by several small commercial structures and fenced lots along either side of Botsford Place. These enterprises are mainly transportation-related businesses with large areas used for bus and tractor-trailer storage.

Elmwood Avenue forms the western border, with a chain-link fence running alongside it and ending at the raised right-of-way at the northwest corner of the property. On the opposite side of Elmwood Avenue is a cluster of several small manufacturing facilities, some of which have been in operation for several decades. Just to the north of these facilities lies a new retail/entertainment center (Elmwood Center) consisting of several storefronts and a theatre complex. The previous use of this property is unknown.

4.3.1 Topography

The Hartwell Street Landfill site is located within the Erie-Ontario lowland topographic province in the City of Buffalo, Erie County, New York. The lowlands are characterized by a low, flat-lying topography resulting from pre-glacial erosion of the bedrock and subsequent modification by glaciation. Consequently, the topography exhibits glacial depositional features.

The natural ground surface over the site is generally flat, showing no appreciable relief. Landfilling, waste pile deposition, and excavation have altered the natural relief at the site.

4.3.2 Soils

The U.S. Department of Agriculture (USDA) identifies the soil type within the vicinity of the Hartwell Street Landfill as urban soils. Urban soils represent areas of disturbed or removed material occurring in areas of residential or commercial development. The urban soils generally overlie undisturbed, moderately well drained, gravel-free clay and silt.

4.4 SITE HYDROGEOLOGY

Groundwater monitoring wells are not installed at the site. The information used to develop the discussion in the groundwater subsection includes United States Geological Survey (USGS) topographic maps, geological survey maps, and regional groundwater reports.

The geophysical survey results are presented in Appendix B, and the subsurface boring logs are included in Appendix C.

4.4.1 Geology

The Hartwell Street Landfill site is underlain by the Camillus Shale, which is a Late Silurian unit approximately 400 feet thick. According to Buehler and Tesmer (1963), the Camillus Shale is gray to grayish-brown in color, varies from a thin-bedded shale to a massive mudstone, and contains large mineable quantities of gypsum. It is also reported to contain a considerable amount of limestone and dolomite interbedded with the shale (LaSala 1968).

Natural subsurface material at the site consists of tight inorganic clay with plasticity increasing from low to high with depth. The rate of water movement (permeability) through this clay is assumed to be very slow. The approximate range of hydraulic conductivity of clays is approximately 10^{-10} - 10^{-7} cm/sec (Freeze and Cherry 1979). The composition of the fill recovered in split-spoon samples collected at the site included foundry sand, slag, and fragments of brick and glass. Geotechnical analysis of split-spoon samples confirmed the field classification of overburden material as dominantly clays with sand and other fill material at the surface and at shallow depths (see Appendix E).

4.4.2 Hydrology

No groundwater monitoring wells were installed at this site. Saturated overburden soil was not encountered during split-spoon sampling of subsurface boreholes. The clays observed beneath the fill material at the site typically exhibit low permeability. It was expected that the first permanently saturated zone would be encountered in the bedrock. The Camillus Shale is by far the most productive bedrock aquifer in the area due mainly to solution cavities formed by the action of groundwater on gypsum deposits. Groundwater also occurs in fractures in the bedrock. A zone of fracturing and solution extending several feet below the bedrock surface produces small but sufficient yields for domestic use. Wells that tap solution openings have yields ranging from 300 to 1,200 gallons per minute (LaSala 1968).

Surface Water

No surface water bodies were observed at the Hartwell Street Landfill site during the course of the Phase II investigation. Surface runoff from the site eventually enters the City of Buffalo storm sewer system.

Surface water bodies located in the site vicinity include Lake Erie and the Niagara River, located 3.5 miles southwest and 1.7 miles west, respectively. Scajaquada Creek is located 1.1 miles south of the site. Lake Erie and the Niagara River are used as sources of municipal drinking water supplies and public recreation. Scajaquada Creek is classified as suitable for primary contact recreation. There are no protected wetlands within 1 mile of the site.

4.5 SITE CONTAMINATION ASSESSMENT

Analytical data for the contamination assessment are presented in Appendix D. Data summary sheets are presented for TCL organic and inorganic analyses.

All CLP data packages were reviewed to determine whether qualified data were acceptable for the intended use.

4.5.1 Surface Soil/Waste

Seven surface soil samples were collected for TCL organic, inorganic, and cyanide analyses as part of the Phase II study.

No volatile organics, pesticides or PCBs were detected in surface soil samples. Semivolatile organic compounds known as PAHs were detected in all of the surface soil samples (see Table 4-1). PAHs are a group of semivolatile compounds composed of hydrogen and carbon arranged in the form of two or more fused benzene rings in linear, angular, or cluster arrangements (Eisler 1987). Total PAH concentrations in surface soil ranged from 4,200 µg/kg in S-9 to 330,000 µg/kg in S-6. PAHs were detected in S-1 and S-7 (the background sample) below quantitation limits. The concentrations of organic compounds found in surface soil samples are presented in Table 4-1.

Twenty-one inorganic analytes were detected in site surface soil samples (see Table 4-2). Nine of these analytes were found above their standard ranges (Schacklette and Boerngen 1984) in one or more of the samples. These include antimony, arsenic, cadmium, chromium, iron, lead, manganese, silver, and zinc. Antimony was found above its standard range in sample S-5 only. Arsenic was found above its standard range in sample S-8 at 75.2 mg/kg. Cadmium was found above its standard range in all samples including the background sample (Lindsay 1979). The only sample containing cadmium at a level significantly (greater than 3 times) above the background level of 4.4 mg/kg was sample S-4 at 54.5 mg/kg. Chromium, manganese, silver, and zinc were found above their standard ranges in S-4 only at concentrations of 1,740 mg/kg, 12,900 mg/kg, 6.7 mg/kg, and 5,720 mg/kg, respectively. Samples S-4 and S-6 contained iron above its standard range at 260,000 mg/kg and 110,000 mg/kg, respectively. Samples S-4 and S-8 contained lead above its standard range at 3,070 mg/kg and 525 mg/kg, respectively.

Concentrations of arsenic, chromium, iron, lead, manganese, and zinc are significantly above the concentration in S-7, the background sample. Antimony was detected in S-5 only; silver was detected in S-4 and S-6 only.

Sample S-4 exhibits the highest concentrations and the greatest number of inorganic analytes of the surface soil and waste samples collected. This sample was collected from a depression near a waste pile that may have received runoff from the pile and/or contained waste itself.

Three waste samples, W-1, W-2 and W-3, were collected for full TCL analysis, and one waste sample, FS-1, was collected for EP toxicity metals analysis only. EP toxicity data indicate that the leaching potential of toxic metals from the foundry sand on site is below detection limits.

No volatile organic compounds, pesticides, or PCBs were detected in the waste samples subjected to full TCL analysis. The only organic compounds found above quantitation limits in waste samples were PAHs (see Table 4-3). Total PAHs above quantitation limits were found at concentrations of 6,200 µg/kg in W-1, 3,900 µg/kg in W-2, and 32,000 µg/kg in W-3.

Seventeen inorganic analytes were detected in waste samples at the site. Cadmium and iron were found above their standard ranges in waste samples (see Table 4-4). Cadmium was detected above its standard range at 12.5 mg/kg in W-1, 9.1 mg/kg in W-2, and 1.7 mg/kg in W-3. Iron was detected above its standard range in W-1 at a concentration of 147,000 mg/kg.

4.5.2 Subsurface Soil

Seventeen subsurface soils samples were collected from eight test borings at the site. Sample depths and analyses performed are summarized in Table 3-2. Analytical results are presented in Tables 4-5 and 4-6.

Volatile organics detected in subsurface soil include chloroform at 7 μg/kg in GW-7 (0 to 20 feet) and GW-8 (4 to 26 feet). Bromodichloromethane was detected below quantitation limits in GW-7 (0 to 20 feet) and GW-8 (4 to 26 feet). Low levels of chloroform and bromodichloromethane are characteristic of potable water supplies. The presence of these compounds in subsurface soil samples may be due to the steam cleaning of drilling and sampling equipment with potable water or from an independent subsurface source of potable water such as a leaking water pipe. Semivolatile organic compounds detected in samples GW-2 (0 to 4 feet), GW-5 (0 to 4 feet), and GW-8 (0 to 4 feet) consisted of various PAHs. Total PAHs above quantitation limits were found at concentrations of 6,100 μg/kg in GW-2 (0 to 4 feet), 68,000 μg/kg in GW-5 (0 to 4 feet), and 89,000 μg/kg in GW-8 (0 to 4 feet). PAHs were detected below quantitation limits in samples GW-3 (0 to 20 feet), GW-4 (0 to 20 feet), GW-6 (0 to 4 feet), and GW-7 (0 to 20 feet). No PAHs were found in GW-1 samples.

No pesticides or PCBs were detected in subsurface soil samples.

Nineteen inorganic analytes were detected in subsurface soil samples at the site. Cadmium was detected above its standard range in all samples collected (see Table 4-6). None of the concentrations of cadmium in subsurface soil samples was significantly above background levels.

Three subsurface soil samples that included foundry sands or other wastes were chosen for EP toxicity metals analysis. These included GW-3 (2 to 4 feet), GW-5 (0 to 4 feet), and GW-7 (0 to 20 feet). The three subsurface soil samples selected for leachability testing exhibited total concentrations of arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver below detection limits.

Cadmium concentrations in waste samples were not significantly above levels in the background sample. The concentration of iron in W-1 is significantly above background levels.

4.5.3 Surface Water/Sediment

Two sediment samples were collected for full TCL analysis from a drainage ditch on the northern perimeter of the site (see Figure 3-1). Analytical results are summarized in Tables 4-7 and 4-8.

No volatile organic compounds, pesticides, or PCBs were detected in sediment samples. Semivolatile organic compounds detected consisted of various PAHs in both sediment samples (see Table 4-7). Total PAHs above quantitation limits were found in sample SED-3 at 13,000 mg/kg and in sample SED-4 at 230,000 µg/kg.

Twenty inorganic analytes were detected in sediment samples from the site (see Table 4-8). Cadmium concentrations exceeded the standard range in SED-3 at 7.7 mg/kg and SED-4 at 4.6 mg/kg. The lead and antimony concentrations in SED-4, 979 mg/kg, and 19.4 mg/kg, respectively, exceeded the standard ranges of these analytes in eastern United States soils and surficial materials.

Cadmium concentrations in sediment samples were not significantly above concentrations in the background sample. The lead concentration in SED-4 is significantly above background levels. Antimony was not detected in the background sample.

4.5.4 Contamination Assessment Summary

The principal immediate threat to public health and the environment posed by the Hartwell Street Landfill site is potential direct contact with surface soil contaminated with heavy metals and semivolatile organic compounds on the site.

The major organic compounds of concern at the site are PAHs. These compounds are widely occurring at the site, being detected in soil, waste, and sediment samples. PAHs were found above quantitation limits in five of the seven surface soil samples at concentrations ranging from

4,200 µg/kg (ppb) to 340,000 µg/kg. The remaining two surface soil samples, including the background sample, contained PAHs below quantitation limits. All of the three waste samples collected contained PAHs ranging from 3,900 µg/kg to 32,000 µg/kg. PAHs were found above quantitation limits in three of the eight shallow samples from soil borings. Concentrations in these samples, all from the 0- to 4-foot interval, ranged from 6,100 µg/kg to 89,000 µg/kg. PAHs were also found below quantitation limits in shallow soil boring samples from four of the remaining five borings. These shallow samples include these 0- to 20-foot composite samples and one 0- to 4-foot composite sample. Reported PAH concentrations in 0- to 20-foot samples may be lower than the actual values in the top few feet of soil due to the effects of compositing a larger volume of soil.

PAHs were detected in both sediment samples collected at the soil at concentrations of 13,000 µg/kg in sample SED-3 and 230,000 µg/kg in SED-4.

According to Edwards (1983), typical concentrations of PAHs in soil range from 0.4 µg/kg in protected remote areas to 650,000 µg/kg in industrial areas. PAHs may be formed by natural processes such as microbial synthesis, forest fires, and volcanic activity. Anthropogenic sources of PAHs include iron and steel manufacturing, asphalt, heating and power generation, refuse incineration, open burning, and engine combustion emissions. Sources of PAHs at the Hartwell Street Landfill site include former steel-making activities, intentional burning and accidental fires, fallout from automobile emissions, and asphalt and roofing tar from a burned building. The concentrations of PAHs detected at the site are indicative of an urban industrial site.

Metals found above their standard ranges at the site include cadmium in all surface and subsurface soil, waste, and sediment samples; arsenic in surface soil and sediment samples; iron in surface soil and waste samples; lead and antimony in surface soil and sediment samples; and chromium, manganese, silver, and zinc in surface soil samples only. Cadmium, chromium, lead, and arsenic are the most toxic of the metals exceeding standard ranges, and of these, cadmium and lead are the most widely occurring at the site. The cadmium concentrations, which exceeded the standard range in all samples collected, may be related to a natural soil condition at the site. This conclusion is based on the fact that values above the standard range were found in the background sample and in deep samples (4 to 26 or 20 to 40 feet) from borings. These soils are not likely to be contaminated by waste disposal at the site. Cadmium levels in these samples may be attributed to natural or non-site-specific conditions. The only cadmium concentration significantly above background levels was 54.5 mg/kg in surface soil sample S-4. The standard range of chromium was exceeded in sample S-4 with a concentration of 1,740 mg/kg. The standard range of lead was exceeded in samples S-4 at 3,070 mg/kg, S-8 at 525 mg/kg and SED-4 at 979 mg/kg. The standard range of arsenic was exceeded in sample S-8 at 75.2 mg/kg.

Cadmium is a naturally occurring element found in soil, air, water, and food. Anthropogenic sources that increase natural concentrations include municipal incinerators, iron and steel making, fossil fuel combustion, and metal melting. Background soil levels in rural areas are normally around 0.1 ppm, while soils in urban areas have considerably higher concentrations of 6 ppm or more. Also, highly industrialized areas have higher soil concentrations than areas of less industrial activity. Possible sources of cadmium at the site include the former steel-making activities, fossil fuel combustion due to power generation at the plant and other nearby industries, and automobile emissions on area roads. As stated earlier, elevated levels of cadmium in the background and deep soil boring samples suggest a potential natural or non-site-specific source for cadmium at the site.

Chromium is a naturally occurring element found in crystal material, and volcanic dust and gases. Human activities such as chemical manufacturing, steel production, and combustion of fossil fuels release additional chromium to the environment (Life Systems, Inc. 1989). Potential sources of chromium at the site include former steel-manufacturing activities and fallout from combustion emissions from fossil fuel consumption at the plant, nearby industries, and automobile traffic.

Lead is a naturally occurring metal found in small quantities in all parts of the environment. Anthropogenic sources of lead include leaded gasoline combustion, emissions from iron and steel production, metal smelting operations, lead-acid battery manufacturing, and weathering of lead-based paints. Potential sources of lead at the site include automobile engine fallout, steel production emissions, and lead-based paints possibly on or inside site buildings. Deposition of lead from atmospheric sources can greatly increase lead levels in soils. It has been estimated that soils adjacent to roadways have been enriched in lead by as much as 10,000 micrograms per gram of soil (ppm) since 1930. Furthermore, soils in urban areas and in sites adjacent to smelters may have as much as 130,000 micrograms of lead per gram of soil. Soils adjacent to buildings with exterior lead-based paint may have concentrations of greater than 10,000 ppm lead (ATSDR 1988).

Arsenic is an inorganic element found naturally in volcanic gases, most fossil fuels, and minerals and ores. Releases of arsenic into the environment as a result of human activities include fossil fuel consumption, pesticide use, use of wood preservatives, and manufacturing (smelting) of copper and other metals. Possible sources of arsenic at the site include former steel-making activities, fossil fuel combustion, and any wood-preserving activities that may occur at an adjacent lumber yard.

Potential exposure routes for PAHs are inhalation, ingestion, and dermal contact. PAHs enter the body rapidly and are metabolized through the action of enzymes to produce chemically reactive compounds potentially capable of inducing cancer. Although it has not been proven that PAHs are human carcinogens, several of these compounds are among the most potent animal carcinogens known to exist (Santodonato et al. 1979).

Ingestion and inhalation of cadmium are the major routes of exposure. Once in the body, cadmium has a somewhat long half-life that causes the accumulation of this metal over the lifetime of an organism. This accumulation occurs chiefly in soft tissue such as the kidneys and lungs. Renal dysfunction is the major adverse health effect from chronic exposure to cadmium. Chronic exposure via inhalation causes emphysema and bronchitis (Grant et al. 1981, Sittig 1985).

Chromium may enter the body through inhalation, ingestion, and eye and skin contact. Chromium and chromium compounds may induce irritant effects on skin and respiratory passages, leading to ulcerations. Oral ingestion may lead to severe irritation of the gastrointestinal tract, circulatory shock, and renal damage. Numerous chromium compounds are known or suspected animal carcinogens. An increased incidence of lung cancer has been noted among workers in some chromium-related industries. Toxic effects vary greatly with the valence state of chromium and the ionic elements or compounds forming chromium compounds (Sittig 1985).

Lead adversely affects survival, growth, reproduction, development, and metabolism of most species under controlled conditions, but its effects are substantially modified by numerous physical, chemical, and biological variables. Biomagnification of lead is negligible, and younger, immature organisms are most susceptible. Uptake of lead by terrestrial plants is limited by the low bioavailability of lead from soils, and adverse effects to plants occur at total lead concentrations of several hundred mg/kg in soils.

Human health may be jeopardized by excessive exposure to lead. Persons with hepatitis, anemia, and nervous disorders are particularly susceptible to lead poisoning. Lead is not considered carcinogenic to humans; however, reports of chromosomal abnormalities in human blood suggest that lead is a probable mutagen (Eisler 1988). Concentrations of lead in soil or dust greater than 500 to 1,000 ppm could lead to elevated blood lead levels in children inhaling and/or swallowing the soil (ATSDR 1988).

The U.S. Department of the Interior (1988) reports that arsenic metabolism and toxicity vary greatly among species, and that effects are significantly altered by numerous physical, chemical, and biological modifiers. Adverse health effects, for example, may involve respiratory, gastrointestinal, cardiovascular, and hematopoietic systems, and may range from reversible effects to cancer and death, depending partly on the physical and chemical forms of arsenic, the route of exposure, and dose.

4.6 CONCLUSIONS AND RECOMMENDATIONS

Minimal possible threats to human health and the environment posed by the Hartwell Street Landfill site include direct dermal contact and indirect ingestion of contaminated shallow soil at the site. Contaminants detected (i.e., PAHs, heavy metals, etc.) are consistent with those expected based on the site's former heavy industrial use.

Considering these facts and in the absence of documented hazardous waste disposal at this site, it is recommended that the Hartwell Street site be referred to the NYSDEC's Division of Solid Waste for appropriate action. The following paragraphs recommend measures for consideration to mitigate the risk associated with the site.

Some portions of the site are fenced while others are open. Local residents have been observed using this area as a shortcut and as a playground. The installation of a fence around the site would prevent unauthorized access.

Any future action at the site should include consideration of the proposed future land use. Commercial and residential uses have been mentioned for the site. Evaluation of site contamination and exposure potential should take into consideration future land use.

In summary, proper closure under 6 NY Part 360 including an upgrading of the site's cover material is recommended. Proper closure would alleviate contaminant migration and further reduce or eliminate any threats caused by the site. To this end, NYSDEC should work toward delisting this site from the Registry of Inactive Hazardous Waste Disposal Sites in New York State.

Table 4-1

SURFACE SOIL ORGANIC ANALYSIS*

Compound	Sample	Concentration (µg/kg)
Naphthalene	S-6	10,000
2-Methylnaphthalene	S-6	3,600
Acenaphthene	S-6	7,400
Dibenzofuran	S-6	5,700
Fluorene	S-6	7,500
Phenanthrene	S-1	2,200
	S-5	960
	S-6	47,000
	S-8	13,000
	S-9	680**
Anthracene	S-6	9,800
	S-8	4,000
Fluoranthene	S-1	3,100
	S-5	1,500
	S-6	49,000
	S-8	16,000
	S-9	410**
Pyrene	S-1	4,500
	S-5	1,800
	S-6	42,000
	S-8	16,000
	S-9	1,300**
Benzo(a)anthracene	S-1	2,200
	S-5	1,100
	S-6	26,000
	S-8	8,600
Chrysene	S-1	2,200
	S-5	1,400
	S-6	25,000
	S-8	8,600
Benzo(b)fluoranthene	S-1	4,100
	S-5	3,400
	S-6	43,000
	S-8	15,000
	S-9	730**
Benzo(a)pyrene	S-1	2,000
	S-5	1,800
	S-6	28,000
	S-8	9,500
Indeno(1,2,3-cd)pyrene	S-1	1,800
	S-5	1,600
	S-6	12,000
	S-8	6,800
	S-9	570**

02[UZ]YP7080:D3136/6040/36

Key at end of table.

Table 4-1 (Cont.)

Compound	Sample	Concentration ($\mu g/kg$)
Dibenz(a,h)anthracene	S-5	480
	S-6	5,700
	S-8	3,000
Benzo(g,h,i)perylene	S-1	1,700
	S-5	1,400
	S-6	11,000
	S-8	5,800
	S-9	510**

02[UZ]YP7080:D3136/6040/36

*No volatile organics, pesticides, or PCBs detected in surface soil samples.

**Result considered as low estimate due to low internal standard areas.

Table 4-2

SURFACE SOIL INORGANIC ANALYSIS

		Guidelines for Soils/ Surface Materials of Eastern United States*		Samples Exceeding Range	
Analyte	Range (mg/kg)	Range (mg/kg)	Estimated Mean (mg/kg)	Location	Concentration (mg/kg)
Aluminum	2,080 - 18,400	7,000 - >100,000	57,000		
Antimony+	ND - 15.3	<1 - 8.8	NA	S-5	15.3
Arsenic+	4.7 - 75.2	<1.1 - 73	7.4	S-8	75.2
Barium	33.5 - 171	10 - 1,500	420		
Beryllium	ND - 0.99	<1 - 7	0.85		
Cadmium**+	2.0 - 54.5	0.01 - 0.70	NA	S-1 S-4 S-5 S-6 S-7 S-8 S-9	5.0 54.5 2.0 9.0 4.4 5.5 7.7
Calcium	2,110 - 152,000	10 - 280,000	630		
Chromium	14.4 - 1,740	1 - 1,000	52	S-4	1,740
Cobalt	4.2 - 15.5	<0.1 - 70	9.2		
Copper++	41.8 - 601	<1- 700	22		
Iron	17,600 - 260,000	10 - >100,000	2,500	S-4 S-6	260,000 110,000
Lead	82.4 - 3,070	<10 - 300	17	S-4 S-8	3,070 525
Magnesium	593 - 17,100	50 - 50,000	460		
Manganese	421 - 12,900	<2 - 7,000	640	S-4	12,900
Mercury	ND - 0.66	0.01 - 3.4	.12		
Nickel+	22.2 - 450	<5 - 700	18		
Potassium	169 - 2,069	50 - 3,700	NA		
Silver**	ND - 6.7	0.01 - 5	NA	S-4	6.7

Key at end of table.

Table 4-2 (Cont.)

		Guidelines for Soils/ Surface Materials of Eastern United States*		Samples Exceeding Range	
Analyte	Range (mg/kg)	Range (mg/kg)	Estimated Mean (mg/kg)	Location	Concentration (mg/kg)
Sodium	ND - 526	<500 - 50,000	780		
Vanadium+	7.5 - 101	<7 - 300	66		
Zinc	157 - 5,720	<5 - 2,900	52	S-4	5,720

02[UZ]YP7080:D3136/6041/16

*Shacklette and Boerngen, 1984, "Element Concentrations in Soils and Other Surficial Materials of The Conterminous United States," U.S.G.S. Professional Paper 1270.
**Lindsay, 1979, Chemical Equilibria in Soils, John Wiley and Sons.

+Results and quantitation limits are considered low estimates due to low spike recoveries.
++Estimated values due to unacceptable precision. Results considered low estimates due to low spike recoveries.

Key:

ND = Not detected.

Table 4-3

WASTE SAMPLE ORGANIC ANALYSIS*

Compound	Sample Concentration (µg/kg)	
Naphthalene	W-3	830
Acenaphthene	W-3	850
Dibenzofuran	W-3	580
Fluorene	W-3	810
Phenanthrene	W-1	550
	W-2	640
	W-3	4,300
Anthracene	W-3	1,300
Fluoranthene	W-1	860
	W-2	730
	W-3	3,700
Pyrene	W-1	1,000
	W-2	830
	W-3	5,100
Benzo(a)anthracene	W-1	510
	W-3	2,300
Chrysene	W-1	570
	W-2	420
	W-3	2,200
Benzo(b)fluoranthene	W-1	1,200
	W-2	810
	W-3	3,700
Benzo(a)pyrene	W-1	660
	W-2	460
	W-3	2,500
Indeno(1,2,3-cd)pyrene	W-1	440
	W-3	1,700
Dibenz(a,h)anthracene	W-3	550
Benzo(g,h,i)perylene	W-1	440
	W-3	1,400

02[UZ]YP7080:D3136/6042/36

*No volatile organics, pesticides, or PCBs detected in waste samples.

Table 4-4

WASTE SAMPLE INORGANIC ANALYSIS

		Guidelines for Soils/ Surface Materials of Eastern United States*		Samples Exceeding Range	
Analyte	Range (mg/kg)	Range (mg/kg)	Estimated Mean (mg/kg)	Location	Concentration (mg/kg)
Aluminum	801 - 2,230	7,000 - >100,000	57,000		
Arsenic+	3.6 - 18.9	<1.1 - 75	7.4		
Barium	10.2 - 19.6	10 - 1,500	420		
Cadmium**+	1.7 - 12.5	0.01 - 0.70	NA	W-1	12.5
				W-2	9.1
				W-3	1.7
Calcium	1,300 - 5,030	10 - 280,000	630		
Chromium	26.1 - 253	1 - 1,000	52		
Cobalt	ND - 13.2	<0.1 - 70	9.2		
Copper++	30.8 - 295	<1- 700	22		
Iron	16,500 - 147,000	10 - >100,000	2,500	W-1	147,000
Lead	30.4 - 147	<10 - 300	17		
Magnesium	488 - 1,640	50 - 50,000	460		
Manganese	357 - 1,900	<2 - 7,000	640		
Nickel+	18.3 - 145	<5 - 700	18		
Potassium	ND - 294	50 - 3,700	NA		
Sodium	ND - 132	<500 - 50,000	780		
Vanadium+	ND - 46.3	<7 - 300	66		
Zinc	39.1 - 198	<5 - 2,900	52		

02[UZ]YP7080:3136/6043/19

*Shacklette and Boerngen, 1984, "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States," U.S.G.S. Professional Paper 1270.

**Lindsay, 1979, Chemical Equilibria in Soils, John Wiley and Sons.

+Results and quantitation limits are considered low estimates due to low spike recoveries.

++Estimated values due to unacceptable precision. Results considered low estimates due to low spike recoveries.

Key:

ND = Not detected.

Table 4-5

SUBSURFACE SOIL ORGANIC ANALYSIS*

Compound	Range (µg/kg)	Sample Concentration (µg/kg)	
Volatile Organics			
Chloroform	ND - 8	GW-7 (0-20)	7
		GW-8 (4-26)	8
Semivolatile Organics			
Acenaphthene	ND - 1,300	GW-5 (0-4)	1,300
Fluorene	ND - 1,300	GW-5 (0-4)	1,300
Phenanthrene	ND - 14,000	GW-2 (0-4)	1,400
		GW-5 (0-4)	9,000
		GW-8 (0-4)	14,000
Anthracene	ND - 3,000	GW-2 (0-4)	420
		GW-5 (0-4)	3,000
Fluoranthene	ND - 15,000	GW-2 (0-4)	1,100
		GW-5 (0-4)	12,000
		GW-8 (0-4)	15,000
Pyrene	ND - 11,000	GW-2 (0-4)	920
		GW-5 (0-4)	10,000
		GW-8 (0-4)	11,000
Benzo(a)anthracene	ND - 7,100	GW-2 (0-4)	580
		GW-5 (0-4)	6,200
		GW-8 (0-4)	7,100
Chrysene	ND - 7,000	GW-2 (0-4)	540
		GW-5 (0-4)	5,200
		GW-8 (0-4)	7,000
Benzo(b)fluoranthene	ND - 12,000	GW-2 (0-4)	670
		GW-5 (0-4)	7,700
		GW-8 (0-4)	12,000
Benzo(k)fluoranthene	ND - 4,100	GW-8 (0-4)	4,100
Benzo(a)pyrene	ND - 6,300	GW-2 (0-4)	480
		GW-5 (0-4)	4,900
		GW-8 (0-4)	6,300
Indeno(1,2,3-cd)pyrene	ND - 2,400	GW-5 (0-4)	3,000
		GW-8 (0-4)	5,900
Dibenz(a,h)anthracene	ND - 2,400	GW-5 (0-4)	750
		GW-8 (0-4)	2,400
Benzo(g,h,i)perylene	ND - 4,100	GW-5 (0-4)	2,800
		GW-8 (0-4)	4,100

02[UZ]YP7080:D3136/6044/27

*No pesticides or PCBs were detected in subsurface soil samples.

Key:

ND = Not detected.

Table 4-6

SUBSURFACE SOIL INORGANIC ANALYSIS

		Guidelines for Soils/ Surface Materials of Eastern United States*		Samples Exceeding Range	
Analyte	Range (mg/kg)	Range (mg/kg)	Estimated Mean (mg/kg)	Location	Concentration (mg/kg)
Aluminum	6,230 - 14,000	7,000 - >100,000	57,000		
Arsenic+	0.98 - 18.7	<1.1 - 73	7.4		
Barium	41.1 - 160	10 - 1,500	420		
Beryllium	ND - 1.3	<1 - 7	0.85		
Cadmium**++	1.4 - 5.9	0.01 - 0.70	NA	GW-1 (0-20)	1.8
				GW-1 (20-40)	1.7
				GW-2 (0-4)	2.3
				GW-2 (4-20)	1.9
				GW-3	3.0
				GW-3	1.6
				GW-4	1.8
				GW-4	2.0
				GW-5 (0-4)	3.7
				GW-6 (0-4)	2.5
				GW-6 (4-26)	1.7
				GW-7 (0-20)	1.9
				GW-7 (20-40)	1.4
				GW-8 (0-4)	5.8
				GW-8 (9-26)	2.3
Calcium	5,510 - 66,900	10 - 280,000	630		
Chromium	11.8 - 40.5	1 - 1,000	52		
Cobalt	6.2 - 17.7	<0.1 - 70	9.2		
Copper+++	14.3 - 122	<1 - 700	22		
Iron	16,600 - 68,800	10 - >100,000	2,500		
Lead	8.6 - 175	<10 - 300	17		
Magnesium	1,100 - 22,700	50 - 50,000	460		
Manganese+	395 - 2,790	<2 - 7,000	640		
Mercury	ND - 0.22	0.01 - 3.4	.12		
Nickel	15.9 - 112	<5 - 700	18		
Potassium	578 - 2,190	50 - 3,700	NA		
Sodium	ND - 564	<500 - 50,000	7,800		

Key at end of table.

Table 4-6 (Cont.)

		Guidelines for Soils/ Surface Materials of Eastern United States*		Samples Exceeding Range	
Analyte	Range (mg/kg)	Range (mg/kg)	Estimated Mean (mg/kg)	Location	Concentration (mg/kg)
Vanadium++	16.7 - 28.1	<7 - 300	66		
Zinc	58.0 - 159	<5 - 2,900	52		

[UZ]YP7080:D3136/6045/16

*Shacklette and Boerngen 1984, "Element Concentrations in Soils and Other Surficial Materials in the Conterminous United States," U.S.G.S. Professional Paper 1270.

**Lindsay 1979, Chemical Equilibria in Soils, John Wiley and Sons.

+Results are considered as low estimates due to low spike recoveries.

++Results for GW-2 and GW-5 samples are considered low estimates due to low spike recoveries.

+++GW-2 and GW-5 values are estimates due to unacceptable precision. Results for GW-2 and GW-5 are considered low estimates due to low spike recoveries.

Key:

ND = Not detected

Table 4-7

SEDIMENT SAMPLE ORGANIC ANALYSIS*

Compound	Sample Number	Sample Concentration (μg/kg)
Semivolatile Organics		
Acenaphthene	SED-4	2,000
Dibenzofuran	SED-4	1,300
Fluorene	SED-4	1,800
Phenanthrene	SED-3	1,600
	SED-4	12,000
Anthracene	SED-4	4,200
Fluoranthene	SED-3	1,900
	SED-4	33,000
Pyrene	SED-3	2,300
	SED-4	35,000
Benzo(a)anthracene	SED-3	1,100
	SED-4	22,000
Chrysene	SED-3	1,300
	SED-4	22,000
Benzo(b)fluoranthene	SED-3	1,900
	SED-4	42,000
Benzo(a)pyrene	SED-3	1,300
	SED-4	25,000
Indeno(1,2,3-cd)pyrene	SED-3	960
	SED-4	14,000
Dibenz(a,h)anthracene	SED-4	1,300
Benzo(g,h,i)perylene	SED-3	870
	SED-4	12,000

02[UZ]YP7080:D3136/6046/29

*No volatile organics, pesticides, or PCBs detected in sediment samples.

Table 4-8

SEDIMENT SAMPLE INORGANIC ANALYSIS

			Guidelines for Soils/ Surface Materials of Eastern United States*		
Analyte	SED-3 Concentration (mg/kg)	SED-4 Concentration (mg/kg)	Range (mg/kg)	Estimated Mean (mg/kg)	Samples Exceeding Range
Aluminum	5,250	13,100	7,000 - 100,000	57,000	
Antimony+	ND	19.4	<1 - 8.8	0.76	SED-4
Arsenic+	14.0	109	<1.1 - 73	7.4	SED-4
Barium	103	167	10 - 1,500	420	
Cadmium+	7.7	4.6	0.01 - 0.70**	NA	SED-3 SED-4
Calcium	6,270	39,200	10 - 280,000	630	
Chromium	22.1	35.9	1 - 1,000	52	
Cobalt	4.5	12.7	<0.1 - 70	9.2	
Copper++	245+	113	<1 - 700	22	
Iron	57,200	44,000	10 - >100,000	2,500	
Lead	222	979	<10 - 300	17	SED-4
Magnesium	1,190	11,700	50 - 50,000	460	
Manganese	151	1,000	<2 - 7,000	640	
Mercury	0.26	0.23	0.01 - 3.4	0.12	

Table 4-8 (Cont.)

			Guidelines for Soils/ Surface Materials of Eastern United States*		
Analyte	SED-3 Concentration (mg/kg)	SED-4 Concentration (mg/kg)	Range (mg/kg)	Estimated Mean (mg/kg)	Samples Exceeding Range
Nickel+	35.5	42.4	<5 - 700	18	
Potassium	453	2,158	50 - 3,700	NA	
Selenium++	1.3	ND	<0.1 - 3.9	0.45	
Sodium	ND	187	<500 - 50,000	7,800	
Vanadium+	19.2	34.1	<7 - 300	66	
Zinc	560	350	<5 - 2,900	52	

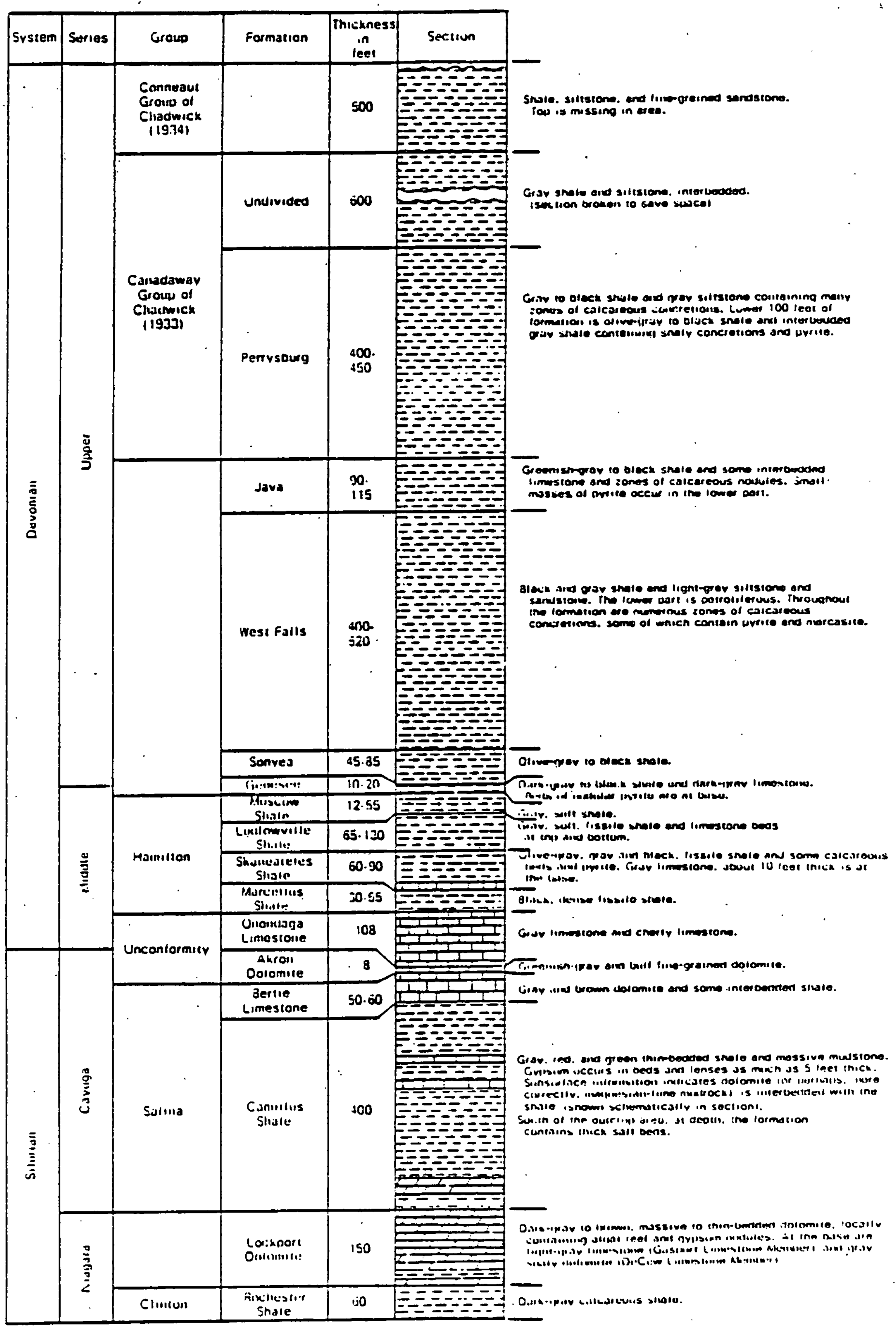
02[UZ]YP7080:3136/6047/20

*Shacklette and Boerngen, 1984, "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States," U.S.G.S. Professional Paper 1270.
**Lindsay, 1979, Chemical Equilibria in Soils, John Wiley and Sons.

+Results and quantitation limits are considered low estimates due to low spike recoveries.
++Estimated values due to unacceptable precision. Results are considered low estimates due to low spike recoveries.

Key:

ND = Not detected.



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

SOURCE: LaSala 1968

Figure 4—1
BEDROCK UNITS OF THE ERIE-NIAGARA BASIN

5

Narrative

5.1

5. FINAL APPLICATION OF HAZARDOUS RANKING SYSTEM

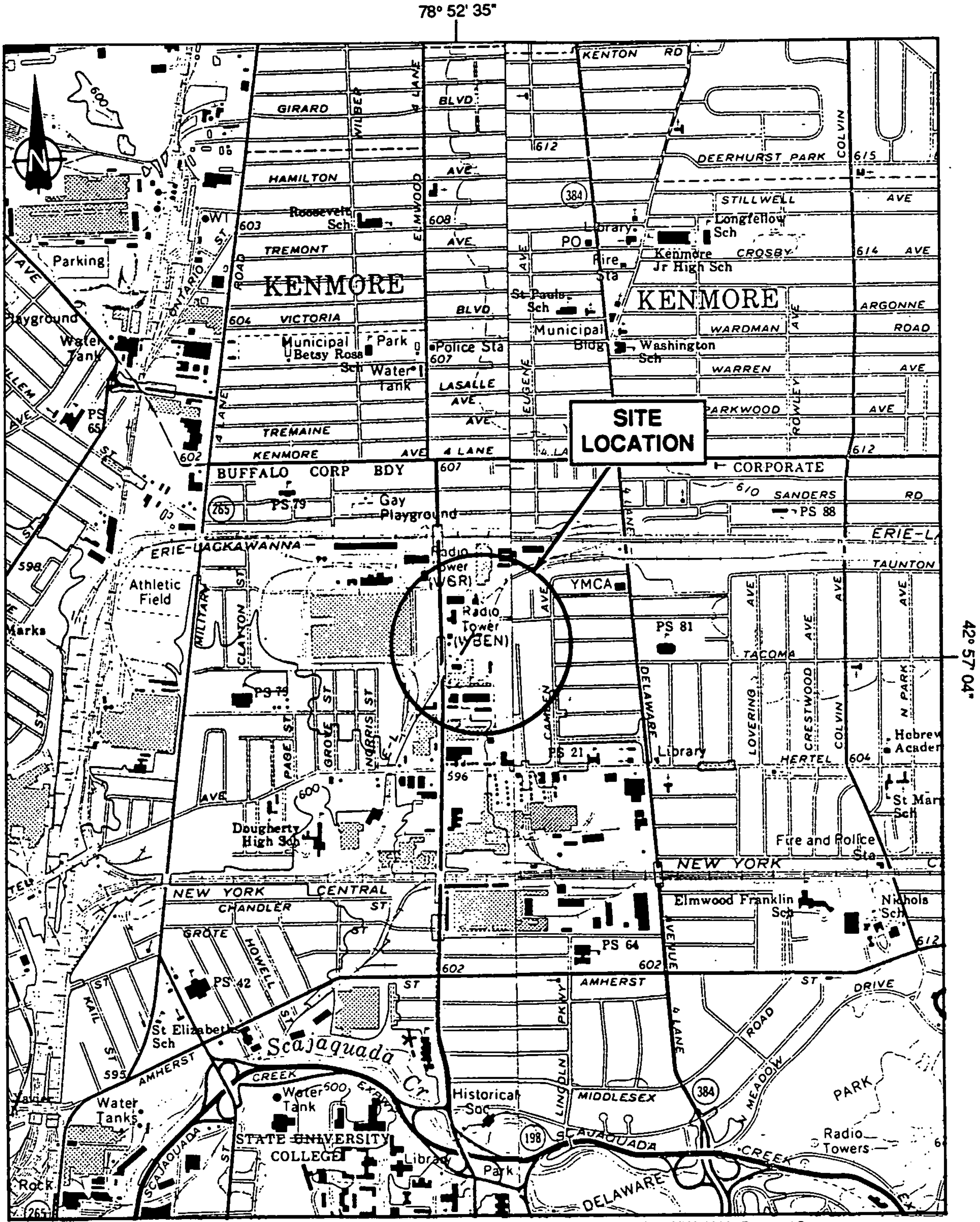
5.1 NARRATIVE SUMMARY

The 18-acre Hartwell Street Landfill site is located at 1963 Elmwood Avenue in the City of Buffalo, Erie County, New York (see Figure 5-1).

Atlas Steel Casting Company owned and operated 13 acres of the site from 1912 to 1986. Atlas Steel purchased an additional 5-acre parcel to the north of the facility in 1952. By 1986, Atlas Steel had filed for bankruptcy and by 1988, the site was allowed to revert to the City of Buffalo. In 1989, the site was purchased for back taxes by Roger Pasquarella and Daniel Mele.

The Hartwell Street site was used for storage of several hundred drums and disposal of construction debris and foundry sand. The dates of disposal and total volume of waste are unknown.

The site is located 2 miles northeast of the Niagara River and 1.1 miles north of Scajaquada Creek. Within a 1-mile radius of the site, approximately 45,000 people are potentially affected by direct contact and/or indirect ingestion of surface soils.



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Buffalo NE, N.Y. 1965 and Buffalo NW, N.Y.-Ont. 1965.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 5-1
SITE LOCATION MAP
HARTWELL STREET LANDFILL

FIGURE 1

HRS COVER SHEET

Facility Name: Hartwell Street Landfill

Location: 1963 Elmwood Avenue, Buffalo, New York

EPA Region: II

Person(s) in Charge of Facility: Roger Pasquarella and Daniel Mele

Name of Reviewer: Ralinda Leichner Date: 11/90

General Description of the Facility:

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

This 5-acre landfill was part of the larger Atlas Steel Castings facility and was used for the storage of drums and disposal of debris and foundary sand. About 400 cubic yards of concrete, construction debris, earthen material, and foundry sand was reportedly landfilled in the northern portion of the site. A Phase I investigation was completed for the site in January 1986. The results of soil sample analyses indicate that direct contact with or indirect ingestion of surface soils are concerns.

Scores: $S_M = 2.08$ ($S_{gw} = 0.60$ $S_{sw} = 3.54$ $S_a = 0$)

$S_{FE} = 8.23$

$S_{DC} = 62.50$

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
$\boxed{1}$ Observed Release	[✓ 0] 45	1	0	45	3.1
If observed release is given a score of 45, proceed to line $\boxed{4}$. If observed release is given a score of 0, proceed to line $\boxed{2}$.					
$\boxed{2}$ Route Characteristics					3.2
Depth to Aquifer of Concern	0 [✓ 1] 2 3	2	2	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	1	3	
	Total Route Characteristics Score		6	15	
$\boxed{3}$ Containment	0 1 2 [✓ 3]	1	3	3	3.3
$\boxed{4}$ 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	
$\boxed{5}$ Targets					3.5
Ground Water Use	0 [✓ 1] 2 3	3	1	9	
Distance to Nearest Well/Population Served	[✓ 0] 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
	Total Targets Score		1	49	
$\boxed{6}$ If line $\boxed{1}$ is 45, multiply $\boxed{1}$ x $\boxed{4}$ x $\boxed{5}$ If line $\boxed{1}$ is 0, multiply $\boxed{2}$ x $\boxed{3}$ x $\boxed{4}$ x $\boxed{5}$			342	57,330	
$\boxed{7}$ Divide line $\boxed{6}$ by 57,330 and multiply by 100		S_{gw} =	0.60		

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
$\boxed{1}$ Observed Release	[✓ 0] 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line $\boxed{4}$. If observed release is given a value of 0, proceed to line $\boxed{2}$.					
$\boxed{2}$ Route Characteristics					4.2
Facility Slope and Intervening Terrain	[✓ 0] 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	0 1 [✓ 2] 3	1	2	3	
Distance to Nearest Surface Water	0 [✓ 1] 2 3	2	2	6	
Physical State	0 [✓ 1] 2 3	1	1	3	
	Total Route Characteristics Score		5	15	
$\boxed{3}$ Containment	0 1 2 [✓ 3]	1	3	3	4.3
$\boxed{4}$ 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	
$\boxed{5}$ Targets					4.5
Surface Water Use	0 1 [✓ 2] 3	3	6	9	
Distance to a Sensitive Environment	0 [✓ 1] 2 3	2	2	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		8	55	
$\boxed{6}$ If line $\boxed{1}$ is 45, multiply $\boxed{1}$ x $\boxed{4}$ x $\boxed{5}$ If line $\boxed{1}$ is 0, multiply $\boxed{2}$ x $\boxed{3}$ x $\boxed{4}$ x $\boxed{5}$			2,280	64,350	
$\boxed{7}$ Divide line $\boxed{6}$ by 64,350 and multiply by 100	S_{sw} = 3.54				

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	[✓ 0] 45	1	0	45	5.1
Date and Location:					
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 Quantity	0 [✓ 1] 2 3 4 5 6 7 8	1	1	8	
	Total Waste Characteristics Score		1	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	2	6	
Land Use	0 1 2 [✓ 3]	1	3	3	
	Total Targets Score		26	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		

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	0.60	0.36
Surface Water Route Score (S_{sw})	3.54	12.53
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$	▨	12.89
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$	▨	3.59
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$	▨	2.08

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
$\boxed{1}$ Containment	1 [✓ 3]	1	3	3	7.1
$\boxed{2}$ Waste Characteristics					7.2
Direct Evidence	[✓ 0] 3	1	0	3	
Ignitability	0 [✓ 1] 2 3	1	1	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	1	8	
	Total Waste Characteristics Score		2	20	
$\boxed{3}$ Targets					7.3
Distance to Nearest Population	0 1 2 3 [✓ 4] 5	1	4	5	
Distance to Nearest Building	0 1 2 [✓ 3]	1	3	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	
$\boxed{4}$ Multiply $\boxed{1}$ x $\boxed{2}$ x $\boxed{3}$			120	1,440	
$\boxed{5}$ Divide line $\boxed{4}$ by 1,440 and multiply by 100		S_{FE} =	8.33		

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
$\boxed{1}$ Observed Incident	[✓ 0] 45	1	0	45	8.1
If line $\boxed{1}$ is 45, proceed to line $\boxed{4}$ If line $\boxed{1}$ is 0, proceed to line $\boxed{2}$					
$\boxed{2}$ Accessibility	0 1 2 [✓ 3]	1	3	3	8.2
$\boxed{3}$ Containment	0 [✓ 15]	1	15	15	8.3
$\boxed{4}$ Waste Characteristics Toxicity	0 1 2 [✓ 3]	5	15	15	8.4
$\boxed{5}$ Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 [✓ 5]	4	20	20	
Distance to a Critical Habitat	[✓ 0] 1 2 3.	4	0	12	
Total Targets Score			20	32	
$\boxed{6}$ If line $\boxed{1}$ is 45, multiply $\boxed{1}$ x $\boxed{4}$ x $\boxed{5}$ If line $\boxed{1}$ is 0, multiply $\boxed{2}$ x $\boxed{3}$ x $\boxed{4}$ x $\boxed{5}$			13,500	21,600	
$\boxed{7}$ Divide line $\boxed{6}$ by 21,600 and multiply by 100		S_{DC} =	62.50		

FIGURE 12
DIRECT CONTACT WORK SHEET

HRS Documentation Records

5.4

DOCUMENTATION RECORDS

FOR

HAZARD RANKING SYSTEM

Instructions: As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,320 drums plus 80 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference. Include the location of the document.

Facility Name: Hartwell Street Landfill

Location: 1963 Elmwood Avenue, City of Buffalo, Erie County, New York

Date Scored: October 1990

Person Scoring: Judith Vangalio

Primary Source(s) of Information (e.g., EPA region, state, FIT, etc.):

Ref. 2 (Users Manual)
Ref. 3 (Dangerous Properties of Industrial Material)
Ref. 4 (Lab Data)
Ref. 6 (Phase I)

Also, NYSDEC records, Ecology and Environment, Inc. site-specific investigations, previous site studies, published reports, and regional planning offices.

Factors Not Scored Due to Insufficient Information:

None.

Comments or Qualifications:

None.

GROUNDWATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (3 maximum):

No groundwater samples collected.

Score = 0

Rationale for attributing the contaminants to the facility:

N/A

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

The aquifer of concern is Camillus Shale. It is a gray shale interbedded with gray limestone and dolomite. Gypsum comprises a significant part of the Camillus Shale. Water-bearing zones in the Camillus Shale consist of fractures and openings formed by the dissolution of gypsum.

The Camillus Shale is by far the most productive bedrock aquifer in the area. Industrial wells yield 300 to 1,200 gpm and coefficients of transmissibility in gpd/ft of 70,000 have been calculated.

Ref. 2, 3, 21

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

60 to 80 feet

Ref. 4, 5

Assigned value = 1

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

Estimated 5 feet

Ref. 4, 5

Net Precipitation

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

Mean annual precipitation is 36 inches.

Ref. 1

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

Mean annual lake evaporation is 27 inches.

Ref. 1

Net precipitation (subtract the above figures):

9 inches

Assigned value = 2

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Urban land (silt and clay)

Ref. 6, 21

Permeability associated with soil type:

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

Ref. 1
Assigned value = 1

Physical State

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

Solid consisting of foundry sand, concrete, construction debris, and pollution-control equipment dust.

Ref. 4, 5, 8, 9
Assigned value = 1

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Waste piles of foundry sand and debris. Also, drums are disposed of on site.

Ref. 5, 8, 9

Method with highest score:

Waste piles that are uncovered and unlined.

Assigned value = 3

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated: (Detected in soil samples)

Cadmium 18	Chromium 18	Lead 18	Benzo(a)pyrene 18

Ref. 10

Compound with highest score:

Heavy metals

Assigned value = 18

Hazardous Waste Quantity

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

No statistically significant/accurate way to estimate quantity. Hazardous substances found in samples but nature and quantity unknown.

Ref. 22

Basis of estimating and/or computing waste quantity:

Factor scored greater than 0 due to presence of hazardous substances in soil samples.

Ref. 22
Assigned value = 1

* * *

5. TARGETS

Groundwater Use

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

Industrial wells

Ref. 4, 5, 9
Assigned value = 1

Distance to Nearest Well

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

Dunlop Tire and Rubber and Polymer Applications, both in Tonawanda

Ref. 4, 5, 9
Assigned value = 0

Distance to above well or building:

2.4 miles northwest

Population Served by Groundwater 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:

None. All persons use municipal water supply.

Ref. 4, 5, 9

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):

N/A

Total population served by groundwater within a 3-mile radius:

N/A

SURFACE WATER ROUTE

1. OBSERVED RELEASE

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

No surface water samples collected.

Assigned value = 0

Rationale for attributing the contaminants to the facility:

N/A

* * *

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Relatively flat - 0.5%

Ref. 11, 12

Name/description of nearest downslope surface water:

Scajaquada Creek, Niagara River

Ref. 11, 12

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

0.5%

Ref. 11, 12

Assigned value = 0

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

No

Ref. 11, 12

Is the facility completely surrounded by areas of higher elevation?

No

Ref. 11, 12

1-Year 24-Hour Rainfall in Inches

2.1 inches

Ref. 1
Assigned value = 2

Distance to Nearest Downslope Surface Water

1.1 miles south to Scajaquada Creek, 2.0 miles southwest to Niagara River

Ref. 4, 5, 9
Assigned value = 1

Physical State of Waste

Solids consisting of foundry sand, concrete, construction debris, and pollution-control equipment dust.

Ref. 4, 5, 8, 9
Assigned value = 1

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Waste piles consisting of foundry sand and construction debris. Drums are disposed of on site.

Ref. 4, 5, 8, 9

Method with highest score:

Waste piles that are uncovered and unlined.

Assigned value = 3

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated: (Detected in soil samples)

Heavy metals 18	PAHs 18

Ref. 10

Compound with highest score:

Heavy metals 18

Assigned value = 18

Hazardous Waste Quantity

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

No statistically significant/accurate way to estimate quantity. Hazardous substances found in samples but nature and quantity unknown.

Basis of estimating and/or computing waste quantity:

Factor scored greater than 0 due to presence of hazardous substances in soil samples.

Assigned value = 1

* * *

5. TARGETS

Surface Water Use

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

Scajaquada Creek - none

Niagara River - recreation

Ref. 13
Assigned value = 2

Is there tidal influence?

No

Ref. 11, 12

Distance to a Sensitive Environment

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

None

Ref. 13

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

0.8 mile west of site

Ref. 13
Assigned value = 1

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

None

Ref. 14

Population Served by Surface Water

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

Intakes >3 miles from site - Emerald Channel Pumping Station at the foot of Jersey Street on the west side of Buffalo.

Ref. 11, 12, 15, 16
Assigned value = 0

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

N/A

Total population served:

N/A

Name/description of nearest of above water bodies:

N/A

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

Intakes >3 miles

Ref. 11, 12, 15, 16

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected:

No air samples collected.

Assigned value = 0

Date and location of detection of contaminants:

N/A

Methods used to detect the contaminants:

N/A

Rationale for attributing the contaminants to the site:

N/A

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

N/A. No air samples collected.

Most incompatible pair of compounds:

N/A. No air samples collected.

Toxicity

Most toxic compound:

Although heavy metals and PAHs have been detected at this site, the potential for these affecting the air pathway is insignificant.

Ref. 4, 5, 7

Hazardous Waste Quantity

Total quantity of hazardous waste:

No statistically significant/accurate way to estimate quantity. Hazardous substances found in samples but nature and quantity unknown.

Ref. 22

Basis of estimating and/or computing waste quantity:

Factor scored greater than 0 due to presence of hazardous substances in the soil.

Ref. 22
Assigned value = 1

* * *

3. TARGETS

Population Within 4-Mile Radius

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

[✓ 0 to 4 mi] 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

309,537

Ref. 5
Assigned value = 21

Distance to a Sensitive Environment

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

None

Ref. 13

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

0.8 mile west of site is a small wetlands.

Ref. 13
Assigned value = 1

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

None

Ref. 14

Land Use

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

Site is located in an industrial/commercial area.

Ref. 5
Assigned value = 3

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

None. However, Buffalo Zoo located 1.4 miles east of site.

Ref. 11, 12

Distance to residential area, if 2 miles or less:

Approximately 100 feet on Hartwell Street.

Ref. 11, 12, 14 E & E site inspection 1990 (7).

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

None within 1 mile.

Ref. 13

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

None within 1 mile.

Ref. 13

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

None

Ref. 18

FIRE AND EXPLOSION

1. CONTAINMENT

Hazardous substances present:

In 1986, NYSDEC drum sampling found material classified as hazardous waste by the ignitability characteristic.

Ref. 4, 20

Type of containment, if applicable:

N/A

Ref. 4, 18
Assigned value = 3

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

None

Assigned value = 0

Ignitability

Compound used:

Ref. 4, 20
Assigned value = 1

Reactivity

Most reactive compound:

None known

Assigned value = 0

Incompatibility

Most incompatible pair of compounds:

None known

Assigned value = 0

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

No statistically significant/accurate way to estimate quantity. Hazardous substances found in samples but nature and quantity unknown.

Ref. 22

Basis of estimating and/or computing waste quantity:

Factor scored greater than 0 due to presence of hazardous substances in soil samples.

Ref. 22
Assigned value = 1

* * *

3. **TARGETS**

Distance to Nearest Population

Approximately 100 feet on Hartwell Street.
Ref. 4, 7
Assigned value = 4

Distance to Nearest Building

Buildings on site and approximately 100 feet away.
Ref. 4, 7
Assigned value = 3

Distance to a Sensitive Environment

Distance to wetlands:

0.8 mile west of site.
Ref. 13

Distance to critical habitat:

None
Ref. 14
Assigned value = 0

Land Use

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

0.0 mile. Site is located in commercial/industrial area.
Ref. 7
Assigned value = 3

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

None. However, Buffalo Zoo located 1.4 miles east of site.
Ref. 11, 12

Distance to residential area, if 2 miles or less:

Approximately 100 feet on Hartwell Street.
Ref. 4, 7, 11, 12

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

None
Ref. 11, 12, 13

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

None.
Ref. 11, 12, 13

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

None
Ref. 18

Population Within 2-Mile Radius

91,630
Ref. 5
Assigned value = 5

Buildings Within 2-Mile Radius

>2,600
Ref. 11, 12
Assigned value = 5

DIRECT CONTACT

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No record of observed incidents of direct contact with hazardous substances at this site.

Ref. 4, 5
Assigned value = 0

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

Some parts of the site fenced while others are open. Used as a shortcut by local residents and as a playground for children.

Ref. 4, 5
Assigned value = 3

* * *

3. CONTAINMENT

Type of containment, if applicable:

No containment of waste. Foundry sand and construction debris just placed on site. These piles are uncovered.

Ref. 4, 5, 7
Assigned value = 15

* * *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Heavy metals - lead, chromium, arsenic

Ref. 10

Compound with highest score:

All scored highest.

Assigned value = 3

* * *

5. TARGETS

Population Within One-Mile Radius

22,810

Ref. 5
Assigned value = 5

Distance to Critical Habitat (of endangered species)

None

Ref. 14
Assigned value = 0

REFERENCES

If the entire reference is not available for public review in the EPA regional files on this site, indicate where the reference may be found.

Reference Number	Description of the Reference
1	Barrett, K.W., S.S. Chang, S.A. Haus, A.M. Platt, 1982, Uncontrolled Hazardous Waste Site Ranking System Users Manual, MITRE Corp. Document Location: Ecology and Environment, Inc., Buffalo, New York.
2	LaSala, A.M., Jr., 1968, Groundwater Resources of the Erie-Niagara Basin, New York, New York State Department of Conservation, Water Resources Commission, Basin Planning Report ENB-3. Document Location: Ecology and Environment, Inc., Buffalo, New York.
3	Buehler, E.J., and I.H. Tesmer, 1963, Geology of Erie County, New York, Buffalo Society of Natural Sciences Bulletin, Vol. 21, No. 3. Document Location: Ecology and Environment, Inc., Buffalo, New York.
4	New York State Department of Environmental Conservation, July 29, 1991, letter from Valerie Lauzze (NYSDEC) to James Griffis (E & E). Document Location: Ecology and Environment, Inc., Buffalo, New York.
5	New York State Department of Environmental Conservation, January 1986, Engineering Investigations at Inactive Hazardous Waste Sites in the State of New York, Phase I Investigations, Hartwell Street Landfill Site No. 915030, Buffalo, Erie County. Prepared by Engineering-Science. Document Location: Ecology and Environment, Inc., Buffalo, New York.
6	United States Department of Agriculture, Soil Conservation Service, 1986, Soil Survey of Erie County, New York. Document Location: Ecology and Environment, Inc., Buffalo, New York.
7	Ecology and Environment, Inc., April 1990, Phase II Investigation, Hartwell Street Landfill, Site Inspection, Section 5.5 (this report). Document Location: Ecology and Environment, Inc., Buffalo, New York.
8	Voell, A.T., July 3, 1986, County of Erie, Department of Environment and Planning, memorandum to Robert Mitrey, NYSDEC. Document Location: Ecology and Environment, Inc., Buffalo, New York.
9	Erie County Department of Environment and Planning, March 1982, Hartwell Street Landfill (Atlas Steel Casting, Inc.), Site 915030. Document Location: Ecology and Environment, Inc., Buffalo, New York.
10	Sax, N.I., Sixth Edition, Dangerous Properties of Industrial Materials. Document Location: Ecology and Environment, Inc., Buffalo, New York.
11	U.S. Geological Survey, 1965, 7.5-Minute Series (Topographic), Buffalo NW, New York-Ontario Quadrangle. Document Location: Ecology and Environment, Inc., Buffalo, New York.
12	U.S. Geological Survey, 1965, 7.5-Minute Series (Topographic), Buffalo NE, New York-Ontario Quadrangle. Document Location: Ecology and Environment, Inc., Buffalo, New York.
13	Alspaugh, M., April 2, 1990, personal communication, Erie County Department of Environmental Planning, Interview Acknowledgement Form. Document Location: Ecology and Environment, Inc., Buffalo, New York.

