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ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PRELIMINARY SITE ASSESSMENT

VOLUME I
MAIN REPORT

Warsaw Village Landfill Site
Warsaw Village

Site No. 961006
Wyoming County

Prepared for:

New York State
Department of
Environmental Conservation
50 Wolf Road, Albany, New York 12233
Michael D. Zagata, Commissioner

Division of Hazardous Waste Remediation
Michael J. O'Toole, Jr., Director

PARSONS ENGINEERING SCIENCE, INC.

Liverpool, New York

PARSONS

JUNE 1995

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FINAL

VOLUME I
MAIN REPORT

WARSAW VILLAGE LANDFILL SITE
NYSDEC SITE NO. 961006
WARSAW VILLAGE
WYOMING COUNTY, NEW YORK

PRELIMINARY SITE ASSESSMENTS
WORK ASSIGNMENT NO. D002478-17
NEW YORK STATE SUPERFUND STANDBY CONTRACT

Prepared for

DIVISION OF HAZARDOUS WASTE REMEDIATION
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD
ALBANY, NEW YORK

Prepared by

Parsons Engineering Science, Inc.
290 Elwood Davis Road
Liverpool, N.Y. 13088

JUNE 1995

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NOTICE

This Preliminary Site Assessment report on the Warsaw Village Landfill Site (NYSDEC Site No. 961006), located in the Village of Warsaw, Wyoming County, New York, was prepared for the New York State Department of Environmental Conservation (NYSDEC) under a Superfund Standby Contract (No. D002478, Work Assignment No. 17). The purpose of this report is to provide information necessary for NYSDEC to reclassify the site according to the Classes 2, 3, and D described in Section 2 of this report.

To achieve the study objectives stated in this report, Parsons Engineering Science, Inc. (Parsons ES) was required to base conclusions on the best information available during this investigation and within the limits prescribed by NYSDEC in the contract agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, Parsons ES cannot guarantee that the investigation completely defined the degree or extent of any contamination by hazardous or otherwise harmful substances described in the report or, if no such contamination was found, its absolute absence. Professional judgment was exercised in gathering and analyzing the information obtained, and Parsons ES is committed to the usual care, thoroughness, and competence of the engineering profession.

Conclusions in this report are based on record reviews, interviews, and limited sampling performed by Parsons ES personnel. The health-based regulatory standards discussed in this report may change in the future. Levels of environmental contamination that are "acceptable" by current standards may not be so in the future.

Consistent with the objectives of the PSA investigation, this report includes an assessment of the presence of hazardous waste as defined by Title 6, Part 371 of the New York Codes, Rules, and Regulations (6NYCRR, Part 371) and "significant threat" to public health and environment as defined by 6NYCRR, Part 375. As such, the report does not include an evaluation of the presence of hazardous wastes regulated under federal law, except when federal and New York State regulations are identical. In particular, the presence of hazardous waste having the characteristic of toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP) under 40CFR, Part 261.24 is not formally evaluated in this report. The characteristic of toxicity in New York State, during the time of the site investigation activities, was determined by the Extraction Procedure Toxicity (EP Tox) test under 6NYCRR, Part 371. Therefore, with the concurrence of the NYSDEC, analysis for characteristics of toxicity were conducted using the EP Tox method.

Information contained in this report may not be suitable for any other use without adaptation for the specific purpose intended. Any such reuse of or reliance on the information, assessments, or conclusions in this report without adaptation will be at the sole risk and liability of the party undertaking the reuse.

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EXECUTIVE SUMMARY

1.1 BACKGROUND SUMMARY

The Warsaw Village Landfill Site (NYSDEC No. 961006) is an unlined, inactive landfill listed as a Class 2a site on the State Registry of Inactive Hazardous Waste Sites and is under investigation because of reported on-site disposal of drummed lead-containing paint sludges and plating wastes (NYSDEC, 1984; NYSDEC, 1985; URS, 1990). The site is an approximately 55-acre parcel located off Industrial Avenue, on the southeast edge of the Village of Warsaw, Wyoming County, New York (Figure 1.1). The landfill is bounded by Oatka Creek to the west; a wooded area, electrical substation, and the Village garage to the north; a run-on diversion ditch and the Baltimore and Ohio Railroad tracks on the east; and the run-on diversion ditch, where it discharges to Oatka Creek, on the south (Figure 1.2).

The Village of Warsaw operated the landfill from 1959 to 1974. In addition to municipal waste from the village, the site also reportedly received approximately 210 tons of leaded paint sludge from Almor Corporation, and plating waste, metal hydroxides, and solvents from Mallory Timers. The disposal of leaded paint sludges was identified in the 1985 Community Right-To-Know Survey. Landfill operations reportedly ceased in 1974, although background data indicates that Mallory Timer continued on-site disposal.

As a result of landfill cover deficiencies, stream bank erosion, and leachate discharges, a closure plan was developed for the site in 1979. An initial closure effort was completed in 1983. A reclosure was conducted in 1986 to address additional site concerns. No documentation was identified confirming whether closure activities were completed to the satisfaction of the NYSDEC.

Two buried drums were identified during the 1986 reclosure effort, with the contents testing as hazardous waste (ignitable waste). As a result, the site was classified as a Class 2a Inactive Hazardous Waste Site. Corrective action following this incident included overpacking and on-site storage of the drums, and improvements to the run-on diversion ditch along the east site boundary. A site drawing submitted by an adjacent resident identified drum disposal areas adjacent to the site access road.

NYSDEC conducted preliminary soil and leachate sampling in July 1986, and drum sampling in January 1988. Metals and semi-volatile organic compounds (SVOCs) were detected in the leachate and soil samples. Five volatile organic compounds (VOCs), including total xylenes at 150,000 micrograms per liter (μg/l), and one SVOC were detected in the drum samples. A Phase I investigation of the Warsaw Village Landfill was completed in 1990. The Phase I investigation recommended reclassifying the site as a Class 2 site and conducting additional monitoring of groundwater and surface water. The recommendation for a Class 2 listing was based on the presence of ignitable wastes and potential threat to the environment. However, the drums containing the ignitable wastes were removed from the site.

1.2 SITE INVESTIGATION SUMMARY

The site investigation was conducted by Parsons Engineering Science, Inc. (Parsons ES) in accordance with the Technical Work Plans provided by the NYSDEC. The field work was conducted between March 24, 1993 and April 27, 1993. The investigation consisted of initial environmental sampling and subsurface environmental sampling. A follow-up field investigation effort was conducted consisting of a geophysical survey conducted in June and July of 1994, and test pit excavation and drum sampling conducted in September of 1994. This follow-up effort was conducted to address the alleged disposal of drums on site. The environmental sampling effort consisted of the installation of five monitoring wells and the collection of:

- four surface water samples,
- four sediment samples,
- three leachate samples
- two surface soil samples,
- five composite subsurface soil samples,
- five groundwater samples,
- three composite test pit soil samples, and
- one drum sample.

Samples were analyzed for TCL organics, TAL metals, and cyanide. In addition, the drum sample was analyzed for corrosivity, ignitability, reactivity, and EP toxicity.

1.3 PRESENCE OF HAZARDOUS WASTES

Title 6 of the New York Code of Rules and Regulations (6NYCRR), Part 371 regulations establishes two categories of hazardous wastes: (1) listed hazardous wastes, and (2) characteristic hazardous wastes. Hazardous wastes are judged to have a substantial hazard or significant toxicity associated with them. Four hazardous waste lists have been established:

(1) hazardous waste from nonspecific sources;

(2) hazardous wastes from specific sources;

(3) discarded commercial chemical products, discarded off-specification species, and containers and spill residues thereof; and

(4) wastes containing polychlorinated biphenyls (PCBs).

Listed hazardous wastes are assigned USEPA hazardous waste numbers with the following prefixes: "F" (non-specific sources), "K" (specific sources), "P" (discarded commercial chemical products which are "acute hazardous wastes"), "U" (discarded commercial chemical products which are "toxic hazardous wastes", or "B" (PCB wastes containing at least 50 milligrams of PCBs per kilogram of dry weight solid or milligrams of PCBs per liter of liquid). Characteristic hazardous wastes are identified

using analytical methods specified in 6NYCRR, Part 371, and are assigned "D" prefixes.

Previous analytical data collected by the NYSDEC indicate that at least one of the drums stored at the site contained hazardous waste as defined by 6NYCRR, Part 371.3(b) (exhibited characteristic of ignitability). Background information and analytical data indicate industrial wastes have been disposed on site, including potential listed hazardous wastes. However, the presence of these listed compounds on-site does not establish the presence of hazardous waste at the site because: (1) they cannot be directly attributed to specific or non-specific sources as required by 6NYCRR, Part 371.4(b) and (c), and (2) they cannot be directly attributed to the disposal of a "commercial chemical product, manufacturing chemical intermediates, or off-specification commercial chemical products" as required by 6NYCRR, Part 371.4(d). The drum of ignitable waste has been removed and disposed off-site.

Parsons ES anticipates that further work is unlikely to establish the presence of hazardous waste because the PSA investigation has primarily addressed suspected hazardous waste areas identified in the background information.

1.4 PRESENCE OF SIGNIFICANT THREAT

The presence of a "significant threat" to public health or the environment, as defined by 6NYCRR, Part 375, may be established by analytical data showing that hazardous substances: (1) have been released to environmental media from hazardous waste disposed at the site, and (2) are present in concentrations exceeding accepted health or environmental standards or guidance values. The criteria used to establish releases is discussed in the introduction to Subsection 4.6.

As discussed in Subsection 4.6.9, the presence of hazardous waste at the site was not established. Therefore, significant threat to the environment resulting from the presence of hazardous waste can not be determined. Although, concern may be warranted for exceedances of standards or guidance values as identified in Sections 4.6.1 through 4.6.8, the concentrations in a number of cases only marginally exceeded the applicable regulatory values. In addition, a number of the regulatory values available for use are conservative (i.e. aquatic values applied to surface water and leachate results and USEPA health-based values applied to subsurface soil results).

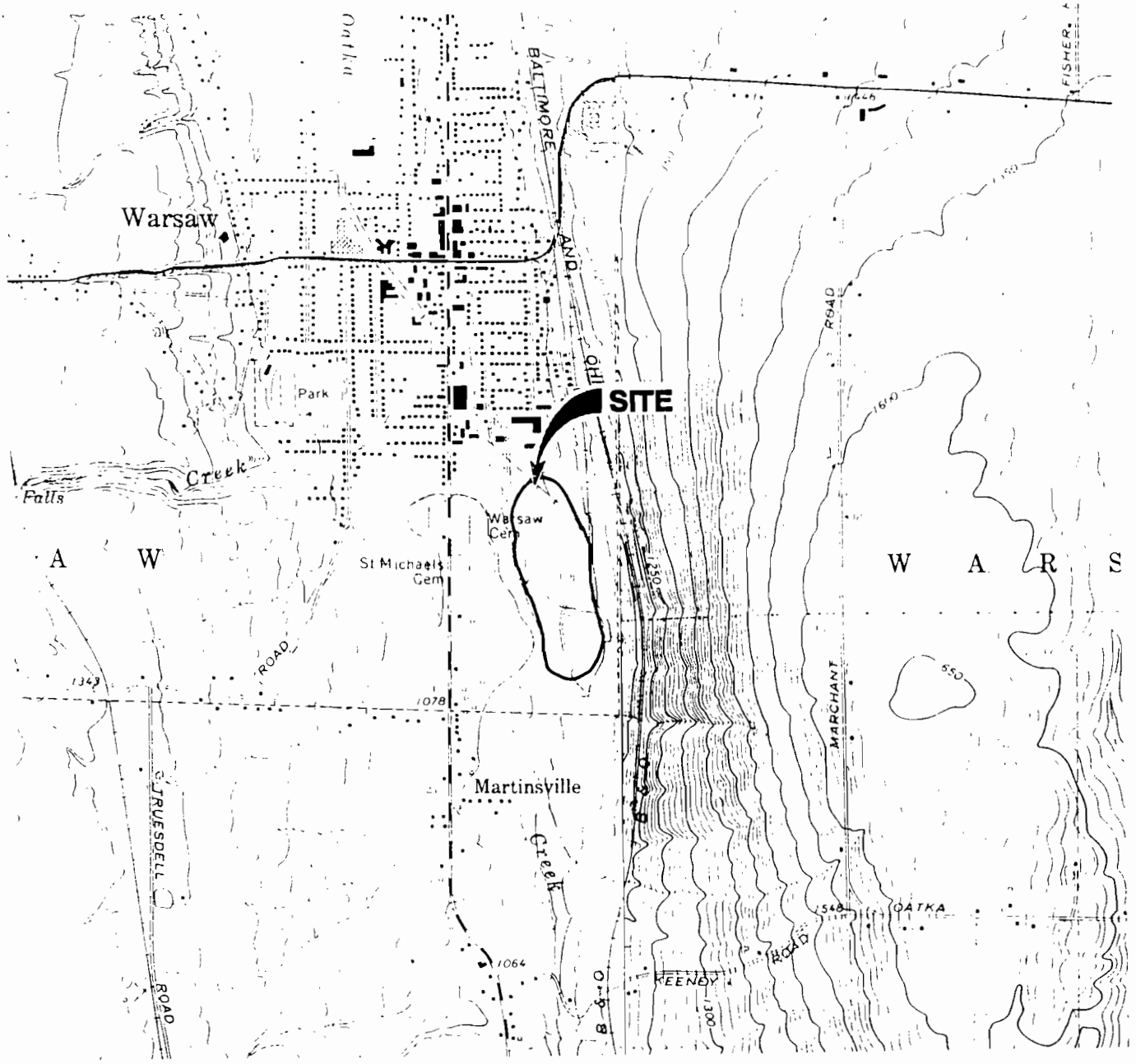
1.5 RECOMMENDATIONS

Although analytical data collected during this investigation indicate that contamination from industrial waste disposed on site may warrant concern, the background and analytical data do not establish the presence of hazardous waste on site as defined by 6NYCRR, Part 371. Additional site studies are not likely to provide sufficient information for listing of the site, because the PSA investigation has primarily addressed suspected areas identified in the background information. Therefore, Parsons ES recommends the following:

1. If applicable, the landfill should be properly closed in accordance with 6NYCRR, Part 360 requirements.

2. Periodic groundwater monitoring should be conducted using the monitoring wells installed during this PSA investigation. The monitoring program should include, as a minimum, the following:

   - Collection of groundwater samples from monitoring wells MW-2, MW-3, MW-4, and MW-5; leachate samples from locations LC002 and LC003, and a surface water sample from SW002.
   - Minimum sampling frequency as follows:
     - Collection of samples the first year in the spring and in the fall to identify "worse case scenario";
     - Collection of samples once a year thereafter from the time of year with the highest concentrations;
     - Collection of samples for a total of five years
     - Evaluation of results after the fifth year on whether to continue monitoring program.
   - Based on the PSA analytical results and site history, analytical parameters should include, as a minimum:
     - benzene, toluene, ethylbenzene, and xylenes (BTEX);
     - polynuclear aromatic hydrocarbons (PAHs);
     - polychlorinated biphenyls (PCBs);
     - Target Analyte List (TAL) metals; and
     - cyanide.



SOURCE: U.S.G.S. 7.5 MINUTE SERIES TOPOGRAPHIC MAP; WARSAW, N.Y. (1972), CASTILE, N.Y. (1972).

QUADRANGLE LOCATION

SCALE

0 2000 4000 FT.

2000 FT.

N

LONGITUDE: 78° 07' 30"
LATITUDE: 42° 44' 00"

PARSONS ENGINEERING SCIENCE, INC.

SITE LOCATION MAP

WARSAW VILLAGE LANDFILL
WARSAW, NEW YORK

H:\GRAPHICS\723800\LOCATION.DS4

CONTOUR INTERVAL: 2'
MAPPING COMPILED BY STEROPHOTOGRAMMETRIC METHODS
FROM 1" = 400' SCALE AERIAL PHOTOGRAPHY FLOWN 05/10/93.
MAPPING COMPILED WITHOUT BENEFIT OF A FIELD EDIT.

