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YO4080 D2824

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

PHASE II INVESTIGATIONS

Old Land Reclamation
Site No. 915129
Village of Depew, Erie County

March 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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STATE OF NEW YORK
ALEXANDER H. WHITMAN, JR.
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LICENSED PROFESSIONAL ENGINEER

Prepared for:

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recycled paper

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1. EXECUTIVE SUMMARY

1.1 SITE DESCRIPTION AND BACKGROUND

The Old Land Reclamation site is an inactive landfill located on Broadway in the southwest section of the Village of Depew, Erie County, New York (see Figures 1-1 and 1-2). The 64-acre site is bordered by Broadway on the north, Cayuga Creek on the south, and farm pasturage to the east. A Conrail right-of-way separates the site from an inactive landfill (Land Reclamation Site) and active transfer station and scrap-yard operation due west of the site. The site is currently owned by four separate parties: the Village of Depew, the Mecca Brothers of North Collins, Hirsch et al. of Buffalo, and Samuel Greenfield of Buffalo, New York.

From the period of 1960 through 1968, Samuel Greenfield leased the property to GCF, Inc. for use as a garbage and refuse disposal site. In October 1968, the property was sublet to Wilfred E. Schultz, Inc., by GCF, Inc. During the next two years, the Schultz corporation disposed of municipal solid waste under contract with the Town of Cheektowaga and the Village of Depew. In April 1970, the Schultz corporation assigned its rights under the lease and municipal contracts to the South Ogden Land Development Corporation, an affiliate of NEWCO Waste Systems, now BFI Waste Systems. From 1970 to 1975, the South Ogden Land Development Corporation operated the Old Land Reclamation landfill while leasing an additional portion of the site owned by the Mecca Brothers. The site was operated as a solid waste landfill from approximately 1960 to 1975 and received municipal and industrial wastes, including miscellaneous refuse, foundry sand, slag, fly ash, oil sludge, pine-tar pitch, inks, and waste colors.

Previous investigations began in 1984 when the Erie County Department of Environment and Planning (DEP) conducted a sampling study and site evaluation. This investigation included a review of aerial photographs taken from 1958 through 1978 that depicted the historical progression of landfilling operations at the site. Analyses of surface water samples indicated that barium, lead, zinc, phenol, aniline, and aniline derivatives were present in drainage ditches and leachate seeps at concentrations in excess of the New York state regulatory and guidance criteria for discharges to state receiving waters. Soil at the site contained metals at concentrations exceeding United States Environmental Protection Agency (EPA) standards for unpolluted sediments, but the concentrations did not differ significantly from those of background urban soils in the Buffalo area. The Erie County DEP concluded that elevated concentrations of phenols, aniline, and aniline derivatives, in conjunction with the visible observation of foundry sand and 55-gallon drums at the site, indicated that the landfill had received industrial waste.

A Phase I investigation, which included a site inspection in January 1986, was conducted by Recra Environmental, Inc., for the New York State Department of Environmental Conservation (NYSDEC). The site inspection report states that wastes at the site were covered, but leachate seeps were observed. No air monitoring was performed during the Phase I site inspection.

Upon review of the Phase I study and other agency file information, NYSDEC concluded that further investigation of the site was necessary.

1.2 PHASE II INVESTIGATION

In an effort to evaluate the extent of contamination at the site, determine the potential risk to human health and the environment, and accurately calculate a final Hazard Ranking System (HRS) score, a number of investigative tasks were performed at the Old Land Reclamation site. The Phase II field investigation begun by Ecology and Environment Engineering, P.C. (E & E) in April 1989 included a site reconnaissance; a geophysical survey employing three methods; the installation of one overburden and three bedrock groundwater monitoring wells; and the collection and analysis of sediment, surface water, groundwater, and leachate/shallow groundwater samples at selected on-site and adjacent property locations.

Prior to the site inspection conducted as part of the site reconnaissance, E & E performed both a detailed record and file search, to allow for review of existing data and identification of data gaps, and a limited air monitoring survey with a photoionization detector. The three geophysical survey methods--magnetometer, EM31, and EM34-3 surveys--were used to optimize the selection of the four monitoring well locations and reduce the risks associated with drilling into unknown terrain and wastes by delineating the boundaries of fill material at the site. E & E collected and analyzed sediment, water, and leachate samples to determine the presence of contaminants and assess their respective mobilities.

1.3 SITE ASSESSMENT

During the Phase II site reconnaissance, exposed fill was observed on the surface of the landfill. A large volume of fill was also exposed on the southern edge of the landfill as a result of Cayuga Creek bank erosion during periods of high water. Additionally, several leachate seeps were observed breaching the southern edge of the landfill and discharging directly into Cayuga Creek. The site is not secure, as evidenced by numerous horse and all-terrain vehicle (ATV) trails.

The geophysical survey performed at the site indicated several electromagnetic terrain conductivity and total earth field magnetic anomalies. These anomalies suggest that an abundance of ferrous material is present within the landfill and/or that a specific conductance gradient is present in the groundwater beneath the site.

Geologic logs from the on-site drilling indicate that assorted fill material is present below monitoring well locations GW-2A and GW-2B (see Figure 1-3) from approximately 5 to 30 feet below the ground surface. Approximately 7 feet of clay-rich soil covers fill material consisting of brick, wood, paper, and plastic at these two well locations. This fill material directly overlies alluvial silt and sand, which is separated from jointed and horizontally-fractured Onondaga Limestone by a layer of lacustrine clay (see Appendix C). No fill material was observed during the drilling of monitoring wells GW-6A or GW-7A (see

Figure 1-3). Approximately 8.5 feet of alluvial clay, silt, sand, gravel, and pebbles overlie Onondaga Limestone at these Cayuga Creek floodplain monitoring well locations (see Appendix C).

Groundwater elevations measured in the bedrock monitoring wells during July 1989 and February 1990 indicate that local groundwater flows in a southwest direction, congruent with the Cayuga Creek channel orientation. The groundwater elevation measured in the overburden well, GW-2B, indicates that considerable downward gradient exists between the first zone of saturation beneath the site and the bedrock aquifer. Additionally, the groundwater elevation measured in GW-2B relative to Cayuga Creek surface water elevations suggests that the direction of flow within the first zone of saturation beneath the site is south toward Cayuga Creek.

Sediment, surface water, groundwater, and leachate/shallow groundwater samples collected at the site (see Figure 1-3) were analyzed for Target Compound List (TCL) organics, including volatile organics, base/neutral and acid extractables (BNAs) and pesticides/polychlorinated biphenyls (PCBs). In addition, these samples were analyzed for TCL inorganic constituents and cyanide.

Groundwater samples were collected from GW-2A, GW-2B, GW-6A, and GW-7A for analysis. Analysis of samples from the overburden monitoring well GW-2B detected benzene and related compounds, toluene, and xylenes. Additionally, phenols, benzoic acid, and naphthalene were present in the first zone of saturation beneath the landfill. Concentrations of cadmium, iron, lead, and manganese were in excess of the NYSDEC standards for Class GA groundwater. Benzene and phenols were detected in the GW-2A bedrock well sample. Iron and manganese concentrations were in excess of the NYSDEC standards in the GW-2A sample. Samples collected at downgradient bedrock monitoring wells GW-6A and GW-7A exhibited benzene, toluene, and xylene contamination. Additionally, benzene-related compounds, phenol, and chloroaniline were found in the GW-7A sample. Total iron and manganese were found in excess of NYSDEC standards in the GW-6A and GW-7A samples.

Two leachate/shallow groundwater samples collected at sampling locations TP-1 and TP-2 included benzene and benzene-related compounds and xylenes. Additionally, toluene was detected in the TP-2 sample.

Total iron, magnesium, and manganese were found at concentrations in excess of NYSDEC regulatory limits for surface water at both sample points. Total aluminum and zinc also were found to be excessive in the TP-2 sample.

Surface water samples (SW-1 and SW-2) and sediment samples (SD-1 and SD-2) were collected along the north bank of Cayuga Creek. No TCL volatile or semi-volatile organic compounds were detected in either the surface water or sediment samples. Inorganic analysis of the surface water samples indicated excessive concentrations of aluminum and iron at the SW-2 location. BNA analysis indicated the presence of a variety of polynuclear aromatic hydrocarbon (PAH) compounds in the sediment samples. The concentrations of semi-volatile organic compounds were consistently higher in the downstream sediment sample, SD-2. Inorganic analysis of the sediment samples did not indicate the presence of metals at concentrations exceeding the typical range for soils of the eastern United States (Shacklette and Boerngen 1984).

No pesticides or PCBs were detected in any of the samples collected. Cyanide was not detected at significant levels in any of the sample matrices collected.

The air monitoring surveys, using a portable HNu photoionization detector, revealed no indication of volatile organics above background levels in ambient air at the site.

The nature and extent of organic and inorganic contamination found in groundwater, leachate, and surface water/sediment samples collected are consistent with reports that the landfill was used for the disposal of municipal waste and a variety of industrial wastes. Elevated concentrations of TCL metals in surface water and semi-volatile organic compounds in sediment collected directly downstream of the landfill indicate that the site is contributing to contamination of Cayuga Creek. This creek is designated a Class C stream under 6 NYCRR 835 and 701. Class C waters are considered suitable for fishing and other uses except as sources of drinking water or for primary-contact recreation.

1.4 HAZARD RANKING SYSTEM SCORE

The HRS was completed to quantify risks associated with the Old Land Reclamation 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:

- 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).
- S_{FE} reflects the potential for harm from substances that can explode or cause fires.
- S_{DC} reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

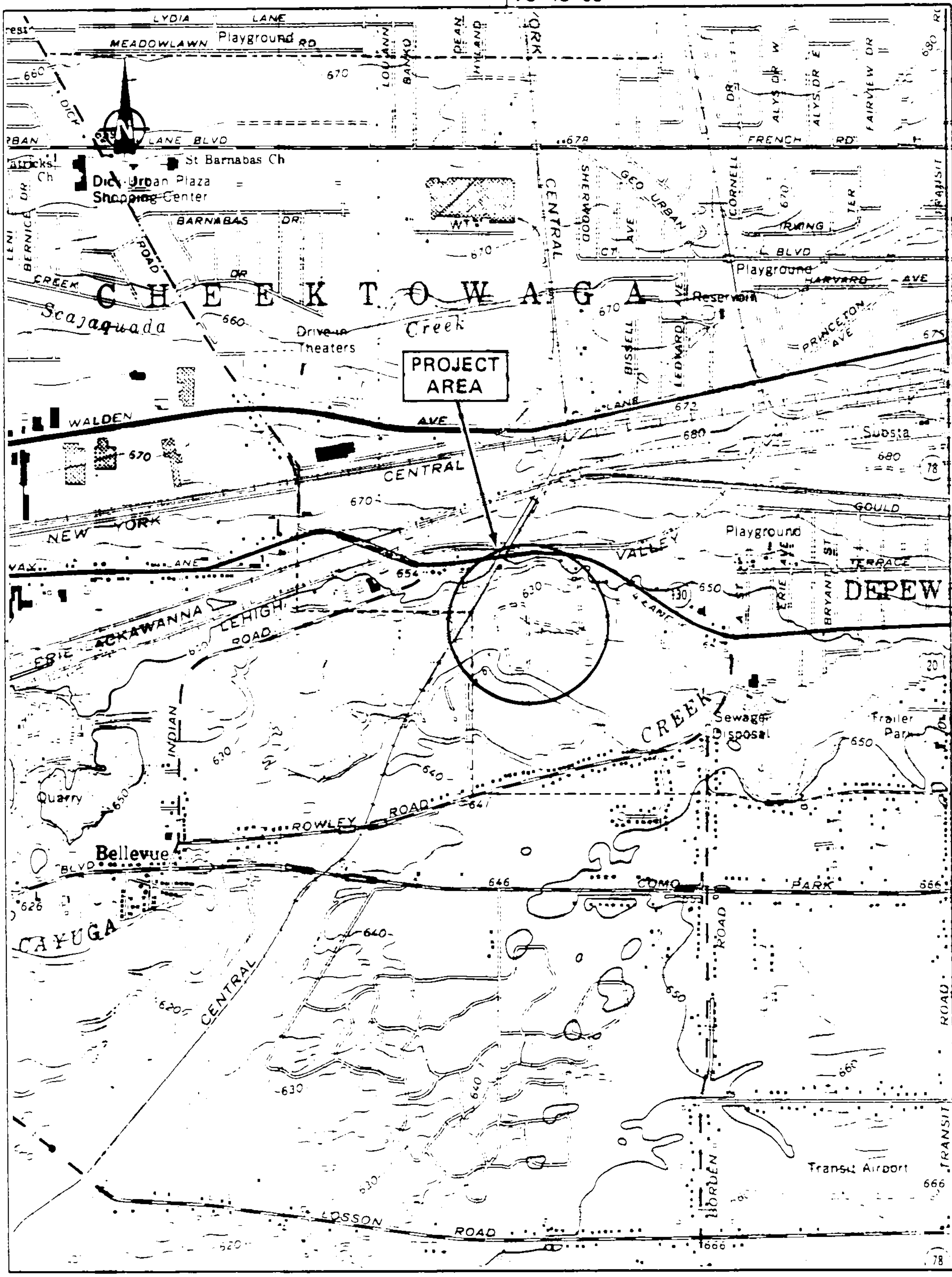
Based on the results of this and previous studies, the HRS scores for the Old Land Reclamation site have been calculated as follows:

$S_M = 8.10$ ($S_{gw} = 4.47$; $S_{sw} = 13.29$; $S_a = 0$)

$S_{FE} = 0$

$S_{DC} = 50$

78° 43' 09"



42° 52' 07"

SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle; Lancaster, N.Y. 1965.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 1—1
LOCATION MAP: OLD LAND RECLAMATION SITE

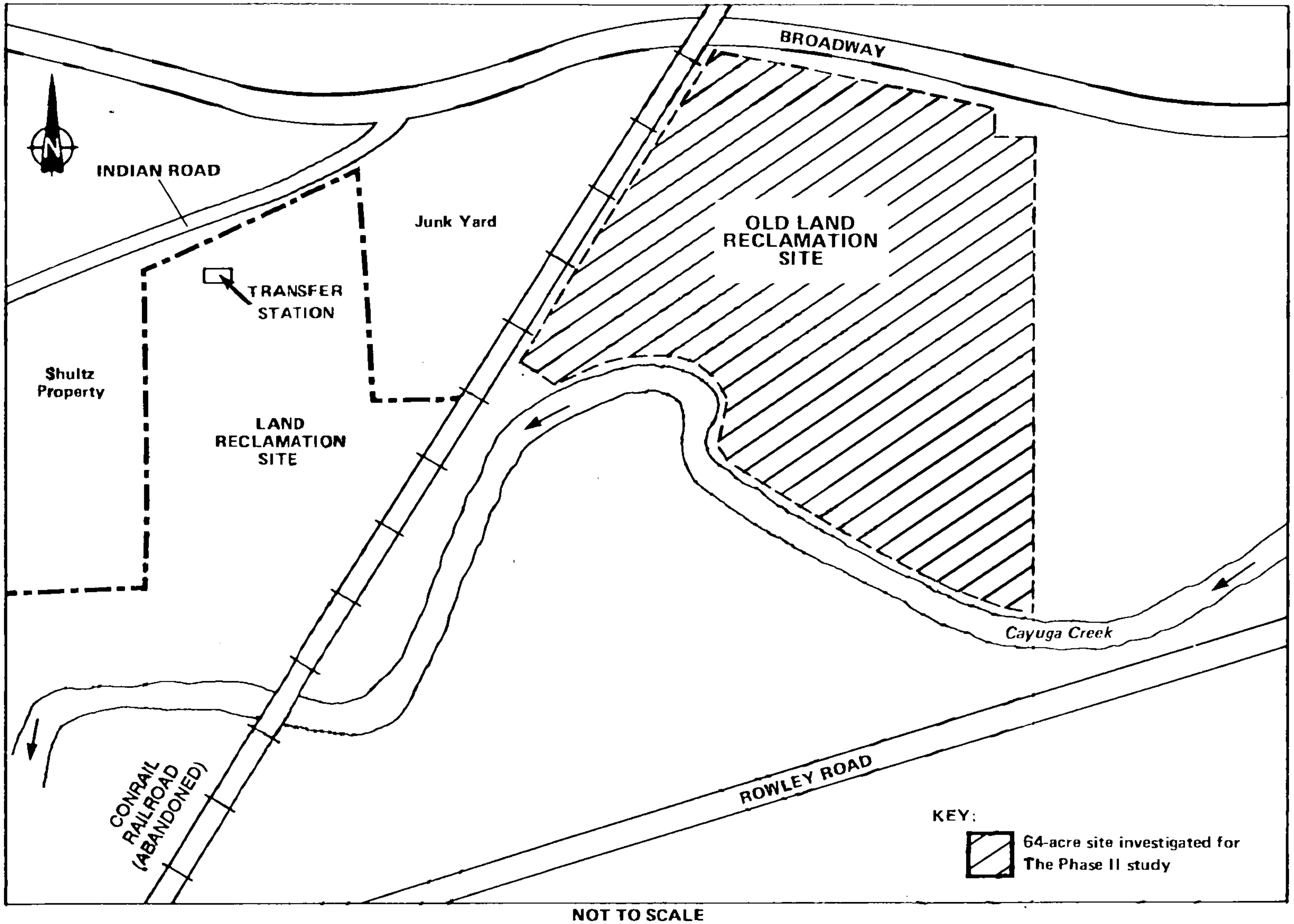
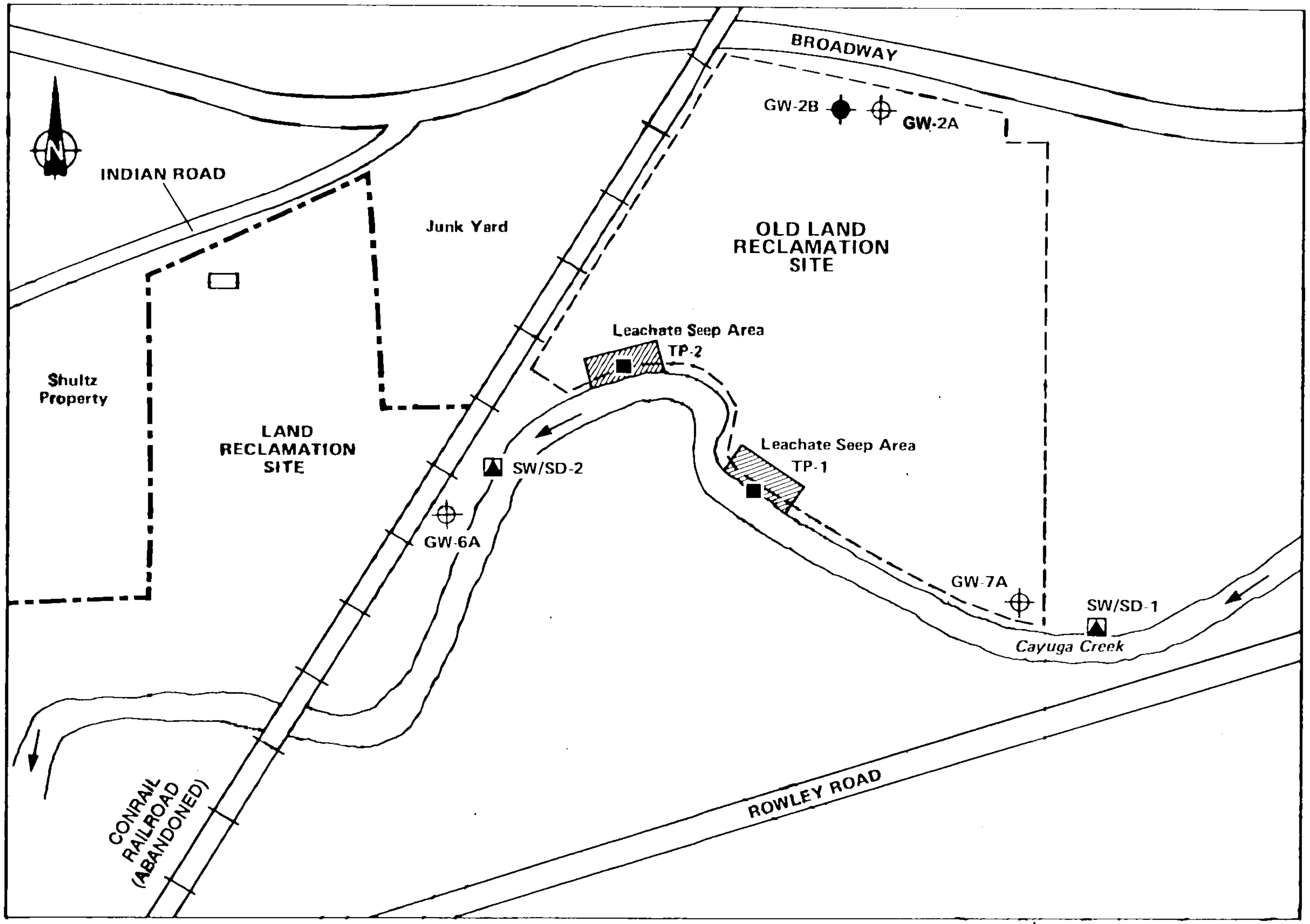


Figure 1–2
SITE SKETCH: OLD LAND RECLAMATION SITE



NOT TO SCALE

KEY:

- Overburden Monitoring Well
- Bedrock Monitoring Well
- Leachate Location
- Surface Water/Sediment Sample

Figure 1–3
OVERBURDEN/BEDROCK MONITORING WELL, LEACHATE AND SURFACE WATER/SEDIMENT SAMPLE LOCATIONS AT OLD LAND RECLAMATION

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Original-BHSC
Copy-REGION
Copy-DEE
Copy-DOH
Copy-PREPARER

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

ADDITIONS/CHANGES TO REGISTRY OF INACTIVE HAZARDOUS WASTE DISPOSAL SITES

1. Site Name	2. Site Number	3. Town	4. County
Old Land Reclamation	915129	Village of Depew	Erie

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

8a. Describe location of site (attach USGS topographic map showing site location). The site is located on Route 130 (Broadway) approximately 1.5 miles east of Route 78 (Transit Road) in Depew, New York.

b. Quadrangle Lancaster c. Site latitude 78°43'09" Longitude 45°52'07" d. Tax Map Number 103.19-1-10, 103.19-1-13, 103.19-1-16, 103.19-1-17

See attachment

b. Area 64 acres c. EPA ID number ______ 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.

The landfill was operated from approximately 1960 to 1975 and received municipal refuse and industrial wastes including foundry sands, slag, fly ash, oil sludge, pine tar pitch, inks, and waste colors.

11a. Summarized sampling data attached

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

b. List contravened parameters and values

Benzene (9-26 ppb), chlorobenzene (13 and 16 ppb), toluene (8 ppb), cadmium (11.5 ppb), chromium (75
See attachment

12. Site impact data

a. Nearest surface water: Distance 0 ft. Direction South Classification C

b. Nearest groundwater: Depth 4-7 ft. Flow direction South [ ] Sole source [ ] Primary [ ] Principal

c. Nearest water supply: Distance >15,840 ft. Direction -- Active [ ] Yes [ ] No

d. Nearest building: Distance 660 ft. Direction North Use Residence

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

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

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

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

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

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

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

l. For Class 2: Prority category ______

m. HRS Score Sm 8.10

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

13. Site owner's name	14. Address	15. Telephone Number
Village of Depew, Mecca Brothers/Hirsch et al./Samuel Greenfield	Village of Depew, 85 Manitou Street	(716) 683-1400

16. Preparer

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

3/21/91
Date

Ralinda Leichner
Signature

17. Approved

______
Name, title, and organization

______
Date

______
Signature

[UZ]YO4080:D2824/4558

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 (CONT.)

9a. (Cont.)

Samuel Greenfield leased the site to GCF, Inc. as a garbage disposal site. In 1968, the property was sublet to Wilfred E. Schultz, Inc. by GCF, Inc. For the next two years, the Schultz Corporation disposed of municipal solid waste under contract to Cheektowaga and Depew. In 1970 the Schultz Corporation assigned its rights under the lease and municipal contracts to the South Odgen Land Development Corporation which operated the landfill from 1970 to 1975 while leasing an additional portion of the site from the Mecca Brothers. The site is currently owned by the Village of Depew, the Mecca Brothers of North Collins, Hirsch et al. of Buffalo, and Samuel Greenfield of Buffalo.

11b. (Cont.)

(766 ppb) in leachate/shallow groundwater. Aluminum (149 ppb) and iron (1,020 ppb) in surface water. ppb), iron (2,040 to 180,000 ppb), lead (141 ppb), magnesium (49,000 to 121,000 ppb), and manganese

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2

2. PURPOSE

This Phase II investigation was conducted under contract to the NYSDEC Division of Hazardous Waste Remediation, Bureau of Hazardous Site Control. The purpose of the investigation was to determine if hazardous wastes have been disposed of at the site; if contaminants exist in the various media; if contaminants are leaving the Old Land Reclamation site; and whether or not 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 Recra Environmental, Inc., in 1986 did not include an air monitoring survey or the collection of any sample matrices. The sampling study and site evaluation performed by the Erie County DEP in 1985 did not include groundwater or upstream and downstream surface water sampling to determine the impact of the site on Cayuga Creek. Subsurface information, including the depth of fill materials, stratigraphy and permeability of unconsolidated materials, and depth to bedrock, was lacking prior to the Phase II study. Groundwater quality and potentiometric surface data for the site were not available previously. Geophysical surveying to determine the presence of buried waste and contaminant plumes and delineate their boundaries had not been conducted prior to this Phase II study.

3

3. SCOPE OF WORK

3.1 INTRODUCTION

E & E began field work for the Phase II investigation at the Old Land Reclamation site in April 1989 and was largely done by July 1989. Prior to the start of field work, E & E submitted a site-specific health and safety plan (HSP) to NYSDEC. A Quality Assurance Project Plan (QAPP) was also prepared and submitted to NYSDEC for approval.

NYSDEC prepared the scope of work for the Phase II investigation at the Old Land Reclamation site. With minor exceptions, E & E performed all field activities in accordance with this scope of work. Variations from the plan occurred as a result of judgments made in the field and were made with the concurrence of NYSDEC representatives.

3.2 PHASE II SITE INVESTIGATION

3.2.1 Records Search/Data Compilation

E & E collected and reviewed available information from state, county, and municipal files prior to the initiation of field work. Records from local and state agency files were reviewed to supplement a sampling study and site evaluation report generated by the Erie County DEP in March 1985 and a Phase II investigation report prepared by Recra Environmental, Inc. in 1987. This data review allowed for the proper completion of the field investigation, site assessment, and calculation of the final HRS score. Specific contacts are listed in Table 3-1.

3.2.2 Site Reconnaissance and Site Safety

On April 25, 1989, E & E personnel conducted a site reconnaissance. The purposes of the site visit were:

- To conduct a limited air monitoring survey using a photoionization detector and radiation detection unit;
- To identify the proposed monitoring well, leachate/shallow groundwater, and surface water/sediment sampling locations;
- To identify potential drilling-rig access problems;
- To identify and approve for use a suitable drilling water supply; and
- To identify any potential problems associated with the subsequent EM31, EM34-3, and magnetometer surveys.

While conducting the site reconnaissance, E & E personnel discovered several significant logistical factors relevant to the Phase II investigation. These included:

- A drilling rig mounted on an ATV would be required to access the proposed monitoring well locations GW-6A and GW-7A on the Cayuga Creek floodplain;
- An abundance of cultural features (a metal fence, high voltage power lines, and ferrous metal debris) present at the site would interfere with surface geophysical surveying methods; and
- The site was not secure from trespassers.

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

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

3.2.3 Geophysical Survey

A geophysical investigation was conducted at the Old Land Reclamation site on May 18 and 19, 1989. The geophysical investigation consisted of EM31 and EM34-3 (electromagnetic terrain conductivity) surveys and a portable proton magnetometer (total earth field magnetics) survey. The objectives of the geophysical methods used were to optimize the locations of the four proposed on-site groundwater monitoring wells; improve the accuracy and confidence of the investigation by reducing the risks associated with drilling into unknown terrain and wastes; and to determine if vertical and/or horizontal anomalies were present which could delineate buried waste boundaries.

The results of the geophysical survey indicate several electromagnetic conductivity and total earth field magnetic anomalies. These anomalies suggest that an abundance of ferrous material is present within the landfill and/or that a specific conductance gradient is present in the groundwater beneath the site. Detailed geophysical survey methodologies and results are presented in the geophysical survey report included as Appendix B.

3.2.4 Subsurface Boring/Monitoring Well Installation

E & E supervised the installation of four groundwater monitoring wells in three areas of the Old Land Reclamation site. Bedrock monitoring well GW-2A was installed at the northern landfill boundary, presumably upgradient from Cayuga Creek. Bedrock monitoring wells GW-6A and GW-7A were installed presumably downgradient of the landfill, along the floodplain of the creek. These bedrock monitoring wells were used to determine the quality and potentiometric surface of the bedrock groundwater. Additionally, overburden monitoring well GW-2B was installed adjacent to GW-2A to determine the water quality in the first zone of saturation (the water table), located in the alluvial deposits directly below the fill materials at the site. This overburden well was also used to determine the vertical gradient between the first zone of saturation and the bedrock groundwater table.

E & E designed the drilling program to obtain quality soil and water samples for environmental analysis while providing the maximum level of safety for personnel working on site.

The drilling subcontractor completed the borehole establishment and well installations using both ATV and standard truck-mounted drilling rigs simultaneously. Prior to the commencement of drilling activities, the drilling rigs and equipment were cleaned with high-pressure steam. This decontamination procedure was performed between each drilling location to reduce the possibility of cross-contamination between boreholes.

The soil samples collected during the drilling of the subsurface borings were obtained by continuous split-spoon sampling in conjunction with a standard penetration test as outlined in ASTM 1586-84. A 2.5-foot by 2-inch outer diameter (OD) hardened steel sample barrel and shoe were driven in specified 2-foot-depth intervals by a 140-pound hammer falling 30 inches. A plastic retainer basket was used to promote satisfactory sample recoveries. The split-spoon recoveries were logged in the field by an on-site geologist. Soil sample depths, descriptions, and other pertinent information are included in the subsurface boring logs (see Appendix C). At each well location, a small decontamination station was set up, consisting of a work table covered with plastic sheeting and a set of three tubs set out on plastic sheeting. After the geology of the sample was logged, the split-spoon was subjected to the following sequential decontamination procedure:

- o Trisodium phosphate (TSP) detergent wash;
- o Distilled water rinse;
- o Pesticide-grade methanol rinse;
- o Distilled water rinse; and
- o Air drying.

The cleaned split-spoon parts were reassembled and placed back in the rack of clean spoons on the drilling rig. The plastic sheeting on the work table was changed after the completion of each borehole to prevent cross-contamination. Chemical analysis of surface soil samples was not performed as no significant air monitoring response above background level was obtained with the photoionization detector during the opening of the split-spoons. Each soil sample obtained from the borings was placed in an 8-ounce, pre-cleaned, labeled, Teflon-lined, screw-cap, glass jar. Selected cohesive and non-cohesive soil samples were subsequently tested for Atterberg limits and cumulative grain size distribution, respectively.

Drilling of the three bedrock monitoring wells involved the advancement of a 4 1/2-inch inside diameter (ID) hollow-stem auger through the overburden, then the coring of a rock socket using a 3 7/8-inch OD coring bit. Three-inch polyvinyl chloride (PVC) casing was placed in the socket and pressure-grouted into position using a tremie line. Following a set-up period of 24 hours, the hole was cored into a water-bearing zone using an NX-size core barrel. The well was pumped and purged to verify that a sufficient sustainable yield could be maintained. Once this criterion was satisfied, a locking protective casing was grouted into place at the ground surface. The monitoring interval remained as an open-bedrock hole, without the use of screened casing (see Table 3-2).

Drilling of the screened overburden well GW-2B involved the advancement of a 4 1/2-inch ID hollow-stem auger through fill material and 2 feet into alluvium and lacustrine clay. The total depth of GW-2B was discontinued at 32 feet below the ground surface to avoid breaching the clay layer separating the fill material from the underlying bedrock. The boring was screened with a 2-inch diameter 0.01-inch-slot schedule-40 PVC screen, 5 feet in length with a cap at the base, and cased with 2-inch diameter, flush-joint, schedule-40 PVC riser. The well screen was packed with No. 20 silica sand to a depth of 2.3 feet above the top of the screened interval. A 2-foot bentonite pellet seal was placed on top of the sand, and a 6% bentonite grout mixture was installed from the top of the bentonite to grade via tremie line (see Table 3-2). A locking steel protective casing was used for the surface construction.

Surface casings in the four monitoring wells extend approximately 2 feet above grade and have sloping concrete drainage pads to divert surface runoff away from the casings.

Each monitoring well was later developed using the drilling rig pump until a high degree of water clarity (<50 NTUs) and the stabilization of temperature, specific conductance, and pH measurements had occurred. These criteria were achieved within 1 to 2 hours in each of the four monitoring wells.

3.2.5 Groundwater Sampling and Analysis

E & E collected groundwater samples from the four newly installed monitoring wells. These samples were analyzed for TCL organic compounds and inorganics by E & E's Analytical Services Center (ASC).

The 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.

Turbidity measurements were taken immediately following the collection of the inorganic sample using a portable nephelometer. The turbidity of the groundwater samples was less than 50 NTUs, with the exception of bedrock monitoring well GW-6A, which measured 56 NTUs. An additional inorganic sample was collected at GW-6A and passed through a 0.45-micron filter. This filtered sample was analyzed for dissolved metals content. Samples for total metals analysis were preserved by adding concentrated nitric acid to the sample until its pH was lowered to less than 2.0 standard units. Samples for cyanide analysis were preserved by the addition of sodium hydroxide (NaOH) pellets until the pH of the sample was raised to greater than 12.0 standard units.

3.2.6 Leachate/Shallow Groundwater Sampling

Two leachate/shallow groundwater samples, TP-1 and TP-2, were collected from areas where iridescent seeps were observed breaching the south bank of the landfill and flowing directly into Cayuga Creek. Sample TP-2 was collected in direct proximity to an oxbow lake and sample TP-1 was located approximately 600 feet upstream of TP-2. Shallow (<1-foot) hand-augured borings were dug as reservoirs for the collection of the leachate/shallow groundwater. The sample containers were filled directly from these hand-augured borings to minimize the loss of volatile constituents. The leachate/shallow groundwater samples were subjected to TCL organic, inorganic, and cyanide analyses. An additional inorganic sample was collected at GW-6A and passed through a 0.45-micron filter. This filtered sample was analyzed for dissolved metals content. The leachate/shallow groundwater samples collected for metals and cyanide analysis were preserved according to the methods stated in Section 3.2.5.

3.2.7 Surface Water/Sediment Sampling

Two surface water samples, SW-1 and SW-2, and corresponding sediment samples SD-1 and SD-2 were collected at the edge of the north bank of Cayuga Creek. The SW-1 and SD-1 sampling location represents parameter concentrations upstream of the Old Land Reclamation site. The SW-2 and SD-2 sampling location represents parameter concentrations directly downstream of the site. The surface water/sediment samples collected were subjected to TCL organic, inorganic, and cyanide analyses. The measured turbidity of the Cayuga Creek surface water samples was less than 15 NTUs. Dissolved metals analysis was not performed.

Surface water was drawn directly from Cayuga Creek into sampling bottles. Sediment samples were collected from stream alluvium directly below the surface water sampling locations. A new stainless steel spoon, decontaminated according to the procedure outlined in Section 3.2.4, was utilized to place the sediment into the appropriate sample containers.

Surface water samples collected for metals and cyanide analysis were preserved according to the methods stated in Section 3.2.5. Sediment samples collected were not preserved.

Table 3-1

SOURCES CONTACTED FOR THE NYSDEC PHASE II INVESTIGATION
AT THE OLD LAND RECLAMATION SITE

Erie County Department of Health
5444 Camp Road
Hamburg, New York
Contact: John Kociella
Telephone Number: 716/858-7677
Date: May 10, 1989
Information Gathered: Information about files pertaining to NYSDEC sites.

Erie County Water Authority
3030 Union Road
Cheektowaga, New York
Contact: Dana Cosselt
Telephone Number: 716/849-8484
Date: April 28, 1989
Information Gathered: Erie County DEC Phase II sites within Erie County's Water Service.

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 27-28, 1989
Information Gathered: File search for NYSDEC Phase II report preparation.

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

New York State Department of Environmental Conservation
Division of Regulatory Affairs
600 Delaware Avenue
Buffalo, New York 14202
Contact: Mary Ketter
Telephone Number: 716/847-4551
Date: April 6, 1989
Information Gathered: File search.

Village Assessors Office
85 Manitou Street
Depew, New York 14043
Contact: Conrad Weinckowski
Telephone Number: 716/683-1931
Date: April 21, 1989
Information Gathered: Property ownership.

02[UZ]YO4080:D2824/2844/20

Table 3-1 (Cont.)

New York State Department of Environmental Conservation
Information Services/Significant Habitat Unit
Wildlife Resources Center
Delmar, New York 12054-9767
Contact: John Ozard
Telephone Number: 518/439-8391
Date: May 2, 1989
Information Gathered: Information on designated critical habitats with respect to NYSDEC Phase II sites.

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

New York State Department of Health
Bureau of Environmental Exposure
11 University Plaza
Room 205
Albany, New York 12203
Contact: Lani D. Rafferty
Telephone Number: 518/458-6306
Date: April 3-4, 1989
Information Gathered: Viewed site inspection reports for NYSDEC Phase II sites.

United States Department of Agriculture
Soil Conservation Service
Erie County District
21 South Grove Street
East Aurora, New York 14052
Contact: John R. Whitney
Telephone Number: 716/652-8480
Date: March 29-30, 1989
Information Gathered: File search for NYSDEC Phase II site report preparation.

02[UZ]YO4080:D2824/2844/20

Table 3-2

MONITORING WELL CONSTRUCTION DATA

Well	Opening	Feet of Screening or Open Hole	Feet of Riser	Thickness of Bentonite (feet)	Total Depth of Well (feet)	Stick-up Height (feet)
GW-2A	Open hole	8.3	38.5	--	44.8	1.98
GW-2B	Screen	10	34.0	2.6	32.0	2.02
GW-6A	Open hole	11	12.5	--	21.5	2.05
GW-7A	Open hole	8.8	14.8	--	21.6	2.04

[UZ]Y04080:D2824, #2837, PM=15

4

4. SITE ASSESSMENT

4.1 SITE HISTORY

The 64-acre Old Land Reclamation site was operated as a solid waste landfill from approximately 1960 through 1975. During these years of operation, the site reportedly accepted municipal and various industrial wastes.

Currently, the site is owned by four separate parties: the Village of Depew; Mecca Brothers, 10788 Main Street, North Collins, New York; Hirsch et al., Buffalo, New York; and Samuel Greenfield, P.O. Box 246, Buffalo, New York. The sequence of ownership and usage of the property is complex.

From the period of 1960 through 1968, Samuel Greenfield leased the property to GCF, Inc. for use as a garbage and refuse disposal site. In October 1968, the property was sublet to Wilfred E. Schultz, Inc., by GCF, Inc. During the next two years, the Schultz corporation disposed of municipal solid waste under contract with the Town of Cheektowaga and the Village of Depew. In April 1970, the Schultz corporation assigned its rights under the lease and municipal contracts to the South Ogden Land Development Corporation, an affiliate of NEWCO Waste Systems, now BFI Waste Systems. From 1970 to 1975, the South Ogden Land Development Corporation operated the Old Land Reclamation landfill while leasing an additional portion of the site owned by the Mecca Brothers. The site was operated as a solid waste landfill from approximately 1960 to 1975 and received municipal and industrial wastes, including miscellaneous refuse, foundry sand, slag, fly ash, oil sludge, pine-tar pitch, inks, and waste colors.

The Land Reclamation site, another landfill located directly west of the Old Land Reclamation site, was operated concurrently. An

Interagency Task Force on Hazardous Wastes draft report indicates that the two sites accepted similar waste streams, including pine tar pitch, inks, laboratory sample bottles, waste colors, foundry sand, slag, spent refractories, calcium and other salts of sulfuric and nitric acid, and other industrial and municipal waste materials.

The Old Land Reclamation landfill was closed in 1975, covered with clay, and graded flat for the planned conversion of the property to a park by the Village of Depew.

In January of 1984, the Erie County DEP, when responding to a complaint filed by a local resident, observed that leachate was migrating from the site. The DEP conducted a site evaluation at this time, which included the collection and analysis of soil, surface water, and leachate samples.

The site was inspected in January of 1986 by Recra Environmental, Inc., as part of a Phase I investigation conducted for NYSDEC. Leachate was observed draining from a culvert originating in the landfill. Leachate was also observed in a ditch west of the culvert and east of an old railroad bed. This ditch was suspected of collecting drainage from a scrapyard located directly northwest of the site. The Phase I investigation report stated that further field investigation would be necessary to address the inadequacy of available data for the site.

In April of 1989, E & E initiated a Phase II investigation for NYSDEC. During the Phase II site inspection, a lack of site security, an abundance of leachate seeps, and the proximity of the site to the inactive Land Reclamation landfill and an active scrapyard operation were noted. The site remains undeveloped, with the landfill densely covered with field grasses and brush. No buildings are present on site.

4.2 REGIONAL GEOLOGY AND HYDROGEOLOGY

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

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

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

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

The Marcellus Shale member overlies the limestone units. This dense, black, fissile shale is approximately 30 to 55 feet thick. This shale, unlike the Camillus Shale, is relatively impermeable. It confines the limestone and Camillus Shale aquifers below. The contact for the Marcellus Shale and Onondaga Limestone is probably located north, east, and south of and in close proximity to the site (Buehler and Tesmer 1963).

Significant amounts of groundwater occur only in the overburden and in the lower bedrock units. The Camillus Shale contains numerous cavities formed by the dissolution of gypsum and is thus a very productive aquifer. The Onondaga, Akron, and Bertie dolostones and limestones contain water in bedding joints widened by dissolution. Vertical fractures in the limestone provide hydraulic connections among the many bedding planes. These vertical fractures exhibit variable orientation as observed in the Onondaga Limestone exposed on the bottom of Cayuga Creek, due south of the site.

4.3 SITE GEOGRAPHY

4.3.1 Topography

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

The majority of the site is occupied by the inactive landfill, which is characterized by gently mounded terrain and an average ground surface elevation of 648 feet above mean sea level. The landfill surface has a slope of less than 2 percent and is covered with dense field grass and brush. The ground surface elevations of the monitoring wells installed on the landfill are approximately 27 feet greater than those on the Cayuga Creek floodplain. Surface water flows south along eroded ditches on the east and west sides of the site into Cayuga Creek. The drainage ditches are stained by leachate. The intermittent flooding of Cayuga Creek has caused the erosion and exposure of the south slope of the landfill. Several iridescent leachate seeps breach the south bank and discharge directly into the creek.

4.3.2 Soils

The U.S. Department of Agriculture (USDA) identifies soils in the northern portion of the site (along Broadway) as "urban soils," a classification representative of disturbed or removed material occurring in areas of residential or commercial development. The permeability and texture of urban soils is listed as "miscellaneous." Naturally-occurring soils at the south portion of the site are classified as Teel and Middlebury soils. These silty soils were formed in recent alluvial deposits. Teel soils are somewhat more silty than Middlebury soils. Both of these soils are moderately well drained to somewhat poorly drained and exhibit a seasonal high water table during the early spring.

The water table is influenced by the water level in Cayuga Creek. In some years, these soils are subject to flooding of the creek, usually in the early spring. In Teel and Middlebury soils, the rate of groundwater movement is moderate. Gravel lenses are commonly present in the soils.

The alluvium deposits observed along the Cayuga Creek floodplain extend for an unknown lateral distance to the north of the site and act as a basal soil unit beneath the landfill. The alluvial unit was observed in subsurface soil samples collected during the installation of the overburden and bedrock wells on the north side of the landfill. This basal unit was composed of silt and medium sand and was measured to be 1.3 feet thick at this location. The alluvium is located directly below fill material and directly above a lacustrine clay exhibiting medium-high plasticity. Sample volumes of both of these soil units were subjected to geotechnical analyses for more accurate classification (see Appendix G). According to a hydrogeologic investigation conducted in 1979, the permeability of the basal alluvium is estimated to be between 650 and 1,850 gpd/ft^2 (3.1×10^{-2} to 8.7×10^{-2} cm/sec) based on previous grain-size analysis. Depending on the degree of excavation of the alluvial deposits during previous landfill operations, this basal stratum may remain continuous beneath the site. The very high permeability of the alluvium would allow for transmission of leachate along the unit to downgradient locations.

4.4 SITE HYDROGEOLOGY

The information used to develop the discussion in this subsection includes the data generated during the installation of three bedrock monitoring wells and one overburden monitoring well; potentiometric groundwater maps generated from groundwater level measurements obtained from the monitoring wells installed; United States Geological Survey (USGS) topographic maps and geological survey maps; the results of a hydrogeologic investigation conducted in 1979; and regional groundwater reports.

The potentiometric groundwater surface maps are presented in Figures 4-2 and 4-3, the subsurface logs are presented in Appendix C, and the results of geotechnical analyses of the subsurface soil units are presented in Appendix G.

4.4.1 Geology

The Old Land Reclamation site is underlain by the Onondaga Limestone formation. This middle-Devonian-aged limestone is approximately 110 feet thick. According to Buehler and Tesmer (1963), the Onondaga Limestone consists of three members: the deepest member (only a few feet thick) is a gray, coarse-grained limestone, the middle member (40 to 45 feet thick) is a cherty limestone, and the upper unit (50 to 60 feet thick) is a dark gray to tan limestone. The depth to the limestone bedrock was measured at 34.5 feet below the ground surface on the north side of the landfill during the drilling for monitoring well GW-2A. The depth to the bedrock on the south side of the landfill along the Cayuga Creek floodplain averages approximately 8 feet below the ground surface (see Table 4-1). The contact between the Onondaga Limestone and the overlying Oatka Creek Shale member of the Marcellus Formation may exist at or in proximity to the east portion of the site. Shale bedrock was not observed in split-spoon or NX rock core samples obtained during the Phase II drilling program.

4.4.2 Hydrology

Groundwater

The groundwater beneath the Old Land Reclamation site occupies two separate water-bearing zones. The shallower, unconfined water-bearing zone is found within the recent alluvial silt and sand. This alluvium occupies the Cayuga Creek floodplain and extends north beneath the landfill, according to the split-spoon sampling performed during the drilling of the newly installed Phase II monitoring wells (see Appendix C). These alluvial deposits were observed to be approximately 8 feet thick at boreholes beneath the landfill and along the Cayuga Creek floodplain (see Appendix C and Figure 1-3). The hydraulic conductivity of the alluvium is estimated at between 650 and 1,850 gpd/ft^2 (3.1 x 10^{-2} to 8.7 x 10^{-2}cm/sec) (Recra Research, Inc., et al. 1979). This hydraulic conductivity will vary depending on the extent of stratum removal that occurred during the past land-filling operations. Groundwater elevations measured in the overburden monitoring well relative to the surface water elevations of Cayuga Creek were used to develop a potentiometric map depicting the probable direction of groundwater movement within the overburden (see Table 4-2). This map indicates that groundwater moves south through the alluvium toward the creek (see Figure 4-2).

A less permeable lacustrine clay stratum approximately 3.2 feet thick separates the alluvial silt and sand from the Onondaga Limestone bedrock aquifer beneath the site. Dissolution along fractures, joints, and cavities in the Onondaga Limestone is observed to have caused the rock overlying solution openings to subside. Vertical fractures of variable thickness and orientation are observed where the Onondaga Limestone is exposed in the bottom of Cayuga Creek, due south of the site. Groundwater elevations measured in the three bedrock monitoring wells were used to develop a potentiometric map depicting the probable direction of groundwater movement within the Onondaga bedrock (see Table 4-2). This map shows that bedrock groundwater elevations are below that of the water table within the overburden indicating that considerable downward gradient exists between the overburden and bedrock aquifers at the site (see Figure 4-3). The direction of groundwater movement in the bedrock is southwest beneath the landfill, and additionally, the bedrock potentiometric surface level is lower at the Cayuga Creek floodplain monitoring well locations than the elevation of the highly fractured limestone stream bed elevation; therefore, it appears that the creek is losing water to the bedrock rather than the bedrock discharging water to the creek. The local hydraulic sink to which the bedrock aquifer beneath the site discharges is thought to be an active quarry located approximately 0.7 mile west-southwest of the site. This quarry, operated by Buffalo Crushed Stone, pumps a significant quantity of water from the Onondaga Limestone during its operations, and this pumping is assumed to be affecting the bedrock potentiometric surface at the site. Water pumped from the quarry operation is discharged to Cayuga Creek through a State Pollutant Discharge Elimination System SPDES. Regulated water quality parameters are routinely monitored and fall within normal respective ranges (Wantuck 1990). The low bedrock water table elevations at the Cayuga Creek floodplain may be the result of hydraulic connection between the fracture system penetrated by the monitoring wells and fractures pumped at the quarry.

Based on the groundwater flow directions in the overburden and bedrock shown in Figures 4-2 and 4-3, the following conclusions are reached:

- GW-2A and GW-2B are hydraulically upgradient of the site for the bedrock and overburden aquifers, respectively. However, these wells were installed through fill from approximately 5 to 30 feet (see Appendix C) and therefore may represent an area where landfilled materials are affecting the quality of the groundwater;
- GW-6A may not be directly hydraulically downgradient of the site due to the potential interruption of bedrock groundwater movement by Cayuga Creek. Groundwater from GW-6A may be affected by its proximity to the abandoned railroad tracks and by downward migration of contaminants in the overburden aquifer from scrapyard activities and landfilling at the Land Reclamation site; and
- GW-7A is not hydraulically downgradient of the landfilled area of the site. Groundwater from this well may be affected by downward migration of contaminants from the overburden aquifer as it flows toward Cayuga Creek. The possibility also exists that groundwater in GW-7A is being affected by an unknown upgradient source to the east of the site.

It should be noted that although these wells may not be in a direct downgradient path from the landfill, the contaminants detected in GW-6A and GW-7A are consistent with those expected based on the site's former usage and the materials reportedly disposed. It is, therefore, likely that these wells give an accurate representation of the groundwater quality beneath the Old Land Reclamation site.

No in-situ permeability testing has been performed to date at monitoring wells at this site.

An intermittently flooded area is currently observed at the southwest corner of the site directly adjacent to Cayuga Creek. This area has been previously described as an oxbow lake (ECDEP 1985).

An oxbow lake is located on the southwest corner of the site (ECDEP 1985). Aerial photograph interpretation indicates the oxbow had become a part of the landfill operations and been filled in by the year 1972, however, much of this area is now observed to be resaturated and inhabited by beaver. It is probable that this swampy area is recharged by shallow groundwater and surficial drainage from the southwest portion of the landfill and by Cayuga Creek during high water events. Based on field observations and laboratory analysis of shallow groundwater/leachate samples collected in this area, it is not readily apparent that the relatively small oxbow lake has a significant hydrogeologic or hydrologic effect on surrounding areas.

4.5 SITE CONTAMINATION ASSESSMENT

Analytical data for the contamination assessment are presented in Appendix D. For TCL organic compounds, all positive reported values and qualifiers for samples are presented on data summary forms. For TCL inorganics, CLP Form 1's are included for all samples.

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 five times the detection limit. TCL organic compound values reported below the quantifiable detection limit are presented in Appendix D, but the values are not included in summary tables in the following text.

As stated on the data summary forms in Appendix D, quantitation limits for organic analyses of water samples are calculated by multiplying the Contract Required Detection Limit (CRDL) by the dilution factor, which in most cases is one. For organic analyses of soil samples, the CRDL is multiplied by the dilution factor and this quantity is divided by the fractional moisture content which is determined by the equation (100-% moisture)/100. For inorganic analyses, quantitation limits are the CRDLs stated on the data summary forms unless sample dilution was required. Information concerning dilution of samples for inorganic analyses and resulting quantitation limits is contained in the analytical data package for the Old Land Reclamation site.

For organic contaminants, general classes of compounds such as PAHs and phenols were identified on tables in the text and the concentrations are reported as respective totals. Individual compounds and their respective concentrations are included on the data summary forms in Appendix D.

4.5.1 Groundwater

One groundwater sample was collected from each of four wells and analyzed for TCL organic compounds and TCL metals. Field measurements of chemical parameters for groundwater samples collected are included in Table 4-3. Well GW-2A was installed on the north side of the landfill and is considered upgradient for the bedrock monitoring zone. Downgradient bedrock monitoring wells GW-6A and GW-7A were installed along the north bank of Cayuga Creek. Overburden monitoring well GW-2B is screened in the basal alluvium beneath the fill material and is installed adjacent to GW-2A in an upgradient location (see Figure 1-3).

The usefulness of groundwater from GW-2A and GW-2B as representative of background water quality is questionable due to the fill material through which the wells were drilled (see Appendix C) and the detection of organic and inorganic contaminants in water samples from these wells (see Tables 4-4 and 4-5). For comparison purposes, as requested by NYSDEC, data from the upgradient well GW-1A installed at the adjacent Land Reclamation site (site no. 915070), is used to represent background water quality for the area. Wells GW-2A and GW-2B are considered upgradient of the site in terms of groundwater flow, but GW-1A is considered to be in a background location with respect to the site.

TCL volatile organic analysis of GW-2A indicated the presence of benzene at a concentration below the accurate quantitation limit (see Table 4-4). BNA analysis of the GW-2A groundwater sample detected phenol and 2- and 4-methylphenols at concentrations below the accurate quantitation limit. Inorganic analysis of the GW-2A sample revealed concentrations of iron and manganese in exceedance of NYSDEC limits for Class GA groundwater at 34,600 ppb and 1,910 ppb respectively (see Table 4-5). TCL volatile organic analysis of the downgradient bedrock monitoring well GW-6A sample detected benzene at 9 ppb (see Table 4-4). Toluene and total xylenes were detected at concentrations below the accurate quantitation limit. Inorganic analysis of the GW-6A sample indicated the presence of iron above the Class GA standards at 25,300 and 2,040 ppb in the non-dissolved and dissolved metals samples, respectively. Additionally, manganese was found above the Class GA standards at 586 ppb in the GW-6A sample (see Table 4-5). TCL volatile organic compounds detected in downgradient bedrock monitoring well GW-7A included benzene at 26 ppb, chlorobenzene at 16 ppb, and total xylenes at 8 ppb. Toluene and ethylbenzene were detected at concentrations below the accurate quantitation limit. The results of the BNA analysis of the GW-7A sample indicate the presence of chloroaniline at 77 ppb (see Table 4-4). Phenol was detected at a concentration below the accurate quantitation limit in the GW-7A sample. Inorganic analysis of the GW-7A sample detected the presence of iron above the Class GA standards at 25,800 ppb (see Table 4-5).

TCL volatile organic analysis of the upgradient overburden monitoring well GW-2B indicated the presence of benzene at 11 ppb, chlorobenzene at 13 ppb, toluene at 8 ppb, and total xylenes at 130 ppb (see Table 4-4). Additionally, ethylbenzene was detected at a concentration below the accurate quantitation limit in the GW-2B sample. BNA analysis indicated the presence of phenol, dichlorobenzene, methylphenol, benzoic acid, and naphthalene at concentrations below the accurate quantitation limit. Inorganic analysis of the GW-2B sample indicated the presence of cadmium, chromium, and iron above Class GA standards at 11.5, 75, and 180,000 ppb, respectively. Additionally, lead was detected above the GA standard at 141 ppb and manganese above the GA standard at 1,600 and 546 ppb in the filtered and unfiltered samples, respectively (see Table 4-5).

No organic compounds were detected in groundwater from GW-1A. Total metals analysis of GW-1A indicated the presence of iron above Class GA standards at 1,750 ppb and manganese above the NYSDEC guidance value at 38,400 ppb.

Inorganic compounds exceeding NYSDEC Class GA groundwater standards include cadmium and chromium in GW-2B, iron in GW-2A, GW-2B, GW-6A, and GW-7A, lead in GW-2B, manganese in GW-2A, GW-2B, and GW-6A and sodium in all wells. Magnesium in exceedance of the NYSDEC guidance value was found in GW-2A, GW-2B, GW-6A, and GW-7A. Cadmium and chromium were not detected in groundwater from the background well, GW-1A, which is the upgradient well for the adjacent Land Reclamation site (see Section 4.5.1). Iron in the background sample was above the Class GA standard; however, the iron concentration in GW-7A was greater than three times the background concentration and so appears to represent contamination from the landfill. Lead was above Class GA standards in GW-2B but not in wells GW-2A, GW-6A, and GW-7A. Therefore, fill material is thought to be releasing lead to overburden groundwater. Manganese concentrations in all of the site wells are greater than three times the background level and may represent contamination as a result of landfilling activities. Magnesium levels in all site wells are above the guidance value. The level in well GW-7A is two to three times the level than in background well GW-1A. This indicates that the landfill may be a source of magnesium in groundwater. Sodium levels in all on-site wells are significantly above background levels and above the Class GA standard. This indicates that the landfill may be a source of magnesium in groundwater.

4.5.2 Leachate/Shallow Groundwater

Two leachate/shallow groundwater samples were collected from selected seep areas along the Cayuga Creek floodplain. Sample TP-2 was collected in direct proximity to an oxbow lake and sample TP-1 was located approximately 600 feet upstream of TP-2. These sample locations were chosen based on field observations of numerous iridescent seeps breaching the south slope of the landfill in these areas (see Figure 1-3). The leachate/shallow groundwater samples were analyzed for TCL organic and inorganic parameters.

TCL volatile analysis of the leachate/shallow groundwater sample TP-1 indicated the presence of benzene, chlorobenzene, and ethylbenzene at 31, 32, and 12 ppb, respectively (see Table 4-4). Total xylenes were detected at 110 ppb, and toluene was detected below the accurate quantitation limit in TP-1. BNA analysis of TP-1 detected naphthalene and chloroaniline at 50 and 220 ppb, respectively (see Table 4-4). Dichlorobenzenes, methylnaphthalene, acenaphthene, dibenzofuran, n-nitrosodiphenylamine, phenanthrene, and di-n-butylphthalate were found at concentrations below the accurate quantitation limit in TP-1. Inorganic analysis of TP-1 indicated that iron is present at 2,040 ppb.

This iron level exceeds NYSDEC's maximum allowable effluent concentrations for the substance (see Table 4-6).