Reference Number	Description of the Reference
14	Buffington, B., April 10, 1990, personal communication, New York State Department of Environmental Conservation, Significant Habitat Unit, Interview Acknowledgement Form. Document Location: Ecology and Environment, Inc., Buffalo, New York.
15	City of Buffalo, Engineering Department, Water Division, April 10, 1990, personal communication, contact report. Document Location: Ecology and Environment, Inc., Buffalo, New York.
16	Martin, M., April 10, 1990, personal communication, Erie County Water Authority, contact report. Document Location: Ecology and Environment, Inc., Buffalo, New York.
17	Ecology and Environment, Inc., April 16, 1990, Site Safety Logbook, Hartwell Street Landfill. Appendix H, this report. Document Location: Ecology and Environment, Inc., Buffalo, New York.
18	National Register of Historic Places, 1966-1988, 1989, American Association for State and Local History. Document Location: Ecology and Environment, Inc., Buffalo, New York.
19	Larson, Fred, October 5, 1990, personal communication, Fire Chief with Bureau of Fire Prevention, Interview Acknowledgement Form. Document Location: Ecology and Environment, Inc., Buffalo, New York.
20	Johnson, T., February 18, 1987, New York State Department of Environmental Conservation, memorandum to Atlas Steel File. Document Location: Ecology and Environment, Inc., Buffalo, New York.
21	New York State Department of Environmental Conservation, 1982, Site Inspection Report Hartwel Street Landfill. Document Location: Ecology and Environment, Inc., Buffalo, New York.
22	Ecology and Environment, Inc., July 1990, Phase II Investigation Hartwell Street Landfill, Analytical Data, Appendix D, this report. Document Location: Ecology and Environment, Inc., Buffalo, New York.

REFERENCE 1

Ref 1

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

5-25

recycled paper

REFERENCE 2

ref 2

Erie-Niagara Basin

Ground-Water Resources

ERIE-NIAGARA BASIN REGIONAL WATER
RESOURCES PLANNING BOARD

5-27

THE NEW YORK STATE WATER RESOURCES COMMISSION
CONSERVATION DEPARTMENT • DIVISION OF WATER RESOURCES

REFERENCE 3

Gray shale containing large amounts of gypsum

Contact

Inferred Contact

45'

GEOLOGIC MAP OF ERIE COUNTY, NEW YORK BEDROCK GEOLOGY

by Edward J. Buehler and Irving H. Tesmer

1963

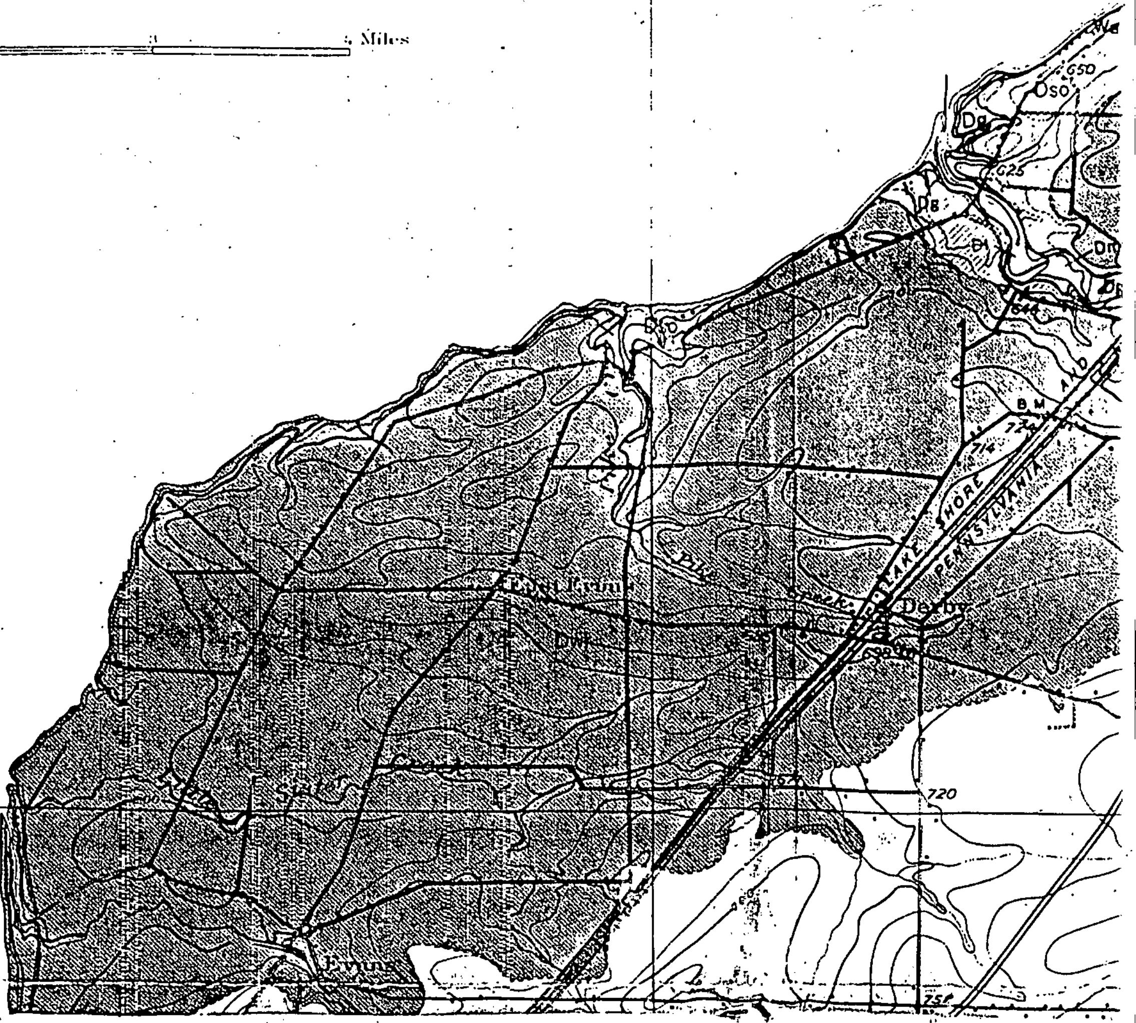
Scale $\frac{1}{62500}$

1 ½ 0 1 2 3 4 Miles

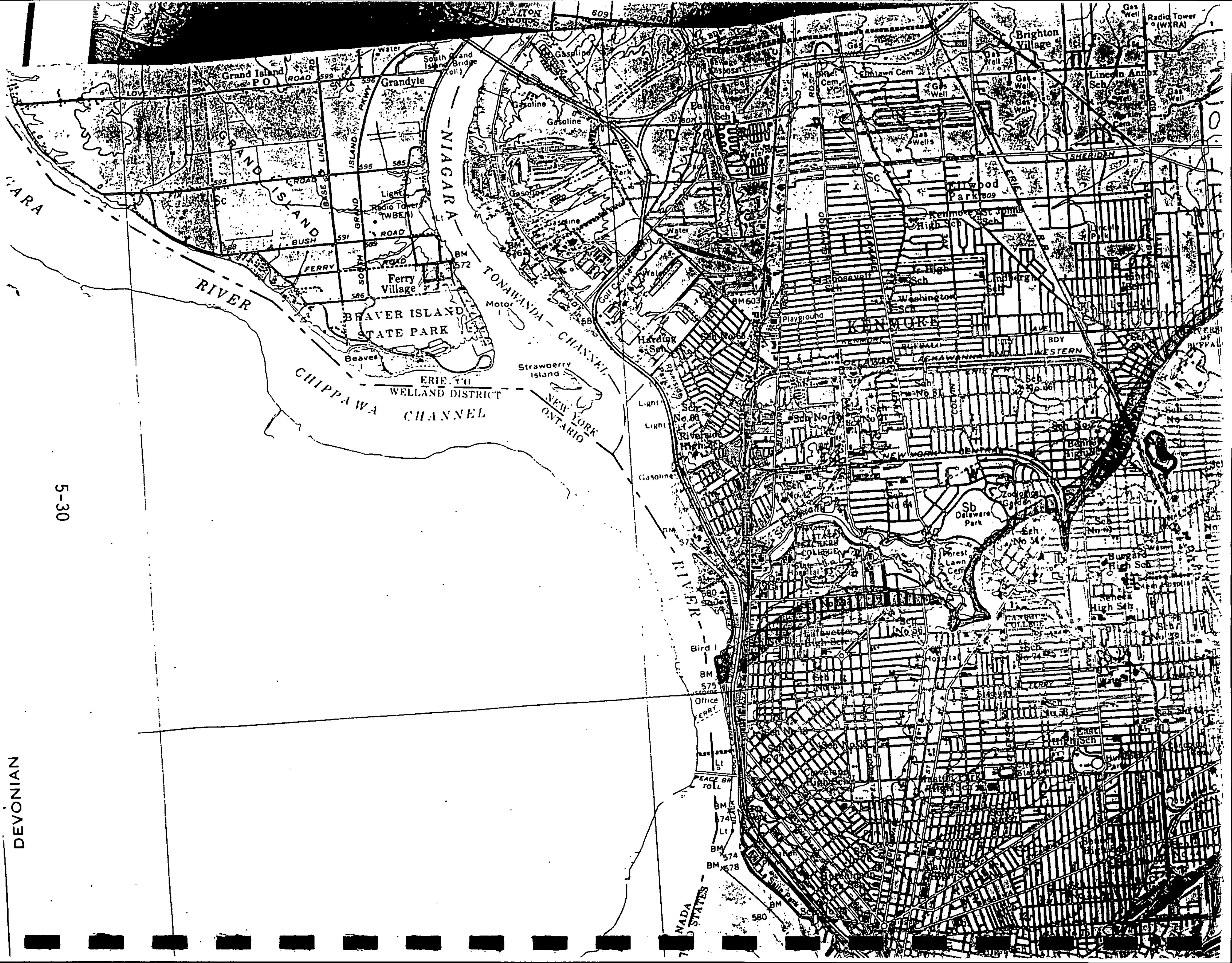
CONTOUR INTERVAL 20 FEET

BUFFALO SOCIETY OF NATURAL SCIENCES
BULLETIN, VOL. 21, NO. 3

5-29



40'


Grand Island P O
Grandyle
GRAND ISLAND
NIAGARA
RIVER
TONAWANDA CHANNEL
CHIPPAWA CHANNEL
BEAVER ISLAND STATE PARK
Ferry Village
Beaver I
Strawberry Island
ERIE CO
WELLAND DISTRICT
NEW YORK
ONTARIO
South Grand Island Bridge
Radio Towers (WBEN)
Light
BUSH ROAD
FERRY ROAD
LOVE ROAD
Harding Sch
Riverside High Sch
Riverside Park
Golf Course
KENMORE
Kenmore High Sch
St Johns Sch
Roosevelt Sch
Washington Sch
Lindbergh Sch
Elmwood Park
Brighton Village
Lincoln Annex Sch
Radio Tower (WXRA)
Gas Well
Gas Wells
SHERIDAN
Delaware Park
Zoological Garden
Forest Lawn Cem
State Teachers College
State Hospital
Lafayette High Sch
Bennett High Sch
Burgard High Sch
Seneca High Sch
East High Sch
Hutchinson Central High Sch
Canisius College
Bird I
PEACE BR TOLL
Black Rock Harbor
CANADA
UNITED STATES
BUFFALO
Sch No 60
Sch No 81
Sch No 56
Sch No 22
Sch No 63
Sch No 54
Sch No 74
Sch No 38
BM 572
BM 603
BM 575
BM 574
BM 578
580
Gasoline
Water
Playground
Hospital
Elmlawn Cem
Mt Olivet Cem
Parkside Sch
LACKAWANNA
WESTERN
DELAWARE
NEW YORK CENTRAL

DEVONIAN

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

Thomas C. Jorling
Commissioner

JUL 29 1991

Rec'd
7/31
JDG

Mr. James Griffis
Project Director
Ecology and Environment, P.C.
Buffalo Corporate Center
368 Pleasantview Drive
Lancaster, NY 14086

Dear Mr. Griffis:

Re: Hartwell Street Landfill
Site No. 915030

The draft Phase II report for the subject site has been reviewed. Enclosed please find a compilation of reviewers comments (Central Office, Regional Office, and State Health Department). Also enclosed is a copy of the draft report with comments in the margins as well as on "post-it" notes. Please return this draft report when submitting the draft final.

A matter of concern common to all reviewers is the significant changes (buildings razed, drums removed, etc.) which have occurred since the time of Ecology and Environment's site investigation. As you may be aware, the site owner has been conducting a general clean-up of his property. To aid in making an appropriate reclassification determination and to update the site description, I hereby request you schedule an additional site visit. The findings should then be reported in the site assessment section of the revised Phase II report. The current conditions should be summarized and used when evaluating the need for future action, if any, at this site.

The cost incurred for this return visit should be reported under the site reconnaissance task in the payment application. As a reminder, please contact the site owner in advance of this site visit.

Please incorporate the comments provided and update the report as discussed above. I appreciate your cooperation with this matter. If you have any questions regarding this matter, please contact me at (518) 457-9538.

Sincerely,

Valerie Lauzze
Senior Engineering Geologist
Western Investigation Section
Bureau of Hazardous Site Control
Division of Hazardous Waste
Remediation

Enclosures

REFERENCE 4

o Page 5-13, Targets: At least two industrial wells draw water from this aquifer (assigned value = 1). The industries are Dunlop Tire and Rubber and Polymer Applications, both in Tonawanda. Distance to the site is 2.4 miles northwest (assigned value = 1). There may be more industrial wells closer to the site. Did Atlas have one?

*This document has been altered for use as a reference.

REFERENCE 5

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

PHASE I INVESTIGATIONS

HARTWELL STREET LANDFILL
NYS SITE NUMBER 915030
CITY OF BUFFALO
ERIE COUNTY
NEW YORK STATE, 14207

Prepared For

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

Prepared By

ENGINEERING-SCIENCE
290 ELWOOD DAVIS ROAD
LIVERPOOL, NEW YORK 13088

In Association With

DAMES & MOORE
2996 BELGIUM ROAD
BALDWINSVILLE, NEW YORK 13027

DATE OF SUBMITTAL: JANUARY, 1986

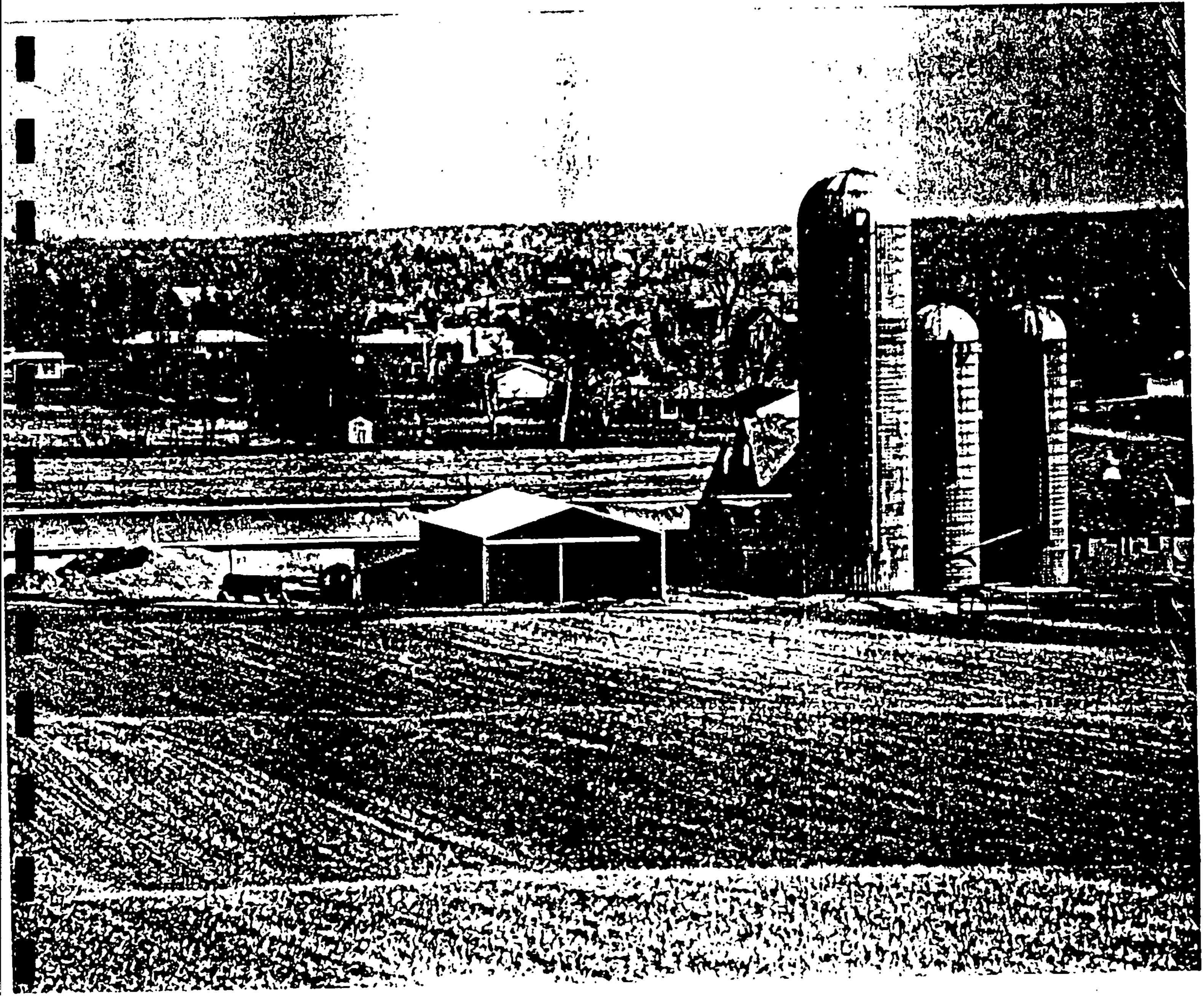
REFERENCE 6

ited States
partment of
Agriculture

il
nservation
Service

In Cooperation with
the Cornell University
Agricultural
Experiment Station

Soil Survey of Erie County, New York



REFERENCE 8

COUNTY OF ERIE
DEPARTMENT OF ENVIRONMENT AND PLANNING
DIVISION OF ENVIRONMENTAL CONTROL

* * * MEMORANDUM * * *

FROM: Anthony T. Voell DATE: 7/3/86

TO: Robert Mitrey, NYSDEC

RE: Atlas Steel Castings, 1963 Elmwood Avenue, Buffalo

Attached is a copy of our report on the Atlas Steel Property in Buffalo.

As we dicussed during a July 3, 1986 telephone conversation with Cameron O'Connor, we are referring this matter to your department for the following reasons:

1) Identification of ownership and the responsible party is not clear.
2) The potential for hazardous wastes on-site has been identified.
3) Access onto the site by unauthorized persons is a possibility.
4) There is information that additional parties are bringing more potentially hazardous waste on-site.

It is our recommendation that NYSDEC investigate this facility to determine if ownership can be established and, if not, the facility become a candidate for either State or Federal emergency samping and drum removal.

Sampling should include PCB analysis of the oil in the transformers and in the soil adjacent to the transformers. The drums that are labeled Cresylic Acid should be sampled for pH to confirm contents. Parameters for the wastes in unidentified drums will have to be analyzed as determined by field sampling observation. The four characteristics of hazardous waste will probably be required of these drums.

In addition, it may be advisable to call all potentially responsible owners to a meeting.

If you have any questions, please call Cameron O'Connor at 846-6085.

Voell

ANTHONY T. VOELL, P.E.
Deputy Commissioner

ATV:COC:jk
Attachments

cc: Councilman A. Copolla, (C) Buffalo
J. Antkowiak, M&T Bank
Joan Loring
City of Buffalo

M. Raab
Please have Cameron O,
Rich R or Lou B call
Atlas to see if we can
help. Let DEC know
we are doing this
ANoel
6/25

FRONTIER LUMBER Co.,Inc.

STORE AND PLANT • 1941 ELMWOOD AVENUE • BUFFALO, NEW YORK 14207 • 716/873-8500

June 24, 1986

New York State
Environmental Conservation
Bureau of Investigation
600 Delaware Avenue
Buffalo, NY 14202

RE: Atlas Steel Plant
Elmwood Avenue
Buffalo, NY 14207

Gentlemen:

A condition exists at the above plant that I believe is the most dangerous in the city. It's an excellent place for some kids - to get hurt or killed in pits full of water. It is a very bad fire hazard; there is garbage and hundreds of chemical drums that no one know what they had in them.

It's a very serious situation and a threat to our plant. It is probably another case of an abandoned plant going to the city for taxes.

It's my belief that either the State, County, or City should look into at once before a tragedy occurs.

Sincerely,

FRONTIER LUMBER CO., INC.

Edward J. McDermid
Edward J. McDermid
President

EJM/eac

CC: -Alfred T. Coppola, Councilman
✓-Erie County Envir. Control Div.
-James J. Antkowiak, M&T Bank

Assistance Card #03763

REPORT: ATLAS STEEL CASTINGS INC.
1963 Elmwood Avenue
Buffalo, NY 14207

SCOPE OF PROBLEM:

Atlas Steel has gone into Chapter 7 (Bankruptcy). Numerous fifty-five gallon drums left on site. The unkown nature of the drums contents has resulted in a citizens complaint to NYSDEC, Erie County Environmental Compliance Services and the City of Buffalo.

FIELD INSPECTION

DATE: June 27, 1986

INSPECTORS: Mr. Grobe, Mr. Becker - NYSDEC Bureau of Investigation.
Cameron O'Connor - Erie County Environmental Compliance Services.

WEATHER CONDITIONS: Heavy Rain

TIME: 12:00 pm - 1:00 pm

ON-SITE OBSERVATIONS

The facility was given a cursory review due to heavy rain. There is an estimated three hundred 55-gallon drums and numerous smaller pails of industrial material (waste) in various locations both inside and outside of the facility. (Note: The facility referenced is not the Hartwell Street Landfill - Site #915030 - on the NYS Registry of Inactive Sites that was utilized by Atlas Steel.) It is estimated that 50% of the 55-gallon drums are empty. The conditions of the other remaining drums are as follows:

a) Filled with casting sands. (Atlas Steel used a non-hazardous binder.)

b) Filled with water and miscellaneous trash and rubbish.

c) Waste drums which were sealed. The contents of those drums could not be determined.

The Atlas facility is presently being stripped of useful salvage (ie. machinery) by G & R Salvage Company. Members of the salvage crew advised that "two weeks ago" the site was investigated by a firm from New Jersey.

FOLLOW-UP:

DATE: June 30, 1986

TIME: 9:10 am

Called Jim Antkowiak, M & T Bank - One M & T Plaza, Buffalo, NY 14203.

M & T Bank holds the first mortgage on the Atlas Steel Property. They are not going to foreclose on the property. Jim Antkowiak was under the impression that all drums were empty. At this time, M & T Bank's involvement only includes the selling of machinery. This is being done under an agreement with G & R Salvage.

I was advised to call Ranny Wyckoff (Formerly of Atlas Steel) at 884-0412 for further information.

TIME: 10:30 am

Called Luke Darragh (201-225-6160) of NUS Company. They are Federal Superfund consultants. They were on site two weeks ago. They only checked the Hartwell Street Landfill area. They did not investigate drums left on the Atlas Steel property.

TIME: 10:45 am

Called Ranny Wyckoff. His secretary advised me that all environmental concerns should be referred to the Trustee of Property, Edwin Ilardo of Ilardo, Ilardo and Nickels at 649-0161.

TIME: 2:00 pm

Called Edwin Ilardo, left message with secretary.

TIME: 3:30 pm

Talked with Edwin Ilardo. He "wrote off" the site in February. Property is in limbo. It will probably revert to the City of Buffalo for back taxes. Mr. Ilardo advised that I call Joe Kishel, a former Atlas Steel employee,(now of KGS Foundry Consultants) who is on site assisting in the removal of salvagable materials.

TIME: 4:00 pm

Called Joe Kishel -- not in, left message.

DATE: July 1, 1986
TIME: 10:00 am

Joe Kishel returned call. The only drums he is aware of on site would be empty drums, and drums of castings sands and iron oxide from air pollution control equipment. He said he would have George Snyder of KGS consultants (also a former Atlas employee) meet me on site at 8:30 am on July 2, 1986 to field check drums.

TIME: 3:00 pm

Advised Jim Grode of above.

FIELD INSPECTION:

DATE: July 2, 1986

INSPECTORS: George Snyder - KGS
Cameron O'Connor - Erie County Environmental Compliance Services.

WEATHER CONDITIONS: Overcast

TIME: 8:30 am

ON-SITE OBSERVATIONS:

Field checked five main drum storage areas -- see map. (Note: isolated drums are throughout property.)

AREA #1 - Twenty one drums noted in this area. Most are emptyor filled with casting sands. One drum appeared to have a solid "sludge like" material. (No odor.)

AREA #2 - Twelve drums. Six had unknown material within.

AREA #3 - Approximately 100 drums. Most are empty. Drums labeled ADCOSIL by Ashland Petroleum. According to George Snyder, this material is used to set casting sands - no waste should be associated with material. Some of the drums in this area have material and will have to be checked.

AREA #4 - These drums (accoring to George Snyder) are not from Atlas Steel operations. There are approximately 21 drums in this area, most have material in them. Nine drums were labeled Vortex Degreaser (Manteil) nonflamable Cresylic) acid (Hazardouse waste U052). Other drums in the area were labeled Max Chemicals, Mobil Lube and Lindo-lure.

AREA #5 - This area had approximately 100 drums. Most are empty or contain casting sands or solid waste from air pollution control devices. There are some drums in this area that may have to be checked for contents. Atlas Steel drums in this area consist of:

1. More Adcosil drums. (Empty.)

2. Drums labeled Sodium Methlyate (Flamable solid). George Snyder did not know what this material was used for.

3. Drums labeled Ceramcote: A flamable liquid used in ~~ears~~ cores and molds. According to George Snyder, this material was completely, used in process. Therefore, no waste from this product should be on the property.

4. Drums of casting sands -- binder is a starch.

5. Drums of air pollution control waste. Air pollutions wastes of Atlas Steel consist of:

   a. sand fines

   b. steel dust

   c. iron oxide

6. Seven large transformers were also in this area. Three of the transformers were open. Oil was noted within transformers. One transformers was disturbed by Salvage crew resulting in substantial spillage to earthen ground. It is unknown if the oil contains PCB's.

   A chemical odor is associated with this area.

During the inspection, small areas of stained ground were noted in drum disposal area.

A laboratory building was also observed at the facility. The lab contained a variety of lab chemcials.

G & R Salvage was advised not to touch or remove any drums or tansfomers from the facility.

CONCLUSIONS:

There are a large number of drums at the facility. Most are empty or contain casting sands and air pollution control dust.

There are some drums that appear to contain liquid waste that may be considered hazardous that will have to be sampled.

Possible sources are:

1. Alleged drums that have been brought on site.

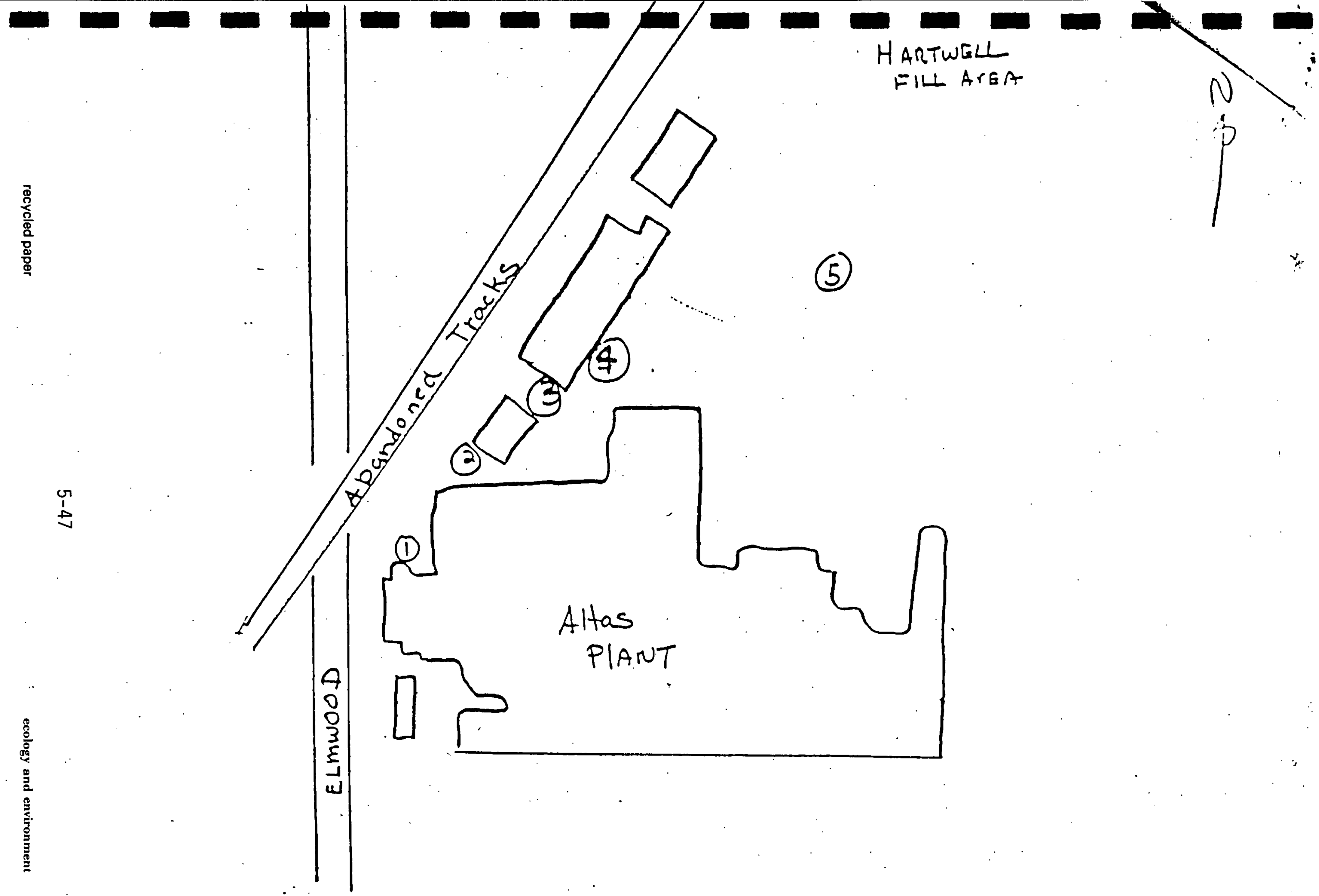
2. Although information does not indicate Atlas produced large quantities of hazardous waste from its process, some of the sealed drums could contain degreasers (solvents) and cleaning agents. Isolated drums of liquid waste were observed on the property. Two drums were observed to be leaking.

At this time, the site is not secure from pedestrian access. Vehicular traffic is restricted by a chain across the access to the facility. The site could pose a direct contact problem to unauthorized citizens who trespass on the property. However, emergency conditions were not noted.. The ownership of the facility is not clear. Therefore, finding the responsible party will be difficult. Action may have to be taken by either NYSDEC or USEPA emergency barrel funds.

Cameron

CAMERON O'CONNOR

COC:ems



Atlas Steel
1963 Elmwood Ave
Buffalo, NY

REFERENCE 9

HARTWELL STREET LANDFILL

(ATLAS STEEL CASTING INC.)

1963 Elmwood Avenue
Buffalo, New York
Site #915030

Prepared by
Erie County Department of
Environment and Planning

March 17, 1982

HARTWELL STREET LANDFILL
(ATLAS STEEL CASTINGS, INC.)
1963 Elmwood Avenue
Buffalo, New York
Site # 915030

BACKGROUND

The Interagency Task Force (IATF), in volume III of Hazardous Waste Disposal Sites in New York State, reported that filling of a low area on Atlas Steel Casting Plant grounds with earth fill and building debris from the plant occurred at this site. It was also reported that spent sand and pollution control equipment dust were stored at the site prior to off-site disposal. The site is coded "F" indicating that no further action is required.

GENERAL INFORMATION

The Hartwell Street Landfill is located at the west end of Hartwell Street on the northern portion of the Atlas Steel Casting's Inc. property (Exhibit I).

The only solid waste generated from the casting operation at the firm are casting sands with a water soluble sodium silicate binder. In the past, this waste was hauled away by "Custom Topsoil." Recently, due to a shift in economic conditions operations had temporarily slowed. According to a March 8, 1982, telephone conversation with NYSDEC, plant officials have contacted them and reported that plant operations have restarted. NYSDEC has advised the company of disposal and hauling requirements.

FIELD INSPECTIONS

The disposal site was originally field inspected by DEP in February 1979. The field inspection was performed due to a complaint from a citizen living on Hartwell Street. The citizen's complaint was in regard to disposal of material outside of Atlas Steel Casting's fence and general "poor housekeeping" practices in the area.

The Atlas Steel Castings site included areas inside and outside of the company's fence (Exhibit 1). The debris inside the fence included earth fill (from plant modifications), wood pallets, scrap trucks and metal products. The area outside of the fence, (on Atlas Steel Property) consisted of construction and demolition debris which was used to fill in a low area.

The Atlas site was again field checked in November of 1979 due to information indicating that foundry sand was being stored on site. During that inspection, no foundry sand was observed. Atlas Steel Casting representatives indicated, at that time, that foundry sand had once been temporarily stored on site because they were in the process of changing haulers. Conditions at the site had essentially remained the same as the February inspections, however, accumulations of concrete and brick were also observed on site.

During the most recent inspection (December 14, 1981) conditions at the site had not changed.

At no time during the site investigations was leachate observed on or leaving the site nor were any odors associated with the disposal area.

No evidence that any disposal of hazardous or toxic material were noted.

Exhibit 2 shows general conditions in this study area.

AERIAL PHOTOGRAPHY

Evaluation of aerial photography for the years 1951, 1958, 1960, and 1966 revealed no landfilling activities.

ENVIRONMENTAL DATA

The General Soil, Map and Interpretation for Erie County by the U.S.D.A. Soil Conservation Service (1979) reports that the soils in this area are classified as Urban Soils. This indicates that the area has received extensive disturbance to the original soil by both filling or removal. Permeability, soil texture and structure would be classified as miscellaneous due to the high degree of variation within the area.

Depth to bedrock is reported to be between 60 to 80 feet.

The U.R.S. report describes depth to groundwater to be miscellaneous. Groundwater in this area is not used as a domestic drinking water supply source. All persons who reside in the area receive their drinking water from the City of Buffalo Municipal System.

There are no surface waters or fresh water wetlands within a one mile radius of the site.

The area is not within a 100 year flood plain.

GEOGRAPHIC DATA

The land use in the area is residential, commercial, and industrial. Census figures (1980) report that the population is greater than 10,000.

DIRECT CONTACT

Direct contact would only be by Atlas employees.

FIRE OR EXPLOSION POTENTIAL

None.

CONCLUSION

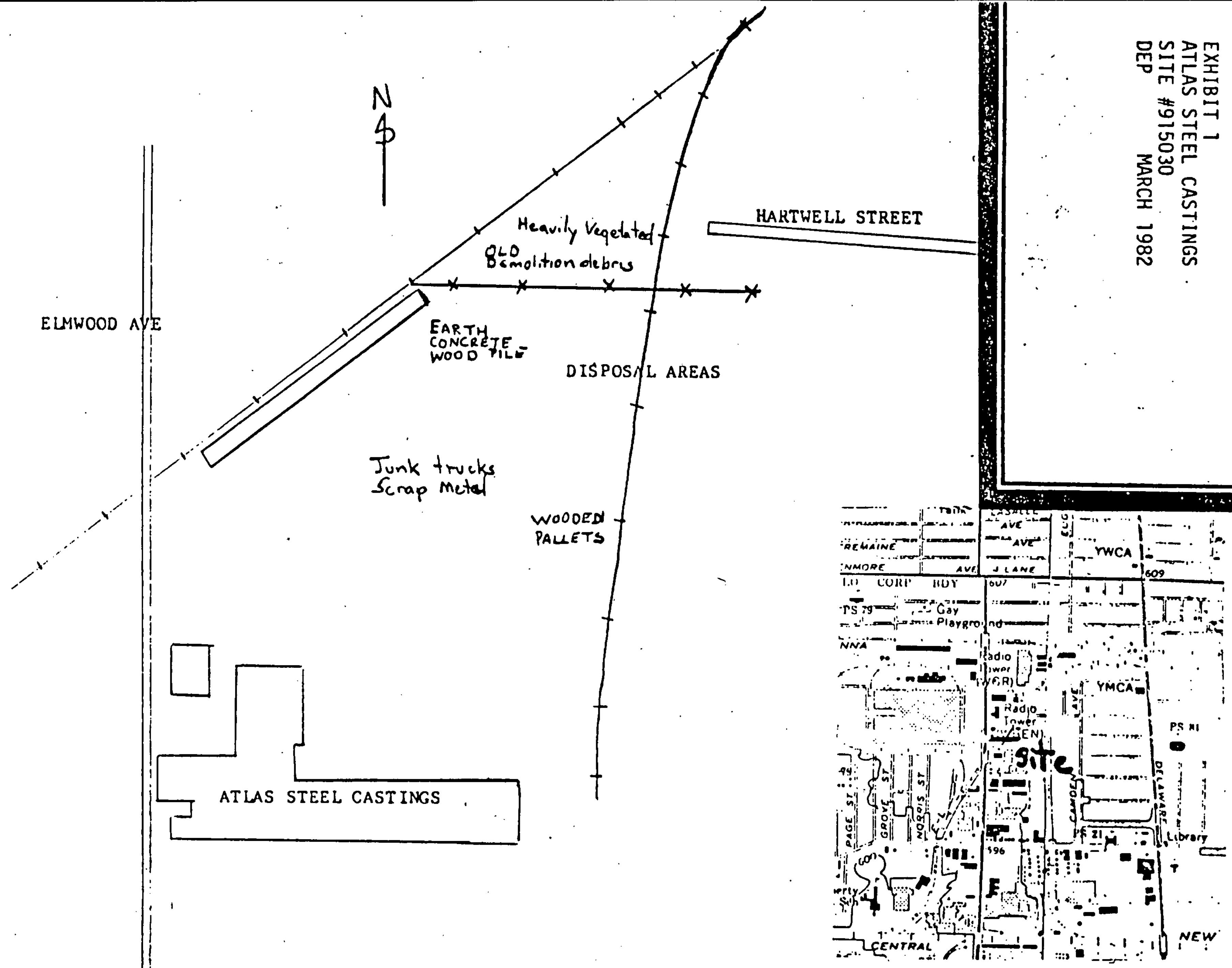
There is no evidence that hazardous or toxic waste have ever been disposed of at this site. Consequently, this area is not expected to pose an environmental or other hazard.

RECOMMENDATIONS

This department recommends that NYSDEC continue to work with company officials in regard to permit requirements.

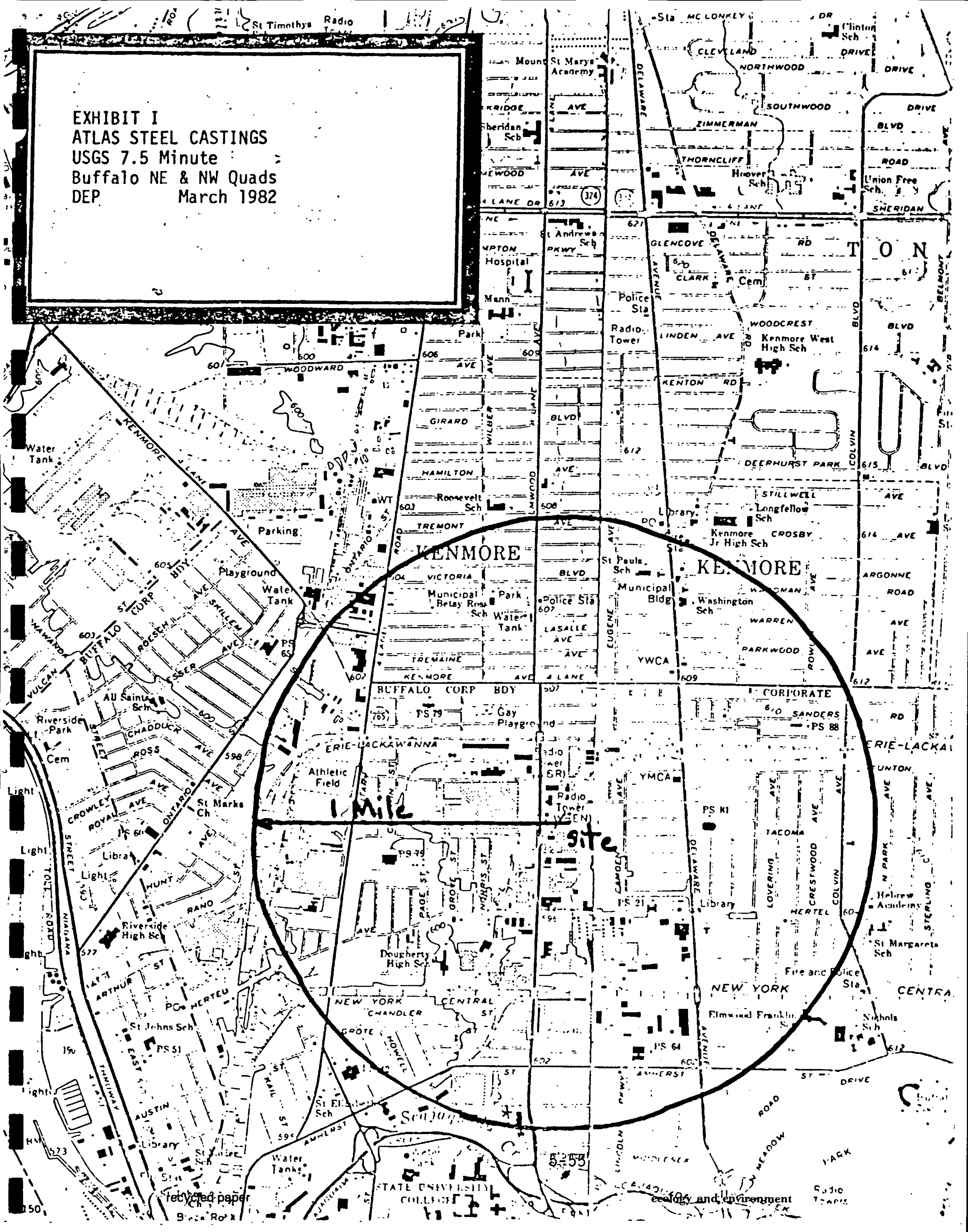
No sampling or remedial measures appear to be necessary at the site.

EXHIBIT 1
ATLAS STEEL CASTINGS
SITE #915030
DEP MARCH 1982



USGS 7.5 min. Buffalo NW and NE Quads

EXHIBIT I
ATLAS STEEL CASTINGS
USGS 7.5 Minute
Buffalo NE & NW Quads
DEP March 1982



REFERENCE 10

Dangerous Properties of Industrial Materials

Sixth Edition

N. IRVING SAX

Assisted by:
Benjamin Feiner/Joseph J. Fitzgerald/Thomas J. Haley/Elizabeth K. Weisburger

VNR VAN NOSTRAND REINHOLD COMPANY
NEW YORK CINCINNATI TORONTO LONDON MELBOURNE

REFERENCE 11

REFERENCE 12

FIGURE 1-1 OF THIS REPORT

REFERENCE 13

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Hartwell Street Landfill

I.D. NUMBER: 915030

PERSON CONTACTED: Michael Alspaugh

DATE: 3/29/90, 4/2/90

AFFILIATION: Dept. ~~Office~~ of Environment~~al~~ and Planning

PHONE NUMBER: 716-858-6013

ADDRESS:
Rath Building
95 Franklin Street
Buffalo, NY

CONTACT PERSON(S):
Natasha Snyder
Melissa Perera
Chris Lewicki

TYPE OF CONTACT: ~~meeting~~ Use of map collection (part of Development Decision Support System [DDSS]) in the Erie County Planning Division.

INTERVIEW SUMMARY

On Thursday, March 28, 1990 we asked Mr. Alspaugh if E & E could use the map room for the entire day on Monday, April 2, 1990. He gave permission for us to do so and requested that we record the number of each map that we used. The map numbers are as follows:

Map #	Date of Map	Map Type/Name
# 1H-75	10-13-51	aerial photo
# 2H-120	10-04-51	aerial photo
# 1H-15	9-20-51	aerial photo
# 6	1978-1981	aerial quad
# 7	1978-1981	aerial quad
# 8-1	1960	aerial photo
# 8-4	1960	aerial photo
-----	1975	General Soils Map MESO SOILS
-----	June 1989	Agricultural Districts of Erie County
DWG # 719-3A-0	Jan. 1980	Depth to Bedrock
DWG # 719-5A-0	Jan. 1980	Depth to Natural Water Table
DWG # 719-9A-0	Jan. 1980	Bedrock Information
-----	Aug. 1983	Significant Fish Habitats
# 6	Jan. 1984	Historic Sites – 1981 LOCAL SURVEY
-----	19~~82~~ 88	Water Districts
-----	19~~79~~ 83	US Waters & Adjacent Wetlands
-----	1987	Significant Wildlife Habitats
-----	19~~80~~ 87	NYS Protected Plant Habitats
#5, #6, #7	1982	Land Use Map
#7	19~~77~~ 84	100 yr. Floodplain Map
#6	19~~81~~ 83	100 yr. Floodplain Map

ACKNOWLEDGMENT

I have read the above transcript and I agree that it is an accurate LISTING ~~summary~~ of the information ~~verbally~~ conveyed to Ecology and Environment, Inc. interviewer(s) (as revised below, if necessary).

Revisions (please write in any corrections needed to above transcript)

THE INTERVIEWERS WERE SHOWN THE MAPS WHICH THEY REQUESTED AND THE INTERVIEWERS INTERPRETED THE MAPS & INFORMATION WITH ONLY INCIDENTAL EXPLANATIONS BY STAFF – SEE ATTACHED DISCLAIMER BY ERIE COUNTY.

Signature: Michael A. Alspaugh Date: 5/7/90

SENIOR PLANNER

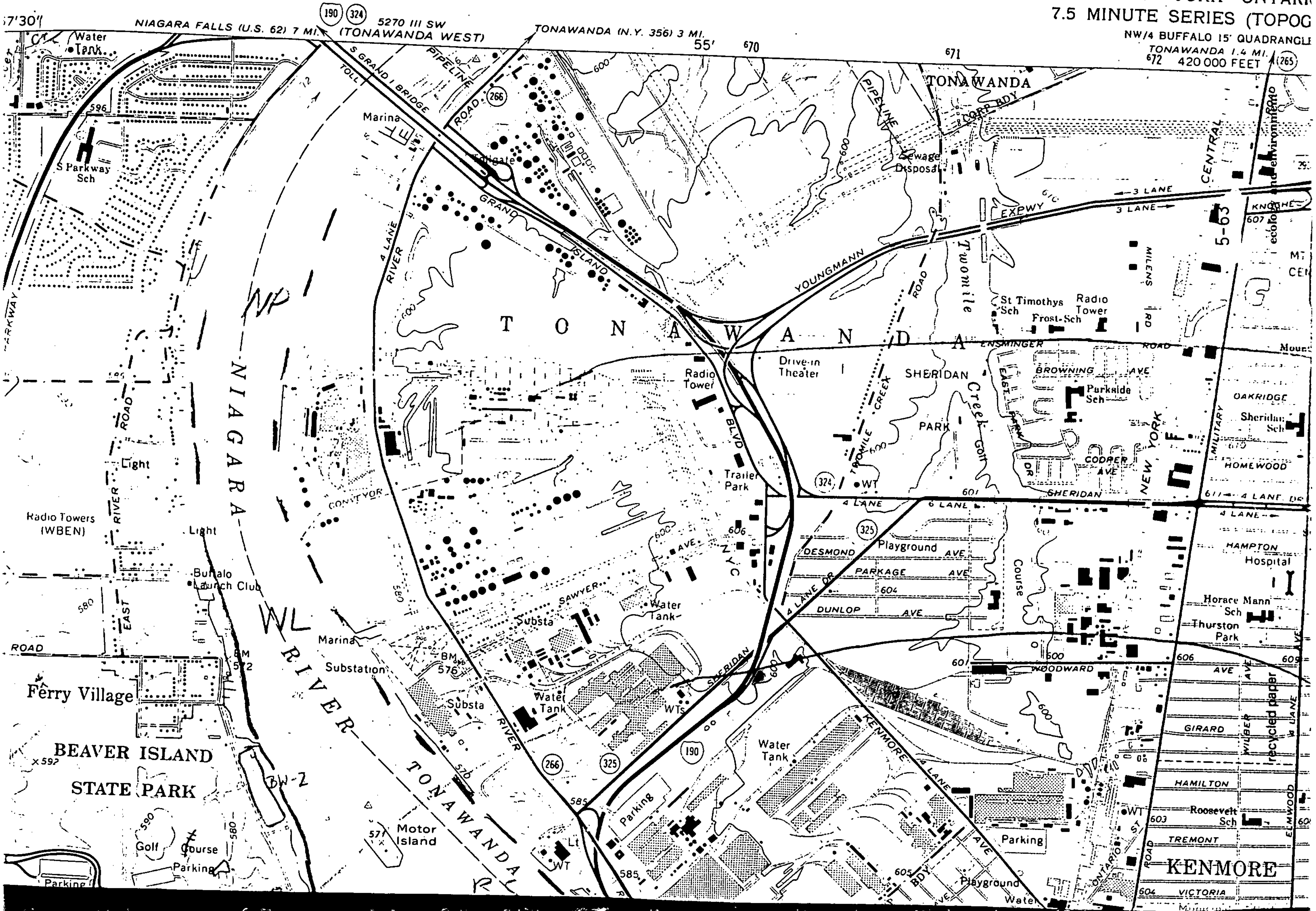
DISCLAIMER

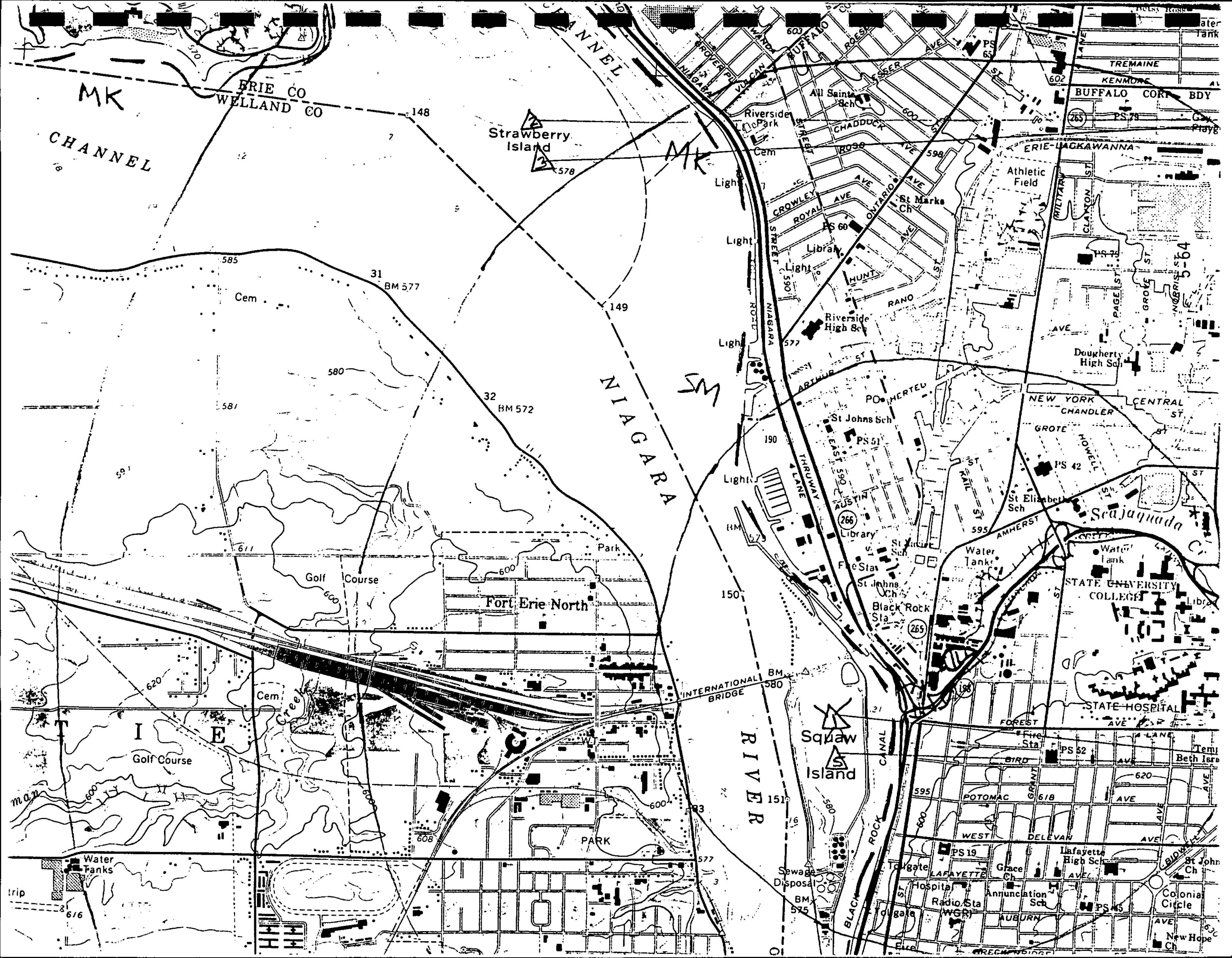
The County makes no representations, warranties or guarantees as to the accuracy or completeness of the material provided through the Development Decision Support System. The System makes available to the public, information which the County has received and compiled in order to assist in basic planning and physical development.

The user of the Development Decision Support System agrees to be responsible for determining the reliability of any information obtained and uses the information at his own risk. The County will not be responsible for any omissions, dissemination of inaccurate information or misuse of any information obtained.

bas063

BUFFALO NW QUADRA
NEW YORK–ONTARI
7.5 MINUTE SERIES (TOPOG
NW/4 BUFFALO 15' QUADRANGLE




MK
ERIE CO
WELLAND CO
148
CHANNEL
Strawberry Island
2
3
578
MK
CHANNEL
NIAGARA
BUFFALO
VULCAN
GROVER
ROESE
LESSER AVE
PS 65
TREMAINE
KENMORE
602
BUFFALO CORP BDY
265
PS 79
All Saints Sch
Riverside Park
CHADDUCK AVE
600
Cem
ROSS
598
ERIE-LACKAWANNA
Athletic Field
Light
CROWLEY AVE
ROYAL AVE
ONTARIO
St Marks Ch
PS 60
Library
Light
HUNT
RANO
STREET
590
MILITARY
CLAYTON
PS 75
PAGE ST
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NORRIS ST
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Riverside High Sch
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Dougherty High Sch
AVE
ARTHUR ST
SM
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581
32
BM 572
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HERTEL
NEW YORK CENTRAL
CHANDLER
St Johns Sch
PS 51
GROTE
HOWELL
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EAST
THRUWAY
4 LANE
PS 42
591
Light
AUSTIN
266
RAIL
St Elizabeth Sch
Scajaquada Cr
595
AMHERST
BM
573
Library
St Xavier Sch
Water Tank
Water Tank
611
Park
Fire Sta
STATE UNIVERSITY COLLEGE
Golf Course
600
Fort Erie North
150
St Johns Ch
Black Rock Sta
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Library
198
INTERNATIONAL BRIDGE
BM 580
620
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Creek
STATE HOSPITAL
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Squaw Island
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FOREST AVE
Fire Sta
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Beth Isra
Golf Course
CANAL
BIRD AVE
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151
583
595
POTOMAC AVE
GRANT
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608
PARK
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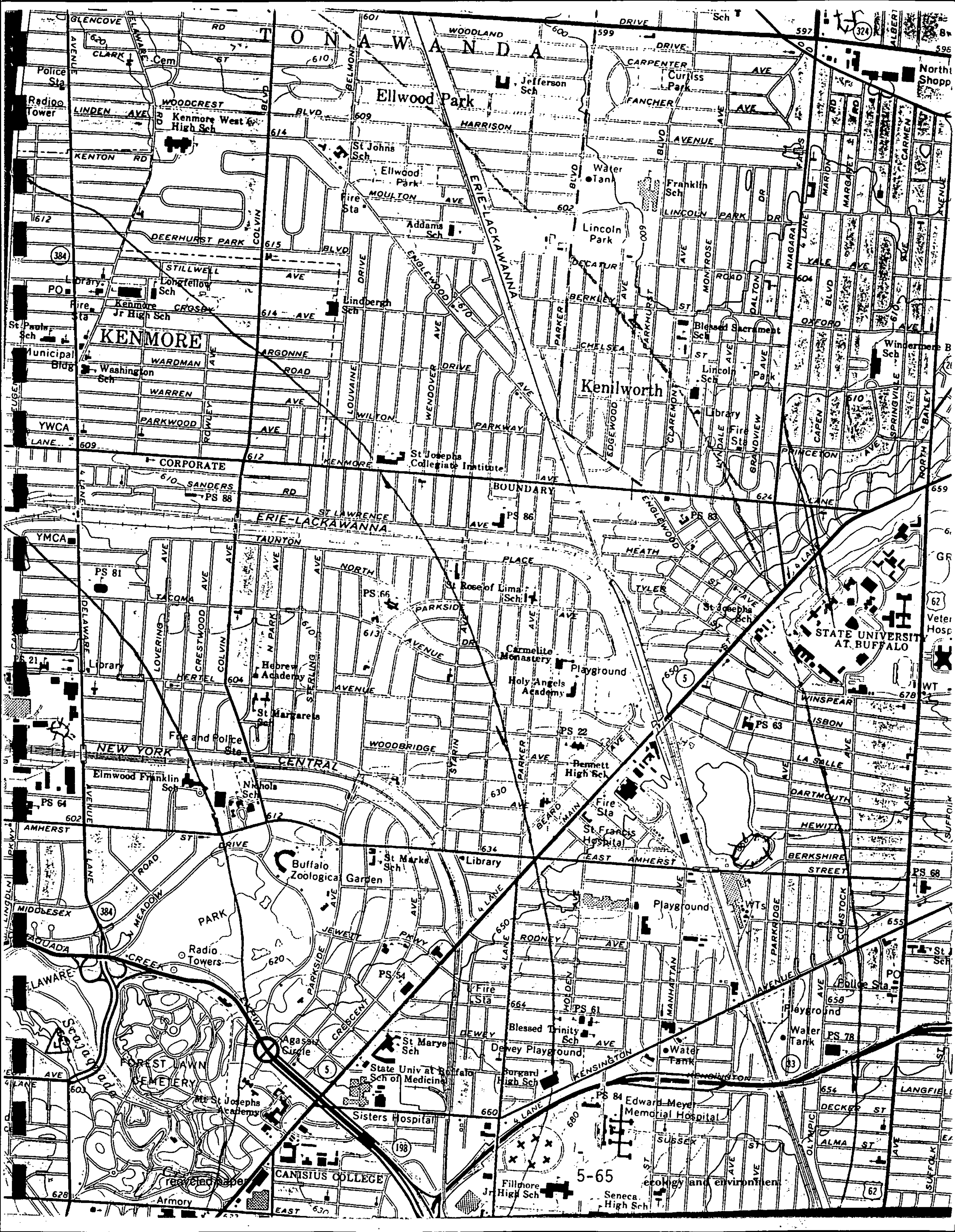
WEST DELEVAN AVE
PS 19
Lafayette High Sch
Water Tanks
577
Sewage Disposal
Tollgate
LAFAYETTE AVE
Grace Ch
St John Ch
BIDWELL
BLACK ROCK
Hospital
Annunciation Sch
Colonial Circle
strip
616
BM 575
Tollgate
Radio Sta (WGR)
PS 45
AUBURN AVE
New Hope Ch
Fire
BRECKENRIDGE


TONAWANDA
KENMORE
Ellwood Park
Kenilworth
Police Sta
Radio Tower
Kenmore West Sr High Sch
Jefferson Sch
Curtiss Park
St Johns Sch
Ellwood Park
Fire Sta
Addams Sch
Water Tank
Franklin Sch
Lincoln Park
Library
PO
Fire Sta
Kenmore Jr High Sch
Longfellow Sch
Lindbergh Sch
St Pauls Sch
Municipal Bldg
Washington Sch
Blessed Sacrament Sch
Lincoln Park
Windermere
YWCA
St Josephs Collegiate Institute
CORPORATE
BOUNDARY
PS 88
PS 86
PS 83
YMCA
PS 81
PS 66
St Rose of Lima Sch
St Josephs Sch
STATE UNIVERSITY AT BUFFALO
Veter Hosp
PS 21
Library
Hebrew Academy
Carmelite Monastery
Playground
Holy Angels Academy
St Margarets Sch
Fire and Police Sta
PS 22
PS 63
Bennett High Sch
Elmwood Franklin Sch
Nichols Sch
PS 64
Fire Sta
St Francis Hospital
Buffalo Zoological Garden
St Marks Sch
Library
PS 68
PARK
Playground
WTs
Radio Towers
PS 54
Fire Sta
PS 61
Police Sta
PO
Playground
Water Tank
PS 78
FOREST LAWN CEMETERY
Agassiz Circle
St Marys Sch
Blessed Trinity Sch
Dewey Playground
Water Tank
State Univ at Buffalo Sch of Medicine
Burgard High Sch
Mt St Josephs Academy
Sisters Hospital
PS 84
Edward Meyer Memorial Hospital
CANISIUS COLLEGE
Armory
Fillmore Jr High Sch
Seneca High Sch
Scajaquada
ERIE-LACKAWANNA
NEW YORK CENTRAL
GLENCOVE RD
CLARK ST
WOODLAND DRIVE
CARPENTER AVE
FANCHER AVE
WOODCREST BLVD
LINDEN AVE
HARRISON
KENTON RD
MOULTON AVE
DEERHURST PARK BLVD
STILLWELL AVE
CROSBY AVE
ARGONNE
WARDMAN ROAD
WARREN AVE
PARKWOOD AVE
LANE
SANDERS RD
ST LAWRENCE AVE
TAUNTON PLACE
NORTH
HEATH
TYLER
TACOMA
PARKSIDE AVENUE
HERTEL AVENUE
WOODBRIDGE AVE
WINSPEAR
LISBON
LA SALLE
DARTMOUTH
HEWITT
BERKSHIRE
AMHERST ST
EAST AMHERST
MIDDLESEX
ROUADA
DELAWARE
CREEK
JEWETT PKWY
RODNEY AVE
DEWEY AVE
KENSINGTON AVENUE
LANGFIELD
DECKER ST
ALMA ST
SUSSEX
MAIN ST
DELAWARE AVENUE
COLVIN BLVD
ELMWOOD AVE
BELMONT
ENGLEWOOD AVE
LOUVAINE DRIVE
WENDOVER AVE
PARKER AVE
EDGEWOOD
CLAREMONT
LYNDALE
GRANDVIEW
MONTROSE
DALTON
NIAGARA FALLS BLVD
CAPEN BLVD
SPRINGVILLE AVE
BAILEY AVE
LOVERING AVE
CRESTWOOD AVE
STERLING AVE
STARIN AVE
BEARD AVE
HOLDEN
MANHATTAN AVE
PARKRIDGE AVE
COMSTOCK AVE
OLYMPIC
SUFFOLK AVE
PARKSIDE AVE
CRESCENT AVE
YALE AVE
OXFORD AVE
PRINCETON AVE
DECATUR
BERKLEY ST
CHILSEA ST
LINCOLN PARK DR
WILTON
PARKWAY
KENMORE AVE
4 LANE
384
324
5
62
198
33
597
598
599
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678
680

REFERENCE 14

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Hartwell Street Landfill

PERSON CONTACTED: Burrell Buffington

AFFILIATION: National Heritage Program

ADDRESS: 700 Troy-Schenectedy Road
Albany, NY 12110

TYPE OF CONTACT: map search

I.D. NUMBER: 915030

DATE: 4/10/90

PHONE NUMBER: 518-783-3932

CONTACT PERSON(S): Judy Vangalio
Ralinda Leichner

INTERVIEW SUMMARY

No significant habitats wer located within 1.5 miles of the site after looking at the Significant Habitat Maps (1980) prepared by the Habitat Inventory Unit for the NYSDEC, Divisionof Fish and Wildife Burea of Wildlife.