250' 0 250'
Approximate Scale in Feet

DATE: 05/08/95 (SEH) (DIMSCALE 1:100)
H:CAD\723800\SITEPLAN.DWG (MODEL SPACE)

FIGURE 1.2

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE

SITE PLAN

PARSONS ENGINEERING SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
290 ELWOOD DAVIS ROAD • SUITE 312 • LIVERPOOL, N.Y. 13088 • 315/451-9560
OFFICES IN PRINCIPAL CITIES

FIGURE 1.3

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
WARSAW VILLAGE LANDFILL	*961006*	*WARSAW*	*WYOMING*

5. REGION	6. CLASSIFICATION	7. ACTIVITY
9	Current *2A* Proposed *D*	[ ] Add [ ] Reclassify [ ] Delist [ ] Modify

8a. DESCRIBE LOCATION OF SITE (Attach U.S.G.S Topographic Map showing location)

The site is located off of Industrial Avenue, on the southeast edge of the Village of Warsaw. The landfill is bounded by Oatka Creek to the west; a wooded area, electrical substation, and the Village garage to the north; a run-on diversion ditch and the Baltimore and Ohio Railroad tracks on the east; and the run-on diversion ditch, where it discharges to Oatka Creek, to the south. The site is located in a valley area with higher elevations to the west and east.

b. Quandrangle *Warsaw and Castile* c. Site Latitude *42° 44' 00"* Longitude *78° 07' 30"* Tax Map Number *085.16-1-5.1*

9a. BRIEFLY DESCRIBE THE SITE (Attach site plan showing disposal/sampling locations)

The site is a 55-acre inactive landfill with no liner. The site is bordered on three sides by the run-on diversion ditch and Oatka Creek, and is also bisected by a drainage ditch. The topography of the site is relatively flat, and is approximately 8 to 12 feet above the level of Oatka Creek. A small tributary to Oatka Creek is located along the west border of the site. Trash and portions of discarded appliances were observed protruding through the ground surface along the eastern slope of the landfill.

b. Area *55* acres c. DEC ID Number *961006* d. PA/SI [ ] Yes [ ] No

e. Completed [ ] Phase I [ ] Phase II [X] 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

In addition to municipal waste from the Village, the site also reportedly received approximately 210 tons of leaded paint sludge from Almor Corporation and plating waste and solvents from Mallory Times. Other wastes allegedly disposed on-site include metal hydroxides, nitric acid, PCBs, hologenatedsolvents, cyanide, formaldehyde, and heavy metals. No quantities or dates of disposal were identified. With the exception of two drums of ignitable wastes (removed from site) the PSA has not confirmed the disposal of the wastes listed above in significant quantities or presence of hazardous waste on site.

11a. SUMMARIZED SAMPLING DATA ATTACHED

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

b. List contravened parameters and values

Paramter	Conc.	Units	Contravened Standard	Standard (ug/l)
Aluminum	*640*	*ug/l*	*Surface Water*	*100*
Iron	*2,320*	*ug/l*	*Surface Water*	*300*
Cyanide	*17.1*	*ug/l*	*Surface Water*	*5.2*
Zinc	*735*	*ug/l*	*Groundwater*	*30*
Aluminum	*5,930*	*ug/l*	*Surface Water (leach.)*	*100*
Copper	*30.0*	*ug/l*	*Surface Water (leach.)*	*17*
Iron	*261,000*	*ug/l*	*Surface Water (leach.)*	*300*
Lead	*25*	*ug/l*	*Groundwater*	*25*

Paramter	Conc.	Units	Contravened Standard	Standard (ug/l or ug/lg)
Lead	*11.3*	*ug/l*	*Surface Water (leach.)*	*5.4*
Zinc	*494*	*ug/l*	*Surface Water (leach.)*	*30*
Manganese	*3,490*	*ug/l*	*Groundwater*	*300*
PCB Aroclor 1260	*0.32*	*ug/l*	*Groundwater*	*0.1*
Iron	*49,900*	*ug/l*	*Groundwater*	*300*
Heptachlor	*0.014*	*ug/l*	*Groundwater*	*ND*

12. SITE IMPACT DATA

a. Nearest surface water: Distance *adjacent* ft. Direction *South to North* Classification *C (t)*

b. Nearest groundwater: Depth *3 - 5* ft. Flow Direction *West* [ ] Sole Source [X] Primary [ ] Principal

c. Nearest water supply: Distance *> 5,000* ft. Direction *West* Active [X] Yes [ ] No

d. Nearest building: Distance *Adjacent* ft. Direction *West* Use *Residential*

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

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

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

k. For Class 2a; Code ____ Health Model Score ____

l. For Class 2; Priority Category ____

m. HRS Score *N/A*

n. Significant Threat [ ] Yes [X] No [ ] Unkown

13. SITE OWNER'S NAME	14. ADDRESS	15. TELEPHONE NUMBER
Village of Warsaw	*15 South Main Street, Warsaw, New York 14569*	*(716) 786-2360*

16. PREPARER

Thomas H. Abrams, Project Manager, Engineering-Science, Inc.
(Name, Title, and Organization)

Date Signature

17. APPROVED

(Name, Title, and Organization)

Date Signature

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SECTION 2

INTRODUCTION

2.1 PURPOSE

This report presents the results for the field investigation portion of the Preliminary Site Assessment (PSA) of the Warsaw Village Landfill Site (NYSDEC Site No. 961006), located in the Village of Warsaw, Wyoming County, New York. The field investigations and report preparation were conducted by Parsons ES under Work Assignment No. D002478-17 of a Superfund Standby Contract between the New York State Department of Environmental Conservation (NYSDEC) and Parsons ES. The Warsaw Village Landfill Site is an inactive landfill listed as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York State. The site is under investigation because of reported on-site disposal of leaded paint sludge and plating wastes. The disposal of leaded paint sludges was identified in the 1985 Community Right-To-Know Survey. The Task 1 investigation, conducted May 22, 1990 by URS Consultants, recommended the site be reclassified to a Class 2 site. Parsons ES was directed by NYSDEC to conduct field studies and complete a PSA investigation for reclassification of the site.

The primary purpose of the PSA investigation was to assign one of the following three site classifications provided by Article 27, Title 13 of the Environmental Conservation Law to the sites:

- Class 2 - Significant threat to public health or environment - action required;
- Class 3 - Does not present a significant threat to public health or environment - action may be deferred; or
- Class D - Site delisted from Registry of Inactive Hazardous Waste Sites.

Classification is based on a determination of:

1. The documented presence of hazardous waste, as defined under Title 6, Part 371 of the New York Code of Rules and Regulations (NYCRR); and
2. The presence of significant threat to the environment posed by on-site hazardous waste, as defined by 6NYCRR, Part 375.

In the event that insufficient data are developed for the determination of the presence or threat posed by hazardous waste at the sites, recommendations for further work will be made to obtain sufficient data.

This report consists of six sections and five appendices. Section 1 provides an executive summary of the results of the investigation, including recommendations for further work at the sites if warranted. Section 2 presents an introduction to the PSA investigation and the PSA program at NYSDEC. Section 3 presents a description of the scope of work for the PSA investigation. Section 4 presents an assessment of the

data gathered during the investigation. Section 5 presents recommendations for reclassification of the site or further work at the site. Section 6 presents a list of cited references. Appendix A contains U.S. Environmental Protection Agency (USEPA) Form 2070-13, completed with the data gathered during this investigation. Appendix B contains the validation report summarizing results of data validation conducted on subsurface soil samples. Attachment B.1 to Appendix B presents a limited data evaluation of analytical data collected during a follow-up field investigation effort (test pit excavation and drum sampling). Appendix C contains boring logs and grain-size analytical results. Appendix D contains analytical results in the Parsons ES data base format. Appendix E presents selected references

2.2 PRELIMINARY SITE ASSESSMENT INVESTIGATION

The PSA investigation is generally comprised of six tasks which may be completed during a PSA investigation. The six PSA tasks are:

Task 1 - Records Search, Site Inspection, and Assessment;

Task 2 - Site Work Plan Development;

Task 3 - Surface Field Investigation;

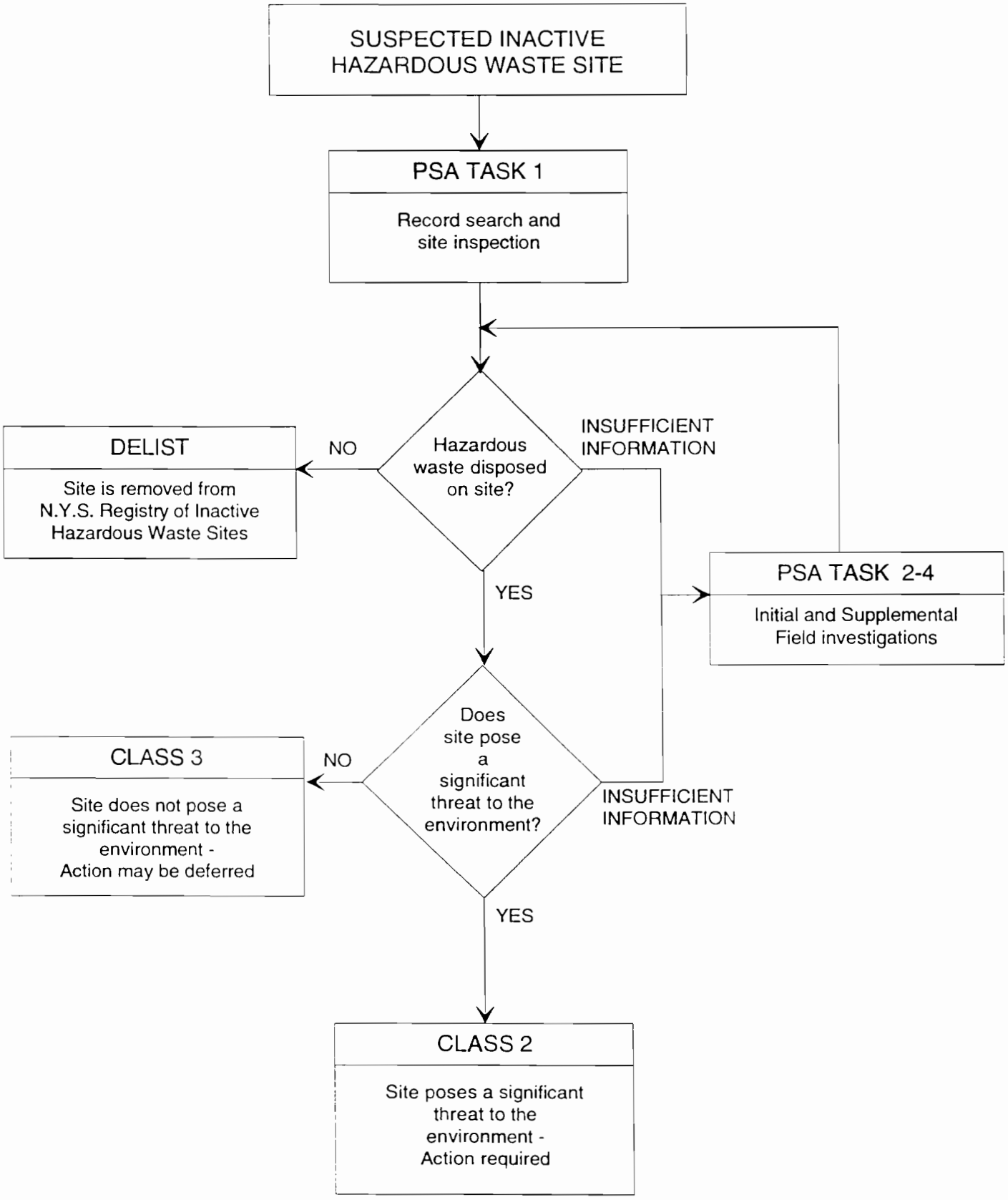
Task 4 - Subsurface Field Investigation;

Task 5 - Draft PSA Report; and

Task 6 - Revised PSA Report.

PSA investigations are intended to be completed with the minimum number of tasks required to generate sufficient information for classification under the Environmental Conservation Law. Figure 2.1 provides a decision tree used for classification of sites.

SITE CLASSIFICATION DECISION TREE



SECTION 3

SCOPE OF WORK

3.1 INTRODUCTION

The scope of work for the PSA investigation (Tasks 2 through 6) at the Warsaw Village Landfill Site consisted of development of a Project Management Plan (including a Quality Assurance Project Plan (QAPP), and site-specific Health and Safety Plans and Sampling Plans) for the entire work assignment (Task 2); initial environmental sampling, including surface water, sediment, leachate, and shallow soil samples (Task 3); subsurface environmental sampling, including installation of monitoring wells, subsurface soil sampling, and groundwater sampling (Task 4); site assessment and preparation of a draft report (Task 5), and completion of a final report (Task 6). The record search and initial site inspection (Task 1) were conducted by URS Consultants of Buffalo, New York. However, a limited supplemental record search effort was conducted by Parsons ES to ensure coverage for available site information. Table 3.1 presents a summary of contacts made.

Task 2 was completed with submittal and approval of the Project Management Plan dated February 1993. Tasks 3 and 4 were conducted in accordance with the Technical Work Plans provided by the NYSDEC (dated December 8, 1992), later modifications as directed by the NYSDEC, and the work plan (letter to Carl Hoffman dated June 21, 1994) prepared by Parsons ES for additional work (geophysical survey, test pit excavation, and drum sampling) at the site. The site specific tasks are described below and summarized in Table 3.2.

Environmental sampling was conducted in accordance with the Technical Work Plans provided by NYSDEC, the scope of work for additional work at the Warsaw Village Landfill site, and the QAPP prepared by Parsons ES (NYSDEC, 1992; Parsons ES, 1992). Environmental sample analyses was conducted by RECRA Environmental Inc. of Amherst, New York. With the exception of minor modifications made as directed by Ms. Betty Seeley (NYSDEC), sample analysis was conducted in accordance with NYSDEC Analytical Service Protocols (ASP) (December 1991) and the QAPP. RECRA is one of three NYSDEC Superfund Standby Laboratory subcontractors for Parsons ES. As directed by the NYSDEC, data validation was conducted on subsurface soil sample data, the first sample delivery group submitted to RECRA under the work assignment. Parsons ES conducted sample tracking and contract compliance screening on all other samples. Grain-size analysis was performed by Huntingdon Empire Soils Investigation, Inc., Groton, New York, using ASTM method D422-63 (1990).

Air monitoring was conducted using a Photoionization Detector (PID) and Draeger Tubes as warranted and/or as called for in the Health and Safety Plan. In general, air in the breathing zone was monitored during drilling, test pit excavation, and sampling activities. Soil samples, the headspace over each monitoring well, and drums were also screened as a means of determining the presence of volatile organic compounds.

3.2 INITIAL ENVIRONMENTAL SAMPLING

3.2.1 Surface Soil Samples

Two surface soil samples were collected on April 26, 1993 (Figure 3.1). Sample SS-001 was collected at the north end of the site adjacent to two crushed drums. Sample SS-002 was collected at the western end of the site from an area where two overpacked drums were previously stored. Soil samples were collected with decontaminated stainless steel spoons and transferred into laboratory-supplied bottles. Both samples were analyzed for TCL organic compounds (VOCs, SVOCs, pesticides, and PCBs), TAL metals, and cyanide. A duplicate sample (SS-003) was collected from sample location SS-002 and analyzed for TCL organics, TAL metals, and cyanide. Matrix Spike and Matrix Spike Duplicate (MS/MSD) samples were also collected from sample location SS-002 and analyzed for TCL organics, TAL metals, and cyanide.

3.2.2 Surface Water Samples

Four surface water samples were collected from Oatka Creek and its tributaries on April 26, 1993 (Figure 3.1). Samples SW-001 and SW-002 were collected from Oatka Creek. Sample SW-001 is located southwest of the site and is considered the upstream sample. Sample SW-002 is located northwest of the site, near the access gate, and is considered the downstream sample. Sample SW-003 was collected from the center of a tributary to Oatka Creek located in the western portion of the site. The tributary sediments were rust stained, and an oily sheen was noted on the water. Sample SW-004 was collected approximately 40 feet east of the access road culvert in the east-west trending drainage ditch which bisects the site. The surface water samples were collected directly into laboratory-supplied bottles. Samples were analyzed for TCL organics, TAL metals, and cyanide.

3.2.3 Sediment Samples

Four sediment samples (SD-001, SD-002, SD-003, and SD-004) were collected from the same locations as the surface water samples on April 26, 1993 (Figure 3.1). Sediment samples were collected after the surface water samples to minimize sediment/water mixing in the surface water samples. Sediment samples were collected with decontaminated stainless steel spoons. Samples were analyzed for TCL organics, TAL metals, and cyanide.

3.2.4 Leachate Samples

Two leachate samples were collected on April 26, 1993 from leachate seeps observed along the perimeter of the landfill (Figure 3.1). Sample LC-001 was collected from a seep near the eastern end of the drainage ditch which bisects the site. Sediments at this location were rust stained, and a sheen was observed on the water. Sample LC-002 was collected in the northwest corner of the site from a small leachate seep which discharges into Oatka Creek. A third leachate sample (LC-003) was collected on September 16, 1994 from a leachate seep in close proximity to LC-002. Leachate samples were collected directly into laboratory-supplied bottles and were analyzed for TCL organics, TAL metals, and cyanide.

3.2.5 Geophysical Survey

A geophysical survey (magnetic survey) was conducted by Parsons ES from June 27 to July 6, 1994. The survey was conducted across three areas of the site, where drums were alleged to be buried, to determine optimum locations for test pit excavations (Figure 3.1). A survey grid with lines located on 25-foot centers was established across the three areas covering approximately 7.6 acres (589 survey stations).

The magnetometer survey was conducted with an EG&G Geometrics Model G-856AX portable proton magnetometer in accordance with protocols specified in Section A4 of the Quality Assurance Project Plan (QAPP) (November 1992). The magnetometer readings were tabulated, contoured, and plotted. Contour maps were used to identify locations where drums or buried waste may be located, and to select test pit locations. Interpretation was limited to a qualitative analysis of contoured total magnetic field readings. A brief letter report was prepared and submitted to NYSDEC summarizing the magnetometer survey results. The magnetometer survey results did not indicate the presence of large quantities of buried drums as indicated by the background information.