TCL volatile analysis of the leachate/shallow groundwater sample TP-2 indicated the presence of benzene and ethylbenzene at 6 and 8 ppb, respectively (see Table 4-4). Total xylenes were found at concentrations below the accurate quantitation limit in TP-2. BNA analysis of TP-2 detected dichlorobenzene, naphthalene, methylnaphthalene, chloroaniline, and nitrosodiphenylamine at concentrations below the accurate quantitation limit. Inorganic analysis of TP-2 indicated that iron, lead, and manganese are present at 55,800, 69.6, and 766 ppb, respectively. These inorganic levels exceed the respective maximum allowable effluent concentration according to the aforementioned regulations (see Table 4-6).

4.5.3 Surface Water/Sediment

Two surface water and two corresponding sediment samples were collected from along the north bank of Cayuga Creek (see Figure 1-3). Surface water sample SW-1 and sediment sample SD-1 were collected upstream from the Old Land Reclamation site. The SW-2 and SD-2 samples were collected directly downstream from the site. These surface water/sediment samples were analyzed for full TCL organic and inorganic parameters. TCL organic analysis of SW-1 did not detect the presence of any volatile or semi-volatile compounds. Inorganic analysis did not detect concentrations of metals exceeding NYSDEC Class C surface water standards in the SW-1 sample (see Table 4-7).

No volatile or semi-volatile compounds were detected during TCL organic analysis of SW-2. Inorganic analysis of SW-2 indicated the presence of aluminum and iron above NYSDEC Class C standards at 149 ppb and 1,020 ppb, respectively (see Table 4-7).

TCL analysis of SD-1 did not detect the presence of any volatile organic compounds. Several PAHs, including phenanthrene, fluoranthrene, pyrene, chrysene, and associated compounds, were detected by the BNA analysis of SD-1. These PAHs were detected at concentrations below the accurate quantitation limit for the respective compounds. Analysis of SD-1 did not detect the presence of inorganic compounds at concentrations in excess of the guidelines for soils/surface materials of the eastern United States (Shaklette and Boerngen 1984).

TCL analysis of SD-2 did not indicate the presence of volatile organic compounds. The BNA analysis of SD-2 detected semi-volatile organic compounds, including methyl phenol, several PAH compounds, and butylbenzylphthalate. The concentrations of PAH compounds that were accurately quantifiable ranged from 570 to 1,200 ppb (see Table 4-4). The PAH compounds in SD-2 were identical to those identified in SD-1, with the addition of two anthracene compounds. Methyl phenol and butylbenzylphthalate were found at concentrations below the respective accurate quantitation limits. Analysis of SD-2 did not detect the presence of inorganic compounds at concentrations in excess of the guidelines for soils/surface materials of the eastern United States.

Pesticide/PCB analyses did not detect the presence of these compounds in any samples collected at the site.

4.5.4 Contamination Assessment Summary

The principal immediate threat to public health and the environment posed by the Old Land Reclamation site is direct contact with leachate seeps breaching the south slope of the landfill. Several of these iridescent leachate seeps are observed draining across the floodplain before entering Cayuga Creek. The two leachate/shallow groundwater samples contained benzene at levels exceeding NYSDEC effluent standards for discharge from a point source, and this compound may enter unsaturated or saturated zones. Other benzene compounds, chloroethane, total xylenes, naphthalene, and chloroaniline were detected in leachate collected at the site. Concentrations of iron, lead, and manganese exceed NYSDEC's maximum allowable effluent concentrations for the respective metals.

The presence of similar organic and inorganic contaminants found in overburden and bedrock groundwater at the site suggests the possibility of migration of landfill contaminants. Although the overburden groundwater that occupies the basal alluvium is suspected to be a direct hydraulic conduit to Cayuga Creek, analyses do not indicate any presence of volatile or semi-volatile organic compounds in surface water samples collected from the creek. Concentrations of aluminum and iron exceed the NYSDEC Class C surface water standard in the downstream surface water sample. The increased aluminum and iron concentrations in the downstream surface water sample, SW-2, relative to the sample collected upstream of the site, SW-1, suggests that the landfill may be contributing to the inorganic contamination of Cayuga Creek. The impact of the site on Cayuga Creek is reduced if the bedrock groundwater is not discharging from beneath the site to the creek.

Several PAHs were detected in both the upstream and downstream sediments collected along the north bank of Cayuga Creek. The PAHs found in the upstream sediment sample, SD-1, were found at concentrations below their respective accurate quantitation limits. The sediment sample collected directly downstream of the site, SD-2, contained fluoranthene and pyrene compounds, chrysene, and other PAHs corresponding to the upstream sediment sample at increased levels. PAHs exhibit low solubility in water and tend to be sorbed onto the suspended organic and inorganic particulates in the water. Low turbidity was measured in the corresponding surface water samples (see Table 4-3); therefore, it is not unusual that PAH compounds were absent from SW-1.

The types and concentrations of organic and inorganic contamination found in leachate, groundwater, surface water, and sediment samples collected during the Phase II investigation suggest that industrial wastes were disposed of at the site during the operation of the landfill. The prevalence of petroleum hydrocarbon contamination may be attributed to the disposal of spent lubricants and/or oil sludges. The automobile scrapyard operating directly west of the site is also considered a potential source of petroleum hydrocarbon contamination in the area. The concentrations of chloroaniline found at the site suggest that industrial dyes, inks, and/or waste colors may have been disposed of at the site. A potential origin of the PAHs migrating from the site is pine tar pitch, which was reported to have been disposed of at the site (Interagency Task Force on Hazardous Wastes 1979).

The effects of the industrial contaminants found at the site on humans and the environment vary according to the specific compound. Benzene clearly produces adverse health effects in mammals. It has long been recognized as toxic if ingested in large quantities, and at nonlethal concentrations it can cause a variety of central nervous system disorders. Prolonged exposure to benzene is suspected to cause leukemia. Other chronic effects of exposure to benzene include pulmonary system and bone marrow mutations; liver, kidney, and lung damage; and hormone alteration (Ochsner, Blackwood, and Zeagler 1979). Acute exposure to toluene may cause central nervous system dysfunction and narcosis. The toxicity of toluene may be increased by concurrent exposure to benzene that results in inhibition of toluene metabolism. Little is known about the impacts of exposure to chloroaniline on human health or the environment. Metabolism of PAH compounds in the human body occurs through the action of enzymes. The PAH metabolites are suspected as carcinogens (IEA Coal Research 1984).

4.5.5 Relationship and Impacts of Nearby Landfill

The following is a discussion of the relationship and potential impacts of the Land Reclamation site (Site Number 915070) on the Old Land Reclamation site. The Land Reclamation site, located directly west of the Old Land Reclamation site, has also recently been the subject of a Phase II investigation, and the results of this investigation will be used to assess the relationship of the two sites.

Both the Old Land Reclamation and Land reclamation sites are inactive landfills that have reportedly received similar wastes during their operations, including pine tar pitch, inks, laboratory sample bottles, waste colors, foundry sand, slag, and other municipal and industrial wastes. Based on groundwater flow directions determined from water levels in wells at both sites, Land Reclamation is downgradient of Old Land Reclamation with respect to the bedrock aquifer (see Figure 4-3). Land Reclamation is also downgradient in terms of surface water since Cayuga Creek, which flows to the south-southwest, receives runoff and overburden groundwater discharge from the Old Land Reclamation site upstream of the Land Reclamation site (see Figure 4-2).

Several volatile and semivolatile organic compounds and inorganic elements are found at both sites in various media. These common contaminants include benzene, chlorobenzene, ethylbenzene, toluene, xylenes, 4-chloroaniline, PAHs, and five metals (cadmium, chromium,, iron, lead, and manganese) above respective standards.

The presence of identical contaminants may be due to the fact that similar wastes were disposed of at the two sites. The presence of petroleum hydrocarbon contamination suggests that a contributing factor for both sites may be the auto salvage yard located between the two sites (see Figure 2-1).

Based on the available groundwater and surface water flow and analytical information, the following conclusions are possible:

- o It is very likely that contaminants from the Old Land Reclamation site are impacting the bedrock aquifer beneath it and subsequently the Land Reclamation site;
- o It is also very likely that wastes from Old Land Reclamation are the source of some portion of the contamination of the bedrock aquifer beneath that site;
- o Any contamination of Cayuga Creek from Old Land Reclamation would result in a decrease in water quality in the creek adjacent to Land Reclamation; and
- o It is impossible to determine, given the available information, the relative contributions of the two sites to the contamination of the bedrock aquifer beneath, or Cayuga Creek adjacent to, the Old Land Reclamation site.

4.6 RECOMMENDATIONS

Potential harm to human health and the environment by the Old Land Reclamation site could occur from direct contact with leachate and/or Cayuga Creek water and sediment. The ingestion of Cayuga Creek fish, which may be contaminated, is an additional concern. Various actions could be performed to prevent these consequences from occurring. The construction of an 8-foot-high chain-link fence around the east, west, and north borders of the site could reduce access to trespassers who presently utilize the property for hiking and horseback and ATV riding. This measure could reduce the risk for direct contact with contamination at the site.

The emplacement of a low-permeability clay cap over the surface of the landfill could reduce the volume of leachate generated and the subsequent migration of leachate to Cayuga Creek. Employing erosion-control measures along the banks of Cayuga Creek, such as installing corrugated steel reinforcement panels, could reduce the rate of erosion of the south bank of the landfill during Cayuga Creek flood events.

Further hydrogeologic investigation of the bedrock groundwater could better define the potentiometric surface and determine if the nearby limestone quarry is influencing the direction of groundwater flow in the Onondaga Limestone beneath the site.

In the absence of documented hazardous waste disposal at the site, a proper closure under 6 NYCRR Part 360 (including additional/long term monitoring) appears warranted. These actions would mitigate the risk of direct contact with contamination and decrease the volume of leachate generated and its subsequent migration to Cayuga Creek. Referral to the Division of Solid Waste is recommended in view of the fact that the contaminants detected are consistent with those expected based on the site's former usage coupled with the lack of confirmed hazardous waste disposal. To this end, NYSDEC should work toward delisting this site from the Registry of Inactive Hazardous Waste Disposal Sites in New York State.

Table 4-1

DRILLING LOG INFORMATION

Well	Approximate Thickness of Overburden (feet)	Approximate Fractured Limestone Thickness (feet)	Monitoring Interval	Comments
GW-2A	34.5	0.1	5	Bedrock monitoring well installed beneath landfill at northern extent of site
GW-2B	>31.6	N/A	5	Overburden monitoring well installed adjacent to GW-2A, partially screened in fill material
GW-6A	7.3	>11	11	Bedrock monitoring well installed at southwestern corner of site on Cayuga Creek floodplain
GW-7A	8.4	8.1	9	Bedrock monitoring well installed at southeastern corner of site on Cayuga Creek floodplain

[UZ]YO4080:D2824, #2833, PM = 22

Table 4-2

WATER LEVEL DATA

Well	Date Measured	Water Level (feet from T.O.C.)*	Elevation of Steel Casing	Grade Elevation	Water Level (feet above MSL)
GW-2A	7/19/89	35.08	649.78	647.8	614.70
GW-2A	2/21/89	34.09	649.78	647.8	615.69
GW-2B	7/19/89	24.25	649.92	647.8	625.67
GW-2B	2/21/89	22.83	649.92	647.9	627.09
GW-6A	7/19/89	19.82	622.05	462.8	602.23
GW-6A	2/21/89	18.51	622.05	462.8	603.54
GW-7A	7/19/89	9.20	623.04	463.8	613.84
GW-7A	2/21/89	8.52	623.04	463.8	614.52

02[UZ]YO4080:D2824/2834/17

*T.O.C. = Top of steel casing

Note: Elevations are referenced to an assumed elevation of 500.00 feet at a R. R. Spike in the powerline pole T-3 as shown on the survey map - Appendix F.

Table 4-3

FIELD MEASUREMENTS OF AQUEOUS SAMPLES COLLECTED AT THE OLD LAND RECLAMATION SITE

Well	Date	Time	pH	Temperature (°F)	Conductivity	Nephelometric Turbidity Units (NTU)
GW-2A	7/19/89	12:22	6.14	84.0	1,705	36
GW-2B	7/19/89	13:19	6.32	73.2	1,790	46
GW-6A	7/19/89	15:33	5.79	81.3	1,208	56
GW-7A	7/19/89	17:05	5.88	78.0	3,040	42
TP-1	7/20/89	15:00	6.01	69.1	2,620	72
TP-2	7/20/89	16:35	6.25	68.8	2,540	38
SW-1	1/29/90	10:35	7.70	37.9	340	7
SW-2	1/29/90	11:20	7.05	38.6	340	12

[UZ]YN4080:D2824, #2836, PM=15

Table 4-4

ORGANIC ANALYSIS SUMMARY

Compound	Concentration	Sample	NYSDEC Regulatory Limit (μg/L)
VOLATILE ORGANICS			
Benzene	31 μg/L	TP-1	
	26 μg/L	GW-7A	Not detectable*
	11 μg/L	GW-2B	
	9 μg/L	GW-6A	
	6 μg/L	TP-2	
Chlorobenzene	32 μg/L	TP-1	5**
	16 μg/L	GW-7A	
	13 μg/L	GW-2B	
Ethylbenzene	12 μg/L	TP-1	5**
	8 μg/L	TP-2	
Toluene	8 μg/L	GW-2B	5**
Total xylenes	130 μg/L	GW-2B	15**
	110 μg/L	TP-1	
	8 μg/L	GW-7A	
SEMI-VOLATILE ORGANICS			
Benzo(a)pyrene	570 μg/L	SD-2	No limit for soils
Benzo(b)fluoranthene	990 μg/L	SD-2	No limit for soils
Chloroaniline	220 μg/L	TP-1	No regulatory limit
	77 μg/L	GW-7A	
Chrysene	610 μg/L	SD-2	No limit for soils
Fluoranthene	1,200 μg/L	SD-2	No limit for soils
Naphthalene	50 μg/L	TP-1	No regulatory limit
Pyrene	830 μg/L	SD-2	No limit for soils
PESTICIDES/PCBs	Not detected in any sample		--

02[UZ]YO4080:D2824/2832/17

*Class GA standard and effluent standard and/or limitation for discharges to Class GA waters.
**Class GA standard only.

Table 4-5

**OLD LAND RECLAMATION
GROUNDWATER INORGANIC ANALYSIS**

Inorganic Detected	Range (µg/L)	NYSDEC Standards for Class GA Groundwater	Comment	Sample Exceeding Standard (µg/L)		
				Location	Non-Dissolved Metals	Dissolved Metals*
Aluminum	0 - 35,600	No regulatory Limit	Levels often high			
Arsenic	8.2 - 15.5	25	All samples below limit			
Barium	495 - 569	1,000	All samples below limit			
Cadmium	0 - 11.5	10		GW-2B	11.5	
Calcium	168,000 - 247,000	No regulatory limit	Levels often high			
Chromium	20.7 - 75	50		GW-2B	75.0	
Cobalt	0	No regulatory limit	All samples below detection limit			
Copper	27.1 - 116	200	All samples below limit			
Iron	2,040 - 180,000	300		GW-2A	34,600	
				GW-2B	180,000	
				GW-6A	25,300	2,040
				GW-7A	25,800	

02[UZ]Y04080:D2824/2768/21

Key at end of table.

Table 4-5 (Cont.)

Inorganic Detected	Range ($\mu g/L$)	NYSDEC Standards for Class GA Groundwater ($\mu g/L$)	Comment	Sample Exceeding Standard ($\mu g/L$) Location	Non-Dissolved Metals	Dissolved Metals*
Lead	0 – 141	25		GW-2B	141	
Magnesium	49,000 – 121,000	35,000**	All levels above guidance value	GW-2A	121,000	
				GW-2B	63,600	
				GW-6A	50,500	49,000
				GW-7A	97,900	
Manganese	263 – 1,910	300		GW-2A	1,910	
				GW-2B	1,600	
				GW-6A	586	546
Nickel	0	No regulatory limit	All samples below detection limit			
Potassium	34,800 – 136,000	No regulatory limit	Levels often high			
Sodium	94,700 – 440,000	20,0000	All levels above standard	GW-2A	440,000	
				GW-2B	347,000	
				GW-6A	94,700	96,900
				GW-7A	218,000	
Vanadium	0 – 56	No regulatory limit				
Zinc	45.2 – 498	5,000				

02[UZ]YO4080:D2824/2768/21

*Dissolved metals analysis performed on sample GW-6A only due to turbidity >50 NTUs.
**Guidance value

Table 4-6

LEACHATE/SHALLOW GROUNDWATER INORGANIC ANALYSIS

Inorganic Detected	Range (µg/L)	NYSDEC Regulatory Limit* (µg/L)	Comment	Samples Exceeding Limit Location	Samples Exceeding Limit Level (µg/L)
Aluminum	ND - 1,230	2,000			
Arsenic	ND - 6	50			
Barium	130 (B) - 512	2,000			
Cadmium	ND	20			
Copper	ND	1,000			
Cyanide	ND	400			
Iron	2,040 - 55,800	600	Levels often high	TP-1 TP-2	2,040 55,800
Lead	11.8 - 69	50		TP-2	69
Manganese	546 - 766	600		TP-2	766
Mercury	ND	4			
Nickel	ND	2,000			
Selenium	ND	40			
Silver	ND	100			
Zinc	ND - 38	5,000			

[UZ]YO4080:D2824, #2831, PM=18

*Effluent standards and/or limitations for discharges to Class GA waters.

Table 4-7

SURFACE WATER INORGANIC ANALYSIS

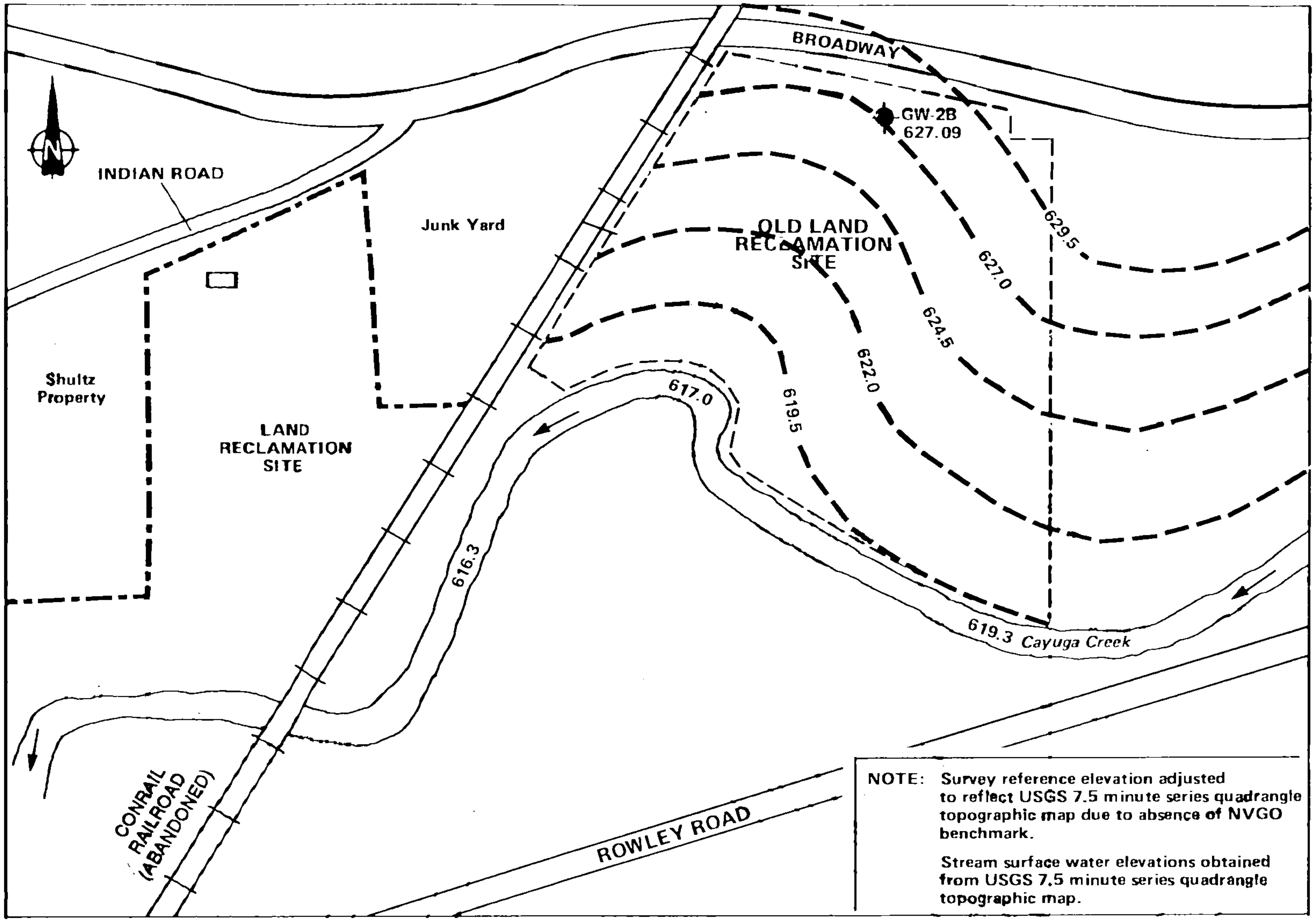
Inorganic Detected	SW-1 (µg/L)	SW-2 (µg/L)	NYSDEC Class C Standard	Sample Exceeding Standard
Aluminum	ND*	149	100	SW-2
Barium	32.7	42.6	NA**	--
Calcium	40,400	46,500	NA	--
Iron	288	1,020	300	SW-2
Lead	6.7	ND	117/144***	--
Magnesium	7,510	9,570	NA	--
Manganese	25.3	71.2	NA	--
Potassium	1,740	3,560	NA	--
Sodium	19,900	22,700	NA	--
Zinc	ND	17.9	30	--

02[UZ]YO4080:D2824/4549/28

*ND = Not detected above detection limit.
**NA = No Class C standard.
***Class C standard calculated by the equation
exp (1.266 [ln (ppm hardness)] - 1.416)

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

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



NOT TO SCALE

KEY:

- Overburden Monitoring Well
- Groundwater Contour
- Inferred Contour

Figure 4–2
POTENTIOMETRIC SURFACE OF OVERBURDEN WATER ELEVATIONS AT OLD LAND RECLAMATION SITE

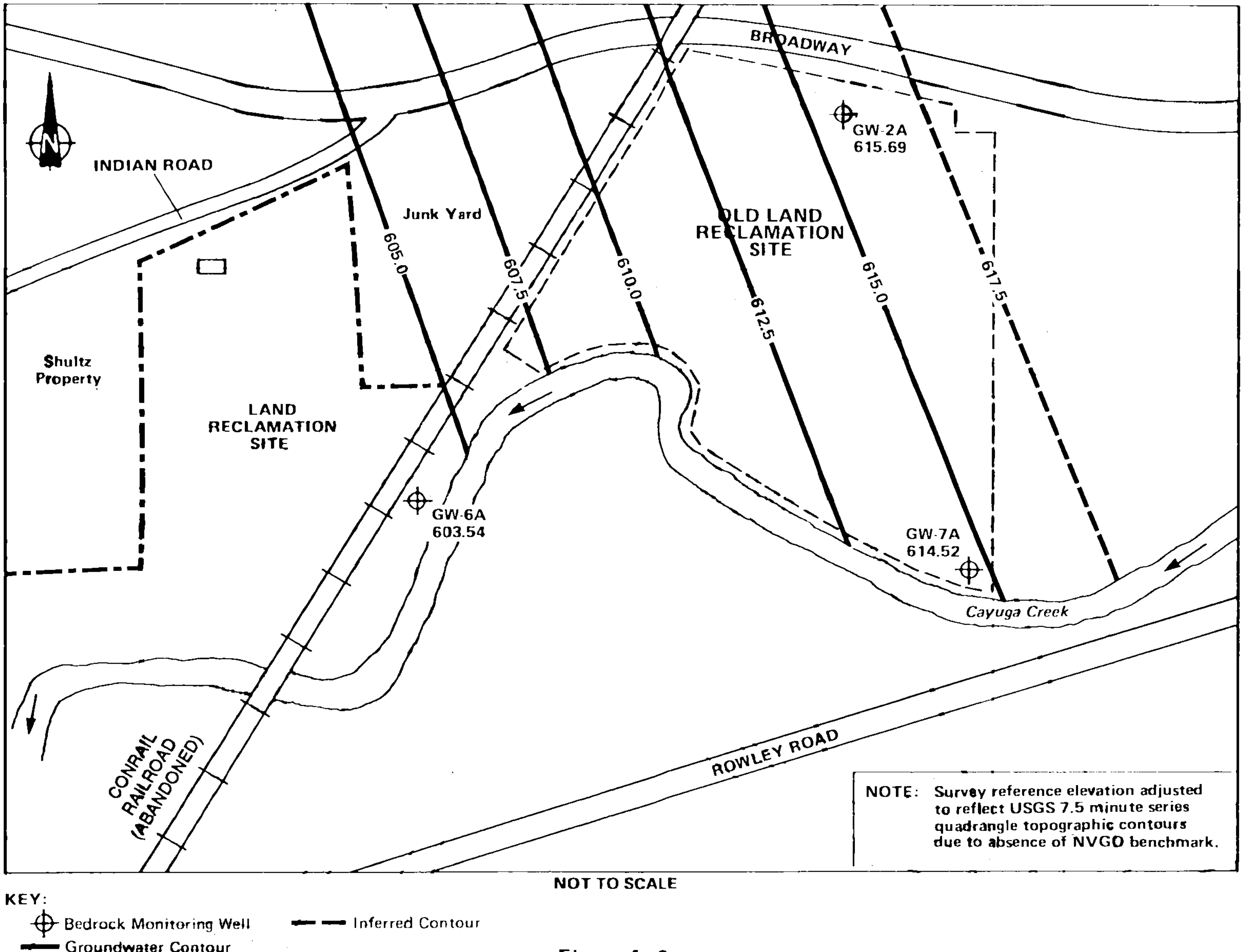


Figure 4–3
POTENTIOMETRIC SURFACE OF BEDROCK WATER ELEVATIONS, AT OLD LAND RECLAMATION SITE

5

Narrative

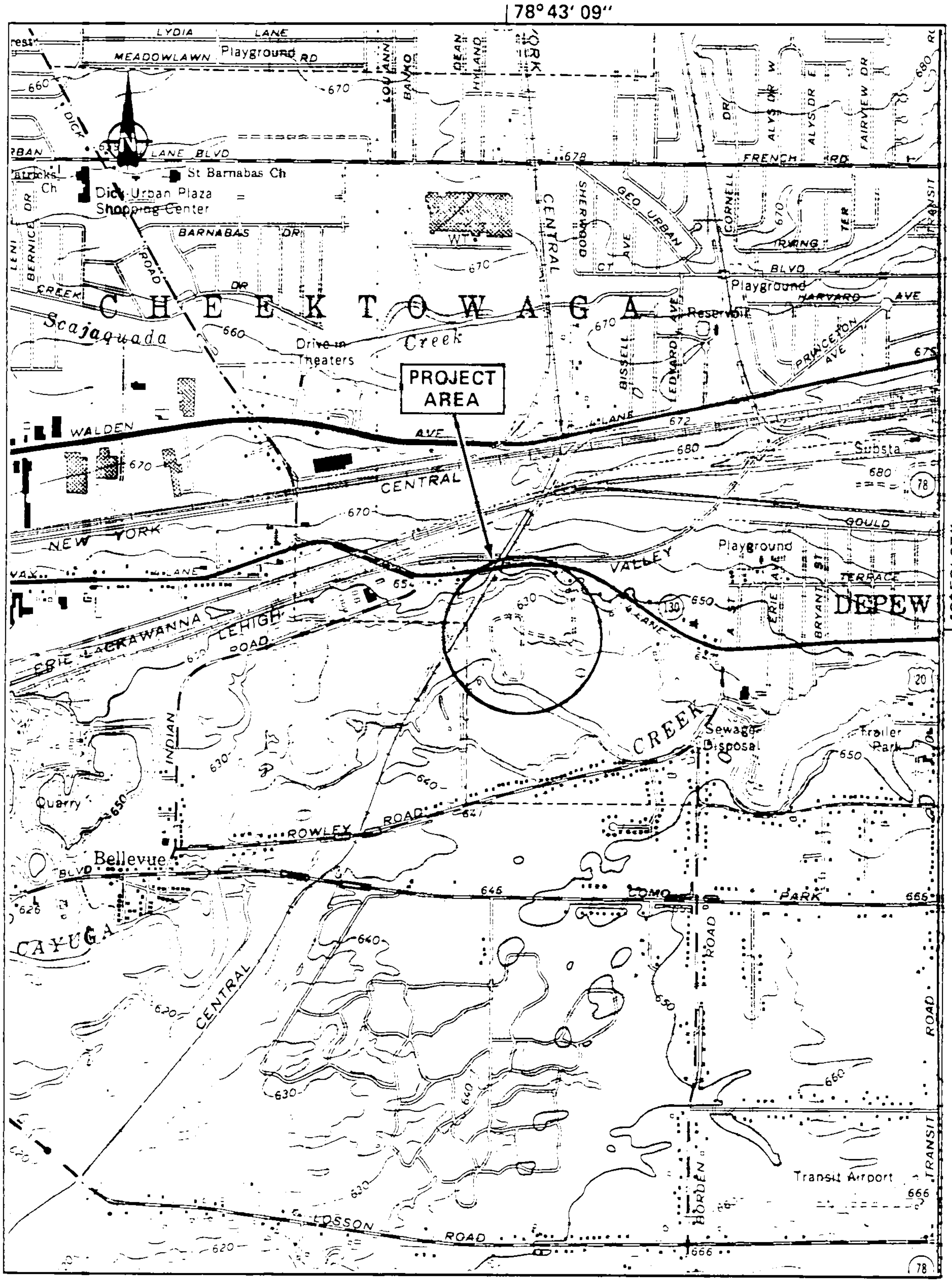
5.1

5. FINAL APPLICATION OF HAZARDOUS RANKING SYSTEM

5.1 NARRATIVE SUMMARY

The Old Land Reclamation site is a 64-acre inactive landfill located on Broadway in the southwest section of the Village of Depew, Erie County, New York (see Figure 1-1). The landfill was operational from 1960 through 1975. During these years of operation, the landfill intermittently accepted various municipal and industrial waste streams. The site is currently owned by the Village of Depew, the Mecca brothers of North Collins, New York; Hirsch et al. of Buffalo, New York; and Samuel Greenfield of Buffalo, New York.

An unknown quantity of miscellaneous refuse, foundry sand, slag, fly ash, oil sludge, pine tar pitch, inks, and waste colors were disposed of at the landfill. According to a sampling study and site evaluation conducted by the Erie County DEP in 1984, leachate seeps and drainage ditches on the site are contaminated with barium, lead, zinc, phenol, aniline, and aniline derivatives. The landfill is bordered by Broadway on the north, Cayuga Creek on the south, and farm pasture to the east. A Conrail right-of-way separates the site from an inactive landfill and an active transfer station and scrapyard operation due west of the site. The site is located approximately 9 miles east of the Niagara River and 1.5 miles west of the Village of Depew. Within a 1-mile radius of the site, approximately 20,051 people are potentially affected by direct contact with, or ingestion of, leachate and/or Cayuga Creek water, sediment, and fish.



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle; Lancaster, N.Y. 1965.

SCALE 1:24,000

0 .5 1 Mile

0 .5 1 Kilometer

Figure 5 – 1
LOCATION MAP: OLD LAND RECLAMATION SITE

5.3 HRS Worksheets

FIGURE 1

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

Facility Name: OLD LAND RECLAMATION

Location: Broadway, Depew, New York

EPA Region: II

Person(s) in Charge of Facility:
1. Village of Depew, 85 Manitou St., Depew, NY 14043
2. Mecca Brothers, 10788 Main St., North Collins, NY 14111
3. Samuel Greenfield, P.O. Box 246, Buffalo, NY 14240
4. Hirsch et al., Buffalo, NY

Name of Reviewer: Ecology and Environment Engineering, P.C. Date: 1/90

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 Old Land Reclamation site is an inactive landfill located along Broadway in the southwest section of the Village of Depew, Erie County, New York. The facility is located along the northern Cayuga Creek floodplain. An inactive Land Reclamation landfill and active transfer station and scrapyard operations are located directly west of the site. The site is under the current ownership of four separate parties, including the Village of Depew. The landfill was operated from approximately 1960 to 1975 and received municipal refuse and industrial wastes including foundry sands, slag, fly ash, oil sludge, pine tar pitch, inks, and waste colors.

Direct contact with observed leachate seeps and migration of contaminated groundwater to Cayuga Creek are major concerns.

Scores: S_M = 8.10 (S_{gw} = 4.47 S_{sw} = 13.286 S_a = 0)

S_{FE} = 0

S_{DC} = 50

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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 4 6 8 10 / 12 16 18 20 / 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

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Surface 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	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	3	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			14	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	4	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			10	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			8,550	64,350	
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} =	13.29		

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

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ecology and environment

NOTE* ROUTE SCORE = 0 NO OBSERVED RELEASE

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

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	4.47	19.981
Surface Water Route Score (S_{sw})	13.286	176.517
Air Route Score (S_a)	0	0
$S^2_{gw} + S^2_{sw} + S^2_a$		196.498
$\sqrt{S^2_{gw} + S^2_{sw} + S^2_a}$		14.018
$\sqrt{S^2_{gw} + S^2_{sw} + S^2_a} / 1.73 = S_M =$		8.10

FIGURE 10
WORKSHEET FOR COMPUTING S_M

*Note: No score needed because the site has not been declared a fire hazard by a fire marshal.

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		S_{FE} = 0			

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	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	16	20	
Distance to a Critical Habitat	0 1 2 3	4	0	12	
Total Targets Score			16	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			10,800	21,600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =	50		

FIGURE 12
DIRECT CONTACT WORK SHEET

5.4 HRS Documentation Records

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: OLD LAND RECLAMATION

Location: BROADWAY, VILLAGE OF DEPEW, NEW YORK

Date Scored: JANUARY/FEBRUARY, 1990

Person Scoring: MICHAEL J. WELCH

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

Ref. 9
Ref. 8
Ref. 10
Ref. 16
Ref. 13
Ref. 1
Ref. 11
Ref. 4
Ref. 5
Ref. 20

Factors Not Scored Due to Insufficient Information:

None

Comments or Qualifications:

None

1. OBSERVED RELEASE

Contaminants detected (3 maximum):

Lead, chromium, 4-chloroaniline, and other contaminants
Ref. 8

Rationale for attributing the contaminants to the facility:

Site has a history of leachate problems and soil and water contamination. The site history, in addition to the groundwater analysis from this study (Ref. 8), are reasonable grounds to attribute groundwater contamination to this site.
Ref. 1, 4, 5, 8

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

Onondaga limestone (approximately 110 feet) - upper member, dark grey-tan approx. 50-60'; middle member, cherty limestone approx. 40-45'; and a lower member, gray, coarse-grained limestone only a few feet thick. On site, the upper member forms the bed of Cayuga Creek (Ref. 14). The upper member here contains vertical and horizontal fractures (Ref. 18). The groundwater quantity in the Onondaga limestone depends on the number of joints and fractures present. Near Cayuga Creek, alluvial silty and sandy clay deposits are associated with stream deposition. The overburden becomes disturbed away from Cayuga Creek and toward the site fill material. Hamlin and Teel silt loam soils on site are often associated with silty floodplain and stream bank deposits (Ref. 17). The Niagara sheet-surficial map (Ref. 21, 1988) indicates that deposits not immediately adjacent to Cayuga Creek on site are glacially-derived lacustrine silts and clays. These seem to be the type of natural materials encountered in wells drilled through fill materials (Ref. 18). Additional coarser deposits (coarse sands/gravels) noted in site logs may be till moraine deposits associated with an east-west trending moraine running through the northern portion of the site. The most likely groundwater migration route proceeds vertically into the fill, then horizontally southward through it, and finally exiting through leachate seeps near the border of the fill, stream alluvium, and Cayuga Creek. The leachates would then flow into Cayuga Creek (a hydrologic barrier). The shallow water table (4-7 feet below natural ground surface) would indicate that fill materials are in frequent contact with groundwater. Because the upper fractured member of the Onondaga limestone forms the bed of Cayuga Creek and is in hydrologic continuity with the creek, alluvium, and possibly saturated fill material (Ref. 3), a second groundwater migration route exists from contaminated/saturated fill vertically into fractured bedrock.
Ref. 3, 14, 17, 18

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

Bedrock encountered at approximately 8 feet below natural ground surface (wells GW-6A, GW-7A). Water was encountered in the wells from 4-7 feet below ground surface. Seasonally, a higher water table may exist corresponding to fluctuations in Cayuga Creek.
Ref. 13, 17, 18

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

Approximately 30 feet of fill material encountered near northern edge of site in well GW-2A. Fill material may be thicker near center of site.
Ref. 18

Net Precipitation

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

36 inches
Ref. 11

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

27 inches
Ref. 11

Net precipitation (subtract the above figures):

36 inches - 27 inches = 9 inches

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Hamlin and Teel silt loams cover the majority of the site. Both of these silt loams are associated with silty floodplain and stream bank deposits, occur in areas with slopes of 0 to 3%, and are subject to seasonally high water tables and flooding associated with streams. Minor amounts of Cazenovia and Ovid silt loams are found in the northeast corner of the site. These silt loams have similar properties to the Hamlin and Teel silt loams. Dump and pit "soils" are also identified in the USDA soil survey. Ref. 17

Permeability associated with soil type:

10^{-5} - 10^{-7} cm/sec.
Ref. 11

Physical State

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

Solids include construction and demolition debris, tires, machine parts, foundry sand, and decayed drums. Decayed drums and the presence of aniline and aniline derivatives found in samples taken (Ref. 1) indicate the likely presence of liquid industrial wastes. Phase I report (Ref. 9) also indicates the presence of fines and sludge-type wastes.
Ref. 1, 8, 9

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No containment structures in place. Waste is covered only by a layer of fill; site has a history of leachate seeps.
Ref. 1, 4, 5, 13

Method with highest score:

All methods score the maximum value.
Ref. 11

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Lead and chromium were evaluated.
Ref. 8

Compound with highest score:

Lead and chromium score the maximum value and occur in samples at levels which exceed NYSDEC Class GA water allowable limits.
Ref. 8, 12, 19

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.):

References 1, 8, and 9 indicate industrial wastes were dumped on site and subsequently detected. Village of Depew Attorney Mr. Joseph Schultz indicated that only municipal wastes were accepted at the facility. Therefore, records pertaining to the quantity of hazardous wastes do not exist. There is no accurate method to estimate hazardous waste quantity.
Ref. 1, 6, 8, 9

Basis of estimating and/or computing waste quantity:

Factor scored above 0 due to hazardous wastes present.
Score = 1
Ref. 2

* * *

5. TARGETS

Groundwater Use

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

Inactive commercial/industrial wells.
Ref. 9, 15

Distance to Nearest Well

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

Not applicable; well water not currently used.
Ref. 9, 15

Distance to above well or building:

Not applicable.

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. 9

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

Groundwater not used for irrigation.
Ref. 9, 16

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

0
Ref. 9, 15, 16

1. OBSERVED RELEASE

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

Lead, iron, manganese, naphthalene, and 4-chloroaniline
Ref. 8

Rationale for attributing the contaminants to the facility:

The site has a past history of leachate seeps. Leachates were detected in the Phase II study (Ref. 8) in in-filled cut-off meanders of Cayuga Creek. These cut-off meanders have been identified as conduits for contaminants to Cayuga Creek. Leachate seeps were observed directly and indirectly entering Cayuga Creek.
Ref. 1, 2, 4, 5, 8, 9

* * *

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Average facility slope is gentle, approximately ≤2 to 3%. (Within the facility, there are several levels of flat areas and one pit.)
Ref. 1, 10

Name/description of nearest downslope surface water:

Cayuga Creek is adjacent to the site.
Ref. 10

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

Approximately 8 to 10%
Ref. 10

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

No
Ref. 10

Is the facility completely surrounded by areas of higher elevation?

No
Ref. 10

1-Year 24-Hour Rainfall in Inches

2.1 inches

Distance to Nearest Downslope Surface Water

Downslope surface water borders site.
Ref. 10

Physical State of Waste

Solids include construction and demolition debris, tires, machine parts, foundry sand, and decayed drums. Decayed drums and the presence of aniline and aniline derivatives found in samples taken (Ref. 1) indicate the likely presence of liquid industrial wastes. Phase I report (Ref. 9) also indicates fines and sludge-type wastes.
Ref. 1, 8, 9

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No containment structures in place. Waste covered only by a layer of fill. History of leachate seeps.
Ref. 1, 4, 5, 13

Method with highest score:

All methods score the maximum value.
Ref. 11

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Benzene, chlorobenzene, ethylbenzene, and lead.

Compound with highest score:

Benzene and lead scored the maximum value and occur at levels in samples exceeding NYSDEC effluent standards and/or limitations for discharges to Class GA waters.
Ref. 8, 12, 19

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.):

References 1, 8, and 9 indicate industrial wastes dumped on site and subsequently detected. Village of Depew Attorney Mr. Joseph Schultz indicated that only municipal wastes were accepted at the facility. Therefore, records pertaining to the quantity of hazardous wastes do not exist. There is no accurate method to estimate hazardous waste quantity.
Ref. 1, 6, 8, 9

Basis of estimating and/or computing waste quantity:

Factor scored above 0 due to hazardous wastes present.
Score = 1
Ref. 2

* * *

5. TARGETS

Surface Water Use

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

Use of Cayuga Creek within 3 miles downstream of the facility is recreational and/or fishing.
Ref. 7, 16

Is there **tidal** influence?

No
Ref. 10

Distance **to a** Sensitive Environment

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

There **are no** coastal wetlands within 2 miles.
Ref. 10

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

Two **freshwater** wetlands are within 1 mile of the site: LA-7 200 feet
LA-6 3,200 feet

Ref. 9

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

There are **no** critical habitats/endangered species within 1 mile of the site.
Ref. 9

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:

There are **no** water supply intakes within 3 miles downstream of the site.
Ref. 20

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

Not **applicable** (no intakes)
Ref. 20

Total **population** served:

0
Ref. 20

Name/description of nearest of above water bodies:

Not **applicable** (no intakes on Cayuga Creek)
Ref. 20

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

Not **applicable**
Ref. 20

1. OBSERVED RELEASE

Contaminants detected:

None on record; none observed
Ref. 9, 13

Date and location of detection of contaminants:

Not applicable; not observed

Methods used to detect the contaminants:

An HNu meter was used during E & E field work (6/89) and revealed no ambient air contamination in breathing zones. However, slightly elevated levels were detected within a few inches of some soil samples.
Ref. 13

Rationale for attributing the contaminants to the site:

No observed levels varied significantly from background levels. Not applicable.
Ref. 13

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable; no air contamination observed; air samples not taken.
Ref. 13

Most incompatible pair of compounds:

Not applicable; no air contamination observed; air samples not taken.
Ref. 13

Toxicity

Most toxic compound:

Not applicable; no air contamination observed; air samples not taken.
Ref. 13

Hazardous Waste Quantity

Total quantity of hazardous waste:

Hazardous wastes present; total quantity of waste unknown from records. No statistically significant/accurate way to estimate quantity.
Ref. 8

Basis of estimating and/or computing waste quantity:

Factor scored above 0 due to hazardous wastes present.
Score = 1
Ref. 11

* * *

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

Approximately 5,700 people
Ref. 9

Distance to a Sensitive Environment

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

There are no coastal wetlands within 2 miles of the site.
Ref. 9

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

There are two wetlands within 1 mile of the site: LA-6 (3,200 feet)
LA-7 (200 feet)
Ref. 9

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

There are no critical habitats within 1 mile of the site.
Ref. 9

Land Use

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

Commercial/industrial areas are within 2,640 feet of the site.
Ref. 16

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

No national or state parks, forests, or wildlife preserves are within 2 miles of the site.
Ref. 10

Distance to residential area, if 2 miles or less:

Residential areas are within 660 feet of the site.
Ref. 16

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

No agricultural lands active within the last 5 years are within 1 mile of the site.
Ref. 16

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

No prime agricultural lands active within the last 5 years are within 1 mile of the site.
Ref. 16

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

No historic landmarks are within view of the site.
Ref. 10

1. CONTAINMENT

Hazardous substances present:

No potentially explosive compound combinations were accepted, none are on record, and none were observed.
Ref. 9

Type of containment, if applicable:

No containment structures are in place. Waste is covered only by a layer of fill.
Ref. 1, 4, 5, 13

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

Not applicable

Ignitability

Compound used:

Not applicable

Reactivity

Most reactive compound:

Not applicable

Incompatibility

Most incompatible pair of compounds:

Not applicable

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

Hazardous wastes present; total quantity of waste unknown from records. No statistically significant/ accurate way to estimate quantity.
Ref. 8, 9

Basis of estimating and/or computing waste quantity:

Factor scored above 0 due to hazardous wastes present.
Score = 1
Ref. 11

* * *

3. TARGETS

Distance to Nearest Population

Approximately 660 feet to nearest residential structure.
Ref. 16

Distance to Nearest Building

Approximately 660 feet
Ref. 16

Distance to a Sensitive Environment

Distance to wetlands:

Two freshwater wetlands are within 1 mile of the site: LA-7 (200 feet)
LA-6 (3,200 feet)

Ref. 9

Distance to critical habitat:

No critical habitats/endangered species are within 1 mile of the site.
Ref. 9

Land Use

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

Commercial/industrial areas are within 2,640 feet of the site.
Ref. 16

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

No national or state parks, forests, or wildlife preserves are located within 2 miles of the site.
Ref. 10, 16

Distance to residential area, if 2 miles or less:

Residential areas are within 660 feet of the site.
Ref. 10, 16

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

No agricultural lands active within the last 5 years are within 1 mile of the site.
Ref. 9, 16

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

No prime agricultural lands active within the last 5 years are within 1 mile of the site.
Ref. 9, 16

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

No historic landmarks are within view of the site.
Ref. 9, 10

Population Within 2-Mile Radius

>10,000 people within 2 miles
Ref. 10

Buildings Within 2-Mile Radius

>2,600 buildings within 2 miles
Ref. 10

DIRECT CONTACT

1. OBSERVED INCIDENT

   Date, location, and pertinent details of incident:

   None on record; none observed
   Ref. 6, 9

* * *

2. ACCESSIBILITY

   Describe type of barrier(s):

   Access to the site is not restricted
   Ref. 9, 21

* * *

3. CONTAINMENT

   Type of containment, if applicable:

   No containment structures are in place. Waste is covered only by a layer of fill. History of leachate seeps.
   Ref. 1, 4, 5, 13

* * *

4. WASTE CHARACTERISTICS

   Toxicity

   Compounds evaluated:

   Benzene, chlorobenzene, ethylbenzene, and lead.
   Ref. 8

   Compound with highest score:

   Benzene and lead scored the maximum value.
   Ref. 11

* * *

5. TARGETS

   Population Within One-Mile Radius

   There are 20,051 individuals within 1 mile of the site.
   Ref. 9

   Distance to Critical Habitat (of endangered species)

   There are no critical habitats/endangered species within 1 mile of the site.
   Ref. 9

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	Erie County Department of Environment and Planning, 1985, Old Land Reclamation, Village of Depew, Sampling Study and Site Evaluation. Document location: Ecology and Environment, Inc., Buffalo, New York.
2	Voell, A.T., August 18, 1986, personal communication, Erie County Department of Environment and Planning, memo to L. Clare, NYSDEC. Document location: Ecology and Environment, Inc., Buffalo, New York.
3	K. Studley, June 15, 1987, personal communication, Erie County Department of Environment and Planning, internal memo to A. T. Voell. Document location: Ecology and Environment, Inc., Buffalo, New York.
4	D. Campbell, May 9, 1984, personal communication, Erie County Department of Environment and Planning, letter to P. Buechi, NYSDEC. Document location: Ecology and Environment, Inc., Buffalo, New York.
5	D. Campbell, January 11, 1984, personal communication, Erie County Department of Environment and Planning, letter to P. Buechi, NYSDEC. Document location: Ecology and Environment, Inc., Buffalo, New York.
6	Schultz, J. J., November 18, 1985, personal communication, Village of Depew Attorney, letter to and reply from NYSDEC. Document location: Ecology and Environment, Inc., Buffalo, New York.
7	Connare, T. P., February 17, 1987, personal communication, Recra Environmental, Inc., letter to L. Clare, NYSDEC. Document location: Ecology and Environment, Inc., Buffalo, New York.
8	Ecology and Environment, Inc., February 1990, Phase II Investigation Old Land Reclamation Site, analytical data, Appendix D (this report). Document location: Ecology and Environment, Inc., Buffalo, New York.
9	New York State Department of Environmental Conservation, June 1986, Engineering Investigations at Inactive Hazardous Waste Sites, Phase I Investigation, Old Land Reclamation Site, No. 915129, Buffalo, Erie County. Prepared by Recra Environmental, Inc. Document location: Ecology and Environment, Inc., Buffalo, New York.
10	U.S. Geological Survey, 1982, 7.5 x 15 minute series (topographic), Lancaster, New York. Document location: Ecology and Environment, Inc., Buffalo, New York.
11	Barrett, K.W., S.S. Chang, S.A. Haus, A.M. Platt, 1982, Uncontrolled Hazardous Waste Site Ranking System Users Manual, MITRE Corp. Document location: Ecology and Environment, Inc., Buffalo, New York.
12	Sax, N.I., 1975, Dangerous Properties of Industrial Materials Sixth Edition. Van Nostrand Reinhold Co., New York, New York. Document location: Ecology and Environment, Inc., Buffalo, New York.
13	Ecology and Environment, Inc., June 14-15, 1989, Site Logbook. Document location: Ecology and Environment, Inc., Buffalo, New York.
14	Buehler, E.J., and I.H. Tesmer, 1963, Geology of Erie County, New York, Buffalo Society of Natural Sciences Bulletin, Vol. 21, No. 3. Document location: Ecology and Environment, Inc., Buffalo, New York.
15	LaSala, A.M., Jr., 1968, Groundwater Resources of the Erie-Niagara Basin, New York, N.Y. State Conservation Department, Water Resources Commission, Basin Planning Report ENB-3. Document location: Ecology and Environment, Inc., Buffalo, New York.

Reference Number	Description of the Reference
16	Richert, J.J., April 26, 1989, personal communication, J. Whitney, District Conservationist, USDA - Soil Conservation Service. Document location: Ecology and Environment, Inc., Buffalo, New York.
17	USDA Soil Conservation Service, 1986, Soil Survey of Erie County, New York. Document location: Ecology and Environment, Inc., Buffalo, New York.
18	Ecology and Environment, Inc., February 1990, Phase II Investigation, Old Land Reclamation Site, well logs, Appendix C (this report). Document location: Ecology and Environment, Inc., Buffalo, New York.
19	NYSDEC, Water Quality Regulations, Surface Water and Groundwater Classifications and Standards, New York State Codes, Rules, and Regulations, Title 6, Chapter X, Parts 700-705. Document location: Ecology and Environment, Inc., Buffalo, New York.
20	New York State Department of Health, 1982, New York State Atlas of Community Water System Sources, 1982. Document location: Ecology and Environment, Inc., Buffalo, New York.
21	Forcucci, M., July 27, 1987, personal communication, Department of Health, memo to L. Rusin, NYSDEC. Document location: Ecology and Environment, Inc., Buffalo, New York.

REFERENCE 1

To: Ron Koczaja
FYI

DRAFT

OLD LAND RECLAMATION

VILLAGE OF DEPEW

Sampling Study and Site Evaluation

Erie County Dept. Environment and Planning

Conducted by Ronald D. Koczaja,
Asst. Env. Quality Engineer

Cameron O'Connor
Env. Quality Technician

MARCH 1985

ADVISORY NOTE

The information contained in this document is presented to show environmental conditions, comparisons to ambient environmental standards and criteria and compliance status relative to applicable environmental regulations.

Any use of this information to assess the risks to personal or public health, identify potential personal or public liability or to estimate the costs of remedial activity should only be done after consultation with appropriate government agencies or private consultants.

TABLE OF CONTENTS

Old Land Reclamation
Broadway
Village of Depew

1.0 INTRODUCTION

On January 5, 1984, the Erie County Department of Environment and Planning received a complaint from a resident living at 4447 Broadway in regard to an "oily liquid" in a stream located adjacent to the western edge of his property.

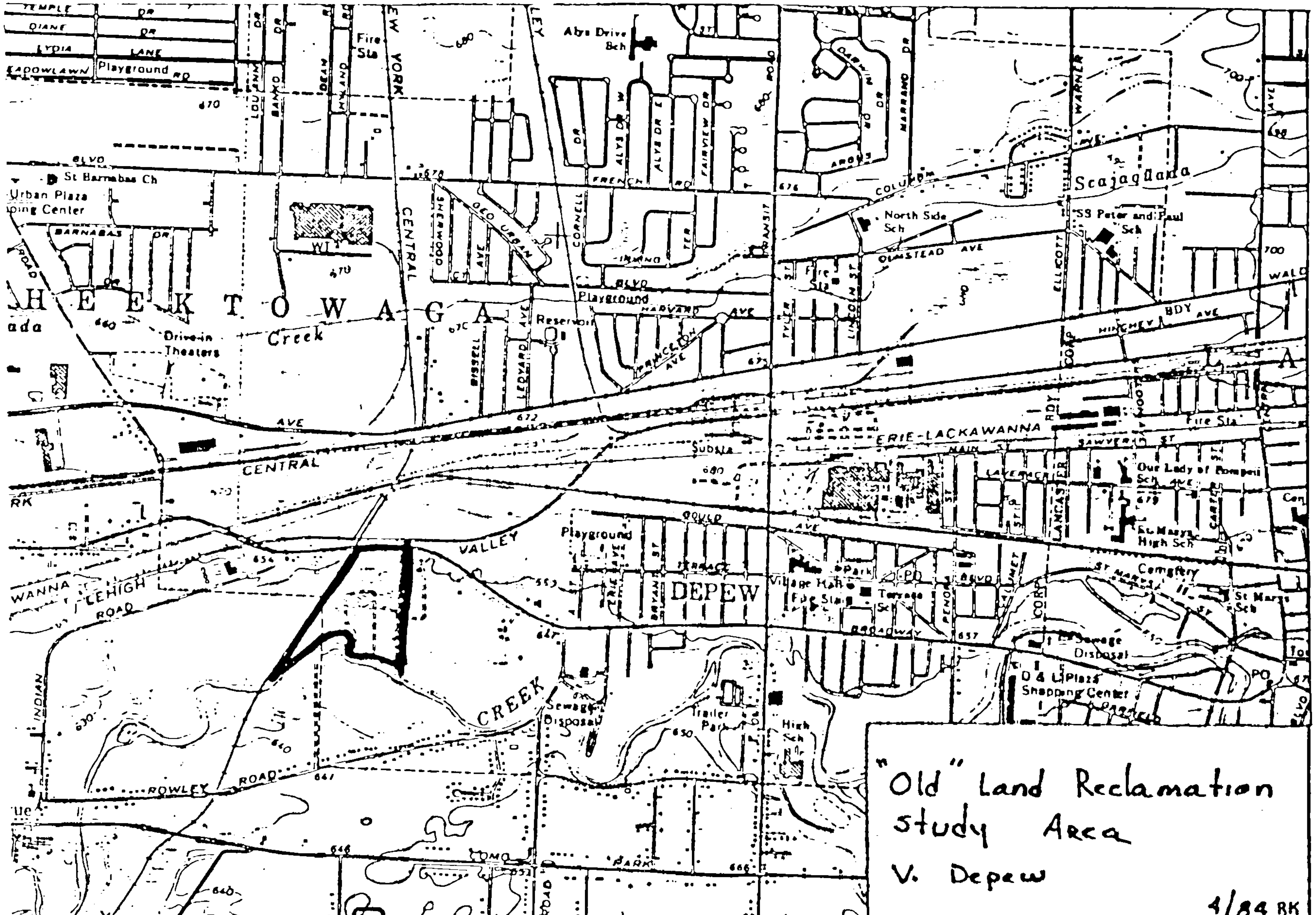
A field inspection was performed by Mr. Campbell of the Division of Environmental Control on the day the complaint was received. Mr. Campbell identified the oily liquid as typical leachate. The source of the leachate was determined to be a former landfill.

It was decided by County Solid Waste personnel, since little information was known about the landfill's history, that a comprehensive site evaluation and sampling study should be performed.

2.0 BACKGROUND AND AERIAL PHOTOGRAPHY

This site is located south of Broadway and east of the Land Reclamation Transfer Station on Indian Road in the Town of Cheektowaga. The site itself is located in the Village of Depew. Site ownership presently lies with 4 parties: 1) the Village of Depew; 2) Mecca Brothers, 10788 Main Street, North Collins, N.Y.; 3) Hirsch et. al., Buffalo, N.Y.; and 4) Samuel Greenfield, P.O. Box 246, Buffalo, N.Y.

On July 9, 1984, Mr. Koczaja of Erie County DEP spoke with Joseph Schultz, Village of Depew Attorney, who advised that this site was not a municipal landfill operated by the Village of Depew. It was operated privately under a contract with the Village, with the land returning to the Village upon closure of the site. The Depew Village Attorney indicated that only municipal refuse from the Village of Depew, the Town of Cheektowga, and the City of Buffalo was disposed of at the site. No industrial wastes were allowed. A portion of this site owned by the Mecca Brothers contained a hole approximately 30 feet deep. This portion of the site reverted to the Mecca Brothers following completion of landfilling. The site is currently zoned LC (land conservation) by the Village of Depew The Village envisions the site becoming a park in approximately 10 years if Federal monies become available. No commercial or residential building or development is contemplated for this area.