The mead sedge (Carex meadii) may be found within 1.5 miles of the site. It is classified SH U (Map #4207887). No wildlife management or wildlife refuge areas are located within 1.5 miles of the site. This information was based on the Natural Heritage Maps.

ACKNOWLEDGMENT

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to Ecology and Environment, Inc. interviewer(s) (as revised below, if necessary).

Revisions (please write in any corrections needed to above transcript)

Signature: Burrell Buffington Date: 4/25/90

REFERENCE 15

ICY: City of Buffalo, Water Division, Engineering Dept.
DRESS: Foot Porter Avenue

NE NO.: 716 851 4710

ON
TACTED: Tom R. ——, pumping station supervisor
: Natasha Snyder
M: Melissa Pereira
April 10, 1990
JECT: water intakes for City of Buffalo

Buffalo uses only 1 water intake regularly, and the pumping station is located in the "round building" in the Emerald Channel (where Lake Erie becomes the Niagara River - at the foot of Jersey St. on the west side in Buffalo) In emergencies, the Massachusetts Avenue pumping station is used. West Seneca does not use the same intakes as the city of Buffalo.

REFERENCE 16

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Hartwell Street Landfill

I.D. NUMBER: 915030

PERSON CONTACTED: Mike Martin

DATE: 4/10/90

PHONE NUMBER: 716-947-4252

AFFILIATION: Erie County Water Authority

ADDRESS: 722 Sturgeon Point Road
Derby, NY 14047

CONTACT PERSON(S): Melissa Perera

TYPE OF CONTACT: telephone interview

INTERVIEW SUMMARY

Mr. Martin described over the phone the locations of six pumping stations which are within a 3-mile radius of the following three inactive hazardous waste sites: Fedders Auto Components, Hartwell Street Landfill, and West Seneca Transfer Station. There are no maps available which illustrate water intake locations for this area. The six pumping stations are:

1. Emerald Channel - water intake for City of Buffalo, located near the foot of Porter Avenue;

2. Massachusetts Avenue Pumping Station - emergency use only for City of Buffalo;

3., 4. River Road and Sheridan Drive - two intakes located about 1/2 mile apart. One is for the Town of Tonawanda, and the other is for Erie County Van De Water Plant;

5. Northern Tip of Grand Island - City of Tonawanda intake; and

6. Northern Tip of Grand Island - Grand Island Water Department.

ACKNOWLEDGMENT

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to Ecology and Environment, Inc. interviewer(s) (as revised below, if necessary).

Revisions (please write in any corrections needed to above transcript)

Signature: M. Mart

Date: 5·11·90

REFERENCE 17

APPENDIX H

(THIS REPORT)

REFERENCE 18

NATIONAL REGISTER OF HISTORIC PLACES
1966-1988

NATIONAL CONFERENCE OF
STATE HISTORIC PRESERVATION OFFICERS
Washington, D.C.

NATIONAL PARK SERVICE
Washington, D.C.

AMERICAN ASSOCIATION FOR
STATE AND LOCAL HISTORY
Nashville, Tennessee

For information, write the American Association for State and Local History, 172 Second Avenue North, Nashville, Tennessee 37201.

Library of Congress Cataloging-in-Publication Data

National Register of Historic Places, 1966-1988.

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1. Historic sites—United States—Directories. I. United States. National Park Service. II. National Conference of State Historic Preservation Officers. III. American Association for State and Local History.
E159.N3418 1989 973'.025 89-15007
ISBN 0-942063-03-3

The cumulative list included in this edition of the *National Register of Historic Places 1966-1988* has been compiled, edited, and provided to the American Association for State and Local History in magnetic tape form by the National Park Service.

Photo Credits

Front Cover - The Glebe in Arlington, Virginia, has evolved to its present condition with additions made to it over the years. Walter Jones built the original portion in the early 1820s with the artist, Clark Mills, adding the octagonal wing to the house in the 1850s. That wing is one of the best examples of this mid-19th century building form. (*HABS, Jack E. Boucher.*)

Back Cover - Top: *W.P. Snyder, Jr.*, shown here underway at Pittsburgh, Pennsylvania, circa 1945, is a sternwheel river towboat designed to pass under low bridges. Called a "poolboat" and built in 1918 for Carnegie Steel, she towed barges of coal on the Ohio, Mississippi, and Monongahela rivers. She is now a museum vessel at the Ohio River Museum in Marietta, Ohio. (*Courtesy of Ohio Historical Society.*) Middle: This archeological site is the remains of Fort Filmore. The fort, near Las Cruces, New Mexico, was a typical southwestern army post of the 1850s. Sand soon covered the fort after it was abandoned in 1862, which helped preserve the lower portions of the adobe walls. (*John P. Wilson.*) Bottom: Southern Terminal and Warehouse Historic District was the wholesaling center for the city of Knoxville, Tennessee, and much of the surrounding region in the late 19th and early 20th centuries. A variety of commercial architectural styles highlights the district. (*Gail L. Guymon.*)

Dutchess County—Continued

Traver, J. E., Farm [Rhinebeck Town MRA], Violet Hill Rd., Rhinebeck, 7/09/87, C, 87001082

Traver, John H., Farm [Rhinebeck Town MRA], Wurtemburg Rd., Wurtemburg, 7/09/87, C, 87001081

Travis House [Poughkeepsie MRA], 131 Cannon St., Poughkeepsie, 11/26/82, A,C, 82001167

Trinity Methodist Episcopal Church and Rectory [Poughkeepsie MRA], 1-3 Hooker Ave., Poughkeepsie, 11/26/82, C,a, 82001168

US Post Office—Beacon [US Post Offices in New York State, 1858-1943, TR], 369 Main St., Beacon, 11/17/88, A,C, 88002456

Union Free School [New Hamburg MRA], Academy St., New Hamburg, 2/27/87, C, 87000117

Union Street Historic District, About 8 blocks in downtown Poughkeepsie centered around Union St., Poughkeepsie, 12/09/71, A,C, 71000537

Upper-Mill Street Historic District [Poughkeepsie MRA], Roughly Mill St. from Center Plaza to Catherine St., Poughkeepsie, 11/26/82, A,C, 82001169

Van Vredenburg Farm [Rhinebeck Town MRA], Cedar Heights Rd., Rhinebeck, 7/09/87, C, 87001079

Van Wyck-Wharton House, S of Fishkill on U.S. 9, Fishkill vicinity, 4/13/72, A,C, 72000828

Vanderbilt Mansion National Historic Site, N edge of Hyde Park, U.S. 9, Hyde Park, 10/15/66, A,C, 66000059

Vassar Home for Aged Men, 1 Vassar St., Poughkeepsie, 4/13/72, A,C, 72000837

Vassar Institute, 12 Vassar St., Poughkeepsie, 1/20/72, A,C, 72001540

Vassar, Matthew, Estate, Academy and Livingston Sts., Poughkeepsie, 8/11/69, C, NHL, 69000141

Vassar-Warner Row [Poughkeepsie MRA], S. Hamilton from Montgomery to 40 Hamilton St., Poughkeepsie, 11/26/82, C, 82001170

Wappingers Falls Historic District [Wappingers Falls MRA], Roughly bounded by South Ave., Elm, Main, Park, Walker, Market, and McKinley Sts., Wappingers Falls, 9/29/84, A,C, 84002380

Williams Farm [Rhinebeck Town MRA], Enterprise Rd., Rhinebeck, 7/09/87, C, 87001080

Winegar, Hendrik, House, SE of Amenia on SR 2 off NY 343, Amenia vicinity, 4/15/75, C, 75001180

Young Men's Christian Association [Poughkeepsie MRA], 58 Market St., Poughkeepsie, 11/26/82, C, 82001171

Zion Memorial Chapel [New Hamburg MRA], 37 Point St., New Hamburg, 2/27/87, C, 87000119

Erie County

33—61 Emerson Place Row [Masten Neighborhood Rows TR], 33—61 Emerson Pl., Buffalo, 3/19/86, C, 86000691

Albright-Knox Art Gallery, 1285 Elmwood Ave., in Delaware Park, Buffalo, 5/27/71, C, 71000538

Allentown Historic District, Off NY 384, Buffalo, 4/21/80, A,C, 80002605

Berkeley Apartments, 24 Johnson Park, Buffalo, 10/15/87, C, 87001852

Blessed Trinity Roman Catholic Church Buildings, 317 LeRoy Ave, Buffalo, 8/03/79, A,C,a, 79001579

Buffalo Gas Light Company Works, 249 W. Genesee St., Buffalo, 9/01/76, A,C, 76001215

Buffalo Main Light [U.S. Coast Guard Lighthouses and Light Stations on the Great Lakes TR], Buffalo River, Buffalo, 7/19/84, A,C, 84002383

Buffalo North Breakwater South End Light [U.S. Coast Guard Lighthouses and Light Stations on the Great Lakes TR], Buffalo Harbor, Buffalo, 8/04/83, A,C, 83001669

Buffalo State Asylum for the Insane, 400 Forest Ave., Buffalo, 6/24/86, C, NHL, 86003557

Buffalo State Hospital, 400 Forest Ave., Buffalo, 1/12/73, C, 73001186

Buffalo and Erie County Historical Society, 25 Nottingham Ct., Buffalo, 4/23/80, A,C, NHL, 80002606

Cazenovia Park-South Park System [Olmsted Parks and Parkways TR], South Park, NW along McKinley Pkwy. to Cazenovia Park, NW along McKinley Pkwy. to Heacock Park, Buffalo, 3/30/82, C, 82005028

Chapel of Our Lady Help of Christians, 4125 Union Rd., Cheektowaga, 12/14/78, A,C,a, 78001851

County and City Hall, 95 Franklin St., Buffalo, 5/24/76, A,C, 76001216

Delaware Avenue Historic District, W side of Delaware Ave. between North and Bryant Sts., Buffalo, 1/17/74, A,C,a, 74001232

Delaware Park-Front Park System [Olmsted Parks and Parkways TR], Front Park, Porter Ave. to Symphony Cir., N along Richmond Ave., Bidwell Pkwy., Gates Cir. and Delaware Park, Buffalo, 3/30/82, C, 82005029

Dorsheimer, William, House, 434 Delaware Ave., Buffalo, 11/21/80, C, 80002607

Durham Memorial A.M.E. Zion Church, 174 E. Eagle St., Buffalo, 9/15/83, A,a, 83001670

Eaton Site, Address Restricted, West Seneca, 4/03/79, D, 79001581

Eberhardt Mansion, 2746 Delaware Ave., Kenmore, 9/08/83, C, 83001671

Eshelman, J., and Company Store, 6000 Goodrich Rd., Clarence Center, 5/06/82, C, 82003356

Fillmore, Millard, House, 24 Shearer Ave., East Aurora, 5/30/74, B,b, NHL, 74001235

Fosdick-Masten Park High School, Masten Ave. and E. North St., Buffalo, 6/30/83, C, 83001672

Gamel Hexadecagon Barn [Central Plan Dairy Barns of New York TR], Shirley Rd., North Collins vicinity, 9/29/84, C, 84002386

Johnson-Jolls Complex, S-4287 S. Buffalo St., Orchard Park, 5/06/80, C, 80002611

King, Martin Luther, Jr., Park [Olmsted Parks and Parkways TR], Roughly bounded by Northampton St., E. Parade Ave., Best St. and Kensington Expressway, Buffalo, 3/30/82, C, 82005027

Kleis Site, Address Restricted, Hamburg vicinity, 4/20/79, D, 79001580

Lafayette High School, 370 Lafayette Ave., Buffalo, 12/03/80, C, 80002608

Laurel and Michigan Avenues Row [Masten Neighborhood Rows TR], 1335—1345 Michigan Ave., Buffalo, 3/19/86, C, 86000688

Macedonia Baptist Church, 511 Michigan Ave., Buffalo, 2/12/74, A,a, 74001233

Martin, D. D., House Complex [Olmsted Parks and Parkways TR (AD)], 123 Jewett Pkwy., Buffalo, 12/30/75, C, 75001185

Martin, Darwin D., House, 125 Jewett Pkwy., Buffalo, 2/24/86, C, NHL, 86000160

New York Central Terminal, 495 Paderewski Dr., Buffalo, 9/07/84, A,C, 84002389

Parkside East Historic District [Olmsted Parks and Parkways TR], Roughly bounded by Parkside Ave., Amherst St., Colvin Ave., NY Central RR tracks, Main St., and Humboldt Ave., Buffalo, 10/17/86, A,C, 86002817

Parkside West Historic District [Olmsted Parks and Parkways TR], Roughly bounded by Amherst St., Nottingham Terr., Middlesex Rd., and Delaware Ave., Buffalo, 12/10/86, C,g, 86003372

Pierce Arrow Factory Complex, Elmwood and Great Arrow Aves., Buffalo, 10/01/74, A,C, 74001234

Prudential Building, Church and Pearl Sts., Buffalo, 3/20/73, A,C, NHL, 73001187

Riverside Park [Olmsted Parks and Parkways TR], Roughly bounded by Vulcan, Tonawanda, Crowley, and Niagara St., Buffalo, 3/30/82, C, 82005026

Roosevelt, Theodore, Inaugural National Historic Site, 641 Delaware Ave., Buffalo, 11/02/66, B, 66000516

Roycroft Campus, Main and W. Grove Sts., East Aurora, 11/08/74, A,B,C,a,g, NHL, 74001236

Shea's Buffalo Theater, 646 Main St., Buffalo, 5/06/75, A,C, 75001186

South Buffalo North Side Light [U.S. Coast Guard Lighthouses and Light Stations on the Great Lakes TR], Buffalo Harbor, Buffalo, 8/04/83, A, 83001673

St. Andrew's Evangelical Lutheran Church Complex, Sherman and Peckham Sts., Buffalo, 9/08/83, A,C,a, 83001674

St. Paul's Cathedral, 139 Pearl St., Buffalo, 12/23/87, C,a, NHL, 87002600

Erie County—Continued

St. Paul's Episcopal Cathedral, 125 Pearl St., Buffalo, 3/01/73, C,a, 73002298

Thomas Indian School, NY 438 on Cattaraugus Reservation, Irving, 1/25/73, A,C, 73001188

U.S. Post Office, 121 Ellicott St., Buffalo, 3/16/72, C, 72000839

US Post Office—Akron [US Post Offices in New York State, 1858-1943, TR], 118 Main St., Akron, 11/17/88, A,C, 88002449

US Post Office—Angola [US Post Offices in New York State, 1858-1943, TR], 80 N. Main St., Angola, 11/17/88, A,C, 88002452

US Post Office—Depew [US Post Offices in New York State, 1858-1943, TR], Warsaw St., Depew, 11/17/88, A,C, 88002481

USS THE SULLIVANS (destroyer), 1 Naval Cove Pk., Buffalo, 1/14/86, A,g, NHL, 86000085

West Village Historic District, Roughly bounded by S. Elmwood Ave., Chippewa, Georgia, Prospect, Carolina and Tracy Sts., Buffalo, 5/06/80, C, 80002610

Williamsville Water Mill Complex, 56 and 60 Spring St., Williamsville, 9/22/83, A,C, 83001675

Woodlawn Avenue Row [Masten Neighborhood Rows TR], 75—81 Woodlawn Ave., Buffalo, 3/19/86, C, 86000690

Young Men's Christian Association Central Building, 45 W. Mohawk St., Buffalo, 9/08/83, A,C, 83001676

Essex County

Adirondack Iron and Steel Company, Address Restricted, Tahawus vicinity, 10/05/77, A,D, 77000940

Black Watch Library [Ticonderoga MRA], 161 Montcalm St., Ticonderoga, 11/15/88, C, 88002199

Brown, John, Farm, John Brown Rd., Lake Placid, 6/19/72, A,B,c, 72000840

Burleigh, H. G., House [Ticonderoga MRA], 307 Champlain Ave., Ticonderoga, 11/15/88, C, 88002192

Camp Santanoni [Great Camps of the Adirondacks TR], N of NY 28N, Newcomb vicinity, 4/03/87, C, 86002955

Central School [Ticonderoga MRA], 324 Champlain Ave., Ticonderoga, 11/15/88, A,C, 88002202

Church of the Nazarene, W of Essex on NY 22, Essex vicinity, 6/19/73, C,a, 73001189

Clark House [Ticonderoga MRA], 331 Montcalm St., Ticonderoga, 11/15/88, C, 88002204

Community Building [Ticonderoga MRA], Montcalm and Champlain Sts., Ticonderoga, 11/15/88, C, 88002198

Delano, Clayton H., House [Ticonderoga MRA], 25 Father Jogues Pl., Ticonderoga. 11/15/88, C, 88002195

Edgewater Farm, 470 Point Rd., Willsboro Point vicinity, 2/17/88, A,C,b, 88000035

Essex County Home and Farm, SW of Whallonsburg on NY 22, Whallonsburg vicinity, 9/23/82, A,C, 82003357

Essex Village Historic District, Town of Essex and surroundings on W bank of Lake Champlain, Essex and vicinity, 5/28/75, A,C, 75001187

Ferris House [Ticonderoga MRA], 16 Carillon Rd., Ticonderoga, 11/15/88, C, 88002203

First Congregational and Presbyterian Society Church of Westport, Main St./CR 10, Westport, 12/19/88, C,a,b, 88002750

Fort Crown Point, Crown Point Reservation, SW of Lake Champlain Bridge and NY 8, Crown Point vicinity, 11/24/68, A,C,D, NHL, 68000033

Fort St. Frederic, Jct. of NY 8 and 9N, Crown Point, 10/15/66, D, NHL, 66000517

Fort Ticonderoga, 2.5 mi. S of Ticonderoga on NY 22, Ticonderoga vicinity, 10/15/66, A,D, NHL, 66000519

Fried, Samson, Estate, NY 74, Severance, 2/26/87, C, 87000225

Gilligan and Stevens Block [Ticonderoga MRA], 115 Montclam St., Ticonderoga, 11/15/88, C, 88002193

Hancock House [Ticonderoga MRA], Montcalm and Wicker Sts., Ticonderoga, 11/15/88, C, 88002197

Hand-Hale Historic District, River and Maple Sts., Elizabethtown, 3/05/79, B,C, 79001582

Ironville Historic District, Area surrounding Ironville including Furnace St. and Penfield Pond, Ironville, 12/27/74, A,B,C, 74001237

Moore, Silas B., Gristmill [Ticonderoga MRA], 218 Montcalm St., Ticonderoga, 11/15/88, C, 88002190

NYS Armory [Ticonderoga MRA], 315 Champlain Ave., Ticonderoga, 11/15/88, C, 88002200

Octagonal Schoolhouse, On Rte. 22 in Bouquet, Essex vicinity, 1/17/73, A,C, 73001190

PAD Factory, The [Ticonderoga MRA], 109 Lake George Ave., Ticonderoga, 11/15/88, A,C, 88002205

Rembrandt Hall [Keeseville Village MRA], Clinton St., Keeseville, 5/20/83, C, 83001677

St. Mary's Church and Rectory [Ticonderoga MRA], 10—12 Father Jogues Pl., Ticonderoga, 11/15/88, C,a, 88002196

Ticonderoga High School [Ticonderoga MRA], Calkins Pl., Ticonderoga, 11/15/88, C, 88002201

Ticonderoga National Bank [Ticonderoga MRA], 101 Montcalm St., Ticonderoga, 11/15/88, C, 88002194

Ticonderoga Pulp and Paper Company Office [Ticonderoga MRA], Montcalm St., Ticonderoga, 11/15/88, A,C, 88002191

Tomlinson House [Keeseville Village MRA], Kent St., Keeseville, 5/20/83, C, 83001678

US Post Office—Lake Placid [US Post Offices in New York State, 1858-1943, TR], 201 Main St., Lake Placid, 11/17/88, A,C, 88002339

Van Ornam & Murdock Block, Main St., Port Henry, 11/14/82, A,C, 82001172

Watson, Elkanah, House, 3 mi. E of U.S. 9, Port Kent, 10/15/66, B, NHL, 66000518

Will Rogers Memorial Hospital, NY 86, Saranac Lake, 9/08/83, A,C, 83001679

Willsboro Congregational Church, NY 22, Willsboro, 5/31/84, C,a, 84002391

Franklin County

Berkeley Square Historic District, 30—84 Mai St., 2—29 Broadway, Saranac Lake, 2/11/8 A,B,C, 88000114

Camp Topridge [Great Camps of the Adiro dacks TR], S of Keese Mills Rd., Upper St. R gis Lake, Keese Hill vicinity, 11/07/86, 86002952

Camp Wild Air [Great Camps of the Adir dacks TR], Upper St. Regis Lake, Upper Regis, 11/07/86, C, 86002930

Eagle Island Camp [Great Camps of the Adir dacks TR], Eagle Island, Upper Sara Lake, Saranac Inn vicinity, 4/03/87, 86002941

Horton Gristmill, Mill St., Malone, 4/21 A,C, 75001188

Joseph, Beth, Synagogue, Lake and Mill Tupper Lake, 9/01/88, C,a, 88001441

Lincoln, Anselm, House, 49 Duane St., Ma 4/21/75, A,C, 75001189

Malone Freight Depot, 99 Railroad St., M 12/12/76, A,C, 76001217

Moss Ledge [Great Camps of the Adiron TR], Off NY 30, Upper Saranac Lake. nac Inn vicinity, 11/07/86, C, 86002

Paddock Building, 34 W. Main St., M 11/07/76, A,C, 76001218

Prospect Point Camp [Great Camps of th rondacks TR], E of NY 30, Saranac Inn ity, 11/07/86, C,a, 86002947

Smith's, Paul, Electric Light and Powe Railroad Company Complex, 2 Main St anac Lake, 11/02/87, A,C, 87001898

Fulton County

Dolge Company Factory Complex, S. M Dolgeville, 9/17/74, A,B,C, 74001238

Downtown Gloversville Historic Roughly bounded by Spring, Pros Fulton, N. and S. Main and Elm Sts., ville, 9/12/85, A,C, 85002367

Fulton County Courthouse, N. Willi Johnstown, 7/24/72, A,C, 72000841

Fulton County Jail, Perry and Montgon Johnstown, 10/19/81, A,C, 8100040

Garoga Site, Address Restricted, Eph cinity, 7/22/80, D, 80002613

Gloversville Free Library, 58 E. Fulton sville, 5/24/76, A,C, 76001219

REFERENCE 19

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Hartwell Street

I.D. NUMBER: 915030

PERSON CONTACTED: Chief Larson

DATE: 10/5/90

PHONE NUMBER: 851-5707

AFFILIATION: Bureau of Fire Prevention

CONTACT PERSON(S): Judy Vangalio

ADDRESS: 312 City Hall
Buffalo, NY 14202

TYPE OF CONTACT: Telephone Interview

INTERVIEW SUMMARY

Atlas Steel Casing Company and the associated Hartwell Street Landfill is a fire hazard. This is due to the area being abandoned, and it is has already had several fires.

ACKNOWLEDGMENT

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to Ecology and Environment, Inc. interviewer(s) (as revised below, if necessary).

Revisions (please write in any corrections needed to above transcript)

Signature: Fred Larson Date: 10-10-90

The complex is in the final stages of demolition and all demolition should be completed shortley. When this is finished there will no longer be a FIRE hazard.

Fred Larson Chief,
Bureau Of Fire Prevention

Fred Larson

REFERENCE 20

15 (12-75)

New York State Department of Environmental Conservation

MEMORANDUM

TO: Atlas Steel File
FROM: Tom Johnson TJ
SUBJECT: Sampling Results

DATE: 2/18/87

On February 9, 1987, our office received the sampling results from the site investigation done September 17-19, 1986. Four samples were sent for analysis, consisting of two foundry sand samples, one drummed liquid sample and one spilled material sample. The foundry sand was analyzed for E. P. Tox. metals and phenols. The drummed liquid was tested for ignitability and the spilled material was tested for corrosivity. The results of the analyses are as follows:

E. P. Tox Metals: Both foundry sand samples passed the metals test, making the representative samples non-hazardous.

Phenols: Trace levels of total phenols were found in each sample of foundry sand.

Ignitability: The drum sample was ignitable, making it a hazardous waste.

pH: The spilled material was a caustic substance but fell below hazardous waste levels for corrosivity.

The foundry sand sampled was representative of drummed sand and mounds of sand. Approximately 200 55-gallon drums of foundry sand are on-site plus large mounds of sand at different locations around the property. Various clusters of 55-gallon drums of oils, resins and miscellaneous compounds are also on the property. The drum sampled was one of a kind on-site and was labeled "Lino-cure".

Robert Wozniak, of the Solid and Hazardous Waste Division, is the contact person for this site. The sample results were issued to him for further cleanup procedures at this site.

TJ:jb

REFERENCE 21

NAME OF SITE: Hartwell Street Landfill

CATION: Foot of Hartwell Street, Buffalo (C), Erie County

RRENT OWNER: Atlas Steel Company

ISTORY

It was reported that low areas on the Atlas Steel Casting Plant grounds were filled with earthen materials and building debris. Also spent casting sand nd pollution control equipment dust were stored at the site prior to off-site disposal. Citizens living near the plant complained that material was disposed of outside Atlas Steel Casting's fence and that poor housekeeping of materials as practiced in the area. Subsequent investigations by the Erie County Department f Environment and Planning revealed that concrete and brick was accumulating on site, however no foundry sand was observed.

INVESTIGATION

his site was inspected on March 29, 1982 by Messrs. Christoffel and Senior of the DEC - Region 9 office. Samples were obtained from three locations. The first was from a puddle of water on the east side of the landfill. The econd location was from a puddle of water on the west side of the landfill, near the Atlas Steel Company property. Both water and soil samples were taken at these locations. The third location was a sump in the basement of a house djacent to the landfill. A water sample was taken from this location.

OIL AND GEOLOGICAL INFORMATION

The soil in this area has been classified by the USDA Soil Conservation Service as urban soils. This means that the area has received extensive disturbance to the original soil by filling and/or removal.

The bedrock in this area is of the Skaneateles and Marcellus Formations which re made up of shale and thin limestone. The approximate depth of the bedrock in this area is 60 to 80 feet.

ISCUSSION OF RESULTS

The water samples contained concentrations of lead in excess of the effluent standards at locations #2 and #3, as well as detectable concentrations of chromium, copper, zinc and total organic carbon. The soil samples contained fairly high amounts of copper, nickel, and zinc, and detectable amounts of chromium, lead and silver.

At the time of this inspection there were no signs of leachate or other material leaving the site, nor were there any detectable odors. Access to this site is partially restricted; part of the landfill is fenced on the Atlas Steel property and part is open. This site is above the 100 year flood level. A code of F has been assigned to this site meaning "no further action is required; subsequent investigation has shown that no in-place toxics are present in dangerous amounts, and the sites do not present a toxics hazard".

RECOMMENDATIONS

Based on the data collected, this site does not appear to present a hazard to health or the environment. A final decision should be made concerning remedial work at this site after analysis of samples obtained as part of the Niagara River study.

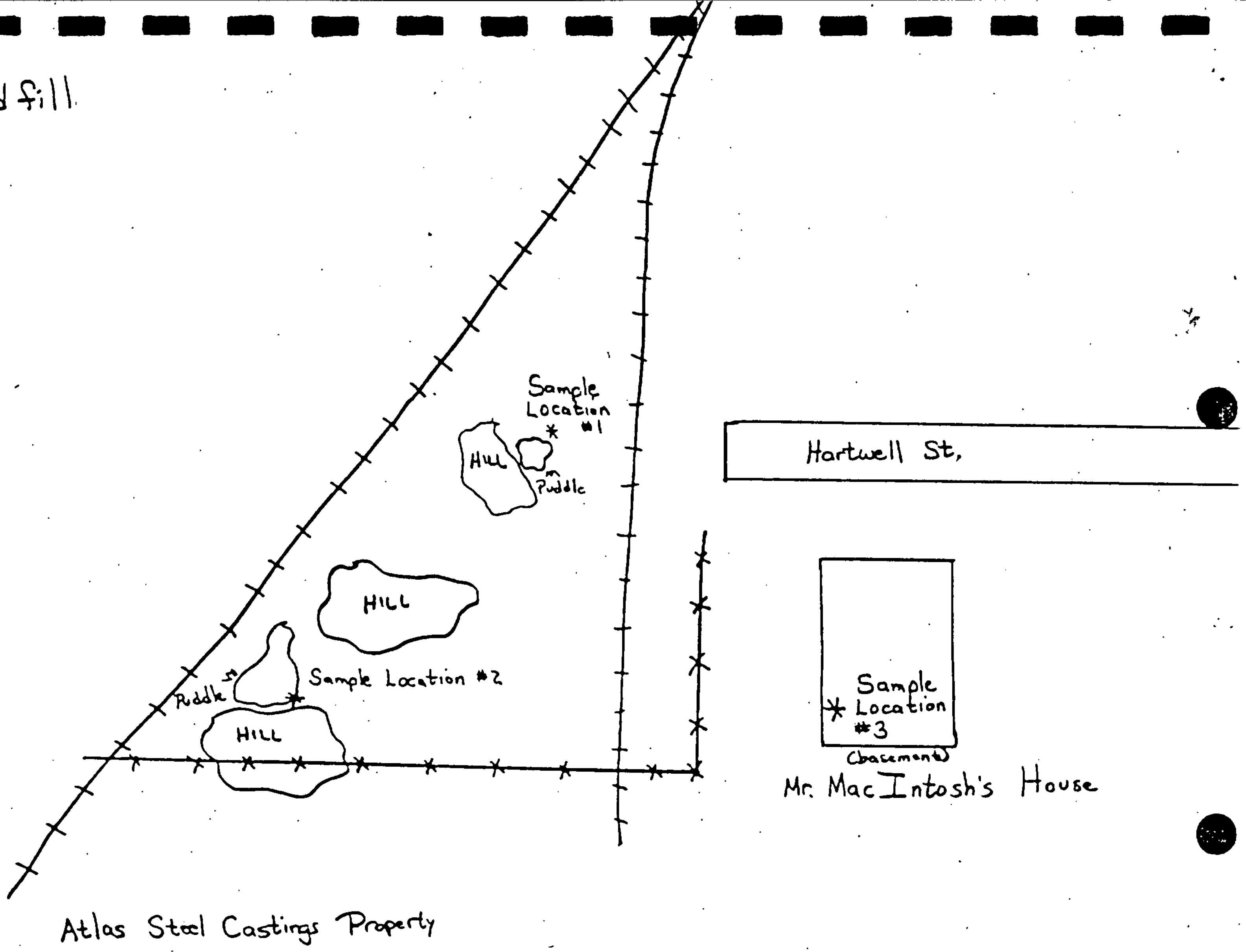
HARTWELL STREET LANDFILL - Water Analyses

PARAMETER	UNITS	Site Locations #1	 #2	 #3	EFFLUENT STANDARD
rsenic	ug/l	<5	<5	<5	0.05 mg/l
Selenium	ug/l	<5	<5	<5	0.04 mg/l
ercury	ug/l	<1	<1	<1	0.004 mg/l
Thallium	mg/l	<0.1	<0.1	<0.1	
Antimony	mg/l	<0.2	<0.2	0.2	
Cadmium	mg/l	<0.004	0.018	<0.004	0.02 mg/l
Chromium	mg/l	0.025	<0.004	<0.004	0.10 mg/l
Copper	mg/l	0.016	<0.005	<0.005	1.0 mg/l
Zinc	mg/l	0.068	0.066	0.081	5.0 mg/l
Lead	mg/l	<0.03	0.18	0.37	0.05 mg/l
Nickel	mg/l	<0.03	<0.03	<0.03	2.0 mg/l
Silver	mg/l	<0.01	<0.01	<0.01	0.1 mg/l
Beryllium	mg/l	<0.01	<0.01	<0.01	
Total Organic Carbon	mg/l	6.5	6.5	7.5	
Phenol	mg/l	<0.01	<0.01	---	0.002 mg/l

HARTWELL STREET LANDFILL - Soil Analyses

PARAMETER	UNITS	SITE LOCATION #1	SITE LOCATION #2
Arsenic	ug/g dry	2.2	1.1
Selenium	ug/g dry	<0.2	<0.1
Mercury	ug/g dry	0.08	0.04
Thallium	ug/g dry	<2	6.5
Antimony	ug/g dry	<5	<5
Cadmium	ug/g dry	0.23	<0.2
Chromium	ug/g dry	12	94
Copper	ug/g dry	43	260
Zinc	ug/g dry	98	100
Lead	ug/g dry	68	44
Nickel	ug/g dry	17	180
Silver	ug/g dry	0.51	3.8
Beryllium	ug/g dry	0.50	<0.5
Halogenated Organic	ug/g dry as Cl_2 Lindane Standard	<0.5	<0.5
Phenol	ug/g dry	<0.4	<0.4
Dry Weight	%	63	65

Hartwell St. Landfill
3/29/82
T. Christoffel



REFERENCE 22

ANALYTICAL DATA

APPENDIX D THIS REPORT

5.5

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 State: NY

02 Site Number: 915030

II. SITE NAME AND LOCATION

01 Site Name (Legal, common, or descriptive name of site): Hartwell Street Landfill

02 Street, Route No., or Specific Location Identifier: 1963 Elmwood Avenue

03 City	04 State	05 Zip Code	06 County	07 County Code	08 Cong. Dist.
Buffalo	NY	14207	Erie	029	37

09 Coordinates Latitude: 4 2 5 7 0 4.

Longitude: 7 8 5 2 3 5.

10 Type of Ownership (Check One)
☒ A. Private ☐ B. Federal ☐ C. State
☐ D. County ☐ E. Municipal
☐ F. Other ________ ☐ G. Unknown

III. INSPECTION INFORMATION

01 Date of Inspection: 4 / 16 / 90 (Month Day Year)

02 Site Status: ☐ Active ☒ Inactive

03 Years of Operation: 1952 (Beginning Year) | 1986 (Ending Year) ☐ Unknown

04 Agency Performing Inspection (Check all that apply)
☐ A. EPA ☐ B. EPA Contractor ________ (Name of Firm) ☐ C. Municipal
☐ D. Municipal Contractor ________ (Name of Firm) ☐ E. State ☒ F. State Contractor Ecology and Environment Engineering, P.C. (E & E) (Name of Firm)
☐ G. Other (Specify) ________

05 Chief Inspector	06 Title	07 Organization	08 Telephone No.
John Nickerson	Geologist	E & E	(716)684-8060

09 Other Inspectors	10 Title	11 Organization	12 Telephone No.
Robert Meyers	Geologist	E & E	(716)684-8060
			( )
			( )
			( )

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
			( )
			( )
			( )
			( )
			( )

17 Access Gained by (Check one): Permission

18 Time of Inspection: 1200

19 Weather Conditions: Sunny, 50°, - 10 mph wind, low humidity

IV. INFORMATION AVAILABLE FROM

01 Contact	02 Agency/Organization	03 Telephone No.
James Griffis	E & E	(716)684-8060

04 Person Responsible for Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
James Griffis		E & E	(716)684-8060	4 / 6 / 90 (Month Day Year)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 State	02 Site Number
NY	915030

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 Physical States
(Check all that apply)

[X] A. Solid
[ ] B. Powder, Fines
[ ] C. Sludge
[ ] D. Other ______________
(Specify)
[ ] E. Slurry
[ ] F. Liquid
[ ] G. Gas

02 Waste Quantity at Site
(Measure of waste quantities must be independent)

Tons Unknown
Cubic Yards ______
No. of Drums ______

03 Waste Characteristics (Check all that apply)

[ ] A. Toxic
[ ] B. Corrosive
[ ] C. Radioactive
[ ] D. Persistent
[ ] E. Soluble
[ ] F. Infectious
[ ] G. Flammable
[X] H. Ignitable
[ ] I. Highly volatile
[ ] J. Explosive
[ ] K. Reactive
[ ] L. Incompatible
[ ] M. Not applicable

III. WASTE TYPE

Category	Substance Name	01 Gross Amount	02 Unit of Measure	03 Comments
SLU	Sludge			
OLW	Oily waste			
SOL	Solvents			
PSD	Pesticides			
OCC	Other organic chemicals			
IOC	Inorganic chemicals			
ACD	Acids			
BAS	Bases			
MES	Heavy Metals			

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

01 Category	02 Substance Name	03 CAS Number	04 Storage/Disposal Method	05 Concentration	06 Measure of Concentration

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)

NYSDEC Phase I Report, 1986

02[UZ]YP7080:D3136/3982

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 State NY

02 Site Number 915030

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [ ] A. Groundwater Contamination 02 [ ] Observed (Date ________) [X] Potential [ ] Alleged
03 Population Potentially Affected ________ 04 Narrative Description

No groundwater samples collected.

01 [X] B. Surface Water Contamination 02 [ ] Observed (Date 3/29/82) [ ] Potential [ ] Alleged
03 Population Potentially Affected ________ 04 Narrative Description:

NYSDEC collected surface water samples (from puddles) on site. Results showed lead in excess of effluent standards and Cr, Cu, Zn and TOC in detectable concentrations.

01 [ ] C. Contamination of Air 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
03 Population Potentially Affected ________ 04 Narrative Description:

None expected or observed.

01 [X] D. Fire/Explosive Conditions 02 [ ] Observed (Date 2/9/87) [X] Potential [ ] Alleged
03 Population Potentially Affected ________ 04 Narrative Description:

A drum passed an ignitability test during NYSDEC sampling.

01 [ ] E. Direct Contact 02 [ ] Observed (Date ________) [X] Potential [ ] Alleged
03 Population Potentially Affected ________ 04 Narrative Description:

Waste is uncovered. Access is not restricted.

01 [ ] F. Contamination of Soil 02 [ ] Observed (Date ________) [X] Potential [ ] Alleged
03 Area Potentially Affected ________ 04 Narrative Description:

Soil samples collected by NYSDEC in 1982 contained Cu, Ni, and Zn in fairly high concentrations and Cr, Pb and Ag in detectable amounts.

01 [ ] G. Drinking Water Contamination 02 [ ] Observed (Date ________) [ ] Potential [ ] Alleged
03 Population Potentially Affected ________ 04 Narrative Description:

None expected or observed. All nearby residents on municipal water from Niagara River.

01 [ ] H. Worker Exposure/Injury 02 [ ] Observed (Date ________) [X] Potential [ ] Alleged
03 Workers Potentially Affected ________ 04 Narrative Description:

Demolition and renovation work is ongoing at the site. Number of workers and hours on site are unknown.

01 [ ] I. Population Exposure/Injury 02 [ ] Observed (Date ________) [X] Potential [ ] Alleged
03 Population Potentially Affected 22,810 04 Narrative Description:

22,810 people within a 1-mile radius. Waste is uncovered and site is unsecured.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

EPA

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)

I. IDENTIFICATION

01 State NY	02 Site Number 915030

II. HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)

01 ☐ J. Damage to Flora 02 ☐ Observed (Date ________) ☐ Potential ☐ Alleged
04 Narrative Description:

None observed or expected.

01 ☐ K. Damage to Fauna 02 ☐ Observed (Date ________) ☐ Potential ☐ Alleged
04 Narrative Description:

None observed or expected.

01 ☐ L. Contamination of Food Chain 02 ☐ Observed (Date ________) ☐ Potential ☐ Alleged
04 Narrative Description:

None observed or expected.

01 ☐ M. Unstable Containment of Wastes (Spills/Runoff/Standing liquids, Leaking drums) 02 ☐ Observed (Date ________) ☐ Potential ☐ Alleged
03 ☐ Population Potentially Affected ________ 04 Narrative Description:

Leaking drums have been observed during NYSDEC site inspections.

01 ☐ N. Damage to Offsite Property 02 ☐ Observed (Date ________) ☐ Potential ☐ Alleged
04 Narrative Description:

None observed or expected.

01 ☐ O. Contamination of Sewers, Storm/ Drains, WWTPs 02 ☐ Observed (Date ________) ☒ Potential ☐ Alleged
04 Narrative Description:

Storm drainage system unknown. Potential contamination possible due to runoff from site.

01 ☐ P. Illegal/Unauthorized Dumping 02 ☐ Observed (Date ________) ☐ Potential ☐ Alleged
04 Narrative Description:

None observed or expected.

05 Description of Any Other Known, Potential, or Alleged Hazards
Nine transformers and potentially stained soil, possibly leaking oil storage tanks, pits in on-site building.

III. TOTAL POPULATION POTENTIALLY AFFECTED 22,810 people within 1-mile radius.

IV. COMMENTS

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

NYSDEC Phase I Report, 1986.
NYSDEC Regional and State Files.
NYSDOH files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 State	02 Site Number
NY	915030

II. PERMIT INFORMATION

01 Type of Permit Issued (Check all apply)	02 Permit Number	03 Date Issued	04 Expiration Date	05 Comments
☐ A. NPDES NA				
☐ 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	04 Treatment (Check all that apply)	05 Other
☐ A. Surface Impoundment			☐ A. Incineration	☒ A. Buildings On Site
☒ B. Piles			☐ B. Underground Injection	
☒ C. Drums, Above Ground			☐ C. Chemical/Physical	
☐ D. Tank, Above Ground			☐ D. Biological	
☐ E. Tank, Below Ground			☐ E. Waste Oil Processing	
☐ F. Landfill			☐ F. Solvent Recovery	06 Area of Site
☐ G. Landfarm			☐ G. Other Recycling Recovery	
☒ H. Open dump			☐ H. Other ______ (specify)	5 Acres
☐ I. Other ______ (Specify)				

07 Comments

IV. CONTAINMENT

01 Containment of Wastes (Check one)

☐ A. Adequate, Secure ☐ B. Moderate ☒ C. Inadequate, Poor ☐ D. Insecure, Unsound, Dangerous

02 Description of Drums, Diking, Liners, Barriers, etc.
Drums observed to be leaking. No other containment visible.

V. ACCESSIBILITY

01 Waste Easily Accessible: ☒ Yes ☐ No
02 Comments:
Waste uncovered. Site unsecured.

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

NYSDEC Phase I Report, 1986.
NYSDEC and NYSDOH site files.

EPA

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

I. IDENTIFICATION

01 State	02 Site Number
NY	915030

II. DRINKING WATER SUPPLY

01 Type of Drinking Supply (Check as applicable)

	Surface	Well
Community	A. [X]	B. [ ]
Non-community	C. [ ]	D. [ ]

02 Status

Endangered	Affected	Monitored
A. [ ]	B. [ ]	C. [ ]
D. [ ]	E. [ ]	F. [ ]

03 Distance to Site

A ______ (mi)

B ______ (mi)

III. GROUNDWATER

01 Groundwater Use in Vicinity (Check one)

[ ] A. Only Source for Drinking

[ ] B. Drinking (Other sources available) Commercial, industrial, irrigation (No other water sources available)

[X] C. Commercial, industrial, irrigation (Limited other sources available)

[ ] D. Not Used, Unusable

02 Population Served by Groundwater NA

03 Distance to Nearest Drinking Water Well NA (mi)

04 Depth to Groundwater 60-80 (ft)

05 Direction of Groundwater Flow Unknown

06 Depth to Aquifer of Concern 60-80 (ft)

07 Potential Yield of Aquifer Unknown (gpd)

08 Sole Source Aquifer [ ] Yes [X] No

09 Description of Wells (including usage, depth, and location relative to population and buildings)

NA

10 Recharge Area

[X] Yes

[ ] No

Comments:

11 Discharge Area

[ ] Yes

[ ] No

Comments:

IV. SURFACE WATER

01 Surface Water (Check one)

[X] A. Reservoir, Recreation, Drinking Water Source

[ ] B. Irrigation, Economically Important Resources

[ ] C. Commercial, Industrial

[ ] D. Not Currently Used

02 Affected/Potentially Affected Bodies of Water

Name:	Affected	Distance to Site
Lake Erie	[ ]	5.5 (mi)
Niagara River	[ ]	1.7 (mi)
Scajaquada Creek	[ ]	1.1 (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. 22,180	B. 91,630	C. 197,410
No. of Persons	No. of Persons	No. of Persons

02 Distance to Nearest Population 0.06 (mi)

03 Number of Buildings Within Two (2) Miles of Site ______

04 Distance to Nearest Off-Site Home 0.06 (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)

East of the site is a small urban residential area. Elsewhere are commercial and industrial areas.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA (Cont.)

I. IDENTIFICATION

01 State
NY

02 Site Number
915030

VI. ENVIRONMENTAL INFORMATION

01 Permeability of Unsaturated Zone (Check one)

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

02 Permeability of Bedrock (Check one)

☐ A. Impermeable (Less than 10^{-6} cm/sec) ☐ B. Relatively Impermeable ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. Relatively Permeable ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. Very Permeable (Greater than 10^{-2} cm/sec)

03 Depth to Bedrock
60-80 (ft)

04 Depth of Contaminated Soil Zone
Unknown

05 Soil pH
Unknown

06 Net Precipitation
9" (in)

07 One Year 24-Hour Rainfall
2.1" (in)

08 Site Slope
0.5" %

Direction of Site Slope
South

Terrain Average Slope
0.5 %

09 Flood Potential
Site is in >100 Year Floodplain

10 ☐ Site is on Barrier Island, Coastal High Hazard Area, Riverine Floodway

11 Distance to Wetlands (5 acre minimum)

ESTUARINE	NA	OTHER
A. >2 (mi)		B. >1 (mi)

12 Distance to Critical Habitat (of endangered species)
>1 (mi)
Endangered Species: ______

13 Land Use in Vicinity
Distance to:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREA; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AG LAND
A. 0.0 (mi)	B. 0.06 (mi)	C. >2 (mi)	D. >1 (mi)

14 Description of Site in Relation to Surrounding Topography

Site is relatively flat and is surrounded by urban areas that are also flat.

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

U.S.G.S. Topographic Map - Buffalo NW Quadrangle
NYSDEC Phase I Report, 1986.
NYSDEC and NYSDOH site files.
E & E Site Inspection, 1990.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 6 - SAMPLE AND FIELD INFORMATION	I. IDENTIFICATION 01 State NY	02 Site Number 915030

II. SAMPLES TAKEN - No samples taken during S.I.

Sample Type	01 Number of Samples Taken	02 Samples Sent to	03 Estimated Date Results Available
Groundwater	--		
Surface Water	2	E & E's ASC	Appendix D
Waste	3		
Air	--		
Runoff	--		
Spill			
Soil (Subsurface surface)	17/7	E & E's ASC	Appendix D
Vegetation	--		
Other Sediment	2	E & E's ASC	Appendix D

III. FIELD MEASUREMENTS TAKEN

01 Type	02 Comments
OVA	No readings above background.
HNu	No readings above background.
MiniRad	No radioactive sources noted.

IV. PHOTOGRAPHS AND MAPS

01 Type [X] Ground [ ] Aerial

02 In Custody of Ecology and Environment Engineering PC
(Name of Organization or Individual)

03 Maps
[X] Yes
[ ] No

04 Location of Maps
Ecology and Environment Engineering PC

V. OTHER FIELD DATA COLLECTED (Provide narrative description of sampling activities)

Geophysical surveys with an EM31 terrain conductivity meter and a proton precession magnetometer. Results in Appendix B.

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

E & E Site Inspection, 1990.

EPA POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION	I. IDENTIFICATION 01 State NY 02 Site Number 915030

II. CURRENT OWNER(S)			PARENT COMPANY (if applicable)		
01 Name R. Pasquerella/D. Mele	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.) 157 Comet Street	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City Buffalo	06 State NY	07 Zip Code	12 City	13 State	14 Zip Code
01 Name	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City	06 State	07 Zip Code	12 City	13 State	14 Zip Code
01 Name	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City	06 State	07 Zip Code	12 City	13 State	14 Zip Code
01 Name	02 D+B Number		08 Name	09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)	11 SIC Code	
05 City	06 State	07 Zip Code	12 City	13 State	14 Zip Code
III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (if applicable, most recent first)		
01 Name Atlas Steel Casting	02 D+B Number		01 Name	02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.) 1463 Elmwood Avenue	04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	
05 City Buffalo	06 State NY	07 Zip Code	05 City	06 State	07 Zip Code
01 Name	02 D+B Number		01 Name	02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	
05 City	06 State	07 Zip Code	05 City	06 State	07 Zip Code
01 Name	02 D+B Number		01 Name	02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	
05 City	06 State	07 Zip Code	05 City	06 State	07 Zip Code

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

E & E Site Inspection, 1990.
NYSDEC Phase I Report, 1986.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 8 - OPERATOR INFORMATION - NA

I. IDENTIFICATION	
01 State NY	02 Site Number 915030

II. CURRENT OPERATOR (if different from Owner)			OPERATOR'S PARENT COMPANY (if applicable)		
01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner				

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)			PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)		
01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				
01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				
01 Name		02 D+B Number	10 Name		11 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)		13 SIC Code
05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
08 Years of Operation	09 Name of Owner During This Period				

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
NY

02 Site Number
915030

II. ON-SITE GENERATOR - NA

01 Name
02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)
04 SIC Code
05 City
06 State
07 Zip Code

III. OFF-SITE GENERATOR(S) - NA

01 Name
02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)
04 SIC Code
05 City
06 State
07 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

01 Name
02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)
04 SIC Code
05 City
06 State
07 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

IV. TRANSPORTER(S) - NA

01 Name
02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)
04 SIC Code
05 City
06 State
07 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

01 Name
02 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)
04 SIC Code
05 City
06 State
07 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

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 NY	02 Site Number 915030

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 ________ 03 Agency ____________________
04 Description:

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 Treament 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:

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

PART 10 - PAST RESPONSE ACTIVITIES (Cont.)

I. IDENTIFICATION

01 State
NY

02 Site Number
915030

II. PAST RESPONSE ACTIVITIES (Cont.)

01 [ ] Q. Subsurface Cutoff Wall 02 Date ________ 03 Agency ________
04 Description:

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)

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

I. IDENTIFICATION

01 State	02 Site Number
NY	915030

II. ENFORCEMENT INFORMATION

01 Past Regulatory/Enforcement Action [ ] Yes [ ] No

02 Description of Federal, State, Local Regulatory/Enforcement Action

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

6

6. REFERENCES

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Appendices

APPENDIX A

SITE-SPECIFIC SAFETY PLAN

ecology and environment, inc.

SITE SAFETY PLAN

Version 988

A. GENERAL INFORMATION

Project Title: Hartwell Street Landfill

Project No.: YP-7000

TDD/Pan No.: --

Project Manager: J. Nickerson

Project Dir.: J. Griffis

Location(s): Elmwood Hartwell Street

Prepared by: J. Nickerson

Date Prepared: 4/16/90

Approval by: __________

Date Approved: 4/20/90

Site Safety Officer Review: __________

Date Reviewed: __________

Scope/Objective of Work: Geophysical surveying, drilling and well installation, sampling

Proposed Date of Field Activities: w/e 4/21

Background Info: Complete: [X] Preliminary (No analytical data available) [ ]

Documentation/Summary:

Overall Chemical Hazard:	Serious	[ ]	Moderate	[ ]
	Low	[X]	Unknown	[ ]
Overall Physical Hazard	Serious	[ ]	Moderate	[X]
	Low	[ ]	Unknown	[ ]

- -

B. SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[ ]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[ ]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	E-P Toxic	[X]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[ ]	Radioactive*	[ ]

Other: __________

Physical Hazards:

Overhead	[X]	Confined* Space	[ ]	Below Grade	[ ]	Trip/Fall	[X]
Puncture	[ ]	Burn	[ ]	Cut	[X]	Splash	[ ]
Noise	[ ]	Other:					

---

*Requires completion of additional form and special approval from the Corporate Health/Safety group. Contact RSC or HQ.

Site History/Description and Unusual Features (see Sampling Plan for detailed description): Abandoned foundry (Atlas Steel); drums of casting sand on site.

Locations of Chemicals/Wastes: Drums on central portion of site; grassed-over water pipes at north end of site.

Estimated Volume of Chemicals/Wastes: 400 yd3; some of which is drummed

Site Currently in Operation Yes: [ ] No: [X]

C. HAZARD EVALUATION

List Hazards by Task (i.e., drum sampling, drilling, etc.) and number them. (Task numbers are cross-referenced in Section D)

Physical Hazard Evaluation: Sampling in abandoned buildings with no windows (open-air type; formerly a railroad passed through one end of building; overhead hazards).

Chemical Hazard Evaluation:

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
Copper		Dust/inhalation	None	--	--
Lead		Dust/inhalation	None	--	--
Phenols		Vapor/ inhalation	Headaches, nausea, dizziness	--	Heavy oily odor
H_2S		Inhalation	Headaches	Low	Rotten eggs

Note: Complete and attach a Hazard Evaluation Sheet for major known contaminant.

D. SITE SAFETY WORK PLAN

Site Control: Attach map, use back of this page, or sketch of site showing hot zone, contamination reduction, zone, etc.

Perimeter identified? [Y] Site secured? Partially; gate always open on north end.

Work Areas Designated? [Y] Zone(s) of Contamination Identified? [Y]

Personnel Protection (TLD badges required for all field personnel):

Anticipated Level of Protection (Cross-reference task numbers to Section C):

	A	B	C	D
Task 1				X
Task 2				X
Task 3				X
Task 4				

(Expand if necessary)

Modifications: Steel-toed shoes, hard hat, booties, (Tyvek gloves) for drilling and sampling.

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates >_____ mg/m^3, other ______________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapor (in breathing zone) >5 ppm, particulates >_____ mg/m^3, other ___________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates >_____ mg/m^3, other ____________.
- Level A: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates >_____ mg/m^3, other ________.

Air Monitoring (daily calibration unless otherwise noted):

Contaminant of Interest	Type of Sample (area, personal)	Monitoring Equipment	Frequency of Sampling
Copper	Area	Mini Ram	Continuous
Lead	Area	Mini Ram	Continuous
H2S	Air in work area	--	Continuous

(Expand if necessary)

Decontamination Solutions and Procedures for Equipment, Sampling Gear, etc.:

TSP wash, D.I. rinse, wipe clean.

Personnel Decon Protocol: Dispose of all protective wear; triple bag, label, and dispose of at lab; render Tyvek unusable.

Decon Solution Monitoring Procedures, if Applicable:

Special Site Equipment, Facilities, or Procedures (Sanitary Facilities and Lighting Must Meet 29 CFR 1910.120):

During drilling, portable toilet will be on site.

Site Entry Procedures and Special Considerations: Enter through gate next to Frontier Lumber.

Work Limitations (time of day, weather conditions, etc.) and Heat/Cold Stress Requirements:

Work only during daylight hours; no drilling if thunderstorming; no use of cathead if any sort of rain.

General Spill Control, if applicable: N/A

Investigation-Derived Material Disposal (i.e., expendables, decon waste, cuttings):

- Dispose of waste waters on site.
- Dispose of disposable clothing at E & E's trash.

Sample Handling Procedures Including Protective Wear:

N/A

Team Member*	Responsibility
Jon Nickerson	Team Leader
Bob Meyers	Site Safety Officer
Jim Richert	

*All entries into exclusion zone require Buddy System use. All E & E field staff participate in medical monitoring program and have completed applicable training per 29 CFR 1910.120. Respiratory protection program meets requirements of 29 CFR 1910.134, and ANSI Z88.2 (1980).

E. EMERGENCY INFORMATION

(Use supplemental sheets, if necessary)

LOCAL RESOURCES

(Obtain a local telephone book from your hotel, if possible)

Ambulance 911

Hospital Emergency Room Children's Hospital, Elmwood and Hodge, 878-7408

Poison Control Center 878-7654

Police (include local, county sheriff, state) 851-4444

Fire Department 911

Airport

Agency Contact (EPA, State, Local USCG, etc.)

Local Laboratory 716/631-0360

UPS/Fed. Express 1-800-238-5355

Client Contact

Site Contact Mr. Daniel Mole

SITE RESOURCES

Site Emergency Evacuation Alarm Method

Water Supply Source

Telephone Location, Number

Cellular Phone, if available

Radio

Other

EMERGENCY CONTACTS

1.	Dr. Raymond Harbison (Univ. of Florida) Alachua, Florida	(501) 221-0465 or (904) 462-3277, 3281 (501) 370-8263 (24 hours)
2.	Ecology and Environment, Inc., Safety Director Paul Jonmaire	(716) 684-8060 (office) (716) 655-1260 (home)
3.	Regional Office Contact	(home) (office)
4.	FITOM, TATOM, or Office Manager	(home)
5.	E & E Corporate Equipment Warehouse	(716) 681-9788 (716) 681-4356 (FAX)

MEDTOX HOTLINE

1. Twenty-four hour answering service: (501) 370-8263

   What to report:

   - State: "this is an emergency."
   - Your name, region, and site.
   - Telephone number to reach you.
   - Your location.
   - Name of person injured or exposed.
   - Nature of emergency.
   - Action taken.

2. A toxicologist, (Dr. Raymond Harbison or associate) will contact you. Repeat the information given to the answering service.

3. If a toxicologist does not return your call within 15 minutes, call the following persons in order until contact is made:

   a. **24 hour hotline - (716) 684-8940**
   b. Corporate Safety Director - Paul Jonmaire - home # (716) 655-1260
   c. Assistant Corp. Safety Officer - Steven Sherman - home # (716) 688-0084

EMERGENCY ROUTES

(NOTE: Field Team must Know Route(s) Prior to Start of Work)

Directions to hospital (include map) Left out site onto Elmwood, go ~2 miles to Hodge Street, Children's Hospital on right.

Emergency Egress Routes to Get Off-Site Gates on south and north sides of site.

F. EQUIPMENT CHECKLIST

PROTECTIVE GEAR

Level A	No.
SCBA	
SPARE AIR TANKS	
ENCAPSULATING SUIT (Type ____________)	
SURGICAL GLOVES	
NEOPRENE SAFETY BOOTS	
BOOTIES	
GLOVES (Type ______________________)	
OUTER WORK GLOVES	
HARD HAT	
CASCADE SYSTEM	
5-MINUTE ESCAPE COOLING VEST	

Level B	No.
SCBA	
SPARE AIR TANKS	
PROTECTIVE COVERALL (Type ___________)	
RAIN SUIT	
BUTYL APRON	
SURGICAL GLOVES	
GLOVES (Type ____________________)	
OUTER WORK GLOVES	
NEOPRENE SAFETY BOOTS	
BOOTIES	
HARD HAT WITH FACE SHIELD	
CASCADE SYSTEM	
MANIFOLD SYSTEM	

Level C	
ULTRA-TWIN RESPIRATOR	
POWER AIR PURIFYING RESPIRATOR	
CARTRIDGES (Type ________________)	
5-MINUTE ESCAPE MASK	
PROTECTIVE COVERALL (Type ______)	
RAIN SUIT	
BUTYL APRON	
SURGICAL GLOVES	
GLOVES (Type ________)	
OUTER WORK GLOVES	
NEOPRENE SAFETY BOOTS	
HARD HAT WITH FACE SHIELD	
BOOTIES	
HARDHAT	X

Level D	
ULTRA-TWIN RESPIRATOR (Available)	X
CARTRIDGES (Type GMC-H)	X
5-MINUTE ESCAPE MASK (Available)	
PROTECTIVE COVERALL (Type Tyvek)	X
RAIN SUIT	X
NEOPRENE SAFETY BOOTS	X
BOOTIES	X
WORK GLOVES (Scorpio)	X
HARD HAT WITH FACE SHIELD	X
SAFETY GLASSES	X

INSTRUMENTATION	No.
OVA	1
THERMAL DESORBER	
O2/EXPLOSIMETER W/CAL. KIT (Drilling)	X
PHOTOVAC TIP	
HNu (Probe 10.2 ev)	X
MAGNETOMETER	X
PIPE LOCATOR	
WEATHER STATION	
DRAEGER PUMP, TUBES ________________	
BRUNTON COMPASS	X
MONITOX CYANIDE	
HEAT STRESS MONITOR	
NOISE EQUIPMENT ____________________	
PERSONAL SAMPLING PUMPS	
HgS Meter	X
RADIATION EQUIPMENT	
DOCUMENTATION FORMS	
PORTABLE RATEMETER	
SCALER/RATEMETER	
NaI Probe	
ZnS Probe	
GM Pancake Probe	
GM Side Window Probe	
MICRO R METER	
ION CHAMBER	
ALERT DOSIMETER	
POCKET DOSIMETER	
FIRST AID EQUIPMENT	
FIRST AID KIT	
OXYGEN ADMINISTRATOR	
STRETCHER	
PORTABLE EYE WASH	
BLOOD PRESSURE MONITOR	
FIRE EXTINGUISHER	

DECON EQUIPMENT	No.
WASH TUBS	
BUCKETS	
SCRUB BRUSHES	
PRESSURIZED SPRAYER	
DETERGENT (Type _____________)	
SOLVENT (Type ___________)	
PLASTIC SHEETING	
TARPS AND POLES	
TRASH BAGS	
TRASH CANS	
MASKING TAPE	
DUCT TAPE	
PAPER TOWELS	
FACE MASK SANITIZER	
FOLDING CHAIRS	
STEP LADDERS	
DISTILLED WATER	
SAMPLING EQUIPMENT	
8 OZ. BOTTLES	
HALF-GALLON BOTTLES	
VOA BOTTLES	
STRING	
HAND BAILERS	
THIEVING RODS WITH BULBS	
SPOONS	
KNIVES	
FILTER PAPER	
PERSONAL SAMPLING PUMP SUPPLIES	

VAN EQUIPMENT	No.
TOOL KIT	
HYDRAULIC JACK	
LUG WRENCH	
TOW CHAIN	
VAN CHECK OUT	
Gas	
Oil	
Antifreeze	
Battery	
Windshield Wash	
Tire Pressure	
MISCELLANEOUS	
PITCHER PUMP	
SURVEYOR'S TAPE	
100 FIBERGLASS TAPE	X
300 NYLON ROPE	
NYLON STRING	
SURVEYING FLAGS	X
FILM	X
WHEEL BARROW	
BUNG WRENCH	
SOIL AUGER	
PICK	
SHOVEL	
CATALYTIC HEATER	
PROPANE GAS	
BANNER TAPE	
SURVEYING METER STICK	
CHAINING PINS & RING	
TABLES	
WEATHER RADIO	
BINOCULARS	
MEGAPHONE	

MISCELLANEOUS (Cont.)	No.
SHIPPING EQUIPMENT	
COOLERS	
PAINT CANS WITH LIDS, 7 CLIPS EACH	
VERMICULITE	
SHIPPING LABELS	
DOT LABELS: "DANGER"	
"UP"	
"INSIDE CONTAINER COMPLIES ..."	
"HAZARD GROUP"	
STRAPPING TAPE	
BOTTLE LABELS	
BAGGIES	
CUSTODY SEALS	
CHAIN-OF-CUSTODY FORMS	
FEDERAL EXPRESS FORMS	
CLEAR PACKING TAPE	

APPENDIX B

GEOPHYSICAL SURVEY

YP-7030 D2967

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

PHASE II INVESTIGATIONS
GEOPHYSICAL SURVEY

Hartwell Street Landfill
Site Number 915030
City of Buffalo, Erie County

November 1990

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
Michael J. O'Toole, Jr., P.E., Director

Prepared by:

Ecology and Environment Engineering, P.C.

