

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

PHASE II INVESTIGATIONS

Wurlitzer Site
Site Number 932041
City of North Tonawanda, Niagara County

April 1992



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Prepared for:

**New York State Department
of Environmental Conservation**

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Division of Hazardous Waste Remediation

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1. EXECUTIVE SUMMARY

1.1 SITE DESCRIPTION AND BACKGROUND

The Wurlitzer site, located at 908 Niagara Falls Boulevard in the City of North Tonawanda, Niagara County, New York, encompasses approximately 44 acres, 14 of which are occupied by the Wurlitzer building (see Figures 1-1 and 1-2). This site was formerly owned by Wurlitzer Industries which manufactured automatic phonographs, player pianos, and electronic organs from 1908 to 1934. From 1934 to 1974, the facility manufactured jukeboxes. Also during this time, Wurlitzer Industries fulfilled defense contracts. Metal plating operations were performed at the facility during some or all of the years of manufacturing. Between 1974 and 1977, Wurlitzer Industries utilized the site as only an engineering and research facility before closing the North Tonawanda facility in 1977 (NYSDEC 1989). Currently, the Wurlitzer building is used as commercial rental space and has approximately 80 tenants. The building is owned by four companies: Wurlitzer Industrial Park, Inc., Irr Supply Centers, Inc., Applied Design Company, Inc., and Ancor Industrial Plastics, Inc. (see Figure 1-2). The site as a whole is currently owned by these four companies, along with Blue Bird Coach Lines, Inc., which owns half of Area B in the southwest corner of the site.

Based on a review of aerial photographs, on-site disposal of wastes appears to have occurred when Wurlitzer was manufacturing player pianos, electronic organs, jukeboxes, and defense products. A large portion of the manufacturing process involved plating. Based on this type of manufacturing, scrap metal, heavy metal sludges, degreasing wastes, and plating wastes (including cyanide) may have been generated.

The disposal of F001 hazardous waste, in the form of trichloroethene (TCE) still bottoms, has been documented at the site, although information on waste quantities, years of disposal, and location of disposal is not available (NYSDOH 1953). Another source of potential hazardous wastes at the site is the past reported practice of dumping the contents of plating tanks on site. Plating waste water is reported to have consisted of acid or alkali cleaners along with a cyanide and other compounds used in the plating of zinc, cadmium, copper, and nickel. A fish kill involving an estimated 8,000 to 10,000 fish was documented in 1965 on Bull and Sawyer creeks, and was concluded to have been the result of cyanide discharging from the Wurlitzer facility into Sawyer Creek.

Two distinct areas within the 44-acre site are of particular concern to the New York State Department of Environmental Conservation (NYSDEC) and the Niagara County Department of Health (NCDOH). These two areas are labeled Area A, north of the railroad right-of-way, and Area B, mentioned above (see Figure 1-2). Area A is currently solely owned by Irr Supply Centers, Inc. while ownership of Area B is currently divided between Bluebird Coach Lines, Inc. and Ancor Industrial Plastics, Inc. These areas are believed to be the most likely repositories for the on-site disposal of waste.

A Phase I investigation was completed by Engineering-Science, Inc., in cooperation with Dames and Moore, Inc., for the NYSDEC Division of Hazardous Waste Remediation in January 1989. This investigation, which included a site inspection in April 1986, detected no organic vapors above background levels up or downwind of the site with a photoionization detector. Furthermore, no exposed wastes were reported. In addition, the Phase I investigation was unable to document the location or existence of on-site disposal, and recommended that no Phase II investigation be conducted.

A subsurface and environmental assessment report was prepared in May 1990 by Buffalo Drilling Company, Inc. (BDC) for Blue Bird Coach Lines, Inc. This study focused on Area B. During a site walkover by BDC, scattered construction debris, miscellaneous slag and soil fills, and localized oil sheens on ponded water were observed. The random fill materials were identified as concrete and other construction debris,

asbestos shingles and roofing materials, deteriorated metal drums, and machine parts. One subsurface soil composited from five test borings was analyzed for Hazardous Substance List volatiles and semivolatiles as well as extraction procedure (EP) Toxicity metals. No organic compounds were found in concentrations above the detection limits. Additionally, no inorganics exceeded the EPA regulatory limits pertaining to the EP Toxicity testing procedure. The conclusion of the BDC report was that "no serious threat to the environment or to the general public was identified" (BDC 1990).

1.2 PHASE II INVESTIGATION

In order to determine if hazardous waste was disposed of 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 Wurlitzer site. The Phase II field investigation begun by Ecology and Environment Engineering, P.C. (E & E) in May 1990 included a site reconnaissance, a geophysical survey, the establishment of 10 groundwater monitoring wells, and the collection and analysis of surface soil, surface water, sediment, and groundwater 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 photoionization and flame ionization detectors. Two geophysical survey methods were used to optimize the selection of locations of the monitoring wells and to reduce the risks associated with drilling into unknown terrain. The collection and analysis of soil, sediment, and water samples were conducted to determine the presence of contaminants and assess their potential for migration.

Following a review of the Phase II sampling results, two additional waste samples were collected by NYSDEC in October 1991. These samples were collected from the western side of Area B and consisted of one sample of tar and one of a sandy drum solid. The tar sample was analyzed for volatiles, semivolatiles, pesticides, and PCBs, and the drum sample was analyzed for full TCL parameters.

1.3 SITE ASSESSMENT

The air monitoring surveillance conducted during the site inspection and subsequent field activities failed to reveal any organic vapors at any level above background in the breathing zone throughout the Phase II investigation. Electromagnetic ground conductivity (EM31) and total earth field magnetic (magnetometer) measurements both yielded anomalous measurements, which were interpreted to represent surface and subsurface features at the site.

Subsurface boring logs from on-site drilling indicate that construction and industrial demolition debris fill exists in both Area A and Area B of the site. Based on split-spoon samples recovered during drilling, the fill extends to an approximate average depth of 1 foot and consists primarily of coal, brick, and concrete in Area A and brick, concrete, and asphalt shingle chips in Area B. The presence of coal in Area A is consistent with its former usage as a coal storage area (Wurlitzer 1948). Natural soil observed at the site consists of lacustrine deposits of clay and silt with sand lenses overlying a layer of glacial till. Bedrock was encountered at 31 to 38 feet below the ground surface and is the Camillus Shale. The site lies adjacent to Sawyer Creek, which joins Tonawanda Creek 1 mile downstream. Six miles downstream of the site, Tonawanda Creek converges with the Niagara River.

Target Compound List (TCL) organics analysis of eight groundwater, two surface water, four sediment, and eight surface soil samples indicates that polynuclear hydrocarbons (PAHs) are present in the soil and sediment. Polychlorinated biphenyls (PCBs) were detected in sediment and surface soil samples and pesticides were detected in numerous surface soil samples. The only volatile organic detected was TCE found in one surface soil sample in Area B as well as one surface water sample downstream of the site. However, as Area B is a low-lying area in which surface runoff ponds, it is unlikely that a hydraulic connection exists between these two sampling points, except for groundwater, in which no TCE was detected. No volatile or semivolatile compounds were detected in any of the groundwater samples.

Analyses for inorganics were performed on seven groundwater, two surface water, four sediment, and eight surface soil samples. Regulatory limits for cadmium, iron, lead, and manganese were exceeded in both up- and downgradient groundwater samples, whereas only iron exceeded the limits in the surface water samples. Common ranges for Eastern United States soils for antimony, barium, cadmium, copper, lead, silver, and zinc were exceeded in some surface soil samples, whereas only antimony, cadmium, lead, and silver exceeded the standard ranges in the sediment samples.

The two surface soils from Area A and the two from Area B with the highest metals concentrations were subjected to EP Toxicity analysis for metals. No samples exceeded the regulatory limit for any metals.

Two additional waste samples were collected by NYSDEC in October 1991 from Area B. A sample of tar was analyzed for volatiles, semi-volatiles, pesticides, and PCBs, and one drum solid sample was analyzed for full TCL parameters. Volatiles found above quantitation limits in the tar sample include acetone, toluene, ethylbenzene, and total xylenes. Semivolatiles detected in the tar sample include various PAHs, dibenzofuran, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene. No PCBs were detected in the tar sample; however, the pesticide endrin was found above the quantitation limit. 4,4'-DDD, methoxychlor, and endrin ketone were also detected in the tar sample, but below quantitation limits.

No volatile or semivolatile organic compounds were detected above quantitation limits in the drum sample. Additionally, no PCBs were detected in this sample; however, the pesticide methoxychlor was detected. Levels of cadmium and sodium in the drum sample exceeded common ranges for Eastern United States soils (Shacklette and Boerngen 1984).

A 1953 New York State Health Department memo documents the disposal of hazardous waste at the site in the form of TCE still bottoms (NYSDOH 1953). Plating wastes containing heavy metals, cyanide, and other compounds were also reported to have been spilled or dumped at the site. Detection of TCE, metals, and cyanide support, but do not confirm, the continued presence of hazardous wastes at the site. Regardless of the source of contamination, contaminant concentrations in surface soil in

Areas A and B may pose a threat to human health through direct contact and/or ingestion.

1.4 HAZARD RANKING SYSTEM SCORE

The HRS was completed to quantify risks associated with the Wurlitzer 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).

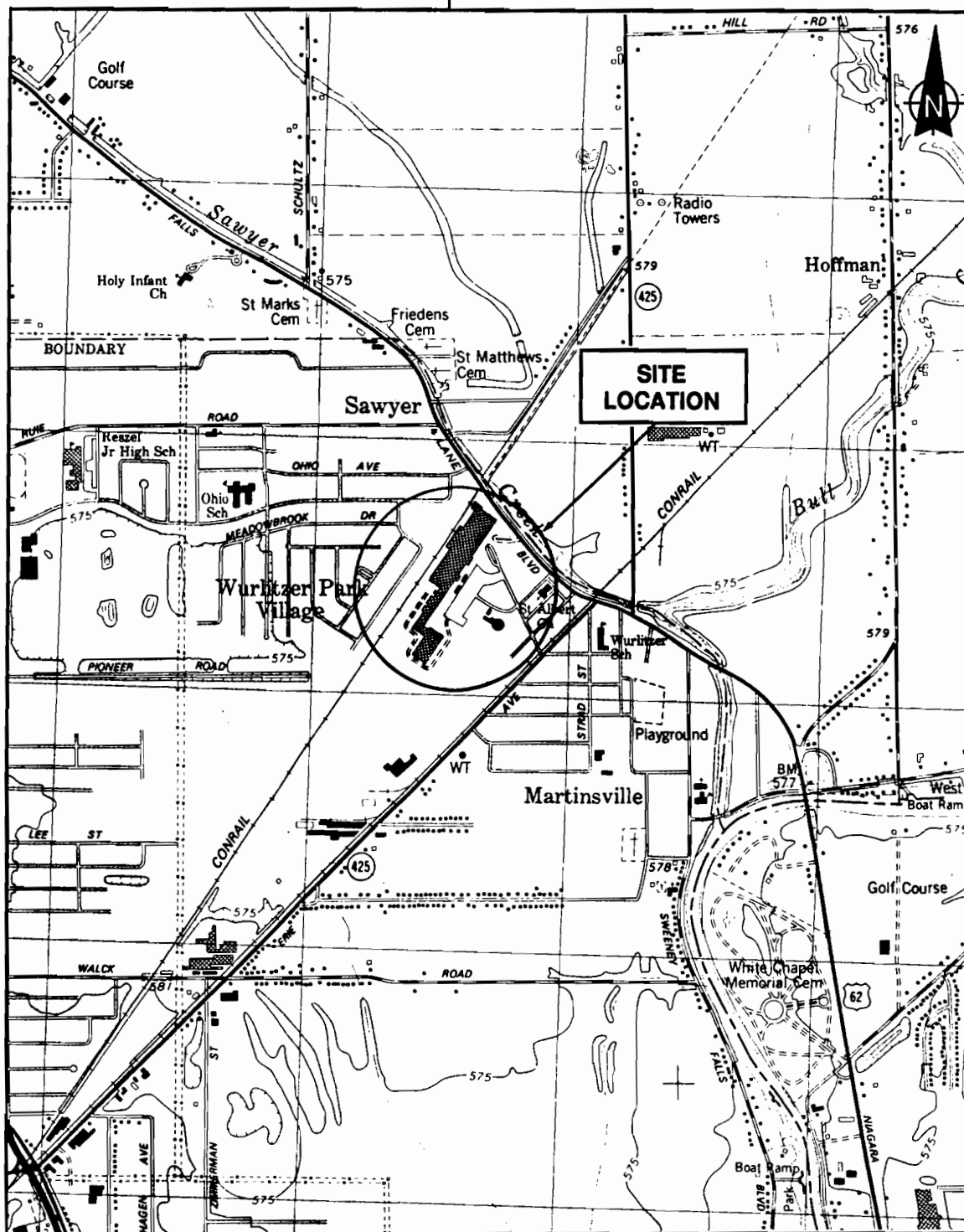
Based on the results of this and previous studies, the HRS scores for the Wurlitzer site have been calculated as follows:

$$S_M = 5.55 \quad (S_{gw} = 4.47; \quad S_{sw} = 8.50; \quad S_a = 0)$$

$$S_{FE} = 0$$

$$S_{DC} = 37.5$$

78° 50' 39" W



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle, Tonawanda East, NY 1980.

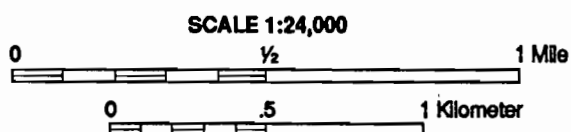


**Figure 1-1
WURLITZER SITE LOCATION MAP**

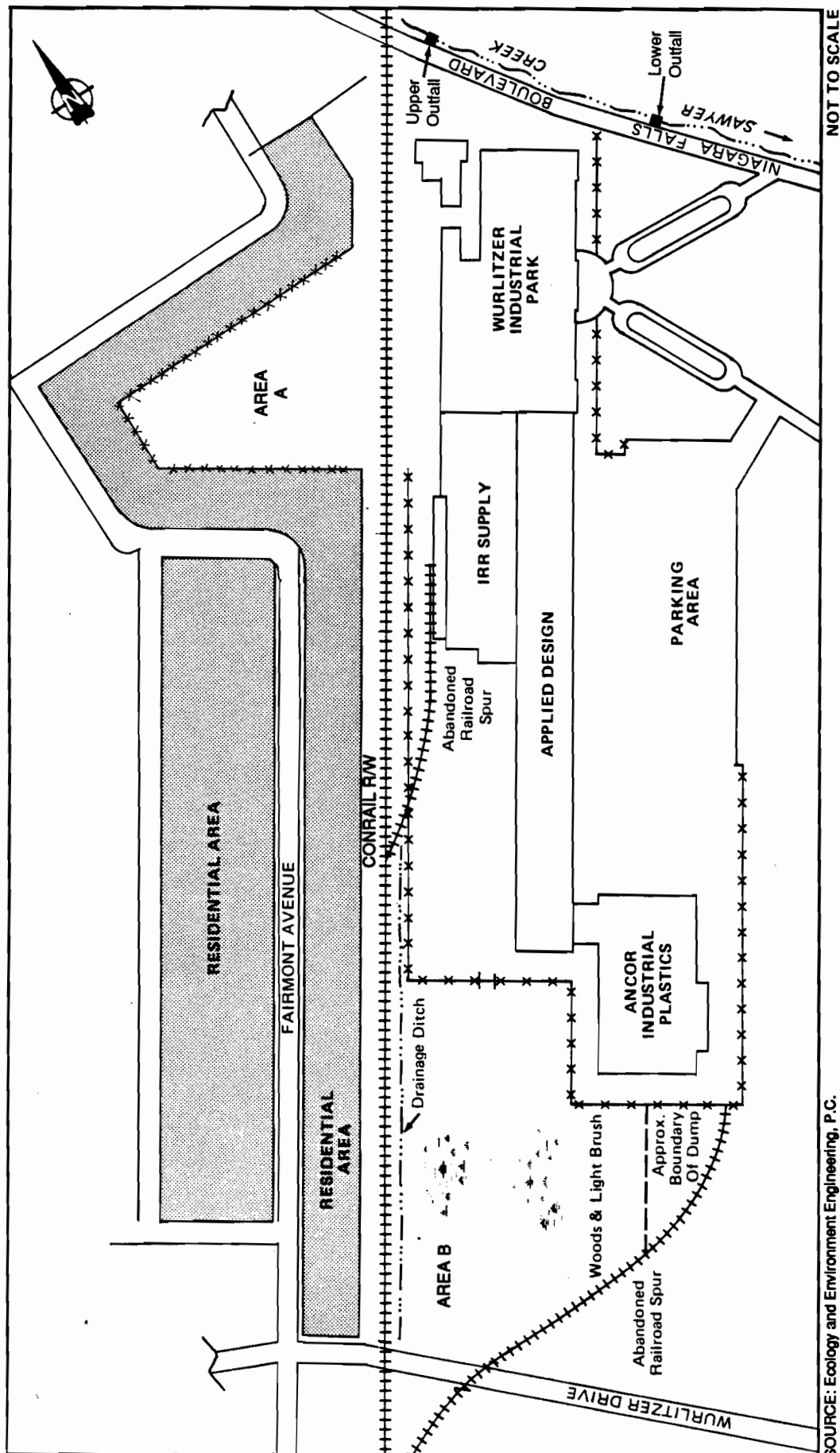


Figure 1-2
WURLITZER SITE MAP

SOURCE: Ecology and Environment Engineering, P.C.

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

Original-BHSC

Copy-REGION

Copy-DEE

Copy-DOH

Copy-PREPARER

ADDITIONS/CHANGES TO REGISTRY OF INACTIVE HAZARDOUS WASTE DISPOSAL SITES

1. Site Name Wurlitzer		2. Site Number 932041	3. Town North Tonawanda	4. County Niagara
5. Region 9	6. Classification Current <u>2a</u> / Proposed _____	7. Activity [] Add [] Reclassify [] Delist [] Modify _____		
8a. Describe location of site (attach USGS topographic map showing site location). Located at 908 Niagara Falls Boulevard in the City of North Tonawanda near the intersection of routes 62 and 425. Directly across Niagara Falls Boulevard from the site is Sawyer Creek.				
b. Quadrangle <u>Tonawanda East</u> c. Site latitude <u>43°03'30"N</u> Longitude <u>78°50'39"W</u> d. Tax Map Number <u>see attached</u>				
9a. Briefly describe the site (attach site plan showing disposal/sampling locations) The site consists of a 14-acre building surrounded by 30 acres of land. Formerly owned by Wurlitzer Industries, currently divided among five owners and leased to 80 commercial tenants. Formerly used as a manufacturing facility for organs, jukeboxes, etc. Two non-paved areas exist where construction and industrial demolition debris were disposed of.				
b. Area <u>44</u> acres c. EPA ID Number <u>N/A</u> D. PA/SI [] Yes [X] 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. Disposal of F001 hazardous waste on site in the form of Trichloroethene (TCE) still bottoms has been documented. Dates of disposal and quantities are uncertain.				
11a. Summarized sampling data attached [] Air [X] Groundwater [X] Surface Water [X] Soil [] Waste [X] EP Tox [] TCLP				
b. List contravened parameters and values (in µg/L) Groundwater: Cd (15.7); Cr (59.2 - 137); Cu (227); Fe (8,460 - 163,000); Pb (43 - 125); Mg (39,400 - 342,000); Mn (480 - 6,000); Zn (414 - 832) Surface Water: Fe (1,130 - 1,480)				
12. Site impact data				
a. Nearest surface water: Distance <u>50</u> ft. Direction <u>Northeast</u> Classification <u>D</u>				
b. Nearest groundwater: Depth <u>10</u> ft. Flow direction <u>Northeast</u> [] Sole source [] Primary [] Principal				
c. Nearest water supply: Distance <u>>15,000</u> ft. Direction <u>Southwest</u> Active [X] Yes [] No				
d. Nearest building: Distance <u>0</u> ft. Direction _____ Use <u>Commercial/Industrial</u>				
e. Crops/livestock on site? [] Yes [X] No j. Within a State Economic Development Zone? [] Yes [] No				
f. Exposed hazardous waste? [] Yes [X] No k. For Class 2A: Code _____ Health model score _____				
g. Controlled site access? [] Yes [X] No l. For Class 2: Priority category _____				
h. Documented fish or wildlife mortality? [] Yes [X] No m. HRS Score <u>5.55</u>				
i. Impact on special status fish or wildlife resource? [] Yes [X] No n. Significant threat [] Yes [] No [X] Unknown				
13. Site owner's name See attached		14. Address		15. Telephone Number () -
16. Preparer James D. Griffis, CHMM, Ecology and Environment Engineering, P.C. Name, title, and organization <u>5/20/92</u> <u>James D. Griffis</u> Date Signature				
17. Approved _____ Name, title, and organization _____ Date Signature				

SITE OWNER LIST

1. Wurlitzer Industrial Park, Inc.
908 Niagara Falls Boulevard
North Tonawanda, New York 14120
716/692-1600
Tax Map Parcel No. 176.16-2-1
2. Irr Supply Centers, Inc.
908 Niagara Falls Boulevard
North Tonawanda, New York 14120
716/694-4800
Tax Map Parcel No. 176.16-2-52 and 176.16-1-18.1
3. Applied Design Company, Inc.
908 Niagara Falls Boulevard
North Tonawanda, New York 14120
716/694-2020
Tax Map Parcel No. 176.16-2-53
4. Ancor Industrial Plastics, Inc.
100 Melody Lane
North Tonawanda, New York 14120
716/695-3141
Tax Map Parcel No. 176.16-2-51
5. Blue Bird Coach Lines, Inc.
502 North Barry
Olean, New York 14760
716/372-5500
Tax Map Parcel No. 176.20-1-1.41

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 the investigation was to determine if hazardous wastes have been disposed of at the site; if contaminants exist in the various media (air, soil, groundwater, or surface water); if contaminants are leaving the Wurlitzer site; and whether threats to human health and/or the environment exist.

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, Inc., in cooperation with Dames and Moore, Inc. in 1986 did not include any sample collection or analysis.

Surficial soil and water, as well as groundwater and sediment samples, were collected as part of the Phase II investigation. Furthermore, EP Toxicity metals analyses were implemented to determine the leaching potential of toxic metals present in soils at the site. 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. SCOPE OF WORK

3.1 INTRODUCTION

Field work for the Phase II investigation at the Wurlitzer site began in May 1990 and was largely completed by October 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 and is included in Appendix A.

The Scope of Work for the Phase II field investigation at the Wurlitzer site was prepared by NYSDEC. All field activities were performed in accordance with this Scope of Work for the changes requested by NYSDEC in their June 8, 1990 letter to E & E and except when changes in sampling protocol and rationale were necessitated by on-site conditions. Variations from the plan occurred as a result of judgments made in the field with the concurrence of NYSDEC representatives and are discussed below in the appropriate sections of the text.

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, Inc. in cooperation with Dames and Moore, Inc., in January 1989. 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 May 7 and 8, 1990, E & E personnel conducted a site reconnaissance. The purposes of the site visit were:

- o To identify access problems;
- o To identify locations for the collection of surficial soil, surficial water and sediment samples;
- o To conduct a limited air-monitoring study using photo-ionization and flame ionization detectors, as well as a radiation monitor;
- o To visually inspect boring locations and contact utility companies to determine if underground utilities may impact the drilling program; and
- o To identify and approve for use a suitable drilling water supply.

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

- o An abundance of cultural features (metal fence, railroad tracks, and surface debris) present on the site would interfere with surface geophysical survey methods;
- o Although the site is private property, the site was not secure; therefore, equipment used during the investigation would have to be secured or removed from the site each day;
- o Air monitoring responses above background levels for volatile organic compounds (VOCs) and radiation were not observed during the site reconnaissance; and
- o Piles of construction and demolition (C&D) debris, including asphalt shingles, concrete, and scrap metal, were observed in Areas A and B. In addition, rusted 55-gallon drums were noted in Area B.

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. This site safety plan is included in Appendix A.

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 suspected 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. The site safety plan was available to all personnel on site at all times.

3.2.3 Geophysical Survey

A geophysical investigation was conducted at the Wurlitzer site on May 7 and 8, 1990. The geophysical investigation included an EM31 survey (to measure electromagnetic terrain conductivity), and a portable proton magnetometer survey (to measure total earth field magnetic). 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; improve the accuracy of and confidence in the investigation; and optimize the locations of the monitoring well 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 Monitoring Well Installation

Ten overburden wells were installed at the Wurlitzer site between August 1 and August 15, 1990 by American Auger and Ditching, Inc. under the supervision of E & E. Originally, six monitoring wells were to be installed; however, field data from four of these six wells indicated that a shallow subsurface saturated zone (silty sand lens) existed independent of the main aquifer monitored by all six wells. Therefore, NYSDEC approved the installation of four additional shallow overburden wells adjacent to the locations where the silty sand lens was identified (GW-2, GW-4, GW-5, and GW-6). See Figure 3-1 and Table 3-2 for monitoring well locations.

All monitoring wells were drilled and constructed in accordance with NYSDEC guidelines. Two-foot soil samples were collected at 5-foot intervals above the water table and continuously below the water table as detailed in Section 3.2.5. Any changes to this sampling plan were made at NYSDEC's request or with NYSDEC field approval. Due to a lack of air monitoring responses and observable staining, no subsurface soil samples were collected for chemical analysis. However, 14 samples were retained for geotechnical analyses. These samples, and the depths from which they were obtained, are listed in Appendix D. GW-2S, GW-4S, GW-5S, and GW-6S monitor the shallow, perched silty sand lens, while GW-1 through GW-6 monitor the most transmissive zone of the deep overburden aquifer which was just above the top of bedrock.

The boreholes were advanced with 4.25-inch inside diameter (ID) continuous-flight, hollow-stem augers. All wells were set in the overburden, above bedrock. Well screen consisting of 2-inch ID, 0.010-inch machine-slotted, polyvinyl chloride (PVC) was set at the bottom of each borehole. Screen length varied from 2 to 10 feet as shown in Table 3-3. The screens were followed by threaded, flush-joint PVC riser of the same diameter as the well screen to approximately 2 feet above the ground surface. The wells were completed with a quartz sand filter pack extending from 0.5 feet to 2.5 feet above the top of the screen depending on the length of screen used and the depth of the borehole. Dependent upon borehole geometry, a 1- to 3-foot-thick bentonite seal was placed above the sand pack. Completing the well to the surface, a Portland cement/bentonite grout was poured. Bentonite was not used in the upper 3 feet of the grout to ensure stability for the locking steel protective casing that was furnished for each well. Each well was completed with a concrete drainage pad constructed on the ground surface around the protective casing. Table 3-3 summarizes the monitoring well construction information.

After completion of the well, but not sooner than 24 hours after grouting was completed, each well was developed by hand bailing (GW-3, GW-4S, GW-6, and GW-6S) or centrifugal pumping (GW-1, GW-2, GW-4, and GW-5). Well development was performed until pH, specific conductance, and temperature remained constant and water turbidity stabilized at less than 50 nephelometric turbidity units (NTUs). If the turbidity

stabilized above 50 NTU, development continued for a maximum period of 2 hours.

The drill rig and all tools and equipment were decontaminated between wells except prior to the drilling of GW-5S by:

- o Removal of foreign matter; then
- o Sanitization with a high pressure steam cleaner.

All split-spoons were decontaminated after each use in the same manner. Due to a malfunction of the steam cleaner, the auger used to drill GW-5S was decontaminated prior to use per the procedures outlined in Section 3.2.7. The water used for decontamination was obtained by permission of the City of North Tonawanda from an on-site hydrant. A sample of this water (DW0807) was collected on August 7, 1990, preserved, and delivered under proper chain-of-custody procedures to E & E's Analytical Services Center (ASC) for TCL organic and inorganic analyses.

Subsurface boring logs for all wells are presented in Appendix C, and geotechnical analyses are presented in Appendix D.

3.2.5 Subsurface Soil Sampling and Analysis

Soil samples were collected during the drilling of the groundwater monitoring wells by split-spoon sampling in conjunction with a standard penetration test as outlined in ASTM Designation D 1586-84, "Standard Method for Penetration Test and Split-Barrel Sampling of Soils." A 2-foot by 1.5-inch ID hardened steel split-barrel sampler with shoe was driven in 2-foot depth intervals by a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler 6 inches was recorded as the blow count on the subsurface boring logs (Appendix C). A plastic retainer basket was used where appropriate in order to promote satisfactory sample recovery. The split-spoon recoveries were logged in the field by an on-site geologist and screened with flame and photoionization detectors (OVA and HNu). No subsurface soil samples exhibited HNu readings of 5 ppm or more above background or observable staining; therefore, no samples were retained for chemical analysis. Representative soil samples from each monitoring well were retained for geotechnical analyses (grain size distribution analysis or Atterberg limits

testing). Soil sample descriptions and other pertinent information are included on the subsurface boring logs in Appendix C. Geotechnical analyses are included in Appendix D.

The decontamination of split-spoons was performed both prior to and after each use as described in Section 3.2.4.

3.2.6 Groundwater Sampling and Analysis

As part of the Phase II investigation at the Wurlitzer site, groundwater samples were collected from eight of the 10 newly installed monitoring wells on August 28 and 29, 1990 by E & E. Monitoring wells GW-2S and GW-5S were found to be dry during development and sampling, and therefore were not sampled.

On September 20, 1990, a second attempt was made to sample GW-2S and GW-5S. However, on this day all four shallow wells (GW-2S, GW-4S, GW-5S, and GW-6S) were dry. Precipitation prior to this sampling attempt had been comparatively less than that prior to the first sampling event. This indicates that the shallow perched sand lens is highly dependent upon weather conditions.

The collected groundwater samples were analyzed for TCL organics and inorganics with the exception of GW-6S. Due to limited sample volume and very slow recharge, GW-6S was analyzed to TCL organics only. For QA/QC purposes, additional water was collected from well GW-1 for matrix spike and matrix spike duplicate (MS/MSD) analyses.

Groundwater samples were collected at each monitoring well using a dedicated, decontaminated, PVC bailer with new, dedicated nylon rope. Prior to sample collection, groundwater level and total depth-of-well measurements were obtained. An amount equaling three standing water volumes was calculated and purged from the monitoring well prior to sample collection. Groundwater sampling information for the September 29, 1990 sampling event is presented in Table 3-4.

Turbidity measurements of the groundwater were taken immediately following purging. The turbidity of the groundwater samples was greater than 200 NTU in all cases; therefore, the suspended sediment was allowed to settle for a period of 24 hours prior to sampling. Following collection, all samples were preserved on ice and delivered to E & E's ASC

under proper chain-of-custody procedures. Samples for total metals analysis were also preserved by adding concentrated nitric acid, and samples for total cyanide analysis were preserved by adding sodium hydroxide.

During data validation review, poor surrogate recoveries were noted in the original base-neutral/acid extractable (BNA) analyses of four groundwater samples (GW-1, GW-2, GW-3, and GW-4). Therefore, on October 23, 1990, monitoring wells GW-1, GW-2, GW-3, and GW-4 were purged of three well volumes of water as described above. Due to turbidity measurements in exceedance of 200 NTU, the suspended sediment in all four wells was allowed to settle for 24 hours. These four wells were then resampled on October 24, 1990 for BNA analysis only. Groundwater sampling information for this resampling event is presented in Table 3-5.

Analytical results are discussed in Section 4.5 and raw data summary sheets are included in Appendix E.

3.2.7 Surface Soil Sampling and Analysis

Eight surface soil samples were collected at the site on August 29, 1990 (see Figure 3-1). Four of these surface soil samples (S-1 through S-4) were collected from within Area A. The remaining four surface soil samples (S-5 through S-8) were collected from within Area B. Sample S-1 was collected near the base of a construction debris and soil pile. No other obvious surface expressions of waste existed in Area A so samples S-2 through S-4 were distributed evenly throughout Area A. Sample S-5 was collected near GW-5, in the area of heaviest foot traffic, adjacent to a pile of construction debris and soil. Sample S-6 was collected from the base of rusted drums containing a pink and white crystalline material. Sample S-7 was collected near a tar-like material that was leaching from a pile of construction debris and soil. Sample S-8 was collected in the vicinity of construction debris including brick, tar, and scrap metal. The samples collected near debris piles and drums included soil mixed with the nearby waste. For QA/QC purposes, additional soil was collected at location S-7 for MS/MSD analyses.

All surface soil samples were collected from 0 to 4 inches below the ground surface using disposable stainless steel sampling equipment.

Prior to use, the new dedicated sampling equipment was decontaminated using the following procedure:

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

Surface soil 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 levels. Each surface soil sample location was marked to provide identification during the subsequent surveying of the site. Each surface soil sample collected was immediately placed in one 8-ounce and two 40-milliliter, pre-cleaned, labeled, Teflon-lined screw cap, glass jars. All samples were stored on ice and transported under proper chain-of-custody to E & E's ASC.

Each surface soil sample was analyzed for TCL volatiles and semi-volatiles, as well as metals and cyanide. The two surface soil samples from Area A and the two surface soil samples from Area B exhibiting the highest total concentrations of metals were subjected to EP Toxicity metals analysis. Organic and inorganic analytical results are discussed in Section 4.5, and data are included in Appendices E and F.

3.2.8 Surface Water/Sediment Sampling and Analysis

Surface water samples were collected from two of the four proposed locations on August 29, 1990. SW-1 and SW-2 were collected from Sawyer Creek down- and upstream of the site, respectively. Corresponding sediment samples, SED-1 and SED-2 were collected from the same locations as SW-1 and SW-2, respectively (see Table 3-6). No surface water samples were collected from Area B as proposed because both marshy regions in this area were dry during sampling. However, a sediment sample was collected from the lowest point in each marshy area within Area B (SED-3 and SED-4) (see Figure 3-1).

All surface water and sediment samples were subjected to TCL organic and inorganic analyses. Furthermore, for QA/QC purposes, additional water volume was collected at location SW-2 for MS/MSD analyses.

Surface water was drawn directly from Sawyer Creek into appropriate sample bottles. Sediment samples were collected with dedicated stainless steel spoons, which were precleaned according to the procedures outlined in Section 3.2.7. Surface water samples were preserved according to the procedures outlined in Section 3.2.6. All samples were stored on ice and delivered under proper chain-of-custody procedures to E & E's ASC. Analytical results are discussed in Section 4.5 and raw data summary forms are included in Appendix E.

3.2.9 Waste Sampling and Analysis

Two additional waste samples were collected by NYSDEC in October 1991. These samples were collected from the western side of Area B and consisted of one sample of tar and one of a sandy drum solid. The tar sample was analyzed for volatiles, semivolatiles, pesticides, and PCBs, and the drum sample was analyzed for full TCL parameters. Analytical results are discussed in Section 4.5 and data are included at the end of Appendix E.

Table 3-1

SOURCES CONTACTED FOR THE NYSDEC PHASE II INVESTIGATION
AT THE WURLITZER SITE

City of North Tonawanda Fire Department
495 Zimmerman
North Tonawanda, New York 14120
Contact: Robert A. Wellence, Fire Prevention/Fire Investigation
Coordinator
Telephone Number: 716-693-2201
Date: October 19, 1990
Information Gathered: Information pertaining to fire and explosion threats.

City of North Tonawanda Water Superintendent
216 Payne Avenue, Room 6, City Hall
North Tonawanda, New York 14120
Contact: Paul F. McDonough
Telephone Number: 716-695-8531
Date: May 15, 1990
Information Gathered: Local water usage.

National Heritage Program
700 Troy-Schenectady Road
Albany, New York 12210
Contact: Burrell Buffington
Telephone Number: 518-783-3932
Date: April 10, 1990
Information Gathered: Map search for NYSDEC Phase II report preparation.

New York State Department of Environmental Conservation
584 Delaware Avenue
Buffalo, New York 14202
Contact: Martin L. Doster, P.E.
Telephone Number: 716-847-4585
Date: April 3, 1990
Information Gathered: Meeting to discuss site-specific information obtained by
NYSDEC site managers.

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
584 Delaware Avenue
Buffalo, New York 14202
Contact: Jaspal Singh Walia
Telephone Number: 716-847-4585
Date: March 29 and April 3, 1990
Information Gathered: File search for NYSDEC Phase II report preparation.

New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12203
Contact: Valerie Lauzze
Telephone Number: 518-457-9538
Date: April 11, 1990
Information Gathered: File search for NYSDEC Phase II report preparation.

New York State Department of Health
2 University Place
Albany, New York 12203
Contact: Dawn Hettrick
Telephone Number: 518-458-6310
Date: April 10, 1990
Information Gathered: File search for NYSDEC Phase II report preparation.

[UZ]YR2080:D3176/4048/21

Table 3-1 (Cont.)

Niagara County Department of Health
10th and Falls Street
Niagara Falls, New York 14302

Contact: Paul Dicky
Telephone Number: 716-284-3128
Date: April 2, 1990

Information Gathered: File search for NYSDEC Phase II report preparation.

Niagara County Department of Health
5467 Upper Mountain Road
Lockport, New York 14094

Contact: Ronald Gwozdek
Telephone Number: 716-439-6109
Date: April 2, 1990

Information Gathered: Information pertaining to local water usage.

Niagara County Environmental Management Council
175 Hawley Street, County Courthouse
Lockport, New York 14094

Contact: Sue Casey
Telephone Number: 716-439-6170
Date: March 30, 1990

Information Gathered: File search for NYSDEC Phase II report preparation.

Niagara County Highway Department
225 South Niagara Street
Lockport, New York 14094

Contact: Carl Allen
Telephone Number: 716-439-6066
Date: April 3, 1990

Information Gathered: Photocopies of aerial photographs from 1938 through 1982.

United States Department of Agriculture
Soil Conservation Service
4487 Lake Avenue
Lockport, New York 14094

Contact: Edward Oliver
Telephone Number: 716-434-4949
Date: April 3, 1990

Information Gathered: Niagara County Soil Survey and agricultural data.

[UZ]YR2080:D3176/4048/21

Source: Ecology and Environment Engineering, P.C. 1990.

Table 3-2
MONITORING WELL LOCATIONS

Well	Overburden Aquifer	Location
GW-1	Deep	Potentially downgradient and north of Area A
GW-2	Deep	Potentially downgradient and northeast of site, adjacent to Niagara Falls Boulevard
GW-2S	Shallow	Northeast of site, adjacent to Niagara Falls Boulevard, and GW-2
GW-3	Deep	Potentially upgradient and south of Area A
GW-4	Deep	Potentially downgradient and north of Area B
GW-4S	Shallow	North of Area B, adjacent to GW-4
GW-5	Deep	Potentially upgradient and in southwest corner of Area B
GW-5S	Shallow	Southwest of Area B, adjacent to GW-5
GW-6	Deep	Potentially upgradient and east of Area B
GW-6S	Shallow	East of Area B, adjacent to GW-6

[UZ]YR2080:D3176/4049/26

Source: Ecology and Environment Engineering, P.C. 1990.

Table 3-3
MONITORING WELL CONSTRUCTION DATA

Well	Total Depth (Feet)	Screen Length (Feet)	Screen Interval (Feet BGS)*	Thickness of Sand Pack (Linear Feet)	Thickness of Bentonite Seal (Linear Feet)	Depth to Water 8-28-90 (Feet BGS)*	Water Level Elevation 8-28-90 (Feet)	Ground Surface Elevation (Feet)	Top of PVC Riser Elevation (Feet)
GW-1	32.5	10	22.5 - 32.5	12.50	2.0	12.7	563.4	576.1	577.82
GW-2	33.5	10	23.5 - 33.5	12.00	2.0	11.8	563.7	575.5	577.34
GW-2S	8.5	3	5.5 - 8.5	3.50	2.0	Dry	Dry	575.6	577.47
GW-3	31.3	10	20.5 - 30.5	12.75	2.0	10.9	564.9	575.8	577.57
GW-4	38.5	10	28.5 - 38.5	12.10	2.6	10.3	563.5	573.8	575.63
GW-4S	8.0	3	5 - 8	4.00	1.0	5.4	568.8	574.2	575.62
GW-5	36.8	10	26.8 - 36.8	12.25	3.0	9.5	564.4	573.9	575.88
GW-5S	7.0	2	5 - 7	3.00	1.0	Dry	Dry	573.8	575.55
GW-6	34.0	10	24 - 34	12.00	3.0	8.6	565.6	574.2	576.09
GW-6S	8.5	4	4.5 - 8.5	4.50	1.0	6.4	567.9	574.3	576.72

02[UZ]YR2080:D3176/4254/0

*BGS = Below ground surface

Source: Ecology and Environment Engineering, P.C. 1990.

Table 3-4
GROUNDWATER SAMPLING INFORMATION
August 29, 1990

Well	Number of Well Volumes Purged	pH*	Temperature (°F)	Specific Conductance (μS/cm)	Turbidity (NTU)
GW-1	3	8.71	59.6	790	>200
GW-2	3	10.76	60.9	1,170	>200
GW-2S	Dry	--	--	--	--
GW-3	3	9.85	59.8	580	>200
GW-4	3	11.15	58.3	1,210	>200
GW-4S	3	6.79	69.8	1,410	>200
GW-5	3	9.23	60.8	580	>200
GW-5S	Dry	--	--	--	--
GW-6	3	11.49	59.7	2,510	>200
GW-6S	1-Dry	7.12	65.4	720	>200

02[UZ]YR2080:D3176/4258/24

*Suspect data due to equipment failure.

Source: Ecology and Environment Engineering, P.C. 1990.

Table 3-5
GROUNDWATER SAMPLING INFORMATION
OCTOBER 24, 1990*

Well	Number of Well Volumes Purged	pH	Temperature (°F)	Specific Conductance (μ S/cm)	Turbidity (NTU)
GW-1	3	7.93	49.9	833	>200
GW-2	3	9.44	49.0	757	>200
GW-3	3	10.57	48.9	593	>200
GW-4	3	11.46	50.2	1,118	>200

02[UZ]YR2080:D3176/4458/23

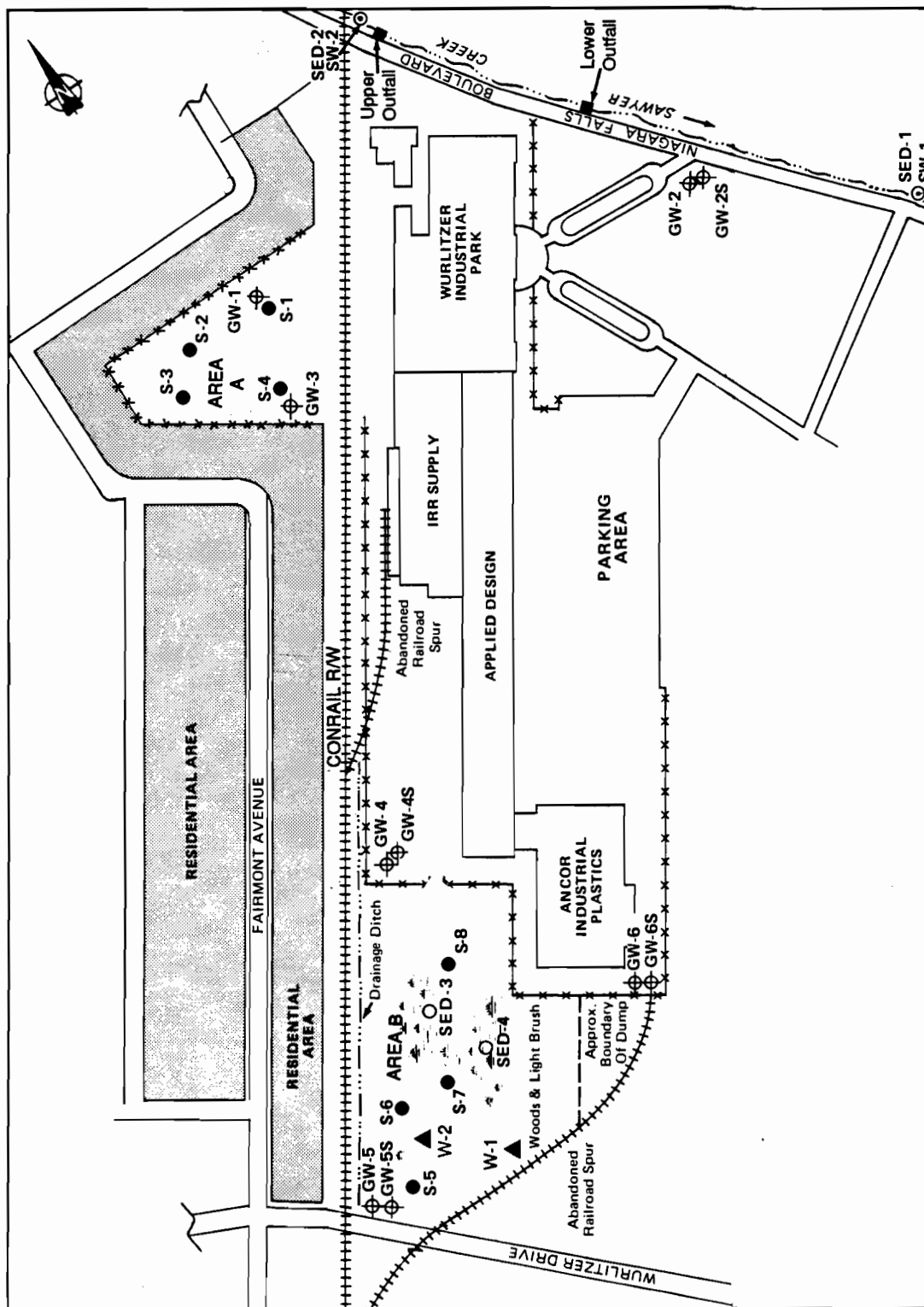
*Data for BNA resampling event.

Table 3-6
SURFACE WATER AND
SEDIMENT SAMPLING LOCATIONS

Sample ID	Matrix	Location
SW-1	Water	Sawyer Creek, downstream of site, across Niagara Falls Boulevard from Melody Lane interchange
SW-2	Water	Sawyer Creek, upstream of site, adjacent to old railroad bridge
SED-1	Sediment	Sawyer Creek, beneath SW-1
SED-2	Sediment	Sawyer Creek, beneath SW-2
SED-3	Sediment	Low point in wetlands on northwest side of Area B
SED-4	Sediment	Low point in wetlands on southeast side of Area B

[UZ]YR2080:D3176/4050/25

Source: Ecology and Environment Engineering, P.C. 1990.



NOT TO SCALE

SOURCE: Ecology and Environment Engineering, P.C.

KEY:

- ⊕ Monitoring Well ● Surface Soil Sample ○ Sediment Sample ⊙ Surface Water and Sediment Sample ▲ Waste Sample

Figure 3-1
SAMPLING LOCATIONS, WURLITZER SITE

4. SITE ASSESSMENT

4.1 SITE HISTORY

The Wurlitzer site, located at 908 Niagara Falls Boulevard in the City of North Tonawanda, Niagara County, New York encompasses approximately 44 acres, 14 of which are occupied by the Wurlitzer building. This site was formerly owned by Wurlitzer Industries and was used to manufacture automatic phonographs, player pianos, and electric organs from 1908 to 1934. From 1934 to 1974, jukeboxes were manufactured at the facility. Defense contracts also formed a significant portion of the business at the facility for at least part of this time. Metal plating was carried out at the plant during some or all of the period of manufacturing operations.

Between 1974 and 1977, Wurlitzer Industries utilized the site as only an engineering and research facility until it closed its North Tonawanda facility in 1977. Subsequently, Wurlitzer Industries changed its name to Wurltech Industries, Inc. Currently, the Wurlitzer building is used as commercial rental space and has approximately 80 tenants. The building is owned by four companies: Wurlitzer Industrial Park, Inc. (not affiliated with the site owner at the time of plant operations), Irr Supply Centers, Inc., Applied Design Company, Inc., and Ancor Industrial Plastics, Inc. (see Figure 1-2). The site as a whole is currently owned by these four companies as well as Blue Bird Coach Lines, Inc., which owns half of Area B.

A review of aerial photographs from 1938 through 1982, which are included in Appendix G, indicates that the manufacturing plant was near its present size in 1938. At that time, there appeared to be minimal activity in Areas A and B. A 1951 aerial view shows earth moving activity in Area A but little in Area B. Aerial photographs from 1958

and 1966 show activity in both areas. This activity is depicted by a lack of vegetation in both areas. Both photos clearly indicated a well-defined path or road in Area B which runs between the vicinities of the newly-installed monitoring wells GW-4 and GW-5. In these photos, stressed vegetation appears to exist only in the southern half of Area B.

Based on a review of aerial photographs, on-site disposal of wastes appears to have occurred in Area B of the site during the manufacture of pianos, organs, jukeboxes, and defense products. Based on this type of manufacturing, scrap metal, heavy metal sludges, degreasing wastes, and plating wastes may have been generated. The disposal of TCE still bottoms, an F001 hazardous waste, has been documented at the site. TCE, as part of a vapor process, was used at the facility as a degreaser for metal parts. Spent solvent was reclaimed in a still and the remaining sludge was disposed of on site "away from the stream" (NYSDOH 1953). Information on waste quantities, years of disposal, and location of disposal of TCE still bottoms is not available. According to a 1953 NYSDOH memo, plating wastes also were spilled and disposed of at the site. These wastes consisted of various acid and alkali cleaners as well as cyanide and other compounds used in the plating of zinc, cadmium, copper, and nickel. Waste quantities, years of practice, and areas of disposal are not known. NYSDEC as well as the NCDOH have identified two probable disposal areas on site. Area A, located west of the Wurlitzer building and north of the inactive railroad tracks was formerly a coal storage area but is currently used as a parking lot. Area B is located southwest of the Wurlitzer building, adjacent to the inactive railroad tracks and Wurlitzer Drive (see Figure 1-2). Area B is currently inactive but is frequently traversed by local residents.

A Phase I investigation was completed by Engineering-Science, Inc., in cooperation with Dames and Moore, Inc., for the NYSDEC Division of Hazardous Waste Remediation in January 1989. This investigation, which included a site inspection in April 1986, detected no organic vapors above background levels up- or downwind on the site with a photoionization detector. Additionally, no exposed wastes were reported. As indicated in the Phase I report and shown in Figure 4-1, Wurlitzer Industries previously owned approximately 400 acres at locations other than the site.

The results of the Phase I investigation are considered incomplete because information concerning processes and wastes generated were not available at the time, and the investigation did not focus on Areas A and B as probable waste disposal locations.

A subsurface and environmental assessment report was prepared in May 1990 by the Buffalo Drilling Company, Inc. (BDC) for Blue Bird Coach Lines, Inc. This study focused on Area B of the Wurlitzer site. During a site walkover by BDC, scattered construction debris, miscellaneous slag and soil fills, and localized oil sheens on ponded water were observed. The random fill materials were identified as concrete and other construction debris, asbestos shingles and roofing materials, deteriorated metal drums, and machine parts. One composite subsurface soil sample from five test borings was analyzed for Hazardous Substance List volatiles and semivolatiles as well as EP Toxicity metals. No organic compounds were detected in this sample. Of the inorganics, barium, cadmium, lead, mercury, and silver were detected in the EP Toxicity extract, but none exceeded the regulatory levels. The conclusion of the BDC report was that "no serious threat to the environment or to the general public was identified" (BDC 1990).

The site is a currently active commercial and industrial facility; however, Area B is currently unused. The site is not actively used for waste disposal. With the exception of Area B, the site is partially enclosed by a chain link fence. Access, however, is easily gained to any portion of the site. During the site reconnaissance the presence of construction debris and drums of oil, grease, and fuel products were noted within the fenced area to the north of Area B. However, during drilling, the amount and types of debris noted in this area were different, indicating that this area is used for temporary storage. The scattered debris in Area B, including asphalt shingles, rusted drums, and construction and demolition debris, was the result of past disposal and did not change during the time of the investigation. During this investigation, only piles of concrete were observed in Area A.

4.2 REGIONAL GEOLOGY AND HYDROGEOLOGY

Niagara County lies within the Central Lowland physiographic province. Specifically, it lies in the eastern lake section and occupies part of the Huron and Ontario Plains (Higgins et al. 1972).

This area, known as the Niagara Frontier, is relatively flat but is broken by two east-west trending escarpments: the Niagara Escarpment and the Onondaga Escarpment. The site lies on the flat area between these escarpments called the Tonawanda Plain. This was the site of the postglacial Lake Tonawanda (Tesmer 1981).

Sediments in this area consist mainly of lacustrine deposits and glacial tills. The lacustrine deposits (i.e., silts and clays that settled to the bottom of a postglacial lake) are generally olive and brownish sediments overlying a red clay. The olive and brownish lacustrine sediments were deposited in glacial Lake Tonawanda following the Wisconsin ice age. These sediments blanket a red clay that was deposited in glacial Lake Lundy following an earlier ice age. Glacial till also occupies a large part of the surface area of the county and underlies most areas of lake sediments. The glacial till deposits consist of ground moraines, drumlins, eskers, and terminal moraines. Ground, or ablation, moraine is formed from material trapped in or on top of the ice and is deposited as the ice stagnates and melts. Ground moraines occupy the low undulating till plain and are approximately 10 to 15 feet thick. Drumlins are rounded hills of bedrock or till that were molded beneath the ice and are elongated in the direction of ice flow. Drumlins in Niagara County are very subdued due to modification by the glacial lakes. Eskers are thin elongated ridges of pebbly till trending northeast-southwest. These ridges may be related to flutings (furrows or grooves cut by glaciers) in the underlying bedrock. The terminal moraines have a general east-west trend and were formed at the terminus of the glacier when the ice stagnated for a long period of time. Other deposits, consisting of glacial outwash and beach deposits, exist in large belts (up to 8 miles long) and are generally 1 to 10 feet thick (Higgins et al. 1972).

Surface drainage of the Ontario Plain is northward into Lake Ontario and soil drainage is relatively poor. Surface drainage of the Huron Plain is southward into Tonawanda Creek and is also not well developed (Higgins et al. 1972).

The lacustrine sediments and glacial till of the Niagara Frontier are underlain by sedimentary rocks varying in thickness between 1,980 to 4,200 feet and are Ordovician, Silurian, and Devonian in age (see Figure

4-2). The lower part of the Ordovician System is composed primarily of limestones and dolostones. The upper part is composed of massive shales, interbedded with thin sandstone layers. These are in turn overlain by the red shales of the Queenston formation (Tesmer 1981).

The Silurian system is composed of the Medina, Clinton, Lockport, and Salina groups. The Medina group consists of sandstones, shales, and siltstones. These are overlain by the limestones, shales, and dolostones of the Clinton, which in turn are overlain by the dolostones of the Lockport group. Above the Lockport are shales, siltstones, dolostones, gypsum, anhydrite, and salt beds of the Salina group. The poorly drained Tonawanda Plain is formed on the weathered surface of the Lockport and Salina groups (Tesmer 1981).

The Devonian system overlies Silurian rocks to the south of Niagara County. The formation at the Devonian-Silurian contact is the Onondaga limestone, a massive cherty limestone that outcrops across most of northern Erie County (Tesmer 1981).

Niagara County has abundant surface waters bordering it: Tonawanda Creek to the south, the Niagara River to the west, and Lake Ontario to the north. The county's municipal water district draws most of its water from the Niagara River. However, rural residents depend on both bedrock and overburden wells. The bedrock wells north of the Niagara Escarpment are dug or drilled into the Queenston shale. The yields of water are often inadequate during extended dry periods and may contain high levels of salt or sulfate. Bedrock wells to the south of the escarpment are drilled into the Lockport dolomite. Yields are generally higher, but the water is hard from high calcium and other base concentrations. Shallow dug wells and springs are common in the three most permeable of the 11 soil associations in Niagara County: the Otisville-Altmar-Fredon-Stafford association, the Howard-Arkport-Phelps association, and the Hilton-Ovid-Ontario association. The shallow wells are less desirable than bedrock wells due to increasing pollution of shallow groundwater, primarily by septage (Higgins et al. 1972). These three associations represent glacial till deposits. The soil at and in the vicinity of the site is not a part of these three members and consists of lacustrine silt and clay overlying a thin till layer. Therefore, the soil near the site is considerably less permeable than other areas of the country.

4.3 SITE GEOGRAPHY

4.3.1 Topography and Land Use

The Wurlitzer site is located on the Huron Plain of the Central Lowland physiographic province. The plain is nearly level and slopes gently westward from an altitude of approximately 600 feet above mean sea level (MSL) on the east to 570 feet above MSL along the Niagara River. The low-lying plain is broken in places by low, narrow, irregular ridges trending northeast-southwest. They extend up to 2 miles in length and are 20 to 50 feet above the general land surface (Higgins et al. 1972).

The ground surface over the site is flat with a <1% slope and is at an elevation of approximately 575 feet above MSL (USGS 1980a). Unpaved areas are generally grass- or brush-covered (e.g., Area B), except in areas of heavy traffic (e.g., Area A).

Area A is currently used as a parking lot and consists mainly of gravel surrounded by grass. Coal was observed beneath the gravel and surface soil in this area. A limited amount of construction debris made up of earth material and reinforced concrete were observed during this investigation. During a 1986 NYSDEC site visit, Area A was observed to be 2 to 6 feet above the level of the surrounding property (residential yards), and scattered debris consisting of rusted drums and pails, ash, roofing tar, and construction and demolition debris.

Area B is sparsely to densely covered by brush and young trees and contains two discrete low-lying swampy areas. Several other areas of ponded water are present in Area B with water depths to 1 foot or more. Scattered and mounded debris was observed across the surface of Area B including rusted drums, asphalt shingles, other construction debris, and discarded metal machine parts.

The site is bordered on the north by Niagara Falls Boulevard, on the west by a Conrail right-of-way and a residential area, to the south by open fields and newly constructed commercial/industrial facilities and to the east by commercial, light industrial, and public properties. Across Niagara Falls Boulevard to the north, in the Town of Wheatfield, is active residential and agricultural land.

4.3.2 Soils

The U.S. Department of Agriculture (USDA) identifies one soil type within the vicinity of the Wurlitzer site: the Canandaigua silt loam. This soil is poorly drained and medium- to fine-textured. A representative profile includes a dark gray silty clay loam topsoil underlain by an olive-gray, firm, silty clay loam to 24 inches. The substratum is a firm, platy, calcareous, grayish brown silt loam. Below 35 inches is fine sand and silt with lenses of clay (Higgins *et al.* 1972).

Subsurface boring logs (Appendix C) indicate that fill material exists in the vicinity of monitoring wells GW-1, GW-3, GW-4, and GW-6. This fill, consisting of construction and industrial demolition debris including brick, asphalt shingle, coal, etc., appears to extend to an approximate average depth of 1 foot. Below this there exists a silt loam. In GW-2, GW-4, GW-5, and GW-6, a thin silty sand lens bearing water was encountered at an average depth of 6 feet. Underlying this lens is a dry, gray, fat clay, which was encountered in all wells. This clay graded downward to a varved red and gray lean clay. The percentage of coarse-grained material in the clay increased with depth until a layer of glacial till, classified as gravelly silt and silt with sand, was encountered just above bedrock. This material had the highest estimated transmissivity of any encountered. The results of the geotechnical analyses (see Appendix D) confirm the general descriptions provided in the subsurface boring logs (see Appendix C) and USDA soil survey.

It is expected that the hydraulic conductivity of the subsurface soil will be considerably greater in the horizontal direction than in the vertical direction due to the presence of the confining clay layers. It is anticipated, however, that the soil will have an average hydraulic conductivity of 10^{-7} to 10^{-5} centimeters/second (cm/s) (Freeze and Cherry 1979).

4.4 SITE HYDROGEOLOGY

The information used to develop the discussion in this subsection includes the data generated during the installation of 10 overburden monitoring wells; a potentiometric groundwater map generated from groundwater level measurements obtained from the monitoring wells installed; United States Geological Survey (USGS) topographic maps and

geological survey maps; the Phase II geophysical study; and regional groundwater reports.

The potentiometric groundwater surface map for the deep overburden aquifer is presented in Figure 4-3, the data used to construct this map are presented in Table 4-1, the geophysical survey results are presented in Appendix B, the subsurface boring logs are presented in Appendix C, and the results of geotechnical analyses of the subsurface soil units are presented in Appendix D.

4.4.1 Geology

The Wurlitzer site is underlain by the Silurian Period Salina Group, specifically the Camillus Shale (Rickard and Fisher 1970, Tesmer 1981). This Late Silurian (Cayugan) unit is about 400 feet thick in western New York. The Camillus varies from thin-bedded shale to massive mudstone and is gray or brownish gray with occasional reddish or greenish beds. Gypsum and anhydrite beds are locally present. No fossils have been found in this unit (Buehler and Tesmer 1963). Some sources suggest that gray limestone may be interbedded with the shale (LaSala 1968). Based upon the subsurface boring logs, depths to bedrock ranged from approximately 31 feet below the ground surface (BGS) in GW-3 to approximately 38 feet BGS in GW-4. Accounting for surface elevation differences, bedrock was encountered approximately 4 to 8 feet deeper in Area B than in Area A.

4.4.2 Hydrology

Groundwater

The groundwater beneath the Wurlitzer site occupies three separate water-bearing zones. The shallow water-bearing zone is comprised of silty sand lenses that are isolated from below by a relatively impermeable gray lacustrine clay. These silty sand lenses were encountered in subsurface borings GW-2, GW-4, GW-5, and GW-6 (see subsurface boring logs, Appendix C). The lenses are discontinuous, but it is suspected that groundwater in them flows toward Sawyer Creek to the northeast and perhaps to Bull Creek to the east, depending upon their continuity. Lack of water table elevation data makes this assessment difficult. In

addition, the lenses receive water through direct surface infiltration and their saturation is highly dependent upon weather conditions.

Due to the low volume of water retained in the shallow silty sand lens, the main aquifer of concern below the site is a deep overburden aquifer. The water table was encountered during drilling in a unit consisting of lean clay and silty clay at an approximate depth of 14 feet below ground surface. The most transmissive zone in this aquifer was found beneath the clay and consists of a gravelly silt till layer just above bedrock.

The permeability of this soil is expected to vary greatly depending upon the percentage of coarse-grained material encountered. Based upon a USGS observation well in the Niagara region, which is set in the lacustrine clay and silt, the permeability is estimated to be 0.04 gallons per day per square foot (gpd/ft²). In comparison, a similar well in the region which penetrates the glacial till yielded an estimated permeability of 23 gpd/ft² (Johnston 1964).

In addition, a bedrock aquifer in the Camillus Shale is suspected to exist beneath the site. This aquifer, however, was not included in the Phase II investigation. Generally, the shale is relatively impermeable; however, dissolved and partly dissolved gypsum layers in the Camillus carry a significant amount of water. The result is that the horizontal hydraulic conductivity is many times greater than the vertical hydraulic conductivity. Well tests in the Camillus indicate that the specific capacity ranges from 4 to 83 gallons per minute per foot (gpm/ft) and the coefficient of transmissibility ranges from 7,000 to 70,000 gallons per day per foot (gpd/ft) (LaSala 1968).

Groundwater elevations measured in each of the monitoring wells were used to develop a potentiometric surface map depicting a probable direction of groundwater flow within the deep overburden aquifer. Water level data are presented in Tables 3-3 and 4-1. Interpretation of the geohydrologic conditions of the site are complicated by the existence of the wetlands, creek, and years of industrial activity in the area. Figure 4-3 indicates that groundwater in the deep overburden aquifer is recharged from areas west and south of the site. Groundwater in the deep overburden appears to flow toward Area B from all directions except the northeast. This water then flows northeast from Area B to Sawyer

Creek. Sawyer Creek is at approximately the same elevation as the potentiometric surface in GW-2; therefore, it appears that groundwater discharges to Sawyer Creek. Based upon Figure 4-3, GW-6 appears to serve as the upgradient well for Area B, while GW-4 appears to serve as the downgradient well for Area B. GW-5 appears to only partly intercept groundwater from Area B. Furthermore, GW-3 is assumed to be upgradient of Area A, while GW-1 is assumed to serve as the downgradient well for Area A. In addition, GW-2 appears to be downgradient of the entire site.

More complete groundwater flow information for the silty sand lenses could not be obtained due to the lack of water level data from some of the shallow wells. Based on the limited data acquired, it is evident that a downward vertical hydraulic gradient exists. However, the apparent seasonality of water within the sand lenses and the presence of a dry clay aquitard beneath the lenses suggests that no actual downward flow occurs.

Surface Water

The only surface water observed at the Wurlitzer site was in Area B. In this area, two distinct marshy areas exist: one on the northwestern side and one to the southeast (see Figure 1-2). In addition, standing water was observed in a ditch alongside the railroad tracks adjacent to Area B. These surface water bodies were observed during the site reconnaissance on May 7 and 8, 1990; however, during the sampling event on August 28 and 29, 1990, no surface water was observed on site.

Surface water bodies located in the vicinity of the site include Sawyer Creek, Bull Creek, Tonawanda Creek, and the Niagara River. Sawyer Creek, a Class D stream, lies directly across Niagara Falls Boulevard from the site. This creek flows southeast where it converges with Bull Creek, 0.5 mile from the site. Bull Creek, a Class C stream, flows south, converging with Tonawanda Creek at a point 1 mile southeast of the site. Tonawanda Creek, a Class C stream which is part of the Erie Canal system, converges with the Niagara River approximately 2.9 miles in a direct line southwest of the site. The distance downstream from the site to the Niagara River is approximately 6 miles. Municipal

drinking water supply intakes are located in the Niagara River near its confluence with Tonawanda Creek (NYSDEC 1986, USGS 1980a, b). These intakes, however, are isolated from Tonawanda Creek's flow by Tonawanda Island.

The nearest NYSDEC-listed freshwater wetland lies just over 1 mile south of the site, and is designated as TE-12.

4.5 SITE CONTAMINATION ASSESSMENT

Analytical data for the contamination assessment are presented in Appendix E. For TCL organic and inorganic analyses, all positive reported values and qualifiers for samples are presented on data summary forms.

All CLP data packages were reviewed to determine whether qualified data were acceptable for the intended use. In general, common laboratory contaminants, including methylene chloride, acetone, 2-butanone, and phthalate compounds, are considered background contamination and not evaluated if the values in the field samples are qualified with a "B" and levels are less than 10 times the quantitation limit. TCL organic compounds detected below the quantitation limit are not included in the summary tables presented below unless necessary for field duplicate assessment or comparison with other samples. These results, however, are discussed in the text and are presented in Appendix E. Inorganic analytes detected above the instrument detection limit but below the contract required quantitation limit are only presented below when necessary for comparison or inclusion in a range.

Water samples GW-1, GW-2, GW-3, GW-4, GW-5, GW-6, GW-4S, and SW-1 were analyzed for cyanide 14 days from sample receipt, and thus within the holding time of 14 days.

Soil samples S-2, S-3, and S-4 were analyzed for cyanide 30 days after receipt. Unknown to the laboratory, sulfide was present in these samples. Initial distillation produced cloudy distillates due to the sulfide. Redistillation after removal of the sulfide took place 30 days after sample receipt due to a scheduling error. Due to the presence of sulfide, the holding time for cyanide analysis is 24 hours. This was exceeded by 29 days for these three soil samples. Cyanide was detected in S-2, S-3, and S-4 at 22.7, 11.2, and 3.3 mg/kg, respectively. Actual

cyanide levels in these samples are probably higher, since cyanide would be reduced in the presence of sulfide. However, with consideration that the cyanide results are low estimates, they are still usable for the purposes of this investigation. The soil criterion for cyanide is 2,000 mg/kg in the Federal Register, Vol. 55, No. 145, p. 30866, July 27, 1990, as well as in NYSDEC's October 1991 Draft Cleanup Policy and Guidelines. The cyanide results obtained, even though low estimates, are substantially lower than this criterion.

4.5.1 Groundwater

One groundwater sample was collected from each of eight of the 10 newly installed monitoring wells on August 29, 1990. As discussed in Section 3.2.6, monitoring wells GW-2S and GW-5S were dry when sampling was attempted and GW-6S yielded very low volume. Monitoring wells GW-2S, GW-4S, GW-5S, and GW-6S monitor shallow overburden silty sand lenses while GW-1 through GW-6 monitor the deep overburden aquifer which is located just above the top of bedrock. While a downward vertical hydraulic gradient exists between the shallow lenses and the deep aquifer, the presence of a dry clay aquitard between the two suggests that little or no downward flow occurs. All samples were analyzed for TCL organics and inorganics with the exception of GW-6S, which was analyzed for only TCL organics due to low sample volume.