"Old" Land Reclamation
Study Area
V. Depew
4/84 RK
CHEEKTOWAGA
DEPEW
Creek
VALLEY
CREEK
CENTRAL
AVE
ERIE-LACKAWANNA
LEHIGH
ROWLEY ROAD
BROADWAY
Drive-in Theaters
Playground
Reservoir
St Barnabas Ch
Urban Plaza
North Side Sch
SS Peter and Paul Sch
Our Lady of Pompeii Sch
St Marys High Sch
Cemetery
Village Hall
Fire Sta
Sewage Disposal
Trailer Park
High Sch
D & L Plaza Shopping Center
Scajaquada
Alys Drive Sch

A review of aerial photographs[1] provided an insight into the site's history. The first evidence of landfilling was visible on the 1958-60 aerial photographs. These photographs indicated the start of a landfilling operation in the northwest portion of the site. Area placement is believed to be the fill method which was employed at that time. The fill material was uniform in tone and mounds of material were readily observable. The light tone may indicate the placement of newly excavated earth or slag. Ponded water was noted at the toe of the landfilling area. Access to the disposal area was from Broadway. To the southeast of the major disposal area was an area of isolated dumping. Access to this area was from a different road and it is unknown if this disposal was associated with Old Land Reclamation activities. There was no activity observed to the west of the railroad tracks in the area which is now occupied by the Land Reclamation Landfill. An oxbow of Cayuga Creek was evident in the southwest corner of the Old Land Reclamation site.

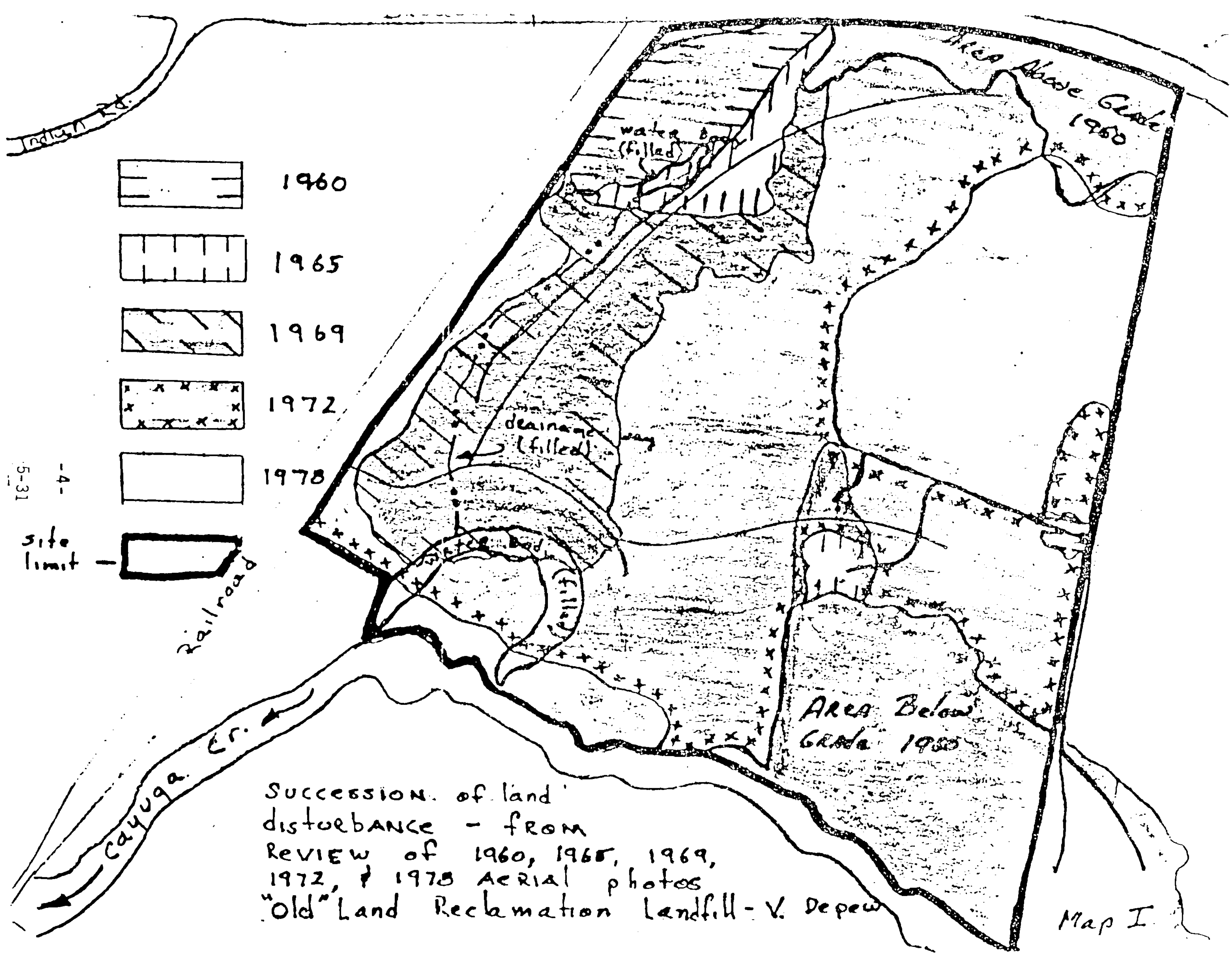
The 1965 aerial photograph showed the continuation of landfilling in the Old Land Reclamation area. Fill progression was to the south and east of the area of disposal which was evident in the 1960 photos. There once again appeared to be minor disposal activity in the isolated area which was first observed in the 1958 and 1960 photos.

The 1969 aerial photograph indicated extensive disposal activity at the Land Reclamation Landfill. Disposal at the Old Land Reclamation site had progressed southward towards Cayuga Creek. The active phase of landfilling activity at the Old Land Reclamation site covered the northern curve of the Cayuga Creek oxbow in this photo. A common access road joining the Old Land Reclamation area with the Land Reclamation Landfill was visible. The 1972 aerial photograph indicated increased operations at both the Old Land Reclamation Landfill and the Land Reclamation Landfill sites. On the Old Land Reclamation site, landfilling had expanded to the east and south from the area previously disturbed. Numerous piles of what could be foundry sand were noted in the aerial photograph. The oxbow of Cayuga Creek was all but covered in this photograph.

The 1978 aerial photograph indicated that landfilling at the Old Land Reclamation site had been completed. Map I shows the historical progression of landfilling at the site.

3.0 HYDROGEOLOGY OF THE SITE

Bedrock under the site is limestone. It has been reported that the bedrock is found at a depth greater than 4 feet below the surface of the site.[2] Cayuga Creek which is located along the south edge of the site, was observed to have a fractured limestone bottom.



Succession of land disturbance - from Review of 1960, 1965, 1969, 1972, & 1978 Aerial photos "Old" Land Reclamation Landfill - V. Depew

The northern section of the study area is reported to have "urban soils" by the Soil Conservation Service. The soil permeability, texture, and depth to groundwater of "urban" soils is "miscellaneous". The southern portion of the study area was reported to contain Teel and Middlebury soils. The Teel and Middlebury soils were formed in recent alluvial deposits dominated by silt. Teel soils are slightly more silty and are less acid than Middlebury soils. Both of these soils are moderately well drained to somewhat poorly drained and have a seasonal high water table that rises into the subsoil for brief periods during the early Spring. The water table is influenced by the water level in the adjacent stream. In some years, these soils are subject to flooding, usually in the early Spring. In both Teel and Middlebury soils, the rate of groundwater movement through the subsoil is moderate. Gravel lenses are commonly present in the soils.[3]

The hydrogeologic data indicates that this was a poor location for a sanitary landfill. The potential for pollution to the groundwater is likely to be high.

4.0 INVESTIGATION PROGRAM

Sample locations were chosen by use of aerial photography and by field inspection. Aerial photographs were used to identify areas that may act as hydraulic connections between the older fill material and Cayuga Creek (i.e. filled in oxbow and drainage ditches). Field inspection was then performed to try to locate those areas found on the aerial photography and also identify other sampling points, such as leachate seeps, that would help characterize environmental conditions on site.

4.1 Field Observation

Field vegetation has established itself over the entire surface of the landfill. There are numerous low spots on the surface which contain ponded water. This indicates poor drainage and the enhanced likelihood of percolation of water through the fill material.

Numerous lechate seeps were evident along the edges of the former landfill. The leachate from the seeps either entered Cayuga Creek directly or via drainage ditches along the east and west sides of the landfill.

Exposed debris was noted along the side slopes of the landfill. Protruding refuse observed included construction and demolition debris, tires, machine parts, hoses, clothing and foundry sand. Fifty-five gallon drums were observed protruding from the landfill in several areas; however, they were in an advanced state of decomposition and it is unknown if they contained waste.

Erosion of the southern slope of the landfill indicates periodic flooding by Cayuga Creek.

The former landfill site appeared to be heavily used by wildlife. Fauna observed on site included deer, raccoons, rabbits, ducks (migration route) reptiles, hawk and song birds. Human use of the site appeared to be limited to horse and dirt bike riding.

Sampling Procedures

Prior to sampling, the sampling sites were chosen and marked with an orange paint for reference. Arrangements were made with the Erie County Laboratory for the receipt and analysis of all samples. Laboratory analyses included PCB, total halogenated organics, anilines, lead, chromium, zinc, arsenic, barium, mercury and phenol. These parameters were chosen as indicators of industrial waste disposal. The Erie County Laboratory prepared and provided the sampling containers. The actual sampling of the site occurred on April 26 and May 2 and 7, 1984.

Soil samples were obtained using a Veiemeyer soil sampler from drainage ditches or from the areas affected by leachate seeps. The sampler was driven to a depth of 36" at each site with the exception of sites #5 and #9. At sampling locations #5 and #9, refusal was at a depth less than 36". The soil core obtained was removed from the sampler, measured and divided. In all cases recovery was less than the penetration depth. Recovery of soil varied from 19-88% and was dependent on the nature of the soil at the sampling site. Replicate soil cores were obtained at each site to assure that the recovery was maximized. The soil samples were then broken into lengths and placed into glass bottles. Observations noted during sampling were recorded. These observations included soil texture, colors, and unusual odors.

Liquid samples were taken from the drainage ditches on the east and west edges of the landfill, and, if possible, directly from leachate seeps.

Charts I, II and III describe the sampling points, water, and soil samples respectively.

5.0 ANALYTICAL RESULTS

The analytical results are displayed in Appendix I. Soil and water sample Number 1 taken upstream of the landfill, served as a control sample. Soil and water samples 2 through 12 were taken from the Old Land Reclamation disposal site as shown on Map II.

5.1 Soil Samples

Soils were analyzed for PCB's, pesticides, arsenic, barium, cadmium, chromium, lead, mercury, and zinc.

PCB's were found at detectable levels in 6 of the 11 sites taken at the landfill site. The highest PCB concentration reported was 1.9 ppm, all other PCB concentrations were 0.29 or less. The concentrations found were well below the 50 ppm criteria for being considered a hazardous substance. They were also below the 10 ppm or greater level that the USEPA has established to classify sediment pollution.[4] The control sample did not contain PCB's at detectable levels.

Herbicides and pesticides were not detected in any sample from the study area.

A comparison was made of metal concentrations at Old Land Reclamation against background concentrations provided by NYSDEC from a 1982 USGS study*, the USEPA guidelines for polluted classification of sediments and the control samples taken during a 1982 Tifft Farm Study** to identify the relative environmental quality at the former landfill. The results of the control samples taken during the Tifft Farm were used for comparison as they reflect urban soils where no known landfilling has occurred.

* The background concentrations were taken as part of NYSDEC, The Niagara River Toxic Study.

** Tifft Farm Nature Preserve soil quality study performed by DEP.

For this comparison, the arithmetic mean was computed for arsenic, barium, chromium, lead and zinc using the highest concentration found at each sample location (#2 through 12). The control sample was not included. Statistical analysis of mercury and cadmium was not performed from analytical data gathered at the Old Land Reclamation site since the majority of the results were below the detection limit. Table 1 in Appendix I shows the compared values.

Detectable amounts of arsenic were found in all samples taken at the landfill. The highest value detected was 10 ppm, the average being 5.6 ppm. This average was above the EPA guidelines of 3 ppm; however, it was below the average for the control samples taken for the Tifft Farm Study.

Barium was detected in 9 out of 11 sampling locations at the Old Land Reclamation site. The highest concentration encountered was 90.0 ppm, the average being 57.2 ppm. This was above the EPA sediment guideline of 20 ppm. The upstream control sample contained 70 ppm for its highest concentration. The elevated level found in the control sample precludes identification of the landfill as the source of barium.

All samples had detectable concentrations of chromium. The highest value encountered was sample #9 at 950 ppm. All other concentrations were 27 ppm or less. The increase in concentration in sample #9 suggested local rather than area-wide contamination with chromium. The average chromium concentration was 103.6 ppm; however, due to sample #9, a more appropriate statistic is probably the median, which was computed at 21.0 ppm. This value was below the USEPA guideline and the Tifft Farm control samples; however, higher than the computed background number in the USGS study. The value for chromium in the control sample did not significantly differ from the majority of values at the former landfill.

Lead was detectable in all samples. The highest value was 340 ppm, all other values were 240 ppm or below. The average concentration was 127.3 ppm. This value was above the USGS background and the USEPA guideline for unpolluted sediments. It is lower than the values computed for the Tifft Farm control samples. The highest lead concentration in the control sample was 52 ppm.

Measurable amounts of mercury were found in 5 of 11 samples. The highest was 0.28 ppm. All other concentrations of mercury were .15 and lower. The control sample contained 0.1 ppm of mercury. These values are lower than the USEPA guidelines for unpolluted sediments and the average found in the Tifft Farm control samples. However, where mercury was detected, the values were above the normal soil background values which have been identified by the NYS Department of Health, as in the range of .01 ppm and .06

ppm.[5] The elevated values indicate minor contamination of soil with mercury; however, the elevated level found in the control sample precludes identification of the landfill as the source of the mercury.

Cadmium was not detected in any of the samples taken during the Old Land Reclamation. Most data available through literature research indicated that background levels for cadmium were below the E.C. Laboratory detection limit of 5.0 ppm, consequently, reliable comparisons were not possible. In the <u>Principles of Geochemistry-Second Edition</u> the average concentration of cadmium in soil is reported to be 0.2 ppm. The NYSDEC has reported that the cadmium background level in this area, as established by the USGS study, is 4.0 ppm. (The USGS studies included sampling at a City of Buffalo Park and Holy Cross Cemetery). Cadmium compounds are used in fungicides, insecticides, nematocides, and superphosphate fertiliers. Consequently, the reported average of 4.0 ppm is probably affected by several samples with altered soil conditions from use of cadmium-containing soil additives).

Zinc was found in detectable levels in all soil samples. The highest concentration found was 327 ppm. Zinc concentrations were elevated throughout the Old Land Reclamation site. The average was 210.8. The upstream sample contained 89 ppm. This average is higher than the background concentration found in the USGS study and for the USEPA guideline for unpolluted sediment, however lower than the average from samples secured during the Tifft Farm study program.

The following conclusions are made based on the above information regarding soil conditions at Old Land Reclamation.

1) Pesticides and PCB contamination was not significant in the areas sampled.
2) Metals concentrations from surface soil samples were not substantially different from samples taken at depth.
3) The soil at the Old Land Reclamation site had elevated concentrations of metals generally higher than the USEPA guidelines for unpolluted sediments. The concentrations are lower than average concentrations of metals found in two parks and Holy Cross Cemetery in the City of Buffalo.

5.2 <u>Liquid Analysis</u>

Liquid samples consisted of both water from drainage tributaries of Cayuga Creek and leachate seeps. The analytical results are displayed in Table II of Appendix I.

The results were compared with information obtained in New York State Ambient Water quality Regulatory and Guidance Criteria by NYSDEC (May 10, 1984). This manual lists regulatory criteria and guidance criteria according to the receiving waters classification. Regulatory criteria and guidance criteria have not been established for all parameters for all classes of streams, consequently, particular attention should be given to the special remarks which are listed in Table 2. In all cases, it was attempted to use the regulatory guidance criteria most suited for Cayuga Creek (Class C) which receives effluent from the tributary ditches and leachate seeps. If Class C criteria were not available, the criteria set forth for water classified as a potable water supply source were used. (It is recognized that the comparisons of analytical data from the leachate seeps with stream guidance criteria is not suitable from a regulatory standpoint. However, the intentof the study was to determine the relative environmental quality in the vicinity of the landfill).

Metals

Liquid samples were analyzed for arsenic, barium, cadmium, chromium, copper, lead, mercury and zinc.

Cadmium and mercury were not detected in any of the sample locations.

Arsenic was detected only in Sample 10. The concentration recorded, 0.08 ppm, exceeded the guideline criteria identified in Table 2.

Barium was detected in five of the twelve samples. Samples 3, 5, 6 and 9 had concentrations at or below the guidelines criteria. Sample 11 was reported to have a concentration of 18.8 which is almost 19 times the criteria identified.

Chromium and copper were detectable only in Sample 11. Chromium was reported as 0.1 ppm which was above the guideline criteria. Copper did not exceed the regulatory criteria.

Lead was detectable in two samples (8 and 11). Both exceeded the guidance criteria. Sample 11 had the highest concentration at 0.8 ppm.

Zinc was found at concentrations above the guidance criteria in 9 of 12samples. The highest concentration was reported at sampling point 11 (1.3 ppm). Zinc was not found in the control sample.

Organics

Samples were analyzed for phenols, THO, pesticides, PCB and an aniline series.

Laboratory analysis did not indicate substantial loss of total halogenated organics to the environment. No pesticides were detected in any of the samples. PCBs were detected in three of twelve samples. The highest concentration (.2 ppb) was encountered in upstream control sample 1.

Phenols were detected in 10 of 12 samples. Six of the sampling sites had phenol concentrations at or greater than the guidance criteria as shown in Table II. The highest value reported (31ppb) was at Sample 7. No phenols were reported in the upstream sample.

Elevated levels of aniline and aniline derivatives were found in all samples taken at the landfill site and the upstream control sample. At all sampling sites, aniline and/or one of its derivatives far exceeds the guidline criteria as set forth by NYSDEC/DOH.

The following observations can be made in regards to liquid sample results.

1) The concentrations of contaminants did not significantly differ between water and leachate samples.

2) Generally, both metal and organic chemical concentrations were higher on the southeast and eastern portions of the landfill.

3) Sample 11 (leachate) contained the highest concentrations of metals encountered during the study. Heavy metal concentrations at the other sample locations did not appear to represent a significant threat to the environment.

4) The landfill appeared to be a source of low level discharge of phenols to the environment.

5) Aniline and aniline derivatives were elevated throughout the landfill. Aniline is not naturally occurring, and therefore is an indication of disposal of industrial waste at the landfill. However, the elevated level in upstream control Sample 1 indicates that the landfill may not be the only source of aniline to the environment.

A literature search was performed for aniline to determine possible sources of discharge to the environment. Aniline is used as the parent compound for more than 300 chemical products. Major uses for this compound are dyes, vulcanization of rubber, an intermediate for monomeric and polymeric isocyanates and intermediates of pesticides and herbicides.[6] It has been reported in the IATF that Land Reclamation received wastes from Allied Dye Corp. This as well as other industrial waste components are likely sources of aniline found in the landfill site samples.

Specify reference

The elevated concentrations in the upstream presents a question as far as identification of possible sources. Because of anilines widespread use, it might be a likely component of industrial wastewater discharges. However, the concentrations of aniline in such discharges have not been studied on a regular basis. Available information indicates that where aniline was being discharge in measurable amounts, that the compound was not detected downstream of the source nor in the stream sediments.[7]

The aniline detected in the upstream sample may also be due to the use of defoliants upstream of the sample location.

The USEPA has designated 950 ppb (aniline) and 450 ppb (n-methylaniline) as a provisional limit for soil and water contamination.[8]

Aniline is reported to be biogradable in wastewater with activated sludges. It is unknown at what rate it degrades in the environment. Little is known about aniline as a human or environmental risk.[8] It is on the USEPA Priority List of Chemicals (TSCA, Section 4(e)).

6.0 CONCLUSIONS

The elevated concentrations of phenols, aniline, and aniline derivatives, the visible observation of foundry sand and 55-gallon drums as well as aerial photography interpretation indicate that the Old Land Reclamation site received industrial waste.

The analytical results in both the liquid and soil samples do not indicate that the areas sampled pose a significant threat to the environment. The samples did not indicate that the landfill was losing substantial amounts of metals and total halogenated organics to its surroundings; however the potential for the loss, or the existance of non-halogenated organic materials could not be assessed.

The discharge of leachate noted at the landfill is a potential violation of Part 360.8 (a)(3) of the Environmental Conservation Rules and Regulations. It is unlikely that capping the leachate seeps will be sufficient to preclude future horizontal extrusions due to the general poor (or nonexistence) cover material and because the southern toe of the landfill is in Cayuga Creeks floodplain. A leachate containment system without a collection system would probably cause vertical migration. Due to the shallow bedrock depth at the southern toe of the landfill and the general limestone bedrock geology of the site, vertical leachate would most likely effect groundwater quality in the area.

7.0. RECOMMENDATIONS

Further analysis of the site is required in order to determine the need for and extent of remedial action at the Old Land Reclamation site.

Additional historical review of what waste materials went into this site should be performed. This should include interviews with private operators, Village employees, etc. This information may provide insight for additional sampling areas, and parameters. The aniline and aniline derivative concentrations found during the investigation should be confirmed by additional water and soil analysis. Volatile organic compounds should also be included in future sampling programs.

Any future development of this site should consider it's past history. Potential developers should become aware of the site's past land use and the limitations to development due to environmental consideration or pending remedial actions determined necessary for the site under the NYS Inactive Hazardous Waste Site clean up program.

Any development alternative that includes excavations or the potential of release of materials in the landfill should be monitored by the appropriate environmental agencies.

Land uses plan which may increase human use of the site should be submitted, along with sampling data, to the Erie County and New York State Health Departments for their review relative to potential risks to the public health. This site should be added to the NYS Registry of Inactive Waste Disposal Sites in accordance with Article 17, Title 13 of the Environmental Conservation Law.

REFERENCES

1. Aerial Photography donated to DEP by Cheektowaga Town Historian.

2. URS Engineers, Map 719-9-0 (A) Bedrock Formation.

3. USDA Soil Conservation Service. General Soil Map and Interpretation, Erie County, 1979.

4. USEPA, 1977 Guidelines for the Pollution Classification of Great Lakes Harbor Sediments.

5. ECHD memorandum, June 15, 1983. Mr. Barry to Mr. Clare.

6. National Academy Press, Washington, D.C., 1981. Aromatic Amine: An Assessment of the Biological and Environmental Effects Page 126.

7. Ibid, Page 131.

8. USEPA, August 1973. Recommended Methods of Reduction, Neutralization, Recovery or Disposal of Hazardous Waste. Volume X Organic Compounds, Page 218.

9. Ibid (6), Page 152

REFERENCE 2

File

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

*** M E M O R A N D U M ***

FROM: Anthony T. Voell DATE: 8/18/86

TO: Larry Clare, NYSDEC

RE: Old Reclamation Site - No. 915129 - Phase I Report

Attached are comments prepared by Cameron O°Connor regarding this site.

I agree with Cameron°s comments and urge you to accept his guidance and recommendations for a followup study of this site.

MVoell

ANTHONY T. VOELL, P.E.
Deputy Commissioner

ATV:jk
Attachments

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

*** MEMORANDUM ***

FROM: Cameron O'Connor DATE: 8/13/86

TO: Anthony T. Voell

RE: Old Land Reclamation - Site #915129 - Phase I Report

The Phase I Report for the Old Land Reclamation site utilized our 1984 Investigation Report to a great degree. No new information was available that was not already in our files. I have no comment in regard to the informational portion of the Phase I other than I disagree with the HRS surface water rank. Our sampling data, sampling points and analytical results well establish an observed release and the HRS score should be corrected to reflect this.

The recommendations for the Phase II are generic as usual and while I agree with the need for a Phase II study for this site, the following site specific conditions should be taken under consideration and incorporated into the Phase II.

1) The Old Land Reclamation Site (915129) and the Land Reclamation Site (915070) should be investigated as one site. They were both utilized by the same firm during the same time and received the same waste during the early 1970's. Separating the two into two different investigations is not reasonable.

2) On-site hydrogeologic conditions are unique, therefore require a unique hydrogeologic investigation. Essentially, information indicates that much of the site is underlain by permeable alluvium (sand and gravel). These unconsolidated deposits contain a groundwater table that is in direct hydraulic connection with Cayuga Creek. In addition, the alluvium is over fractured limestone which is a water bearing zone.

Information is also available (Hydrogeological Study for the Land Reclamation Site, 1979) that the groundwater in the unconsolidated deposits (alluvium) is in "intimate hydraulic continuity with the landfill leachate". (i.e.leachate from landfill reflects unconfined groundwater). Consequently, it is likely that groundwater from the unconsolidated deposits is leaving the site from the many leachate seeps and flow horizontally to Cayuga Creek. There is, however, the possibility that in some areas groundwater has the potential to migrate vertically downward to the deeper limestone aquifer.

The placement of single monitoring wells into the landfill (as proposed) in the unconsolidated stratum may miss potential pathways of leachate migration. It is recommended, that well clusters be installed to monitor both consolidated and unconsolidated zones.

The Phase I Report indicates potential placement of wells on top of the landfill. This is not the best location, however, it may be the only location available at the Old Land Reclamation site. From our field observations, in some places the toe of the landfill is adjacent to the bank of Cayuga Creek and in other places there is little room for drilling units to be set up. Field checks by DEP found refusal at (bedrock) 1.5 feet below the ground surface on undisturbed areas adjacent to the Creek. Phase II consultation work will require extensive subsurface testing as proposed in order to correctly place wells. It also is to be kept in mind that it was noted during aerial photography review that a cutoff meander on the Old Land Reclamation site was filled in. The filled in cutoff meander may act as a leachate interceptor that directs flow to leachate extrusion points on the bank of Cayuga Creek (These points were tentatively identified during our investigation). Placement of a monitoring well in the area bounded by the former meander and the creek could result in a false impression of unconsolidated leachate conditions. (Note: The liquid discharge at the point of this cutoff meander can be considered groundwater and would be a good place to sample).

3) Additional sampling of the Old Land Reclamation surface water drainage is a good idea (even though it was thoroughly done in 1984) because RECRA's proposal includes additional sampling parameters that our Lab could not do. However, sampling sediment in Cayuga Creek itself will be difficult because it has a bedrock bed in the area. Also, yearly scouring could remove contaminated sediments, if any, downstream. In addition, downstream sampling would be affected by contaminants from the "New" Land Reclamation Site. The downstream sample should be moved downstream of both landfills (another reason to study both together).

4) All samples should be analyzed for the parameters proposed in the Phase II.

Cameron H O'Connor

CAMERON O'CONNOR

Hazardous Waste Specialist.

REFERENCE 3

File

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

* * * M E M O R A N D U M * * *

FROM: Kermit Studley DATE: 6/15/87

TO: Anthony T. Voell

RE: Phase I Comment Review
Old Land Reclamation - Site No. 915129

During the Phase I review, the County contested the computed HRS surface waters score because evidence of an observed release had been established. Calculation (i.e. scoring procedure) of an HRS score is initially dependent upon direct evidence of an observed release. If evidence is lacking, then route characteristics and containment factors are evaluated. Although the consultant (Recra Environmental, Inc.) did acknowledge our findings, the consultant chose to compute the HRS score using these factors, ignoring the observed release.

Whichever scoring procedure is used, however, the resultant scores are quite similar (11.52 vs 13.29). The migration potential (Sm) which includes surface water, groundwater and air route scores would not be appreciably affected (from 7.08 to 8.05).

What really is at issue is the identity and quantity of landfilled wastes. The consultant has identified this is a serious data inadequacy.

The County thought certain site specific conditions should be addressed and incorporated into a proposed Phase II study.

We recommended that the Old Land Reclamation site and the Land Reclamation Site (915070) should be investigated as one site. The consultant has incorporated this suggestion into their proposed Scope of Work (Section 7.2, p.20). However, the consultant has indicated that the decision to consider both sites as one would be made by the New York State DEC. Therefore, the proposed Phase II study pertains only the Old Land Reclamation site.

We recommended the installation of well clusters to monitor both consolidated and unconsolidated water bearing zones for the following reasons:

1. Permeable alluvium underlies much of the site and overlies fractured limestone which is a water bearing zone.

2. The alluvium is in "intimate hydraulic continuity" with the landfill leachate.

3. The alluvium is also in hydraulic continuity with Cayuga Creek.

4. The potential exists for groundwater to migrate vertically downward to the bedrock aquifer.

The consultant thought most leachate generated within the landfill is discharged to Cayuga Creek through the alluvium. In addition, the consultant stated the presence of relatively impermeable to marginally permeable glacial till between the alluvium and the bedrock (Section 7.2.3) could act as an aquitard to the downward migration of contaminants to the bedrock aquifer. Therefore, monitoring wells would be screened in the lower alluvial deposits.

Whether or not well clusters are installed should be determined by the test borings. This would establish the presence and/or absence of the reported aquitard. This would also be useful in determining the hydraulic continuity between the two water bearing zones.

The consultant did not address the placement of wells with respect to the meander cutoff. We identified the filled-in meander cutoff as a conduit for leachate flow.

Although the proposed Phase II study is site specific, downstream samples from Cayuga Creek would be affected by contaminants from the Land Reclamation site. This was another reason to study both sites together.

Groundwater samples will be analyzed for priority pollutant metals and organics, PCB's, hardness and specific conductance. The County agrees with the proposed testing parameters.

Kermit Studley

KERMIT STUDLEY
Environmentalist

KS:jk

REFERENCE 4

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

* * * MEMORANDUM * * *

FROM: Donald Campbell DATE: 5984

TO: Peter Buechi, NYSDEC

SUBJECT: Old Land Reclamation - Broadway, Village of Depew

Cameron O'Connor and I have completed the field work at the Old Land Reclamation site. The field work included soil, leachate, and water samples. Laboratory analysis will include the following - PCB, THO, Aniline, Pb, Cr, Zn, As, Ba, Hg, and FID series. We anticipate the report will be completed by October 15, 1984.

Preliminary field work found that leachate is entering Cayuga Creek directly (along the south edge of the landfill) and via drainage ditches which parallel the east and west sides. The north edge is at the grade of Broadway. No leachate problems were noted on the top surface of the landfill.

Current ownership of the site is complex and will require more research. We will develop the historical ownership pattern during periods of disposal. Aerial photographic interpretations, original drainage patterns, current leachate seeps and property lines will be superimposed on a single map in an attempt to identify and isolate specific water sources and responsibilities for off-site water flow.

We will keep you advised of the investigations progress, especially if laboratory analysis indicates an alarming situation may exist.

Should you need any further information, please call Ron Koczaja at 846-8556.

DONALD CAMPBELL, P.E.
Sr. Environmental Quality Engineer

DC:RDK:rb

REFERENCE 5

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

File

MEMORANDUM

TO Peter Buechi DATE Jan. 11, 1984

FROM Donald Campbell

SUBJECT Land Reclamation (Old Site).

Our Department has received a complaint on January 5, 1984 regarding oil-like material accumulating in an area east of the old Land Reclamation site on Broadway, Village of Depew.

Our Department is presently reviewing aerial photographs to obtain additional information on the site.

We are planning to conduct a site inspection as soon as weather permits. Sampling will be done to aid in leachate identification. Should corrective measures appear extensive, we will prepare a Legal Referral as required under our State-County agreement.

The aerial photo interpretation will be a part of a profile report that will be prepared and submitted to you.

Attached is a copy of the original complaint.

DONALD CAMPBELL, P.E.
Sr. Env. Quality Engineer
Division of Environmental Control

DC:rb

Attachment

ERIE COUNTY ENVIRONMENTAL CONTROL - COMPLAINT CARD

Name of Person, Company, or Institution Complained against: Land Reclamation (Old Site)

Address: Broadway Depew, N.Y. Phone Number: —

Date: Jan - 5 - 1984 (Month Date Year) Time: A.M. (P.M.) 4:35

Name of Complainant: Marty Snyder

Address: 4447 Broadway Depew, N.Y. Phone Number: 683-0685

DESCRIPTION OF COMPLAINT

Happening Now: Yes (X) No ( ) Emergency: Yes ( ) No (X)

OIL LIKE MATERIAL IN VICINITY OF LANDFILL AREA.

COMPLAINT CATEGORY/COUNTY RULE (STATE RULE)

A.	Open Burning/Rule (Part 215)	( )	H.	Solid Waste (Part 360, 364)	(X)
B.	Fuel Burning/Rule 3 (Part 227)	( )	I.	Oil Spill	( )
C.	Incinerators/Rule 4 (Part 219)	( )	J.	Chemical Spill (17-0701)	( )
D.	Process Equipment/Rule 5 (Part 212)	( )	K.	Sewerage	( )
E.	Nuisance/Rule 7.5 (Part 211)	( )	L.	Water Pollution	( )
F.	Internal Combustion/Rule 8 (Part 217-218)	( )	M.	Other	( )
G.	Odors	( )			

Person taking complaint:

Person handling complaint:

Contact Complainant Date: Jan. 6, 84 Time: 4:00 p.m. Field: YES ☒ NO ☐ *(If YES see back)

Referral to:

INSPECTOR'S REPORT: Inspected area with complainant. Observed what appeared to be oil in the ditch bordering the complaints property and Old Land Rec. site. Heavy Snow cover prohibited a through area evalution. Our dep is presently reviewing aerial photos. Our dept will contact complainant in one week, expect samples to

MANDATORY NOTIFICATION:

	DATE	TIME	REASON
N.Y.S. DEC	–	–	–
U.S.C.G.	–	–	–
OTHER	–	–	–

STATUS:

( ) Abated

(X) Resolved

( ) Referred

Inspector's Signature

5-55

Supervisor's Signature and Date

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1. FACILITY # ______ SOURCE # ______

COMPANY ______

SOURCE ______

GROUP CODE ( )

2. FIELD INVESTIGATION: Type 5 ( )
Other ______

3a. DATE OF INSPECTION ___ ___ ___

TOTAL NUMBER OF VISITS

VIOLATION: Yes ☐ No ☐ P (Rule 10) ☐

DATE OF VIOLATION NOTICE ___ ___ ___

REPLY OR CONFERENCE DUE ___ ___ ___

3b. PLEASE SCHEDULE INSPECTION FOR ___ ___ ___

TYPE ___

4. COMPLIANCE SCHEDULE REQUIRED Yes ☐ No ☐

DATE REQUIRED ___ ___ ___

FIELD REPORT AND FOLLOW UP:
(Include Sketch as needed)

be taken. D.E.C. advised of our action (R. Mitke)

POST INVESTIGATION NOTIFICATION: TOTAL

3.0 hours

15 miles

	DATE	TIME
Complainant	1/9/84	11:00 a.m. (no answer)
N.Y.S. DEC	By letter 1/11/84 & phone con 1/? P. Pucchi	
Specify Other		

5-56

REFERENCE 6

Walt this one ...

DOROTHY F. WOJTYLAK
VILLAGE CLERK
PHONE: (716) 683-1400

85 MANITOU STREET
MUNICIPAL BUILDING
DEPEW, NEW YORK 14043

Arthur J. Domino, Mayor

RECEIVED
NOV 20 1985
BUREAU OF
HAZARDOUS SITE CONTROL
DIVISION OF SOLID AND
HAZARDOUS WASTE

November 18, 1985

New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

Attention: Charles N. Goddard, P.E.

RE: Preliminary Field Investigations at Inactive Harardous Waste Disposal Sites - New York State Superfund Chapter 857, Laws of 1982

Dear Mr. Goddard:

In behalf of the Village of Depew and concerning the Old Land Reclamation Site, ID #915129 in the Village of Depew, County of Erie. I would like to submit to you the following information requested in your letter, which I hope will be helpful in collecting all available information that is needed by your department.

This site was previously used by the Village of Depew as a garbage disposal site and was discontinued in 1962, when the Village of Depew deposited their garbage at a private disposal site owned by Land Reclamation Industries. The only materials that were deposited on the site owned by the Village of Depew was garbage collected and there were no deposits of any hazardous wastes or metals from outside concerns.

Our records reflect the site was in use for approximately fifteen years since the collection of garbage up to 1962 was very light and the Village did not expand until after that period of time.

The site was completely covered with dirt and since 1962 has been used by the Department of Public Works as a storage area for pipe, sand, stone and a deposit of a collection of leaves and wood chips. No garbage or any materials have been deposited on said site since 1962. The Village of Depew, in 1983, sold five acres to Erie County Sewer District No. 4 which constructed a resevoir for waste water on said site and the excavation of the five acres revealed, at that time, that there was only deteriorated garbage. There was no evidence of any material or containers extracted from said property. I imagine that the DEC granted some permit for this project and would have more complete records as to what was excavated and hauled away from said site.

There have been no known reports of any health or environmental problems at the site since it has been closed and I can state this as a fact, since I have been the attorney for the Village of Depew from 1960 to the present time.

I hope that this information is helpful to you in preparing your report and I would appreciate any report that is made, be forwarded to me for our files.

Very truly yours,

Joseph J. Schultz

Joseph J. Schultz
Village Attorney

JJS/ga

cc: Vincent LiPuma
Superintendent of Public Works

[illegible]
CONFUSION AMONG SITES IN
THE VILLAGE ATTORNEYS LETTER.

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

1885 NYS Forest Preserve Centennial 100

DEC 03 1985

Henry G. Williams
Commissioner

Mr. Joseph Schultz
Village Attorney
85 Manitou Street
Municipal Building
Depew, NY 14043

Dear Mr. Schultz:

Re: Old Land Reclaimation
Site I.D. #915129

Thank you for your letter of November 18, 1985 providing informational history on the Old Land Reclaimation site. This will be helpful to our consultant in developing his Phase I report for this particular site.

It has been our policy to provide final copies of site reports to owners as a courtesy. I expect that this report will be available and provided to you in June of next year.

Sincerely,

Walter E. Demick

Walter E. Demick, P.E.
Supervisor
Western Investigation Section
Bureau of Hazardous Site Control
Division of Solid and Hazardous Waste

bcc: w/inc. - C. Goddard
G. Cox -
Recra Research
P. Buechi - Region 9
W. Demick
file

WD:jaf

REFERENCE 7

1/L4847

RECRA ENVIRONMENTAL, INC.

Chemical Waste Analysis, Prevention and Control

February 17, 1987

Mr. Lawrence Clare, P.E.
New York State Department of
Environmental Conservation
600 Delaware Avenue
Buffalo, New York 14202

Re: Old Land Reclamation
NYSDEC Superfund Site #915129

Dear Mr. Clare:

Thank you for your assistance in the Phase I Superfund investigation we are conducting with regard to the Old Land Reclamation site.

As part of the background research requirements for the NYSDEC Superfund investigations, we the consultants are required to have all of our interviews, personal or by telephone, documented. Below is an account of our conversation on February 17, 1987. Please read the account, check its accuracy, sign at the bottom and return the original to me. This is only to serve as documentation that the conversation took place.

- To the best of your knowledge, usage of Cayuga Creek within three miles downstream of the Old Land Reclamation site is limited to casual recreation including some fishing.

Thank you for your cooperation.

Sincerely,

RECRA ENVIRONMENTAL, INC.

Thomas P. Connare

Thomas P. Connare
Environmental Analyst

TPC/dls

Lawrence Clare

Lawrence Clare

REFERENCE 8

RAW ANALYTICAL DATA SUMMARIES

Note: The raw analytical data summaries are included as Appendix D of this report.

REFERENCE 9

Facility name: Old Land Reclamation

Location: Broadway, Village of Depew, New York

EPA Region: II

Person(s) in charge of the facility: Joseph Schultz

Attorney for the Village of Depew, New York

Name of Reviewer: Recra Date: March 1986

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 64 acre site was used as a landfill from approximately 1960 to 1975 and received both municipal and industrial wastes. Soil and leachate sampling was performed in 1984. Surface water in drainage ditches and leachate seeps contained elevated barium, lead, zinc, phenol and aniline. Soil quality was not different from background. Leachate from site enters Cayuga Creek and probably groundwater.

Scores: $S_M = 7.08$ ($S_{gw} = 4.18$ $S_{sw} = 11.52$ $S_a = 0$)

$S_{FE} = 0$

$S_{DC} = 50$

FIGURE 1
HRS COVER SHEET

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

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

FACILITY NAME: OLD LAND RECLAMATION

LOCATION: Broadway, Depew, New York

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GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

No analytical data

Rationale for attributing the contaminants to the facility:

N/A

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern: Recent alluvium and Onondaga Limesto

Recent alluvium, consisting of: upper unit of silts, clays and sand; lower unit of sand and gravel. This aquifer is in direct hydraulic continuity with Cayuga Creek. (Ref. 2)
A potentially significant hydraulic connection may exist between the overburden groundwater and the bedrock aquifer.

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

<20 feet from the natural ground surface to (Ref. 2)
to the water table.

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

Waste disposal onto ground surface by area fill method. Average 20 feet of fill over natural ground surface.
(Ref. 1).

Net Precipitation

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

36 inches (Ref. 3)

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

27 inches (Ref. 3)

Net precipitation (subtract the above figures):

9 inches (Ref. 3)

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Sand (Ref. 2)

Permeability associated with soil type:

$>10^{-3}$ cm/sec. (Ref. 2 and 3)

Physical State

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

Solids, fine material, sludge and liquids (protruding drums) (Ref. 2, 5, 6)

* * *

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3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Wastes were placed by the area fill method.
At closure, the landfill was graded flat. (Ref. 1 and 6)

Method with highest score:

Landfill, no liner; landfill surface encourages ponding. (Ref. 1, 3 and 6)

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Barium, lead, phenol, aniline (Ref. 1)

Compound with highest score:

Barium, lead (Ref. 3)

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):

Presence of hazardous substances confirmed by analytical results.
Quantity unknown.

(Ref. 1)

Basis of estimating and/or computing waste quantity:

Quantity unknown

5 TARGETS

Ground Water Use

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

Industrial; not used, but usable (Ref. 3 and 10)

Distance to Nearest Well

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

Industrial wells no longer in use (Ref. 10)

Distance to above well or building:

N/A

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

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

None (Ref. 10)

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

N/A

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

None (Ref. 10)

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SURFACE WATER ROUTE

1 OBSERVED RELEASE

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

No analytical data for Cayuga Creek.

Rationale for attributing the contaminants to the facility:

Barium, lead, zinc, phenol, and aniline were detected in drainage ditches and leachate seeps. These are not considered surface waters for HRS scoring purposes. (Ref. 1)

2 ROUTE CHARACTERISTICS

<u>Facility Slope and Intervening Terrain</u>

Average slope of facility in percent:

± 1.5% (Ref. 8)

Name/description of nearest downslope surface water:

Cayuga Creek

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

>8% Adjacent to creek (Ref. 8)

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

No

Is the facility completely surrounded by areas of higher elevation?

No

1-Year 24-Hour Rainfall in Inches

Approximately 2.1 inches (Ref. 3)

Distance to Nearest Downslope Surface Water

Adjacent to site (Ref. 1, 4)

Physical State of Waste

Solids, fine material, sludge and liquid (protruding drums) (Ref. 2, 5, 6)

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Wastes were placed by the area fill method. At closure, the landfill was graded flat. (Ref. 1 and 6)

Method with highest score:

Landfill not covered and no diversion system. (Ref. 1 and 3)

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4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

Barium, Lead, Zinc, Phenol, Aniline (Ref. 1)

Compound with highest score:

Barium, lead (Ref. 3)

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):

Presence of hazardous substances confirmed by analytical results. Quantity unknown. (Ref. 1)

Basis of estimating and/or computing waste quantity:

Quantity unknown

* * *

5 TARGETS

Surface Water Use

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

Recreation and fishing

(Ref. 14)

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

N/A

Total population served:

N/A

Name/description of nearest of above water bodies:

Cayuga Creek

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

N/A

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Is there tidal influence?

No

Distance to a Sensitive Environment

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

N/A

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

WETLAND #LA-7: 200 feet
#LA-6: 3200 feet

(Ref. 12)

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

> 1 mile (Ref. 12)

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 (Ref. 9)

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

No analytical data

Date and location of detection of contaminants

N/A

Methods used to detect the contaminants:

N/A

Rationale for attributing the contaminants to the site:

N/A

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Unknown

Most incompatible pair of compounds:

Unknown

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Toxicity

Most toxic compound:

Aniline

(Ref. 1)

Hazardous Waste Quantity

Total quantity of hazardous waste:

Unknown

Basis of estimating and/or computing waste quantity:

Unknown

* * *

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

± 5,700   (Ref. U.S. Bureau of the Census, 1980)

Distance to a Sensitive Environment

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

N/A

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

100 to 200 feet   (Ref. 12)

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

1 mile (Ref. 12)

Land Use

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

2000 feet (Ref. 13)

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

N/A

Distance to residential area, if 2 miles or less:

500 feet (Ref. 13)

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

N/A (Ref. 13)

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

N/A (Ref. 13)

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

N/A

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ecology and environment

FIRE AND EXPLOSION

1 CONTAINMENT

Hazardous substances present:

N/A

Type of containment, if applicable:

N/A

(Ref. 1)

* * *

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:

Unknown (Ref. 1)

Basis of estimating and/or computing waste quantity:

Quantity unknown

* * *

3 TARGETS

Distance to Nearest Population

500 feet (Ref. 13)

Distance to Nearest Building

200 feet (Ref. 13)

Distance to Sensitive Environment

Distance to wetlands:

200 feet to Wetland #LA-7 (Ref. 12)

Distance to critical habitat:

> one mile (Ref. 12)

Land Use

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

2000 feet (Ref. 13)

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

N/A

Distance to residential area, if 2 miles or less:

500 feet

(Ref. 13)

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

N/A

(Ref. 13)

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

N/A

(Ref. 13)

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

No

Population Within 2-Mile Radius

> 10,000

(Ref. 13)

Buildings Within 2-Mile Radius

> 1000

(Ref. 13)

DIRECT CONTACT

1 OBSERVED INCIDENT

Date, location, and pertinent details of incident:

N/A

* * *

2 ACCESSIBILITY

Describe type of barrier(s):

No barriers to entry (Ref. 4)

* * *

3 CONTAINMENT

Type of containment, if applicable:

Drums protruding from side slope (Ref. 4)

* * *

4 WASTE CHARACTERISTICS

<u>Toxicity</u>

Compounds evaluated:

Barium, lead, phenol, aniline (Ref. 1)

Compound with highest score:

Barium, lead (Ref. 3)

* * *

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5 TARGETS

Population within one-mile radius

> 5,000

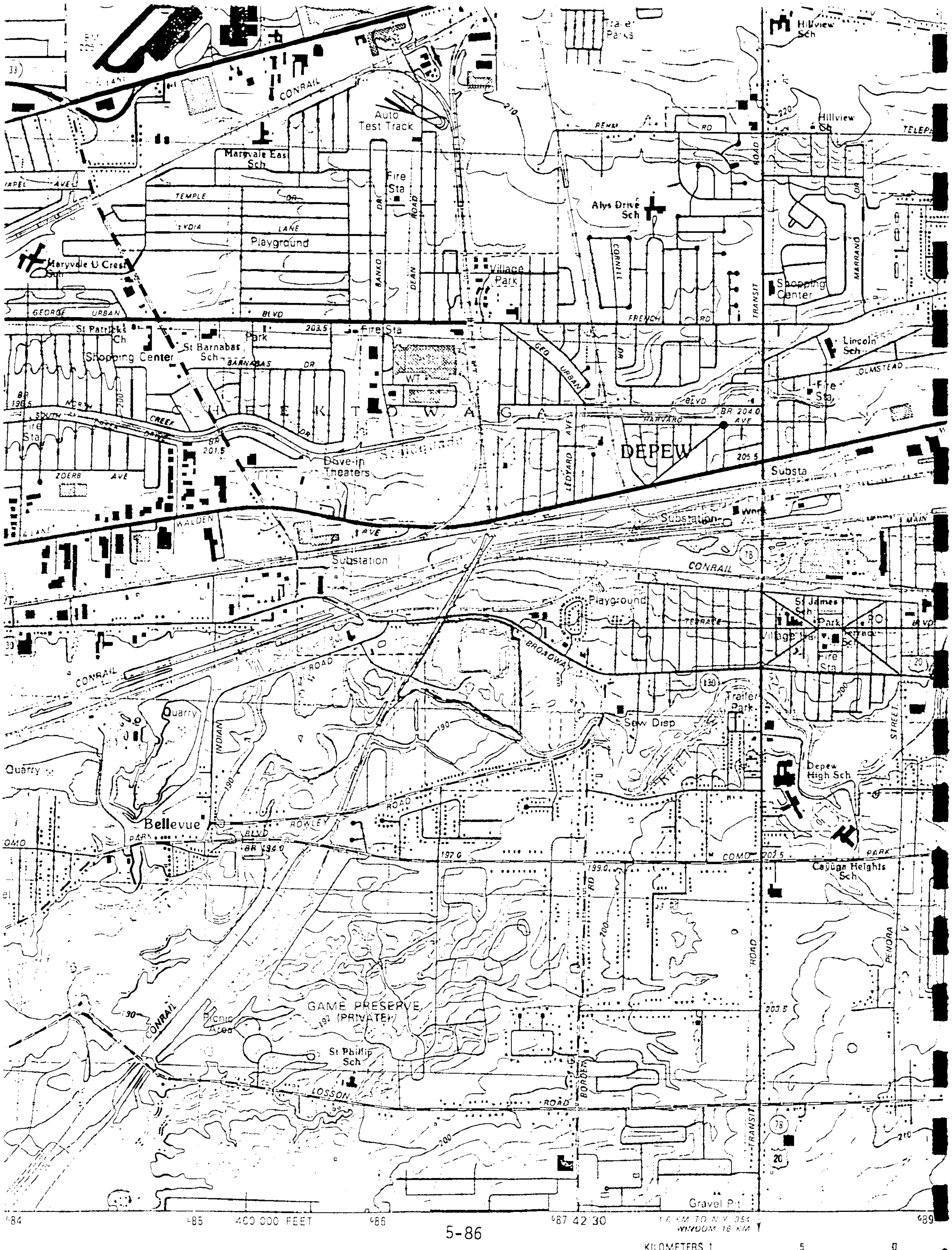
(Ref. 13)

Distance to critical habitat (of endangered species)

> one mile

(Ref. 12)

REFERENCE 10


Trailer Parks
Hillview Sch
CONRAIL
Auto Test Track
Maryvale East Sch
Fire Sta
Alys Drive Sch
Hillview Ch
TEMPLE DR
LYDIA LANE
Playground
BANKO DR
DEAN ROAD
Village Park
CORNELL
TRANSIT ROAD
Shopping Center
MARRANO DR
Maryvale U Crest Sch
GEORGE URBAN BLVD
FRENCH RD
St Patricks Ch
St Barnabas Sch
BARNABAS DR
Park
Shopping Center
Fire Sta
WT
GEO URBAN BLVD
Lincoln Sch
OLMSTEAD
C H E E K T O W A G A
DEPEW
HARVARD AVE
LEDYARD AVE
SOUTH CREEK DR
Fire Sta
ZOERB AVE
Drive-in Theaters
WALDEN AVE
Substa
Substation
Substation
MAIN
CONRAIL
Playground
TERRACE
St James Sch
Park
Village Hall
Fire Sta
BROADWAY
Trailer Park
Sew Disp
Quarry
Quarry
INDIAN ROAD
Depew High Sch
ROWLEY ROAD
Bellevue
PARK BLVD
COMO PARK
Cayuga Heights Sch
BORDEN RD
TRANSIT ROAD
PENORA STREET
GAME PRESERVE (PRIVATE)
Picnic Area
CONRAIL
St Phillip Sch
LOSSON ROAD
Gravel Pit
400 000 FEET
42°30'
KILOMETERS 1 .5 0

REFERENCE 11

T. FARRELL
(P.G./M.C.)

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual

Kris W. Barrett
S. Steven Chang
Stuart A. Haus
Andrew M. Platt

August 1982

MTR-82W111

SPONSOR:
U.S. Environmental Protection Agency
CONTRACT NO.:
68-01-6278

The MITRE Corporation
Metrek Division
1820 Dolley Madison Boulevard
McLean, Virginia 22102

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REFERENCE 12

Dangerous Properties of Industrial Materials

Sixth Edition

N. IRVING SAX

Assisted by:

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

5-90

VNR VAN NOSTRAND REINHOLD COMPANY
NEW YORK CINCINNATI TORONTO LONDON MELBOURNE

REFERENCE 13

ecology and environment, inc.

International Specialists in the Environment

Job Number 404040

Old Land Reclamation

Project Manager Don Johnson

Wednesday 6-14-89

0800 Don Johnson, John Nickerson, Sharon Walck, Arrive on site. The Drillers And ourselves walk the site to determine the well locations.

0900 John Raner, Bob Myers Arrive on site Site Safety meeting held Don Johnson leaves Site Overcast - 66°

1009 B. Myers, And Rocky Clear Path At GW-6. S Walck Drills Holes in well Casings. At wells 3A And 3B And 1A.

1135 Drilling Begins At GW-6. 1st split Spoon Taken 0-2'.

1139 Augering continues down to 5'. Hnu down Hole Reading = 0 ppm.

1151 2nd split spoon Taken. 3'-5'.

1156 3rd split spoon A 5'-7'. Retaken because we didn't get A Sample. Hit water At 3'.

1205 We have water 6" from the top of the Hole. Wet raining, 65°

1208 7'-9' split spoon not taken. Refusal 7' 3". We Are going to Auger to see why There was Refusal.

1211 Augered to 8' 2" where we Hit Rock.

1230 Mike Ryan Arrives on site.

1234 Rock core Taken. Only Recovered pieces of

1240 Rock core taken down to 13' 2"

Competent Rock was Recovered.

1302 Began pouring Grout. 2 Bags of Grout were used And 1/2 Bag of Benseal. 13' 2" PVC used.

1316 Placed PVC in Grout Down Hole. Removed Augers.

1349 Capped well

S. Walck

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ecology and environment

3

Wednesday 6-14-89

1355 Put protective casing on well. Preparing to steam clean and mobilize to GW-7.

S. Walker

Wednesday 6-14-89

1630 ARRived At GW-7. Rocky, Lee, WAlck And Myers.

1640 1st Split spoon 0'-2'. The RAin has stopped. Conditions Are Muddy. HNu=0ppm

1647 2nd split spoon 2'-4'. Poor Recovery.

1651 sw 2nd Split spoon RetAken 2'-4'. HNu=0ppm

1700 3rd Split Spoon TAken 4'-6'. HNu=0ppm

1711 4th split spoon TAken 6'-8'. HNu=0ppm Down Hole Reading HNu=0ppm. Hit WATER At ~~8'~~ 7'.

1715 Auger Refusal At 8'. Expecting Refusal. 5th Split spoon taken. 8'5" Split Spoon Refusal. Hit Rock At 8'.

1731 Mike Ryan ARRives At GW-7. Setting up to take Rock core.

1750 Preparing to TAke core.

1753 Begin to core Rock. @ 8'5"

1756 1st Foot 2:20. Down to 9'5".

1759 10'5" 2min 30sec (2:30).

~~1763 down to 11'5" 4min 22 sec~~ sw

1803 Down to 11'5" 4min 22sec.

1808 Down to 12'5" 4min 20sec. LAst Foot will on be Cored For 6".

1811 2min 20sec. For 6". 12'11".

1824 Competant Rock core Recovered 4'5"

1840 Mixing Grout. used 2 Bags of Grout And 1/2 Bag of Ben seal.

1852 Poured Grout Into Hole.

1854 Put 3" PVC sw CAsing Downhole. Total Depth of well 12'10" Due to the 4'5" well core. Used 2 Ten Foot PVC CAsings ~~At~~ sw And cut off 5'2" of the PVC.

S Walck

Wednesday 6-14-89

1935 The Grout HAS seeped through the Hole. We need to use more. 1 Additional BAg of Grout WAS used.

1958 Mike Ryan Departs GW-7. Well Installation is complete.

2002 B Meyers, S. Walck, M. Ryan leave GW-7

2030 J. Raner, S. Walck, M. Ryan, B. Meyers leave site for the day.

S Walck

Thursday 6-15-89

0800 Don Johnson, Sharon Walck, John Raner, Bob Myers, Rocky, Lee, John, Kevin, Mike Ryan Arrive on site.

0830 Site Safety meeting Held. Overcast 60°

0900 J. Raner, Don Johnson Begin to Drill GW-2B. S. Walck, B. Myers, Return to Buffalo office.

~~1110~~ SW

1100 S. Walck, B. Myers, go to LAB to get Supplies for Project.

1200 S. Walck B. Myers Arrive on site. Preparing to Rock core GW-6 Raining, 60°

1212 B. Myers, S. Walck, Are put on Standby until 3:00. We Are going Back to the office. Mike Ryan Said That the Grout on GW-6 is not set yet. J. Raner, D. Johnson Continue Drilling.

1500 B. Myers S. Walck Return to site. D. Johnson, J. Raner Finished Rock core At GW-6.

~~1520 D. Johns~~ SW

~~1530 D.~~ SW

~~1550 D.~~ SW

1600 D. Johnson, S. Walck leave site for the Day. J. Raner, B. Myers prepare to core GW-7.

S. Walck

REFERENCE 14

GEOLOGY

OF

ERIE COUNTY

New York

By
EDWARD J. BUEHLER
Professor of Geology
State University of New York at Buffalo
AND
IRVING H. TESMER
Professor of Geology
State University College at Buffalo

BUFFALO SOCIETY OF NATURAL SCIENCES
BULLETIN
Vol. 21. No. 3 Buffalo, 1963

ARTHROPODS

Eurypterus remipes lacustris Harlan
Pterygotus sp.
Leperditia scalaris Jones

GRAPTOLITES

Inocaulis akronensis Ruedemann
Medusaegraptus graminiformis (Pohlmann)

Devonian System

LOWER DEVONIAN (ULSTERIAN) SERIES

ORISKANY SANDSTONE

The Oriskany Sandstone is not exposed as such in western New York but sand grains at the Silurian-Devonian contact have been termed Oriskany by Clarke (1900, pp. 79, 96-98).

MIDDLE DEVONIAN (ERIAN) SERIES

ONONDAGA LIMESTONE

TYPE REFERENCE: Hall (1839, pp. 293-309).

TYPE LOCALITY: Onondaga County, New York. A more exact type locality has not been designated.

TERMINOLOGY: Eaton (1828, p. 153) called the Onondaga Limestone "Corniferous limerock." Oliver (1954) conducted the most recent and thorough study. He recognized four members: the Edgecliff (oldest), Nedrow, Moorehouse, and Seneca (see fig. 5).

AGE AND CORRELATION: The Onondaga Limestone is generally dated as early Middle Devonian but comparison with the European standard section suggests a late Early Devonian age to some (Cooper *et al.* 1942). This formation has been traced eastward across New York State and southward into the Appalachian Mountains. To the west, the Onondaga correlates in part with the Detroit River Group of Michigan.