3.2.6 Test Pit Excavation

Test pit excavation was conducted under Parsons ES supervision by an excavation subcontractor, Rayford Enterprises, Inc., from September 12, 1994 to September 16, 1994 (Buffalo Drilling Company conducted test pit excavations under subcontract to Rayford Enterprises). Test pits were excavated at nine locations (TP-1, TP-2, TP-3, TP-5, TP-6, TP-7, TP-8, TP-9, and TP-10) to address eight areas with high anomalous magnetic readings and one area with a magnetic low. Test pit excavation locations were selected with the concurrence of the NYSDEC Project Manager. Test pit excavations were conducted in accordance with the protocols specified in Section A4 of the QAPP. Test pit depths ranged from 5 to 10 feet with areal coverage ranging from 100 square feet to 300 square feet. Table 3.3 presents a summary of test pit findings.

With the exception of two test pits, wastes encountered during excavation activities consisted primarily of municipal trash and/or construction and demolition (C & D) debris. A flattened drum and a section of a drum were encountered in TP-3. Although drum contents were not visually apparent for sampling, a soil sample was collected from soils underlying the drums (TP-003-003). A drum was also encountered during excavation of TP-10, an optional test pit conducted to identify potential sources of low anomalous magnetic readings identified in Area 3. The drum was encountered during supplemental excavation around the outer perimeter of the test pit in search of potential sources for elevated PID readings (PID readings of 786 ppm were detected during initial excavation; however, no potential sources were identified). The drum was significantly damaged and contained a grey, light-weight material. PID readings exceeded the measurable range of the equipment when the drum material was disturbed. One drum sample was collected and a soil sample was collected from underlying soil. Buffalo Drilling also collected samples to characterize the material for disposal.

The test pit excavation findings were generally characteristic of what would be expected at a municipal landfill.

Excavated soil and drums were staged in an area lined by reinforced plastic and diked to contain any contamination or leakage. Drum openings and soils surrounding buried drums were screened with a PID. The test pits were closed by returning excavated soils to the pits. Suspect materials, including drums and stained soils were placed in overpack drums by the test pit subcontractor.

Level B protection was used for test pit excavation and drum sampling operations as specified in the Health and Safety Plan (HASP). Air monitoring was conducted using a photoionization detector (PID), an explosimeter, and Draeger tubes as described in the HASP.

3.2.7 Test Pit Soil and Drum Sampling

One drum sample (DR-010-001) and three test pit soil (TP-003-003, TP-010-010, and TP-010-003) samples were collected. Soil sample TP-010-010 was collected from soils where elevated PID readings (786 ppm) were encountered. Soil sample TP-010-003 was collected from soils underlying a crushed drum and corresponds with drum sample DR-010-001. Soil sample TP-003-003 was collected from stained soils in the vicinity of drum fragments identified in TP-3.

The drum sample was collected by the excavation subcontractor prior to removal of the drum from the test pit because of the questionable condition of the drum. The drum contents were readily accessible and the sample was collected using a stainless steel spoon. The drum sample was analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides and PCBs, Target Analyte List (TAL) metals and cyanide, corrosivity, ignitability, reactivity, and EP toxicity to determine whether the contents are hazardous waste.

The three test pit soil samples were collected using stainless steel equipment and were analyzed for TCL VOCs, SVOCs, pesticides and PCBs; and TAL metals and cyanide.

The test pit soil and drum samples were combined under one sample delivery group as discussed with the NYSDEC. QC samples were collected at sample location TP003003 and consisted of one duplicate, one matrix spike, and one matrix spike duplicate sample.

3.3 SUBSURFACE ENVIRONMENTAL SAMPLING

3.3.1 Monitoring Wells

Five monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5) were installed around the perimeter of the landfill between March 24, 1993 and March 26, 1993 by SJB Services, Inc. of Buffalo, New York (Figure 3.1). The monitoring wells were installed at locations specified in the Technical Work Plans and as directed by the NYSDEC field personnel. All of the wells are located around the perimeter of the landfill and monitor groundwater quality downgradient of the fill area. Although MW-2 was originally scheduled to be the upgradient well, access restrictions required its relocation to the west side of the run-on diversion ditch. Well MW-1, located on the

southern end of the landfill, penetrated approximately six feet of fill material. The well is screened in sands below a thin layer of clay which underlies the fill.

The monitoring wells were drilled and constructed in accordance with the Technical Work Plans and the QAPP. Split-spoon samples were collected continuously throughout the depth of each well. Monitoring wells were constructed of two-inch inside diameter threaded, PVC flush-joint casing with 0.010-inch slotted screen. The annulus around the outside of the screen was backfilled with clean silica sand with the sand pack extended to at least two feet above the top of the well screen. Bentonite slurry was placed above the sand pack to form a minimum two-foot thick seal. Vented caps and four-inch diameter, steel casing with hinged locking caps were installed over the monitoring wells. The protective casings extend at least two feet above the ground surface and were cemented in place. A summary of well specifications are presented in Table 3.3. Boring logs and schematics are included in Appendix B.

Monitoring wells were developed on April 15 and 16, 1993 using disposable bailers. Wells were developed by removing from 15 to 90 volumes of water from each well. The turbidity remained at greater than 50 NTU after development. The wells were redeveloped on April 19, 1993 using a Grunfos pump. An additional 10 to 30 well volumes of water were removed from each well until a turbidity reading of less than 50 NTU was achieved. Water levels were measured in each well prior to development and prior to sampling.

3.3.2 Subsurface Soil Samples and Grain-Size Analysis

Split spoon samples were collected continuously throughout the depth of each well during drilling. A composite sample from selected intervals of each well was selected for TCL organics, TAL metals, and cyanide analysis (Table 3.4). A duplicate sample was collected from MW-2 and analyzed for TCL organics, TAL metals, and cyanide. MS/MSD samples were collected from MW-3 and analyzed for TCL organics, TAL metals, and cyanide. Analytical results are discussed in Section 4 and analytical data sheets are presented in Appendix C.

One sample from within the 10-foot screened interval of each well was selected from the split spoon samples for grain-size characterization. Geotechnical analysis results are presented in Appendix B.

3.3.3 Groundwater Samples

Groundwater samples were collected from each of the five monitoring wells installed during Task 4 on April 27, 1993. The groundwater samples were collected using dedicated, disposable polyethylene bailers and polypropylene lines. Groundwater samples were collected in accordance with the QAPP and were analyzed for TCL organics, TAL metals, and cyanide. A duplicate sample (GW-006) was collected from GW-002 and was analyzed for TCL organics, TAL metals, and cyanide. MS and MSD samples were also collected from GW-002 and analyzed for TCL organics, TAL metals, and cyanide.

3.3.4 Survey

Surveying and mapping was conducted in accordance with the Technical Work Plans. The control survey was performed by Modi Associates, a New York State-licensed surveyor. Aerial photography and AutoCAD mapping was conducted by TVGA of Lansing, Pennsylvania, under subcontract to Modi Associates.

3.3.5 Data Validation

As requested by NYSDEC, data validation was conducted only on analytical results from subsurface soil samples from the Warsaw site, the first site submitted to the laboratory. Data validation was performed by Parsons ES following guidelines in the most recent USEPA documents adapted to the QA/QC criteria in the NYSDEC ASP and in accordance with the QAPP. Data validation was performed by trained and experienced data validators who meet the NYSDEC approval criteria. The data validation report is presented in Appendix B. Although full data packages were collected for the remaining samples and all of the remaining sites, review of analytical results was limited to sample tracking and contract compliance screening. Usability of nonvalidated data is assumed to be adequate, based on satisfactory results from validation of SDG MW1 because all analysis was conducted by the same laboratory, RECRA, within an approximately 73 day period (with the exception of test pit excavation and drum sampling data). It is assumed that during this period that all quality assurance/quality control protocols were followed in a similar manner and with similar results those for SDG MW1. As directed by NYSDEC, complete data validation was not conducted on the drum, test pit soil, and leachate samples collected during the follow-up field investigation effort conducted in September 1994. However, a limited evaluation of data usability was conducted by Parsons ES to address data concerns as a result of laboratory performance. Results of this evaluation are presented in Attachment A of Appendix B.

3.3.6 Slug Test

Rising and falling head in-situ hydraulic conductivity tests were budgeted as optional tasks, but, as directed by the NYSDEC, were not conducted at the Warsaw Village Landfill site.

3.4 REPORT PREPARATION

3.4.1 Site Assessment

The site assessment subtask included data evaluation and the collection of background data as necessary to complete report documentation.

3.4.2 Report Preparation

This report was prepared to present a summary of background information, results of the field investigation, and recommendations for site reclassification.

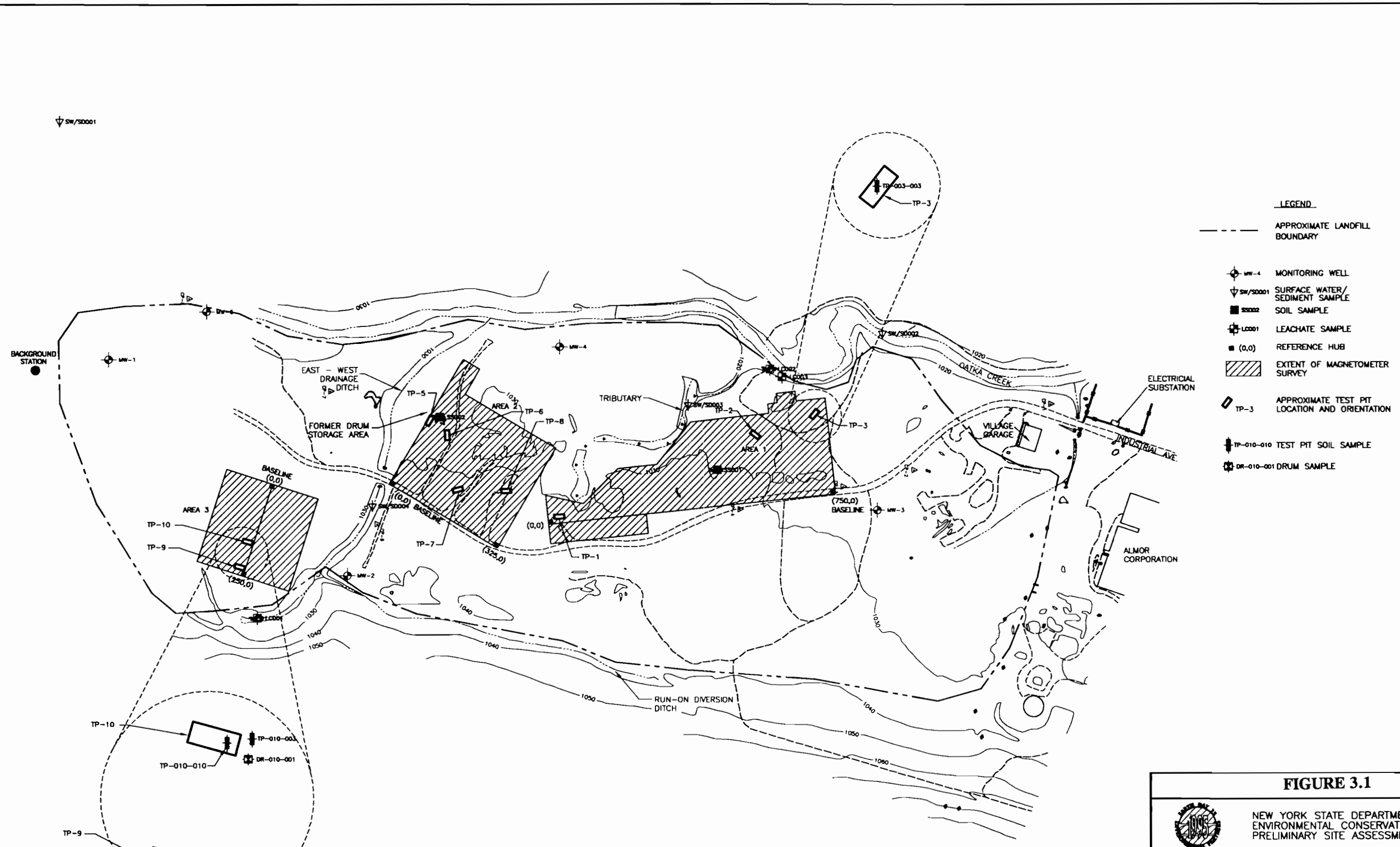


FIGURE 3.1

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE

GEOPHYSICAL SURVEY AREA, TEST PIT AND SAMPLE LOCATION MAP

PARSONS ENGINEERING SCIENCE, INC.
DESIGN • RESEARCH • PLANNING
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OFFICES IN PRINCIPAL CITIES

TABLE 3.1

RECORD SEARCH CONTACTS
WARSAW VILLAGE LANDFILL
WYOMING COUNTY, NEW YORK

Source	Information Provided
NYSDEC - Albany, Carl Hoffman, Project Manager, (518) 457-9538.	Division of Hazardous Waste Remediation site files.
NYSDEC - Latham, Burrell Buffington, New York Natural Heritage Program.	Natural Heritage Program files.
NYSDEC-Region 9, Buffalo, Robert Wozniak, (716) 851-7220.	Limited site background information.
Gerard Miller - Former Village of Warsaw Highway Department Superintendent, (716) 786-3554.	Limited site background operation on landfill operations.
Redford Parhurst - Former Village of Warsaw Department of Sanitation Worker, (716) 786-8454.	Limited site background operation on landfill operations.
Donald Gott - Village of Warsaw resident, (716) 786-8197.	Limited site background information.
Village of Warsaw - Gilbert Stearns/Tom Gebel, Department of Sanitation, (716) 786-2120.	Limited site background information, names of former employees, December 1979 Landfill Closure Plan.
Village of Warsaw - Ms. Eccleston, Village Clerk, (716) 786-2120.	Limited site background information given over the telephone.
Wyoming County Health Department, Owen Eddy, (716) 786-8894.	Regional groundwater flow and Warsaw Village water source.
Wyoming County Clerks Office - Warsaw, (716) 786-8810.	Tax maps and deed information.
Federal Emergency Management Agency, (800) 358-9616	Flood insurance maps.

TABLE 3.2

SUMMARY OF PSA TASKS
WARSAW VILLAGE LANDFILL SITE
WYOMING COUNTY, NEW YORK

Task	Description of Task
Initial Environmental Sampling	
Geophysical Survey	A magnetometer survey was conducted across three areas where background information indicated drum disposal may have occurred.
Test Pit Excavation	Test pit excavation conducted at nine locations to address magnetic anomalies identified by the geophysical survey.
Test Pit Soil and Drum Sampling	Three test pit soil samples and one drum sample were collected. The drum sample was analyzed for TCL organic compound, TAL metals, cyanide, corrosivity, ignitability, reactivity, and EP toxicity. The test pit soil samples were analyzed for TCL organic compounds, TAL metals, and cyanide.
Surface Water Samples	Four surface water samples were collected, including two from Oatka Creek and one each from two tributaries to Oatka Creek. Samples were analyzed for TCL organic compounds, TAL metals, and cyanide.
Sediment Samples	Four sediment samples were collected from the same location as the surface water samples and analyzed for TCL organic compounds, TAL metals, and cyanide.

TABLE 3.2 (CONT.)

SUMMARY OF PSA TASKS
WARSAW VILLAGE LANDFILL SITE
WYOMING COUNTY, NEW YORK

Task	Description of Task
Shallow Soil Samples	Two shallow soil samples, one adjacent to two crushed drums and one from an area where previous overpacked drums were stored, were collected and analyzed for TCL organic compounds, TAL metals, and cyanide.
Leachate Samples	Three leachate samples were collected from seeps along the landfill edge and analyzed for TCL organic compounds, TAL metals, and cyanide.
Subsurface Environmental Sampling	
Monitoring Well Installation	Five monitoring wells were installed around the perimeter of the site. Wells were constructed of 2-inch inside diameter PVC casing with 10 feet of 0.010-inch slotted screen. Wells ranged in depth from 16 to 22 feet.
Subsurface Soil Samples	Split spoon samples were collected continuously from ground surface to the bottom of the monitoring well borings. Five composite subsurface soil samples were collected, one from each monitoring well installed during the PSA. The samples were analyzed for TCL organic compounds, TAL metals, and cyanide. One sample was also collected from the screened portions of each well for grain-size analysis.
Well Development	Well development was conducted using disposable polyethylene bailers and the Grunfos pump. Wells were developed until a turbidity reading of <50 NTU was achieved.

TABLE 3.2 (CONT.)

SUMMARY OF PSA TASKS
WARSAW VILLAGE LANDFILL SITE
WYOMING COUNTY, NEW YORK

Task	Description of Task
Groundwater Samples	Five groundwater samples were collected from the wells installed during Task 4 and analyzed for TCL organic compounds, TAL metals, and cyanide.
Surveying	Monitoring well elevations and locations, and sample locations were surveyed relative to fixed datum. The surveying task included aerial photography and AutoCAD mapping.
Data Validation	Data validation was conducted only on analytical results from subsurface soil samples from the Warsaw Site, the first site submitted to the laboratory. A limited data usability evaluation was conducted on sample results for the test pit excavation and drum sampling effort. Review of other analytical results were limited to sample tracking and contract compliance screening.
Report Preparation	
Site Assessment	A preliminary site contamination assessment was conducted prior to report preparation for evaluation of background data and data from the field investigation.
Report Preparation	A report was prepared containing a summary of background information, field data, and a site assessment.