Due to poor surrogate recovery during the original BNA analyses, monitoring wells GW-1 to GW-4 were resampled for BNAs only on October 24, 1990. Any necessary data qualification is included in the data summary forms presented in Appendix E.

In the sample of water obtained from an on-site hydrant that was used during the drilling of the monitoring wells and for decontamination, no TCL compounds or analytes were detected above NYSDOH maximum contaminant levels (MCLs) or NYSDEC Class GA standards except iron at 357 µg/L. The only organic compound detected in this sample, which is not attributable to laboratory contamination, was chloroform at 9 µg/L, which is common in chlorinated water supplies. Therefore, the quality of this water did not have an impact on the investigation.

Analysis of the groundwater samples showed no TCL volatile or semivolatile compounds above detection limits or significantly above concentrations found in the method blank.

Table 4-2 lists all inorganic elements detected in the groundwater samples.

Of the inorganics detected, cadmium, chromium, copper, iron, lead, magnesium, manganese, and zinc were found to exceed appropriate NYSDEC Class GA standards or guidance values. Cadmium and copper were found to exceed the standards in GW-1 only, which appeared to be downgradient of Area A at the time of sampling (see Figure 4-3). When the concentrations of cadmium and copper in GW-1 are compared to the concentrations in GW-3, which appeared to be upgradient of Area A at the time of sampling, neither analyte constitutes an observed release (USEPA 1984).

Iron and manganese were found to exceed the standards in all samples. Additionally, magnesium exceeded the guidance value in all samples except GW-4. When the concentrations of these three analytes in downgradient well GW-2 are compared to upgradient well GW-6, magnesium and manganese constitute an observed release (USEPA 1984). However, iron, magnesium, and manganese are commonly high in turbid, unfiltered samples and variations in concentration are commonly caused by chemical variations in the soil. This may be the case at this site since the concentrations of these three analytes were lower in downgradient well GW-4 than in upgradient well GW-6.

Lead was found to exceed the Class GA standard in GW-1, GW-2, GW-3, and GW-6; however, when up- and downgradient concentrations are compared, no observed release exists. Zinc was found to exceed the Class GA standard in GW-1, GW-2, GW-3. The concentration of zinc in GW-1 does not constitute an observed release when compared to GW-3. When the concentration in GW-2 is compared to GW-6, an observed release does exist; however, the concentration in GW-4, which is also downgradient, is lower than in the upgradient well.

Of the wells monitoring the shallow perched silty sand lens, only GW-4S could be sampled for inorganics due to low sample volume and dry conditions in the other shallow wells. The only inorganic analytes detected above NYSDEC Class GA standards in GW-4S include iron at 8,460 µg/L and manganese at 514 µg/L, both of which are commonly high in turbid, unfiltered samples.

4.5.2 Surface Soil

Eight surface soil samples were collected at the Wurlitzer site. Four were collected from Area A (S-1 through S-4) and four were collected from Area B (S-5 through S-8). Detailed locations are described in Section 3.2.7. The most common class of chemicals detected was PAHs. All of the TCL organic compounds detected above the quantitation limits are listed in Table 4-3.

The total PAH concentration in S-1 is estimated to be 2,200 µg/kg. Of this total, only fluoranthene at 440 µg/kg was detected above the quantitation limit. 4,4'-DDE was also detected, but below instrument quantitation limits. Di-n-butylphthalate was found to be present at approximately 100 times the concentration detected in the associated method blank. While it cannot be confirmed, this is most likely due to excessive handling with rubber gloves in the field and/or laboratory.

The total PAH concentration in S-2 is estimated to be 5,100 µg/kg. Of this total, 3,800 µg/kg are attributed to compounds detected above quantitation limits, including phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, and benzo(b)fluoranthene. The only other compound detected above the quantitation limit was 4,4'-DDT at 59 µg/kg; however, 4,4'-DDE was also detected, but below the quantitation limit. In addition, 2-butanone was detected at an estimated concentration of 3 µg/kg and was not detected in the method blank. However, this compound may still be attributable to laboratory contamination, especially at such a low concentration. Di-n-butylphthalate was detected at approximately 20 times the concentration detected in the associated method blank. However, while it cannot be confirmed, this is most likely due to excessive handling with rubber gloves in the field and/or laboratory. Furthermore, dibenzofuran was detected below the quantitation limit.

The total PAH concentration in S-3 is estimated to be 2,800 µg/kg, of which 950 µg/kg is attributed to compounds detected above the quantitation limits, including fluoranthene and pyrene. No other organic compounds were detected significantly above the levels in the method blank.

The total PAH concentration in S-4 is estimated to be 2,300 µg/kg; however, no PAHs were detected above the quantitation limits. Compounds

that were detected above the quantitation limits include 4,4'-DDE at 32 µg/kg and 4,4'-DDT at 68 µg/kg. In addition, the following non-PAH compounds were detected below the quantitation limits: methoxychlor, dibenzofuran, and Aroclor-1254, a PCB.

The total PAH concentration in S-5 is estimated to be 920 µg/kg; however, no organic compound was found to be present above instrument quantitation limits. In addition, 2-butanone was detected below the quantitation limits. While this compound was not detected in the method blank, it may still be attributable to laboratory contamination, especially as such a low concentration.

The total PAH concentration in S-6 is estimated to be 1,800 µg/kg; however, no organic compound was found to be present above instrument quantitation limits. Other non-PAH compounds detected below the quantitation limits included 4,4'-DDE and Aroclor-1254.

The total PAH concentration in S-7 is estimated to be 26,000 µg/kg, of which 24,000 µg/kg is attributed to compounds detected above the quantitation limits including acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(a)pyrene. The only other compound detected above the quantitation limit was trichloroethene at 7 µg/kg. In addition, dibenzofuran and dimethylphthalate were detected below the quantitation limits. Dimethylphthalate was not detected in the method blank.

The total PAH concentration in S-8 is estimated to be 13,000 µg/kg; however, no PAHs were detected above instrument quantitation limits, primarily due to the necessary five-fold dilution. Compounds that were detected above the quantitation limits include endosulfan sulfate at 190 µg/kg and Aroclor-1254 at 750 µg/kg. In addition, dibenzofuran and dimethylphthalate were detected below the quantitation limits. Dimethylphthalate was not detected in the method blank.

The inorganic elements detected in the surface soil samples are listed in Table 4-4. Common ranges were obtained from Lindsay 1979 as well as Shacklette and Boerngen 1984. Antimony was detected above the common range in S-2 at 17.4 mg/kg and in S-4 at 16.0 mg/kg. Barium was found to exceed the common range in S-8 only, at 6,900 mg/kg. Cadmium was detected above the common range in all surface soil samples with the

exception of S-7, and ranged from 2.0 to 74.8 mg/kg. Copper was found to exceed the common range in S-8 only, at 1,360 mg/kg. Furthermore, lead exceeded the common range in S-6 at 464 mg/kg and in S-8 at 1,280 mg/kg. Silver exceeded the common range in S-6 and S-8, as well, at 9.3 and 6.8 mg/kg, respectively. Lastly, zinc exceeded the common range in S-8 only, at 3,050 mg/kg.

In addition, cyanide was detected in S-2, S-3, S-4, and S-8 at estimated concentrations of 22.7, 11.2, 3.3, and 130 mg/kg, respectively. The concentrations in S-2, S-3, and S-4 may be biased low, however, due to the presence of sulfides in those samples.

EP Toxicity analysis for metals was applied to S-3 and S-4 from Area A as well as S-6 and S-8 from Area B. The only metals detected were in sample S-8 and were barium at 16 mg/L and cadmium at 0.34 mg/L, both of which are below the regulatory levels of 100 and 1.0 mg/L, respectively.

4.5.3 Surface Water/Sediment

Two of four proposed surface water samples were collected. SW-1 was collected off site from Sawyer Creek, a Class D stream, downstream of the site. Corresponding sediment sample SED-1 was collected immediately beneath SW-1. SW-2 was collected off site from Sawyer Creek, upstream of the site. Corresponding sediment sample SED-2 was collected immediately beneath SW-2. SW-3 and SW-4 were not collected because both marshy regions in Area B were dry during the sampling event. However, SED-3 and SED-4 were collected from the lowest points in the northwestern and southeastern wetlands, respectively.

The only TCL organic compound detected above the quantitation limit in either surface water sample was trichloroethene in SW-1 at a concentration of 9 µg/L, which exceeds the NYSDEC regulatory limit for Class D streams (see Table 4-5). In addition, total-1,2-dichloroethene was detected below the quantitation limit in SW-1.

Table 4-6 lists the inorganic compounds detected in the surface water samples. The only compound found to exceed NYSDEC Class D standards was iron, detected at 1,130 µg/L in SW-1 and 1,480 µg/L in SW-2.

TCL organic compounds detected in the sediment samples are listed in Table 4-7. PAHs were detected in all four sediment samples. In

SED-1, the concentration of total PAHs is estimated to be 7,200 µg/kg, of which 5,300 µg/kg is attributed to compounds detected above the quantitation limits. Furthermore, Aroclor-1254 was detected at 380 µg/kg. In addition, total xylenes were detected below the quantitation limit.

The total PAH concentration in SED-2 is estimated to be 9,000 µg/kg, of which 3,400 µg/kg is attributed to compounds detected above the quantitation limits. Furthermore, Aroclor-1254 was detected at 940 µg/kg. In addition, the following non-PAH compounds were detected in SED-2 at estimated values: total 1,2-dichloroethene, 2-butanone, trichloroethene, and butyl benzyl phthalate. While not detected in the method blank, phthalate compounds are common laboratory contaminants. SED-2 contains the highest total concentration of contaminants.

The concentration of total PAHs in SED-3, which is from the northwestern wetland in Area B, is estimated to be 1,500 µg/kg; however, no organic compounds were detected in SED-3 above the quantitation limits. In addition, benzoic acid was detected below the quantitation limit.

The concentration of total PAHs detected in SED-4, from the southeastern wetland in Area B, is estimated to be 4,800 µg/kg, of which 1,300 µg/kg is attributed to compounds detected above the quantitation limits. In addition, Aroclor-1254 was detected above the quantitation limit at 490 µg/kg.

Table 4-8 lists the inorganic elements detected in the sediment samples. Standard ranges were obtained from Lindsay 1979 as well as Shacklette and Boerngen 1984. The inorganic analytes detected above standard ranges in SED-1 and SED-2 include only cadmium at 29.8 and 14.6 mg/kg, respectively. Those inorganics detected above the standard range in SED-3 include cadmium at 45.2 mg/kg, lead at 316 mg/kg, and silver at 47.4 mg/kg. Those inorganics detected above the standard range in SED-4 include antimony at 23.6 mg/kg and cadmium at 13.9 mg/kg.

In addition, cyanide was detected in SED-2 and SED-3 only, at estimated concentrations of 2.2 and 2.3 mg/kg, respectively.

4.5.4 Contamination Assessment Summary

Based on analytical results from Phase II sampling, the primary threat to human health and the environment posed by the Wurlitzer site is direct contact with contaminated surface soil and waste. Surface

soil has been found to contain PAHs, pesticides, TCE, and Aroclor-1254, as well as heavy metals above common ranges including antimony, barium, cadmium, copper, lead, silver, and zinc. Waste samples collected by NYSDEC contained significant concentrations of several volatile and semivolatile organic compounds, PAHs, pesticides, cadmium, and sodium at concentrations above common ranges. An additional threat may be posed by contamination resulting from disposal of TCE still bottoms and the possible disposal of plating wastes containing heavy metals, cyanide, and other compounds. The continuing presence of these wastes is supported, but not confirmed, by analytical results from samples taken at the site. Disposal quantities and locations of TCE and plating wastes are not known; therefore, an adequate assessment of the current threat potentially posed by the disposal of these wastes is not possible at this time.

VOCs detected at the site include TCE in one surface soil sample at 7 µg/kg and in one surface water sample at 9 µg/kg. VOCs detected in the tar sample collected from Area B by NYSDEC include acetone at 2,200 µg/kg, toluene at 1,100 µg/kg, ethylbenzene at 1,300 µg/kg, total xylenes at 9,800 µg/kg, and chlorobenzene below quantitation limits.

Semivolatiles detected at the site include PAHs in soil, sediment, and tar. Also detected in the tar sample was 1,2-dichlorobenzene at 370,000 µg/kg, and 1,2,4-trichlorobenzene and 1,4-dichlorobenzene below quantitation limits.

Various PAHs were detected in all eight surface soil samples at estimated concentrations ranging from 920 µg/kg to 26,000 µg/kg. PAHs were also detected in all four sediment samples with estimated concentrations ranging from 1,500 µg/kg to 9,000 µg/kg. Including those PAHs detected below quantitation limits, the total PAH concentration in the tar sample collected by NYSDEC was approximately 3,060,000 µg/kg.

PAHs may be formed by natural processes such as microbial synthesis and forest fires. Anthropogenic sources of PAHs include the iron and steel industry, petroleum industry, coal tar pitch, asphalt, heating and power generation, refuse incineration, open burning, and emissions from internal combustion engines. Typical concentrations of PAHs in soil range from 0.4 µg/kg in protected, remote areas to 650,000 µg/kg in industrial areas (Edwards 1983). The concentrations of PAHs detected in

soil and sediment at the Wurlitzer site are typical of industrial areas and areas surrounded by heavily transported roads and railroad tracks.

Pesticides detected above the quantitation limits include 4,4'-DDE, 4,4'-DDT, and endosulfan sulfate. These compounds were detected in surface soil samples S-2, S-4, and S-8, with total concentrations ranging from 59 µg/kg to 190 µg/kg. Pesticides were also detected in the waste samples collected from Area B by NYSDEC. Endrin was found in the tar sample at 1,100 µg/kg, and methoxychlor was found in the drum sample at 270 µg/kg. The tar sample also contained 4,4'-DDD, methoxychlor, and endrin ketone below quantitation limits. Since these pesticides are persistent in the environment, these levels are most likely attributable to past spraying events in the vicinity.

In addition, a PCB, specifically Aroclor-1254, was detected above quantitation limits in three sediment samples and one soil sample, ranging from 380 µg/kg to 940 µg/kg. The highest concentration detected was in SED-2, the sample collected from Sawyer Creek upstream of the site. While this sample was collected upstream of the site, it was only about 25 feet upstream of a discharge pipe carrying water from the site. While no eddying of Wurlitzer discharge was observed at the time of sampling, mixing of Wurlitzer wastewater has been observed 35 to 40 feet upstream of the discharge pipe (NYSDEC 1965). Therefore, contaminants detected in SED-2 may also be site-related.

Cadmium and copper were found to exceed NYSDEC Class GA standards in groundwater sample GW-1 at 15.7 and 227 µg/L, respectively; however, neither constituted an observed release. Cadmium was also found to exceed the common range in all soil and sediment samples, with the exception of S-7, and ranged from 2.0 to 74.8 µg/kg. Cadmium in the tar sample exceeded the common range with a concentration of 4.3 mg/kg. Copper exceeded the common range in one soil sample (S-8) at 1,360 µg/L.

Lead was found to exceed NYSDEC Class GA standards in four groundwater samples, ranging from 43.0 to 123 µg/L; however, it did not constitute an observed release. Lead was also found to exceed the common range in two soil samples and one on-site sediment sample, ranging from 316 to 1,280 µg/kg.

Zinc was found to exceed NYSDEC Class GA standards in three groundwater samples, ranging from 414 to 832 µg/L. In addition, zinc exceeded the common range in one soil sample (S-8) at 3,050 µg/L.

Cadmium, copper, lead, and zinc are all, in varying proportions, natural components of soil and rock material. In addition, these contaminants are also released to the environment as a result of fuel combustion (ATSDR 1987, 1988a).

BDC's investigation of Area B included the analysis of one composite soil sample which contained no organic compounds and no inorganics in an EP Toxicity extract above regulatory levels. The BDC investigation failed to show evidence of hazardous waste disposal.

4.6 CONCLUSIONS AND RECOMMENDATIONS

Hazardous waste disposal has been documented at the site, and hazardous substances have been detected in various media at the site. However, while the detection of TCE, cyanide, and heavy metals supports the documented and alleged disposal, no conclusive evidence of the continuing presence of hazardous waste was provided by the sample results especially in light of the urban/industrial nature of the site area. This is due in part to the fact that information documenting manufacturing processes, wastes produced, and hazardous waste disposal was not available at the start of the investigation and waste disposal locations were not provided by this data. The lack of disposal data in the planning stages did not allow focusing of the investigation on finding disposal locations. In addition, the lack of waste disposal location information does not allow conclusive interpretation of sample analytical results with respect to the current potential threat posed by past hazardous waste disposal. In addition, other hazardous substances detected, including pesticides, PAHs, and PCBs, may also pose a threat but are not related to documented disposal at the site. The principal immediate threat to public health and the environment posed by the Wurlitzer site is potential direct contact with or ingestion of surface soil and waste. Based on analytical results, elevated levels of PAHs, heavy metals, pesticides, PCBs, and several organic compounds including TCE have been found in surface soil, sediment, and waste samples at the Wurlitzer site.

Based on this information, certain mitigative actions can be taken to reduce the threat posed by direct contact with contaminated surface soil and waste. Appropriate actions to be considered include:

- o All piles of construction and industrial demolition debris in Area A and Area B, as well as the exposed, rusted drums in Area B, should be removed for proper disposal; and
- o Area B should be enclosed within a chain link fence to prevent access by local residents, which is common. Area A is already partly enclosed by a fence and appears to be used only for parking.

However, a final decision about appropriate reclassification of the site cannot be made until recently acquired hazardous waste documentation data are investigated. Recommendations for further investigation include:

- o Attempting to locate the still bottom disposal area;
- o Location of sumps under the former plant building and their connection to discharge pipes on Sawyer Creek;
- o Further definition of disposal areas along railroad tracks;
- o Additional sampling in Sawyer Creek at located discharge points; and
- o Assessment of whether disturbance to site property and probable disposal seen on historical aerial photographs is related to hazardous waste disposal.

Table 4-1
MONITORING WELL WATER LEVEL DATA

Well	Date Completed	Total Depth Below Ground Surface (feet)	Water Level Elevation (feet)		
			8-28-90	9-20-90	10-24-90
GW-1	8-2-90	32.5	563.4	NA	563.2
GW-2	8-8-90	33.5	563.7	NA	563.1
GW-2S	8-13-90	8.5	Dry	Dry	NA
GW-3	8-2-90	31.25	564.9	NA	565.3
GW-4	8-6-90	38.5	563.5	NA	563.4
GW-4S	8-14-90	8.0	568.8	Dry	NA
GW-5	8-9-90	36.75	564.4	NA	NA
GW-5S	8-10-90	7.0	Dry	Dry	NA
GW-6	8-7-90	34	565.6	NA	NA
GW-6S	8-13-90	8.5	567.9	565.9	NA

[UZ]YR2080:D3176/6880/30

NA = Reading not acquired

Source: Ecology and Environment Engineering, P.C. 1990.

Table 4-2
INORGANIC ELEMENTS DETECTED IN GROUNDWATER SAMPLES

Element	Range (µg/L)	NYSDEC Class GA Regulatory Standard (µg/L)	Samples Exceeding Standard	
			Sample Number	Concentration (µg/L)
Aluminum	4,040 - 77,600	NA	--	--
Arsenic	ND - 20.8	25	--	--
Barium	54.0 - 919	1,000	--	--
Beryllium	ND - 1.6	3G	--	--
Cadmium	ND - 15.7	10	GW-1	15.7
Calcium	84,800 - 1,110,000	NA	--	--
Chromium	11.8 - 137	50	GW-1	137
			GW-2	59.2
			GW-3	117
			GW-6	61.4
Cobalt	ND - 76.4	NA	--	--
Copper	ND - 227	200	GW-1	227
Iron	8,460 - 163,000	300	GW-1	163,000
			GW-2	88,700
			GW-3	126,000
			GW-4	13,100
			GW-4S	8,460
			GW-5	12,500
Lead	9.0 - 125	25	GW-6	55,800
			GW-1	123
			GW-2	125
			GW-3	87.5
Magnesium	30,400 - 342,000	35,000G	GW-6	43.0
			GW-1	270,000
			GW-2	342,000
			GW-3	92,000
			GW-4S	57,700
			GW-5	39,400
Manganese	480 - 6,000	300	GW-6	65,000
			GW-1	4,880
			GW-2	6,000
			GW-3	2,750
			GW-4	558
			GW-4S	514
Mercury	ND - 0.26	2	GW-5	480
			GW-6	1,810
			--	--
			--	--
Nickel	ND - 170	NA	--	--
Potassium	2,820 - 164,000	NA	--	--
Sodium	37,000 - 105,000	NA	--	--

[UZ]YR2080:D3176/6881/25

Table 4-2 (Cont.)

Element	Range ($\mu\text{g/L}$)	NYSDEC Class GA Regulatory Standard ($\mu\text{g/L}$)	Samples Exceeding Standard	
			Sample Number	Concentration ($\mu\text{g/L}$)
Thallium	ND - 2.3	4G	--	--
Vanadium	ND - 224	NA	--	--
Zinc	62.3 - 832	300	GW-1	640
			GW-2	832
			GW-3	414

[UZ]YR2080:D3176/6881/25

G = Guidance value.
 NA = No regulatory standard.
 ND = Not detected.

Source: Ecology and Environment Engineering, P.C. 1990.

Table 4-3
ORGANIC COMPOUNDS DETECTED
IN SURFACE SOIL SAMPLES

Compound	Range Found in Samples ($\mu\text{g/kg}$)	Concentration by Sample Number ($\mu\text{g/kg}$)
Total PAHs*	920 - 26,000*	S-1: 2,200* S-2: 5,100* S-3: 2,800* S-4: 2,300* S-5: 920* S-6: 1,800* S-7: 26,000* S-8: 13,000*
Trichloroethene	ND - 7	S-7: 7
4,4'-DDE	ND - 32	S-4: 32
Endosulfan sulfate	ND - 190	S-8: 190
4,4'-DDT	ND - 68	S-2: 59 S-4: 68
Aroclor-1254	ND - 750	S-8: 750

[UZ]YR2080:D3176/4037/31

ND = Not detected.

*Since PAHs were detected in all samples, compounds detected below the CRQL were included in the total. Therefore, these values are considered estimates.

Source: Ecology and Environment Engineering, P.C. 1990.

Table 4-4
INORGANIC ANALYTES DETECTED
IN SURFACE SOIL SAMPLES

Compound	Range Found in Samples (mg/kg)	Common Range in U.S. Soils* (mg/kg)	Samples Exceeding Standard Range	
			Sample Number	Concentration (mg/kg)
Aluminum	4,140 - 36,000	7,000 - >100,000	--	--
Antimony	ND - 17.4	<1 - 8.8	S-2 S-4	17.4 16.0
Arsenic	1.2 - 16.9	<0.1 - 73	--	--
Barium	77.2 - 6,900	10 - 1,500	S-8	6,900
Beryllium	ND - 5.6	<1 - 7	--	--
Cadmium	ND - 74.8	0.01 - 0.70	S-1 S-2 S-3 S-4 S-5 S-6 S-8	2.4 2.3 8.8 2.6 2.0 47.7 74.8
Calcium	9,330 - 176,000	100 - 280,000	--	--
Chromium	6.6 - 608	1 - 1,000	--	--
Cobalt	ND - 15.7	<0.3 - 70	--	--
Copper	11.6 - 1,360	<1 - 700	S-8	1,360
Iron	5,720 - 103,000	100 - >100,000	--	--
Lead	14.3 - 1,280	<10 - 300	S-6 S-8	464 1,280
Magnesium	1,460 - 29,100	50 - 50,000	--	--
Manganese	92.1 - 3,600	<2 - 7,000	--	--
Mercury	ND - 0.61	<0.01 - 3.4	--	--
Nickel	6.4 - 216	<5 - 700	--	--
Potassium	582 - 2,600	50 - 37,000	--	--
Selenium	ND - 1.1	<0.1 - 3.9	--	--
Silver	ND - 9.3	0.01 - 5	S-6 S-8	9.3 6.8
Sodium	446 - 23,100	<500 - 50,000	--	--
Vanadium	7.7 - 76.2	<7 - 300	--	--
Zinc	54.6 - 3,050	<5 - 2,900	S-8	3,050
Cyanide	ND - 130	NA		

[UZ]YR2080:D3176/6883/20

ND = Not detected.

*After Lindsay 1979 and Shacklette and Boerngen 1984.

Source: Ecology and Environment Engineering, P.C. 1990.

Table 4-5
ORGANIC COMPOUNDS DETECTED IN
SURFACE WATER SAMPLES

Compound	Range Found in Samples ($\mu\text{g/L}$)	NYSDEC Ambient Water Standard ($\mu\text{g/L}$)	Samples Exceeding Standard	
			Sample Number	Concentration ($\mu\text{g/L}$)
Trichloroethene	ND-9	11*	--	--

[UZ]YR2080:D3176/6884/29

*Guidance value.

Note: NYSDEC Class D water standards apply.

Source: Ecology and Environment Engineering, P.C. 1990.

Table 4-6
INORGANIC ELEMENTS DETECTED
IN SURFACE WATER SAMPLES

Compound	Range Found in Samples ($\mu\text{g/L}$)	NYSDEC Ambient Water Standard ($\mu\text{g/L}$)	Samples Exceeding Standard	
			Sample Number	Concentration ($\mu\text{g/L}$)
Aluminum	526 - 681	NA	--	--
Arsenic	1.5 - 3.4	360	--	--
Barium	34.2 - 36.9	NA	--	--
Calcium	39,900 - 48,800	NA	--	--
Chromium	ND - 16.5	2,220 ^a	--	--
Copper	ND - 23.4	29.4 ^b	--	--
Iron	1,130 - 1,480	300	SW-1 SW-2	1,130 1,480
Lead	9.8 - 21.0	121 ^a	--	--
Magnesium	8,620 - 12,000	NA	--	--
Manganese	58.2 - 521	NA	--	--
Nickel	ND - 17.6	2,320 ^a	--	--
Potassium	2,320 - 2,600	NA	--	--
Selenium	ND - 1.2	NA	--	--
Sodium	53,200 - 65,500	NA	--	--
Thallium	ND - 4.0	20	--	--
Zinc	51.5 - 164	412 ^a	--	--

[UZ]YR2080:D3176/4042/26

Note: NYSDEC Class D water standards apply.

ND = Not detected.

NA = No regulatory limit.

^a Based on the hardness of SW-1 calculated to be 135 ppm.

^b Based on the hardness of SW-2 calculated to be 171 ppm.

Source: Ecology and Environment Engineering, P.C. 1990.

Table 4-7
ORGANIC COMPOUNDS DETECTED IN SEDIMENT SAMPLES

Compound	Range Found in Samples ($\mu\text{g}/\text{kg}$)	Concentration in Affected Samples ($\mu\text{g}/\text{kg}$)			
		SED-1	SED-2	SED-3	SED-4
Total PAHs	1,500 - 9,000*	7,200*	9,000*	1,500*	4,800*
Aroclor-1254	ND - 940	380	940	ND	490

[UZ]YR2080:D3176/4043/25

ND = Not detected.

*Since PAHs were detected in all samples, compounds detected below the CRQL were included in the total. Therefore, these values are considered estimates.

Source: Ecology and Environment Engineering, P.C. 1990.

Table 4-8
INORGANIC ELEMENTS DETECTED IN SEDIMENT SAMPLES

Compound	Range Found in Samples (mg/kg)	Standard Range in U.S. Soils* (mg/kg)	Samples Exceeding Standard Range	
			Sample Number	Concentration (mg/kg)
Aluminum	3,890 - 10,300	7,000 - >100,000	--	--
Antimony	ND - 23.6	<1 - 8.8	SED-4	23.6
Arsenic	1.7 - 8.2	<0.1 - 73	--	--
Barium	74.2 - 1,320	10 - 1,500	--	--
Cadmium	13.9 - 45.2	0.01 - 0.70	SED-1	29.8
			SED-2	14.6
			SED-3	45.2
			SED-4	13.9
Calcium	6,140 - 21,200	100 - 280,000	--	--
Chromium	49.4 - 635	1 - 1,000	--	--
Cobalt	4.4 - 6.2	<0.3 - 70	--	--
Copper	76.9 - 490	<1 - 700	--	--
Iron	8,510 - 51,700	100 - >100,000	--	--
Lead	36.1 - 316	<10 - 300	SED-3	316
Magnesium	806 - 8,410	50 - 50,000	--	--
Manganese	62.5 - 248	<2 - 7,000	--	--
Mercury	ND - 1.2	<0.01 - 3.4	--	--
Nickel	31.0 - 77.7	<5 - 700	--	--
Potassium	290 - 660	50 - 37,000	--	--
Selenium	ND - 2.4	<0.1 - 3.9	--	--
Silver	ND - 47.4	0.01 - 5	SED-3	47.4
Sodium	407 - 678	<500 - 50,000	--	--
Vanadium	10.3 - 20.7	<7 - 300	--	--
Zinc	230 - 838	<5 - 2,900	--	--

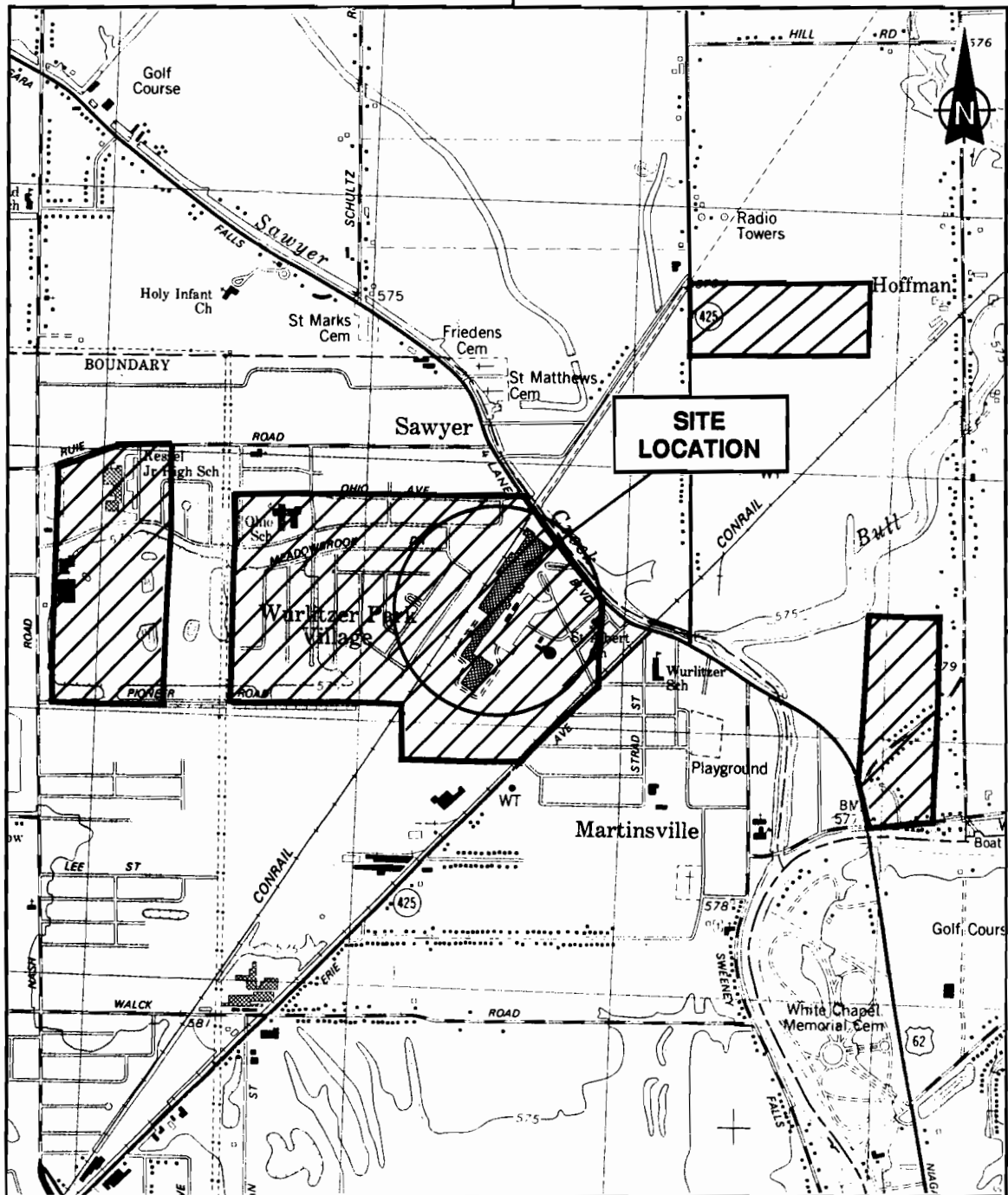
[UZ]YR2080:D3176/4044/22

ND = Not detected.

*After Lindsay 1979 and Shacklette and Boerngen 1984.

Source: Ecology and Environment Engineering, P.C. 1990.

78° 50' 39" W



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle, Tonawanda West, NY 1980, Engineering-Science Phase I Investigation, January 1989.

KEY:

 Approximate Extent of Former Wurlitzer Properties

SCALE 1:24,000

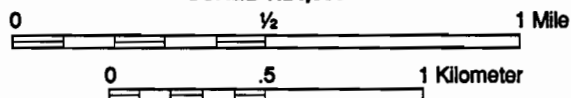
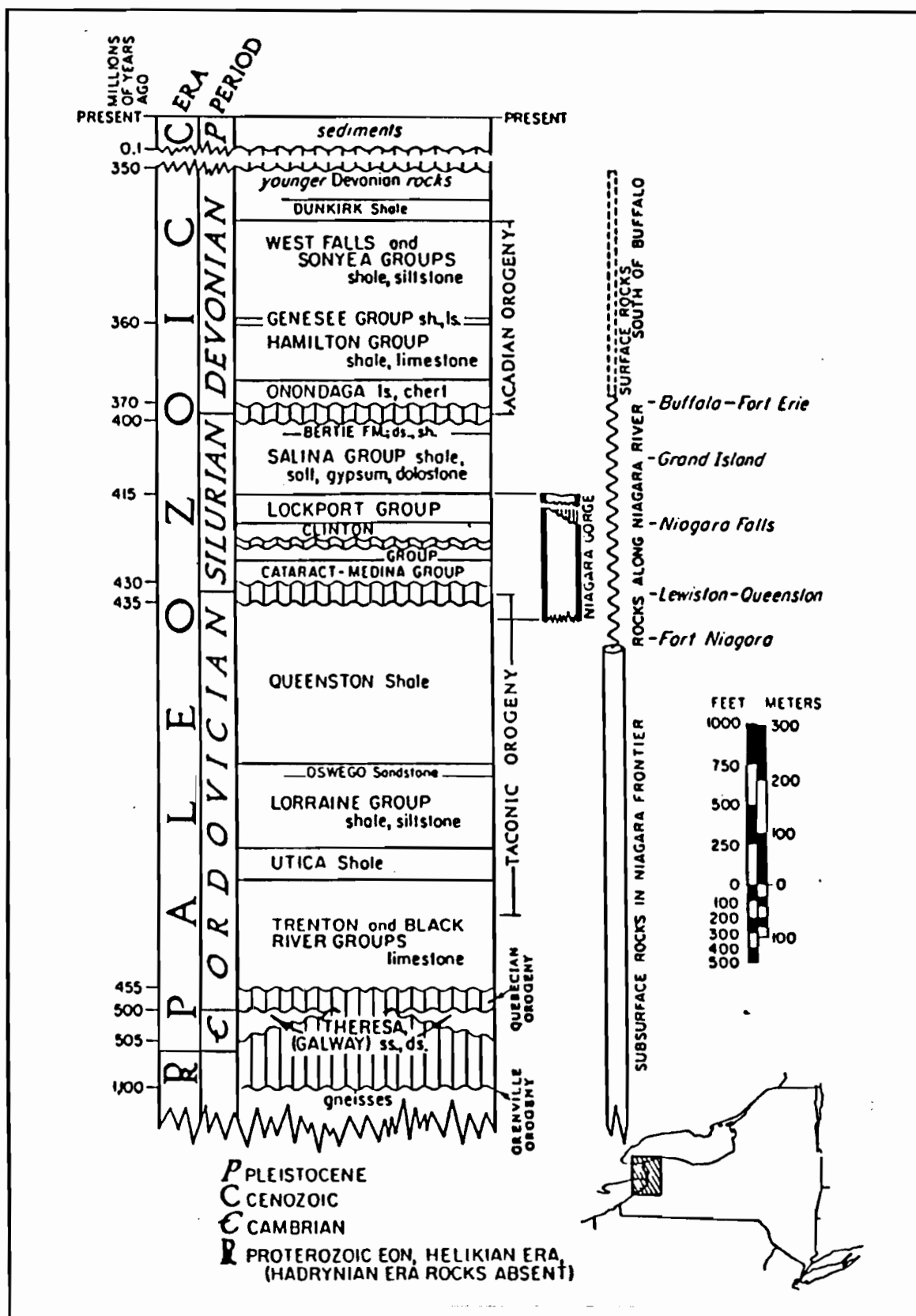
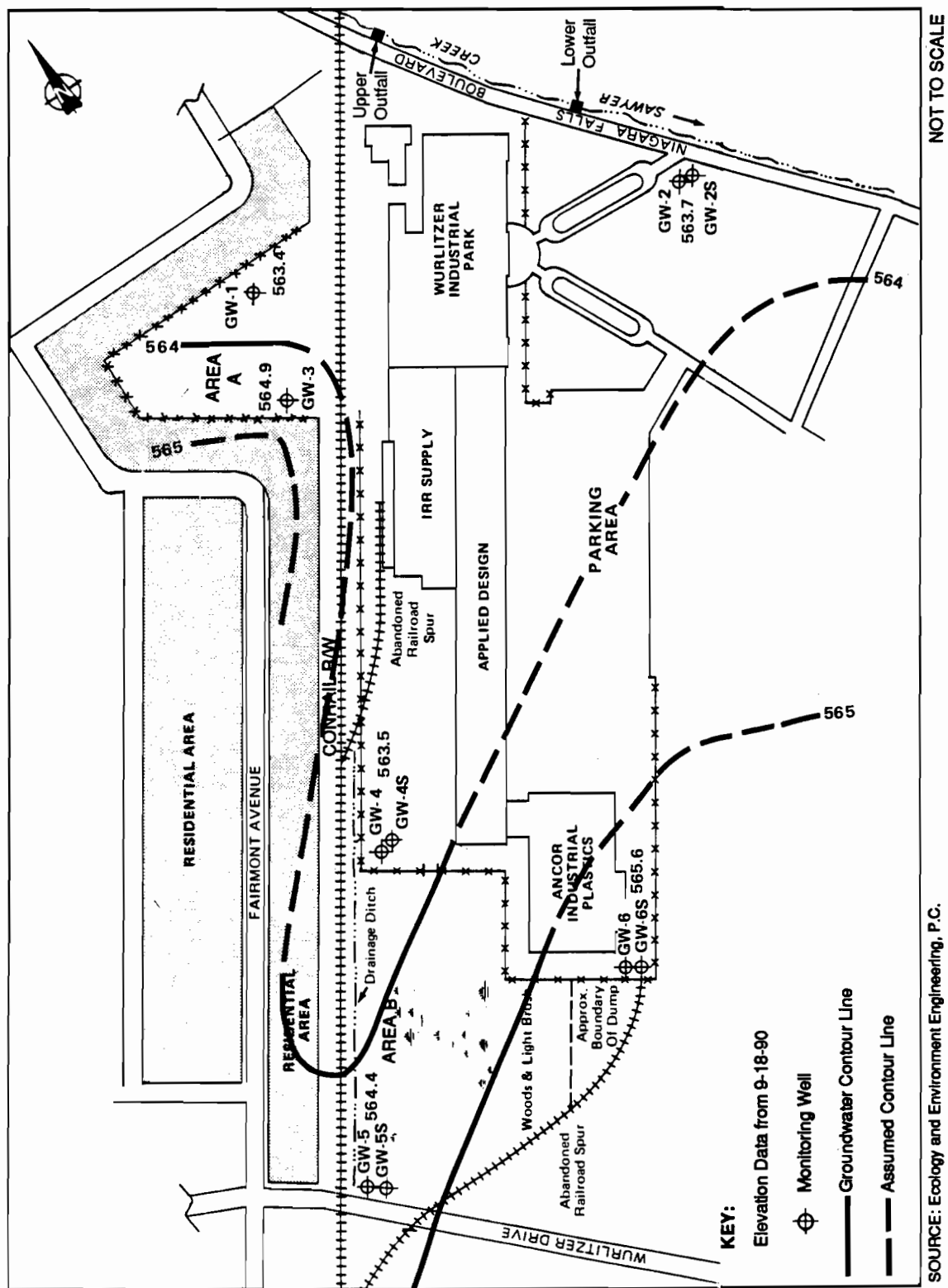


Figure 4-1
WURLITZER SITE AND OTHER WURLITZER PROPERTIES



SOURCE: Tesmer 1981.

Figure 4-2
STRATIGRAPHIC COLUMN, NIAGARA FRONTIER



5. FINAL APPLICATION OF HAZARDOUS RANKING SYSTEM

5.1 NARRATIVE SUMMARY

The Wurlitzer site occupies approximately 44 acres of land, including a 14-acre building at 908 Niagara Falls Boulevard, City of North Tonawanda, Niagara County, New York.

Wurlitzer Industries owned the site from 1908 until 1977. During the period from 1908 to 1974, electronic organs, player pianos, jukeboxes, and defense products were manufactured on site. Manufacturing activities ceased in 1974, and from 1974 to 1971, the facility was used for engineering and research purposes. Subsequently, Wurlitzer Industries was renamed Wurltech Industries, Inc. Currently, the site is owned by Wurlitzer Industrial Park, Inc. (not connected with the site owner at the time of plant operations), Irr Supply Centers, Inc., Applied Design Company, Inc., Ancor Industrial Plastics, Inc., and Blue Bird Coach Lines, Inc. Approximately 80 commercial tenants currently lease space in the Wurlitzer building.

The spillage and disposal of TCE still bottoms and plating wastes containing heavy metals, cyanide, and other compounds during plant operations are documented. Waste quantities and years of disposal are unknown. The exact location of disposal is also unknown, although Areas A and B are probable disposal areas based on aerial photos and current site conditions.

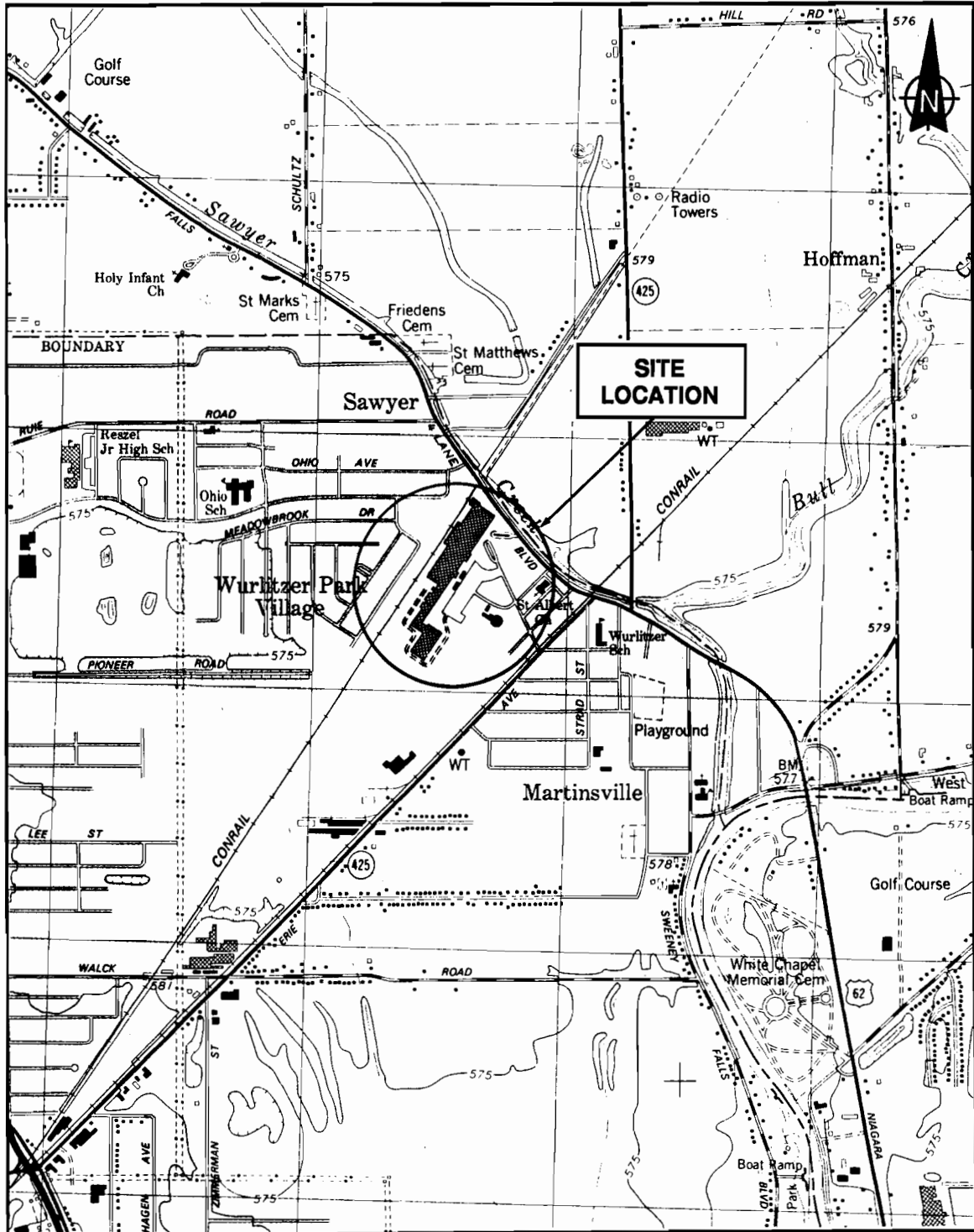
A May 1965 fish kill on Sawyer and Bull creeks reportedly involving 8,000 to 10,000 fish, was attributed to cyanide discharging from the Wurlitzer plant into Sawyer Creek. Upstream, downstream, and fish tissue samples were collected and analyzed to reach this conclusion.

Contamination found in the various media sampled (groundwater, surface water, sediment, and soil) supports, but does not confirm the continued existence of hazardous waste at the site.

The most prevalent form of contamination is PAHs and heavy metals in soil and sediment. Also, TCE was detected in surface soil and surface water, and PCBs were detected in surface soil and sediment.

The site is located adjacent to Sawyer Creek which joins Bull Creek and flows into Tonawanda Creek. Approximately 5.7 miles downstream from the site, Tonawanda Creek joins the Niagara River, but this flow is diverted around the Niagara River water intakes by Tonawanda Island. All residents within 3 miles are served by city water. Within a 1-mile radius of the site, approximately 2,554 people are potentially affected by direct contact with surface soil from the site. The area west of the site is primarily residential while commercial and light industrial facilities exist south and east of the site. The site is bordered to the north by Niagara Falls Boulevard and Sawyer Creek. The site is essentially flat and mostly paved except for Areas A and B. Area A, a former coal storage area, is currently used for parking and consists of gravel surrounded by grass. A few piles of broken concrete exist on the north side of Area A. Area B is covered by brush and young trees and contains two discrete low-lying swampy areas. Rusted drums, one of which contained an unknown solid material, and several construction and demolition debris piles exist throughout Area B. This debris consists of concrete, scrap metal, asphalt shingles, etc.

78° 50' 39" W



43° 03' 30" N

SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle, Tonawanda East, NY 1980.

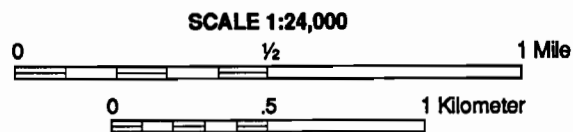


Figure 5-1
WURLITZER SITE LOCATION MAP

FIGURE 1

H R S C O V E R S H E E T

Facility Name: Wurlitzer

Location: 908 Niagara Falls Blvd./City of North Tonawanda

EPA Region: 2

Person(s) in Charge of Facility: Wurlitzer Industrial Park, Inc., Irr Supply Centers, Inc.,

Applied Design Co., Inc., Ancor Industrial Plastics, Inc.,

and Blue Bird Coach Lines, Inc.

Name of Reviewer: Ecology and Environment Engineering, P.C.

Date: 10/90

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.)

The Wurlitzer site, located at the above address, consists of approximately 44 acres in an area zoned for commercial and industrial purposes, with nearby private residences located to the east and south. The 14-acre Wurlitzer building and approximately 30 surrounding acres of property was owned entirely by Wurlitzer Industries until 1977. Wurlitzer Industries previously manufactured pianos, organs, jukeboxes, and defense products at this site. TCE still bottoms and plating wastes containing heavy metals, cyanide, and other compounds are reported to have been disposed of on site. Waste quantities, years of disposal, and locations of disposal are not known. A Phase I investigation was completed in January 1989. Half-buried rusty 55-gallon drums and piles of debris are visible in Area B of the site. Since this area is unfenced and accessible to the public, direct contact is a concern.

Scores: S = 4.50 (S = 4.47 S = 6.38 S = 0)
M gw sw a

S = 0
FE

S = 37.5
DC

Ground Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)	
1 Observed Release	0 (45)	1	45	45	3.1	
If observed release is given a score of 45, proceed to line 4 . If observed release is given a score of 0, proceed to line 2 .						
2 Route Characteristics					3.2	
Depth to Aquifer of Concern	0 1 2 (3)	2	6	6		
Net Precipitation	0 1 (2) 3	1	2	3		
Permeability of the Unsaturated Zone	0 (1) 2 3	1	1	3		
Physical State	0 1 2 (3)	1	3	3		
Total Route Characteristics Score			12	15		
3 Containment	0 1 2 (3)	1	3	3	3.3	
4 Waste Characteristics					3.4	
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18		
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8		
Total Waste Characteristics Score			19	26		
5 Targets					3.5	
Ground Water Use	0 (1) 2 3	3	3	9		
Distance to Nearest Well/Population Served	(0) 12 24 4 6 8 10 16 18 20 22 24 30 32 35 40	1	0	40		
Total Targets Score			3	49		
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			2,565	57,330		
7 Divide line 6 by 57,330 and multiply by 100			$S_{gw} = 4.47$			

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)	
[1] Observed Release	0 45	1	0	45	4.1	
If observed release is given a value of 45, proceed to line [4] . If observed release is given a value of 0, proceed to line [2] .						
[2] Route Characteristics					4.2	
Facility Slope and Intervening Terrain	0 1 2 3	1	1	3		
1-yr. 24-hr. Rainfall	0 1 2 3	1	2	3		
Distance to Nearest Surface Water	0 1 2 3	2	6	6		
Physical State	0 1 2 3	1	3	3		
Total Route Characteristics Score			12	15		
[3] Containment	0 1 2 3	1	3	3	4.3	
[4] Waste Characteristics					4.4	
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18		
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	1	8		
Total Waste Characteristics Score			19	26		
[5] Targets					4.5	
Surface Water Use	0 1 2 3	3	6	9		
Distance to a Sensitive Environment	0 1 2 3	2	2	6		
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 24 30 32 35 40	1	0	40		
Total Targets Score			8	55		
[6] If line [1] is 45, multiply [1] x [4] x [5] If line [1] is 0, multiply [2] x [3] x [4] x [5]			5,472	64,350		
[7] Divide line [6] by 64,350 and multiply by 100			S_{sw} = 8.50			

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)	
[1] Observed Release	(0) 45	1	0	45	5.1	
Date and Location:						
Sampling Protocol:						
If line [1] is 0, the $S_a = 0$. Enter on line [5] . If line [1] is 45, then proceed to line [2] .						
[2] Waste Characteristics					5.2	
Reactivity and Incompatibility	0 1 2 3	1		3		
Toxicity	0 1 2 3	3		9		
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8		
Total Waste Characteristics Score				20		
[3] Targets					5.3	
Population Within 4-Mile Radius	0 9 12 15 (18) 21 24 27 30	1	18	30		
Distance to Sensitive Environment	0 (1) 2 3	2	2	6		
Land Use	0 1 2 (3)	1	3	3		
Total Targets Score			23	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	s²
Groundwater Route Score (S_{gw})	4.47	19.98
Surface Water Route Score (S_{sw})	8.50	72.25
Air Route Score (S_a)	0	0
S_{gw}² + S_{sw}² + S_a²		92.23
√ S_{gw}² + S_{sw}² + S_a²		9.60
√ S_{gw}² + S_{sw}² + S_a² / 1.73 = S_M =		5.55

FIGURE 10
WORKSHEET FOR COMPUTING S_M

*No scoring necessary because site is not certified to be a significant fire or explosion hazard

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

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)	
1 Observed Incident	0 45	1	0	45	8.1	
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2						
2 Accessibility	0 1 2 3	1	3	3	8.2	
3 Containment	0 15	1	15	15	8.3	
4 Waste Characteristics Toxicity	0 1 2 3	5	15	15	8.4	
5 Targets					8.5	
Population Within a 1-Mile Radius	0 1 2 3 4 5	4	12	20		
Distance to a Critical Habitat	0 1 2 3.	4	0	12		
Total Targets Score			12	32		
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			8,100	21,600		
7 Divide line 6 by 21,600 and multiply by 100			SOC = 37.5			

FIGURE 12
DIRECT CONTACT WORK SHEET

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: Wurlitzer
Location: 908 Niagara Falls Blvd./City of North Tonawanda (Niagara County)
Date Scored: 10/90
Person Scoring: Sandra Lare

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

Ref. 1
Ref. 4
Ref. 16
Ref. 23
Ref. 24

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

NONE

COMMENTS OR QUALIFICATIONS:

NONE

02[UZ]YR2080:D3176/6868

GROUNDWATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (3 maximum):

Magnesium, manganese, zinc.
Ref. 1, 24

Rationale for attributing the contaminants to the facility:

Detected in downgradient well GW-2 at greater than three times the concentration detected in upgradient well GW-6.

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern: Overburden aquifer, approximately 20 feet thick. Soils range from lean clay above to gravelly silt at bottom. Most transmissive zone is in layer of glacial till just above bedrock.

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

Approximately 14 feet.
Ref. 25

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

Evidence of hazardous waste (plating waste) disposed at the facility.
Ref. 26

Net Precipitation

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

32 inches
Ref. 1, 18

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

26 inches
Ref. 1

Net precipitation (subtract the above figures):

32 inches - 26 inches = 6 inches

Permeability of Unsaturated Zone

Soil type in unsaturated zone: Canandaigua Silt Loam: a poorly-drained, medium to moderately fine-textured soil formed in lacustrine deposits of silt, very fine sand, and clay. Silty clay and loam extends to depths of 35 inches; at depths greater than 35 inches there is fine sand and silt with thin lenses of clay.
Ref. 5, 6, 8, 9

Permeability associated with soil type:

$10^{-5} - 10^{-7}$ cm/sec.
Ref. 1

Physical State

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

Evidence of hazardous waste (plating waste) disposal at the site.
Ref. 26

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No liner
Piles uncovered
No run-off control
Ref. 2, 10

Method with highest score:

No liner, piles uncovered & no run-off control
Score = 3
Ref. 1

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Magnesium, manganese, and zinc.
Ref. 4, 24

Compound with highest score:

Zinc and manganese scored the highest toxicity/persistence values (Score = 18).
Ref. 1, 23, 24

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.):

TCE still bottoms, an F001 hazardous waste, is documented to have been disposed of at the site. No quantity information is available.
Ref. 26

Basis of estimating and/or computing waste quantity:

There is no statistically significant/accurate way to estimate hazardous waste quantity based on existing information. Factor is scored greater than 0 due to documentation of hazardous waste disposal.
Score = 1

* * *

5. TARGETS

Groundwater Use

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

All residents within 3 miles are on public water supplies, City of Tonawanda, which gets water from the Niagara River; there is no irrigation. It is possible, but not probable, that a chemical plant in the area may still use its wells, but for commercial usage only, (not for drinking), therefore, assigned score = 1.
Ref. 4, 11, 12

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply: Greater than 3 miles.

There are 2 inactive commercial wells on-site, previously owned by Wurlitzer, which had drawn water from the Camillus Shale at depths between 67 and 70 feet below ground surface. The nearby chemical plant's well is thought to be inactive, as well.
Ref. 4, 11, 19

Distance to above well or building:

N/A

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

Ref. 4, 11, 12, 17

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

None

Ref. 11

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

Zero

Ref. 4, 11, 12, 17, 19

S U R F A C E W A T E R R O U T E

1. OBSERVED RELEASE

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

There is no direct evidence that a release has occurred from the site.
Ref. 4, 22, 24

Rationale for attributing the contaminants to the facility:

N/A

* * *

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

2 - 3%
Ref. 4

Name/description of nearest downslope surface water:

Sawyer Creek, located 200 m. north of the site
Ref. 4

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

4 - 5%
Ref. 4

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

No
Ref. 16

Is the facility completely surrounded by areas of higher elevation?

No
Ref. 16

1-Year 24-Hour Rainfall in Inches

2.1 inches
Ref. 1

Distance to Nearest Downslope Surface Water

200 m. from area A to Sawyer Creek.
700 m. from area B to Sawyer Creek.
Ref. 4, 16

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Physical State of Waste

Evidence of hazardous waste (plating waste) disposal at the facility.
Ref. 26

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No liner, piles uncovered, no run-off control
Ref. 2, 10

Method with highest score:

All above, score = 3
Ref. 1

* * *

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Trichloroethene, benzo(a)pyrene, cadmium
Ref. 4, 24

Compound with highest score:

Benzo(a)pyrene and cadmium scored the highest toxicity/persistence value (Score = 18).
Ref. 1, 23, 24

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.):

TCE still bottoms, a F001 hazardous waste, is documented to have been disposed of at the site. No quantity information is available.
Ref. 26

Basis of estimating and/or computing waste quantity:

There is no statistically significant/accurate way to estimate hazardous waste quantity based on existing information. Factor is scored greater than 0 due to documentation of hazardous waste disposal.
Score = 1

* * *

5. TARGETS

Surface Water Use

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

Sawyer Creek, located 0.05 mile north of the site, and Bull Creek, 0.4 mile southeast of the site, are possibly used for recreation and irrigation. Tonawanda Creek, located 0.7 mile downstream of the site, is designated for no contact recreational use (boating, fishing), and reserved as an emergency drinking water supply, although it is not known to be used.
Ref. 4, 16

Is there tidal influence?

No. However, Tonawanda Creek, as a part of the Erie Canal system, experiences seasonal changes in flow directions; summer flow is to the northeast, and winter flow is to the southwest.
Ref. 4

Distance to a Sensitive Environment

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

No coastal wetland within 2 miles.
Ref. 4, 16

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

TE-12 wetland is 1 mile south of the site.
Ref. 16

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

None within 1 mile.
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:

None within 3 miles downstream.
Ref. 4, 15

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

N/A

Total population served:

None
Ref. 4, 15

Name/description of nearest of above water bodies:

N/A

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

N/A

A I R R O U T E

1. OBSERVED RELEASE

Contaminants detected:

No air samples collected. No observed release on record.
Ref. 2, 4, 7

Date and location of detection of contaminants:

N/A
Ref. 2, 7

Methods used to detect the contaminants:

Rationale for attributing the contaminants to the site:

N/A

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

N/A; no air contamination observed; no air samples taken
Ref. 2, 4, 5, 7

Most incompatible pair of compounds:

N/A; no air contamination observed; no air samples taken
Ref. 2, 4, 5, 7

Toxicity

Most toxic compound:

N/A; no air contamination observed; no air samples taken
Ref. 2, 4, 5, 7

Hazardous Waste Quantity

Total quantity of hazardous waste:

TCE, an F001 hazardous waste is documented to have been disposed of at the site. No quantity information is available.
Ref. 26

Basis of estimating and/or computing waste quantity:

There is no statistically significant/accurate way to estimate hazardous waste quantity based on existing information. Factor is scored greater than 0 due to documentation of hazardous waste disposal.
Score = 1

* * *

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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

2,554

Ref. 4

Distance to a Sensitive Environment

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

None within 2 miles.

Ref. 4

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

TE-12 wetland is 1 mile south of the site.

Ref. 16

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

None within 1 mile.

Ref. 4

Land Use

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

0 miles; site is in a commercial/industrial area.

Ref. 17, 20

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

None within 2 miles; there is a city park 1-1/2 miles south, however.

Ref. 4, 14, 16

Distance to residential area, if 2 miles or less:

0.1 mile

Ref. 4, 16

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

Active agricultural land approx. 1/2 mile north of site, across Sawyer Creek.

Ref. 16, 20

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

1-1/4 miles north to Agricultural District #2.

Ref. 16, 20

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

No.

Ref. 21

02[UZ]YR2080:D3176/6868

FIRE AND EXPLOSION

1. CONTAINMENT

Hazardous substances present:

Site has not been certified by fire marshall to present a significant fire or explosion hazard to the public, and no fire/explosion threat was observed at site.
Ref. 7, 25

Type of containment, if applicable:

N/A

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

N/A

Ignitability

Compound used:

N/A

Reactivity

Most reactive compound:

N/A

Incompatibility

Most incompatible pair of compounds:

N/A

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

TCE still bottoms, a F001 hazardous waste, is documented to have been disposed of at the site. No quantity information is available.
Ref. 26

Basis of estimating and/or computing waste quantity:

There is no statistically significant/accurate way to estimate hazardous waste quantity based on existing information. Factor is scored greater than 0 due to documentation of hazardous waste disposal.
Score = 1

* * *

3. TARGETS

Distance to Nearest Population

0.1 mile
Ref. 4, 16

Distance to Nearest Building

On site; 0 miles
Ref. 17, 20

Distance to a Sensitive Environment

Distance to wetlands:

TE-12 wetland is 1 mile south of the site
Ref. 16

Distance to critical habitat:

None within 1 mile
Ref. 4

Land Use

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

0 miles; site is in a commercial/industrial area
Ref. 17, 20

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

None within 2 miles
Ref. 4, 14, 16

Distance to residential area, if 2 miles or less:

0.1 mile
Ref. 4, 16

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

Active agricultural land approximately .5 mile north of site, across Sawyer Creek
Ref. 16, 20

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

1.25 miles north, Agricultural District #2
Ref. 16, 20

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

No
Ref. 21

Population Within 2-Mile Radius

10,381
Ref. 4

Buildings Within 2-Mile Radius

>2,600
Ref. 16

02[UZ]YR2080:D3176/6868

D I R E C T C O N T A C T

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

There is no record of incident of injury, illness, or death from human or animal contact with substances at site.

Ref. 4

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

Fences separate site from residential land at some points, but they are discontinuous and do not limit access. Treaded grass footpaths lead through areas A and B, revealing that public access is frequent.

Ref. 5, 10, 17

* * *

3. CONTAINMENT

Type of containment, if applicable:

Debris piles are uncovered, containers are only partially buried; some are rusty and leaking - No perceivable diversion or containment systems.

Ref. 7, 10, 12

* * *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Trichloroethene, Benzo(a)pyrene, 4,4'-DDT, antimony, barium, cadmium, copper, silver, and zinc.

Ref. 24

Compound with highest score:

Benzo(a)pyrene, 4,4'-DDT and the metals scored the highest toxicity rating. (Score = 18).

Ref. 1, 23

* * *

5. TARGETS

Population Within One-Mile Radius

2,554

Ref. 4

Distance to Critical Habitat (of endangered species)

More than 1 mi.

Ref. 14

02[UZ]YR2080:D3176/6868

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	U.S. Environmental Protection Agency, 1984, <u>Uncontrolled Hazardous Waste Site Ranking System User's Manual</u> . Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
2	Ecology and Environment Engineering, P.C., May 7-8, 1990, Wurlitzer Site Reconnaissance and Geophysics, EM Survey Logbook, 11 pages. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
3	Wellence, City of North Tonawanda Fire Prevention/Investigation Coordinator, October 19, 1990, personal communication, interview acknowledgment. Document Location: Ecology and Environment Engineering, P.C. Buffalo, New York.
4	New York State Department of Environmental Conservation, January 1989, "Engineering Investigations at Inactive Hazardous Waste Sites, Phase I Investigation, Wurlitzer, City of North Tonawanda, Site No. 932041, Niagara County," prepared by Engineering-Science. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
5	New York State Department of Environmental Conservation, June 1990, "Phase II (Fifth Round) Work Plan, Engineering Investigations and Evaluations at Inactive Hazardous Waste Disposal Sites: Wurlitzer Site, City of North Tonawanda, Niagara County" prepared by Western Site Investigation Section, Bureau of Hazardous Site Control, Division of Hazardous Waste Remediation. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
6	U.S. Department of Agriculture, Soil Conservation Service, 1972, Soil Survey of Niagara County, New York. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
7	Ecology and Environment Engineering, P.C., August 1 - September 20, 1990, Wurlitzer Drilling and Well Installation Logbook, 43 pages. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
8	Rickard, L. and D. Fisher, New York State Museum and Science Service, 1970, "Geologic Map of New York State, Niagara Sheet." Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
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10	Dickey, P., Niagara County Department of Health, 1986 and 1990, 3 reports of investigation: site/field inspection - Wurlitzer Site. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
11	McDonough, P.F., Town of North Tonawanda Water Superintendent, May 15, 1990, personal communication, interview acknowledgment. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
12	Dickey, P., Niagara County Department of Health, April 2, 1990, personal communication interview acknowledgment. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.

Reference Number	Description of the Reference
13	Dickey, P., Niagara County Department of Health, May 8, 1990, Memorandum to Valerie Lauzze/NYSDEC. Document Location: Ecology and Environment, Inc., Buffalo, New York.
14	Buffington, B., National Heritage Program, April 10, 1990, personal communication, interview acknowledgment. Document Location: Ecology and Environment Engineering, P.C. Buffalo, New York.
15	Gwozdek, R., Niagara County Department of Health, April 2, 1990, personal contact, interview acknowledgment. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
16	U.S. Geological Survey, 1980, 7.5 minute series (Topographic) Tonawanda East Quadrangle, and Tonawanda West Quadrangle. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
17	New York State Department of Health Bureau of Toxic Substance Assessment, July 22, 1985, "Hazardous Waste Site Inspection Report/Wurlitzer." Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
18	U.S. Geological Survey and NY State Conservation Department, Division of Water Resources, 1968, <u>Surface Water in the Erie-Niagara Basin, NY</u> , Basin Planning, Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
19	LaSala, A.M., Jr., 1968, <u>Groundwater Resources of the Erie-Niagara Basin, New York</u> , State of New York Conservation Department, Water Resources Commission, Basin Planning Report ENB-3. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
20	City of North Tonawanda, "Land Use Map." Document Location: City of North Tonawanda, New York.
21	National Conference of State Historic Preservation Officers, 1989, <u>National Register of Historic Places 1966-1968</u> . Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
22	Shacklette, H.T. and J.G. Boerngen, 1984, "Element Concentrations in Soils and Other Surficial Materials in the Conterminous United States," U.S. Geological Survey professional paper 1270. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
23	Sax, N.I., <u>Dangerous Properties of Industrial Materials</u> , Sixth Edition. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
24	Ecology and Environment Engineering, P.C., 1990, Lab analytical data for Wurlitzer site, Appendix E of this report. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
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26	New York State Health Department, 1953, memo from Mr. Zollner to Mr. Larkin, May 1, 1953. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.
27	Buffalo Drilling Company, Inc., May 30, 1990, Subsurface and Environmental Assessment Report for Wurlitzer Drive Commercial Property Development Site, Tonawanda, New York. Document Location: Ecology and Environment Engineering, P.C., Buffalo, New York.