THICKNESS: Complete measured sections of the Onondaga Limestone in Erie County have not been published. Luther (1906, p. 13) mentions 162 feet. Bishop (1897, p. 390) gives a more probable figure of 108 feet. The Edgecliff Member, normally only a few feet in thickness, swells to about 35 feet in the bioherm at Williamsville (filled quarry at Main Street and Kensington Avenue). This produces a local dome with dips as great as 10 degrees.

LITHOLOGY: The *Edgecliff Member* is a gray, coarse-textured, crinoidal limestone with abundant corals. In the Williamsville bioherm and vicinity, there are beds of green tinted shale and some disseminated bituminous matter.

The *Nedrow Member* is a rough-weathering, cherty limestone. The chert is generally blue-black in color and in some beds so greatly exceeds the limestone in amount that the term bedded chert is applicable. Fossils are not as common as in the other members.

The *Moorehouse Limestone Member* bears a coral-brachiopod-bryozoan fauna. The texture varies from coarse to very finely crystalline and the color from dark gray to tan. Chert, some light buff in color, and disseminated bituminous matter are present.

Oliver (1954, pp. 637-641) suggests that the *Seneca*, the uppermost member of the Onondaga, cannot be recognized in Erie County. The upper part of the Moorehouse may be of Seneca age. A thin layer which may represent the Tioga Bentonite occurs near the top of the Onondaga Limestone in western New York and is said to crop out in the Federal Crushed Stone quarry in Cheektowaga.

The north-facing cliff of the Onondaga escarpment consists chiefly of the Edgecliff and Nedrow Members.

PROMINENT OUTCROPS: East Amherst Street storm sewer; Buffalo Crushed Stone quarry at Wehrle and Harris Hill roads; Louisville Cement Company quarry on New York route 5 near Clarence; Murder Creek near Akron Falls Park (pl. 6, lower). There are numerous exposures along the Onondaga escarpment. The exposure at Greiner Road is especially prominent. The upper part of the Onondaga can be observed in the quarry of the Federal Crushed Stone Company on Como Park Road in Cheektowaga, and in the Lancaster Crushed Stone quarry at Clarence (pl. 7, upper).

CONTACTS: The Onondaga Limestone rests disconformably on the Upper Silurian Akron Dolostone. The contact with the overlying Marcellus Formation cannot be seen in Erie County.

ECONOMIC GEOLOGY: The Onondaga Limestone is an important source of crushed stone in Erie County and is quarried for that purpose by several companies. In the past, the Nedrow Member has been used for building stone.

PALEONTOLOGY: Oliver (1954, pp. 638-639; 1958, p. 822) lists the following species from the Edgecliff Member in Erie County:

COELENTERATES

Bethanyphyllum *robustum*
Billingsastraea cf. *verneuili* (Edwards and Haime)
Blothrophyllum *decorticatum* Billings
B. promissum
Breviphrentis *yandelli*
Caunopora sp.
Chonophyllum *magnificum* (Billings)
Cocnites sp.
Cystiphylloides *robustum*
C. sulcatum
C. cf. conifollis
C. sp. A
Eridophyllum gigas
Favosites basalticus
F. canadensis (Billings)
F. emmonsi
F. epidermatus
F. tuberosa
F. turbinatus Billings
Heliophylloides corniculum
Heliophyllum gemmatum
H. halli (?) Edwards and Haime
H. sp. C

REFERENCE 15

Erie-Niagara Basin

Ground-Water Resources

ERIE-NIAGARA BASIN REGIONAL WATER
RESOURCES PLANNING BOARD

THE NEW YORK STATE WATER RESOURCES COMMISSION

CONSERVATION DEPARTMENT • DIVISION OF WATER RESOURCES

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

Yields of wells

The Camillus Shale is by far the most productive bedrock aquifer in the area. Except in the vicinity of Buffalo and Tonawanda, where industrial wells produce from 300 to 1,200 gpm, no attempt has been made to obtain large supplies from the formation. However, the inflow of water to gypsum mines near Clarence Center and Akron indicate that large supplies are not necessarily restricted to the Buffalo and the Tonawanda area. Two examples of large flows of water encountered in gypsum mining have already been mentioned. Pumpage from gypsum mines near Clarence Center (including the mine mentioned previously) is substantial. The water pumped is discharged to Got Creek. On July 2, 1963, the creek had a flow of 2.1 mgd (million gallons per day) about half a mile downstream from the mines, that was due almost entirely to the pumpage. Water for industrial use is pumped from a flooded, abandoned gypsum mine at Akron. This pumpage, at a rate of 500 to 700 gpm, has had no appreciable effect on the water level in the mine.

Probably the larger solution openings are most common in discharge areas near Tonawanda Creek and its tributaries and near the Niagara River; the flow of ground water becomes concentrated as it approaches the streams to which it discharges. Other discharge areas, such as low-lying swampy areas and headwaters of small streams that have perennial flow, are likely places to drill wells.

LIMESTONE UNIT

Bedding and lithology

The term "limestone unit" in this report is applied to a sequence of limestone and dolomite overlying the Camillus Shale. The limestone unit includes the Bertie Limestone at the base, the Akron Dolomite, and the Onondaga Limestone at the top. The lithology and thickness of these units are shown in figure 7. The Bertie Limestone and the Akron Dolomite are Silurian in age and are separated from the overlying Onondaga Limestone of Devonian age by an unconformity or erosional contact.

The Bertie Limestone is mainly dolomite and dolomitic limestone but contains interbedded shale particularly in the thin-bedded lower part of the formation. The middle part is brown, massive dolomite, and the upper part is gray dolomite and shale whose beds are of variable thickness. The total thickness of the formation is about 55 feet (Buehler and Tesmer, 1963, p. 30-31).

The Akron Dolomite is composed of greenish-gray and buff dolomite beds varying from a few inches to about a foot in thickness. The upper contact of the Akron is erosional and is often marked by remnants of shallow stream channels. Thin lenses of sandy sediments lie in the bottoms of some channels. The thickness of the formation is generally between 7 and 9 feet (Buehler and Tesmer, 1963, p. 33-34).

Hydrologic and hydraulic characteristics

The Camillus Shale forms a low topographic trough split down the axis by Tonawanda Creek. Ground water that enters the formation discharges mainly to the creek. Little water is discharged to the small, barely incised streams on the Camillus. These streams are dry much of the year.

Coefficients of transmissibility given in table 2 were computed for the Camillus Shale on the basis of specific capacities of wells penetrating a considerable thickness of the aquifer, by the method described by Walton (1962, p. 12-13).

Table 2.--Specific-capacity tests of wells finished in the Camillus Shale

Well number	Pumping rate (gpm)	Duration of pumping (hours) e: estimated	Drawdown (feet)	Specific capacity (gpm/ft)	Coefficient of transmissibility (gpd/ft)
a/ 258-853-1	1,090	e8	53	21	40,000
-2	90	--	22	4	7,000
258-855-1	500	e8	17	29	55,000
-2	1,000	e8	26	38	70,000
-3	1,500	e8	38	39	70,000
303-850-1	700	24	10	70	--
-2	660	e8	8	83	--

a/ Well also penetrates water-bearing zone in Lockport Dolomite.

The large specific capacities of wells 303-850-1 and -2 probably result in part from recharge induced from Sawyer Creek. Measurements of recovery of water levels in well 303-850-1 were made when well 303-850-2 was shut down after a year of continuous pumping. From these data, a coefficient of transmissibility of about 80,000 per foot and a coefficient of storage of 0.025 were computed. The computed transmissibility is about half the transmissibility that would have been indicated from specific capacity if recharge were not induced from Sawyer Creek.

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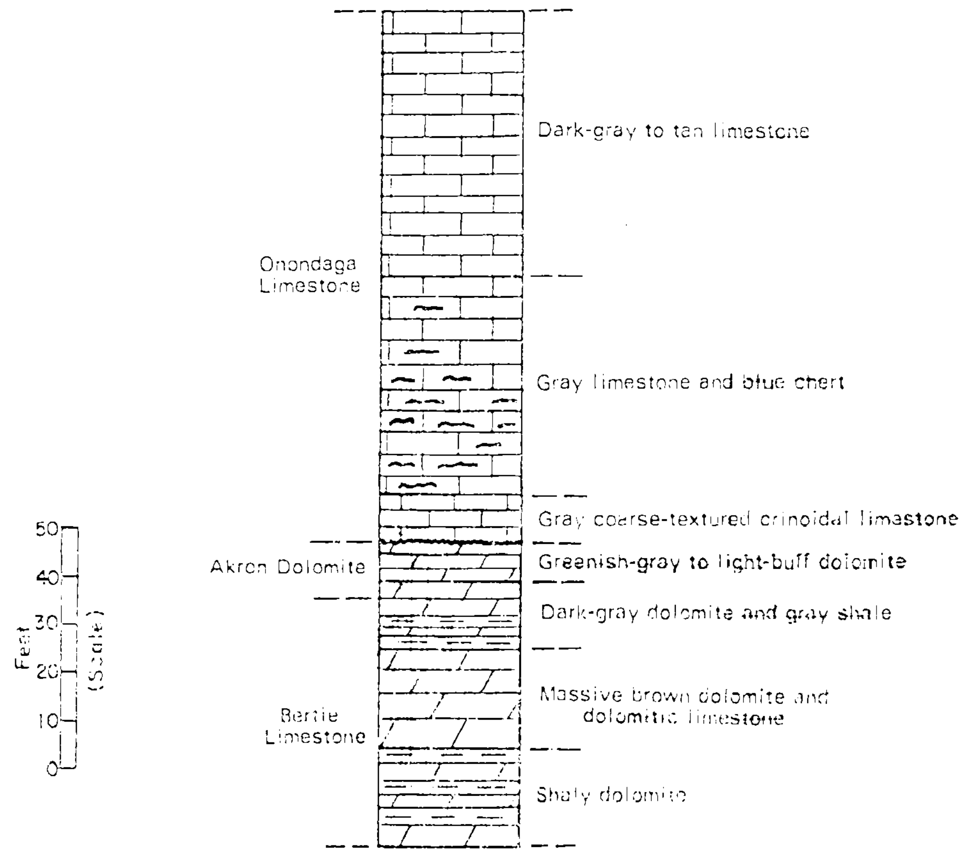


Figure 7.--Lithology of the limestone unit.

The Onondaga Limestone, about 110 feet thick, makes up the greatest thickness of the limestone unit. The formation consists of three members. The lowest member is a gray coarse-grained limestone, generally only a few feet thick. At places this member grades laterally into reef deposits which increases its thickness (Buehler and Tesmer, 1963, p. 35-36).

The middle member of the Onondaga is a cherty limestone. In some zones the chert exceeds the amount of limestone. The unit is probably 40-45 feet thick.

The upper unit is a dark-gray to tan limestone of varying texture and is probably about 50-60 feet thick.

Water-bearing openings

The limestone unit contains water-bearing openings that are similar to those of the Lockport Dolomite. Because the limestone unit is more soluble, however, solution widening of the openings appears to be more pronounced. The types of water-bearing joints in the limestone can be seen at the falls of Murder Creek at Akron. Not all of the flow of Murder Creek plunges over the falls. A considerable part of the flow percolates into the limestone unit upstream from the falls and discharges from bedding joints both at the face and along the sides of the falls. The principal zones of discharge are at the base of the Bertie, and at a contact of a shaly zone and overlying thick-bedded dolomite 20 feet above the base.

The falls at Akron also illustrate in an exaggerated way the role of vertical joints. Water from Murder Creek percolates into the rock through solution-widened vertical joints before reaching the bedding-plane joints. The continuous and concentrated flow of water in the creek has widened the vertical joints to an unusual degree. Vertical joints are ordinarily very narrow. They probably are most effective in aiding the movement of water to the bedding joints where the bedding joints are close to the rock surface.

Locally, solution along bedding joints in the limestone unit has been great enough to cause the rock overlying the solution opening to settle. Settling of this type probably accounts for at least some of the small depressions in the outcrop belt of the Onondaga Limestone. A collapsed solution zone in the Onondaga Limestone discharges a large volume of water into a quarry (257-840-A) near Harris Hill. About 3,000 gpm is pumped from the quarry, and most of the water is reported to come from the solution zone.

The limestone unit is cut by a fault on the east side of Batavia. Faults cutting limestone are likely to cause shattering along the fault and, thus, create a permeable water-bearing zone.

Hydrologic and hydraulic characteristics

The limestone unit is similar to the Lockport Dolomite in structure. However, its hydrology is different. The limestone unit is cut transversely by Tonawanda Creek and its major tributaries. Small tributaries flow across it in northerly and westerly directions. The limestone unit receives water in the interstream areas by percolation into joints. The water is discharged laterally to the streams and at places along the north-facing scarp or enters the Camillus Shale at depth.

The coefficient of transmissibility of the limestone unit probably ranges from about 300 to 25,000 gpd per foot. Specific capacity data are given in table 3. Drillers' reports indicate high transmissibilities for the limestone unit in Williamsville which probably arise from relatively intense circulation of ground water near Ellicott Creek. The coefficients of transmissibility given in table 3 were computed from specific capacity data by the method described by Walton (1962, p. 12-13).

Table 3.--Specific-capacity tests of wells finished in the limestone unit

Well number	Pumping rate (gpm)	Duration of pumping (hours)	Drawdown (feet)	Specific capacity (gpm/ft)	Coefficient of transmissibility (gpd/ft)
252-852-1	85	34	7	12.1	25,000
-2	30	--	17	2	4,000
255-848-1	130	--	10	13	25,000
255-850-1	180	6	45	4	8,000
259-824-1	100	8	30	3.3	6,000
-2	100	8	12	8.3	15,000
300-824-1	104	8	28	3.7	7,000

The coefficient of storage of the limestone unit is probably between those of the Lockport Dolomite and the Camillus Shale. The storage coefficients of these three units vary mainly with the volume of the openings in the rocks which, in turn, vary with the solubility of the rocks. Limestone is more soluble than dolomite but less soluble than gypsum. Storage coefficients in the limestone unit should, therefore, be somewhat higher than those of the Lockport Dolomite but somewhat lower than those of the Camillus Shale.

Yields of wells

The limestone unit is more productive than the Lockport. A number of large-yield wells in Buffalo, Cheektowaga, Williamsville, Pembroke, and Batavia are finished in the limestone unit and indicate that yields of 300 gpm and possibly more can be obtained. Like the Lockport Dolomite, the yields of wells in the limestone unit range through a broad spectrum. However, the more productive wells in the limestone unit are relatively abundant when compared to those in the Lockport. Of significance also is that three wells half a mile apart drilled for an industrial firm near Pembroke, each sustained a discharge of about 100 gpm (table 6, wells 259-824-1, -2, and 300-824-1). These three wells indicate that such yields are available in some areas.

OCCURRENCE OF WATER IN UNCONSOLIDATED DEPOSITS

The unconsolidated deposits overlie the bedrock units previously discussed and consist of a variety of granular material. The bulk of the unconsolidated deposits are glacial in origin and include till, lake deposits, and sand and gravel deposits. The materials laid down since glaciation are thin and consist of alluvium and swamp deposits.

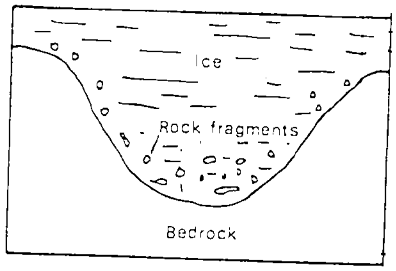
The deposits vary in their hydrologic characteristics because of differences in their lithology and thickness and because of their distribution and spatial relationships to one another. Plate 3 is a geologic map showing the division of the unconsolidated deposits into several groups on the basis of their origin. The distribution of these groups at the surface is readily apparent from the map. An understanding of the geologic processes that formed the deposits allows their subsurface distribution to be inferred. The map, therefore, can be read in three dimensions through proper interpretation.

An explanation of the origin and general features of the several types of deposits is given in figure 8. When the ice sheet advanced over the area, the ice tore and abraded the bedrock surface. The hills were somewhat reduced and rounded and the valleys were deepened. Some of the rock material eroded from the bedrock was redeposited by the ice and forms the poorly sorted mantle material that is called till (fig. 8A). Eventually, the ice began to wane with a change in climate. As the amount of snow nourishing it decreased, the ice sheet thinned. It had difficulty maintaining flow over rough topography along its marginal zone. The margin became scalloped, and some marginal zones grew so thin that they stagnated. These zones separated from the ice sheet and wasted away in place.

The sequence of deposition in an upland valley during retreat generally followed a particular order. A temporary valley was formed between the wasting ice and the rock wall of the valley. Melt water from the ice sheet, which at times of rapid melting was released in enormous quantities, flowed through the valley away from the retreating ice sheet. The melt water carried a heavy load of sediment washed out of the ice. It deposited sediment, mainly sand and gravel, and began to fill up the valley. This type of sand and gravel deposit is an ice-contact deposit (fig. 8B). In southward drained valleys, ice-contact deposits could form at low levels, even in the valley bottoms. In northward drained valleys, because of the divide to the south, the ice-contact deposits could form only high on the sides of the valley above the level of melt-water lakes impounded to the level of the spillway over the divides.

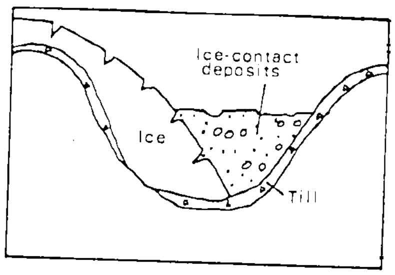
As the ice sheet melted back, a lower outlet for the melt water was uncovered. The melt-water stream was diverted from the ice-contact deposit. As the stagnant ice mass bordering the ice-contact deposits continued to melt away, the sand and gravel held up by the ice mass subsided toward the center of the valley. A lake formed in the open area left by the ice as it melted (fig. 8C). In a southward drained valley, the lake would be caused by a dam of earlier glacial deposits across the valley, perhaps part of the ice-contact deposits. In a northward drained valley, the lake would be formed between the divide to the south and the ice sheet to the north. Fine-grained sediments (clay, silt, and fine sand) settled out

A



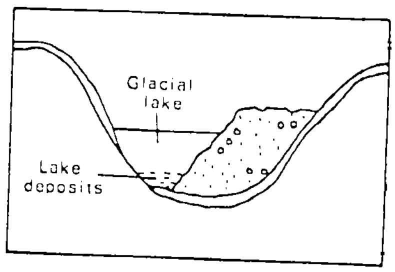
Ice advances over area and gathers load by eroding bedrock. Later, at the base of the ice, rock fragments are deposited to form till. (See B)

B



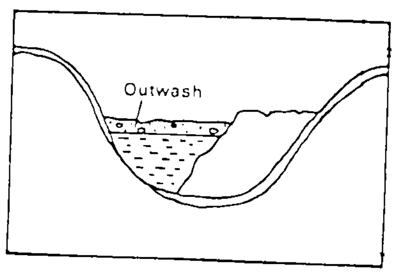
Ice begins to melt. Sand and gravel (ice-contact) deposits are laid down in a temporary valley between ice and valley wall.

C



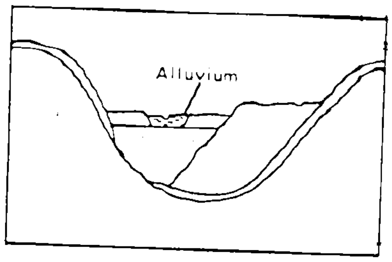
Stagnant ice melts. Ice-contact deposits slope toward center of valley. A glacial lake forms in which clay and silt accumulate.

D



Glacial lake is filled with sediment or is drained. Glacial streams flow over surface of lake deposits and lay down sand and gravel deposits.

E



Recent stream cuts into glacial deposits and lays down alluvium consisting of silt, sand and gravel.

Figure 8.--Origin of unconsolidated deposits.

in the lake and gradually filled it (fig. 8D).

Eventually the lake deposits built up to the threshold of the dam, or the dam was cut away by the water spilling over it, or the ice sheet retreated northward opening up the valley. Streams could then flow over the surface of the lake deposits and lay down a second sand and gravel deposit, an outwash deposit (fig. 8D). The sources of the stream waters were the wasting ice sheet (particularly so in southward drained valleys), small masses of wasting ice remaining in tributary valleys, and precipitation. The thickest and most extensive outwash deposits were formed in southward drained valleys and in zones peripheral to the ice sheet. With time, the ice sheet retreated still farther northward, the glacial streams ceased to flow, and glacial deposition came to an end.

As the ice sheet retreated farther north, the climate more nearly approached that of the present. A drainage system developed in response to precipitation. Streams began to incise channels into the deposits. Vegetation took hold as the weather warmed and helped stabilize the slopes. In time, with a change in regimen, the streams began to lay down alluvium (fig. 8E).

The sequence of events discussed above and shown in figure 8 is generalized. Nevertheless, it is useful in understanding the occurrence of the unconsolidated deposits, particularly in valley areas where they constitute an important source of ground water. In the following sections the lithology and water-bearing characteristics of each of the major types of deposits in the Erie-Niagara basin will be discussed.

TILL

As shown in plate 3, till is the most widespread of all the unconsolidated deposits in the Erie-Niagara basin. Till is essentially a nonsorted material whose character depends principally upon the types of rocks over which the ice passed and the vigor with which the ice crushed and abraded the rock. Till overlying the shale is dark gray and clayey or silty. In some areas, mainly on hillsides and terraces south of Cattaraugus Creek, part of the till is stony material. Till on the soluble rocks is light red and silty; in some morainic ridges it is mostly fine sand.

Thickness of the till varies considerably from a thin cover of 2 or 3 feet to more than 200 feet along the divides between Cattaraugus Creek and the northwestward flowing streams, such as Tonawanda, Buffalo, and Eighteenmile Creeks. On flat terraces mapped as till in Buttermilk Creek valley, the stony till is as much as 30 feet thick.

Only small supplies of water are available from till. The permeability of till is so small that wells with large wall areas are required to obtain even small supplies. This requirement for a large wall area is met by digging large-diameter wells.

LAKE DEPOSITS

Lake deposits consist of horizontally bedded clay, silt, and sand. They form a thin skin over till and bedrock in the Erie-Ontario Lowlands, but reach thicknesses of 300 feet or more in some valleys in the uplands. Thick sequences of clay (such as penetrated by well 229-842-1 near Springville) are so impermeable as to yield no water to wells. The lake deposits also contain thick sections of water-bearing fine sand in the major valleys of the Appalachian Uplands. This fine sand is called quicksand because it moves into wells. Small supplies can be developed from the fine sand by careful well construction, but usually these deposits are not utilized as sources of water.

GLACIAL SAND AND GRAVEL DEPOSITS

Glacial sand and gravel deposits include the ice-contact and outwash deposits shown in plate 3. In addition, deltaic deposits are present within the area. A prominent delta (lat 42°30', long 78°56') west of Collins, composed of sand and gravel, was built out from Clear Creek into a lake that occupied the Erie-Ontario Lowlands. Another delta (lat 42°50', long 78°34') was formed by Little Buffalo Creek, northeast of Marilla. These deltas are shown arbitrarily in plate 3 as ice-contact deposits. Deltaic deposits, presently concealed, probably interfinger with glacial lake deposits in the major valleys of the Appalachian Uplands where tributary streams deposited coarse-grained sediments in lakes. Subsurface data indicate deltaic deposits interfinger with lake deposits near the junction of Crow and Tonawanda Creeks south of the Attica State Prison. The sand and gravel deposits occur principally in the valleys of the Appalachian Uplands with only scattered, minor occurrences elsewhere. The relationship of the sand and gravel to the other unconsolidated deposits and to the bedrock is shown in figure 8. Where the deposits are thick and water bearing, they constitute the best aquifers found in the Erie-Niagara basin.

Lithology and thickness

The glacial sand and gravel deposits exhibit a variety of textures and sedimentary structures but they all are marked by stratification and a high degree of sorting. Characteristic of the deposits are horizontal beds of well-sorted sand, lenticular beds of cobble and boulder gravel, and scattered beds and lenses of open-work gravel. These various materials are interbedded in varying proportions, though boulder gravel is not present in most outwash deposits.

The deposits form thick fills in valleys of the upland section. In the valley bottoms the saturated thickness of the deposits exceeds 100 feet at many places. Thick deposits underlying terraces along the valley walls are to a large extent above the saturated zone. Buried sand and gravel deposits 10 to 40 feet thick underlie lake deposits in some valleys.

The thickness of the sand and gravel deposits can be inferred from the surficial geologic map (pl. 3) and the data on wells (table 6). The sand and gravel mapped as ice-contact deposits extends downward to till or bedrock. Till forms only a thin cover on the bedrock in most valleys, so the depth to bedrock can be assumed to be the thickness of the ice-contact deposits. The sand and gravel deposits mapped as outwash, on the other hand, are generally thin and overlie lake deposits in most valleys. The outwash deposits are thinnest wherever lake deposits are mapped in narrow bands along the edge of outwash terraces or as small areas within larger areas of outwash.

A thick outwash deposit of high permeability lies in the Tonawanda Creek valley south of Batavia. This outwash deposit contains open-work gravel which enhances its permeability. In addition its saturated thickness exceeds 70 feet. This is the most permeable large deposit known in the study basin.

The sand and gravel deposits that underlie lake deposits in the major valleys are not mapped. The location and thickness of these deposits are known only from subsurface data. The only such deposit developed for large ground-water supplies is at Gowanda. Small to moderate capacity public-supply wells are also developed from buried sand and gravel deposits at Holland, Varysburg, and at Hamburg for the Biehler Meadows development.

Hydraulic properties

Coefficients of transmissibility of the sand and gravel deposits given in table 4 were estimated on the basis of reported specific capacities of larger yield wells using graphs given by Walton (1962, p. 12-13). If the screened interval is small in relation to the thickness of the aquifer, the computed transmissibility applies mainly to the materials opposite the screen. The position of the aquifer and the depth of the screened interval are given to allow evaluation of these factors. The transmissibilities computed for some wells may be misleading because the drawdowns may have been affected by infiltration from streams. The transmissibility of the aquifer at well 259-809-1 is phenomenally high. Various wells drilled for the city of Batavia also had specific capacities that indicated similarly high transmissibilities. Yet, the transmissibilities computed from the specific capacities of wells 258-809-1 and 259-809-7 are an order of magnitude less. Irregularly distributed zones of open-work gravel in these deposits may account for this disparity.

Yields of wells

The yields of wells in the sand and gravel deposits vary greatly depending on the permeability and saturated thickness of the deposits and on well construction. Most wells for domestic supply are 6-inch diameter drilled wells with open-end casings. Such wells have low yields because they are necessarily inefficient; this type of construction is cheap and is adequate for household supplies. Wells drilled for public supplies are constructed for high efficiency and give a representative picture of the availability of water in the sand and gravel deposits. Efficient

228-851 (50)
229-849

Table 4.--Specific-capacity tests of wells finished in sand and gravel deposits

Well number	Pumping rate (gpm)	Drawdown (feet)	Specific capacity (gpm/ft)	Position of aquifer (feet below land surface) Top	Bottom	Screened interval (feet below land surface)	Coefficient of transmissibility (gpd/ft)
227-856-1	545	92	5.9	332	377	336-376	12,000
-4	517	81.3	6.4	301	347	303-333	12,000
229-822-1	425	30.5	13.9	1/ 24	75	64-74	17,000
229-856-1	150	9.5	15.8	1/ 19	35	30-35	18,000
230-840-1	830	25	33	100	157	119-138	40,000
231-825-1	150	3	50	1/ 16	48	38-48	55,000
-2	502	7.1	71	1/ 17	49	39-49	100,000
232-825-1	305	6.9	44.2	1/ 7	>53	44-49	60,000
234-856-3	254	19.3	13.1	1/ 11	>35	25-35	15,000
238-832-1	300	33	9.1	--	--	--	20,000
238-855-1	130	42.7	3.0	43	58	47-57	4,500
-2	137	12.6	10.9	1/ 9	24	19-24	13,000
239-853-1	115	42.4	2.7	47	54	49-54	3,500
246-836-1	690	46.5	14.8	40	>112	75-105	20,000
-2	700	102	6.9	72	>132	121-131	10,000
254-829-1	220	11.1	19.8	1/ 9	>34	29-34	25,000
258-809-1	456	12.8	35.6	1/ 26	>49	41-49	40,000
259-809-1	600	1.5	400	1/ 15	>64	40-60	600,000
-7	200	4.4	45.6	1/ 14	>60	50-60	60,000

1/ For a water-table aquifer, the depth to the water table is given.

wells yield 500 to 600 gpm from sand and gravel deposits in most valleys in the Uplands. The highly permeable outwash deposits in Tonawanda Creek valley provide yields of 1,000 to 1,400 gpm. Wells with these yields cannot be developed everywhere in the sand and gravel deposits. It is necessary to locate a sufficient thickness of water-saturated coarse-grained material (generally 10 to 20 feet), in which a screen can be set. Several test holes may be needed to locate the required aquifer materials. The success of communities and industries in developing large-yield supplies from sand and gravel deposits indicates that the relatively thick zones of permeable materials needed for well development are abundant.

ALLUVIUM AND SWAMP DEPOSITS

Some alluvium lies along all streams. Larger streams have built flood plains or terraces of alluvium consisting of silt, sand, and gravel. In most of the smaller streams with steep gradients, the alluvium is a bed deposit of gravel. The gravelly alluvium along Cattaraugus Creek is tapped for small supplies at places by means of driven and dug wells. Alluvial deposits otherwise are not significant sources of water.

Swamp deposits of muck and sediments lie in poorly drained areas. They generally mark areas of ground-water discharge. Because of their generally low permeability, they are not a significant source of water.

REFERENCE 16

Diarsand/

ecology and environment, inc.
BUFFALO CORPORATE CENTER
368 PLEASANTVIEW DRIVE, LANCASTER, NEW YORK 14086, TEL. 716/684-8060
International Specialists in the Environment

April 26, 1989

Mr. John Whitney
District Conservationist
U.S. Department of Agriculture
Soil Conservation Service
21 South Grove Street
East Aurora, NY 14052

Dear John:

On 3/28/89 and 3/29/89, Chad Eich and I met with you for the purpose of gathering information in support of seven DEC Phase II investigations to be performed in Erie County, New York by Ecology and Environment, Inc. Attached, in table form, I have outlined the information obtained from your office with your assistance.

Since the DEC requires that all references used in their reports be fully documented, I would ask that you review the information and make any corrections necessary. I would then like you to sign below to indicate that to the best of your knowledge, you agree with the information listed. Finally, please return the signed and dated original to me as soon as possible. If you have any questions or comments, please contact me or Chad at 684-8060.

Thank you again for your assistance.

Sincerely,

James J. Richert

Signature

Title

Date

PHASE II DATA OBTAINED FROM ERIE COUNTY SOIL SURVEY

SITE NAME	WATER USE	SURFACE WATER	ACTIVE AG. LAND	RESIDENTIAL AREA	INDUSTRIAL AREA	IRRIGATION GROUND WATER	IRRIGATION SURFACE WATER	AG. DISTRICT	WETLANDS
Diarsenol	Drinking	7,000'	NA	Adjacent	<100'	NA	NA	NA	NA
Evans/ Ed Ball	Recreational	Adjacent	Adjacent	1,150'	4,000'	NA	NA	NA	Adjacent to PFOIA
Land Reclamation	"	"	NA	660'	Adjacent	NA	NA	NA	700' from LA-7
La Salle	"	NA	NA	Adjacent	<100'	NA	NA	NA	NA
Old Land Reclamation	"	Adjacent	NA	660'	<2640'	NA	NA	NA	1000' from TE-23
Tonawanda Landfill	Drinking	500'	NA	<1320'	Adjacent	NA	NA	NA	300' from TE-23
Marilla Landfill	Recreational	<2640'	Adjacent	900'	NA	NA	NA	District #5	3000' from EA-25

Definitions:

1) WATER USE - uses of surface water within 3-miles downstream of site.
2) SURFACE WATER - distance to nearest downslope surface water.
3) ACTIVE AG. LAND - distance to agricultural land in production within past 5-years if 1 mile or less from site.
4) RESIDENTIAL AREA - distance to residential area if 2-miles or less from site.
5) INDUSTRIAL AREA - distance to commercial/industrial area if 1 mile or less from site.
6) IRRIGATION GROUNDWATER - land area irrigated by groundwater within 3-miles of site.
7) IRRIGATION SURFACE WATER - land area irrigated by surface water within 3-miles downstream of site.
8) AG. DISTRICT - sites within an Erie County agricultural district.
9) WETLANDS - distance to a 5-acre (minimum) fresh-water wetland, if 1-mile or less from site.

U.S. DEPARTMENT OF AGRICULTURE

REFERENCE SLIP

DATE 4/28/89

TO

James J. Richert
Ecology and Environment, Inc.
Buffalo Corporate Center
368 Pleasantview Drive
Lancaster, N.Y. 14086

- [ ] ACTION
- [ ] APPROVAL
- [x] AS REQUESTED
- [ ] FOR COMMENT
- [x] FOR INFORMATION
- [ ] INITIALS
- [ ] NOTE AND FILE
- [ ] NOTE AND RETURN
- [ ] PER PHONE CALL
- [ ] RECOMMENDATION
- [ ] REPLY FOR SIGNATURE OF ....
- [ ] RETURNED
- [ ] SEE ME
- [ ] YOUR SIGNATURE

REMARKS While we are not aware of any irrigation within [illegible] of [illegible] sites, there is certainly POTENTIAL for irrigation, especially if the current drought cycle continues. It may be appropriate to note the potential in ALL ag. areas.

FROM

John Whitney
District Conservationist

USGPO 1985-526-216 FORM AD-314 (8-64)

New York State Department of Environmental Conservation

Information Services
Wildlife Resources Center
Delmar, New York 12054

May 12, 1989

Thomas C. Jorling
Commissioner

James J. Richert
Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, N.Y. 14086

Dear Mr. Richert:

We have reviewed the Significant Habitat Program and the Natural Heritage Program files with respect to your work with the 15 inactive hazardous waste sites in western and central New York.

We have identified the following concerns:

1. Site YO-1000: Historically had a rare plant, the Tall Tick-Clover, Desmodium glabellum, occurring there. It may still be there if suitable habitat exists. We recommend a thorough search of the area be done at the appropriate time of the year.

2. Site YO-1000: Historically had a rare plant, the Green Gentian, Frasera carolinonsis, occurring there. It may still be there if suitable habitat exists. We recommend a thorough search of the area be done at the appropriate time of the year.

3. Site YO-7000: Contains at the mouth of Cayuga Creek, a rare plant, the Shy Blue Aster, Aster oolentangiensis). This plant is (was) located about 0.8 miles southwest of the waste site.

4. Site YN-1000: Contains part of deer wintering concentration #15-108. We suggest you contact our Region 9 office in Olean, N.Y. for more complete and up-to-date information.

5. Site YN-7000: May contain spawning populations of coldwater anadramous fishes. You should definitely contact the Region 9 fisheries office in Olean for more complete information about these or other fishes of concern.

Our files are continually growing as new habitats and occurrences of rare species and communities are discovered. In most cases, site-specific or comprehensive surveys for plant and animal occurrences have not been conducted. For these reasons, we can only provide data which have been assembled from our files. We cannot provide a definitive statement on the presence or absence of species, habitats or natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

New York Natural Heritage Program is supported in part by The Nature Conservancy

This response applies only to known occurrences of rare animals, plants and natural communities and/or significant wildlife habitats. You should contact our regional offices(s), Division of Regulatory Affairs, at the address(es) enclosed for information regarding any regulated areas or permits that may be required (e.g., regulated wetlands) under State law.

If this project is still active one year from now we recommend that you contact us again so that we may update this response.

If we can be of further assistance please do not hesitate to contact us.

Sincerely,

Burrell Buffington
Field Technician
Significant Habitat Unit

Enc.
cc: Region 9, Wildlife Mgr
Region 9, Fish Mgr
Don Einhouse, Dunkirk

recycled paper ecology and environment

New York State Department of Environmental Conservation
Regulatory Affairs Regional Offices

REGION	COUNTIES	NAME	LOCATION
Region 1	Nassau Suffolk	Robert Greene	Bldg. 40, SUNY Stony Brook, NY 11790
Region 2	NYC	Barbara Rinaldi	Hunter Point Plaza 47-40 21st Street Long Island City, NY 11101
Region 3	Dutchess Orange Putnam Rockland Sullivan Ulster Westchester	Ralph Manna	21 South Putt Corners Road New Paltz, NY 12561
Region 4	Albany Columbia Delaware Greene Montgomery Otsego Rensselaer Schenectady Schoharie	Jeffrey Sama	2176 Guilderland Avenue Schenectady, NY 12306
Region 5	Clinton Essex Franklin Fulton Hamilton Saratoga Warren Washington	Richard Wild	Route 86 Ray Brook, NY 12977
Region 6	Herkimer Jefferson Lewis Oneida St. Lawrence	Randy Vaas	State Office Bldg. 317 Washington Street Watertown, NY 13601

New York State Department of Environmental Conservation
Regulatory Affairs Regional Offices
(continued)

REGION	COUNTIES	NAME	LOCATION
Region 7	Broome Cayuga Chenango Cortland Madison Onondaga Oswego Tioga Tompkins	Allan Coburn	P.O. Box 1169 Fisher Avenue Cortland, NY 13045
Region 8	Chemung Genesee Livingston Monroe Ontario Orleans Schuyler Seneca Steuben Wayne Yates	Albert Butkas	6274 East Avon-Lima Road Avon, NY 14414
Region 9	Allegany Cattaraugus Chautauqua Erie Niagara Wyoming	Steven Boleski	600 Delaware Avenue Buffalo, NY 14202

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ecology and environment, inc.

BUFFALO CORPORATE CENTER
368 PLEASANTVIEW DRIVE, LANCASTER, NEW YORK 14086, TEL. 716/684-8060
International Specialists in the Environment

May 2, 1989

Mr. John Ozard
Information Services
Significant Habitat Unit
Wildlife Resource Center
Delmar, New York 12054-9767

Dear Mr. Ozard:

Ecology and Environment, Inc., (E & E) has been contracted by the New York State Department of Environmental Conservation (NYSDEC) to conduct "Phase II" investigations at 15 inactive hazardous waste sites in western and central New York. As part of the investigations, each site must be examined for the presence of and distance to any federally or state designated critical habitats of federally designated endangered species within within one mile of the site. Also, national wildlife refuges within one mile of a site must be documented.

For your review, I have enclosed photocopies of 1:24,000 scale topographic map sections with each site and its corresponding one-mile radius study area indicated on them. Please examine each of these sites for the two criteria described above and return to me a listing of your findings. In addition, and in accordance with the NYSDEC requirements, I would ask that you sign and date this letter in the spaces provided below and return with the information as a verification that the information forward to me is correct and complete to the best of your knowledge.

Your assistance in this matter is greatly appreciated, if you have any questions or comments, please do not hesitate to call me.

Sincerely,

James J. Richert

James J. Richert

Enclosure

Signed

Title

Date

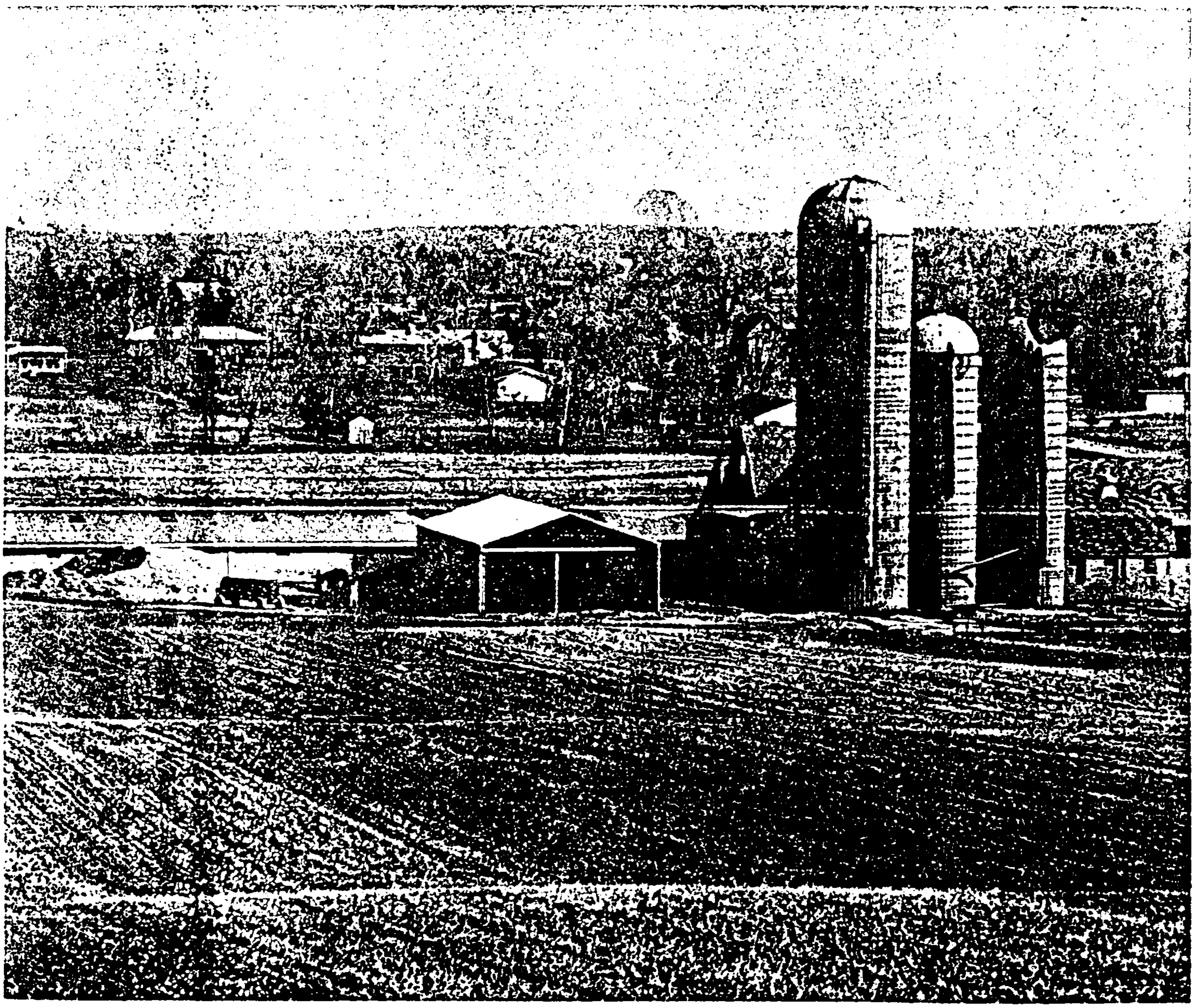
REFERENCE 17

United States
Department of
Agriculture

Soil
Conservation
Service

In Cooperation with
the Cornell University
Agricultural
Experiment Station

Soil Survey of Erie County, New York



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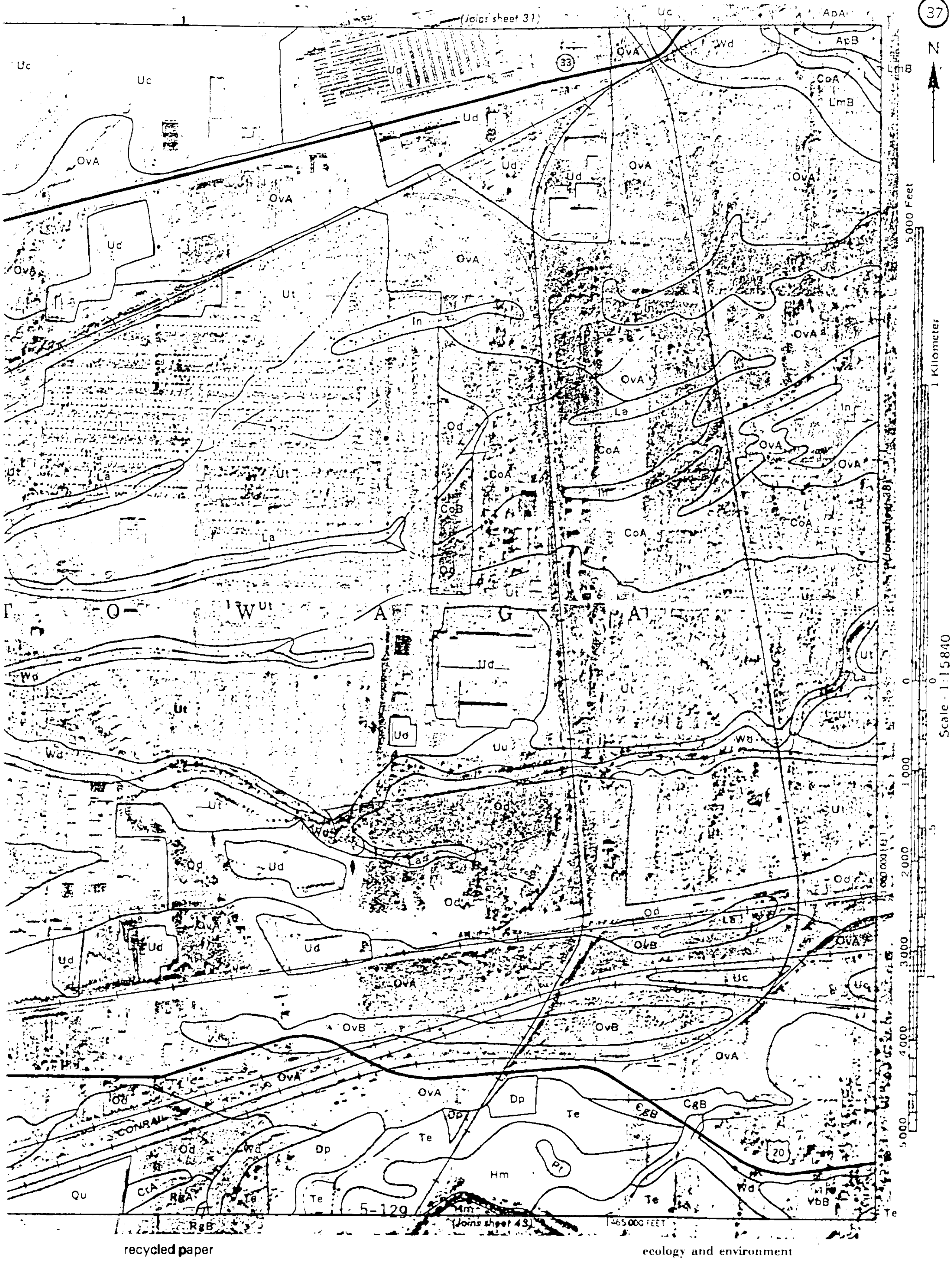
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CtA
RgA
RgB
VbB

The Cayuga soil is moderately suited to cultivated crops, but the erosion hazard and temporary wetness in the spring are limitations. Drainage of spots of included wet soils makes the use of many fields more efficient. Erosion is a serious hazard, particularly on long slopes and where the soil is intensively cultivated. Maintaining good tilth is difficult because of the high clay content of the soil. If tilth deteriorates, crusting and clodding can result, internal drainage is impeded, and seed germination and root growth are reduced. Keeping tillage to a minimum, tilling on the contour, using cover crops, incorporating crop residues into the soil, stripcropping, plowing at the proper soil moisture content, and including sod crops in the cropping system reduce the hazard of erosion and help maintain good tilth.

This soil is well suited to pasture and hay. Grazing should be avoided when the soil is wet to prevent compaction and puddling of the soil and trampling of pasture plants. Restricted grazing during these periods helps insure good growth and reduces the risk of seeding loss.

The potential of this soil for wood crops is good. Seedling mortality is generally not a problem, but seedlings should be planted early in the spring when the soil is moist. Erosion is usually not a hazard, but placing skid trails across the slope reduces the chances of trail gullying and erosion.

The temporary seasonal high water table, slope, slow permeability in the subsoil and substratum, and the high clay content of the subsoil are limitations for urban uses of this soil. Drains around foundations and interceptor drains help remove excess water during wet periods. If the clayey subsoil is disturbed during construction, it is difficult to recompact and settlement is usually uneven. Erosion and mud flows are serious problems when the subsoil is exposed on construction sites. Revegetating these sites as soon as possible reduces the erosion hazard.

This Cayuga soil is in capability subclass IIIe.

CgB—Cazenovia silt loam, 3 to 8 percent slopes. This gently sloping soil is well drained and moderately well drained. It formed in glacial till deposits on the higher parts of the lowland till plains and on convex tops of some ridges. Areas of this soil are irregular in shape on till plains and elongated in a southwest-northeast direction on ridges. Areas range from 3 to 100 acres or more, but areas of 5 to 40 acres are most common.

Typically, this soil has a surface layer of dark brown silt loam about 9 inches thick that is underlain by a leached layer of pinkish gray silt loam about 2 inches thick. The subsoil is about 21 inches thick. It is reddish brown silty clay loam that is friable in the upper part and firm in the lower part. The substratum is reddish brown gravelly silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of the Ovid, Churchville, and Honeoye soils. The somewhat poorly drained Ovid soils are in depressional areas and along some drainageways. The Churchville soils are in nearly flat areas. They formed in deposits of shallow, clayey, lake sediment. The well drained Honeoye soils contain less clay than this Cazenovia soil and are on a few rises or knolls. Also included are small areas where stone-free sandy loam layers are 20 inches or less thick over glacial till. These areas have been identified with a special symbol on the soil map. Areas of included soils range from 1/4 acre to 3 acres.

In the spring and during other wet periods, a perched seasonal high water table is in the lower part of the subsoil of this Cazenovia soil for brief periods. Permeability is moderately slow in the subsoil and slow in the substratum. The available water capacity is moderate to high, and runoff is medium. Bedrock is at a depth of more than 5 feet. In unlimed areas, reaction ranges from medium acid to neutral in the surface layer and from medium acid to mildly alkaline in the subsoil.

This soil is suitable for farming but has some limitations for urban development. Most areas are farmed or used for urban development.

This Cazenovia soil is well suited to most crops common to the region. After a rain, it remains wet for a short period. If tilled when too wet, this soil is likely to puddle and then to crust as it dries. Erosion is a hazard, particularly where slopes are long. Keeping tillage to a minimum, cultivating at timely intervals, using cover crops, including grasses and legumes in the cropping system, and tilling across slopes help control erosion and maintain tilth. With adequate drainage of wet spots and maintenance of tilth and fertility levels, this soil can be productive for most crops.

This soil is also suited to pasture. Overgrazing and grazing when the soil is wet are the major concerns of pasture management. Rotational grazing and restricted grazing during wet periods help maintain a productive pasture.

The potential of this soil for wood crops is good. There are few limitations for equipment use, and seedling mortality is low. Erosion is generally not a problem. Placing logging trails on the contour minimizes the hazard of trail gullying.

Temporary seasonal wetness, slow permeability in the substratum, and potential frost action damage are limitations for many urban uses of this soil. Interceptor drains placed upslope and proper grading of the soil minimize the seasonal wetness around foundations. Heaving resulting from frost action is a threat to shallow foundations and streets. Because the substratum is slowly permeable, some areas are good sites for ponds.

This Cazenovia soil is in capability subclass IIe.

CgC—Cazenovia silt loam, 8 to 15 percent slopes. This sloping soil is well drained and moderately well drained. It formed in glacial till deposits on sides of knolls and subdued drumlin-type ridges on the lowland lower part. The substratum to a depth of 60 inches is mottled, olive silty clay loam.

Included with this soil in mapping are small intermingled areas of 3 acres or less of the Schuyler, Orpark, and Hornell soils. The moderately well drained Schuyler soils are higher and are moderately steep. The Orpark soils are underlain by bedrock at a depth of 20 to 40 inches. The Hornell soils have a very high clay content in the subsoil. Also included are sizable areas of an unnamed soil that is similar to the Derb soil but has more sand and shale fragments in the subsoil.

From November through May this Derb soil has a perched seasonal high water table in the upper part of the subsoil. Permeability is moderate or moderately slow in the subsoil and slow in the substratum. The available water capacity is high, and runoff is medium. Shale fragments make up 10 percent or less of the surface layer and subsoil. Bedrock is as shallow as 40 inches below the surface in some areas. In unlimed areas, the surface layer and subsoil are strongly acid or very strongly acid.

Seasonal wetness and slope are limitations for farming and urban uses of this Derb soil. Most areas of this soil are in woodland or pasture or are idle.

This soil is poorly suited to most cultivated crops, unless drained. Interceptor drains that divert runoff and subsurface seepage make earlier cultivation of most fields possible. Erosion is a serious hazard on this silty soil. Keeping tillage to a minimum, using cover crops, incorporating crop residues into the soil, tilling at the proper soil moisture content, tilling on the contour, stripcropping, and rotating crops help promote good tilth and reduce the erosion hazard.

Hay and pasture plants that can withstand seasonal wetness do well, particularly if this soil is adequately limed. Overgrazing and grazing when the soil is wet are major concerns of pasture management because they restrict plant growth and may lead to the loss of the pasture seeding. Grazing when the soil is wet also causes it to compact and puddle.

The potential of this soil for wood crops is fair. Seasonal wetness limits equipment use on this soil, increases seedling mortality, and restricts rooting depth, which causes uprooting of trees during windstorms. Placing logging trails across the slope reduces trail gullying and erosion.

The seasonal wetness, slow permeability in the substratum, high risk of frost damage, and slope are serious limitations for most urban uses of this soil. Interceptor drains that divert runoff and subsurface seepage reduce the wetness around foundations. Lawns and gardens usually require liberal applications of lime because the soil is very acid. Where bedrock is nearly 40 inches below the surface, excavation is difficult. Construction sites should be revegetated as soon as possible to minimize the serious erosion hazard.

This Derb soil is in capability subclass IIIe.

Dp—Dumps. This miscellaneous area consists mostly of excavations that are filled or to be filled with rubbish and debris. Some areas consist of piles of rubbish where the landscape has been only slightly altered by man. More commonly, landfills are made by removing the soil and subsequently dumping trash and refuse into the excavated area. The refuse is covered, partially covered, or mixed with earth material. These areas are usually 3 to 50 feet deep. The sides are steep, and rubbish, consisting mostly of garbage, trash, old tires, bottles, cans, slabs of asphalt, and discarded appliances, lines the pit floor. The depth of the refuse and amount of soil covering are quite variable.

Included in mapping are small pools of water on some pit floors. These areas are irregular in shape, depending on the topography and ownership boundaries. They range from 3 to 160 acres or more.

Dumps usually have no vegetation, but some dumps have scattered bushes, grass, and other plants if the cover material has not been disturbed for a long period. The degree of wetness on these sites varies from dry to ponded, depending on the type of soil deposited and the extent of grading.

The suitability of these areas for urban or recreational uses is quite variable. Often the sites have a pungent odor, poor stability, unsanitary effluent, and rodent infestations, which make them undesirable for these uses. Onsite investigation of each site is necessary to determine its reclamation value for other proposed uses. Some areas can be reclaimed for farming or woodland.

This map unit is not assigned a capability subclass.

Du—Dumps, slag. This miscellaneous unit consists of mounds of iron ore residue. These areas were created by the dumping of waste material from the steel mills located in the cities of Buffalo and Lackawanna. The depth of these deposits varies, but mostly ranges from 3 to 60 feet. In some areas the sides of mounds are steep, but in most areas they are gently sloping or sloping. Many of these slag piles have been formed and shaped by grading. Included in mapping are small pools of water. The areas are commonly irregular in shape, depending on the nature of the deposited material and ownership boundaries. They range from 50 to 100 acres or more.

This map unit, consisting of iron slag, usually has no vegetation, although some older areas have scattered bushes and grasses. The areas are usually quite droughty.

The suitability of these areas for urban, recreational, farming, and woodland uses is generally very poor. Onsite investigation is needed to determine the suitability and limitations for any proposed use.

This Dumps, slag, unit is not assigned a capability subclass.

Ed—Edwards muck. This level soil is very poorly drained. It formed in well decomposed organic material of the sandy substratum, drains do not have to be closely spaced.

This soil is suited to pasture if it is partially drained. Proper stocking, rotating crops, yearly mowing, and restricting grazing when the soil is wet are the main management needs. Grazing when the soil is wet causes compaction and puddling of the soil and the trampling of pasture plants, which reduce plant growth and can lead to the loss of pasture seeding.

Because of prolonged wetness, the potential of this soil for wood crops is poor. Wetness is a serious problem for the use of equipment. It also increases seedling mortality and limits the rooting depth of trees, which can cause them to uproot during windstorms. Seedlings that can withstand wet conditions are best suited to this soil.

The prolonged high water table, low soil strength, tendency of sidewalls of excavations to cave or slump, and high risk of frost damage very seriously limit urban uses of this soil. Overcoming the prolonged wetness is very difficult in most areas. Rare ponding or flooding is an additional hazard in a few areas. This soil is suited to dugout ponds, and most sites quickly refill if the water is used for irrigation. Many areas have excellent suitability for wildlife marshes.

This Getzville soil is in capability subclass IVw.

Ha—Halsey silt loam. This nearly level soil is deep and very poorly drained. It formed in gravelly glacial outwash deposits. This soil is in circular depressions on outwash plains and in oblong areas along drainageways and seep areas. Slope ranges from 0 to 3 percent. Areas of this soil range from 5 to 50 acres or more.

Typically, this soil has a surface layer of very friable, black silt loam about 8 inches thick. The subsoil is 17 inches thick. It is mottled, grayish brown gravelly silt loam in the upper part and mottled, gray very gravelly sandy loam in the lower part. The substratum to a depth of 50 or more inches is loose, gray, stratified gravel and sand.

Included with this soil in mapping are a few areas of the slightly better drained Red Hook soils on few small, slightly higher rises. Also included are small areas where clayey deposits are at a depth of less than 40 inches. Included drainageways are indicated by special symbols on the soil map. Areas of included soils range from 1/4 acre to 2 acres.

This Halsey soil has a high water table at or near the surface from September through June. It mostly limits rooting to the upper 10 to 12 inches of soil. Some areas are susceptible to ponding in the spring. Permeability is moderate or moderately slow in the subsoil and rapid or moderately rapid in the substratum. The available water capacity is moderate to high but is somewhat dependent on rooting depth. Runoff is slow to ponded. The surface layer has a high organic matter content. In unlimed areas, reaction ranges from medium acid through neutral in the surface layer and subsoil.