TABLE 3.3

TEST PIT SUMMARY
WARSAW VILLAGE LANDFILL

TEST PIT ID	FINAL TEST PIT DIM. (LxDxW) (FEET)	DEPTH RANGE (FEET)	MATERIAL DESCRIPTION	TEST PIT COMMENTS	SAMPLES COLLECTED
TP-1	20 x 7.5 x 10	0-3 3-7.5	Compost Large trash, including metal debris, mixed with sand, silt, and gravel	Elevated PID reading from mulch, otherwise PID readings were 0.0 ppm	No samples collected
TP-2	20 x 5 x 5	0-1 1-2 2-5 5	Top soil Sand, silt, and some gravel Sand and silt with municipal trash. Native soil	Brown leachate encountered at 4-5 feet (PID reading of 10 ppm) with slight sheen. Some oil cans and filters observed in municipal trash. Newspaper dated April 3, 1961 found.	No samples collected
TP-3	20 x 7 x 8	0-0.6 0.6-2.4 2.4-6 6-7	Topsoil Sand, silt, and gravel with municipal construction debris (including metal pipes and a drum) mixed in. Sandy soil with municipal trash Natural soils	A flattened drum was encountered at 2-3 feet. A piece of drum was encountered at 3 feet. PID reading was 0.0 ppm and no drum markings were identified.	Soil sample collected from soils under drums.
TP-5	22 x 5.5 x 4	0-3 3-5.5 5.5-6	Demolition debris mixed in with sand, silt, and gravel Sand and silt with increasing gravel and cobble Groundwater encountered.	Rebar identified in demolition debris; PID readings were all 0.0 ppm; groundwater was clear.	No samples collected
TP-6	20 x 6 x 5	0-0.6 0.6-3 3-6	Topsoil Concrete, wood, plastic, and scrap metal mixed with sand, and silt . Municipal trash mixed with sand, silt, and some cobble.	PID readings were all 0.0 ppm; a muffler was observed at 4 feet.	No samples collected

TABLE 3.3

TEST PIT SUMMARY
WARSAW VILLAGE LANDFILL

TEST PIT ID	FINAL TEST PIT DIM. (LxDxW) (FEET)	DEPTH RANGE (FEET)	MATERIAL DESCRIPTION	TEST PIT COMMENTS	SAMPLES COLLECTED
TP-7	20 x 8 x 5	0-0.5 0.5-2 2-7 7-8	Topsoil Small metal debris mixed with sand. C and D debris and municipal trash mixed with sand, silt, and some gravel Sand and silt with some water seepage encountered.	Pieces of drums encountered at 2-3 feet; metal frame encountered at 2-4 feet. PID readings were all at 0.0 ppm.	No samples collected
TP-8	20 x 8 x 5	0-0.6 0.6-3 3-8	Topsoil Small amounts of municipal trash mixed with sand and silt. Wood, metal, and brick debris mixed with sand; some black staining observed; leachate observed.	PID readings all at 0.0 ppm.	No samples collected
TP-9	25 x 8 x 8	0-1 1-3 3-8 8	Topsoil Municipal trash mixed with sand, silt, and gravel. Large pieces of sheet metal encountered at 2 feet. Municipal trash mixed with silt and sand. Native material encountered at 8 feet.	PID readings all at 0.0 ppm; black, coal-like material encountered at 4 feet.	No samples collected
TP-10	25 x 12 x 10	0-1 1-1.8 1.8-12	Topsoil Some C and D debris mixed with sand, silt, and gravel. General municipal trash (including diapers, newspapers, plastic, and metal sheeting) mixed with sand, silt, and gravel.	Elevated PID readings (786 ppm) encountered during excavation but no drums initially found. Drum encountered east of main pit at 2 feet. Drum was filled with grey, light-weight material. PID reading for drum material exceeded 10,000 ppm. No other drums were found in immediate area east of TP-10.	Samples collected from drum and underlying soils at 2-3 feet.

TABLE 3.4

MONITORING WELL LOCATIONS AND SPECIFICATIONS
WARSAW VILLAGE LANDFILL

Well Number	Unit Screened	Location	Top of Screen Depth (ft.)*	Top of Screen Elevation (ft.)**	Bottom of Screen Depth (ft.)*	Bottom of Screen Elevation (ft.)**
MW-1	overburden	edge of landfill	9.0	1025.5	19.0	1015.5
MW-2	overburden	edge of landfill	9.0	1025.1	19.0	1015.1
MW-3	overburden	edge of landfill	5	1022.4	15	1012.4
MW-4	overburden	edge of landfill	5	1019.4	15	1009.5
MW-5	overburden	edge of landfill	7	1025.0	17	1015.0

Note: Overburden consists of varying thicknesses of one or more of the following: clay, silt, sand, and gravel.
Refer to Table 4.1 for stratigraphic summary.

* Depths on feet below ground surface.

** Elevations in feet above Mean Sea Level.

TABLE 3.5

SPLIT–SPOON SAMPLE LOCATIONS
WARSAW VILLAGE LANDFILL

Sample ID	Well Location	Matrix	Depth (ft.)*	Location
MW1	MW–1	Fill / Soil	0–20	edge of landfill
MW2	MW–2	Soil	0–20	edge of landfill
MW3	MW–3	Soil	0–14	edge of landfill
MW4	MW–4	Soil	0–10	edge of landfill
MW5	MW–5	Soil	0–14	edge of landfill

* Depth in feet below ground surface.

SECTION 4

SITE ASSESSMENT

4.1 SITE DESCRIPTION

The Warsaw Village Landfill Site (NYSDEC No. 961006) is an unlined, inactive landfill listed as a Class 2a site on the State Registry of Inactive Hazardous Waste Sites and is under investigation because of reported on-site disposal of drummed leaded paint sludges and plating wastes (NYSDEC, 1984; NYSDEC, 1985; URS, 1990) [1]. The site is an approximately 55-acre parcel located off Industrial Avenue, on the southeast edge of the Village of Warsaw, Wyoming County, New York (Figure 4.1). The landfill is bounded by Oatka Creek to the west; a wooded area, electrical substation, and the village garage to the north; a run-on diversion ditch and the Baltimore and Ohio Railroad tracks on the east; and on the south by the run-on diversion, where it discharges to Oatka Creek (Figure 4.2).

Access to the site is from Industrial Avenue. Although the site does not have perimeter fencing, an access gate on Industrial Avenue restricts vehicular access to the site. A majority of the site is covered with fairly dense vegetation. The northwest portion of the site is being used by the Village of Warsaw as a recycling center for brush, leaves and compost material. A portion of the site is also used for storage of road grading materials. An area in the southern portion of the site near MW-1 is currently used for cultivation of street trees by the Village of Warsaw.

The topography of the site is relatively flat, approximately 8 to 12 feet above the level of Oatka Creek. The eastern edge of the site drops down approximately 15 feet to the run-on diversion ditch. Trash and portions of discarded appliances were observed protruding through the surface along the eastern slope of the landfill. A sheen was noted on the water in the run-on diversion ditch. A small tributary to Oatka Creek is located along the west border of the site. The tributary appears to originate near the center of the site and discharges into Oatka Creek. The land surface slopes down approximately 15 feet into an east-west trending drainage ditch which bisects the site.

A snow fence surrounds an area formerly used to store two overpacked drums. The overpacked drums have been removed and reportedly disposed off-site; however, two crushed drums were found during the PSA sampling effort, just north of the fenced area. The drums were corroded with no labels visible. There are no other structures present on-site.

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1 The identification of disposal of drummed leaded paint wastes on site was determined from results of the Community Right-To-Know Survey conducted by the NYSDEC in 1985. The Community Right-To-Know Survey was an industrial chemical survey conducted to study hazardous waste disposal practices by industries operating in New York State from 1952, and to inform citizens and local authorities of any danger from chemical dumps.

4.2 SITE HISTORY

The Warsaw Village Landfill Site is an inactive, unlined, 55-acre landfill that is currently owned by the Village of Warsaw (URS, 1990). The present site is a compilation of originally smaller parcels that the Village acquired in stages between 1943 and 1959. The Village of Warsaw operated the landfill from 1959 to 1974. In addition to municipal waste from the village, the site also reportedly received approximately 210 tons of drummed leaded paint sludge (D008) from Almor Corporation and drums of metal hydroxide waste, plating waste, plastic timers, and solvents from Mallory Timers (NYSDEC, 1978; NYSDEC, 1984; NYSDEC, 1985; URS, 1990; Parsons ES, 1993e)[2]. The disposal of lead-containing paint sludges was identified in the 1985 Community Right-To-Know Survey. Almor Corporation operates two facilities; one located on the corner of Allan Street and Main Street, and another located directly north of the site. Almor manufacturers retail display counters and shelving. Mallory Timers manufactured timers for household appliances. Mallory Timers is no longer operating in Warsaw. Their facility was reportedly located north of the site, where Almor is currently located (Parsons ES, 1993d). Background information indicates that wastes disposed by Mallory Timer were initially contained in drums (Parsons ES, 1993c). Mallory reportedly had a gate key and continued to dispose of waste at the site after landfilling operations had ceased, including chemicals which were dumped prior to the plants closure in an effort to "clean house" (URS 1990). Tankers were also reportedly emptied approximately 200 to 300 yards north of the landfill. However, a recent investigation by NYSDEC did not identify any wastes from the reported tank dumping activities (Parsons ES, 1993a).

Landfilling at the site consisted of filling low areas with little, if any, excavation performed because of the high water table (Parsons ES, 1993c). Limited background information indicates that landfilling was conducted from the central access road outward. Although there appears to be conflicting information on drum disposal at the site, reported drum disposal areas are shown on Figure 4.3 (Gott, no date(a); Parsons ES, 1993b; Parsons ES, 1993c). On-site burning was reportedly limited to scrap wood, with all other materials buried. At least two uncontrolled scrap wood fires were reported to have occurred in the 1960's (Parsons ES, 1993b; Parsons ES, 1993c). Access to the site has reportedly always been restricted by a locked gate at night (Parsons ES, 1993c). However, the landfill was reportedly open during the day without supervision.

Parsons ES conducted telephone interviews with several persons familiar with the history of the landfill operations as part of the supplemental background information search. A former Highway Department Superintendent (1972 to 1988) indicated that "a couple" of drums of unknown material were disposed on site by Mallory Timer (Parsons ES, 1993b). However, the Highway Superintendent did not recall Almor disposing of drums on site. A former sanitation employee (1959 to 1973) recalled only seeing one or two drums on site (Parsons ES, 1993c).

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2 The "Community Right-To-Know Survey" indicates that 30 tons of leaded paint sludge was disposed on site; however, the questionnaire completed by Almor Corporation (the source of information for the survey) indicates 30 tons per year were disposed on site from 1967 to 1974.

Landfill operations ceased in 1974, and no formal closure was done beyond the daily cover. Continued site use included storage/disposal of brush, leaves, grass clipping, road grading materials, street sweepings, and snow by the Village of Warsaw Highway Department (Gott, 1986; NYSDOT, 1986).

In 1979, a closure plan was prepared for the Village by Tallamy, Van Kuren, Gertis and Thielman to correct severe leachate concerns and erosion of Oatka Creek banks. As part of the closure, fifteen soil borings were drilled to determine the cover thickness and extent of fill (Tallamy et. al., 1979). The initial closure effort was completed in 1983, reportedly using state funds available for closure of municipal landfills. The initial closure effort included removal and off-site disposal of exposed refuse and repairs to the silty-loam cover to ensure at least a two foot cover. No documentation was identified confirming whether the initial closure effort was completed to the satisfaction of the NYSDEC.

A second closure effort was conducted starting in 1986 to address continued leachate outbreaks. Two soil samples and three leachate samples were collected along the east side of the landfill during the investigative portion of the second closure effort. The samples were collected by the NYSDEC and analyzed by Weston Laboratories, Inc. in July 1986 (URS, 1990). Seven metals, including barium at 637 μg/l, and eight SVOCs were detected in the leachate samples. Six metals, including lead at a maximum concentration of 472 mg/kg, ten SVOCs, including di-n-butylphthalate at 4,500 μg/kg, were detected in the soil samples.

Two drums were unearthed in January 1988 during grading of the east-west drainage ditch and site grading as part of the second closure effort (Parsons ES, 1993b; URS, 1990). Two drum samples were collected by NYSDEC and analyzed by Ecology and Environment, Inc. Five VOCs and one SVOC were detected in the drum samples, including total xylenes at 150,000 μg/l. Characteristic testing of the drum materials identified the contents as ignitable. As a result, the site was classified as a Class 2a Inactive Hazardous Waste Site and removed from the municipal landfill closure program. Corrective action following this incident included overpacking of exposed drums, on-site storage, and the eventual off-site disposal by the Village of Warsaw (URS, 1990; NYSDEC, 1992b). Buried drums were also reportedly detected during grading activities approximately 100 yards south of the east-west drainage ditch, along the east side of the landfill (Parsons ES, 1993a).

Groundwater samples were collected by the New York State Department of Health (NYSDOH) in August 1991 from two locations north of the site. Tap water from the Brown residence was analyzed for VOCs, SVOCs, PCBs, and metals. All concentrations detected were "...within ranges that naturally occur in groundwater in New York State and are below the applicable State and Federal groundwater standards. More importantly, none of the contaminants associated with the site were detected." (NYSDOH, 1991a).[3] Similar results were also detected from the Almor Corporation well (NYSDOH, 1991b).

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[3] Iron was detected at 543 ppb, in exceedance of the NYS Water Quality standard of 300 ppb.

Additional contaminants of concern identified by the NYSDEC include trichloroethylene, muriatic acid, electroplating acids, anti-static solvents, thaneldahyde (sic), antifreeze, nitric acid, PCBs, halogenated solvents, degreasing solvent sludges, cyanide, formaldehyde, and heavy metals (URS, 1990).[4] A Phase I investigation of the Warsaw Village Landfill was completed in 1990 by URS Consultants, Inc. The Phase I investigation recommended reclassifying the site as a Class 2 site and conducting additional monitoring of groundwater and surface water, based on the presence of ignitable wastes and potential threat to the environment.

4.3 SITE VICINITY

The Warsaw Village Landfill is located in Oatka Valley within the Appalachian Uplands physiographic province of New York State (USGS, 1974). The Ontario lowlands approach the extreme northeastern corner of the county. The Oatka Valley is the largest valley in Wyoming County, extending from just south of Warsaw to beyond the Genesee County line (north). The topography in the vicinity of the site consists of a fairly level floodplain area extending to the north and south. The valley wall rises abruptly in elevation, to approximately 600 feet above the floodplain floor, less than 0.75 miles east of the site. The elevation continues to increase gradually for approximately six miles to the west of the valley wall. The steep ravines of the valley are a result of postglacial stream cutting. The depth of the stream cutting and the difference in elevation between the valley floors and the surrounding uplands ranges from 300 to 700 feet. The lowest elevation of 627 feet is at a point where the Genesee River leaves the county to the east. The highest elevation is just over 2,100 feet and is near the Allegany County line.

The majority of the county consists of farms, with about two-thirds of the acreage in crops (USGS, 1974). Dairy farming is the dominant type of farming. About one-third of the county is wooded, primarily on steeper soils. Many industries are located within the county. The principle items of manufacture are cutlery, time clocks, knit goods, electronic parts, and various other metal, wood, and plastic parts. The Village of Warsaw is the County Seat.

The Warsaw Village Landfill site is located in a small industrial area on the southeast edge of the Village of Warsaw. Land use in the vicinity of the site consists of relatively rural agricultural areas to the east, south and west. Several residences are located north of the site across Allen Street. A cemetery and several residences are located west of the site. There is prime agricultural land located within 0.25 miles of the site.

With the exception of a narrow area along the banks of Oatka Creek, most of the site is located within flood zone C, classified as an area of minimal flooding (FEMA, 1981). There are no NYSDEC regulated wetlands located within one mile of the site (NYSDEC, 1977a; NYSDEC, 1977b; NYSDEC, 1977c; NYSDEC, 1977d).

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[4] A follow-up search for the original source of this information was only able to identify notes from a phone conversation with Mr. Gott (i.e., no waste disposal documentation was found) (NYSDEC, no date(b)).

However, there are NYSDEC regulated wetlands (CT-4, CT-7, CT-10, WY-5, WY-15, and WY-24) located within three miles east of the site.

4.4 REGIONAL SETTING

4.4.1 Geology

The Warsaw Village Landfill is located in Oatka Valley in the east-central portion of Wyoming County. Wyoming County is located in the Appalachian Uplands, which consist of a plateau that is moderately dissected by streams. The relief is partly the result of the action of glacial ice that entirely covered the county during the last continental glaciation and partly to postglacial stream cutting. The site vicinity is underlain by unconsolidated alluvial and glacial sediments which overly Middle to Upper Devonian bedrock (USGS, 1974).

Bedrock underlying the site consists mainly of the Upper Devonian age West Falls group. The West Falls group consists of interbedded sandstone, siltstone, and shale. The bedrock is essentially horizontal, dipping gently to the south at approximately 60 feet per mile. Bedrock was not encountered in the borings at the site but is estimated to be at a depth of up to 100 feet below the site (URS, 1990).