02[UZ]YR2080:D3176/6868

REFERENCE 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

REFERENCE 2

**SITE RECONNAISSANCE FIELD NOTEBOOKS
APPENDIX J OF THIS REPORT**

REFERENCE 3

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Wurlitzer I.D. NUMBER: 932041
PERSON CONTACTED: Mr. Wellence,
Fire Prevention/Fire
Investigation Coordinator
AFFILIATION: City of North Tonawanda
Fire Department
ADDRESS: 495 Zimmerman
North Tonawanda, NY 14120
PHONE NUMBER: 716-693-2201
CONTACT PERSON(S): Sandy Lare
TYPE OF CONTACT: telephone

INTERVIEW SUMMARY

The old Wurlitzer Building and property (at 908 Niagara Falls Boulevard in North Tonawanda) presents no significant or unusual fire or explosion threat to the public.

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: Robert A. Wellence

Date: 10/24/90

REFERENCE 4

32041
ENGINEERING INVESTIGATIONS AT
INACTIVE HAZARDOUS WASTE SITES

PHASE I INVESTIGATION

Wurlitzer

Site No. 932041

City of North Tonawanda

Niagara County



Prepared for:
New York State
Department of
Environmental Conservation

50 Wolf Road, Albany, New York 12233

Thomas C. Jorling, *Commissioner*

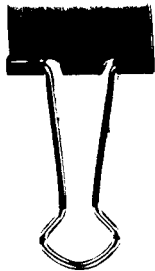
Division of Hazardous Waste Remediation

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

By:

ENGINEERING-SCIENCE

REFERENCE 5



Phase II (Fifth Round) Work Plan
Engineering Investigations and Evaluations at
Inactive Hazardous Waste Disposal Sites

Wurlitzer Site

City of North Tonawanda, Niagara County

NYSDEC ID No.: 932041

Prepared For:

New York State Department of Environmental Conservation

Prepared by:

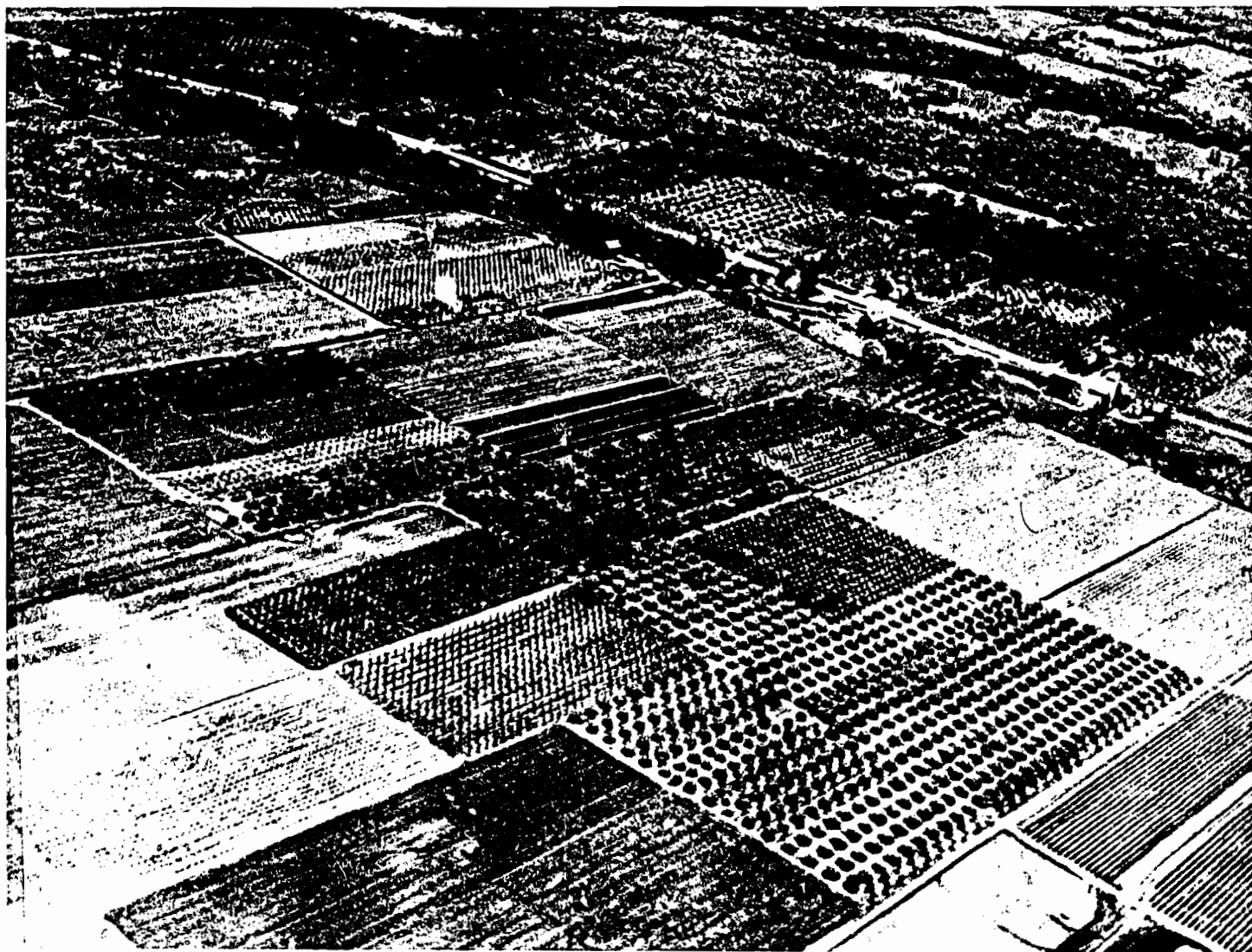
Western Site Investigation Section
Bureau of Hazardous Site Control
Division of Hazardous Waste Remediation
June 1990

REFERENCE 6

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G3803.N5
1972

157 0

SOIL SURVEY OF Niagara County, New York



Furnished by:
Soil Conservation Service
Farm & Home Center
4487 Lake Avenue
Lockport, New York 14094

Phone 434-4949



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

Issued October 1972

recycled paper

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Roslyn Center
1700 N. Moore
ecology and environment

County. The sections, "Descriptions of the Soils" and "Formation, Morphology, and Classification of Soils," in this soil survey give the geologic origin of the soils in the county. The following geologic deposits occur: glacial till, glacial outwash, lacustrine sediments, alluvium, and muck and peat.

Each geologic unit has engineering significance that differs from that of other geologic units. The broad engineering significance of each geologic unit is discussed in the following paragraphs.

Deep Glacial Till

Deep glacial till occurs in the uplands, mostly where the topography is sloping or hilly. Ordinarily, the deposits are 3 1/2 feet thick or more over bedrock. Compactness of the material in place varies and depends on whether the material was overridden by the ice or left in place when the ice melted. Glacial till is generally unstratified, but in some places local sorting has formed pockets of sand, gravel, silt, or clay within the soil mass.

Soils formed dominantly in deep glacial till are in the Appleton, Bombay, Cayuga, Cazenovia, Hilton, Massena, Ontario, Ovid, and Sun series. Some phases of the Cayuga, Hilton, Ontario, and Ovid series are underlain by limestone bedrock at a depth of 3 1/2 to 6 feet. A phase of the Cazenovia series is underlain by shale at these same depths.

Generally, these soils provide stable subgrades, good foundations for embankments consisting of 10 feet or more of fill material, and, with proper treatment, stable highway slopes. These soils also furnish good foundation support for buildings. Where properly compacted, materials excavated from the deposits can be used to form stable fills and embankments.

Soils of the Cayuga and Churchville series and the Madalin series, loamy subsoil variant, have a 20- to 40-inch layer of lacustrine clay or silt over till. The material below a depth of 20 to 40 inches has the same characteristics as that formed in deep glacial till. Unless the clayey cap is removed, these soils are generally suitable only for moderately high embankments of 5 to 10 feet.

Thin Glacial Till

This material is similar to deep glacial till, except that the depth to bedrock is generally less than 3 1/2 feet. Even in light grading operations, bedrock generally is exposed in cuts. The content of channery and flaggy fragments in soils formed in thin glacial till is generally higher than in soils formed in deeper material. Farmington soils formed in thin till over limestone bedrock.

The Brockport, Lairdsville, and Lockport soils formed in thin till, lacustrine silt or clay, or loess, over soft shale bedrock. The soft shale under these soils disintegrates and becomes unstable where it is exposed to the effect of frost and

alternate wetting and drying. Where Queenston shale occurs north of Ridge Road, there are hard layers in the formation that are difficult to excavate in some places.

Glacial Outwash

These deposits include outwash terraces, eskers, valley trains, kames, and lake beaches and bars. The material consists of sorted sand and gravel deposited by the melt water from a glacier. Many deposits include localized silt and clay strata that impede drainage. The Altmar, Fredon, Howard, Otisville, and Phelps soils formed in deposits of glacial outwash.

Sand and gravel from outwash are suitable for many uses. Depending on gradation, soundness, and plasticity, outwash can be used for such purposes as (1) fill material for underwater placement; (2) ordinary fill; (3) material to strengthen an unstable subgrade; (4) subbase for pavements; (5) wearing surfaces for driveways, parking lots, and some low-class roads; (6) material for highway shoulders; (7) free-draining, granular backfill for structures and pipes; (8) outside shells of impounding dams; and (9) abrasives for ice control on highways.

In some places these granular materials are too permeable for the construction of a homogeneous embankment intended to hold water. Cut slopes in the more sandy material are subject to severe erosion and sloughing. In some places soils formed in glacial outwash are underlain by layers of wet, compressible soil materials and suitable only for moderately high embankments of 5 to 10 feet.

Lacustrine Sediments

These deposits consist of coarse-textured to fine-textured materials that washed into glacial lakes and eventually settled to the bottom. In some places they are stratified fine sand and silt, and in other places are varved silt and clay. A few sand and silt lenses occur interbedded with the varved materials, and because lake elevations fluctuated, silt and clay lacustrine sediments underlie outwash deposits in many areas.

Many areas of these lacustrine sediments have a high water table, and loose, wet silt and clay underlie the surface materials. Lacustrine sediments normally are increasingly wet as depth increases. Infiltration is restricted, and where the relief is nearly level, runoff is slow.

The landform of these deposits is a plain, a dissected terrace, or a delta that has an unstable front. Where the soils are steep on terrace fronts, erosion is serious and landslides are numerous.

The kinds of lacustrine deposits and kinds of soil that formed in these deposits are as follows:

Deep, sandy deposits-----Arkport, Colonie, Elnora, Galen, Lamson, Minoa, and Stafford soils.

Sand 20 to 40 inches thick over clay.	Claverack, Cosad, and Cheektowaga soils.
Sand 3 to 6 feet thick over gravel.	Gravelly substratum phases of Lamson and Stafford soils.
Deep, silty deposits-----	Dunkirk, Collamer, Niagara, Canandaigua, and Raynham soils.
Deep, clayey deposits-----	Hudson, Madalin, Odessa, Rhinebeck, Schoharie and Lakemont soils, and Rhinebeck soils, thick surface variant.
Clay deposits 40 inches or more thick over sandy material.	Rhinebeck soils, sandy substratum.

Except for muck and peat, soils formed in lacustrine sediments present more engineering problems than any other soils in the county because of their topographic location and their low strength and stability. Some of the silty and clayey deposits are difficult to drain. They are highly susceptible to frost heave. Also, they lose strength seasonally when thawing increases the moisture content. Silty and clayey deposits are generally suitable only for low embankments 5 feet high or less. Settlement under heavy fills and structures is considerable in places. Cut slopes are generally very unstable and piping is a concern in the silty and sandy or gravelly deposits.

Alluvial Deposits

These stratified material are sediments dropped from the present streams, and they form the flood plain adjacent to the streams. The textures in each deposit vary from place to place. Alluvium is subject to periodic flooding. Surface drainage varies. A shallow water table is characteristic of alluvial deposits in many areas.

Alluvial land and soils of the Hamlin and Wayland series formed in alluvial sediments. In some areas of the Hamlin and Wayland soils, limestone or shale bedrock is within 1 1/2 to 3 1/2 feet of the surface.

The support for foundations is normally poor on alluvial sediments. Soils formed in recent alluvium should be avoided as building sites. Sewage effluent disposal is troublesome because of flooding or the seasonal or permanent high water table.

Muck and Peat

Accumulations of plant and animal remains in very poorly drained areas are mostly organic matter, but they contain varying amounts of inorganic material in places. They are in swamps and at the surface of other very poorly drained, depressed areas.

Muck, shallow, is the only mapping unit of organic soils in the county. In areas of this shallow muck, there is sandy, loamy, or clayey material within 1 to 3 1/2 feet of the surface.

Organic soils ordinarily are entirely unsuitable for highway and embankment sites and for other engineering structures because they are highly compressible and unstable. Generally, these materials are underlain by soft wet alluvium, marl, or lacustrine sediments.

Bedrock

The subsection "Geology" in this soil survey describes the extent and geographical occurrence of the different kinds of bedrock underlying the soils of Niagara County. In addition to some exposed rock, there are many areas where it is at shallow depths. This is true for cuts in thin glacial till and in some deeper cuts in thick glacial till.

Hard bedrock normally provides good foundations for highways. Bedrock in dam foundations generally requires sealing to prevent excess seepage. Some kinds of shale swell and flake readily if exposed in cuts, whereas others quickly revert to their original clay content. Knowledge of rock durability and other characteristics is required when considering the suitability of bedrock for construction uses.

Nonfarm Uses of the Soils

This subsection gives ratings for the limitations of soils that are used for homesites, disposal of septic tank effluent, picnic and extensive play areas, camping sites, and other community development and recreational uses. Table 9 lists the soils in the county and shows the soil features that are most limiting and the estimated degree to which these features affect use for the various purposes.

The major properties that affect use of soils for community development are slope; drainage or depth to a seasonal high water table; soil permeability or the rate at which water moves through the soil; stoniness, or the content of stones 10 inches or more across; texture of the surface layer or particle-size (sand, silt, clay, gravel, and cobbles); distribution; hard bedrock that generally requires blasting before it can be removed; soft bedrock that generally can be removed with power tools; and the flooding and ponding hazards.

In table 9, the limitations of the soils in the county are rated slight, moderate or severe. If the limitations are rated moderate or severe, the chief limitation or limitations for the use specified are listed. A rating of slight indicates that the soil has few or no limitations and is considered desirable for the use named. A rating of moderate shows that a moderate problem is recognized but can be overcome or corrected. A rating of severe indicates that the use of the soil is seriously limited by hazards or restrictions that are difficult to overcome. A rating of severe does not imply that a soil so rated cannot be put to that use. Also, it should be recognized that large scale cuts or fills in an area may alter the natural soil so much that ratings given in the table no longer apply.

Brockport silt loam, 0 to 4 percent slopes
 A).--Individual areas of this soil range from small as 5 acres to more than 100 acres in size. They are roughly oblong or circular, and they follow bedding planes of the underlying rock. Included with this soil in mapping are some small areas of better drained soils on slight rises or hills. Also included are small areas of Brockport soils that have slopes of more than 4 percent. Some areas have a gravelly glacial till smear that is less than 12 inches thick over the weathered shale. Also included, where the underlying shale is at a depth of more than 40 inches, are small areas of Rhinebeck or Madalin soils. Unless drained, this soil is better suited to forest, small grains, pasture, and trees than to cultivated crops. Where this soil is used for cultivated crops, adequate surface drainage needs to be provided along with good cultural practices that maintain soil tilth. Irrigation or tile drainage generally is not suitable for this soil. (Capability class IIIw-2; woodland suitability group 3w1)

Canandaigua Series

The Canandaigua series consists of deep, poorly drained and very poorly drained, medium-textured to coarsely fine textured soils. These soils formed in lacustrine deposits of silt, very fine sand, and clay. Canandaigua soils are level or depressional and occupy areas where water ponds or runs off very slowly. Also, runoff is received from surrounding areas.

A representative profile of a Canandaigua soil is a dark-gray, neutral silty clay loam surface layer about 7 inches thick. It is underlain by an olive-gray, firm, neutral silty clay loam subsoil that is distinctly mottled. The subsoil extends to a depth of 24 inches. The substratum is calcareous. It is firm, platy, grayish-brown silt loam that is prominently mottled in the upper part. Below a depth of 35 inches, the substratum is fine sand, silt, and very thin lenses of clay.

Canandaigua soils, unless drained artificially, have water standing at the surface throughout spring and after each rainy period. The downward percolation of water is restricted by the high water table, as is the depth of rooting. In spring, roots are confined to a depth of about 6 inches. As the season progresses, the rooting depth extends to about 15 inches below the surface. The available water capacity is moderate to low.

Representative profile of Canandaigua silty clay loam (0 to 2 percent slopes), 30 feet south of Sawanda Creek Road and five-eighths mile west of Idle Road:

0 to 7 inches, very dark-gray (10YR 3/1) silty clay loam, very dark grayish-brown (2.5Y 3/2) when rubbed; moderate, fine and very fine, subangular blocky structure; friable; abundant fine roots; neutral; abrupt, smooth boundary. 6 to 9 inches thick.

B2g--7 to 24 inches, olive-gray (5Y 5/2) silty clay loam; gray (5Y 5/1) ped coats and common, medium and coarse, prominent, yellowish-brown (10YR 5/6) mottles in ped interiors; weak, coarse, prismatic structure breaking to moderate, medium and coarse, blocky structure; firm; plentiful roots in upper part and few fine roots in lower part; neutral; clear, wavy boundary. 12 to 21 inches thick.

Clg--24 to 35 inches, grayish-brown (2.5Y 5/2) silt loam; gray (5Y 5/1) ped coats and many (about 30 percent), fine and medium, prominent, yellowish-brown (10YR 5/6) mottles in ped interiors; few, white lime streaks; weak, fine, medium and thick, platy structure; firm; very few roots; calcareous; clear, wavy boundary. 6 to 15 inches thick.

IIC2--35 to 50 inches, light olive-brown (2.5Y 5/4), stratified or varved loamy fine sand, silt, and very thin clay lenses; lime streaks and lime concretions or nodules; many, coarse; distinct, yellowish-brown (10YR 5/6) mottles; very weak, platy structure; friable; calcareous.

The solum ranges from 20 to 30 inches in thickness, and depth to carbonates ranges from 18 to 40 inches. Depth to bedrock is more than 40 inches. To a depth of 30 inches, chroma is 2 or less in 60 percent of the matrix in the B and C horizons. Ped faces in the B and C horizons are 2 or less in chroma.

The Ap horizon ranges from 10YR to 2.5Y in hue, is 2 or 3 in value, and is 1 or 2 in chroma. Thickness of the Ap horizon does not exceed one-third the thickness of the solum. The Ap horizon ranges from silt loam to silty clay loam.

The B horizon ranges from 5YR to 5Y in hue, from 4 to 6 in value, and is 1 or 2 in chroma. It ranges from fine sandy loam to silty clay. The average clay content of the 10- to 40-inch control section is between 18 and 35 percent. The B horizon has moderate or weak, blocky structure that is within weak, coarse, prismatic structure in many places. Common to many, distinct and prominent mottles that have a higher chroma than that described occur in the B and C horizons in some places.

The Canandaigua soils formed in deposits similar to those of the moderately well drained Collamer soils and the somewhat poorly drained Niagara soils. Canandaigua soils are finer textured than Lamson soils and have a coarser textured B horizon than the Lakemont and Madalin soils. Canandaigua soils are wetter and have a finer textured B horizon than the Raynham soils. Canandaigua soils are wetter and have a coarser textured B horizon than Odessa and Rhinebeck soils.

Canandaigua silt loam (0 to 2 percent slopes)
 (Ca).--This soil occupies areas that receive runoff from adjacent soils. The surface layer of this soil contains less clay than that of the soil having the profile described as representative for the series. This soil occurs in irregularly shaped

areas that generally are less than 20 acres in size.

Commonly included areas are spots of better drained Raynham and Rhinebeck soils south of the limestone escarpment. Other common inclusions are finer textured Lakemont and Madalin soils that have drainage similar to that of this soil. In many places north of the limestone escarpment, there are included areas of somewhat poorly drained Appleton and poorly drained Sum soils that formed in glacial till. Areas near U.S. Highway No. 104 (Ridge Road) contain numerous sand lenses in the subsoil and substratum. In some depressional areas and potholes, spots of very poorly drained Canandaigua soils occur and have a mucky surface layer. Other spots of Canandaigua soils have a sandy surface layer.

This soil is not intensively used. Most areas are wooded, idle, or used for pasture. But this soil is well suited to crops, pasture, and trees if it is adequately drained and protected from flooding or from ponding caused by runoff from the surrounding uplands. It is particularly well suited to intensive use for some vegetable and row crops. Undrained areas can be used for pasture if management is good, but most areas cannot be used for other crops. (Capability unit IIIw-3; woodland suitability group 4w1)

Canandaigua silty clay loam (0 to 2 percent slopes) (Cb).--This soil has the profile described as representative for the series. The soil occurs in long, narrow drainageways and basinlike areas in the southern part of the county. Areas range from 10 to 50 acres in size.

Included with this soil in mapping are small areas of better drained Rhinebeck and Raynham soils. Also included are small areas of Lamson, Lakemont, and Madalin soils.

This soil is not used intensively. Most areas are wooded, idle, or in pasture. If this soil is adequately drained and fertilized, it is suited to crops. Because of the moderately fine textured surface layer, this soil puddles easily if tilled when wet. It crusts or forms hard clods as it dries. Maintaining good tilth is difficult. (Capability unit IIIw-3; woodland suitability group 4w1)

Cayuga Series

The Cayuga series consists of deep, moderately well drained to well drained, medium-textured soils. These soils developed in lacustrine silt and clay that is 20 to 36 inches thick over loamy calcareous glacial till. They are nearly level to moderately sloping or undulating and occur in areas that are adjacent to or within old glacial lakebeds. Cayuga soils occur throughout the county, mainly south of the Lockport limestone formation.

A representative Cayuga soil has a dark grayish-brown silt loam surface layer 8 inches thick. The next layer is reddish-brown silty clay loam 3 inches thick. The subsoil occurs at a depth of 11 inches and is firm, reddish-brown silty clay 14 inches

thick. It contains a few coarse fragments and is plastic when wet and hard when dry. The reddish-brown gravelly loam substratum is at a depth of about 25 inches and has a few large stones. It is firm and calcareous.

These soils have a seasonal high water table that rises to within 18 inches of the surface. The water table is perched above the slowly permeable subsoil and underlying glacial till. In some places during extended rainy periods, water stays for a few days in small depressions.

Roots are confined mainly to the uppermost 25 inches of the Cayuga soils. The available moisture capacity is high. Because of the clay in the surface layer and subsoil, care must be taken to maintain good tilth. If these soils are plowed when wet, they become compact and cloddy.

Representative profile of a Cayuga silt loam having slopes of 0 to 2 percent, in a hayfield 1,000 feet west of the junction of Packard and Lockport Roads and 125 feet north of Lockport Road:

Ap--0 to 8 inches, dark grayish-brown (10YR 4/2) heavy silt loam; moderate, fine, and medium, subangular blocky structure; friable; abundant roots; neutral; abrupt, smooth boundary. 6 to 10 inches thick.

B&A--8 to 11 inches, reddish-brown (5YR 4/3) silty clay loam; moderate, fine to medium, subangular blocky structure within weak, coarse, prismatic structure; firm; plentiful fine roots; common root and worm channels; patchy clay films on ped surfaces; a few fragments larger than 2 millimeters; thin coats of brown (10YR 5/3) loam on blocks and prisms; neutral; clear, wavy boundary. 2 to 6 inches thick.

B2t--11 to 25 inches, reddish-brown (5YR 4/3) silty clay; moderate, fine to medium, subangular blocky structure within weak, coarse, prismatic structure; firm; plentiful fine roots; a few fragments larger than 2 millimeters; thin clay films on most ped surfaces; thick films in the pores; neutral; abrupt, wavy boundary. 8 to 20 inches thick.

IIC--25 to 50 inches, reddish-brown (5YR 4/4) gravelly loam of which about 25 percent is fragments larger than 2 millimeters; weak, thick, platy structure; firm; very few fine roots; calcareous.

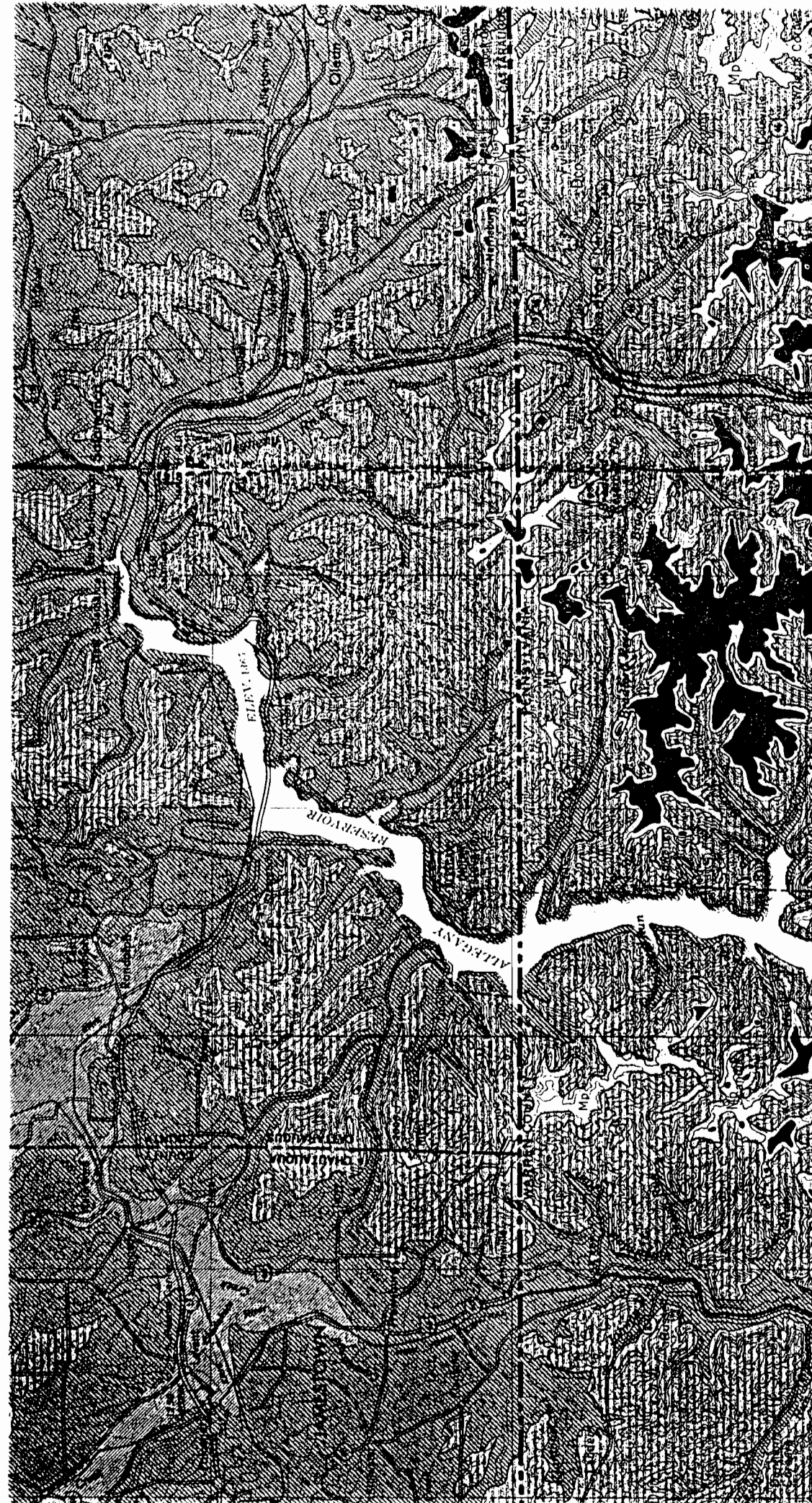
The solum ranges in thickness from 20 to 36 inches, and this is the same as the depth to carbonates. Content of coarse fragments in the solum ranges from 0 to about 10 percent. The IIC horizon has a content of coarse fragments ranging from 5 to 35 percent. The solum is neutral to medium acid, and the IIC horizon is calcareous.

The Ap horizon has a hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. When the Ap horizon is dry, values are more than 5.5. Where the Ap horizon is thin, there is an A2 horizon in some places.

REFERENCE 7

**DRILLING AND SAMPLING FIELD NOTEBOOK
APPENDIX J OF THIS REPORT**

REFERENCE 8



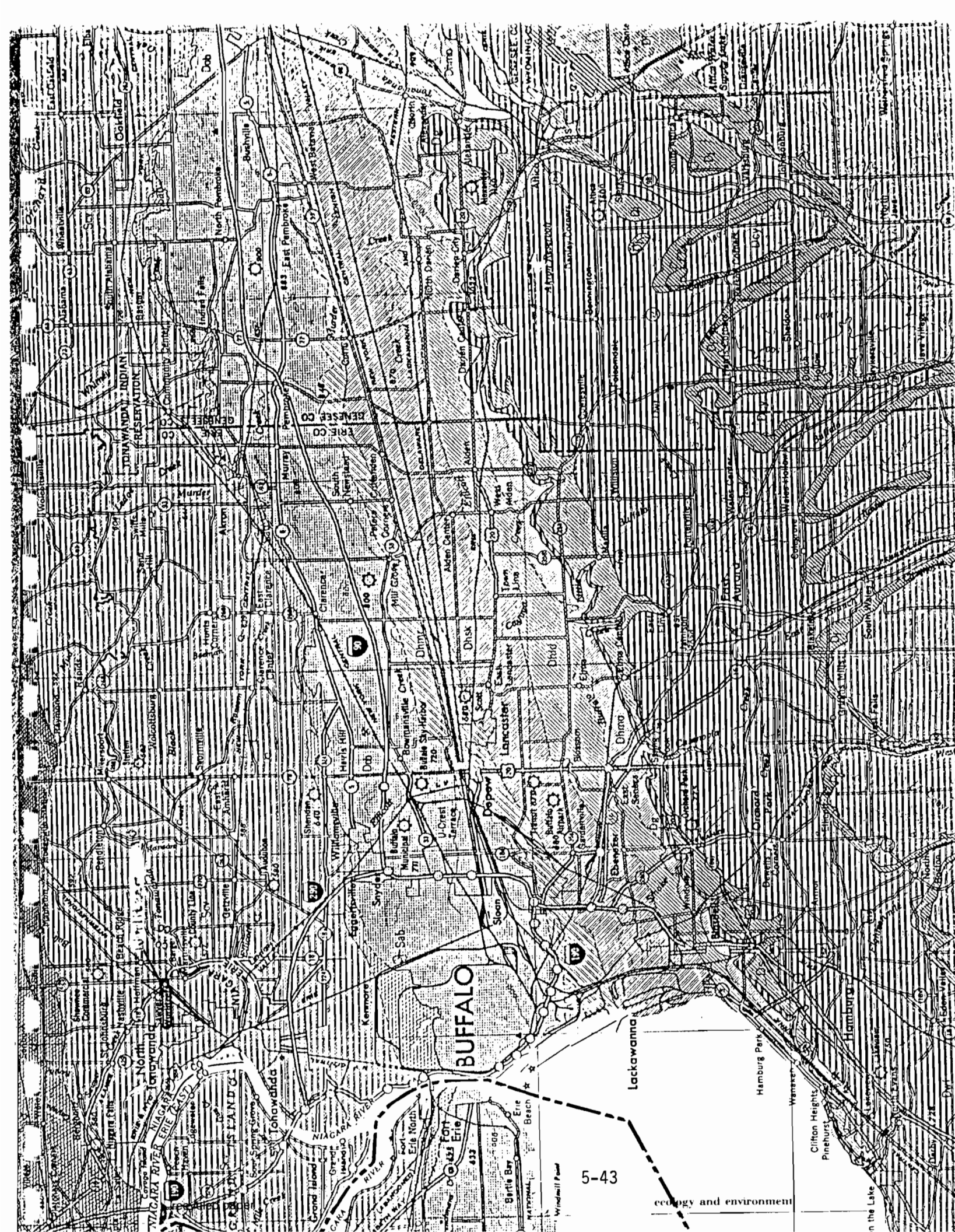
GEOLOGIC MAP OF NEW YORK

1970

Niagara Sheet

Scale 1:250,000





BUFFALO

5-43

ecology and environment

in the Lake

REFERENCE 9

**GEOTECHNICAL SAMPLING RESULTS
APPENDIX D OF THIS REPORT**

REFERENCE 10

**NIAGARA COUNTY
DEPARTMENT OF HEALTH**

Code Activity 1002

Code Location

Service Request No.

Date Received Complaint 8/1/86

Service Request SITE INSPECTION - WURLITZER SITE (932041)

Originator of Complaint LARRY CLARE OF DEC Address

Owner Address

Occupant Address

te	Hours	REPORT OF INVESTIGATION
1/86		THIS WRITER WENT TO INVESTIGATE A LEAD REGARDING THE POSSIBLE LOCATION OF THE WURLITZER SITE LANDFILL WHICH HAS NEVER BEEN POSITIVELY IDENTIFIED. THE AREA INVESTIGATED INCLUDED A TRIANGULAR PARCEL OF LAND BOUNDED ON TWO SIDES BY RESIDENTIAL PROPERTIES AND ON THE THIRD SIDE BY RAILROAD TRACKS WHICH RUN ALONG THE BACK SIDE OF THE OLD WURLITZER PLANT. THE FOLLOWING ~~NOTE~~ WAS OBSERVED IN THIS AREA. 1) PILES OF RAIN DEBRIS WERE SCATTERED ABOUT ALONG WITH RUINED TAPAPER & SAMPLES. 2) NUMEROUS PAIRS WERE SCATTERED ABOUT - THEY SEEMED TO HAVE CONTAINED TANK AIR OR OIL TANKS. 3) SEVERAL HIGHLY RUSTED 55 GALLON DRUMS WERE NOTED IN THE SURROUNDING REGION - THEY ~~APPEARED TO BE~~ WERE EMPTY AT THIS TIME. 4) - ALSO 2 55 gal. DRUMS CONTAINED A PLASTER-LIKE MATERIAL WITH METAL CHIPS MIXED IN. - ONE 55 gal. DRUM 3/4 FULL OF UNKNOWN MATERIAL - CONTENTS WERE NOT EASILY ACCESSIBLE. 5) PILES OF FILL MATERIAL SURROUNDED THE RESIDENTIAL SIDES OF THE LOT - THESE SURROUNDING EDGES SUPPORTED AN ABUNDANT GROWTH OF BRUSH & TREES. 6) THE ENTIRE TRIANGULAR AREA WAS 2 TO 3 FEET ABOVE THE SURROUNDING GRADE. THE RAISED AREAS HAD A VERY UNEVEN GRADE.

Code Activity 2 of 2
Code Location
Service Request No.
Date Received Complaint 4/2/99

Date	Hours	REPORT OF INVESTIGATION
		c) THE GROUND WAS COVERED WITH A VERY DARK CRUSHED ROCK - POSSIBLY A CINDER MATERIAL MIXED IN. OTHER AREAS HAD A TOP SOIL COVER
		I DID NOT IDENTIFY ANY MATERIALS AT THIS SITE WHICH MAY CONSTITUTE A HEALTH THREAT. SCAVENGER DUMPING SEEMS TO BE THE SOURCE OF MATERIALS FOUND ABOVE THE GROUND AT THIS PORTION OF LAND. THE AREA MAY HAVE BEEN LANDFILLED IN THE PAST AS IS INDICATED BY THE RAISED GRADE AND UNEVEN SURFACE. PRESENT CONDITIONS DO NOT VISUALLY ~~REVEAL~~ REVEAL THE NATURE OF THE FILL.
		Paul Dwyer

NIAGARA COUNTY DEPARTMENT OF HEALTH

Code Activity SW
 Code Location NORTH TONAWANDA
 Service Request No. _____
 Date Received Complaint 5-1-9

Service Request WURLITZER SITE / FIELD INSPECTION

Originator of Complaint _____ Address _____

Owner _____ Address _____

Occupant _____ Address _____

Date	Hours	REPORT OF INVESTIGATION
5-1-90	9 ⁰⁰ AM	THIS WRITER MET WITH JOHN HYDEN / DEC-9 VALERIE LAZZE } BUREAU OF HAZARDOUS JANE THAPA } SITE CONTROL / ALBANY AT THE WURLITZER SITE TO HAVE A WALK OVER INSPECTION OF AREAS SUSPECT TO BE FILL AREAS FOR BACKGROUND INFORMATION FOR A FUTURE PHASE II STUDY. I FIRST SHOWED AREA #1 (SEE ATTACHED SKETCH) AN AREA WHICH THIS DEPARTMENT CONSIDERS SUSPECT. REASON FOR SUSPICIONS 1) SUBDIVISION DEVELOPEMENT CONVENIENTLY JOGS AROUND THIS AREA 2) ELEVATION OF THIS AREA IS ABOUT 4 OR 5 FEET HIGHER THAN SURROUNDING HOMES 3) SOME MOUNDING / DEPRESSIONS / AREAS LACKING VEGETATION I SUGGESTED A PHASE II INVESTIGATION TO INCLUDE BORINGS THROUGH THIS AREA TO IDENTIFY THE DEPTH OF FILL AND A COUPLE SAMPLES OF FILL WHICH MIGHT APPEAR TO BE CONTAMINATED. WE THEN WENT ALONG THE BACK OF THE WURLITZER BUILDING - I NOTED THE ROADWAY / PARKING AREA MIGHT ALSO CONTAIN FILL WHICH COULD BE INVESTIGATED IN A SIMILAR FASHION AS AREA #1. WE THEN PROCEEDED TO AREA #3. A VERY LARGE "JUMP"

Code Activity

Case Number

Service Request No.

Date Received Complaint 5-1-90

o. ice Request Worlitzer Site/Field Inspection page 2 of 3

Originator of Complaint Address

by per Address

Occupant Address

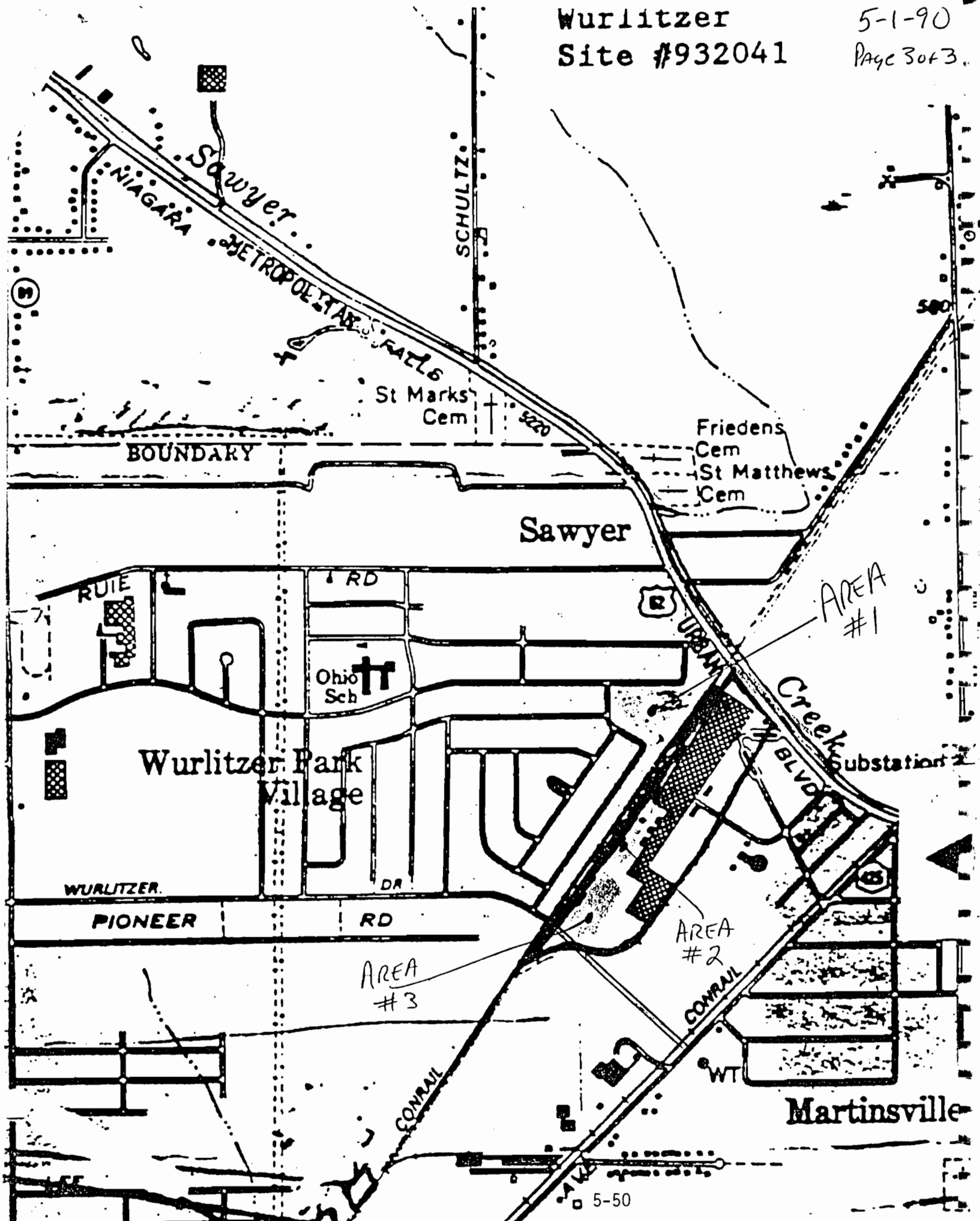
[illegible]

Date Abated 5-49 By _____

By _____
ecology and environment

Wurlitzer
Site #932041

5-1-90
Page 3 of 3



NIAGARA COUNTY DEPARTMENT OF HEALTH

Code Activity Sc
 Code Location NORTH TONAWAND
 Service Request No.
 Date Received Complaint 5-2-90

Service Request WURLITZER SITE INSPECTION

Originator of Complaint Address

Owner Address

Occupant Address

Date	Hours	REPORT OF INVESTIGATION
5-2-90	12 ⁰⁰ PM	THIS WRITER RETURNED TO THE WURLITZER "DUMP" (WHICH WAS POINTED OUT TO THIS DEPARTMENT YESTERDAY) FOR A MORE DETAILED LOOK AT THE CURRENT CONDITION. TWENTY FOUR PICTURES WERE TAKEN TO DOCUMENT ~~THE~~ ITEMS OF POSSIBLE ENVIRONMENTAL CONCERN. THE DUMP AREA APPEARED TO HAVE RECEIVED MANY LOADS OF WHAT MIGHT BE AN ASH MATERIAL ACROSS MOST OF THE SITE - THIS MATERIAL MAY ACCOUNT FOR 80-90% OF THE MOUNDING THAT IS NOTICABLE. THE EASTERN AND WESTERN SIDES DO NOT APPEAR TO HAVE BEEN FILLED AND REMAIN LOW, WET (VERY SWAMPY) SCATTERED ACROSS THE SITE IS EVIDENCE OF OLD TAR PAPER/ROOFING SHINGLES - ALSO DOZENS OF 5 GALLON METAL PAILS WHICH MAY HAVE CONTAINED ROOFING TAR. LARGE PIECES OF SHEET METAL SCRAP ARE ALSO FOUND ACROSS THE SITE. EVIDENCE OF SEVERAL DOZEN 55 GALLON DRUMS IS VISIBLE (IN VARIOUS STATES OF DECAY) - SOME BARELY VISIBLE IN FILL - OTHERS HALF BURIED - AND MANY ON THE SURFACE. ONE CLUSTER OF DRUMS CONTAINED A WHITE/GRAY SLUDGE-LIKE MATERIAL. A BLACK-TARRY MATERIAL APPEARED TO HAVE OOOZED TO THE SURFACE IN ONE AREA. SOME PONDING WHICH WAS DRYING OUT ON THE EASTERN SIDE HAD SLIGHTLY DISCOLORED THE GROUND SURFACE (REDDISH) POSSIBLY DUE TO METAL SCRAP & DRUMS DECAYING. MUCH EVIDENCE OF ANIMAL BURROWING IS SEEN IN MANY "ASH?" PILES. THE DUMP IS UNFENCED ON THREE SIDES WITH THE SIDE

Date Abated 5-51

By

Code Activity 54
Code Location NORTH TONAWANDA
Service Request No. _____
Date Received Complaint 5-2-90

Originator of Complaint Address

Owner Address

Occupant Address

Date Abated 5-52 By _____

REFERENCE 11

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Wurlitzer I.D. NUMBER: 932041
PERSON CONTACTED: ~~Paul F. McDonough~~ ^{Paul F. McDonough} DATE: May 15, 1990
AFFILIATION: ~~City~~ ^{City} Town of North Tonawanda PHONE NUMBER: 695-8531
Water Superintendent
ADDRESS: 216 Payne Avenue CONTACT
Room 6, City Hall PERSON(S): Judy Vangalio
N. Tonawanda, NY 14120
TYPE OF CONTACT: phone interview

INTERVIEW SUMMARY

No people in the vicinity of the Wurlitzer site use well water. All are connected to a public water supply. There are no farms in the area therefore no irrigation.

A chemical plant in the area may have wells on their property but not for drinking water purposes. To Mr. McDonough knowledge, the wells may be shut down as of now.

McDonough

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: Paul F. McDonough

Date: 5-25-90

Paul F. McDonough,
Water Superintendent

for City of North Tonawanda

REFERENCE 12

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Wurlitzer I.D. NUMBER: 932041
 PERSON CONTACTED: Mr. Paul Dickoy DATE: 4/2/90
 AFFILIATION: Niagara County Department of Health PHONE NUMBER: 284-~~443~~ 3128
 ADDRESS: 10th and Falls St. CONTACT PERSON(S): J. Vangalio
 Niagara Falls R. Leichner
 TYPE OF CONTACT: personal interview and file search

INTERVIEW SUMMARY

Mr. Dickoy told us that all residences in a 3-mile radius of the Wurlitzer site are on public water.

In a file on the site, a Department of Health memo dated 4/7/86, by P. Dickoy, noted the following:

- o C and D debris, roofing tar paper, shingles, and numerous pails, which at one time contained tar, scattered about the site;
- o Several highly rusted 55-gallon drums, which were empty, in the surrounding bush;
- o 2 55-gallon drums containing a plaster-like material with metal chips mixed in;
- o 1 55-gallon drum 3/4 full of an unknown material;
- o Pile of fill material surrounding the residential sides of the lot. These surrounding edges support abundant brush and trees;
- o Entire site area is 2 to 8 feet above the surrounding grade and the raised area has a very uneven grade; and
- o No materials were identified that may be a health threat. Scavenger dumping seems to be the source of the above ground material, but the site may have been landfilled in the past as indicated by the raised grade and uneven surface.

Interview Acknowledgement Form
Wurlitzer
Page Two

Also, a memo from the Department of Health dated 3/31/86, to P. Buechi and L. Clare of the DEC, contained the following information:

- o There were never significant plating operations at the Wurlitzer Plant; and
- o During WW II, the plant produced printed circuit boards and electrical components. All plating was subcontracted out to local platers.

~~It was stated that the~~
~~_____~~
~~_____~~
~~_____~~
RECENT MEMOS DATED MAY 8, 1990 TO
RON TRAMANTANO AND VALERIE LAURIE OUTLINE THIS DEPARTMENT'S CURRENT
CONCERNS AT THE WURLITZER SITE (COPIES ATTACHED)
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: _____

Paul D. [Signature]

Date: _____

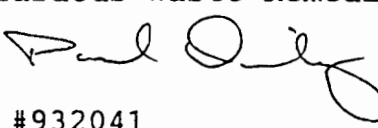
4-23-90

REFERENCE 13

MEMORANDUM

NIAGARA COUNTY HEALTH DEPARTMENT

TO: Ms. Valerie Lauzze/NYSDEC
Bureau of Hazardous Site Control
Division of Hazardous Waste Remediation

FROM: Mr. Paul Dicky 

SUBJECT: Wurlitzer Site #932041

DATE: May 8, 1990

This memo shall serve as a follow-up to my May 1, 1990 walk-through inspection of the above site with yourself, Mr. Hyden, and Ms. Thapa. As I had mentioned at that time, this department was previously unaware of the "open dump" (yellow area on attached map) which is located behind the Wurlitzer plant. Previous to this inspection, the two areas of suspected landfilling of industrial wastes (pink areas on attached map) were the only areas of concern by this department.

The current condition of the open dump area is quite alarming with respect to potential public health exposures. The site is currently unfenced on three sides with access available through a break in the fenced side. Waste materials appear to be largely uncovered. Wastes have been dumped into surface waters. Established foot paths crisscross the site.

In light of these currently conditions, this department requests that the Phase II investigation which is scheduled to begin this spring/summer include the following:

- 1) Waste sample analysis for visually different types of waste on the surface of the site-This should include ashlike material which is visible near animal burrowing locations. An area of oozing black tar (potentially different material from the large amounts of old roofing materials), a white solid material in partially decomposed drums, a red leachate outbreak area, a dead/dying vegetation area near a low swampy section of the site. The contractor should have the flexibility to add additional samples in the event the field crew identifies other areas of waste materials which may pose a public health threat.
- 2) Surface water samples from ponding areas where the waste has been placed.
- 3) Sediment samples from ponding areas which may have dried by the time of the sampling portion of the investigation.

Ms. Valerie Lauzze
Page 2
May 8, 1990

- 4) Ground water monitoring should concentrate on the uppermost aquifer. In the case of this site, a perched ground water table may exist since there will probably be a good amount of clay before overburden/bedrock is reached.

Also, a stated objective of the Phase II investigation should be to present recommendations with respect to preventing future public exposures to the wastes at the site. This department recognizes that there will remain many unknowns with regard to the possibilities of different wastes becoming exposed to the surface. It can also be expected that a fair amount of children will play in the landfill area, as evidence of tree forts is visible in the adjacent wooded area on the opposite side of Wurlitzer Drive.

The locations of surface waste noted in No. 1 have been pointed out during a May 7, 1990 walk-through inspection of the site with Mr. Richard Watt and Don Johnson of Ecology and Environment, Inc. I can be available to again point out these areas during the time of actual sample collection. Please call me at (716) 284-3128 if I can be of any assistance during this investigation.

PD:ms

cc: Mr. James J. Devald, P.E.
Mr. Joseph Sciascia/DEC-R90
Mr. Ronald Tramantano/DOH-Albany
Dr. Olivia Smith-Blackwell/DOH-BRO

REFERENCE 14

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Wurlitzer Site I.D. NUMBER: 932041
PERSON CONTACTED: Burrell Buffington DATE: 4/10/90
AFFILIATION: National Heritage Program PHONE NUMBER: 518-783-3932
ADDRESS: 700 Troy-Schenectedy Road CONTACT PERSON(S): Judy Vangalio
Albany, NY 12210 Ralinda Leichner
TYPE OF CONTACT: map search

INTERVIEW SUMMARY

No significant habitats were found within 1.5 miles of the site after looking at the Significant Habitat Maps (1980) prepared by the Habitat Inventory Unit of the NYSDEC Division of Fish and Wildlife Bureau of Wildlife.

No endangered species, wildlife management, or wildlife refuge areas are located within 1.5 miles of the site. This 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

INTERVIEW ACKNOWLEDGMENT FORM

SITE NAME: Wurlitzer I.D. NUMBER: 932041
PERSON CONTACTED: Ronald Gwozdek DATE: 4-2-90
AFFILIATION: Niagara County Health Department PHONE NUMBER: 439-6109
ADDRESS: 5467 Upper Mountain Rd. CONTACT PERSON(S): J. Vangalio
TYPE OF CONTACT: Personal Interview R. Leichner

INTERVIEW SUMMARY

Mr. Gwozdek told us that there is only one municipal well in the county which is in the Town of Royalton, Village of Middleport. The rest of the county is on municipal water from the Niagara River. We had copies made of a file containing test data from the Village of Middleport well.

Water intakes for Niagara County are on U.S.G.S. maps. The Niagara Falls quad shows the Niagara Falls and Niagara County intakes. The Tonawanda West Quad shows the Lockport and North Tonawanda intakes and also the Tonawanda intakes which are not in Niagara County. Mr. Gwozdek recommended that we contact Mr. Paul Dickey, of the Department of Health in Niagara Falls, for specific water information relating to hazardous waste sites. The Department of Health has no list of people using well water because they test wells only on request. Mr. Gw to find out who is connected to the water supply. He provided us with a list of the water superintendents.

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. inter-viewer(s) (as revised below, if necessary).

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

Signature: Russ J. [Signature] Date: 04-16-70

REFERENCE 16

REFERENCE 17

Wulitzer
NYS DOH Albany NY
Dawn Hettrick

ref 18

site inspection 7/22/85 from: Bureau of Toxic Substance Assessment, Hazardous Waste Site Inspection Report

The Wulitzer Company is no longer in business at this address. They still own the property but it is being managed by Mike Stan (NCTPA). The company did generate waste but own many properties where it may have disposed industrial waste. Jack Tyger of NYSDEC recalls a fire in 1960 or 1961 in Sawyer and Bull Creek that stopped production. He said that ~~Wulitzer~~ Wulitzer had a permit for discharge. They were producing the following wastes: Chrome, Hexachrome, Halogenated organics, plastic paints, BTX's

There are no wells for public/private use within 2 miles

The Niagara County Health Department has been unable to locate this site. It is not confirmed whether or not this site actually exists.

Site has no fences - site is being used as an industrial park, there are stores, restaurants, warehouses, manufacturing in the one large structure

REFERENCE 18

R. KARPOWICZ

SURFACE WATER IN THE ERIE-NIAGARA BASIN, NEW YORK

by
W. E. Harding and B. K. Gilbert

With a Chapter on STORAGE REQUIRED TO MAINTAIN FLOWS

by
R. M. Beall



**Prepared for the
Erie-Niagara Basin Regional Water Resources
Planning Board**

by
**UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**
in cooperation with
**THE NEW YORK STATE CONSERVATION DEPARTMENT
DIVISION OF WATER RESOURCES**

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

**Basin Planning Report ENB-2
1968**

5-71

REFERENCE 19

GROUND-WATER RESOURCES OF THE ERIE-NIAGARA BASIN, NEW YORK



**Prepared for the
Erie-Niagara Basin Regional Water Resources
Planning Board**

by

A. M. La Sala, Jr.

**UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
in cooperation with
THE NEW YORK STATE CONSERVATION DEPARTMENT
DIVISION OF WATER RESOURCES**

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

Basin Planning Report ENB-3

1968

5-73

REFERENCE 20



CATEGORY SYMBOLS

NEW YORK LAND USE MAP
ref. 2

NEW YORK STATE LAND USE AND NATURAL RESOURCES INVENTORY

AREA LAND USE DATA

Active

Ao Orchard
Av Vineyard
Ah Horticulture
At High intensity -
Ac Cropland/cropland pasture
Ap Permanent pasture

Inactive

Ai Agriculture Inactive
Ui Urban Inactive
Uc Ui under construction

Specialty Farm

Ay Minks, game, aquatic ag,
horse farms

Forestland

Fc Brush cover up to fully stocked
poles less than 30 feet
Fn Forest over 30 feet
Fp Plantations, any size

Water

Wn Natural, any size
Wc Artificial, one acre
Ws Streams, rivers - 100 feet

Wetlands

Wb Bogs, shrub wetlands
Ww Wooded wetlands
Wm Marine wetlands, navigable (St.
Lawrence)
Wh Hudson River

Non-Productive

Ns Sands
Nr Exposed rocks

Public

P All categories

Communications

recycled paper

Area of service facilities

Residential

Rh High density, 50 feet frontage
Rm Medium density, 50-100 feet frontage
Rl Low density, over 100 feet frontage
Rs Strip with max of 1/3 intermixture
of Cs commercial
Rr Rural hamlet
Re Estates, 5 acres
Rc Farm labor camp

Shoreline

Rk Shoreline developed

Commercial

Cu Urban (Downtown)
Cc Shopping center
Cs Commercial strip with max of 1/3 inter-
mixture of Rs or density housing
Cr Resorts

Industrial

I1 Light manufacturing
Ih Heavy manufacturing

Outdoor Recreation

OR ALL categories

Extractive

Eg Gravel, sand
Es Stone quarries
Em Minerals, cement, clay
Eu Oil, gas, salt

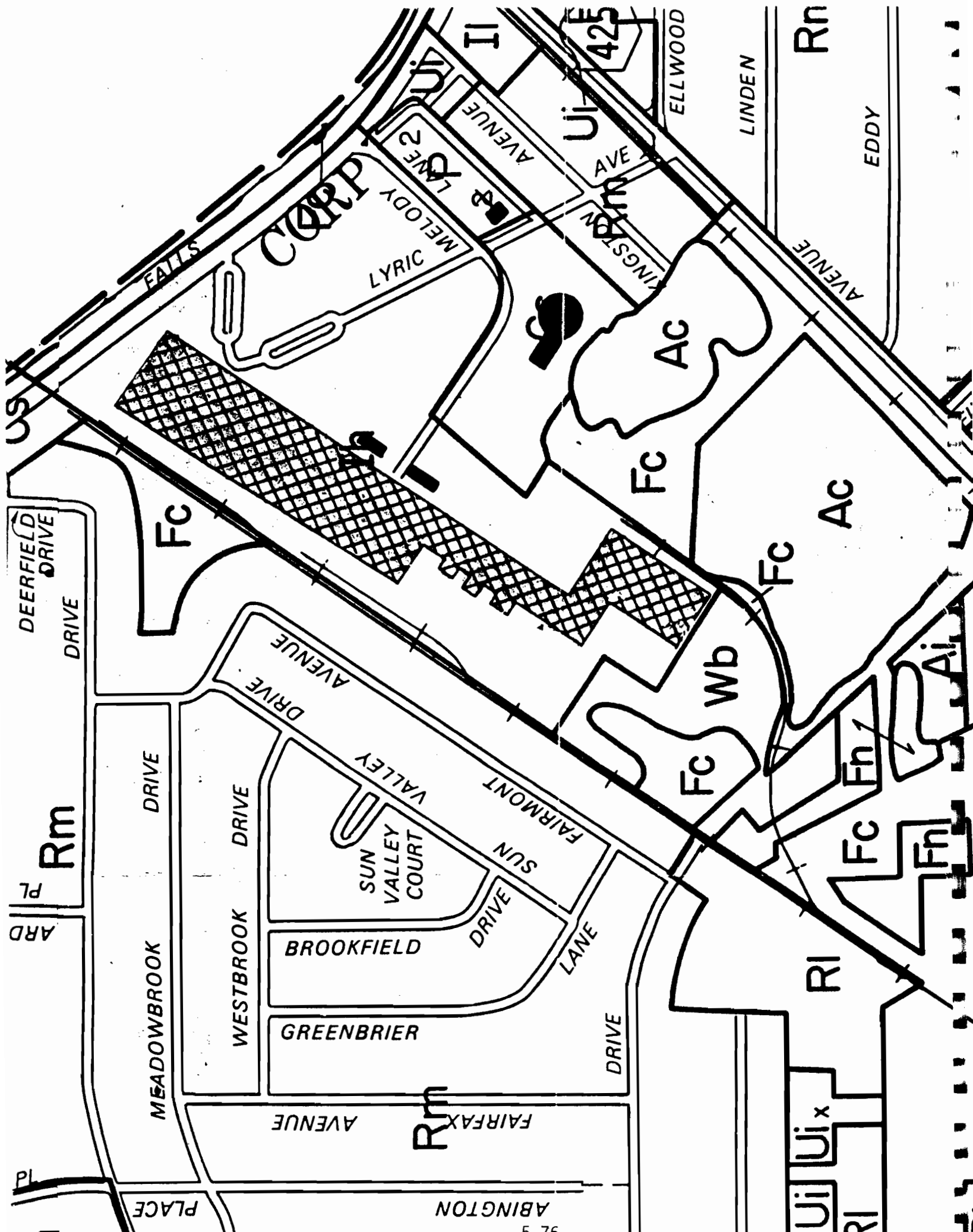
Transportation

Th Highway (limited access)
Tb Barge canal (channel, lock)
Tp Port or dock
Tl Locks or dams
Ts Shipyards
Ta Airport, any type
Tr Railroad

Land Area Not in New York State

No 5-75

ecology and environment



REFERENCE 21

**NATIONAL REGISTER
OF HISTORIC PLACES
1966-1988**

New York County—Continued

Stuyvesant Square Historic District, Roughly bounded by Nathan D. Perleman Pl., 3rd Ave., E. 18th and E. 15th Sts., New York, 11/21/80, C, 80002723

Surrogate's Court, 31 Chambers St., New York, 1/29/72, C, NHL, 72000888

Sutton Place Historic District, 1—21 Sutton Pl. & 4—16 Sutton Sq., New York, 9/12/85, C, 85002294

Theodore Roosevelt Birthplace National Historic Site, 28 E. 20th St., New York, 10/15/66, B,c,e, 66000054

Third Judicial District Courthouse, 425 Avenue of the Americas, New York, 11/09/72, C, NHL, 72000875

Tiffany and Company Building, 401 5th Ave., New York, 6/02/78, A,C, NHL, 78001886

Tiklen, Samuel J., House, 14—15 Gramercy Park South, New York, 5/11/76, B,C, NHL, 76001251

Town Hall, 113—123 W. 43rd St., New York, 4/23/80, A,C, 80002724

Trinity Chapel Complex, 15 W. 25th St., New York, 12/16/82, C,a, 82001205

Trinity Church and Graveyard, Broadway and Wall St., New York, 12/08/76, A,C,a,d, NHL, 76001252

Tudor City Historic District, Roughly bounded by Forty-third St., First Ave., Forty-first St., and Second Ave., New York, 9/11/86, C, 86002516

Turtle Bay Gardens Historic District, 226-246 E. 49th St. and 227-245 E. 48th St., New York, 7/21/83, A,C, 83001750

Tweed Courthouse, 52 Chambers St., New York, 9/25/74, B,C, NHL, 74001277

U.S. Customhouse, Bowling Green, New York, 1/31/72, C, NHL, 72000889

U.S. General Post Office, 8th Ave. between 31st and 33rd Sts., New York, 1/29/73, C, 73002257

US Courthouse, 40 Foley Sq., New York, 9/02/87, A,C, 87001596

USS INTREPID (aircraft carrier), Intrepid Sq., New York, 1/14/86, A,g, NHL, 86000082

Union Theological Seminary, W. 120th St. and Broadway, New York, 4/23/80, A,C,a, 80002725

United Charities Building Complex, 105 E. 22nd St., 289 Park Ave. S. and 111-113 E. 22nd St., New York, 3/28/85, B,C, 85000661

University Club, 1 W. 54th St., New York, 4/16/80, C, 80002726

University Settlement House, 184 Eldridge St., New York, 9/11/86, A, 86002515

Upper East Side Historic District, Roughly bounded by 3rd and 5th Aves., 59th and 79th Sts., New York, 9/07/84, C, 84002803

Van Rensselaer, Stephen, House, 149 Mulberry St., New York, 6/16/83, C, 83001751

Vanderbilt, Mrs. Graham Fair, House, 60 E. 93rd St., New York, 4/02/82, C, 82001206

Villard Houses, 29 1/2 50th St., 24—26 E. 51st St., and 451, 453, 455, and 457 Madison Ave., New York, 9/02/75, B,C,a, 75001210

WAVERTREE, Pier 17, foot of Fulton St., New York, 6/13/78, A,C, 78001887

Waldo, Gertrude Rhinclander, Mansion, 867 Madison Ave., New York, 5/06/80, C, 80002727

Warburg, Felix M., Mansion, 1109 5th Ave., New York, 10/29/82, C, 82001207

Watson, James, House, 7 State St., New York, 7/24/72, C,a, 72000891

Webster Hotel, 40 W. 45th St., New York, 9/07/84, C, 84002806

West 67th Street Artists' Colony Historic District, 1—39 and 40—50 W. 67th St., New York, 7/11/85, A,C, 85001522

West 73rd-74th Street Historic District, 73rd, 74th Sts. and Columbus Ave., New York, 9/08/83, C, 83001752

West 76th Street Historic District, W. 76th St., New York, 7/24/80, C, 80002728

West End Collegiate Church and Collegiate School, W. End Ave. and W. 77th St., New York, 5/06/80, C,a, 80002729

Westchester House, 541—551 Broome St., New York, 3/20/86, A,C, 86000450

Woolworth Building, 233 Broadway, New York, 11/13/66, A,C, NHL, 66000554

Yiddish Art Theatre, 189 Second Ave., New York, 9/19/85, A,C, 85002427

Niagara County

Adams Power Plant Transformer House, Buffalo Ave. near Portage Rd., Niagara Falls, 6/11/75, A,C, NHL, 75001212

Deveaux School Historic District, 2900 Lewiston Rd., Niagara Falls, 6/05/74, A,a, 74001281

Fort Niagara Light [U.S. Coast Guard Light-houses and Light Stations on the Great Lakes TR], Niagara River, Youngstown, 7/19/84, A,C, 84002809

Frontier House, 460 Center St., Lewiston, 7/08/74, A,C, 74001278

Herschell, Allan, Carousel Factory, 180 Thompson St., North Tonawanda, 4/18/85, A,C, 85000856

Holley-Rankine House, 525 Riverside Dr., Niagara Falls, 10/04/79, B,C, 79003793

Lewiston Mound, Address Restricted, Lewiston vicinity, 1/21/74, D, 74001279

Lewiston Portage Landing Site, Address Restricted, Lewiston vicinity, 7/18/74, A,D, 74001280

Lockport Industrial District, Bounded roughly by Erie Canal, Gooding, Clinton, and Water Sts., Lockport, 11/11/75, A,C, 75001211

Lowertown Historic District, Roughly bounded by Erie Canal and New York Central RR, Lockport, 6/04/73, A,C, 73001225

Moore, Benjamin C., Mill, Pine St. on the Erie Canal, Lockport, 6/19/73, A,C, 73001226

Niagara Falls Public Library, 1022 Main St., Niagara Falls, 6/05/74, A,C, 74001282

Niagara Reservation, Niagara Reservation, Niagara Falls, 10/15/66, A, NHL, 66000555

Old Fort Niagara, N of Youngstown on NY 18, Youngstown vicinity, 10/15/66, A,D, NHL, 66000556

Riviera Theatre, 27 Webster St., North Tonawanda, 3/20/80, A,C, 80002731

Thirty Mile Point Light [U.S. Coast Guard Light-houses and Light Stations on the Great Lakes TR], Niagara River, Somerset, 7/19/84, A,C, 84003922

U.S. Customhouse, 2245 Whirlpool St., Niagara Falls, 7/16/73, A,C, 73001227

Union Station, 95 Union Ave., Lockport, 12/02/77, A,C, 77000966

Whitney Mansion, 335 Buffalo Ave., Niagara Falls, 1/17/74, B,C, 74001283

Williams, Johann, Farm, 10831 Cayuga Dr., Niagara Falls, 1/10/80, A,C,a, 80002730

Oneida County

Arsenal House, 514 W. Dominick St., Rome, 7/18/74, A,C, 74001284

Boonville Historic District, Schuyler, Post, W. Main and Summit Sts., Boonville, 11/16/79, A,C, 79001608

Clinton Village Historic District, North, South, East, West Park Rows, Marvin, Williams, Chestnut, Fountain, College and Utica Sts., Clinton, 6/14/82, A,C, 82003389

Conkling, Roscoe, House, 3 Rutger St., Utica, 5/15/75, B, NHL, 75001214

Erwin Library and Pratt House, 104 and 106 Schuyler St., Boonville, 8/14/73, A,B,C, 73001228

First Baptist Church of Deerfield, Herkimer Rd., Utica, 7/11/85, C,a,d, 85001497

First Congregational Free Church, 177 N. Main St., Oriskany Falls, 1/25/79, A,C,a, 79001609

First Presbyterian Church, 1605 Genesee St., Utica, 11/03/88, C,a, 88002172

Five Lock Combine and Locks 37 and 38, Black River Canal, NY 46, Boonville, 3/20/73, A,C, 73001229

Floyd, Gen. William, House, W side of Main St., Westernville, 7/17/71, B, NHL, 71000549

Fort Stanwix National Monument, Bounded by Dominick, Spring, Liberty, and James Sts., Rome, 10/15/66, A,c, NHL, 66000057

Fountain Elms, 318 Genesee St., Utica, 11/03/72, B,C, 72001599

Gansevoort-Bellamy Historic District, Roughly bounded by Liberty, Stuben, and Huntington Sts. to Bissel, Rome, 11/12/75, C,a,g, 75001213

Hamilton College Chapel, Hamilton College campus, Clinton, 11/03/72, A,C,a, 72000892

Jervis Public Library, 613 N. Washington St., Rome, 11/04/82, B,C, 82001208

Lower Genesee Street Historic District, Roughly bounded by Genesee, Liberty, Seneca, and

REFERENCE 22

Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States

By HANSFORD T. SHACKLETTE and JOSEPHINE G. BOERNGEN

U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER 1270

*An account of the concentrations of
50 chemical elements in samples of
soils and other regoliths*



RECEIVED

JUN 11 1984

ECOLOGY & ENVIRONMENT

1, unlike the geometric means shown in table 2, are estimates of geochemical abundance (Miesch, 1967). Arithmetic means are always larger than corresponding geometric means (Miesch, 1967, p. B1) and are estimates of the fractional part of a single specimen that consists of the element of concern rather than of the typical concentration of the element in a suite of samples.