Job Number

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

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Michael J. O'Toole, Jr., P.E., Director

Prepared by:

TABLE OF CONTENTS

LIST OF FIGURES

1. INTRODUCTION

This geophysical investigation report for the Hartwell Street Landfill site (I.D. No. 915030) on Elmwood Avenue in the City of Buffalo, Erie County, New York, was prepared by Ecology and Environment Engineering, P.C. (E & E), under contract to the New York State Department of Environmental Conservation (NYSDEC). The geophysical investigation consisted of an EM31 (electromagnetic terrain conductivity) survey and a portable proton magnetometer (total earth field magnetics) survey. This report includes field data (Appendix A) and contour maps (Appendix B) for the geophysical surveys performed at this site on April 17, and June 26, 1990 as part of the Phase II Investigation. Additionally, interpretations of the data generated, along with conclusions, are provided in this report.

2. OBJECTIVES

The geophysical survey program at the Hartwell Street Landfill site was designed to achieve several general goals. The main objectives of the geophysical methods used were to optimize the locations of the eight proposed groundwater monitoring wells; reduce the risks associated with drilling into unknown terrain and wastes; reduce overall project time and cost; improve the accuracy and confidence of the investigation; identify the existence and boundaries of buried waste or groundwater contamination plumes; and determine vertical and horizontal anomalies.

3. METHODS

For the purpose of performing ground conductivity (EM31) and geomagnetic (magnetometer) surveys, grid coordinates were established in locations which correspond to the eight proposed on-site groundwater monitoring wells.

During the original geophysical survey, the location of GW-2 was moved to the east from its proposed location to facilitate drilling rig access. During a subsequent NYSDEC site visit, GW-2 was moved back to its proposed location because demolition at the site allowed access to the original location. Also during this site visit, NYSDEC moved GW-5 to an area along the northwestern site boundary to avoid cultural interferences and facilitate drill-rig access. These two new well locations were resurveyed as grids 2A and 5A corresponding to wells GW-2 and GW-5, respectively.

Survey grids 1 through 8, 2A, and 5A included the proposed locations of monitoring wells GW-1 through GW-8, GW-2A, and GW-5A as follows:

Geophysical Survey Grid No.	Proposed Monitoring Well Included
1	GW-1
2	GW-2
2A	GW-2
3	GW-3
4	GW-4

Geophysical Survey Grid No.	Proposed Monitoring Well Included
5	GW-5
5A	GW-5
6	GW-6
7	GW-7
8	GW-8

Geophysical survey grids 1, 2, 2A, 3, and 5A are 1,600 square feet in area. Grids 4, 5A, 6, and 7 are 800 square feet due to fence obstructions, while grid 8 is 1,200 square feet due to a building location. The X and Y axes of each survey grid were oriented approximately east-west and north-south, respectively. Precise compass orientations were obtained for each of the survey grid axes. These orientations are indicated on the geophysical contour maps (see Appendix B). Coordinate 0,0 is located in the southwest corner of each survey grid. Semi-permanent wooden stakes mark the proposed monitoring well locations for reference during drilling.

Horizontal and vertical dipole readings in north-south and east-west orientations were recorded at each node while performing the electromagnetic ground conductivity survey with a Geonics, Ltd. EM31 instrument. The effective depths of penetration provided by the EM31 in the vertical and horizontal dipole modes are $\leq$ 18 feet and $\leq$ 9 feet, respectively. Geomagnetic readings were recorded at each node in both north-south and east-west orientations using an EG+G Unimag II (Model G-846) Portable Proton Magnetometer. The response of the magnetometer is proportional to the mass of the ferrous target. The effective depths of the EM31 and magnetometer were considered adequate to delineate any buried materials that may be encountered while drilling.

All geophysical field data were initially recorded in two logbooks dedicated to this site investigation. Magnetometer data were reduced after using background station readings to correct the recorded values for diurnal variations. EM31 ground conductivity data were averaged for north-south and east-west orientations for the vertical and horizontal dipole positions. The reduced geophysical data were then plotted and contoured for each magnetometer and EM31 survey (see Appendices A and B).

4. DATA INTERPRETATION

EM31 and Magnetometer Interpretations

The purpose of interpreting the results of the EM31 and magnetometer surveys at the Hartwell Street Landfill site is to provide a probable explanation for anomalous data contours. The presence of buried waste, metal objects, and utilities is often manifested as relatively increased or decreased nodal readings and gradient values.

The following interpretations are based on the geophysical contour maps (see Appendix B) generated from the ground conductivity and geomagnetic field measurements listed in Appendix A. These ten geophysical survey grids encompass the eight groundwater monitoring well locations as proposed by NYSDEC in the Phase II Investigation Work Plan for the site (see Figure 4-1).

The following discussion provides details of each of the ten geophysical survey grids.

Survey Grid Area No. 1. A review of magnetometer data contours at survey grid No. 1 indicates that this 1,600-square-foot survey area does not contain significant geomagnetic field anomalies. Magnetic contours range from 55,297 gammas to 57,563 gammas. The steepest geomagnetic gradients are observed in the north-central and southeast corners of the survey grid. The source of these increases in geomagnetic field strength may be attributed to shallow ferrous metal objects northeast of the survey grid.

Contours of EM31 data exhibit a shallow ground conductivity in the vertical and horizontal dipole survey modes at grid No. 1. Ground conductivity ranges from 25 to 64 millimhos/meter at this survey area.

The installation of proposed groundwater monitoring well GW-1 indicated on the contour maps (see Appendix B) is acceptable. The well location may be moved to any area within the survey grid except the northeast or southeast corners (grid coordinates 30,0 and 30,30).

Survey Grid Area No. 2. A review of magnetometer data contours at survey grid No. 2 indicates that this 1,600-square-foot survey area exhibits a moderately high geomagnetic field gradient. Magnetic contours range from 53,953 gammas to 57,785 gammas. Three isolated variations in magnetic field strength (53,953 to 56,119 gammas) are observed at grid coordinates 0,0, 40,0, and 30,10. A similar isolated increase (from 53,696 to 57,091 gammas) occurs between coordinates 20,10 and 30,20. These isolated anomalies may be attributed to small ferrous metal objects at shallow depths.

Contours of EM31 data indicate shallow ground conductivity gradients in the horizontal and vertical dipole survey modes at grid No. 2. Ground conductivity ranges from 28 to 103 millimhos/meter at this survey area. One prominent high-gradient area is located around coordinates 20,20 and 20,30.

The location of proposed groundwater monitoring well GW-2 was moved and resurveyed as grid No. 2A.

Survey Grid Area No. 2A. A review of magnetometer data contours at survey grid No. 2A indicates that this 1,600-square-foot survey area exhibits a moderate geomagnetic field gradient. Geomagnetic field values range from 53,509 gammas to 56,359 gammas. Two isolated magnetic anomalies are observed at grid coordinates 30,10 and 40,30. These anomalies may be attributed to small ferous metal objects at shallow depths.

Contours of EM31 data indicate shallow ground conductivity gradients in the vertical and horizontal dipole modes at grid 2A. Ground conductivity ranges from 40 to 93 millimhos/meter in the vertical dipole mode and 30 to 82 millimhos/meter in the horizontal dipole mode. An isolated electromagnetic anomaly occurs at grid coordinate 30,30 in the vertical dipole. In the horizontal dipole, conductivities increase from lows in the northwest and southeast to a high trending northeast-southwest from grid coordinates 20,0 to 40,30.

The installation of proposed monitoring well GW-2 at the location indicated on the contour map (see Appendix B) is acceptable. To facilitate drill rig access, the location could be moved anywhere west of the 20,0 grid line.

Survey Grid Area No. 3. A review of magnetometer data contours at survey grid No. 3 indicates that this 1,600-square-foot survey area exhibits an increase in geomagnetic gradient in the southeast portion of this survey area. The source of this anomaly is not confirmed, but the anomaly is likely due to metallic objects buried in the fill mounds at the southeast portion of the grid. Geomagnetic anomalies are observed at grid coordinates 30,0, 30,10, 40,0, and 40,10.

Contours of EM31 data indicate shallow ground conductivity gradients in the horizontal and vertical dipole survey modes at grid No. 3. Ground conductivity ranges from 34 to 103 millimhos/meter at this survey area. The anomalies are in the area of coordinates 30,10, 40,10, 40,20, and 0,30.

The installation of the proposed groundwater monitoring well GW-3 at the location indicated on the contour maps (see Appendix B) is acceptable.

Survey Grid Area No. 4. A review of magnetometer data contours at survey grid No. 4 indicates that this 800-square-foot survey area exhibits a moderately high geomagnetic field gradient. Magnetic contours range from 51,048 to 58,935 gammas. Variance in geomagnetic field strength is observed along the X axis and at coordinates 40,20 and 30,20. These variances are suspected to represent shallow ferrous metal objects.

Contours of EM31 data indicate a large, shallow ground conductivity gradient in the horizontal dipole and a relatively increased gradient in the vertical dipole survey mode. The readings of both dipoles were tremendously affected by the presence of two chain-link fences and some overhead power lines in the area. Ground conductivity values range from a negative reading to 310 millimhos/meter in the horizontal dipole and from a negative reading to 220 millimhos/meter in the vertical dipole survey mode. The contours of the ground conductivity values in the vertical dipole are subparallel in an east-west orientation, most likely due to the steel fences. Strong anomalies seen in the plot of the horizontal dipole are also indicative of fence interference. An overhead power line adjacent to survey grid No. 4 is also likely responsible for some anomalies.

Due to the low quality of the geophysical data from this survey grid, the quality of the proposed location for GW-4 cannot be verified. The proposed location for GW-4 could remain where it is, or it could be relocated and another survey could be performed.

Survey Grid Area No. 5. A review of magnetometer data contours at survey grid No. 5 indicates that this 800-square-foot survey area exhibits a relatively high geomagnetic field gradient. Magnetic contours range from 52,254 to 59,015 gammas. Two isolated anomalies in magnetic field strength are observed at grid coordinates 10,30 and 0,0. These variances in magnetic field strength are suspected to represent proximity to shallow ferrous metal objects.

Contours of EM31 data indicate shallow ground conductivity gradients in the horizontal and vertical dipole survey modes at grid No. 5. These gradients occur at the northwest portion of the grid near coordinates 0,30 and 0,40. Ground conductivity ranges from negative to 275 millimhos/meter in the vertical dipole and from 90 to 500 millimhos/meter in the horizontal dipole at this survey area.

The proposed location of groundwater monitoring well GW-5 was moved and resurveyed as grid No. 5A.

Survey Grid Area No. 5A. A review of magnetometer data contours at survey grid No. 5 indicates that this 1,600-square-foot survey area exhibits a moderately high geomagnetic field gradient. Geomagnetic field values range from 51,101 gammas to 56,367 gammas. Variances in geomagnetic field strength are observed throughout the survey area, with the highest gradient in the east-central and southeast area of the grid. The source(s) of these variances is not confirmed, but they are likely related to metallic debris and drums in and around the survey area.

Contours of EM31 data indicate relatively steep conductivity gradients in the vertical and horizontal dipole modes. Ground conductivity values range from 78 millimhos/meter to negative readings in the vertical dipole and 46 millimhos/meter to negative readings in the horizontal dipole mode. Increases in conductivity across the survey area may be attributed to metal debris and drums in and around the survey area.

The installation of proposed groundwater monitoring well GW-5 at the location indicated on the contour map (see Appendix B) is acceptable. The well location could be moved to grid coordinates 0,10, 10,10, or 10,20 to facilitate drill-rig access.

Survey Grid Area No. 6. A review of magnetometer data contours at survey grid No. 6 indicates that the southeast corner of this 800-square-foot survey area exhibits a high geomagnetic field gradient. Magnetic contours range from 32,740 to 58,574 gammas. An isolated decrease in magnetic field strength is observed at the southeastern portion of the survey grid near grid coordinates 30,0 and 40,0. This variance in magnetic field strength is suspected to represent proximity to a shallow ferrous metal object. A steel chain-link fence is also most likely affecting the magnetometer and EM31 readings in this survey grid.

Contours of EM31 data indicate shallow ground conductivity gradients in the horizontal and vertical dipole survey modes in grid No. 6. Ground conductivity ranges from a negative reading to 120 millimhos/meter in the vertical dipole and from a negative reading to 190 millimhos/meter in the horizontal dipole at this survey area. Anomalous areas of the grid include coordinates 0,10, 10,10, 10,20, 0,20, and 20,20.

The installation of proposed groundwater monitoring well GW-6 at the originally proposed location indicated on the contour maps (see Appendix B) is unacceptable. It is recommended that the proposed location for GW-6 be moved to the southwest portion of the grid to increase its distance from the isolated anomalous areas mentioned above.

Survey Grid Area No. 7. A review of magnetometer data contours at survey grid No. 7 indicates that this 1,200-square-foot survey area exhibits a high geomagnetic field gradient. Magnetic contours range from 49,343 to 57,881 gammas. The wide variance of geomagnetic field strength is attributed to the metallic machinery northwest of the grid as well as to ferrous metal debris that is suspected to lie beneath this area of the site.

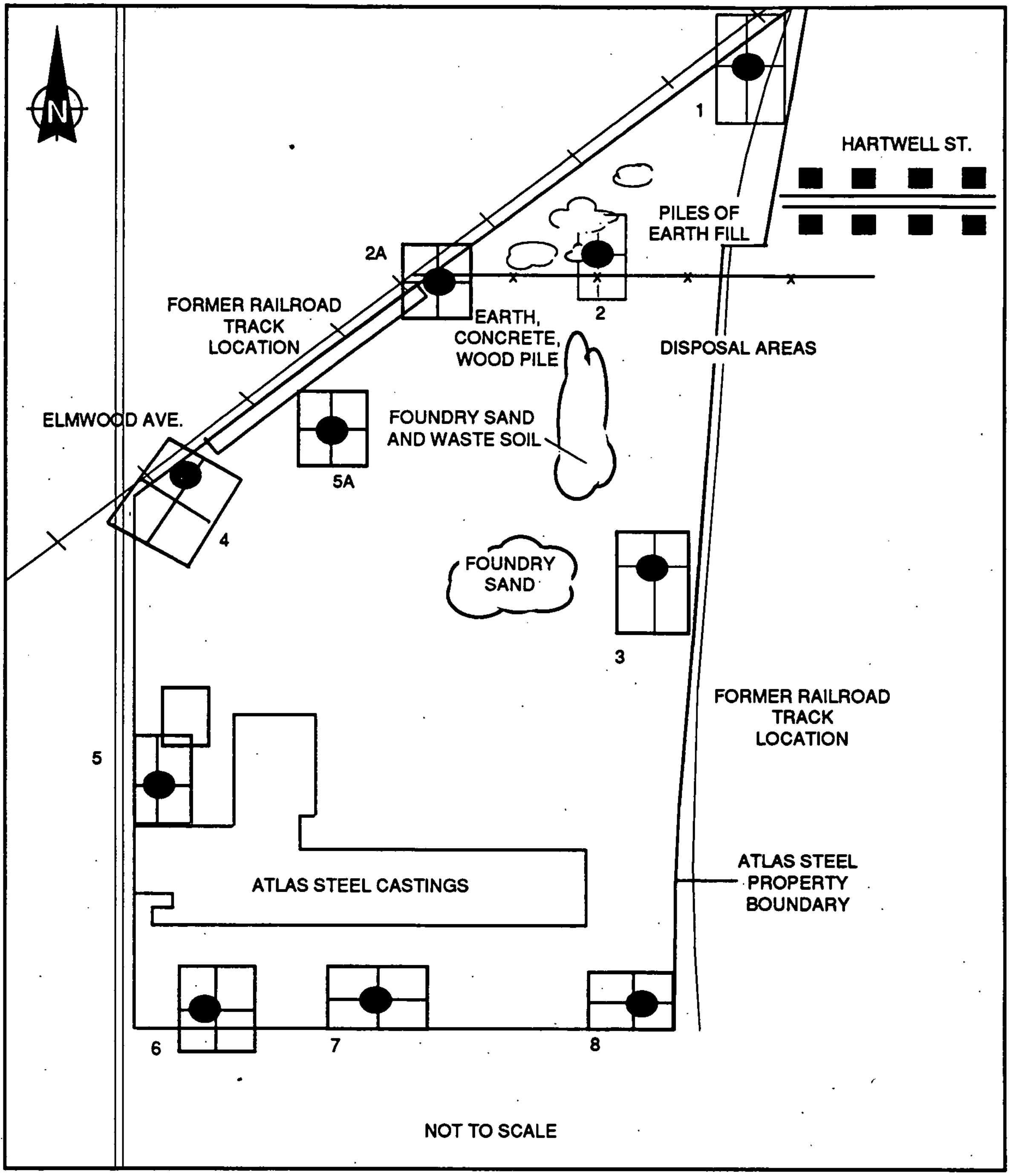
Contours of EM31 data indicate distinct ground conductivity anomalies in the horizontal and vertical dipole modes at survey grid No. 7. An isolated 33 millimhos/meter contour at grid coordinate 20,10 in the vertical dipole survey mode is observed, with ground conductivity increasing radially away from this location. A relatively high ground conductivity exists along the northern border of the survey grid in both the vertical and horizontal dipoles. These anomalies and other high ground conductivity values relative to those at other site locations suggest the presence of metallic fill below survey grid No. 7 as well as interference from the machinery.

The installation of proposed groundwater monitoring well GW-7 at coordinate 20,20, the location indicated on the contour map (see Appendix B), is acceptable.

Survey Grid Area No. 8. A review of magnetometer data contours at survey grid No. 8 indicates that this 800-square-foot survey area exhibits a moderate geomagnetic field gradient. Magnetic contours range from 55,808 to 37,796 gammas. These increases in the magnetic field gradient are located in the area of grid coordinates 0,0 and 10,20.

Contours of the EM31 survey indicate shallow ground conductivity gradients along the X axis of the survey grid. These gradients are most likely due to the chain-link fence in the area. Ground conductivity ranges from negative to 110 millimhos/meter.

The installation of proposed groundwater monitoring well GW-8 at the location indicated on the contour map (see Appendix B) is acceptable. However, locating the well at coordinate 0,10 may be more suitable for facilitating drill-rig access.



KEY:

●	Proposed Well Location
⊞	Geophysical Survey Grid

Figure 4 - 1
GEOPHYSICAL SURVEY AND PROPOSED GROUNDWATER MONITORING WELL LOCATIONS, HARTWELL STREET LANDFILL

5. CONCLUSIONS AND RECOMMENDATIONS

Based upon the interpretations discussed in Section 4, particular care must be taken when selecting the placement of two of the eight proposed monitoring wells at the Hartwell Street Landfill site. Locations exhibiting significant geophysical anomalies should be avoided due to associated drilling risks.

At survey grid No. 4, EM31 anomalies are likely due to interferences from the fences and overhead power lines, and the geophysical survey data for this survey grid should, therefore, still be considered reliable. It is recommended that proposed monitoring well GW-4 be located at coordinate 20,10 within survey grid No. 4. This location will intercept the periphery of a moderate ground conductivity gradient (horizontal dipole) with parallel orientation to the western boundary of the landfill. Additionally, this relocation will avoid the geomagnetic anomaly detailed in Section 4.

It is recommended that proposed monitoring well GW-6 be relocated to coordinate 5,5 within survey grid No. 6. This relocation will avoid the geomagnetic and ground conductivity anomalies that indicate an apparent abundance of buried metal debris below this location, as detailed in Section 4.

Groundwater monitoring wells GW-1, GW-2, GW-3, GW-5, GW-7, and GW-8 may be installed at the locations indicated on the contour maps (see Appendix B). The chain-link fence, metallic debris, and drums in the areas of these grids has affected the geophysical data. If the well location needs to be moved to facilitate rig access, refer to Section 4 of this report for approved areas.

Prior to drilling, the underground-utility locating service should be contacted to indicate possible public utilities buried in the vicinity of the drill sites.

All proposed well locations should be confirmed with a NYSDEC representative prior to the commencement of drilling.

APPENDIX A

MAGNETOMETER AND EM31
SURVEY DATA

Table A-1

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 1

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	55,860	55,865
0,10	55,636	55,681
0,20	55,429	55,479
0,30	55,704	55,794
0,40	55,675	55,683
10,0	57,563	55,572
10,10	56,790	56,831
10,20	55,682	55,736
10,30	55,474	55,560
10,40	55,735	55,751
20,0	55,301	55,315
20,10	55,472	55,508
20,20	56,077	56,136
20,30	56,094	56,175
20,40	55,700	55,724
30,0	57,200	57,218
30,10	56,138	56,170
30,20	56,303	56,366
30,30	57,143	57,220
30,40	55,361	55,393
40,0	56,775	56,752
40,10	56,411	56,384
40,20	55,778	55,710
40,30	55,297	55,225
40,40	55,608	55,568

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*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST
MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 2

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	55,763	55,755
0,10	57,500	57,484
0,20	56,431	56,407
0,30	56,453	56,420
0,40	56,523	56,482
10,0	56,138	56,056
10,10	56,138	56,065
10,20	55,805	55,740
10,30	56,632	56,575
10,40	56,498	56,449
20,0	56,065	55,975
20,10	57,298	57,200
20,20	54,838	54,732
20,30	56,574	56,460
20,40	55,918	55,796
30,0	55,803	55,640
30,10	57,246	57,091
30,20	53,843	53,696
30,30	55,785	55,646
30,40	55,640	55,509
40,0	54,124	53,953
40,10	56,299	56,119
40,20	55,023	54,835
40,30	56,043	55,847
40,40	56,073	55,869

02[UZ]YP7080:D3136/4071/30

*Data has been corrected for natural magnetic fluctuations (i.e., drift), by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 2A

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	55,435	55,430
0,10	55,958	55,947
0,20	55,666	55,649
0,30	55,286	55,263
0,40	--	--
10,0	54,984	54,933
10,10	55,896	55,850
10,20	55,696	55,656
10,30	55,645	55,611
10,40	56,329	56,321
20,0	54,131	54,074
20,10	54,517	54,454
20,20	56,427	56,359
20,30	56,116	56,042
20,40	55,628	55,548
30,0	56,134	56,026
30,10	53,612	53,509
30,20	56,345	56,257
30,30	57,006	56,915
30,40	55,477	55,392
40,0	55,300	55,186
40,10	55,687	55,567
40,20	56,363	56,238
40,30	53,769	53,638
40,40	55,928	55,791

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*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 3

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	55,582	55,567
0,10	55,576	55,546
0,20	56,917	56,872
0,30	55,658	55,598
0,40	54,593	54,517
10,0	55,320	55,169
10,10	55,634	55,498
10,20	56,191	56,070
10,30	55,314	55,208
10,40	57,096	57,005
20,0	56,048	55,882
20,10	55,750	55,569
20,20	56,811	56,614
20,30	57,700	57,488
20,40	56,621	56,394
30,0	59,200	58,898
30,10	55,048	54,761
30,20	55,893	55,621
30,30	55,980	55,723
30,40	55,740	55,498
40,0	56,709	56,391
40,10	56,381	56,048
40,20	56,700	56,352
40,30	55,548	55,185
40,40	55,136	54,758

02[UZ]YP7080:D3136/4071/30

*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 4

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	53,621	53,621
0,10	55,891	55,891
0,20	--	--
0,30	--	--
0,40	--	--
10,0	56,818	56,818
10,10	58,935	58,935
10,20	--	--
10,30	--	--
10,40	--	--
20,0	56,542	56,542
20,10	54,218	54,218
20,20	56,739	56,739
20,30	--	--
20,40	--	--
30,0	51,048	51,048
30,10	51,819	51,819
30,20	56,299	56,299
30,30	--	--
30,40	--	--
40,0	54,136	54,136
40,10	53,094	53,094
40,20	53,113	53,113
40,30	--	--
40,40	--	--

02[UZ]YP7080:D3136/4071/30

*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 5

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	59,015	58,936
0,10	54,163	53,690
0,20	56,532	55,980
0,30	55,675	54,729
0,40	57,919	56,895
10,0	52,547	52,389
10,10	55,813	55,419
10,20	56,569	55,939
10,30	52,254	51,387
10,40	52,714	51,611
20,0	56,720	56,484
20,10	57,584	57,269
20,20	56,374	55,665
20,30	56,628	55,840
20,40	55,522	54,340
30,0	--	--
30,10	--	--
30,20	--	--
30,30	--	--
30,40	--	--
40,0	--	--
40,10	--	--
40,20	--	--
40,30	--	--
40,40	--	--

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*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 5A

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	56,377	56,367
0,10	55,460	55,439
0,20	53,277	53,246
0,30	54,281	54,239
0,40	53,316	53,264
10,0	53,612	53,508
10,10	54,458	54,364
10,20	53,883	53,780
10,30	55,087	55,014
10,40	53,970	53,908
20,0	53,925	53,810
20,10	51,726	51,601
20,20	52,845	52,710
20,30	53,837	53,691
20,40	51,257	51,101
30,0	54,031	53,823
30,10	51,598	54,400
30,20	51,945	51,758
30,30	54,843	54,666
30,40	53,941	53,775
40,0	51,586	51,368
40,10	55,252	55,023
40,20	54,657	54,418
40,30	54,028	53,778
40,40	53,816	53,556

02[UZ]YP7080:D3136/4071/30

*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 6

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	55,691	55,701
0,10	56,106	56,210
0,20	58,460	58,574
0,30	--	--
0,40	--	--
10,0	56,393	56,414
10,10	56,064	56,158
10,20	56,710	56,835
10,30	--	--
10,40	--	--
20,0	52,980	53,011
20,10	54,805	54,888
20,20	56,336	56,471
20,30	--	--
20,40	--	--
30,0	32,698	32,740
30,10	51,529	51,602
30,20	58,381	58,527
30,30	--	--
30,40	--	--
40,0	35,924	35,976
40,10	46,213	46,275
40,20	55,927	56,083
40,30	--	--
40,40	--	--

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*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 7

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	57,907	57,881
0,10	56,373	56,321
0,20	49,420	49,343
0,30	56,826	56,723
0,40	--	--
10,0	57,105	56,976
10,10	53,572	53,417
10,20	51,318	51,137
10,30	56,610	56,404
10,40	--	--
20,0	55,504	55,272
20,10	57,301	57,043
20,20	55,000	54,716
20,30	57,678	57,368
20,40	--	--
30,0	54,932	54,577
30,10	50,379	50,018
30,20	55,009	54,622
30,30	55,287	54,874
30,40	--	--
40,0	57,596	57,157
40,10	53,658	53,194
40,20	55,869	55,379
40,30	56,296	55,780
40,40	--	--

02[UZ]YP7080:D3136/4071/30

*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-1 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

HARTWELL STREET LANDFILL

Grid No. 8

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	57,243	57,189
0,10	55,995	55,886
0,20	55,349	55,186
0,30	--	--
0,40	--	--
10,0	56,651	56,324
10,10	56,195	55,923
10,20	58,014	57,796
10,30	--	--
10,40	--	--
20,0	55,694	55,313
20,10	56,639	56,204
20,20	56,298	55,808
20,30	--	--
20,40	--	--
30,0	57,339	56,686
30,10	56,522	55,923
30,20	56,357	55,813
30,30	--	--
30,40	--	--
40,0	56,997	56,289
40,10	55,607	54,845
40,20	56,302	55,486
40,30	--	--
40,40	--	--

*Data has been corrected for natural magnetic fluctuations (i.e., drift) by using data obtained at an off-site base station.

Table A-2

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 1

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	49.5	40.5
0,10	52.0	46.0
0,20	52.0	49.0
0,30	53.0	42.5
0,40	64.0	46.0
10,0	45.5	40.5
10,10	42.0	41.0
10,20	45.0	39.5
10,30	45.0	41.0
10,40	59.5	43.0
20,0	44.0	41.0
20,10	43.5	41.0
20,20	39.5	37.5
20,30	37.0	43.0
20,40	52.5	48.0
30,0	37.0	39.5
30,10	38.5	42.0
30,20	39.5	37.5
30,30	41.0	37.5
30,40	41.0	41.5
40,0	39.5	43.0
40,10	25.0	49.0
40,20	35.0	33.5
40,30	39.0	37.0
40,40	42.5	40.0

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Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 2

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	53.5	45.5
0,10	35.0	29.0
0,20	28.0	25.0
0,30	33.5	36.5
0,40	61.5	49.5
10,0	55.0	45.5
10,10	59.0	54.0
10,20	55.5	45.5
10,30	57.0	51.5
10,40	58.0	48.0
20,0	57.5	49.5
20,10	21.5	70.0
20,20	NEG*	77.0
20,30	66.0	52.0
20,40	62.0	48.0
30,0	39.0	55.0
30,10	35.0	62.5
30,20	NEG	103.5
30,30	51.5	54.0
30,40	57.5	48.5
40,0	37.5	55.0
40,10	49.0	46.0
40,20	35.0	59.5
40,30	58.5	48.5
40,40	52.5	46.0

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 2A

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	40.0	44.0
0,10	46.0	33.0
0,20	44.0	30.0
0,30	44.0	37.0
0,40	NA	NA
10,0	61.0	43.0
10,10	57.0	49.0
10,20	56.0	44.0
10,30	53.0	40.0
10,40	46.0	30.0
20,0	40.0	76.0
20,10	56.0	76.0
20,20	69.0	62.0
20,30	46.0	59.0
20,40	52.0	45.0
30,0	57.0	49.0
30,10	51.0	82.0
30,20	51.0	78.0
30,30	93.0	63.0
30,40	51.0	66.0
40,0	61.0	34.0
40,10	61.0	40.0
40,20	56.0	67.0
40,30	52.0	80.0
40,40	69.0	71.0

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST
GROUND CONDUCTIVITY READINGS
WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 3

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	54.0	43.5
0,10	61.5	58.0
0,20	34.5	90.0
0,30	34.0	125.5
0,40	103.5	83.0
10,0	55.0	55.0
10,10	70.5	54.0
10,20	69.0	90.5
10,30	27.5	124.0
10,40	95.5	73.5
20,0	65.0	80.0
20,10	99.0	84.5
20,20	54.0	61.0
20,30	66.5	96.0
20,40	88.0	83.0
30,0	71.5	NEG*
30,10	152.5	118.0
30,20	81.0	186.0
30,30	64.0	91.0
30,40	90.5	102.5
40,0	57.5	51.5
40,10	157.5	85.0
40,20	NEG	NEG
40,30	157.5	135.0
40,40	108.5	80.0

02[UZ]YP7080:D3136/4070/30

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 4

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	46.0	190.0
0,10	NEG*	115.0
0,20	--	--
10,0	NEG	104.0
10,10	NEG	140.0
10,20	--	--
20,0	NEG	180.0
20,10	38.5	200.0
20,20	220.0	310.0
30,0	52.0	70.0
30,10	46.0	175.0
30,20	NEG	155.0
40,0	100.0	40.0
40,10	NEG	NEG
40,20	NEG	202.5

02[UZ]YP7080:D3136/4070/30

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 5

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	91.0	90.0
0,10	122.5	94.0
0,20	61.0	105.0
0,30	275.0	380.0
0,40	200.0	500.0
10,0	50.0	60.0
10,10	15.0	132.5
10,20	NEG*	225.0
10,30	107.5	200.0
10,40	142.5	167.5
20,0	90.0	47.0
20,10	115.0	167.5
20,20	47.5	185.0
20,30	160.0	185.0
20,40	175.0	520.0

02[UZ]YP7080:D3136/4070/30

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 5A

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	160.0	85.0
0,10	120.0	95.0
0,20	105.0	100.0
0,30	143.0	88.0
0,40	105.0	110.0
10,0	190.0	145.0
10,10	140.0	78.0
10,20	113.0	88.0
10,30	90.0	75.0
10,40	120.0	85.0
20,0	NEG*	95.0
20,10	185.0	105.0
20,20	125.0	75.0
20,30	133.0	NEG
20,40	90.0	65.0
30,0	NEG	123.0
30,10	NEG	193.0
30,20	165.0	70.0
30,30	100.0	68.0
30,40	98.0	63.0
40,0	NEG	NEG
40,10	NEG	95.0
40,20	NEG	180.0
40,30	90.0	55.0
40,40	78.0	46.0

02[UZ]YP7080:D3136/4070/30

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 6

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	77.5	71.5
0,10	NEG*	140.0
0,20	NEG	190.0
10,0	61.0	67.0
10,10	NEG	135.0
10,20	NEG	167.5
20,0	103.5	42.5
20,10	NEG	NEG
20,20	NEG	152.5
30,0	NEG	68.0
30,10	112.5	50.5
30,20	32.0	51.5
40,0	70.0	75.0
40,10	92.0	97.0
40,20	120.0	45.0

02[UZ]YP7080:D3136/4070/30

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 7

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	70.0	52.0
0,10	NEG*	NEG
0,20	71.0	60.5
0,30	90.0	320.0
10,0	45.0	125.0
10,10	42.0	56.0
10,20	57.5	52.5
10,30	60.0	340.0
20,0	54.0	120.0
20,10	33.0	57.5
20,20	67.5	56.5
20,30	NEG	290.0
30,0	46.0	105.0
30,10	41.0	46.0
30,20	49.0	49.0
30,30	52.5	81.0
40,0	42.0	100.0
40,10	41.0	44.0
40,20	48.5	46.5
40,30	95.5	82.0

02[UZ]YP7080:D3136/4070/30

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

Table A-2 (Cont.)

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

HARTWELL STREET LANDFILL

Survey Grid No. 8

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	70.0	85.0
0,10	41.5	49.5
0,20	45.0	52.0
10,0	50.0	110.0
10,10	48.0	49.0
10,20	56.0	43.5
20,0	40.0	120.0
20,10	42.0	46.5
20,20	52.0	50.5
30,0	70.0	90.0
30,10	49.0	42.0
30,20	NEG*	74.0
40,0	50.0	80.0
40,10	45.0	45.0
40,20	83.0	57.5

02[UZ]YP7080:D3136/4070/30

*Negative meter readings (NEG) indicate very high conductivities beyond the capabilities of the instrument.

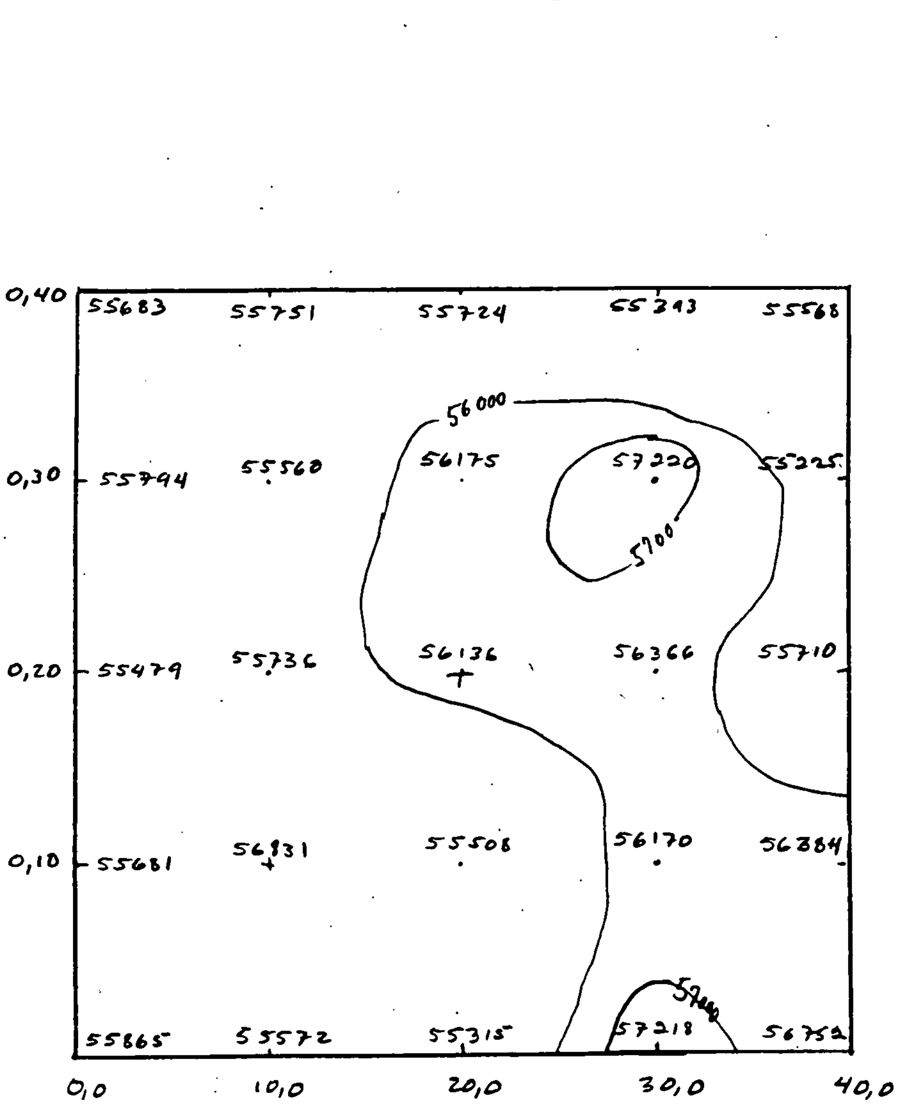
APPENDIX B

MAGNETOMETER AND
EM31 SURVEY CONTOUR MAPS

HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID No. 1



CONTOUR INTERVAL : 1000 γ

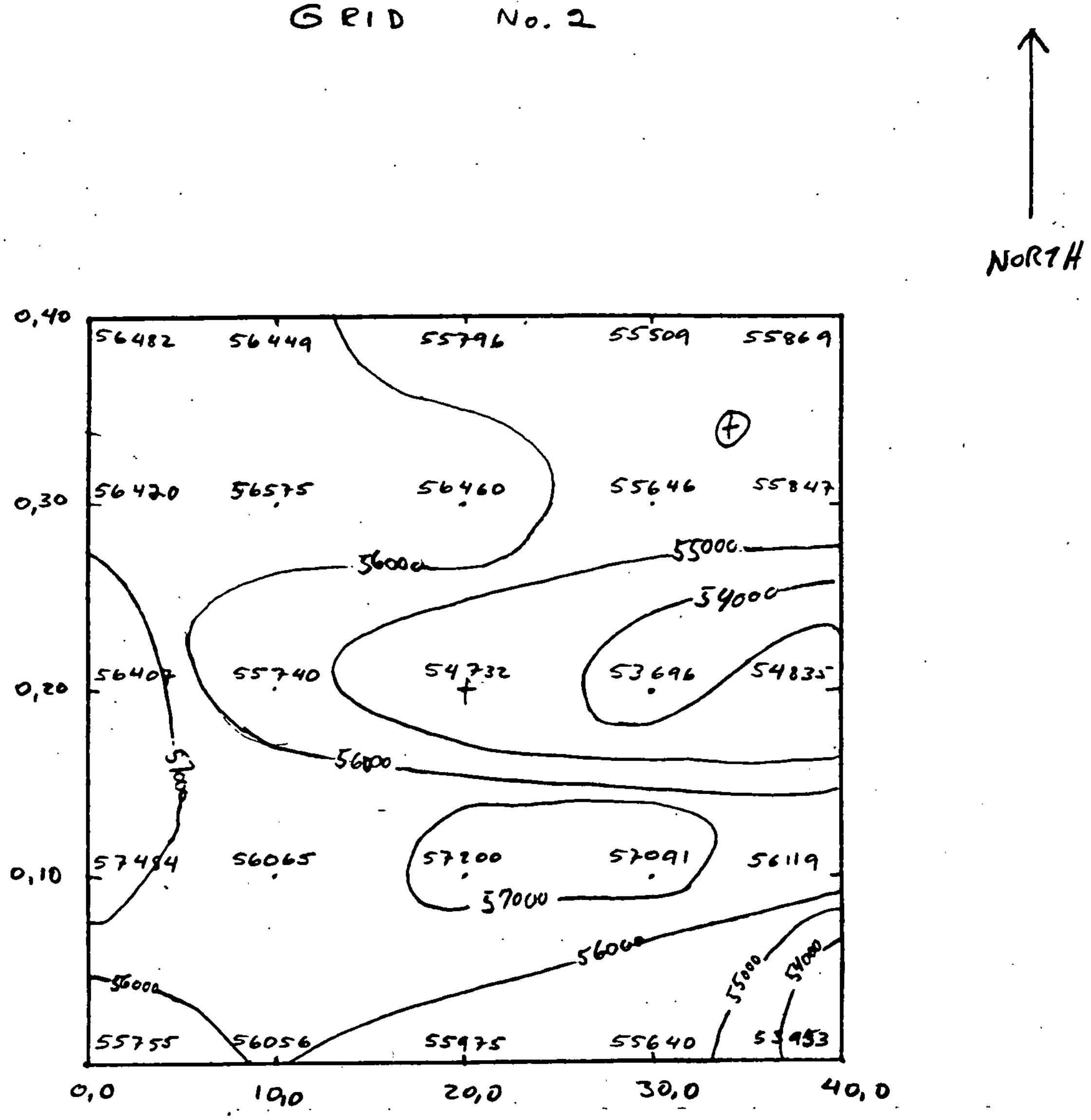
+ PROPOSED WELL LOCATION

SCALE: 1" = 10 Ft

HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID No. 2



CONTOUR INTERVAL: 1000 γ

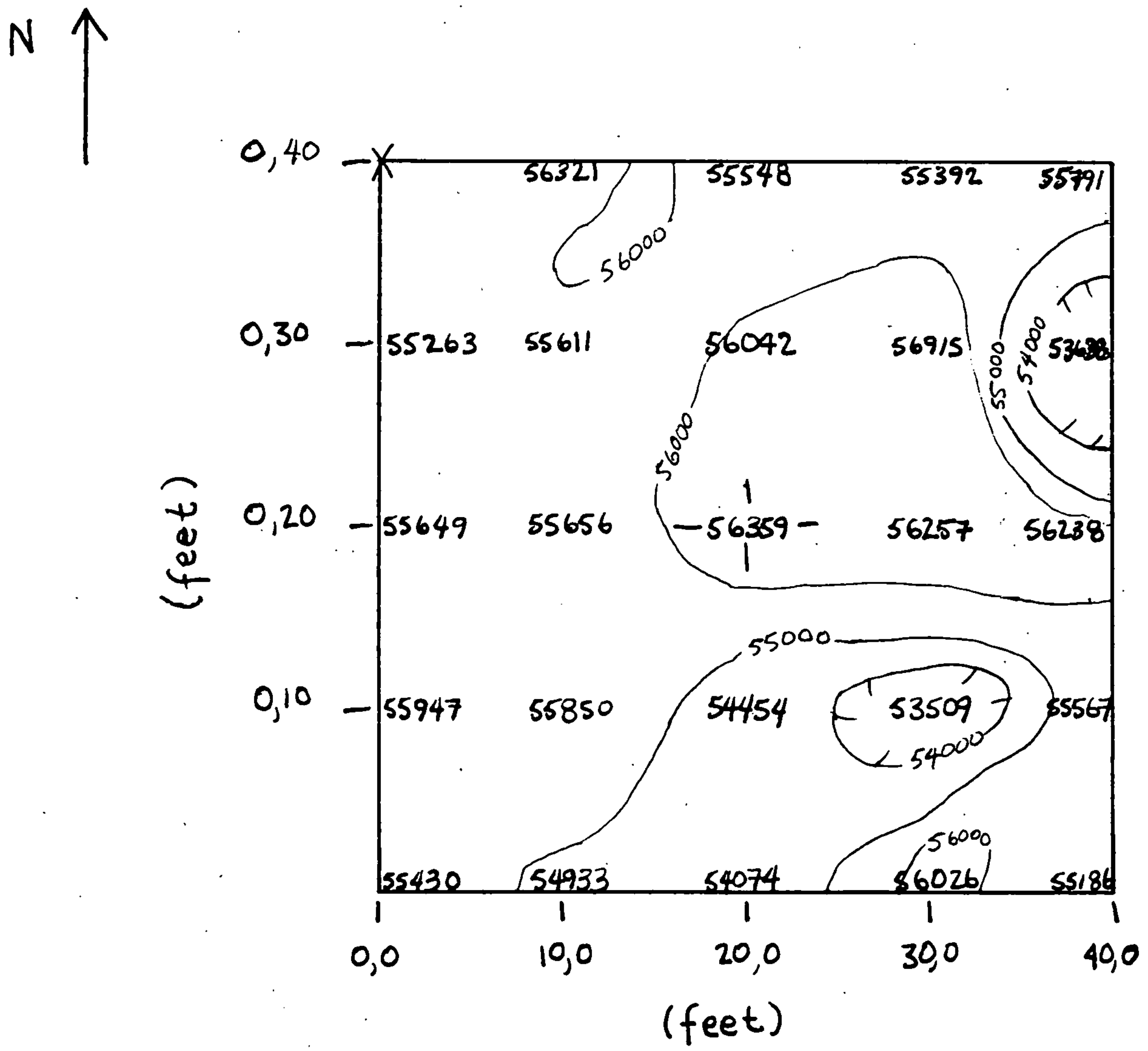
+ OLD PROPOSED WELL LOCATION

⊕ NEW PROPOSED WELL LOCATION

SCALE 1" = 10'

B-43

MAGNETOMETER SURVEY
GRID NO 2A



C. I. = 1000 gammas

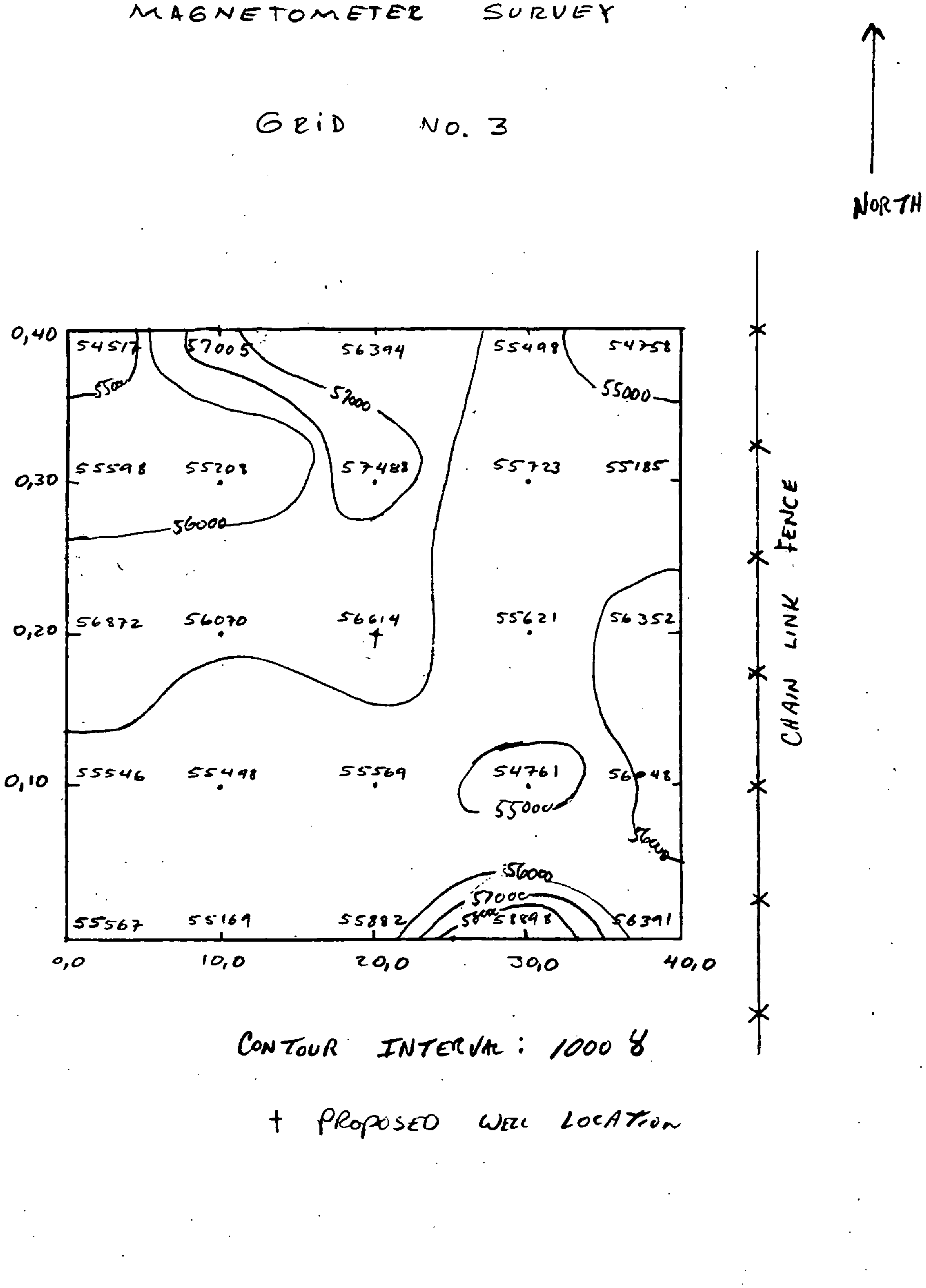
Proposed Well Location : -¦-

Unaccessible Station Location : X

HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID NO. 3



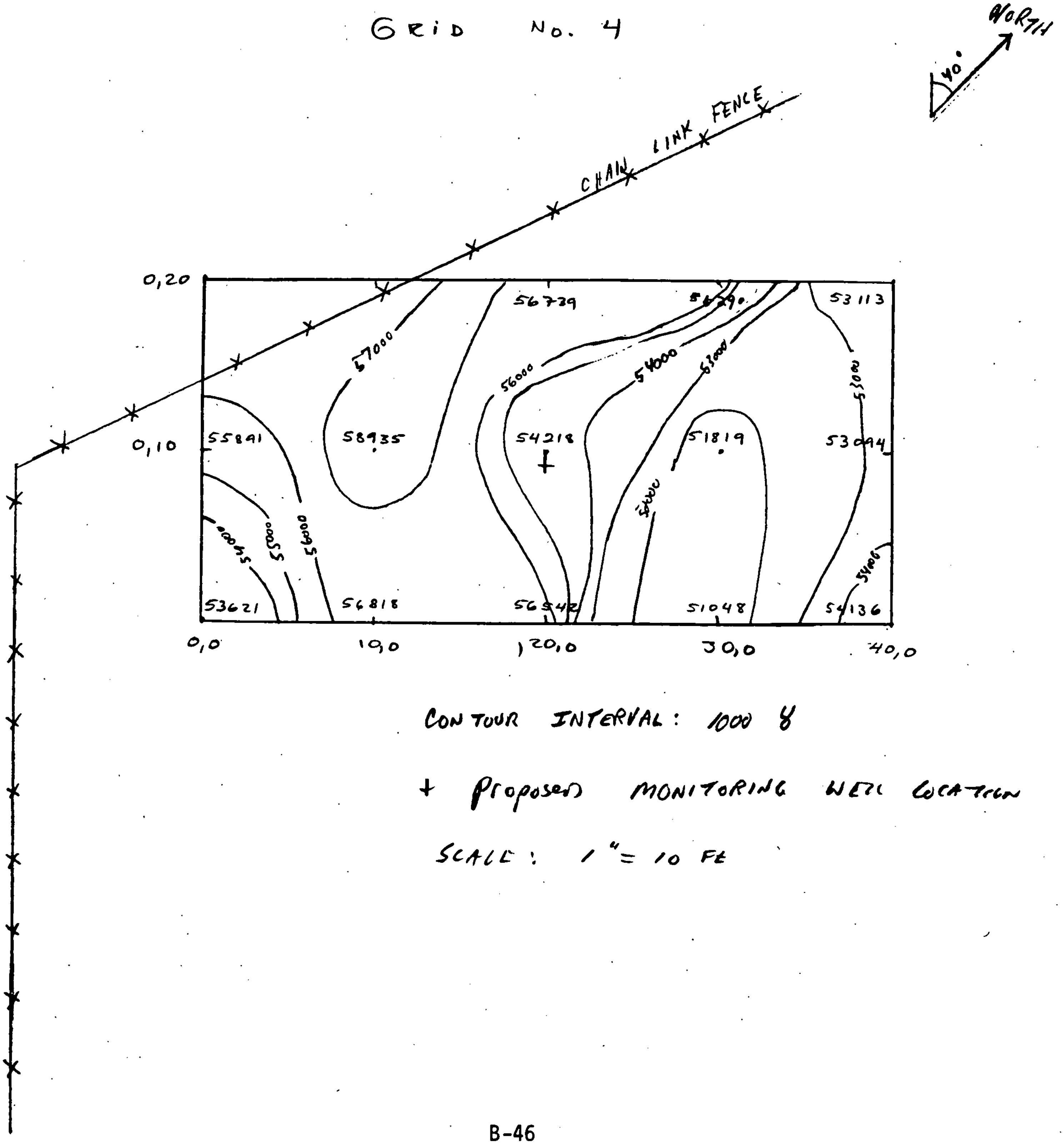
CONTOUR INTERVAL: 1000 γ

+ PROPOSED WELL LOCATION

HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID NO. 4



CONTOUR INTERVAL: 1000 γ

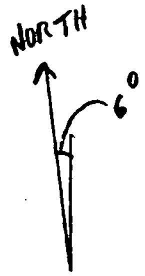
+ Proposed MONITORING WELL LOCATION

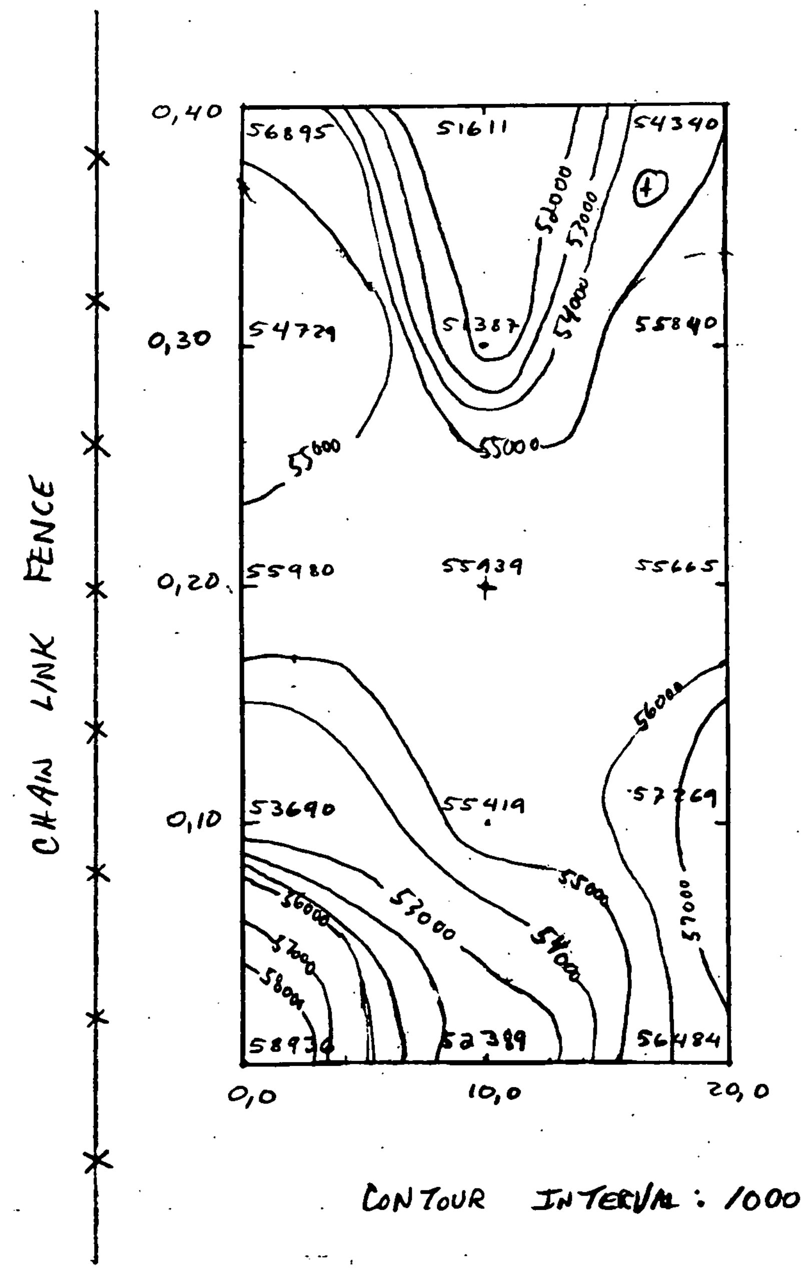
SCALE: 1" = 10 Ft

HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID No. 5





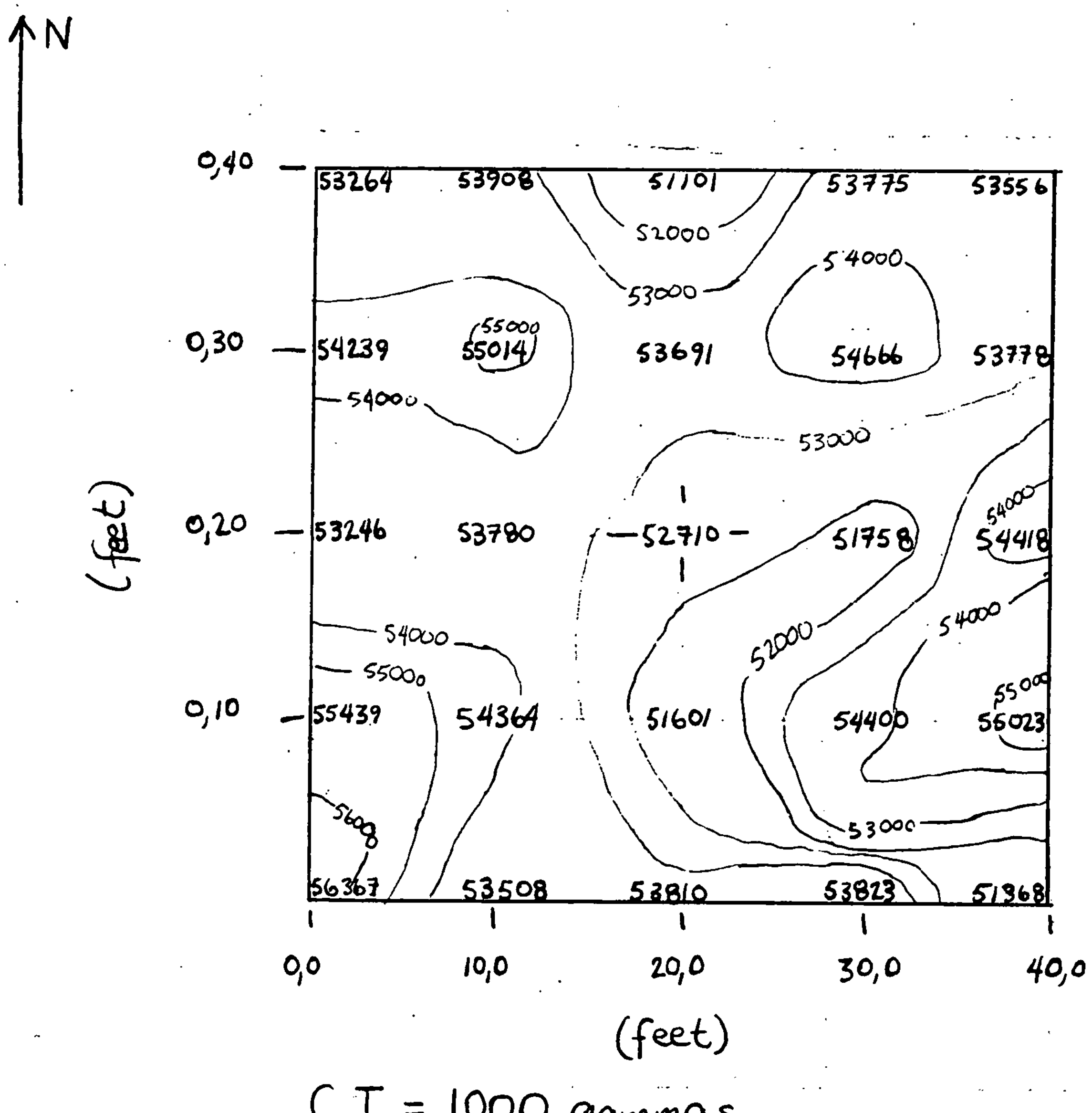
CONTOUR INTERVAL: 1000 γ

+ OLD PROPOSED WELL LOCATION

⊕ NEW PROPOSED WELL LOCATION

SCALE 1" = 10 Ft

MAGNETOMETER SURVEY
GRID NO 5A



C.I. = 1000 gammas

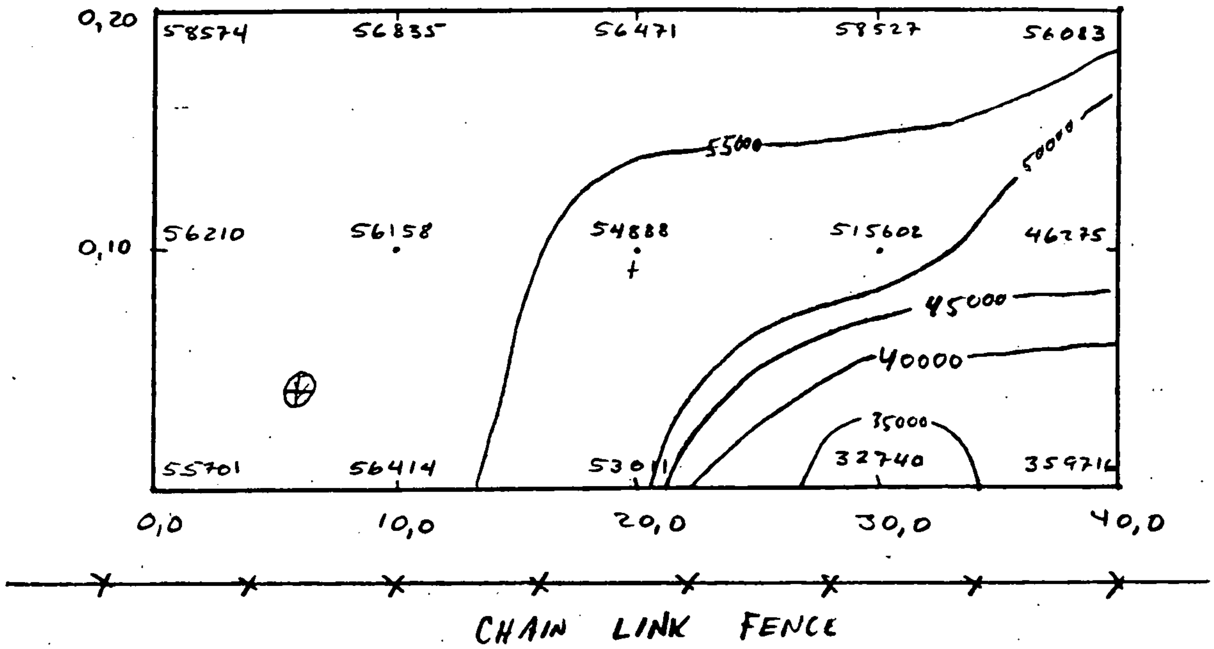
Proposed Well Location: -¦-

HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID No. 6

NORTH



CONTOUR INTERVAL: 5000 γ.