This soil is poorly suited to farming because there are few available outlets for drainage. With adequate drainage, it is suitable for most crops grown in the county. This soil is poorly suited to most urban uses because of wetness. Most of the acreage is idle, or it is wooded or pastured.

Without artificial drainage, this Halsey soil is not suited to cultivated crops, but where drained, it is especially productive for certain vegetable crops and for cash crops. In most areas, outlets for drainage are difficult to locate because the soil is low on the landscape. Open ditches, surface drainage, land shaping, or some combination of these with tile drainage is needed for adequate drainage. If this soil is drained and cultivated, using cover crops, keeping tillage to a minimum, and returning crop residue to the soil help maintain high organic matter content and promote good tilth.

This soil has limited suitability for pasture. Pasture plants should be able to tolerate long periods of wetness and restricted rooting depth. Grazing when the soil is wet is the major concern of pasture management. If the pasture is grazed when the soil is wet, compaction occurs and growth is restricted, which can lead to the loss of the pasture seeding. Land shaping can improve many areas for more productive pasture.

The potential of this soil for wood crops is low. The prolonged high water table severely limits the use of equipment for planting seedlings and harvesting timber. It also causes high seedling mortality and restricts rooting depth, which can result in trees uprooting during windstorms.

The prolonged high water table that is at or near the surface most of the year is a very serious limitation for most urban uses of this soil. Seepage and high risk of frost damage are also limitations for some uses. Many areas are well suited to wetland wildlife habitat. Some areas are excellent sites for dugout ponds.

This Halsey soil is in capability subclass IVw.

Hm—Hamlin silt loam. This deep and nearly level soil is well drained. It formed in silty alluvial deposits on the higher parts of flood plains along major streams in the county. The areas are generally oblong, and they parallel adjacent streams and creeks. Slope ranges from 0 to 3 percent. Areas of this soil range from 3 to 100 acres, but areas of 5 to 50 acres are most common.

Typically, this soil has a surface layer of very dark grayish brown silt loam about 8 inches thick. The subsoil extends to a depth of 42 inches. It is dark grayish brown silt loam in the upper part and brown silt loam in the lower part. The substratum to a depth of 65 inches or more is dark grayish brown silt loam.

Included with this soil in mapping are small areas of the Teel, Tioga, and Wayland soils. The Teel soils are similar to this Hamlin soil but are moderately well drained to somewhat poorly drained. The Tioga soils contain more sand and gravel than this Hamlin soil. The poorly drained and very poorly drained Wayland soils are in old meander scars and in low depressional areas. In a few included areas, bedrock is less than 40 inches below the surface. Areas of included soils range from 1/4 acre to 3 acres.

This Hamlin soil is subject to flooding from nearby streams for brief periods in some years. A seasonal high water table is at a depth of 3 to 6 feet from November through May and is somewhat controlled by the water level in the adjacent stream. Permeability is moderate. The available water capacity is high, and runoff is slow. There is usually no gravel in the surface layer, and bedrock is at a depth of 5 feet or more. In unlimed areas, the surface layer and subsoil range from strongly acid to neutral.

The soil is well suited to farming, but it is poorly suited to urban uses because of the flood hazard. Most of the acreage is farmed. Some areas are idle, and some are in woodland.

This Hamlin soil is well suited to cultivated crops. Flooding generally occurs early in the spring before crops are planted. Vegetable crops do very well on this gravel-free soil. Keeping tillage to a minimum, using cover crops, incorporating crop residues into the soil, tilling at the proper soil moisture level, and rotating crops improve tilth and help maintain organic matter content. Timely planting of crops is essential to insure optimum yields. This soil is easy to till and is well suited to most crops grown in the region.

Pasture and hay crops also do well on this soil; however, overgrazing of pasture can cause loss of the seeding and restrict plant growth. Proper stocking, rotation of pasture, yearly mowing, and the deferment of grazing early in the spring are the chief management needs.

The potential of this soil for wood crops is very good, but only a small acreage is actually wooded. Erosion hazard, equipment limitation, seedling mortality, and windthrow hazard are generally not problems on this soil. However, planting seedlings early in the spring when the soil is moist insures their survival.

The flood hazard and high risk of frost damage are very serious limitations for many urban uses of this soil. This soil is an excellent source of topsoil. Some areas that are not seriously affected by flooding are well suited to recreational uses.

This Hamlin soil is in capability class I.

Hn—Haplaquolls, ponded. These are freshwater marshes made up of very poorly drained soils ponded with shallow water most of the year. They often border lakes, ponds, and other open bodies of water. These level soils formed in lacustrine, outwash, glacial till, and alluvial and organic deposits. Slope ranges from 0 to less than 1 percent. The soils in this map unit are classified above the series level because of the variability of their characteristics and properties.

Most areas are natural depressions, while others have been manmade or are areas that were dammed by beaver. Cattails, rushes, grasses, and other water-tolerant herbaceous plants are the dominant vegetation. In most areas there are commonly no trees, but where the water is very shallow, wetness-tolerant species are common.

The Haplaquolls are variable and covered with ponded water 5 to 10 inches deep. In one of the more common profiles the surface layer is mottled, black or gray loamy, silty, or sandy material enriched with organic material 5 to 25 inches thick. The underlying layers are mottled, gray or brown sandy, silty, or loamy deposits with varying amounts of gravel to a depth of 60 inches or more.

Onsite investigation is needed to determine the feasibility of a particular use of an area. Most uses involve drainage. These marshes are generally extremely difficult to drain because the water level is controlled by adjacent open bodies of water, and Haplaquolls are so low on the landscape that adequate outlets are not available. Most areas provide excellent habitat for wetland wildlife, including habitat for beaver, muskrat, fish, and waterfowl. In some areas wildlife habitat can be improved by constructing islands, building nesting boxes, and planting food-producing wetland shrubs.

These Haplaquolls are in capability subclass VIIIw.

HoA—Honeoye loam, 0 to 3 percent slopes. This nearly level soil is deep and well drained. It is on convex hilltops and ridgetops on glacial till plains. Some areas of this soil are quite broad, and most areas are irregular in shape. They range from 3 to 75 acres, but areas of 5 to 20 acres are most common.

Typically, this soil has a surface layer of dark grayish brown loam about 10 inches thick. The subsurface layer is light brownish gray loam about 2 inches thick. The subsoil is about 13 inches thick. It is brown loam in the upper part and reddish brown loam in the lower part. The substratum is brown gravelly loam to a depth of 60 inches.

Included with this soil in mapping are small intermingled areas of the Lima, Appleton, Cazenovia, and Ovid soils. The Lima soils are similar to this Honeoye soil but are moderately well drained. The somewhat poorly drained Appleton soils are on foot slopes and along drainageways. The Cazenovia and Ovid soils have a red color and a higher clay content in the subsoil than this Honeoye soil. The somewhat poorly drained Ovid soils are along a few drainageways. Some areas include the gently sloping Honeoye soils. Areas of included soils range up to 3 acres.

In the spring this Honeoye soil has a perched water table at a depth of 4 to 6 feet. Permeability is moderate in the subsoil but is slow or very slow in the underlying substratum. The available water capacity is moderate to upland plateau. Some areas are on hillsides. Areas of this soil are 5 to 200 acres in size and are generally elongated to oblong. This soil usually receives some seepage or runoff from adjacent higher soils.

Typically, this soil has a surface layer of dark grayish brown silty clay loam about 9 inches thick. The subsoil is light olive brown and olive brown silty clay loam about 13 inches thick. The substratum is mottled, pale olive silty clay loam about 5 inches thick. Olive, soft shale bedrock is at a depth of 27 inches.

Included with this soil in mapping are small areas of the slightly deeper Derb soils, the moderately well drained Schuyler soils on convex shoulder slopes, and a few areas of the Angola soils that are less acid than this Orpark soil. In some areas, the slope is moderately steep, or bedrock is within 20 inches of the surface. Occasional seep spots at the base of slopes are indicated by a special symbol on the soil map. Areas of included soils range from 1/4 acre to 3 acres.

This Orpark soil has a perched seasonal high water table in the upper part of the subsoil from November through May. The root zone is limited by the seasonal high water table and by underlying bedrock at a depth of 20 to 40 inches. Permeability is moderate in the surface layer and slow or moderately slow in the subsoil. The available water capacity is moderate, and runoff is rapid. Shale fragments are usually less than 10 percent throughout the soil. Unless limed, this soil is strongly acid or very strongly acid.

This soil is poorly suited to most uses because of seasonal wetness, slope, and moderate depth to bedrock. Many areas are in woodland or are idle. Some areas are pasture or hayland.

This Orpark soil is poorly suited to cultivated crops unless drained and protected from erosion. Subsurface drainage is difficult to install because of the underlying bedrock. Even with drainage, the potential for crops is only fair because fertility is low and liberal applications of lime are needed to reduce natural acidity. Interceptor drains divert runoff and seepage from higher, adjacent soils. The erosion hazard is severe in intensively cultivated areas.

This soil is often better suited to hay and pasture than to cultivated crops. Grazing when the soil is wet causes puddling and soil compaction and leads to poorer quality pasture.

Timber production on this soil is fair. Rooting depth is limited by wetness and by the moderate depth to bedrock; therefore, certain tree species tend to uproot during windstorms. Seasonal wetness also limits the use of planting and harvesting equipment and increases seedling mortality. Placing logging trails across the slope reduces the hazard of trail gullying and erosion.

Moderate depth to bedrock, slope, moderately slow or slow permeability, and seasonal wetness are serious limitations for most urban uses. They affect highways, sewers and pipelines, buildings with basements, and septic tank absorption fields. Interceptor drains that divert runoff and seepage minimize the wetness around foundations. Installation of drains is difficult because of the underlying bedrock, although the rock is rippable. This silty soil is very erosive and when it is disturbed during construction, vegetative cover should be reestablished as soon as possible. Liberal applications of lime and fertilizer are needed to establish and maintain lawns.

This Orpark soil is in capability subclass IIIe.

OvA—Ovid silt loam, 0 to 3 percent slopes. This nearly level soil is somewhat poorly drained. It is in broad, flat areas of till plains, which are often adjacent to glacial lakebeds. This soil formed in reddish glacial till or lacustrine sediment that has been reglaciated and mixed with till. Areas of this soil are irregular in shape and range from 5 to 200 acres or more.

Typically, this soil has a surface layer of very dark grayish brown silt loam 10 inches thick. The subsoil extends to a depth of 20 inches. The upper 2 inches is mottled, brown light silty clay loam, and the lower part is mottled, dark brown clay loam. The substratum is mottled, reddish brown gravelly loam.

Included with this soil in mapping are small areas of the Kendaia, Appleton, Churchville, and Ilion soils. The Kendaia and Appleton soils have a lower clay content in the subsoil than this Ovid soil. The Churchville soils have a moderately deep layer of clayey sediments. Most areas of the poorly drained Ilion soils are in wet spots and drainageways. Areas of included soils range from 1/2 acre to 3 acres.

From January through May this Ovid soil has a perched seasonal high water table in the upper part of the subsoil. Permeability is moderately slow in the subsoil and slow in the substratum. The available water capacity is moderate to high, and runoff is slow. Gravel makes up 0 to 15 percent of the surface layer. Bedrock is generally many feet deep, but may be as little as 5 feet deep. Unless limed, the surface layer is medium acid or slightly acid and the subsoil is medium acid to neutral.

Because of seasonal wetness and slow permeability, this soil is only moderately suited to farming and is poorly suited to many urban uses. Most of the acreage is farmed, in woodland, or idle. A few areas are urbanized.

This Ovid soil is only moderately suited to cultivated crops, unless drained. Subsurface drains generally require close spacing to be effective. Erosion is not a problem on this nearly level soil, but it may puddle and compact if tilled when wet. Keeping tillage to a minimum, using cover crops, plowing at the proper soil moisture level, and including grasses and legumes in the cropping system improve tilth and increase crop yields. Drainage is difficult to install because of the nearly level slopes and slowly permeable substratum; but with adequate drainage and maintenance of tilth and fertility, this soil is suitable for many crops grown in the county, except for early-market and long-season varieties.

Without adequate drainage this soil is better suited to hay or pasture. Overgrazing and grazing when the soil is wet are major concerns of pasture management. They cause soil compaction and trampling of forage plants, which lead to reduced plant growth and the eventual loss of the pasture seeding. Proper stocking, rotation of pastures, yearly mowing, and deferment of grazing during wet periods are the chief management needs.

The potential of this soil for wood crops is fair to good. Erosion is usually not a hazard, but seasonal wetness causes moderate seedling mortality and limits the use of equipment. The seasonal high water table also limits rooting depth, which can result in uprooting of trees during windstorms. Trees that can withstand high lime conditions are best suited to this soil.

The seasonal high water table, slow permeability in the substratum, and danger of frost heave are serious limitations for many urban uses of this Ovid soil. Drains around foundations are needed to minimize wetness. Some areas are suitable sites for recreation, such as picnic areas and hiking trails. Many areas are good sites for dugout ponds.

This Ovid soil is in capability subclass IIIw.

OvB—Ovid silt loam, 3 to 8 percent slopes. This gently sloping soil is somewhat poorly drained. It is in low, undulating, slightly concave areas on lower sideslopes, along field drainageways, and in shallow depressions. This soil formed in red glacial till or lacustrine sediments that were reglaciated and mixed with till. Areas of this soil are oblong or irregular in shape and range from 3 to 50 acres or more.

Typically, this soil has a surface layer of very dark grayish brown silt loam 10 inches thick. The subsoil extends to a depth of 20 inches. The upper 2 inches is mottled, brown light silty clay loam, and the lower part is mottled, dark brown clay loam. The substratum is mottled, reddish brown gravelly loam to a depth of 60 inches.

Included with this soil in mapping are small areas of the Cazenovia, Kendaia, Appleton, Churchville, and Ilion soils. The well drained and moderately well drained Cazenovia soils are on a few small convex knolls. The Kendaia and Appleton soils have a lower clay content in the subsoil than this Ovid soil. The Churchville soils have a moderately deep layer of clayey sediments. The poorly drained Ilion soils are in wet spots and the bottom of drainageways. Areas of included soils range from 1/2 acre to 3 acres.

From January through May this Ovid soil has a perched seasonal high water table in the upper part of the subsoil. Permeability is moderately slow in the subsoil and slow in the substratum. The available water capacity is moderate to high, and runoff is slow to medium. Gravel makes up 0 to 15 percent of the surface layer. Bedrock is generally many feet deep, but may be as little as 5 feet deep. Unless limed, the surface layer is medium acid or slightly acid and the subsoil is medium acid to neutral.

Because of seasonal wetness and slow permeability, this soil is only moderately suited to farming and is poorly suited to many urban uses. Most of the acreage is farmed, in woodland, or idle. A few areas are urbanized.

This Ovid soil is moderately suited to cultivated crops, unless drained. Subsurface drains generally require close spacing to be effective. Interceptor drains divert runoff and seepage. Erosion is a moderate hazard, and puddling and soil compaction are problems if the soil is tilled when wet. Keeping tillage to a minimum, using cover crops, plowing at the proper soil moisture level, tilling across slopes, and including grasses and legumes in the cropping system improve tilth, increase crop yields, and control erosion. This gently sloping soil is often easier to drain than the nearly level Ovid soil because suitable outlets are available. With adequate drainage and maintenance of tilth and fertility, this soil is suitable for many crops grown in the county, except for early-market and long-season varieties.

Without adequate drainage, this soil is often better suited to hay crops or pasture. Overgrazing and grazing when the soil is wet are major concerns of pasture management. Overgrazing can cause the loss of the pasture seeding. Grazing when the soil is wet can cause soil compaction and trampling of forage plants. Proper stocking, rotation of pastures, yearly mowing, and deferment of grazing during wet periods are the chief management needs.

The potential of this soil for wood crops is fair to good. Erosion is usually not a hazard, but seasonal wetness causes moderate seeding mortality and limits the use of equipment on this soil. The seasonal high water table also limits rooting depth, which can result in the uprooting of trees during windstorms.

The seasonal high water table, slow permeability in the substratum, and danger of frost heave are serious limitations for many urban uses of this Ovid soil. Drains around foundations and interceptor drains placed upslope from buildings minimize the wetness. Many areas are good sites for diked ponds.

This Ovid soil is in capability subclass IIIw.

Pa—Palms muck. This nearly level organic soil is deep and very poorly drained. It is in basinlike areas on the lowland lake plain and in depressions on the upland plateau. The organic material is well decomposed and 16 to 50 inches thick. It is underlain by loamy mineral soil. Areas of this soil are roughly oval or irregular in shape and range from 3 to 50 acres, but areas of 5 to 20 acres are most common.

Typically, this soil has a black, well decomposed, organic (muck) surface layer about 12 inches thick. The subsurfce layer extends to a depth of about 38 inches. It investigations are essential, and each site must be considered individually.

Pits, borrow, have not been assigned a capability subclass.

Pu—Pits, gravel. This unit consists of excavated areas from which gravel has been removed for construction purposes. They are usually 5 to about 50 feet deep. The soils in these areas have a high sand and gravel content. Pit sides are mostly steep, and the floor is relatively level. Piles of stones and boulders and sloughed materials are commonly scattered over the floor. Small pools of water are common in low parts of some of the pits, particularly in the spring. These excavated areas are commonly irregular in shape, depending on the nature of the soil deposits and ownership boundaries, and they range from 3 to 200 acres or more.

Pits are usually devoid of vegetation; however in some of the older ones there are scattered bushes and grass. Pits are droughty because of the very low available water capacity of the soil. Permeability varies, but usually it is moderately rapid to very rapid.

These miscellaneous areas are generally not suited to farming and woodland because the topsoil has been removed and the subsoil material is not suitable for root development. The potential of these areas is usually poor for wildlife habitat, although some animals and birds may find shelter or refuge in these areas.

The suitability of these areas for urban and recreational uses ranges from good to poor. Onsite investigations are essential and each site must be considered individually.

Pits, gravel, have not been assigned a capability subclass.

Qu—Quarries. These are open pits created by removing limestone rock for agricultural, industrial, and construction purposes. They are mainly in the northern part of the county, and the surrounding soils are usually shallow over bedrock. The excavated areas are usually 20 to 100 feet deep. They are irregular in shape, depending on the nature of the bedrock strata and ownership boundaries. They range from 3 to 125 acres or more.

Quarries are generally devoid of vegetation; however, in some of the older quarries, scattered plants and grass have become established in cracks where the bedrock has weathered and some soil has accumulated. Piles of stones and boulders are commonly scattered over the quarry floor. Included in mapping are small pools of water on many of the quarry floors. The entire floor of some abandoned quarries is covered with water up to several feet deep.

The suitability of abandoned areas for some urban and recreational uses ranges from poor to fair. Onsite investigation is necessary, and each site is considered individually for any proposed use.

Some areas are well suited to educational uses, such as outdoor classrooms for studying the bedrock geology of the region. Onsite investigation is needed to determine the feasibility of using Quarries for such purposes.

Abandoned Quarries are usually poorly suited to farming and woodland becuase of the lack of soil material. Some areas provide habitat for certain kinds of wildlife and birds, and a few areas that are ponded contain fish and other aquatic animals. Boating is also possible in some of the pits that are ponded. Where trash and other wastes are dumped in abandoned quarries there is a hazard of pollution of the water table by seepage through the cavernous and fractured limestone bedrock.

Quarries are not assigned a capability subclass.

RaA—Raynham silt loam, 0 to 3 percent slopes. This level or nearly level, silty soil is deep and somewhat poorly drained. It is mainly on broad plains in the lowlands in the northern part of the county and in small pockets on the upland plateau. Areas of this soil are irregular in shape or roughly elongated where they parallel streams. Most areas range from 50 to 200 acres or more, but in the uplands, areas range from 3 to 50 acres in size.

Typically, this soil has a surface layer of dark grayish brown silt loam about 8 inches thick. The subsoil is about 18 inches thick. It is mottled, yellowish brown silt loam. The substratum extends to a depth of 60 inches. The upper part is mottled, yellowish brown silt loam, and the lower part is grayish brown fine sand.

Included with this soil in mapping are small areas of the Minoa and the Niagara soils. The Minoa soils are more sandy and the Niagara soils are more clayey than this Raynham soil. Also included are soils that are similar to this Raynham soil but have a dense fragipan in the subsoil. In some areas, particularly in the uplands, the subsoil is more acid than is typical for this Raynham soil. Areas of included soils range from 1/2 acre to 3 acres.

From November through June this Raynham soil has a seasonal high water table in the upper part of the subsoil. Permeability is moderate or moderately slow in the subsoil and slow in the substratum. The available water capacity is high, and internal drainage and runoff are slow. There is usually no gravel in this soil, and bedrock is more than 5 feet deep. The surface layer and subsoil are strongly acid to neutral.

This soil is moderately suited to farming but poorly suited to many urban uses. Most of the acreage is in hay, pasture, woodland, or it is idle. Some areas of this soil are in residential development.

The suitability of this Raynham soil for cultivated crops can be improved with drainage. In undrained areas, seasonal wetness delays planting until late spring.

water is a hazard where the soil is used for septic tank absorption fields, because the substratum is moderately rapidly or rapidly permeable. Dwellings with basements are difficult to keep dry, but subsurface drains around foundations minimize the wetness. Frequent watering during dry periods and fertilization help maintain quality lawns and shrubs. This soil is a fair source of sand or gravel.

This Phelps soil is in capability subclass IIw.

PhB—Phelps gravelly loam, 3 to 8 percent slopes. This deep, gently sloping soil is deep and moderately well drained. It formed in water-laid deposits of sand, silt, and gravel. This soil is in moderately low areas of outwash plains and on low, undulating terraces. Areas of this soil are oblong and range from 3 to 50 acres, but areas of 5 to 30 acres are most common.

Typically, this soil has a surface layer of very dark grayish brown gravelly loam about 10 inches thick. The subsoil extends to a depth of 32 inches. The upper 18 inches is mottled, brown gravelly heavy loam, and the lower part is mottled, yellowish brown gravelly sandy loam. The substratum to a depth of 50 inches or more is stratified brown and grayish brown very gravelly loamy sand.

Included with this soil in mapping are small intermingled areas of the Palmyra and Red Hook soils. The Palmyra soils are similar to this Phelps soil but are well drained and are on the higher knolls. The somewhat poorly drained Red Hook soils are in slight depressions and along shallow drainageways. Also included in mapping are small areas of the Phelps soils that have a surface layer of finely gravelly loam. Areas of included soils range from 1/4 acre to 3 acres.

In the spring this Phelps soil has a seasonal high water table in the lower part of the subsoil. Permeability is moderate in the subsoil and moderately rapid to rapid in the sand and gravel substratum. The available water capacity is moderate, and runoff is medium. Gravel makes up 15 to 35 percent of the surface layer. Bedrock is at a depth of more than 5 feet. In unlimed areas, reaction of the surface layer and upper part of the subsoil is medium acid to neutral.

This soil is suited to farming but has some limitations for most urban uses. Most of the areas are farmed or in residential development. A few areas of this soil are idle or woodland.

This Phelps soil is suited to cultivated crops. Temporary seasonal wetness is a limitation for early season tillage. Gravel in the surface layer interferes with planting and cultivation of some specialized crops and causes excessive wear of equipment. Erosion can be a hazard in intensively cultivated areas. Keeping tillage to a minimum, using cover crops, tilling across slopes, incorporating crop residues into the soil, plowing at the proper soil moisture level, and rotating crops help maintain tilth, control erosion, improve the organic matter content, and increase crop yields. Increasing the organic matter content improves the available water capacity of the soil. This soil responds well to irrigation in the drier summer months but is more difficult to irrigate than the nearly level Phelps soil. Included wet spots are usually easy to drain.

This soil is well suited to pasture and hay. Overgrazing and grazing when the soil is wet are the main management concerns. Proper stocking, rotation of pastures, yearly mowing, and deferment of grazing during wet periods maintain high quality pasture.

The potential of this soil for wood crops is good. The hazard of erosion, equipment limitations, seedling mortality, and uprooting of trees during windstorms are slight limitations. Seedlings should be planted early in the spring when the soil is moist.

The temporary seasonal high water table, seepage, and high frost damage potential are limitations for many urban uses of this soil. The contamination of ground water is a hazard where the soil is used for septic tank absorption fields, because the substratum is moderately rapidly or rapidly permeable. Dwellings with basements are difficult to keep dry, but subsurface drains around foundations or interceptor drains minimize this problem. Frequent watering during dry periods and fertilization help maintain quality lawns and shrubs. This soil is a fair source of sand or gravel.

This Phelps soil is in capability subclass IIw.

Pt—Pits, borrow. Pits are excavated areas from which loamy material has been removed to use as fill in other areas. They are about 3 to 10 feet deep. The soil material in these pits is well drained to somewhat poorly drained. The sides of the pits are usually steep, and the floor is relatively level. Stones and boulders are commonly scattered over the floor. Included in mapping are small pools of water on some pit floors. A few abandoned pits are ponded with water throughout the year. The excavated areas are commonly irregular in shape, depending on the nature of the adjacent soils and ownership boundaries, and they range from 1 to 150 acres or slightly more.

These borrow pits are generally devoid of vegetation; however on some of the older ones there are scattered bushes and grass. The pits range from dry to moist depending on the soil deposits and their position on the landscape. Permeability varies, but usually it is moderately slow to very slow on pit floors.

This map unit is generally poorly suited to farming and woodland because the topsoil has been removed and the subsoil material is not suitable for root development. Generally, the potential is poor for wildlife habitat, although birds and animals, such as woodchucks, may find shelter or refuge in some of these areas.

The suitability of these areas for urban and recreation uses ranges from good to poor. Most sites require regrading and landscaping for such uses, but onsite pastures, yearly mowing, deferment of grazing, and restricted grazing when the soil is wet are the chief management needs.

The potential of this soil for wood crops is fair to good. Seasonal wetness limits equipment use, causes moderate seedling mortality, and restricts rooting depth, which can lead to the uprooting of trees during windstorms. Seedlings that can withstand the seasonal high water table are best suited to this soil.

The seasonal high water table, low soil strength, poor soil compaction, slow or moderately slow permeability in the upper part of the subsoil, unstable and erodible substratum, and high risk of frost damage are serious limitations for most urban uses of this soil. Where this soil is used for septic tank absorption fields, seasonal wetness and slow or moderately slow permeability in the upper part of the subsoil require that the waste systems be specially designed. An additional concern is the possible contamination of ground water because water moves through the substratum at a moderately rapid rate. Drains around foundations minimize the seasonal wetness. Erosion and sloughing are serious hazards when the sandy substratum is exposed in excavations. Some areas are good pond sites, but the sides need to be gently sloped because the soil tends to slide or slump. The high clay content in the surface layer is a limitation for some recreational uses.

This Swormville soil is in capability subclass IIIw.

Te—Teel silt loam. This nearly level soil is deep and moderately well drained to somewhat poorly drained. It formed in silty alluvial deposits on flood plains along major streams in the county. Many areas are long and narrow and parallel the adjacent stream or creek. Other areas are roughly circular and lie in broad, shallow basins. Slope is 0 to 3 percent. Areas of this soil range from 3 to 100 acres, but areas of 5 to 50 acres are most common.

Typically, this soil has a surface layer of very dark grayish brown silt loam 9 inches thick. The subsoil extends to a depth of 48 inches. It is dark grayish brown silt loam in the upper part; mottled, brown to dark brown silt loam in the middle part; and mottled, grayish brown silt loam in the lower part. The substratum is mottled, dark gray very fine sandy loam varved with silt loam to a depth of 60 inches.

Included with this soil in mapping are small intermingled areas of the Hamlin, Wayland, and Middlebury soils. The Hamlin soils are similar to this Teel soil but are well drained and are on small rises or higher benches on the flood plain. The Wayland soils are poorly drained and very poorly drained and are in low depressions or slack water areas. The Middlebury soils are underlain by sand and gravel. Areas of included soils range up to 3 acres.

This Teel soil is subject to common flooding for brief periods, usually in early spring. From January through May, the seasonal high water table rises into the subsoil and is somewhat controlled by the water level in the adjacent stream. Permeability is moderate. The available water capacity is high, and runoff is slow. There is generally no gravel in the surface layer and subsoil. Bedrock is at a depth of 5 feet or more. In unlimed areas, the surface layer ranges from strongly acid to neutral.

This soil is well suited to farming but is poorly suited to urban uses because of the flood hazard. Most of the acreage is farmed, is in woodland, or is idle.

This Teel soil is well suited to cultivated crops. Although flooding is a hazard, it usually occurs early in the spring before the crops are planted. In addition, the seasonal high water table can delay tillage operations in some years. Drainage of included wet spots improves the use of many fields, although drains can be difficult to install because suitable outlets are not available. At the proper soil moisture content this gravel-free soil is easy to till. The soil is suited to most field crops and to many specialized crops grown in the county. Keeping tillage to a minimum, using cover crops, incorporating crop residues into the soil, plowing at the proper soil moisture level, and rotating crops improve tilth and help maintain the organic matter content of the soil. Some of these practices also minimize scouring by floodwaters early in the spring. Streambanks may need protection from erosion in some areas (fig. 9).

The soil is also suited to pasture and hay. However, grazing when the soil is wet can restrict plant growth and compact the soil. Proper stocking, rotation of pastures, yearly mowing, and deferment of grazing when the soil is wet are the chief management needs.

The potential of this soil for wood crops is good. The hazard of erosion equipment limitations, seedling mortality, and uprooting of trees during windstorms are generally not problems. Seedlings should be planted early in the spring when the soil is moist to insure a high rate of survival.

The flood hazard, seasonal wetness, and high risk of frost damage are serious limitations for most urban uses of this soil. Some areas that are not affected by flooding or wetness early in the spring are suitable for recreational uses. Other areas are good sites for pond reservoir areas.

This Teel soil is in capability subclass IIw.

To—Tioga silt loam. This nearly level soil is deep and well drained. It formed in recent alluvium on high parts of flood plains along major streams. Areas of this soil are mostly elongated and parallel to the adjacent stream. These areas range from 3 to 50 acres, but areas of 5 to 20 acres are more common. Slope ranges from 0 to 3 percent.

Typically, this soil has a surface layer of very dark grayish brown silt loam about 10 inches thick. The subsoil extends to a depth of 51 inches. It is dark

REFERENCE 18

Note: the well logs for the four groundwater monitoring wells drilled at the Old Land Reclamation site are included as Appendix C of this report.

REFERENCE 19

5-142

M. WELCH

[redacted]

[redacted]

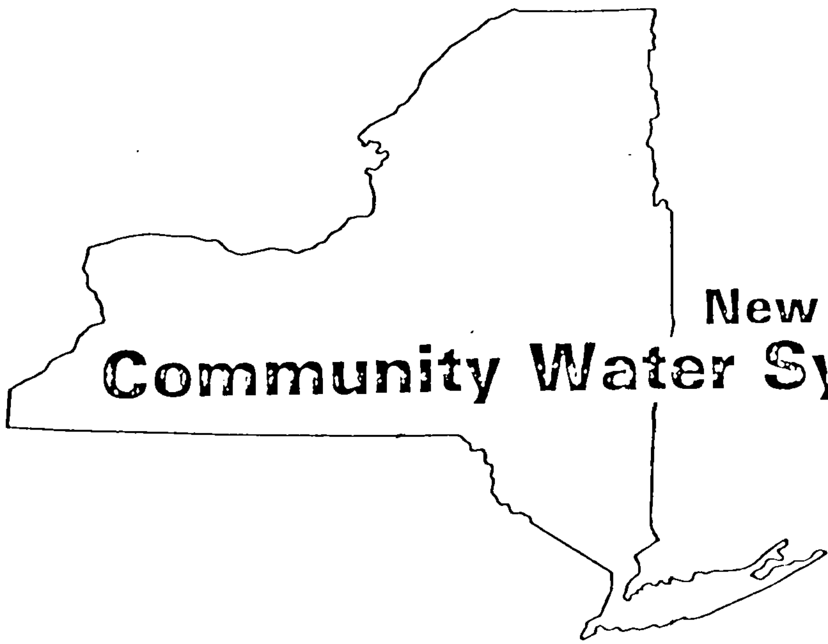
WATER QUALITY REGULATIONS

SURFACE WATER AND GROUNDWATER CLASSIFICATIONS AND STANDARDS

New York State
Codes, Rules and Regulations
Title 6, Chapter X
Parts 700-705

New York State Department of Environmental Conservation

REFERENCE 20

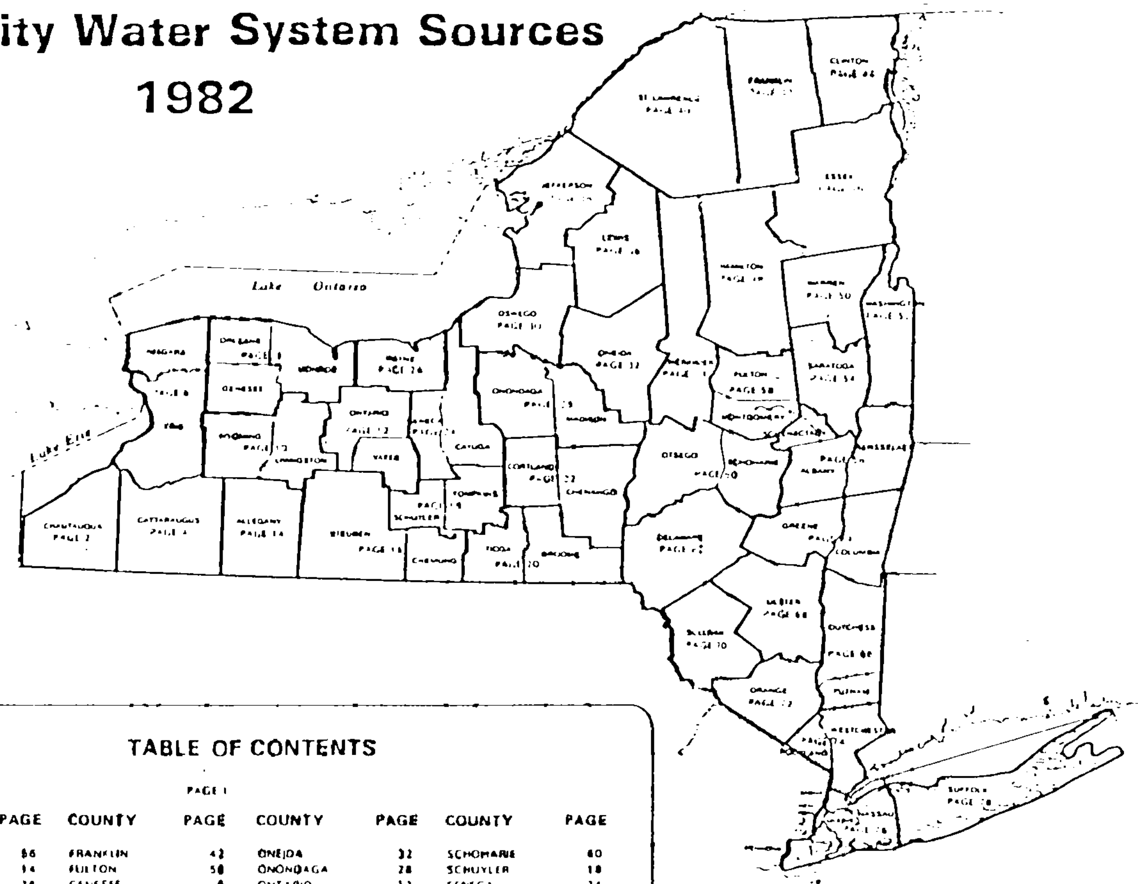


New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE
DEPARTMENT OF HEALTH



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LEGEND

BOUNDARIES AND PLACES

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

CLASSIFICATION OF POPULATED PLACES

100 000 or more — YONKERS
50 000 to 100 000 — Levittown
12 500 to 50 000
2 500 to 12 500
250 to 2 500
250 or less

TRANSPORTATION

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

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

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

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

RECREATION FACILITIES

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

COMMUNITY WATER SYSTEMS SOURCES - 1982

DIVISION OF ENVIRONMENTAL PROTECTION
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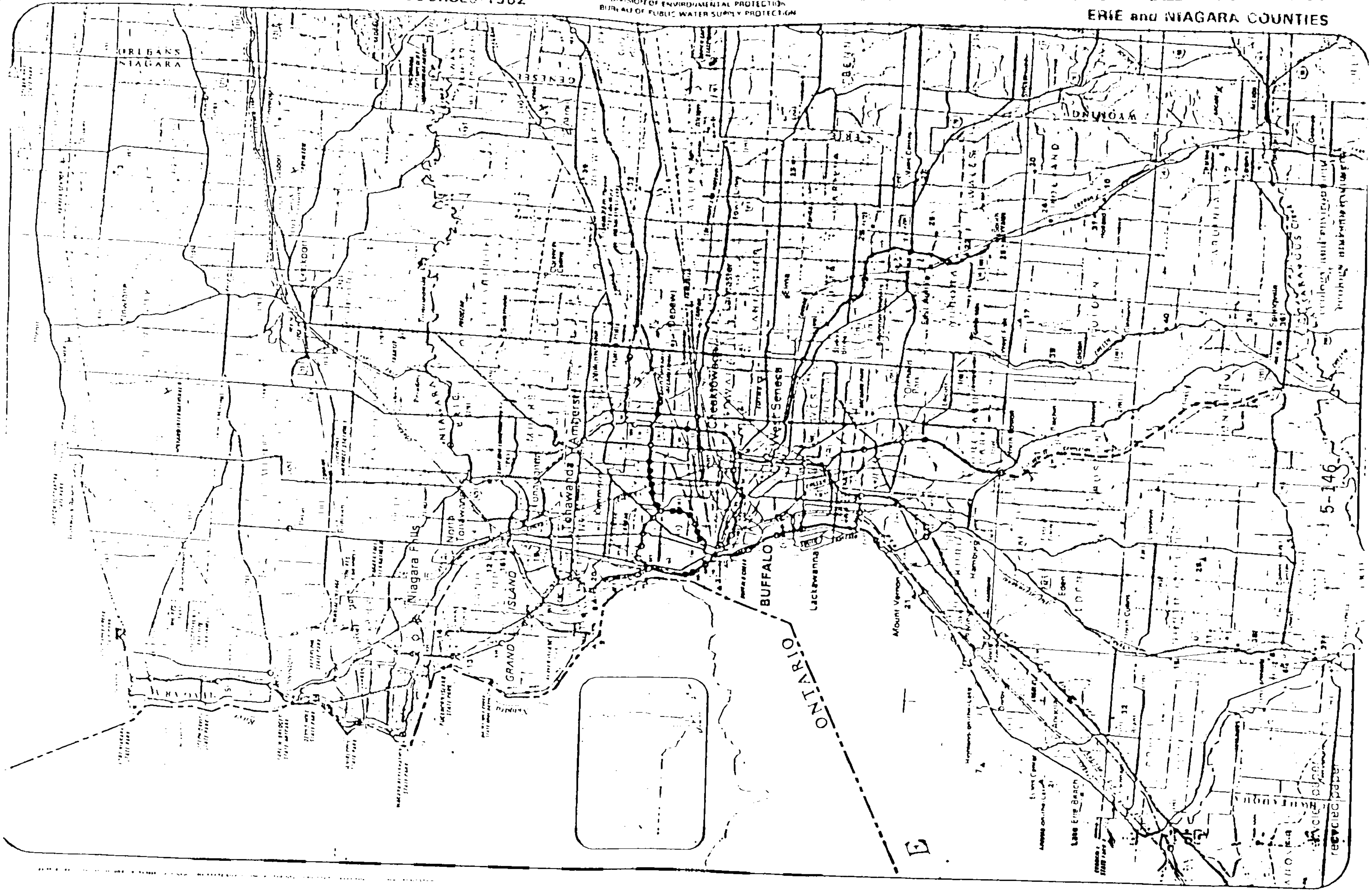
ERIE and NIAGARA COUNTIES



ERIE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
	Akron Village (See No 1 Wyoming Co, Page 101)	3600	
1	Alden Village	3460	Wells
2	Angola Village	8500	Lake Erie
3	Buffalo City Division of Water	357870	Lake Erie
4	Cattee Water Company	210	Wells
5	Collins Water District #3	704	Wells
6	Collins Water Districts #1 and #2	1384	Wells
7	Erie County Water Authority (Sturgeon Point Intake)	375000	Lake Erie
8	Erie County Water Authority (Van DeWater Intake)	NA	Niagara River - East Branch
9	Grand Island Water District #2	9390	Niagara River
10	Holland Water District	1670	Wells
11	Lawtons Water Company	138	Wells
12	Lockport City (Niagara Co)		Niagara River - East Branch
13	Niagara County Water District (Niagara Co)		Niagara River - West Branch
14	Niagara Falls City (Niagara Co)		Niagara River - West Branch
15	North Collins Village	1500	Wells
16	North Tonawanda City (Niagara Co)		Niagara River - West Branch
17	Orchard Park Village	3671	Pipe Creek Reservoir
18	Springville Village	4169	Wells
19	Tonawanda City	18538	Niagara River - East Branch
20	Tonawanda Water District #1	91269	Niagara River
21	Wanakah Water Company	10750	Lake Erie
	Non Municipal Community		
22	Aurora Mobile Park	125	Wells
23	Bush Gardens Mobile Home Park	270	Wells
24	Circle B Trailer Court	50	Wells
25	Circle Court Mobile Park	125	Wells
26	Creekside Mobile Home Park	120	Wells
27	Donnelly's Mobile Home Court	99	Wells
28	Gowanda State Hospital	NA	Clear Lake
29	Hillside Estates	160	Wells
30	Hunters Creek Mobile Home Park	150	Wells
31	Knox Apartments	NA	Wells
32	Maple Grove Trailer Court	72	Wells
33	Millgrove Mobile Park	100	Wells
34	Perkins Trailer Park	75	Wells
35	Quarry Hill Estates	400	Wells
36	Springville Mobile Park	114	Wells
37	Springwood Mobile Village	132	Wells
38	Taylors Grove Trailer Park	39	Wells
39	Valley View Mobile Court	42	Wells
40	Villager Apartments	NA	Wells

NIAGARA COUNTY

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

REFERENCE 21

MEMORANDUM

TO: Linda Rusin

FROM: Matt Forcucci MJF

DATE: July 27, 1987

SUBJECT: Visit to Old Land Reclamation Landfill (Broadway, Depew) Site 09-15-129, and Land Reclamation (Broadway and Indian Road, Cheektowaga) Site 09-15-070

SITE: Old Land Reclamation Landfill, and Land Reclamation

DATE OF VISIT: July 23, 1987 (a.m.)

DOH REP: Matt Forcucci

DEC REP: Larry Clare (Reg. 9), Tom Reynolds (Albany)

SITE FEATURES

Old Land Reclamation is an inactive site bordered by Broadway to the north, a farm to the east, Cayuga Creek on the south, and an abandoned railroad to the west. The cover is good, and the southeast corner and southern edges are heavily vegetated with small trees and other growth. Land Reclamation is an active site which acts as a transfer station as well. A large landfill on the site has been capped. This site is bounded by Broadway to the north, the abandonded railroad to the east, Cayuga Creek to the south, and Indian Road to the west.

OBSERVATIONS

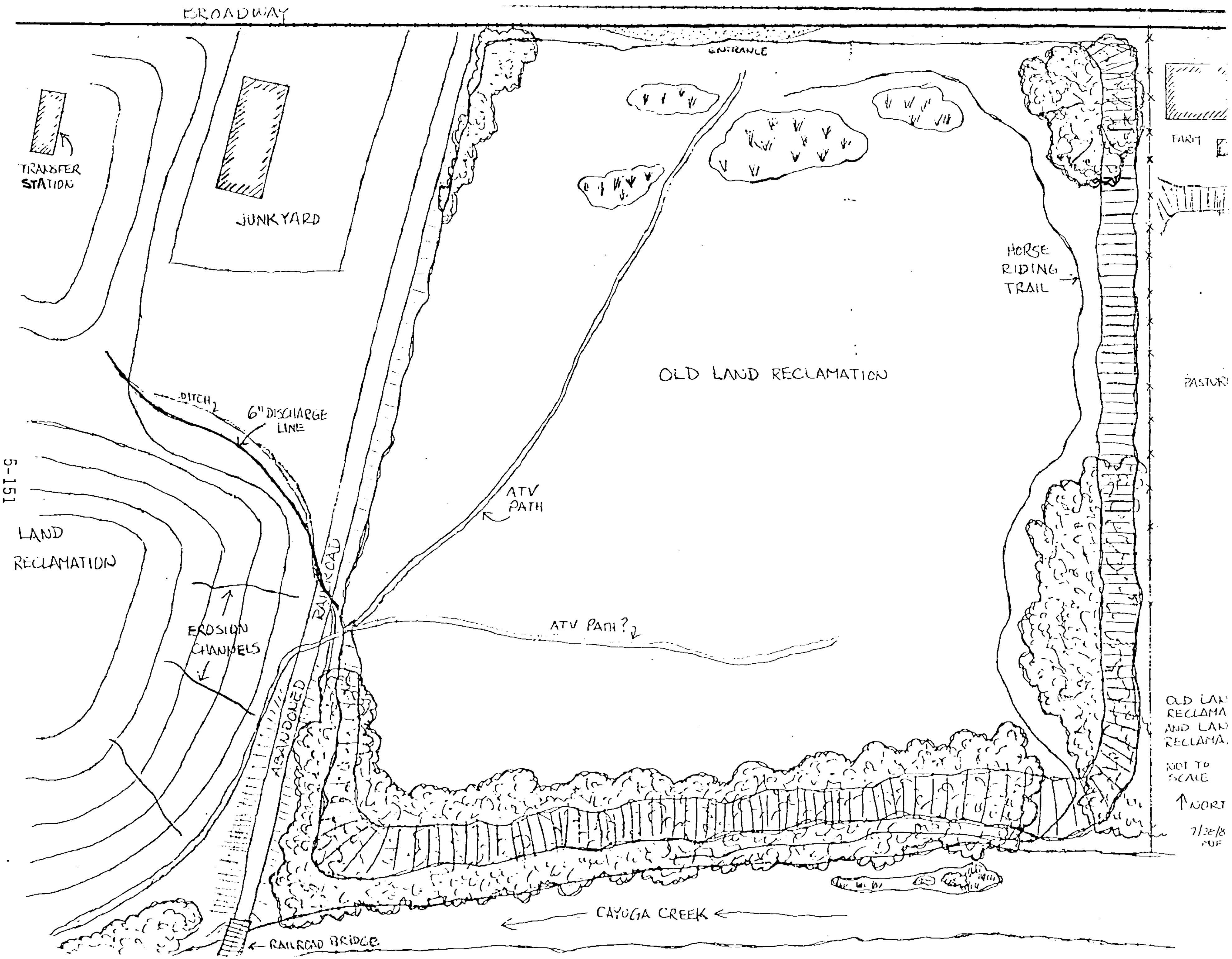
Old Land Reclamation

The site is generally flat, with some depressions containing standing water located in the north-central third of the site. The side slopes on the eastern side are steep and heavily vegetated. The slopes leading to Cayuga Creek are less steep and do not exhibit any signs of erosion from higher creek levels that may be common in the Spring. The opposite shoreline of the creek seems to be undeveloped. Leachate seeps noted in the past on both the east and south sides were not evident during this visit. Using the HNu meter, no volatiles were detected.

Access to the site can be made along Broadway. There is also a horse riding trail along the eastern side leading to the shores of the creek, as well as an ATV trail which seems to diagonally bisect the site.

Land Reclamation

The capped portion of the Land Reclamation site had deep erosion channels on the side slopes, compounded by damage caused by ATV's riding up and down the slope near these channels. No waste materials or signs of leachate were visible. A 6 inch diameter flexible discharge line was noted leading from a portion of the landfill to a ditch on the Old Land Reclamation site. It was not apparent where the line started, nor what was discharged through it.


BROADWAY
ENTRANCE
TRANSFER STATION
JUNKYARD
FARM
HORSE RIDING TRAIL
OLD LAND RECLAMATION
PASTUR
DITCH
6" DISCHARGE LINE
ATV PATH
LAND RECLAMATION
ABANDONED RAILROAD
EROSION CHANNELS
ATV PATH?
OLD LAN RECLAMA AND LAN RECLAMA.
NOT TO SCALE
NORT
7/28/8
CAYUGA CREEK
RAILROAD BRIDGE

EPA 2070–13

5.5

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 1 - SITE LOCATION AND INSPECTION INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 915129

II. SITE NAME AND LOCATION

01 Site Name (Legal, common, or descriptive name of site)	02 Street, Route No., or Specific Location Identifier
Old Land Reclamation	Broadway

03 City	04 State	05 Zip Code	06 County	07 County Code	08 Cong. Dist.
Village of Depew	NY	14043	Erie		

09 Coordinates Latitude	Longitude	10 Type of Ownership (Check One)
42° 52′ 07".	78° 43" 09".	[ ] A. Private [ ] B. Federal [ ] C. State [ ] D. County [ ] E. Municipal [X] F. Other Multiple (see Part 7) [ ] G. Unknown

III. INSPECTION INFORMATION

01 Date of Inspection	02 Site Status	03 Years of Operation
4 / 25 / 89 Month Day Year	[ ] Active [X] Inactive	+ 1960 / 1975 [ ] Unknown Beginning Year Ending Year

04 Agency Performing Inspection (Check all that apply)

[ ] A. EPA [ ] B. EPA Contractor ______ (Name of Firm) [ ] C. Municipal

[ ] D. Municipal Contractor ______ (Name of Firm) [ ] E. State [X] F. State Contractor Ecology and Environment Engineering, P.C. (Name of Firm)

[ ] G. Other (Specify) ______

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

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

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
Joe Schultz	Village Attorney	85 Manitou St. Village of Depew, NY 14043	(716)683-6056
Conrad Wienckowski	Village Assessor	(as above)	(716)683-1931
			( )
			( )
			( )

17 Access Gained by (Check one)	18 Time of Inspection	19 Weather Conditions

IV. INFORMATION AVAILABLE FROM

01 Contact	02 Agency/Organization	03 Telephone No.
Walter Demick	NYSDEC	(518) 457-9538

04 Person Responsible for Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
James Griffis		E & E	(716) 684-8060	2 / 19 / 90 Month Day Year

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT	I. IDENTIFICATION	
EPA PART 2 - WASTE INFORMATION	01 State	02 Site Number
	NY	915129

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 Physical States (Check all that apply)

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

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

Tons ________
Cubic Yards ________
No. of Drums ________

Unknown; no records exist of wastes disposed

03 Waste Characteristics (Check all that apply)

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

III. WASTE TYPE

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

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

01 Category	02 Substance Name	03 CAS Number	04 Storage/Disposal Method	05 Concentration	06 Measure of Concentration
SLU	Pine tar pitch	999	landfill	unknown	--
ACD	Salts of sulfuric and nitric acids	7697-37-2 7664-93-9	landfill	unknown	--
OCC	Polymerized sulfur	999		unknown	--
IOC	Sulfur drainings	999		unknown	--
MES	Foundry sand, slag, vanadium pentoxide	999 1314-62-1	landfill	unknown	--

V. FEEDSTOCKS (See Appendix for CAS Numbers)

Category	01 Feedstock Name	02 CAS Number	Category	01 Feedstock Name	02 CAS Number
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

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

NYSDEC Region 9

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT EPA PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS	I. IDENTIFICATION	
	01 State	02 Site Number
	NY	915129

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

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

Leachate seeps observed near Cayuga Creek.

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

None noted during site inspection.

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

None observed during site inspection.

01 [X] E. Direct Contact 02 [ ] Observed (Date ________) [X] Potential [ ] Alleged
03 Population Potentially Affected 20,051 04 Narrative Description:

Potential exists because leachate seeps were observed during the Phase II investigation. People use the site for horseback and ATV riding.

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

None observed during site inspection.

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

Groundwater is not used for drinking in the site vicinity.

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

None documented.

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

None documented.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

EPA

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

I. IDENTIFICATION	
01 State	02 Site Number
NY	195129

II. HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)

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

None noted during site inspection; however, potential exists because leachate seeps were observed.

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

None noted during site inspection.

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

None documented.

01 [X] M. Unstable Containment of Wastes (Spills/Runoff/Standing liquids, Leaking drums)   02 [X] Observed (Date 4/25/89)   [ ] Potential   [ ] Alleged
03 [ ] Population Potentially Affected ________   04 Narrative Description:

Leachate seeps and corroded drums observed.

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

None noted during site inspection.

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

None documented.

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

None documented

05 Description of Any Other Known, Potential, or Alleged Hazards

III. TOTAL POPULATION POTENTIALLY AFFECTED 0-1 mi = 20,051 persons, 0-2 mi = 30,131 persons, 0-3 mi = 59,700 prsons

IV. COMMENTS

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

NYSDEC Region 9
Ecology and Environment, Inc. Site Inspection
GEMS Data Base - 1980 US Census Bureau Data

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 State	02 Site Number
NY	915129

II. PERMIT INFORMATION

01 Type of Permit Issued (Check all apply)	02 Permit Number	03 Date Issued	04 Expiration Date	05 Comments
[ ] A. NPDES NA				
[ ] B. UIC				
[ ] C. AIR				
[ ] D. RCRA				
[ ] E. RCRA Interim Status				
[ ] F. SPCC Plan				
[ ] G. State (Specify)				
[ ] H. Local (Specify)				
[ ] I. Other (Specify)				
[X] J. None				

III. SITE DESCRIPTION

01 Storage Disposal (Check all that apply)	02 Amount	03 Unit of Measure	04 Treatment (Check all that apply)	05 Other
[ ] A. Surface Impoundment			[ ] A. Incineration	[ ] A. Buildings On Site
[ ] B. Piles			[ ] B. Underground Injection	
[ ] C. Drums, Above Ground			[ ] C. Chemical/Physical	None
[ ] D. Tank, Above Ground			[ ] D. Biological	
[ ] E. Tank, Below Ground			[ ] E. Waste Oil Processing	
[X] F. Landfill	Unknown		[ ] F. Solvent Recovery	06 Area of Site
[ ] G. Landfarm			[ ] G. Other Recycling Recovery	
[ ] H. Open dump				
[ ] I. Other ______ (Specify)			[ ] H. Other ______ (specify)	64 Acres

07 Comments

IV. CONTAINMENT

01 Containment of Wastes (Check one)

[ ] A. Adequate, Secure [ ] B. Moderate [X] C. Inadequate, Poor [ ] D. Insecure, Unsound, Dangerous

02 Description of Drums, Diking, Liners, Barriers, etc.

Leachate seeps were noted; no liner encountered during subsurface investigation.

V. ACCESSIBILITY

01 Waste Easily Accessible: [X] Yes [ ] No

02 Comments: There are no barriers to prevent entry to the site. Wastes are covered but leachate seeps are exposed.

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

NYSDEC Region 9
Site Inspection

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 State	02 Site Number
NY	915129

II. DRINKING WATER SUPPLY

01 Type of Drinking Supply (Check as applicable)

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

02 Status

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

03 Distance to Site

A 10 (mi)

B 9.5 (mi)

III. GROUNDWATER

01 Groundwater Use in Vicinity (Check one)

[ ] A. Only Source for Drinking

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

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

[X] D. Not Used, Unusable

02 Population Served by Groundwater N/A

03 Distance to Nearest Drinking Water Well ______ (mi)

04 Depth to Groundwater ± 20 (ft)

05 Direction of Groundwater Flow South

06 Depth to Aquifer of Concern <20 (ft)

07 Potential Yield of Aquifer ______ (gpd)

08 Sole Source Aquifer Unknown [ ] Yes [X] No

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

N/A

10 Recharge Area

[X] Yes

[ ] No

Comments: Direct hydraulic continuity between landfill and upper groundwater table

11 Discharge Area

[ ] Yes

[ ] No

Comments:

IV. SURFACE WATER

01 Surface Water (Check one)

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

[ ] B. Irrigation, Economically Important Resources

[ ] C. Commercial, Industrial

[ ] D. Not Currently Used

02 Affected/Potentially Affected Bodies of Water

Name:	Affected	Distance to Site
Cayuga Creek	[ ]	Adjacent ( )
	[ ]	(mi)
	[ ]	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 Total Population Within

One (1) Mile of Site	Two (2) Miles of Site	Three (3) Miles of Site
A. 20,051	B. 30,131	C. 59,700
No. of Persons	No. of Persons	No. of Persons

02 Distance to Nearest Population <0.1 (mi)

03 Number of Buildings Within Two (2) Miles of Site >1,000

04 Distance to Nearest Off-Site Home <0.1 (mi)

05 Population Within Vicinity of Site (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The site is located in the Village of Depew with a smaller portion in the Town of Cheektowaga. The surrounding area is residential and industrial to the north and east; mixed open land and residential to the south and west.

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

EPA

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

I. IDENTIFICATION

01 State	02 Site Number
NY	915129

VI. ENVIRONMENTAL INFORMATION

01 Permeability of Unsaturated Zone (Check one)

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

02 Permeability of Bedrock (Check one)

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

03 Depth to Bedrock	04 Depth of Contaminated Soil Zone	05 Soil pH
from 7 to 35 feet (ft)	Unknown	Unknown

06 Net Precipitation	07 One Year 24-Hour Rainfall	08 Site Slope	Direction of Site Slope	Terrain Average Slope
9 (in)	2.1 (in)	± 1-2 %	East, West & South	± 1.5 %

09 Flood Potential

Site is in 100 Year Floodplain

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

11 Distance to Wetlands (5 acre minimum)

ESTUARINE NA	OTHER
A. ____ (mi)	B. <0.1 (mi)

12 Distance to Critical Habitat (of endangered species)

>1 (mi)

Endangered Species: None

13 Land Use in Vicinity

Distance to:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREA; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AG LAND
A. Adjacent	B. <1 (mi)	C. >3 (mi)	D. >3 (mi)

14 Description of Site in Relation to Surrounding Topography

Site is located in a mixed open-industrial area of Depew and Cheektowaga. Topography is generally flat; however, the sides of the landfill slope toward drainage ditches on the east and west and Cayuga Creek on the south.