Concentrations of 46 elements in samples of this study are presented in table 2, which gives the determination ratios, geometric-mean concentrations and deviations, and observed ranges in concentrations. The analytical data for most elements as received from the laboratories were transformed into logarithms because of the tendency for elements in natural materials, particularly the trace elements, to have positively skewed

TABLE 2.—Mean concentrations, deviations, and ranges of elements in samples of soils and other surficial materials in the conterminous United States

(Means and ranges are reported in parts per million (ppm), and means and deviations are geometric except as indicated. Ratio, number of samples in which the element was found in measurable concentrations to number of samples analyzed. <, less than; >, greater than)

Element	Conterminous United States			Western United States (west of 96th meridian)				Eastern United States (east of 96th meridian)					
	Mean	Deviation	Estimated arithmetic mean	Ratio	Mean	Deviation	Observed range	Estimated arithmetic mean	Ratio	Mean	Deviation	Observed range	Estimated arithmetic mean
Al, percent	4.7	2.48	7.2	661:770	5.8	2.00	0.5 - >10	7.4	470:477	3.1	2.87	0.7 - >10	5.7
As-----	5.2	2.23	7.2	778:770	5.5	1.98	<0.10 - 97	7.0	521:527	4.8	7.56	<0.1 - 73	7.0
B-----	26	1.97	33	506:778	23	1.99	<20 - 300	29	425:541	31	1.88	<20 - 150	38
Ba-----	440	2.14	580	778:778	580	1.72	70 - 5,000	670	541:541	290	2.35	10 - 1,500	420
Be-----	.63	2.38	.92	310:778	.68	2.30	<1 - 15	.97	169:525	.55	2.53	<1 - 7	.85
Br-----	.56	2.50	.85	113:220	.52	2.74	<0.5 - 11	.86	78:128	.62	2.18	<0.5 - 5.3	.85
C, percent	1.6	2.57	2.5	250:250	1.7	2.37	0.16 - 10	2.5	162:162	1.5	2.88	0.06 - 37	2
Ca, percent	.92	4.00	2.4	777:777	1.8	3.05	0.06 - 37	3.3	514:514	.34	3.08	0.01 - 28	1
Ce-----	63	1.78	75	81:683	65	1.71	<150 - 300	75	70:489	63	1.85	<150 - 300	76
Co-----	6.7	2.19	9.1	698:778	7.1	1.97	<3 - 50	9.0	403:533	5.9	2.57	<0.3 - 70	9.2
Cr-----	37	2.37	54	770:778	41	2.19	3 - 2,000	56	541:541	33	2.60	1 - 1,000	52
Cu-----	17	2.44	25	778:778	21	2.07	2 - 300	27	521:513	13	2.80	<1 - 700	22
F-----	210	3.34	430	598:610	280	2.52	<10 - 1,900	440	390:435	130	4.19	<10 - 3,700	360
Fe, percent	1.8	2.30	2.6	776:777	2.1	1.95	0.1 - >10	2.6	577:560	1.4	2.87	0.01 - >10	2.5
Ga-----	13	2.03	17	767:776	16	1.68	<5 - 70	19	431:540	9.3	2.38	<5 - 70	14
Ge-----	1.2	1.37	1.2	224:224	1.2	1.32	0.58 - 2.5	1.2	170:171	1.1	1.45	<0.1 - 2.0	1
Hg-----	.050	2.52	.087	777:733	.046	2.33	<0.01 - 4.6	.065	534:534	.081	2.52	0.01 - 3.4	.072
I-----	.75	2.63	1.2	167:246	.79	2.55	<0.5 - 9.6	1.2	90:153	.68	2.81	<0.5 - 7.0	1.2
K, percent ¹	1.5	.79	None	777:777	1.8	.71	0.19 - 6.3	None	577:577	1.2	.73	0.005 - 3.7	1.2
La-----	30	1.92	37	462:777	30	1.89	<30 - 200	37	294:516	29	1.98	<30 - 200	37
Li-----	20	1.85	24	731:731	22	1.58	5 - 170	25	479:577	17	2.16	<5 - 140	28
Mg, percent	.44	3.28	.90	777:778	.74	2.21	0.03 - >10	1.0	578:578	.21	3.55	0.005 - 5	.46
Mn-----	330	2.77	550	777:777	380	1.98	30 - 5,000	480	537:560	260	3.87	<2 - 7,000	640
Mo-----	.59	2.72	.97	57:774	.85	2.17	<3 - 7	1.1	12:574	.32	3.93	<1 - 15	.9
Na, percent	.59	3.27	1.2	744:744	.97	1.95	0.05 - 10	1.2	363:449	.25	4.55	<0.05 - 5	.8
Nb-----	9.3	1.75	11	418:771	8.7	1.82	<10 - 100	10	327:498	10	1.65	<10 - 50	17
Nd-----	40	1.68	46	120:538	36	1.76	<70 - 300	43	109:332	46	1.58	<70 - 300	51
Ni-----	13	2.31	19	747:778	15	2.10	<5 - 700	19	443:560	11	2.66	<5 - 700	18
P-----	260	2.67	430	524:524	370	2.33	80 - 4,500	480	380:587	200	2.95	<70 - 6,800	36
Pb-----	16	1.86	19	712:778	12	1.80	<10 - 700	20	422:541	14	1.95	<10 - 300	18
Rb-----	58	1.72	67	221:274	69	1.50	<20 - 210	74	107:131	43	1.94	<20 - 160	53
S, percent	.12	2.04	.16	34:224	.13	2.37	<0.08 - 4.8	.19	20:131	.10	1.34	<0.08 - 0.31	.11
Sb-----	.48	2.27	.67	35:773	.47	2.15	<1 - 2.6	.62	31:131	.52	2.38	<1 - 8.8	.76
Sc-----	7.5	1.82	8.9	685:778	8.2	1.74	<5 - 50	9.6	389:526	6.5	1.90	<5 - 30	.0
Se-----	.26	2.46	.39	590:733	.23	2.43	<0.1 - 4.3	.34	449:534	.30	2.44	<0.1 - 3.9	.45
Si, percent ¹	31	6.48	None	250:250	30	5.70	15 - 44	None	156:156	34	6.64	1.7 - 45	5
Sn-----	.89	7.74	1.3	218:774	.90	2.11	<0.1 - 7.4	1.2	171:171	.86	2.81	<0.1 - 10	5
Sr-----	120	3.10	240	778:778	200	2.15	10 - 3,000	270	501:560	53	3.61	<5 - 700	11
Ti, percent	.24	1.89	.29	777:777	.22	1.78	0.05 - 2.0	.76	540:560	.28	2.00	0.007 - 1.5	.35
Th-----	8.6	1.53	9.4	195:195	9.1	1.49	2.4 - 31	9.8	102:102	7.7	1.58	2.2 - 23	8.6
U-----	2.3	1.73	2.7	224:274	2.5	1.45	0.68 - 7.9	2.7	170:170	2.1	2.12	0.79 - 11	7
V-----	58	2.25	80	778:778	70	1.95	7 - 500	88	516:541	43	2.51	<7 - 300	7
Y-----	21	1.78	25	759:778	27	1.66	<10 - 150	25	477:541	20	1.97	<10 - 200	25
Yb-----	2.6	1.79	3.1	754:764	2.6	1.63	<1 - 20	3.0	452:484	2.6	2.06	<1 - 50	3.3
Zn-----	48	1.95	60	766:766	55	1.79	10 - 2,100	65	471:487	40	2.11	<5 - 2,900	52
Zr-----	180	1.91	230	777:778	160	1.77	<20 - 1,500	190	539:541	220	2.01	<20 - 2,000	27

¹Means are arithmetic, deviations are standard.

REFERENCE 23

Dangerous Properties of Industrial Materials

Sixth Edition

N. IRVING SAX

Assisted by:

Benjamin Feiner/Joseph J. Fitzgerald/Thomas J. Haley/Elizabeth K. Welsburger

TABLE I

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

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

Table 1 (cont.)

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

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

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

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

REFERENCE 24

**LABORATORY ANALYTICAL DATA
APPENDIX E OF THIS REPORT**

REFERENCE 25

**SUBSURFACE BORING LOGS
APPENDIX C OF THIS REPORT**

REFERENCE 26

Mr. Larkin

May 1, 1953

Mr. Zellner - Batavia District

Additional information on industrial waste, Wurlitzer plant, No. Tonawanda, N.Y.

In accordance with our discussion of yesterday at Buffalo, I conferred with Mr. Daniel Goodman, plant manager in the Wurlitzer plant, No. Tonawanda, yesterday afternoon relative to the sewage and industrial waste from this plant located in the city of North Tonawanda.

I advised Mr. Goodman of our surveys of the Niagara River and Tonawanda watersheds and of the fact that no information had been included on the Wurlitzer plant since it had been thought that the plant emptied all of its sewage and industrial waste into the city sewers. Mr. Goodman showed me then a permit issued by Mr. Devendorf on April 11, 1947 in which condition 3 was worded as follows: That only rinse water and no toilet wastes nor any acids nor plating liquid excepting such very small quantities as may of necessity be contained in rinse water shall be discharged or allowed to flow into the proposed waste outlet pipe.

He advised that they had received no definite word that the recent fish kill was caused by waste from their plant. This approval was given over a year before I was familiar with Niagara County. Mr. Bates probably recalls this, since he was handling Niagara County at that time. I obtained other information from Mr. Goodman which is being listed as follows: The plant makes organs, phonographs and does defense work, certain of which is classified and restricted. The plant is located on the eastern end of the city, along Sawyer Creek and employs approximately 3,000 persons. Mr. Goodman advised that all sanitary wastes (toilet, etc.), are discharged into the city sanitary sewer. The raw materials used in this plant are metal and wood. The plant also has a well supply which is used for cooling water. This cooling water is discharged into the Sawyer Creek through the drain pipe permitted by the approval of 1947. Into this same pipe entering into Sawyer Creek is discharged rinse water from the plant. He advised that they are adhering to the requirements of condition 3 of their permit and that the chemist is checking pHs, etc. on the effluent. With regard to the amount of waste, I could not obtain any definite information. With regard to the water usage per day, they use about 500,000 gallons of the North Tonawanda public water supply. A very rough estimate of the amount discharged into Sawyer Creek of this city water used in rinsing, boiler room, etc., would be between 100,000 and 150,000 according to him.

FDZ:jln

cc: Mr. Bernhardt

November 13, 1953

Record Memo

Rudolph Wurlitzer Co., North Tonawanda

On November 13, 1953, I called Mr. Goodman's office and arranged to see him to discuss the pollution problem in his plant. Upon arrival, found he was in conference and talked to his assistant. Finally, was turned over to Mr. Ralph Mead, Chemist, for the information.

The company is preparing to file a brief with the W.P.C.B. on the proposed classification of Sawyer Creek. Mr. Mead has prepared the technical portion and turned it over to the legal department for transmission to the Board.

The company draws some 500 gallons per minute of well water to use in cooling an air humidifier. This water passes through indirect cooling units once and then is discharged to Sawyer Creek through the common plant sewer. This water has a high sulfur content and therefore is suspected of being low in dissolved oxygen.

All the sanitary wastes are discharged to the municipal sanitary sewer system.

The other major source of waste water is from the plating room. Here zinc, cadmium, copper, and nickel are plated and cyanides are used with the first three. Some anodizing of aluminum with chromic acid is carried on here.

There are also the preliminary steps of acid and alkali cleaners. While the plating tanks are not supposed to be dumped, the tanks of cleaners are dumped about twice a week. No attempt is made to dump an alkali tank at the same time an acid tank is dumped for neutralization.

The plating tanks have to be emptied by siphoning as there are no draw offs. Spillage may occur through leakage or overflow. Automatic water level equipment is being installed on these tanks. The material used in making up the tanks must be obtained from the storeroom which is a little guard against a workman dumping the batch without management's notice.

The material is lifted from the plating baths and placed immediately in a running water rinse. These overflow continuously to the open drains in the plating room floor which lead to the sewer discharging to Sawyer Creek. All of the plating room operates two shifts a day and some three. As the total plant wastes approximate 800 g.p.m., the water from here is around 300 g.p.m.

Metal parts are degreased by a vapor process using trichlorethylene. When the solvent is spent, it is reclaimed in a still and the waste sludge is dumped on the property away from the stream.

The company has requested permission of the City of North Tonawanda to discharge all the wastes into the municipal sanitary sewers. At this time there has not been any reply from the city.

All the above was obtained from Mr. Mead and no plant inspection was made.

REFERENCE 27

BUFFALO DRILLING COMPANY
INC.



955 NIAGARA STREET
BUFFALO, NEW YORK
14213

May 30, 1990

JOB NO: 90-138

Blue Bird Coachlines, Inc.
502 N. Barry
Olean, New York 14760

ATTN: Mr. Steve Sellberg

RE: Subsurface and Environmental
Assessment Report for
Wurlitzer Drive Commercial
Property Development Site,
Tonawanda, New York.

Gentlemen:

This report presents the findings of the subsurface explorations and environmental assessment for the above referenced site. In summary, five test borings were field located and drilled by Buffalo Drilling Company, Inc. (BDC) on March 26, 1990. Other efforts undertaken for this report include: thorough site walkover; background and records review; and analytically testing one composite soil sample.

SUBSURFACE EXPLORATION METHODS

A track mounted Mobile B-47 rotary drill rig was used to drill the test borings to a depth of 12 feet below ground surface elevation. Drilling operations were done using 3-1/4 inch inside diameter (ID), continuous flight hollow stem augers. Soil samples were recovered by driving a standard split-spoon sampler (2 foot long by 1-3/8 inch inside diameter) 24 inches using a 140 pound hammer falling 30 inches each blow (ASTM D1586). The number of blows for 12

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS	I. IDENTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">01 State</td> <td style="width: 50%;">02 Site Number</td> </tr> <tr> <td style="text-align: center;">NY</td> <td style="text-align: center;">932041</td> </tr> </table>		01 State	02 Site Number	NY	932041
01 State	02 Site Number					
NY	932041					

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. Groundwater Contamination	02 ☐ Observed (Date _____)	[X] Potential	[] Alleged
03 Population Potentially Affected <u>0</u>	04 Narrative Description:		
Cadmium, Iron, Lead, Magnesium, and Manganese detected in groundwater samples above NYSDEC Class GA standards.			

01 ☒ B. Surface Water Contamination	02 ☐ Observed (Date _____)	[X] Potential	[] Alleged
03 Population Potentially Affected _____	04 Narrative Description:		
Potential due to past plant discharge into Sawyer Creek			

01 ☐ C. Contamination of Air	02 ☐ Observed (Date _____)	[] Potential	[] Alleged
03 Population Potentially Affected _____	04 Narrative Description:		
None documented or observed			

01 ☐ D. Fire/Explosive Conditions	02 ☐ Observed (Date _____)	[] Potential	[] Alleged
03 Population Potentially Affected _____	04 Narrative Description:		
None documented or observed			

01 ☒ E. Direct Contact	02 ☐ Observed (Date _____)	[X] Potential	[] Alleged
03 Population Potentially Affected <u>2554</u>	04 Narrative Description:		
Potential due to exposed fill material in disposal area Low concentrations of PAHs, PCBs, pesticides, and heavy metals detected in numerous soil samples.			

01 ☒ F. Contamination of Soil	02 ☐ Observed (Date _____)	[X] Potential	[] Alleged
03 Area Potentially Affected <u>Approx 10 acres</u>	04 ☐ Narrative Description:		
Potential due to exposed fill material in disposal area Low concentrations of PAHs, PCBs, pesticides, and heavy metals detected in numerous soil samples collected 8-29-90.			

01 ☒ G. Drinking Water Contamination	02 ☐ Observed (Date _____)	[X] Potential	[] Alleged
03 Population Potentially Affected _____	04 Narrative Description:		
None expected No drinking water wells within 3 miles of site			

01 ☐ H. Worker Exposure/Injury	02 ☐ Observed (Date _____)	[] Potential	[] Alleged
03 Workers Potentially Affected _____	04 Narrative Description:		
Unlikely due to inactive status of disposal area			

01 ☒ I. Population Exposure/Injury	02 ☐ Observed (Date _____)	[X] Potential	[] Alleged
03 Population Potentially Affected <u>2554</u>	04 Narrative Description:		
Potential due to exposed fill material in disposal area			

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 932041

II. HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)		
01 ☒ J. Damage to Flora 04 Narrative Description:	02 ☒ Observed (Date <u>5/1/90</u>)	☐ Potential ☐ Alleged
Areas of dead/dying vegetation observed during a NCDOH/NYSDEC walkover.		
01 ☒ K. Damage to Fauna 04 Narrative Description:	02 ☒ Observed (Date <u>5/5/65</u>)	☐ Potential ☐ Alleged
A 1965 fish kill on Sawyer and Bull creeks involving approximately 8,000 to 10,000 fish attributed to cyanide from Wurlitzer plant discharging to Sawyer Creek.		
01 ☒ L. Contamination of Food Chain 04 Narrative Description:	02 ☒ Observed (Date <u>6/4/65</u>)	☐ Potential ☐ Alleged
A 1965 fish kill on Sawyer and Bull creeks involving approximately 8,000 to 10,000 fish attributed to cyanide from Wurlitzer plant discharging to Sawyer Creek		
01 ☒ M. Unstable Containment of Wastes (Spills/Runoff/Standing liquids, Leaking drums) 03 ☐ Population Potentially Affected <u>2554</u>	02 ☒ Observed (Date <u>05/7/90</u>)	☐ Potential ☐ Alleged
04 Narrative Description: Exposed, rusted, and broken drums containing solid material		
01 ☐ N. Damage to Offsite Property 04 Narrative Description:	02 ☐ Observed (Date _____)	☐ Potential ☐ Alleged
None documented or observed		
01 ☒ O. Contamination of Sewers, Storm/ Drains, WWTPs 04 Narrative Description:	02 ☐ Observed (Date _____)	☒ Potential ☐ Alleged
Rinse water from factory reportedly was formerly discharged into sewers		
01 ☒ P. Illegal/Unauthorized Dumping 04 Narrative Description:	02 ☐ Observed (Date _____)	☒ Potential ☐ Alleged
Exposed fill in disposal area is primarily construction debris and may have resulted from scavenger dumping		
05 Description of Any Other Known, Potential, or Alleged Hazards Secondary alleged disposal area appears to contain coal only		
III. TOTAL POPULATION POTENTIALLY AFFECTED <u>2554</u>		
IV. COMMENTS		
V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)		
NYSDEC Phase I Report, 1989 E & E Site Inspection, 1990 NYSDEC & NCDOH Site Files		

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 4 - PERMIT AND DESCRIPTIVE INFORMATION				I. IDENTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">01 State NY</td> <td style="width: 50%;">02 Site Number 932041</td> </tr> </table>		01 State NY	02 Site Number 932041
01 State NY	02 Site Number 932041						
II. PERMIT INFORMATION							
01 Type of Permit Issued (Check all apply) ☐ A. NPDES ☐ B. UIC ☐ C. AIR ☐ D. RCRA ☐ E. RCRA Interim Status ☐ F. SPCC Plan ☐ G. State (Specify) ☐ H. Local (Specify) ☐ I. Other (Specify) ☐ J. None	02 Permit Number NA	03 Date Issued	04 Expiration Date	05 Comments			
III. SITE DESCRIPTION							
01 Storage Disposal (Check all that apply) ☐ A. Surface Impoundment ☒ B. Piles ☐ C. Drums, Above Ground ☐ D. Tank, Above Ground ☐ E. Tank, Below Ground ☐ F. Landfill ☐ G. Landfarm ☐ H. Open dump ☒ I. Other dumping of TCE still bottoms (Specify)	02 Amount Unknown <10 Unknown	03 Unit of Measure Drums	04 Treatment (Check all that apply) ☐ A. Incineration ☐ B. Underground Injection ☐ C. Chemical/Physical ☐ D. Biological ☐ E. Waste Oil Processing ☐ F. Solvent Recovery ☐ G. Other Recycling Recovery ☐ H. Other (specify)	05 Other ☒ A. Buildings On Site Wurlitzer Plant 06 Area of Site 44 Acres			
07 Comments Numerous piles and several drums observed; appear to be primarily construction debris							
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. Exposed piles of construction debris. Drums are old, rusted, and open but most are empty. Main alleged disposal area lies lower than surrounding roads.							
V. ACCESSIBILITY							
01 Waste Easily Accessible: ☒ Yes ☐ No 02 Comments: Site often trafficked by area youths.							
VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports) NYSDEC Phase I Report, 1989 E & E Site Inspection, 1990 NYSDEC & NCDOH Site Files							

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA (Cont.)		I. IDENTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">01 State NY</td> <td style="width: 50%;">02 Site Number 932041</td> </tr> </table>		01 State NY	02 Site Number 932041
01 State NY	02 Site Number 932041				

VI. ENVIRONMENTAL INFORMATION														
01 Permeability of Unsaturated Zone (Check one)														
<table style="width: 100%;"> <tr> <td style="text-align: center;">-6 -8</td> <td style="text-align: center;">-4 -6</td> <td style="text-align: center;">-4 -3</td> <td colspan="2"></td> </tr> <tr> <td>☐ A. 10⁻⁶ - 10⁻⁸ cm/sec</td> <td>☒ B. 10⁻⁴ - 10⁻⁶ cm/sec</td> <td>☐ C. 10⁻⁴ - 10⁻³ cm/sec</td> <td colspan="2">☐ D. Greater than 10⁻³ cm/sec</td> </tr> </table>					-6 -8	-4 -6	-4 -3			☐ 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	
-6 -8	-4 -6	-4 -3												
☐ 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)														
<table style="width: 100%;"> <tr> <td style="width: 25%;"> ☒ A. Impermeable (Less than 10⁻⁶ cm/sec) </td> <td style="width: 25%;"> ☐ B. Relatively Impermeable (10⁻⁴ - 10⁻⁶ cm/sec) </td> <td style="width: 25%;"> ☐ C. Relatively Permeable (10⁻² - 10⁻⁴ cm/sec) </td> <td colspan="2" style="width: 25%;"> ☐ D. Very Permeable (Greater than 10⁻² cm/sec) </td> </tr> </table>					☒ 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)						
☒ 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 <u>30-40</u> (ft)	04 Depth of Contaminated Soil Zone <u>Potentially 0 to 4 ft</u>	05 Soil pH <u>Unknown</u>												
06 Net Precipitation <u>6</u> (in)	07 One Year 24-Hour Rainfall <u>2.1</u> (in)	08 Site Slope <u>2-3</u> %	Direction of Site Slope <u>Variable</u>	Terrain Average Slope <u>4-5</u> %										
09 Flood Potential Site is in _____ Year Floodplain		10 ☐ Site is on Barrier Island, Coastal High Hazard Area, Riverine Floodway												
11 Distance to Wetlands (5 acre minimum) <table style="width: 100%;"> <tr> <td style="width: 33%;">ESTUARINE</td> <td style="width: 33%;">NA</td> <td style="width: 33%;">OTHER TE-12</td> </tr> <tr> <td>A. _____ (mi)</td> <td>B. <u>1</u> (mi)</td> <td></td> </tr> </table>		ESTUARINE	NA	OTHER TE-12	A. _____ (mi)	B. <u>1</u> (mi)		12 Distance to Critical Habitat (of endangered species) <u>>1</u> (mi) Endangered Species: _____						
ESTUARINE	NA	OTHER TE-12												
A. _____ (mi)	B. <u>1</u> (mi)													
13 Land Use in Vicinity Distance to:														
<table style="width: 100%;"> <tr> <td style="width: 25%;">COMMERCIAL/INDUSTRIAL</td> <td style="width: 25%;">RESIDENTIAL AREA; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES</td> <td style="width: 25%;">PRIME AG LAND</td> <td colspan="2" style="width: 25%;">AGRICULTURAL LANDS AG LAND</td> </tr> <tr> <td>A. <u>0</u> (mi)</td> <td>B. <u>0.1</u> (mi)</td> <td>C. _____ (mi)</td> <td colspan="2">D. <u><0.5</u> (mi)</td> </tr> </table>					COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREA; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	PRIME AG LAND	AGRICULTURAL LANDS AG LAND		A. <u>0</u> (mi)	B. <u>0.1</u> (mi)	C. _____ (mi)	D. <u><0.5</u> (mi)	
COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREA; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	PRIME AG LAND	AGRICULTURAL LANDS AG LAND											
A. <u>0</u> (mi)	B. <u>0.1</u> (mi)	C. _____ (mi)	D. <u><0.5</u> (mi)											
14 Description of Site in Relation to Surrounding Topography The majority of the site is flat or nearly so. The disposal area contains two low-lying swamps and is generally lower than the surrounding area. The secondary alleged disposal area is nearly flat but is approximately 3-4 feet above the surrounding grade. Limited dumping of construction debris has occurred in the secondary area.														

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)
NYSDEC Phase I Report, 1989 E & E Site Inspection, 1990 Soil Survey of Niagara County, 1972 City of North Tonawanda Land Use Map HRS Manual, 1984

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 6 - SAMPLE AND FIELD INFORMATION		I. IDENTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">01 State NY</td> <td style="width: 50%;">02 Site Number 932041</td> </tr> </table>		01 State NY	02 Site Number 932041
01 State NY	02 Site Number 932041				

II. SAMPLES TAKEN			
Sample Type	01 Number of Samples Taken	02 Samples Sent to	03 Estimated Date Results Available
Groundwater	8	E & E Analytical Services Center	12/90
Surface Water	2	E & E Analytical Services Center	12/90
Waste			
Air			
Runoff			
Spill			
Soil	8	E & E Analytical Services Center	12/90
Vegetation			
Other/Sediment	4	E & E Analytical Services Center	12/90

III. FIELD MEASUREMENTS TAKEN	
01 Type	02 Comments
PID/FID	No readings of volatile organic compounds above background were detected
Radiation	No radiation above background was noted

IV. PHOTOGRAPHS AND MAPS		
01 Type	☐ Ground ☒ Aerial	02 In Custody of <u>Ecology & Environment, Inc.</u> (Name of Organization or Individual)
03 Maps	04 Location of Maps	
☒ Yes ☐ No	<u>Ecology & Environment, Inc.</u>	

V. OTHER FIELD DATA COLLECTED (Provide narrative description of sampling activities)
Samples collected as above for TCL organic and inorganic analyses. In addition, 4 soil samples subjected to EP Toxicity metals analysis. Furthermore, subsurface boring data and geotechnical data collected.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)
E & E Site Inspection, 1990 E & E Analytical Data, Wurlitzer Site, 1990

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 7 - OWNER INFORMATION						I. IDENTIFICATION	
						01 State NY	02 Site Number 932041
II. CURRENT OWNER(S)				PARENT COMPANY (if applicable)			
01 Name An-Cor Industrial Plastics		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.) 100 Melody Lane		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code	
05 City North Tonawanda	06 State NY	07 Zip Code 14120		12 City	13 State	14 Zip Code	
01 Name Blue Bird Coach Lines, Inc.		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.) 502 North Barry		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code	
05 City Olean	06 State NY	07 Zip Code 14760		12 City	13 State	14 Zip Code	
01 Name Applied Design		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.) 908 Niagara Falls Blvd.		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code	
05 City North Tonawanda	06 State NY	07 Zip Code 14120		12 City	13 State	14 Zip Code	
01 Name Irr Supply/Wurlitzer I.P.		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.) 908 Niagara Falls Blvd.		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code	
05 City North Tonawanda	06 State NY	07 Zip Code 14120		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 Wurlitzer Company		02 D+B Number		01 Name		02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.) 908 Niagara Falls Blvd.		04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	
05 City North Tonawanda	06 State NY	07 Zip Code 14120		05 City	06 State	07 Zip Code	
01 Name Wurltech Industries, Inc. (Wurlitzer Co. name change in 1988)		02 D+B Number		01 Name		02 D+B Number	
03 Street Address 4265 San Felipe Suite 1200		04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	
05 City Houston	06 State TX	07 Zip Code 77027		05 City	06 State	07 Zip Code	
01 Name Wurltech Industries, Inc.		02 D+B Number		01 Name		02 D+B Number	
03 Street Address (P.O. Box,		04 SIC Code		03 Street Address (P.O. Box,		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)							
NYSDEC Phase I Report, 1989 City of North Tonawanda, Tax Maps 176.16 & 176.20							

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 8 - OPERATOR INFORMATION - NA						I. IDENTIFICATION	
						01 State NY	02 Site Number 932041
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)							

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 9 - GENERATOR/TRANSPORTER INFORMATION						I. IDENTIFICATION			
						01 State NY	02 Site Number 932041		
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		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	
01 Name			02 D+B Number		01 Name			02 D+B Number	
03 Street Address (P.O. Box, RFD #, etc.)			04 SIC Code		03 Street Address (P.O. Box, RFD #, etc.)			04 SIC Code	
05 City		06 State	07 Zip Code		05 City		06 State	07 Zip Code	
IV. TRANSPORTER(S) - NA									
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)									

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 10 - PAST RESPONSE ACTIVITIES		I. IDENTIFICATION	
		01 State NY	02 Site Number 932041
II. PAST RESPONSE ACTIVITIES			
01 ☐ A. Water Supply Closed 04 Description:	02 Date _____	03 Agency _____	
01 ☐ B. Temporary Water Supply Provided 04 Description:	02 Date _____	03 Agency _____	
01 ☐ C. Permanent Water Supply Provided 04 Description:	02 Date _____	03 Agency _____	
01 ☐ D. Spilled Material Removed 04 Description:	02 Date _____	03 Agency _____	
01 ☐ E. Contaminated Soil Removed 04 Description:	02 Date _____	03 Agency _____	
01 ☐ F. Waste Repackaged 04 Description:	02 Date _____	03 Agency _____	
01 ☐ G. Waste Disposed Elsewhere 04 Description:	02 Date _____	03 Agency _____	
01 ☐ H. On-Site Burial 04 Description:	02 Date _____	03 Agency _____	
01 ☐ I. In Situ Chemical Treatment 04 Description:	02 Date _____	03 Agency _____	
01 ☐ J. In Situ Biological Treatment 04 Description:	02 Date _____	03 Agency _____	
01 ☐ K. In Situ Physical Treatment 04 Description:	02 Date _____	03 Agency _____	
01 ☐ L. Encapsulation 04 Description:	02 Date _____	03 Agency _____	
01 ☐ M. Emergency Waste Treatment 04 Description:	02 Date _____	03 Agency _____	
01 ☐ N. Cutoff Walls 04 Description:	02 Date _____	03 Agency _____	
01 ☐ O. Emergency Diking/Surface Water Diversion 04 Description:	02 Date _____	03 Agency _____	
01 ☐ P. Cutoff Trenches/Sump 04 Description:	02 Date _____	03 Agency _____	

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 10 - PAST RESPONSE ACTIVITIES (Cont.)	I. IDENTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">01 State NY</td> <td style="width: 50%; text-align: center;">02 Site Number 932041</td> </tr> </table>		01 State NY	02 Site Number 932041
01 State NY	02 Site Number 932041			
II. PAST RESPONSE ACTIVITIES (Cont.)				
01 ☐ Q. Subsurface Cutoff Wall 04 Description:	02 Date _____	03 Agency _____		
01 ☐ R. Barrier Walls Constructed 04 Description:	02 Date _____	03 Agency _____		
01 ☐ S. Capping/Covering 04 Description:	02 Date _____	03 Agency _____		
01 ☐ T. Bulk Tankage Repaired 04 Description:	02 Date _____	03 Agency _____		
01 ☐ U. Grout Curtain Constructed 04 Description:	02 Date _____	03 Agency _____		
01 ☐ V. Bottom Sealed 04 Description:	02 Date _____	03 Agency _____		
01 ☐ W. Gas Control 04 Description:	02 Date _____	03 Agency _____		
01 ☐ X. Fire Control 04 Description:	02 Date _____	03 Agency _____		
01 ☐ Y. Leachate Treatment 04 Description:	02 Date _____	03 Agency _____		
01 ☐ Z. Area Evacuated 04 Description:	02 Date _____	03 Agency _____		
01 ☐ 1. Access to Site Restricted 04 Description:	02 Date _____	03 Agency _____		
01 ☐ 2. Population Relocated 04 Description:	02 Date _____	03 Agency _____		
01 ☐ 3. Other Remedial Activities 04 Description:	02 Date _____	03 Agency _____		
III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)				

6. REFERENCES

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APPENDIX A

SITE-SPECIFIC SAFETY PLAN

ecology and environment, inc.
S I T E S A F E T Y P L A N

Version 988

A. GENERAL INFORMATION

Project Title: Wurlitzer Project No.: YR2000
 TDD/Pan No.: _____
 Project Manager: Richard Watt Project Dir.: James Griffis
 Location(s): 908 Niagara Falls Boulevard, North Tonawanda, New York
 Prepared by: R. Watt Date Prepared: 4-16-90
 Approval by: G. Weinstein/Health & Safety Group Date Approved: 4/20/90
 Site Safety Officer Review: _____ Date Reviewed: _____
 Scope/Objective of Work: Site reconnaissance and geophysical survey of site of alleged hazardous waste disposal.
 Proposed Date of Field Activities: 5/90
 Background Info: Complete: [] Preliminary (No analytical [X] 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 []	Sludge [X]	Gas/Vapor [X]

Characteristic(s):

Flammable/ [X] Ignitable	Volatile [X]	Corrosive []	Acutely Toxic []
Explosive []	Reactive []	Carcinogen [X]	Radioactive* []

Other: _____

Physical Hazards:

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

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

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Site History/Description and Unusual Features (see Sampling Plan for detailed description): Current
industrial park formerly operated by piano/organ manufacturer who allegedly disposed of heavy metal sludges
on site.

Locations of Chemicals/Wastes: Unknown.

Estimated Volume of Chemicals/Wastes: Unknown.

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

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: (1) Site reconnaissance - hazards associated with operational industrial park
including trip/fall, noise, vehicular traffic, etc. (2) Geophysical survey - same as task 1. Later tasks
include (3) Drilling/well installation, (4) Surface water/sediment sampling, and (5) surveying.

Chemical Hazard Evaluation:

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
Chromium/Cr(VI)	1 mg/m3 TWA (metal) 0.05 mg/m3 (Cr(vi))	Ingestion, Skin/eye contact	Sensitization dermatitis, abdominal pain	N/A	N/A
Benzene	1 ppm TWA (OSHA)	Inhalation, ingestion, skin absorption, skin/eye contact	Irritation, nausea, dermatitis abdominal pain	61 ppm	Aromatic/sweet
Toluene	100 ppm TWA 150 ppm ceiling	Inhalation, ingestion, skin absorption, skin/eye contact	Fatigue, weakness, confusion, dizziness, dermatitis	1.6 ppm	Sour/burnt
Xylene	100 ppm TWA 150 ppm ceiling	Inhalation, ingestion, skin absorption, skin/eye contact	Dizziness, drowsiness, irritation, vomiting, abdominal pain	20 ppm	Sweet
Nickel	1 mg/m3	Inhalation, ingestion, skin/eye contact	Sens./derm; allergic, asthma, pneumonitis	N/A	N/A
Cyanide	5 mg/m3	Inhalation, skin absorption, ingestion, skin/eye contact	Asphyxia, weakness, nausea, vomiting, death	--	Almond
Halogenated Organics	--	--	--	--	--

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

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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? [Y]

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

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	X
Task 2			X	X
Task 3				
Task 4				

(Expand if necessary)

Modifications: Upgrade to Level "C" based on air monitoring. Phase I investigation reported no HNu readings above background up or downwind of the site.

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

- o Level D: O₂ <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 1 mg/m³, other _____.
- o Level C: O₂ <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapor (in breathing zone) >5 ppm, particulates > 5 mg/m³, other _____.
- o Level B: O₂ <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > _____ mg/m³, other _____.
- o Level A: O₂ <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > _____ mg/m³, other _____.

Air Monitoring (daily calibration unless otherwise noted):

Contaminant of Interest	Type of Sample (area, personal)	Monitoring Equipment	Frequency of Sampling
Volatile organics	Area	FID/PID	Continuous

(Expand if necessary)

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

None anticipated for these tasks.

During later phases of the investigation, equipment and sampling gear will be cleaned of foreign matter and then thoroughly steam cleaned.

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Personnel Decon Protocol: Dry decontamination (removal of PPE) followed by hand and face wash. Remove outer gloves, Tyvek coveralls, boot covers, then inner gloves.

Decon Solution Monitoring Procedures, if Applicable: N/A

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

Where survey equipment, etc. is to be used, tripod ends will be poly wrapped to avoid need to decontaminate.

Site Entry Procedures and Special Considerations: Enter through main gate on Niagara Falls Blvd. Use caution while in parking areas or near railroad tracks on west side of site. Hardhat, steel-toed boots, and TLD badge to be worn at all times. Boot covers and surgical gloves to be worn during investigation of non-paved areas.

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

Work during daylight hours only. No work during thunderstorms.

No intrusive or sampling activities permitted.

General Spill Control, if applicable: N/A

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

Expendables to be shredded, double bagged, and labelled; plan to be developed for off-site disposal. Drilling water and soil cuttings will not be containerized unless PID/FID readings of 5 or more ppm above background are noted, as per contingency plan.

Sample Handling Procedures Including Protective Wear:

Rubber gloves and boot covers, steel-toed boots, Tyvek coveralls. Surgical gloves for handling samples during documentation and packing.

<u>Team Member*</u>	<u>Responsibility</u>
Richard Watt	Team Leader
To be determined	Site Safety Officer

*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 DeGraff Memorial Hospital, 445 Tremont, N. Tonawanda 690-2111

Poison Control Center 219 Bryant, Buffalo, NY 878-7654

Police (include local, county sheriff, state) City of N. Tonawanda, emergency: 911 (general: 692-4111).

Niagara County Sheriff, emergency: 911 (general: 439-9393). State Thruway Patrol: 836-0240.

Fire Department City of N. Tonawanda, emergency: 911 (general: 693-2201)

Airport Buffalo International Airport, Genesee St., Cheektowaga, NY

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

Local Laboratory E & E Analytical Services Center

UPS/Fed. Express _____

Client Contact Valerie Lauzey - NYSDEC Albany: 518-457-9538

Site Contact Quinton King, Building Manager, Ancor Industrial Plastics 695-3141

SITE RESOURCES

Site Emergency Evacuation Alarm Method To be determined during site reconnaissance.

Water Supply Source TBD

Telephone Location, Number TBD

Cellular Phone, if available TBD

Radio TBD

Other _____

EMERGENCY CONTACTS

1. Dr. Raymond Harbison (Univ. of Florida) (501) 221-0465 or (904) 462-3277, 3281
Alachua, Florida (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 - Steve Sherman (home)
..... (office)
4. FITOM, TATOM, or Office Manager (home)

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) South on Niagara Falls Blvd. (Rt. 62). Right on Erie Ave. (Rt 425).

Follow Rt. 425 (name changes) for approximately 3 miles. Right on Tremont St. Hospital at 445 Tremont.

Emergency Egress Routes to Get Off-Site To be determined during site reconnaissance.

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F. EQUIPMENT CHECKLIST

PROTECTIVE GEAR

<u>Level A</u>	No.	<u>Level B</u>	No.
SCBA		SCBA	
SPARE AIR TANKS		SPARE AIR TANKS	
ENCAPSULATING SUIT (Type _____)		PROTECTIVE COVERALL (Type _____)	
SURGICAL GLOVES		RAIN SUIT	
NEOPRENE SAFETY BOOTS		BUTYL APRON	
BOOTIES		SURGICAL GLOVES	
GLOVES (Type _____)		GLOVES (Type _____)	
OUTER WORK GLOVES		OUTER WORK GLOVES	
HARD HAT		NEOPRENE SAFETY BOOTS	
CASCADE SYSTEM		BOOTIES	
5-MINUTE ESCAPE COOLING VEST		HARD HAT WITH FACE SHIELD	
		CASCADE SYSTEM	
		MANIFOLD SYSTEM	
<u>Level C</u>		<u>Level D</u>	
ULTRA-TWIN RESPIRATOR	X	ULTRA-TWIN RESPIRATOR (Available)	X
POWER AIR PURIFYING RESPIRATOR		CARTRIDGES (Type GMC-H)	X
CARTRIDGES (Type GMC-H)	X	5-MINUTE ESCAPE MASK (Available)	
5-MINUTE ESCAPE MASK		PROTECTIVE COVERALL (Type Tyvek)	X
PROTECTIVE COVERALL (Type Tyvek)	X	RAIN SUIT	X
RAIN SUIT		NEOPRENE SAFETY BOOTS	
BUTYL APRON		BOOTIES	X
SURGICAL GLOVES	X	WORK GLOVES	X
GLOVES (Type Neoprene)	X	HARD HAT WITH FACE SHIELD	X
OUTER WORK GLOVES		SAFETY GLASSES	X
NEOPRENE SAFETY BOOTS		TLD BADGE	X
HARD HAT WITH FACE SHIELD	X	SURGICAL GLOVES	X
BOOTIES	X	SAFETY BOOTS	X
HARDHAT	X		
SAFETY BOOTS	X		

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INSTRUMENTATION	No.	DECON EQUIPMENT	No.
OVA	X	WASH TUBS	
THERMAL DESORBER		BUCKETS	
O2/EXPLOSIMETER W/CAL. KIT		SCRUB BRUSHES	X
PHOTOVAC TIP		PRESSURIZED SPRAYER	X
HNu (Probe 10.2 eV)	X	DETERGENT (Type _____)	
MAGNETOMETER	X	SOLVENT (Type _____)	
PIPE LOCATOR		PLASTIC SHEETING	X
WEATHER STATION		TARPS AND POLES	
DRAEGER PUMP, TUBES _____		TRASH BAGS	X
BRUNTON COMPASS	X	TRASH CANS	
MONITOX CYANIDE		MASKING TAPE	
HEAT STRESS MONITOR		DUCT TAPE	X
NOISE EQUIPMENT _____		PAPER TOWELS	X
PERSONAL SAMPLING PUMPS		FACE MASK SANITIZER	
EM-31	X	FOLDING CHAIRS	
		STEP LADDERS	
		DISTILLED WATER	
RADIATION EQUIPMENT			
DOCUMENTATION FORMS			
PORTABLE RATEMETER			
SCALER/RATEMETER		SAMPLING EQUIPMENT	
NaI Probe		8 OZ. BOTTLES	X
ZnS Probe		HALF-GALLON BOTTLES	X
GM Pancake Probe		VOA BOTTLES	X
GM Side Window Probe		STRING	
MICRO R METER		HAND BAILERS	
ION CHAMBER		THIEVING RODS WITH BULBS	
ALERT DOSIMETER		SPOONS	X
POCKET DOSIMETER		KNIVES	
		FILTER PAPER	
FIRST AID EQUIPMENT		PERSONAL SAMPLING PUMP SUPPLIES	
FIRST AID KIT	X		
OXYGEN ADMINISTRATOR			
STRETCHER			
PORTABLE EYE WASH			
BLOOD PRESSURE MONITOR			
FIRE EXTINGUISHER			

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HAZARD EVALUATION OF CHEMICALS

Chemical Name Chromium (hexavalent) Date 20 April 1990
 DOT Name/U.N. No. _____ Job No. YR2
 CAS Number 7440-47-3

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschuieren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: SAX, Aldrich
Rad Health Handbook NCRP 65 10 CFR 20 Handbook of Chemistry and Physics

Chemical Properties: (Synonyms: Chromic oxide, soluble chromic salts)

Chemical Formula Cr(VI) (CrO3) Molecular Weight 52

Physical State variable Solubility (H2O) insoluble (Cr) Boiling Point variable

Flash Point variable Vapor Pressure/Density variable Freezing Point variable

Specific Gravity variable Odor Characteristic variable Flammable Limits variable

Incompatibilities strong oxidizers, water

Biological Properties:

TLV-TWA 0.05 mg/m3 PEL 0.5 mg/m3 Odor/Odor Threshold variable

IDLH 250 mg/m3 Human _____ Aquatic _____ Rat/Mouse _____

Route of Exposure INHalation, INGestion, skin/eye CONTACT, dermal ABSorption

Carcinogen possible - animal Teratogen experimental Mutagen experimental

Radiological Properties:

N/A

Handling Recommendations: (Personal protective measures)

Respirators: any detectable limit - SCBA. Wear viton or neoprene gloves, boots, etc. Prevent skin/eye contact.

Monitoring Recommendations:

N/A - sediment bound material.

Disposal/Waste Treatment:

N/A

Health Hazards and First Aid:

Ingestion: give large amounts of water, induce vomiting, immediate medical attention. Inhalation:

Move to fresh air, CPR if necessary, immediate medical attention. Contact: Rinse with large amounts of water; wash skin thoroughly with soap and water.

Symptoms: Acute: Contact dermatitis; irritation on mucous membranes and upper respiratory tract, coughing, wheezing, headache, fever, nausea, vomiting.

Chronic: Carcinogen, liver and kidney damage, bronchitis, ulceration of skin, lung cancer.

HAZARD EVALUATION OF CHEMICALS

Chemical Name Cyanide Date 20 April 1990
DOT Name/U.N. No. 1588, 1935 Job No. YR2
CAS Number 151-50-8, 143-33-9

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: _____
Rad Health Handbook NCRP 65 10 CFR 20 Handbook of Chemistry and Physics

Chemical Properties: (Synonyms: potassium cyanide, sodium cyanide)

Chemical Formula KCN/NaCN Molecular Weight 65/49

Physical State white solid Solubility (H₂O) 72%/58% Boiling Point ?/2732°F

Flash Point N/A Vapor Pressure/Density 0 mm Freezing Point 1175°/1040°F

Specific Gravity 1.52/1.60 Odor Characteristic N/A Flammable Limits N/A

Incompatibilities oxidizers, i.e. nitrates, chlorates, acids, acid salts

Biological Properties:

TLV-TWA 5 mg/m3 PEL 5 mg/3 Odor/Odor Threshold faint almond

IDLH 50 mg/m3 Human _____ Aquatic _____ Rat/Mouse _____

Route of Exposure INHalation, INGestion, skin/eye CONTACT, dermal ABSorption

Carcinogen _____ Teratogen _____ Mutagen _____

Radiological Properties:

N/A

Handling Recommendations: (Personal protective measures)

Respirator: >50 mg/m3 use SCBA. Wear impervious clothing and avoid skin/eye contact.

Monitoring Recommendations:

Cyanide Draeger tube

Disposal/Waste Treatment:

N/A

Health Hazards and First Aid:

ING: immediate medical attention, give water or milk, induce vomiting. INH: move to fresh air, CPR

if necessary, immediate medical attention. CON: rinse with water, wash skin thoroughly with soap & water

Symptoms: Acute: asphyxia, death, weakness, headache, confusion, nausea, vomiting, CNS depression

Chronic: death, CVS, CNS, liver, kidney, and/or skin damage

HAZARD EVALUATION OF CHEMICALS

Chemical Name Benzene Date 20 April 1990
DOT Name/U.N. No. 1114 Job No. YR2
CAS Number 71-43-2

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: Sax, Aldrich
Rad Health Handbook NCRP 65 10 CFR 20 Handbook of Chemistry and Physics

Chemical Properties: (Synonyms: benzol, benzole, cyclohexatriene)

Chemical Formula C6H6 Molecular Weight 78
Physical State liquid Solubility (H2O) slight Boiling Point 176°F
Flash Point 12°F Vapor Pressure/Density 75 mm Freezing Point 42°F
Specific Gravity 0.879 Odor Characteristic 61 ppm Flammable Limits 1.3 - 7.1%
Incompatibilities strong oxidizers, chlorine, bromine

Biological Properties:

TLV-TWA 10 ppm PEL 1 ppm Odor/Odor Threshold aromatic/sweet
IDLH 2000 ppm Human IHL Tclo 100/CNS Aquatic Rat/Mouse IHL Tclo 50/24h
Route of Exposure INHalation, INGestion, skin/eye CONTACT, dermal ABSorbtion
Carcinogen human - susp. Teratogen exper. Mutagen exper.

Radiological Properties:Handling Recommendations: (Personal protective measures)

Respirators: >10 ppm use SCBA. Neoprene or viton protective gear, avoid skin/eye contact.

Monitoring Recommendations:

Flame ionization detector (OVA) or Photo ionization detector (HNU) with 10.2 eV probe.

Disposal/Waste Treatment:

N/A

Health Hazards and First Aid:

ING: do not induce vomiting, give water or milk, immediate medical attention. INH: move to fresh air, CPR if necessary, immediate medical attention. Skin/eye CON: rinse with water, wash skin thoroughly with soap and water.

Symptoms: Acute: skin irritation, CNS depression, headache, dizziness, vomiting, tremors, convulsions
Chronic: anorexia, drowsiness, anemia, reduced blood clotting, liver, kidney and bone marrow damage, leukemia

HAZARD EVALUATION OF CHEMICALS

Chemical Name Xylene Date 20 April 1990
DOT Name/U.N. No. 1307 Job No. YR2
CAS Number 1330-20-7, 95-47-6, 108-38-3

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: _____
Rad Health Handbook NCRP 65 10 CFR 20 Handbook of Chemistry and Physics

Chemical Properties: (Synonyms: Dimethylbenzene, Xylol)

Chemical Formula C8H10 Molecular Weight 106
Physical State colorless liquid Solubility (H2O) 0.00003% Boiling Point 292°F
Flash Point 77°F Vapor Pressure/Density 3.7 Freezing Point -12°F
Specific Gravity 0.86 Odor Characteristic 20 ppm Flammable Limits 1.0 - 7.0%
Incompatibilities strong oxidizers, strong acids, heat, peroxide

Biological Properties:

TLV-TWA 100 ppm PEL 100 ppm Odor/Odor Threshold aromatic/sweet
IDLH 10,000 ppm Human IHL Tclo-200 ppm Aquatic _____ Rat/Mouse IHL L050-5000 ppm
Route of Exposure INHalation, INGestion, skin/eye CONTACT, dermal ABSorbtion
Carcinogen experimental Teratogen _____ Mutagen _____

Radiological Properties:

N/A

Handling Recommendations: (Personal protective measures)

Respirators: organic vapor cartridge to 5,000 ppm, >5,000 ppm use SCBA. PVC gloves and impervious clothing. Prevent skin/eye contact.

Monitoring Recommendations:

Flame ionization detector (OVA) or Photo ionization detector (HNU) with 10.2 eV probe.

Disposal/Waste Treatment:

N/A

Health Hazards and First Aid:

ING: immediate medical attention. INH: move to fresh air, immediate medical attention. Skin/eye CON: rinse with large amounts of water, wash skin thoroughly with soap and water.

Symptoms: Acute: eye and mucous membrane irritation, CNS depression, gastrointestinal discomfort
Chronic: more intensified symptoms of above plus hyperplasia of bone marrow

HAZARD EVALUATION OF CHEMICALS

Chemical Name Toluene Date 20 April 1990
 DOT Name/U.N. No. 1294 Job No. YR2
 CAS Number 108-88-3

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: _____
Rad Health Handbook NCRP 65 10 CFR 20 Handbook of Chemistry and Physics

Chemical Properties: (Synonyms: Methyl benzene, Toluol)

Chemical Formula C7H8 Molecular Weight 92

Physical State colorless liquid Solubility (H2O) 0.05g/100g H2O Boiling Point 231°F

Flash Point 40°F Vapor Pressure/Density 3.2 Freezing Point -139°F

Specific Gravity 0.8669 Odor Characteristic 2 ppm Flammable Limits 1.3 - 7.1%

Incompatibilities strong oxidizers, HNO3, H2SO4, O2, peroxides, heat

Biological Properties:

TLV-TWA 100 ppm PEL 100 ppm Odor/Odor Threshold sour/burnt

IDLH 2000 ppm Human _____ Aquatic _____ Rat/Mouse _____

Route of Exposure INHalation, INGestion, skin/eye CONTACT, dermal ABSorbtion

Carcinogen exper. Teratogen _____ Mutagen _____

Radiological Properties:

N/A

Handling Recommendations: (Personal protective measures)

Respirator: Organic vapor cartridge up to 1000 ppm. >10000 ppm use SCBA viton gloves and impervious clothing. Prevent skin/eye contact.

Monitoring Recommendations:

Flame ionization detector (OVA).

Disposal/Waste Treatment:

N/A

Health Hazards and First Aid:

ING: Do not induce vomiting, immediate medical attention. INH: move to fresh air, immediate medical attention. CON: rinse with large amounts of water, wash skin thoroughly with soap and water

Symptoms: Acute: CNS depression, fatigue, nausea, confusion, dermatitis

Chronic: bone marrow depression, defatting of skin, dermatitis

HAZARD EVALUATION OF CHEMICALS

Chemical Name Chromium (metal)Date 18 April 1990

DOT Name/U.N. No. _____

Job No. YR2CAS Number 7440-47-3References Consulted (circle):NIOSH/OSHA Pocket GuideVerschuerenMerck IndexHazardlineChris (Vol. II)Toxic and Hazardous Safety ManualACGIHOther: SAX, AldrichRad Health HandbookNCRP 6510 CFR 20Handbook of Chemistry and PhysicsChemical Properties: (Synonyms: Chromium (Cr) metals and insoluble salts)Chemical Formula CrMolecular Weight 52Physical State variableSolubility (H₂O) insolubleBoiling Point 4842 FFlash Point variableVapor Pressure/Density variableFreezing Point 3339 FSpecific Gravity 7.2 @ 82 FOdor Characteristic noneFlammable Limits 23% LELIncompatibilities strong oxidizers; powdered Cr metal is explosiveBiological Properties:TLV-TWA 0.05 mg/m3PEL 1.0 mg/m3Odor/Odor Threshold N/AIDLH 500 mg/m3

Human _____

Aquatic _____

Rat/Mouse _____

Route of Exposure INHalation, INGestion, skin/eye CONTACT.Carcinogen N/ATeratogen N/AMutagen N/ARadiological Properties:N/AHandling Recommendations: (Personal protective measures)Respirators: >5 mg/m3, use SCBAPrevent skin/eye contact - wear impervious clothingMonitoring Recommendations:N/A - sediment bound material.Disposal/Waste Treatment:N/AHealth Hazards and First Aid:Ingestion: give large amounts of water, induce vomiting, immediate medical attention. Inhalation:move to fresh air, CPR if necessary, immediate medical attention. Eye/Skin Contact: Rinse w/largeamounts of water. Wash skin with soap and water.Symptoms: Acute: Contact dermatitis; ulceration of skin and nasal mucosa; irritation of eyes and mucous membranes.Chronic: Not often encountered in trivalent (3+) state since Cr compounds in this state are of a lower order toxicity.

HAZARD EVALUATION OF CHEMICALS

Chemical Name Nickel Date 18 April 1990
DOT Name/U.N. No. _____ Job No. YR2
CAS Number 7440-02-0

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: SAX, Aldrich
Rad Health Handbook NCRP 65 10 CFR 20 Handbook of Chemistry and Physics

Chemical Properties: (Synonyms: Raney alloy; nickle particles)

Chemical Formula Ni Molecular Weight 58.7
Physical State powder Solubility (H₂O) insoluble Boiling Point 4946 F
Flash Point N/A Vapor Pressure/Density N/A Freezing Point 2651 F
Specific Gravity N/A Odor Characteristic none Flammable Limits N/A
Incompatabilities strong acids, sulfur, wood, potassium perchlorate

Biological Properties:

TLV-TWA 1 mg/m3 PEL 1 mg/m3 Odor/Odor Threshold N/A
IDLH none estab. Human _____ Aquatic _____ Rat/Mouse _____
Route of Exposure INHalation, INGestion, eye/skin CONTACT.
Carcinogen human-suspected Teratogen experimental Mutagen experimental

Radiological Properties:

N/A

Handling Recommendations: (Personal protective measures)

Respirators: any detectable limit - use SCBA. Prevent skin exposure or prolonged contact.

Monitoring Recommendations:

N/A - sediment bound material.

Disposal/Waste Treatment:

N/A

Health Hazards and First Aid:

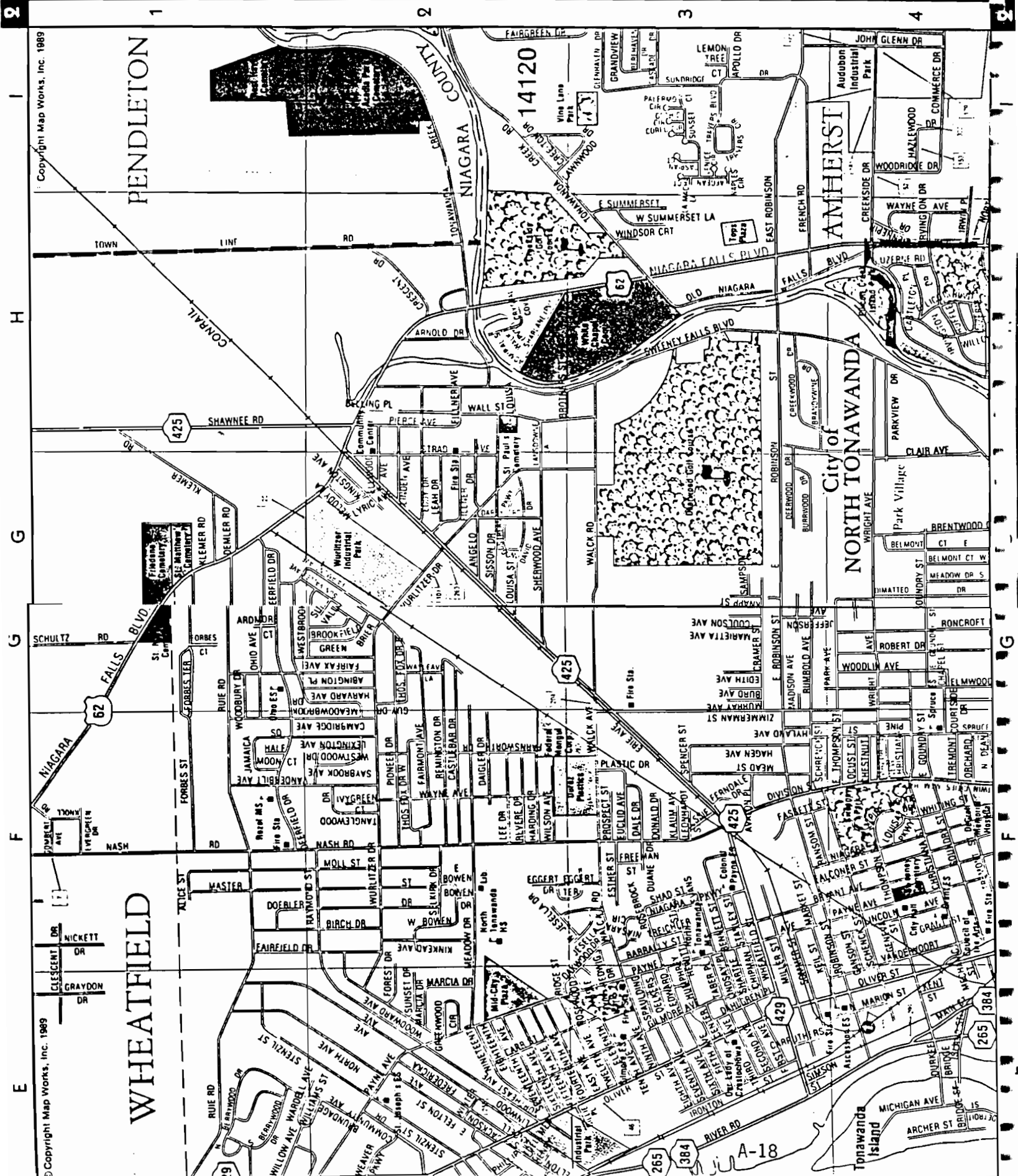
Inhalation: move to fresh air; keep quiet/warm. CPR if necessary. Immediate medical attention.

Ingestion: do not induce vomiting. Immediate medical attention to remove by gastric lavage. Eye/Skin

Contact: rinse immediately. Wash skin thoroughly with soap and water.

Symptoms: Acute: Irritation of skin, eyes, mucous membranes of upper respiratory tract; nausea; vomiting; giddiness; headache.
Chronic: Dermatitis from skin sensitization. Cancer of lungs and nasal passages in nickel refining employees.

ROUTE TO HOSPITAL



EXISTING SITE SAFETY PLAN ADDENDUM FORM

Site Name: Wurlitzer TDD/Pan/Project Number: YR2000
 Date of original SSP: 4-20-90
 Date of amendment: 7-20-90
 Date of proposed new work: w/e 7-28-90
 Added activities and hazard evaluations: Monitoring well drilling & installation (6 wells).
Typical drill rig hazards mandate hardhat, safety boots + safety glasses. Tyvek,
booties + surgical gloves during split spoon sampling and when near rig.
Tyvek, gloves + booties during well development. If Tyvek becomes wet, remove +
replace. Saranex considered unwise due to possible heat stress. Tick/mosquito
problem when drilling near tall weeds.
 Added monitoring activities: As per original SSP. FID, PID + Minirad.

Level of protection: A B C X D

Reason for up/downgrading: Upgrade to "C" if PID reading 1ppm or more above background

PPE: Hardhat, safety boots, safety glasses, TID badge, Tyvek, booties, surgical
gloves - see above for uses.

Decon: PPE: Dry decon + double bag followed by hand/face wash.
Equipment: Steam clean.

Team Members

R. Meyers

K. Horn

Responsibility

Field Team Leader / Geologist

Site Safety Officer.

Equipment	Quantity	Equipment	Quantity
<u>OVA</u>	<u>1</u>	<u>Baiters (dedicated) (no PVC)</u>	<u>6</u>
<u>HNU 10.2</u>	<u>1</u>		
<u>Minirad</u>	<u>1</u>		
<u>Sampling jars / spoons</u>			

THE TERMS OF THE ORIGINAL SSP SHALL BE IN EFFECT EXCEPT AS NOTED ON THIS FORM.

Prepared by: Richard M. Watt

Date: 7-19-90

Reviewed by: [Signature]

Date: 19 July 90

APPENDIX B

GEOPHYSICAL SURVEY

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

PHASE II INVESTIGATIONS GEOPHYSICAL SURVEY

**Wurlitzer Site
Site Number 932041
City of North Tonawanda, Niagara County**

January 1991



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.

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1. INTRODUCTION

This geophysical investigation report for the Wurlitzer site (I.D. No. 932041) on Niagara Falls Boulevard in the City of North Tonawanda, Niagara 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 survey performed at this site on May 7 and 8, 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 Wurlitzer site was designed to achieve several general goals. The main objectives of the geophysical methods used were to optimize the locations of the six 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 six proposed on-site groundwater monitoring wells.

Survey grids 1 through 6 included the proposed locations of monitoring wells GW-1 through GW-6 as follows:

Geophysical Survey Grid No.	Proposed Monitoring Well Included
1	GW-1
2	GW-2
3	GW-3
4	GW-4
5	GW-5
6	GW-6

All geophysical survey grids were 1,600 square feet in area, with the exception of grid No. 6, which was 800 square feet in area. 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). Survey grid coordinate

0,0 is located in the southwest corner of each contour map. Semi-permanent wooden stakes mark the proposed monitoring well locations for reference during drilling.

Multiple geomagnetic readings were recorded at each node in a north-south orientation 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. 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 nodes are ≤ 18 feet and ≤ 9 feet, respectively. The effective depths of the magnetometer and EM31 were considered adequate to delineate any buried materials that may be encountered while drilling.

All geophysical field data were recorded in two logbooks dedicated to this site investigation. Magnetometer data were reduced by averaging the north-south station readings and correcting these values for diurnal variations based on background station readings. 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 Wurlitzer 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 and geomagnetic field and ground conductivity measurements listed in Appendix A. These six geophysical survey grids encompass the six proposed 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 six 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 contains significant peripheral geomagnetic field anomalies. Magnetic contours range from 56,100 gammas to 56,700 gammas. The steepest geomagnetic gradients are observed in the northwest corner and east side of the survey grid. The source of these changes in geomagnetic field strength may be attributed to debris piles located north and east of the survey grid that contain surface and shallow subsurface ferrous objects.

Contours of EM31 data exhibit minor anomalies on the east side and southwest corner of survey grid No. 1. The anomalous area on the east side may be attributed to the debris pile, while the anomaly in the southwest corner may be attributed to interference resulting from nearby

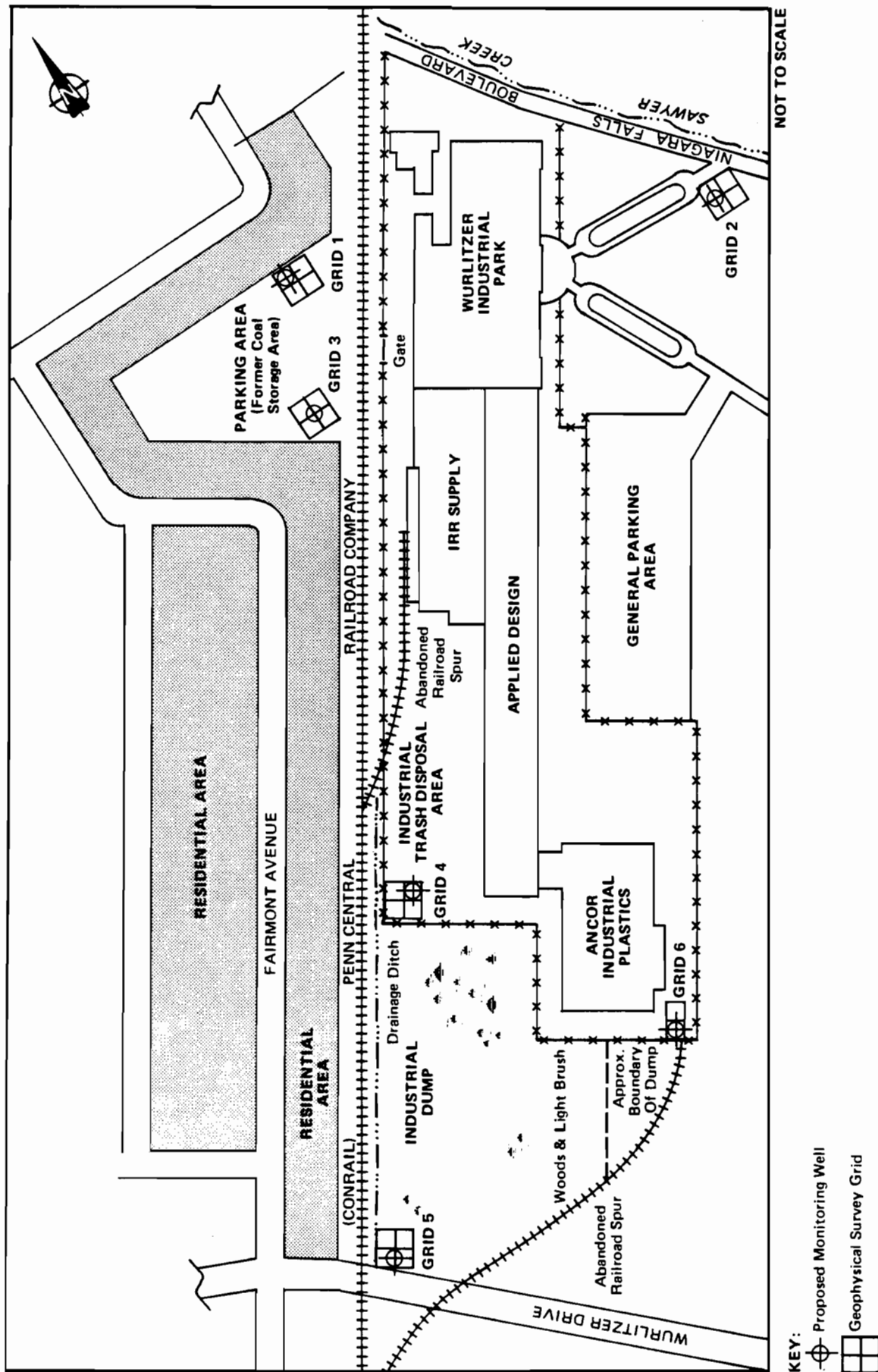


Figure 4-1
GEOPHYSICAL SURVEY GRIDS AND PROPOSED GROUNDWATER
MONITORING WELL LOCATIONS, WURLITZER SITE

automobiles in the parking area. Ground conductivity ranges from 27.5 to 38.5 millimhos/meter in the horizontal dipole mode and from 35 to 49 millimhos/meter in the vertical dipole mode.