Unconsolidated sediments overlying the bedrock consist of Pleistocene Age glacial till, proglacial fluvial deposits, and proglacial lacustrine sediments (USGS, 1974). The glacial till is predominantly grayish brown in color and consists of material derived by glacial scouring of the middle and upper Devonian bedrock. The proglacial fluvial deposits consist of stratified sand and gravel laid down by glacial meltwater. Glacial lakes were formed as meltwaters trapped between the ice to the north and the higher areas to the south. Proglacial lacustrine sediments consisting of silt and clay settled out in the glacial lakes. Postglacial deposits in the region consist of recent alluvium along existing streams.

4.4.2 Hydrogeology

Drinking water to most residents outside the Village of Warsaw is supplied by private wells. Wells are typically screened in the Pleistocene sand and gravel (URS, 1990). A number of overburden and some bedrock wells (presumably private) are located over one mile east and west of the site along Route 20. Regional information indicates that yields from wells tapping sand and gravel aquifers typically range from 50 to 100 gallons per minute (Kammerer and Hobba, 1986). Maximum dependable aquifer yields from wells in valleys containing such deposits are estimated to range from 0.2 to 5 million gallons per day per lineal mile of aquifer; this includes infiltration of water from the streams in some valleys.

4.4.3 Surface Water Hydrology

The Warsaw Village Landfill is located in Oatka Valley which is located in the Erie-Ontario drainage basin. The northeast-central portion of the basin, where the site is located, drains into Lake Ontario via Oatka Creek, Wiscoy Creek, East Koy Creek, and the Genesee River. Maximum 24-hour rainfall in this region is approximately 2.5 inches, annual precipitation is 40 inches, and net precipitation is approximately 13 inches per year (URS, 1990).

The site is located adjacent to Oatka Creek, which flows along the western border of the site. Oatka Creek flows northward and eventually discharges to the Genesee River (NYSDOH, 1961). The creek drains an area of 215 square miles, composed mainly of farmland and swampy areas. Oatka Creek is a high quality trout stream and a tributary to the lower Genesee River. Background information indicates that the creek has generally been clean from its source to the Village of Warsaw, where knitting wastes, plating wastes, and primary effluent from the village sewage treatment plant have been discharged. The Village of Warsaw obtains its water from Cotton Creek (a tributary to Oatka Creek) located upstream and approximately 4.25 miles southwest (upgradient) of the site (NYSDOH, 1982).

4.5 SITE HYDROGEOLOGY

4.5.1 Geology

Five monitoring wells were installed at the site as part of the PSA field investigation (Figure 4.4). The wells ranged in depth from 16 to 22 feet. A stratigraphic summary of the well boring information from each well is presented in Table 4.1. A map showing geologic cross-section locations is presented as Figure 4.5. Cross-sections A-A' and B-B' showing the site geology are presented as Figures 4.6 and 4.7.

Borings conducted for the closure plan in 1979 penetrated up to 9 feet of fill and refuse underlain by sandy gravel or clayey silt. Subsurface soils encountered in the PSA well borings consist primarily of brown and gray, fine to medium grained sands occasionally interbedded with gravel and thin beds of gray silt and clay. The silt and clay layers are not laterally continuous. As a result, no confining layer or barrier to vertical migration out of the landfill is apparent. Approximately 6 feet of fill was penetrated in the upper section of MW-1, which is located at the southern end of the landfill. The fill consists of black sand, wood, concrete, and red bricks. In MW-3, the sand and gravel from a depth of 6 to 8 feet was coated with a thick black substance. No VOCs were detected using the PID.

Grain size analysis of samples from the screened intervals indicate that the soils consist primarily of sandy silt with clay and some gravel. Grain size characteristics for each sample are summarized on Table 4.2. Based on grain size characteristics, permeabilities of the sediments in the screened intervals are estimated to range from 10^{-5} centimeters/second (cm/sec) for sandy silts to 1 cm/sec for the sand with gravel.

Surface soils on-site are only identified as "dump" due to landfill activities (USGS, 1974). Soils in the immediate vicinity are described as Scio silt loam, Sun silt loam, Fremont channery silt loam, and Alluvial land.

Soils northwest and southwest of the site are classified as Scio silty loam. The Scio series is made up of deep, moderately well drained, medium-textured soils that formed in thick silty deposits of old alluvium or material of eolian origin (wind deposited). They are strongly acid in nonlimed areas. Scio soils have a temporary high water table during spring at a depth of 18 to 24 inches. Permeability is generally moderate in the subsoil and ranges from rapid to slow in the substratum (4.4×10^{-3} to greater than 4.4×10^{-2} cm/s).

Soils along the northern boundary of the site are classified as the Sun series. The Sun series is made up of deep, very poorly drained to poorly drained soils that formed over calcareous glacial till. Sun soils have a seasonally high water table at or near the surface that remains until May or early in June. These soils receive runoff water from adjacent higher soils and are commonly ponded in very wet periods. Permeability is moderate in the surface layer and subsoil and moderately slow or slow in the substratum (less than 4.4×10^{-3} to 1.4×10^{-2} cm/s).

Soils along the east side of the site are classified as the Fremont series. The Fremont series is made up of deep, somewhat poorly drained soils that have a moderately fine textured subsoil. These soils formed in acid glacial till derived mainly from olive-gray silty shale. The soils are strongly acid and have a seasonal high water table within a few inches of the surface in spring and during wet periods. Permeability is moderately slow in the subsoil and slow in the substratum (less than 1.4×10^{-3} to 1.4×10^{-2} cm/s).

Alluvial land is located southwest and south of the site along Oatka Creek and is made up of intermingled soils on deposits of alluvium. The areas are in narrow strips along the smaller streams or as a gravelly soil mass in areas of riverwash. Alluvial land is subject to stream cutting and erosion that shift the soil material from one place to another downstream. Soil drainage, texture, and the content of fragments vary widely within a short distance. Permeability is variable.

4.5.2 Hydrogeology

Five groundwater monitoring wells were installed during the 1993 investigation at the Warsaw Village Landfill site to determine groundwater flow directions and to assess the groundwater quality upgradient and downgradient of the landfill. A contour map of water level elevations measured April 27, 1993, is shown on Figure 4.8. Monitoring well construction data and water level data are presented in Table 4.3.

Groundwater at the site occurs in unconsolidated sands at depths between 3 and 5 feet below the ground surface. Groundwater levels were measured on three dates following well installation. Water level data suggest that shallow groundwater flows predominantly to the west and discharges to Oatka Creek. However, topographic features of the landfill and the surrounding drainage ditch most likely result in a localized radial flow. As a result, all of the wells appear to be located downgradient of the landfill.

4.5.3 Surface Water Hydrology

Surface water in the vicinity of the site, as well as on-site, flows towards Oatka Creek. A small tributary to Oatka Creek, along the west-central edge of the landfill appears to originate near the center of the landfill. Sediments in the tributary were rust stained and a sheen was noted on the water. A run-on diversion ditch borders the east and south edge of the landfill. The ditch drains into Oatka Creek southwest of the site. Oatka Creek, from the south side of the Village of Warsaw to the North Gainesville water supply intake (south and upstream of the site), is a Class C(t) water body. Class C(t) water bodies are suitable for fishing, fish propagation, and primary and secondary

contact recreation (NYSDEC, 1985). Oatka Creek is considered a high quality trout stream.

4.6 SITE CONTAMINATION ASSESSMENT

The following subsections summarize the results of Tasks 3 (Initial Environmental Sampling) and 4 (Subsurface Environmental Sampling). When possible, samples were collected upgradient of the site to establish ambient or background conditions. These levels were compared to those found on-site, downstream, or downgradient of the site. Concentrations downstream or downgradient of the site in excess of three times the upgradient or upstream concentrations may indicate a release from an on-site contaminant source. This criterion is generally recognized by the USEPA and the NYSDEC as constituting a "significantly higher" concentration for purposes of scoring an HRS observed release for a particular pathway.

Downgradient or downstream results may also be used to determine the threat posed by hazardous waste on-site to the public health and environment. Extraction Procedure Toxicity (EP Tox), corrosivity, ignitability, and reactivity testing was also conducted where deemed appropriate to address visible, or otherwise suspected, on-site contamination for confirmation of on-site hazardous waste. Where appropriate, aqueous analytical results have been compared to applicable NYSDEC ambient water quality and guidance values (NYSDEC, 1991a). Inorganic soil and sediment samples have been compared to published naturally-occurring ranges in New York State (NYSDEC, 1991b). VOC, SVOC, PCB, and pesticide analytical results have been compared to USEPA Health-Based Standards.

The sample results from one Sample Delivery Group (Warsaw SDG MW1) were validated and reviewed for usability with respect to the requirements as stated in the NYSDEC Analytical Services Protocol (ASP) dated December 1991 and the following USEPA publications: "Laboratory Data Validation: Functional Guidelines for Evaluating Organic Analyses", February 1988; "Laboratory Data Validation: Functional Guidelines for Evaluating Inorganics Analyses", July 1988; "National Functional Guidelines for Organic Data Review," Draft Edition, June 1991; and "National Functional Guidelines for PCB/Pesticides Data Review," Draft Edition, June 1991.

Complete data validation was conducted only on subsurface soil analytical data (SDG MW1) from the Warsaw Village Landfill Site. As directed by the NYSDEC, quality assurance review of all other data from the site (as well as the five other sites under this work assignment) was limited to sample tracking and contract compliance screening. However, a limited evaluation of data usability was conducted by Parsons ES to address data concerns (as a result of laboratory performance) with laboratory deliverables for the test pit excavation and drum sampling effort. Results of this evaluation are presented in Attachment B.1 of Appendix B.

Usability of nonvalidated data is assumed to be adequate, based on satisfactory results from validation of SDG MW1 because all analysis was conducted by the same laboratory, RECRA, within an approximately 73-day period (with the exception of the test pit soil, drum, and leachate samples collected during the follow-up field

investigation effort conducted in September 1994). It is assumed that during the initial sampling period that all quality assurance/quality control protocols were followed in a similar manner and with results similar to those for SDG MW1.

The analytical laboratory for this project was RECRA Environmental, Inc. of Amherst, New York. The laboratory is certified by the New York State Department of Health under the Environmental Laboratory Approval Program to perform analyses in accordance with the NYSDEC ASP, dated December 1991.

Data package SDG MW1 was paginated, complete, and overall data were of good quality. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report (Appendix B). All samples were properly preserved and shipped under proper COC procedures.

Summaries of the problems concerning the laboratory analyses, the qualifications resulting from the data validation procedures, and statements on the laboratory analytical precision, accuracy, representativeness, comparability, and completeness (PARCC) are given for each analytical method in Appendix B, Section 1.3.1 through 1.3.4. According to the definition of completeness in the LQAP, analysis for VOCs, SVOCs, PCBs, pesticides, metals, and cyanide were 100% complete. Data are valid and usable within listed qualifiers on the Form 1 data summaries contained in Appendix B.

With the exception of data validation conducted on SDG MW-1, analytical results presented in this section have been assessed by reviewing the sample holding times and evaluating laboratory blank samples. Violations of holding times are identified in the data summary tables and values are considered estimated values, likely to be biased low. In most cases concentrations in field samples less than five times blank sample concentrations were considered to be attributable to laboratory contamination and were identified as such. For common laboratory contaminants (methylene chloride, acetone, toluene, 2-butanone, and common phthalate esters) the criterion used was ten times the blank sample concentrations.

A summary of detected analytes is presented in Tables 4.4 through 4.11. Complete analytical results are presented in Appendix D.

4.6.1 Surface Soil Samples

Two surface soil samples were collected, one adjacent to a gravel pile and two crushed drums, and one from an area where two overpacked drums were reportedly stored previously. Surface soil samples were analyzed for TCL organic compounds, TAL metals and cyanide. Analytical results are summarized in Table 4.4.

VOC's

Three VOCs, methylene chloride, acetone, and 2-butanone, were detected in the surface soil samples. The presence of these compounds is suspect because they were also detected in the trip blank that accompanied the sample to the laboratory and are common laboratory contaminants.

SVOC's

Twenty-two semi-volatile organic compounds (SVOCs) were detected in both of the surface soil samples. SVOCs consisted of 3 phthalates, 17 polynuclear aromatic hydrocarbons (PAHs), dibenzofuran, and carbazole. No phenols were detected in the surface soil samples. The maximum SVOC concentration was 3,500 μg/kg for fluoranthene. There is generally good agreement between results for sample SS-002 and SS-002DUP. Three PAHs (benzo(a)anthracene at 2,000 μg/kg, benzo(a)pyrene at 2,000 μg/kg, and dibenzo(a,h)anthracene at 800 μg/kg) exceeded the applicable USEPA health-based guidance values. Possible sources for the PAHs in the surface soil samples may be the reported on-site fires or atmospheric deposition.

Seven of the detected SVOCs are potential listed hazardous wastes including five PAHs and two phthalates. The presence of these listed SVOCs on-site does not establish the presence of hazardous waste at the site because they cannot be attributed to documented disposal or use on-site as required by Part 371.

Although naphthalene was detected in both the surface soil samples and the overpacked drums removed in 1988, the source of contamination is not documented in a form that confirms hazardous waste as defined in 6NYCRR, Part 371.4(d).

Pesticides

Nine pesticides were detected at estimated concentrations below the quantitation limits in the surface soil samples. None of the pesticides exceeded the applicable USEPA health-based guidance values. Two of these pesticides, heptachlor and endosulfan II, were also detected in subsurface soil sample MW-2. A potential source of the pesticides may be agricultural activities in the vicinity of the site.

Although six of the pesticides are potential listed hazardous wastes, the presence of these listed SVOCs on-site does not establish the presence of hazardous waste at the site because they cannot be attributed to documented disposal or use on-site as required by Part 371.

PCBs

No PCBs were detected in surface soil samples.

Inorganics

Seventeen metals and cyanide were detected in the surface soil samples. With the exception of mercury, the metals concentrations were within the published naturally occurring ranges. The concentration of mercury (0.52 mg/kg) only slightly exceeded the published naturally occurring range (0.02 mg/kg to 0.5 mg/kg) in sample SS-001. Cyanide was detected at a low concentration of 1.5 mg/kg in sample SS-001.

Concentrations of detected metals were generally consistent with those detected in the subsurface soil samples. The concentration of lead in the surface soil samples was approximately three times higher than in the subsurface soil samples. These results are consistent with results of previous soil samples collected in 1986 and may be at least partially attributable to atmospheric deposition. Although mercury was only slightly above the naturally-occurring range, potential sources include agricultural activities (including use of lime, fertilizer, and fungicides) and on-site disposal of electrical

switches (Mallory Timer) and batteries (ATSDR, 1992). Heavy metals and cyanide were included in the list of wastes reportedly disposed of in the landfill (NYSDEC, 1986). Potential anthropogenic sources for the low detection of cyanide include stored road salt adjacent to the site (anti-caking ingredient), pesticide use in adjacent farm areas, and on-site disposal of cyanide wastes (NYSDEC, 1986; ATSDR, 1991).

4.6.2 Surface Water Samples

Four surface water samples were collected from Oatka Creek and its tributaries and analyzed for TCL organics, TAL metals, and cyanide. Sample SW-001 is considered the upstream sample and sample SW-002 is considered the downstream sample. Samples SW-003 and SW-004 were collected from the on-site tributary and the east-west drainage ditch, respectively. Analytical results are summarized in Table 4.5.

VOC's

Four VOCs were detected in the surface water samples. The presence of methylene chloride, acetone, and 2-butanone is suspect because they were also detected in the laboratory blank samples and are common laboratory contaminants. Carbon disulfide was detected below the quantitation limit at an estimated concentration of 3 μg/l in sample SW-003 from the rust stained tributary. In addition to industrial generation, carbon disulfide is a common product of biodegradation in municipal landfills (ATSDR, 1990).

SVOC's

No SVOCs were detected in the surface water samples. Nineteen semi-volatile tentatively identified compounds (TICs) were detected in surface water sample SW-003. Most of these consisted of unknown compounds. The maximum estimated concentration was 80 μg/l. No TICs were detected in the other surface water samples.

Pesticides

One pesticide, delta-BHC, was detected in sample SW-003 at a concentration of 0.31 μg/l. No pesticides were detected in the other samples, including the upgradient sample. This indicates that delta-BHC may be potentially released from the site, although delta-BHC was not detected in the subsurface or surface soil samples on-site. A potential source of the pesticide may be the on-site nursery or the use of pesticides in nearby farmland.

PCBs

No PCBs were detected in surface water samples.

Inorganics

Ten metals and cyanide were detected in the surface water samples. Aluminum and iron were detected in all four samples at concentrations exceeding the Class C surface water standards. Barium, calcium, iron, manganese, potassium and zinc were detected in SW-003 (on-site) at concentrations exceeding three times the upstream sample. This indicates the landfill is the source these metals.

Cyanide was detected in one surface soil sample, and in the downstream sample at 17.1 μg/l, SW-002, at a concentration exceeding the applicable surface water standard

of 5.2 μg/l. Cyanide was not detected in the upstream sample, indicating that it was potentially released from the site. Cyanide was included in the list of wastes reportedly disposed in the landfill (NYSDEC, 1986). Potential anthropogenic sources for the cyanide exceedance include stored road salt adjacent to the site (anti-caking ingredient), pesticide use in adjacent farm areas, and on-site disposal of cyanide wastes (ATSDR, 1991).