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

Site Inspection
NYSDEC Region 9
Erie County DEP

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 6 - SAMPLE AND FIELD INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 915129

II. SAMPLES TAKEN -

Sample Type	01 Number of Samples Taken	02 Samples Sent to	03 Estimated Date Results Available
Groundwater	4	Ecology and Environment Analytical Services Center	February 1990
Surface Water	2	Ecology and Environment Analytical Services Center	February 1990
Waste			
Air			
Runoff			
Spill			
Soil			
Vegetation			
Other	2 sediment, 2 leachate/shallow groundwater	Ecology and Environment Analytical Services Center	February 1990

III. FIELD MEASUREMENTS TAKEN

01 Type	02 Comments
HNu	No readings above background
Mini-Rad	No readings above background

IV. PHOTOGRAPHS AND MAPS

01 Type [ ] Ground [X] Aerial

02 In Custody of Erie County Dept. of Environment and Planning
(Name of Organization or Individual)

03 Maps
[X] Yes
[ ] No

04 Location of Maps
Ecology and Environment Engineering, P.C.

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

The Erie County Department of Environment and Planning collected twelve (12) surface water and twelve (12)soil samples around the perimeter of the site in April 1985. The samples were analyzed for metals, PCBs, pesticides, phenol, TOX, and aniline.

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

Site Inspection
NYSDEC Region 9
Erie County DEP

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 915129

II. CURRENT OWNER(S) / PARENT COMPANY (if applicable)

II. CURRENT OWNER(S)			PARENT COMPANY (if applicable)		
01 Name Village of Depew		02 D+B Number	08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.) 85 Manitou St.		04 SIC Code	10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City Depew	06 State NY	07 Zip Code 14043	12 City	13 State	14 Zip Code
01 Name Mecca Brothers		02 D+B Number	08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.) 10788 Main St.		04 SIC Code	10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City North Collins	06 State NY	07 Zip Code 14111	12 City	13 State	14 Zip Code
01 Name Hirsch et al.		02 D+B Number	08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.)		04 SIC Code	10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City Buffalo	06 State NY	07 Zip Code	12 City	13 State	14 Zip Code
01 Name Samuel Greenfield		02 D+B Number	08 Name		09 D+B Number
03 Street Address (P.O. Box, RFD #, etc.) P.O. Box 246		04 SIC Code	10 Street Address (P.O. Box, RFD #, etc.)		11 SIC Code
05 City Buffalo	06 State NY	07 Zip Code 14240	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		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

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

Erie County DEP

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 8 - OPERATOR INFORMATION - NA	I. IDENTIFICATION 01 State: NY 02 Site Number: 915129

II. CURRENT OPERATOR (if different from Owner)

01 Name	02 D+B Number

03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code

05 City	06 State	07 Zip Code

08 Years of Operation	09 Name of Owner

OPERATOR'S PARENT COMPANY (if applicable)

10 Name	11 D+B Number

12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code

14 City	15 State	16 Zip Code

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

PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)

01 Name	02 D+B Number	10 Name	11 D+B Number
S. Ogden Land Dev. Corp.		NEWCO/Browning Ferris Industries	

03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code
350 Fillmore Ave.		2321 Kenmore Ave.	

05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
Buffalo	NY		Kenmore	NY	14217

08 Years of Operation	09 Name of Owner During This Period
5	

01 Name	02 D+B Number	10 Name	11 D+B Number
Wilfred E. Schultz			

03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code
6100 Hunter Creek Road			

05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code
South Wales	NY	14139			

08 Years of Operation	09 Name of Owner During This Period
2	Samuel Greenfield

01 Name	02 D+B Number	10 Name	11 D+B Number

03 Street Address (P.O. Box, RFD #, etc.)	04 SIC Code	12 Street Address (P.O. Box, RFD #, etc.)	13 SIC Code

05 City	06 State	07 Zip Code	14 City	15 State	16 Zip Code

08 Years of Operation	09 Name of Owner During This Period

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

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 9 - GENERATOR/TRANSPORTER INFORMATION	I. IDENTIFICATION	
		01 State	02 Site Number
		NY	915129

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

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	02 Site Number
	NY	915129

II. PAST RESPONSE ACTIVITIES -

01 [ ] A. Water Supply Closed — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] B. Temporary Water Supply Provided — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] C. Permanent Water Supply Provided — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] D. Spilled Material Removed — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] E. Contaminated Soil Removed — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] F. Waste Repackaged — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] G. Waste Disposed Elsewhere — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] H. On-Site Burial — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] I. In Situ Chemical Treatment — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] J. In Situ Biological Treatment — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] K. In Situ Physical Treament — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] L. Encapsulation — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] M. Emergency Waste Treatment — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] N. Cutoff Walls — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] O. Emergency Diking/Surface Water Diversion — 02 Date ______ 03 Agency ______
04 Description:

01 [ ] P. Cutoff Trenches/Sump — 02 Date ______ 03 Agency ______
04 Description:

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 10 - PAST RESPONSE ACTIVITIES (Cont.)	I. IDENTIFICATION	
		01 State NY	02 Site Number 915129

II. PAST RESPONSE ACTIVITIES - (Cont.)

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

01 [ ] R. Barrier Walls Constructed 02 Date ______ 03 Agency ______
04 Description:

01 [ ] S. Capping/Covering 02 Date ______ 03 Agency ______
04 Description:

01 [ ] T. Bulk Tankage Repaired 02 Date ______ 03 Agency ______
04 Description:

01 [ ] U. Grout Curtain Constructed 02 Date ______ 03 Agency ______
04 Description:

01 [ ] V. Bottom Sealed 02 Date ______ 03 Agency ______
04 Description:

01 [ ] W. Gas Control 02 Date ______ 03 Agency ______
04 Description:

01 [ ] X. Fire Control 02 Date ______ 03 Agency ______
04 Description:

01 [ ] Y. Leachate Treatment 02 Date ______ 03 Agency ______
04 Description:

01 [ ] Z. Area Evacuated 02 Date ______ 03 Agency ______
04 Description:

01 [ ] 1. Access to Site Restricted 02 Date ______ 03 Agency ______
04 Description:

01 [ ] 2. Population Relocated 02 Date ______ 03 Agency ______
04 Description:

01 [ ] 3. Other Remedial Activities 02 Date ______ 03 Agency ______
04 Description:

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

Unknown based on available information.

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 11 - ENFORCEMENT INFORMATION	I. IDENTIFICATION 01 State: NY 02 Site Number: 915129

II. ENFORCEMENT INFORMATION

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

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

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

6. BIBLIOGRAPHY

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Appendices

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: Old Land Reclamation
Project No.: Y04020
TDD/Pan No.:
Project Manager: D. Johnson
Project Dir.: J. Griffis
Location(s): Brodway, Depew, Erie County
Prepared by: C. Traynor
Date Prepared: 4-26-89
Approval by: Corp H/S Group DPV
Date Approved: 5 May 89
Site Safety Officer Review:
Date Reviewed:
Scope/Objective of Work: Site reconnaissance and geophysical survey.

Proposed Date of Field Activities: May - June 1989

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

Documentation/Summary:

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

B. SITE/WASTE CHARACTERISTICS

Waste Type(s):

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

Characteristic(s):

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

Other:

Physical Hazards:

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

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

Site History/Description and Unusual Features (see Sampling Plan for detailed description): 64-acre site was used as a landfill from about 1960 to 1975 and received both municipal and industrial wastes.

Locations of Chemicals/Wastes: Landfilled in ditches and mounds, and in leachate and surface water media.

Estimated Volume of Chemicals/Wastes: Unknown.

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

C. HAZARD EVALUATION

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

Physical Hazard Evaluation: 1. Geophysical survey, 2. Site reconnaissance.

Chemical Hazard Evaluation:

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
Barium	0.5 mg/m cu	Inhalation, oral, dermal	Cardiac, GI, neuromuscular distress	--	--
Lead	0.05 mg/m cu	Inhalation, oral, dermal	Stomach distress, vomiting, nervous system	--	--
Zinc	Varies with compound; 1 to 5 mg/m cu	Inhalation, oral, dermal	Skin irritation, cough, fever, nausea	--	--
Phenol	5 ppm	Inhalation, oral, dermal	Headache, CNS effects, skin-burns	--	--
Aniline	5 ppm	Inhalation, oral, dermal	Cyanosis, anoxia	0.37 mg/m cu	Pungent
PCBs NIOSH	1 ug/m cu 0.5	Inhalation, oral, dermal	Nausea, pain, fatigue, skin irritation	--	--

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

D. SITE SAFETY WORK PLAN

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

Perimeter identified? [Y] Site secured? [N]

Work Areas Designated? [N] 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: Approach leachate in Level C and determine basis for downgrade based on monitoring.

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

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

Air Monitoring (daily calibration unless otherwise noted):

Contaminant of Interest	Type of Sample (area, personal)	Monitoring Equipment	Frequency of Sampling
Volatile organics			
Radiation			
Flammables			
Particulates			

(Expand if necessary)

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

1. Scrub with brushes in trisodium phosphate solution, 2. Rinse with deionizing water, 3. 10% Nitric acid rinse, 4. Rinse with hexane, 5. Rinse with acetone, 6. Rinse with deionized water, 7. Air dry.

*Note: Decon activities requiring solvent use necessitate wearing APR with GMC-H cartridges as well as impermeable gloves.

Personnel Decon Protocol: Following disposal of expendables, crew will wash hands/face ASAP. Water, pump soap, and paper towels to be available at hotline.

Decon Solution Monitoring Procedures, if Applicable: N/A.

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

Site Entry Procedures and Special Considerations:

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

Daylight; no work during thunderstorms.

General Spill Control, if applicable: N/A.

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

To be determined; solid materials are to be double bagged; liquids to be containerized. Written authorization must be obtained to leave IDMs on-site after beginning of fieldwork; or provide plans for off-site disposal.

Sample Handling Procedures Including Protective Wear:

N/A.

Team Member*	Responsibility
To be determined.	Team Leader
	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 Dial 911

Hospital Emergency Room St. Joseph Intercommunity Hospital, 2605 Harlem Road, Cheektowaga, NY (716) 891-2450

Poison Control Center ______

Police (include local, county sheriff, state) 911 (local and county)

______

Fire Department 685-1212 Cheektowaga, also dial 911

Airport Buffalo International Airport

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

Local Laboratory E & E ASC

UPS/Fed. Express ______

Client/EPA Contact ______

Site Contact ______

SITE RESOURCES

Site Emergency Evacuation Alarm Method To be determined.

Water Supply Source ______

Telephone Location, Number ______

Cellular Phone, if available ______

Radio ______

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 .... ______ (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, (Drs. 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 Indian Road to Como Park Boulevard. Turn right on Como Park Blvd. and proceed to Union Road (Route 277). Turn right on Union Road and proceed to Walden Avenue. Turn left on Walden and proceed to Harlem Road. Turn right onto Harlem; hospital is on the right.

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

F. EQUIPMENT CHECKLIST

PROTECTIVE GEAR

Level A	No.	Level B	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	
Level C		**Level D**	
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	
RAIN SUIT		NEOPRENE SAFETY BOOTS	
BUTYL APRON		BOOTIES	X
SURGICAL GLOVES	X	WORK GLOVES	X
GLOVES (Type ____________)		HARD HAT WITH FACE SHIELD	X
OUTER WORK GLOVES		SAFETY GLASSES	X
NEOPRENE SAFETY BOOTS	X		
HARD HAT WITH FACE SHIELD			
BOOTIES	X		
HARDHAT			

INSTRUMENTATION	No.	DECON EQUIPMENT	No.
OVA		WASH TUBS	X
THERMAL DESORBER		BUCKETS	
O2/EXPLOSIMETER W/CAL. KIT	1	SCRUB BRUSHES	
PHOTOVAC TIP		PRESSURIZED SPRAYER (SPRAY BOTTLES)	X
HNu (Probe 10.2 eV lamp)	1	DETERGENT (Type TSP)	
MAGNETOMETER	1	SOLVENT (Type hexane/acetone)	X
PIPE LOCATOR		PLASTIC SHEETING	X
WEATHER STATION		TARPS AND POLES	
DRAEGER PUMP, TUBES ANILINE	1	TRASH BAGS	X
BRUNTON COMPASS		TRASH CANS	
MONITOX CYANIDE		MASKING TAPE	
HEAT STRESS MONITOR		DUCT TAPE	X
NOISE EQUIPMENT ______________		PAPER TOWELS	X
PERSONAL SAMPLING PUMPS		FACE MASK	
		FACE MASK SANITIZER	
		FOLDING CHAIRS	
		STEP LADDERS	
RADIATION EQUIPMENT (MINI-RAD)	1	DISTILLED WATER	X
DOCUMENTATION FORMS		10% NITRIC ACID	X
PORTABLE RATEMETER			
SCALER/RATEMETER		**SAMPLING EQUIPMENT**	
NaI Probe		8 OZ. BOTTLES	
ZnS Probe		HALF-GALLON BOTTLES	
GM Pancake Probe		VOA BOTTLES	
GM Side Window Probe		STRING	
MICRO R METER		HAND BAILERS	
ION CHAMBER		THIEVING RODS WITH BULBS	
ALERT DOSIMETER		SPOONS	
POCKET DOSIMETER		KNIVES	
		FILTER PAPER	
FIRST AID EQUIPMENT		PERSONAL SAMPLING PUMP SUPPLIES	
FIRST AID KIT	1		
OXYGEN ADMINISTRATOR			
STRETCHER			
PORTABLE EYE WASH	1		
BLOOD PRESSURE MONITOR			
FIRE EXTINGUISHER			

VAN EQUIPMENT	No.	**MISCELLANEOUS (Cont.)**	No.
TOOL KIT			
HYDRAULIC JACK			
LUG WRENCH			
TOW CHAIN			
VAN CHECK OUT			
Gas			
Oil			
Antifreeze			
Battery			
Windshield Wash			
Tire Pressure			
		SHIPPING EQUIPMENT	
MISCELLANEOUS		COOLERS	
PITCHER PUMP		PAINT CANS WITH LIDS, 7 CLIPS EACH	
SURVEYOR'S TAPE	X	VERMICULITE	
100 FIBERGLASS TAPE		SHIPPING LABELS	
300 NYLON ROPE		DOT LABELS: "DANGER"	
NYLON STRING		"UP"	
SURVEYING FLAGS	X	"INSIDE CONTAINER COMPLIES ..."	
FILM		"HAZARD GROUP"	
WHEEL BARROW		STRAPPING TAPE	
BUNG WRENCH		BOTTLE LABELS	
SOIL AUGER		BAGGIES	
PICK		CUSTODY SEALS	
SHOVEL		CHAIN-OF-CUSTODY FORMS	
CATALYTIC HEATER		FEDERAL EXPRESS FORMS	
PROPANE GAS		CLEAR PACKING TAPE	
BANNER TAPE	X		
SURVEYING METER STICK			
CHAINING PINS & RING			
TABLES			
WEATHER RADIO			
BINOCULARS			
MAGAPHONE			

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HAZARD EVALUATION OF CHEMICALS

Chemical Name Barium Date 4/12/89
DOT Name/U.N. No. 1400 Job No. YN 7000
CAS Number

References Consulted (circle):
NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: OHS database

Chemical Properties: (Synonyms: Metallic Barium, Barium Metal)
Chemical Formula BA Molecular Weight 137.36
Physical State Solid Solubility (H_2O) Reacts Boiling Point 2934°F
Flash Point Flammable solid Vapor Pressure/Density 10mm @ 1920°F Freezing Point 1337°F
Specific Gravity 3.5 Odor/Odor Threshold Flammable Limits
Incompatabilities Reacts with water releasing toxic gases.
also Ammonia, O_2, Halogens, Acids, metal in powdered form is explosive.

Biological Properties:
TLV-TWA 0.5 mg/m^3 PEL 0.5 mg/m^3 Odor Characteristic
IDLH 250 mg/m^3 Human Aquatic Rat/Mouse
Route of Exposure Skin, Ingestion, Inhalation.
Carcinogen Teratogen Mutagen

Handling Recommendations: (Personal protective measures)
Prevent skin contact, wear gloves impervious clothing.

Monitoring Recommendations:

Disposal/Waste Treatment:

Health Hazards and First Aid:
Soluble Barium compounds are Primary skin irritants and convulsant Poisons.

Symptoms: Acute: tightness of neck and facial muscles. vomiting, Diarrhea, pain, weakness, cardiac disturbances and convulsions

Chronic: No chronic poisoning has been reported

recycled paper

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HAZARD EVALUATION OF CHEMICALS

Chemical Name PCBs Date

DOT Name/U.N. No. UN 2315 Job No.

CAS Number 1336-36-3

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)

Toxic and Hazardous Safety Manual ACGIH Other: Sittig

Chemical Properties: (Synonyms: chlorobiphenyls Aroclors Kanechlors

Chemical Formula $C_{12}H_{10-x}Cl_x$ Molecular Weight Varies 258 - 376

Physical State Liquid Solubility (H_2O) 0.04 - 0.2 ppm Boiling Point

Flash Point Vapor Pressure/Density 4×10^{-4} to 4×10^{-5} Freezing Point

Specific Gravity Odor/Odor Threshold Flammable Limits

Incompatabilities

Biological Properties: (ACGIH) 1 ug/m³ (NIOSH)

1254 - TLV-TWA 1.0 mg/m³ PEL 0.5 mg/m³ Odor Characteristic

IDLH Human Aquatic Rat/Mouse

Route of Exposure Inhalation of fume or Vapor and Dermal absorption, Ingestion

Carcinogen Teratogen ✓ Mutagen

Handling Recommendations: (Personal protective measures) and eye wear

Wear protective clothing to prevent skin, eye contact and wash promptly if skin is wet or contaminated.

Monitoring Recommendations:

air monitoring for particulates

Disposal/Waste Treatment:

Incineration (3000°F) with scrubbing. Some landfills approved for PCB disposal.

Health Hazards and First Aid:

If chemical gets in the eyes, irrigate immediately. If contacts skin, wash immediately. If swallowed, give large quantities salt water and induce vomiting.

Symptoms: Acute: Edema, jaundice, vomiting, nausea, abdominal pain and fatigue

Chronic: Same as acute, may be carcinogenic. also may be fetotoxic.

375103

(12/83,DLD)

Chemical Name Phenol Date _____

DOT Classification _____ Job Number _____

CAS Number 108-95-2

REFERENCES CONSULTED (circle; also include MSDS if appropriate.)
NIOSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol. III)
ACGIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
RTECS other: _____

CHEMICAL PROPERTIES: (Synonyms: carbolic acid, phenic acid, phenyl hydroxide)
Chemical Formula C_6H_5OH MW 94 Ionization Potential 8.5ev
Physical State solid, thick liq. Boiling Point 359° F Freezing Point 106° F
Flash Point 185° F Flammable Limits 1.7-8.6% Vapor Pressure .36mm
Specific Gravity/Density 1.058@41° F Odor/Odor Threshold .05ppm
Solubility-water: soluble Solubility-other: miscible-alcohol, ether
Incompatabilities & Reactivity: strongoxidizers, bases, calcium hypochlorite

TOXICOLOGICAL PROPERTIES:
Exposure Limits: TLV-TWA (ACGIH) 5ppm(skin) PEL (OSHA) 5ppm
STEL none est. Ceiling Limits 15.6ppm IDLH 100ppm
Toxicity Data: (Indicate duration of study)
Human; IHL _____ Dermal _____ Oral LDlo 140mg/kg
Rat/Mouse; IHL _____ Dermal LD50 669mg/kg Oral LD50 414mg/kg
Aquatic: Tlm 96:100-10ppm Other: strong poison, ingestion of 1gram
Carcinogen exper. Mutagen exper. Reproductive Toxin exper. teratogen
Route(s) of exposure - (circle all that apply): Inhalation Ingestion
Dermal Contact Eye(ocular) Dermal Absorption Other rapid skin absorption

HANDLING RECOMMENDATIONS: (personal protective measures)
Respirators: 50ppm-APR w/organic filter; 100ppm-SCBA
Protective Clothing: excel-viton: good-butyl, vinyl, neoprene; poor-nitrile.
Special Equipment: Prevent skin/eye contact.

DISPOSAL, FIRE and SPILLS: (Use numbered codes; see attached sheets for explanation.)
Disposal A Fire 3,7 Leaks&Spills 4,6,9,11
Decomposition Products: fumes of carbon monoxide, carbon dioxide

FIRST AID:
ING: Do not induce vomiting; give milk, eggwhites, water, medical attent. immed.
IHL: remove to fresh air, artificial resp. if necessary, medical attent.
Eye/Skin: irrigate/flush with water for at least 15minutes. After complete rinsing of skin w/water, wash with soap. Medical attent immed.

SYMPTOMS:
Acute(immediate) exposure effects: main effect on CNS, symptoms develop quickly(15-20)minutes), headache, muscular weakness, dimness of vision, ringing in ears, rapid breathing, weak pulse, collapse, possible death. Severe skin burns.

Chronic(long term) exposure effects: Rarely reported but symptoms include vomiting, difficulty in swallowing, diarrhea, lack of appetite, headache, fainting, dizziness, mental disturbances, skin rash, liver & kidney damage. Ingestion of 1gram may be fatal.

Reproductive effects: None specified for humans. Experimental teratogen in animals.

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HAZARD EVALUATION OF CHEMICALS

Chemical Name Zinc
Date
DOT Name/U.N. No. UN1436
Job No.
CAS Number

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)
Toxic and Hazardous Safety Manual ACGIH Other: OHS [illegible]

Chemical Properties: (Synonyms: Blue Powder C.I. 77945 JASAD)
Chemical Formula ZN Molecular Weight 65.37
Physical State Solid Solubility (H_2O) Insoluble Boiling Point 1665°F
Flash Point Non-Flammable Vapor Pressure/Density [illegible] 909°F Freezing Point 787°F
Specific Gravity 7.14 Odor/Odor Threshold Flammable Limits
Incompatabilities Acids, Sodium Peroxide, Chlorine water, Sulfer [illegible]

Biological Properties:
TLV-TWA — PEL None Established Odor Characteristic
IDLH Not specified Human Aquatic Rat/Mouse
Route of Exposure Eye, Skin Contact, Inhalation, INGESTION
Carcinogen Teratogen Mutagen

Handling Recommendations: (Personal protective measures)
Prevent repeated or prolonged skin contact wear impervious clothing, gloves & Faceshield

Monitoring Recommendations:
air monitoring for particulates

Disposal/Waste Treatment:
Place contaminated clothing in closed containers for storage until laundered or discard

Health Hazards and First Aid:
If it gets in Eyes wash with large amts of water, get medical Attention immediately

Symptoms: Acute: Skin irritation [illegible] Coughing weakness Muscular Ache Fever NAUSEA Vomiting
Chronic: None Specified

375103
(12/83,DLD)

Hazard Evaluation of Chemicals
Region V - Chicago

Chemical Name Lead Date

DOT Classification Job Number

CAS Number 7439-92-1

EFERENCES CONSULTED (circle; also include MSDS if appropriate.)
OSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol. III)
GIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
ECS other: Sittig

HEMICAL PROPERTIES: (Synonyms: White lead, plumbum)
emical Formula Pb MW 207 Ionization Potential N/A
ysical State Variable Boiling Point 3164° F Freezing Point
ash Point Incombust. Flammable Limits Incombus Vapor Pressure variable
ecific Gravity/Density 11.3 @61° F Odor/ Odor Threshold None
lubility-water: Insoluble Solubility-other:
compatabilities & Reactivity: Strong oxidizers, perioxides, active metals

XICOLOGICAL PROPERTIES:
posure Limits: TLV-TWA (ACGIH) .15 mg/m3 PEL (OSHA) 50ug/m3
STEL None est. Ceiling Limits None est. IDLH Variable
xicity Data: (Indicate duration of study)
Human; IHL Dermal Oral Td10 450mg/kg/6Y
Rat/Mouse; IHL Dermal Oral Tdlo 790mg/kg
Aquatic: Unknown Other: Toxicity varies with lead cpds.
Carcinogen Indef. Mutagen Indef Reproductive Toxin exp. teratogen
ute(s) of exposure - (circle all that apply): Inhalation Ingestion
rmal Contact Eye(ocular) Dermal Absorption Other

NDLING RECOMMENDATIONS: (personal protective measures)
espirators: 5mg/m3 high efficiency particulate respirator, other concentrations - SCBA.
otective Clothing: Avoid skin and eye contact
ocial Equipment: None

SPOSAL, FIRE and SPILLS: (Use numbered codes; see attached sheets for explanation.)
sposal P Fire 13 Leaks&Spills 7,8,10
composition Products: Toxic fumes of lead

RST AID:
IG: Give water, induce vomiting, medical attention immed.
IL: Move to fresh air, artifical resp. if necessary, medical attent.
e/Skin: Irrigate/wash with water. Wash skin thoroughly with soap & water.

MPTOMS:
ute(immediate) exposure effects: Cumulative neurotoxin-commonly occurs om prolonged exposure. Symptoms include stomach distress, vomiting, arrhea, black stools, anemia, nervous system effects.
ronic(long term) exposure effects: 3 clinical types: a-ailmentary-abominal in, discomfort, constipation or diarrhea, metallic taste, lead line on gum adache. b-nueromuscular, muscle weakness, joint/muscle pain, dizziness, somnia, paralysis c-encephalic: brain involvement, stupor, coma, death, rare.
productive effects: Human epid. studies have concluded that lead is a ison to male & female germ cells; increased incidence of miscarriages, illbirths, sterility in females; sperm depression & decreased motiltiy in

ecology and environment, inc.

HAZARD EVALUATION OF CHEMICALS

Chemical Name Aniline Date

DOT Name/U.N. No. Job No.

CAS Number

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline Chris (Vol. II)

Toxic and Hazardous Safety Manual ACGIH Other: Sittig

Chemical Properties: (Synonyms: Aminobenzene, Phenylamine, aniline oil, amino-benzene

Chemical Formula C6 H5 NH2 Molecular Weight 93.1

Physical State Oily liquid Solubility (H_2O) 34,000 mg/l Boiling Point 184

Flash Point 158°F Vapor Pressure/Density 0.4 mm Freezing Point

Specific Gravity 1.02 Odor/Odor Threshold pungent Flammable Limits

Incompatabilities Strong acids Strong oxidizers

Biological Properties:

TLV-TWA 5 ppm PEL 2 ppm Odor Characteristic pungent

IDLH 100 ppm Human 100 ppm Aquatic 26.2 ug/L (Rat/Mouse

Route of Exposure Inhalation Absorption Ingestion

Carcinogen ? Teratogen Mutagen

Handling Recommendations: (Personal protective measures)

Respirators needed if vapor exposure potential, protective clothing to protect skin contact, eye protection to prevent eye contact.

Monitoring Recommendations:

Drager tubes min det. lim 1 ppm

Disposal/Waste Treatment:

Incineration with provision for NOx removal

Health Hazards and First Aid:

Irrigate eyes if any chemical contacts them. If skin contact occurs, wash with soap promptly. If ingested, give large quantities of water and induce vomiting.

Symptoms: Acute: Cyanosis anoxia.

Chronic: Cyanosis Anoxia

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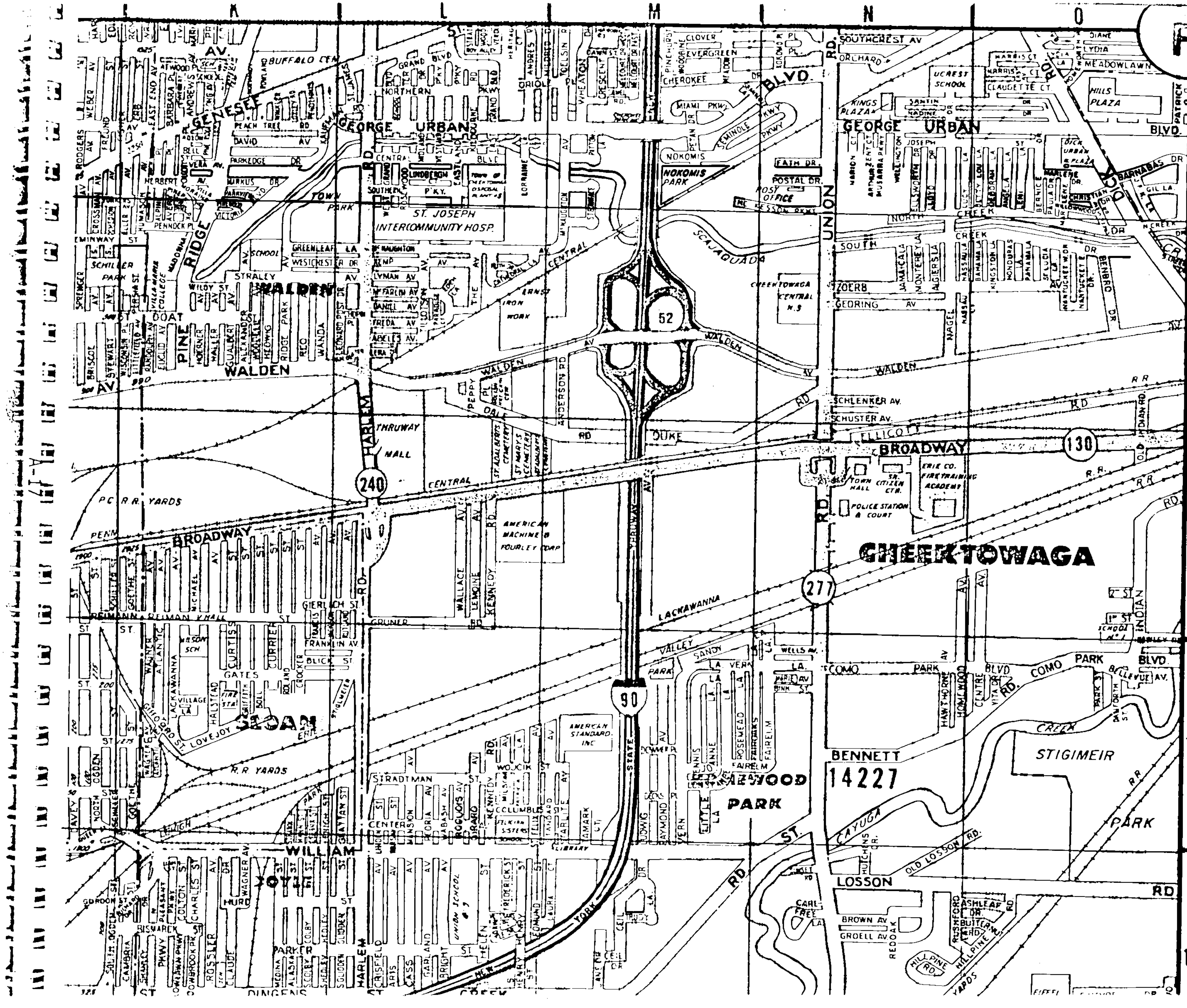
(12/83,DLD)



Continued On Map No. 7

APPENDIX B

GEOPHYSICAL SURVEY

YO-4030 D2425

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATIONS

GEOPHYSICAL SURVEY

OLD LAND RECLAMATION
SITE NUMBER 915129
VILLAGE OF DEPEW, ERIE COUNTY

June 1989

DEPARTMENT OF ENVIRONMENTAL CONSERVATION • NEW YORK STATE •

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.

YO-4030 D2425

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATIONS

GEOPHYSICAL SURVEY

OLD LAND RECLAMATION
SITE NUMBER 915129
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Michael J. O'Toole, Jr., P.E., Director

Prepared by:

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

This geophysical investigation report for the Old Land Reclamation site (I.D. No. 915129) in Depew, 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 EM31 and EM34-3 (electromagnetic terrain conductivity) surveys and a portable proton magnetometer (total earth field magnetics) survey. This report includes field data (Appendix A) and contour maps (Appendix B) for the geophysical surveys performed at this site on May 18 and 19, 1989, 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 Old Land Reclamation was designed to achieve several general goals. The main objectives of the geophysical methods used were to optimize the locations of the four proposed on-site 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 to determine vertical and horizontal anomalies.

3. METHODS

Survey grids were set up at each of the prospective monitoring well locations. The X and Y axes of each survey grid were initially oriented approximately east-west and north-south, respectively. Precise compass orientations were then obtained for each of the survey grid axes. Survey grid coordinate 0,0 is located in the southwest corner of each contour map. Semi-permanent wooden stakes mark the proposed well locations for reference during drilling.

The dimension and station spacing of each survey grid varied due to physical restrictions at each proposed site (i.e., dense vegetation, steepness of slope, standing water, exposed refuse, high voltage power lines, etc.) and proximity of the well to the landfill boundary. An electromagnetic ground conductivity survey was performed using both the Geonics, Ltd. EM34-3 and EM31 ground conductivity meters. Survey lines for the EM34-3 consisted of north-south and/or east-west transects with stations at 50-foot intervals. The EM34-3 equipment provided a greater effective depth of penetration (≤90 feet and ≤45 feet with 20- meter coil spacing) than the EM31 (≤18 feet and ≤9 feet) in the vertical and horizontal dipole modes, respectively. The EM34-3 equipment was used to determine the existence of a contaminant plume exhibiting a ground conductivity gradient at the landfill's northern boundary and at the low-lying area which separates the southwest corner of the landfill from Cayuga Creek.

Attempts to utilize the EM34-3 equipment at other locations at the Old Land Reclamation site were severely hindered by standing water, high voltage power lines, and other cultural surface interference.

Both horizontal and vertical dipole readings in north-south/east-west orientations were recorded at each survey grid node when performing an EM31 survey. Horizontal and vertical dipole readings for the EM34-3 surveys were recorded in only one direction, either north-south or east-west, depending upon the location of the survey grid. Magnetometer readings were recorded at each node in both north-south/east-west orientations using an EG+G UniMag II (model G-846) portable proton precession magnetometer.

All geophysical field data were initially recorded in two log books dedicated to this site investigation. Magnetometer data were reduced by averaging station readings for north-south and east-west orientations and correcting these values for diurnal variation based on background station readings. EM31 conductivity data were averaged for north-south and east-west orientations for both vertical and horizontal dipole positions. The reduced geophysical data (see Appendix A) were then plotted and contoured or profiled for each survey (see Appendix B).

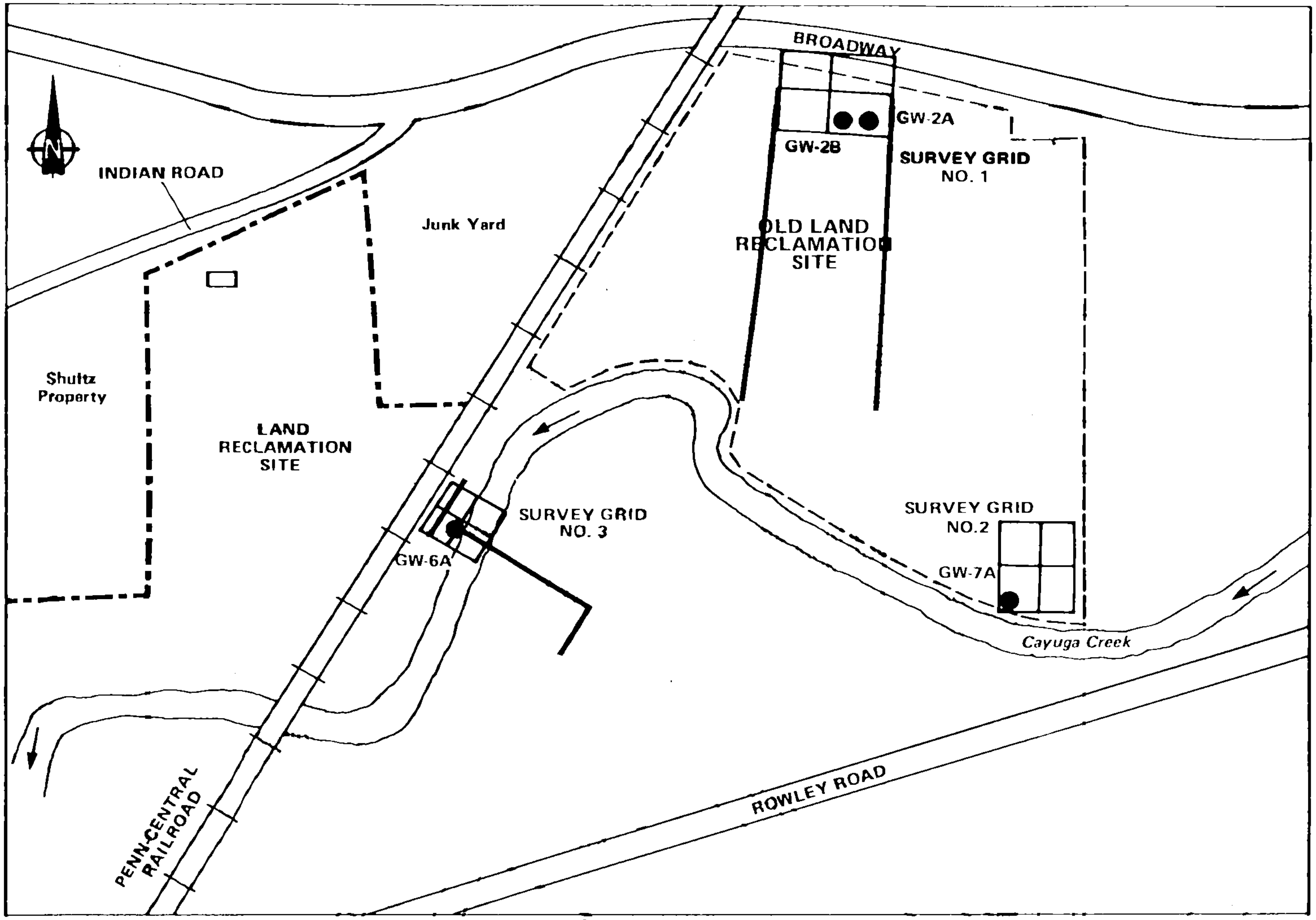
4. DATA INTERPRETATION

The purpose of interpreting the results of the magnetometer, EM31, and EM34-3 surveys is to provide a probable explanation for anomalous geophysical contours. The presence of buried utilities, metal objects, wastes, and contaminant plumes are often manifest as relatively elevated or decreased station readings and gradient values. The following interpretations are based on the contour maps generated from magnetometer, EM31, and EM34-3 data which are listed in Tables A-1, A-2, and A-3 in Appendix A. Three survey grids encompass the four groundwater monitoring well locations as proposed by NYSDEC in the Phase II Investigation Work Plan for the Old Land Reclamation site (see Figure 4-1).

The following discussion provides details of each of the three survey grids:

Survey Grid Area No. 1. A review of magnetometer data contours at the no. 1 grid location indicates that this 4,200-square-foot survey area contains several geomagnetic anomalies. Fill material is suspected to underlie this survey area. Power lines to the north and a snow fence to the south are potential sources of interference in the instrument readings. Anomalous areas appear to be discontinuous, trending northeast-southwest across the survey grid. There is also a north-south trending anomalous area in the northwest corner and an east/west trending anomalous area in the northern section of the survey grid.

Electromagnetic conductivity values from the EM31 (50 to 98 millimhos/meter) are high in both vertical and horizontal dipole modes as compared to lower values (15 to 22 millimhos/meter) in survey area no. 3. These higher values seem to indicate that conductive fill



NOT TO SCALE

KEY:

Geophysical Survey Grid (EM31)

Proposed Groundwater Monitoring Well

EM34-3 Survey Line

Figure 4—1
GEOPHYSICAL SURVEY AND PROPOSED GROUNDWATER MONITORING WELL LOCATIONS AT THE OLD LAND RECLAMATIONS SITE

material underlies survey area no. 1. A prominent north-northeast trending anomaly appears in the horizontal dipole mode ($\leq$9 feet in depth). This anomaly can also be seen in the vertical dipole mode and may represent buried metallic debris at this location. The presence of a geomagnetic anomaly in close proximity and with the same general orientation as the ground conductivity anomaly, substantiates this interpretation of the data. A smaller and less intensive anomaly also appears to be located along the east side of the grid in the southeast quadrant. Ground conductivity readings generally increase to the south as the EM31 was moved closer to the landfill. High readings along the southern border of the survey grid may be exaggerated by the presence of a snow fence less than 20 feet south of the grid.

Two 350-foot EM34-3 survey transects were established along the east and west sides of the survey grid. These east and west transects were initiated at survey grid coordinates 70,30 and 0,30, respectively, and progress in a southerly direction onto the landfill. Ground conductivity readings increased on the east side of the survey grid from 55 to 120 millimhos/meter in the horizontal dipole mode as the EM34-3 was moved south. Ground conductivity readings on the west side of the survey grid were negative (>1,000 millimhos/meter) in the horizontal dipole throughout the entire survey transect. Ground conductivity readings in the vertical dipole followed the same pattern on the east and west transects, with negative readings (>1,000 millimhos/meter) obtained over the fill. (EM34-3 readings greater than 1,000 millimhos/meter are represented by a negative instrument response due to ground conductivity values which exceed the upper limitations of the instrument.) The anomalous areas to the south of this survey grid are oriented northeast-southwest. The high conductivity readings from the start of the survey lines indicate high power line interference or extensive fill material beneath this survey area.

The installation of the proposed groundwater monitoring wells GW-2A and 2B at the locations indicated on the contour map is not recommended. Geophysical survey data suggests that GW-2A lies directly over an electromagnetic (ground conductivity) anomaly. Monitoring well GW-2B is adjacent to this electromagnetic anomaly as well as to a geomagnetic anomaly. It is recommended that these wells be moved to an area in the southeast quadrant of the survey grid. A location east of grid point 40,0, and south of grid point 0,30 would represent lower risk during drilling operations.

Survey Grid Area No. 2. A review of magnetometer data contours at the no. 2 grid location indicates that this 3,200-square-foot survey area contains several geomagnetic anomalies. There is a major northwest-southeast trending anomaly encompassing approximately two-thirds of the survey grid. Another localized anomaly occurs in the southern portion of the survey grid with the same orientation.

EM31 ground conductivity readings for survey grid no. 2 range from 5 to >1,000 millimhos/meter. These ground conductivity values are higher and cover a broader range than those values obtained in survey grid area no. 3. EM31 readings greater than 1,000 millimhos/meter are represented by a negative instrument response due to ground conductivity values which exceed the upper limitations of the instrument. These negative ground conductivity readings seem to indicate the presence of fill material beneath this survey area. The highest conductivity readings occur between survey grid coordinates 0,50 and 0,10 and in a localized area at 40,60. A localized anomaly within the broad ground conductivity anomaly also trends northwest-southeast, thus confirming the orientation of the geomagnetic anomaly described. In general, ground conductivity increases from east to west as the instrument approaches the landfill.

The installation of the proposed groundwater monitoring well GW-7A at the location indicated on the contour map is unsatisfactory due to its close proximity to the localized geomagnetic and ground conductivity anomaly described. It is recommended that GW-7A be moved to an area potentially free of buried metallic debris. A location in the southwest quadrant between grid points 0,10 and 10,10 would lower the risk of drilling in this survey area.

Survey Grid Area No. 3. A review of magnetometer data contours at the no. 3 grid location indicates that this 3,000-square-foot survey area is without substantial geomagnetic anomalies. The risk of drilling into any shallow ferrous material within this grid area is expected to be minimal.

Low electromagnetic conductivity values from the EM31 (12.4 to 22.3 millimhos/meter) were observed in both vertical and horizontal dipole modes. In general, ground conductivity increased in a southerly direction.

Two of three EM34-3 survey transects are integrated with the EM31 and magnetometer grid used in survey area no. 3. Conductivity values ranged from 0.7 to 20 millimhos/meter using the 20-meter coil spacing (depth of penetration ≤90 feet). The results of the ground conductivity readings taken along the western border of the site indicate an increase in conductivity from south to north with increasing proximity to the landfill. A decrease and a subsequent increase in ground conductivity from the center of the survey grid to 120 feet east of the grid indicates an anomalous area east of the grid--the landfill boundary is in close proximity to this location (survey grid coordinates 130,20). A decrease in ground conductivity is recorded with progression in a southerly direction on the east side of the grid. This decrease in ground conductivity represents decreased proximity to the landfill boundary along the east transect.

The installation of the proposed monitoring well GW-6A at the location indicated on the contour map is suitable. The location may also be moved to any area within the survey grid if required to facilitate rig access.

5. CONCLUSIONS AND RECOMMENDATIONS

Based upon the interpretations discussed in Section 4, particular care must be taken when drilling in survey grid area numbers 1 and 2 due to the presence of several electromagnetic and magnetic anomalies. Onsite field observations indicate that an abundance of fill material is present around the landfill periphery. The EM34-3 transect data profiles for survey grid area no. 1 indicate the presence of a ground conductivity anomaly of considerable amplitude and lateral extent south of the survey grid. This prominent anomalous area is suspected to represent the high ground conductivity of landfill material. Onsite field observations indicate that an abundance of fill material is also present throughout the landfill periphery. Particular care should be exercised in order to avoid drilling through this potentially hazardous material.

Proposed locations for monitoring wells GW-2A, 2B, and 7A require relocation to areas which present a lower risk during drilling (see Section 4).

Property line identification has been initiated through the attorney and property tax assessor for the Village of Depew.

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

APPENDIX A

MAGNETOMETER, EM31, AND EM34-3
DATA

Table A-1

AVERAGE NORTH-SOUTH/EAST-WEST MAGNETOMETER READINGS

OLD LAND RECLAMATION

Grid No. 1

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
0,0	56,471	56,471
0,10	56,520	56,520
0,20	56,178	56,178
0,30	56,031	56,031
0,40	55,685	55,685
0,50	55,743	55,743
0,60	55,978	55,978
10,60	56,136	56,136
10,50	56,644	56,644
10,40	56,087	56,087
10,30	56,010	56,010
10,20	56,423	56,423
10,10	56,881	56,881
10,0	56,932	56,932
20,0	56,549	56,549
20,10	56,621	56,621
20,20	56,512	56,512
20,30	56,223	56,223
20,40	56,047	56,047
20,50	56,292	56,292
20,60	56,310	56,310
30,60	56,320	56,320
30,50	56,514	56,514
30,40	56,039	56,039
30,30	56,268	56,268
30,20	56,036	56,036

Table A-1, Grid No. 1 (Cont.)

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
30,10	56,118	56,118
30,0	57,271	57,271
40,0	55,988	55,988
40,10	56,117	56,117
40,20	56,238	56,238
40,30	56,578	56,578
40,40	55,912	55,912
40,50	56,297	56,297
40,60	56,241	56,241
50,60	56,501	56,501
50,50	56,129	56,129
50,40	56,795	56,795
50,30	56,326	56,326
50,20	56,164	56,164
50,10	56,013	56,013
50,0	55,952	55,952
60,0	55,800	55,800
60,10	55,958	55,958
60,20	56,249	56,249
60,30	56,373	56,373
60,40	55,818	55,818
60,50	55,641	55,641
60,60	56,152	56,152
70,60	55,986	55,986
70,50	55,647	55,647
70,40	55,931	55,931
70,30	56,202	56,202
70,20	56,501	56,501
70,10	56,187	56,187
70,0	55,756	55,756

*Data has been corrected for natural magnetic fluctuation (i.e., drift) by using data obtained at an offsite base station.

Table A-1

AVERAGE NORTH-SOUTH/EAST-WEST
MAGNETOMETER READINGS

OLD LAND RECLAMATION

Grid No. 2

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
40,80	56,338	56,338
40,70	56,430	56,430
40,60	56,724	56,724
40,50	56,743	56,743
40,40	56,418	56,417
40,30	57,138	57,137
40,20	57,433	57,432
40,10	57,486	57,485
40,0	56,598	56,597
30,0	56,691	56,690
30,10	58,111	58,110
30,20	58,389	58,388
30,30	57,356	57,355
30,40	56,148	56,146
30,50	56,934	56,932
30,60	56,906	56,904
30,70	56,694	56,692
30,80	56,571	56,569
20,80	56,093	56,091
20,70	55,941	55,939
20,60	57,387	57,385
20,50	56,631	56,629
20,40	57,167	57,164
20,30	57,983	57,980
20,20	58,010	58,007
20,10	57,462	57,459
20,0	56,609	56,606
10,0	56,538	56,535
10,10	57,187	57,184

Table A-1, Grid No. 2 (Cont.)

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
10,20	57,264	57,261
10,30	57,644	57,641
10,40	57,248	57,244
10,50	57,385	57,381
10,60	56,826	56,822
10,70	56,912	56,908
10,80	56,193	56,189
0,80	57,207	57,203
0,70	56,471	56,467
0,60	56,741	56,737
0,50	57,322	57,318
0,40	57,083	57,078
0,30	57,218	57,213
0,20	58,262	58,257
0,10	57,059	57,054
0,0	56,487	56,482

*Data has been corrected for natural magnetic fluctuation (i.e., drift) by using data obtained at an offsite base station.

Table A-1

AVERAGE NORTH-SOUTH/EAST-WEST
MAGNETOMETER READINGS

OLD LAND RECLAMATION

Grid No. 3

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
60,50	56,071	56,070
60,40	56,030	56,028
60,30	56,103	56,100
60,20	56,117	56,113
60,10	56,175	56,170
60,0	56,200	56,194
50,0	56,129	56,122
50,10	56,166	56,158
50,20	56,153	56,144
50,30	56,074	56,064
50,40	56,031	56,020
50,50	55,918	55,906
40,50	55,998	55,984
40,40	56,065	56,050
40,30	56,109	56,093
40,20	56,182	56,165
40,10	56,187	56,169
40,0	56,197	56,178
30,0	56,173	56,153
30,10	56,185	56,164
30,20	56,155	56,133
30,30	56,124	56,101
30,40	56,081	56,057
30,50	56,048	56,022
20,50	56,047	56,020

Table A-1, Grid No. 3 (Cont.)

Station #	Average N-S/E-W (Gammas)	Corrected Data* (Gammas)
20,40	56,094	56,066
20,30	56,118	56,089
20,20	56,138	56,108
20,10	56,189	56,158
20,0	56,165	56,133
10,0	56,165	56,132
10,10	56,143	56,109
10,20	56,136	56,101
10,30	56,104	56,068
10,40	56,084	56,047
10,50	56,043	56,005
0,50	56,093	56,054
0,40	56,071	56,031
0,30	56,094	56,003
0,20	56,115	56,073
0,10	56,122	56,079
0,0	56,140	56,096

*Data has been corrected for natural magnetic fluctuation (i.e., drift) by using data obtained at an offsite base station.

Table A-2

AVERAGE NORTH-SOUTH/EAST-WEST
GROUND CONDUCTIVITY READINGS
WITH EM31

OLD LAND RECLAMATION

Survey Grid No. 1

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
70,60	70.0	53.5
70,50	69.5	52.5
70,40	74.0	60.0
70,30	70.5	67.0
70,20	91.0	57.0
70,10	81.0	57.0
70,0	80.0	62.0
60,0	80.5	62.5
60,10	80.0	60.0
60,20	77.0	62.0
60,30	77.0	63.0
60,40	75.0	58.0
60,50	70.0	50.5
60,60	66.0	53.5
50,60	68.0	56.0
50,50	69.0	51.0
50,40	75.0	56.5
50,30	77.5	59.5
50,20	80.5	59.0
50,10	81.5	60.5
50,0	82.0	61.5
40,0	85.0	70.5
40,10	80.0	64.5
40,20	81.0	59.0
40,30	80.5	59.5
40,40	75.5	59.0
40,50	71.0	54.0
40,60	72.0	56.0
30,60	73.5	62.0

Table A-2, Survey Grid No. 1 (Cont.)

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
30,50	71.0	60.0
30,40	66.5	67.5
30,30	82.0	64.0
30,20	85.5	79.5
30,10	87.0	76.5
30,0	86.5	93.5
20,0	98.0	90.0
20,10	95.0	75.0
20,20	88.5	71.5
20,30	78.0	68.5
20,40	76.5	63.0
20,50	73.5	59.5
20,60	75.5	61.0
10,60	75.5	61.5
10,50	73.0	58.0
10,40	76.0	56.5
10,30	78.0	71.5
10,20	85.5	73.0
10,10	84.5	77.5
10,0	93.0	86.0
0,0	93.5	82.0
0,10	91.5	76.0
0,20	86.5	73.5
0,30	80.5	69.5
0,40	76.0	57.5
0,50	75.0	58.0
0,60	76.5	60.5

Table A-2

AVERAGE NORTH-SOUTH/EAST-WEST
GROUND CONDUCTIVITY READINGS
WITH EM31

OLD LAND RECLAMATION

Survey Grid No. 2

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	13.5	14.7
0,10	13.4	17.4
0,20	1000.0	42.0
0,30	neg. (>1,000)*	61.0
0,40	14.5	73.0
0,50	23.8	72.0
0,60	29.5	65.0
0,70	22.8	66.5
0,80	17.5	68.5
10,80	37.0	59.0
10,70	10.3	60.5
10,60	12.7	59.0
10,50	neg. (>1,000)*	74.0
10,40	26.5	71.5
10,30	5.0	62.0
10,20	neg. (>1,000)*	36.3
10,10	14.8	14.8
10,0	15.0	13.0
20,0	14.5	11.9
20,10	16.3	18.6
20,20	neg. (>1,000)*	41.5
20,30	neg. (>1,000)*	73.5
20,40	neg. (>1,000)*	73.5
20,50	15.3	43.0
20,60	20.8	60.5
20,70	17.5	67.0
20,80	33.5	63.0
30,80	24.5	44.0

Table A-2, Survey Grid No. 2 (Cont.)

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
30,70	17.5	47.0
30,60	8.0	50.0
30,50	14.5	42.5
30,40	6.4	51.0
30,30	neg. (>1,000)*	69.0
30,20	neg. (>1,000)*	46.0
30,10	5.2	17.5
30,0	10.2	11.0
40,0	9.3	9.5
40,10	neg. (>1,000)*	13.3
40,20	neg. (>1,000)*	25.0
40,30	neg. (>1,000)*	43.0
40,40	neg. (>1,000)*	28.8
40,50	6.0	29.0
40,60	neg. (>1,000)*	31.8
40,70	6.1	28.0
40,80	14.3	34.5

*Indicates "high" transmitter power level on the EM31.

Table A-2

AVERAGE NORTH-SOUTH/EAST-WEST GROUND CONDUCTIVITY READINGS WITH EM31

OLD LAND RECLAMATION

Survey Grid No. 3

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,0	22.3	21.3
0,10	20.0	20.8
0,20	19.0	14.8
0,30	16.3	13.3
0,40	16.7	12.7
0,50	16.3	13.4
10,50	16.0	12.7
10,40	14.9	12.4
10,30	15.0	12.5
10,20	17.7	14.4
10,10	17.3	18.5
10,0	21.0	20.5
20,0	21.0	20.4
20,10	16.5	17.5
20,20	17.0	14.0
20,30	14.7	12.7
20,40	15.0	12.3
20,50	15.5	12.5
30,50	15.5	13.7
30,40	15.0	12.7
30,30	15.0	13.4
30,20	17.9	14.4
30,10	17.1	17.3
30,0	19.5	19.4
40,0	20.5	19.0
40,10	18.0	17.3
40,20	17.0	16.3

Table A-2, Survey Grid No. 3 (Cont.)

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
40,30	16.0	13.7
40,40	16.3	13.5
40,50	17.0	14.3
50,50	17.5	15.0
50,40	17.5	14.7
50,30	15.8	16.0
50,20	17.0	16.7
50,10	19.4	17.5
50,0	20.0	19.5
60,0	21.0	19.3
60,10	19.3	18.3
60,20	19.0	17.4
60,30	17.5	17.3
60,40	18.0	16.8
60,50	21.0	17.1

*Average negative readings with one positive and one negative N-S/E-W reading.

Table A-3

OLD LAND RECLAMATION
EM34-3
(20-Meter Spacing)

Survey Grid No. 1

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,30	neg. (>1,000)*	neg. (>1,000)*
0,-20	neg. (>1,000)*	neg. (>1,000)*
0,-70	neg. (>1,000)*	neg. (>1,000)*
0,-120	neg. (>1,000)*	neg. (>1,000)*
0,-170	36	neg. (>1,000)*
0,-220	42	neg. (>1,000)*
0,-270	neg. (>1,000)*	neg. (>1,000)*
0,-320	22	neg. (>1,000)*
70,30	neg. (>1,000)*	55
70,-20	neg. (>1,000)*	62
70,-70	neg. (>1,000)*	61
70,-120	38	77
70,-170	neg. (>1,000)*	112
70,-220	22	120
70,-270	60	120
70,-320	42	120

*Indicates "high" transmitter power level on the EM34-3.

Table A-3

OLD LAND RECLAMATION
EM34-3
(20-Meter Spacing)

Survey Grid No. 2

EM34-3 ground conductivity data were unobtainable in survey grid no. 2 due to excessive interference.