The installation of proposed groundwater monitoring well GW-1 at the location indicated on the contour maps (see Appendix B) is acceptable. The well location may be moved to any area within the central portion of the survey grid, if necessary, to facilitate drill-rig access.

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 low geomagnetic field gradient. Magnetic contours range from 56,500 gammas to 56,750 gammas. Two isolated changes in magnetic field strength are observed at grid coordinates 0,0 and 20,40. The isolated anomaly at 0,0 may be attributed to small ferrous objects at shallow depths. The minor decline in magnetic field strength at grid coordinate 20,40 may be attributed to the presence of an electric sign and wires north of the grid.

Contours of EM31 data are presented only for the vertical dipole mode and indicate a shallow conductivity gradient that increases toward the east side of survey grid No. 2. This increase may be attributed to the presence of Niagara Falls Boulevard and utilities alongside the road east of the survey grid. Ground conductivity ranges from 8.3 to 29.5 millimhos/meter in the vertical dipole configuration. The negative values recorded in the horizontal dipole mode indicate values above the analog scale of the EM31 (>1,000 millimhos/meter). The negative values throughout the grid may be attributed to cultural interference (i.e., Niagara Falls Boulevard, automobiles, overhead power lines, etc.).

The installation of proposed groundwater monitoring well GW-2 at the location indicated on the contour maps (see Appendix B) is acceptable. The well location may be moved to any area within the survey grid with the exception of the east side and southwest corner, if necessary, to facilitate drill-rig access.

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 significant geomagnetic anomalies in the southeast corner of this survey area. No surface features exist to indicate the source of these anomalies; therefore, they are suspected to represent shallow ferrous objects.

Contours of EM31 data indicate a low ground conductivity gradient in the horizontal dipole mode at survey grid No. 3. The ground conductivity gradient is significantly steeper in the vertical dipole mode, especially in the northeast corner, southwest corner, and south-central portion of the survey grid. The anomalous region in the northeast corner may be attributed to surface debris and the proximity of automobiles north of the survey grid. No surface features exist to indicate the source of the anomalies to the south and southwest; therefore, they are suspected to represent buried (<18 feet) debris. Ground conductivity ranges from 30 to 53.5 millimhos/meter in the horizontal dipole configuration and from 32.5 to 73.5 millimhos/meter in the vertical dipole configuration in this survey area.

The installation of the proposed groundwater monitoring well GW-3 at the location indicated on the contour maps (see Appendix B) is acceptable. The well location may be moved anywhere within the northwest quadrant of the survey area, if necessary, to facilitate drill-rig access.

Survey Grid Area No. 4. A review of magnetometer data contours at survey grid No. 4 indicates that this 1,600-square-foot survey area exhibits a moderate geomagnetic field gradient. Magnetic contours range from 56,000 to 57,000 gammas. An isolated anomaly is observed near grid coordinate 10,10. This variance is suspected to represent shallow ferrous objects found in a debris pile at this location.

Contours of EM31 data indicate a low ground conductivity gradient in the horizontal dipole mode. This gradient increases toward the southwest and is suspected to represent interference from a metal chain-link fence which lies parallel to and southwest of the Y axis of this survey grid. The ground conductivity gradient in the vertical dipole mode is somewhat greater than in the horizontal dipole mode, especially near the southwest side of the survey grid. The rapid decrease in ground conductivity near grid coordinates 20,0 and 30,0 may be

attributed to a change in soil type at depth, a change in the ionic characteristics of the groundwater, or cultural interference from the nearby chain-link fence. No surface features other than the chain-link fence exist near coordinates 20,0 and 30,0 that indicate a possible source for this change in ground conductivity. Ground conductivity ranges from 28.5 to 49 millimhos/meter in the horizontal dipole mode and from 9.8 to 50 millimhos/meter in the vertical dipole configuration.

The installation of proposed groundwater monitoring well GW-4 at the location indicated on the contour maps (see Appendix B) is acceptable. The well location may be moved to any location on the eastern half of the grid, if necessary, to facilitate drill-rig access.

Survey Grid Area No. 5. A review of magnetometer data contours at survey grid No. 5 indicates that this 1,600-square-foot survey area exhibits a low geomagnetic field gradient on the western half of the survey grid and a high geomagnetic field gradient on the eastern side. Magnetic contours range from 56,100 to 57,200 gammas. The anomalous zones near grid coordinates 30,30 and 40,40 may be attributed to a debris pile containing ferrous objects and electrical conduit observed at these locations.

Contours of EM31 data indicate shallow ground conductivity gradients in the horizontal and vertical dipole survey modes on the western half of survey grid No. 5. The conductivity anomaly located near coordinate 30,30 on both the horizontal and vertical dipole contour maps may be attributed to the debris pile located at this location. Ground conductivity ranges from 29.5 to 55.5 millimhos/meter in the horizontal dipole mode and from 24 to 52.5 millimhos/meter in the vertical dipole mode in this survey area.

The installation of proposed groundwater monitoring well GW-5 at the location indicated on the contour maps (see Appendix B) is acceptable. The well location may be moved to any area on the western half of the survey grid, if necessary, to facilitate drill-rig access.

Survey Grid Area No. 6. Site conditions mandated an 800-square-foot survey grid at this location. The area northwest of the X=0 axis was bounded by a large quantity of metal debris. The area southeast of the

X=20 axis contained an abandoned railroad track and an underground water line. Therefore, a 20-foot by 40-foot grid was placed between these boundaries. A review of magnetometer data contours at survey grid No. 6 indicates that this survey area exhibits a low to moderate geomagnetic field gradient. Magnetic contours range from 56,000 to 56,500 gammas. The increase in magnetic field strength toward the east and southeast is due to the proximity of the railroad tracks.

Contours of EM31 data indicate high ground conductivity gradients in the horizontal and vertical dipole modes in survey grid No. 6. The increase in ground conductivity toward the southeast in both the horizontal and vertical dipole modes may be attributed to the railroad tracks as well as an underground water line that parallels both the northeast and southeast sides of the grid. Ground conductivity ranges from 21 to 70 millimhos/meter at this survey area in the horizontal dipole mode and from 42.5 to greater than 1,000 millimhos/meter in the vertical dipole mode.

The installation of proposed groundwater monitoring well GW-6 at the location indicated on the contour maps is unacceptable. It is recommended that GW-6 be moved to survey grid coordinate 10,10 to avoid the area of high geomagnetic and ground conductivity gradients.

5. CONCLUSIONS AND RECOMMENDATIONS

Based upon the interpretations discussed in Section 4, particular care was taken when selecting the placement of the ten monitoring wells at the Wurlitzer site. Locations exhibiting significant geophysical anomalies were avoided due to associated drilling risks.

Proposed monitoring well GW-6 was relocated to coordinate 10,10 within survey grid no. 6. As detailed in Section 4, this relocation avoided the steep geomagnetic and ground conductivity gradients observed directly adjacent to the location presently staked for GW-6.

Groundwater monitoring wells GW-1, GW-2, GW-3, GW-4, and GW-5 were installed at the locations indicated on the contour maps. GW-2S, GW-4S, GW5S, and GW-6S were drilled in areas of the respective grids which appeared free of subsurface debris according to the interpretation in Section 4 of this report.

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

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

APPENDIX A

MAGNETOMETER AND EM31
SURVEY DATA

Table A-1
AVERAGE MAGNETOMETER READINGS
WURLITZER SITE
Grid No. 1

Station #	Average Reading (Gammas)	Corrected Data* (Gammas)
0,0	56,133	56,067
0,10	56,283	56,220
0,20	56,441	56,382
0,30	56,650	56,592
0,40	56,543	56,487
10,0	56,326	56,284
10,10	56,379	56,334
10,20	56,363	56,315
10,30	56,423	56,373
10,40	56,802	56,749
20,0	56,327	56,288
20,10	56,419	56,383
20,20	56,411	56,377
20,30	56,404	56,373
20,40	56,672	56,644
30,0	56,249	56,235
30,10	56,436	56,419
30,20	56,408	56,388
30,30	56,403	56,381
30,40	56,322	56,297
40,0	56,226	56,215
40,10	56,663	56,655
40,20	57,028	56,022
40,30	56,420	56,417
40,40	56,352	56,352

*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 MAGNETOMETER READINGS
WURLITZER SITE
Grid No. 2

Station #	Average Reading (Gammas)	Corrected Data* (Gammas)
0,0	56,780	56,801
0,10	56,569	56,589
0,20	56,627	56,646
0,30	56,664	56,682
0,40	56,555	56,572
10,0	56,632	56,649
10,10	56,616	56,632
10,20	56,610	56,625
10,30	56,616	56,630
10,40	56,570	56,583
20,0	56,633	56,645
20,10	56,644	56,655
20,20	56,632	56,642
20,30	56,606	56,616
20,40	56,481	56,490
30,0	56,629	56,637
30,10	56,640	56,647
30,20	56,659	56,664
30,30	56,660	56,664
30,40	56,621	56,624
40,0	56,613	56,616
40,10	56,564	56,566
40,20	56,582	56,583
40,30	56,728	56,729
40,40	56,638	56,638

*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 MAGNETOMETER READINGS
WURLITZER SITE
Grid No. 3

Station #	Average Reading (Gammas)	Corrected Data* (Gammas)
0,0	56,563	56,571
0,10	56,323	56,332
0,20	56,088	56,097
0,30	56,330	56,340
0,40	56,772	56,782
10,0	56,361	56,374
10,10	56,419	56,431
10,20	56,259	56,271
10,30	56,456	56,467
10,40	56,459	56,470
20,0	56,414	56,422
20,10	56,360	56,367
20,20	56,394	56,401
20,30	56,488	56,494
20,40	56,344	56,350
30,0	55,198	55,201
30,10	56,260	56,264
30,20	56,285	56,289
30,30	56,392	56,397
30,40	56,437	56,442
40,0	56,534	56,537
40,10	56,271	54,273
40,20	56,220	56,222
40,30	56,211	56,212
40,40	56,133	56,133

*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 MAGNETOMETER READINGS
 WURLITZER SITE
 Grid No. 4

Station #	Average Reading (Gammas)	Corrected Data* (Gammas)
0,0	56,241	56,241
0,10	56,628	56,628
0,20	55,824	55,824
0,30	55,838	55,838
0,40	56,260	56,261
10,0	56,535	56,536
10,10	57,194	57,195
10,20	56,840	56,841
10,30	56,111	56,112
10,40	56,176	56,176
20,0	56,084	56,085
20,10	56,468	56,469
20,20	56,387	56,388
20,30	56,456	56,457
20,40	56,436	56,437
30,0	56,469	56,471
30,10	56,317	56,319
30,20	56,425	56,427
30,30	56,389	56,391
30,40	56,362	56,363
40,0	56,285	56,287
40,10	56,355	56,357
40,20	56,431	56,433
40,30	56,572	56,574
40,40	56,507	56,509

*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 MAGNETOMETER READINGS
WURLITZER SITE
Grid No. 5

Station #	Average Reading (Gammas)	Corrected Data* (Gammas)
0,0	56,257	56,257
0,10	56,398	56,398
0,20	56,458	56,457
0,30	56,496	56,495
0,40	56,330	56,329
10,0	56,098	56,096
10,10	56,299	56,297
10,20	56,369	56,367
10,30	56,337	56,335
10,40	56,289	56,288
20,0	56,258	56,255
20,10	56,273	56,270
20,20	56,290	56,287
20,30	56,101	56,098
20,40	55,892	55,889
30,0	56,274	56,269
30,10	56,285	56,281
30,20	56,395	56,391
30,30	55,650	55,645
30,40	56,423	56,419
40,0	56,202	56,217
40,10	56,320	56,315
40,20	56,748	56,743
40,30	56,660	56,654
40,40	57,233	57,227

*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 MAGNETOMETER READINGS

WURLITZER SITE

Grid No. 6

Station #	Average Reading (Gammas)	Corrected Data* (Gammas)
0,0	55,997	55,999
0,10	56,056	56,059
0,20	56,104	56,108
0,30	55,990	55,994
0,40	55,684	55,689
10,0	56,020	56,028
10,10	56,161	56,168
10,20	56,267	56,274
10,30	56,373	56,379
10,40	55,940	55,945
20,0	55,896	55,904
20,10	56,427	56,438
20,20	56,551	56,561
20,30	56,281	56,291
20,40	56,103	56,114

[UZ]YR2030:D2979, PM 30, #3210

*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

WURLITZER SITE

Survey Grid No. 1

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	49.0	37.0
0,10	47.0	35.5
0,20	44.0	34.0
0,30	42.0	35.0
0,40	41.0	37.0
10,0	45.5	38.5
10,10	40.0	38.0
10,20	42.5	33.5
10,30	41.5	32.5
10,40	40.5	34.0
20,0	43.0	35.0
20,10	46.0	34.5
20,20	43.5	32.0
20,30	41.0	33.0
20,40	39.0	32.0
30,0	42.0	33.0
30,10	38.0	36.5
30,20	43.0	34.0
30,30	44.0	33.0
30,40	41.0	32.0
40,0	42.5	32.0
40,10	39.0	28.5
40,20	37.0	31.0
40,30	35.0	30.5
40,40	39.5	27.5

Table A-2 (Cont.)
AVERAGE NORTH-SOUTH/EAST-WEST
GROUND CONDUCTIVITY READINGS
WITH EM31

WURLITZER SITE

Survey Grid No. 2

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	11.3	negative*
0,10	9.0	negative
0,20	11.3	negative
0,30	18.5	negative
0,40	22.5	negative
10,0	13.5	negative
10,10	15.0	negative
10,20	16.0	negative
10,30	18.0	negative
10,40	26.0	negative
20,0	8.3	negative
20,10	14.3	negative
20,20	16.0	negative
20,30	18.3	negative
20,40	15.5	negative
30,0	22.8	5.0**
30,10	29.5	8.8**
30,20	19.8	negative
30,30	24.0	negative
30,40	22.5	negative
40,0	21.5	negative
40,10	24.5	negative
40,20	29.3	1.5**
40,30	17.5	12.5**
40,40	29.0	8.3**

*Negative meter readings indicate very high conductivities (>1,000 millimhos/meter) beyond the capabilities of the analog scale of the instrument.

**readings not precise due to vehement needle fluctuations caused by localized cultural interference.

Table A-2 (Cont.)
AVERAGE NORTH-SOUTH/EAST-WEST
GROUND CONDUCTIVITY READINGS
WITH EM31

WURLITZER SITE

Survey Grid No. 3

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	65.5	43.0
0,10	50.5	47.5
0,20	50.5	42.0
0,30	53.0	36.5
0,40	51.5	38.0
10,0	32.5	47.5
10,10	40.5	53.5
10,20	54.0	43.5
10,30	50.0	38.0
10,40	52.0	38.5
20,0	59.0	45.0
20,10	62.5	41.0
20,20	40.0	45.0
20,30	51.0	36.0
20,40	55.5	33.0
30,0	42.5	42.5
30,10	42.0	43.0
30,20	42.5	44.0
30,30	47.5	33.0
30,40	60.5	31.5
40,0	38.0	36.0
40,10	40.0	37.5
40,20	47.0	32.0
40,30	44.0	31.0
40,40	73.5	30.0

Table A-2 (Cont.)
 AVERAGE NORTH-SOUTH/EAST-WEST
 GROUND CONDUCTIVITY READINGS
 WITH EM31

WURLITZER SITE
 Survey Grid No. 4

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	27.5	45.0
0,10	42.0	40.5
0,20	50.0	33.0
0,30	43.5	31.0
0,40	39.5	31.5
10,0	27.8	48.5
10,10	31.0	40.5
10,20	38.0	35.0
10,30	31.0	32.5
10,40	31.5	35.0
20,0	18.8	49.0
20,10	49.0	33.0
20,20	41.5	29.0
20,30	40.0	31.5
20,40	34.5	36.0
30,0	9.8	45.0
30,10	39.5	32.0
30,20	40.0	30.0
30,30	38.5	29.0
30,40	36.0	33.5
40,0	38.0	28.5
40,10	39.5	29.0
40,20	40.0	32.0
40,30	39.0	30.5
40,40	39.0	29.5

Table A-2 (Cont.)
AVERAGE NORTH-SOUTH/EAST-WEST
GROUND CONDUCTIVITY READINGS
WITH EM31

WURLITZER SITE

Survey Grid No. 5

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	47.0	31.5
0,10	47.5	30.5
0,20	46.0	32.5
0,30	45.5	33.5
0,40	51.0	37.0
10,0	50.0	31.0
10,10	47.5	29.5
10,20	46.0	32.0
10,30	45.5	35.5
10,40	52.5	39.5
20,0	51.0	30.0
20,10	46.5	30.5
20,20	49.5	34.0
20,30	46.5	32.0
20,40	51.5	47.5
30,0	49.5	30.5
30,10	46.5	32.0
30,20	50.0	38.0
30,30	24.0	45.0
30,40	33.0	55.5
40,0	52.0	33.0
40,10	46.5	34.0
40,20	29.0	36.0
40,30	31.5	38.0
40,40	34.0	51.0

Table A-2 (Cont.)
 AVERAGE NORTH-SOUTH/EAST-WEST
 GROUND CONDUCTIVITY READINGS
 WITH EM31

WURLITZER SITE

Survey Grid No. 6

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	46.5	21.0
0,10	47.5	21.0
0,20	60.5	23.0
0,30	45.5	44.0
0,40	42.0	44.5
10,0	68.0	23.5
10,10	61.5	23.5
10,20	73.0	23.0
10,30	45.5	54.5
10,40	49.5	41.0
20,0	negative*	27.0
20,10	88.5	24.0
20,20	93.0	25.5
20,30	55.0	70.0
20,40	60.0	40.5

[UZ]YR2030:D2979, PM 30, #3209

*Negative meter readings indicate high conductivities
 (>1,000 millimhos/meter) beyond the capabilities of the
 analog scale of the instrument.

APPENDIX B

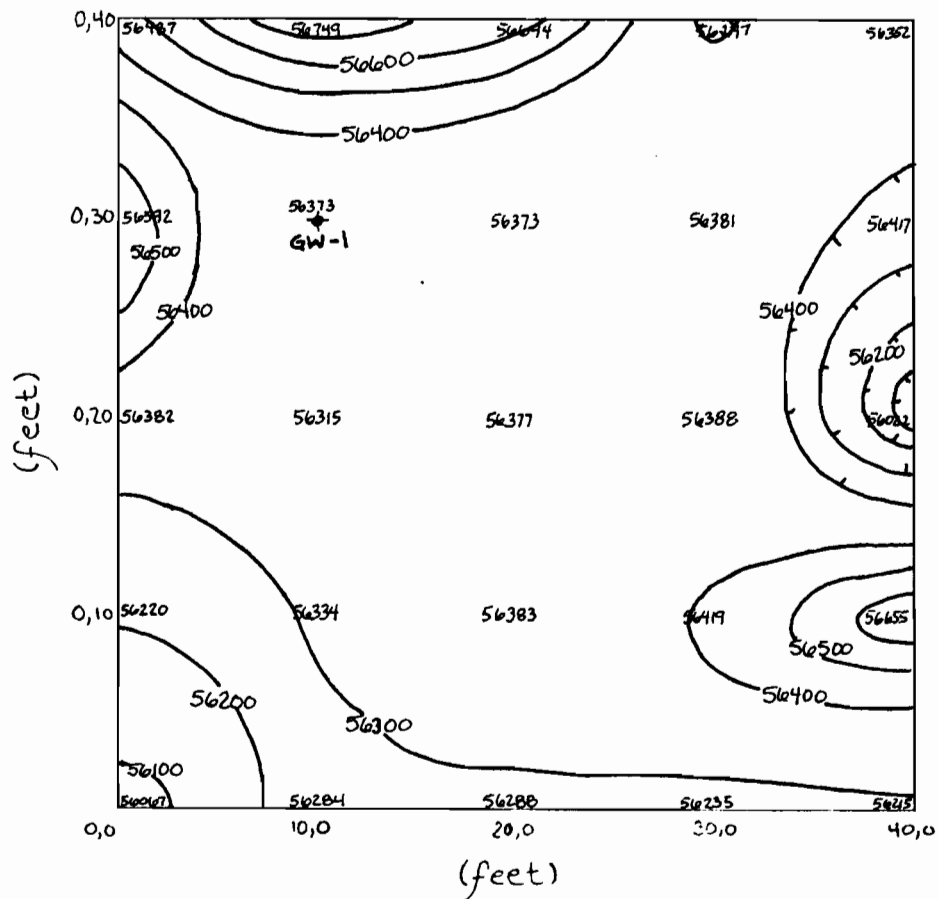
**MAGNETOMETER AND
EM31 SURVEY CONTOUR MAPS**

WURLITZER

MAGNETOMETER SURVEY

GRID No. 1

Magnetic Field Intensity
(Gammas)



Contour Interval = 100 Gammas

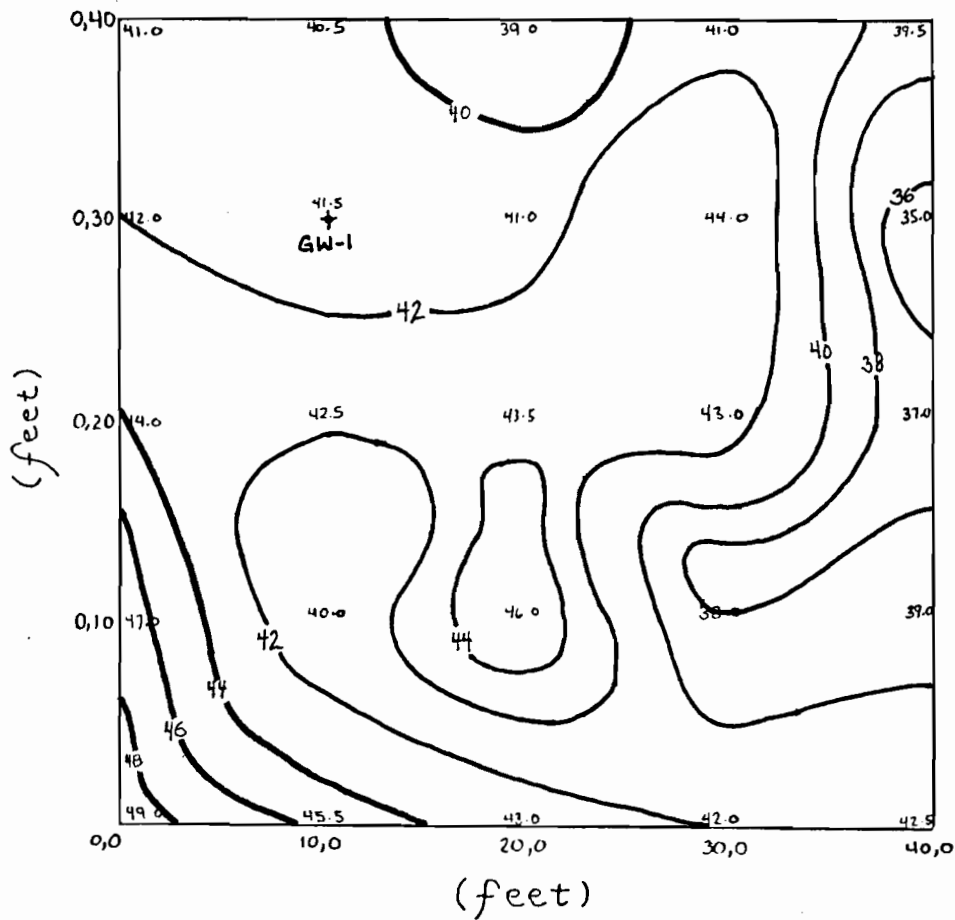
✦ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 1

Vertical Dipole
(millimhos/meter)



Contour Interval = 2.0 millimhos/meter

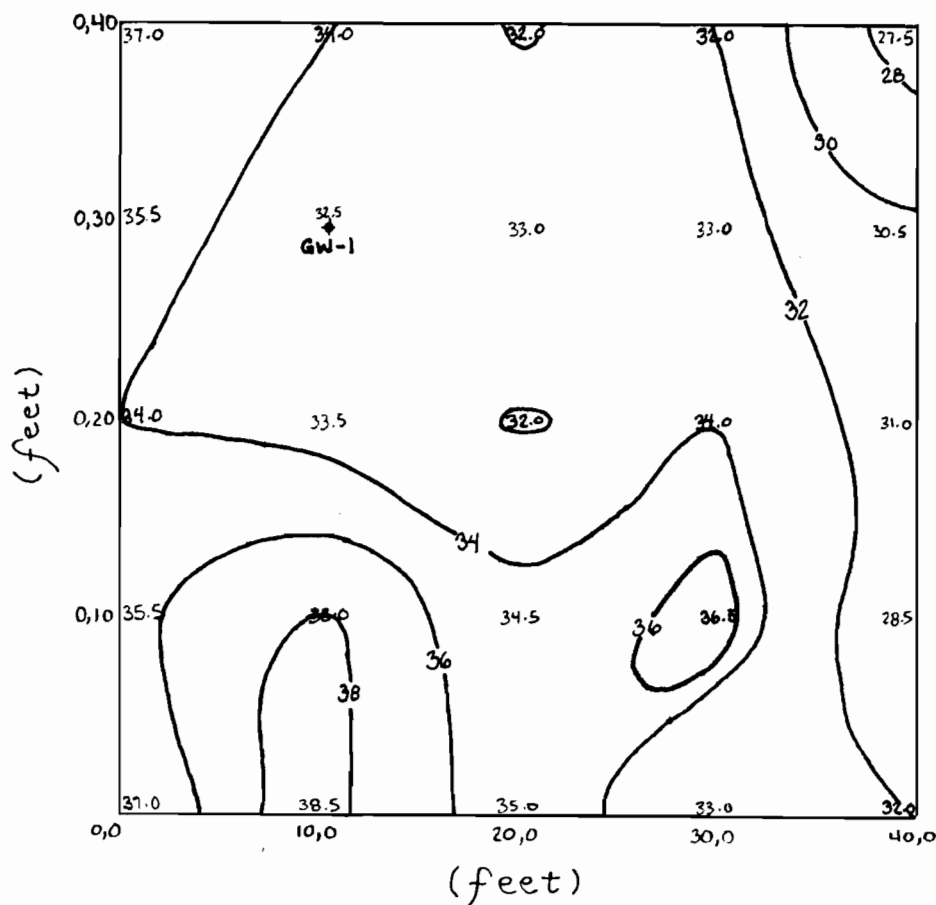
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 1

Horizontal Dipole
(millimhos/meter)



Contour Interval = 2.0 millimhos/meter

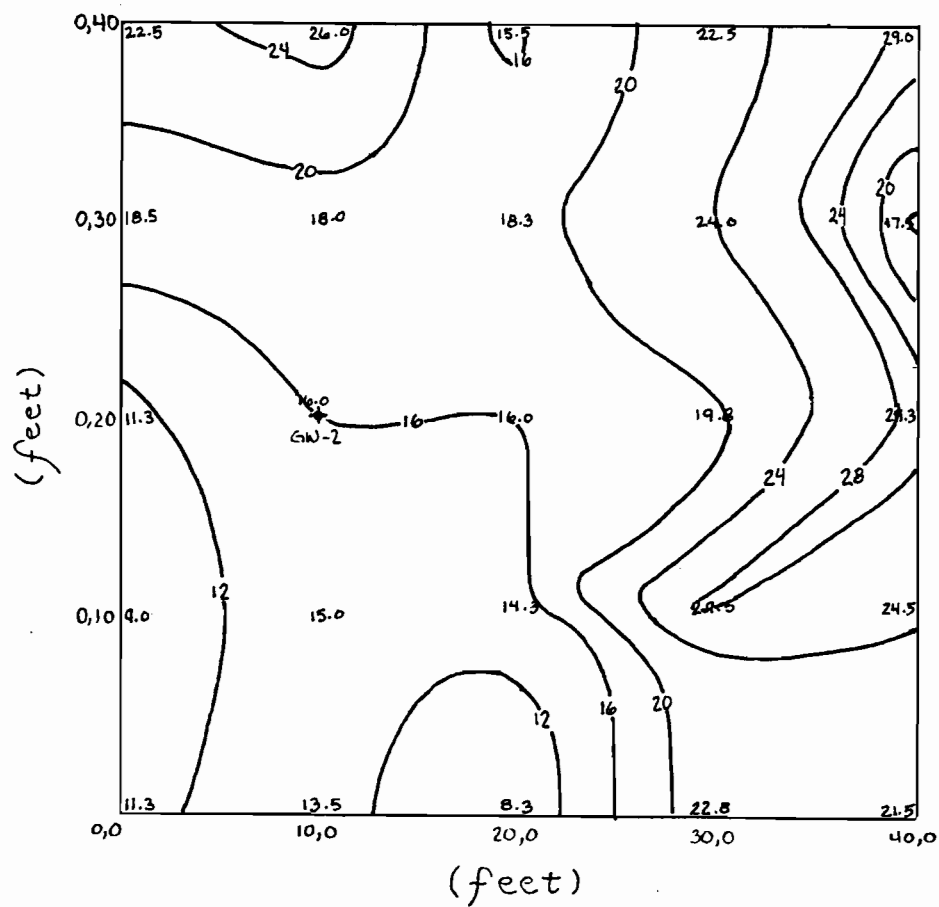
♦ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 2

Vertical Dipole
(millimhos/meter)



Contour Interval = 4.0 millimhos/meter

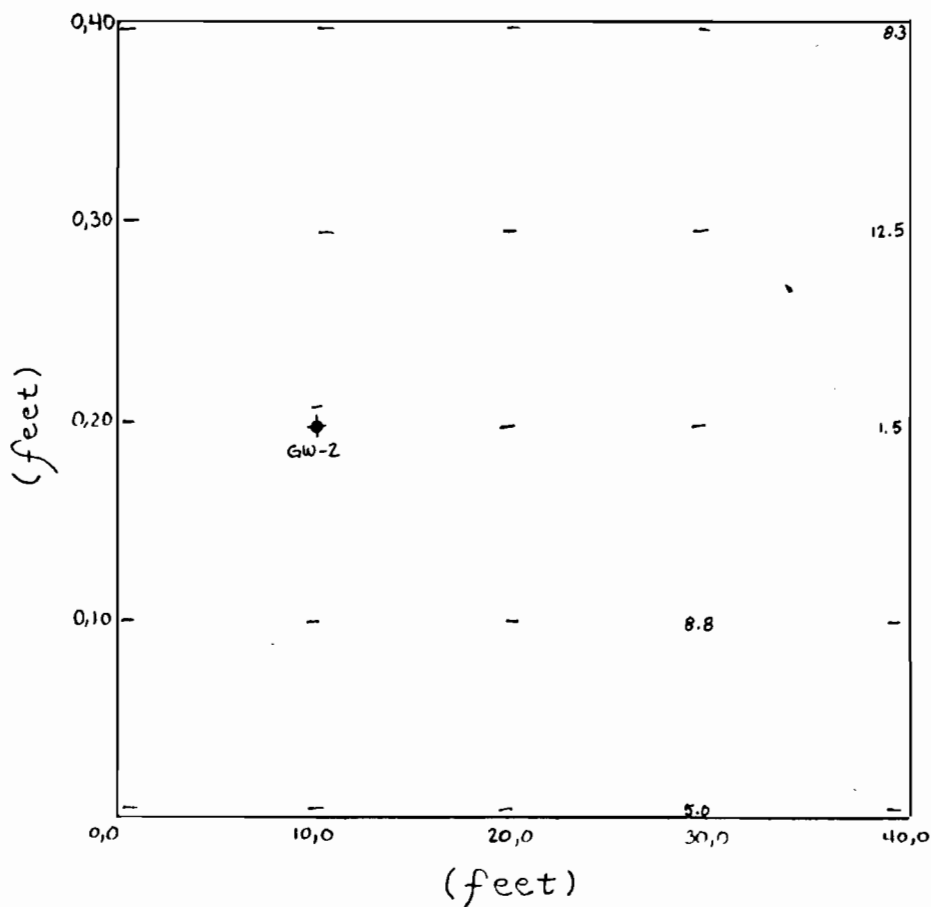
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 2

Horizontal Dipole
(millimhos/meter)



Contour Interval = 0 millimhos/meter

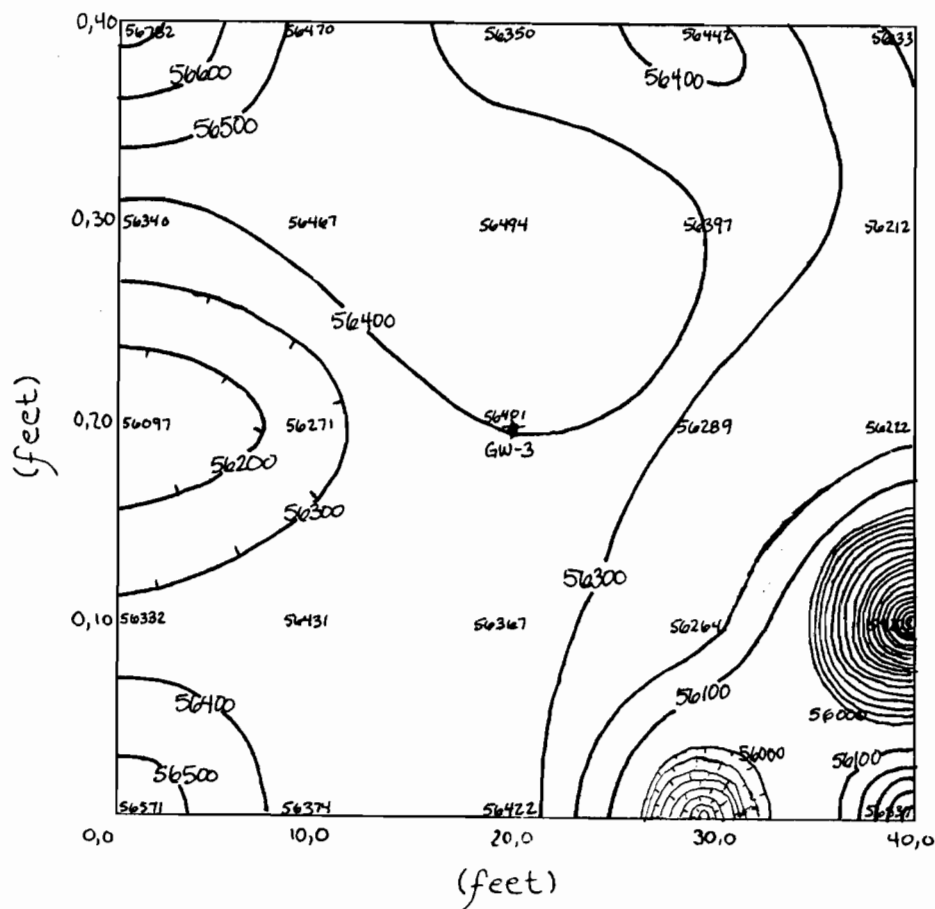
♦ Proposed Monitoring Well Location

WURLITZER

MAGNETOMETER SURVEY

GRID No. 3

Magnetic Field Intensity
(Gammas)



Contour Interval = 100 Gammas

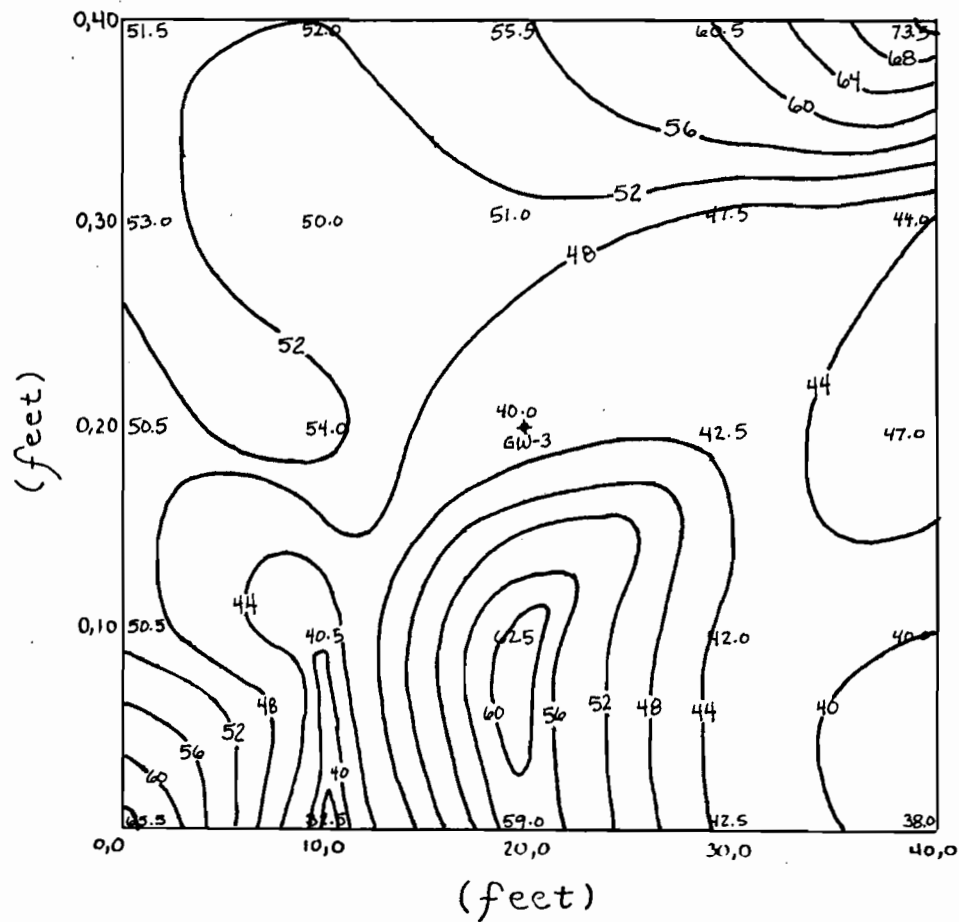
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 3

Vertical Dipole
(millimhos/meter)



↑ N

Contour Interval = 4.0 millimhos/meter

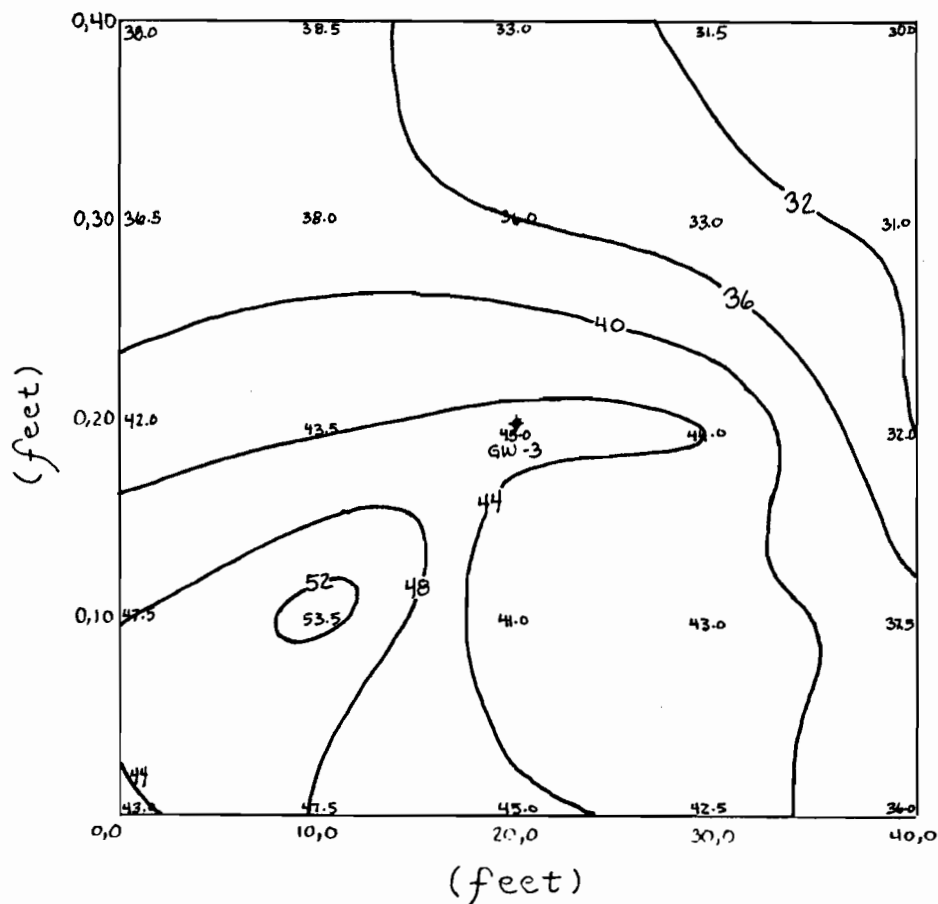
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 3

Horizontal Dipole
(millimhos/meter)



Contour Interval = 4.0 millimhos/meter

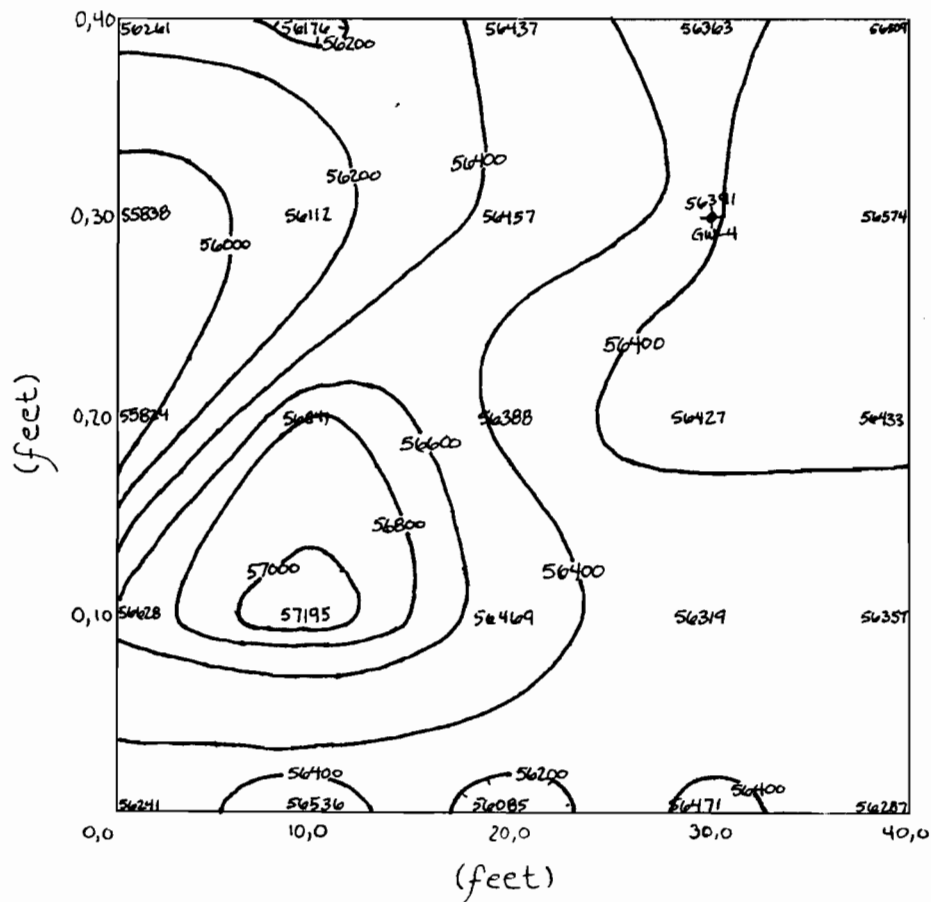
★ Proposed Monitoring Well Location

WURLITZER

MAGNETOMETER SURVEY

GRID No.4

Magnetic Field Intensity
(Gammas)



Contour Interval = 200 Gammas

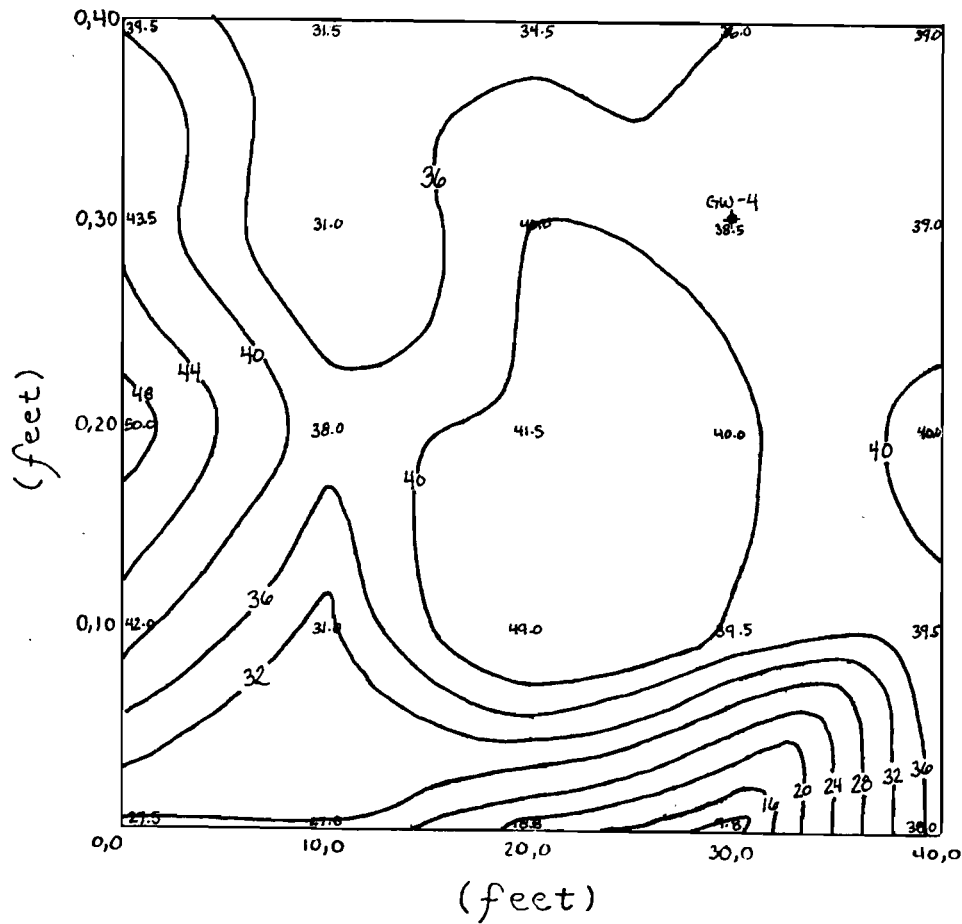
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 4

Vertical Dipole
(millimhos/meter)



1 N38E

Contour Interval = 4.0 millimhos/meter

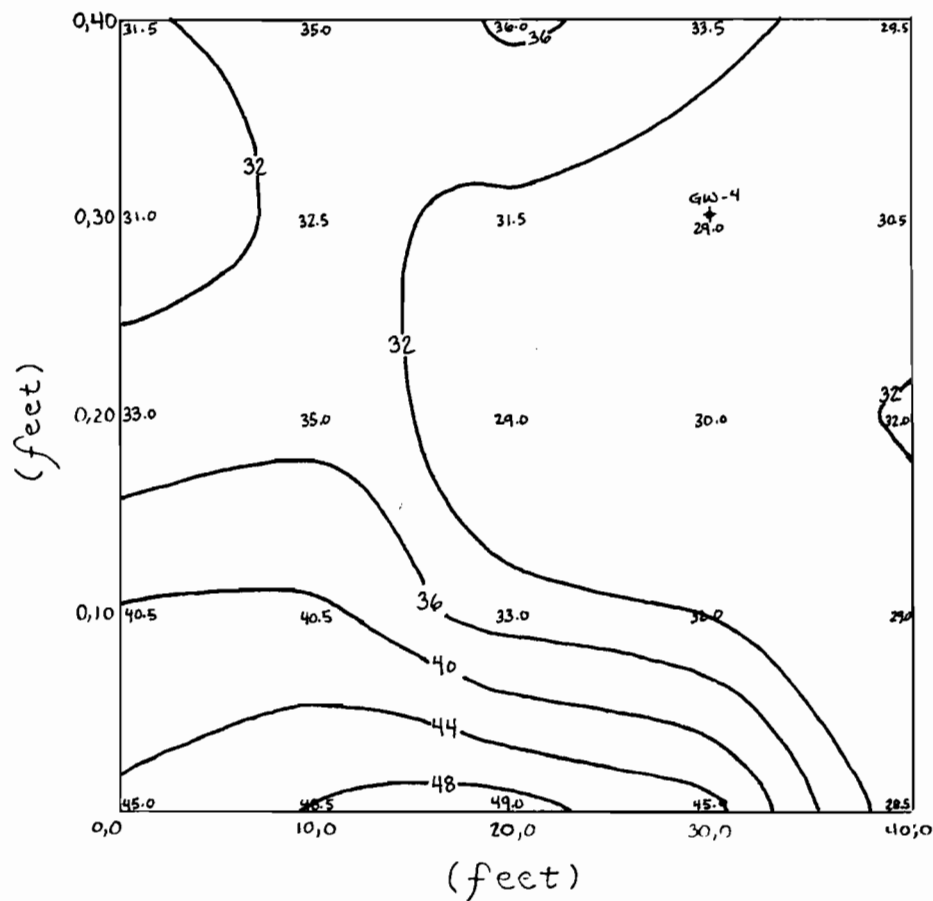
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 4

Horizontal Dipole
(millimhos/meter)



Contour Interval = 4.0 millimhos/meter

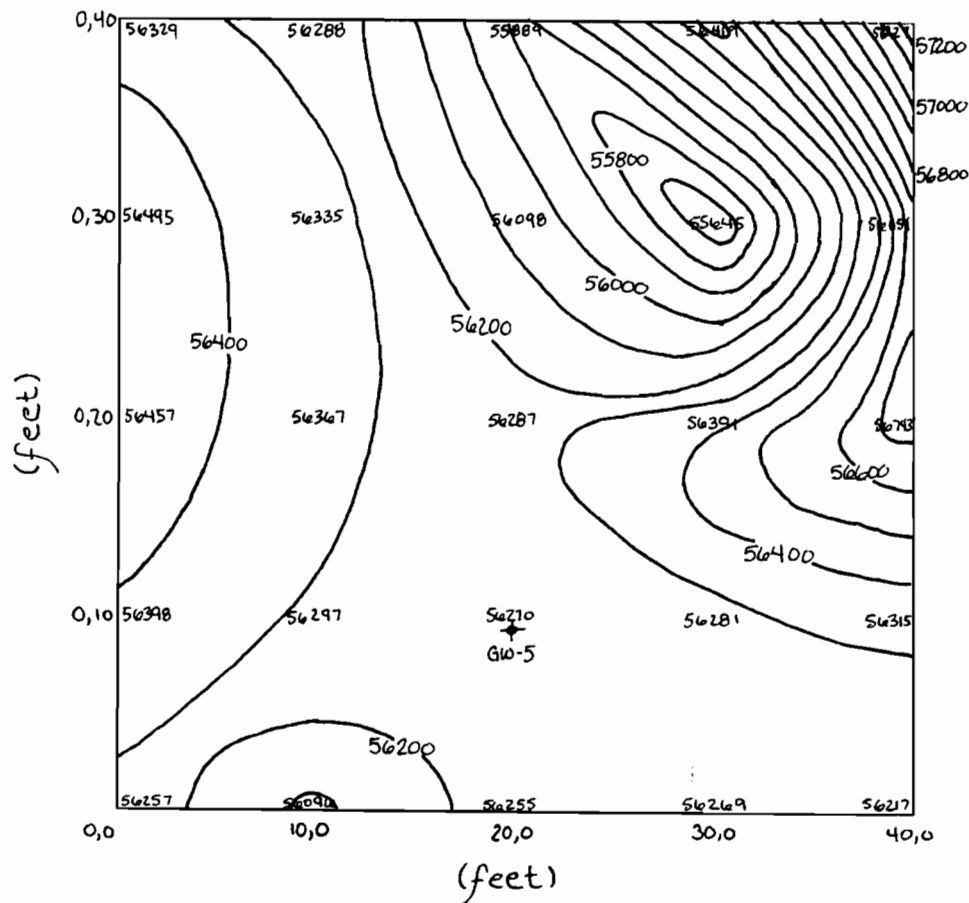
★ Proposed Monitoring Well Location

WURLITZER

MAGNETOMETER SURVEY

GRID No. 5

Magnetic Field Intensity
(Gammas)



Contour Interval = 100 Gammas

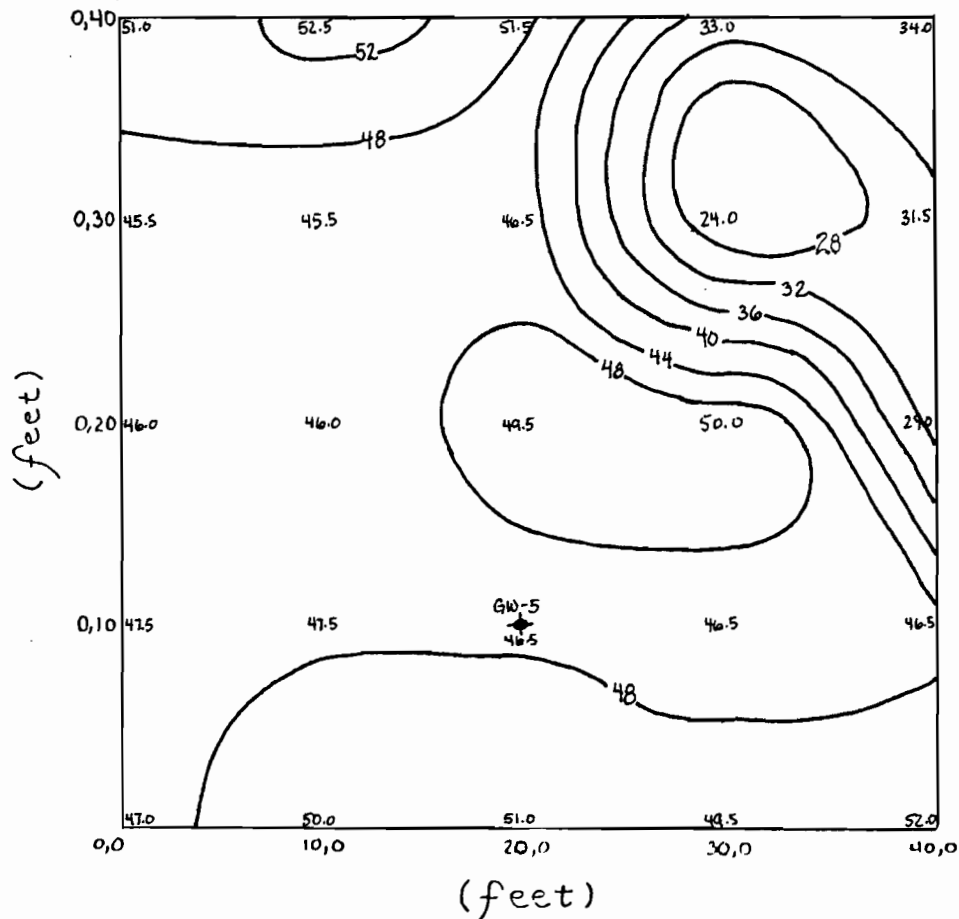
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 5

Vertical Dipole
(millimhos/meter)



Contour Interval = 4.0 millimhos/meter

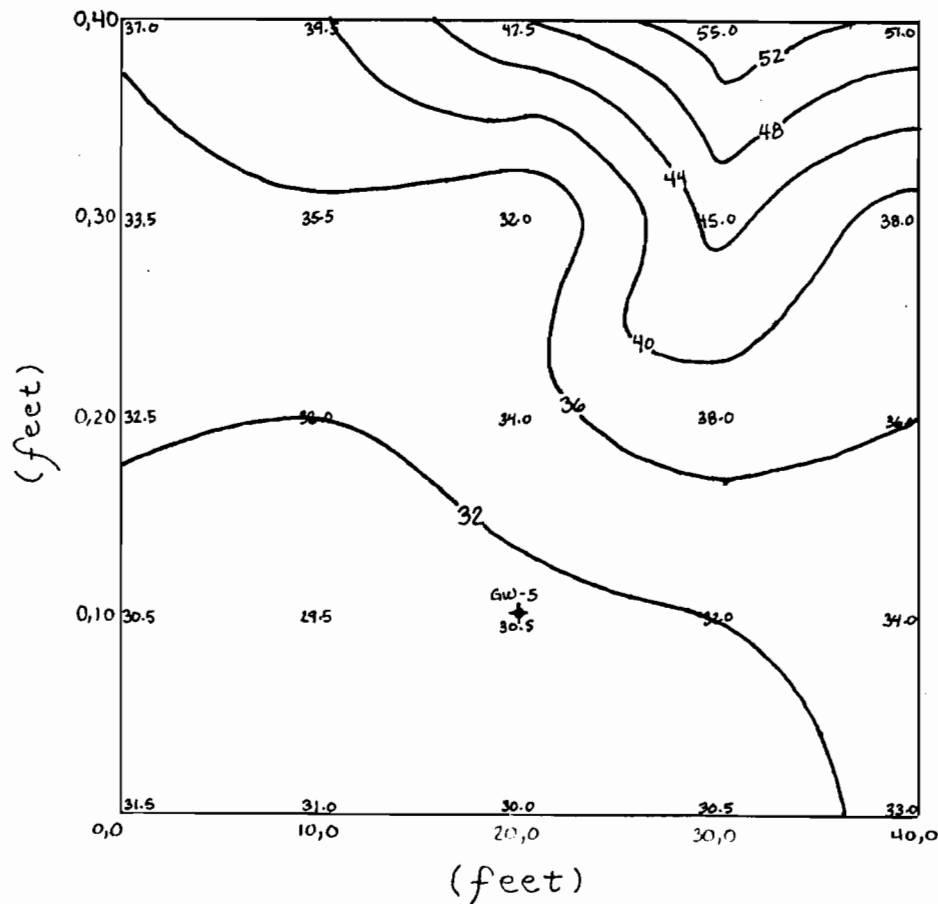
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 5

Horizontal Dipole
(millimhos/meter)



Contour Interval = 4.0 millimhos/meter

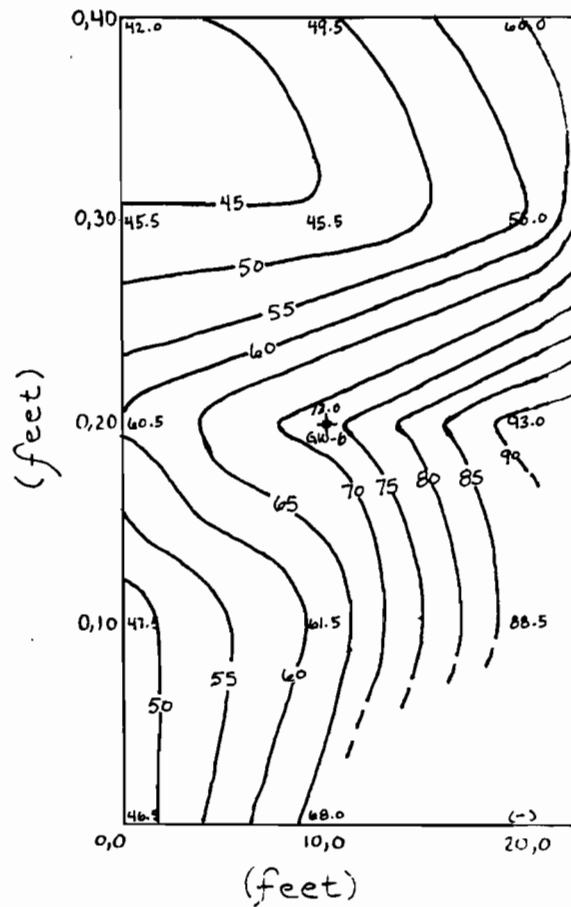
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 6

Vertical Dipole
(millimhos/meter)



↑ N32E

Contour Interval = 5.0 millimhos/meter

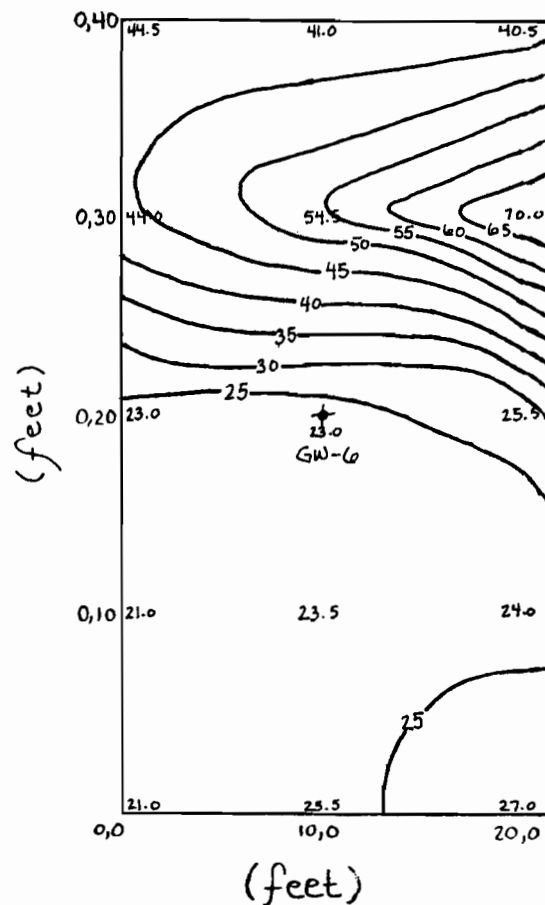
★ Proposed Monitoring Well Location

WURLITZER

EM-31 SURVEY

GRID No. 6

Horizontal Dipole
(millimhos/meter)



↑ N32E

Contour Interval = 5.0 millimhos/meter

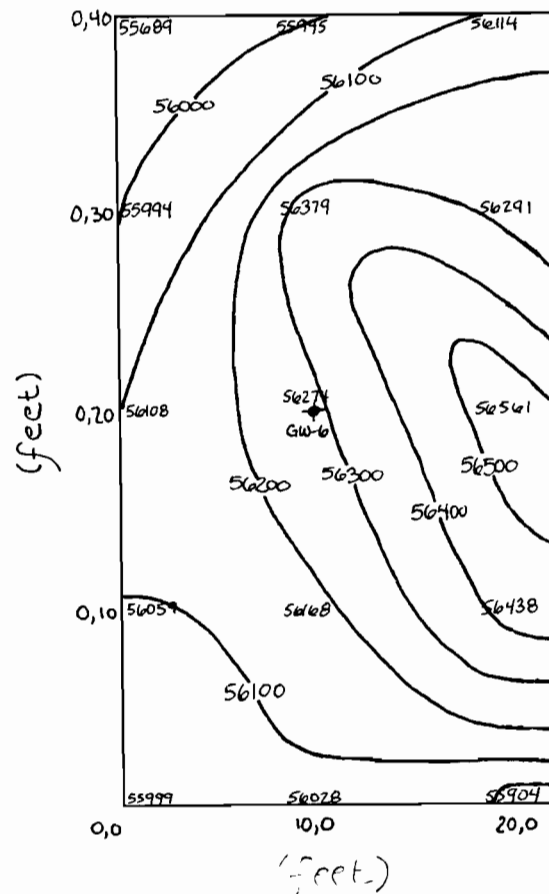
★ Proposed Monitoring Well Location

WURLITZER

MAGNETOMETER SURVEY

GRID No. 6

Magnetic Field Intensity
(Gammas)



1 N32E

Contour Interval = 100 Gammas

★ Proposed Monitoring Well Location

APPENDIX C

SUBSURFACE BORING LOGS

DATE STARTED <u>08-01-90</u> FINISHED <u>08-02-90</u> SHEET <u>1</u> OF <u>1</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>GW-1</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>12.7' Bas</u> (<u>9-28-90</u>)

PROJECT <u>Wurlitzer Site</u> <u>NYSDEC Phase II</u>	LOCATION <u>North side Area A</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER				PROFILE	FIELD IDENTIFICATION OF SOILS	NOTES
				0-6		6-12				
				0	6	6	12			
								CI SI Sd Gr		
		SS	1	8	11				SS #1 0-2' 1.1' Recovery	Dry
				12	7				Fill material; mix of slag, brick, concrete, silt, and glass fragments	
5		SS	2	7	4				SS #2 4-16' 1.1' Recovery	Dry to moist
				3	3				0-0.5' Fill material; dry slag and brick with silt (may be from auger bit?)	
									0.5-1.1' Moist gray silt with rust mottling.	
10		SS	3	4	5				SS #3 9-11' 1.05' Recovery	Damp
				5	10				Dense, slightly moist grey clay, cohesive with low plasticity. No pebbles, etc.	
15		SS	4	1	1				SS #4 14-16' 2.0' Recovery	Wet
				1	1				Highly plastic, cohesive grey clay with some red mottling, no inclusions except 0.1' zone of Fill material (brick, etc.)	Augering became easy @ ~13.0'
		SS	5	1	2					
20		SS	6	1	1				SS #5 16-18' 2.0' Recovery	Wet
				1	1				Same as SS #4. No inclusions	
		SS	7	1	0				SS #6 18-20' 2.0' Recovery	Wet
				1	1				Same as SS #5.	
25		SS	8	1	2				SS #7 20-22' 2.0' Recovery	Wet
				1	2				Same as SS #6	
		SS	9	1	3				SS #8 22-24' 2.0' Recovery	Wet
				1	3				Same as SS #7. Grey with red mottling.	
		SS	10	1	3				SS #9 24-26' 2.0' Recovery	Wet
				7	5				Same as SS #8, but with a few small silty areas.	
30		SS	11	2	4				SS #10 26-28' 2.0' Recovery	Wet
				8	8				26-27.6' same as SS #9	
		SS	12	3	9				27.6-28' same coloration but much siltier with green shale fragments.	
				50					SS #11 28-30' 1.7' Recovery	Wet
									Fine silt with numerous (~5%) small rounded and angular pebbles and a few cobbles.	
35									SS #12 30-31.5' 1.5' Recovery	Saturated
									Same fine silt as SS #1 with two 0.3' flowing fine sand/silt sections	
40									split spoon refusal @ 31.5'	
									Augered to refusal @ 32.5'	

640088

recycled paper
recycled paper

CLASSIFICATION/BY

C-2

R. Meyersecology and environment
ecology and environment

DATE STARTED <u>08-08-90</u> FINISHED <u>08-08-90</u> SHEET <u>1</u> OF <u>2</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>GW-2</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>11.8' Bas</u> <u>(9-28-90)</u>

PROJECT <u>Wurlitzer Site</u> <u>NYSDEC Phase II</u>	LOCATION <u>Niagara Falls Blvd.</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER				PROFILE	FIELD IDENTIFICATION OF SOILS	NOTES								
				<table><tr><td>0</td><td>6</td><td>6</td><td>12</td></tr><tr><td>12</td><td>18</td><td>18</td><td>24</td></tr></table>							0	6	6	12	12	18	18	24
				0	6	6	12											
12	18	18	24															
Cl	Sl	Sd	Gr															