\+ OLD PROPOSED WELL LOCATION.

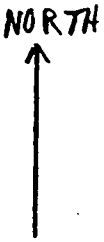
⊕ NEW PROPOSED WELL LOCATION

SCALE: 1" = 10 Ft

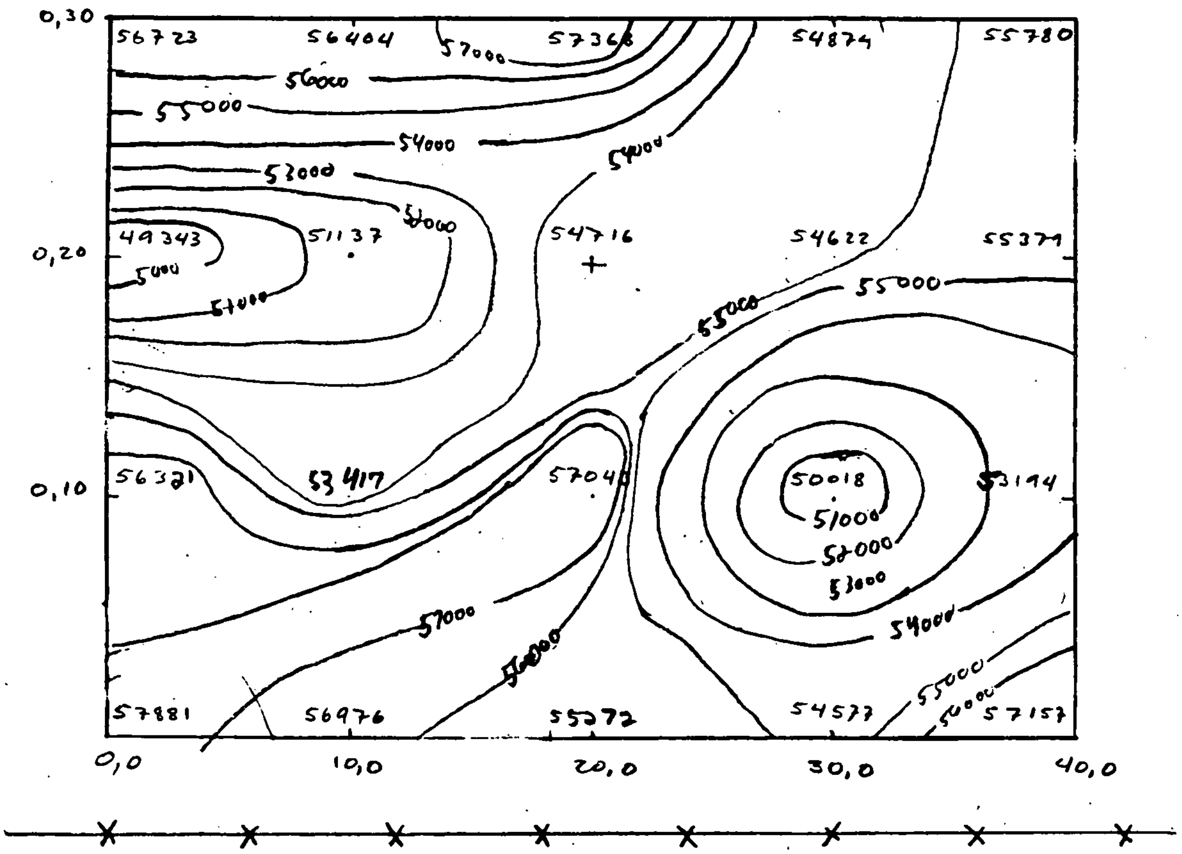
HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID No. 7



CLOSE TO BUILDINGS



CHAIN LINK FENCE

CONTOUR INTERVAL: 1000 γ

\+ PROPOSED WELL LOCATION

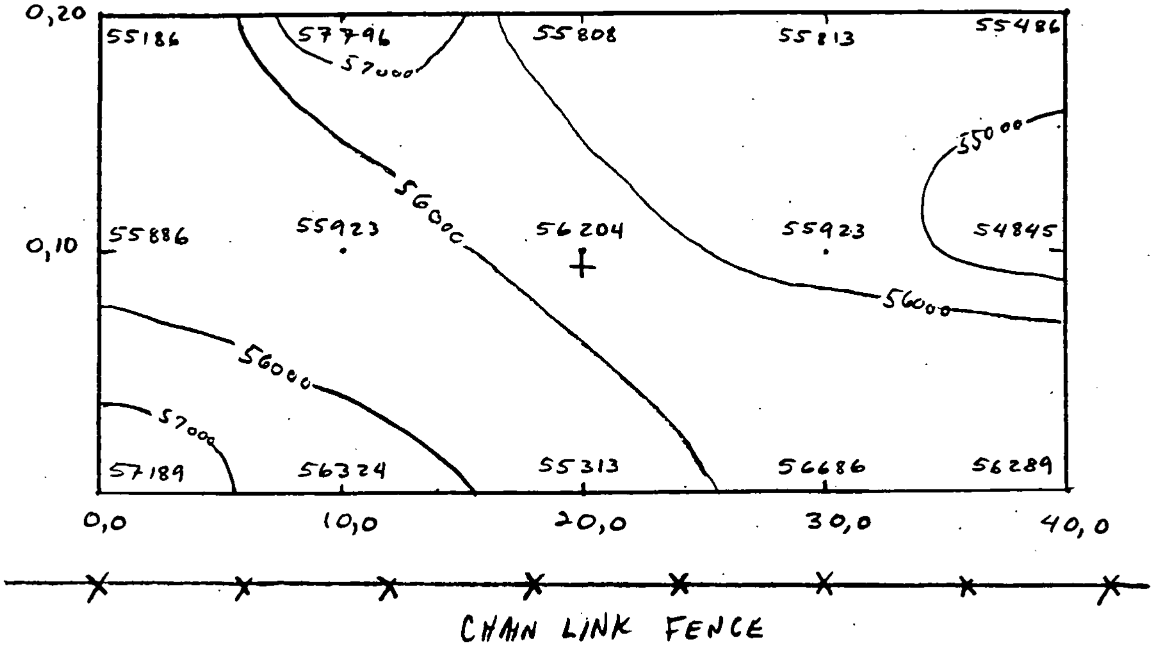
SCALE: 1" = 10 Ft

HARTWELL ST. LANDFILL

MAGNETOMETER SURVEY

GRID No. 8

NORTH



CONTOUR INTERVAL: 1000 ɣ

+ PROPOSED WELL LOCATION

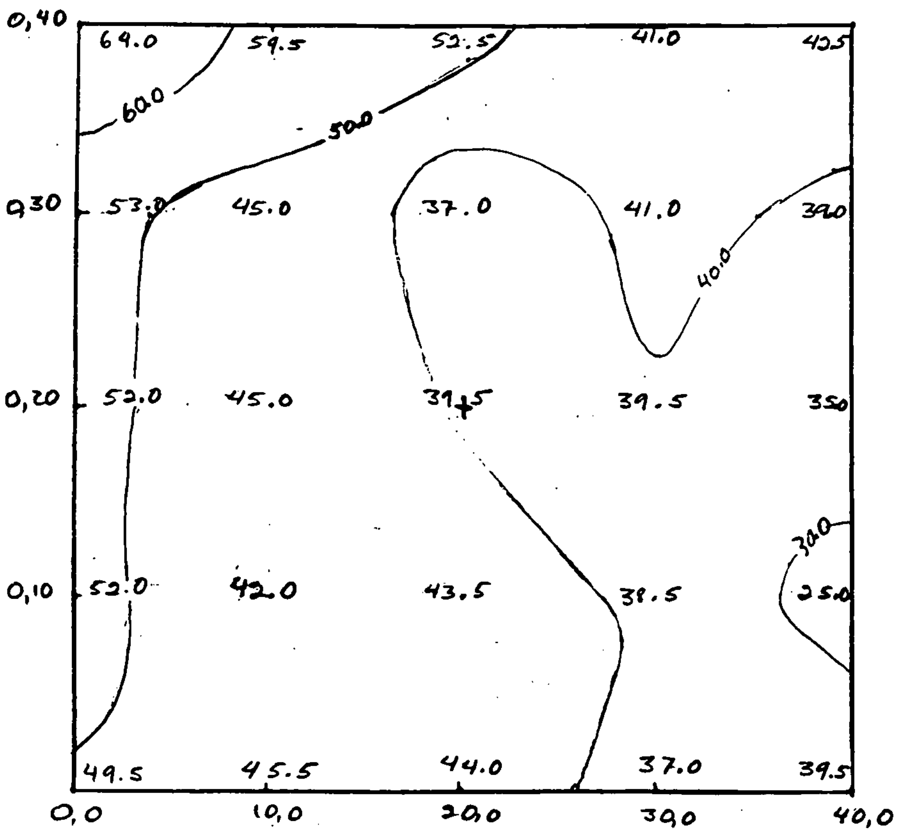
SCALE: 1" = 10 Ft

HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID NO. 1

VERTICAL DIPOLE
(mmhos/m)



C.I = 10.0 mmho/m

SCALE = 1" = 10'

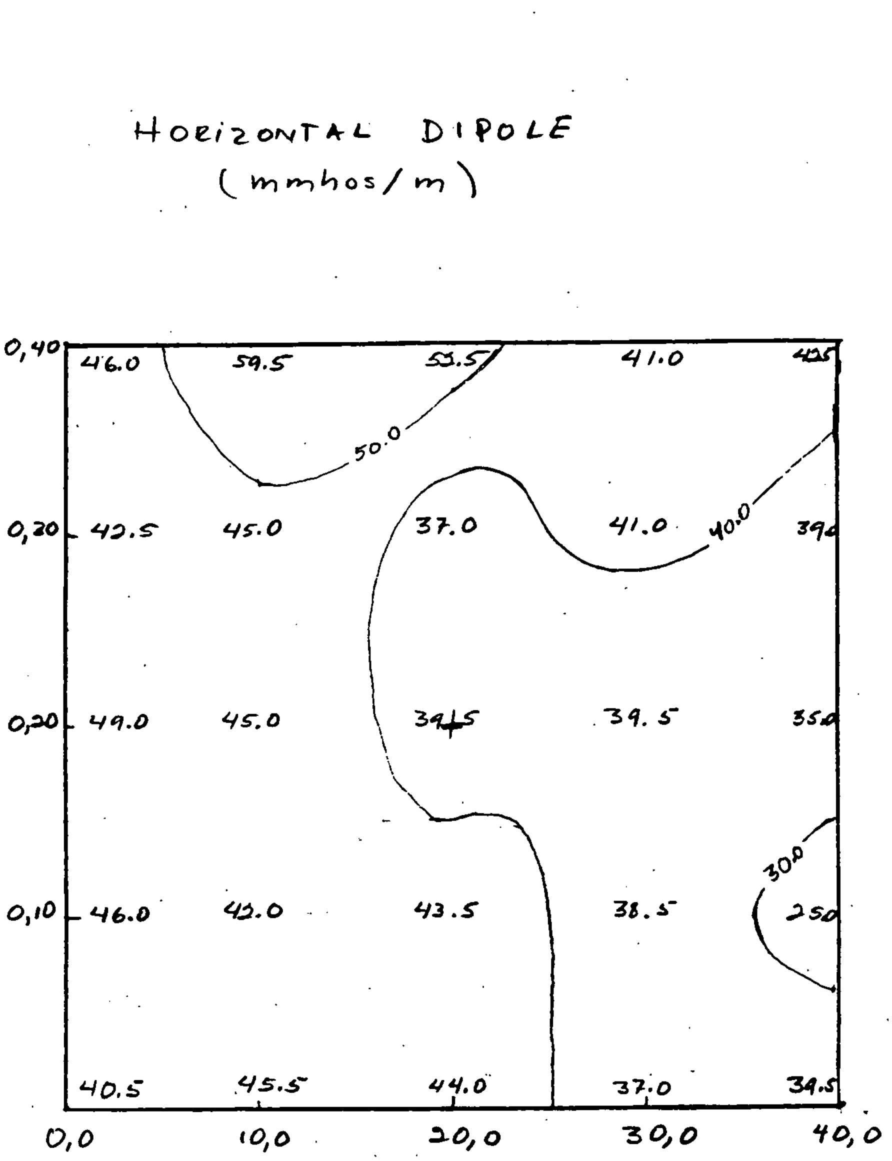
+ PROPOSED WELL LOCATION

HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID NO. 1

HORIZONTAL DIPOLE
(mmhos/m)



C.I = 10.0 mmho/m

+ PROPOSED WELL LOCATION

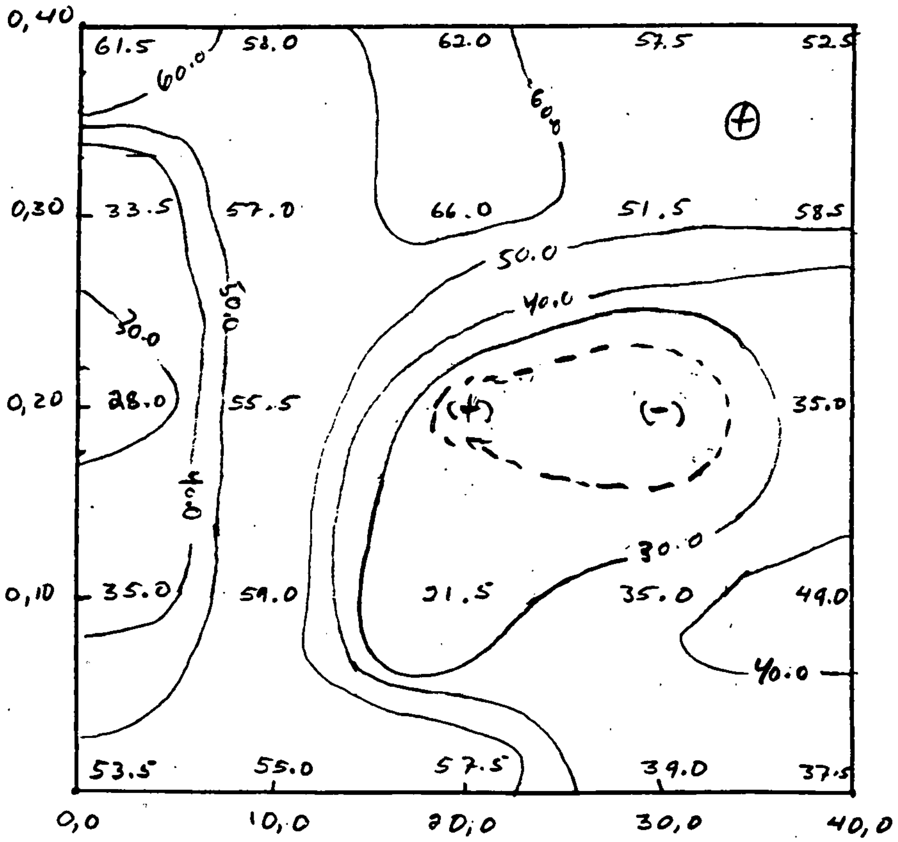
SCALE 1" = 10 Ft

HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID NO. 2

VERTICAL DIPOLE
(mmhos/m)



C.I. = 10 mmho/m

⊕ NEW PROPOSED WELL LOCATION

+ OLD PROPOSED WELL LOCATION

--- ZONE OF NEGATIVE READING

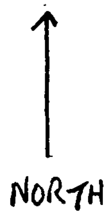
SCALE: 1"=10'

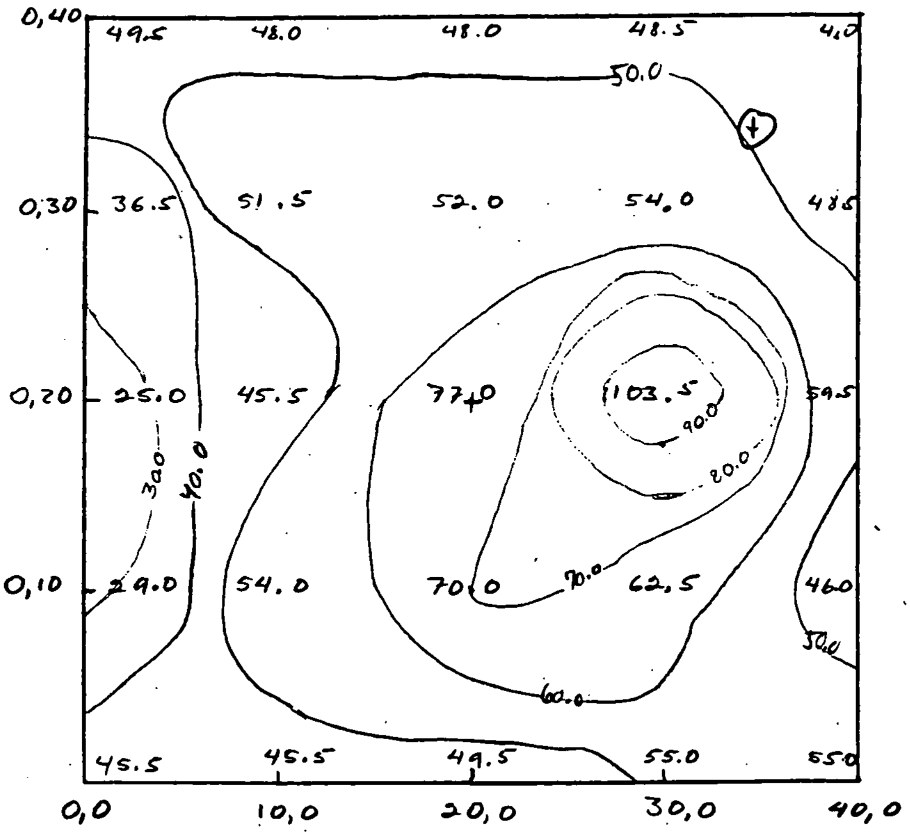
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID NO. 2

HORIZONTAL DIPOLE
(mmhos/m)





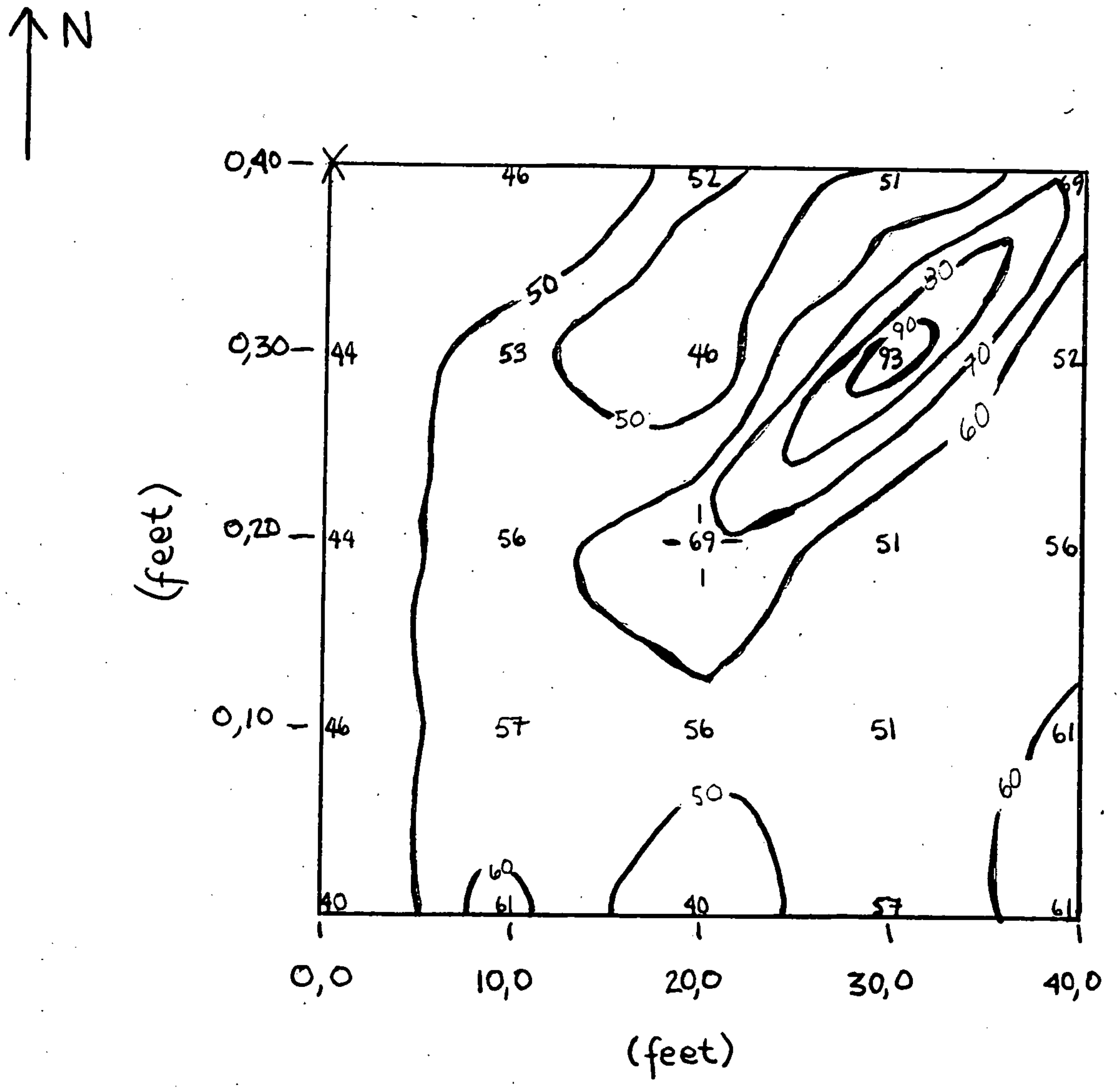
C.I = 10 mmho/m

⊕ OLD PROPOSED WELL LOCATION

⊕ NEW PROPOSED MONITORING WELL LOCATION

EM-31 SURVEY
GRID NO 2A

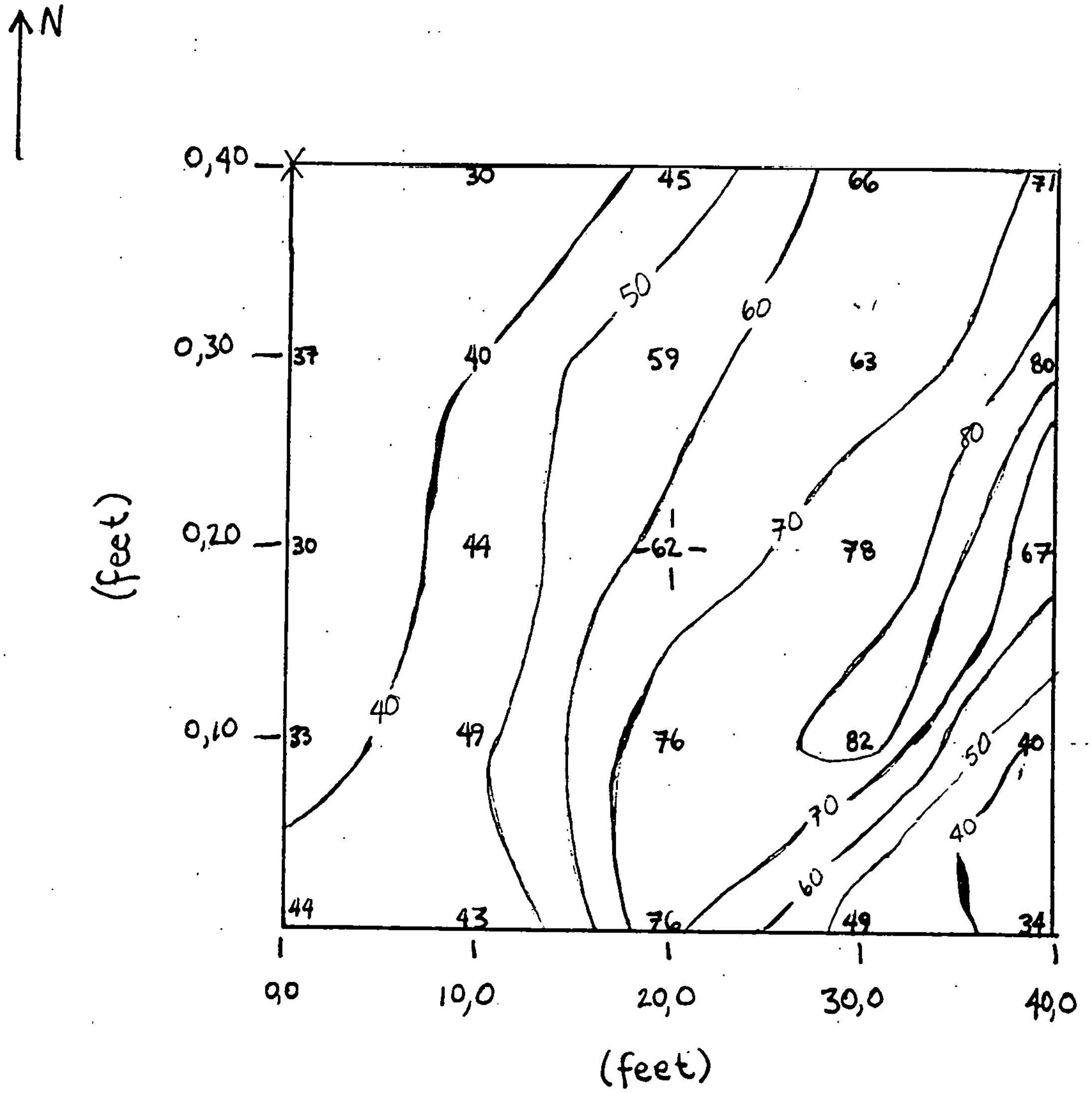
Vertical Dipole
(millimhos/meter)



C.I. = 10 millimhos/meter
Proposed Well Location: -¦-
Unaccessible Station Location: X

EM-31 SURVEY
GRID NO 2A

Horizontal Dipole
(millimhos/meter)



C.I. = 10 millimhos/meter

Proposed Well Location: -¦-

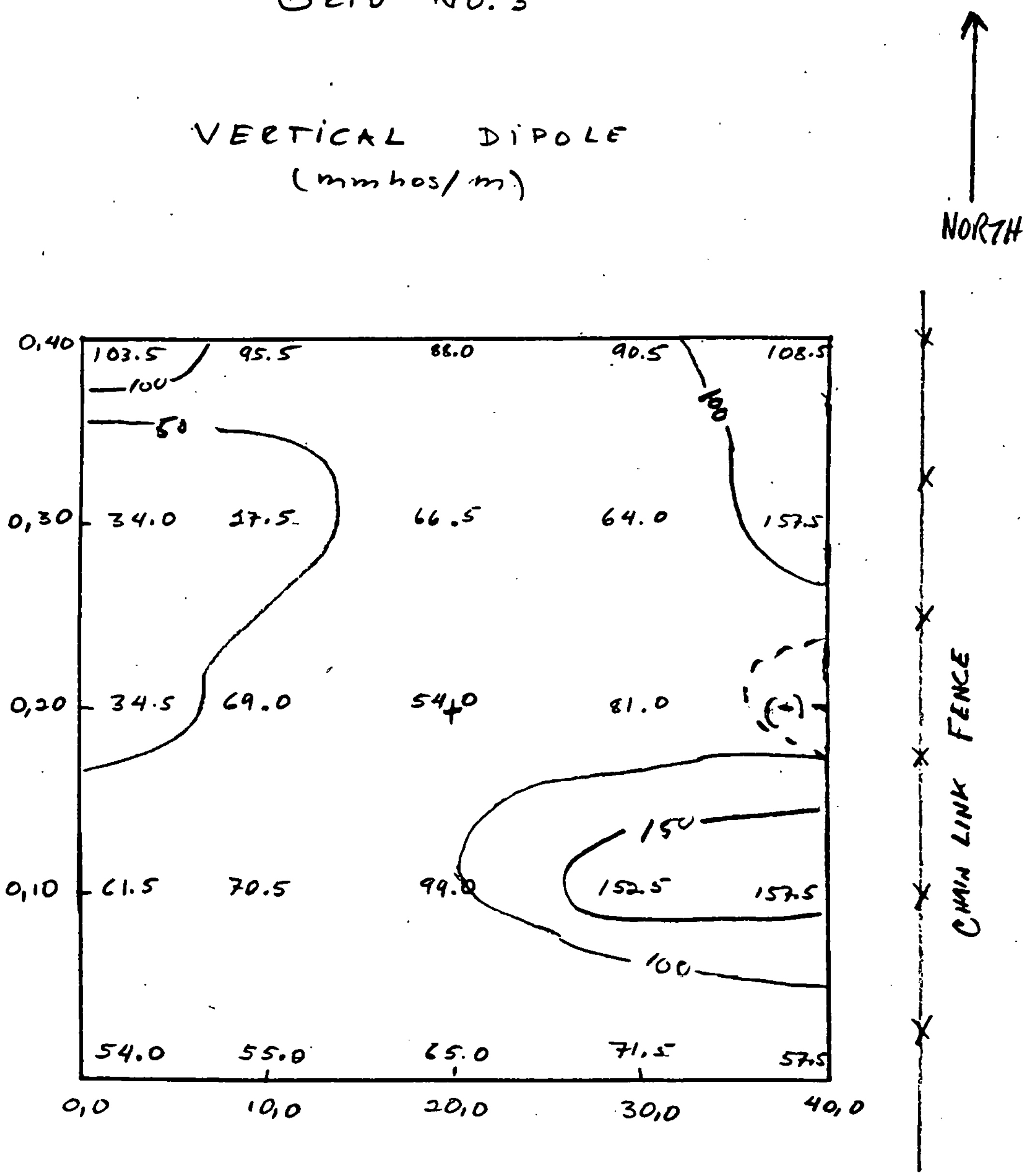
Unaccessible Station Location: X

HARTWEL ST. LANDFILL

EM-31 SURVEY

GRID NO. 3

VERTICAL DIPOLE
(mmhos/m)



C.I. = 50 mmHos/m

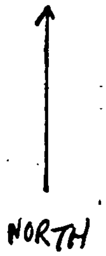
+ PROPOSED WELL LOCATION

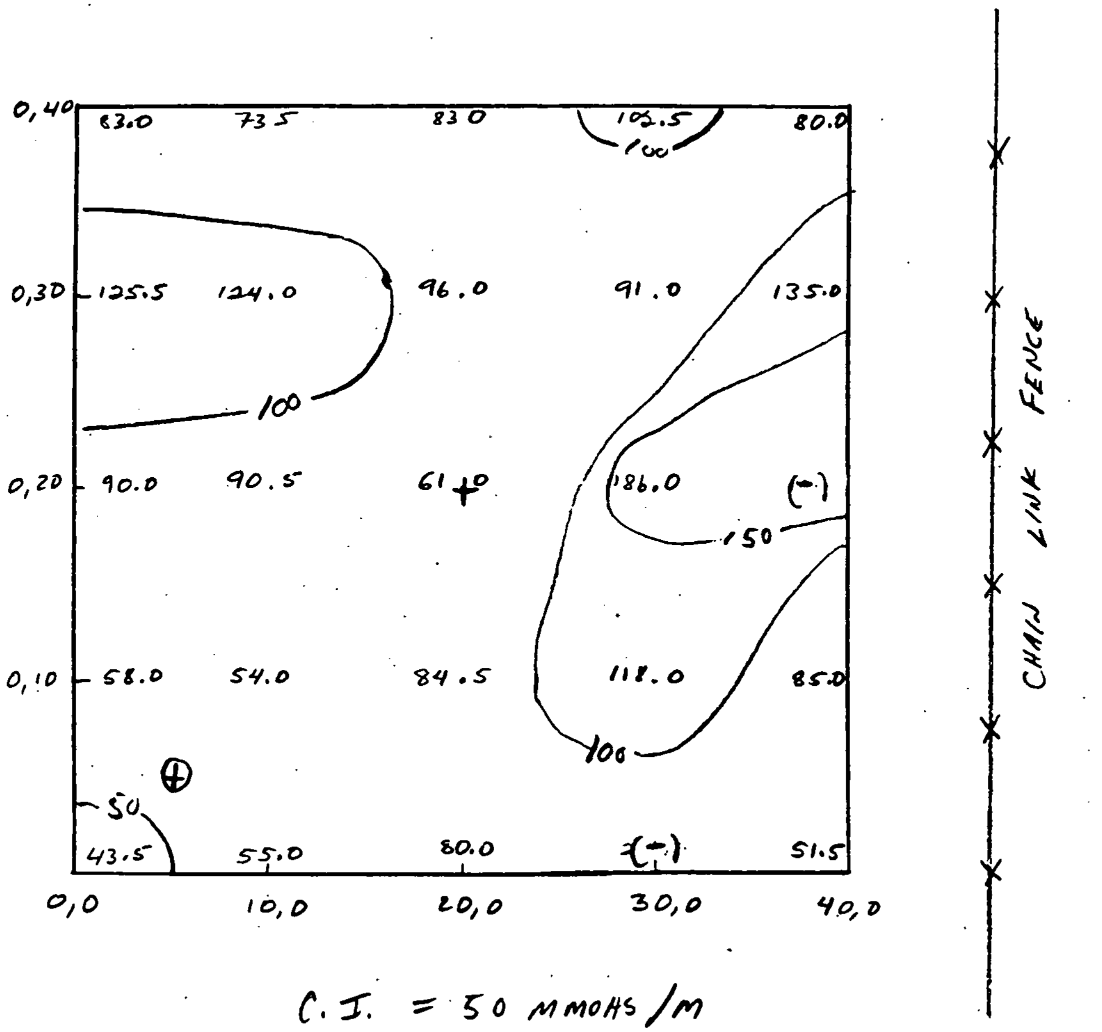
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID NO. 3

HORIZONTAL DIPOLE
(mmhos/m)





C.I. = 50 MMOHS/M

+ OLD PROPOSED WELL LOCATION

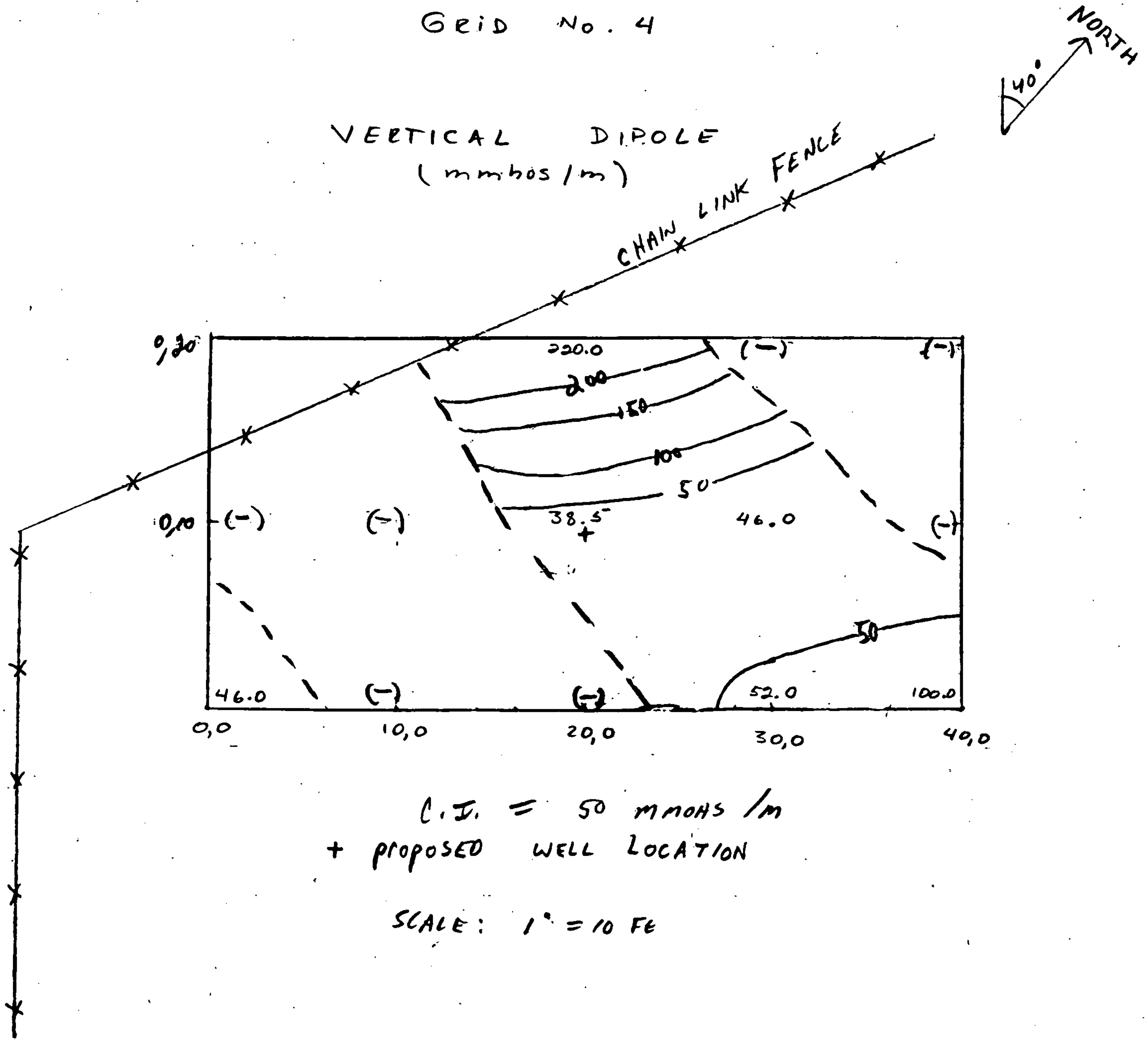
⊕ NEW PROPOSED WELL LOCATION

HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 4

VERTICAL DIPOLE
(mmhos/m)



C.I. = 50 mmohs/m
+ proposed well location

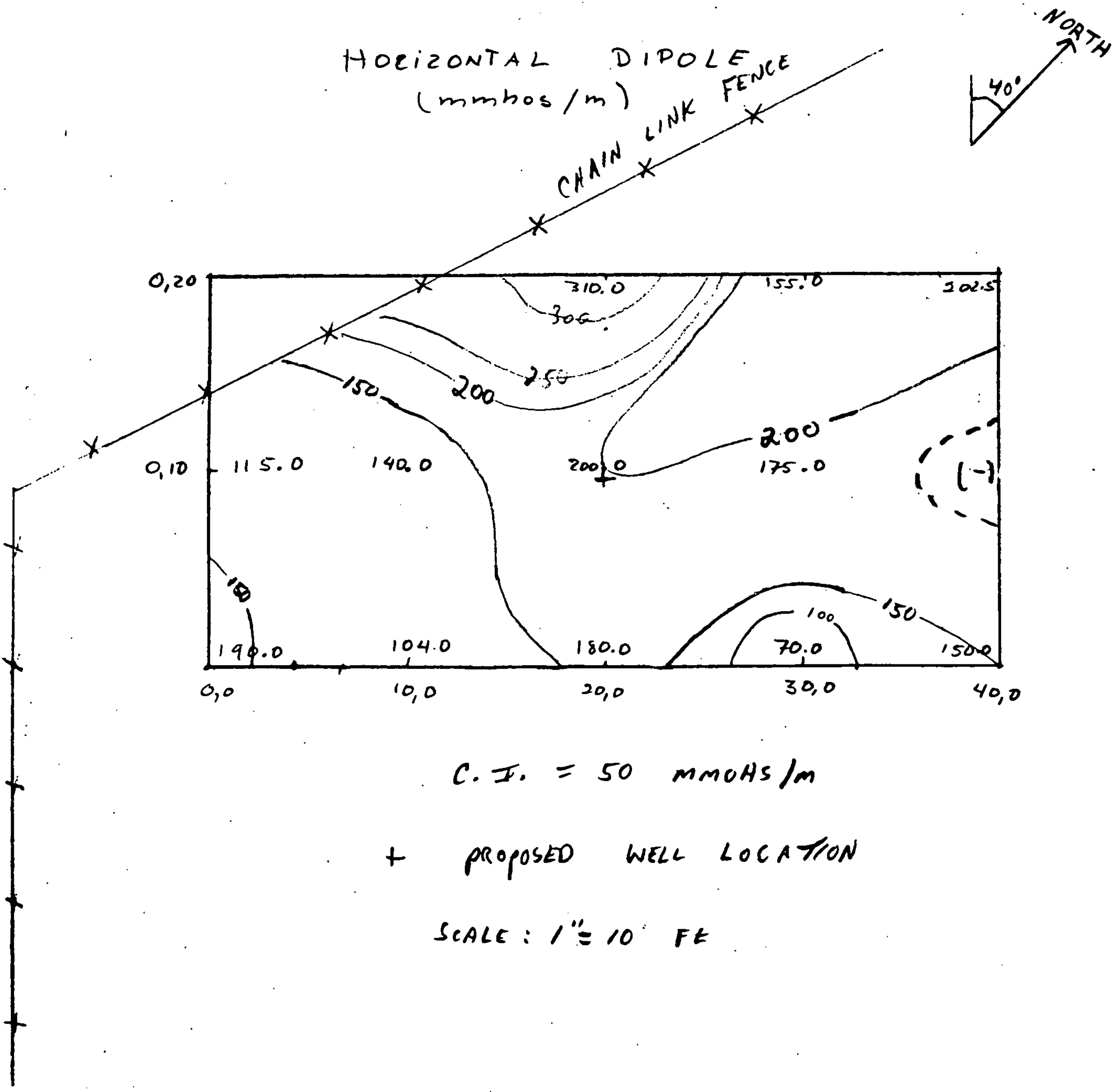
SCALE: 1" = 10 Ft

HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID NO. 4

HORIZONTAL DIPOLE
(mmhos/m)



C.I. = 50 MMOHS/m

+ PROPOSED WELL LOCATION

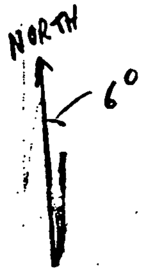
SCALE: 1" = 10 FT

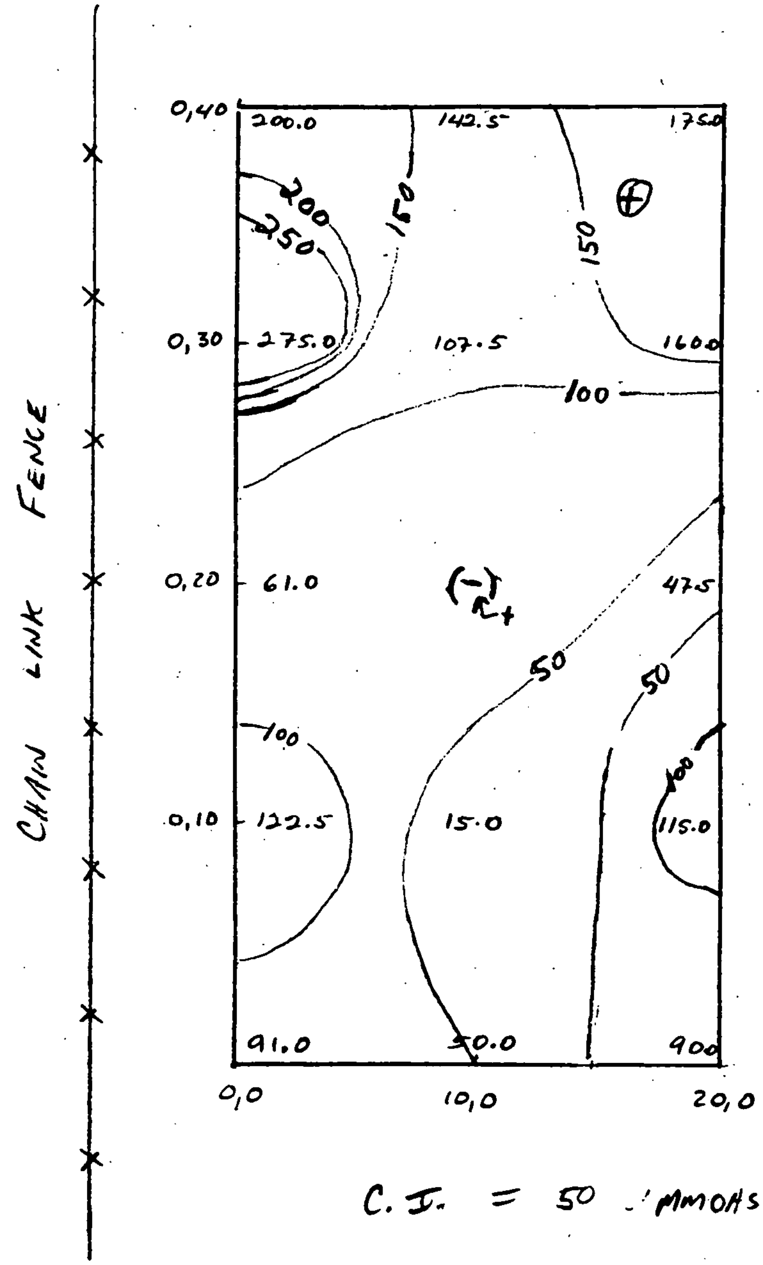
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 5

VERTICAL DIPOLE
(mmhos/m)





C.I. = 50 mmohs/m

+ OLD PROPOSED WELL LOCATION

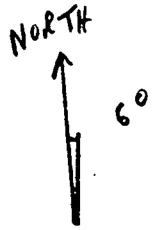
⊕ NEW PROPOSED WELL LOCATION

SCALE: 1" = 10'

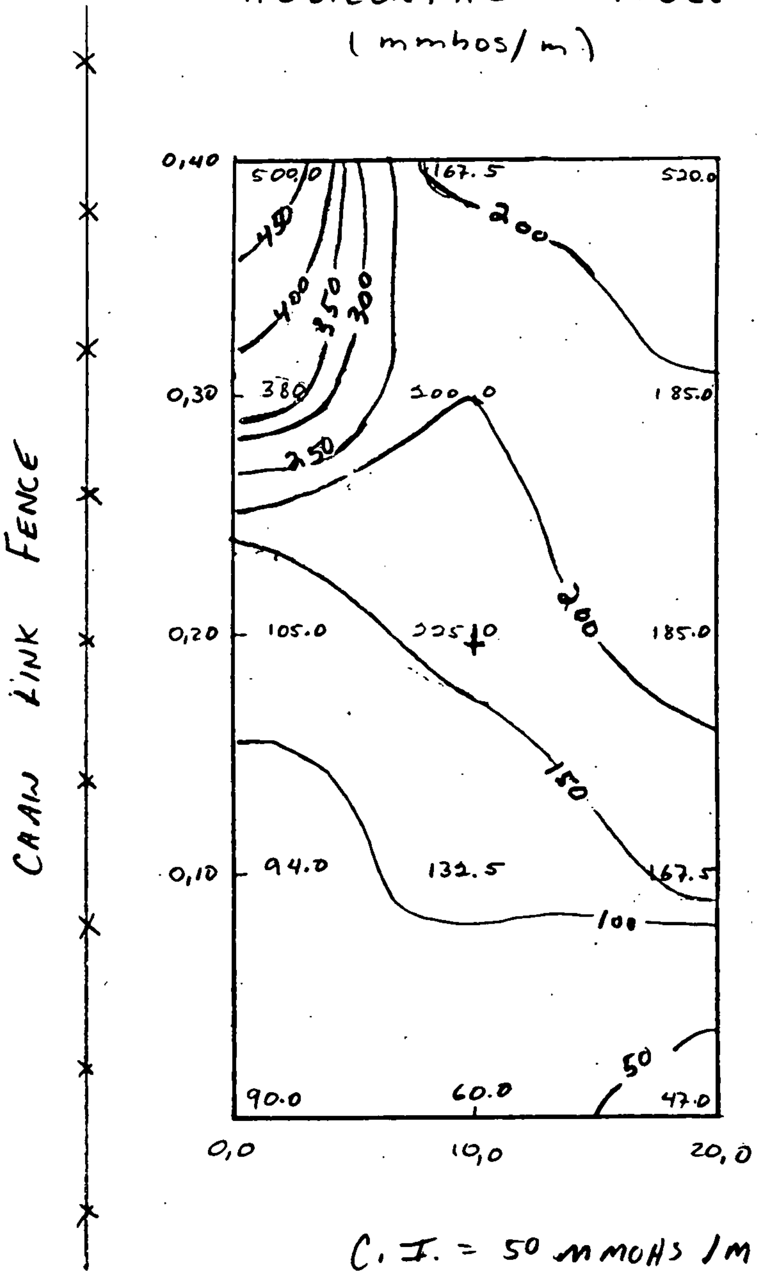
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 5



HORIZONTAL DIPOLE
(mmhos/m)

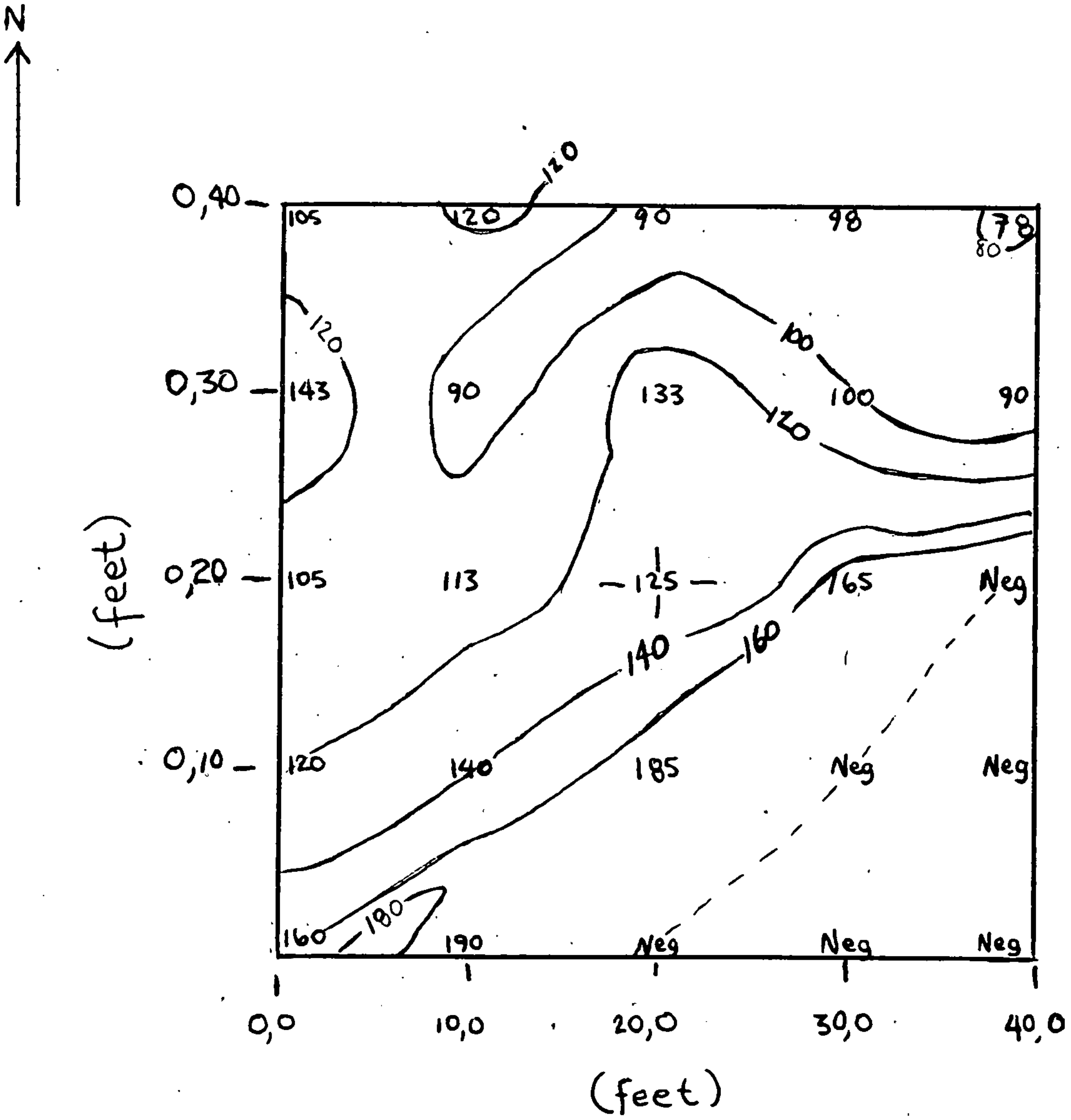


C.I. = 50 mmohs/m

+ PROPOSED WELL LOCATION

EM-31 SURVEY
GRID NO 5A

Vertical Dipole
(millimhos / meter)



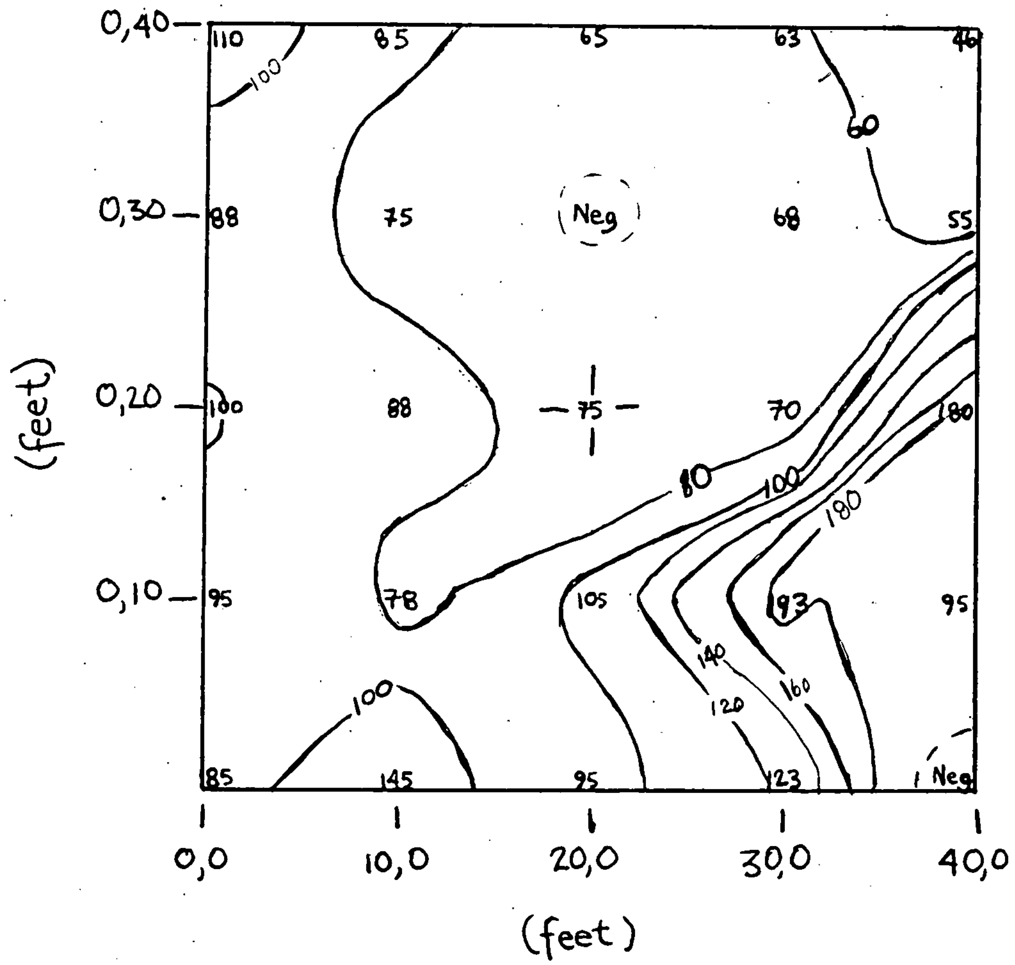
C.I. = 20 millimhos/meter

Proposed Well Location : -¦-

Area of extremely high conductivities : - - - - - -

EM-31 SURVEY
GRID NO 5A

Horizontal Dipole
(millimhos / meter)



C.I. = 20 millimhos/meter

Proposed Well Location : -|-

Area of extremely high conductivities : - - - - -

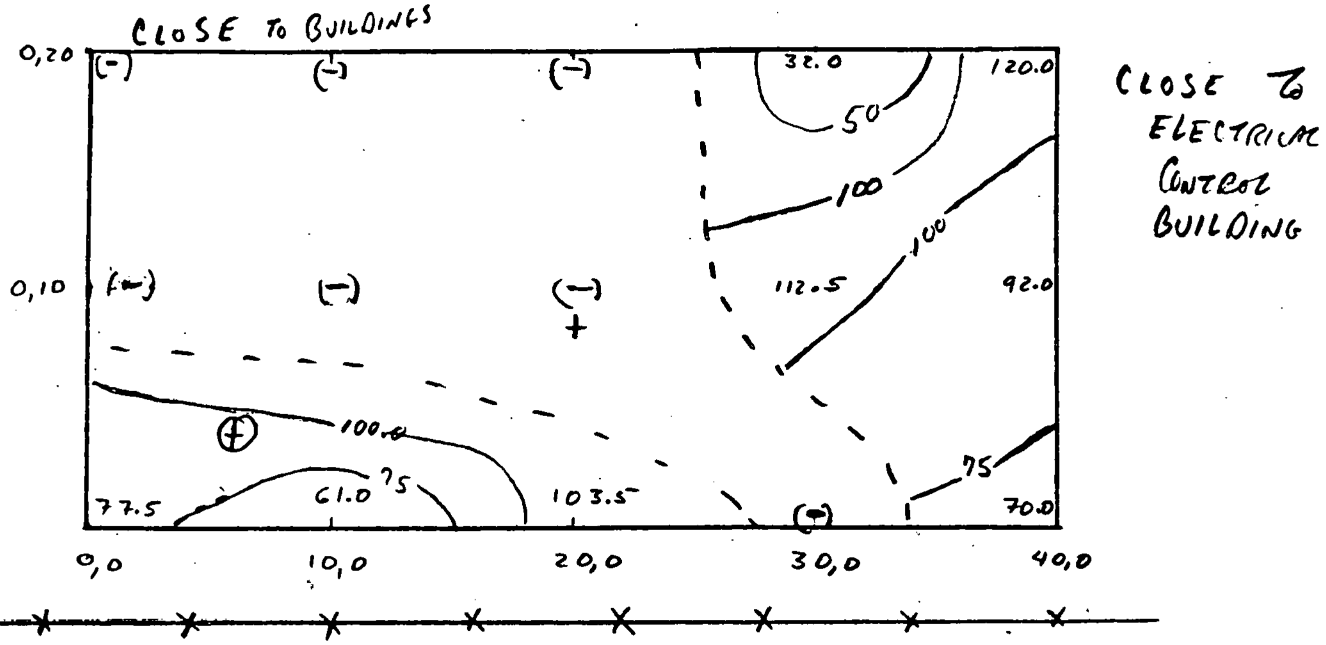
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 6

VERTICAL DIPOLE
(mmhos/m)

NORTH ↑



CHAIN LINK FENCE

+ OLD PROPOSED WELL LOCATION

⊕ NEW PROPOSED WELL LOCATION

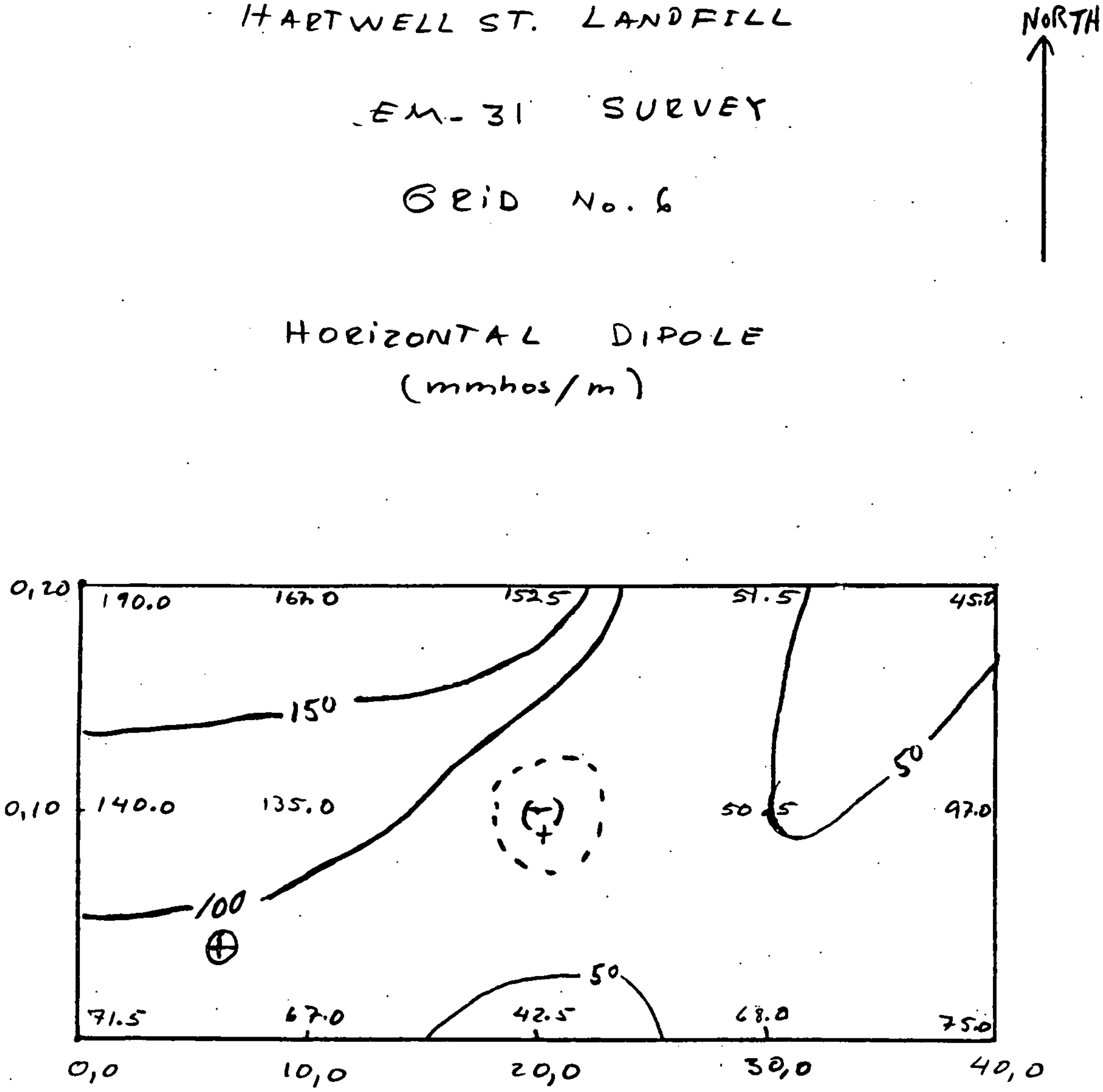
SCALE: 1" = 10 Ft

HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 6

HORIZONTAL DIPOLE
(mmhos/m)