4.6.3 Sediment Samples

Four sediment samples were collected from the same locations as the surface water samples and analyzed for TCL organics, TAL metals, and cyanide. Sample SD-001 was collected upstream of the site and is considered the background sample. Analytical results are summarized in Table 4.6.

VOC's

Four VOCs, methylene chloride, acetone, 2-butanone, and benzene were detected in the sediment samples. The presence of methylene chloride, acetone, and 2-butanone is suspect because they were also detected in the laboratory blank samples and are common laboratory contaminants. Benzene was detected at 3 μg/kg, below the quantitation limit, in the background sample, and in samples from the on-site tributary (3 μg/kg) and the east-west drainage ditch (4 μg/kg). Benzene was not detected in the downstream sample SD-002. Benzene was not detected in the surface water or on-site soil samples; however, ethylbenzene and xylenes were detected in the waste sample from the overpacked drums sampled during the 1994 test pit excavation and drum sampling effort.

SVOC's

Fifteen SVOCs, including two phthalates, 12 PAHs, and carbazole, were detected in the sediment samples. Highest concentrations were detected in sample SD-003 from the on-site tributary. The concentrations of benzo(a)anthracene (300 μg/kg) and benzo(a)pyrene (220 μg/kg) in sample SD-004, and benzo(a)pyrene (270 μg/kg) in sample SD-003, exceeded the applicable USEPA health-based guidance values.

Twelve SVOCs, primarily in sample SD-004, were detected at concentrations exceeding three times the background sample or were not detected in the background sample. This indicates that they were potentially released to the east-west drainage ditch. Similar SVOCs were also detected in the on-site surface and subsurface soil samples.

Six of the detected SVOCs are potential listed hazardous wastes including four PAHs and two phthalates. The presence of these listed SVOCs on-site does not establish the presence of hazardous waste at the site because: (1) they cannot be attributed to the disposal of a commercial chemical product and (2) they cannot be attributed to documented disposal or use on-site as required by Part 371.4.

Pesticides

Five pesticides were detected at estimated concentrations below the quantitation limits in the sediment samples. None of the pesticides exceeded the applicable USEPA health-based guidance values. Two pesticides, 4,4'-DDE and 4,4'-DDT were detected

in the background sample. Endosulfan II and endrin ketone were detected in SD-004, and 4,4'-DDD was detected in SD-003, but were not detected in the background sample. This indicates that they may be potentially released from the site.

All five pesticides were also detected in the on-site surface soil samples. The presence of pesticides in the background sample may be attributable to use of pesticides on farmland in the vicinity of the site. A local source of pesticides on-site may be the nursery located on the southern portion of the site.

PCBs

No PCBs were detected in sediment samples.

Inorganics

Fifteen metals and cyanide were detected in the sediment samples. Eight metals, in sample SD-003, were detected at concentrations exceeding three times the background sample indicating a potential release to the small tributary. The surface water sample from this same location also indicated a potential release of these same metals. None of the metals concentrations exceeded the published naturally occurring range.

Cyanide was detected at a concentration of 2.9 mg/kg in the downstream sample SD-002. Cyanide was also detected in the surface water sample from this location and in on-site surface soil sample SS-001, but not in the other sediment samples indicating a potential release attributable to the site. Cyanide is included in the list of wastes reportedly disposed of in the landfill and is a potential listed hazardous waste (NYSDEC, 1986).

4.6.4 Leachate Samples

Two leachate samples were collected from leachate seeps observed along the perimeter of the landfill and analyzed for TCL organics, TAL metals, and cyanide. Analytical results are summarized in Table 4.7.

VOC's

Four VOCs were detected in the leachate samples. No volatile organic TICs were detected. The presence of methylene chloride, acetone, and 2-butanone is suspect because they were also detected in the laboratory blank samples and are common laboratory contaminants. Carbon disulfide was detected at a concentration of 54 μg/l in sample LC-001. No applicable surface water standard exists for this compound. In addition to industrial generation, carbon disulfide is a common product of biodegradation in municipal landfills (ATSDR, 1990).

SVOC's

Di-n-butyl phthalate was the only SVOC detected in the leachate samples (detected at 0.5 μg/l). Six semi-volatile organic TICs were detected in sample LC-001. These consisted of organic acids and unknown hydrocarbons. The maximum estimated concentration was 44 μg/l. No TICs were detected in sample LC-002.

Pesticides

Two pesticides, delta-BHC and lindane, were detected in leachate sample LC-001. No pesticides were detected in sample LC-002. No applicable surface water standards exist for these compounds. Potential sources include agricultural activities in the vicinity of the site and on-site disposal of pesticide containers (both household and farm waste).

PCBs

No PCBs were detected in leachate samples.

Inorganics

Thirteen metals were detected in the leachate samples. Five metals, including aluminum (5,930 μg/l), copper (30 μg/l), iron (261,000 μg/l), lead (11.3 μg/l) and zinc (494 μg/l), were detected in sample LC-001 at concentrations exceeding the Class C (aquatic) surface water standards. Iron was detected at a concentration above the Class C surface water standard in sample LC-002. Potential sources for the metal exceedances include on-site municipal wastes (i.e., scrap metal). The elevated lead concentration may be attributable to the Community Right-To-Know Survey data indicating 210 tons of drummed leaded paint wastes were disposed on site by Almor Corporation (NYSDEC, 1985; URS, 1990).

4.6.5 Subsurface Soil Samples

A total of five subsurface soil samples were collected from the five monitoring well borings. Samples were analyzed for TCL organics, TAL metals and cyanide. The wells are primarily located around the perimeter of the landfill with no background locations because of access restrictions. Analytical results are summarized in Table 4.8.

VOC's

Acetone was detected in the initial analyses of sample MW-2 and MW-2DUP, the duplicate sample, but was not detected in the re-analyses. The presence of acetone is suspect because it is a common laboratory contaminant. Toluene was detected below the laboratory's quantitation limit in sample MW-3 at an estimated concentration of 3 μg/kg. Although no documentation was identified specifically identifying disposal of toluene on-site, waste samples from the drums removed from the site had toluene detected at 32,000 μg/l (URS, 1990). However, the concentration was flagged with a "B" indicating blank contamination was also detected.

SVOC's

Twenty-five SVOCs were detected in the subsurface soil samples. The SVOCs detected include four phenols, three phthalates, 16 PAHs, dibenzofuran, and carbazole. The SVOCs were primarily detected in samples MW-2 and MW-2DUP. Two to four SVOCs were detected in each of the other four samples.

Twenty SVOC TICs were detected in the subsurface soil samples, consisting primarily of unknown hydrocarbon compounds. The maximum estimated concentration was 4,200 μg/kg.

Highest SVOC concentrations were detected in samples MW-2 and MW-2DUP. The concentrations in sample MW-2DUP were an order of magnitude higher than those in MW-2. This may indicate that the samples were not completely homogenized prior to placing them in the sample bottles. Two PAHs, benzo(a)anthracene and benzo(a)pyrene, in samples MW-2 and MW-2DUP exceeded the applicable USEPA health-based guidance values.

Potential PAH sources include natural and anthropogenic sources, including incomplete combustion of organic compounds. The presence of PAHs may be attributable to the on-site burning of scrap wood or the reported on-site fires. Naphthalene, which was detected in MW-2 and is a potential listed hazardous waste, was also detected in the waste sample from one of the overpacked drums sampled in 1988. Although naphthalene was detected in the subsurface soil sample, the source of contamination is not documented in a form that confirms the presence of hazardous waste as defined in 6NYCRR, Part 371.4(d).

Nine of the detected SVOCs are potential listed hazardous wastes including two phenols, five PAHs and two phthalates. The presence of these listed SVOCs on-site does not establish the presence of hazardous waste at the site because: (1) they cannot be attributed to the disposal of a commercial chemical product and (2) they cannot be attributed to documented disposal or use on-site as required by Part 371.4.

Pesticides

Five pesticides were detected below the quantitation limits at estimated concentrations ranging from 0.24 μg/kg to 2.2 μg/kg in the subsurface soil samples. Pesticides were detected primarily in sample MW-2. Only one pesticide, endosulfan II, was detected at extremely low concentrations in samples MW-1 and MW-4. None of the pesticides exceeded the applicable USEPA health-based guidance values. Possible sources of pesticides may be the use of pesticides on nearby farms or the nursery located at the southern end of the site.

PCBs

No PCBs were detected in subsurface soil samples.

Inorganics

Eighteen metals were detected in the subsurface soil samples. None of the samples exceeded the published naturally-occurring ranges.

4.6.6 Groundwater Samples

Five groundwater samples were collected from the monitoring wells around the perimeter of the landfill. Samples were analyzed for TCL organics, TAL metals, and cyanide. Water level measurements indicate that the wells are all located downgradient of the landfill. Although no upgradient samples were obtained because of access restrictions, groundwater sample results from the Brown residence (north of the site) were used for background comparison to facilitate assessment of potential off-site impacts (WCHD, 1991).

VOC's

Four VOCs, methylene chloride, acetone, carbon disulfide, and 2-butanone, were detected in the groundwater samples at estimated concentrations below the quantitation limits. The presence of methylene chloride is suspect because it was also detected in the laboratory blank sample. Acetone was detected at an estimated concentration below the Class GA groundwater quality standard in one well GW-004. Acetone and 2-butanone are also common laboratory contaminants. Carbon disulfide was not analyzed for at the Brown residence. In addition to industrial generation, carbon disulfide is a common product of biodegradation in municipal landfills (ATSDR, 1990).

SVOC's

One SVOC, bis(2-ethylhexyl)phthalate, was detected in three of the groundwater samples at estimated concentrations below the Class GA groundwater quality standard. Although bis(2-ethylhexyl)phthalate was not detected in the Brown residence sample, the detected on-site concentrations were below the quantitation limit. One semi-volatile TIC, caprolactam, was detected in the groundwater samples at estimated concentrations ranging from 12 to 300 μg/l.

Pesticides

One pesticide, heptachlor, was detected in GW-002 at an estimated concentration of 0.014 μg/l. No pesticides were detected in the duplicate sample from this location. Heptachlor was also detected in the surface water samples and in one subsurface soil sample. Although heptachlor was detected in the Brown residence sample, the quantitation limit was higher than the detected on-site concentrations.

PCBs

Aroclor-1260 was detected above the Class GA groundwater quality standard in GW-002DUP, at an estimated concentration of 0.32 μg/l. PCBs were not detected in the original sample, GW-002, or the other groundwater samples. PCBs were not detected in the Brown residence sample. PCBs were included in the list of wastes reportedly disposed of in the landfill (NYSDEC, 1986).

Inorganics

Sixteen metals were detected in the groundwater samples. Five metals, iron, lead, magnesium, manganese, and zinc were detected at concentrations exceeding the Class GA groundwater quality standards. Highest concentrations of most metals were detected in sample GW-004, located along the western side of the landfill. With the exception of sodium, all on-site inorganic detections exceeded results for the Brown residence sample. Aluminum, barium, calcium, chromium, copper, iron, manganese, nickel potassium, vanadium, and zinc on-site results exceeded the Brown residence results by three or more times. Potential sources for the metal exceedances include on-site municipal waste, general commercial/industrial waste, leaded paint wastes reportedly disposed on-site by Almor Corporation, and metal hydroxide wastes reportedly disposed by Mallory Timer.

4.6.7 Test Pit Soil Samples

A total of three test pit soil samples were collected from the nine test pits. Samples were analyzed for TCL organics, TAL metals, cyanide, reactivity, ignitability, and corrosivity. The test pit soil samples consisted of TP-003-003 collected from test pit TP-3 (collected from the vicinity of crushed drum located at a depth of 3 feet); TP-010-010 collected from test pit TP-10 (collected from soils with an elevated PID reading of 768 ppm); and TP-010-003 collected from TP-10 (collected from the vicinity of a damaged drum located at a depth of 3 feet). Analytical results are summarized in Table 4.10.

VOC's

Seven VOCs were detected in the test pit soil samples. Acetone and 2-butanone were detected in the test pit soil sample from the vicinity of the drum located in TP-10 (TP-010-003) and methylene chloride was detected in the sample from TP-3 (TP-003-003). The presence of all three is considered suspect because they are common laboratory contaminants. Ethylbenzene and toluene were detected at low estimated concentrations (2 μg/kg for both) in sample TP-010-003 and at elevated estimated concentrations (1,400 μg/kg and 650 μg/kg respectively) in sample TP-010-010. Total xylene was detected at 35 μg/kg in sample TP-010-003 and at 5,900 μg/kg in sample TP-010-010. Trichloroethylene was detected at 46 μg/kg in sample TP-003-003.

SVOC's

Twenty-seven SVOCs were detected in the test pit soil samples. The SVOCs detected include three phenols, four phthalates, 18 PAHs, dibenzofuran, and carbazole. A number of unknown hydrocarbon compounds were also detected as tentatively identified compounds.

Exceedances of applicable USEPA health-based guidance values were limited to benzo(a)pyrene and benzo(a)anthracene in samples TP-003-003 and TP-010-003. However, the values were over an order of magnitude lower than subsurface soil samples collected during the 1993 sampling effort.

Twelve of the detected SVOCs are potential listed hazardous wastes. However, the presence of these listed SVOCs on-site does not establish the presence of hazardous waste at the site because: (1) they cannot be attributed to the disposal of a commercial chemical product and (2) they cannot be attributed to documented disposal or use on-site as required by Part 371.4.

Pesticides

4,4-DDD was the only pesticide detected (detected in TP-010-003) and was below the applicable USEPA health-based guidance values. Possible sources may be from the use of pesticides on nearby farms or the nursery located at the southern end of the site.

PCBs

No PCBs were detected in test pit soil samples.

4.6.9 PRESENCE OF HAZARDOUS WASTES

Title 6 of the New York Code of Rules and Regulations (6NYCRR), Part 371 regulations establishes two categories of hazardous wastes: (1) listed hazardous wastes, and (2) characteristic hazardous wastes. Hazardous wastes are judged to have a substantial hazard or significant toxicity associated with them. Four hazardous waste lists have been established:

(1) hazardous waste from nonspecific sources;

(2) hazardous wastes from specific sources;

(3) discarded commercial chemical products, discarded off-specification species, and containers and spill residues thereof; and

(4) wastes containing polychlorinated biphenyls (PCBs).

Listed hazardous wastes are assigned USEPA hazardous waste numbers with the following prefixes: "F" (non-specific sources), "K" (specific sources), "P" (discarded commercial chemical products which are "acute hazardous wastes"), "U" (discarded commercial chemical products which are "toxic hazardous wastes", or "B" (PCB wastes containing at least 50 milligrams of PCBs per kilogram of dry weight solid or milligrams of PCBs per liter of liquid). Characteristic hazardous wastes are identified using analytical methods specified in 6NYCRR, Part 371, and are assigned "D" prefixes.

Previous analytical data collected by the NYSDEC indicate that at least one of the drums stored at the site contained hazardous waste as defined by 6NYCRR, Part 371.3(b) (exhibited characteristic of ignitability). Background information and analytical data indicate industrial wastes have been disposed on site, including potential listed hazardous wastes. However, the presence of these listed compounds on-site does not establish the presence of hazardous waste at the site because: (1) they cannot be directly attributed to specific or non-specific sources as required by 6NYCRR, Part 371.4(b) and (c), and (2) they cannot be directly attributed to the disposal of a "commercial chemical product, manufacturing chemical intermediates, or off-specification commercial chemical products" as required by 6NYCRR, Part 371.4(d). The drum of ignitable waste has been removed and disposed off-site.

Parsons ES anticipates that further work is unlikely to establish the presence of hazardous waste because the PSA investigation has primarily addressed suspected hazardous waste areas identified in the background information.

4.6.10 PRESENCE OF SIGNIFICANT THREAT

The presence of a "significant threat" to public health or the environment, as defined by 6NYCRR, Part 375, may be established by analytical data showing that hazardous substances: (1) have been released to environmental media from hazardous waste disposed at the site, and (2) are present in concentrations exceeding accepted health or environmental standards or guidance values. The criteria used to establish releases is discussed in the introduction to Subsection 4.6.

Inorganics

Nineteen metals were detected in the test pit soil samples. Cadmium was the only metals analyte to exceed the published naturally-occurring range. Although the concentration in TP-003-003 was significantly higher than concentrations detected in subsurface soil samples from the 1993 site investigation, the concentration only slightly exceeded the background range, was detected in the drum sample from TP-10 with an EP Tox concentration significantly below the regulatory limit, and has not been documented as a waste disposed on site.

Reactivity, ignitability, and corrosivity data did not exceed levels for characteristics of hazardous waste.

4.6.8 Drum Sample

One drum sample (DR-010-001) was collected. The sample was analyzed for TCL organics, TAL metals, cyanide, EP Tox, reactivity, ignitability, and reactivity. Analytical results are summarized in Table 4.11.

VOC's

Three VOCs were detected in the drum waste sample. Ethylbenzene and toluene were detected at estimated concentrations (760 μg/kg and 67 μg/kg, respectively). Total xylenes were detected at 35,000 μg/kg. Both ethylbenzene and toluene are common constituents of xylene mixtures.