5

640088

DATE STARTED <u>08-13-90</u> FINISHED <u>08-13-90</u> SHEET <u>1</u> OF <u>1</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>GW-25</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>DRY</u> (9-28-90)

PROJECT <u>Wurlitzer Site</u> <u>NYSDEC Phase II</u>	LOCATION <u>Niagara Falls Blvd.</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER	PROFILE	FIELD IDENTIFICATION OF SOILS	NOTES
				06612 12181824			
					ClSlSdGr		
						SS #1 6.5-8.5'	2.0' Driven
						6.5-6.8': void	1.7' Recovery
						6.8-7.0': Clay; medium brown, silty	HNu = 0 ppm
						(~10% silt), soft, high plasticity.	
						7.0-7.6': Clay; medium brown, high	
						moisture content & plasticity	
						7.6-8.2': Sand; medium brown, wet	
						8.2-8.5': clay; medium brown,	
						plasticity, dry, compact.	
					</		

DATE STARTED <u>08-02-90</u> FINISHED <u>08-02-90</u> SHEET <u>1</u> OF <u>1</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>GW-3</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>10.94' BGS</u> (9-28-90)

PROJECT <u>Wurlitzer Site</u> <u>NYSDEC Phase II</u>	LOCATION <u>South side Area A</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER				PROFILE Cl Si Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
				0	6	6	12			
				12	18	18	24			
5 <										

DATE STARTED <u>08-06-90</u> FINISHED <u>08-06-90</u> SHEET <u>1</u> OF <u>2</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>GW-4</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>10.28' Bas</u> (9-28-90)

PROJECT <u>Wurlitzer site</u> <u>NYSDEC Phase II</u>	LOCATION <u>North of Area B</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER				PROFILE Cl Si Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
				0	6	6	12			
				12	18	18	24			
5		SS	1	11	7				SS #1 0-2' 1.35' Recovery 0-0.5' Brown sandy, gravelly fill with organics + CID (asphalt shingle) 0.5-1.15' Black silt with clay 1.15-1.35' Mottled grey + yellow silt with sand.	Moist from recent rain OVA = 2ppm H ₂ Nu = 0
				8	10					
		SS	2	2	2				SS #2 4-6' 1.8' Recovery 4-4.3' Black silt with sand + clay. Minor sand is very fine. 4.3-5.3' Light brown silt with very fine sand + clay (moist). 5.3-5.8' Light brown, fine sand with silt + clay (wet)	Wet at bottom OVA = 0 H ₂ Nu = 0
				2	4					
10		SS	3	5	5				SS #3 7-9' 1.6' Recovery 7-7.6' Light brown / yellow sand (dry to moist) 7.6-8.6' Dry, highly plastic + cohesive grey clay.	Dry OVA = 0 H ₂ Nu = 0
				7	12					
		SS	4	4	7				SS #4 9-11' 1.5' Recovery 9-9.2' Light brown, tight, highly plastic clay 9.2-10.5' Dry, highly plastic + cohesive grey clay.	Dry OVA = 0 H ₂ Nu = 0
				11	11					
15		SS	5	2	1				SS #5 14-16' 1.9' Recovery 14-15.9' Greyish brown, wet, highly plastic clay. Similar to Gw-1 + Gw-3.	WET OVA = 0 H ₂ Nu = 0
				1	1					
20		SS	6	1	1				SS #6 19-21' 2.0' Recovery All varved grey + red, wet, highly plastic clay as in Gw-1/-3	WET OVA = 0 H ₂ Nu = 0
				1	1					
25		SS	7	3	1				SS #7 24-26' 1.7' Recovery 24-25.2' varved clay as in SS #6 25.2-25.6' yellow-grey silt with sand and gravel 25.6-25.7' varved clay as above but more red clay.	WET OVA = 0 H ₂ Nu = 0
				1	2					
		SS	8	1	1				SS #8 26-28' 2.0' Recovery All varved red / grey clay as above.	WET OVA = 0 H ₂ Nu = 0
				1	5					
30		SS	9	2	1				SS #9 28-30' 2.0' Recovery 28-29.0' same varved clay as above but mostly red now. 29-30.0' Red sand with clay, silt + gravel. one 1" diam. subangular rock fragment @ 13'	WET OVA = 0 H ₂ Nu = 0
				1	2					
		SS	10	1	1					
				2	5					
35		SS	11	3	35					
				43	50					
40										

T.D. = 38.5
Screen: 28.5-38.5'
sand: 26.4-38.5'
seal: 23.8-26.4'
grout: 0-23.8'

2" ID PVC screen & riser

640088

CLASSIFICATION/BY R. Watt

C-7

recycled paper
recycled paperecology and environment
ecology and environment

640088

DATE STARTED <u>08-14-90</u> FINISHED <u>08-14-90</u> SHEET <u>1</u> OF <u>1</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>GW-45</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>5.42' BGS</u> (9-28-90)

PROJECT <u>Wurlitzer Site</u> <u>NYSDEC Phase II</u>	LOCATION <u>North of Area B</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER	PROFILE	FIELD IDENTIFICATION OF SOILS	NOTES
				06612 12181824			
				CI SI Sd Gr			
5							

DATE STARTED <u>08-09-90</u> FINISHED <u>08-09-90</u> SHEET <u>1</u> OF <u>2</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>GW-5</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>9.45' BGS</u> (9-28-90)

PROJECT <u>Wurlitzer Site</u> <u>NYSDEC Phase II</u>	LOCATION <u>SW of Area B</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER				PROFILE Cl Si Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
				0	6	6	12			
				12	18	18	24			
5 										

DATE STARTED <u>08-07-90</u> FINISHED <u>08-07-90</u> SHEET <u>1</u> OF <u>2</u>	 E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER <u>CW-6</u> SURFACE ELEVATION _____ GROUNDWATER DEPTH <u>8.42' BGS</u> (9-28-90)

PROJECT <u>Wurlitzer Site</u> <u>NYSDEC Phase II</u>	LOCATION <u>East of Area B.</u> <u>North Tonawanda, NY</u>

DEPTH - FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER	PROFILE	FIELD IDENTIFICATION OF SOILS	NOTES	
				0 6 12				Cl Si Sd Gr
				12 18 24				
5						SS #1 0-2' 1.1' Recovery 0-0.35' Dark brown sand with silt + organics (topsoil); contains a few coal fragments. 0.35-0.8' Sandy, gravelly fill 0.8-1.1' Light brown silt with sand + clay.	Dry OVA = 0 H _{Nu} = 0	
10						SS #2 4-6' 1.0' Recovery 4-5' Light brown fine sand with silt + clay. Sand is wet.	Moist to Wet OVA = 0 H _{Nu} = 0	
15						SS #3 6-8' 0.9' Recovery All light to medium brown, medium to coarse grained sand. A few chert fragments (1/2"-1" diam.) @ top - may have fallen in from above.	Moist OVA = 0 H _{Nu} = 0 Cuttings from sandy zone are saturated	
20						SS #4 8-10' 1.2' Recovery 8-8.7' same wet sand w/ <15% gravel as in SS #3 8.7-9.2' slightly moist, tight, highly plastic grey clay	WET / DRY OVA = 0 H _{Nu} = 0	
25						SS #5 14-16' 2.0' Recovery 14-14.3' Light brown wet sand with gravel (probably fell in from above) 14.3-14.6' same grey clay as SS #4 14.6-16.0' varved red + grey clay, highly plastic + cohesive, wet. Same as in other wells	WET OVA = 0 H _{Nu} = 0	
30						SS #6 19-21' 2.0' Recovery Same varved red / grey clay as above	Wet OVA = 0 H _{Nu} = 0	
35						SS #7 24-26' 2.0' Recovery 24-24.3' same varved clay as above 24.3-25.1' Light brown sand with clay + gravel 25.1-26.0' same varved clay as above	WET OVA = 0 H _{Nu} = 0	
40						SS #8 26-28' 2.0' Recovery Same varved clay as above	WET OVA = 0 H _{Nu} = 0	
						SS #9 28-30' 2.0' Recovery Same varved clay as above but silty / sandy in places	WET OVA = 0 H _{Nu} = 0	

GRAVEL

T.D. = 34.0'

screen:
24.0-34.0'

sand:
22.0-34.0'

seal:
19.0-22.0'

grout:
0-19.0'

2" ID PVC screen & riser

640088

CLASSIFICATION/BY R. Wattrecycled paper
recycled paper

C-13

ecology and environment
ecology and environment

SHEET 2 OF 2



E + E DRILLING AND TESTING CO., INC.
SUBSURFACE LOG

HOLE NUMBER GW-6
SURFACE ELEVATION _____
GROUNDWATER DEPTH _____

PROJECT Wurlitzer site
NYSDE

LOCATION East of Area B
North Tonawanda, NY

[illegible]ecology and environment
ecology and environment

APPENDIX D

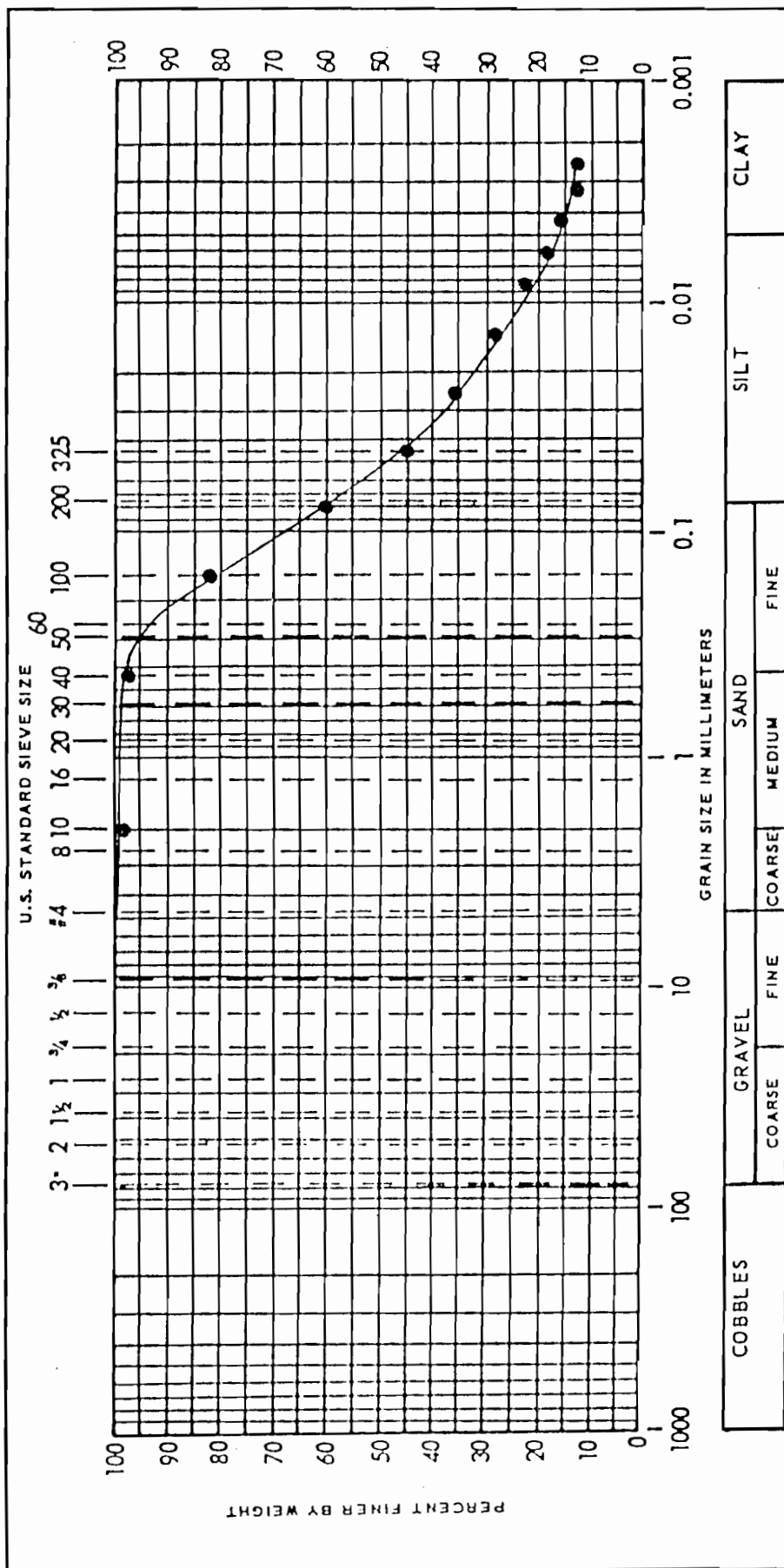
GEOTECHNICAL SAMPLING RESULTS

Project No. 11420		TOLEDO TESTING LABORATORY, INC.										Sheet 1 Of 1					
TABULATION OF TEST DATA																	
Station Location	Depth of Sample Tip	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		Group Designation and Index (AASHTO)	
							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)
GW-02-01	6'-8'						0	0	2	26	55	17					
GW-02-02	30'-31'						0	0	0	55	42	3					
GW-05-01	5'-6'						1	1	3	31	49	15					
GW-05-04	35'-35.5'						0	0	0	80	6	14					
GW-05-02	26'-28'													41	21	20	
GW-1-03	30'-31.5'						17	4	4	23	44	8					
GW-04-01	5.5'-6'						0	0	1	25	58	16					
GW-04-02	9'-11'													49	23	26	
GW-04-04	29'-30'						8	8	8	19	42	15		41	21	20	
GW-04-03	28'-29'																
GW-06-01	4'-8'						0	0	2	58	32	8					
GW-06-04	33'-34'						20	7	6	16	36	15		51	23	28	
GW-03-01	9'-11'													46	21	25	
GW-03-02	19'-21'																

Figure 1

Figure 1

SOIL CLASSIFICATION SHEET



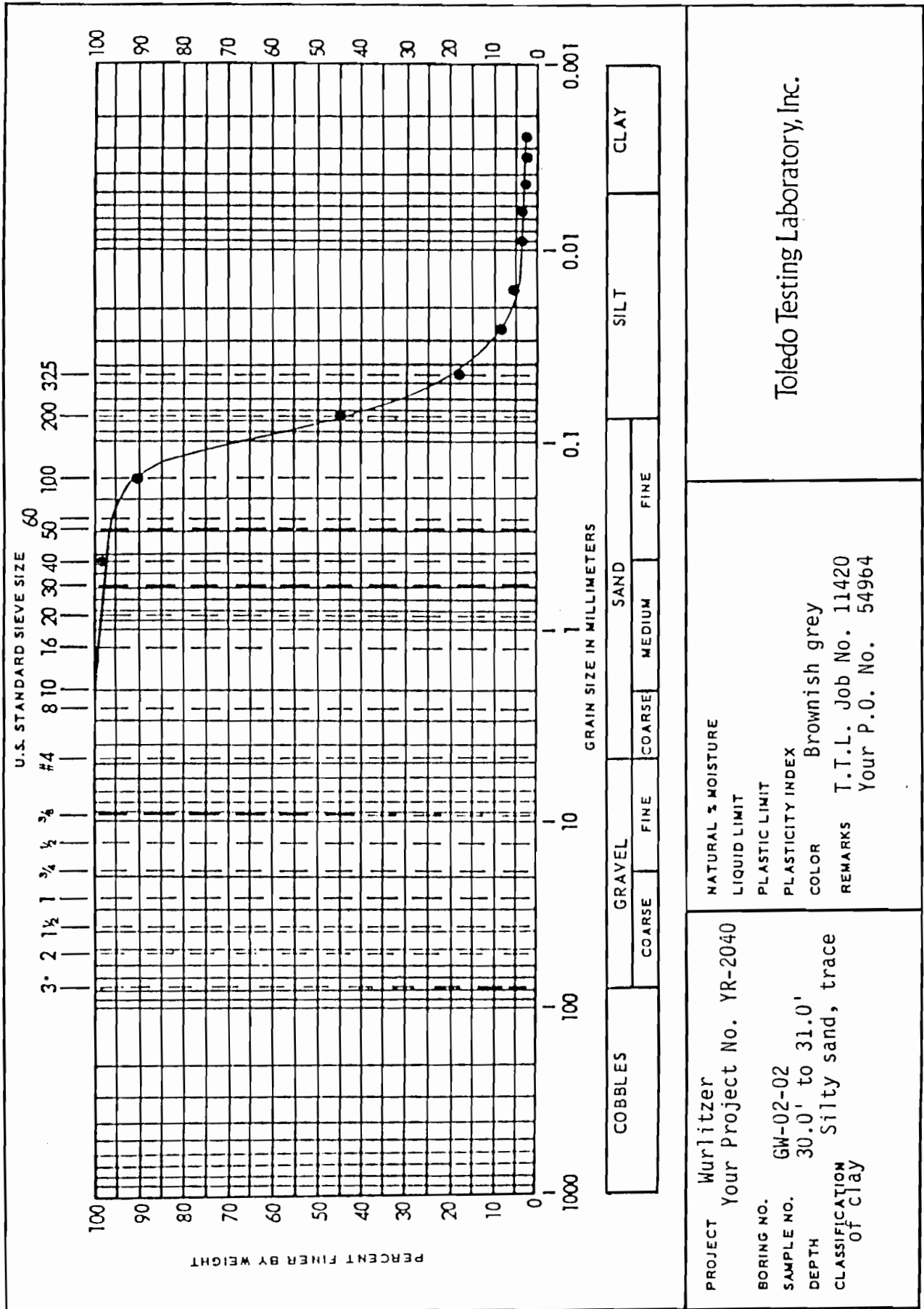
PROJECT Wurlitzer
Your Project No. YR-2040

BORING NO. GW-02-01
SAMPLE NO. 6.0' to 8.0'
DEPTH
CLASSIFICATION Sandy silt, little clay

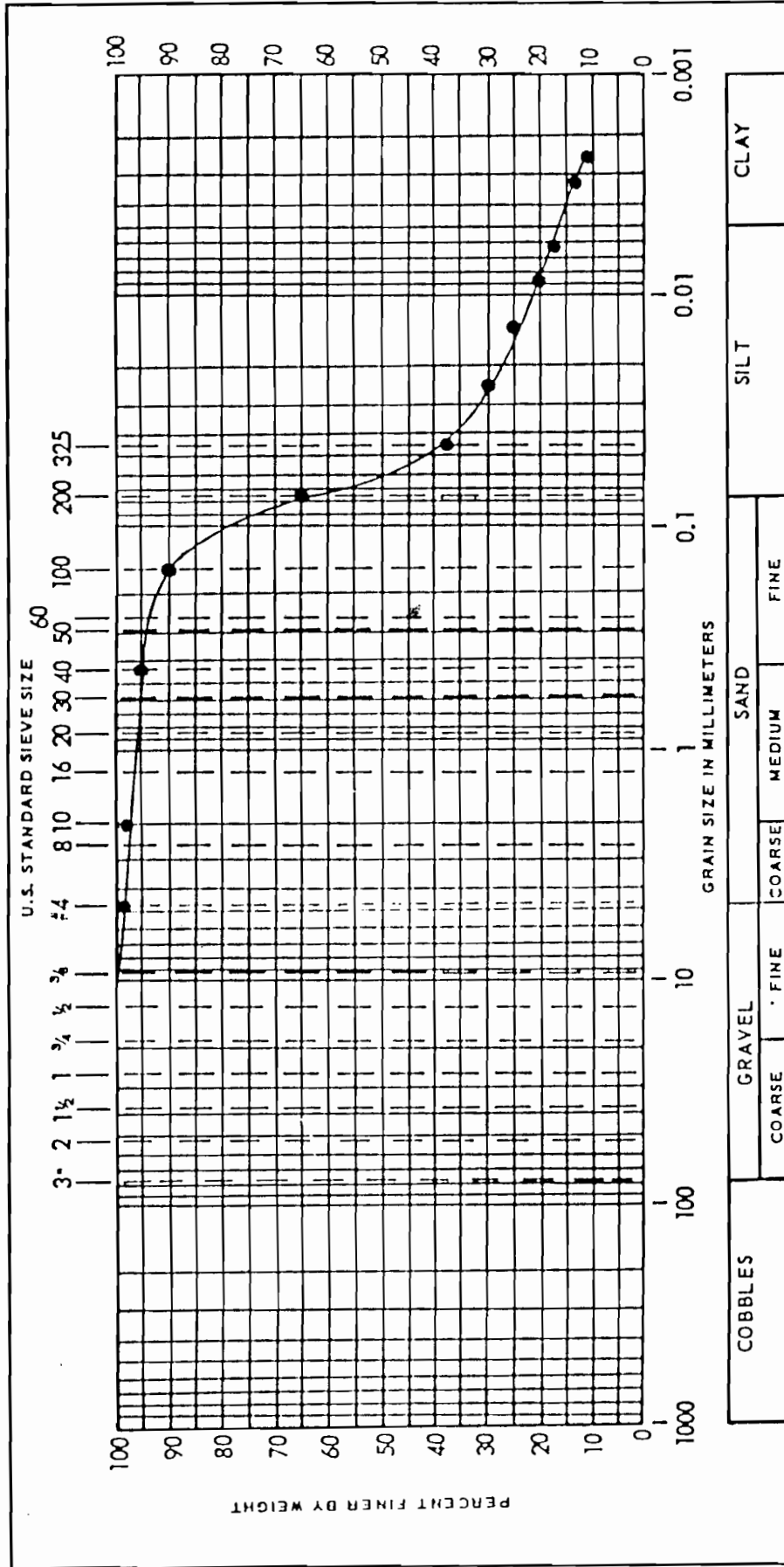
NATURAL % MOISTURE
LIQUID LIMIT
PLASTICITY INDEX
COLOR Brown
REMARKS T.T.L. Job No. 11420
Your P.O. No. 54964

Toledo Testing Laboratory, Inc.

SOIL CLASSIFICATION SHEET



SOIL CLASSIFICATION SHEET



PROJECT Wurlitzer
Your Project No. YK-2040

BORING NO. GW-05-01

SAMPLE NO. 5.0' to 6.0'

DEPTH

CLASSIFICATION Sandy silt, little clay, trace of gravel

NATURAL % MOISTURE

LIQUID LIMIT

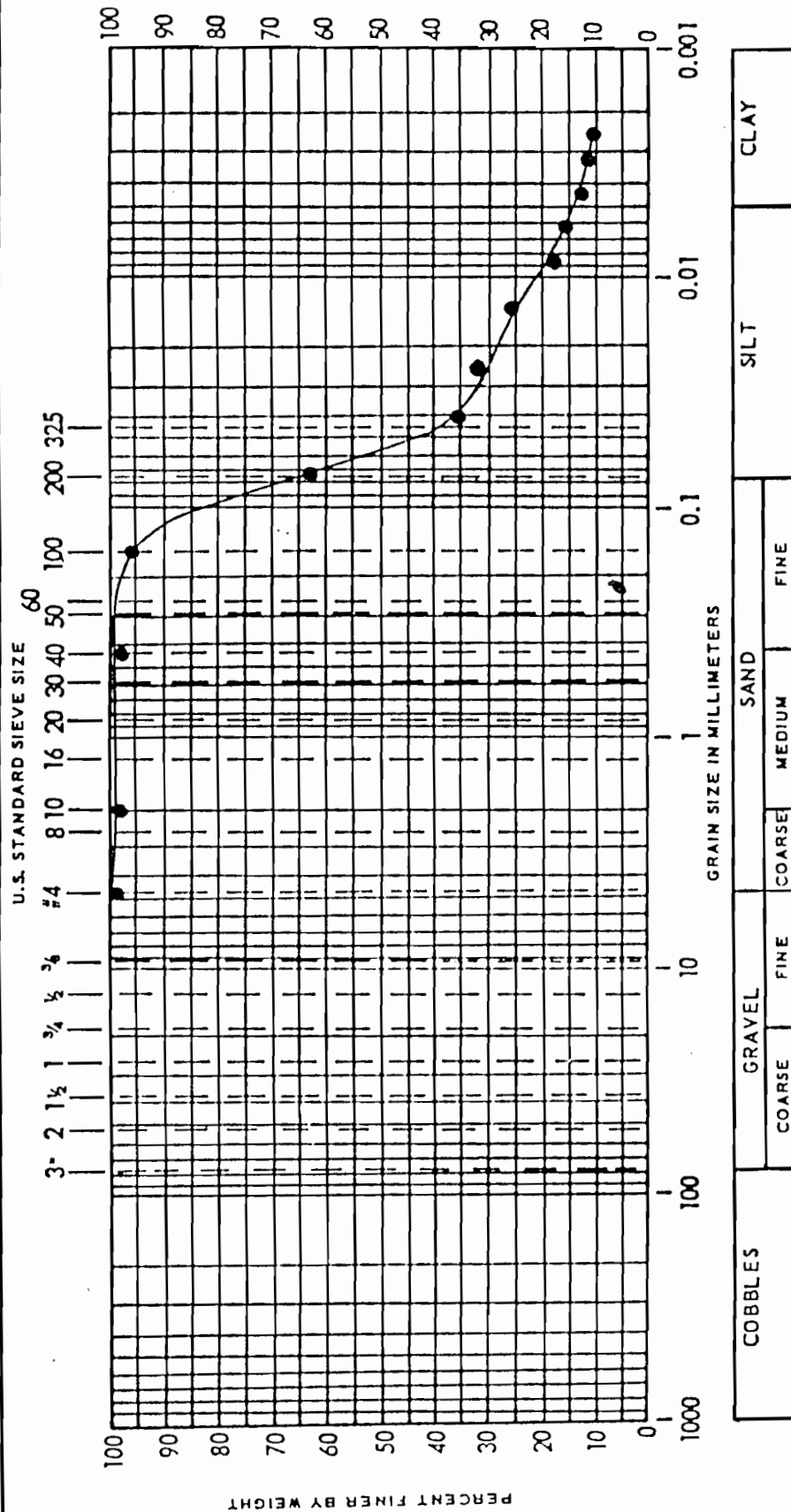
PLASTICITY INDEX

COLOR BROWN

REMARKS T.T.L. Job No. 11420
Your P.O. No. 54964

Toledo Testing Laboratory, Inc.

SOIL CLASSIFICATION SHEET

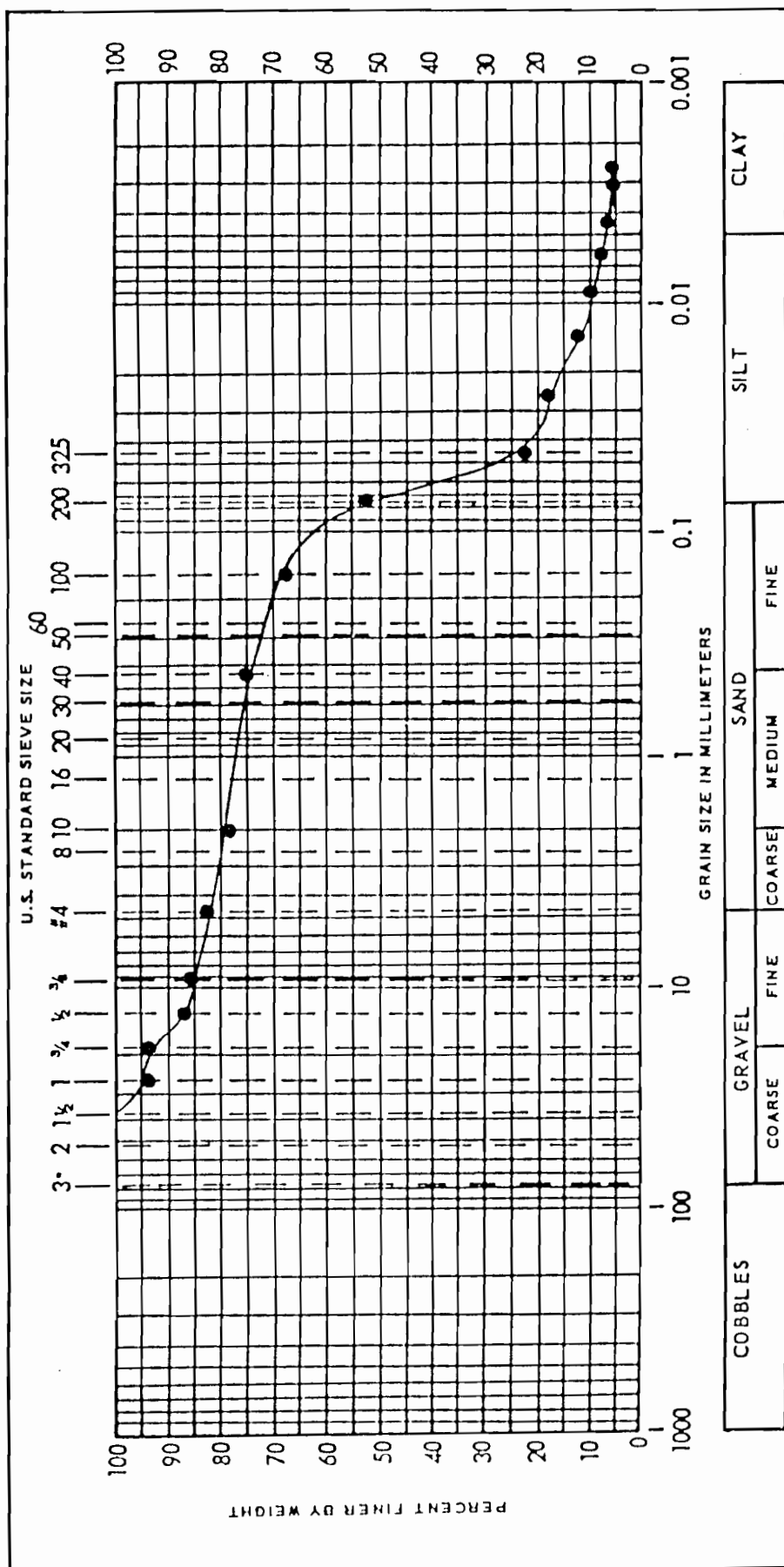


PROJECT Wurlitzer
Your Project No. YR-2040

BORING NO. GW-05-04
SAMPLE NO. 35.0' to 35.5'
DEPTH Fine sand, little
CLASSIFICATION clay, trace of silt
REMARKS T.T.L. Job No. 11420
Your P.O. No. 54964

Toledo Testing Laboratory, Inc.

recycled paper



PROJECT Wurlitzer
Your Project No. YR-2040

BORING NO.

SAMPLE NO.

DEPTH

CLASSIFICATION Sandy silt, little gravel, trace of clay

NATURAL % MOISTURE

LIQUID LIMIT

PLASTIC LIMIT

PLASTICITY INDEX

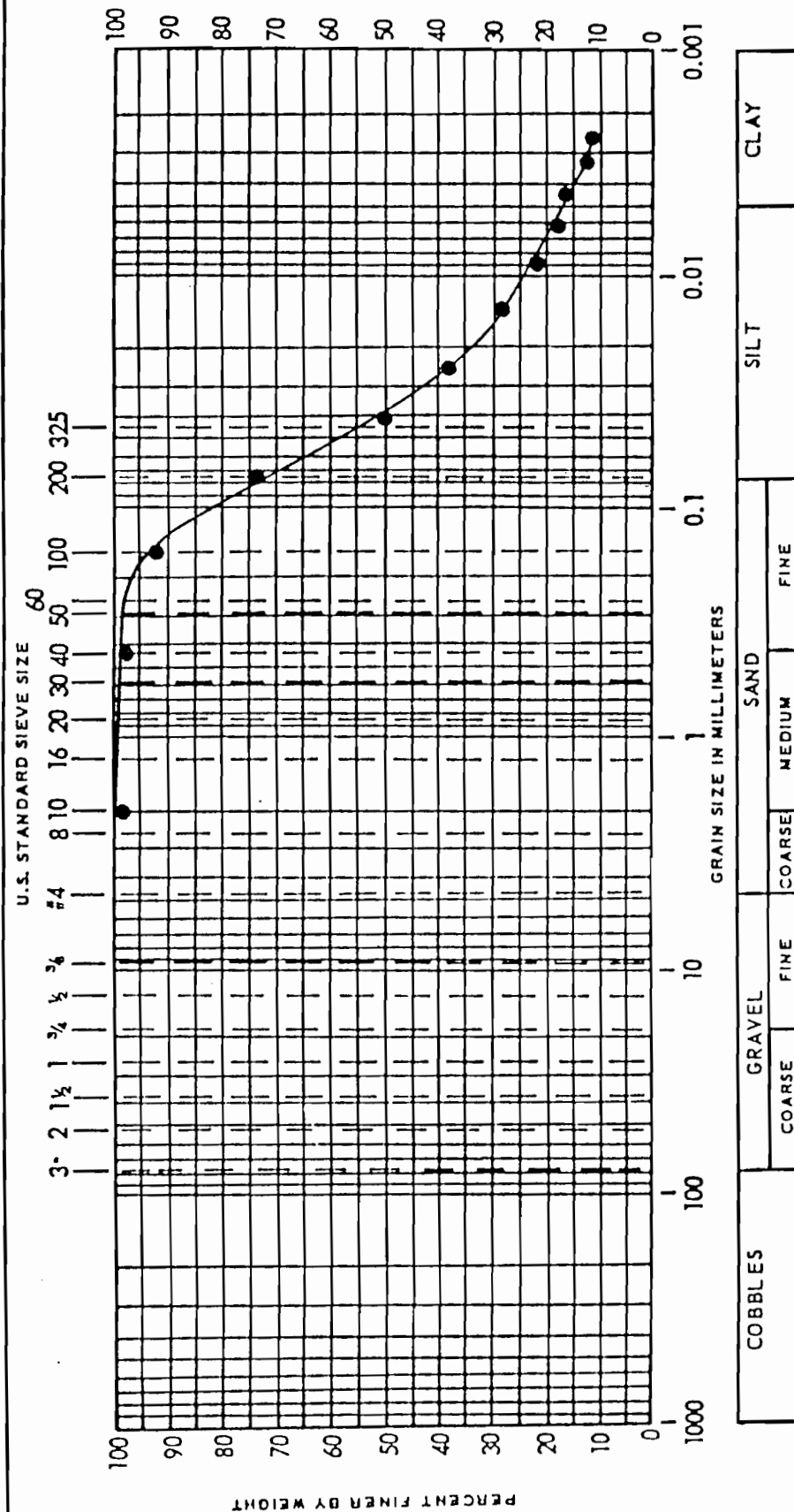
Reddish brown

COLON	REGISTRATION DISC	T T 1	Job No	11d20

REMARKS	I.L.L.	JOB NO.	
	Your D ()	No	
		54964	11420

Toledo Testing Laboratory, Inc.

SOIL CLASSIFICATION SHEET



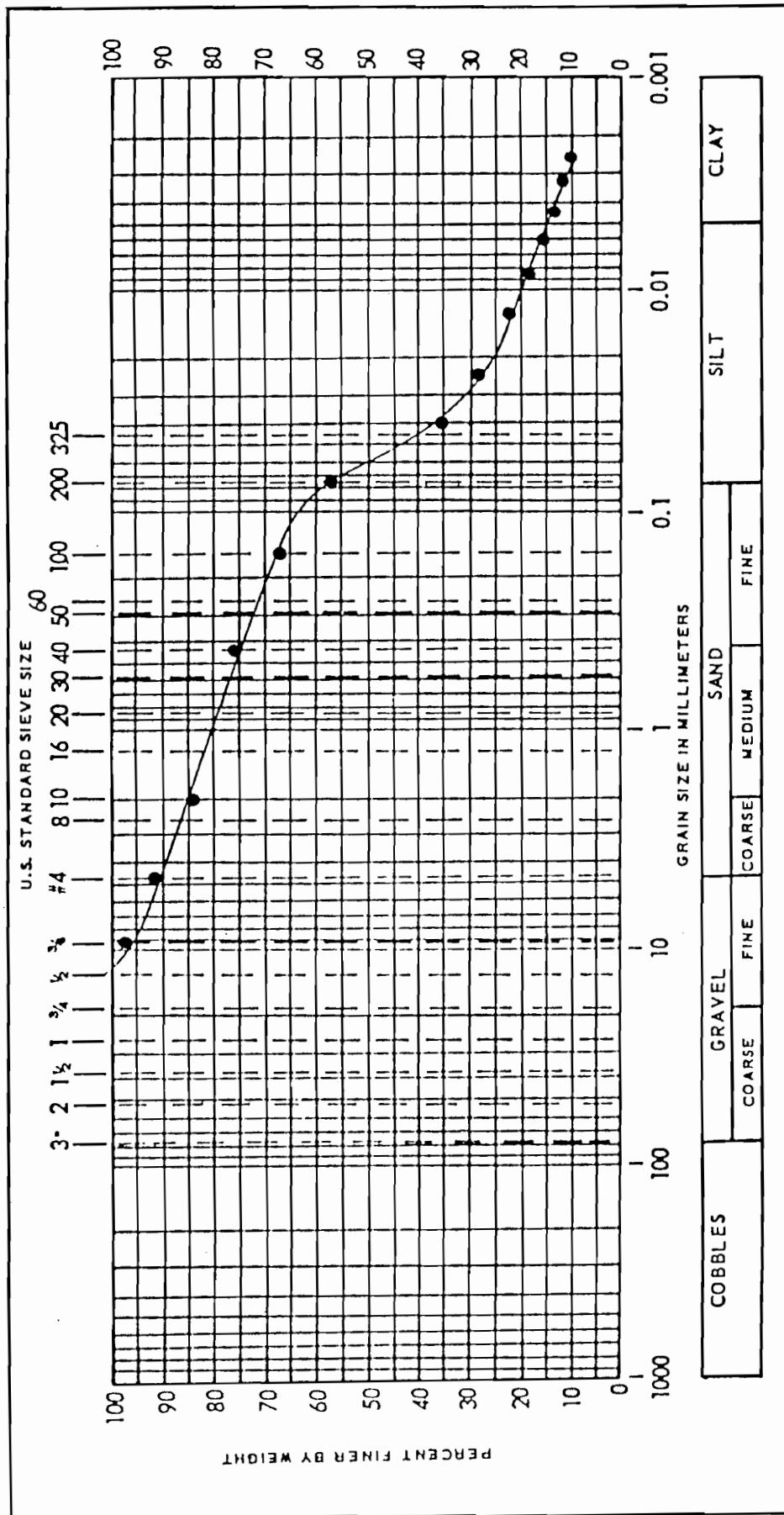
PROJECT Wurlitzer
Your Project No. YR-2040

BORING NO. GW-04-01
SAMPLE NO. 5.5' to 6.0'
DEPTH
CLASSIFICATION Sandy silt, little clay

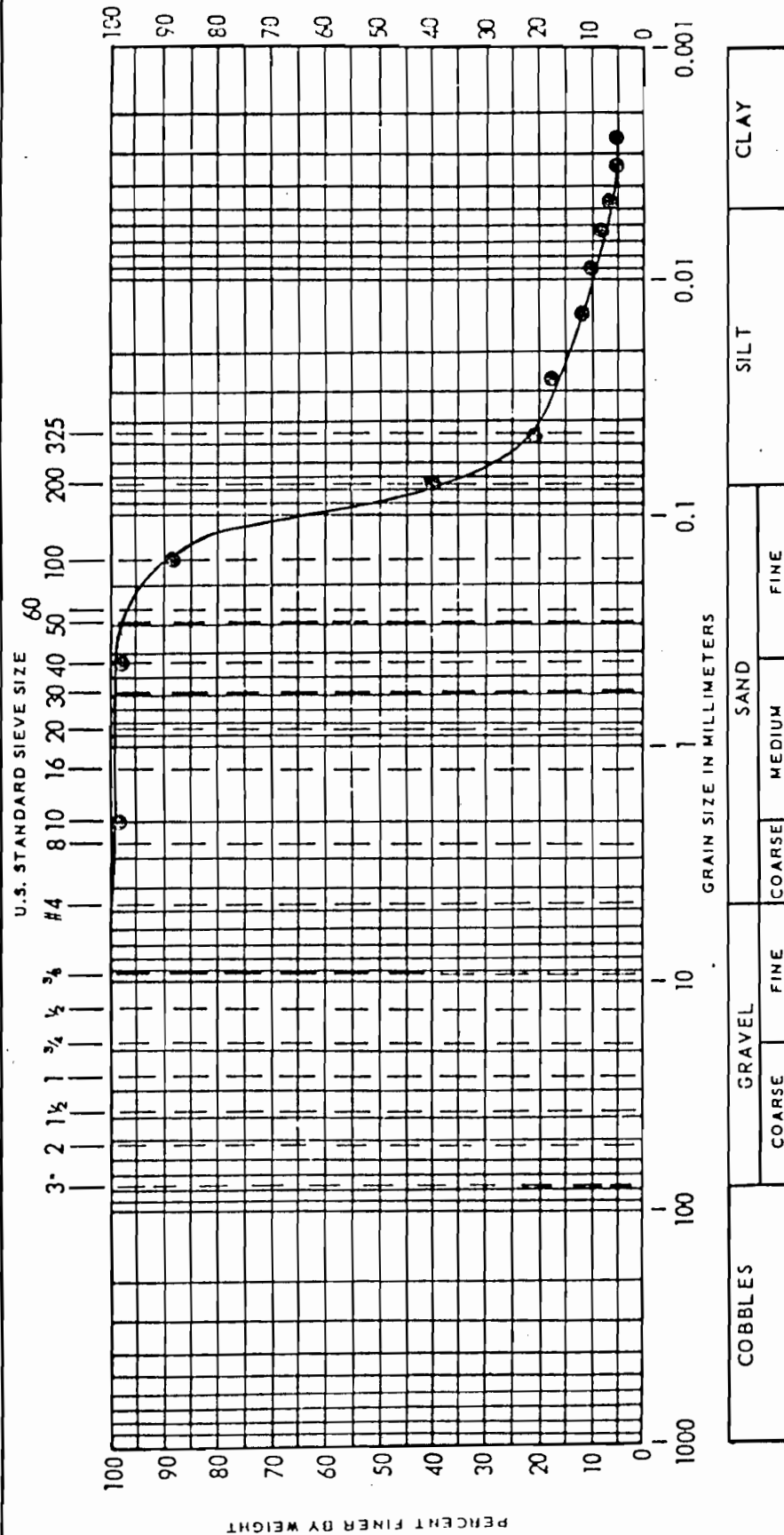
NATURAL % MOISTURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
COLOR Yellowish Brown
REMARKS T.T.L. Job No. 11420
Your P.O. No. 54964

Toledo Testing Laboratory, Inc.

SOIL CLASSIFICATION SHEET



SOIL CLASSIFICATION SHEET



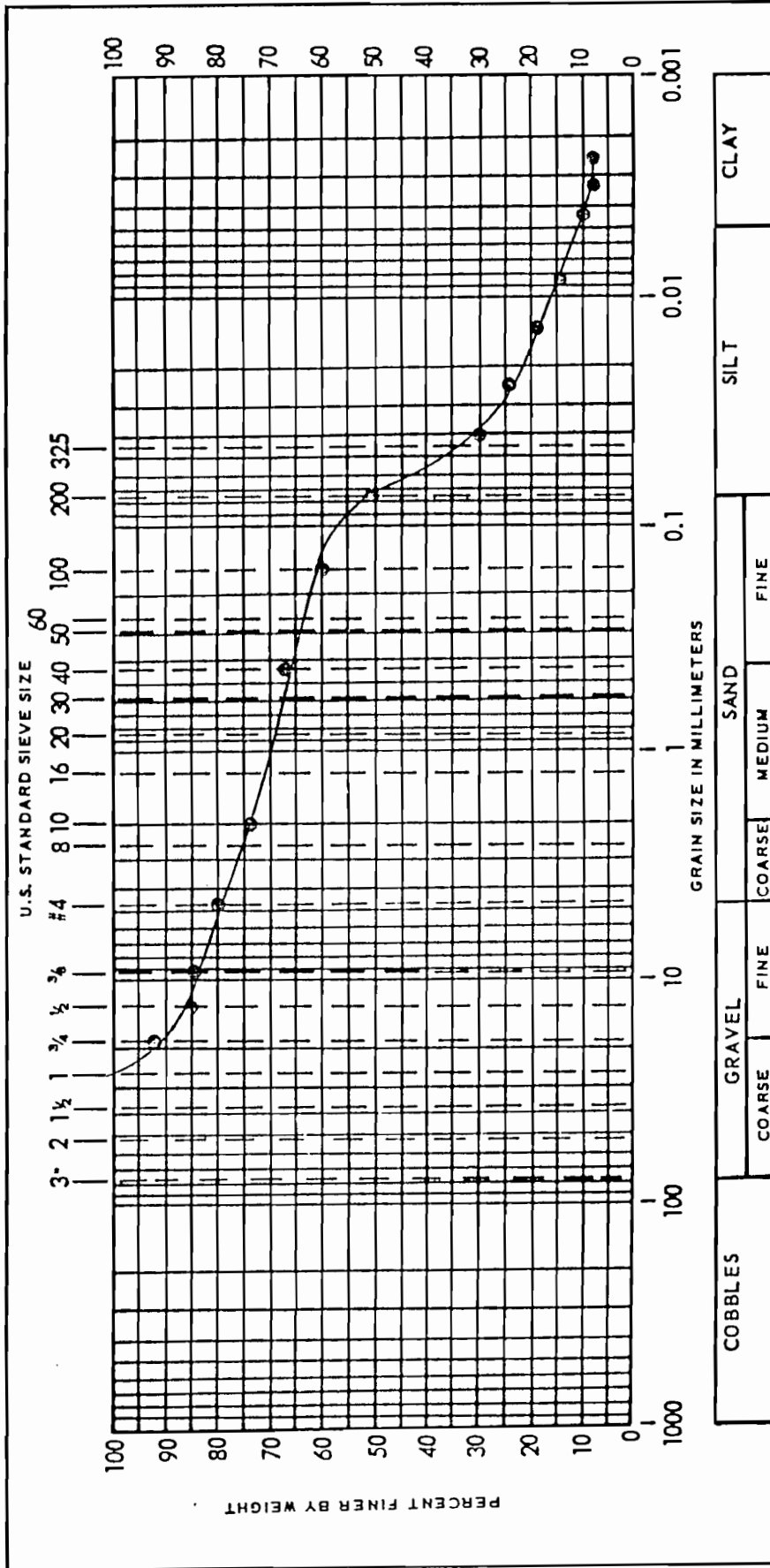
PROJECT Wurlitzer
Your Project No. YR-2040

BORING NO. GW-06-01
SAMPLE NO. 4.0' to 8.0'
DEPTH
CLASSIFICATION Silty sand, trace
of clay

NATURAL % MOISTURE
LIQUID LIMIT
PLASTICITY INDEX
COLOR Yellowish Brown
REMARKS T.T.L. Job No. 11420
Your P.O. No. 54964

Toledo Testing Laboratory, Inc.

SOIL CLASSIFICATION SHEET



PROJECT Wurlitzer
Your Project No. YR-2040

BORING NO. GW-06-04

SAMPLE NO. 33.0' to 34.0'

DEPTH

CLASSIFICATION Sandy silt, little gravel and clay

NATURAL % MOISTURE

LIQUID LIMIT

PLASTIC LIMIT

PLASTICITY INDEX

COLOR Reddish Brown

REMARKS T.T.L. Job No. 11420
Your P.O. No. 54964

Toledo Testing Laboratory, Inc.

APPENDIX E

ANALYTICAL DATA SUMMARY SHEETS FROM WATER AND SOIL SAMPLING

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

- B = Not detected substantially above the level reported in laboratory or field blanks.
- R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm results.

CODES RELATING TO QUANTITATION

- J = Analyte present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value expected to be higher.
- [] = Inorganic analyte present. As values approach the IDL the quantitation may not be accurate.
- UJ = Not detected, quantitation limit may be inaccurate or imprecise.
- UL = Not detected, quantitation limit is probably higher.

DATA SUMMARY FORM: VOLATILES

WATER SAMPLES

Site Name: Wuritzer

Case #: 9001.922 Sampling Date(s): 8-7-90, 8-29-90

To calculate sample quantization limit:
(CRQL * Dilution Factor)

CRQL	Sample No. Dilution Factor Location	DW-0807 1.0	GW-1 1.0	GW-2 1.0	GW-3 1.0	GW-4 1.0	GW-4S 1.0	GW-5 1.0	GW-6 1.0	GW-6S 1.0
	COMPOUND									
10	Chloromethane									
10	Bromomethane									
10	*Vinyl Chloride									
10	Chloroethane									
5	*Methylene Chloride	7 B	3 B	4 B	6 B	4 B	7 B	5 B	11 B	9 B
10	Acetone	31 B	15 B	18 B	15 B	14 B	14 B	9 B	7 B	
5	Carbon Disulfide									
5	*1,1-Dichloroethene									
5	1,1-Dichloroethane									
5	*Total-1,2-Dichloroethene									
5	Chloroform	9	6 B	2 B	4 B					
5	*1,2-Dichloroethane									
10	*2-Butanone									
5	*1,1,1-Trichloroethane									
5	*Carbon Tetrachloride									
10	Vinyl Acetate									
5	Bromodichloromethane	4 J								

CRQL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: VOLATILES

WATER SAMPLES

Site Name: Wurlitzer

To calculate sample quantitation limit:
(CROL * Dilution Factor)

Case #: 9001.922 Sampling Date(s): 8-7-90, 8-29-90

CROL	COMPOUND	Sample No. Dilution Factor Location	DW0807	GW-1	GW-2	GW-3	GW-4	GW-4S	GW-5	GW-6	GW-6S
			1.0 Drill Water								
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										3 J

CROL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: VOLATILES 1

WATER SAMPLES
(ug/L)

Site Name: Wurliizer

Case #: 9001.922 Sampling Date(s): 8-7-90 / 8-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND	Sample No. Dilution Factor Location	SW-1 1.0	SW-2 1.0	VBLKW1 1.0	VBLKW2 1.0	VBLKW3 1.0	SW-2MS 1.0	SW-2MSD 1.0
10	Chloromethane								
10	Bromomethane								
10	*Vinyl Chloride								
10	Chloroethane								
5	*Methylene Chloride		3 B	12 B	10	6	13	6 B	5 B
10	Acetone		14 B		23	13	32	10 B	9 B
5	Carbon Disulfide								
5	*1,1-Dichloroethene								
5	1,1-Dichloroethane								
5	*Total 1,2-Dichloroethene		4 J						
5	Chloroform				1 J				
5	*1,2-Dichloroethane								
10	*2-Butanone								
5	*1,1,1-Trichloroethane								
5	*Carbon Tetrachloride								
10	Vinyl Acetate								
5	Bromochloromethane								

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: VOLATILES

2

Site Name: W. Utilizer

WATER SAMPLES
(ug/L)

Case #: 9001.922 Sampling Date(s): 8-7-90/8-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. Dilution Factor Location	SW-1 1.0	SW-2 1.0	VBLKW1 1.0	VBLKW2 1.0	VBLKW3 1.0	SW-2MS 1.0	SW-2HSD 1.0	
5	*1,2-Dichloropropane			Blank for: DW0807	SW-2 GW-6	GW-1 GW-6S GW-2 SW-1 GW-4 SW-2MS GW-5 SW-2MS GW-3 GW-4S			
5	Cis-1,3 Dichloropropene								
5	Trichloroethene	9							
5	Dibromochloromethane								
5	1,1,2-Trichloroethane								
5	*Benzene								
5	Trans-1,2-Dichloropropene								
5	Bromoforn								
10	4 Methyl 2-pentanone								
10	2 Hexanone								
5	*1,1,1-Trichloroethane								
5	1,1,2,2-Tetrachloroethane								
5	*Toluene								
5	*Chlorobenzene								
5	*Ethylbenzene								
5	*Styrene								
5	*Total Xylenes								

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: VOLATILES 1

SOIL SAMPLES

(ug/Kg)

Site Name: Wurliizer

Case #: 9001.922 Sampling Date(s): 8-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

CRQL	Sample No. Dilution Factor % Moisture Location	S-1	S-2	S-3	S-4	S-5	S-5RE	S-6	S-7	S-8
10	Chloromethane	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
10	Bromomethane	23	20	26	19	24	24	49	28	37
10	Vinyl Chloride									
10	Chloroethane									
5	Methylene Chloride	6	11	20	6	32	6	35	43	41
10	Acetone	8	15	22	13	29	20	37	9	34
5	Carbon Disulfide									
5	1,1-Dichloroethene									
5	1,1-Dichloroethane									
5	Total 1,2 Dichloroethene									
5	Chloroform	2		2	2	2	1	2	2	2
5	1,2 Dichloroethane									
10	2 Butanone		3			5				
5	1,1,1 Trichloroethane									
5	Carbon Tetrachloride									
10	Vinyl Acetate									
5	Bromodichloromethane									

More Acceptable

More Acceptable

CRDL = Contract Required Detection Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: VOLATILES 2

SOIL SAMPLES
(ug/Kg)

Site Name: Wyrliizer

Case #: 9001.922 Sampling Date(s): 8-29-96

To calculate sample quantitation limit:
(CRQL = Dilution Factor) / ((100 - % moisture)/100)

CRQL	Sample No. Dilution Factor % Moisture Location	S-BRE	SED-1	SED-2	SED-3	SED-3RE	SED-4	SED-4RE	VBLKS1	VBLKS2
		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		37	40	42	32	32	35	39		
					More Acceptable		More Acceptable		52 58 53 54 55 56 56 57 57 58	51 54 55RE 58RE
	COMPOUND									
5	1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene			5 J						
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromofarm									
10	4 Methyl-2-pentanol									
10	2-Hexanone									
5	Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	Toluene							3 J		
5	Chlorobenzene									
5	Ethylbenzene									
5	Styrene		4 J							
5	Total Xylenes									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: VOLATILES 1

Site Name: Wurliizer

SOIL SAMPLES

(ug/Kg)

Case #: 9001-922 Sampling Date(s): 8-29-90

To calculate sample quantitation limit:
(CROL * Dilution Factor) / ((100 - % moisture)/100)

Sample No.		Dilution Factor		% Moisture		Location		VBKLS3		VBKLS4		VBKLS5		S-7MS		S-7MSD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

CROL = Contract Required Detection Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S

1

WATER SAMPLES

Site Name: Wurlitzer

Case #: 9001.922 Sampling Date(s): 8-7-90; 8-29-90;
9002.589 10-24-90

To calculate sample quantitation limit:
 (CRQL * Dilution Factor)

CRQL	Sample No. Dilution Factor	Location	DW0807 1.0	GW-1 1.0	GW-2 1.0	GW-3 1.0	GW-4 1.0	GW-4S 1.0	GW-5 1.0	GW-6 1.0	GW-6DE 1.0
10	Phenol										
10	bis(2-Chloroethyl)ether										
10	2-Chlorophenol										
10	*1,3-Dichlorobenzene										
10	*1,4-Dichlorobenzene										
10	Benzyl Alcohol										
10	1,2-Dichlorobenzene										
10	2-Methylphenol										
10	bis(2-Chloroisopropyl)ether										
10	4-Methylphenol										
10	N-Hydroxy di n propylamine										
10	Hexachlorocyclopentadiene										
10	Nitrobenzene										
10	Isophorone										
10	2-Nitrophenol										
10	2,4-Dimethylphenol										
50	Benzoic Acid										
10	bis(2-Chloroethoxy)methane										
10	2,4-Dichlorophenol										
10	1,2,4-Trichlorobenzene										
10	Naphthalene										
10	4-Chloroaniline										

More
Acceptable

SEE NARRATIVE FOR CODE DEFINITIONS

*Action Level Exists

CRDL = Contract Required Detection Limit

revised 12/88

WATER SAMPLES
(ug/L)

Site Name: Wurlitzer

Case #: 9001.922 Sampling Date(s): 8-7-90; 8-29-90
9002.589 10-24-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. Dilution Factor Location	DW-001	GW-1	GW-2	GW-3	GW-4	GW-4S	GW-5	GW-6	GW-6RE
10	Hexachlorobutadiene	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
10	4-Chloro-3-methylphenol									
10	2-Methylnaphthalene									
10	Hexachlorocyclopentadiene									
10	2,4,6-Trichlorophenol									
50	2,4,5-Trichlorophenol									
10	2-Chloronaphthalene									
50	2-Nitroaniline									
10	Dimethylphthalate									
10	Acenaphthylene									
10	2,6-Dinitrotoluene									
50	3-Nitroaniline									
10	Acenaphthene									
50	2,4-Dinitrophenol									
50	4-Nitrophenol									
10	Dibenzofuran									
10	2,4-Dinitrotoluene									
10	Diethylphthalate									
10	4-Chlorophenyl phenylether									
10	Fluorene									
50	4-Nitroaniline									
50	4,6-Dinitro-2-methylphenol									

More
Acceptable

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

Site Name: Wurlitzer

WATER SAMPLES

(ug/L)

Case #: 9001.922 Sampling Date(s): 8-7-90; 8-29-90
9002.589 10-24-90

To calculate sample quantitation limit:
 (CRQL * Dilution Factor)

CRDL	Sample No. Dilution Factor	Location	DW-007	GW-1	GW-2	GW-3	GW-4	GW-4S	GW-5	GW-6	GW-6DE
			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Drill water								More Acceptable	
		COMPOUND									
10		N Nitrosodiphenylamine									
10		4 Bromophenyl phenylether									
10		*Hexachlorobenzene									
50		*Pentachlorophenol									
10		Phenanthrene									
10		Anthracene									
10		Di-n-butylphthalate	1	5	5	5					
10		Fluoranthene									
10		Pyrene									
10		Diethylphthalate									
20		1,3-Dichlorobenzene									
10		Benzo(a)anthracene									
10		Chrysene									
10		bis(2 Ethylhexyl)phthalate	14	15	10	20	18	3	4	3	4
10		Di-n-octylphthalate									
10		Benzo(b)fluoranthene									
10		Benzo(k)fluoranthene									
10		Benzo(a)pyrene									
10		Indeno(1,2,3-cd)pyrene									
10		Dibenz(a,h)anthracene									
10		Benzo(g,h,i)perylene									

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S

WATER SAMPLES

Site Name: Wurtsmith

(ug/L)

Case #: 9001.922 Sampling Date(s): 8-7-90; 8-29-90
9003.539 10-24-90

To calculate sample quantitation limit:
 (CRDL * Dilution Factor)

CRDL	Sample No. Dilution Factor	Location	GW-6S#	SW-1	SW-2	SW-2MS	SW-2MSD	SW-2MSD	SW-2MSD
10	Phenol		1.0	1.0	1.0	1.0	1.0	1.0	1.0
10	bis(2-Chloroethyl)ether								
10	2-Chlorophenol								
10	*1,3-Dichlorobenzene								
10	*1,4-Dichlorobenzene								
10	Benzyl Alcohol								
10	1,2-Dichlorobenzene								
10	2-Methylphenol								
10	bis(2-Chloroanpropyl)ether								
10	4-Methylphenol								
10	N-Hydro-2,2,4-trimethyl-5-norbornane								
10	Hexachlorocyclopentadiene								
10	Nitrobenzene								
10	Isophorone								
10	2-Nitrophenol								
10	2,4-Dimethylphenol								
50	Benzoic Acid								
10	bis(2-Chloroethoxy)methane								
10	2,4-Dichlorophenol								
10	1,2,4-Trichlorobenzene								
10	Naphthalene								
10	4-Chloroaniline								

SEE NARRATIVE FOR CODE DEFINITIONS

*Action Level Exists

CRDL = Contract Required Detection Limit

revised 12/88

*Detection limit elevated due to limited volume (155ml).