Table A-3

OLD LAND RECLAMATION
EM34-3
(20-Meter Spacing)

Survey Grid No. 3

Station #	Vertical Dipole (millimhos/meter)	Horizontal Dipole (millimhos/meter)
0,5	12.0	8.2
0,55	20.0	0.7
30,20	10.8	8.2
80,20	6.9	7.6
130,20	7.5	8.4
180,20	12.2	8.2
180,20	11.5	10.5
180,-30	2.2	5.4

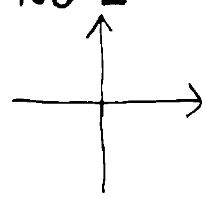
APPENDIX B

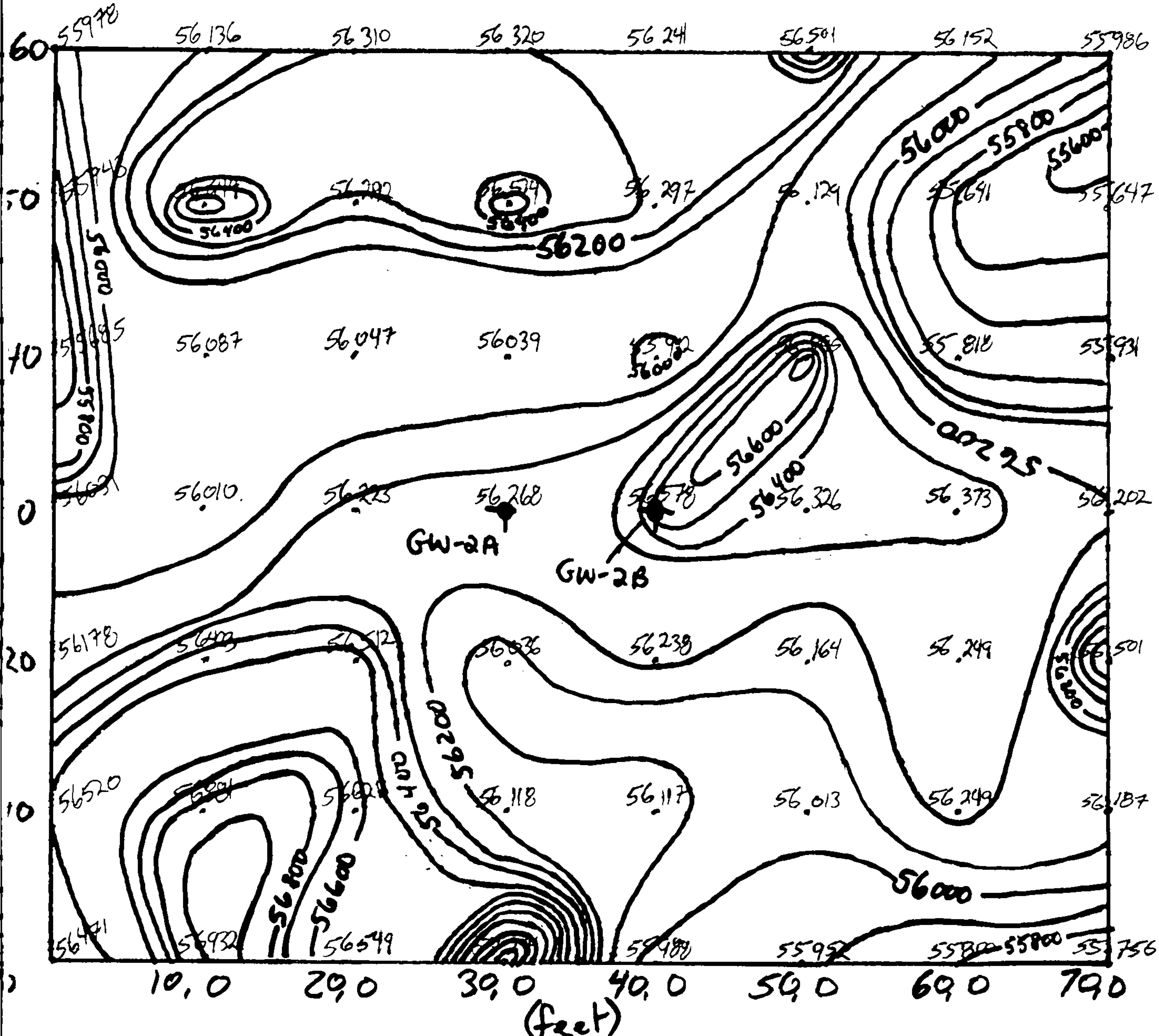
MAGNETOMETER, EM31, AND EM34-3
CONTOUR MAPS AND PROFILES

OLD LAND RECLAMATION
Site Number 915129

MAGNETOMETER SURVEY GRID 1
(gammas)

N6°E

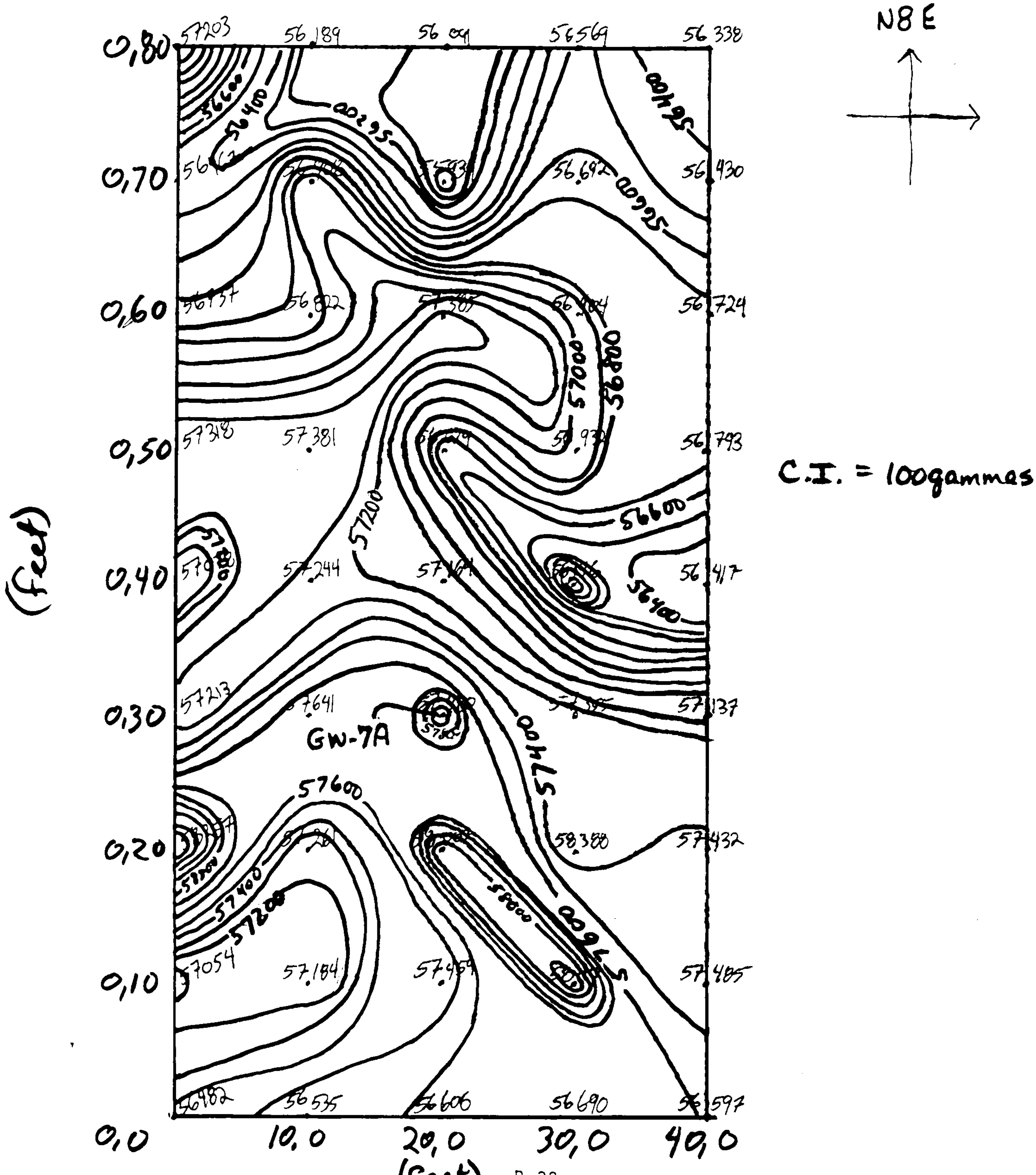




C.I. = 100 gammas
= Proposed Well locations

OLD LAND RECLAMATION
Site Number 915129

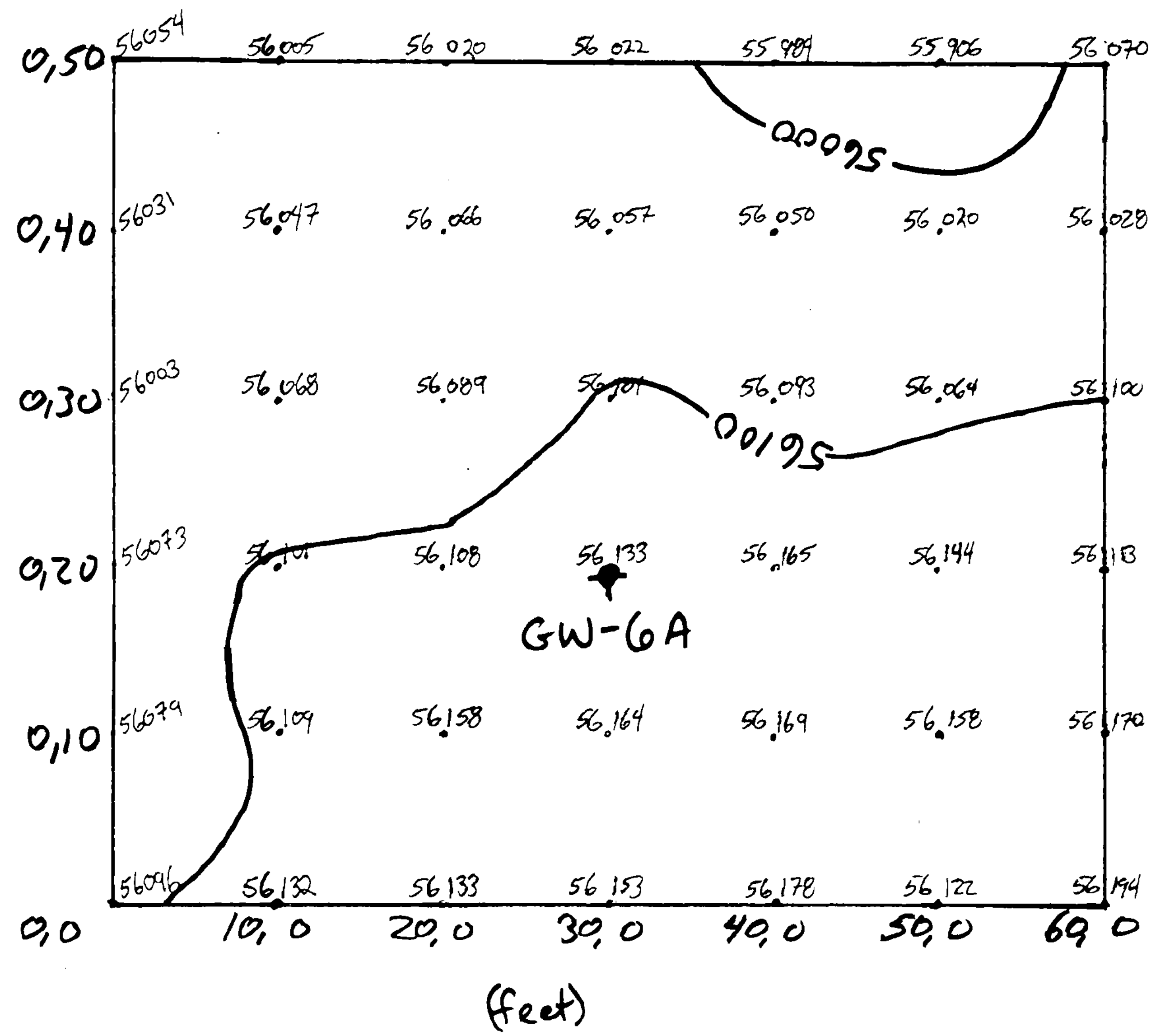
MAGNETOMETER SURVEY GRID 2
(gammas)



OLD LAND RECLAMATION
Site Number 915129

Magnetometer Survey Grid 3
(gammas)

N 18 E



C.I. = 100 gammas
● = Proposed well location

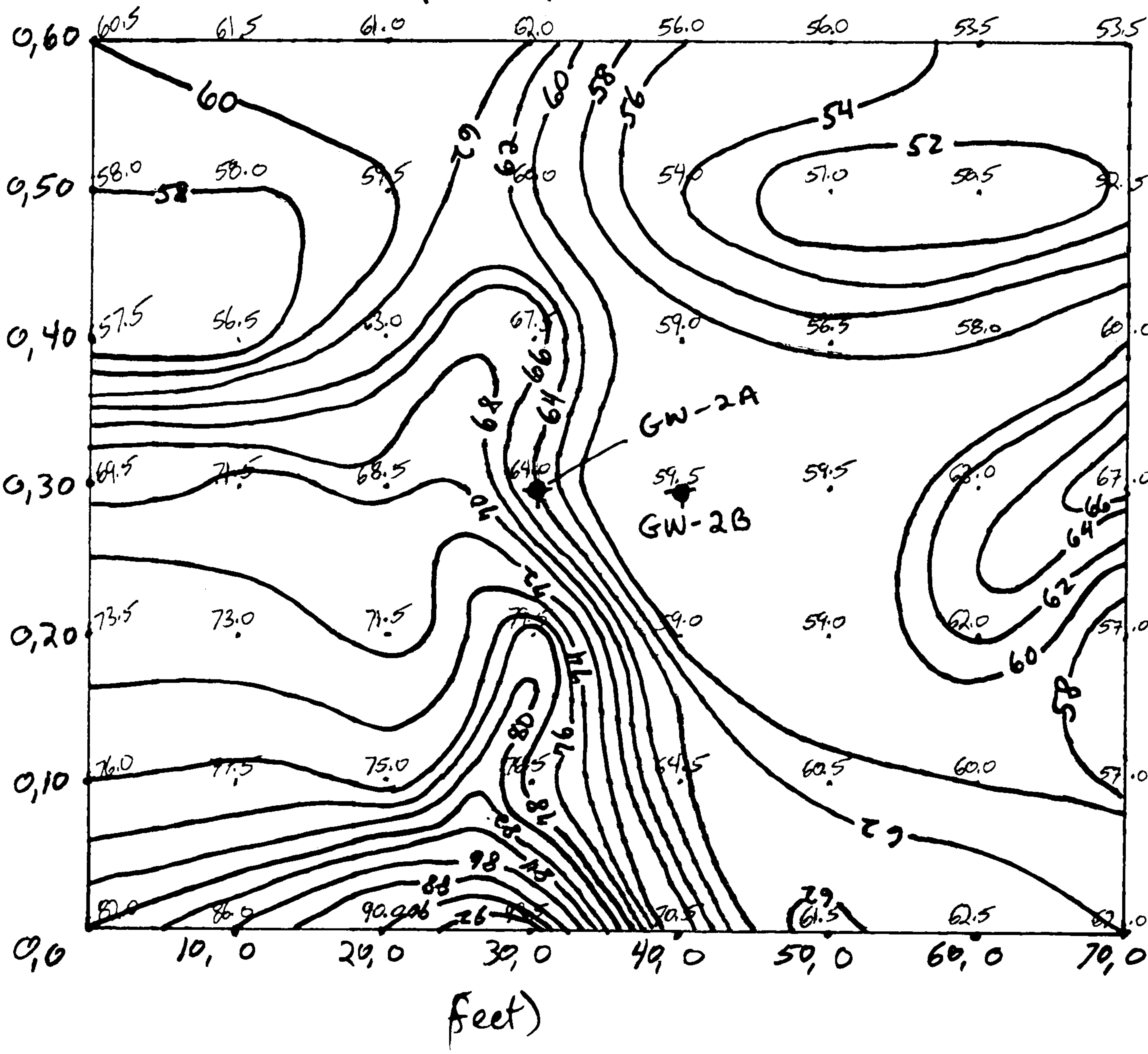
OLD LAND RECLAMATION
Site Number

EM-31 SURVEY GRID 1

HORIZONTAL DIPOLE
(millimhos/meter)

N6E

C.I. = 2 millimhos/meter
= Proposed well locations



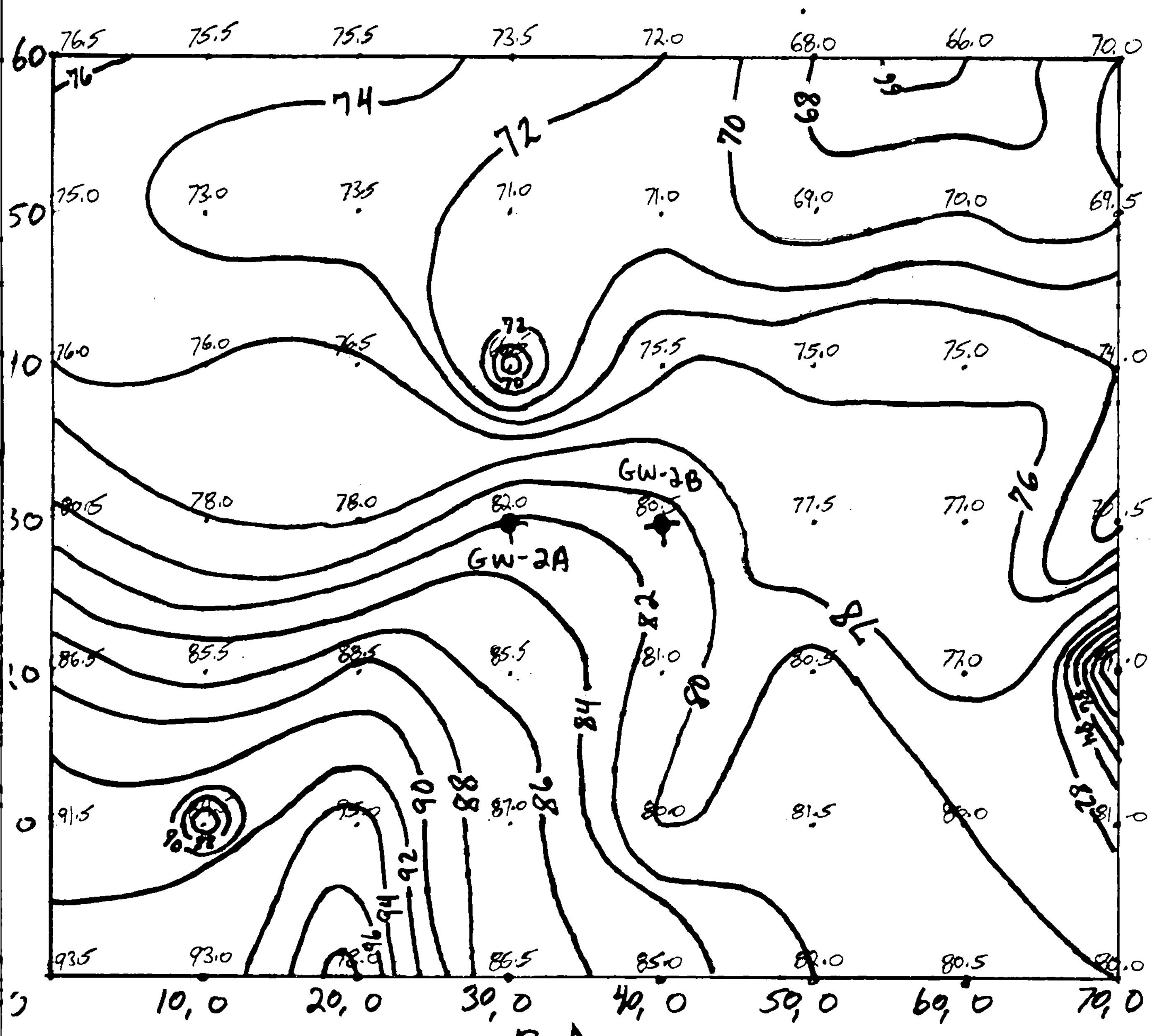
OLD LAND RECLAMATION
Site Number 915129

EM-31 SURVEY GRID 1

Verticle Dipole
(millimhos/meter)

C.I. = 2 millimhos/meter

N6E

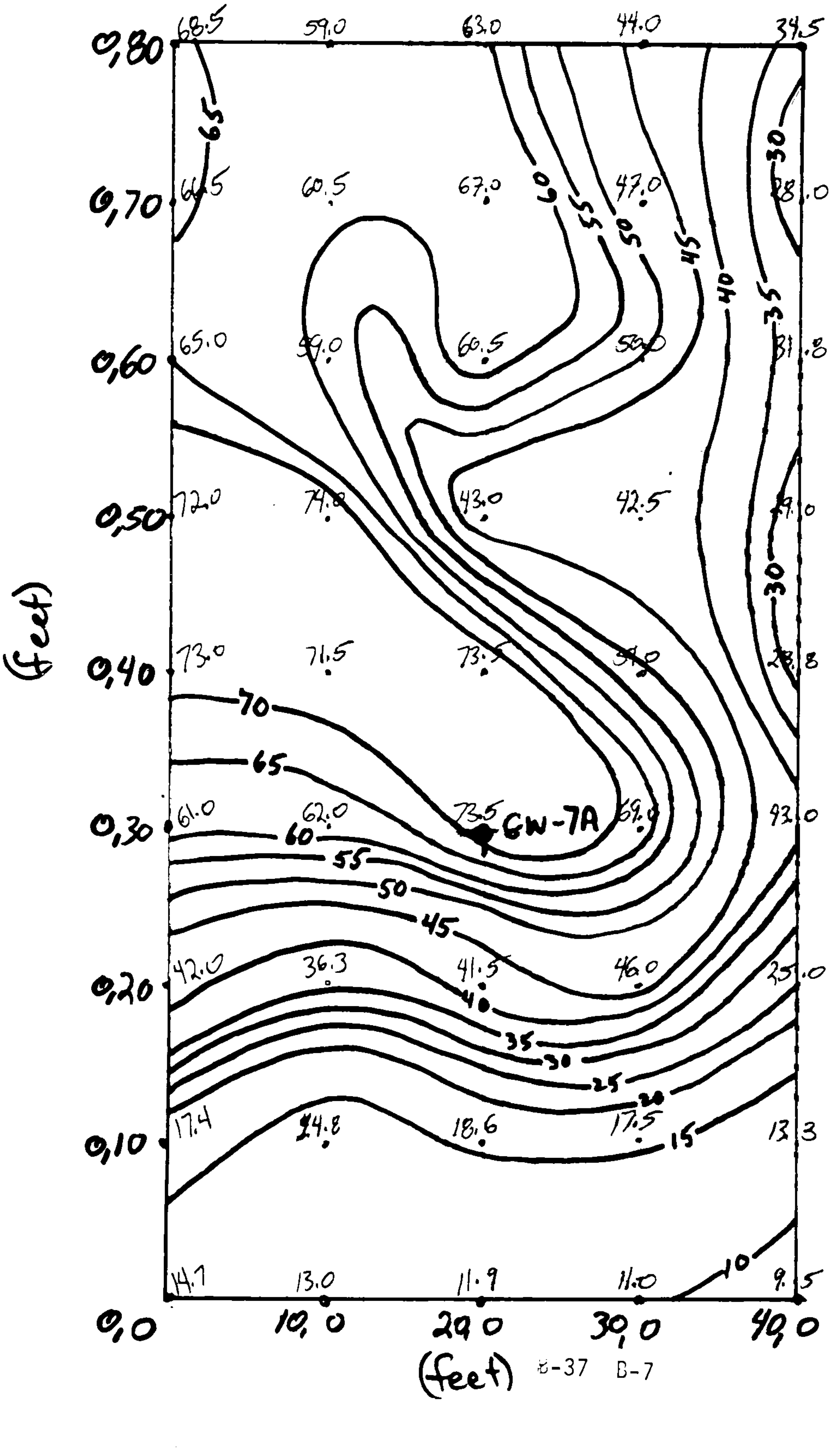


OLD LAND RECLAMATION
Site Number 915129

EM-31 SURVEY GRID 2

HORIZONTAL DIPOLE

N8E



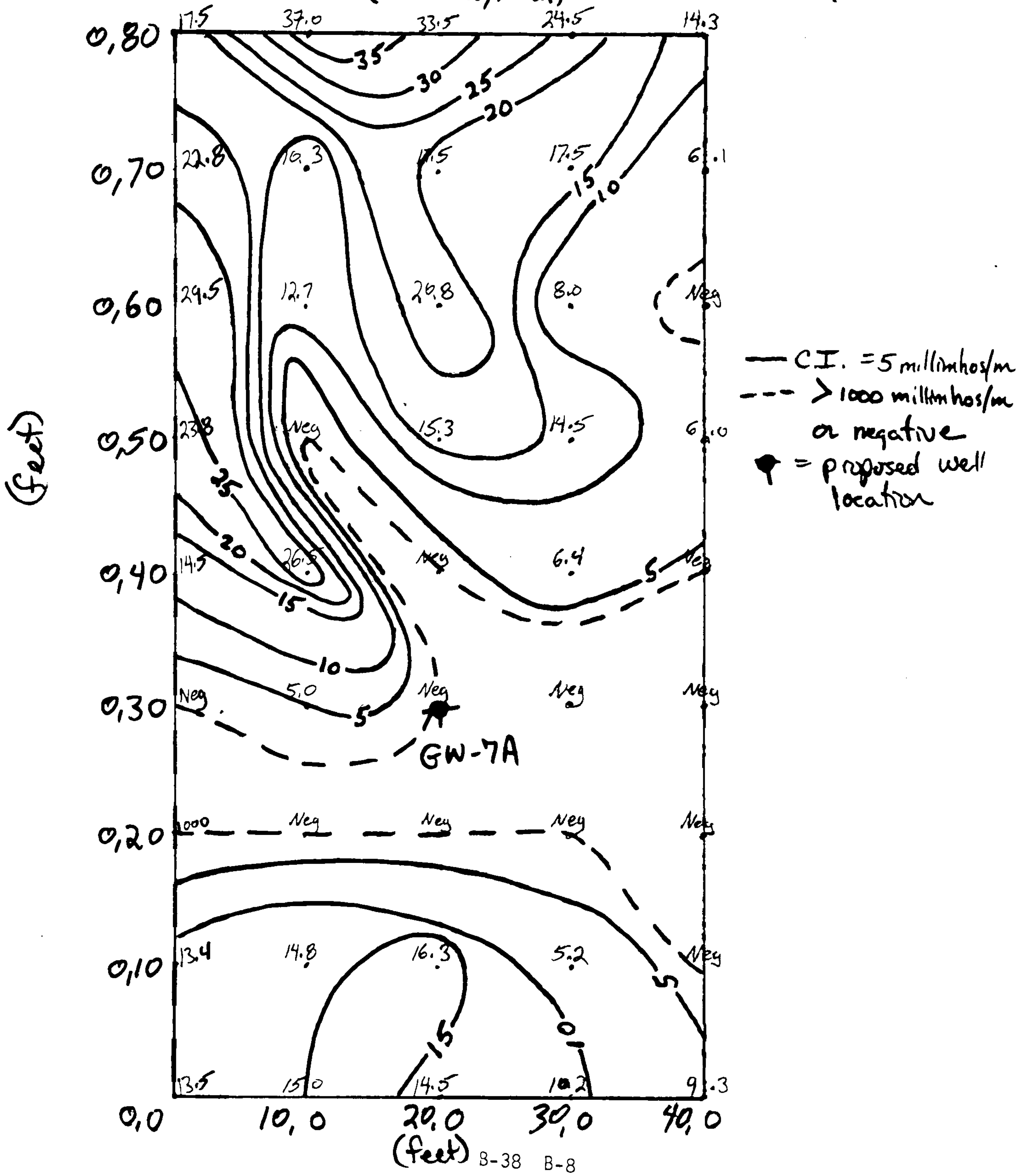
C.I. = 5 millimhos/meter
⬥ = Proposed well location

OLD LAND RECLAMATION
Site Number 915129

EM-31 SURVEY GRID 2

N8E

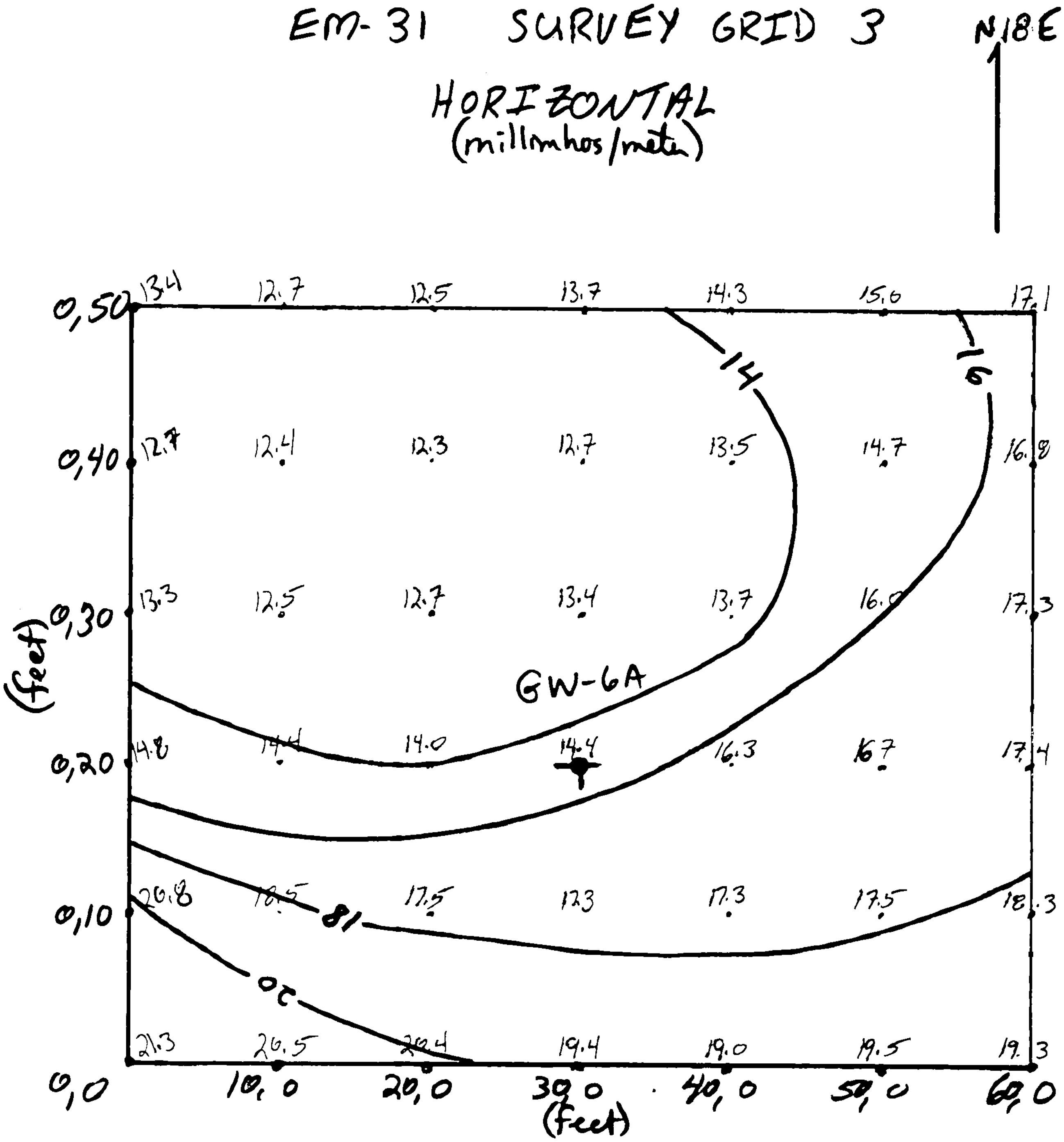
Verticle Dipole
(millimhos/meter)



OLD LAND RECLAMATION
Site Number

EM-31 SURVEY GRID 3

HORIZONTAL
(millimhos/meter)



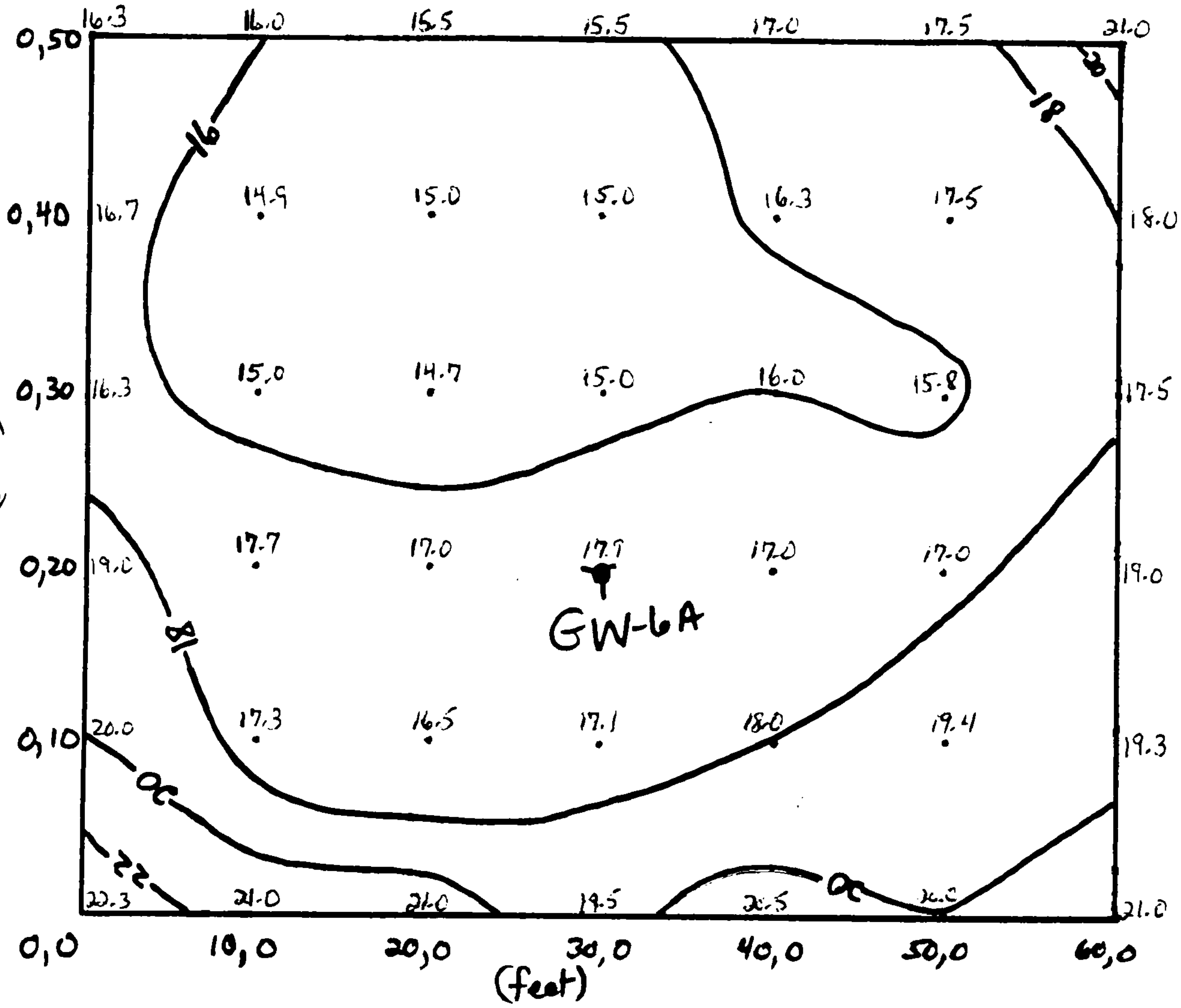
C.I. = 2 millimhos/meter
= Proposed well location

OLD LAND RECLAMATION
Site. No. 915129

N18E

EM31 SURVEY GRID 3

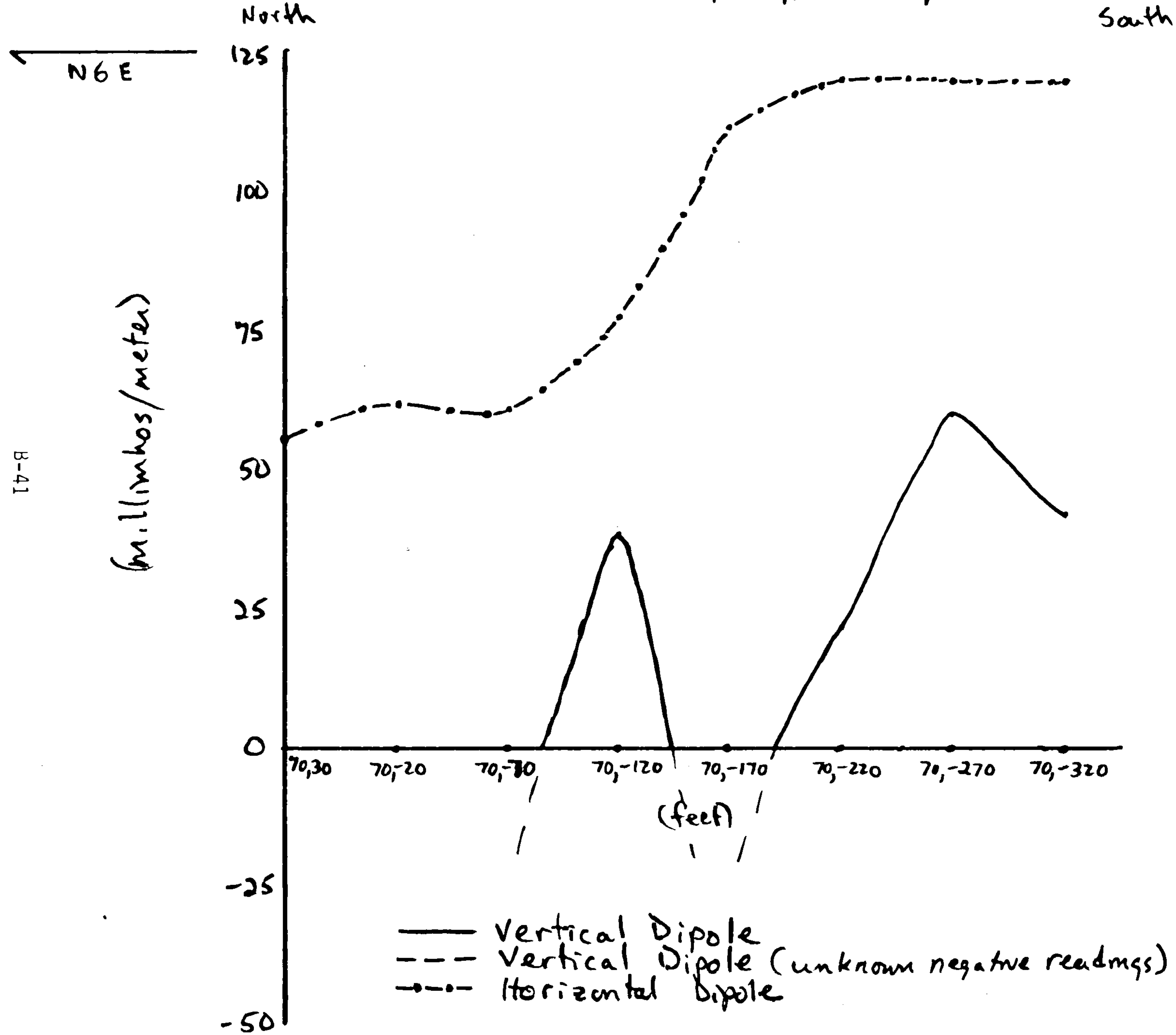
Vertical Dipole
(millimhos/meter)



C.I. = 2 millimhos/meter
✦ = proposed well location

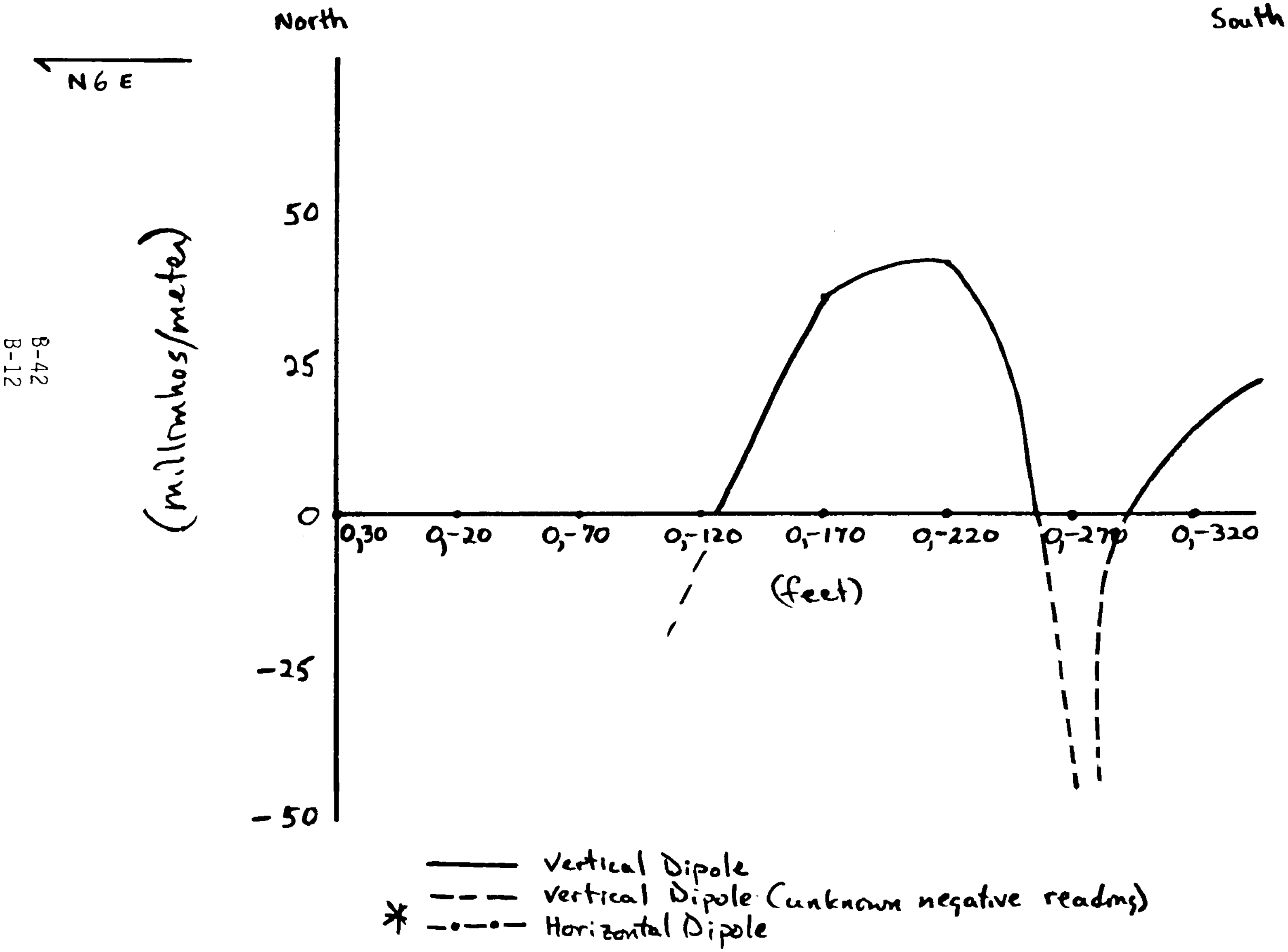
OLD LAND RECLAMATION
Site No. 915129

EM34-3 (20m spacing) Survey GRID 1



B-41
B-11

EM34-3 (20m spacing) Survey GRID 1

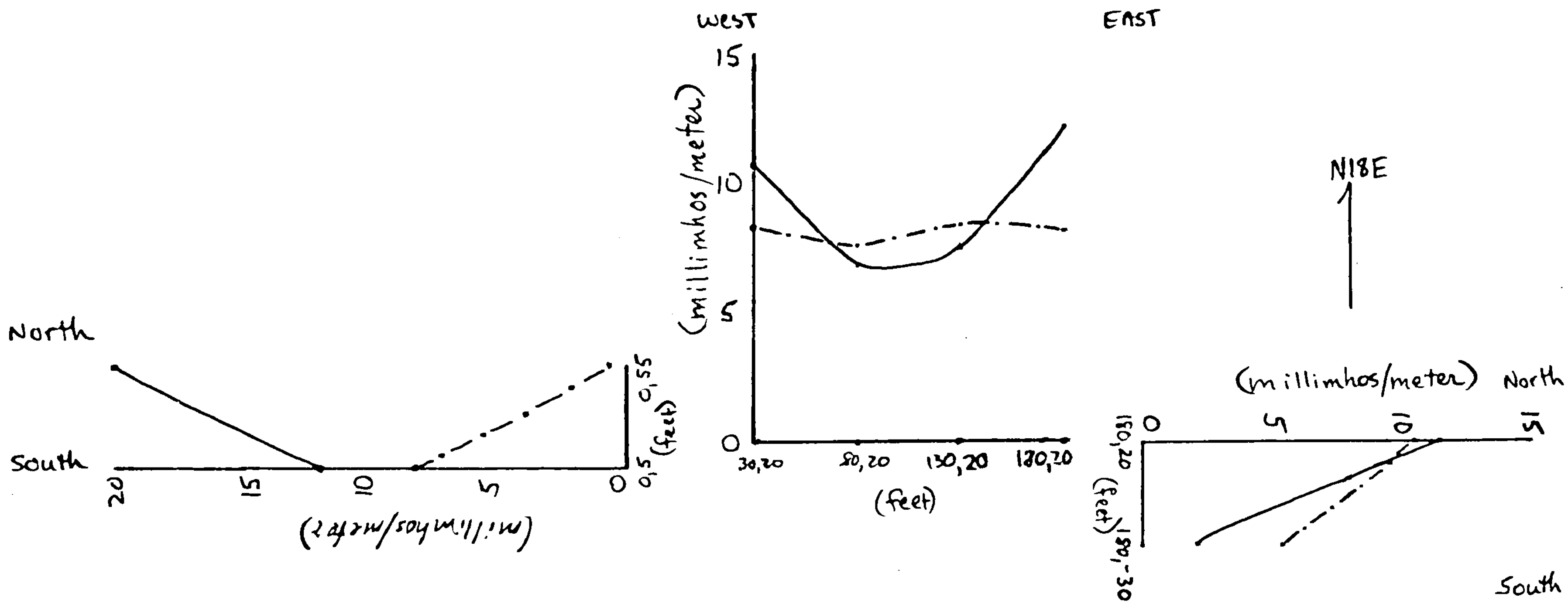


* Note: All horizontal readings were negative

B-42
B-12

OLD LAND RECLAMATION
site. No. 915129

EM 34-3 (20 meter spacing) SURVEY GRID 3



Vertical Dipole
Horizontal Dipole

B-43
B-13

APPENDIX C

WELL LOGS FOR FOUR GROUNDWATER MONITORING WELLS

DATE
STARTED 6-14-89
FINISHED 6-16-89
SHEET 1 OF 2

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

HOLE NUMBER GW-2A
SURFACE ELEVATION *647.8'
GROUNDWATER DEPTH
*Assumed reference elev.

PROJECT OLD LAND RECLAMATION PHASE II INVESTIGATION
LOCATION Broadway Depew, New York

WELL DIAGRAM: 3" PVC

Sample Type	Sample No.	Blows on Sampler 0–6	6–12	12–18	18–24
SS	1	1	1	2	3
SS	2	26	17	69	16
SS	3	34	100/4"		
SS	4	13	6	8	6
SS	5	8	12	12	23
SS	6	8	5	7	5
SS	7	9	11	6	6
SS	8	9	5	4	6
SS	9	5	5	10	7
SS	10	8	4	4	5
SS	11	8	12	3	3
SS	12	4	6	8	5
SS	13	7	4	6	6
SS	14	4	4	4	4

PROFILE: Cl Sl Sd Gr

FIELD IDENTIFICATION OF SOILS

0'-1.0': Moist, red CLAY, moderately cohesive.

5'-≈26': Assorted FILL material including concrete; wood; brick; newspaper; cardboard; plastic; and grass cuttings. Staining and saturation observed at intermittent intervals.

26.0'-26.6': Moist, gray silty CLAY, medium plasticity, cohesive.

28'-29': Moist, tan-gray silty CLAY, low plasticity, moderate cohesion.

30'-34': Moist-wet, gray CLAY (directly beneath black sandy material).

34.0'-34.5': Wood fragments, pebble causes broken split-spoon shoe.

34.5'-39.5': NX-core no. 1. Dark gray limestone, narrow horizontal (weathered) fracture at 39.4'.

NOTES

6¼" hollow stem augers and NX core advanced with Mobile B-57 truck mounted drilling rig. Standard penetration test performed with 140 lb. hammer falling 30".

SS-1: 1.0' recovery
SS-2: 0.5' recovery
SS-3: 0.5' recovery
SS-4: 0.8' recovery
SS-5: 1.0' recovery
SS-6: 0.5' recovery

540088

CLASSIFICATION/BY ASTM 1584-86/D. Johnson

DATE STARTED 6-14-89 FINISHED 6-16-89 SHEET 2 OF 2	E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER GW-2A SURFACE ELEVATION * 647.8' GROUNDWATER DEPTH *Assumed reference elev.

PROJECT OLD LAND RECLAMATION PHASE II INVESTIGATION

LOCATION Broadway Depew, New York

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
						39.5'-39.8': NX-coring run no. 2. Dark gray limestone continued, (3) horizontal, weatherd fractures. 39.8'-44.8': NX-coring run no. 3. Dark gray limestone continued, competent.	SS-7: 0.5' recovery SS-8: 0.5' recovery SS-9: No recovery SS-10: 1.0' recovery SS-11: 0.6' recovery SS-12: 1.0' recovery NX run no. 1: 95% recovery 88% RQD NX run no. 2: 100% recovery 100% RQD NX run no. 3: 100% recovery 100% RQD

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CLASSIFICATION/BY ASTM D1584-86 / D. Johnson

DATE
STARTED 6-15-89
FINISHED 6-15-89
SHEET 1 OF 1

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

HOLE NUMBER GW-2B
SURFACE ELEVATION * 647.9'
GROUNDWATER DEPTH
* Assumed reference elev.

PROJECT OLD LAND RECLAMATION PHASE II INVESTIGATION
LOCATION Broadway Depew, New York

DEPTH – FT	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24
0	SS	1	3	4	3	3
5	SS	2	5	8	12	27
10	SS	3	10	14	2	2
15	SS	4	5	4	2	3
20	SS	5	2	3	2	3
25	SS	6	3	7	7	7
30	SS	7	3	2	w/H	w/H

PROFILE: Cl Sl Sd Gr

FIELD IDENTIFICATION OF SOILS

0-0.72': Moist, red-brown CLAY with small brick fragments.

5.0'-10.36': Moist-wet, red-brown CLAY with angular limestone (gravel).

10.36-17': Moist, dark grey-black assorted FILL material.

20.0'-27.0': Wet, dark grey assorted FILL material, including wood, paper, and plastic.

30.0'-31.4': Wet, gray silty SAND (M), non-cohesive.

31.4'-31.6': Moist, gray CLAY, fat, plastic, cohesive.

NOTES

6¼" hollow stem augers advanced with Mobile B-57 truck mounted drilling rig. Standard penetration test performed with 140lb. hammer falling 30".

SS-1: 0.72' recovery
SS-2: 0.5' recovery
SS-3: 0.64' recovery
SS-4: 0.4' recovery
SS-5: 0.8' recovery
SS-6: 1.0' recovery
SS-7: 1.60' recovery

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CLASSIFICATION/BY ASTM 1584-86 / D. Johnson

DATE STARTED 6-14-89 FINISHED 6-15-89 SHEET 1 OF 1	E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER GW-6A SURFACE ELEVATION * 620.0' GROUNDWATER DEPTH * Assumed reference elev.

PROJECT OLD LAND RECLAMATION PHASE II INVESTIGATION

LOCATION Broadway Depew, New York

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	PROFILE (Cl Sl Sd Gr)	FIELD IDENTIFICATION OF SOILS	NOTES
	3" PVC	SS	1	2	4	4	4		0'-1.0': Moist, lt. brown CLAY and SILT with pebbles (angular).	6¼" hollow stem augers and NX core advanced with ATV drilling rig. Standard penetration test performed with 140lb hammer falling 30".
5		SS	2	4	4	6	8		1.0'-2.0': Moist, lt. brown silty SAND (M) with clay.	
		SS	3	6	3	8	12		3.0'-3.9': Moist, lt. brown clayey SILT.	
10									3.9'-4.08': Wet, gray SAND with pebbles (rounded and angular), and limestone fragments.	
15									7.25': Split-spoon refusal. 8.16': Auger refusal.	SS-1: 2.0' recovery SS-2: 1.16' recovery SS-3: 1.08' recovery
20									8.16'-13.16': NX-coring run no. 1. Onondaga limestone exhibiting horizontal fractures and one vertical fracture.	
									13.16'-21.5': NX-coring run no.'s 2 and 3. Continued limestone with weathered horizontal fractures.	

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DATE
STARTED 6-14-89
FINISHED 6-15-89
SHEET 1 OF 2

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

HOLE NUMBER GW-7A
SURFACE ELEVATION * 621.0'
GROUNDWATER DEPTH
*Assumed reference elev.

PROJECT OLD LAND RECLAMATION PHASE II INVESTIGATION
LOCATION Broadway Depew, New York

SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12
SS	1	2	3
		2	4
SS	2	3	2
		5	4
SS	3	4	5
		10	13
SS	4	4	5
		5	9
SS	5	50/5"	

PROFILE: Cl Si Sd Gr

FIELD IDENTIFICATION OF SOILS

0'-0.5': Moist, brown SILT with clay, sand, and rounded pebbles.

2.0'-3.5': Moist, brown clayey SILT with rounded pebbles.

4.0'-5.0': Moist, brown clayey SILT.

5.0'-6.0': Moist, grey clayey SILT with rounded and angular pebbles. Sample is mottled and exhibits rust and limonitic staining.

6.0'-7.0': Moist, gray clayey SILT with sand and larger pebbles.

7.0'-7.58': Wet, grey limestone fragments (angular), mixed with silt.

8.0'-8.4': Wet, grey limestone fragments (angular) with silt and clay.
* Split-spoon refusal at 8.4'.

NOTES

6¼" hollow stem augers and NX-core advanced with ATV drilling rig. Standard penetration test performed with 140 lb. hammer falling 30".

SS-1: 0.50' recovery
SS-2: 1.5' recovery
SS-3: 2.0' recovery
SS-4: 1.58' recovery
SS-5: 0.40' recovery

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DATE		
STARTED 6-14-89 FINISHED 6-15-89 SHEET 2 OF 2	E + E DRILLING AND TESTING CO., INC. SUBSURFACE LOG	HOLE NUMBER GW-7A SURFACE ELEVATION * 621.0' GROUNDWATER DEPTH * Assumed reference elev.