SVOC's

SVOCs detected in the drum sample included bis(2-ethylhexyl)phthalate (17,000 μg/kg), 2-methylnaphthalene (2,500 μg/kg), napthalene (6,600 μg/kg), pentachlorophenol (1,300 μg/kg), phenanthrene (16 μg/kg), pyrene (52 μg/kg), and 2,4,6-trichlorophenol (390 μg/kg).

Pesticides

No pesticides were detected in the drum waste sample.

PCBs

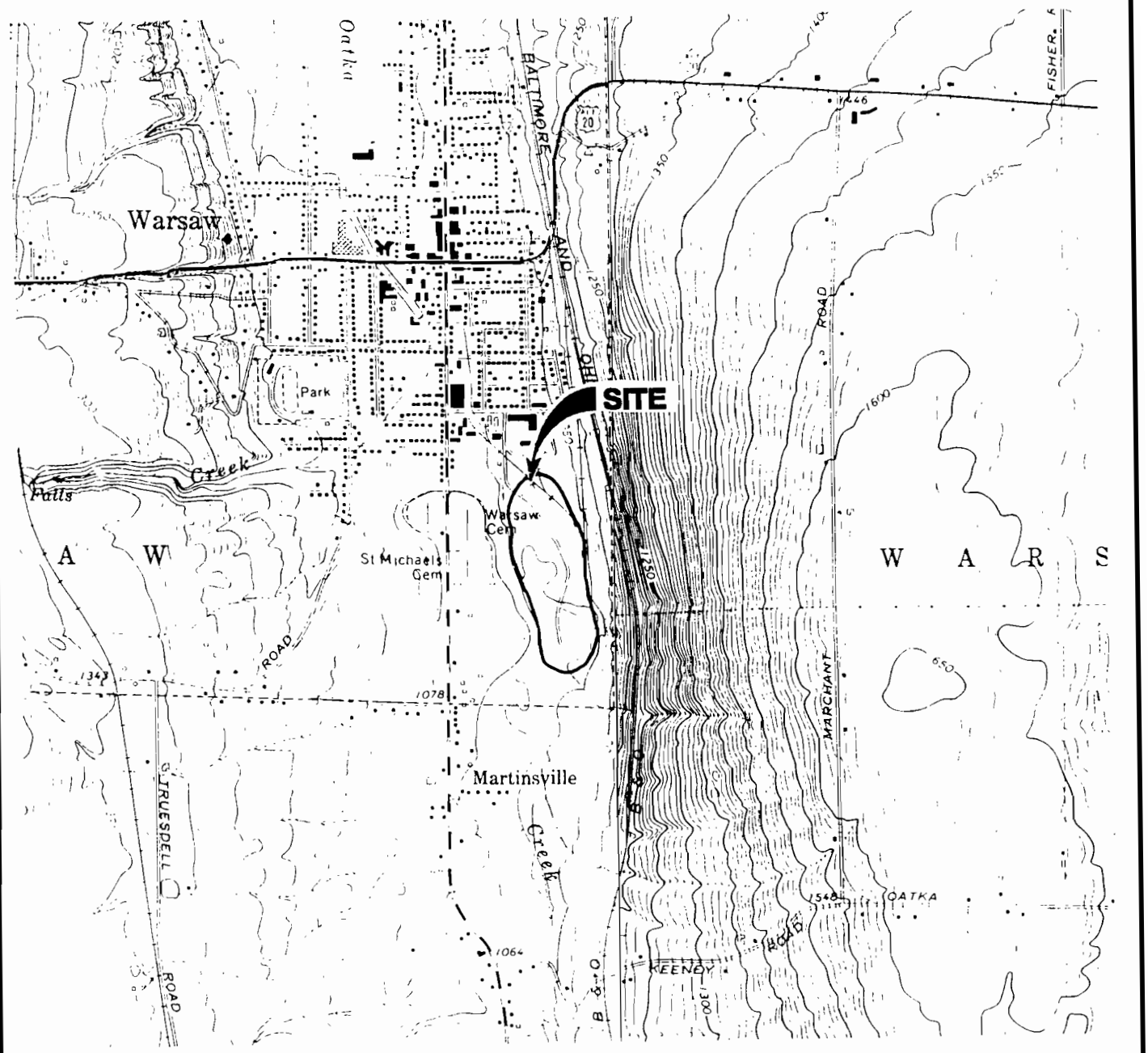
PCB Aroclor 1254 was detected in the drum sample at 8,600 μg/kg, below the level of 50,000 μg/kg for classification as a hazardous waste.

Inorganics

Fourteen metals were detected in the drum sample. Although an elevated total lead concentration was detected at 1,190 mg/kg, the EP Tox concentration for lead was 0.259 mg/kg, significantly below the regulatory concentration of 5 mg/kg.

Concentrations for EP Tox testing and levels for corrosivity, ignitability, and reactivity were all below regulatory limits. Although the value for mercury was rejected based on the data usability evaluation findings (holding time exceedance), the concentration for total mercury was not detectable.

As discussed in Subsection 4.6.9, the presence of hazardous waste at the site was not established. Therefore, significant threat to the environment resulting from the presence of hazardous waste can not be determined. Although, concern may be warranted for exceedances of standards or guidance values as identified in Sections 4.6.1 through 4.6.8, the concentrations in a number of cases only marginally exceeded the applicable regulatory values. In addition, a number of the regulatory values available for use are conservative (i.e. aquatic values applied to surface water and leachate results and USEPA health-based values applied to subsurface soil results).



SOURCE: U.S.G.S. 7.5 MINUTE SERIES TOPOGRAPHIC MAP; WARSAW, N.Y. (1972), CASTILE, N.Y. (1972).

QUADRANGLE LOCATION

N

LONGITUDE: 78° 07' 30"
LATITUDE: 42° 44' 00"

SCALE

0 2000 4000 FT.

2000 FT.

PARSONS ENGINEERING SCIENCE, INC.

SITE LOCATION MAP

WARSAW VILLAGE LANDFILL WARSAW, NEW YORK

H:\GRAPHICS\723800\LOCATION.DS4

LEGEND

APPROXIMATE LANDFILL BOUNDARY

VAL: 2'

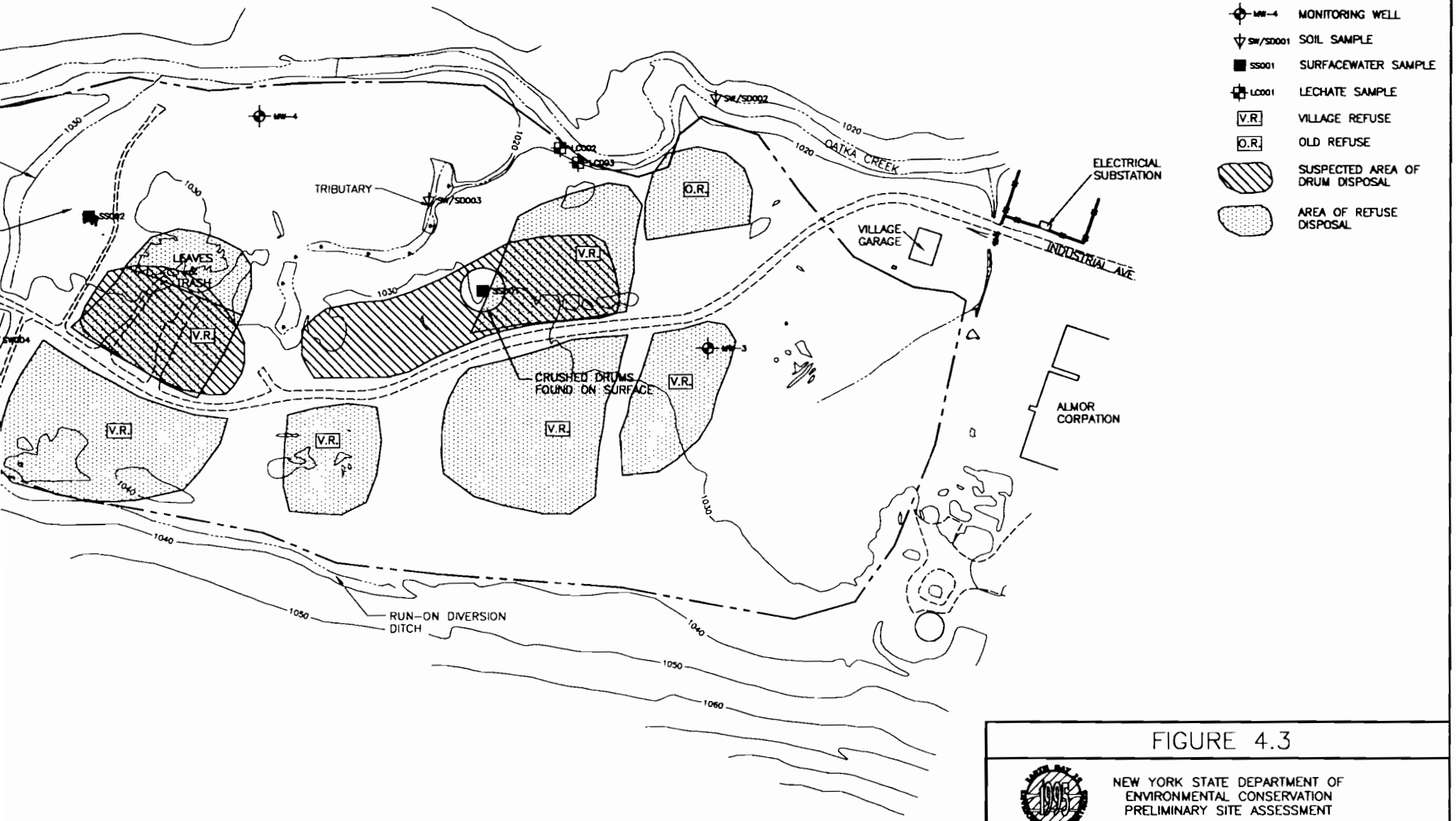
250' 0 250'

FIGURE 4.2

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE

SITE PLAN

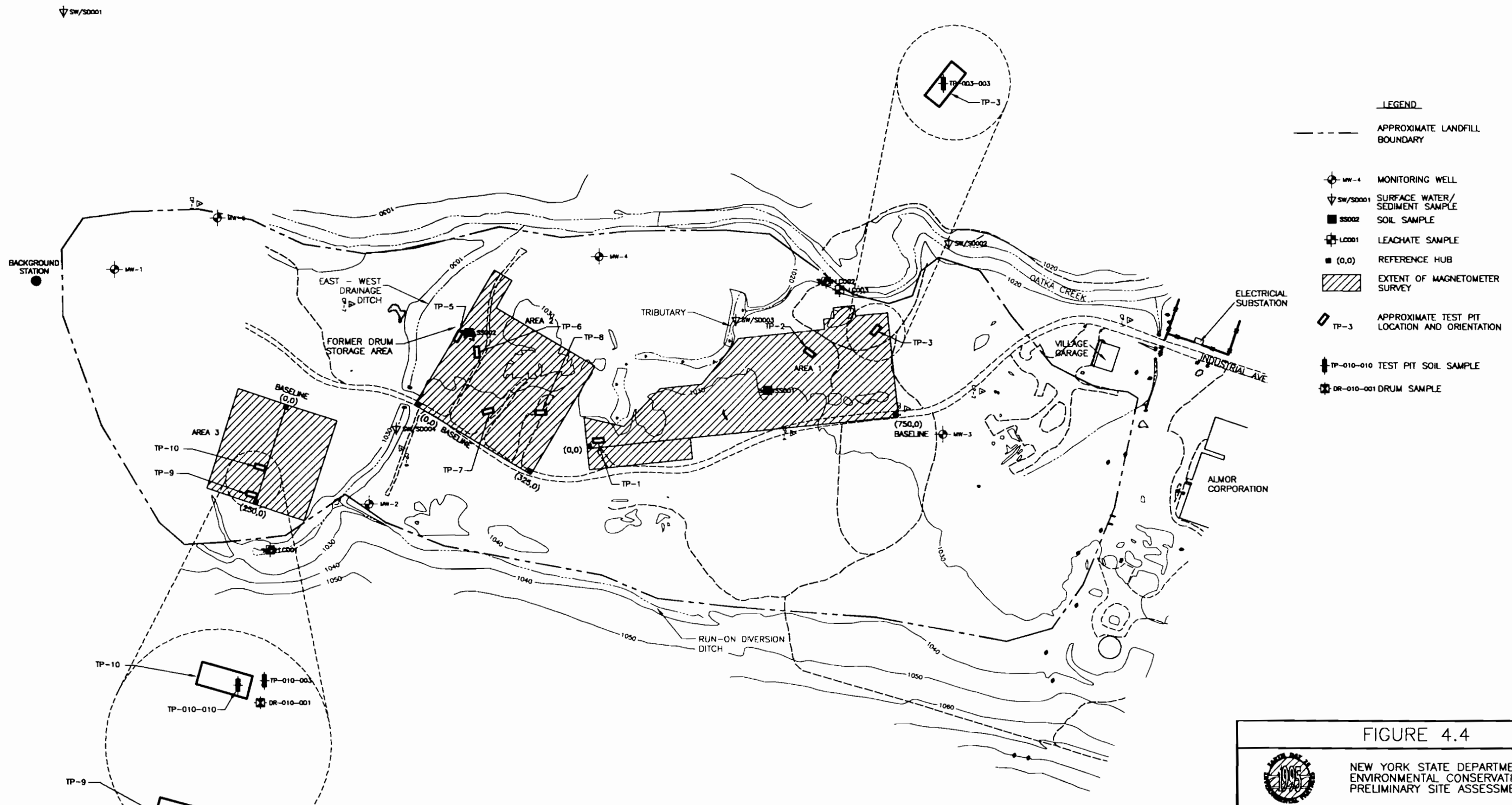


ERVAL: 10'

FIGURE 4.3

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE LANDFILL SITE



CONTOUR INTERVAL: 10'
MAPPING COMPILED BY STEROPHOTOGRAMMETRIC METHODS
FROM 1" = 400' SCALE AERIAL PHOTOGRAPHY FLOWN 05/10/93.
MAPPING COMPILED WITHOUT BENEFIT OF A FIELD EDIT.

DATE: 05/08/95 (SEH) (DIMSCALE 1:100)
H:CAD\723800\23800G03.DWG (MODEL SPACE)

FIGURE 4.4

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE

GEOPHYSICAL SURVEY AREA, TEST PIT AND SAMPLE LOCATION MAP

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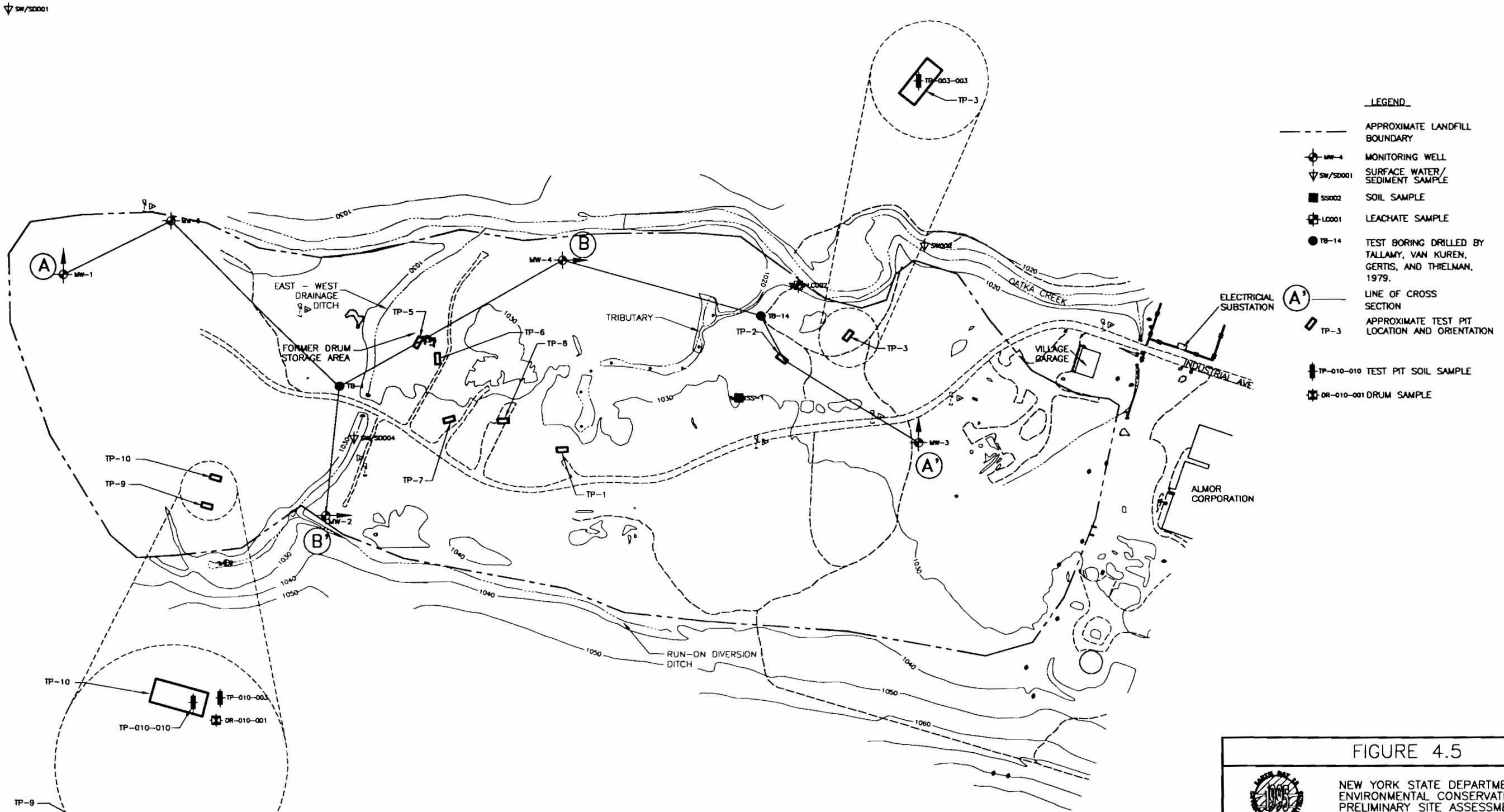

CONTOUR INTERVAL: 10'
MAPPING COMPILED BY STEROPHOTOGRAMMETRIC METHODS FROM 1" = 400' SCALE AERIAL PHOTOGRAPHY FLOWN 05/10/93.
MAPPING COMPILED WITHOUT BENEFIT OF A FIELD EDIT.