DATA SUMMARY FORM: B N A S

Site Name: Wurlitzer

WATER SAMPLES
(ug/L)

Case #: 1001.922 Sampling Date(s): 8-7-90, 8-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. Dilution Factor Location	GW-6S 1.0	SW-1 1.0	SW-2 1.0	SBLKW1 1.0	SBLKW11 1.0	SW-2MS 1.0	SW-2MSD 1.0	SW-1 1.0
10	Hexachlorobutadiene								
10	4-Chloro-3-methylphenol								
10	2-Methylnaphthalene								
10	Hexachlorocyclopentadiene								
10	2,4,6-Trichlorophenol								
50	2,4,5-Trichlorophenol								
10	2-Chloronaphthalene								
50	2-Nitroaniline								
10	Dimethylphthalate								
10	Acenaphthylene								
10	2,6-Dinitrotoluene								
50	3-Nitroaniline								
10	Acenaphthene								
50	2,4-Dinitrophenol								
50	4-Nitrophenol								
10	Dibenzofuran								
10	2,4-Dinitrotoluene								
10	Diethylphthalate								
10	4-Chlorophenylphenylether								
10	Fluorene								
50	4-Nitroaniline								
50	4,6-Dinitro-2-methylphenol								

SEE NARRATIVE FOR CODE DEFINITIONS

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Site Name: Wurlitzer

WATER SAMPLES
(ug/L)

Case #: 9001.922 Sampling Date(s): 8-7-90; 8-29-90

To calculate sample quantitation limit:
(CRDL * Dilution Factor)

CRDL	Sample No. Dilution Factor Location	GW-6S	SW-1	SW-2	SBLKW1	SBLKW11	SW-2MS	SW-2MSD	SBLKW1
	COMPOUND								
10	N Nitrosodiphenylamine	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
10	4-Bromophenyl phenylether								
10	*Hexachlorobenzene								
50	*Pentachlorophenol				QW0807	QW-45 SW-2MS QW-60 SW-2MSD SW-64E SW-65 SW-1			QW-1 QW-2 QW-3 QW-4
10	Phenanthrene								
10	Anthracene								
10	Di-n-butylphthalate								
10	Fluoranthene				3 J				
10	Pyrene								
10	Butylbenzylphthalate								
20	3,3'-Dichlorobenzidine								
10	Benzofluoranthene								
10	Chrysene								
10	bis(2-Ethylhexyl)phthalate	26 B	5 D	5 B	14	3 J	4 B	3 B	17
10	Di-n-octylphthalate								
10	Benzofluoranthene								
10	Benzofluoranthene								
10	Benzo(a)pyrene								
10	Indeno(1,2,3-cd)pyrene								
10	Dibenz(a,h)anthracene								
10	Benzofluoranthene								

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 1

Site Name: Wurlitzer

SOIL SAMPLES

Case #: 001-922 Sampling Date(s): 8-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

CRQL	COMPOUND	Sample No.										Dilution Factor		% Moisture		Location	
		S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-E-1							
330	Phenol	1.0	1.0	1.0	1.0	1.0	1.0	2.0	5.0	1.0							
330	bis(2-Chloroethyl)ether	23	20	20	19	24	49	28	37	40							
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																
1000	Benzoic Acid																
330	bis(2-Chloroethoxy)methane																
330	2,4 Dichlorophenol																
330	1,2,4 Trichlorobenzene																
330	Naphthalene		120	5	64	5	69	5	130	5							
330	4-Chloroaniline																

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: B N A S 3

Site Name: Wurliizer SOIL SAMPLES
(ug/Kg)

Case #: 9001.922 Sampling Date(s): 8-29-90

To calculate sample quantitation limit:
(CROL * Dilution Factor) / ((100 - % moisture)/100)

CROL	Sample No. Dilution Factor	% Moisture	Location	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	SED-1
330	1.0	2.3		1.0	1.0	1.0	1.0	1.0	1.0	2.0	5.0	1.0
330	2.3			2.3	2.0	2.0	1.9	2.4	4.9	2.8	3.7	4.0
330												
1600												
330	300			300	1630	280	280	110	220	4900	1900	770
330	54			54	120	46				1600	390	1600
330	5400			5400	1600	690	850	190	140	76	800	470
330	446			446	800	450	370	210	420	4200	2400	1200
330	380			380	890	500	390	190	370	3300	2100	1000
330												
1600												
330	210			210	420	240	170	93	180	1800	1100	560
330	220			220	450	280	230	130	230	1800	1300	520
330	510			510	260	280	300	140	440	120	690	670
330												
330	270			270	570	360	290			2100	1300	1200
330												
330	150			150	320	200	160	79	170	1400	810	600
330	110			110	210	150	120	57	120	830	490	470
330					53					220	170	130
330	100			100	170	140	100	55	120	750	500	440

CROL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S

SOIL SAMPLES

Site Name: W4rlitzer

(ug/Kg)

Case #: 9001.922 Sampling Date(s): 8-29-90To calculate sample quantitation limit:
(CRQL = Dilution Factor) / ((100 - % moisture)/100)

CRQL	Sample No. Dilution Factor % Moisture Location	SED-2	SED-3	SED-4	SED-4 RE	SBLKSI	S-7MS	S-7MSD
330	Phenol	2.0	2.0	1.0	5.0	1.0	2.0	2.0
330	bis(2-Chloroethyl)ether	42	32	39	39	—	28	28
330	2-Chlorophenol					51 57 SIMS		
330	1,3-Dichlorobenzene					52 58 SIMS		
330	1,4-Dichlorobenzene					53 SED1		
330	Benzyl Alcohol					54 SED2		
330	1,2-Dichlorobenzene					55 SED3		
330	2-Methylphenol					56 SED4 RE		
330	bis(2-Chloroisopropyl)ether					57 58 SIMS		
330	4-Methylphenol					59 60 SIMS		
330	N-Nitroso di n propylamine							
330	Hexachloroethane							
330	Nitrobenzene							
330	Isophorone							
330	2-Nitrophenol							
330	2,4-Dimethylphenol							
1000	Benzoic Acid		400 J					
330	bis(2-Chloroethoxy)methane							
330	2,4-Dichlorophenol							
330	1,2,4-Trichlorobenzene			90 J			800 J	710 J
330	Naphthalene							
330	4-Chloroaniline							

SEE NARRATIVE FOR CODE DEFINITIONS

CRQL = Contract Required Quantitation Limit

revised 12/88

Site Name: Wuritzer

Case #: 9001.922 Sampling Date(s): 8-29-90

To calculate sample quantitation limit:

$$(CROL \cdot \text{Dilution Factor}) / ((100 - \% \text{ moisture})/100)$$

Sample No.								
Dilution Factor		SED-2	SED-3	SED-4	SED-4 RE	SBLK-SI	S-7MS	S-7MSD
% Moisture		2.0	2.0	1.0	5.0	1.0	2.0	2.0
Location		42	32	39	39	-	28	28
				Note Acceptable		SI SS SED4 S2 S7MS S3 S7MSD S4 SED1 S5 SED2 S6 SED3 S7 SED4E		
CROL	COMPOUND							
310	Hexachlorobutadiene							
310	4-Chloro-3-methylphenol							
330	2-Methylnaphthalene			140 J			840 J	870 J
310	Hexachlorocyclopentadiene							
330	2,4,6-Trichlorophenol							
1600	2,4,5-Trichlorophenol							
330	2-Chloronaphthalene							
1600	2-Nitroaniline							
330	Dimethylphthalate							
330	Acenaphthylene	64 J					180 J	150 J
330	2,6-Dinitrotoluene							
1600	3-Nitroaniline							
330	Acenaphthene							
1600	2,4-Dinitrophenol							
1600	4-Nitrophenol							
330	Dibenzofuran						1500	1600
330	2,4-Dinitrotoluene							
330	Diethylphthalate							
330	4-Chlorophenyl phenylether							
330	Fluorene	73 J					2000	2300
1600	4-Nitroaniline							
1600	4,6-Dinitro-2-methylphenol							

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: B N A S 3

Site Name: Wurlitzer

SOIL SAMPLES

(ug/Kg)

Case #: 9001922 Sampling Date(s): 8-29-90To calculate sample quantitation limit:
(CROL * Dilution Factor) / ((100 - % moisture)/100)

CROL	Sample No. Dilution Factor % Moisture Location	SED-2	SED-3	SED-4	SED-4RE	SBLES1	S-7HS	S-7MSD
330	N-Nitrosodiphenylamine	2.0	2.0	1.0	5.0	1.0	2.0	2.0
330	4-Bromophenyl phenylether	42	32	39	39	—	28	28
330	Hexachlorobenzene					51 58 SEDN 52 57MS 53 57MSD 54 5601 55 5602 56 5603 57 5604E		
1600	Pentachlorophenol			More Acceptable				
330	Phenanthrene	710 J	100 J	480 J	480 J		6600	7900
330	Anthracene	140 J		89 J			2400	2900
330	Di-n-butylphthalate	350 B	320 B	510 B	550 B	61 J	100 B	
330	Fluoranthene	1900	210 J	620	610 J		5600	7000
330	Pyrene	1500	270 J	600	670 J			
330	Butylbenzylphthalate	60 B						
1600	3,3-Dichlorobenzidine							
330	Benzol(a)anthracene	780 J	140 J	320 J	310 J		2300	2900
310	Chrysene	920 J	180 J	410 J			2500	2800
330	bis(2-Ethylhexyl)phthalate	1200 B	410 B	1000 B	1000 B	49 J	150 B	150 B
330	Di-n-octylphthalate							
330	Benzol(b)fluoranthene	1100 J	210 J	810 J	720 J		2800	3300
330	Benzol(k)fluoranthene							
330	Benzol(a)pyrene	640 J	130 J	480 J	410 J		1900	2200
330	Indeno(1,2,3-cd)pyrene	520 J	76 J	280 J			1100	1500
330	Dibenz(a,h)anthracene	130 J		85 J			320 J	430 J
310	Benzol(a,h)perylene	490 J	82 J	310 J	270 J		1000	1300

CROL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

DATA SUMMARY FORM: I N O R G A N I C S

WATER SAMPLES

Site Name: Wurliizer

(ug/L)

Case #: 1001-922 Sampling Date(s): 8-7-90, 8-29-90

*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

CRDL	Sample No. Dilution Factor Location	GW-1	GW-2	GW-3	GW-4	GW-4S	GW-5	GW-6	SW-1	SW-2
200	Aluminum	77,600	39,800	68,300	7,330	4040	7280	30500	526	681
60	Antimony									
10	*Arsenic	17.2	18.9	12.9	[9.8]		[3.2]	20.8	[1.5]	[3.4]
200	Barium	919	857	480	[116]	[540]	[125]	273	[34.9]	[34.3]
5	Beryllium	[1.6]		[1.6]						
5	*Cadmium	15.7	6.8	5.3						
5000	Calcium	69,000	110,000	304,000	94,900	16,000	84,800	23,000	37,900	48,800
10	*Chromium	137	59.2	117	14.6	12.7	11.8	61.4	16.5	
50	Cobalt	76.4	[39.3]	56.5				[24.9]		
25	Copper	22.7	12.5	13.6		[16.8]		48.4		[23.4]
100	Iron	163,000	88,700	126,000	13,100	84,600	12,500	55,800	1130	1480
5	*Lead	123	125	87.5	22.3	9.6	19.2	43.0	9.8	21.0
5000	Magnesium	270,000	342,000	92,000	30,400	57,700	39,400	65,000	8620	12,000
15	Manganese	52.4	6600	2750	55.8	514	480	1810	521	68.2
0.2	Mercury			0.26						
40	*Nickel	170	79.7	123	[13.3]	[12.1]		56.1	[17.6]	
5000	Potassium	50600	124,000	62,000	96,100	[2820]	22,900	114,000	[2320]	[2600]
5	Selenium								[7.2]	
10	Silver									
5000	Sodium	56700	92,700	79,500	105,000	78,800	59,400	37,000	53200	65500
10	Thallium						[2.3]			[40]
50	Vanadium	224	89.5	136	[18.9]		[18.4]	99.6		
20	Zinc	640	832	414	84.1	62.3	73.6	245	51.5	164
10	*Cyanide	[11.3]								

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: I N O R G A N I C S

SOIL SAMPLES
(mg/Kg)Site Name: WurditzerCase #: 9001.922 Sampling Date(s): 8-29-90

*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

Sample No.	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	SED-1	SED-2
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
% Solids	76.9	80.5	74.2	81.3	76.5	51.0	72.5	62.6	59.9	57.7
Location										
ANALYTE	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	SED-1	SED-2
Aluminum	8550	36000	41600	31000	10300	4140	161600	9270	3890	8530
Antimony	UL	17.4	UL	16.5	UL	UL	UL	UL	UL	UL
Arsenic	3.9	[1.8]	[1.8]	[1.2]	2.6	[2.2]	5.4	16.9	[1.7]	[3.1]
Barium	77.2	342	909	2916	115	479	223	6900	742	952
Beryllium		5.6	5.3	4.0				[6.37]		
Cadmium	2.4	2.3	8.8	2.16	2.0	47.7		74.8	45.2	13.9
Calcium	9330	167000	176000	131000	32200	29300	11800	21100	20000	21200
Chromium	23.9	7.5	10.7	9.6	65.4	217	6.6	608	102	49.4
Cobalt	[4.3]			[3.5]	[9.8]	[5.8]	[5.2]	[15.7]	[4.4]	[6.2]
Copper	39.2	35.1	84.3	19.7	58.6	348	11.6	1360	76.9	77.5
Iron	13800	6690	9660	5720	20400	40500	8730	103000	8510	18100
*Lead	59.4	61.2	60.6	39.4	44.3	4164	14.3	1280	36.1	72.8
Magnesium	2960	16300	29100	17800	9920	5300	1460	6270	7450	8410
Manganese	214	2500	3600	2070	373	455	92.1	771	1216	248
Mercury								0.61		0.17
Nickel	12.3	[8.0]	13.3	10.0	23.9	99.9	[6.4]	216	31.0	37.0
Potassium	[597]	2080	2600	1860	1820	[598]	[882]	[698]	[290]	[660]
Selenium	[5.52]	[1.1]	[0.62]	[10.34]	UL	9.3	[10.74]	[0.77]	UL	[0.59]
Silver								6.8		
Sodium	[446]	[1220]	1350	[1090]	[592]	23100	[7107]	[7.57]	[678]	[427]
Thallium										
Vanadium	17.2	[9.5]	[10.2]	[7.7]	21.6	[10.6]	16.9	76.2	[10.3]	[6.9]
Zinc	137	12.6	352	95.6	170	6163	54.6	3050	230	325
Cyanide	UL	22.7	11.2	3.3	UL	UL	5.5	130	UL	7.2

SEE NARRATIVE FOR CODE DEFINITIONS

*Action Level Exists

CRDL = Contract Required Detection Limit

revised 12/88

DATA SUMMARY FORM: PESTICIDES AND PCBs

Site Name: Murkitzer SOIL SAMPLES (ug/Kg)

Case #: 9001.922 Sampling Date(s): 8-29-90

To calculate sample quantitation limit:
(CROL * Dilution Factor) / ((100 - % moisture)/100)

CROL	COMPOUND	Sample No. Dilution Factor % Moisture Location	SED-2	SED-3	SED-4	PBLK51	PBLK52	S-7MS	S-7MSD	
			2.0 42	1.0 32	1.0 39	1.0 -	1.0 -	1.0 28	1.0 28	
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-1018									
80	Aroclor-1221									
80	Aroclor-1232									
80	Aroclor-1242									
80	Aroclor-1248									
160	Aroclor-1254		940		490					
160	Aroclor-1260									

CROL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS
revised 12/88

DATA SUMMARY FORM: PESTICIDES AND PCBs

WATER SAMPLES

Site Name: WUSTLER

To calculate sample quantitation limit:
(CROL * Dilution Factor)

Case #: 1001.922 Sampling Date(s): 8-29-90; 8-29-90

CROL	COMPOUND	Sample No.		GW-1		GW-2		GW-3		GW-4		GW-4S		GW-5		GW-6	
		Dilution Factor	Location	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	40
0.05	alpha BHC																
0.05	beta BHC																
0.05	delta BHC																
0.05	*Gamma-BHC (Lindane)																
0.05	*Heptachlor																
0.05	Aldrin																
0.05	Heptachlor Epoxide																
0.05	Endosulfan I																
0.10	Dieldrin																
0.10	4,4'-DDE																
0.10	*Endrin																
0.10	Endosulfan II																
0.10	4,4'-DDD																
0.10	Endosulfan Sulfate																
0.10	4,4'-DDT																
0.5	*Methoxychlor																
0.10	Endrin ketone																
0.5	*Alpha-Chlordane																
0.5	*Gamma-Chlordane																
1.0	*Toxaphene																
0.5	*Aroclor-1016																
0.5	*Aroclor-1221																
0.5	*Aroclor-1232																
0.5	*Aroclor-1242																
0.5	*Aroclor-1248																
1.0	*Aroclor-1254																
1.0	*Aroclor-1260																

SEE NARRATIVE FOR CODE DEFINITIONS
revised 12/88

*Action Level Exists

CRDL = Contract Required Detection Limit

DATA SUMMARY FORM: PESTICIDES AND PCB'S

WATER SAMPLES
(ug/L)

Site Name: Worlitzer

Case #: 9001.922 Sampling Date(s): 8-7-90: 8-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. Dilution Factor Location	SW-1 1.0	SW-2 1.0	PBLKW1 1.0 DW0807	PBLKW4 1.0 GW-1 GW-3 GW-2 GW-4 GW-4 GW-6S GW-5 GW-2 GW-1 SW3ms GW-4S SW2ms	SW-2MS 1.0	SW-2MSD 1.0		
	COMPOUND								
0.05	alpha-BHC								
0.05	beta-BHC								
0.05	delta-BHC								
0.05	*Gamma-BHC (Lindane)								
0.05	*Heptachlor								
0.05	Aldrin								
0.05	Heptachlor Epoxide								
0.05	Endosulfan I								
0.10	Dieldrin								
0.10	4'-DDE								
0.10	*Endrin								
0.10	Endosulfan II								
0.10	4'-DDD								
0.10	Endosulfan Sulfate								
0.10	4'-DDT								
0.5	*Methoxychlor								
0.10	Endrin ketone								
0.5	*Alpha-Chlordane								
0.5	*Gamma-Chlordane								
1.0	*Toxaphene								
0.5	*Aroclor-1016								
0.5	*Aroclor-1221								
0.5	*Aroclor-1232								
0.5	*Aroclor-1242								
0.5	*Aroclor-1248								
1.0	*Aroclor-1254								
1.0	*Aroclor-1260								

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS
revised 12/88

DATA SUMMARY FORM: I N O R G A N I C S

SOIL SAMPLES
(mg/Kg)

Site Name: Wurliizer
Case #: 9001.922 Sampling Date(s): 8-29-90

*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

CRDL	ANALYTE	Sample No.		Dilution Factor		Location		SED-3		SED-4									
40	Aluminum			10300				UL		8130									
12	Antimony									23.6		L							
2	Arsenic			6.8						8.2									
40	Barium			1320						354									
1	Beryllium																		
1	Cadmium			29.8						14.6									
1000	Calcium			6140						10500									
2	Chromium			635						59.0									
10	Cobalt			[4.7]						[5.7]									
5	Copper			490						146									
20	Iron			51000						15300									
1	*Lead			3/6				L		115		L							
1000	Magnesium			[806]						[628]									
3	Manganese			152						67.5									
0.2	Mercury			1.2						0.32									
8	Nickel			77.7						32.4									
1000	Potassium			[444]						[334]									
1	Selenium			[0.84]				L		2.4		L							
2	Silver			47.4															
1000	Sodium			[407]						[636]									
2	Thallium																		
10	Vanadium			18.4						20.7									
4	Zinc			838						455									
2	Cyanide			2.3				J'				UJ							

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

61701

Lab Name: RECRA ENVIRON

Contract: COO2412

Lab Code: RECNY

Case No.: SH991

SAS No.: _____

SDG No.: 1009

Matrix: (soil/water) SOIL

Lab Sample ID: 61701

Sample wt/vol: 4.0 (g/mL) G

Lab File ID: D5517

Level: (low/med) MED

Date Received: 10/09/91

% Moisture: not dec. 0

Date Analyzed: 10/11/91

Column: (pack/cap) PACK

Dilution Factor: 1.0

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	1200	U
74-83-9-----	Bromomethane	1200	U
75-01-4-----	Vinyl Chloride	1200	U
75-00-3-----	Chloroethane	1200	U
75-09-2-----	Methylene Chloride	620	U
67-64-1-----	Acetone	2200	
75-15-0-----	Carbon Disulfide	620	U
75-35-4-----	1,1-Dichloroethene	620	U
75-34-3-----	1,1-Dichloroethane	620	U
540-59-0-----	1,2-Dichloroethene (total)	620	U
67-66-3-----	Chloroform	620	U
107-06-2-----	1,2-Dichloroethane	620	U
78-93-3-----	2-Butanone	1200	U
71-55-6-----	1,1,1-Trichloroethane	620	U
56-23-5-----	Carbon Tetrachloride	620	U
108-05-4-----	Vinyl Acetate	1200	U
75-27-4-----	Bromodichloromethane	620	U
78-87-5-----	1,2-Dichloropropane	620	U
10061-01-5-----	cis-1,3-dichloropropene	620	U
79-01-6-----	Trichloroethene	620	U
124-48-1-----	Dibromochloromethane	620	U
79-00-5-----	1,1,2-Trichloroethane	620	U
71-43-2-----	Benzene	620	U
10061-02-6-----	trans-1,3-dichloropropene	620	U
75-25-2-----	Bromoform	620	U
108-10-1-----	4-Methyl-2-Pentanone	1200	U
591-78-6-----	2-Hexanone	1200	U
127-18-4-----	Tetrachloroethene	620	U
79-34-5-----	1,1,2,2-Tetrachloroethane	620	U
108-88-3-----	Toluene	1100	
108-90-7-----	Chlorobenzene	390	J
100-41-4-----	Ethylbenzene	1300	
100-42-5-----	Styrene	620	U
1330-20-7-----	Total Xylenes	9800	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

21

EPA Sample No.: 61701

Lab Name: RECRA ENVIRONMENTAL, INC.

Contract: C002412

Lab Code: RECONY Case No: SH991 SAS No.:

SDG No.: 1009

Matrix (Soil/Water): SOIL

Lab Sample ID.: 61701

Sample wt/vol: 4.0 (g/ml): G

Lab File ID.: D5517

Level (low/med): MED

Date Received: 10/09/91

% Moisture not Dec: 0

Date Analyzed: 10/11/91

Column (pack/cap): PACK

Dilution Factor: 1.0

Number TICs Found: 10

Concentration Units:

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1	UNKNOWN	3.82	1400	J
2	ALKYL SATURATED HYDROCARBON	31.22	7600	J
3	CYCLOHEXANE DERIVATIVE	24.23	14000	J
4	UNKNOWN	24.57	11000	J
5	CYCLOHEXANE DERIVATIVE	25.53	8400	J
6	ALKYL CYCLOALKANE	27.48	7700	J
7	UNKNOWN	30.03	24000	J
8	UNKNOWN	30.68	13000	J
9	DICHLOROBENZENE ISOMER	33.27	990000	J
10	UNKNOWN	35.15	42000	J
11				
12				
13				
14				
15				
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17				
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FORM I VOA-TIC

E-35

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

61702

Lab Name: RECRA ENVIRON Contract: COO2412

Lab Code: RECNY Case No.: SH991 SAS No.: _____ SDG No.: 1009

Matrix: (soil/water) SOIL Lab Sample ID: 61702

Sample wt/vol: 5.2 (g/mL) G Lab File ID: H6681

Level: (low/med) LOW Date Received: 10/09/91

% Moisture: not dec. 49 Date Analyzed: 10/11/91

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg) <u>UG/KG</u>	<u>Q</u>
74-87-3-----	Chloromethane	19	U
74-83-9-----	Bromomethane	19	U
75-01-4-----	Vinyl Chloride	19	U
75-00-3-----	Chloroethane	19	U
75-09-2-----	Methylene Chloride	9	U
67-64-1-----	Acetone	33	B
75-15-0-----	Carbon Disulfide	9	U
75-35-4-----	1,1-Dichloroethene	9	U
75-34-3-----	1,1-Dichloroethane	9	U
540-59-0-----	1,2-Dichloroethene (total)	9	U
67-66-3-----	Chloroform	9	U
107-06-2-----	1,2-Dichloroethane	9	U
78-93-3-----	2-Butanone	19	U
71-55-6-----	1,1,1-Trichloroethane	9	U
56-23-5-----	Carbon Tetrachloride	9	U
108-05-4-----	Vinyl Acetate	19	U
75-27-4-----	Bromodichloromethane	9	U
78-87-5-----	1,2-Dichloropropane	9	U
10061-01-5-----	cis-1,3-dichloropropene	9	U
79-01-6-----	Trichloroethene	9	U
124-48-1-----	Dibromochloromethane	9	U
79-00-5-----	1,1,2-Trichloroethane	9	U
71-43-2-----	Benzene	9	U
10061-02-6-----	trans-1,3-dichloropropene	9	U
75-25-2-----	Bromoform	9	U
108-10-1-----	4-Methyl-2-Pentanone	19	U
591-78-6-----	2-Hexanone	19	U
127-18-4-----	Tetrachloroethene	9	U
79-34-5-----	1,1,2,2-Tetrachloroethane	9	U
108-88-3-----	Toluene	9	U
108-90-7-----	Chlorobenzene	9	U
100-41-4-----	Ethylbenzene	9	U
100-42-5-----	Styrene	9	U
1330-20-7-----	Total Xylenes	9	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA Sample No.: 61702

Lab Name: RECRA ENVIRONMENTAL, INC.

Contract: C002412

Lab Code: RECNY

Case No: SH991

SAS No.:

SDG No.: 1009

Matrix (Soil/Water): SOIL

Lab Sample ID.: 61702

Sample wt/vol: 5.2 (g/ml): G

Lab File ID.: H6681

Level (low/med): LOW

Date Received: 10/09/91

: % Moisture not Dec: 49

Date Analyzed: 10/11/91

Column (pack/cap): PACK

Dilution Factor: 1.0

Number TICs Found: 0

Concentration Units:

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
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FORM I VOA-TIC

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. **34**

61701

Lab Name: RECRA ENVIRON Contract: COO2412

Lab Code: RECNY Case No.: SH991 SAS No.: _____ SDG No.: 1009

Matrix: (soil/water) SOIL Lab Sample ID: 61701

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 9322Y

Level: (low/med) LOW Date Received: 10/09/91

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/14/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/28/91

GPC Cleanup: (Y/N) N pH: 10.0 Dilution Factor: 50

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
108-95-2-----	Phenol	250000	U
111-44-4-----	bis(2-Chloroethyl) Ether	250000	U
95-57-8-----	2-Chlorophenol	250000	U
541-73-1-----	1,3-Dichlorobenzene	250000	U
106-46-7-----	1,4-Dichlorobenzene	68000	J
100-51-6-----	Benzyl Alcohol	250000	U
95-50-1-----	1,2-Dichlorobenzene	370000	
95-48-7-----	2-Methylphenol	250000	U
108-60-1-----	bis(2-Chloroisopropyl) Ether	250000	U
106-44-5-----	4-Methylphenol	250000	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	250000	U
67-72-1-----	Hexachloroethane	250000	U
98-95-3-----	Nitrobenzene	250000	U
78-59-1-----	Isophorone	250000	U
88-75-5-----	2-Nitrophenol	250000	U
105-67-9-----	2,4-Dimethylphenol	250000	U
65-85-0-----	Benzoic Acid	1200000	U
111-91-1-----	bis(2-Chloroethoxy) Methane	250000	U
120-83-2-----	2,4-Dichlorophenol	250000	U
120-82-1-----	1,2,4-Trichlorobenzene	31000	J
91-20-3-----	Naphthalene	160000	J
106-47-8-----	4-Chloroaniline	250000	U
87-68-3-----	Hexachlorobutadiene	250000	U
59-50-7-----	4-Chloro-3-Methylphenol	250000	U
91-57-6-----	2-Methylnaphthalene	840000	
77-47-4-----	Hexachlorocyclopentadiene	250000	U
88-06-2-----	2,4,6-Trichlorophenol	250000	U
95-95-4-----	2,4,5-Trichlorophenol	1200000	U
91-58-7-----	2-Chloronaphthalene	250000	U
88-74-4-----	2-Nitroaniline	1200000	U
131-11-3-----	Dimethyl Phthalate	250000	U
208-96-8-----	Acenaphthylene	250000	U
606-20-2-----	2,6-Dinitrotoluene	250000	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

61701

Lab Name: RECRA ENVIRON Contract: COO2412

Lab Code: RECNY Case No.: SH991 SAS No.: _____ SDG No.: 1009

Matrix: (soil/water) SOIL Lab Sample ID: 61701

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 9322Y

Level: (low/med) LOW Date Received: 10/09/91

% Moisture: not dec. _____ dec. _____ Date Extracted: 10/14/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/28/91

GPC Cleanup: (Y/N) N pH: 10.0 Dilution Factor: 50

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
99-09-2-----	3-Nitroaniline	1200000	U
83-32-9-----	Acenaphthene	250000	U
51-28-5-----	2,4-Dinitrophenol	1200000	U
100-02-7-----	4-Nitrophenol	1200000	U
132-64-9-----	Dibenzofuran	27000	J
121-14-2-----	2,4-Dinitrotoluene	250000	U
84-66-2-----	Diethylphthalate	250000	U
7005-72-3-----	4-Chlorophenyl-phenylether	250000	U
86-73-7-----	Fluorene	120000	J
100-01-6-----	4-Nitroaniline	1200000	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	1200000	U
86-30-6-----	N-Nitrosodiphenylamine (1)	250000	U
101-55-3-----	4-Bromophenyl-phenylether	250000	U
118-74-1-----	Hexachlorobenzene	250000	U
87-86-5-----	Pentachlorophenol	1200000	U
85-01-8-----	Phenanthrene	860000	
120-12-7-----	Anthracene	88000	J
84-74-2-----	Di-n-Butylphthalate	250000	U
206-44-0-----	Fluoranthene	42000	J
129-00-0-----	Pyrene	390000	
85-68-7-----	Butylbenzylphthalate	250000	U
91-94-1-----	3,3'-Dichlorobenzidine	500000	U
56-55-3-----	Benzo(a)Anthracene	140000	J
218-01-9-----	Chrysene	280000	
117-81-7-----	Bis(2-Ethylhexyl)Phthalate	250000	U
117-84-0-----	Di-n-Octyl Phthalate	250000	U
205-99-2-----	Benzo(b)Fluoranthene	34000	J
207-08-9-----	Benzo(k)Fluoranthene	250000	U
50-32-8-----	Benzo(a)Pyrene	81000	J
193-39-5-----	Indeno(1,2,3-cd)Pyrene	250000	U
53-70-3-----	Dibenz(a,h)Anthracene	250000	U
191-24-2-----	Benzo(g,h,i)Perylene	250000	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA Sample No.: 61701

Lab Name: RECRA ENVIRONMENTAL, INC.

Contract: C002412

Lab Code: RECNY Case No: SH991 SAS No.:

SDG No.: 1009

Matrix (Soil/Water): SOIL

Lab Sample ID.: 61701

Sample wt/vol: 2.0 (g/ml): G

Lab File ID.: 9322Y

Level (low/med): LOW

Date Received: 10/09/91

% Moisture not Dec: Dec:

Date Extracted: 10/14/91

Extraction: (SepF/Cont/Sonc/Sox): SONC

Date Analyzed: 10/28/91

GPC Cleanup: (Y/N): N pH: 10.0

Dilution Factor: 50.0

Number TICs Found: 20

Concentration Units:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	UNKNOWN HYDROCARBON	17.45	1300000	J
2	SATURATED HYDROCARBON	19.12	1500000	J
3	LONG CHAIN HYDROCARBON	20.70	1700000	J
4	ALKYL SATURATED HYDROCARBON	22.22	3000000	J
5	ALKYL SATURATED HYDROCARBON	25.02	3200000	J
6	PAH DERIVATIVE	25.17	1100000	J
7	PAH DERIVATIVE	25.25	1000000	J
8	UNKNOWN HYDROCARBON	26.32	3100000	J
9	PAH DERIVATIVE	26.95	1300000	J
10	UNKNOWN	27.17	1000000	J
11	LONG CHAIN HYDROCARBON	27.55	3600000	J
12	LONG CHAIN HYDORCARBON	28.73	2000000	J
13	ALKYL SATURATED HYDROCARBON	29.87	2000000	J
14	LONG CHAIN HYDROCARBON	30.95	1800000	J
15	LONG CHAIN HYDROCARBON	31.98	1500000	J
16	LONG CHAIN HYDROCARBON	32.98	1200000	J
17	LONG CHAIN HYDROCARBON	33.95	1900000	J
18	LONG CHAIN HYDROCARBON	34.90	1600000	J
19	LONG CHAIN HYDORCARBON	35.80	1200000	J
20	UNKNOWN HYDROCARBON	36.77	970000	J
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

FORM I SV-TIC

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

27
EPA SAMPLE NO.

61702

Lab Name: RECRA ENVIRON Contract: COO2412

Lab Code: RECNY Case No.: SH991 SAS No.: _____ SDG No.: 1009

Matrix: (soil/water) SOIL Lab Sample ID: 61702

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 9304Y

Level: (low/med) LOW Date Received: 10/09/91

% Moisture: not dec. 30 dec. _____ Date Extracted: 10/14/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
108-95-2	Phenol	470	U
111-44-4	bis(2-Chloroethyl) Ether	470	U
95-57-8	2-Chlorophenol	470	U
541-73-1	1,3-Dichlorobenzene	470	U
106-46-7	1,4-Dichlorobenzene	470	U
100-51-6	Benzyl Alcohol	470	U
95-50-1	1,2-Dichlorobenzene	470	U
95-48-7	2-Methylphenol	470	U
108-60-1	bis(2-Chloroisopropyl) Ether	470	U
106-44-5	4-Methylphenol	470	U
621-64-7	N-Nitroso-Di-n-Propylamine	470	U
67-72-1	Hexachloroethane	470	U
98-95-3	Nitrobenzene	470	U
78-59-1	Isophorone	470	U
88-75-5	2-Nitrophenol	470	U
105-67-9	2,4-Dimethylphenol	470	U
65-85-0	Benzoic Acid	2300	U
111-91-1	bis(2-Chloroethoxy) Methane	470	U
120-83-2	2,4-Dichlorophenol	470	U
120-82-1	1,2,4-Trichlorobenzene	470	U
91-20-3	Naphthalene	470	U
106-47-8	4-Chloroaniline	470	U
87-68-3	Hexachlorobutadiene	470	U
59-50-7	4-Chloro-3-Methylphenol	470	U
91-57-6	2-Methylnaphthalene	470	U
77-47-4	Hexachlorocyclopentadiene	470	U
88-06-2	2,4,6-Trichlorophenol	470	U
95-95-4	2,4,5-Trichlorophenol	2300	U
91-58-7	2-Chloronaphthalene	470	U
88-74-4	2-Nitroaniline	2300	U
131-11-3	Dimethyl Phthalate	470	U
208-96-8	Acenaphthylene	470	U
606-20-2	2,6-Dinitrotoluene	470	U

FORM I SV-1

1/87 Rev.

E-41

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

61702

Lab Name: RECRA ENVIRON Contract: COO2412

Lab Code: RECNY Case No.: SH991 SAS No.: _____ SDG No.: 1009

Matrix: (soil/water) SOIL Lab Sample ID: 61702

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 9304Y

Level: (low/med) LOW Date Received: 10/09/91

% Moisture: not dec. 30 dec. _____ Date Extracted: 10/14/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO. COMPOUND Q

99-09-2-----3-Nitroaniline	2300	U
83-32-9-----Acenaphthene	470	U
51-28-5-----2,4-Dinitrophenol	2300	U
100-02-7-----4-Nitrophenol	2300	U
132-64-9-----Dibenzofuran	470	U
121-14-2-----2,4-Dinitrotoluene	470	U
84-66-2-----Diethylphthalate	470	U
7005-72-3-----4-Chlorophenyl-phenylether	470	U
86-73-7-----Fluorene	470	U
100-01-6-----4-Nitroaniline	2300	U
534-52-1-----4,6-Dinitro-2-Methylphenol	2300	U
86-30-6-----N-Nitrosodiphenylamine (1)	470	U
101-55-3-----4-Bromophenyl-phenylether	470	U
118-74-1-----Hexachlorobenzene	470	U
87-86-5-----Pentachlorophenol	2300	U
85-01-8-----Phenanthrene	470	U
120-12-7-----Anthracene	470	U
84-74-2-----Di-n-Butylphthalate	470	U
206-44-0-----Fluoranthene	470	U
129-00-0-----Pyrene	470	U
85-68-7-----Butylbenzylphthalate	55	J
91-94-1-----3,3'-Dichlorobenzidine	930	U
56-55-3-----Benzo(a)Anthracene	470	U
218-01-9-----Chrysene	470	U
117-81-7-----Bis(2-Ethylhexyl)Phthalate	470	U
117-84-0-----Di-n-Octyl Phthalate	470	U
205-99-2-----Benzo(b)Fluoranthene	470	U
207-08-9-----Benzo(k)Fluoranthene	470	U
50-32-8-----Benzo(a)Pyrene	470	U
193-39-5-----Indeno(1,2,3-cd)Pyrene	470	U
53-70-3-----Dibenz(a,h)Anthracene	470	U
191-24-2-----Benzo(g,h,i)Perylene	470	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

29

Lab Name: RECRA ENVIRONMENTAL, INC.	EPA Sample No.: 61702
Lab Code: RECNY Case No: SH991 SAS No.:	Contract: C002412
Matrix (Soil/Water): SOIL	SDG No.: 1009
Sample wt/vol: 30.3 (g/ml): G	Lab Sample ID.: 61702
Level (low/med): LOW	Lab File ID.: 9304Y
% Moisture not Dec: 30 Dec:	Date Received: 10/09/91
Extraction: (SepF/Cont/Sonc/Sox): SONC	Date Extracted: 10/14/91
GPC Cleanup: (Y/N): N pH: 7.0	Date Analyzed: 10/25/91
Number TICs Found: 2	Dilution Factor: 1.00
	Concentration Units: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	UNKNOWN	7.57	7	15
2	UNKNOWN ACID	30.83	11	
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
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21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

FORM I SV-TIC

E-43

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

A61701

Lab Name: RECRA ENVIRON Contract: _____

Lab Code: RECNY Case No.: SH991 SAS No.: _____ SDG No.: 1009

Matrix: (soil/water) SOIL Lab Sample ID: SS5056

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

Level: (low/med) LOW Date Received: 10/09/91

% Moisture: not dec. 0 dec. _____ Date Extracted: 10/14/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/24/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 4.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND		
319-84-6	alpha-BHC	480	U
319-85-7	beta-BHC	480	U
319-86-8	delta-BHC	480	U
58-89-9	gamma-BHC (Lindane)	480	U
76-44-8	Heptachlor	480	U
309-00-2	Aldrin	480	U
1024-57-3	Heptachlor epoxide	480	U
959-98-8	Endosulfan I	480	U
60-57-1	Dieldrin	960	U
72-55-9	4,4'-DDE	960	U
72-20-8	Endrin	1100	
33213-65-9	Endosulfan II	960	U
72-54-8	4,4'-DDD	98	J
1031-07-8	Endosulfan sulfate	960	U
50-29-3	4,4'-DDT	960	U
72-43-5	Methoxychlor	860	J
53494-70-5	Endrin ketone	170	J
5103-71-9	alpha-chlordane	4800	U
5103-74-2	gamma-chlordane	4800	U
8001-35-2	Toxaphene	9600	U
12674-11-2	Aroclor-1016	4800	U
11104-28-2	Aroclor-1221	4800	U
11141-16-5	Aroclor-1232	4800	U
53469-21-9	Aroclor-1242	4800	U
12672-29-6	Aroclor-1248	4800	U
11097-69-1	Aroclor-1254	9600	U
11096-82-5	Aroclor-1260	9600	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

A61702

Lab Name: RECRA ENVIRON Contract: _____

Lab Code: RECNY Case No.: SH991 SAS No.: _____ SDG No.: 1009

Matrix: (soil/water) SOIL Lab Sample ID: SS5052

Sample wt/vol: 30.3 (g/mL) G Lab File ID: _____

Level: (low/med) LOW Date Received: 10/09/91

% Moisture: not dec. 42 dec. _____ Date Extracted: 10/14/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/22/91

GPC Cleanup: (Y/N) N pH: 10.0 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
319-84-6	alpha-BHC	14	U
319-85-7	beta-BHC	14	U
319-86-8	delta-BHC	14	U
58-89-9	gamma-BHC (Lindane)	14	U
76-44-8	Heptachlor	14	U
309-00-2	Aldrin	14	U
1024-57-3	Heptachlor epoxide	14	U
959-98-8	Endosulfan I	14	U
60-57-1	Dieldrin	27	U
72-55-9	4,4'-DDE	27	U
72-20-8	Endrin	27	U
33213-65-9	Endosulfan II	27	U
72-54-8	4,4'-DDD	27	U
1031-07-8	Endosulfan sulfate	27	U
50-29-3	4,4'-DDT	27	U
72-43-5	Methoxychlor	270	U
53494-70-5	Endrin ketone	27	U
5103-71-9	alpha-chlordane	140	U
5103-74-2	gamma-chlordane	140	U
8001-35-2	Toxaphene	270	U
12674-11-2	Aroclor-1016	140	U
11104-28-2	Aroclor-1221	140	U
11141-16-5	Aroclor-1232	140	U
53469-21-9	Aroclor-1242	140	U
12672-29-6	Aroclor-1248	140	U
11097-69-1	Aroclor-1254	270	U
11096-82-5	Aroclor-1260	270	U

FORM I PEST

1/87 Rev.

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

02

Lab Name: RECRA_ENVIRONMENTAL_INC. Contract: C002412

Lab Code: RECNY Case No.: SH991 SAS No.: SDG No.: 1009

Matrix (soil/water): SOIL

Lab Sample ID: 11180,0160,
0325

Level (low/med): LOW

Date Received: 10/09/91

% Solids: 70.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.6	B		P
7440-36-0	Antimony	1.4	B		F
7440-38-2	Arsenic	1.4	U	W	F
7440-39-3	Barium	8.7	U		P
7440-41-7	Beryllium	1.5	U		P
7440-43-9	Cadmium	4.3			P
7440-70-2	Calcium	6230		E	P
7440-47-3	Chromium	365			P
7440-48-4	Cobalt	5.8	U	N	P
7440-50-8	Copper	5.9	B		P
7439-89-6	Iron	42500		E	P
7439-92-1	Lead	13.3		S	F
7439-95-4	Magnesium	901	B		P
7439-96-5	Manganese	468		EN	P
7439-97-6	Mercury	0.13	U		CV
7440-02-0	Nickel	153			P
7440-09-7	Potassium	57.7	U		P
7782-49-2	Selenium	1.4	U		F
7440-22-4	Silver	1.7	U	N	P
7440-23-5	Sodium	285000			P
7440-28-0	Thallium	1.4	U		F
7440-62-2	Vanadium	8.7	U		P
7440-66-6	Zinc	2.9	U		P
	Cyanide	1.8	U		C

Color Before: RED

Clarity Before:

Texture: MEDIUM

Color After: YELLOW

Clarity After: CLEAR

Artifacts:

Comments:

FORM I - IN

3/90

E-47

APPENDIX F

EP TOXICITY RESULTS

Results of Analysis of EP Toxicity Extracts Job Number :9002.167

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : YR-2000 WURLITZER PHASE II
SAMPLE ID LAB :EE-90-84694 MATRIX: SOLID
SAMPLE ID CLIENT: S3 UNITS : MG/L

PARAMETER		RESULTS	Q	DETECTION LIMIT	REGULATORY LEVEL
Mercury		ND		0.00080	0.20
Arsenic	(ICP)	ND		0.50	5.0
Barium	(ICP)	ND		5.0	100
Cadmium	(ICP)	ND		0.10	1.0
Chromium	(ICP)	ND		0.50	5.0
Lead	(ICP)	ND		0.50	5.0
Selenium	(ICP)	ND		0.50	1.0
Silver	(ICP)	ND		0.50	5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

Results of Analysis of EP Toxicity Extracts Job Number :9002.167

Ecology and Environment, Inc.
Analytical Services Center

CLIENT : YR-2000 WURLITZER PHASE II
SAMPLE ID LAB :EE-90-84695 MATRIX: SOLID
SAMPLE ID CLIENT: S4 UNITS : MG/L

PARAMETER		RESULTS	Q	DETECTION LIMIT	REGULATORY LEVEL
Mercury		ND		0.00080	0.20
Arsenic	(ICP)	ND		0.50	5.0
Barium	(ICP)	ND		5.0	100
Cadmium	(ICP)	ND		0.10	1.0
Chromium	(ICP)	ND		0.50	5.0
Lead	(ICP)	ND		0.50	5.0
Selenium	(ICP)	ND		0.50	1.0
Silver	(ICP)	ND		0.50	5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

Results of Analysis of EP Toxicity Extracts Job Number :9002.167

Ecology and Environment, Inc. .
Analytical Services Center

CLIENT : YR-2000 WURLITZER PHASE II
SAMPLE ID LAB :EE-90-84697 MATRIX: SOLID
SAMPLE ID CLIENT: S6 UNITS : MG/L

PARAMETER		RESULTS	Q	DETECTION LIMIT	REGULATORY LEVEL
Mercury		ND		0.00080	0.20
Arsenic	(ICP)	ND		0.50	5.0
Barium	(ICP)	ND		5.0	100
Cadmium	(ICP)	ND		0.10	1.0
Chromium	(ICP)	ND		0.50	5.0
Lead	(ICP)	ND		0.50	5.0
Selenium	(ICP)	ND		0.50	1.0
Silver	(ICP)	ND		0.50	5.0

QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

Results of Analysis of EP Toxicity Extracts Job Number :9002.167

Ecology and Environment, Inc.
Analytical Services Center

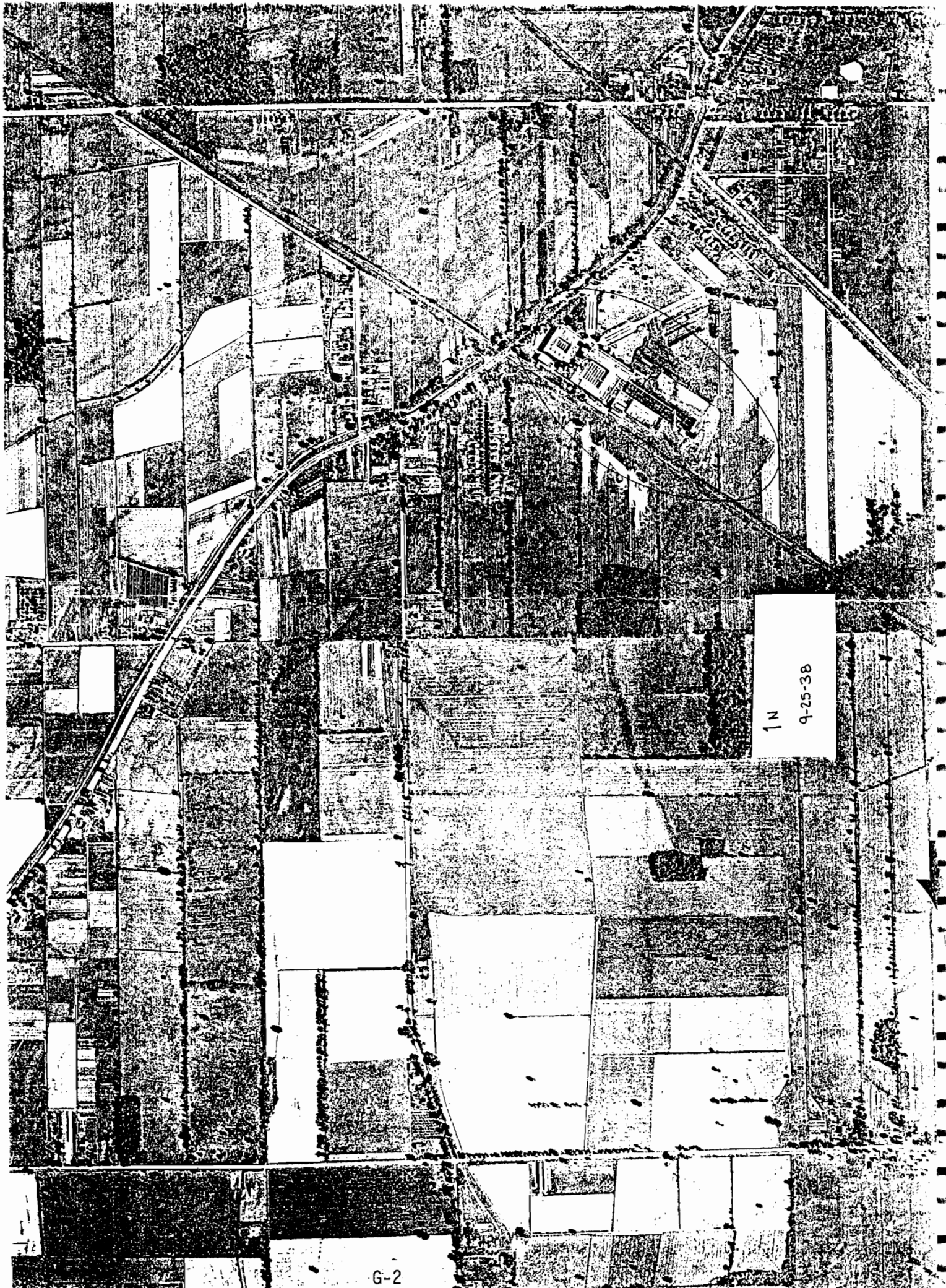
CLIENT : YR-2000 WURLITZER PHASE II
SAMPLE ID LAB :EE-90-84699 MATRIX: SOLID
SAMPLE ID CLIENT: S8 UNITS : MG/L

PARAMETER		RESULTS	Q	DETECTION LIMIT	REGULATORY LEVEL
Mercury		ND		0.00080	0.20
Arsenic	(ICP)	ND		0.50	5.0
Barium	(ICP)	16		5.0	100
Cadmium	(ICP)	0.34		0.10	1.0
Chromium	(ICP)	ND		0.50	5.0
Lead	(ICP)	ND		0.50	5.0
Selenium	(ICP)	ND		0.50	1.0
Silver	(ICP)	ND		0.50	5.0

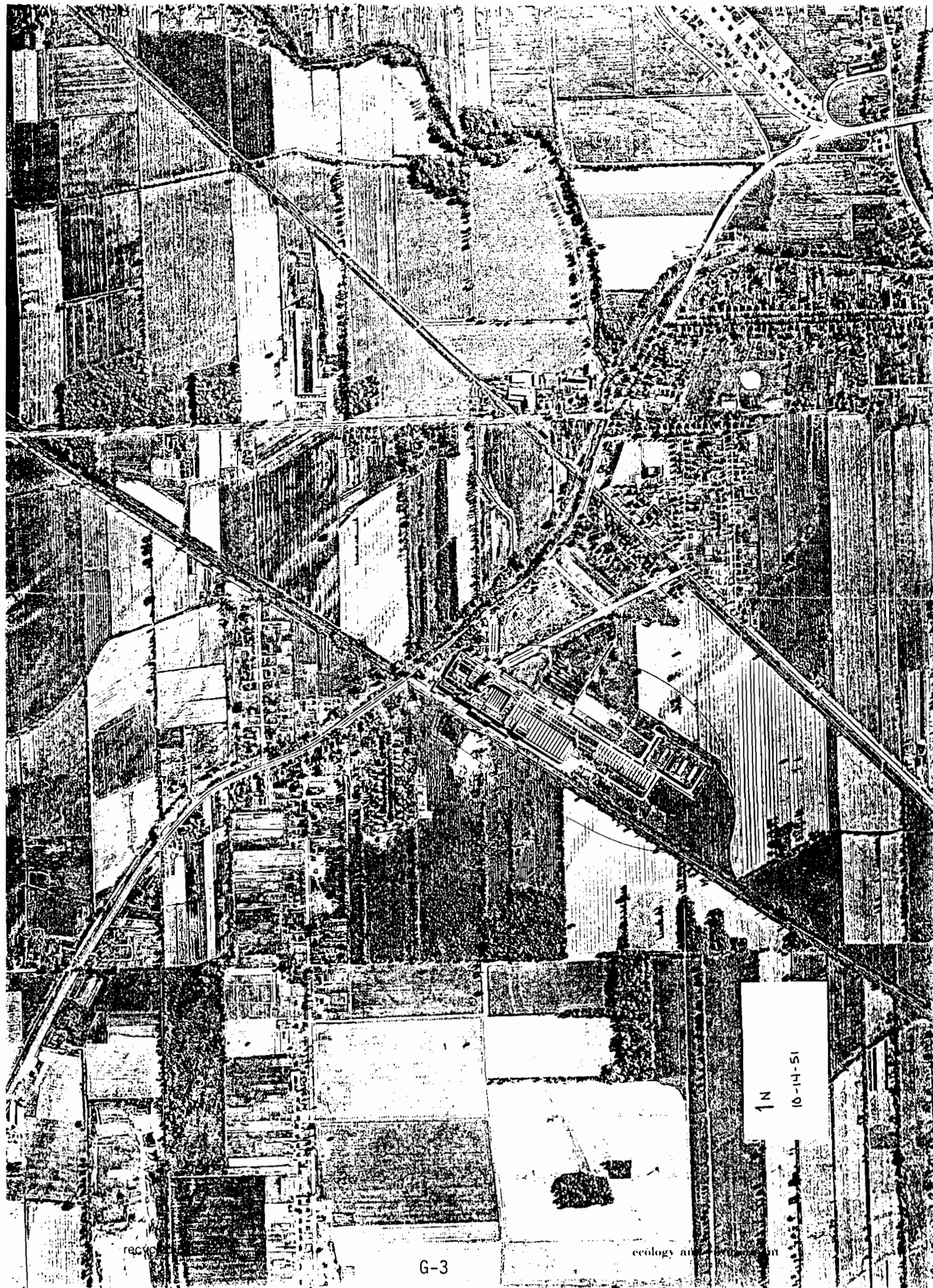
QUALIFIERS: C = COMMENT ND = NOT DETECTED
J = ESTIMATED VALUE B = ALSO PRESENT IN BLANK
L = PRESENT BELOW STATED DETECTION LIMIT

APPENDIX G

AERIAL PHOTOGRAPHS

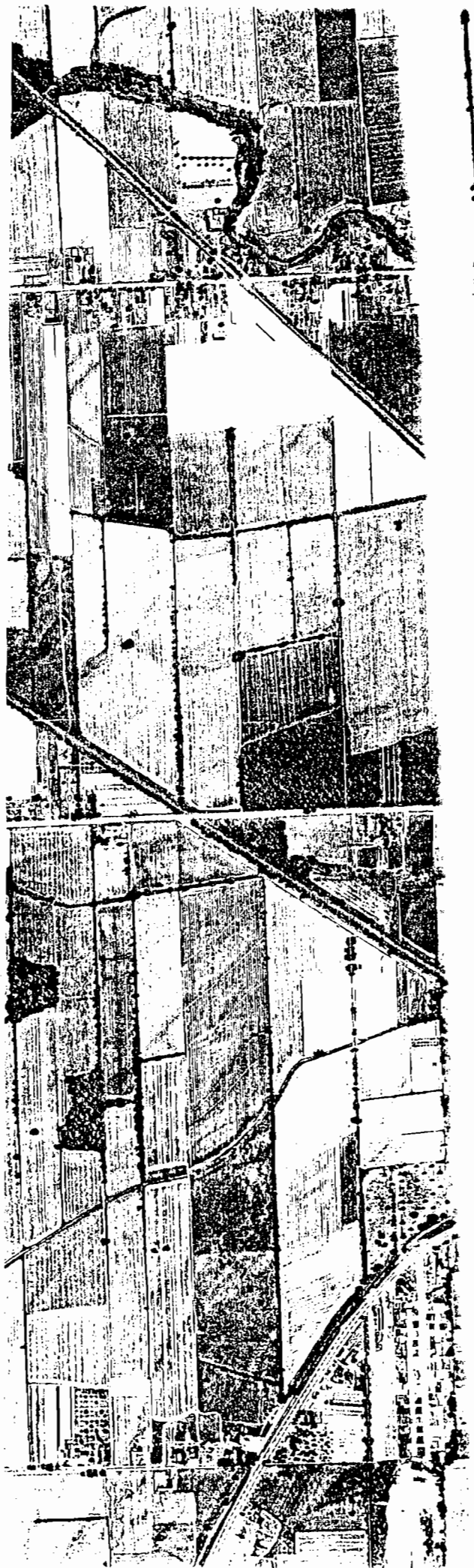


1N
9-25-38



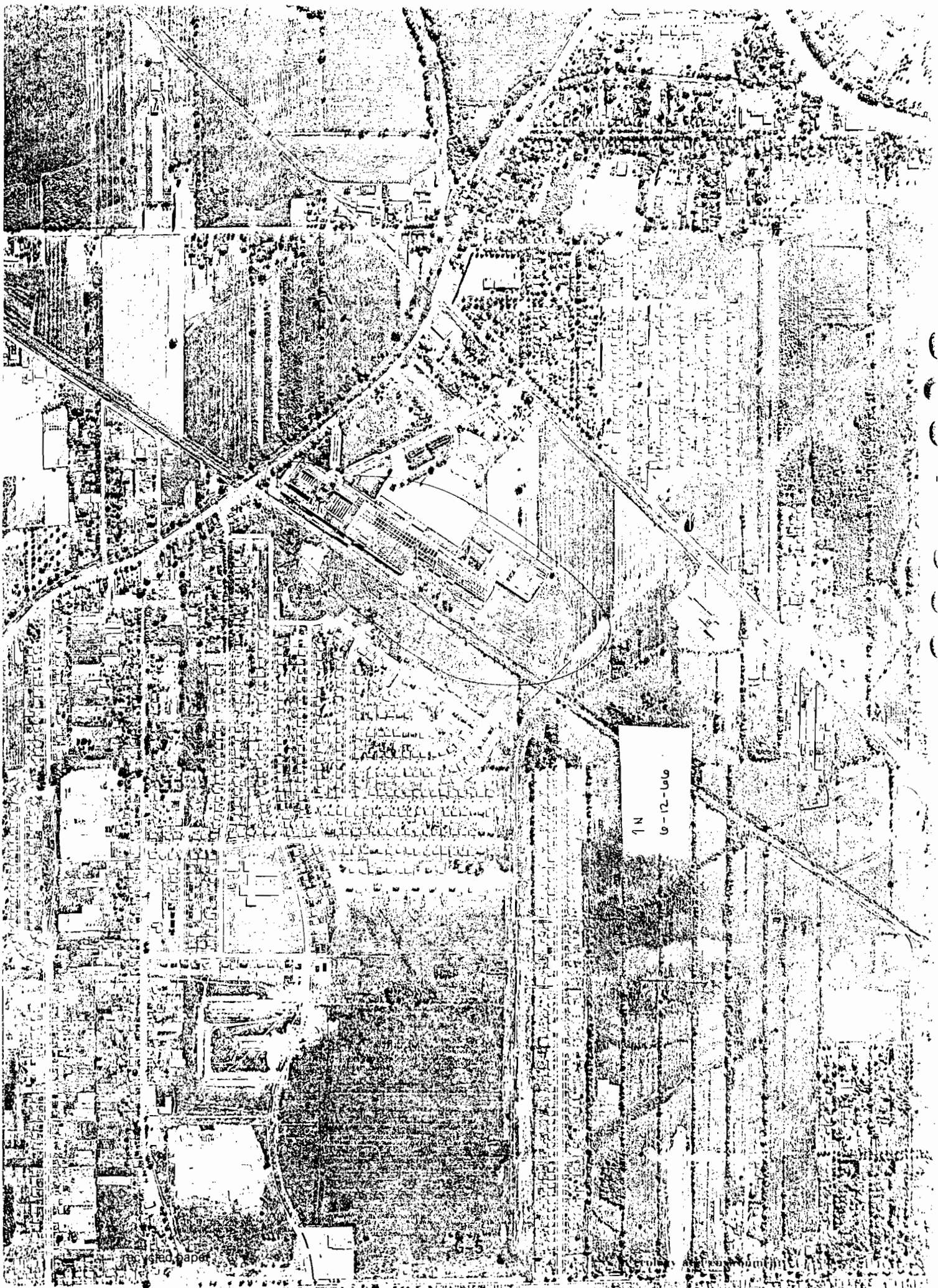
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racys

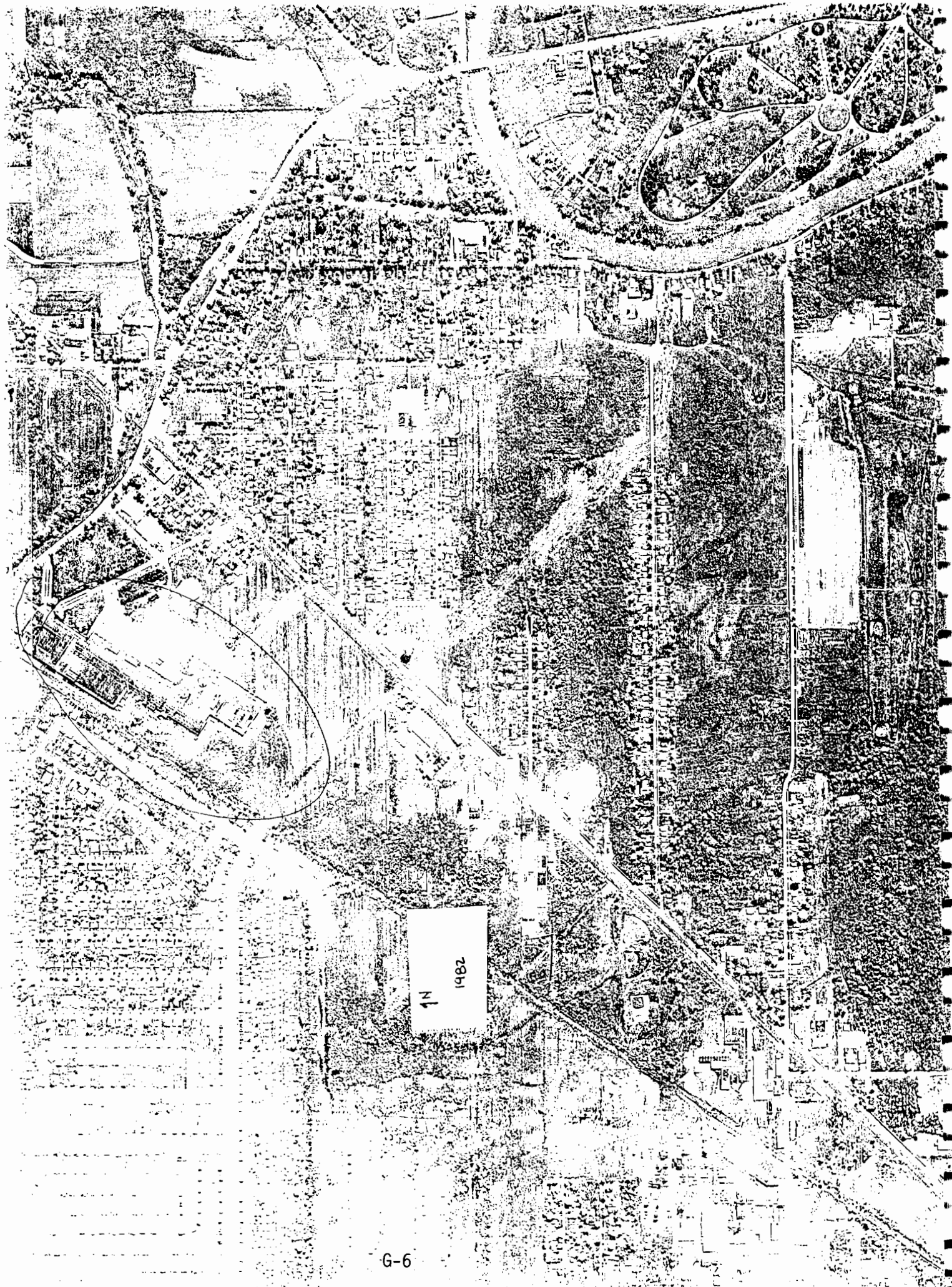


1N 8-9-58

G-4



1 N
6-12-66



APPENDIX H

SITE PHOTOGRAPHIC LOGS

ecology and environment, inc.
P H O T O G R A P H I C R E C O R D

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 10

Comments: Rusted empty drum and pile of C&D debris and soil with seep of a tar-like material in
Area B. Location of soil sample S-7.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 11

Comments: C&D debris in Area B. Front and back of photo show rusted steel. Center right is asphalt shingles. Soil sample S-8 taken in this area.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 12

Comments: Northwestern marshy region in Area B, with rusted empty drum in lower left. View is to
the north.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 13

Comments: Rusted drums along footpath in Area B containing an unknown solid material. Soil sample
S-6 collected at base of open drum.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 14

Comments: Red stain in northwestern marshy region in Area B at center of picture interpreted as
spot-dumping. Sediment sample SED-3 collected from lowest point in this region, near this stain.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

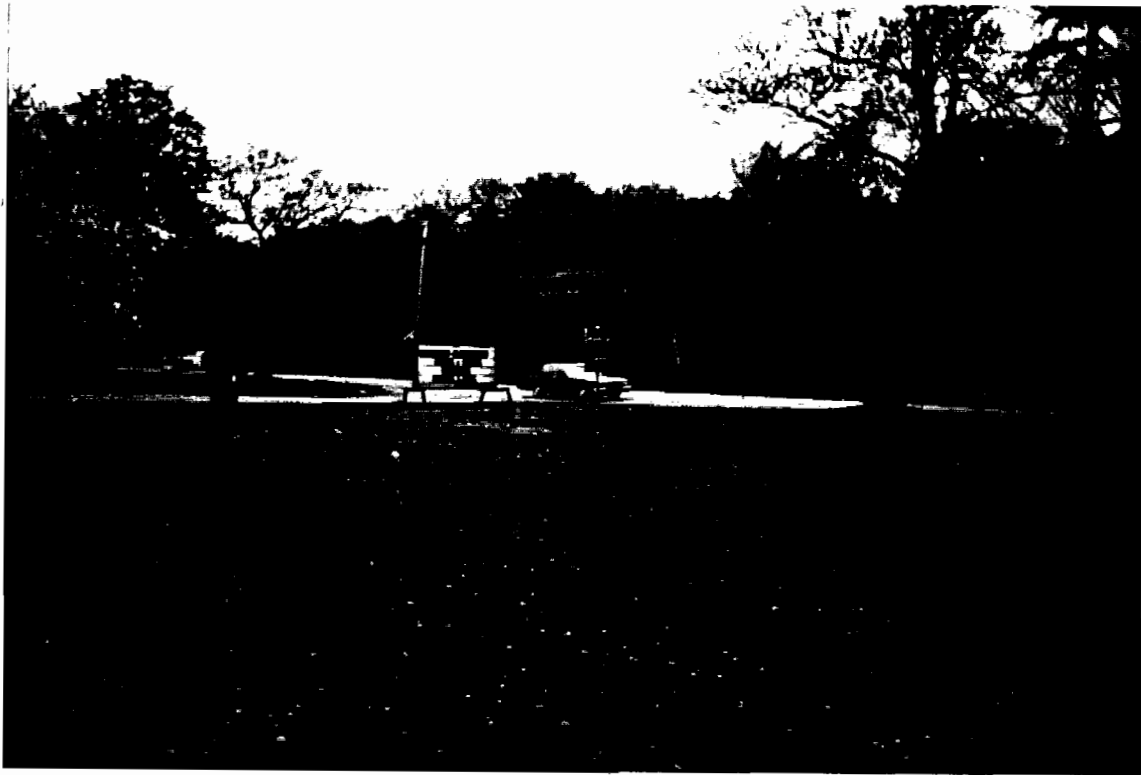
Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 16

Comments: Survey grid #2 along Niagara Falls Blvd. Future site of wells GW-2 and GW-2S. View is
to the north.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 17

Comments: Survey grid #1 in Area A. Future site of well GW-1. View is to the north.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 18

Comments: C&D debris and footpath at northeast corner of Area A. View is to the north.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 19

Comments: C&D debris in northeast corner of Area A. View is to the north.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.
P H O T O G R A P H I C R E C O R D

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 20

Comments: Survey grid #3 in Area A. Future site of well GW-3. View is to the south.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

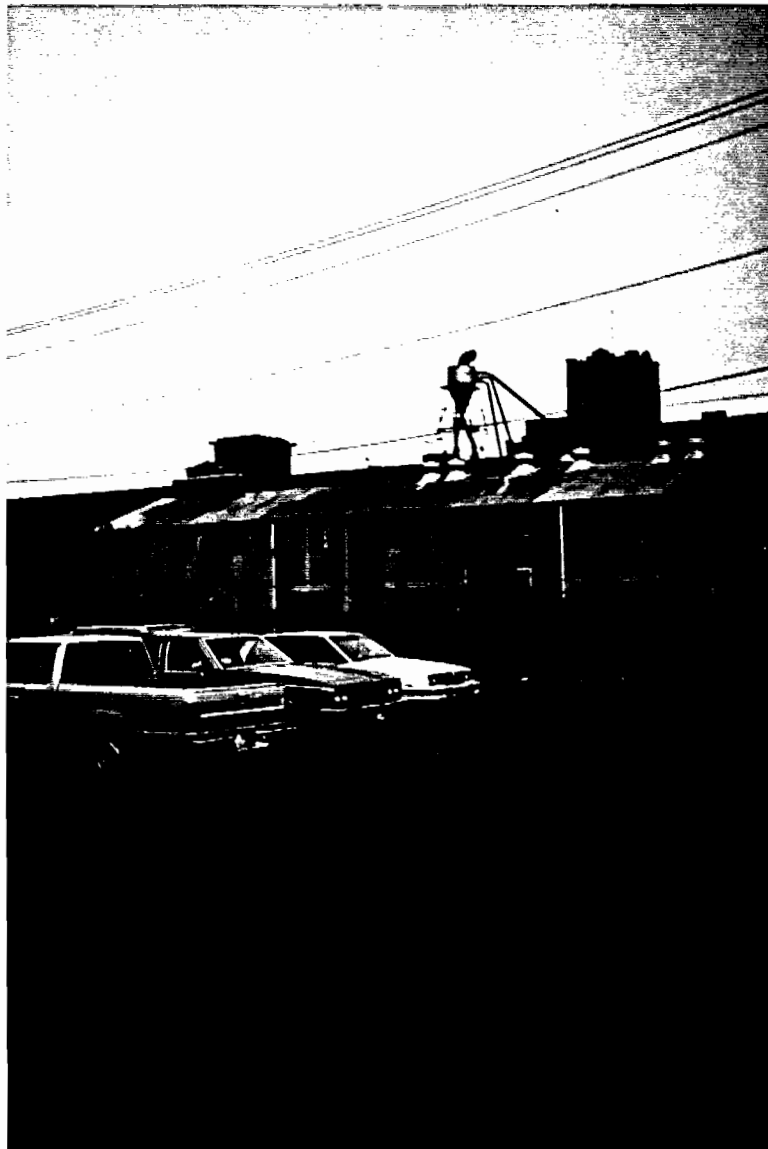
Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 21

Comments: Wurlitzer Industrial Park building in background as viewed from Area A. Diesel fuel
staining in foreground in Area A. View is to the northeast.



ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak

SN: NA

Photographer: R. Watt

Date/Time: May 7, 1990

Lens: Type Auto Focus

SN: NA

Frame No.: 22

Comments: Diesel storage tank in southeast corner of Area A, with Wurlitzer building in background.

Tank was removed prior to the drilling of GW-3 which is nearby. View is to the south.



02[UZ]YR2080:D3176/4307

recycled paper

ecology and environment

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 23

Comments: Survey grid #4 showing scattered C&D debris. Future site of wells GW-4 and GW-4S. View is
to the west.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 24

Comments: C&D debris piles just north of survey grid #4. View is to the west.



02[UZ]YR2080:D3176/4307

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Department of Environmental Conservation E & E Job No.: YR2000

Camera: Make Kodak SN: NA

Photographer: R. Watt Date/Time: May 7, 1990

Lens: Type Auto Focus SN: NA Frame No.: 25

Comments: C&D debris and abandoned trailer in area just north of survey grid #4. View is to the north.



02[UZ]YR2080:D3176/4307

APPENDIX I

SURVEY MAP OF THE WURLITZER SITE

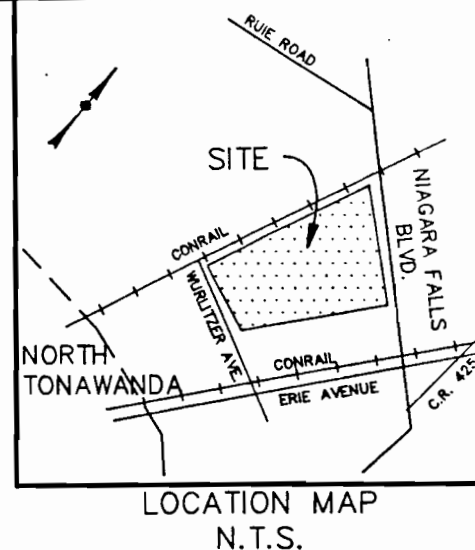
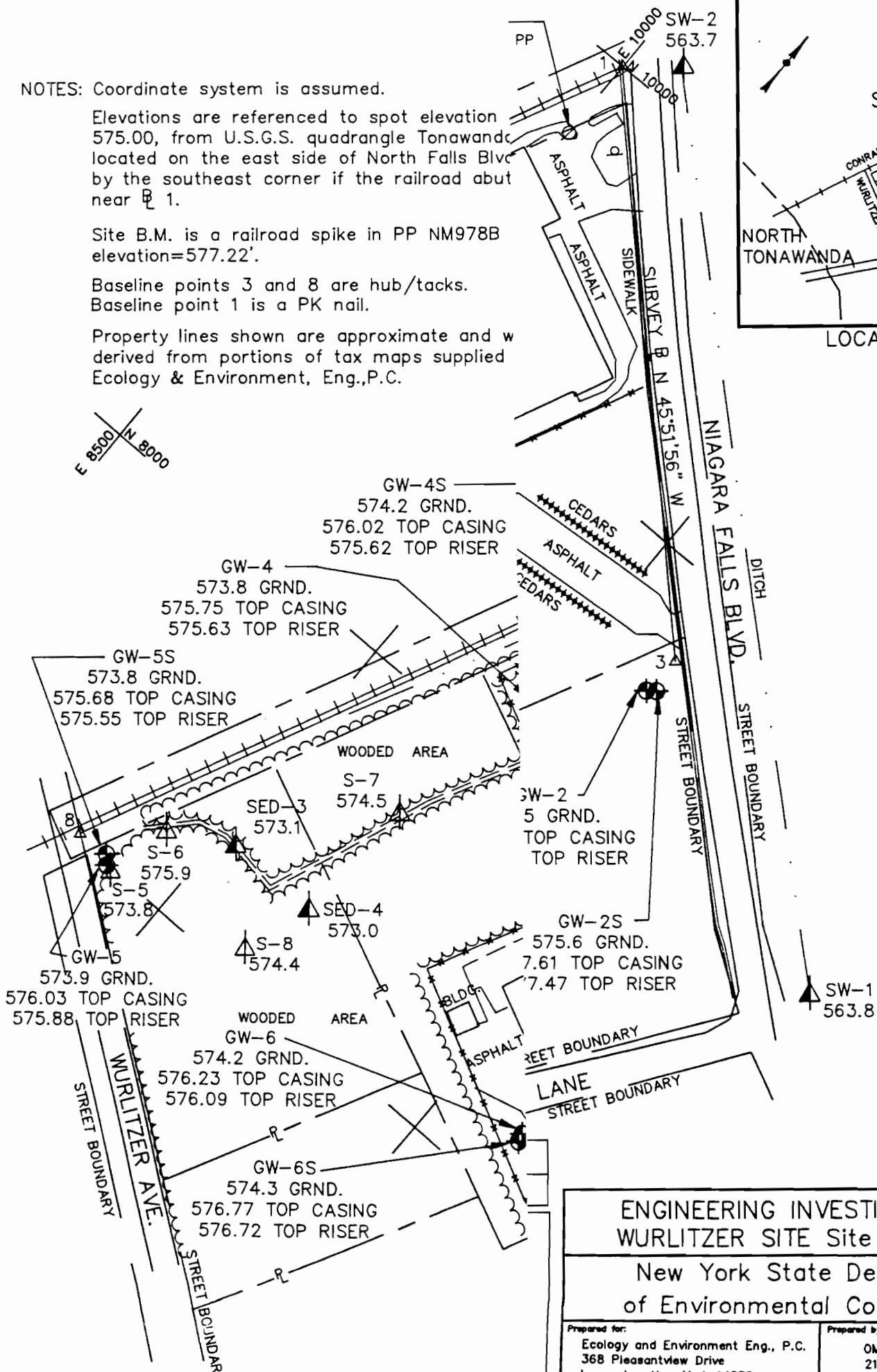
NOTES: Coordinate system is assumed.