PROJECT OLD LAND RECLAMATION PHASE II INVESTIGATION

LOCATION Broadway Depew, New York

DEPTH – FT	WELL DIAGRAM	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6, 6/12, 12/18, 18/24	PROFILE Cl Sl Sd Gr	FIELD IDENTIFICATION OF SOILS	NOTES
						8.4'-10.8': Limestone with horizontal fractures. Chert noted at beginning of core.	Rec = 100%
						10.8'-16.5': Limestone with (3) horizontal fractures.	Rec = 97% RQD = 77%
						16.5'-21.5': Competent limestone.	Rec = 99% RQD = 95%

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APPENDIX D

RAW ANALYTICAL DATA SUMMARIES

GROUNDWATER ORGANIC ANALYTICAL DATA

recycled paper

ecology and environment

VOLATILES

DATA SUMMARY FORM: V O L A T I L E S 1

Site Name: Old Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 874-002 Sampling Date(s): 7/19/89
874-008 6/16/89
874-003 7/20/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

	Sample No.	GW-2A		GW-2B		GW-6A		GW-7A		TP-1		TP-2		RW-01		VBLKW1		VBLKW1	
	Dilution Factor	1		1		1		1		1		1		1		1		1	
	Location	Station GW-2A		Station GW-2B		Station GW-6A		Station GW-7A		Station TP1		Station TP2		Drilling Rig Water Supply		RW-01		GW-2A	
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	*Vinyl Chloride																		
10	Chloroethane							20		11									
5	*Methylene Chloride	[8]	B	[7]	B	[8]	B	[8]	B	[7]	B	[9]	B	[2]	BJ	3	J	13	
10	Acetone	[31]	B	[26]	B	[50]	B	[28]	B	[14]	B	[19]	B	[18]	B	45		5	J
5	Carbon Disulfide																		
5	*1,1-Dichloroethene																		
5	1,1-Dichloroethane																		
5	*Total-1,2-Dichloroethene																		
5	Chloroform													24					
5	*1,2-Dichloroethane																		
10	*2-Butanone																		
5	*1,1,1-Trichloroethane																		
5	*Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane													8					

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: V O L A T I L E S 1

Site Name: OD Land Reclamation

Case #: 874-003 Sampling Date(s): ________

WATER SAMPLES
(ug/L)

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND	VBLKW1	
	Sample No.	VBLKW1	
	Dilution Factor	1	
	Location	TP-1	
10	Chloromethane		
10	Bromomethane		
10	*Vinyl Chloride		
10	Chloroethane		
5	*Methylene Chloride	12	
10	Acetone	6	J
5	Carbon Disulfide		
5	*1,1-Dichloroethene		
5	1,1-Dichloroethane		
5	*Total-1,2-Dichloroethene		
5	Chloroform		
5	*1,2-Dichloroethane		
10	*2-Butanone		
5	*1,1,1-Trichloroethane		
5	*Carbon Tetrachloride		
10	Vinyl Acetate		
5	Bromodichloromethane		

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: V O L A T I L E S 2

WATER SAMPLES (ug/L)

Site Name: Old Land Reclamation

Case #: 874-002 874-001 874-003 Sampling Date(s): 7/19/89 6/16/89 7/26/89

To calculate sample quantitation limit: (CRQL * Dilution Factor)

CRQL	Sample No.	GW-2A		GW-2B		GW-6A		GW-7A		TP-1		TP-2		RW-01		VBLKW1		VBLKW	
	Dilution Factor	1		1		1		1		1		1		1		1		1	
	Location	Station GW-2A		Station GW-2B		Station GW-6A		Station GW-7A		Station TP1		Station TP2		Drilling Rig Water Supply		RW-01		GW-2A	
CRQL	COMPOUND																		
5	*1,2-Dichloropropane																		
5	Cis-1,3-Dichloropropene																		
5	Trichloroethene																		
5	Dibromochloromethane																		
5	1,1,2-Trichloroethane																		
5	*Benzene	[4]	J	11		9		26		31		6							
5	Trans-1,3-Dichloropropene																		
5	Bromoform																		
10	4-Methyl-2-pentanone																		
10	2-Hexanone															9	J		
5	*Tetrachloroethene																		
5	1,1,2,2-Tetrachloroethane																		
5	*Toluene			8		[2]	J	[3]	J	[2]	J								
5	*Chlorobenzene			13				16		32									
5	*Ethylbenzene			[4]	J			[4]	J	12		8							
5	*Styrene																		
5	*Total Xylenes			130		[4]	J	8		110		[4]	J						

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: OlD Land Reclamation

Case #: 87-003 Sampling Date(s): ________

WATER SAMPLES
(ug/L)

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND									
	Sample No.	VBLKW1								
	Dilution Factor	1								
	Location	TP-1								
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									

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 1

WATER SAMPLES
(ug/L)

Site Name: Old Land Reclamation

Case #: 874-002, 874-001, 874-003 Sampling Date(s): 7/19/89, 6/16/89, 7/20/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

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Sample No.	GW-2A	GW-2B	GW-6A	GW-7A	TP-1	TP-2	RW-01	SBLKW1	SBLKW
Dilution Factor	1	1	1	1	1	1	1	1	1.0
Location	Station GW-2A	Station GW-2B	Station GW-6A	Station GW-7A	Station TP1	Station TP2	Drilling Rig Water Supply	RW-01	GW-2A
COMPOUND									
Phenol	[4] J	[3] J		[4] J					
bis(2-Chloroethyl)ether									
2-Chlorophenol									
*1,3-Dichlorobenzene									
*1,4-Dichlorobenzene		[3] J			[7] J	[3] J			
Benzyl Alcohol									
1,2-Dichlorobenzene					[2] J				
2-Methylphenol	[2] J								
bis(2-Chloroisopropyl)ether									
4-Methylphenol	[6] J	[3] J							
N-Nitroso-di-n-propylamine									
Hexachloroethane									
Nitrobenzene									
Isophorone									
2-Nitrophenol									
2,4-Dimethylphenol									
Benzoic Acid		[32] J							
bis(2-Chloroethoxy)methane									
2,4-Dichlorophenol									
1,2,4-Trichlorobenzene									
Naphthalene X		[6] J			50	[7] J			
4-Chloroaniline				77	220	[10] J			

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S

Site Name: Old Land Reclamation

Case #: 874-002 Sampling Date(s):

WATER SAMPLES
(ug/L)

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND									
	Sample No.	SBLKW2	SBLKW2RE	SBLKW1						
	Dilution Factor	1.0	1.0	1.0						
	Location	GW-2A	GW-2A	TP-1						
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-Nitroso-di-n-propylamine									
10	Hexachloroethane									
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									

CRDL = Contract Required Detection Limit

*Action Level Exists

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DATA SUMMARY FORM: B N A S 2

WATER SAMPLES
(ug/L)

Site Name: Old Land Reclamation

Case #: 874-002 874-001 874-003 Sampling Date(s): 7/19/89 8/16/89 7/20/89

To calculate sample quantitation limit: (CRQL * Dilution Factor)

CRQL	Sample No.	GW-2A	GW-2B	GW-6A	GW-7A	TP-1	TP-2	RW-01	SBLKW1	SBLKW1
	Dilution Factor	1	1	1	1	1	1	1	1	1
	Location	Station GW-2A	Station GW-2B	Station GW-6A	Station GW-7A	Station TP1	Station TP2	Drilling Rig Water Supply	RW-01	GW-2A
CRQL	COMPOUND									
10	Hexachlorobutadiene									
10	4-Chloro-3-methylphenol									
10	2-Methylnaphthalene *					[8] J	[2] J			
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 *					[5] J				
50	2,4-Dinitrophenol									
50	4-Nitrophenol									
10	Dibenzofuran					[3] J				
10	2,4-Dinitrotoluene									
10	Diethylphthalate									
10	4-Chlorophenyl-phenylether									
10	Fluorene *									
50	4-Nitroaniline									
50	4,6-Dinitro-2-methylphenol									

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 2

Site Name: Old Land Reclamation

Case #: 874-002 Sampling Date(s): ____________

WATER SAMPLES
(ug/L)

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND									
	Sample No.	SBLKW2	SBLKW2RA	SBLKW1						
	Dilution Factor	1.0	1.0	1.0						
	Location	GW-2A	GW-2A	TP-1						
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-Chlorophenyl phenylether									
10	Fluorene									
50	4-Nitroaniline									
50	4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 3

WATER SAMPLES
(ug/L)

Site Name: Old Land Reclamation

Case #: 874-002
874-001
874-003

Sampling Date(s): 7/19/89
7/20/89
6/16/89

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

Sample No.	GW-2A		GW-2B		GW-6A		GW-7A		TP-1		TP-2		RW-01		SBLKW1		SBLKW)	
Dilution Factor	1		1		1		1		1		1		1		1		1	
Location	Station GW-2A		Station GW-2B		Station GW-6A		Station GW-7A		Station TP1		Station TP2		Drilling Rig Water Supply		RW-01		GW-7A	
COMPOUND																		
N-Nitrosodiphenylamine									[2]	J	[3]	J						
4-Bromophenyl-phenylether																		
*Hexachlorobenzene																		
*Pentachlorophenol																		
Phenanthrene ·AH *									[4]	J								
Anthracene *																		
Di-n-butylphthalate									[2]	J								
Fluoranthene *																		
Pyrene *																		
Butylbenzylphthalate																		
3,3-Dichlorobenzidine																		
Benzo(a)anthracene *																		
Chrysene *																		
bis(2-Ethylhexyl)phthalate	[7]	BJ	[13]	B	390	BE	[9]	BJ	[25]	B	[5]	BJ	[4]	BJ	2	J	4	J
Di-n-octylphthalate																		
Benzo(b)fluoranthene *																		
Benzo(k)fluoranthene *																		
Benzo(a)pyrene *																		
Indeno(1,2,3-cd)pyrene *																		
Dibenz(a,h)anthracene *																		
Benzo(g,h,i)perylene *																		

CRQL = Contract Required Detection Limit

*Action Level Exists

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DATA SUMMARY FORM: B N A S 3

WATER SAMPLES
(ug/L)

Site Name: Old Land Reclamation

Case #: 874-002 Sampling Date(s): __________

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRDL	COMPOUND									
	Sample No.	SBLKW2	SBLKW2RE	SBLKW1						
	Dilution Factor	1	1	1						
	Location	GW-2A	GW-2A	TP-1						
10	N-Nitrosodiphenylamine									
10	4-Bromophenyl-phenylether									
10	*Hexachlorobenzene									
50	*Pentachlorophenol									
10	Phenanthrene									
10	Anthracene									
10	Di-n-butylphthalate									
10	Fluoranthene									
10	Pyrene									
10	Butylbenzylphthalate									
20	3,3-Dichlorobenzidine									
10	Benzo(a)anthracene									
10	Chrysene									
10	bis(2-Ethylhexyl)phthalate	1 J		4 J						
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									

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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PESTICIDES AND PCBs

DATA SUMMARY FORM: PESTICIDES AND PCBS

WATER SAMPLES (ug/L)

Site Name: Old Land Reclamation

Case #: 874.002, 874.001, 574.003

Sampling Date(s): 7/19/89, 6/16/89, 7/20/89

To calculate sample quantitation limit: (CRQL * Dilution Factor)

CRQL	Sample No.	GW-2A	GW-2B	GW-6A	GW-7A	TP-1	TP-2	RW-01	PBLKW3	PBLKW6
	Dilution Factor	1	1	1	1	1	1	1	1	1
	Location	GW-2A	GW-2B	GW-6A	GW-7A	TP-1	TP-2	Brill Water	RW-01	GW-2B
CRQL	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	4,4'-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									

CRDL = Contract Required Detection Limit

*Action Level Exists

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DATA SUMMARY FORM: V O L A T I L E S 1

Site Name: Old Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 9000.272 Sampling Date(s): 1-21-92

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

	Sample No.	SW-1		SW-2		TRIP Blank		Trip Blank		VBLKW1									
	Dilution Factor	1.0		1.0		1.0		1.0		1									
	Location					GW-7A		SD-1		SD-1									
CRQL	COMPOUND																		
10	Chloromethane																		
10	Bromomethane																		
10	*Vinyl Chloride																		
10	Chloroethane																		
5	*Methylene Chloride					8	B												
10	Acetone	16	B	17	E	12	B	15	B	32									
5	Carbon Disulfide																		
5	*1,1-Dichloroethene																		
5	1,1-Dichloroethane																		
5	*Total-1,2-Dichloroethene																		
5	Chloroform																		
5	*1,2-Dichloroethane																		
10	*2-Butanone																		
5	*1,1,1-Trichloroethane																		
5	*Carbon Tetrachloride																		
10	Vinyl Acetate																		
5	Bromodichloromethane																		

CRQL = Contract Required Detection Limit

*Action Level Exists

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DATA SUMMARY FORM: VOLATILES 2

WATER SAMPLES
(ug/L)

Site Name: Old Land Reclamation

Case #: 9000.272 Sampling Date(s): 1-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No.	SW-1	SW-2	Trip Blank	Trip Blank	VBLKW1				
	Dilution Factor	1.0	1.0	1.0	1.0	1				
	Location			GW-2A	SD-1	SD-1				
CRQL	COMPOUND									
5	*1,2-Dichloropropane									
5	Cis-1,3-Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2-Trichloroethane									
5	*Benzene									
5	Trans-1,3-Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
5	*Tetrachloroethene									
5	1,1,2,2-Tetrachloroethane									
5	*Toluene									
5	*Chlorobenzene									
5	*Ethylbenzene									
5	*Styrene									
5	*Total Xylenes									

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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BNAs

Site Name: Old Land Reclamation

Case #: 2600-273 Sampling Date(s): 1-29-90

WATER SAMPLES
(ug/L)

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	SW-1 / 1.0	SW-2 / 1.0	Trip Blank / 1.0	SBLKW1 / 1.0 / 50-1					
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-Nitroso-di-n-propylamine									
10	Hexachloroethane									
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									

CRQL = Contract Required Detection Limit

*Action Level Exists

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DATA SUMMARY FORM: B N A S 2

Site Name: Old Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 9666-272 Sampling Date(s): 1-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

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	Sample No.	SW-1	SW-2	Trip Blank	SBLK(W)					
	Dilution Factor	1.0	1.0	1.0	1.0					
	Location				SD-1					
CRQL	COMPOUND									
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-Chlorophenyl-phenylether									
10	Fluorene									
50	4-Nitroaniline									
50	4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 3

WATER SAMPLES
(ug/L)

Site Name: Fill Land Reclamation

Case #: 9000-272 Sampling Date(s): 1-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRDL	COMPOUND	SW-1		SW-2		Trip Blank		SBL(W)	
	Dilution Factor	1.0		1.0		1.0		1.0	
	Location							SD-1	
10	N-Nitrosodiphenylamine								
10	4-Bromophenyl-phenylether								
10	*Hexachlorobenzene								
50	*Pentachlorophenol								
10	Phenanthrene								
10	Anthracene								
10	Di-n-butylphthalate	1	BJ					1	J
10	Fluoranthene								
10	Pyrene								
10	Butylbenzylphthalate								
20	3,3-Dichlorobenzidine								
10	Benzo(a)anthracene								
10	Chrysene								
10	bis(2-Ethylhexyl)phthalate	17	B	5.5	B	2	BJ	14	
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

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PESTICIDES AND PCBs

DATA SUMMARY FORM: P E S T I C I D E S AND P C B S

Site Name: Oil Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 9000.272 874-002 Sampling Date(s): 1-24-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND									
	Sample No.	SW-1	SW-2	Trip Blank	PBLK(W)					
	Dilution Factor	1.0	1.0	1.0	1.0					
	Location									
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									

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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SOIL ANALYTICAL DATA

SOIL ORGANIC ANALYTICAL DATA

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VOLATILES

DATA SUMMARY FORM: V O L A T I L E S 1

Site Name: *Old Land Reclamation*

SOIL SAMPLES (ug/Kg)

Case #: *9000.272* Sampling Date(s): *1-29-90*

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

CRQL	Sample No.	SD-1		SD-2		VBLKS1	
	Dilution Factor	1.0		1.0		1.0	
	% Moisture	26	not dec	42	not dec	—	
	Location						
CRQL	COMPOUND						
10	Chloromethane						
10	Bromomethane						
10	Vinyl Chloride						
10	Chloroethane						
5	Methylene Chloride	5	BJ	8	BJ	22	
10	Acetone	19	B	37	B	14	
5	Carbon Disulfide						
5	1,1-Dichloroethene						
5	1,1-Dichloroethane						
5	Total-1,2-Dichloroethene						
5	Chloroform						
5	1,2-Dichloroethane						
10	2-Butanone						
5	1,1,1-Trichloroethane						
5	Carbon Tetrachloride						
10	Vinyl Acetate						
5	Bromodichloromethane						

CRQL = Contract Required Detection Limit

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DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: Old Land Reclamation

SOIL SAMPLES (ug/Kg)

Case #: 7000.272 **Sampling Date(s):** 1-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	SD-1		SD-2		VBLKS1													
	Dilution Factor	1.0		1.0		1.0													
	% Moisture	26	[illegible]	42	[illegible]	—													
	Location																		
CRQL	**COMPOUND**																		
5	1,2-Dichloropropane																		
5	Cis-1,3-Dichloropropene																		
5	Trichloroethene																		
5	Dibromochloromethane																		
5	1,1,2-Trichloroethane																		
5	Benzene																		
5	Trans-1,3-Dichloropropene																		
5	Bromoform																		
10	4-Methyl-2-pentanone																		
10	2-Hexanone																		
5	Tetrachloroethene																		
5	1,1,2,2-Tetrachloroethane																		
5	Toluene																		
5	Chlorobenzene																		
5	Ethylbenzene																		
5	Styrene																		
5	Total Xylenes					3	J												

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 1

Site Name: Old Land Reclamation

SOIL SAMPLES (ug/Kg)

Case #: 9000.272 Sampling Date(s): 1-29-90

To calculate sample quantitation limit: (CRQL * Dilution Factor) / ((100 - % moisture)/100)

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	Sample No.	SD-1	SD-2	SBLKS1	SBLKS2					
	Dilution Factor	1.0	1.0	1.0	1.0					
	% Moisture	26	42	—						
	Location									
CRQL	COMPOUND									
330	Phenol									
330	bis(2-Chloroethyl)ether									
330	2-Chlorophenol									
330	1,3-Dichlorobenzene									
330	1,4-Dichlorobenzene									
330	Benzyl Alcohol									
330	1,2-Dichlorobenzene									
330	2-Methylphenol									
330	bis(2-Chloroisopropyl)ether									
330	4-Methylphenol		380 J							
330	N-Nitroso-di-n-propylamine									
330	Hexachloroethane									
330	Nitrobenzene									
330	Isophorone									
330	2-Nitrophenol									
330	2,4-Dimethylphenol									
1600	Benzoic Acid									
330	bis(2-Chloroethoxy)methane									
330	2,4-Dichlorophenol									
330	1,2,4-Trichlorobenzene									
330	Naphthalene									
330	4-Chloroaniline									

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 2

Site Name: *Old Land Reclamation*

SOIL SAMPLES (ug/Kg)

Case #: *9000-272* **Sampling Date(s):** *1-29-90*

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

	Sample No.	SD-1	SD-2	SBLK31	SBLKS2					
	Dilution Factor	1.0	1.0	1.0						
	% Moisture	26	42	—						
	Location									
CRQL	COMPOUND									
330	Hexachlorobutadiene									
330	4-Chloro-3-methylphenol									
330	2-Methylnaphthalene									
330	Hexachlorocyclopentadiene									
330	2,4,6-Trichlorophenol									
1600	2,4,5-Trichlorophenol									
330	2-Chloronaphthalene									
1600	2-Nitroaniline									
330	Dimethylphthalate									
330	Acenaphthylene									
330	2,6-Dinitrotoluene									
1600	3-Nitroaniline									
330	Acenaphthene									
1600	2,4-Dinitrophenol									
1600	4-Nitrophenol									
330	Dibenzofuran									
330	2,4-Dinitrotoluene									
330	Diethylphthalate									
330	4-Chlorophenyl-phenylether									
330	Fluorene									
1600	4-Nitroaniline									
1600	4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Quantitation Limit

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DATA SUMMARY FORM: B N A S 3

Site Name: Old Coal Reclamation

SOIL SAMPLES (ug/Kg)

Case #: 7000-272 Sampling Date(s): 1-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

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CRQL	Sample No.	SD-1		SD-2		SBLKS1		SBLKS2						
	Dilution Factor	1.0		1.0		1.0		1.0						
	% Moisture	26		42		—		—						
	Location													
CRQL	COMPOUND													
330	N-Nitrosodiphenylamine													
330	4-Bromophenyl-phenylether													
330	Hexachlorobenzene													
1600	Pentachlorophenol													
330	Phenanthrene	120	J	560	J									
330	Anthracene			98	J									
330	Di-n-butylphthalate	62	BJ	520	BJ	150	J	140	J					
330	Fluoranthene	170	J	1200										
330	Pyrene	130	J	830										
330	Butylbenzylphthalate			94	J									
1600	3,3-Dichlorobenzidine													
330	Benzo(a)anthracene	75	J	380	J									
330	Chrysene	100	J	610										
330	bis(2-Ethylhexyl)phthalate	680	B	3700	B	1400		2000						
330	Di-n-octylphthalate													
330	Benzo(b)fluoranthene	130	J	790										
330	Benzo(k)fluoranthene													
330	Benzo(a)pyrene	74	J	570										
330	Indeno(1,2,3-cd)pyrene	53	J	350	J									
330	Dibenz(a,h)anthracene			120	J									
330	Benzo(g,h,i)perylene	48	J	330	J									

CRQL = Contract Required Quantitation Limit

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PESTICIDES AND PCBs

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DATA SUMMARY FORM: PESTICIDES AND PCBS

Site Name: OLP Land Reclamation

SOIL SAMPLES (ug/Kg)

Case #: 9000.272 **Sampling Date(s):** 1-29-90

To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100 - % moisture)/100)

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CRQL	Sample No.	SD-1	SD-2	PBLKS1						
	Dilution Factor	1.0	1.0	1.0						
	% Moisture	26	44	—						
	Location									
CRQL	COMPOUND									
8	alpha-BHC									
8	beta-BHC									
8	delta-BHC									
8	Gamma-BHC (Lindane)									
8	Heptachlor									
8	Aldrin									
8	Heptachlor Epoxide									
8	Endosulfan I									
16	Dieldrin									
16	4,4'-DDE									
16	Endrin									
16	Endosulfan II									
16	4,4'-DDD									
16	Endosulfan Sulfate									
16	4,4'-DDT									
80	Methoxychlor									
16	Endrin ketone									
80	Alpha-Chlordane									
80	Gamma-Chlordane									
160	Toxaphene									
80	Aroclor-1016									
80	Aroclor-1221									
80	Aroclor-1232									
80	Aroclor-1242									
80	Aroclor-1248									
160	Aroclor-1254									
160	Aroclor-1260									

CRQL = Contract Required Quantitation Limit

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GROUNDWATER INORGANIC ANALYTICAL DATA

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1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

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ab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

ab Code: ______ Case No.: 874002 SAS No.: YD-4060 SDG No.: GW-2A

atrix (soil/water): WATER Lab Sample ID: 44451

evel (low/med): LOW Date Received: 7/19/89

Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	10.0	U		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	200	U		P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	291			P
7439-92-1	Lead	5.0	U	W	F
7439-95-4	Magnesium	200	U		P
7439-96-5	Manganese	5.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	400	U		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	200	U		P
7440-28-0	Thallium	5.0	U	W	F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide	10.0	U		C

olor Before: CLEAR Clarity Before: CLEAR Texture: ______

olor After: ______ Clarity After: ______ Artifacts: ______

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NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-2A

ame: Ecology & Environment Inc. Contract: D001549

ode: ______ Case No.: 874.002 SAS No.: YD-4060 SDG No.: GW-2A

x (soil/water): WATER Lab Sample ID: 44452

(low/med): LOW Date Received: 7/19/89

ids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	495			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	208000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	34600			P
7439-92-1	Lead	5.0	U	W	F
7439-95-4	Magnesium	121000			P
7439-96-5	Manganese	1910			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	102000			P
7782-49-2	Selenium	10.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	440000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	12.2	B		P
7440-66-6	Zinc	60.6			P
	Cyanide	10.0	U		C

Before: YELLOW Clarity Before: CLEAR Texture: ______

After: ______ Clarity After: ______ Artifacts: ______

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1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO. GW-2B

b Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

b Code: ______ Case No.: 874002 SAS No.: YD-4060 SDG No.: GW-2A

trix (soil/water): WATER Lab Sample ID: 44453

vel (low/med): LOW Date Received: 7/19/89

Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	35600			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	15.5			F
7440-39-3	Barium	569			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	11.5			P
7440-70-2	Calcium	181000			P
7440-47-3	Chromium	75.0			P
7440-48-4	Cobalt	18.6	B		P
7440-50-8	Copper	116			P
7439-89-6	Iron	180000			P
7439-92-1	Lead	141			P
7439-95-4	Magnesium	63600			P
7439-96-5	Manganese	1600			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	81.1			P
7440-09-7	Potassium	37600			P
7782-49-2	Selenium	10.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	347000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	56.4			P
7440-66-6	Zinc	498			P
	Cyanide	10.0	U		C

lor Before: YELLOW Clarity Before: CLEAR Texture: ______

lor After: ______ Clarity After: ______ Artifacts: ______

mments:

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NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-6A

ame: Ecology & Environment Inc. Contract: D001549

ode: ______ Case No.: 874002 SAS No.: YD-4060 SDG No.: GW-2A

x (soil/water): WATER Lab Sample ID: 44454.06

(low/med): LOW Date Received: 7/19/89

ids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2040			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	198	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	247000			P
7440-47-3	Chromium	20.7			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	27.1			P
7439-89-6	Iron	25300			P
7439-92-1	Lead	10.0			F
7439-95-4	Magnesium	50500			P
7439-96-5	Manganese	586			P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	35600			P
7782-49-2	Selenium	10.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	94700			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	45.2			P
	Cyanide	10.0	U		C

Before: YELLOW Clarity Before: CLEAR Texture: ______

After: ______ Clarity After: ______ Artifacts: ______

nts:

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NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-6A

Lab Name: Ecology & Environment Inc.   Contract: D001549

Lab Code: ______   Case No.: 874.002   SAS No.: Y0-4060   SDG No.: GW-2A

Matrix (soil/water): WATER   Lab Sample ID: 44454.07

Level (low/med): LOW   Date Received: 7/19/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	~~Q~~	M
7429-90-5	Aluminum	100.0	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	130	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	168000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	2040			P
7439-92-1	Lead	5.0	U	W	F
7439-95-4	Magnesium	49000			P
7439-96-5	Manganese	546			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	34800			P
7782-49-2	Selenium	5.0	U	W	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	96900			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	11.9	B		P
	Cyanide				NR

Color Before: CLEAR   Clarity Before: CLEAR   Texture: ______

Color After: ______   Clarity After: ______   Artifacts: ______

Comments: DISSOLVED METALS

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

GW-7A

Name: Ecology & Environment Inc. Contract: D001549

Code: ______ Case No.: 874.002 SAS No.: Y0-4060 SDG No.: GW-2A

rix (soil/water): WATER Lab Sample ID: 44455

el (low/med): LOW Date Received: 7/19/89

Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	358.0			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	8.2			F
7440-39-3	Barium	561			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	195000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	25800			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	91900			P
7439-96-5	Manganese	263			P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	136000			P
7782-49-2	Selenium	10.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	218000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	45.7			P
	Cyanide	13.0			C

lor Before: Yellow Clarity Before: Clear Texture: ______

lor After: ______ Clarity After: ______ Artifacts: ______

mments:

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LEACHATE INORGANIC ANALYTICAL DATA

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

TP-1

Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Code: ______ Case No.: 874.003 SAS No.: YO-4050 SDG No.: TP-1

ix (soil/water): WATER Lab Sample ID: 44954.06

l (low/med): LOW Date Received: 7/20/89

lids: D

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	6.1			F
7440-39-3	Barium	130	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	247000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	2040			P
7439-92-1	Lead	11.8			F
7439-95-4	Magnesium	49000			P
7439-96-5	Manganese	546			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	34800			P
7782-49-2	Selenium	10.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	96900			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	11.9	B		P
	Cyanide	10.0	U		C

or Before: YELLOW Clarity Before: CLOUDY Texture: ______

or After: ______ Clarity After: ______ Artifacts: ______

ments:

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NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

TP-2

ab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

ab Code: ______ Case No.: 874.003 SAS No.: YO-4050 SDG No.: TP-1

atrix (soil/water): WATER Lab Sample ID: 44955.06

evel (low/med): LOW Date Received: 7/20/89

Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	~~Q~~	M
7429-90-5	Aluminum	1230			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	512			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	168000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	55800			P
7439-92-1	Lead	69.6			F
7439-95-4	Magnesium	75000			P
7439-96-5	Manganese	766			P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	69500			P
7782-49-2	Selenium	10.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	150000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	20.5	B		P
7440-66-6	Zinc	38.0			P
	Cyanide	10.0	U		C

Color Before: YELLOW Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

TP-2

ame: ECOLOGY & ENVIRONMENT INC. Contract: D001549

ode: ______ Case No.: 874.003 SAS No.: YD-4050 SDG No.: TP-1

((soil/water): WATER Lab Sample ID: 44955.07

(low/med): LOW Date Received: 7/20/89

ids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U	W	F
7440-39-3	Barium	237			P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	166000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	6780			P
7439-92-1	Lead	5.0	U	W	F
7439-95-4	Magnesium	79800			P
7439-96-5	Manganese	675			P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	75400			P
7782-49-2	Selenium	5.0	U	W	F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	161000			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide				NR

Before: YELLOW Clarity Before: CLEAR Texture: ______

After: ______ Clarity After: ______ Artifacts: ______

nts: DISSOLVED METALS

DRILLWATER INORGANIC ANALYTICAL DATA

1
INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

RW-01

Lab Name: ECOLOGY & ENVIRONMENT INC. Contract: D001549

Lab Code: ______ Case No.: 874.001 SAS No.: YD-4000 SDG No.: RW-01

Matrix (soil/water): WATER Lab Sample ID: 41695

Level (low/med): LOW Date Received: 6/16/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	M	Q
7429-90-5	Aluminum	356			P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	5.0	U		F
7440-39-3	Barium	33.4	B		P
7440-41-7	Beryllium	4.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	35400			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	2630			P
7439-92-1	Lead	7.8			F
7439-95-4	Magnesium	8950			P
7439-96-5	Manganese	146			P
7439-97-6	Mercury	0.2	U		CV
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	1360	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	12300			P
7440-28-0	Thallium	5.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	18.9	B		P
	Cyanide	10.0	U		C

Color Before: CLEAR Clarity Before: CLEAR Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

SURFACE WATER INORGANIC ANALYTICAL DATA

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SW-1

Name: Ecology & Environment Inc. Contract: ______

Code: ______ Case No.: ______ SAS No.: ______ SDG No.: ______

rix (soil/water): WATER Lab Sample ID: 63853

el (low/med): LOW Date Received: 1/29/90

olids: 0

Concentration Units (ug/L or mg/kg dry weight): ~~MG/KG~~ mg/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	U		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic				
7440-39-3	Barium	32.7	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	40400			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	288			P
7439-92-1	Lead	6.7			F
7439-95-4	Magnesium	7510			P
7439-96-5	Manganese	25.3			P
7439-97-6	Mercury				
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	1740	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	19900			P
7440-28-0	Thallium				
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	10.0	U		P
	Cyanide				

or Before: ______ Clarity Before: ______ Texture: ______

or After: ______ Clarity After: ______ Artifacts: ______

ments:

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NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SW-2

Lab Name: ______ Contract: ______

Lab Code: ______ Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix (soil/water): WATER Lab Sample ID: 63854

Level (low/med): LOW Date Received: 1/29/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	149	B		P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic				
7440-39-3	Barium	42.6	B		P
7440-41-7	Beryllium	2.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	41500			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	1020			P
7439-92-1	Lead	5.0	U		F
7439-95-4	Magnesium	9570			P
7439-96-5	Manganese	71.2			P
7439-97-6	Mercury				
7440-02-0	Nickel	15.0	U		P
7440-09-7	Potassium	3560	B		P
7782-49-2	Selenium	5.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	22700			P
7440-28-0	Thallium				
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	17.9	B		P
	Cyanide				

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

SEDIMENT INORGANIC ANALYTICAL DATA

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NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SD-1

Lab Name: ____________ Contract: ____________

Lab Code: ______ Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix (soil/water): SOIL Lab Sample ID: 63856

Level (low/med): LOW Date Received: 1/29/90

% Solids: 73.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1880			P
7440-36-0	Antimony	16.3	U		P
7440-38-2	Arsenic				
7440-39-3	Barium	28.9	B		P
7440-41-7	Beryllium	0.54	U		P
7440-43-9	Cadmium	1.4	U		P
7440-70-2	Calcium	14300			P
7440-47-3	Chromium	3.8			P
7440-48-4	Cobalt	3.7	B		P
7440-50-8	Copper	15.7			P
7439-89-6	Iron	6370			P
7439-92-1	Lead	185			F
7439-95-4	Magnesium	3630			P
7439-96-5	Manganese	139			P
7439-97-6	Mercury				
7440-02-0	Nickel	6.1	B		P
7440-09-7	Potassium	183	B		P
7782-49-2	Selenium	1.4	U		F
7440-22-4	Silver	2.7	U		P
7440-23-5	Sodium	516	B		P
7440-28-0	Thallium				
7440-62-2	Vanadium	5.1	B		P
7440-66-6	Zinc	39.9			P
	Cyanide				

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

NYSDEC

1

INORGANIC ANALYSIS DATA SHEET

NYSDEC SAMPLE NO.

SD-2

Name: ______ Contract: ______

Code: ______ Case No.: ______ SAS No.: ______ SDG No.: ______

rix (soil/water): SOIL Lab Sample ID: 63857

el (low/med): LOW Date Received: 1/29/90

Solids: 56.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4520			P
7440-36-0	Antimony	21.3	U		P
7440-38-2	Arsenic				
7440-39-3	Barium	57.2	B		P
7440-41-7	Beryllium	0.71	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	20100			P
7440-47-3	Chromium	6.9			P
7440-48-4	Cobalt	5.5	B		P
7440-50-8	Copper	24.0			P
7439-89-6	Iron	12700			P
7439-92-1	Lead	46.9			P
7439-95-4	Magnesium	3890			P
7439-96-5	Manganese	477			P
7439-97-6	Mercury				
7440-02-0	Nickel	12.6	B		P
7440-09-7	Potassium	523	B		P
7782-49-2	Selenium	1.8	U		P
7440-22-4	Silver	3.6	U		P
7440-23-5	Sodium	367	B		P
7440-28-0	Thallium				
7440-62-2	Vanadium	9.6	B		P
7440-66-6	Zinc	78.3			P
	Cyanide				

lor Before: ______ Clarity Before: ______ Texture: ______

lor After: ______ Clarity After: ______ Artifacts: ______

mments:

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Telecopier Phone: (716) 631-0378

TELECOPIER TRANSMISSION FORM

Date: 2/19/90	Time:
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To: D... ...UNSON	
Company:	
Tel... ...ne:	

...KRAJEWSKI,

...ructions:

...ING ... LAND REC. RESULTS:

	SW-1	SW-2	SD-1	SD-2
ARSENIC	<5.0 UG/L	<5.0 UG/L	1.7 MG/KG	[illegible]
MERCURY	<0.2 UG/L	<0.2 UG/L	<0.14 MG/KG	<0.18 MG/KG
T...	<5.0 UG/L	<5.0 UG/L	<1.4 MG/KG	<1.8 MG/KG
...ANIDE	<10 UG/L	<10 UG/L	<1.4 MG...	...1.8 MG/KG

...he unit for SW-1 ... ...anics Form 1 ... read ... MG/KG

BACKGROUND WELL GW-1A DATA

DATA SUMMARY FORM: V O L A T I L E S 1

WATER SAMPLES
(ug/L)

Site Name: Land Reclamation

Case #: 9001.392 Sampling Date(s): 6/22/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND	Sample No. GW-1A*	
	Dilution Factor	1.0	
	Location		
10	Chloromethane		
10	Bromomethane		
10	*Vinyl Chloride		
10	Chloroethane		
5	*Methylene Chloride	4	B
10	Acetone		
5	Carbon Disulfide		
5	*1,1-Dichloroethene		
5	1,1-Dichloroethane		
5	*Total-1,2-Dichloroethene		
5	Chloroform		
5	*1,2-Dichloroethane		
10	*2-Butanone		
5	*1,1,1-Trichloroethane		
5	*Carbon Tetrachloride		
10	Vinyl Acetate		
5	Bromodichloromethane		

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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* Background well from nearby Land Reclamation site to be used as background for Old Land Reclamation site as per NYSDEC letter of January 18, 1991.

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DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 9001.392 Sampling Date(s): 6/22/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. / Dilution Factor / Location — COMPOUND									
5	*1,2-Dichloropropane									
5	Cis-1,3 Dichloropropene									
5	Trichloroethene									
5	Dibromochloromethane									
5	1,1,2 Trichloroethane									
5	*Benzene									
5	Trans-1,3 Dichloropropene									
5	Bromoform									
10	4-Methyl-2-pentanone									
10	2-Hexanone									
[illegible]	*Tetrachloroethene									
[illegible]	1,1,2,2-Tetrachloroethane									
[illegible]	*Toluene									
[illegible]	*Chlorobenzene									
5	*Ethylbenzene									
5	*Styrene									
5	*Total Xylenes									

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 1

WATER SAMPLES
(ug/L)

Site Name: Land Reclamation

Case #: 9601.392 Sampling Date(s): 6/22/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. / Dilution Factor / Location / COMPOUND	GW-1A / 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-Nitroso-di-n-propylamine									
10	Hexachloroethane									
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									

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S 2

Site Name: Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 9001.392 Sampling Date(s): 6/22/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND									
	Sample No.	GW-1A								
	Dilution Factor	1.0								
	Location									
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-Chlorophenyl-phenylether									
10	Fluorene									
50	4-Nitroaniline									
50	4,6-Dinitro-2-methylphenol									

CRQL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

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DATA SUMMARY FORM: B N A S . 3

Site Name: Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 9001.392 Sampling Date(s): 6/22/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

	Sample No.	GW-1A																	
	Dilution Factor	1.0																	
	Location																		
CRDL	COMPOUND																		
10	N Nitrosodiphenylamine																		
10	4 Bromophenyl phenylether																		
10	*Hexachlorobenzene																		
50	*Pentachlorophenol																		
10	Phenanthrene																		
10	Anthracene																		
10	Di n butylphthalate																		
10	Fluoranthene																		
10	Pyrene																		
10	Butylbenzylphthalate																		
20	3,3 Dichlorobenzidine																		
10	Benzo(a)anthracene																		
10	Chrysene																		
10	bis(2 Ethylhexyl)phthalate	12	B																
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

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DATA SUMMARY FORM: P E S T I C I D E S AND P C B S

Site Name: Land Reclamation

WATER SAMPLES
(ug/L)

Case #: 9001.392 Sampling Date(s): 6/22/90

To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No.	GW-1A								
	Dilution Factor	1.0								
	Location									
CRQL	COMPOUND									
0.05	alpha-BHC	UL								
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									

CRQL = Contract Required Detection Limit

*Action Level Exists

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DATA SUMMARY FORM: INORGANICS

Site Name: Land Reclamation

WATER SAMPLES (ug/L)

Case #: 9001.392 Sampling Date(s): ______

*Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

CRDL	ANALYTE	Sample No. GW-1A, Dilution Factor 1.0, Location										
200	Aluminum	1150										
60	Antimony											
10	*Arsenic											
200	Barium	[40.1]										
5	Beryllium											
5	*Cadmium											
5000	Calcium	58,900										
10	*Chromium											
50	Cobalt											
25	Copper											
100	Iron	1750										
5	*Lead	4.6										
5000	Magnesium	38,400										
15	Manganese	64.5										
0.2	Mercury											
40	*Nickel	[14.1]										
5000	Potassium	[1590]										
5	Selenium		UL									
10	Silver											
5000	Sodium	44,900										
10	Thallium											
50	Vanadium											
20	Zinc	91.6										
10	*Cyanide											

CRDL = Contract Required Detection Limit

*Action Level Exists

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APPENDIX E

PHOTOGRAPHIC LOG

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PHOTOGRAPHIC RECORD

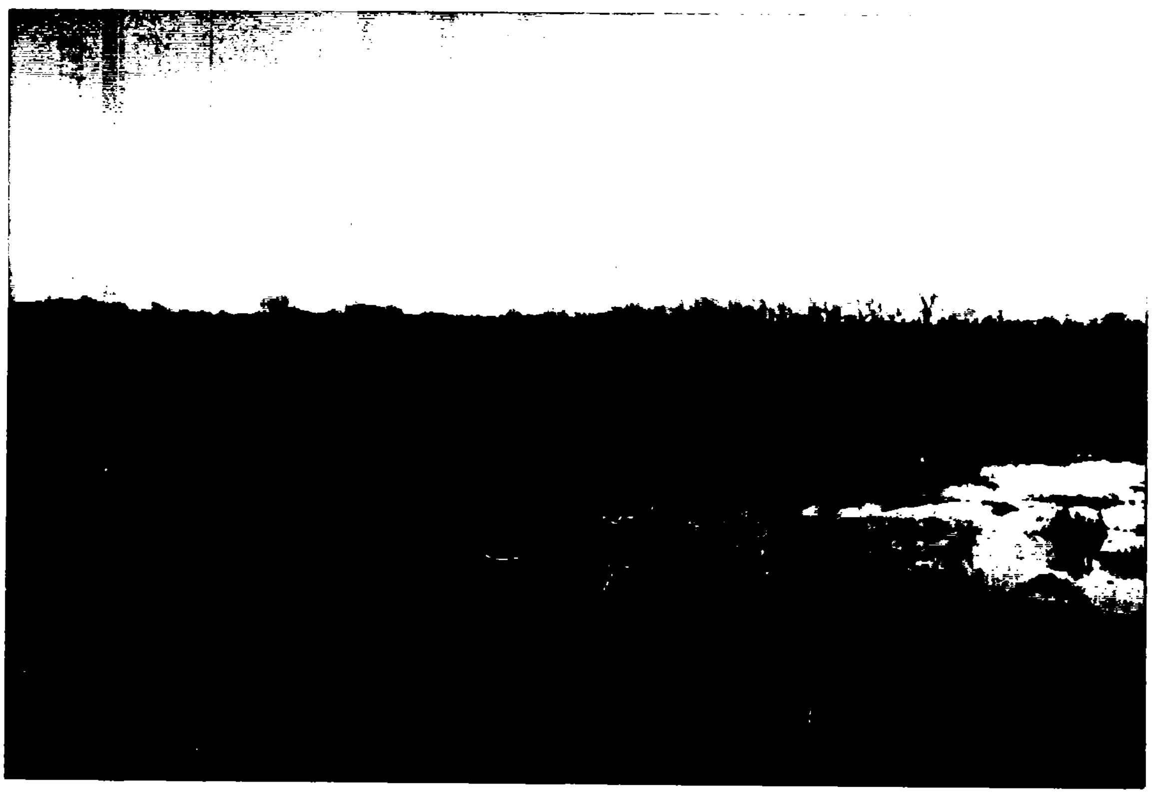
Client: New York State Dept. of Environmental Conservation (NYSDEC) E & E Job No.: Y04000

Camera: Make Fuji - 35mm SN: N/A

Photographer: D. Johnson Date/Time: 1/24/90 1520

Lens: Type 50mm SN: N/A Frame No.: 1

Comments: Old Land Reclamation landfill. View of site topography and cover facing south from Broadway entrance.



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[UZ]Y04080:D2824, #2715

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PHOTOGRAPHIC RECORD

Client: New York State Dept. of Environmental Conservation (NYSDEC) E & E Job No.: Y04000

Camera: Make Fuji - 35mm SN: N/A

Photographer: D. Johnson Date/Time: 1/24/90 1524

Lens: Type 50mm SN: N/A Frame No.: 2

Comments: Old Land Reclamation landfill. View of groundwater monitoring wells 2A (right) and 2B (left). Monitoring well 2A is an open bedrock completion. Monitoring well 2B is completed in overburden material.

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ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Dept. of Environmental Conservation (NYSDEC) E & E Job No.: YO4800

Camera: Make Fuji - 35mm SN: N/A

Photographer: D. Johnson Date/Time: 1/24/90 1529

Lens: Type 50mm SN: N/A Frame No.: 3

Comments: Old Land Reclamation landfill. View of scrap yard operation located directly northwest of the site.

578

[UZ]YO4080:D2824, #2715

ecology and environment, inc.

PHOTOGRAPHIC RECORD

Client: New York State Dept. of Environmental Conservation (NYSDEC) E & E Job No.: Y04000

Camera: Make Fuji - 35mm SN: N/A

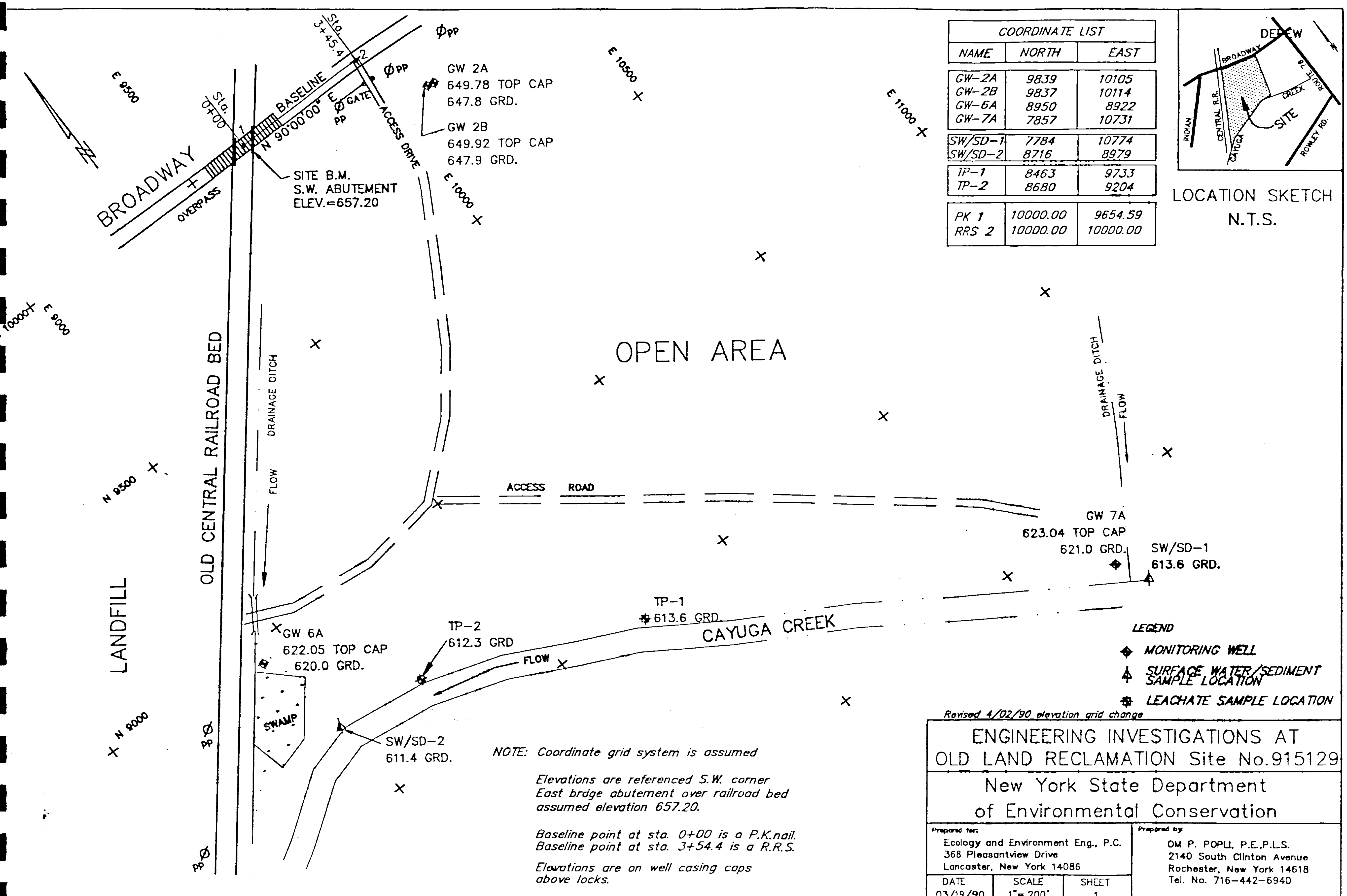
Photographer: D. Johnson Date/Time: 1/24/90 1550

Lens: Type 50mm SN: N/A Frame No.: 4

Comments: Old Land Reclamation landfill. View of groundwater monitoring well 6A on the north bank of the Cayuga Creek floodplain. Monitoring well 6A is an open bedrock completion.

APPENDIX F

OLD LAND RECLAMATION SITE SURVEY MAP



COORDINATE LIST

NAME	NORTH	EAST
GW-2A	9839	10105
GW-2B	9837	10114
GW-6A	8950	8922
GW-7A	7857	10731
SW/SD-1	7784	10774
SW/SD-2	8716	8979
TP-1	8463	9733
TP-2	8680	9204
PK 1	10000.00	9654.59
RRS 2	10000.00	10000.00

NOTE: Coordinate grid system is assumed

Elevations are referenced S.W. corner East brdge abutement over railroad bed assumed elevation 657.20.

Baseline point at sta. 0+00 is a P.K.nail.
Baseline point at sta. 3+54.4 is a R.R.S.

Elevations are on well casing caps above locks.

Revised 4/02/90 elevation grid change

ENGINEERING INVESTIGATIONS AT
OLD LAND RECLAMATION Site No.915129

New York State Department
of Environmental Conservation

Prepared for:
Ecology and Environment Eng., P.C.
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Lancaster, New York 14086

Prepared by:
OM P. POPLI, P.E.,P.L.S.
2140 South Clinton Avenue
Rochester, New York 14618
Tel. No. 716-442-6940

DATE	SCALE	SHEET
03/19/90	1"= 200'	1

APPENDIX G

GEOTECHNICAL ANALYSIS

Project No. 11420	TOLEDO TESTING LABORATORY, INC.	Sheet 1 Of 4

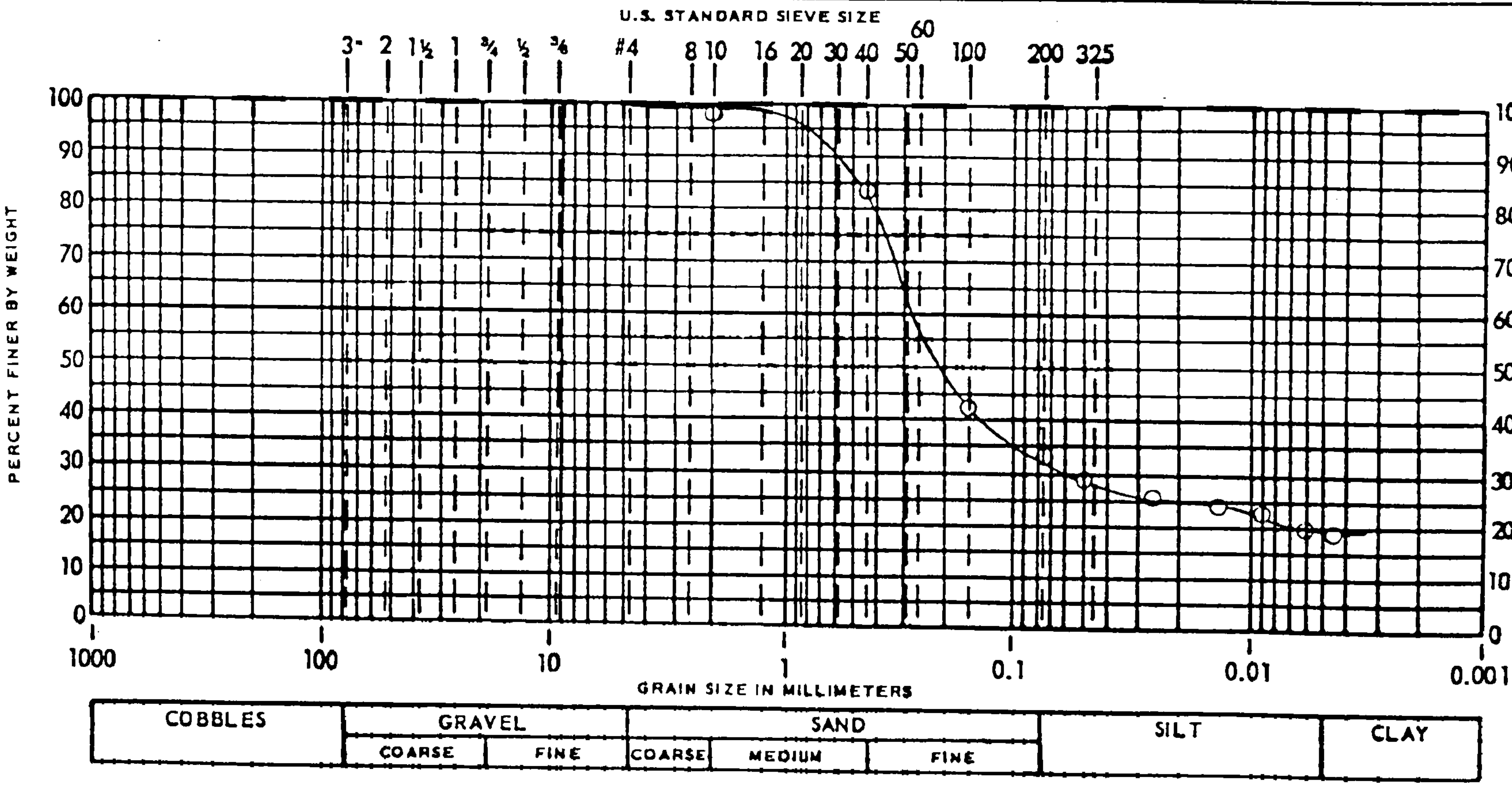
TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	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: Gravel (Percent)	Coarse Sand (Percent)	Medium Sand (Percent)	Fine Sand (Percent)	Silt (Percent)	Clay (Percent)	Colloids (Percent)	Atterberg Limits: Liquid Limit (Percent)	Plastic Limit (Percent)	Plasticity Index (Percent)	Group Designation and Index (AASHTO)
G-2	GW-2B	30'-31.3'							0	2	15	50	13	20					
	GW-2A	34'-35'														59	29	20	
	GW-6A	5'-7'							44	9	11	15	16	5					
	GW-7A	6'-8'							60	10	11	11	5	3					

YOUR PROJECT NO.: YO-4060
OLD LAND RECLAIMATION, PHASE II

Figure 3

SOIL CLASSIFICATION SHEET



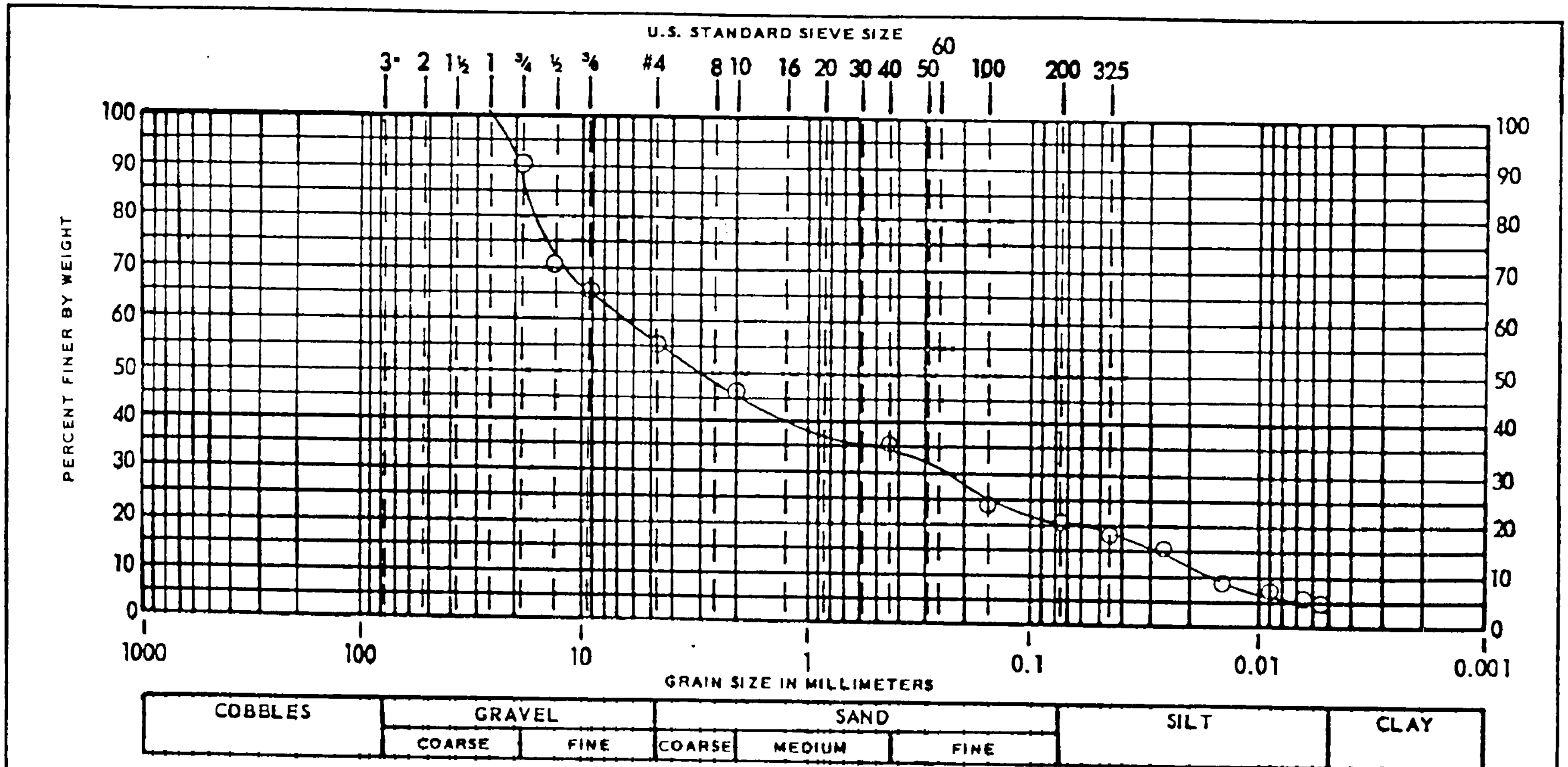
PROJECT OLD LAND RECLAIMATION
YOUR PROJECT NO.: YO-4060
BORING NO.
SAMPLE NO. GW-2B
DEPTH 30' - 31.3'
CLASSIFICATION

NATURAL % MOISTURE
LIQUID LIMIT
PLASTIC LIMIT
PLASTICITY INDEX
COLOR
REMARKS 2 of 4

Toledo Testing Laboratory, Inc.

Figure 4

SOIL CLASSIFICATION SHEET



PROJECT OLD LAND RECLAIMATION
YOUR PROJECT NO.: YO-4060

BORING NO.

SAMPLE NO. GW-6A

DEPTH 5' - 7'

CLASSIFICATION

NATURAL % MOISTURE

LIQUID LIMIT

PLASTIC LIMIT

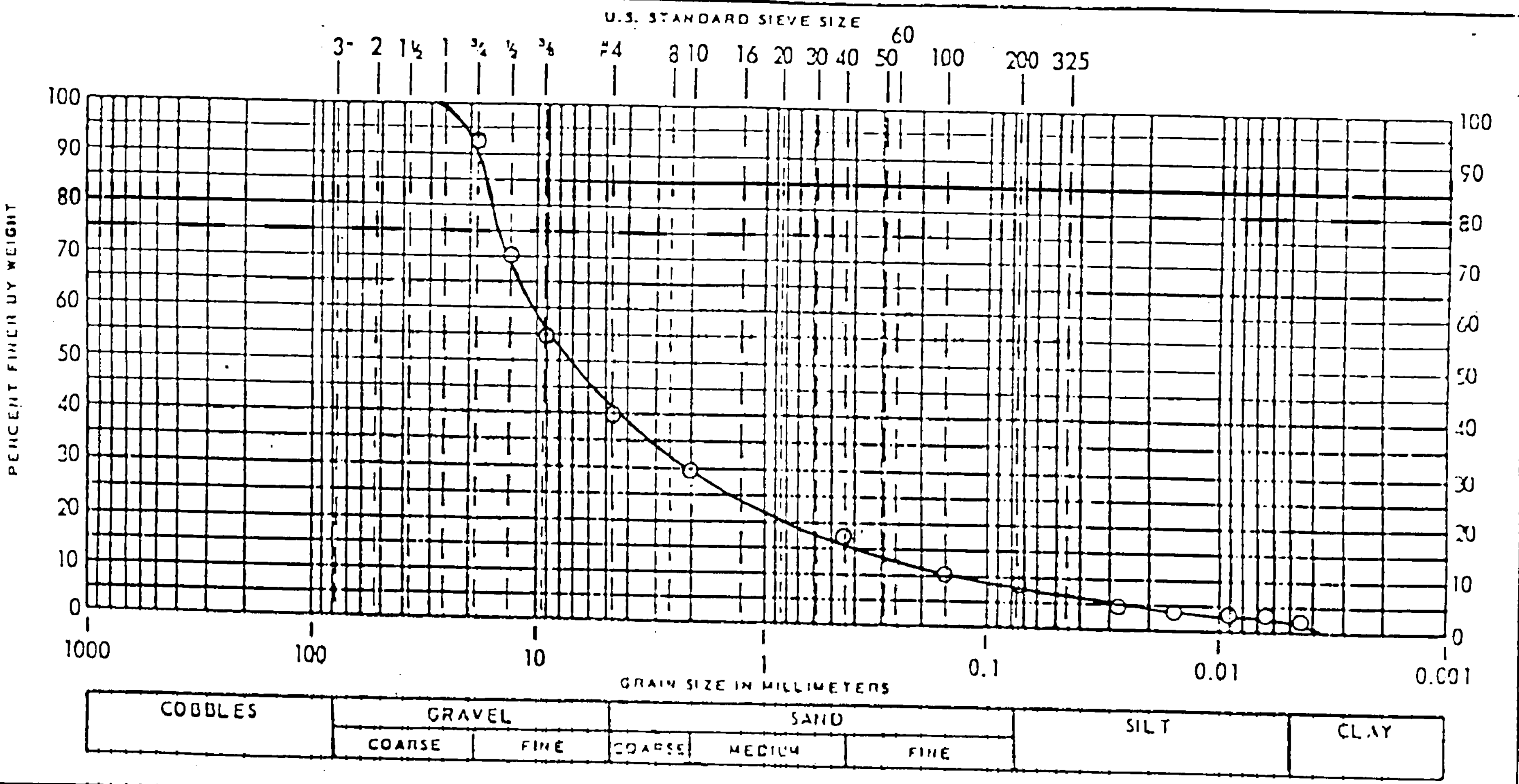
PLASTICITY INDEX

COLOR

REMARKS 3 of 4

Toledo Testing Laboratory, Inc.

Figure 5



PROJECT OLD LAND RECLAIMATION
YOUR PROJECT NO.: YO-4060

BORING NO.

SAMPLE NO. GW-7A

DEPTH 6' - 8'

CLASSIFICATION

NATURAL % MOISTURE

LIQUID LIMIT

PLASTIC LIMIT

PLASTICITY INDEX

COLOR

REMARKS 4 of 4

Toledo Testing Laboratory, Inc.

G-5

Figure 6