C.I. = 50 mmOHS /m

\+ OLD PROPOSED WELL LOCATION

⊕ NEW PROPOSED WELL LOCATION

SCALE: 1" = 10 Ft

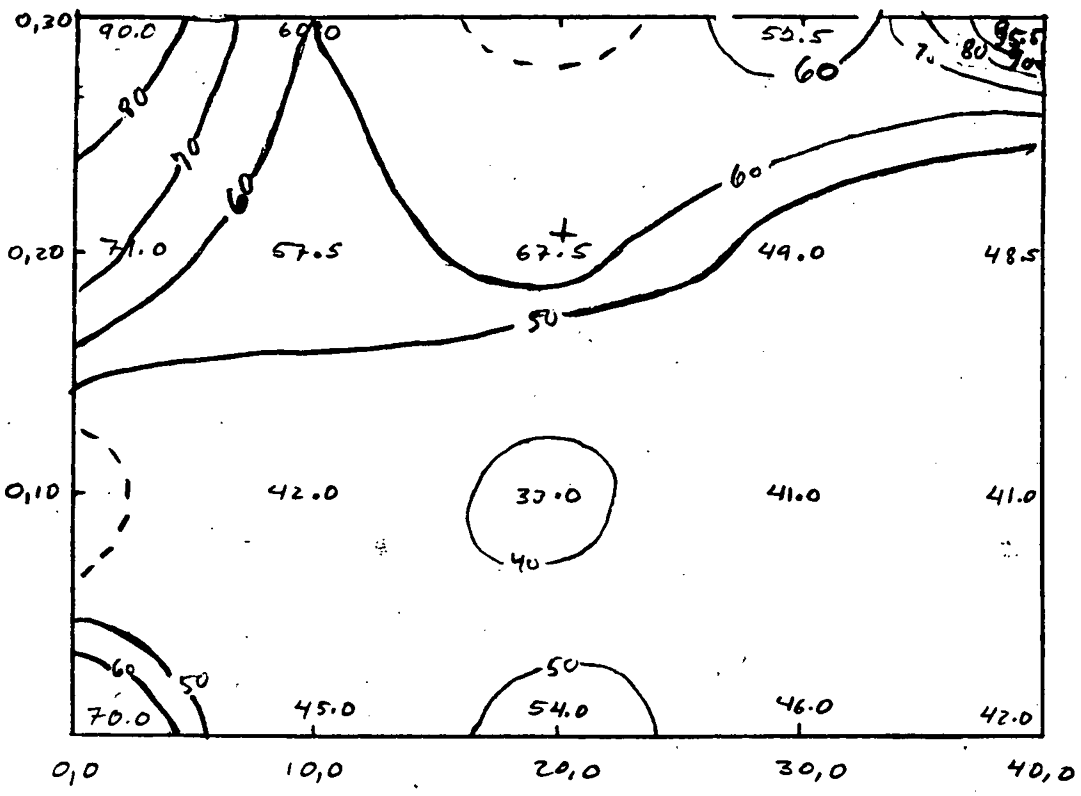
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 7

VERTICAL DIPOLE
(mmhos/m)

NORTH



CHAIN LINK FENCE

+ PROPOSED WELL LOCATION

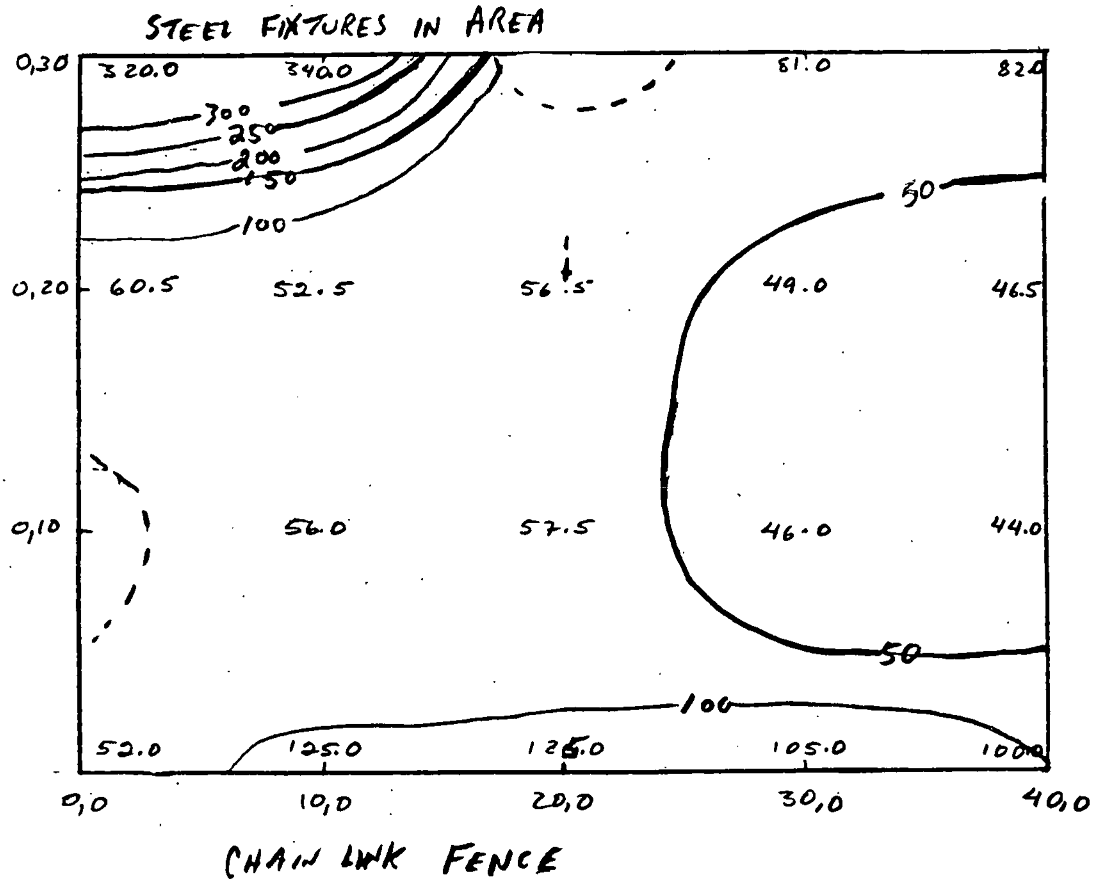
SCALE: 1" = 10 Ft

HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 7

HORIZONTAL DIPOLE
(mmhos/m)



C.I. = 50 MMOHS /m

+ PROPOSED WELL LOCATION

SCALE 1" = 10 Ft

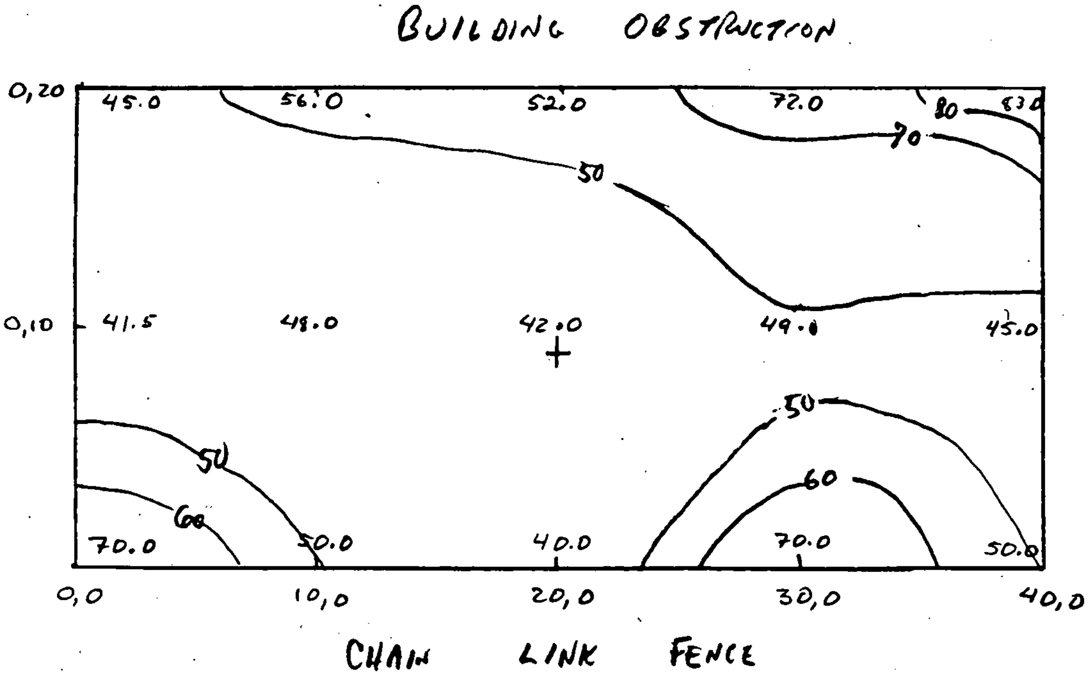
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 8

NORTH

VERTICAL DIPOLE
(mmhos/m)



+ PROPOSED WELL LOCATION

SCALE : 1" = 10 Ft

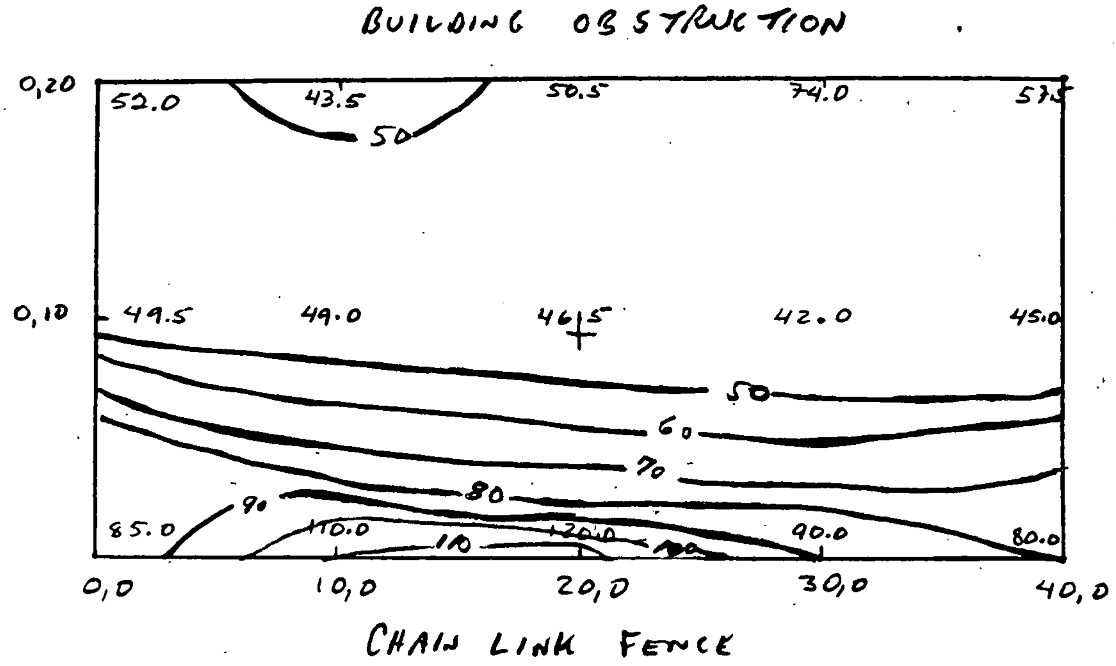
HARTWELL ST. LANDFILL

EM-31 SURVEY

GRID No. 8

NORTH ↑

HORIZONTAL DIPOLE
(mmhos/m)



C.I. = 10 mmohs/m

+ PROPOSED WELL LOCATION

SCALE : 1" = 10 Ft

APPENDIX C

SUBSURFACE BORING LOGS

DATE
STARTED 6/25/90
FINISHED 6/25/90
SHEET 1 OF 7

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-1
SURFACE ELEVATION
GROUNDWATER DEPTH

PROJECT YP 7040 NYSDEC Phase II
LOCATION Hartwell Street L.F. Buffalo, NY

DEPTH – FT	WELL DIAGRAM	OVA ~~SAMPLE TYPE~~	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE ~~Cl~~ ~~Sl~~ ~~Sd~~ ~~Gr~~	FIELD IDENTIFICATION OF SOILS	NOTES
				3	4	5	8		SS-1/0'-2' Fill-dark brown with rust staining + traces of glass Some organic-rich soil	Rec. = 10'
1								Fill		
2				3	4	2	3		SS-2/2'-4' 100% silty and clayey sand Dark brown with some rust staining	Rec. = 1.0'
3		0							Got 50 ppm methane initially	
4								Not Sampled		
5										
6										
7								Red Clay Returns		
8										
9										

C-2

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CLASSIFICATION/BY J. Richert

DATE
STARTED 6/25/90
FINISHED 6/25/90
SHEET 2 OF 7

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-1
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT YP-7040 NYSDEC Phase II
LOCATION Hartwell St. L.F. Buffalo, NY

DEPTH – FT	WELL DIAGRAM	~~SAMPLE TYPE~~ OVA	SAMPLE NO.	BLOWS ON SAMPLER 0/6, 6/12, 12/18, 18/24	PROFILE ~~Cl~~ Sl ~~Sd~~ ~~Gr~~	FIELD IDENTIFICATION OF SOILS	NOTES
				8 13 19 22		SS-3/9'-11' 9'-9.3': Organic soil and gravel from above 9.3'-11': 100% pure clay, red, very dry	Rec. = 2.0'
10		0					
12					Red clay		
14						SS-4/14'-16' 14.0'-14.3': Organic-rich soil (silty sandy loam) probably cave in from hole 14.3'-16': Clay, as above	Rec. = 2.0'
		0					
16							
18							

C-3

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DATE
STARTED 6/25/90
FINISHED 6/25/90
SHEET 3 OF 7

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-1
SURFACE ELEVATION
GROUNDWATER DEPTH
( )

PROJECT YP 7040
NYSDEC Phase II

LOCATION Hartwell St, L.F.
Buffalo, NY

DEPTH – FT	WELL DIAGRAM	OVA ~~SAMPLE TYPE~~	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE ~~Cl Sl Sd Gr~~	FIELD IDENTIFICATION OF SOILS	NOTES
19				4	4	7	10		SS-5/19'-21' 100% red clay Slightly damp, pure	Rec. = 2.0'
20		0								
21								Red clay	Red clay auger returns	
22										
23										
24				3	4	8	10		SS-6/24'-26' Red clay, damp, more malleable	Rec. = 0.6'
25		0								
26										
27										

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CLASSIFICATION/BY J. Richert

DATE
STARTED 6/25/90
FINISHED 6/25/90
SHEET 4 OF 7

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-1
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT YP 7040
NYSDEC Phase II

LOCATION Hartwell Street L.F.
Buffalo, NY

DEPTH – FT	WELL DIAGRAM	OVA ~~SAMPLE TYPE~~	SAMPLE NO.	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	PROFILE ~~Cl~~ Sl ~~Sd~~ ~~Gr~~	FIELD IDENTIFICATION OF SOILS	NOTES
							Red clay returns from auger	
28								
				2	3		SS-7/29'-31' 100% reddish gray clay Very plastic, damp, trace gravel	Rec. = 2.0'
				4	6			
		0						
30						clay		
							Red-gray clay, damp from auger returns	
32								
34				2	4		SS-8/34'-36' Same as above	
				3	5			
		0						
36								

(Blows on sampler second row: 12/18, 18/24)

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DATE
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SHEET 5 OF 7

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-1
SURFACE ELEVATION
GROUNDWATER DEPTH

PROJECT YP 7040 NYSDEC Phase II
LOCATION Hartwell St. L.F. Buffalo, NY

DEPTH – FT	WELL DIAGRAM	OVA ~~SAMPLE TYPE~~	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE ~~Cl~~ ~~Si~~ ~~Sd~~ ~~Gr~~	FIELD IDENTIFICATION OF SOILS	NOTES
37									Gray-red clay returns	
38										
39				1	2	2	2		SS-9/39'-41' 100% grey/red clay, very damp, traces of gravel	Rec.=2.0'
40		0								
41										
42									Grey/red clay returns from auger	
43										
44				1	2	2	3		SS-10/44'-46' Same as above	Rec.=2.0'
45		0								

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DATE
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FINISHED 6/25/90
SHEET 6 OF 7

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-1
SURFACE ELEVATION
GROUNDWATER DEPTH

PROJECT YP 7040
NYSDEC Phase II

LOCATION Hartwell St. L.F.
Buffalo, NY

DEPTH – FT	WELL DIAGRAM	OVA ~~SAMPLE TYPE~~	SAMPLE NO.	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	PROFILE ~~Cl~~ ~~Sl~~ ~~Sd~~ ~~Gr~~	FIELD IDENTIFICATION OF SOILS	NOTES
46										
48										
				1	1	2	3	clay	SS-11/49'-51' Same as above	
50		0								
52										
54										

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DATE
STARTED 6/25/90
FINISHED 6/25/90
SHEET 7 OF 7

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-1
SURFACE ELEVATION
GROUNDWATER DEPTH

PROJECT YP 7040 NYSDEC Phase II
LOCATION Hartwell St. L.F. Buffalo, NY

DEPTH – FT	WELL DIAGRAM	~~SAMPLE TYPE~~	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
				3	8	18	30		SS-12/54'-56' Gravelly clay Med. brown to gray Gravel ≈ rounded siltstone Some silt, dry	Rec. = 1.5'
55		0								
56				31	27	45	50+3.5"		SS-13/56'-57.35' Same as above with some angular dolomite chips Bertie Formation?	Rec. = 2.0' ✱ Hole making natural gas
57										
58										

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CLASSIFICATION/BY J. Richert

DATE
STARTED 6/28/90
FINISHED 6/28/90
SHEET 1 OF 2

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-2
SURFACE ELEVATION
GROUNDWATER DEPTH
( )

PROJECT HARTWELL STREET LANDFILL YP 7040
LOCATION MIDPOINT OF WESTERN PROPERTY LINE

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
		SS	1 0-2'	3	5	5	5		0-2': Brown fine to coarse sand with gravel and organics (30%). Black sand and gravel and slag (70%)	90% recovery OVA - 0ppm
1'										
2		SS	2 2-4'	6	6	5	10		2'-4': Black sand and gravel, moist (40%) Medium brown sand with grave (20%) Red clay, fairly soft, slightly moist (10%) Medium brown sand, less gravel (20%)	80% recovery OVA - 0ppm
3										
4		SS	3 4-6'	6	3	4	4		4'-6': Med. brown, black, and orange-brown sand with gravel, slightly moist (70%) Red clay, stiffer than above (30%)	80% recovery OVA - 0ppm
5										
6		SS	4 6-8'	2	3	7	12		6'-8': Red clay, as above, moderate plasticity, fairly stiff, semi-rounded rock fragments (coarse sand-to gravel-sized) scattered throughout, occasional thin vertical lines of greenish brown color	40% recovery OVA - 0ppm
7										
8		SS	5 8-10'	10	12	15	18		8'-10': Red clay, as above, stiff	80% recovery OVA - 0ppm

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CLASSIFICATION/BY B. Leichner

DATE
STARTED 6/28/90
FINISHED 6/28/90
SHEET 2 OF 2

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-7
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT HARTWELL STREET LANDFILL
YP 7040

LOCATION MIDPT. OF WESTERN
PROPERTY LINE

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0-6	BLOWS ON SAMPLER 6-12	BLOWS ON SAMPLER 12-18	BLOWS ON SAMPLER 18-24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
10'										
15		SS	6 14'-16'	5	8	12	15		14'-16': Red clay, as above.	90% recovery OVA - 0ppm
20		SS	7 19'-21'	7	8	12	21		19'-21': Red clay, as above.	90% recovery OVA -.0ppm
25		SS	8 24'-26'	6	7	7	8		24'-26': Red clay, slightly less stiff	70% recovery OVA - 0ppm

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CLASSIFICATION/BY R. Leichner

DATE
STARTED 6/26/90
FINISHED 6/26/90
SHEET 1 OF 3

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-3
SURFACE ELEVATION
GROUNDWATER DEPTH

PROJECT Hartwell St. Landfill NYSDEC Phase II
LOCATION 1963 Elmwood Ave. (Rear of site, East side)

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
		SS	1	13	14	11	12		0'-1.6': Tan sand and gravel, fill; 1.6'-2.0': Black sand fill; iron oxide staining; moist; med.-coarse grained, homogeneous	HNu = 0ppm
2		SS	2	7	7	2	5		2'-3.9': Black foundry sand; homogeneous, fine-med. grained; 3.9'-4.0': compact clay, very cohesive; mod. high plasticity; damp; top 2" stained, then a tan color	HNu = 0ppm
6										
		SS	3	4	7	12	17		9'-11': Very cohesive, tight, brown clay; occasional 1-2mm pebbles (one every 2-3" linearly) damp	
10										
14		SS	4	7	7	8	12		14'-16': Gray staining along vertical fractures; same brown clay; one piece ≈ 20" long; cohesive; damp	
18										

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DATE
STARTED 6/26/90
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SHEET 2 OF 3

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-3
SURFACE ELEVATION
GROUNDWATER DEPTH
( )

PROJECT Hartwell St. Landfill NYSDEC Phase II

LOCATION 1963 Elmwood Ave. East side of site

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
		SS	5	2	5	4	6		19'-21': Mod. plastic, damp, brown clay; pebbles 1-3mm intermittently along column	
20										
22									Clay chips: evidence of moist to damp material in cuttings	
24		SS	6	5	4	4	5		24'-26': Moist brown clay; very cohesive; highly plastic	
26										
28										
		SS	7	3	2	3	5		29'-31': Moist, cohesive, highly plastic, brown clay; pebbles 1-3mm every few inches	
30										
32										
		SS	8	2	2	3	4		33'-35': Brown-tan clay; very cohesive, highly plastic	HNu=0ppm
34										
36										

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CLASSIFICATION/BY J. Nickerson

DATE
STARTED 6/26/90
FINISHED 6/26/90
SHEET 3 OF 3

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-3
SURFACE ELEVATION
GROUNDWATER DEPTH
( )

PROJECT Hartwell St. L.F.
NYSDEC Phase II

LOCATION Elmwood Ave.
East Side

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6 12/18	6/12 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
38		SS	9	2 3	2 3		38'-40': Greasy clay at 39'. brown, very plastic, cohesive, no pebbles	

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STARTED 6/26/90
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SHEET 1 OF 3

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-4
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT Hartwell St.
NYSDEC Phase II

LOCATION Hartwell St. LF
Elmwood Ave.

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
									Concrete 0-1'	
		SS Comp	1	2	2	2	3		1'-3': Tan sandy fill, 1'-2', then moisture in sand, then clay 2'3" - tan, greasy texture, very plastic; cohesive; brick fragments	
2										
		SS Comp	2	2	1	2	5		3'-5': Brown, very cohesive clay; dry; low plasticity; gravel in clay at 4.5'; moist at gravel layer	
4										
6										
8										
10		SS Comp	3	7	10	11	15		9'-11': Tight brown clay; mod. cohesive; low plasticity; no pebbles	
12										
14										
16										
18										

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CLASSIFICATION/BY J. Nickerson

DATE
STARTED 6/26/90
FINISHED 6/26/90
SHEET 2 OF 3

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-4
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT Hartwell St. NYSDEC Phase II
LOCATION Hartwell St. LF. Elmwood Ave.

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
20		SS	5	3	3	4	5		19'-21': Highly plastic, damp-moist, brown, cohesive clay	
24		SS	6	2	2	3	4		24'-26': Highly plastic, damp-moist, brown, cohesive clay; visible pebbles 1-2mm	
28		SS	7	2	3	2	4		29'-31': Highly plastic, damp-moist brown, cohesive clay; slightly greasy on outside edge against spoon	
32										
36		SS	8	2	2	3	4		34'-36': Brown, highly plastic, moist, cohesive clay containing very few rounded pebbles, 1-3mm in diameter	

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DATE
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FINISHED 6/26/90
SHEET 3 OF 3

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-4
SURFACE ELEVATION
GROUNDWATER DEPTH
( )

PROJECT Hartwell St.
NYSDEC Phase II

LOCATION Hartwell St. L.F.
Elmwood Ave

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	BLOWS ON SAMPLER 12/18	BLOWS ON SAMPLER 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
38										
		SS	9	2	2	2	3		39'-41': As above	
40										
41										

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CLASSIFICATION/BY J. Nickerson

DATE
STARTED 6/28/90
FINISHED 6/28/90
SHEET 1 OF 2

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-5
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT HARTWELL STREET LANDFILL
YP 7040

LOCATION MIDWAY BETWEEN GW-2 and GW-4 ON WESTERN BOUNDARY

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0-6	6-12	12-18	18-24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
		SS	1 0-2'	4	8	4	5		0-2': Brown silty sand, trace pieces of brick, coal. Red-brown clay (~2") Brick material (3"). Bottom 4" is black brown sand and gravel, slightly moist	85% recovery OVA - 0ppm HNu - 1-2 ppm
2		SS	2 2'-4'	3	2	1	1		2'-4': Brown sand and gravel, wet (60%). Riddish brown clay (40%)	40% recovery OVA - 2 ppm HNu - 0ppm
4										
6										
8										
		SS	3 9'-11'						9'-11': Red clay, very stiff, low to mod. plasticity, scattered thin vertical lines of greenish brown color, occasional areas of white, green, brown, material, coarse sand to 1" angular to semi-rounded rock fragments	60% recovery OVA HNu > 0ppm
10										
12										
14		SS	4 14'-16'						14'-16': Red clay, as above, more criss-crossing thin vertical green-colored lines	60% recovery OVA - 0ppm HNu - moisture
16										

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DATE
STARTED 6/28/90
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SHEET 2 OF 2

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-5
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT HARTWELL STREET LANDFILL
YP 7040

LOCATION MIDWAY BETWEEN GW-2 and GW-4 ON WESTERN BOUNDARY

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6 12/18	BLOWS ON SAMPLER 6/12 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
		SS	5 19'-21'	14 9	7 9		19'-21': Red clay, as above, less stiff, slightly moist	OVA - 0ppm HNu - 0ppm
20'								
22								
24		SS	6 24'-26'	4 6	5 7		24'-26': No sample	0% recovery
26		SS	7 26'-28'	5 7	7 8		26'-28': Red clay, as above, less stiff, slightly moist	OVA - 0ppm HNu - 0ppm
28								

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CLASSIFICATION/BY R. Leuchner

DATE
STARTED 6/27/90
FINISHED 6/27/90
SHEET 1 OF 1

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-6
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT HARTWELL STREET LANDFILL
YP 7040

LOCATION SOUTHWEST CORNER OF
PROPERTY

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	BLOWS ON SAMPLER 6/12	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
		SS	1 0-2'	7 5	5 6		0-2': Brown fine sand with gravel and organics (30%) Reddish clay (70%) with slag, glass, and sand throughout	60% recovery OVA - 0ppm HNu - 2ppm off spoon
2		SS	2 2'-4'	4 6	4 8		2'-4': Reddish clay, low plasticity, trace coarse sand- to fine gravel-sized semi-rounded rock fragments scattered throughout	40% recovery HNu - 2ppm
4								
6								
8								
10		SS	3 9'-11'				9'-11': Red clay as above, very stiff, scattered vertical, thin, brown colored areas	OVA - 0 ppm HNu - 2.5 ppm
15		SS	4 14'-16'	5 5	4 6		14'-16': Red clay, as above, larger rock fragments (~3/4"), less stiff, mod. plastic	50% recovery HNu - 0 ppm
20		SS	5 19'-21'	3 6	5 8		19'-21': Red clay, less stiff, mod. plastic	100% recovery HNu - 0 ppm
25		SS	6 24'-26'	3 7	5 7		24'-26': Red clay, small (1/2" by 1/2") area of black-gray and clear sand-sized particles, against side of sample	90% recovery OVA HNu >0ppm

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DATE
STARTED 6/27/90
FINISHED 6/27/90
SHEET 1 **OF** 2

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-7
SURFACE ELEVATION
GROUNDWATER DEPTH
( )

PROJECT HARTWELL STREET LANDFILL YP 7040
LOCATION MIDPOINT OF SOUTHERN PROPERTY LINE

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0-6 / 12-18	BLOWS ON SAMPLER 6-12 / 18-24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
		SS	1 0-2'	4 21	7 22		0-2': Light to medium brown and black sand with organics and wood debris near top with some pieces of slag (to 1½")	75% recovery OVA HNu > 0ppm
2		SS	2 2'-4'	6 4	3 5		2'-4': Brown sand with slag (40%) Clay (60%) - dark grayish, turning reddish at bottom, mod. plastic, little coarse sand-sized, semi-rounded to rounded rock fragments scattered throughout clay, thin vertical areas of brown color scattered sparsely	50% recovery 2-3 ppm OVA
4								
6								
8								
		SS	3 9'-11'	7 18	13 20		9'-11': Reddish clay, very tight, mod. to high plasticity, scattered coarse sand- to gravel-sized fragments	80% recovery OVA - 5ppm initially then 0ppm on OVA & HNu
10								
12								
14		SS	4 14'-16'	10 14	12 15		14'-16': No sample, only fall-in from above. Cuttings - red clay	0% recovery
16								
18								

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CLASSIFICATION/BY K. Leichner

DATE
STARTED 6/27/90
FINISHED 6/27/90
SHEET 2 OF 2

E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-7
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT HARTWELL STREET LANDFILL YP 7040
LOCATION MIDPOINT OF SOUTHERN PROPERTY LINE

DEPTH — FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
20		SS	5 19'-21'	6	4	6	8		19'-21': Red clay, as above, softer	40% recovery OVA HNu > 0ppm
25		SS	6 24'-26'	4	5	8	10		24'-26': Red clay, stiffer, slightly more plastic	80% recovery OVA - 0 ppm
30		SS	7 29'-31'	3	3	6	6		29'-31': Reddish clay, as above, less stiff	OVA HNu > 0ppm
35		SS	8 34'-36'	4	4	6	5		34'-36': Red clay, as above, less stiff, slightly moist, slightly more plastic	75% recovery OVA HNu > 0 ppm
40		SS	9 39'-41'	2	2	3	4		39'-41': Red clay, as above	100% recovery OVA HNu > 0 ppm

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Ecology and Environment

SUBSURFACE LOG

DATE
STARTED 6/27/90
FINISHED 6/27/90
SHEET 1 OF 1

HOLE NUMBER GW-8
SURFACE ELEVATION
GROUNDWATER DEPTH ( )

PROJECT HARTWELL STREET LANDFILL
YP 7040

LOCATION SOUTHEAST CORNER OF SITE

DEPTH – FT: 2 4 6 8 10 15 20 25

WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0-6	6-12	12-18	18-24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
	SS	1 0-2'	6	10	30	37		0-2': Medium brown sand with some clay and organics, moist (50%) Black sand with large (2") slag fragments, moist (50%)	85% recovery OVA -10-20ppm
	SS	2 2'-4'	30	13	3	5		2'-4': Black sand with slag fragments (80%) Reddish brown clay, moderately plastic, very tight, slightly moist (20%)	60% recovery OVA -8-10ppm
	SS	3 9'-11'	2	2	2	3		9'-11': Reddish clay, as above, more grayish, slightly moist, coarse sand-sized semi-rounded rock fragments, little thin vertical brown colored areas	40% recovery 500-600ppm in sample – appears to be methane 20ppm in hole
	SS	4 14'-16'	6	5	8	13		14'-16': Reddish brown clay, as above, tighter, trace gravel-sized fragments, drier	60% recovery 2ppm-OVA
	SS	5 19'-21'	3	6	9	12		19'-21': Reddish brown clay, as above, trace gravel (bottom 1/2 of sample - 2 long coils, not solid)	60% recovery
	SS	6 24'-26'	3	3	4	5		24'-26': Red clay, as above, mod. to high plasticity, slightly moist near bottom	70% recovery

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CLASSIFICATION/BY R. Leichner

APPENDIX D

ANALYTICAL DATA SUMMARY SHEETS

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DATA SUMMARY FORM: VOLATILES 1

Site Name: Hartwell Street Landfill SOIL SAMPLES (ug/Kg)

Case #: 9001.539 Sampling Date(s): 6/25/90 to 6/27/90

SDG #GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-1		GW-1		GW-03-02		GW03-03		GW4-01		GW4-2		GW-6		GW-6		GW-7	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	11		18		17		17		14		17		17		15		13	
	Location	(0-20')		(20-40')		(0-20')		(20-40')		(0-20')		(20-40')		(0-4')		(9-26')		(0-20')	
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride	7	B	9	B	12	B	20	B	22	B	24	B	8	B	7	B	5	B
10	Acetone	15	B	26	B	37	B	37	B	46	B	61	B	30	B	22	B	59	B
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																	7	
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1-Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																	2	J

CRDL = Contract Required Detection Limit

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DATA SUMMARY FORM: VOLATILES 2

Site Name: Hartwell Street Landfill **SOIL SAMPLES (ug/Kg)**

Case #: 9001.539 **Sampling Date(s):** 6/25/90 to 6/27/90

SDG # GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-1	GW-1	GW03-U2	GW-03-U3	GW4-1	GW4-2	GW-6	GW-6	GW-7
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	% Moisture	11	18	17	17	14	17	17	15	13
	Location	(0-20')	(20-40')	(0-20')	(20-40')	(0-20')	(20-40')	(0-4')	(4-16')	(0-20')
CRQL	COMPOUND									
5	1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
5	Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	Toluene									
5	Chlorobenzene									
5	Ethylbenzene									
5	Styrene									
5	Total Xylenes									

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: VOLATILES 1

Site Name: Hartwell Street Landfill

SOIL SAMPLES (ug/Kg)

Case #: 9001-539 Sampling Date(s): 6/25/90 to 6/27/90

SDG # GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-7		GW-8		GW-8		GW-8MS		GW-8MSD		VBLKS1		VBLKS2		VBLKS3		VBLKS4	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	13		11		23		23		23		—		—		—		—	
	Location	(20-40')		(0-4')		(9-26')													
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride	8	B	10	B	7	B	8	B	7	B	7		15		5		4	
10	Acetone	22	B	50	B	38	B	36	B	25	B	6	J	14		13		10	
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform					8													
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1-Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane					3	J												

CRDL = Contract Required Detection Limit

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DATA SUMMARY FORM: VOLATILES 2

Site Name: Hartwell Street Landfill SOIL SAMPLES (ug/Kg)

Case #: 9WI.539 Sampling Date(s): 6/25/90 to 6/27/90

SDG# 0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-7		GW-5		GW-8		GW-8-MS		GW-8-MSD		VBLKS1		VBLKS2		VBLKS3		VBLKS4	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	15		11		23		23		23		—		—		—		—	
	Location	(20-40')		(0-4')		(9-26')		(9-26')		(9-26')									
CRQL	COMPOUND																		
5	1,2-Dichloropropane																		
5	Cis-1,3-Dichloropropene																		
5	Trichloroethene																		
5	Dibromochloromethane																		
5	1,1,2-Trichloroethane																		
5	Benzene																		
5	Trans-1,3-Dichloropropene																		
5	Bromoform																		
10	4-Methyl-2-pentanone																		
10	2-Hexanone																		
5	Tetrachloroethene																		
5	1,1,2,2-Tetrachloroethane																		
5	Toluene																		
5	Chlorobenzene																		
5	Ethylbenzene																		
5	Styrene																		
5	Total Xylenes																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: VOLATILES 1

SOIL SAMPLES
(ug/Kg)

Site Name: Hartwell Street Landfill

Case #: 9W1,539 Sampling Date(s): ____________

SDG #GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	VBLKS5																	
	Dilution Factor	1.0																	
	% Moisture	—																	
	Location																		
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride	7																	
10	Acetone	15																	
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																		
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1-Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

CRDL = Contract Required Detection Limit

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DATA SUMMARY FORM: VOLATILES 2

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(ug/Kg)

Case #: 901-539 **Sampling Date(s):** 6/25/90 to 6/27/90

SDG # GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	VBLK55																	
	Dilution Factor	1.0																	
	% Moisture																		
	Location																		
CRQL	COMPOUND																		
5	1,2-Dichloropropane																		
5	Cis-1,3-Dichloropropene																		
5	Trichloroethene																		
5	Dibromochloromethane																		
5	1,1,2-Trichloroethane																		
5	Benzene																		
5	Trans-1,3-Dichloropropene																		
5	Bromoform																		
10	4-Methyl-2-pentanone																		
10	2-Hexanone																		
5	Tetrachloroethene																		
5	1,1,2,2-Tetrachloroethane																		
5	Toluene																		
5	Chlorobenzene																		
5	Ethylbenzene																		
5	Styrene																		
5	Total Xylenes																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

Site Name: Hartwell Street Landfill **SOIL SAMPLES**

(ug/Kg)

Case #: 9001.539 **Sampling Date(s):** 6/25/90 to 6/27/90

SDG # GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-1		GW-1		GW-03-02		GW-03-03		GW-4-1		GW-4-2		GW-6		GW-6		GW-7	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	11		18		17		17		14		17		17		15		13	
	Location	(0-20')		(20-40')		(0-20')		(20-40')		(0-20')		(20-40')		(0-4')		(9-26')		(0-20')	
CRQL	COMPOUND																		
330	Phenol																		
330	bis(2-Chloroethyl)ether																		
330	2-Chlorophenol																		
330	1,3-Dichlorobenzene																		
330	1,4-Dichlorobenzene																		
330	Benzyl Alcohol																		
330	1,2 Dichlorobenzene																		
330	2-Methylphenol																		
330	bis(2-Chloroisopropyl)ether																		
330	4-Methylphenol																		
330	N-Nitroso di-n-propylamine																		
330	Hexachloroethane																		
330	Nitrobenzene																		
330	Isophorone																		
330	2 Nitrophenol																		
330	2,4-Dimethylphenol																		
1600	Benzoic Acid																		
330	bis(2 Chloroethoxy)methane																		
330	2,4 Dichlorophenol																		
330	1,2,4-Trichlorobenzene																		
330	Naphthalene																		
330	4-Chloroaniline																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 2

SOIL SAMPLES
(ug/Kg)

Site Name: Hartwell Street

Case #: 9001.539 **Sampling Date(s):** 6/25/90 to 6/27/90

SDG # GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-1		GW-1		GW03-02		GW-03-03		GW-4-1		GW-4-2		GW-6		GW-6		GW-7	
	Dilution Factor	1		1		1		1		1		1		1		1		1	
	% Moisture	11		18		17		17		14		17		17		15		13	
	Location	(0-20')		(20-40')		(0-20')		(20-40')		(0-20')		(20-40')		(0-4')		(9'-26')		(0-20')	
CRQL	COMPOUND																		
330	Hexachlorobutadiene																		
330	4-Chloro-3-methylphenol																		
330	2-Methylnaphthalene																		
330	Hexachlorocyclopentadiene																		
330	2,4,6-Trichlorophenol																		
1600	2,4,5-Trichlorophenol																		
330	2-Chloronaphthalene																		
1600	2-Nitroaniline																		
330	Dimethylphthalate																		
330	Acenaphthylene																		
330	2,6-Dinitrotoluene																		
1600	3-Nitroaniline																		
330	Acenaphthene																		
1600	2,4-Dinitrophenol																		
1600	4-Nitrophenol																		
330	Dibenzofuran																		
330	2,4-Dinitrotoluene																		
330	Diethylphthalate																		
330	4-Chlorophenyl-phenylether																		
330	Fluorene																		
1600	4-Nitroaniline																		
1600	4,6-Dinitro-2-methylphenol																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 3

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(ug/Kg)

Case #: 9001-539 **Sampling Date(s):** ____________
SDG #. GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-1		GW-1		GW03-02		GW03-03		GW4-1		GW4-2		GW-6		GW-6		GW-7	
	Dilution Factor	1		1		1		1		1		1		1		1		1	
	% Moisture	11		18		17		17		14		17		17		15		13	
	Location	(0-20')		(20-40')		(0-20')		(20-40')		(0-20')		(20-40')		(0-4')		(19-26')		(0-20')	
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene									120	J			52	J			75	J
330	Anthracene																		
330	Di-n-butylphthalate	46	B							45	B								
330	Fluoranthene									130	J			66	J			120	J
330	Pyrene									110	J			58	J			95	J
330	Butylbenzylphthalate																		
1600	3,3 Dichlorobenzidine																		
330	Benzo(a)anthracene									67	J							53	J
330	Chrysene									73	J							54	J
330	bis(2 Ethylhexyl)phthalate	2200	B	2400	B	1100	B	1600	B	1900	B	960	B	2700	B	1800	B	930	B
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene									82	J							90	J
330	Benzo(k)fluoranthene																		
330	Benzo(a)pyrene									53	J							49	J
330	Indeno(1,2,3-cd)pyrene																	44	J
330	Dibenz(a,h)anthracene																		
330	Benzo(g,h,i)perylene					44	J												

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

Site Name: Hartwell Street Landfill **SOIL SAMPLES**

(ug/Kg)

Case #: 9001.539 **Sampling Date(s):** 6/25/90 to 6/27/90

SDG #GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-7		GW-8		GW-8		GW-8MS		GW-8MSD		SBLKS1		SBLKS2		SBLKS3		SBLKS4	
	Dilution Factor	1		10		1		1		1		1		1		1		1	
	% Moisture	15		11		23		23		23		—		—		—		—	
	Location	(20-40')		(0-4')		(9-26')		(9-26')		(9-26')									
CRQL	COMPOUND																		
330	Phenol																		
330	bis(2-Chloroethyl)ether																		
330	2-Chlorophenol																		
330	1,3-Dichlorobenzene																		
330	1,4-Dichlorobenzene																		
330	Benzyl Alcohol																		
330	1,2 Dichlorobenzene																		
330	2-Methylphenol																		
330	bis(2-Chloroisopropyl)ether																		
330	4-Methylphenol																		
330	N-Nitroso di-n-propylamine																		
330	Hexachloroethane																		
330	Nitrobenzene																		
330	Isophorone																		
330	2 Nitrophenol																		
330	2,4-Dimethylphenol																		
1600	Benzoic Acid																		
330	bis(2 Chloroethoxy)methane																		
330	2,4 Dichlorophenol																		
330	1,2,4-Trichlorobenzene																		
330	Naphthalene			2600	J														
330	4-Chloroaniline																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 2

Site Name: Hartwell-Street Landfill **SOIL SAMPLES** (ug/Kg)

Case #: 9WL 539 Sampling Date(s): 6/25/90 to 6/27/90

SDG #GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-7		GW-8		GW-8		GW-8MS		GW-8MSD		SBLKS1		SBLKS2		SBLKS3		SBLKS4	
	Dilution Factor	1		10		1		1		1		1		1		1		1	
	% Moisture	15		11		23		23		23		—		—		—		—	
	Location	(20-40')		(0-4')		(9-26')		(9-26')		(9-26')									
CRQL	COMPOUND																		
330	Hexachlorobutadiene																		
330	4-Chloro-3-methylphenol																		
330	2-Methylnaphthalene			930	J														
330	Hexachlorocyclopentadiene																		
330	2,4,6-Trichlorophenol																		
1600	2,4,5-Trichlorophenol																		
330	2-Chloronaphthalene																		
1600	2-Nitroaniline																		
330	Dimethylphthalate																		
330	Acenaphthylene																		
330	2,6-Dinitrotoluene																		
1600	3-Nitroaniline																		
330	Acenaphthene			2600	J														
1600	2,4-Dinitrophenol																		
1600	4-Nitrophenol																		
330	Dibenzofuran			1600	J														
330	2,4-Dinitrotoluene																		
330	Diethylphthalate																		
330	4-Chlorophenyl-phenylether																		
330	Fluorene			2300	J														
1600	4-Nitroaniline																		
1600	4,6-Dinitro-2-methylphenol																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 3

Site Name: Hartwell Street Landfill

SOIL SAMPLES (ug/Kg)

Case #: 9001, 539 **Sampling Date(s):** 6/25/90 to 6/27/90

SDG#GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-7		GW-8		GW-8		GW-8 MS		GW-8MSD		SBLKS1		SBLKS2		SBLKS3		SBLKS4	
	Dilution Factor	1		10		1		1		1		1		1		1		1	
	% Moisture	15		11		23		23		23		—		—		—		—	
	Location	(20-40')		(0-4')		(9-26')		(9-26')		(9-26')									
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene	49	J	14000															
330	Anthracene			3300	J														
330	Di-n-butylphthalate											34	J	62	J	94	J	36	J
330	Fluoranthene	53	J	1500															
330	Pyrene	43	J	11000															
330	Butylbenzylphthalate																		
1600	3,3 Dichlorobenzidine																		
330	Benzo(a)anthracene			7100															
330	Chrysene			7000															
330	bis(2 Ethylhexyl)phthalate	2100	B	1500	B	2200	B	2500	B	3000	B	640		840		790		630	
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene			12000															
330	Benzo(k)fluoranthene			4100															
330	Benzo(a)pyrene			6300															
330	Indeno(1,2,3-cd)pyrene			5900															
330	Dibenz(a,h)anthracene			3400	J														
330	Benzo(g,h,i)perylene			4100															

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

Site Name: Hartwell Street Landfill **SOIL SAMPLES (ug/Kg)**

Case #: 9001-539 **Sampling Date(s):** 6/27/90

SDG #GWD302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	2BX55								
	Dilution Factor	1								
	% Moisture	—								
	Location									
CRQL	COMPOUND									
330	Phenol									
330	bis(2-Chloroethyl)ether									
330	2-Chlorophenol									
330	1,3-Dichlorobenzene									
330	1,4-Dichlorobenzene									
330	Benzyl Alcohol									
330	1,2 Dichlorobenzene									
330	2-Methylphenol									
330	bis(2-Chloroisopropyl)ether									
330	4-Methylphenol									
330	N-Nitroso di-n-propylamine									
330	Hexachloroethane									
330	Nitrobenzene									
330	Isophorone									
330	2 Nitrophenol									
330	2,4 Dimethylphenol									
1600	Benzoic Acid									
330	bis(2 Chloroethoxy)methane									
330	2,4 Dichlorophenol									
330	1,2,4-Trichlorobenzene									
330	Naphthalene									
330	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 2

Site Name: Hartwell Street Landfill **SOIL SAMPLES (ug/Kg)**

Case #: 901-539 **Sampling Date(s):** 6/25/90 - 6/27/90

SDG #GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	8JLK55																	
	Dilution Factor	1.0																	
	% Moisture	—																	
	Location																		
CRQL	COMPOUND																		
330	Hexachlorobutadiene																		
330	4-Chloro-3-methylphenol																		
330	2-Methylnaphthalene																		
330	Hexachlorocyclopentadiene																		
330	2,4,6-Trichlorophenol																		
1600	2,4,5-Trichlorophenol																		
330	2-Chloronaphthalene																		
1600	2-Nitroaniline																		
330	Dimethylphthalate																		
330	Acenaphthylene																		
330	2,6-Dinitrotoluene																		
1600	3-Nitroaniline																		
330	Acenaphthene																		
1600	2,4-Dinitrophenol																		
1600	4-Nitrophenol																		
330	Dibenzofuran																		
330	2,4-Dinitrotoluene																		
330	Diethylphthalate																		
330	4-Chlorophenyl-phenylether																		
330	Fluorene																		
1600	4-Nitroaniline																		
1600	4,6-Dinitro-2-methylphenol																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 3

Site Name: Hartwell Street Landfill

SOIL SAMPLES (ug/Kg)

Case #: 921.539 **Sampling Date(s):** 6/25/90 - 6/27/90

SDG # GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	315255																	
	Dilution Factor	1																	
	% Moisture	—																	
	Location																		
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene																		
330	Anthracene																		
330	Di-n-butylphthalate	61	J																
330	Fluoranthene																		
330	Pyrene																		
330	Butylbenzylphthalate																		
1600	3,3 Dichlorobenzidine																		
330	Benzo(a)anthracene																		
330	Chrysene																		
330	bis(2 Ethylhexyl)phthalate	840																	
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene																		
330	Benzo(k)fluoranthene																		
330	Benzo(a)pyrene																		
330	Indeno(1,2,3-cd)pyrene																		
330	Dibenz(a,h)anthracene																		
330	Benzo(g,h,i)perylene																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: Hartwell Street Landfill

SOIL SAMPLES (ug/Kg)

Case #: 9001, 539 Sampling Date(s): 6/23/90 to 6/27/90

SDG # 6W0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-1	GW-1	GW-03-02	GW-03-03	GW-4-1	GW-4-2	GW-6	GW-6	GW-7
	Dilution Factor	1	4	1	1	4	5	1	1	1
	% Moisture	11	18	17	17	14	17	17	15	13
	Location	(0-20')	(20-40')	(0-20')	(20-40')	(0-20')	(20-40')	(0-4')	(9-26')	(0-20')
CRQL	COMPOUND									
8	alpha-BHC									
8	beta-BHC									
8	delta-BHC									
8	Gamma-BHC (Lindane)									
8	Heptachlor									
8	Aldrin									
8	Heptachlor Epoxide									
8	Endosulfan I									
16	Dieldrin									
16	4,4'-DDE									
16	Endrin									
16	Endosulfan II									
16	4,4'-DDD									
16	Endosulfan Sulfate									
16	4,4' DDT									
80	Methoxychlor									
16	Endrin ketone									
80	Alpha-Chlordane									
80	Gamma-Chlordane									
160	Toxaphene									
80	Aroclor-1016									
80	Aroclor-1221									
80	Aroclor-1232									
80	Aroclor-1242									
80	Aroclor-1248									
160	Aroclor-1254									
160	Aroclor-1260									

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: Hartwell Street Landfill SOIL SAMPLES

Case #: 9001, 539 Sampling Date(s): 6/25/90 to 6/27/90 (ug/Kg)

SDG #GW0302

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-7		GW-8		GW-8		GW-8MS		GW-8MSD		PBLKS1		PBLKS2		PBLKS3		PBLKS4	
	Dilution Factor	1		5		1		1		1		1		1		1		1	
	% Moisture	15		11		23		23		23		—		—		—		—	
	Location	(20-40')		(10-4')		(9-26')		(9-26')		(9-26')									
CRQL	COMPOUND																		
8	alpha-BHC																		
8	beta-BHC																		
8	delta-BHC																		
8	Gamma-BHC (Lindane)																		
8	Heptachlor																		
8	Aldrin																		
8	Heptachlor Epoxide																		
8	Endosulfan I																		
16	Dieldrin																		
16	4,4'-DDE																		
16	Endrin																		
16	Endosulfan II																		
16	4,4'-DDD																		
16	Endosulfan Sulfate																		
16	4,4'-DDT																		
80	Methoxychlor																		
16	Endrin ketone																		
80	Alpha-Chlordane																		
80	Gamma-Chlordane																		
160	Toxaphene																		
80	Aroclor-1016																		
80	Aroclor-1221																		
80	Aroclor-1232																		
80	Aroclor-1242																		
80	Aroclor-1248																		
160	Aroclor-1254																		
160	Aroclor-1260																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: INORGANICS

Site Name: Hartwell Street Landfill

SOIL SAMPLES

(mg/Kg)

Case #: 9001,539 **Sampling Date(s):** 6/25/90 to 6/27/90

SDG #GW0302

•Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

	Sample No.	GW-1		GW-1		GW03-02		GW03-03		GW-4-1		GW-4-2		GW-6		GW-6		GW-7		GW-7	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Solids	89.2		81.8		83.2		82.8		85.8		83.2		83.2		84.9					
	Location	(0-20')		(20-40')		(0-20')		(20-40')		(0-20')		(20-40')		(0-4')		(4-26')		(0-20')		(20-40')	
CRDL	ANALYTE																				
40	Aluminum	8660		9830		11200		8960		9350		8920		13900		8700		9670		7670	
12	Antimony																				
2	Arsenic	2.4	L	2.8	L	6.7	L	4.2	L	1.6	L	2.3	L	18.7	L	1.7	L	1.2	L	2.2	L
40	Barium	78.8		92.8		72.3		87.2		87.2		83.6		133	J	54.6	J	88.7		65.1	
1	Beryllium													1.3							
1	Cadmium	1.8		1.7		3.0		1.6		1.8		2.0		2.5		1.7		1.9		1.4	
1000	Calcium	57800		59800		40100		60400		56700		59400		57800		59500		57500		14300	
2	Chromium	14.3		15.4		17.3		13.1		14.1		12.8		23.9		13.2		16.3		11.8	
10	Cobalt	6.9		7.8		13.1		7.5		7.9		8.8		6.5		7.0		8.7		6.2	
5	Copper	17.2		17.2		25.7		16.2		16.2		16.2		83.7		15.6		20.4		14.3	
20	Iron	18600		19800		30200		19700		18100		17800		28300		17200		20000		16600	
1	*Lead	13.5		12.7		17.1		12.1		9.6		12.3		175		9.3		10.2		8.6	
1000	Magnesium	17900		19400		22700		20200		17300		19100		8480		19300		18200		21300	
3	Manganese	435	L	490	L	990	L	507	L	455	L	441	L	2790	L	408	L	588	L	395	L
0.2	Mercury																				
8	Nickel	18.7		19.2		15.9		20.5		18.8		20.2		22.2		17.4		21.5		16.5	
1000	Potassium	1670		2170		1370		1900		1830		1890		1170		1760		2060		1660	
1	Selenium					0.40	L							0.56	L						
2	Silver																	1.6			
1000	Sodium	178		231		147		233		217		248		564		188		221		236	
2	Thallium																				
10	Vanadium	18.4		18.8		28.1		17.3		19.2		18.2		16.7		17.0		19.2		17.2	
4	Zinc	62.1		94.3		68.1		64.5		62.9		59.3		115	J	59.8	J	67.7		61.9	
2	Cyanide																				

CRDL = Contract Required Detection Limit

*Action Level Exists

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DATA SUMMARY FORM: INORGANICS

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(mg/Kg)

Case #: 9001,539 Sampling Date(s): __________

SDG #GW0302

•Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

	Sample No.	GW-8		GW-8																	
	Dilution Factor	1.0		1.0																	
	% Solids	89.1		76.8																	
	Location	(0-4')		(9-26')																	
CRDL	ANALYTE																				
40	Aluminum	6230		10400																	
12	Antimony																				
2	Arsenic	18.0	L	0.98	L																
40	Barium	75.1		102																	
1	Beryllium																				
1	Cadmium	5.9		2.3																	
1000	Calcium	5510		66800																	
2	Chromium	40.5		16.4																	
10	Cobalt	7.7		8.1																	
5	Copper	122		18.9																	
20	Iron	68800		20500																	
1	**•Lead**	42.1		10.2																	
1000	Magnesium	1100		20600																	
3	Manganese	714	L	492	L																
0.2	Mercury																				
8	Nickel	112		21.1																	
1000	Potassium	578		1940																	
1	Selenium																				
2	Silver																				
1000	Sodium	173		178																	
2	Thallium																				
10	Vanadium	20.4		21.1																	
4	Zinc	37.8		31.4																	
2	Cyanide																				

CRDL = Contract Required Detection Limit

•Action Level Exists

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DATA SUMMARY FORM: VOLATILES 1

SOIL SAMPLES

(ug/Kg)

Site Name: Hartwell Street Landfill

Case #: 901.583 Sampling Date(s): 6/28/90-7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-2(0-4)		GW-2(4-26		GW-5(0-4)		GW-5(9-24		S-1		S-4		S-5		S-6		S-7	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	19		14		25		16		11		33		31		16		29	
	Location																		
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride	11	B	11	B	12	B	8	B	8	B	8	B	6	B	9	B	10	B
10	Acetone	25	B	76	B	39	B	32	B	9	B	19	B	15	B	14	B	4	B
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																		
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1-Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

CRQL = Contract Required Detection Limit

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DATA SUMMARY FORM: VOLATILES 2

Site Name: Hutwell Street Landfill SOIL SAMPLES

Case #: 9W1.583 Sampling Date(s): 6/28/90, 7/12/90 (ug/Kg)

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

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	Sample No.	GW-2(0-4)		GW-2(4-26)		GW-5(0-4)		GW-5(4-26)		S-1		S-4		S-5		S-6		S-7	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	19		14		25		16		11		33		31		16		29	
	Location																		
CRQL	COMPOUND																		
5	1,2-Dichloropropane																		
5	Cis-1,3-Dichloropropene																		
5	Trichloroethene																		
5	Dibromochloromethane																		
5	1,1,2-Trichloroethane																		
5	Benzene																		
5	Trans-1,3-Dichloropropene																		
5	Bromoform																		
10	4-Methyl-2-pentanone																		
10	2-Hexanone																		
5	Tetrachloroethene																		
5	1,1,2,2-Tetrachloroethane																		
5	Toluene																		
5	Chlorobenzene																		
5	Ethylbenzene																		
5	Styrene																		
5	Total Xylenes																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: VOLATILES 1

Site Name: Hartwell Street Landfill SOIL SAMPLES

Case #: 9001-583 Sampling Date(s): 6/28/90, 7/12/90 (ug/Kg)

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-8		S-9		SED-3		SED-4		W-1		W-2		W-3		GW-2(0-4		GW-2(0-4)	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	33		4		35		40		13		15		15		19		19	
	Location															MS		MSD	
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride	7	B	8	B	7	B	15	B	7	B	5	B	4	B	20	B	19	B
10	Acetone	16	B	20	B	24	B	34	B	9	B	8	B	9	B	35	B	30	B
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																		
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1-Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

CRDL = Contract Required Detection Limit

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DATA SUMMARY FORM: VOLATILES 2

Site Name: Hartwell Street Landfill
SOIL SAMPLES
(ug/Kg)

Case #: 9W1.583 Sampling Date(s): 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-8		S-9		SED-3		SED-4		W-1		W-2		W-3		GW-2(0-1)		GW-2(0-1)	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Moisture	33		4		35		40		13		15		15		19		19	
	Location															MS		MSD	
CRQL	COMPOUND																		
5	1,2-Dichloropropane																		
5	Cis-1,3-Dichloropropene																		
5	Trichloroethene																		
5	Dibromochloromethane																		
5	1,1,2-Trichloroethane																		
5	Benzene																		
5	Trans-1,3-Dichloropropene																		
5	Bromoform																		
10	4-Methyl-2-pentanone																		
10	2-Hexanone																		
5	Tetrachloroethene																		
5	1,1,2,2-Tetrachloroethane																		
5	Toluene																		
5	Chlorobenzene																		
5	Ethylbenzene																		
5	Styrene																		
5	Total Xylenes																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: VOLATILES 1

Site Name: Hartwell Street Landfill

SOIL SAMPLES

(ug/Kg)

Case #: 9001-583 Sampling Date(s): 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-9 ms		S-9 MSD		VBLKS1		VBLKS2		VBLKS3		VBLKS4							
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0							
	% Moisture	4		4		—		—		—		—							
	Location																		
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	Vinyl Chloride																		
10	Chloroethane																		
5	Methylene Chloride	5		5		4		7		5		3							
10	Acetone	9		7		10		14		8		6							
5	Carbon Disulfide																		
5	1,1 Dichloroethene																		
5	1,1-Dichloroethane																		
5	Total-1,2 Dichloroethene																		
5	Chloroform																		
5	1,2-Dichloroethane																		
10	2 Butanone																		
5	1,1,1 Trichloroethane																		
5	Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

CRQL = Contract Required Detection Limit

SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: VOLATILES 2

Site Name: Hartwell Street Landfill **SOIL SAMPLES (ug/Kg)**

Case #: 901.583 **Sampling Date(s):** 6/28/90, 7/2/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-9MS		S-9MSD		VBLKS1		VBLKS2		VBLKS3		VBLKS4									
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0									
	% Moisture	4		4		—		—		—		—									
	Location																				
CRQL	COMPOUND																				
5	1,2-Dichloropropane																				
5	Cis-1,3-Dichloropropene																				
5	Trichloroethene																				
5	Dibromochloromethane																				
5	1,1,2-Trichloroethane																				
5	Benzene																				
5	Trans-1,3-Dichloropropene																				
5	Bromoform																				
10	4-Methyl-2-pentanone																				
10	2-Hexanone																				
5	Tetrachloroethene																				
5	1,1,2,2-Tetrachloroethane																				
5	Toluene																				
5	Chlorobenzene																				
5	Ethylbenzene																				
5	Styrene																				
5	Total Xylenes																				

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

Site Name: Hartwell Street Landfill **SOIL SAMPLES (ug/Kg)**

Case #: 9006 583 **Sampling Date(s):** 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW2(0-4)		GW2(9-26)		GW5(0-4)		GW3(9-26)		S-1		S-4		S-5		S-6 DL		S-7	
	Dilution Factor	1.0		1.0		2.0		2.0		2.0		5.0		1.0		2.0/10		1.0	
	% Moisture	9		14		25		16		11		33		31		15		28	
	Location																		
CRQL	**COMPOUND**																		
330	Phenol															200	J		
330	bis(2-Chloroethyl)ether																		
330	2-Chlorophenol																		
330	1,3-Dichlorobenzene																		
330	1,4-Dichlorobenzene																		
330	Benzyl Alcohol																		
330	1,2-Dichlorobenzene																		
330	2-Methylphenol															110	J		
330	bis(2-Chloroisopropyl)ether																		
330	4-Methylphenol															460	J		
330	N-Nitroso-di-n-propylamine																		
330	Hexachloroethane																		
330	Nitrobenzene																		
330	Isophorone																		
330	2-Nitrophenol																		
330	2,4-Dimethylphenol															160	J		
1600	Benzoic Acid																		
330	bis(2-Chloroethoxy)methane																		
330	2,4-Dichlorophenol																		
330	1,2,4-Trichlorobenzene																		
330	Naphthalene	170	J			400	J			150	J			83	J	10000			
330	4-Chloroaniline																		

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 2

Site Name: Hartwell Street Landfill SOIL SAMPLES

Case #: 9001.583 Sampling Date(s): 6/28/90, 7/12/90 (ug/Kg)

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-2(0-4)		GW-2(4-2)		GW-5(0-4)		GW-5(4-2)		S-1		S-4		S-5		S-6DL		S-7	
	Dilution Factor	1.0		1.0		2.0		2.0		2.0		5.0		1.0		2.0/10		1.0	
	% Moisture	19		14		25		16		11		33		31		15		28	
	Location																		
CRQL	COMPOUND																		
330	Hexachlorobutadiene																		
330	4-Chloro-3-methylphenol																		
330	2-Methylnaphthalene	190	J			400	J			120	J			58	J	3600			
330	Hexachlorocyclopentadiene																		
330	2,4,6-Trichlorophenol																		
1600	2,4,5-Trichlorophenol																		
330	2-Chloronaphthalene																		
1600	2-Nitroaniline																		
330	Dimethylphthalate																		
330	Acenaphthylene					83	J			59	J					59	J		
330	2,6-Dinitrotoluene																		
1600	3-Nitroaniline																		
330	Acenaphthene	270	J			1300				260	J			120	J	7400			
1600	2,4-Dinitrophenol																		
1600	4-Nitrophenol																		
330	Dibenzofuran	220	J			850	J			180	J			68	J	5700			
330	2,4-Dinitrotoluene																		
330	Diethylphthalate																	200	J
330	4-Chlorophenyl-phenylether																		
330	Fluorene	290	J			1300				290	J			100	J	7300			
1600	4-Nitroaniline																		
1600	4,6-Dinitro-2-methylphenol																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 3