Elevations are referenced to spot elevation 575.00, from U.S.G.S. quadrangle Tonawanda located on the east side of North Falls Blvd by the southeast corner of the railroad about near B 1.

Site B.M. is a railroad spike in PP NM978B elevation=577.22'.

Baseline points 3 and 8 are hub/tacks.
Baseline point 1 is a PK nail.

Property lines shown are approximate and w derived from portions of tax maps supplied Ecology & Environment, Eng.,P.C.



ENGINEERING INVESTIGATIONS AT
WURLITZER SITE Site No. 932041

New York State Department
of Environmental Conservation

Prepared for:
Ecology and Environment Eng., P.C.
368 Pleasantview Drive

Prepared by:
OM P. POPLI, P.E., P.L.S.
2140 South Clinton Avenue

APPENDIX J

FIELD NOTEBOOKS



ecology and environment, inc.

International Specialists in the Environment

Job Number YR2000

WURLITZER

SITE RECON. & GEOPHYSICS

EM SURVEY

MONDAY 7 MAY 1990

E+E Personnel: Rick Watt - Field Team Leader

Don Johnson - Site Safety Officer

WEATHER: Sunny, clear, 50°/70°E, 5-10 mph SW wind

OBJECTIVE: Site recon. + geophysics @ Wurlitzer site

0645 Rick Watt arrives @ E+E + mobilizes equip.

- Action Rented mini-van lic. # 2EP-1165 CNY1

- EN-31:

- Unimag II: 04-04-001

- Century OVA: 01-01-003

- 10.2eV HNU: 01-02-002

0730 Don Johnson arrives + we head out to Wurlitzer.

OUTGOING MILEAGE: 028055

0815 Arrive on site + begin recon.

Met w/ Neil Saffron of Applied Design who was very

pleasant + offered his services if we need them.

Met w/ Merrill Artman of Ancor Plastics who's only

pertinent comment regarded sample splits which

his lawyer (Groot-Sprague) + the DEC showed work

out.

1000 1020 Paul Dickey of NCDOT showed us around

his "suspect" areas are identified on the map.

He showed us the dump in the back where there

is stagnant standing water, scrap metal, asphalt

shingles, rusted open drums containing an unknown

residue, areas of an unknown black viscous material

(dielectric or boiler residue?), etc.

Took numerous photos in "dump"

R. Watt

MON 7 MAY '90

1000 Met Pete Quinlan of Accudie which is a new

company along Wurlitzer Dr. G.W. may be on

their property - Don + I will try to find boundary

markers.

1040 Met Quinton King of IRR/Wurlitzer who drove

us around + showed us property boundaries. He

gave us a map of the industrial park for reference

He was helpful + offered his services should

we need them. Q.K. said there was used for coal storage.

1100 SITE WEATHER: overcast, occasional drizzle, 55° High

expected clear up in pm. 10 mph SW wind.

HNU reading 0 ppm above background up + downwind of site.

1100 - 1130 Surveyed grids 1-4

1045 Don + Rick leave site + return to E+E @ 1725

Rick goes to buy stakes + film.

~~R. Watt~~

MON 7 MAY 1990

1253 Photo of grid #1 facing N from 20' S of op
 2 Additional photos taken in area of GW-1
 Well GW-1 partially shaded @ 10,30.

1258 - N → S E ← W

Station	V	H	V	H
0,0 1257 hrs	49	38	49	36
0,10	46	34	48	37
0,20	44	34	44	34
0,30	42	36	42	34
0,40 1302 hrs	40	38	42	36
10,40	40	34	41	34
10,30	40	33	43	32
10,20	43	35	42	32
10,10	42	40	38	36
10,0 1312 hrs	47	41	44	36
40,40 Debris	40	29	39	26
40,30 "	36	32	34	29
40,20 "	42	27	32	35
40,10 "	41	26	37	31
40,0 1314 hrs	41	32	44	32
30,0	42	34	42	32
30,10	38	36	38	37
30,20	44	32	42	36
30,30 Debris Pile	44	32	44	34
30,40 Debris Pile	41	32	41	32
20,40 1319 hrs	38	32	40	32
20,30	40	33	42	33
20,20	43	32	44	32
20,10	45	33	47	30
20,0 1313 hrs	44	30	42	34

DAY

R. W. WALK

MON 7 MAY 90

1323 GRID 1 ~~entire~~ complete

GRID No. 3 (GW-3)

Station	V	H	V	H	Comments
0,0	50, 63	40	68	46	1443 hrs
0,10	52, 68	36	49	59	
0,20	51	42	50	42	
0,30	54	38	52	35	Debris
0,40	52	42	51	34	1452 hrs
10,40	52	40	52	37	
10,30	56	40	50	36	Debris
10,20	52	44	56	43	
10,10	44	58	37	49	
10,0	33	52	32	43	1458 hrs
20,0	56	38	62	52	
20,10	54	38	71	44	
20,20	35	44	45	46	
20,30	52	38	50	34	1511 hrs
20,40	56	34	55	32	1512 hrs
30,40	60	33	61	30	
30,30	48	34	47	32	
30,20	42	45	43	43	
30,10	41	40	43	46	
30,0	42	41	43	44	
40,0	36	30	40	30	1514 hrs
40,10	37	31	43	38	
40,20	46	32	48	33	
40,30	50	30	38	32	
40,40	70	28	77	32	new sand + debris

1518 hrs

5.7.90

YR-2000

1603 hrs.

Grid No. 4 (GW-4)

Station

Elev

	Vert.	Horiz.	Unit.	1/4 in.
0,0 (1610 hrs)	32.17	31	38	59
0,10	51	31	33	50
0,20	50	32	50	34
0,30	45.1	28	42	34
0,40	39	30	40	33
0,48	33	32	30	38
0,50	30	30	32	29
0,52	32	40	44	30
0,54	33	41	29	40
0,56	11.5	34	44	63
0,58	11.5	34	26	64
0,60	46	32	52	34
0,62	41	30	42	28
0,64	40	32	40	31
0,66	38	34	31	38
0,68	36	34	36	33
0,70	37	30 well stake	40	28
0,72	40	30	40	30
0,74	37	34	42	30
0,76	12.5	43	7	47
0,78	37	26	39	31
0,80	39	28	40	30
0,82	40	32	40	32
0,84	39	30	39	31
0,86	40	29	38	30

5-6

2. 0. 0. 0.

TUESDAY 8 MAY 1990

9

WEATHER: Sunny, 50°F, expected high 70°F, 5-10 mph SW wind

ETE Personnel: Rick Watt + Don Johnson

OBJECTIVE: Survey grids 5 & 6 w/ EM31 + Magnetometer.

0730 Rick arrives @ ETE + mobilizes equipment.

0740 Don arrives + we head out.

0830 ONA rdg a downwind of dump (Area B)

HNA rdg a downwind of dump.

0900 GRID 5 oriented N33E (Y-axis) in corner formed by Wulfsberg Dr. + RR tracks. Grid is 3'-5' below grade of Wulfsberg Dr. + RR roadbed.

1020 Recon into dump w/ OVA

standing water alongside Grid 5 (near RR tracks) rdg 75 ppm when disturbed, but dissipates quickly. Smells of old gym socks.

Pile of black ash 0 ppm

Pile of ~~the~~ what appears to be degraded new print 0 ppm.

various ash + debris pile 0 ppm.

unknown black core 0 ppm (begins to soften @ 60-70°)

fusty gas tank - inside 250 ppm - can smell gas

oily substance near rusty drums on ground 10 ppm

rusty drum containing trichloroethylene

rusty blue drums contain low visc. liquid w/ 1/2 fuel

ant. freeze jugs w/ waste oil

blue vertical drum 1/2 fuel

staged drums seem to contain rusty oil + grease

recycled paper

Tues 8 May 90

Some of the staged drums have expanded shiny rock, foundry waste, Mg or graphite?

Dave Olsen + Kevin? from IIR warehouse stopped us to ask us what we were doing. He needs to be informed when we come on site

300 left site

330 Arrive @ site + unload van

U-7

ecology and environment

TUES. 8 MAY 1990

GRID NO. 5 (GW-5)

* Meas. in millimhos/water

STATION	N	S	E	W	COMMENTS/TIME
0,0	47	33	47	30	0933 hrs.
0,10	48	31	47	30	
0,20	46	33	46	32	
0,30	46	34	45	33	
0,40	52	38	50	36	Surface water 0939 hrs.
10,10	53	40	52	39	" "
10,30	45	35	46	36	
10,20	46	32	46	32	
10,10	48	30	47	29	
10,0	51	32	50	30	0945 hrs.
20,0	52	31	50	29	
20,10	47	31	46	30	
20,20	50	34	49	34	
20,30	48	31	45	33	Above inundated debris
20,40	54	43	49	52	Surface water, debris, (ONS)
30,40	36	63	30	48	Debris Pile (rebar visible)
30,30	19	44	30	46	" " " "
30,20	50	42	50	34	
30,10	47	33	46	31	
30,0	51	32	48	29	0959 hrs.
40,0	52	34	52	32	
40,10	47	39	46	29	
40,20	21	38	37	34	Debris Pile / slope
40,30	32	34	31	42	Debris Pile
40,40	36	48	32	54	Debris Pile 1012 hrs.

$\gamma_{axis} = N 33^{\circ} E$, $X_{axis} = S 57^{\circ} E$

DATA

1411 hrs, Grid No. 6 (incl. GW-6)

055° E ← S

E ← W

Location	Vert.	Horiz.	Vert.	Horiz.	Comments/ Time (1158 hrs.)
0,0	45	21	48	21	
0,10	48	22	47	20	
0,20	60	22	61	24	
0,30	20	20	71	68 Fire Hydrant 10' west	
0,40	18	23	66	66 " " "	
10,40	29	23	70	59 (156 hrs.)	
10,30	21	20	70	89	
10,20	72	22	74	24	
10,10	60	23	63	24	
10,0	65	23	71	24 (1204 hrs.)	
20,0	150	36	Neg.	18 R.R. spur - 5' east	
20,10	145	39	32	9 " " "	
20,20	119	29	67	22 " " "	
20,30	31	22	79	118 " " "	
20,40	38	25	82	156 (1213 hrs.)	

* 6' chain link fence located ~15' south of station

D. J.



ecology and environment, inc.

International Specialists in the Environment

Job Number

YR-2040

Wurlitzer drilling and
well installation

YR2040 - SAMPLING

Weather - sunny clear sky, T 70°-80°, wind 5-10 mph

8-1-90

1 Aug 1990 Monday

YR 2040 Split Newchurch

3

0720 Pack up OVA, HNU, Exp/Cu meter and then head to Benbro & Action Van rental

0800 Arrive at Action rental and change Van over from RO-1040 to YR-2040

0820 Arrive at Benbro, fill OVA with hydrogen and pick up disposable supplies. Pete F. forgot to pack CN monitor which B. Meyers requested, and 2 lg. log books.

0915 Meet at HQ with Jim Griffiths to discuss days events

0930 Pick up safety OTC (Sybil Newchurch) in the office and depart for the Wulitzer site.

1030 B. Meyers & Sybil Newchurch arrive on site. Mike Ryan (DEC) and drillers already on site.

Mike Ryan meet with Neil Safer

1045 Drillers & B. Meyers go and locate hydrant for water, and begin filling water tank.

1135 Drillers return with water.

1300 gallons picked up this trip

Total to date is also 1300 gallons.

1135 Drillers begin decor (steam clearing)

1210 Completed decor, held site gate meeting. All Personnel Attended, covered heat stress, contaminants of concern, rig safety, route to hospital.

1215 Put rig on G-W-1 location

Robert A. Meyer

1240 Dullies start-up rig & prepare to split spoon. Background readings: OVA 4.5 ppm

Mini Rad - normal hNu Oppm

Exhumeter 20.870 O₂ / 0.70 REL

1245 Split spoon 0-2 ft Oppm AB (OVA)

- All readings are taken with OVA, if anything is detected readings will also be taken with hNu also.

1255 hNu reading @ BH of 4 ft Oppm AB

1300 Split spoon @ 4-6 ft Oppm AB (OVA), BZ Oppm AB

BH Oppm AB

1310 BH @ 8 ft Oppm AB Split spoon @ 8-10 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1320 Taking sample taken 9-11 ft split spoon

1325 Split spoon @ 13-15 ft Oppm AB, BZ Oppm AB, BH Oppm AB. Close to water

1335 Split spoon @ 16-18' Oppm AB, BZ Oppm AB, BH Oppm AB.

Owner of Oncore Plastics on site. Talked to DEC.

1345 Split spoon @ 18-20' Oppm AB, BH Oppm AB, BZ Oppm AB

Quentin King, representative of IRR, who wanted to know what we are doing. Incore Plastics rep. left site.

1355 Split spoon @ 20-22' Oppm AB, BH Oppm AB, BZ Oppm AB

IRE left. Applied Design rep on site. Break

1400 Applied Design left. DEC ion B-fab on site. Dullies

Start up rig & continue split spoon.

1415 Split spoon @ 22-24' Oppm AB, BZ Oppm AB, BH Oppm AB

1420 Split spoon @ 24-26' Oppm AB, BZ Oppm AB, BH Oppm AB

1435 Split spoon @ 26-28' Oppm AB, BZ Oppm AB, BH Oppm AB

IRE return. Rig located on site.

1445 Split spoon @ 28-30' Oppm AB, BZ Oppm AB, BH Oppm AB.

1500 Split spoon @ 30-32' Oppm AB, BZ Oppm AB, BH Oppm AB.

1510 Digger down to 32.5 ft. Stop drilling & set cut down the auger.

S. Newchurch

August 1990 (M) R2040 Sept 11th

Mike Ryan (DEC) left site. Began to flush the well.

MR (DEC) returns to site after making phone calls to office.

Bob Hower left site.

0 Set screen.

5 Pull screen, because sand was flowing + would not set.

5 Turn off drill rig + clean site.

10 MR left site.

5 All employees left site. Bob Meyer, Sept 11th.

Newchurch, Lee Piroch, Dick Shepley.

5 SN arrived at home + changed instruments.

Thursday 2 August 1990

WEATHER: Clear, sunny, expected high 85°F

0745 Rick Watt (ETE Geologist) + Sybil

Newchurch (ETE SSO) meet @ ETE + await the arrival of Bob Meyer w/ van and equipment.

0810 Bob M. arrives, transfer equipment + load up van.

0820 ETE arrives on site. Mike Ryan (NIDES - Albany) on site as well as American Auger drillers Lee + Derrick.

0905 Create in w/ Neil Saper of Applied Design.

0910 At GW-1 drillers are setting

2" PVC screen + riser. 10' of 10 slot

screen (sch. 40). Bottom of screen at

32.5' BGS. 2mu. HNU Blackboard Upper

0930 Drillers using Mobile B-57 rig w/ 5' sections of 4.5" ID augers. RWS

1015 Finish pouring sand to about 20' (19' 11") BGS

1030 Finish pumping 5 gal of "Benseal" slurry in hole. Top of bentonite seal @ 18' 2" BGS. Begin mixing grout - Type I Portland cement w/ 2:1 Benseal mix.

1100 Finish pulling augers

RWS

THURSDAY 2 AUGUST 1990

2 August 1990 Thursday YR2040

L. J. Hurchuck

1110 Brief visit from Neile Safere (Applied Design) and

15 Setting the protective casing + cap
Used 4 bags sand

1 bag Bensal
3 bags cement

35 When drillers decan, Rick + Sybil
go to get lunch + buy some ice.

15 Rick + Sybil return to GW-1
Drillers are decoring everything
(high pressure steam wash). They
were down for 10-15 min. to fix the
wand.

30 Finish decan. Begin to mobilize to
GW-3, but first the drillers must
get another load of water. We'll
probably need to get a load everyday
(1000-1200 gal.)

15 Finish making water run (1100 gal.)
Total water to date 2400 gal.
Set up rig @ GW-3

25 Bob Stinner of REACT stops in.

30 Start up rig + first split spoon for 0-2 ft
Backward 100 ft. Oppm, CVA 3.5 ppm

Then Rod normal; Explanator 26.5 ppm / 2.5 ft

L. J. Hurchuck

1455 Split spoon @ 0-2 ft Oppm AB (hNu)

- All records will be taken with the QVA unless
something is detected. Then both shall be used.

1445 Split spoon @ 4-6 ft Oppm AB, BH Oppm AB,
BZ Oppm AB (OVA)

1500 Split spoon @ 9-11 ft Oppm AB, BH Oppm AB,
BZ Oppm AB (OVA)

1510 Split spoon @ 14-16 ft Oppm AB, Oppm AB (hNu)
BH Oppm AB (OVA), BZ Oppm AB (OVA)

1520 Split spoon @ 19-21 ft. BH-3 ppm AB (OVA), Oppm AB (hNu)
BZ Oppm, sample 1 ppm AB (OVA), Oppm AB (hNu)

530 Split spoon @ 24-26 ft. BH-7 ppm AB (OVA), Oppm AB
(hNu), BZ Oppm AB, sample Oppm AB (OVA + hNu)

1645 Split spoon @ 29-31 ft. BH 1 ppm AB (OVA) Oppm AB (hNu)
BZ Oppm AB, sample Oppm AB (OVA + hNu)

555 Split spoon @ 34 refusal Oppm AB, BH Oppm AB,
BZ Oppm AB. Begin auguring to refusal.

1557 Auger refusal @ 31.25'

1600 Begin setting 3 7/8" roller bit to flush clay
out of auger bit so that the well will go to
the bottom. But first will decor the screen
+ riser so that they can go in the hole
immediately after flushing.

1610 Bit string left site.

1625 Puller put three pegged rollers but is unable to
push it out.

1635 Set screen. Nail taken on site.

1645 NS, Applied Design left site.

1700 A truck driver from one of the companies in the area
came out from behind the rig and started to
ask what we were doing. After a minute or two he
left.

L. J. Hurchuck

22 August 1990 Thursday YR 2040 *Spill Newchurch*

705 Had a brief visit from Bill Arthur, Ancon.

733 Finished pouring sand to 18' 11" BGS
Begin mixing 3 1/2 gal Bensel slurry
Bensel to 17.5'. Mike Ryan says a 1.5' seal is enough.

733 Begin mixing grout (cement/bentonite)

710 Finish pumping grout & pulling augers
Used: 2.5 bags sand
0.75 bag Bensel
3 bags cement

710 All off-site.

715 Return to ESE

FRIDAY 3 AUGUST 1990

WEATHER: Sunny, clear, high 85°F, moderate humidity

0735 Rick Wood (E+E Geologist) picks up Sybil Newchurch (E+E SSD) & stop to do the daily shopping (ice & drink)

0830 Arrive on site. Mike Ryan (NYSDEC-Ancon) & American Auger drillers already on site. Drillers are packing up equipment & moving rig. They will then decon everything & move to GW-4.

0845 Begin decon.

0910 Steam cleaner pump died. Have to go get a new 1/2 HP pump

0930 Lee, Derrick & Rick leave site to drive to Cheektowaga to purchase new pump.

1125 Return to site w/ new pump
Drillers install pump

1140 Drillers resume steam cleaning

1338 Finish decon.
There is not enough time to start a new hole because the drillers leave early on Friday so that they can get home! Everything is ready to start GW-4 on Monday.

1435 After stopping @ lab de, Rick & Sybil return to ESE.

2 weeks

Monday 6 August 1990

Weather: overcast, 76°F, chance of showers

1440 Rick Watt (EVE Geologist) + Sybil Newchurch (EVE SSO) leave EVE

1410 After stopping to purchase ice, arrive on site. Drillers are just leaving to get water. We started late today because drillers spent the morning moving equipment from another site to this one.

He wasn't noted on Thurs. 2 Aug 90 but we continued split spooning at 5' intervals below the water table at Mike Ryan's (NYSDEC) request. Since GW-3 was so near GW-1, and all these were from 13' - 30' was clay, we did continue sampling from 29' to refusal.

2300 Check in w/ Neil Saffer of Applied Design. He is out of the office so the receptionist said she will give the message to John Paronites, the president of A.D.

2250 Drillers return w/ 1300sm gal water. (3700 gal to date). Move rig to GW-4 + set up equipment.

3300 Background readings
Explanometer 20.8% O₂ / 0.7% LEL, Mini Rad 1/6 count/min - normal
iHNU .5 ppm 10.2 dS/10
All readings will be taken with OVA, if anything is detected readings will be also taken with HVE

Monday 6 August 1990

1335 GW-4 Ground Surface conditions: scattered CID, i.e. asphalt shingles, brick, concrete, etc.

Will shovel some of this off the surface prior to sampling.

Refer to GW-4 log sheet for well info
1355 Split spoon @ 0-2 ft 2 ppm AB (OVA) + oppm (hNU). BZ Oppm AB. Duller commented on the smell of oil on the floor 1st auger while cleaning the hole. OVA reading at BM Oppm AB 1400 Bob's Stener on site.

1405 Split spoon @ 4-6 ft Oppm BZ Oppm Bore hole Oppm 1415 Split spoon @ 7-9 ft Oppm BZ Oppm BH Oppm 1425 Rick Watt left site to call DEC because we hit water at 6 ft + then hit clay again. He was wondering if we need to set a new casing on concrete at

1445 Rick returns. Jim Cliffe was unavailable. Valerie Lauze, Jane Thapa + Mike Ryan (NYSDEC - Albany) unavailable. John Hydon (NYSDEC - Buffalo) unavailable. Talked to Glenn May (NYSDEC - Buffalo). He thinks we should continue on + see what there is below.

Maybe we can set a well at a similar depth to GW-1 + GW-3. We can also then set a shallow well in the same area on backfill

Set only a shallow well. Run
1500 Split spoon @ 9-11 ft Oppm AB, BZ Oppm AB, BM Oppm AB

Split spoon @ 14-16 ft Oppm AB, BZ Oppm AB, BM Oppm AB, Bob Stener leaves site.

S Newchurch

6 August 1990 Monday SR 2046 J. Hurchund

520 Split spoon @ 19-21 ft. Oppm AB, B2 Oppm AB
BH Oppm AB, Bill Nutter (Owner) was on site.

530 Split spoon @ 24-26 ft. Oppm AB, B2 Oppm AB
BH Oppm AB

540 Split spoon @ 26-28 ft. Oppm AB, B2 Oppm AB
BH Oppm AB

550 Split spoon @ 28-30 ft. Oppm AB, B2 Oppm AB
BH Oppm AB, Bill Nutter (Owner) left site.

555 Split spoon @ 30-32 ft. Oppm AB, B2 Oppm AB
BH Oppm AB

565 Split spoon @ 32-34 ft. Oppm AB, B2 Oppm AB
BH Oppm AB

25 Not refusal w/ auger @ 38 ft.

229 Decon well casing & screen.
10' of 10 slot schedule 40 PVC screen (2" ID)
+ 30' of Sch. 40 PVC riser
complete decon.

Begin getting 3 7/8" roller bit & AW rod to
flush out hole.

Rig out of ops. The 8' refueling tank
has diesel in it for the truck, as soon
as that is empty, it can be filled
with gas for the rig.

Begin flushing out hole.

Finish flushing hole - Begin pulling rods.

Set 10' screen + 30' riser. TD = 38.5' GW-4
Begin pouring sand

Finish pouring sand to 26.4' BGJ
Will now theme in a 2' Bensoal then pull the
auger.

Bensoal. 23.8' BGJ

2/11/90

Monday 12 August 1990

Sec Next Page

MONDAY 6 AUGUST 1990

50 Finish grouting + setting the protective casing.

Materials used: 3 bags sand

1 1/2 bags Benseal

4 bags Portland Type 1 cement

05 After cleaning the ground out of the augers + trench pipe, all leave site.

30 Sybil + Rick return to ETE

~~R. Watt~~

TUESDAY 7 AUGUST 1990

WEATHER: Partly cloudy, light NE wind, expected high 80°F

0730 Rick Watt (ETE Geologist) + Sybil Newchurch (ETE SSO) meet @ ETE warehouse to fill

OVA w/ H₂ + to get sample bottles for the drilling water. After leaving ESS, stop to buy ice.

0835 Rick + Sybil on-site. Drillers (Lee + Derek) already on-site. They have moved the rig away from the hole + begun steam cleaning all of the equipment.

0927 WEATHER CHANGE: Increased clouds + begins to drizzle.

1009 Move rig to GW-4 + set up to drill (Finish section @ 1000)

Rick calls Jim G. to check in - all in well

Rick checks in w/ Neil Saper (Applied Design)

1030 Bob Steiner (Racra Env.) arrives

1054 Begin GW-4 Background readings.

Mini Rad - normal 18 counts/min

Explanimeter 20.8% O₂ / 0% LEL

OVA 3.0 ppm H₂Nu 80 ppm

Split spoon @ 0-3 ft Oppm AB, BZ Oppm AB

- All readings will be taken with the OVA unless there is a reading above background then a

second reading will be taken with the OVA.

- Split spoon @ 4-6 Oppm AB, BZ Oppm AB

S. Newchurch

7 August 1990 Tuesday YR2000 S. Newchurch

1115 Split spoon @ 6-8 ft Oppm AB, BZ Oppm AB, BH
Oppm AB.

1120 Split spoon @ 8-10 ft Oppm AB, BZ Oppm AB, BH
Oppm AB

1124 Hit same clay as previous wells @ 10' ±. back
to standard sampling. Next spoon @ 14'

- Weather - skip trying to clear, sea warning up but
still clouds (rain) in the sky.

1135 Split spoon @ 14-16 Oppm AB, BZ Oppm, BH Oppm AB

1150 Split spoon @ 19-21 Oppm AB, BZ Oppm, BH Oppm AB

1205 Split spoon @ 24-26 Oppm AB, BZ Oppm, BH Oppm AB

1210 Russ Short on site. (E+E QA/QC) Bob Short
leaves site.

1215 Split spoon @ 26-28 ft Oppm AB, BZ Oppm AB,
BH Oppm AB.

1225 Split spoon @ 28-30 ft Oppm AB, BZ Oppm AB,
BH Oppm AB.

1235 Split spoon @ 30-32 ft Oppm AB, BZ Oppm AB,
BH Oppm AB.

1245 Split spoon @ 32-34 ft Oppm AB, BZ Oppm AB, BH
Oppm AB.

1255 Split spoon @ 34-34.5 refusal Oppm AB, BZ Oppm AB
BH Oppm AB

1300 After flushing out the augers with water, bit & water,
the scrub was set & out for 2 ft stick up.

1340 Pull auger

1345 Bail of water (near) on site for minute

1405 Finish pouring sand up to 22 ft.

1418 Bentonite seal to 19' BGS. Begin mixing grout
(Portland Type 1 cement + 5% Benneval)

(weather) change @ 1100 - rain stopped)

S. Newchurch

7 August 1990 Tuesday YR 2000 Split Newchurch

1450 John Hyden ^{Buffalo} DEC. came on site & talked
with Rick. With about site.

1500 Finished pulling all the augers.

1510 Bob Short on site.

1555 Demob. from GW-6. will decan near GW-4.

Russ Short & Jack Hyden off-site.

Rick W. calls Jim Griffiths. Rick suggests call
CNTPD about parking the support truck on

Wolfe Dr. when we drill GW-5. Rick will
call on Wednesday.

1605 Begin decan.

1710 Stop decan. Drillers are making a water run
this is 4th run (2000 gal) for a total

to date of 6400 gal.

1800 Drillers return w/ water. They need
to refuel the steam cleaner & then

finish up about 10 min. worth of decan.

∴ Rick & Sybil off-site to drop
sample @ Lab.

At 1600 Rick sampled the drilling
water from the holding tank for fuel

TC analysis. The water comes from
a hydrant near GW-6. (DWO807)

1815 Drillers off-site

1850 Deliver samples to Lab

1905 Return to E+E

~~Printed~~

WEDNESDAY 8 AUGUST 1990

WEATHER: Sunny, v. light w. wind, expected high 80°F

3730 Rick Warr (ETE Geologist) picks up Sybil Newschuck (ETE JIC) + loads equip.

835 After stopping to make daily purchases Rick + Sybil arrive on-site. Doreena (last Derek - American Auger) arrive. Begin mobilization on to GW-2

40 Rice checks in with Neil Saper of Applied Design John Hyder (WV:EC - Reg. 91) on-site.

50 we will contain cuttings + water today + dispose of them near GW-4 because we are drilling GW-2 today which is right off Niagara Falls. Bud + we don't want to create an eye sore.

115 Safety Meeting - all addressed (ZEE + 2 AH + 1 DEC) Discussed: Keep fluids in holes - gatehead provided on site.

First-aid kit location + map to Hospital. Smell of natural gas in drill area.

Calibration of hNu with span bal to 5.4 @ 10.3 V. Background readings hNu Oppm, OVA will not be Mini Rad - normal 10 units/min. Spectrometer 20.8% O₂ 1% % LEL

930 Start up aug. All readings of split spoon will be taken with hNu. S. Newchuck

8 August 1990 Wednesday YR2040 S. Newchuck

0940 Split spoon @ 0-2 ft Oppm AB, BZ Oppm AB. Bore hole Oppm AB. BH + SS reading cause the needle on the instrument to read below 0 on background.

0945 Split spoon @ 4-6 ft Oppm AB, BZ Oppm AB, BH Oppm AB

0955 Split spoon @ 6-8 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1005 Split spoon @ 9-11 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1015 Split spoon @ 14-16 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1025 Split spoon @ 19-21 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1035 Split spoon @ 21-23 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1042 Split spoon @ 23-25 ft Oppm AB, BZ Oppm AB

1048 Split spoon @ 25-27 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1055 Split spoon @ 27-29 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1105 Split spoon @ 29-31 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1115 Split spoon @ 31- refusal Oppm AB, BZ Oppm AB, BH Oppm AB. Wind increasing.

1122 Auger refusal at 33.5'. Begin set-up of roller bit to push out the auger bit.

1125-1135 Derek decons 10' screen + 30' screen.

1138 - Begin finishing out GW-2

1143 - Finish finishing + remove AW rods. S. Newchuck

WEDNESDAY 8 AUGUST 1990

1600 Set screen & riser. TD = 33.5'
3550 Finish pouring sand to 21.5'
4550 Rick Watt left site to take care of business at E+E.

5550 Ben sent to A.5'
30 Mike Steedon, Wauludugen Industrial Park, on site.

50 Finished pulling all the augers.

Materials used: 3 bags of Spand

1 bag of Pensul

3 bags of Portland Type 1 Cement

05 Set camp & prepare to leave ^{6W-2} site. Wauludugen Industrial Park rep left site.

30 Duller begin decom

05 Rick Watt return to site

0 Rick goes to talk to site owners about change in scope of work.

Neil Safen unavailable.

0 Mike Steedon out 'til tomorrow

10 Take to Bill Arthur - no problem.

At 1400 Rick spoke to Mike Ryan - N/DEC

Due to the presence of the perched aquifer the DEC feels there is a need to drill additional wells to a depth of ~10'. One well will be added @ GW-6. IF a similar perched aquifer is found @ GW-5 then shallow wells will be added @ GW-5 + GW-4. IF no perched zone is found @ GW-5, only the shallow well @ GW-6 will be drilled.

Due Date

WEDNESDAY 8 AUGUST 1990

NOTE: Sand used as filter pack in all wells is No. 3 Q-Rok

11030 Finish decom

Lee is going to get more water & more gas & we will start right up in the morning.

1700 Tee off - site.

1730 Dispose of trash in dumpster @ lab.

1740 Sybil + Rick return to E+E.

~~Bill Arthur~~
8/8/90

1 August 1990 Thursday YR 2040 Split Newchurch

Weather - 70° with predicted highs in the low 80's, with 10-15 mph, clear sky, & humidity.

30 Rick Watt picked up split Newchurch, loaded equipment & left for site.

00 RW & SN stop at store for ice & eggs.

20 RW & SN, just to arrive on site.

25 AA Drillers on site - Lee Pinard & Davis.

Greene & DEC, John Hyden.

30 Mobilize to Gate of GW-5 after RW checks in with Mike Stedden, Wurlitzer, Bob Park & Neil Saper, Applied Design. He also informed them of 1 or 3 additional wells.

30 All equipment at GW-5 and drillers prepare to start drilling.

0 Split spoon @ 0-2 ft Oppm AB (hNu).

Background reading - hNu - cal. w/ span cal 5.4 ppm for 102.

.25 ppm background; OVA 4.0 ppm, Mini Rad 10 counts/min.

Explanometer 20.8% O₂ / 0.2% LEL.

10 Split spoon @ 4-6' Oppm AB (hNu).

Safety Meeting - all attended.

Kept not in truck because it is parked on street, but in RW pocket.

Fluicks & heat stress.

Bugs & repellent.

20 Split spoon @ 6-8' Oppm AB (hNu), BZ Oppm AB, BH

Oppm AB (hNu).

All readings will be taken w/ OVA, if there is anything above background a second reading will be taken with the hNu.

Newchurch

23
9 August 1990 Thursday YR 2040 Split Newchurch

1030 Split spoon @ 9-11 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1040 Split spoon @ 14-16 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1045 John Hyden, NYSDDEC, left site.

1050 Bob Steiner, RECCA on site.

1055 Split spoon @ 19-21 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1103 Split spoon @ 21-23 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1115 Split spoon @ 24-26 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1125 Split spoon @ 26-28 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1130 Split spoon @ 28-30 ft Oppm AB, BZ Oppm AB, BH Oppm AB

1140 Split spoon @ 30-32 ft was removed from the auger and the sound of gas was escaping (like a hissing sound). RW grabbed the OVA & SN grabbed the hNu. OVA readings were only .5 to 1 ppm AB

& Oppm AB on the hNu. After about 45 sec. the sound changed to a hissing, building noise which continued for about 4 min. The auger is at 30 ft

and water level is at 25 ft. At first it was thought to be methane, but with back leading to back

theory. No soon as it was heard, everyone backed away. Source unknown. It had no smell.

1150 Continued drilling - leading @ 34 ft BH / ppm AB, BZ Oppm (OVA)

310 ppm AB, BZ Oppm AB. (hNu)

1205 Split spoon @ 35-37 ft: OVA - BH 4 ppm AB, hNu BH

Oppm AB, BZ Oppm AB, sample Oppm AB

Newchurch

9 August 1990 Thursday KR2040 Newchunch

2:10 Auger refusal @ 36 ft. Set up to flush out bit
25/1235 Decon 30' PVC riser + 10' PVC screen

550 Begin flushing GW-5

550 Finish flushing + begin removing AW rods
+ 3 3/8" bit.

600 Install 10' of 2" ID 0.010" slot schedule

40 PVC screen + 30' PVC riser.

TD = 34.5' ~~34.7'~~ 34.7'

620 Bob Steiner (Recon) off-site

1110 Ben seal @ 21.5' with 3 ft of seal above sand
which was at 24.5'

175 The last auger was pulled
530 Set casing + more everything that will be
needed for the shallow well to truck
for decon

540 Begin decon.

550 Powder washer will not start. will try
to jump start.

600 Still will not start. Will take apart start
+ try to by-pass.

1110 Unable to start the power washer, we
clean site + prepare to leave for the day,
while steam cleaner was down, Sybil
painted the area for trash, etc. Rick went +
painted + marked some previously installed
wells + then took a walk thru the dump
to get an idea of where to sample.

25 All off-site

~~2400~~

25
FRIDAY 10 AUGUST 1990

WEATHER: Sunny, clear, light SW wind, expected
high 85°F. As the last 2 days, there is
a natural gas odor in the air.

0740 Rick Wath (E+ESedologist) meets Sybil
Newchunch (ETE SSO)

Go to ESC for Alconox - need to decon-
by hand today.

0825 Arrive on site. Unload decon equipment.

08 Drillers are pulling the truck around
to GW-5 + staging the equipment

0840 Jack Hyden (NYSDEC-Buffalo) on site

Rick + Sybil go to purchase more
distilled water.

0900 Rick + Sybil return. Jack Hyden off-site
Begin decon of 2 augers.

1002 Finish hand decon of augers

• scrub w/ Alconox + water

• rinse w/ water

• rinse w/ methanol

• rinse w/ distilled water

• allowed to air dry.

1009 Begin ungening GW-5S

NOTE: Jim Griffin told Rick yesterday that Wath
Demick (NYSDEC-Albany) wants shallow
wells at GW-2, 4, 5, + 6. Jack Hyden
told Rick the same thing this morning.

NOTE ON GW-5S: located 8-9' toward RR
tracks from GW-5. we will take 1
confirmatory split spoon (steam cleaned
yesterday before failure of unit).
R. Wath

FRIDAY 10 AUGUST 1990

Note on GW-SS cont.: Split spoon from 4'-5'-6.5' to confirm sand lens presence will get well @ about 6.5'. Rich in out of drill log sheets so GW-SS split spoon description is presented here.

31 GW-SS split spoon #1 4.5-6.5'
Blow count 4/7/12/12

OVA readings BH Opn AB, BZ Opn AB, SS Opn AB

background OVA 3.2ppm hNu Opn
Exhauster 20.8% O₂ / 0.7% LEL
Mini Rad - normal 15 cts/min

Split spoon #1 2.0' REC.

1.0' Black/dk brown silt w/ clay followed by 1.0' of red brown sand becoming coarser grained toward bottom. Sand is saturated.

Drill to 7'. About 1-2" above 7', drilling became harder. Lee says were in the tight dry clay or that silty clay. Will set 2' of screen from 7'-5' with sand to 4'. Benseal from 4'-3' followed by grout.

5 Finish pouring sand to 4' BGs

2 Finish pouring Benseal to 3' BGs - hydrated as we went along.

Finish grouting to surface + installing protective casing
12. Wood

10 August 1990 Friday YR 2040 April Newchurch

1140 Clean area and prepare to move to decom area.

1200 Moved power washer from left truck to pick-up so drillers could bring it back to get it fixed. Clean decom area for week-end

1215 AM leave site.

1240 Pick + April arrive at warehouse at Benbur to unload truck.

1310 Leave warehouse for E+E office.

1325 Arrive at office for paperwork.

~~Split Spoon~~

~~8/13/90~~

3 August 1990 Monday YR 2040 Split Spawning

0 Split Spawning (550) + Jim Richert (site geologist) left for warehouse to bring to load van.

0 Leave warehouse for site.
0 Arrive on site. Pullus in site clearing from Pensacola + American Auger)
begin on site since 1000.
0 SN + JR went to get ice + tell Neil before we are here + want we plan to do today.

Weather: Draining, 65-70°, cloudy sky
00 Mobilize the GW-65.
20 Drillers run to hardware store to get smaller sections of screen for shallow wells.
0 Start rig + clear area for auger.
0 Meeting - all attended.
0 Location of hospital + first aid kit.
0 Start + gatoraid in van.

0 Split spoon @ 8-10 ft Oppn AB, BZ Oppn AB, Borehole Oppn AB.
0 Ground - CVA will be used + kept in plastic bag to protect it from rain + moisture.
0 Will not be used because of rain.
0 3.2 ppm Explosimeter 20.8702 / 0.8 CEL.
0 Count 3 6:17:12
0 RECOVERED 2' (100%).

0 8-8.9 - BLACK SILTY CLAY - UPPER SOIL FROM 0.17
0 3-3.8 - SAND FINE, WET YELLOWISH CLAY
0 8-7.0 - CLAY MEDIUM GRAY, DAMP, PURE,
will set a 4' screen from 8.5-9.5
0 SAND FROM 8.5-40, BENT = 40-30.
0 112 GROUT FROM 30" TO SURFACE.

J. Richert

Monday Aug 13 1990 YR-2040

1480 DRILLERS PREPARE TO COMPLETE WELL GW-65 AT 8.5' TOTAL DEPTH

RICHERT SAVED @ 402 JAR OF SAND
LAYER = 8.5' TO 8.8' JR

NO OVA READING FROM SPLIT SPOON.
MATERIALS USED TO CONSTRUCT GW-65

2" PVC SCREEN 2 JR 4.0'

2" PVC CASING 6.5'

PVC END CAPS 2

JR 1" STEEL LACING PROTECTIVE CASING 1

BENTONITE 1/4 BAG

SAND 1 BAG

CEMENT 5 TO 3/4 BAG

1440 WELL IS COMPLETED

1450 LISA HELTON OF ETE ARRIVES ON SITE

DRILLERS DECOMMISSION AUGERS

1500 DRILLERS FINISHED DECOMMISSIONING

1524 RIG SETTING UP AT GW-25

1530 BEGIN DRILLING GW-25 2' AWAY FROM GW-2

GW-25 IS FURTHER FROM THE ROAD.

1543 Split spoon @ 6.5'-8.5' Oppn AB, BZ Oppn AB, BH Oppn AB

1615 Set screen + sand to 5 ft.

1630 Set casing

MON 8-13-90

0900 RICHERT DEPARTS OFF CAMP
0915 RICHERT ARRIVES AT SITE

[Handwritten signature]

J-24

31

TUES 8-14-90

0900 RICHERT & HERTON ARRIVE ON SITE
DRILLERS ARE HERE & START CLEANING

GOALS FOR TODAY:

① DRILL & COMPLETE GWYS

② BEGIN DEVELOPING WELLS

WEATHER: PARTLY CLOUDY - FOGGY 70°F
FORECAST: SUNNY & 80°F

0910 RICHERT MEETS w/ NIEL SAEFER OF
APPLIED DESIGN TO UPDATE HIM ON
PROGRESS & PLANNED ACTIVITIES

0915 RICHERT MEETS WITH AN ANDOR REP.

TO ASK IF THEY COULD UNLOCK A
CHAIN IN ORDER TO ALLOW ACCESS

BETWEEN WELLS. HE SAID

HE WOULD WORK IT NOW & LEAVE

IT OPEN FOR THE NEXT 2 DAYS

0920 BEGIN DRILLING GW-MS.

0935 SPIT DOWN S-1 7-90' INTO RECOVERY

TOTAL DEPTH AT 8.0'

SCREEN = 5.0-8.0

BENT - 4.0-3.0'

GROUT - 3.0-0'

SAND - 8.0'-4.0'

0940 REACHED TOTAL DEPTH AT 8.0'

0941 BEGAN CONSTRUCTING WELL

1015 WELL IS COMPLETE

DECOMING. RIG.

1030 FINISHED DECOMING. Spill Cleanup on site.

[Handwritten signature: J. Richert]

TUES 8-14-90

INITIAL

WELL DEPTH, WATER LEVEL, VOLUMES

WELL #	DATE	TIME	TOTAL DEPTH	WATER LEVEL	ONE VOL. (GAL)	THREE VOL. (GAL)
GW-1	8-15-90	1037	38.5'	13.1'	2.84	8.51
GW-2	8-14-90	1645	32.65'	12.4'	3.30	9.90
GW-2S				-0-		
GW-3	8-15-90	1035	30.95'	9.90'	3.43	10.29
GW-4	8-14-90	1030	38.3'	10.5'	4.54	13.61
GW-4S	8-15-90	1300	7.55'	4.1'	0.56	1.69
GW-5	8-14-90	1435	36.25'	10.25'	4.24	12.71
GW-5S	8-14-90			-0-		
GW-6	8-15-90	1323	33.85'	8.50'	4.13	12.40
GW-6S	8-15-90	1325	7.48'	6.27'	0.18	0.55

MEASUREMENTS ARE FROM GROUND SURFACE

140 DRILLERS STEAM CLEANING TREMMIE RODS

155 BEGIN DEVELOPING GW-4 PUMPING PROBLEMS

15 " " "

DEVELOPMENT RECORD FOR GW-4

0.5/CM

TIME	CUM VOLUME	TEMP	PH	COND	TURBIDITY	COMMENTS
15	1.3 GAL	38.6°F	10.31	3.15X1000	>200	VERY CLOUDY
	3	86.4	10.77	2.00X1000	>200	"
	5	78.6	11.06	2.47X1000	161.0	"
	10	83.7	10.77	1.04X1000	189.5	"
	15	86.3	9.62	5.64X100	>200	"
	20	69.60	9.42	5.54X100	>200	"
	25	69.9	8.79	5.55X100	>200	"
	30	66.0	8.77	5.50X100	>200	"
	35	70.0	8.38	5.24X100	>200	"

14 August 1990 Tuesday YR 2040 Sgt H Newchurch

1220 HEATON 5 YBIL JOHN 644E
Separate the 2VCEH.1230 FLEET of American Angus catfishes
from pulling their water tank
TOOK 800 GALLONS TOTAL TO DATE 7200gal1313 HEATON, HOOD, NEWCHURCH RETURN ON SITE
1330 REVERSEMENT OF GW-4 COMPLETE AFTER
PUMPING 98 GALLON. WATER LEVEL AT
31.4' BGS.1340 SN + JH want to get galvanized, use & trash bags.
Jim Rickett left site. LH moved to GW-4 + 45.
1430 SN, JH + LH move to GW-5 + 55 when the drillers
were waiting.1440 SN spray painted well caps. Start development of
GW-5, no water in GW-55.1455 LH left site to call G & E office.
1530 LH return to site.

1620 Complete development & drillers move to GW-2.

G & E replaces chain site & prepare to move

1635 Stopped for gas in van while drillers decon.

1645 Begin development

1820 Finished GW-2. Drillers off site &
all G & E employees.Sgt H Newchurch
8/14/90

08-15-90

WUKUTZER PH. II

430 E & E ARRIVE ON SITE DEILLERS ARE PRESENT

3938 W.L. AT MW45 = 4.1' BGS, T.D. = 7.55' BGS.
3956 W.L. AT MW25 = 0.0' BGS

1010 W.L. AT MW55 = 0.0' BGS, T.D. 9.58' BGS
Weather - sunny, windy 5-10 mph, T in low 70's predicted high low 80's.

MW out w/ bal span 54pm for 10.2cV @ 0935.

All wells were read with fNu as the cap were removed. All were Oppa AB background 0.0ppm.

1035 Start development on GW-3 + GW-1. Lisa Delta left site to call E+E office

1100 LH return to site.

1130 GW-3 went dry so moved equipment to GW-1.

A TOTAL OF 12 GAS. PURGED FROM GW-1; PH, COND. TEMP, TURBIDITY STABILIZED. Syd Newcomb left site to check in with Neil Salter.

1140 SN return to site.

1210 Finish GW-1.

220 SN + LH left site for lunch. The drillers left site to check out of hotel.

255 SN + LH return to site + prepare to start development of GW-45.

300 Drillers return to site. Begin development.

315 Finish development on GW-45 + moving to GW-6 RES.

325 LH takes water back + SN takes fNu as caps are being opened. Oppm AB

335 Begin development of GW-6 + 65.

405 GW-65 went dry

1450 GW-6 went dry. Clean area + prepare to leave for next job.

Shuchner

15 August 1990 Wednesday R2040 Shuchner

1500 All employees leave site.

1530 LH + SN arrive at E+E office.

8/16/90
J.D. Shuchner

TUESDAY AUGUST 28, 1990

YEZ0160

WEATHER: PLY SUNNY, HUMID, 75°, WINDS SOUTH 5-10 mph

PERSONNEL: C. EICH J. RANER

1000 J. RANER PICKED UP C. EICH AT HOME. PICKED UP RENTAL VAN, STOPPED AT E+F TO CONFIRM SAMPLE LOCATIONS w/ R. WATT. PICKED UP PAPERWORK

STOPPED AT WAREHOUSE TO GET PRE + MONIT EQUIP. HNU CALIBRATED 54 ppm, SPAN 7.8, 10.2 ppm

1300 LEFT FOR SITE. STOPPED FOR ROPE + STEEL DRAIN. ARRIVE ON-SITE. MET WITH NEIL SAFFER. TOLD HIM WHAT WE WOULD DO TODAY. BACK 8/29 @ 0830. HE WILL HAVE REBA PERSON HERE.

DRIVE AROUND SITE + LOCATED ALL WELLS TO PREPARING TO PURGE WELLS 4 + 4S HNU SNIFE OF GW-4 + GW-4S - Oppm.

Oppm BACKGROUND C. EICH + J. RANER DOWN TIER TO BEGIN PURGING

1400 W.L. IN GW-4S - 5.42 BGS TD GW-4S - 7.55

2.13' OF WATER

+ GALS. TO PURGE

MOVED TO GW-4 - Oppm on HNU

W.L. IN GW-4 10.28' TD IN GW-4 38.3'

28.02

4 GALS TO PURGE

W.L. IN GW-4 10.28' TD IN GW-4 38.3'

TUESDAY AUGUST 28, 1990

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Oppm BACKGROUND C. EICH + J. RANER DOWN TIER TO BEGIN PURGING

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2.13' OF WATER

+ GALS. TO PURGE

MOVED TO GW-4 - Oppm on HNU

W.L. IN GW-4 10.28' TD IN GW-4 38.3'

28.02

4 GALS TO PURGE

W.L. IN GW-4 10.28' TD IN GW-4 38.3'

37

TUESDAY AUGUST 28, 1990

YEZ0160

WEATHER: PLY SUNNY, HUMID, 75°, WINDS SOUTH 5-10 mph

PERSONNEL: C. EICH J. RANER

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DRIVE AROUND SITE + LOCATED ALL WELLS TO PREPARING TO PURGE WELLS 4 + 4S HNU SNIFE OF GW-4 + GW-4S - Oppm.

Oppm BACKGROUND C. EICH + J. RANER DOWN TIER TO BEGIN PURGING

1400 W.L. IN GW-4S - 5.42 BGS TD GW-4S - 7.55

2.13' OF WATER

+ GALS. TO PURGE

MOVED TO GW-4 - Oppm on HNU

W.L. IN GW-4 10.28' TD IN GW-4 38.3'

28.02

4 GALS TO PURGE

W.L. IN GW-4 10.28' TD IN GW-4 38.3'

TUESDAY AUGUST 20, 1990

482060

AT GW-65

WL GW-65-6.42' BGS

TD

7.40 BGS

1/2 GAL TO PURGE

PH Temp. COND.

7.12 65.4 0.72 x 1000

light brown

WENT DRY AFTER LESS THAN 1/2 GAL.

D AT GW-5 LOCATION - 0 ppm ON HNW, BSH WELLS

WELL GW-5 DID NOT HAVE A LOCK ON IT

W.L. IN GW-5 9.45'

TD GW-5 36.25'

13 GALS TO PURGE 26.80

2 WELL GW-55 DRY TD 6.52' BGS

TOOK LOCK OFF OF GW-55 + PUT IT

ON GW-5

TIME	TEMP	PH	COND	TUBER	GALS	COMMENTS
50	60.4	10.88	1.16	7200	0	W/LT, BROWN
55	60.8	9.23	0.58	7200	13+	CLOUDY LT. BROWN

START w/ VOA'S, THEN BNA'S - (CALLED J. GRIFFIN

TO FIND OUT WHAT BOTTLES TO FILL IN GW-65)

WEDNESDAY AUGUST 29, 1990

482060

WEATHER: SUNNY, WARM, 75°

PERSONNEL: C. EICH, J. RANER

0730 C. EICH LEAVES HOME IN RENTAL VAN TO PICK UP

J. RANER - STOPPED FOR ICE + GATORADE

0820 PICKED UP J. RANER + LEFT FOR SITE (CALL R. WATT

0833 ARRIVED AT WURTLER. MET w/ N. SAFFER WHO

SAID B. STEINER FROM RECPA WILL BE HERE THIS

MORNING SOMETIME. UNSURE IF HE WANTS TO SPLIT

ALL SAMPLES OR JUST WELLS. N. SAFFER TOLD US

TO JUST GO AHEAD + GET STARTED

0920 COLLECTED SAMPLE SW-2 FROM CREEK

UPSTREAM OF WURTLER PLANT.

ALSO COLLECTED M/MSD.

TEMP - 69.1

COND - 0.69 x 1000

PH - 6.67

0930 COLLECTED SAMPLE SED-2. BLACK SEDIMENT.

1000 COLLECTED SAMPLE SW-1. DOWNSTREAM OF

WURTLER PLANT IN SAWYER CREEK.

STRAIGHT ACROSS N.F. BLVD. FROM MELODY FAIR

SIGN.

TEMP - 69.2

COND - 0.73 x 1000

PH - 6.69

1010 COLLECTED SAMPLE SED-1 - BLACK SEDIMENT SANDY

1026 R. WATT ON-SITE.

1035 COLLECTED SAMPLE S-1. SOIL NEAR GW-1

1040 COLLECTED SAMPLE S-4. SOIL NEAR GW-3

1045 COLLECTED SAMPLE S-3

1050 COLLECTED SAMPLE S-2

COLLECTED ADDITIONAL VOLUME OF SOIL

FROM EACH LOCATION FOR EP TOX

WEDNESDAY AUGUST 29, 1990 422000
 555 COLLECTED SAMPLE GW-5
 WL 9.9' BGS
 TEMP: 60.4
 CLOUD 0.98 x 1000
 TURB 7200
 D B. STEINER LEFT SITE
 220 BACK AT GW-45 COLLECTED METALS SAMPLE
 227 BACK AT GW-65. COLLECTED ~ ANOTHER 1/4 OF
 BNA. TOTAL NOW ~ 1/2 FULL.
 COMPLETED SAMPLING GW-65
 45 COMPLETED SAMPLING GW-45
 TOTAL: 2 VOLS
 1-1/2 GAL AMBER (BNA + PET/PCB)
 1-1/2 polt (METALS)
 1/2-1/2 polt (CW-)
 50 (LEAVING FOR WAREHOUSE
 55 ARRIVE AT ESC CLOSED
 55 DROPPED OFF SAMPLES AT LAB. WHILE BRINGING
 SAMPLES IN WE DROPPED A COOLER + BROKE THE
 PET/PCB BOTTLE FROM GW-3 + THE BNA BOTTLE
 FROM GW-6. R. MARSH SAID THEY COULD RUN BOTH.
 ANALYSIS ON THE REMAINING 1/2 GAL'S
 5 DROPPED EQUIPMENT OFF AT EYE HQ
 5 RETURNED RENTAL VAN.

C1
 Chel

THURSDAY 20 SEPTEMBER 1990 422000

WEATHER: Sunny, clear, 55-60°F

PERSONNEL: Rick Wath + Mike Withraver

OBJECTIVE: Today: purge GW-65

Tomorrow: sample 65 for Metals, CN, + BNA

0830 Rick + Mike leave for ESC

Pick up bailer

WL indicator 13-03-012

Turbidimeter 02-03-002

pH/temp 02-01-015

COND MH 02-01-002

0920 Arrive on-site

Pick checks in @ ANCOR

 0930 Open GW-65. No water detected with WL IND.
 TRY WITH BAILER - LESS THAN 1" WATER @ BOTTOM.

0940 GW-25 - Dry.

0945 GW-55 - Dry

0950 Leave site.

DEVEL.
WATER SAMPLING LOG

Date: 08-15-90 Project: WURLITZER PH. II Job Number: YR2040

Well Number: MWD 1 Sample Number: _____

Water Level: 13.1' (BGS/TOC) Total Depth: 30.5' (BGS/TOC)

Stick-up: 2.0' 1 x Volume: 2.84
3 x Volume: 8.51 GALS Actual Purge Volume: 12.52 GALS

Purge Time Start: 1037 Finish: H20 1211

Volume (GALS.)	pH	Conductivity (x)	Temperature	Turbidity
<u>1</u>	<u>6.5</u>	<u>7.43 X100</u>	<u>64.2</u>	<u>7200</u>
<u>2</u>	<u>6.8</u>	<u>5.25 X100</u>	<u>66.5</u>	<u>7200</u>
<u>3</u>	<u>10.28.64</u>	<u>10.27 X100</u>	<u>65.7</u>	<u>" 1.98</u>
<u>5</u>	<u>7.39</u>	<u>6.06 X100</u>	<u>61.9</u>	<u>" 1.4</u>
<u>10</u>	<u>7.96</u>	<u>8.01 X100</u>	<u>60.7</u>	<u>" 1.5</u>
<u>15</u> ~~15.12~~	<u>6.96</u>	<u>9.25 X100</u>	<u>65.5</u>	<u>7200</u>
<u>20</u> ~~20~~	<u>7.59</u>	<u>9.96 X100</u>	<u>62.4</u>	<u>7200</u>
<u>25</u> ~~25~~	<u>11.89</u>	<u>9.43 X100</u>	<u>66.6</u>	<u>"</u>
<u>30</u> ~~30~~	<u>9.24</u>	<u>6.14 X100</u>	<u>66.8</u>	<u>4</u>
<u>35</u>	<u>6.63</u>	<u>8.28 X100</u>	<u>66.3</u>	<u>"</u>
<u>40</u>	<u>9.57</u>	<u>8.38 X100</u>	<u>61.7</u>	<u>"</u>
<u>45</u>	<u>9.59</u>	<u>8.25 X100</u>	<u>63.2</u>	<u>"</u>
<u>48</u>	<u>9.58</u>	<u>8.43 X100</u>	<u>61.2</u>	<u>"</u>
<u>50</u>	<u>9.62</u>	<u>8.38 X100</u>	<u>61.2</u>	<u>"</u>

WATER FLUCTUATES
WIDELY FOR COND. READINGS

Sample Date/Time: _____

Sampler: _____

DEVEL.
WATER SAMPLING LOG

Date: 08-14-20 Project: WURLITZER PH. II Job Number: YR2640

Well Number: MW02 Sample Number: _____

Water Level: 12.4' (BGS/TOC) Total Depth: 32.65' (BGS/TOC)

Stick-up: 2.0' 1 x Volume: 3.30
3 x Volume: 9.90 GALS Actual Purge Volume: 57.5 GALS

Purge Time Start: 1647 Finish: 1820

Volume (GALS)	pH	Conductivity (x)	Temperature (OF)	(NTU) Turbidity
<u>1</u>	<u>9.64</u>	<u>11.92 x 100</u>	<u>63.2</u>	<u>7200</u>
<u>4</u>	<u>9.33</u>	<u>8.74 x 100</u>	<u>63.3</u>	<u>720</u>
<u>5</u>	<u>7.88</u>	<u>6.61 x 100</u>	<u>60.9</u>	<u>7200</u>
<u>10</u>	<u>6.66</u>	<u>7.43 x 100</u>	<u>62.1</u>	<u>720</u>
<u>15</u>	<u>6.55</u>	<u>6.07 x 100</u>	<u>62.4</u>	<u>7200</u>
<u>20</u>	<u>6.49</u>	<u>6.29 x 100</u>	<u>61.0</u>	<u>7200</u>
<u>25</u>	<u>6.37</u>	<u>6.16 x 100</u>	<u>59.4</u>	<u>7200</u>
<u>30</u>	<u>6.53</u>	<u>6.17 x 100</u>	<u>59.6</u>	<u>7200</u>
<u>35</u>	<u>6.53</u>	<u>6.61 x 100</u>	<u>59.9</u>	<u>7200</u>
<u>40</u>	<u>6.44</u>	<u>6.04 x 100</u>	<u>59.3</u>	<u>7200</u>
<u>45</u>	<u>6.42</u>	<u>5.54 x 100</u>	<u>59.2</u>	<u>7200</u>
<u>50</u>	<u>6.41</u>	<u>6.03 x 100</u>	<u>59.3</u>	<u>7200</u>
<u>52.5</u>	<u>6.55</u>	<u>5.76 x 100</u>	<u>59.2</u>	<u>7200</u>
<u>55</u>	<u>6.59</u>	<u>6.39 x 100</u>	<u>59.1</u>	<u>7200</u>
<u>57.5</u>	<u>6.56</u>	<u>6.35 x 100</u>	<u>58.9</u>	<u>7200</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Sample Date/Time: _____

Sampler: _____

DEVEL.
WATER ~~SAMPLING~~ LOG

Date: 08-15-90 Project: WURITZER, PA. II Job Number: YR 2040

Well Number: MW03 Sample Number: _____

Water Level: 9.90' (BGS/TOC) Total Depth: 30.95' (BGS/TOC)

Stick-up: 2.0 1 x VOLUME: 3.43
3 x Volume: 10.29 GALS Actual Purge Volume: 12 GALS

Purge Time Start: 10:35 Finish: 1120 (OKY APT 12 GALS)

[illegible]

Sample Date/Time: _____

Sampler: _____

DEVEL.
WATER SAMPLING LOG

Date: 08-14-90 Project: WURLITZER PH. II Job Number: YR2040

Well Number: MW04 Sample Number:

Water Level: 10.5' (BGS/TOC) Total Depth: 38.3' (BGS/TOC)

Stick-up: 2.0' 1 x Volume: 4.53 3 x Volume: 13.6 GALS Actual Purge Volume: 48 GALS

Purge Time Start: 1057 Finish: 1330

Volume (GALS.)	pH	Conductivity (x)	Temperature (OF)	(NTU) Turbidity
<u>1.3</u>	<u>10.31</u>	<u>3.15 x 1000</u>	<u>88.6</u>	<u>> 200</u>
<u>2</u>			<u>8</u>	
<u>3</u>	<u>10.77</u>	<u>2.00 x 1000</u>	<u>86.4</u>	<u>7200</u>
<u>5</u>	<u>11.06</u>	<u>2.47 x 1000</u>	<u>98.6</u>	<u>161.4</u>
<u>10</u>	<u>10.77</u>	<u>1.04 x 1000</u>	<u>83.7</u>	<u>189.5</u>
<u>15</u>	<u>9.62</u>	<u>5.64 x 100</u>	<u>86.3</u>	<u>> 200</u>
<u>20</u>	<u>9.42</u>	<u>5.54 x 100</u>	<u>69.6</u>	<u>> 200</u>
<u>25</u>	<u>8.79</u>	<u>5.55 x 100</u>	<u>69.9</u>	<u>> 200</u>
<u>30</u>	<u>8.47</u>	<u>5.5 x 100</u>	<u>66.0</u>	<u>> 200</u>
<u>35</u>	<u>8.38</u>	<u>5.36 x 100</u>	<u>70.0</u>	<u>> 200</u>
<u>42</u>	<u>8.39</u>	<u>6.05 x 100</u>	<u>69.6</u>	<u>> 200</u>
<u>46</u>	<u>8.49</u>	<u>5.21 x 100</u>	<u>67.2</u>	<u>> 200</u>
<u>48</u>	<u>8.98</u>	<u>4.87 x 100</u>	<u>66.2</u>	<u>> 200</u>

W.L. AFTER 48 GALS. = 31.4' BGS

Sample Date/Time:

Sampler:

DEVEL.
WATER ~~SAMPLING~~ LOG

Date: 08-15-90 Project: WURITZER P.H. II Job Number: YR 2040

Well Number: 116048 Sample Number: 1

Water Level: 4.1' (BGS/TOC) Total Depth: 7.55' (BGS/TOC)

Stick-up: 1.5 1 x Volume: 0.56
3 x Volume: 1.69 GALS Actual Purge Volume: 4.5 GALS

Purge Time Start: 1300 Finish: 1330 Dry HPI. 4.5 GALS

[illegible]

Sample Date/Time: _____

Sampler: _____

DEVEL,
WATER ~~SAMPLING~~ LOG

Date: 08-14-90 Project: WURLITZER Ph II Job Number: YR 2040

Well Number: MW05 Sample Number: _____

Water Level: 10.25 (BGS/TOC) Total Depth: 36.25 (BGS/TOC)

Stick-up: 2.0' 1 x Volume: 4.24
3 x Volume: 12.71 GALS Actual Purge Volume: 45 GALS

Purge Time Start: 1435 Finish: 1630

Volume (GALS.)	pH	Conductivity (x ~~100~~)	Temperature (°F) ^(NTC)	~~Temp~~
<u>1</u>	<u>8.43</u>	<u>8.21 x 100</u>	<u>71.0</u>	<u>>20</u>
<u>2.5</u>	<u>4.24</u>	<u>8.00 x 100</u>	<u>64.5</u>	<u>>200</u>
<u>5</u>	<u>7.74</u>	<u>4.23 x 100</u>	<u>64.5</u>	<u>>200</u>
<u>10</u>	<u>7.35</u>	<u>3.77 x 100</u>	<u>61.3</u>	<u>03.4</u>
<u>15</u>	<u>7.21</u>	<u>4.04 x 100</u>	<u>62.7</u>	<u>11.0</u>
<u>20</u>	<u>7.25</u>	<u>4.44 x 100</u>	<u>63.6</u>	<u>33.3</u>
<u>25</u>	<u>7.25</u>	<u>5.08 x 100</u>	<u>65.2</u>	<u>>200</u>
<u>30</u>	<u>7.36</u>	<u>5.28 x 100</u>	<u>67.9</u>	<u>>200</u>
<u>35</u>	<u>6.82</u>	<u>8.48 ~~6.82~~ x 100</u>	<u>64.8</u>	<u>>200</u>
<u>40</u>	<u>7.30</u>	<u>4.30 x 100</u>	<u>63.1</u>	<u>>200</u>
<u>45</u>	<u>6.71</u>	<u>7.95 x 100</u>	<u>61.5</u>	<u>>200</u>
<u>50</u>			~~59.1~~	

Sample Date/Time: _____

Sampler: _____

DEVEL.
WATER SAMPLING LOG

Date: 08-15-90 Project: WURITZER PH II Job Number: VR 2040

Well Number: MW06 Sample Number: _____

Water Level: 8.50' (BGS/TOC) Total Depth: 33.85' (BGS/TOC)

Stick-up: 2.10' 1 x Volume: 4.13
3 x Volume: 12.40 GAS Actual Purge Volume: 13.5 GAS

Purge Time Start: 1325 Finish: 1500 DRY AT 13.5 GAS

Volume	pH	Conductivity (x)	Temperature	Turbidity
<u>1</u>	<u>6.06</u>	<u>4.03 x 100</u>	<u>65.9</u>	<u>7200</u>
<u>2</u>				
<u>3</u>	<u>1.47</u>	<u>5.00 x 100</u>	<u>69.7</u>	<u>"</u>
<u>5</u>	<u>8.87</u>	<u>4.00 x 100</u>	<u>59.0</u>	<u>"</u>
<u>10</u>	<u>5.70</u>	<u>2.53 x 100</u>	<u>58.4</u>	<u>"</u>
<u>12.5 15</u>	<u>4.96</u>	<u>2.48 x 100</u>	<u>61.7</u>	<u>"</u>
<u>13 20 13</u>	<u>5.39</u>	<u>3.39 x 100</u>	<u>61.6</u>	<u>"</u>
<u>14 25 13.5</u>	<u>4.65</u>	<u>3.39 x 100</u>	<u>61.6</u>	<u>"</u>
<u>20 30</u>				
<u>22 35</u>				
<u>25 40</u>				
<u>45</u>				
<u>50</u>				
<u>55</u>				

Sample Date/Time: _____

Sampler: _____

J-37

DEVEL.
WATER ~~SAMPLING~~ LOG

Date: 8-15-90 Project: WURLITZER PA. II Job Number: YR2040

Well Number: MW068 Sample Number: _____

Water Level: 6.27' (BGS/TOC) Total Depth: 7.40' (BGS/TOC)

Stick-up: 2.0' 1 x Volume: 0.18
3 x Volume: 0.55 Gals Actual Purge Volume: 3.5 Gm³

Purge Time Start: 13:37 Finish: 14:10 124 17 3.5 GALS

Volume (GALS)	pH	Conductivity (x)	Temperature	TURBIDITY
0.5	5.81	5.70 X 100	61.6	> 200

1.0 4.11 5.52×10^8 64.3 1

1.5 4.20 5.69×100 63.9 1.5

2 3.07 4.83 (100) 64.2 "

2.5 3.59 3.89 \times 10^2 57.9 "

3 3.27 3.77×10^2 58.1 1.1

3.5 3.18 4.12×10^3 57.4

Sample Date/Time:

Sampler: _____