Site Name: Hartwell Street Landfill **SOIL SAMPLES**

Case #: 9001-583 **Sampling Date(s):** 6/28/90, 7/12/90 **(ug/Kg)**

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-2(0-4)		GW-2(4-20)		GW-3(0-4)		GW-3(4-20)		S-1		S-4		S-5		S-6 DL		S-7	
	Dilution Factor	1.0		1.0		2.0		2.0		2.0		5.0		1.0		2.0/10		1.0	
	% Moisture	19		14		25		16		11		33		31		15		28	
	Location																		
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl-phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene	1400				9000				2200		710	J	960		4700		230	J
330	Anthracene	420				3000				460	J			230	J	9800		49	J
330	Di-n-butylphthalate	2000	B			130	B			210	B	840	B	280	B			300	B
330	Fluoranthene	1100				12000				3100		760	J	1500		49000		300	J
330	Pyrene	920				10000				4500		510	J	1800		42000		260	J
330	Butylbenzylphthalate									110	J			54	J				
1600	3,3 Dichlorobenzidine																		
330	Benzo(a)anthracene	580				6200				2200				1100		26000		140	J
330	Chrysene	340				5200				2200				1400		35000		150	J
330	bis(2-Ethylhexyl)phthalate	1900	B	1800	B	920	B	1100	B	1300	B	1300	B	800	B	4600	B	390	B
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene	670				7700				4100		610	J	3400		43000		170	J
330	Benzo(k)fluoranthene																		
330	Benzo(a)pyrene	480				4900				2000		360	J	1800		28000		140	J
330	Indeno(1,2,3-cd)pyrene	210	J			3500				1800		360	J	1600		12000		94	J
330	Dibenz(a,h)anthracene	84	J			750				920	J			480		5800			
330	Benzo(g,h,i)perylene	220	J			2800				1700		320	J	1400		11000		99	J

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

Site Name: Hartwell Street Landfill **SOIL SAMPLES** (ug/Kg)

Case #: 9181-583 **Sampling Date(s):** 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-8	S-9	SED-3	SED-4R	W-1	W-2	W-3	W-1MS	W-1MSD
	Dilution Factor	5.0	1.0	1.0	2.0/10	1.0	1.0	1.0	1.0	1.0
	% Moisture	33	4	35	40	13	15	15	13	13
	Location									
CRQL	**COMPOUND**									
330	Phenol									
330	bis(2-Chloroethyl)ether									
330	2-Chlorophenol									
330	1,3-Dichlorobenzene									
330	1,4-Dichlorobenzene									
330	Benzyl Alcohol									
330	1,2 Dichlorobenzene									
330	2-Methylphenol									
330	bis(2-Chloroisopropyl)ether									
330	4-Methylphenol				380 J					
330	N-Nitroso di-n-propylamine									
330	Hexachloroethane									
330	Nitrobenzene									
330	Isophorone									
330	2-Nitrophenol									
330	2,4 Dimethylphenol									
1600	Benzoic Acid									
330	bis(2-Chloroethoxy)methane									
330	2,4 Dichlorophenol									
330	1,2,4-Trichlorobenzene									
330	Naphthalene	710 J	45 J	140 J	760 J			830		
330	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 2

Site Name: Hartwell Street Landfill SOIL SAMPLES

(ug/Kg)

Case #: 901.383 Sampling Date(s): 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-8		S-9		SED-3		SED-4/1D		W-1		W-2		W-3		W-1MS		W-1MSD	
	Dilution Factor	5.0		1.0		1.0		2.0/10		1.0		1.0		1.0		1.0		1.0	
	% Moisture	33		4		35		40		13		15		15		13		13	
	Location																		
CRQL	COMPOUND																		
330	Hexachlorobutadiene																		
330	4-Chloro-3-methylphenol																		
330	2-Methylnaphthalene	680	J			220	J	850	J					370	J				
330	Hexachlorocyclopentadiene																		
330	2,4,6-Trichlorophenol																		
1600	2,4,5-Trichlorophenol																		
330	2-Chloronaphthalene																		
1600	2-Nitroaniline																		
330	Dimethylphthalate																		
330	Acenaphthylene	140	J					350	J										
330	2,6-Dinitrotoluene																		
1600	3-Nitroaniline																		
330	Acenaphthene	1900	J	67	J	160	J	2000		62	J	70	J	850					
1600	2,4-Dinitrophenol																		
1600	4-Nitrophenol																		
330	Dibenzofuran	1300	J	51	J	140	J	1300				44	J	530					
330	2,4-Dinitrotoluene																		
330	Diethylphthalate																		
330	4-Chlorophenyl-phenylether																		
330	Fluorene	2100	J	67	J	180	J	1800		60	J	73	J	810		160	J	88	J
1600	4-Nitroaniline																		
1600	4,6-Dinitro-2-methylphenol																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 3

SOIL SAMPLES (ug/Kg)

Site Name: Hartwell Street Landfill

Case #: 9001.583 **Sampling Date(s):** 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-8		S-9		SED-3		SED-4DL		W-1		W-2		W-3		W-1MS		W-1MSD	
	Dilution Factor	5.0		1.0		1.0		2.0/10		1.0		1.0		1.0		1.0		1.0	
	% Moisture	33		4		35		40		13		15		15		13		13	
	Location																		
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl-phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene	13000		680	L	1600		12000		550		640		4300		1100		900	
330	Anthracene	4000				320	J	4200		130	J	150	J	1300		200	J	180	J
330	Di-n-butylphthalate	200	B	290	B	300	B	350	B	190	B	310	B	180	B	290	B	240	B
330	Fluoranthene	16000		410	L	1900		33000		860		720		3700		1300		1000	
330	Pyrene	16000		1300	L	2300		35000		1000		830		5100					
330	Butylbenzylphthalate	100	J			93	J	200	J					40	J				
1600	3,3-Dichlorobenzidine																		
330	Benzo(a)anthracene	8600				1100		22000		510		380	J	2300		570		310	
330	Chrysene	8600				1300		22000		570		420		2200		600		540	
330	bis(2-Ethylhexyl)phthalate	1520	B	1600	B	890	B	1200	B	550	B	530	B	530	B	1500	B	1800	B
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene	15000		730	L	1900		42000		1200		810		3700		1100		1100	
330	Benzo(k)fluoranthene																		
330	Benzo(a)pyrene	9500				1300		23000		660		460		2500		550		520	
330	Indeno(1,2,3-cd)pyrene	2800		570	L	960		14000		440		320	J	1700		410		380	
330	Dibenz(a,h)anthracene	3000				290	J	1300		130	J	84	J	550		92	J	110	J
330	Benzo(g,h,i)perylene	3800		510	L	870		12000		440		310	J	1400		390		370	J

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

SOIL SAMPLES
(ug/Kg)

Site Name: Hartwell Street Landfill

Case #: 9001.583 Sampling Date(s): 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	SBLKS1		SBLKS2		SBLKS3		SBLKS4		SBLKS5		SBLKS6		SBLKS7		SBLKS11			
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0			
	% Moisture	—		—		—		—		—		—		—		—			
	Location																		
CRQL	COMPOUND																		
330	Phenol																		
330	bis(2-Chloroethyl)ether																		
330	2-Chlorophenol																		
330	1,3-Dichlorobenzene																		
330	1,4-Dichlorobenzene																		
330	Benzyl Alcohol																		
330	1,2 Dichlorobenzene																		
330	2-Methylphenol																		
330	bis(2-Chloroisopropyl)ether																		
330	4-Methylphenol																		
330	N-Nitroso di-n-propylamine																		
330	Hexachloroethane																		
330	Nitrobenzene																		
330	Isophorone																		
330	2-Nitrophenol																		
330	2,4-Dimethylphenol																		
1600	Benzoic Acid																		
330	bis(2-Chloroethoxy)methane																		
330	2,4 Dichlorophenol																		
330	1,2,4-Trichlorobenzene																		
330	Naphthalene																		
330	4-Chloroaniline																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 2

Site Name: Hartwell Street Landfill SOIL SAMPLES

Case #: 9001.583 Sampling Date(s): 6/28/90 7/12/90 (ug/Kg)

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	SBLKS1	SBLKS2	SBLKS3	SBLKS4	SBLKS5	SBLKS6	SBLKS7	SBLKS11	
	Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
	% Moisture	—	—	—	—	—	—	—	—	
	Location									
CRQL	COMPOUND									
330	Hexachlorobutadiene									
330	4-Chloro-3-methylphenol									
330	2-Methylnaphthalene									
330	Hexachlorocyclopentadiene									
330	2,4,6-Trichlorophenol									
1600	2,4,5-Trichlorophenol									
330	2-Chloronaphthalene									
1600	2-Nitroaniline									
330	Dimethylphthalate									
330	Acenaphthylene									
330	2,6-Dinitrotoluene									
1600	3-Nitroaniline									
330	Acenaphthene									
1600	2,4-Dinitrophenol									
1600	4-Nitrophenol									
330	Dibenzofuran									
330	2,4-Dinitrotoluene									
330	Diethylphthalate									
330	4-Chlorophenyl-phenylether									
330	Fluorene									
1600	4-Nitroaniline									
1600	4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 3

Site Name: Hartwell Street Landfill **SOIL SAMPLES**
(ug/Kg)

Case #: 9001.583 **Sampling Date(s):** 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	SBLKS1		SBLKS2		SBLKS3		SBLKS4		SBLKS5		SBLKS6		SBLKS7		SBLKS11			
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0			
	% Moisture	—		—		—		—		—		—		—		—			
	Location																		
CRQL	COMPOUND																		
330	N-Nitrosodiphenylamine																		
330	4-Bromophenyl-phenylether																		
330	Hexachlorobenzene																		
1600	Pentachlorophenol																		
330	Phenanthrene																		
330	Anthracene																		
330	Di-n-butylphthalate	460		300		94		130		61		180		310		34			
330	Fluoranthene																		
330	Pyrene																		
330	Butylbenzylphthalate																		
1600	3,3-Dichlorobenzidine																		
330	Benzo(a)anthracene																		
330	Chrysene																		
330	bis(2-Ethylhexyl)phthalate	2100		490		790		700		840		620		530		640			
330	Di-n-octylphthalate																		
330	Benzo(b)fluoranthene																		
330	Benzo(k)fluoranthene																		
330	Benzo(a)pyrene																		
330	Indeno(1,2,3-cd)pyrene																		
330	Dibenz(a,h)anthracene																		
330	Benzo(g,h,i)perylene																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: TENTATIVELY IDENTIFIED COMPOUNDS

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(ug/Kg)

Case #: 9001.583 **Sampling Date:** 6/28/90 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((1 - % moisture/100)

	Sample No.	GW-SW-1		S-6		S-8		W-3						
	Dilution Factor	2.0		2.0		5.0		1.0						
	% Moisture	25		15		33		15						
	Location													
CRQL	**COMPOUND**													
	CAS # 132650	1100	J			1400	J	390	J					
	Dibenthiophene													
								470	J					
	CAS # 86748			3700	J									
	9H-Carbazole													

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(ug/Kg)

Case #: 9001.583 Sampling Date(s): 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	GW-2(0-4)		GW-2(4-20)		GW5(0-4)		GW-5(4-20)		S-1		S-4		S-5		S-6		S-7	
	Dilution Factor	2.0		1.0		1.0		1.0		4.0		2.0		1.0		10		2.5	
	% Moisture	19		14		25		16		11		33		31		16		28	
	Location																		
CRQL	COMPOUND																		
8	alpha-BHC		UL		UL		UL		UL		UL		UL		UL		UL		UL
8	beta-BHC		UL		UL		UL		UL		UL		UL		UL		UL		
8	delta-BHC						UL												
8	Gamma-BHC (Lindane)						UL												
8	Heptachlor		UL		UL		UL		UL		UL		UL		UL		UL		UL
8	Aldrin						UL												
8	Heptachlor Epoxide						UL												
8	Endosulfan I						UL												
16	Dieldrin						UL												
16	4,4'-DDE						UL												
16	Endrin						UL												
16	Endosulfan II						UL												
16	4,4'-DDD						UL												
16	Endosulfan Sulfate						UL												
16	4,4' DDT						UL												
80	Methoxychlor						UL												
16	Endrin ketone						UL												
80	Alpha-Chlordane						UL												
80	Gamma-Chlordane						UL												
160	Toxaphene						UL												
80	Aroclor-1016						UL												
80	Aroclor-1221						UL												
80	Aroclor-1232						UL												
80	Aroclor-1242						UL												
80	Aroclor-1248						UL												
160	Aroclor-1254						UL												
160	Aroclor-1260						UL												

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(ug/Kg)

Case #: 901.583 Sampling Date(s): 6/28/90 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	S-8		S-9		SED-3		SED-4		W-1		W-2		W-3		W-1MS		W1-MSD	
	Dilution Factor	10		100		1.0		10		2.0		1.0		4		2.0		2.0	
	% Moisture	33		4		35		40		13		15		15		13		13	
	Location																		
CRQL	COMPOUND																		
8	alpha-BHC		UL		UL		UL		UL		UL		UL		UL		UL		UL
8	beta-BHC		UL		UL		UL		UL		UL		UL		UL		UL		UL
8	delta-BHC																		
8	Gamma-BHC (Lindane)																		
8	Heptachlor		UL		UL		UL		UL		UL		UL		UL		UL		UL
8	Aldrin																		
8	Heptachlor Epoxide																		
8	Endosulfan I																		
16	Dieldrin																		
16	4,4'-DDE																		
16	Endrin																		
16	Endosulfan II																		
16	4,4'-DDD																		
16	Endosulfan Sulfate																		
16	4,4'-DDT																		
80	Methoxychlor																		
16	Endrin ketone																		
80	Alpha-Chlordane																		
80	Gamma-Chlordane																		
160	Toxaphene																		
80	Aroclor-1016																		
80	Aroclor-1221																		
80	Aroclor-1232																		
80	Aroclor-1242																		
80	Aroclor-1248																		
160	Aroclor-1254																		
160	Aroclor-1260																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(ug/Kg)

Case #: 9001-953 Sampling Date(s): 6/28/90, 7/12/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	PBLKS1		PBLKS3		PBLKS4		PBLKS5											
	Dilution Factor	1.0		1.0		1.0		1.0											
	% Moisture	—		—		—		—											
	Location																		
CRQL	COMPOUND																		
8	alpha-BHC																		
8	beta-BHC																		
8	delta-BHC																		
8	Gamma-BHC (Lindane)																		
8	Heptachlor																		
8	Aldrin																		
8	Heptachlor Epoxide																		
8	Endosulfan I																		
16	Dieldrin																		
16	4,4'-DDE																		
16	Endrin																		
16	Endosulfan II																		
16	4,4'-DDD																		
16	Endosulfan Sulfate																		
16	4,4'-DDT																		
80	Methoxychlor																		
16	Endrin ketone																		
80	Alpha-Chlordane																		
80	Gamma-Chlordane																		
160	Toxaphene																		
80	Aroclor-1016																		
80	Aroclor-1221																		
80	Aroclor-1232																		
80	Aroclor-1242																		
80	Aroclor-1248																		
160	Aroclor-1254																		
160	Aroclor-1260																		

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: INORGANICS

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(mg/Kg)

Case #: 900.583 Sampling Date(s): 6/28/90, 7/12/90

•Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

	Sample No.	GW2(0-4)		GW2(4-26)		GW-5(0-4)		GW-5(4-20)		S-1		S-4		S-5		S-6		S-7		S-8	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Solids	80.8		85.9		74.8		84.1		89.2		67.3		69.1		84.5		71.6		66.6	
	Location																				
CRDL	ANALYTE																				
40	Aluminum	9100		9250		19000		10100		8530		2080		4080		2380		18400		17600	
12	Antimony		UL		UL		UL		UL		UL		UL	15.3	L		UL		UL		UL
2	Arsenic	17.0	L	1.6	L	6.5	L	3.6		5.3	L	38.5		8.8	L	56.9	L	5.8	L	75.2	L
40	Barium	86.1		79.0		160		41.1		76.9		33.5		42.5		44.6		152		171	
1	Beryllium					0.58				0.99										0.72	
1	Cadmium	2.3	L	1.9	L	3.7	L		UL	5.0	L	54.5	L	2.0	L	9.0	L	4.4		5.5	L
1000	Calcium	33800		66900		19500		65900		153000		2110		4010		8530		8150		7350	
2	Chromium	13.6		12.3		20.6		14.1		116		1740		14.4		163		27.5		17.6	
10	Cobalt	9.1		7.3		17.7		11.1		4.2		15.5		4.5		10.4		7.4		5.4	
5	Copper	50.3	LJ	17.0	LJ	49.6	LJ	19.7	LJ	112	LJ	601	LJ	64.6	LJ	517	LJ	41.8	LJ	110	LJ
20	Iron	28300		17700		38300		20300		49200		260000		17600		110000		35300		41200	
1	*Lead	44.7		12.1		97.1		13.0		101		3070		89.7		125		82.4		525	
1000	Magnesium	8700		30600		11600		21300		17100		1130		593		2290		5860		16900	
3	Manganese	516		484		1050		539		3340		12900		497		1390		421		952	
0.2	Mercury	0.14				0.22						0.66									
8	Nickel	20.6	L	18.8	L	31.2	L	18.0	L	27.4	L	450	L	22.7	L	131	L	22.2	L	26.5	L
1000	Potassium	1100		1970		1560		1900		354		511		504		169		2060		1078	
1	Selenium		UL		UL		UL		UL		UL		UL		UL		UL		UL		UL
2	Silver											6.7				2.5					
1000	Sodium			208				220		355		526								398	
2	Thallium																				
10	Vanadium	19.7	L	13.0	L	27.6	L	19.3	L	49.9	L	9.08	L	7.5	L	33	L	36	L	24.2	L
4	Zinc	58.0		72.2		159		81.8		120		5730		157		360		180		240	
2	Cyanide																			3.6	

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: INORGANICS

Site Name: Hartwell Street Landfill

SOIL SAMPLES
(mg/Kg)

Case #: 9UL-583 Sampling Date(s): 6/28/90, 7/10/90

*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

	Sample No.	S-9		SED-3		SED-4		W-1		W-2		W-3									
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0									
	% Solids	95.8		64.6		60.4		86.6		84.7		84.8									
	Location																				
CRDL	ANALYTE																				
40	Aluminum	3640		5250		13100		801		2230		1050									
12	Antimony		UL		UL	19.4	L		UL		UL		UL								
2	Arsenic	4.7	L	14.0	L	109	L	18.9		6.5	L	3.6	L								
40	Barium	64.3		103		167		10.2		19.6		10.7									
1	Beryllium																				
1	Cadmium	7.7	L	7.7	L	4.6	L	12.5	L	9.1	L	1.7	L								
1000	Calcium	114000		6270		39200		1500		5030		1300									
2	Chromium	348		22.1		35.9		253		160		26.1									
10	Cobalt	6.3		4.5		12.7		13.2		6.9											
5	Copper	65.9	LJ	254	LJ	113	LJ	197	LJ	295	LJ	30.8	LJ								
20	Iron	76800		37200		44000		147000		64500		16500									
1	*Lead	93.8		222		977		30.4		147		30.4									
1000	Magnesium	6440		1190		11700		488		1640		638									
3	Manganese	6720		151		1000		1340		1900		357									
0.2	Mercury			0.26		0.23															
8	Nickel	50.4	L	33.5	L	48.4	L	145	L	127	L	18.3	L								
1000	Potassium	395		453		2158				244		136									
1	Selenium		UL	1.3	L		UL		UL		UL		UL								
2	Silver																				
1000	Sodium	212				187		128		132											
2	Thallium																				
10	Vanadium	101	L	19.2	L	34.1	L	46.3	L	22	L		UL								
4	Zinc	212		560		350		39.1		198		41.5									
2	Cyanide																				

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

APPENDIX E

GEOTECHNICAL ANALYSES

Project No. 11420

TOLEDO TESTING LABORATORY, INC.

Sheet 1 **Of** 1

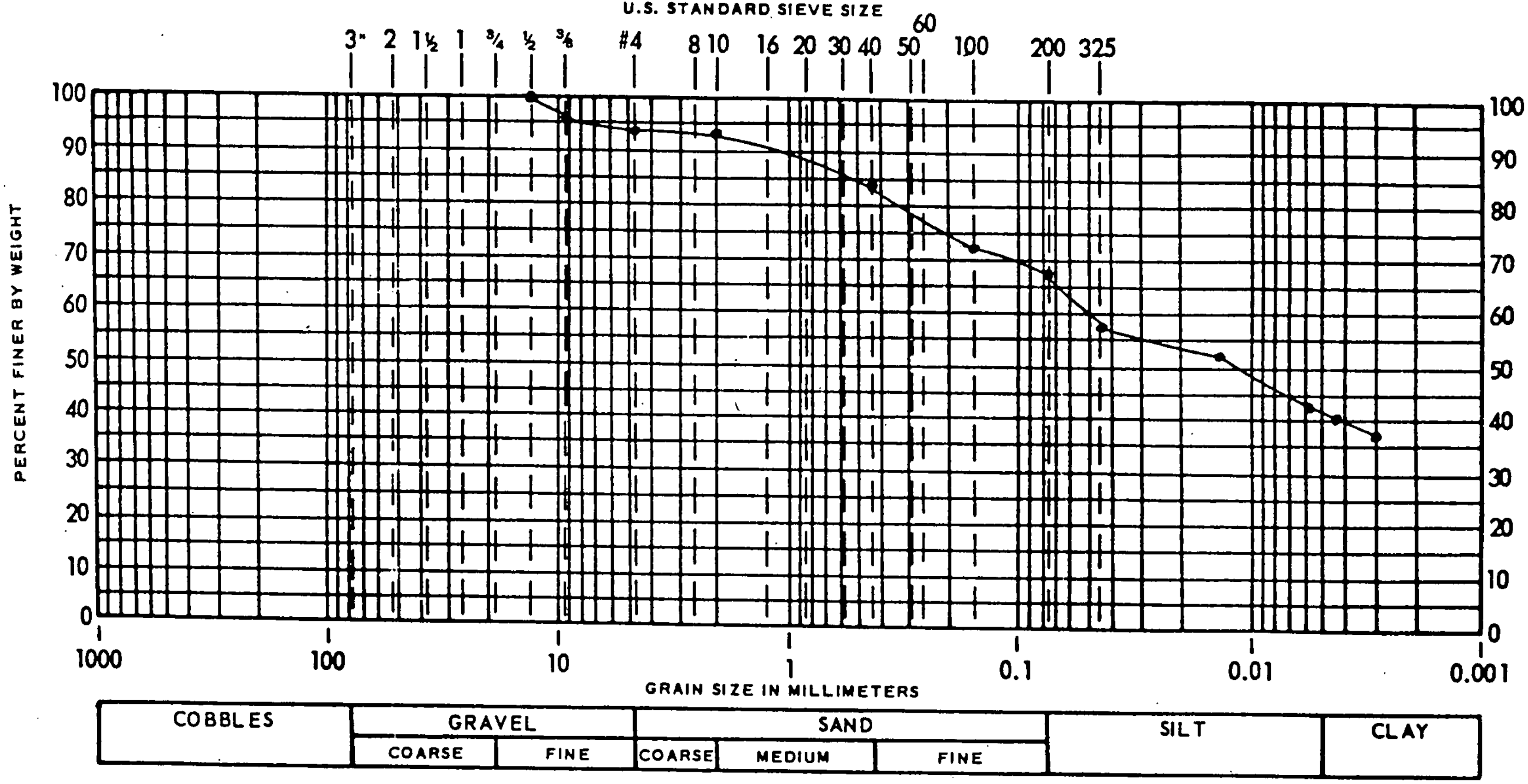
TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample	Elevation of Sample Tip	Standard Penetration (Number of Blows/Foot Unless Otherwise Stated)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Unconfined Compressive Strength (PSF)		Particle Size Distribution							Atterberg Limits			Unified Soil Classification System Designation
									Gravel (Percent)	Coarse Sand (Percent)	Medium Sand (Percent)	Fine Sand (Percent)	Silt (Percent)	Clay (Percent)	Colloids (Percent)	Liquid Limit (Percent)	Plastic Limit (Percent)	Plasticity Index (Percent)	
GW1	GW-1	24'-26'														33	17	16	CL
GW2	GW-2	6'-8'														52	23	29	CH
GW3	GW-3	2'-4'							6	0	9	17	26	42					
GW4	GW-4	1'-3'														31	18	13	CL
GW5	GW-5	26'-28'														33	17	16	CL
GW6	GW-6	0'-2'							19	15	16	15	13	22					
GW7	GW-7	2'-4'							7	1	13	16	20	43					
GW8	GW-8	9'-11'														42	26	16	CL-ML*

* On "A" Line

Figure 1

SOIL CLASSIFICATION SHEET



PROJECT Hartwell Street Landfill
Your Project No. YP-7040
BORING NO. GW3
SAMPLE NO. GW-3
DEPTH 2' - 4'
CLASSIFICATION

NATURAL % MOISTURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
COLOR
REMARKS Your P.O. NO. 54964
T.T.L. Job No. 11420

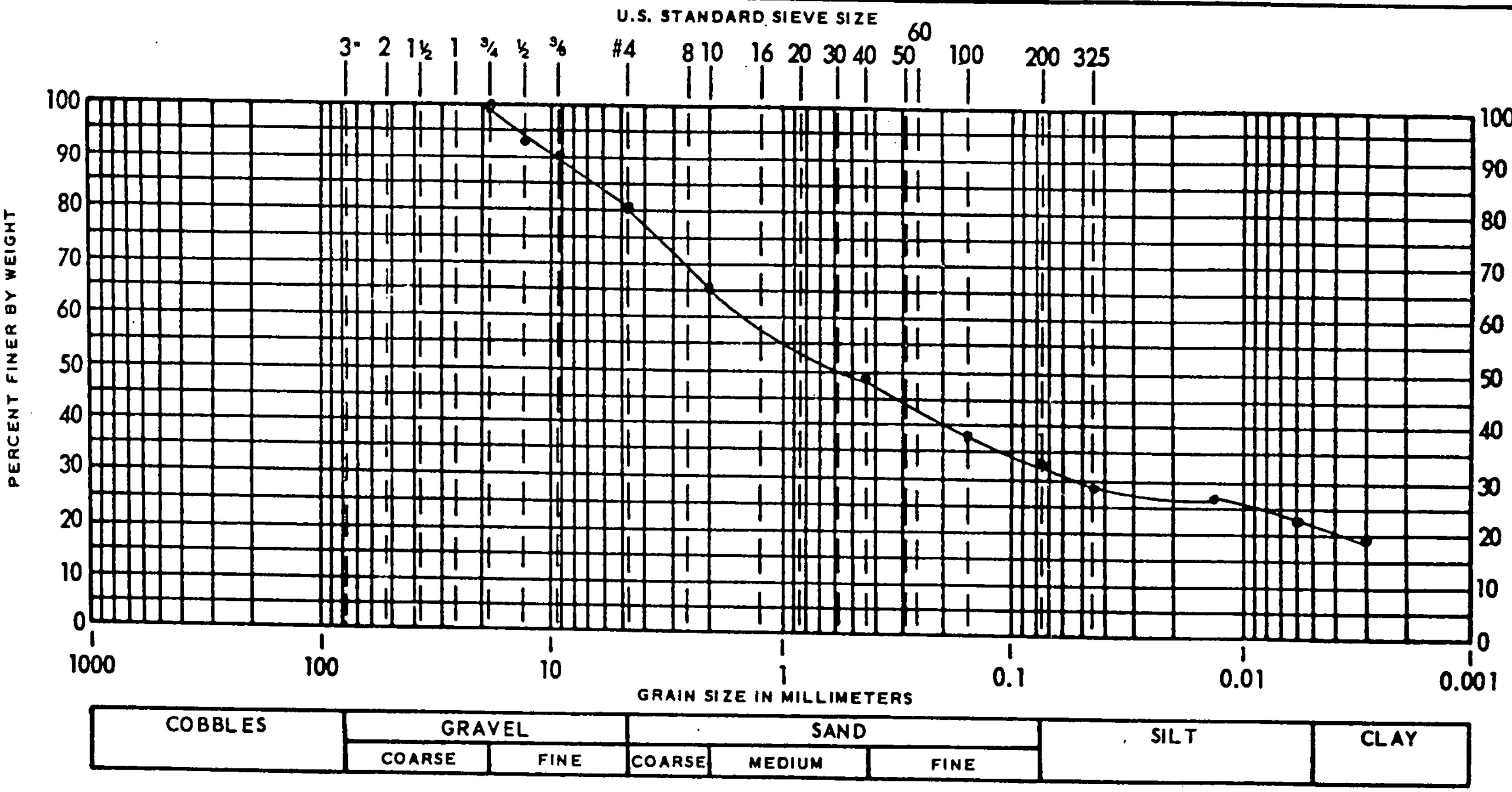
Toledo Testing Laboratory, Inc.

recycled paper

ecology and environment

Figure 2

SOIL CLASSIFICATION SHEET



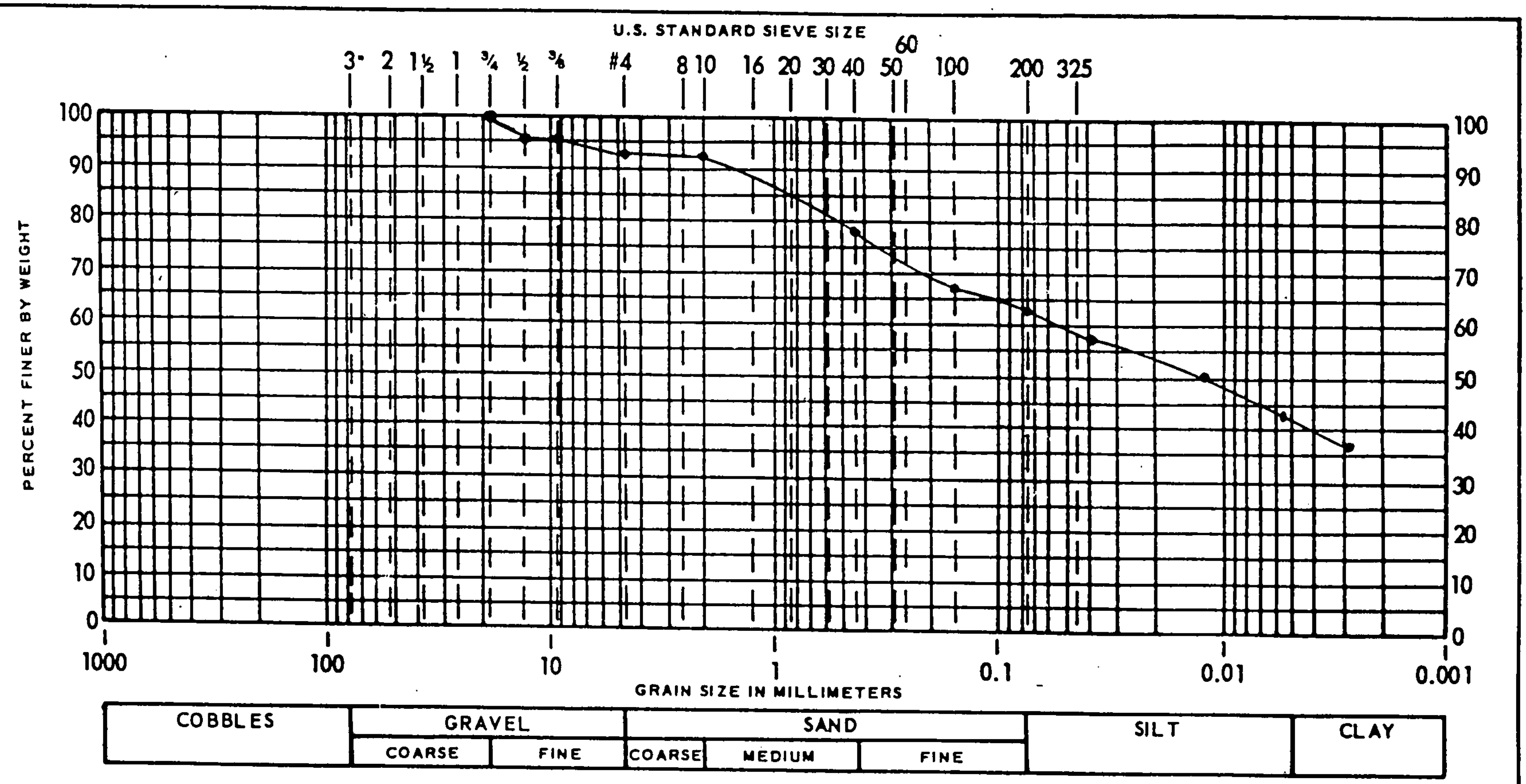
PROJECT Hartwell Street Landfil
Your Project No. YP-7040
BORING NO. GW6
SAMPLE NO. GW-6
DEPTH 0' - 2'
CLASSIFICATION

NATURAL % MOISTURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
COLOR
REMARKS Your P.O. NO. 54964
T.T.L. Job No. 11420

Toledo Testing Laboratory, Inc.

Figure 3

SOIL CLASSIFICATION SHEET



PROJECT Hartwell Street Landfill
Your Project No. YP-7040
BORING NO. GW7
SAMPLE NO. GW-7
DEPTH 2' - 4'
CLASSIFICATION

NATURAL % MOISTURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
COLOR
REMARKS Your P.O. NO. 54964
T.T.L. Job No. 11420

Toledo Testing Laboratory, Inc.

Figure 4

APPENDIX F

SITE PHOTOGRAPHIC LOGS

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation (NYSDEC) E & E Job No.: YP 7000

Camera: Make Cannon AE-1 SN:

Photographer: Jim Richert Date/Time: 6/25/90 12:40 hours

Lens: Type 50mm SN: Frame No.: 1

Comments: Drill rig facing northwest at location GW-1.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

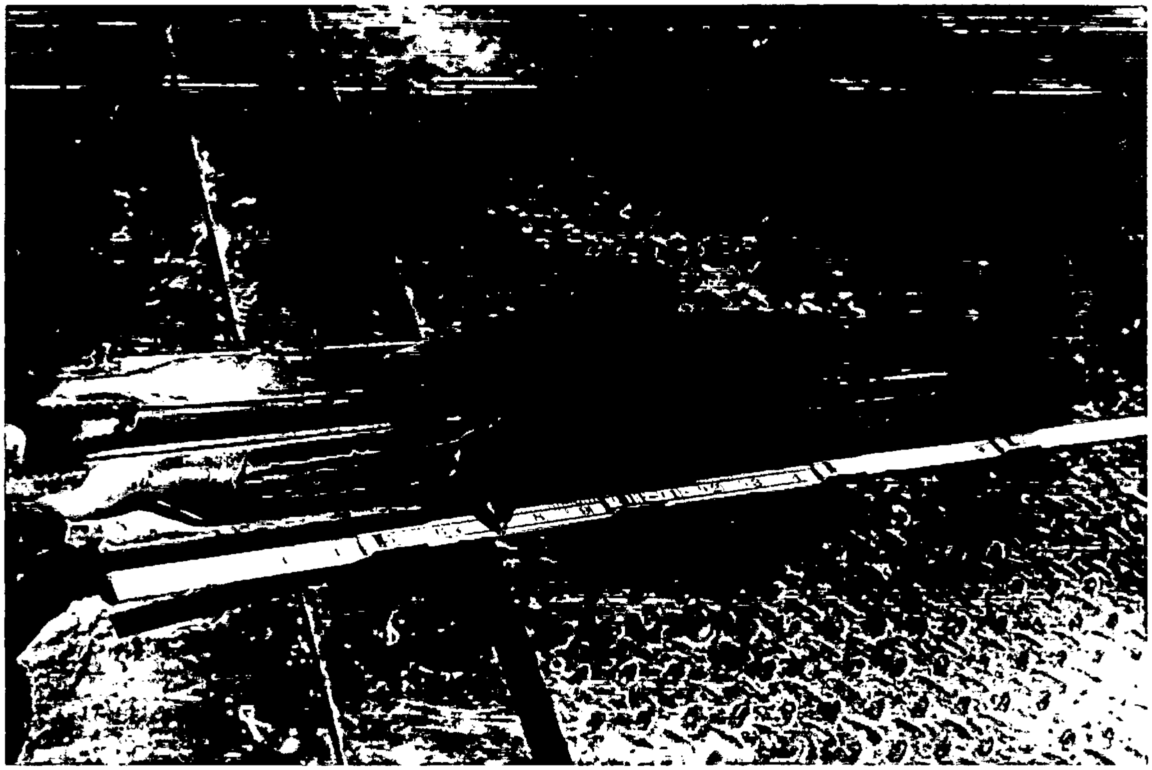
Client: New York State Department of Environmental Conservation (NYSDEC) E & E Job No.: YP 7000

Camera: Make Cannon AE-1 SN:

Photographer: Jim Richert Date/Time: 6-25-90 13:55 hours

Lens: Type 50mm SN: Frame No.: 2

Comments: Split spoon of typical day from GW-1 34-36 feet.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation (NYSDEC)   E & E Job No.: YP 7000

Camera: Make Cannon AE-1   SN:

Photographer: Jim Richert   Date/Time: 6-25-90 14:00 hours

Lens: Type 35mm   SN: Frame No.: 3

Comments: Clay from split spoon from GW-1 34-36 feet.

02[UZ]YP7080:D3136/3987/4

ecology and environment, inc.

PHOTOGRAPHIC RECORD

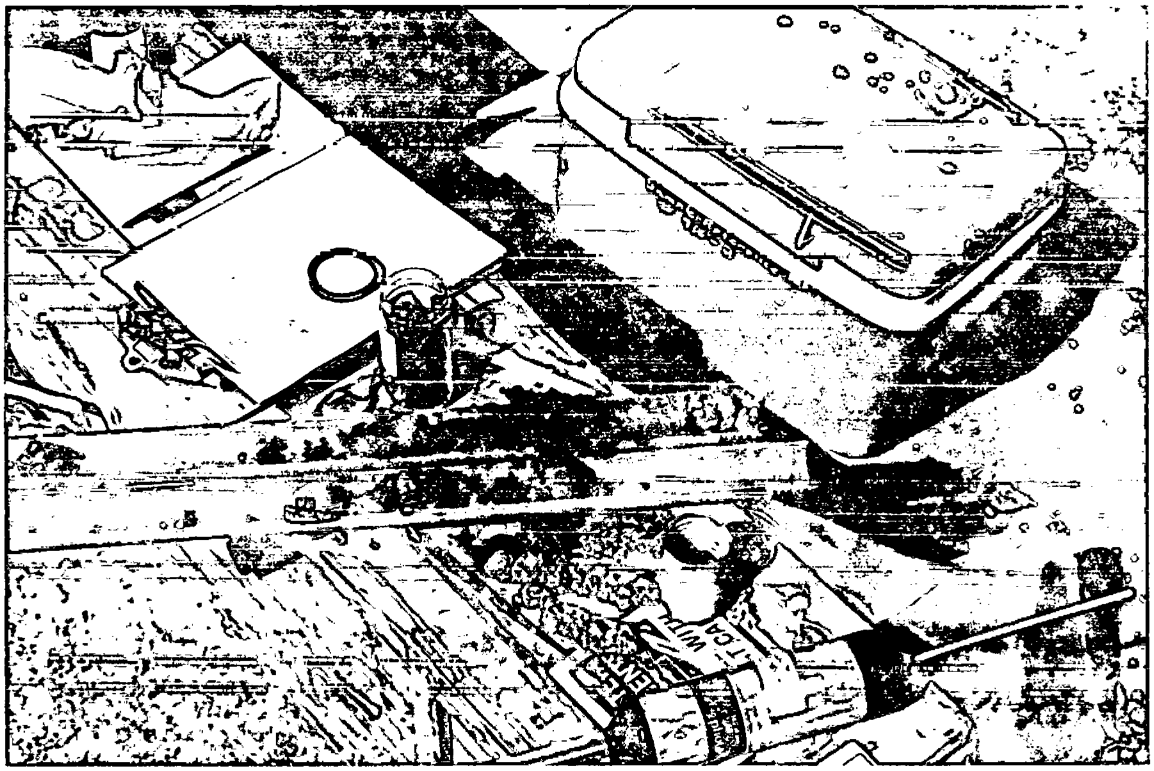
Client: New York State Department of Environmental Conservation (NYSDEC) E & E Job No.: YP 7000

Camera: Make Cannon AE-1 SN:

Photographer: Jim Richert Date/Time: 6-26-90 10:19 hours

Lens: Type 50mm SN: Frame No.: 4

Comments: Two - four foot sample at GW-3 location showing contact of clay and foundry sand.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

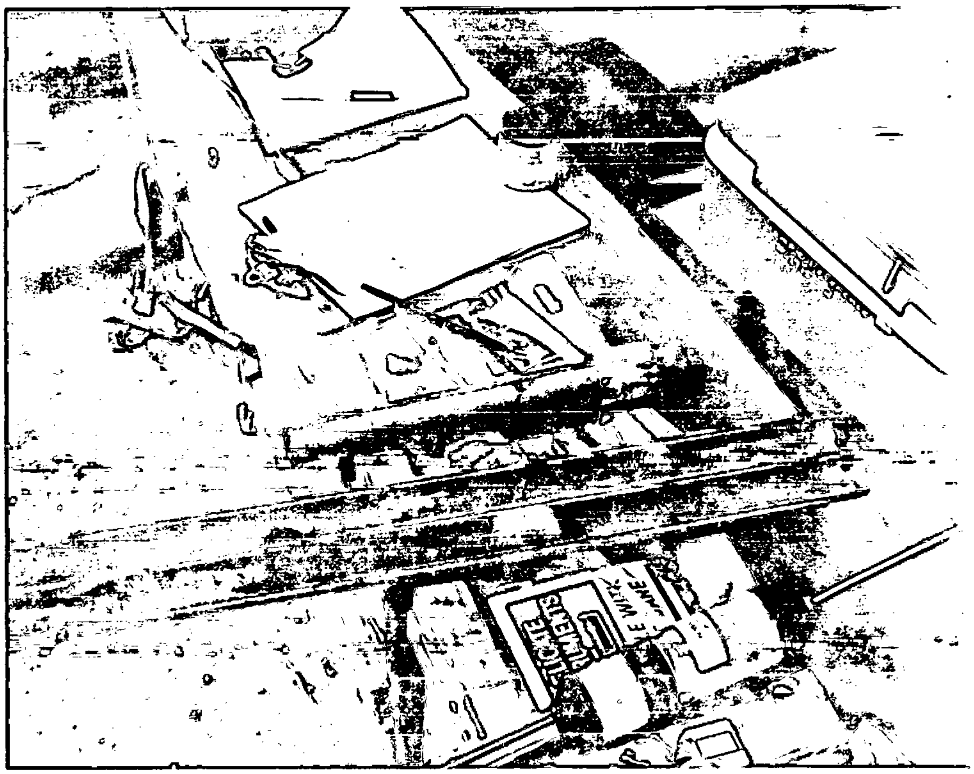
Client: New York State Department of Environmental Conservation (NYSDEC)
E & E Job No.: YP 7000

Camera: Make Cannon AE-1
SN:

Photographer: Jim Richert
Date/Time: 6-26-90 10:40 hours

Lens: Type 50mm
SN:
Frame No.: 5

Comments: Very cohesive clay from the 9-11 foot sample at GW-3 location.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC
E & E Job No.: YP7020

Camera: Make Kodak Fling
SN: NA

Photographer: R. Leichner
Date/Time: 9/12/91

Lens: Type NA
SN: NA
Frame No.: 21

Comments: Wood debris from demolition of old pattern building. Elmwood Ave. in background. Facing west.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: . NA

Photographer: J. Vangalio

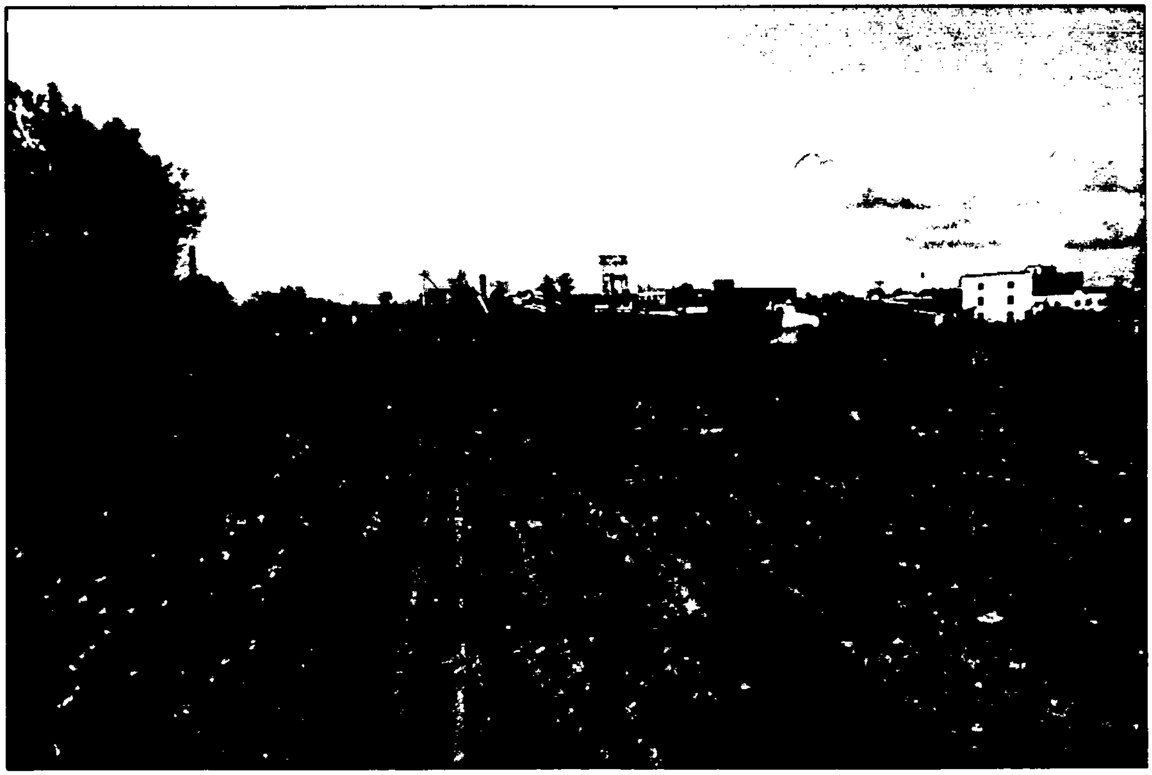
Date/Time: 9/12/91

Lens: Type NA

SN: NA

Frame No.: 23

Comments: Area where mounds of foundry sand were located. Recently graded, but sand still visible at the surface. Northeast portion of site. Facing south.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: NA

Photographer: J. Vangalio

Date/Time: 9/12/91

Lens: Type NA

SN: NA

Frame No.:

Comments: Piles of tires, foundry sand, and empty drums to the west of green pattern building (visible to extreme right). Facing south.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: NA

Photographer: J. Vangalio

Date/Time: 9/12/91

Lens: Type NA

SN: NA

Frame No.: 18

Comments: Pile of empty drums along western edge of property, south of former pattern building. Elmwood Ave. in background. Facing west.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: NA

Photographer: J. Vangalio

Date/Time: 9/12/91

Lens: Type NA

SN: NA

Frame No.: 17

Comments: Former location of Atlas Steel office building, lumber yard in background, Elmwood Ave. to right, debris removal truck to left. Facing south.

recycled paper

ecology and environment

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: NA

Photographer: J. Vangalio

Date/Time: 9/12/91

Lens: Type NA

SN: NA

Frame No.: 12

Comments: Pattern and storage buildings with piles of empty drums, foundry sand, and tires to right. Facing north.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: NA

Photographer: J. Vangalio

Date/Time: 9/12/91

Lens: Type NA

SN: NA

Frame No.: 9

Comments: Debris located along western edge of property, at location of former pattern building. Remaining storage building and pattern building seen at right. Facing north.

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client:	NYSDEC	E & E Job No.:	YP7020
Camera: Make	Kodak Fling	SN:	NA

Photographer:	J. Vangalio			Date/Time:	9/12/91
Lens: Type	NA	SN:	NA.	Frame No.:	6

Comments: Pile of empty drums and foundry sand (background, right) located to southeast of remaining pattern building. Facing northeast.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: NA

Photographer: J. Vangalio

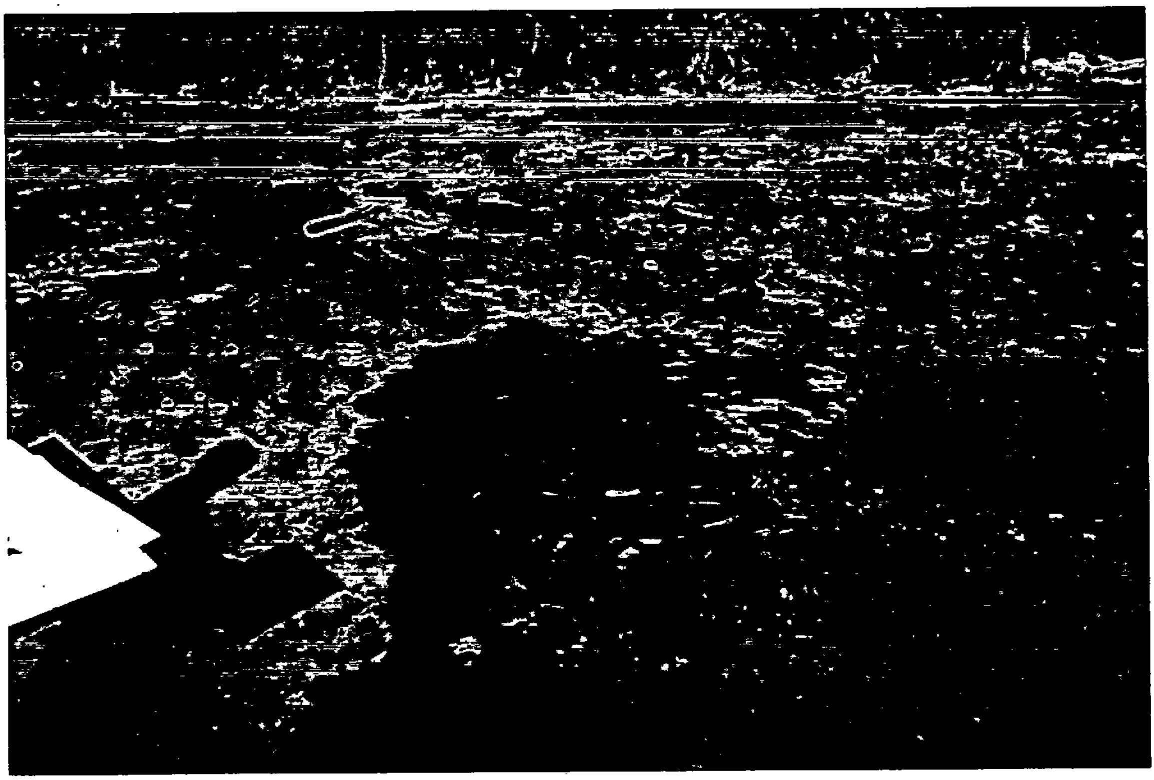
Date/Time: 9/12/91

Lens: Type NA

SN: NA

Frame No.: 4

Comments: Oil-stained soil near former drum storage area, south of former pattern building. Facing northwest.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: NYSDEC

E & E Job No.: YP7020

Camera: Make Kodak Fling

SN: NA

Photographer: J. Vangalio

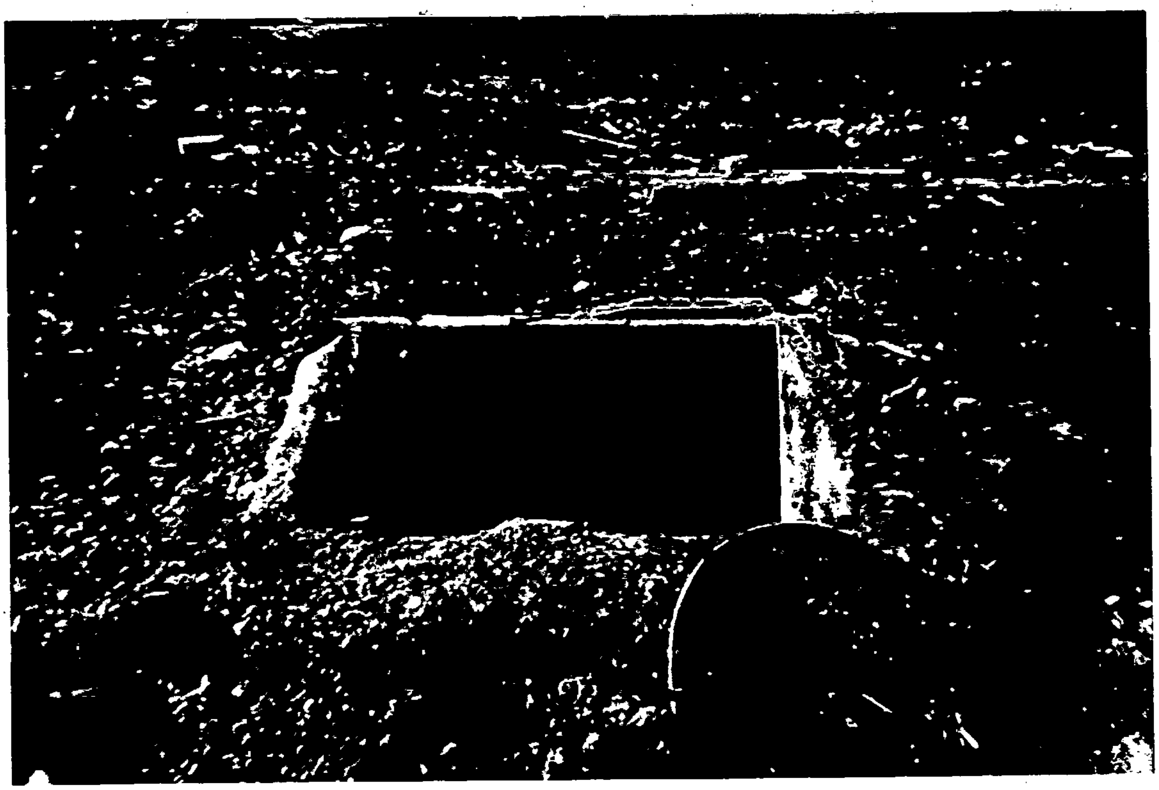
Date/Time: 9/12/91

Lens: Type NA

SN: NA

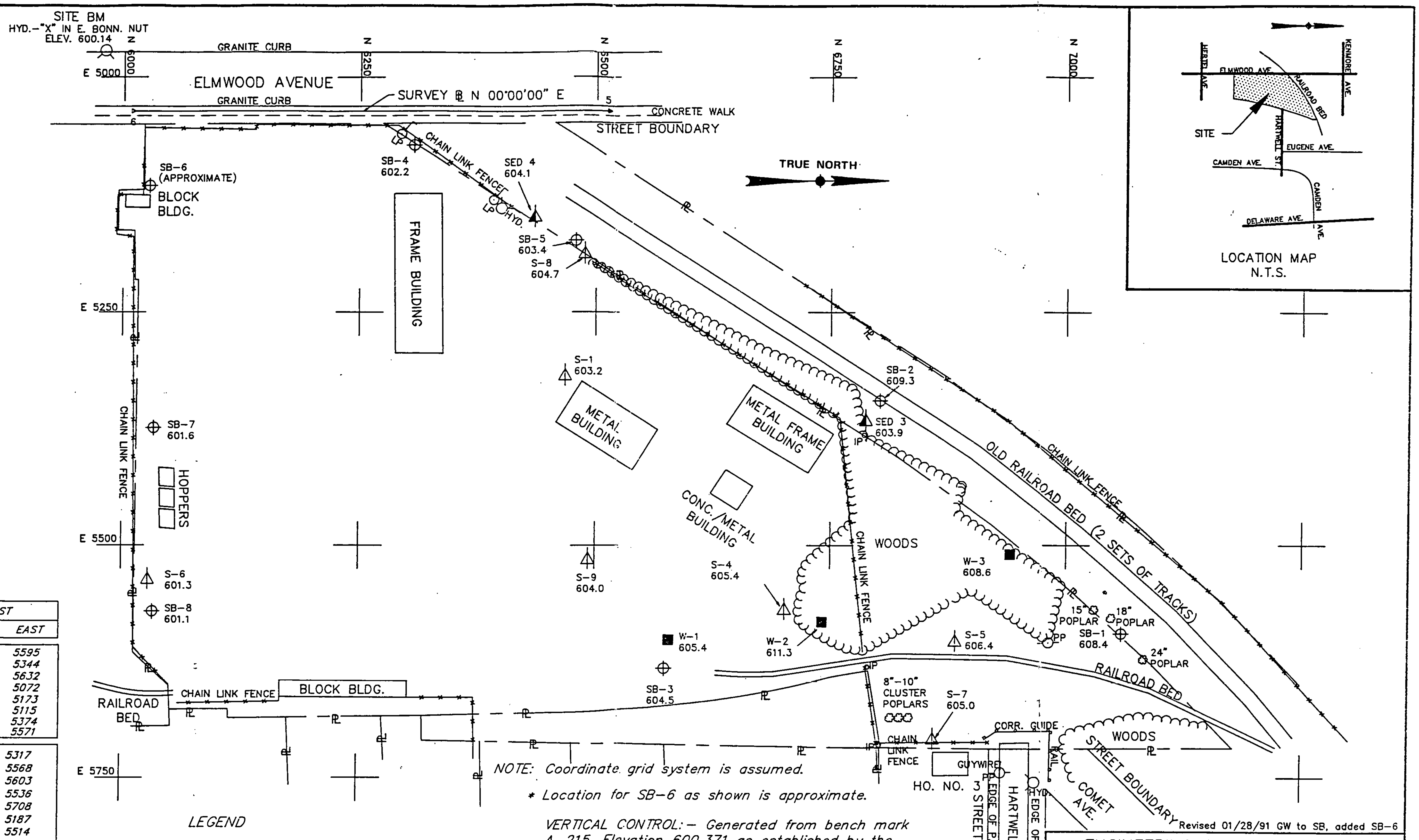
Frame No.: 5

Comments: Pit containing oily water and debris on foundation of former foundry building. Three pits previously observed, this is the only one that is still visible. Facing south.



APPENDIX G

SURVEY MAP



NOTE: Coordinate grid system is assumed.

* Location for SB-6 as shown is approximate.

VERTICAL CONTROL:- Generated from bench mark A-215, Elevation 600.371 as established by the City of Buffalo Survey Office.

Baseline points 5 and 6 are PK nails.

Property lines shown are approximate and were derived from Tax Map information furnished by Ecology & Environment Eng., P.C.

COORDINATE LIST

NAME	NORTH	EAST
SB-1	7059	5595
SB-2	6803	5344
SB-3	6576	5632
SB-4	6307	5072
SB-5	6479	5173
* SB-6	6028	5115
SB-7	6034	5374
SB-8	6034	5571
S-1	6468	5317
S-4	6702	5568
S-5	6883	5603
S-6	6029	5536
S-7	6860	5708
S-8	6489	5187
S-9	6493	5514
SED3	6787	5365
SED4	6435	5147
W-1	6580	5602
W-2	6742	5582
W-3	6940	5510
P.K. 6	6010.00	5035.59
P.K. 5	6513.68	5035.59

LEGEND

- ⊕ *SOIL BORING*
- △ *SURFACE SOIL SAMPLE LOCATION*
- ▲ *SURFACE WATER/SEDIMENT SAMPLE LOCATION*
- ■ *WASTE PILE SAMPLE LOCATION*

Revised 01/28/91 GW to SB, added SB-6

ENGINEERING INVESTIGATIONS AT HARTWELL LANDFILL SITE, NO. 915030

New York State Department of Environmental Conservation

Prepared for:
Ecology and Environment Eng., P.C.
368 Pleasantview Drive
Lancaster, New York 14086

Prepared by:
OM P. POPLI, P.E.,P.L.S.
2140 South Clinton Avenue
Rochester, New York 14618
Tel. No. 716-442-6940

DATE	SCALE	SHEET
10/26/90	1"= 100'	1

APPENDIX H

FIELD NOTEBOOKS

ecology and environment, inc.

International Specialists in the Environment

Job Number YP-7010

HARtwell St. &.

NYSDEC PHASE I

4/16/90

4/16/90 Monday
Hartwell St Landfill
12:00 B. Meyers has been mobilizing this morning

1345 Stop to get stakes

1420 Find site; can't enter from Hartwell St

1435 At Elmwood entrance of Atlas Steel, at Frontier Lumber Co.
E+E Crew:
J. Nickerson, E&E
B. Meyers, E&E

Weather: sunny, 50°, wind ≈ 10 mph from South; low humidity

Goals: perform air monitoring, check out items on site recon list

4/16/90

4/16/90 Monday
1:45 Meyers fires up OVA + HNU

HNU: 10.2 eV probe, machine # 01-02-004-02

~~HNU~~ OVA 01-01-003

HNU calibrated w/ isobutane at 57 ppm, 9.8 span
Will locate 8 wells

1453 Background sampling of air.
OVA = 0 ppm
HNU: 0 ppm

Concrete along GW-4, GW-5, GW-6
Sewer by GW-4

Overhead power lines by GW-4
@ in sewer:
2 ppm on OVA
1 on HNU

4/16/90

4/16
TRIP - Fall and cuts
Hazards are extreme

Sand at base of post
60°E of sewer

Oil staining on ground
by drum storage area

Much scrap debris north
of drums

Surface (W) in creek at
northwest side of site

Suspect surface (W) sampling

GW-2: [illegible] in trash

GW-1: OK

Bulldozer would be
good to push trash
out of way

4/16/90

Much iron debris
throughout site area

HNU around disposal area:
0ppm
OVA: 0ppm

Drums are open, 0ppm readings
on OVA / HNU
Much oil staining on ground
by drums in central
portion of site

Standing (W) in middle of site

Drums broken/open and partially
buried along east side of site
OVA: 0ppm
HNU: 0ppm

3 fuel tanks capacity
10,000 gal each, on
northeast ~~side of~~ corner
of main building

4/16/90

SIGN ON western
TANK says "Small
OIL RETURN

ASBESTOS ON PIPES
IN BUILDING near
TANK

GW-8 AND GW-7:
OK; might move
GW-8 towards west
(towards Elmwood Ave).

OVERHEAD WIRES
along southern side of
SITE

1550 Completed walkover
AND AIR Monitoring surveys
with new MARK well
locations

GW-6 slightly IN FROM
SOUTH entrance gate due to
concrete in area

4/16/90

4/16/90
GW-4 IS OBSTRUCTED BY
overhead power lines

Moved GW-2 to SW end of
BUILDING

GW-1 slightly south of
RR TRAX; AND west of [illegible]
ON EASTERN side of site

1621 Relocated our GW-2 to
better MATCH location
ON MAP; NOW IT IS
AROUND waste piles ON
NW side of site

1625 MOVED GW-3 ~ 30' west of
EASTERN property BOUNDARY

1630 GW-7 IN open area

Front end loader AND Truck
W/ 3 men loading up
steel scraps at site

4/16/90

4/16/90
Pits in ground near
GW-8

Photo #1
Facing North, Drum
Storage area on east
side of site, North
of main Building

Photo #2 Facing East
Near Drums on west
side of site, Building
w/No windows

1640 Demobilizing at
Site

1700 ETE Crew Departs site

1720 Return to ETE HQ

J. Nickerson
4/16/90

4/17/90
0800 J. Rickert + J. Nickerson
meet at ETE HQ
Job: Hartwell St L.F.
Goals: Perform Geophysical Survey
0805: Pick up Geophysical Equipment
0825 Drove to site
Setting up Geophysical equipment
- Magnetometer + EM-31
Weather: Cloudy, 35-40°F,
Wind 10-15 mph
Rained last night

0831 B. Meyers arrives on site

0835 Site Safety meeting

0917 at background, near GW-1;
will use to calibrate
EM-31 and to calibrate Mag

0922 J. Nickerson departs to
buy Batteries for EM-31,
Meyers + Rickert begin to set
up grids #1 and #2

J. Nickerson
4/17/90

* → Background Reading ①

well

Time	NODe	Reading	CommenT
0955	~~0,0~~	55942	* BG
0955		55890	* BG
0956		55790	* BG
0956		55837	* BG
0956		55775	* BG
1000	0, 0	55860	
	10, ~~1~~0	57563	
RAM	20, ~~2~~0	55301	
	30, ~~3~~0	57200	
1006	40, ~~4~~0	56775	
	40, 10	56411	
	30, 10	56138	
	20, 10	55472	
	10, 10	56790	
1010	0, 10	55636	
	0, 20	55429	
	10, 20	55682	
1012	20, 20	56077	well location
	30, 20	56303	
	40, 20	55778	
1015	40, 30	55297	
	30, 30	57143	
	20, 30	56094	
	10, 30	55474	
1023	0, 30	55764	

Faced North for all readings

~75 N of Grid - large radio towers

- also swamp along West side of Grid

0933 Complete GW-1 Grid set up
move to GW-2 Grid

0945 Complete GW-2 Grid
move to next Grid

0946 J. Nickerson returns
will Calibrate EM-31 and
then begin Surveys

0955 J. Nickerson & J.R. go to do
EM-31 @ Grid GW-2
B. Meyers Begins Mag
@ Grid GW-1

Mag Survey Grid GW-1 Con't

Time	node	Reading	Comment
1020		55852	*BG
		55711	*BG
		55879	*BG
		55559	*BG
1021		55784	*BG
	0, 40	55675	
	10, 40	55735	
	20, 40	55700	
	30, 40	55361	
1025	40, 40	55608	

4/17/96

4-17-90

1030 RICKERT TAKES
MAGNETOMETER TO
DO SURVEY AT GRID
#2 will use same
background LOCATION
AT MEYERS DID FOR
GRID #1

BACKGROUND READINGS
TIME 1030
55756
55802
55709
55940
55778

1035 START GRID #②

NODE	READING	COMMENTS
0 0	55763	
0 10	575	VARY IN 10,000'S
0 20	56431	
0 30	56453	
0 40	56758	VARY'S IN 1000'S
10 40	56498	"
10 30	56632	"
10 20	55805	

-Jon Rickert

4-17-90

NODE	READING	COMMENTS
1016	56138	GOOD READING
10 0	56523	VARIED IN 1000S
20 0	56065	8' N OF METAL FENCE
20 10	57298	
20 20	54838	WELL
20 30	56574	
10 40	55918	
30 40	55640	GOOD READING
30 30	55783	DEBRIS PILE
30 20	53843	GOOD READING
30 10	57446	VARIED IN 10,000'S
30 0	55803	GOOD READING
40 0	54124	VARY'S IN 10,000'S
40 10	56299	GOOD READING
40 20	55023	VARIED IN 1000'S
40 30	56043	GOOD
40 40	56073	GOOD

055 END SURVEY

BACKGROUND
56066
55981
56035
55973
55951

4-17-90

NOTE: the Background station used for both grids #1 + #2 is LOCATED APPROX. 45' N + 10' W OF THE NORTHERN MOST CORNER OF THE END GARD RAIL FOR HART WELL ST.

FOR DESCRIPTION OF GRID #2 INTERFERENCES SEE EM-31 NOTEBOOK.

1107 RICHERT WALKS TO GRID #3 TO MEET NICKERSON + MEYERS, NOT HERE.

Richart will Begin to survey GRID #3 using a new Background station. at 15' W OF 00 POINT

TAKE BACKGROUND AT

1113 55671 55975

55402 55381

55302

Richart

4-17-90

1115 start GRID #3

NODE	READING	COMMENTS
00	55582	
0 10	55576	
0 20	56917	10,000'S VARY
030	55658	
040	54593	DRUMS 5' TO WEST
1040	57096	1,000'S VARIATION
1030	55314	GOOD
1020	56191	SCATTERED STEEL
10 10	55634	GOOD
10 0	55370	"
20 0	56048	VARY 1000'S
20 10	55750	DRYWALL, WOOD + METAL ETC
20 20	56811	VARY'S IN 1000'S
2030	577	VARYS IN 50,000'S
2040	56621	3' S. OF DEBRIS PILE
30 40	55740	GOOD
30 30	55980	TOP OF DIRTY Fill PILE
30 20	55893	VARYS IN 1000'S
30 10	55048	GOOD
30 0	55200	VARY'S 10,000'S
40 0	56709	" "

Jim Richart

17

4-17-96

16

4-17-90

GRID #3 CONT.

NODE	READING	COMMENTS
4010	56381	
4020	56700	VARIED UP TO 45000
4030	55548	
4000	55136	GOOD

1134 END SURVEY

BACKGROUND -

55964

56190

55628

56170

55666

00 point of grid is in the center of an intersection of 2 dirt road / PATH's which, run ~~thru~~ to + around several junk piles of wood pallets metal roofing, steel drums

J. Robert

4-17-90

c&d debris, dirty fill foundry sand etc.

entire survey had varying degree's of interference.

Moving To GW-④

Background at wooden place w/ holes in ground NE of site

1144 BACKGROUND

548	12
547	75
541	58
544	97
546	02
546	00

0,0	536	21
0,10	558	91
10,0	568	18
10,10	589	35

4/17/90 GW ④

20, 0	565	42
20, 10	542	18
20,20	567	39
30, 0	510	48
30,20	518	19
30,20	562	98
40, 0	541	36
40, 10	530	94
40, 20	531	6

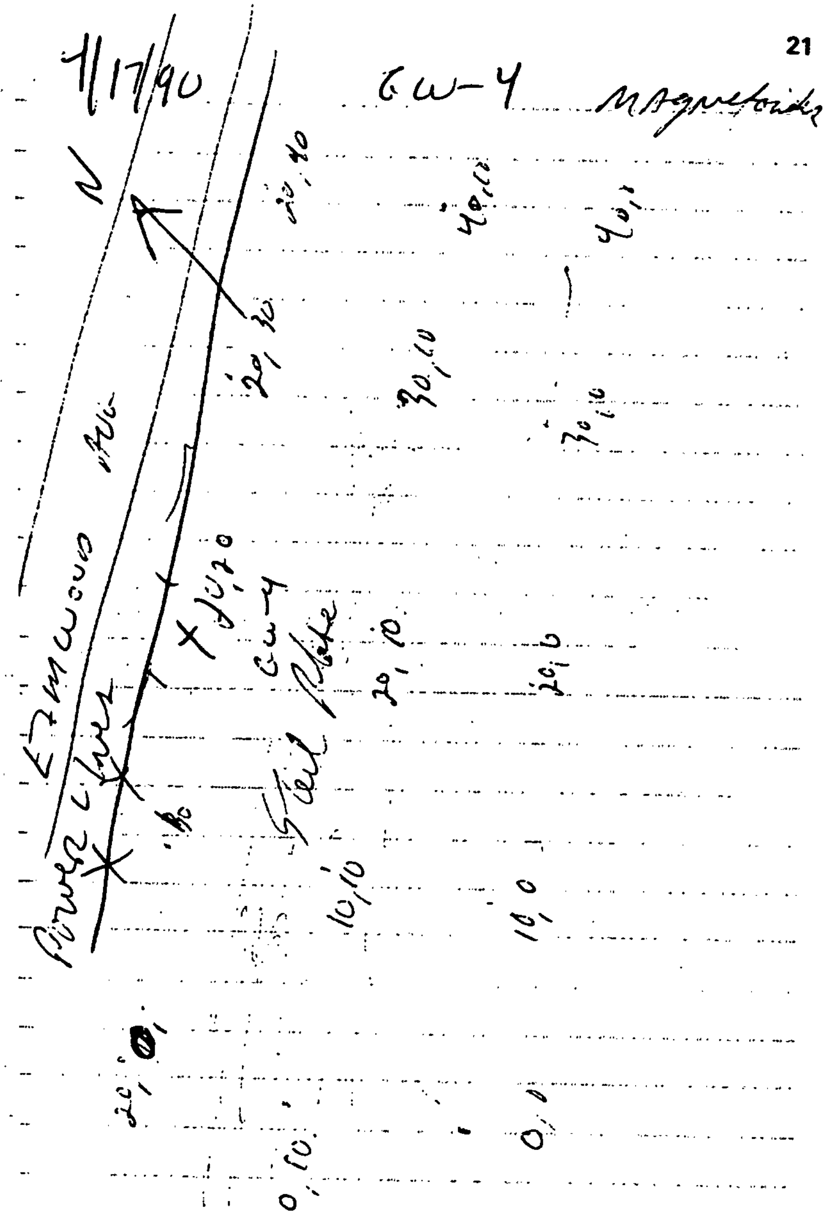
1156 Background

547	54
544	72
549	87
545	98
542	66

GRID POSITIONED N-S
- CAN'T get more points; They are on other side of property LINE

Steel shelting stacked near Background point

7/17/90 GW-4 Magnetometer



[illegible] 4/17/90

1227 E&E Crew

Departs for Lunch

1250 E&E Crew Returns

from Lunch

set up for Grids

Grids 5, 6, 7, and 8)

along with [illegible] 4

1345 Complete setting up Grids
GW-5, 6, 7 & 8.
J. Richert and J. Nickerson begin
EM-31 Survey @ Grid GW-4.
Bob Meyers Begins Mag.
Survey @ GW-~~6~~ 5

1350 Mag. Background location is
15 ~~east of~~ RM west of NW
Corner of Grid GW-6

4/17/90

Grid GW-5

Time	Node	reading	Comments
1353	BG	56321	Background
	"	56209	"
	"	55663	"
	"	55128	"
1354	,	55869	"
1355	0,0	59015	
	10,0	52547	
	20,0	56720	
1357	20,10	57584	
	10,10	55813	
	0,10	54163	
	0,20	56532	GW-5 location
	10,20	56569	
1400	20,20	56374	
	20,30	56628	
	10,30	52254	
1402	0,30	55675	
	0,40	57919	
	10,40	52714	
1404	20,40	55522	
	BG	56442	Background
	↓	57220	"
		57440	"
		57275	"
1406		56724	"

Grid GW-6 (Same BG location as 5)

Time	Node	Reading	Comment
1409	B.G.	557 33	Background
	"	568 82	"
	"	575 41	"
	"	564 11	"
1410	"	565 71	"
1411	0,0	556 91	
	10,0	563 93	
	20,0	529 80	GW-6 Location
	30,0	326 98	
1415	40,0	359 24	
	40,10	462 13	
	30,10	515 29	
	20,10	548 05	
	10,10	560 64	
1417	0,10	561 06	
	0,20	584 60	
	10,20	587 10	
	20,20	563 36	
	30,20	583 81	
1419	40,20	559 27	
1421	BG	561 16	Background
	↓	570 86	"
		553 60	"
		569 58	"
1422		568 39	"

Grid GW-7 Mag.

Time	Node	Reading	Comment
1440	BG	527 34	Background
	"	516 81	"
	"	519 74	"
	"	520 "	"
	"	522 55	"
	Fence along 0" Line		
1441	0,0	379 07	2X
	0,10	563 73	
	0,20	494 [illegible]	[illegible]
	0,30	[illegible]	
	10,0	571 05	
	10,10	535 72	
	10,20	313 18	2X
	10,30	566 10	
	20,0	553 04	
	20,10	573 01	
	20,20	550 00	
	20,30	576 78	
	30,0	54932	
	30,10	303 79	V
	30,20	550 09	
	30,30	552 87	

Continued →

4/17/90 GW-7 Mag
HARTWELL ST

NoDE		
40,0	575^{96}	3x
40,10	536^{58}	
40,20	55864	
40,30	562^{46}	2x

Background GW-7 FINISHED

1455	521^{30}	
	523^{24}	
	513^{41}	
	520^{44}	
	509^{45}	

Reckart will do OW-8
BACKGROUND
[illegible]

51436
51462
51470
50735

J Reckart

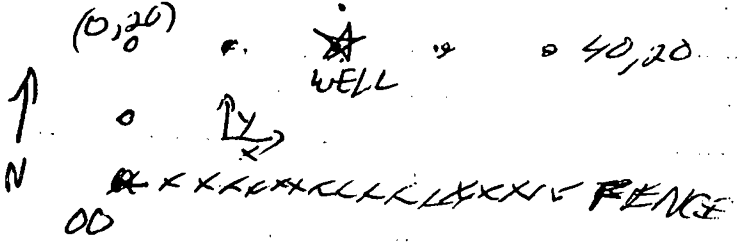
4/17/90 OW-8 HARTWELL ST. L.F.
Mag

NODE	READING	COMMENTS
0,0	57243	FENCE
0,10	55795	
0,20	55349	
10,20	58014	I BEAM
10,10	56195	
10,0	[illegible]	FENCE
20,0	55694	"
20,10	56639	
20,20	56298	WELL
30,20	56357	
30,10	56522	
30,0	57339	FENCE
40,0	56997	"
40,10	55607	
40,20	56302	
~~40,30~~ JR		

1510 END	52103
SURVEY	51390
BACKGROUND	52113
	51752
	52103

J. Reckart

4-17-90
GRID # GW-8
is A 20 x 40 GRID
ORIENTED PARRALEL TO
THE SOUTHWARD FENCE



Y AXIS = N 11° E

4/17/90
15:45 Completed EM And Mag Surveys.
Will pack up

16:20 EM Crew departs site

16:45: Fill up van w/ GAS
$6.50

17:10 Demobilizing at HQ; MAG, OVA,
AND HNU put ON CHARGE; EM-31
LEFT IN VAN

4/17/90

6/26

Magnetometer: E & E 04-04-001

Resurvey of Grid 5

0,0 is SW corner, orientation is N0°E

Background Readings

10:40 ~~5~~ 55375

55645

55878

55392

55639

~~56051~~

Node	Reading	Comment
0,0	~~577~~ 56377	
0,10	55460	metal below
0,20	53277	
0,30	54281	
0,40	53316	
10,40	53470	
10,30	55087	
10,20	53883	
10,10	54458	
10,0	53612	metal Drum 5'
20,0	53925	" " 4'
20,10	51726	
20,20	52845	Well Location

Chris [illegible]

6/26/90

Node	Reading	Comment
20,30	53837	
20,40	51257	
30,40	53941	near metal grocery card C&D ~~C&D~~ Debris
30,30	54843	
30,20	51945	
30,10	51598	
30,0	54031	≈ 10' west from Drums Pile
40,0	51582	1' from Drums
40,10	55252	
40,20	54657	
40,30	54028	metal 2' away
40,40	53816	a lot of tires, ~~etc~~ C&D debris

- Grid 5 appears to be over fill

Background reading for grid 5 & grid 2

11:04	55808	56090
	55729	
	55799	
	55802	

Chris [illegible]

6/26/90

grid 2 Resurvey

orientation is N 0°E

Node	Reading	Comment
0,0	55436	
0,10	55958	
0,20	55666	
0,30	55286	
X0,40	~~55267~~ NP	unaccessable dense Vegetation
~~X0,30~~	~~55267~~	
10,40	56329	
10,30	55645	
10,20	55696	
10,10	55896	
10,0	54984	
20,0	54131	
20,10	54517	
20,20	56427	well Loca. stand over lumber
20,30	56116	
20,40	55628	
30,40	55477	Near rail-road Lumber
30,30	57006	
30,20	53354	
30,10	53612	
30,0	56134	

6/26/90

40,0	55300	
40,10	55687	over railroad Lumber
40,20	56363	
40,30	53769	
40,40	55928	

Background Readings

11:23 AM	56073
	56068
	55855
	55879
	56039

Chris Snider

ecology and environment, inc.
International Specialists in the Environment

Job Number YP-7000

Geophysical Survey

Hartwell St. L.F

ecology and environment, inc.
Recycled Paper/569053

4/17/90 Twenty
Geophysical Survey
Hartwell STL.F.
GW-2 grid is oriented N-S

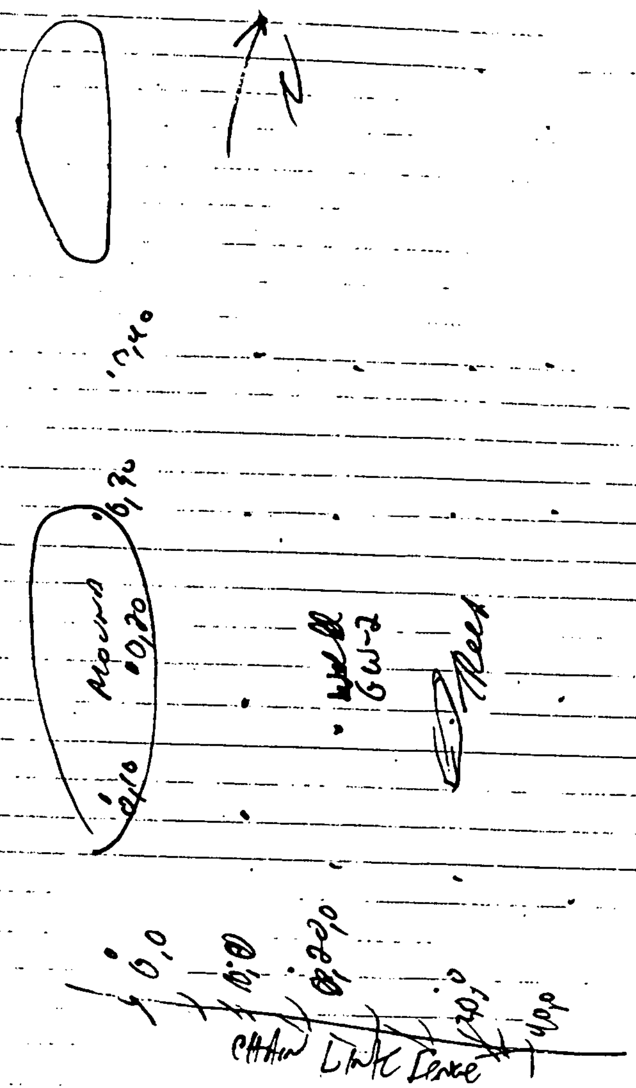
well # GW-2	Vert N-S	Vert E-W	Horiz N-S	Horiz E-W	comments
Node					10:02
0,0	55	52	48	43	
*10,0	32	38	31	27	size of Hill
*20,0	28	28	25	25	of Fill
*30,0	33	34	42	31	Top of Hill
*40,0	63	60	50	49	
10,40	57	59	49	47	
10,30	58	56	49	54	Base of
10,20	59	52	39	52	Hill or Fill
10,10	68	50	48	60	
*10,0	56	54	45	46	
*20,0	66	59	53	46	
20,10	14	29	71	69	
Well 0970	34	(-) NEG	75	79	
20,30	68	64	52	52	
20,40	62	62	47	49	
30,40	60	55	48	49	
30,30	50	53	54	54	Tree Area
30,20	9	(-) Neg	97	110	
30,10	24	48	70	35	steel
*30,0	34	44	58	52	Fence Here
*40,0	25	50	62	48	Fence Here
40,10	48	50	46	46	
40,20	46	24	62	57	
40,30	60	57	49	48	
40,40	53	52	48	44	
				completed	10:25

4/17/90
Well GW-1

	N+S		E+W		COMMENTS
NODE	VERT	Horiz	VERT	Horiz	
0,0	49	40	50	41	
0,10	52	44	52	48	
0,20	54	44	50	54	
0,30	52	39	54	46	over puddle
0,40	62	43	66	49	
10,40	62	42	57	44	
10,30	46	38	44	44	
10,20	45	39	45	40	
10,10	42	40	42	42	
10,0	46	41	45	40	
20,0	43	41	45	41	
20,10	43	40	44	42	
20,20	39	37	40	38	GW-1 location
20,30	38	44	36	42	
20,40	59	52	46	44	
30,40	44	39	38	44	
30,30	42	38	40	37	
30,20	42	37	37	38	
30,10	41	39	36	45	
30,0	34	43	40	36	
40,0	32	50	47	36	
40,10	27	50	23	48	
40,20	38	37	32	30	
40,30	40	36	38	38	
40,40	44	38	41	42	

NOTE - Grid has True N-S orientation
- large Radio Tower to the North
- swamp to the west

4/17/90



4/17/90

11 34 Meyers ~~Rickert~~ J. McKeen Fielder
ff: GW-3 AND GW-4

GW-3 N-S ORIENTATION

	VERT		HOR		
~~0,0~~	N-S	E-W	N-S	E-W	
0,0	55	53	44	43	
0,10	69	~~56~~ 54	~~0~~ ~~54~~ 66	53	
0,20	28	41	③ ~~[illegible]~~ 110	70	
0,30	NEG (-)	34	121	130	
0,40	125	82	71	95	[illegible] in area (< 5 [illegible]
10,40	120	71	90	57	
10,30	36	19	128	120	
10,20	64	74	56	55	
10 10	70	71	62	46	
10 0	60	50	59	51	
20 0	80	50	80	80	
20, 10	118	80	120	49	
20,20	28	80	56	66	WELL
20,30	89	44	62	130	
20,40	160	66	98	68	
30,40	122	59	129	76	
30,30	64	64	77	105	ON DIRTY FILL PILE
30 20	90	72	241	131	
30,10	195	110	145	91	
30, 0	37	106	NEG	129	
40, 0	40	75	(9)	94	ON DEBRIS PILE
40,10	160	155	85	85	" " "
40,20	NEG	320	NEG	148	
40,30	105	210	50	220	
40,40	135	82	68	92	

1203 END SURVEY OF GRID 3

J. Ricker

L[illegible] -90

1245 [illegible] SURVEY
GRID-MW w/EM-31

GRID IS 20x40'

NODE	N&S VERT	HOR	E&W VERT	HORZ	COMMENTS
00	12	~~NEG~~	80	170	
0,10	NEG	70	63	160	LIGHT POLE
10,0	110	140	NEG	68	
10,10	NEG	150	70	130	LIGHT POLE
20,0	NEG	170	40	190	
20,10	12	170	65	230	
20,20	TO CLOSE TO FENCE		220	310	(STAKE) ALONG FENCE
30,0	24	40	80	100	
30,10	52	110	40	240	
30,20	NEG	120	120	190	NEAR FENCE
40,0	100	155	NEG	145	
40,10	NEG	200	NEG	220	
40,20	NEG	95	22	310	NEAR FENCE

1404 END EM-31 SURVEY

grid is 20x40' w/0,0 at SW

0,0 TO 0,20 = NOT NORTH BUT N40°W
stake is along fence at 20,20)

GW-5: ORIENTED N-60E
40'x20' GRID

NODE	N-S Vert	Hor	E-W Vert	Hor
0,0	92	90 ~~[illegible]~~	[illegible]	Fence w/ [illegible]
0,10	155	94	"	"
0,20	32	105	"	"
0,30	275	380		
0,40	200	300		
10,40	170	225	115	110
10,30	90	~~170~~ 210	~~240~~ 135	190
10,20	negative	170	70	28
10,10	14 ~~negative~~	150	16	115
20,10	20	70	80	50
20,20	80	58	100	36
30,10	115	175	neg	160
30,20	[illegible]	160	15	210
[illegible]	160	185	can't get	[illegible] to well
[illegible]	175	320	can't get	[illegible] to well

1432 Complete EM-31 [illegible] GW-5

EM-31 GW-6 set to True North
Y-axis increasing to the North
X-axis is 8' from chain fence

Time 1435

Node	N-S Vert.	N-S Horiz	E-W Vert	E-W Horiz	Comment
0,0	80	55	75	88	
0,10	Neg.	130	* 15	150	* Fluctuating
0,20	Neg	180	Neg.	200	
10,20	Neg.	150	Neg.	185	
10,10	Neg.	120	*15	150	*Fluctuating
10,0	72	52	50	82	
20,0	87	50	120	35	GW-6 location
20,10	Neg.	160	Neg.	Neg.	
20,20	Neg.	140	Neg.	165	
30,20	32	48	Neg.	55	
30,10	110	57	115	44	
30,0	Neg.	61	130	75	steel on Gravel surface
40,0	25	75	115	Neg.	
40,10	140	150	44	44	
40,20	120	45	120	Neg.	@ Corner of electrical building

GW-~~37~~ ⑥

1500

	Vert		~~Horiz~~	
0	N-S	E-W 70	N-S	E-W 82
*70,0	Can't get due to fence	~~70~~ 80 50	Can't get due to fence	~~80~~
20		54		120
30,0		46		105
40,0		42		100
40,10	31	[illegible]	40	48
30,10	38	[illegible]2	3[illegible]	59
20,10	25	41	56	59
10,10	50	34	50	62
*1[illegible]	Fence OBST	45	Fence OBST	125
0,10	NEG	Neg	Neg	58
0,20	58	84	64	57
10,20	42	⑤ ~~5~~ 73	52	53
(well) 20,20	67	68	58	55
30,20	60	48	44	54
40,20	49	48	47	46
40,30	165	36	120	44
near edge of Concrete pit				
30,30	64	36	70	92
Pipe Debris Nearby				
*30,20	well obst.	Neg	wall obst	290
30,10		60		340
*30,0		4[illegible]		[illegible]
1[illegible]0				
20,30				
10,30				
0,30				

EM-31 GW-8

1517

	N-S		E-W	
	Vert	Horiz	Vert.	Horiz
0,0			70	85
10,0			50	110
20,0	fence line		40	120
30,0			70 RAM	90
40,0			50	80
40,10	45	40	45	50
30,10	48	40	50	44
20,10	40	43	44	50
10,10	46	42	50	56
0,10	38 ~~45~~	43 ~~56~~	45	56
0,20	20	42	70	62
10,20	57	29	55	58
20,20	51	50	53	51
30,20	* Neg	110	72	38
40,20	71	48	95	67

Comment

* reciever over metal

Robert A

6/26

Resurvey of Grid 5 Time 1130

orientation N 0°E

EM-31 : E & E 04-02-001-02

Node	N-S		E-W		Commen
	Vert	Horiz	Vert	Horiz	
0,0	160	90	160	80	
0,10	120	100	120	90	near metal
0,20	110	110	100	90	
0,30	150	100	135	75	
0,40	110	120	100	100	
10,40	120	95	120	75	
10,30	95	90	85	60	
10,20	120	90	105	85	
10,10	140	75	140	80	
10,0	210	140	170	150	near metal
20,0	NEG	110	Neg	80	"
20,10	190	110	180	100	
20,20	125	75	125	75	well location
20,30	140	Neg	125	55	near metal
20,40	100	70	80	60	
30,40	95	75	100	50	metal nearby
30,30	95	60	105	75	
30,20	170	70	160	70	
30,10	Neg	285	Neg	100	
30,0	Neg	160	Neg	85	
40,0	Neg	75	Neg	Neg	Near Drums
40,10	Neg	100	Neg	90	
40,20	Neg	150	60	310	
40,30	125	40	55	70	over metal
40,40	75	50	80	42	

Chris Loucks

6/26

12:05 Re-survey of Grid 2

Orientation N 0°E

	N-S		E-W		
Node	Ver	Hor	Vert	Hori	Comm
0,0	40	48	40	40	
0,10	48	34	43	32	
0,20	44	30	43	30	
0,30	43	32	45	41	
0,40					
10,40	45	30	46	30	
10,30	57	38	50	42	
10,20	59	48	52	40	
10,10	60	53	54	45	
10,0	68	46	54	40	
20,0	50	86	29	66	
20,10	64	86	48	66	well location
20,20	75	70	62	54	
20,30	53	73	38	44	
20,40	56	44	47	46	
30,40	56	62	46	70	
40,40	72	76	66	66	
40,30	~~6~~55	84	49	76	
40,20	60	66	52	68	
40,10	64	40	57	40	
40,0	61	33	60	34	
30,30	105	70	80	55	
30,20	56	86	45	69	
30,10	64	88	38	76	
30,0	60	48	54	50	

12:35 end survey

Chris Hewitt

8 → 7 → 6

5 ft ?

3' 0x20

2' Return EM-31 + [illegible]

Pick up more 4-oz jars

Bottles

~~[illegible]~~

0'-4' TRAFFIC Four 18oz

[illegible]- 2½ "

~~OE~~

~~0-20'~~

~~20-40'~~

~~Atterberg~~ GRAIN SIZE: 5 [illegible] Ø = Ø

ATTERBERG: One per boring 8 oz ⑤

EP-Tox 1'/3' [illegible] USE SAND

recycled paper

H-26

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International Specialists in the Environment

Job Number YP-7040

HARTWELL STREET LF

DRILLING TASK

FRI. 6-22-90

0730 RICHERT ARRIVES AT EYE EQUIPT. WAREHOUSE TO MEET J. NICKERSON + PICK-UP EQUIPT + SAMPLE JARS

0815 RICHERT DEPARTS WAREHOUSE

0830 RICHERT CALLS EYE (TOM SIENER) TO SEE WHO WILL BE S. SAFETY OFFICER.. MUST CALL HIM BACK IN 15 MINUTES

0840 RICHERT MEETS DRILLERS AT WATER AUTHORITY AT 3030 UNION RD. THEY ARE FINISHED FILLING WATER TANKS.

0865 DRILLERS LEAVE TO DRIVE RIG TO WATER AUTH.

0900 RICHERT DEPARTS TO CALL EYE TO SEE IF I HAVE A SAFETY OFFICER TO ACCOMPANY ME TODAY

0905 Richert spoke w/ T. SIENER of EYE SAID HE HAS NO ONE WHO CAN WORK WITH ME TODAY BUT SINCE THE DRILLERS HELPER (FRED) HAS 1st AID AND CPR TRAINING (AS of 9-26-89) I CAN WORK ALONG W/ THEM TODAY.

1010 ARRIVE AT SITE.

1030 MEET W/ SITE OWNER MR DANIEL MELE

1035 WALK SITE W/ OWNER + DRILLERS

NOTE: VERY HELPFUL OWNER SHOWED DRILLER WHERE THEY CAN PARK EQUIPT.

24 HR SITE WATCHMAN IN SMALL BLUE BUILDING AT 157 COMET ST. RONNIE.

J. Richert

FRI 6-22-90

NOTE: SITE PETROL MAN = JOE (THE LEG BREAKER)

1055 Driller drive rig to secure spot for the weekend. Behind building at 157 Comet

1100 Driller & Richert depart site to pick up support truck + BULL DOZER AT ~~WEST SENECA~~ SITE JR WATER AUTH.

1140 ARRIVE AT WATER AUTHORITY

1145 DEPART " " WITH DRILLERS TRUCKS

1205 ARRIVE W/ DRILLER AT LOCATION

1238 DRILLERS DEPART FOR HOME WILL MEET ON SITE AT 10.00 MON.

1240 RICHERT DEPARTS SITE FOR DAY

MON. 6-25-90

0830 RICHERT ARRIVES AT E+E HQ
TO MOBILIZE FOR WEEK'S ACTIVITY
0920. RICHERT + DZIARNOWSKI DEPART E+E
HEADQUARTERS TO SITE.
0945 ARRIVE ON SITE
1015 DRILLERS ARRIVE ON SITE
1025 JANE THAPA OF NYSDEC ARRIVE
WEATHER: SUNNY + 65°F
EXPECT SUNNY + HIGH of 80°F.
GOALS FOR TODAY: DRILL + INSTALL 2 WELLS
GW-1 + GW-3?
1115 HOLD SITE SAFETY MEETING
DRILLING COMPANY IS AMERICAN AUGER
DRILLER = JOHN PIETRUCK
HELPER = FRED WALDEN
RIG IS A MOBILE DRILL B-57
DRILLING TRUCKS ARE:
① MOBILE RIG ON FORD F700 TRUCK
② A 10 WHEEL MACK BOX TRUCK
w/ 1200 GALLON WATER TANK INSIDE
③ DODGE RAM PICKUP
④ FLAT BED TRAILER w/ BULLDOZER
DOZER IS A CATTERPILLER D-4
1133 BEGIN DRILLING GW-1
1205 AT ≈ 6' see red clay returns
COMMING OUT OF HOLE. WILL ASSUME
≈ 5' of FILL AT THIS LOCATION
1240 ★ PHOTO #1 RIG DRILLING GW-1 FACING NW
CAMERA = CANNON AE-1 w/50 MM NORMAL LENSE
FILM = KODACK COLOR PRINT 200 ASA.
"★" SYMBOL WILL REPRESENT PHOTO'S TAKEN.
Jim Richert

MON 6-25-90

1355 ★ PHOTO #2 SPLIT SPOON of
TYPICAL CLAY FROM GW-1 34-36'

1400 ★ PHOTO #3 CLAY FROM SPLIT SPOON
34-36' well GW-1

1445 Richert departs site to call
JON Nickerson
1500 RICHERT RETURNS TO SITE
1530 at 54' got into stiff clay w/ gravel
+ weathered DOLOSTONE BEDROCK.

1545 at 57.5' got split spoon refusal
+ hole started to make natural gas

1600 RICHERT + THAPA OF NYSDEC DEPART
TO PHONE - RIG IS SHUT DOWN TO SEE
IF GAS WILL BLOW DOWN
1620 RICHERT SPOKE w/ JON NICKERSON of E+E
HE HAD SPOKEN w/ V. LAUZZE + M. RYAN OF
NYSDEC THEY DECIDED TO NOT INSTALL ANY
GROUND WATER MONITORING WELLS ON SITE SINCE
WE ARE AT 58' of CLAY w/ NO WATER YET.
WILL PERFORM SOIL BORINGS AT GW LOCATION
1-8 AND COMPOSITE SAMPLE FROM
0-20 AND FROM 20-40' FULL TCL.
ALSO WILL TAKE 4 EP TOX SAMPLES
FROM THE ENTIRE SITE FROM SOIL
BORINGS NOTE IF WATER IS ENCOUNTERED AT <40' WE WILL INSTALL A GROUND
WATER MONITORING WELL.
J. Richert

Mon. 6-25-90

1655 check for water in Hole
NO WATER. ONLY DAMP GREY MUD
ON PROBE. TD=57' BGS.
will GROUTE UP HOLE + SAMPLE
FROM 0-20 + 20-40' FULL TCL

1700 DRILLERS BEGIN PULLING AUGERS
RICHERT COMPOSITES + PACKS
TWO SAMPLE, GW1-0-20'
AND GW1 20-40'

1745 DRILLERS OUT OF HOLE WITH AUGERS
+ MIXING UP CEMENT GROUTE

1800 DRILLERS STILL GROUTING UP WELL GW-1
RICHERT DEPARTS TO CALL LAB

1825 RICHERT RETURNS TO SITE

1820 HOLE IS COMPLETELY GROUTED TO GROUND LEVEL.
HOLE TOOK 6 BAGS of CEMENT
4 BAGS of BENTONITE CHIPS
(BENSEAL

1845 DEC + E&E DEPART SITE FOR
DAY. WILL MEET AT
0800 TOMORROW

1915 RICHERT ARRIVES AT ASC
TO DROP OFF SAMPLES
+ VAN

1930 RICHERT DEPARTS ASC

J. Richert

6/26/90

0715 J. Nickerson arrives at E&E's ASC; picks up van;
drives to BenBro warehouse

0735 J. Nickerson arrives at BenBro
warehouse; inventories equipment + supply.
Needs:
- 1 magnetometer
- 12 8-oz jars
- 24 VOA
- sample labels

0812 J. Nickerson arrives on site

0816 Talked to Drillers (J. Pietruck +
J. Tilley) will decon Rig at
its current position) will decon augers
too; Jan Thar (NYSDEC Rep) stated
it was acceptable to decon at this
location

Weather: CLEAR, 70°F; WIND 0-5 mph
low HUMIDITY

Goals for day: Decon, then mobilize to
GW-3 location; DRILL 17'; then decon and
mobilize to GW-6 location or Gary
location

0817: Geoff A. met C. Lawick + H. Serella of E&E;
brought them over to GW-1 area; MARK
DZIARNOWSKI is on site; he is
site safety officer

J. Nickerson
6/26/90

6/26/90 Hartwell ST Lot

0855 Dave Trappa discussing + showing new geophysical locations to Chris + Herb

0857 Nickerson goes to get permission + key from Dan Mele

0903 Dan not in; collision shop guys tell me person w/keys not around. Tell me to drive on railroad tracks

0907 Mark is calibrating HNU

0915 Nickerson departed site to call Jim Rickert at ETC; Jim will call Underground Utilities Corp to arrange for them to be here at 3:00 pm (1500)

0929 Nickerson returns to site; drillers mobilizing to location GW-3

1004 Conduct site safety meeting

1007 Commence drilling boring B-3 (formerly GW-3)) will split spoon 0-2' and 2'-4', then every 5' after that

1011 1st sample 0-2' Fill

6/26/90

1015 OVA background at hole after 2nd split spoon
Hit clay (tan, cohesive) at 3.9'-4.0'

1019 Photo of 2'-4' sample GW-3, showing contact of clay and foundry sand fill

1040 Sampling 9'-11'
Photo of very cohesive clay; like bottom deposit

1109 Obtaining ~~23'-25'~~ sample
~~this was~~ No. 19-21

1120 Dan Mele (site owner) stopped by; he is on site showing demolition contractors the area

1124 Obtaining 30'-32' sample → No. ~~26-29~~ 24-26
OVA on split spoon 150.0 ppm above background;
Sample BA03-2 for TAL/TCL

1149 Obtaining ~~37'-39'~~ sample
29-31

At 31 feet: Clay: much more moist

1200 Ready to obtain 33-35' sample
OVA: 0 ppm
HNU on samples: 0 ppm

6/26/90

6/26/96

1206 Dan Mele returns to Drilling Area

1216 Obtaining 88'-90' Sample

1233 Will pull out Augers and Decon; will grout hole; Nickerson departs site to purchase ice for samples; Mark + Jane stay at site

1305 Return to site; Ready to Resume Sampling; Drillers grouting hole

1338 Drillers decon'ing; ~~NIAGARA M~~ National Fuel Representative arrives on site; Nickerson shows the locations of wells in front

1400: Drillers used 5 Bags of grout and #2 Bags Bentonite @6/26

National Fuel; 14" W from sidewalk (5' 4" L/WC)
PAT. GOO~~[illegible]~~ = (GOOCH)
Line is PVC inside Steel

1420 Nickerson calls HQ from Dan Mele's phone

1458 Drillers relocate to MW-4S

6/26/96 Hartwell St LF

Now set up on MW-4:
Mark has HNU at Geologist's table, MSA-260 Explosimeter at tail of Rig monitoring Borehole Area; and HNU at back of Rig to give Downhole Readings. RAD-MINIalert at Rig Gate at back to monitor Radiation

1456: Ready to Commence Drilling + Sampling
Concrete at surface;
Drilled through it
1st Spoon: @3'

1508 Obtained 3'-5' Sample
Will Sample at 9'-11' to keep routine for all holes of Area

1519 Obtaining 9'-11' Spoon
Will submit for Atterberg limit Analyses

1530 Obtaining 14'-16' Sample

1541 Preparing to Collect 19'-21' Spoon

1545 Obtained TAL/TCL Sample from 0'-2
GW-4-02

1556 Obtained 24'-26' Spoon

6/26/96

6/26/90

1604 Mark D. Took a photo of
Drillers steam cleaning split spoons
Jane departed site at 1604 to make a phone call

1609 Obtained 29-31' spoon

~~[illegible]~~ Obtained and logged 34-36" sample

1633 Obtaining 39'-41' spoon

1646 Jane returned to site;
says we only need to drill
to 40' on GW-7, and to
25' on GW-8, 6, 5, and 2

1703 Picking up; drillers are
pulling augers from hole

6/27/90

0731 Crew meets at labs
J. Richert + R. ~~Miller~~ Leichner go to site;
J. Nickerson heads to warehouse to fill up
OVA

0803 Nickerson filled OVA; picked up jars;
driving to site

0830 Nickerson arrives on site

0850 Setting up on GW-8 location

0856 Niagara Mohawk ~~rep~~ (Jr.) representative
arrives on site; J. Richert showing
him around

Weather partly cloudy; 70°F; wind
0-5 mph; low-mod humidity

Personnel present
Jane Thapa (NYSDEC Rep)
R. ~~Miller~~ Leichner, Geologist
J. Nickerson, P.M.
Mark Dziarnowski, site safety
J. Richert, geologist
Drillers: John Pietrick
Fred

Nickerson + Richert are just here temporarily
to address needs of Niagara Mohawk
and to check on change of sampling plan.
Now plan to sample 0-4' for TIC/TCL
and 5'-25' for A TIC/TCL.

6/27/90

6/27/90 Hartwell St. L.F.

0905 Joe Pigatti From
Niagara Mohawk [illegible]
Site; He marked electric
LINES

0920 Nickesson & Richert depart site
to get ice.

0925 Set up at GW-8

0927 Begin 1st split spoon

0930 Pull first spoon.

0935 Pull 2nd spoon

1002 Augering to 14 feet

1015 Augering to 19" feet

1020 Begin 5th split spoon

1030 Augering to 24 feet.
Possible hit for volatile
organics on 19'-21' sample

1037 Pulling 6th spoon (24'-26')

1045 Pulling augers at GW-8

1100 Begin mixing cement to backfill
hole

1108 Pumping cement into GW-8
Cement used = 3 bags (90 lb)
Benseal " = 1/2 bag (50 lb)

1110 Drillers rinsing out mixing
barell, cleaning up, getting ready
to decon

1123 Fred steam cleaning equipment
and rig. John going to buy cement.

1130 Ograisdowski and Leichner depart
site for lunch

1150 Return to site. John hasn't returned

R. Leichner

6/27/90 Hartwell St. 8th L.F. YP 7040

1205 J. Thapa returns from Reg. DEC office

1213 John returns to site. He and Fred
have to go to Kenmore Builders supply
for cement.

1245 Drillers return with cement.

1305 At GW-7. Rig set up over hole

1307 Begin augering at GW-7

1325 Augering to 9 feet

1345 Augering to 14 feet

1355 Augering to 19 feet
Deconing split spoons

1403 Begin 5th spoon

1411 Augering to 24 feet

1425 Augering to 29 feet

1430 Begin 6th split spoon 29'-31'

1437 Augering to 34 feet

1443 Begin 7th split spoon 34'-36'

1450 Augering to 39 feet

1455 Begin 8th split spoon at GW-7

1505 Pulling augers at GW-7

1510 J. Thapa leaves to make a phone call

1515 Mixing cement to backfill GW-7"

1522 Pumping cement into hole

1525 Begin adding water to mix 2nd barrel of
cement

1532 Pumping 2nd mix into hole
Cement used = 7 bags (94 lbs)

1535 Rinsing out mixing barrel

1542 Deconing augers, split spoons and rig

1605 Packing up to move to GW-6

1610 Discuss GW-6 location with J. Thapa
referring to geophysics report

Richard Leichner

6/27/90 Hartwell St. Landfill YP 7040

1615 Decide to move GW-6 to northeast portion of geophysical survey grid to avoid chain link fence and buried power cable that runs near southern area of grid

1623 Moving support truck

1632 Rig over new GW-6 location

1648 Begin split spoon #1

1657 Hit something impenetrable (sewer line?, underground conduit?) Check with Jane. Moving hole forward (WNW) approx. 3 feet

1702 Augering to 2' at new location to redo 2'-4' spoon (previously had refusal)
Note 2'-4' in previous location - HNu read ~2ppm above background. Some moist medium brown staining in 1st 2-4' sample.

1710 Augering to 9' feet

1720 Begin ~~2nd~~ 3rd split spoon

1725 Augering to 14 feet

1731 Begin 4th spoon - 14' to 16'

1737 Augering to 19 feet

1741 Begin 19-21' spoon

1745 Augering to 24' feet

1751 Begin 24'-26' spoon

1758 Pulling augers

1805 Mixing cement grout

1812 Pumping grout into GW-6
Cement used = 3 bags (94 lbs)
Bentonite used = ~1/2 bag (50 lbs)

Rolinda Leichner

6/27/90 Hartwell St. Landfill YP 7040

1815 Rinsing mixing barrel

1835 Discuss water sources

1847 Depart site for lab

1920 Arrive at lab to drop off samples

1927 Depart lab

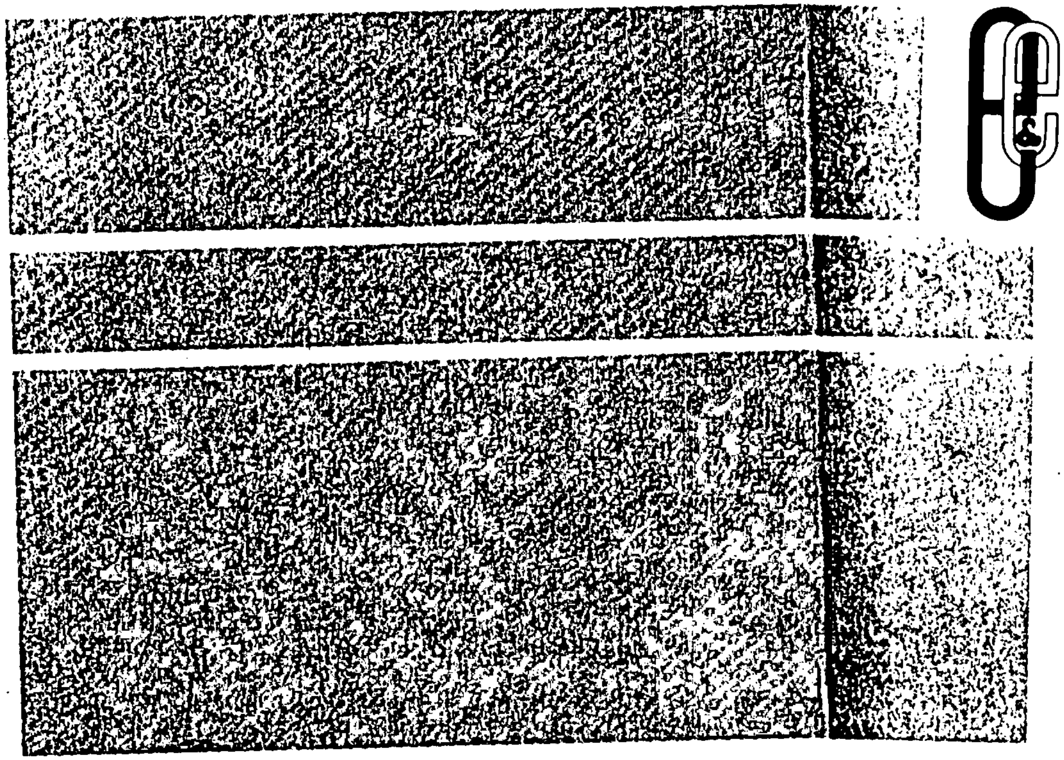
6/28/90 Hartwell St. Landfill YP7040
0815 Pick up van at lab
0835 Get ice at Tops on Delaware
0855 Arrive at site. J. Hapa here.
0905 Meet Mr. Dan Hall, Hartwell St. resident
to return stolen belongings found on
site by J. Nickerson and J. Richert
on 6/27/90
0910 Drillers arrive from getting water
Begin steam cleaning rig and
equipment. Mark D. with them
1000 At GW-5 location with rig
1005 Bringing support truck to GW-5
1025 Pregduring for first split spoon
1028 Begin 1st split spoon at GW-5
1035 Augering to 9 feet
1059 Beginning 2nd split spoon
1107 Augering to 14 feet
1130 Begin 4th split spoon
1140 Augering to 19 feet
1155 Begin 5th split spoon - 19'-21'
1205 Augering to 24 feet
1213 Begin 6th spoon
1216 No recovery from 24'-26' spoon
Going to take another one from
26'-28'
1219 Begin 7th split spoon (26'-28')
1228 Pulling augers at GW-5
1230 J. Hapa departs site to make
travel plans.
1240 Depart site for lunch.
1250 Return to site. Drillers steam
cleaning. Hole has been grouted.
Cement used = .5 bags (94 lbs)

6/28/90 Hartwell St. Landfill YP7040
Bentonite used = ~ 1/2 bag
1400 Finish steam cleaning
Discussing GW-2 location
Need bulldozer or on-site backhoe
to move railroad ties at location
1420 Drillers move railroad ties by hand
Moving to GW-2 location which has
been moved across abandoned
R.R. tracks approx. 15' East ~~South & 10' east~~
1437 Set up over GW-2
1443 Begin 1st split spoon
1447 Auger to 4 feet
1510 Split spoon 8'-10'
decided to do continuous until
continuous clean clay is hit
1519 Augering to 14 feet for next sample
1525 Begin split spoon # 5 → 14'-16'
1527 Augering to 19 feet
1540 Beginning split spoon # 7th → 19'-21'
1546 Augering to 24 feet
1550 Beginning 8th split spoon - 24'-26'
1555 Pulling augers at GW-2
1610 Mixing cement
1617 Pumping cement into GW-2
Cement used = 5 bags
1620 Mixing more cement
1625 Pumping 2nd mix
Cement used = 2 bags
Total = 7 bags
1635 At GW-3 location to take sand samples
for EPTox and grain size analysis
1645 Collect sample FS-1 from pile of
~~foundary~~ foundry sand along road

6/28/90 Hartwell St. Landfill YP7040
approx. 100 feet N-NE of ~~M~~ GW-3
1653 Back at GW-2
Drillers steam cleaning
1658 Finish steam cleaning
Loading up rig and truck
1715 Depart site to go to lab
1750 Arrive at lab to drop off samples
1805 Depart lab

Yolanda Fischer

recycled paper



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Job Number YP7060

HARTWELL STREET SITE
SAMPLING LOGBOOK

ecology and environment

Recycled Paper / 568019

THURSDAY JULY 12, 1990

WEATHER: OVERCAST, HUMID, 63° F
SCATTERED SHOWERS

0815 C. EICH ARRIVES AT WAREHOUSE TO PICK UP SAMPLE BOTTLES AND EQUIPMENT.

0825 B. KOERNER ARRIVES

0900 STOP AT HQ

0915 STOP AT LAB TO PRESERVE WATER BOTTLES.

1000 ARRIVE AT SITE. DAN MELE NOT HERE. MAY NOT BE FOR SEVERAL HOURS ONE OF HIS EMPLOYEES TOLD US.
WENT TO FRONT ENTERANCE OF SITE. WENT ON-SITE + MET WITH DEMOLISHION CREW. WE WERE TOLD THAT DAN MELE HAD LEFT INSTRUCTIONS NOT TO LET ANYONE ON SITE WITHOUT HIS PRESENCE. B. KOERNER + C. EICH LEAVE SITE TO CALL J. GRIFFIS.

1030 SPOKE TO J. GRIFFIS. WE WILL GO TO DAN'S OFFICE + TRY TO CALL HIM AT HOME.

1050 BACK AT D. MELE'S OFFICE
DAN SAID HE SIGNED A CONTRACT THIS MORNING WITH A DEMOLISHION CREW THAT IS WORKING NOW + NO ONE IS ALLOWED ON THE SITE WHILE THEY ARE WORKING (INSURANCE WORRIES). DAN SAID HE CAN GET US ON-SITE TO GET MOST OF THE SAMPLES BUT NOT S-2, S-3, SW-1, SED-1, SW-2, SED-2 WHICH ARE IN THE AREA THE DEMO CREW IS WORKING. WE WALKED THE SITE WITH DAN

1115 MET W/ J. WALIA + TOLD HIM WHAT DAN HAD SAID. WE WILL SAMPLE WHAT WE CAN.

1125 COLLECTED SAMPLE S-6. SOIL FROM S.W. CORNER OF SITE

1145 COLLECTED SAMPLE S-1. SOIL FROM S.E. CORNER OF GREEN BUILDING.

1200 LOOKED FOR GW-5 LOCATION + COULD NOT FIND IT.

1215 COLLECTED SAMPLE SED-4 FROM DRAINAGE DITCH SOUTH OF SUSPECTED

GW-5 Location. In weeds
just South of Excavation.
J. Walia arrives and walked
w/ C. Eich to locate GW-5.
Could not. Walked North
from Excavation along R.R.
Tracks. Saw numerous drums
mostly full. Some labeled
only as ZEP, one said
Quaker State.
Could not find GW-5.
No water in Excavation
J. Walia said not to try
digging hole J. Thapa wanted
+ just take a soil sample.

1255 Collected sample S-8
North of Excavation +
West of drums near burned
building. Frame 6
Drove to N. end of site
to pack samples. Donned Tyvek.

1320 Collected sample S-7
Background sample in open
field West of RR Tracks
+ East side of Red House

at End of Hartwell St.

1325 Collected Sample S-5.
~ 10' East of RR Tracks
across from S-7.

1345 Collected Sample SED-3.
Upgradient in Drainage
Ditch near RR Tracks.
Directly ~~West~~ East of GW-2
Location. No water in ditch

1352 Collected sample W-3
from West side of waste
pile.

1404 Collected sample W-2 from
waste pile just inside North
Gate enterance to site. Pile
full of metal, slag, bricks, concrete
Frame 5

1412 Collected sample S-4 at South
end of waste pile in a
depression filled with catails.
Soil sample. Frame 4

1420 Collected sample W-1 from
sand piles (MS/MSD) south of
where clean sand spread to
make a road. Frame 3.

1430 WE APPROACHED S-2 + S-3 LOCATIONS + FOUND NUMEROUS DRUMS. ONE HAD A PUNCTURE + APPEARED TO CONTAIN CLEAN MOTOR OIL.

INSTEAD OF SAMPLES S-2 + S-3 WE WILL COLLECT A COMPOSITE SAMPLE FROM 3-4 LOCATIONS (STAINED) AROUND DRUM STORAGE AREA, + CALL IT S-9. FRAME 2

1440 COLLECTED SAMPLE S-9

1445 J. WALIA LEAVES SITE.

PACKING UP SAMPLES, COC

FRAME 1 - S-5 LOCATION

1500 LEAVING SITE FOR ASC

1630 DROPPED SAMPLES OFF ~~AT~~ LAB

DROPPED EQUIPMENT OFF AT WAREHOUSE.

1730 RETURNED RENTAL VAN.

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International Specialists in the Environment

Job Number YP7010

Hartwell Street Landfill

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Rolinda Lechner 9/12/91

9/12/91

E&E personnel – J. Vangalio
R. Lechner
RL 9-12-91

0845 Arrive at site. Meet Dan Mele.

0848 Dan works through Jaspal Walia as to what work can be done on site. Large plant building gone – hauled off debris in tractor trailers. Kids often on site & have started fires. Office building down.

0926 John Dempsey arrives on site to discuss historical backgrounds. Large foundry building torn down. One pit still open with oily water and debris. Other pits not visible. Must be filled in. Surface has been mostly levelled and consists of fill material (gravel, debris, some fine sand & silt). In the area where foundry sand was found, the surface has been graded to level it out. Two piles of drums (crushed & empty, in poor condition) are on site. One SE of the remaining pattern building, the other S of the pattern building that has been torn down. A pile of foundry sand is located near the former pile of drums (SE of newer pattern building). The drums were crushed and piled as per Jaspal W.'s direction, according to Dan M. Dan is waiting for DEC word about what to do with the piles. Piles of wood and cement are near building they came from. Two buildings remain on site, a newer pattern building and a former storage building (?). Buildings removed include the foundry building, office building,

Rolinda Lechner 9-12-91

9/12/91

9/12/91

and a pattern building that was used ~~was~~ by kids and the site of a fire. Stained soil still exists near the pile of drums south of the old pattern building. Pieces of scrap metal and slag are still present on the ground. Dan M. says that no fill has been brought in and nothing has left without DEC consent. Several DEC & DOH inspectors have visited the site during the recent work, according to Dan M.

Frontier Lumber property borders the site to the south and east up to Hartwell Street. To the east of the triangular disposal area, north of Hartwell Street, AC Automotive, a garage/junk yard, borders the site. On the west side of the triangle, a new Tops Market is going up. To the Northwest is Channel 4 property, an auto repair shop, and Sunoco station along Elmwood.

A firebrick building also remains on site near the border (E) with Frontier Lumber. A former Conrail/NFTA right-of-way separates the site from properties to the NW along Elmwood. Drums in this area (and junked cars) belong to the auto repair shop.

Piles of bricks are present around the old pattern building area.

9-12-91

9/12/91

H-44

Rolinda Leichner

9/12/91

The basement of the office building is filled with bricks!

A pile of tires is present S of the drums of foundry sand.

A pile of metal, wood, etc. debris is located in the SE corner of the site. A bulldozer was nearby.

Scrap removal is continuing to the present.

The disposal area had piles of soil and scattered surface metal debris (forms, scrap metal, etc.). Dan says it stays wet after rain. Disposal area is small cottonwood wetland.

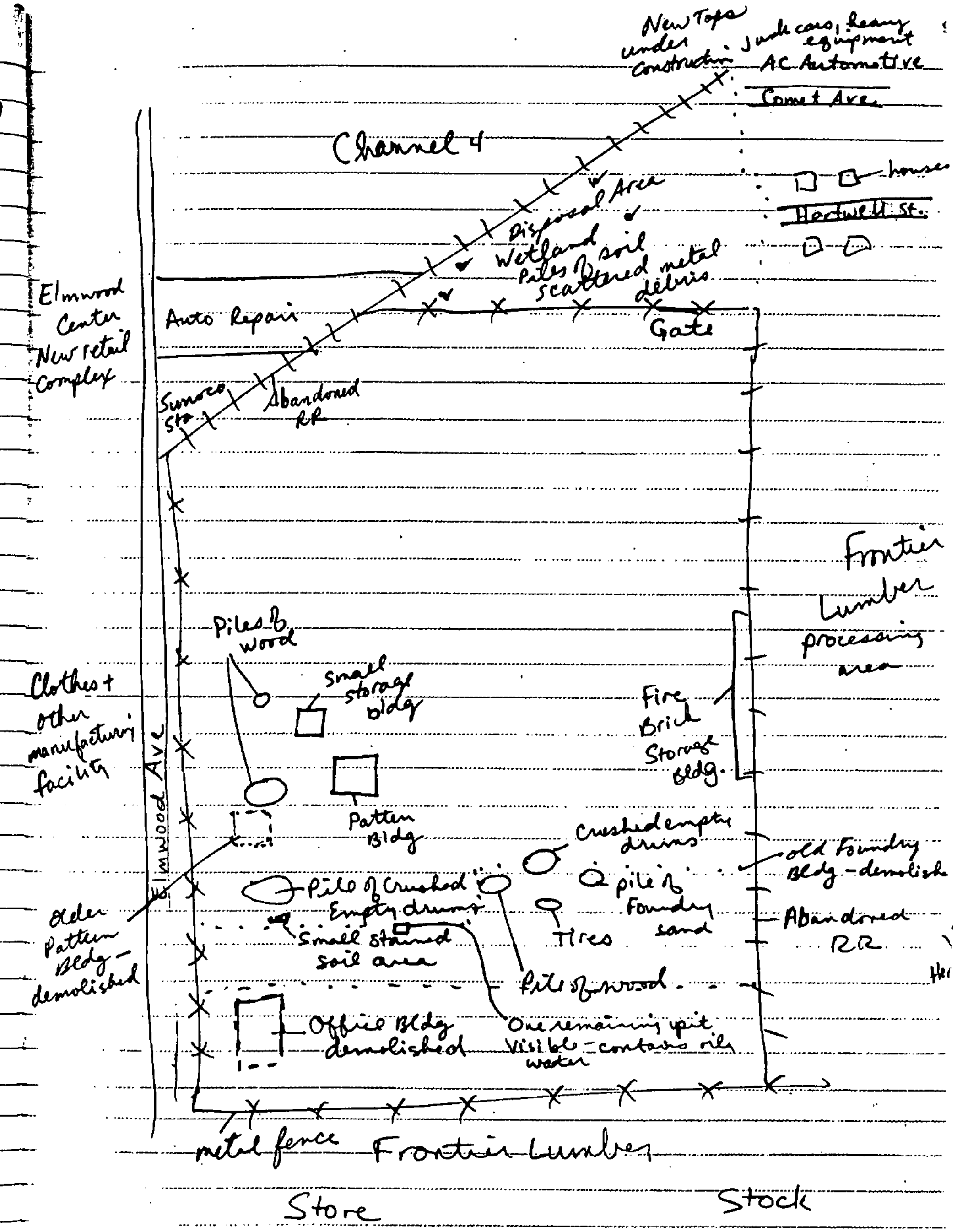
New pattern building is now being used for storage, other building is empty.

1000 Dan talking about status of report, time frame for final report, etc.

1015 Depart site. See next page for site sketch.

Rolinda Leichner 9-12-91 RL

H-45


New Tops under construction
Junk cars, heavy equipment
AC Automotive
Comet Ave.
houses
Hartwell St.
Channel 4
Disposal Area
Wetland
Piles of soil
scattered metal debris
Gate
Elmwood Center New retail Complex
Auto Repair
Sunoco Sta.
Abandoned RR
Frontier Lumber processing area
Piles of wood
Small storage bldg
Clothes + other manufacturing facility
Elmwood Ave
Pattern Bldg
Fire Brick Storage Bldg.
Crushed empty drums
old Foundry Bldg - demolish
pile of Foundry sand
Pile of Crushed Empty drums
Older Pattern Bldg - demolished
Small stained soil area
Tires
Abandoned RR
Pile of wood
Office Bldg demolished
One remaining pit visible - contains oily water
metal fence
Frontier Lumber
Store
Stock

recycled paper

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Job Number YP7010

Photo Log

9/12/91 Roll 1

photo 24 Looking South into site

23 Looking South east into Stack lumber

22 Looking Southwest at green bldg

21 Lumber Pile west end of site

20 Pile of rusted drums on [illegible] South end of bldg

19 Pile of old debris where use to be a building Southwest

18 Pile of drums on SW corner of property (empty)

17 area where office Bldg use to be

16 Looking northeast into site

15 Looking west toward Lumber yd

14 Part of the old foundary

13 Southeast Corner of property

12 Looking North into old drum pile

11 Looking South at entrance

10 Looking East from corner [illegible]

9 Looking North from west edge of property at old bldg

8 Tire pile in the center of the site

7 Foundary foundation

6 closeup of drum pile

5 pit

4 oily stain

3 evidence fire use by kids

2 foundary sand pile

1 Looking north at entrance

Judy Vangelder

Judy Vangelder

H-47

H-48

9/1 12:19 Roll 2

24 Pile of tires

23, 22, 21 panoramic view of woodpile That was one the pattern bldg

20, 19 Bldg showing debris on west side

~~18~~ 18, 17 Bldg showing pile of drums w/ background