DATE: 05/08/95 (SEH) (DIMSCALE 1:100)
H:CAD\723800\23800G04.DWG (MODEL SPACE)

FIGURE 4.5

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE

CROSS SECTION LOCATION

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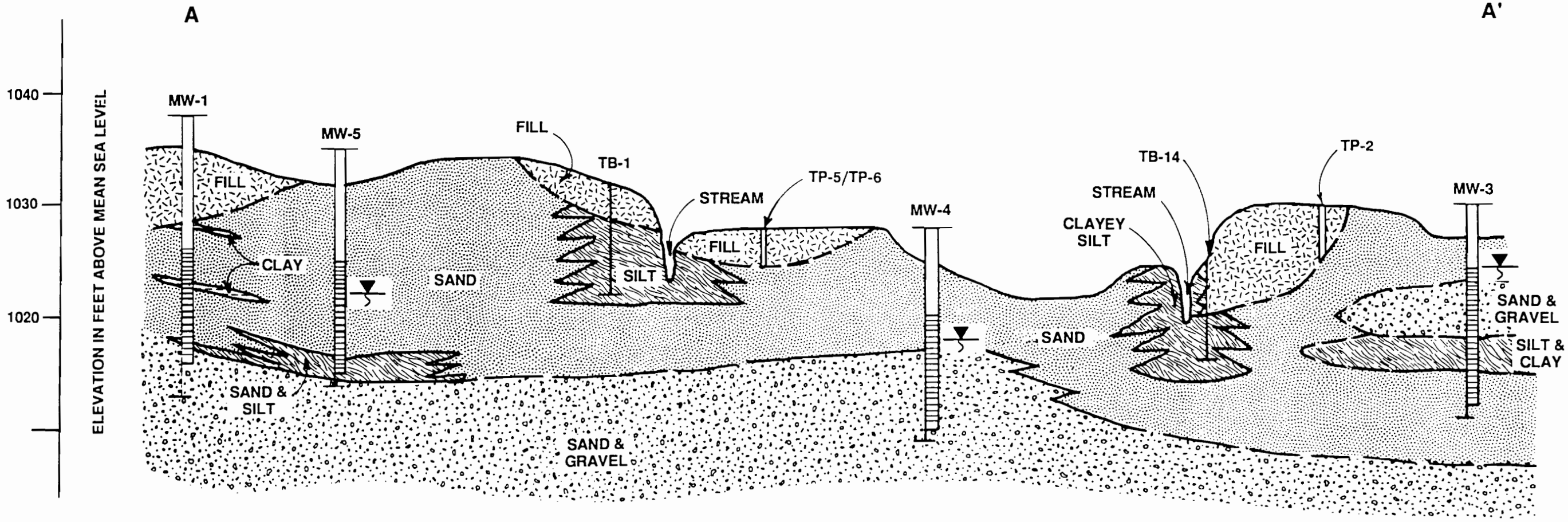
SOUTH
A

NORTH
A'



LEGEND

———	INFERRED STRATIGRAPHIC BOUNDARY
▼ 5	WATER LEVEL IN FEET (4/15/1993)
MW-1	MONITORING WELL INSTALLED BY ES MARCH,1993
TB-14	TEST BORING DRILLED BY TALLAMY,VANKUREN,GERTIS AND THIELMAN, 1979
TP-5/TP-6	TEST PITS INSTALLED BY ES SEPTEMBER, 1994

VERTICAL EXAGGERATION = 20X

HORIZONTAL

200FT. 0 200FT.

FIGURE 4.6

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE

CROSS SECTION A–A'

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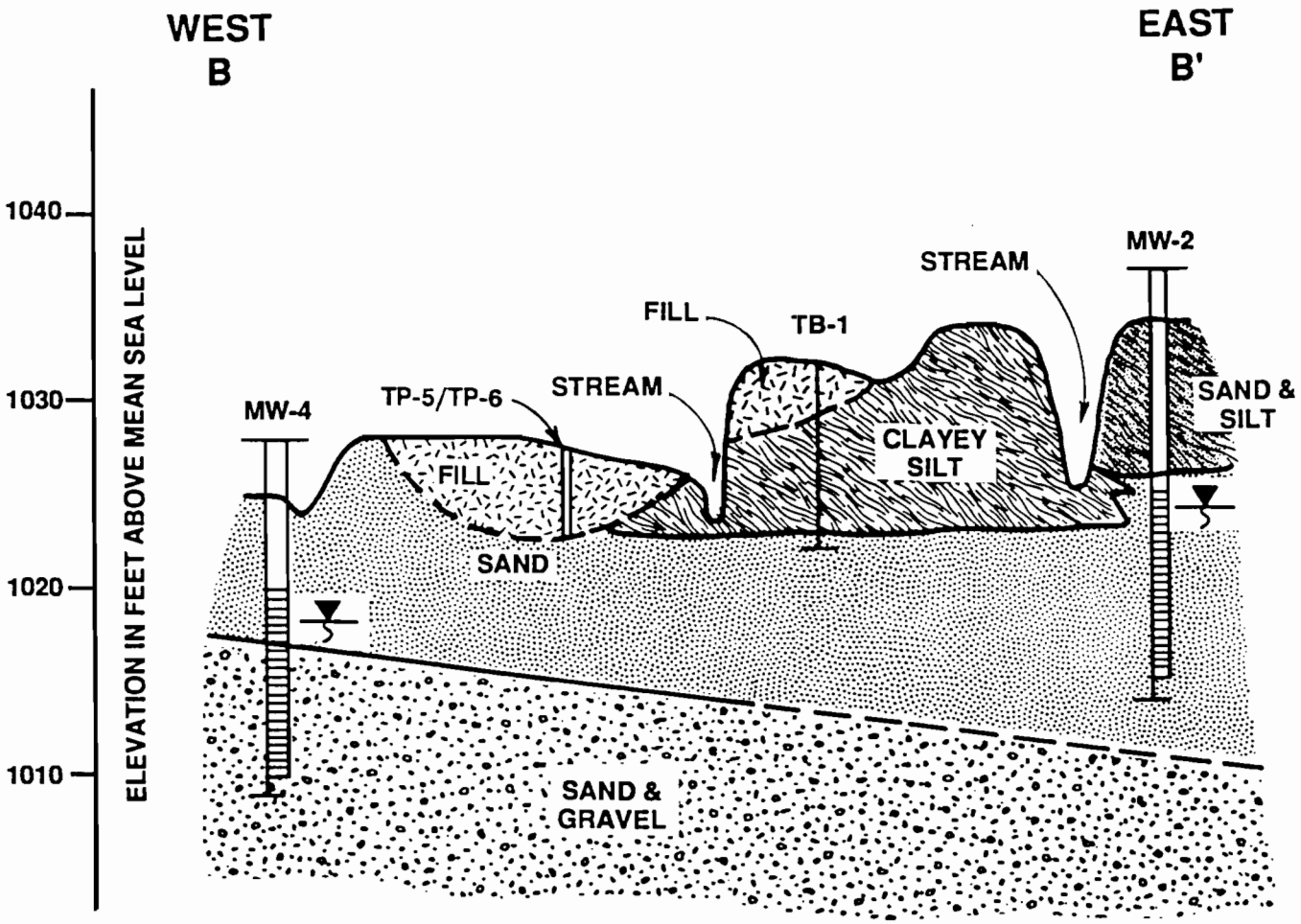
DATE: 05/10/95 (SEH) (DIMSCALE 1:1)
H:CAD\723800\23800G06.DWG (MODEL SPACE)



LEGEND

— — —	INFERRED STRATIGRAPHIC BOUNDARY
⏚	WATER LEVEL IN FEET (4/15/1993)
MW-4	MONITORING WELL INSTALLED BY ES MARCH,1993
TB-1	TEST BORING DRILLED BY TALLAMY,VANKUREN,GERTIS AND THIELMAN, 1979
TP-5/TP-6	TEST PITS INSTALLED BY ES SEPTEMBER, 1994

VERTICAL EXAGERATION = 20X
HORIZONTAL

200 FT. 0 200FT

DATE: 05/10/95 (SEH) (DIMSCALE 1:1)
H:CAD\723800\23800G07.DWG (MODEL SPACE)

FIGURE 4.7

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE

CROSS SECTION B–B'

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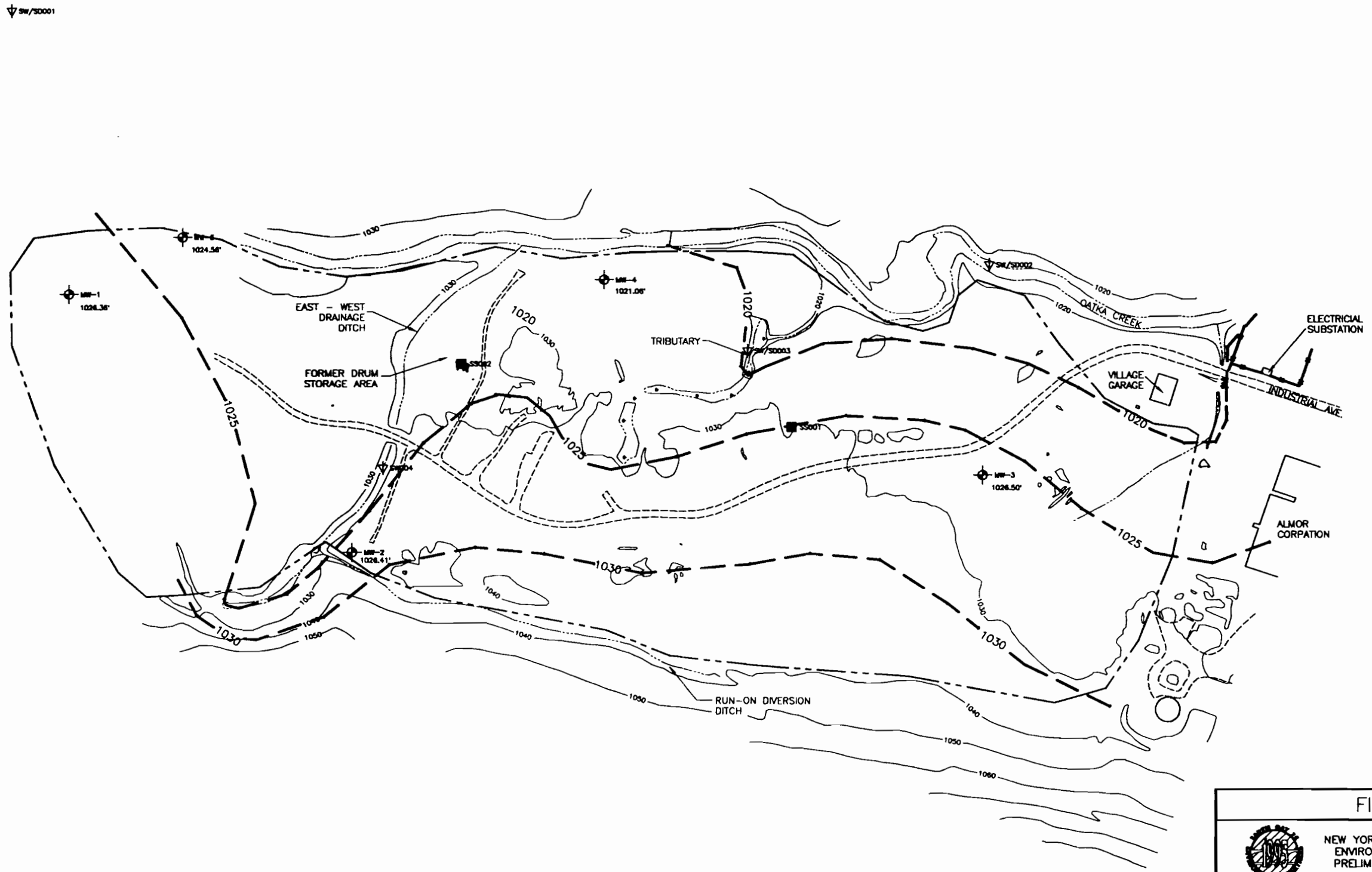

CONTOUR INTERVAL: 10'
MAPPING COMPILED BY STEROPHOTOGRAMMETRIC METHODS
FROM 1" = 400' SCALE AERIAL PHOTOGRAPHY FLOWN 05/10/93.
MAPPING COMPILED WITHOUT BENEFIT OF A FIELD EDIT.

DATE: 05/08/95 (SEH) (DIMSCALE 1:100)
H:CAD\723800\23800G05.DWG (MODEL SPACE)

FIGURE 4.8

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
PRELIMINARY SITE ASSESSMENT

WARSAW VILLAGE
LANDFILL SITE
GROUNDWATER ELEVATION MAP

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TABLE 4.1

STRATIGRAPHIC SUMMARY
PSA WELL BORINGS
WARSAW VILLAGE LANDFILL

Stratgraphic Unit	MW-1 (1034.5)*	MW-2 (1034.1)*	MW-3 (1027.4)*	MW-4 (1024.5)*	MW-5 1032.0)*
Fill	0-6.8'	3.5-4.2'	-	-	-
Clay	6.8-7.2', 12-12.5'	-	-	-	-
Sand	7.2-12', 12.5-17.8'	4.2-20'	0-3.8', 12-16	0-8'	0-15'
Gravel	-	-	3.6-3.8'	-	-
Sand and Silt	-	0-3.5'	-	-	15-17.5'
Silt and Clay	-	-	3.8-4'	-	-
Sand and Gravel	17.8-22'	-	4-12'	8-16'	17.5-18'

* Ground surface elevation in feet above Mean Sea Level.

TABLE 4.2

GRAIN–SIZE CHARACTERISTICS
WARSAW VILLAGE LANDFILL

Well Boring Number	Sample Depth* (ft.)	Gravel (%)	Sand (%)	Silt and Clay (%)	Unified Classification	Stratigraphic Unit
MW–1	12–14', 14–16'	0	39.1	60.9	ML or CL	Sandy silt and clay
MW–2	14–16', 16–18'	3.5	19.6	76.9	ML or CL	Sandy silt and clay
MW–3	8–10', 10–12'	4.7	13.5	81.8	ML or CL	Sandy silt and clay
MW–4	6–8', 10–12'	30.0	52.9	17.1	SM	Silty sand and gravel
MW–5	8–10', 10–12'	0	58.8	41.2	SM	Silty sand

* Measured below ground surface.

TABLE 4.3

WARSAW VILLAGE LANDFILL
WATER LEVEL DATA

WELL NUMBER	GROUND SURFACE ELEVATION (FEET) \1	TOP OF PVC WELL PIPE ELEVATION (FEET)	WELL SCREEN TOP ELEVATION (FEET)	WELL SCREEN BOTTOM ELEVATION (FEET)	4/15/93		4/19/93		4/27/93	
					DEPTH TO WATER LEVEL (FEET) \2	WATER LEVEL ELEVATION (FEET)	DEPTH TO WATER LEVEL (FEET) \2	WATER LEVEL ELEVATION (FEET)	DEPTH TO WATER LEVEL (FEET) \2	WATER LEVEL ELEVATION (FEET)
MW-1	1034.50	1036.96	1025.50	1015.50	10.6	1026.36	10.7	1026.26	11	1025.96
MW-2	1034.10	1036.21	1025.10	1015.10	9.8	1026.41	9.8	1026.41	9.7	1026.51
MW-3	1027.40	1029.70	1022.40	1012.40	3.2	1026.50	3.2	1026.50	3.5	1026.20
MW-4	1024.50	1027.36	1019.50	1009.50	6.3	1021.06	6.4	1020.96	6.4	1020.96
MW-5	1032.00	1034.71	1025.00	1015.00	10.15	1024.56	10.2	1024.51	10.3	1024.41

\1 Feet above mean sea level.
\2 Mearsurement taken from top of casing (TOC).

TABLE 4.4
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SURFACE SOIL DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	USEPA (1) HEALTH BASED STANDARDS	FIELD ID: SAMPLED: UNITS:	SS001 04/26/93	SS002 04/26/93	SS002-DUP 04/26/93
	VOLATILES					
F002	Methylene chloride	93,000	ug/kg	68 B	32 B	72 B
F003	Acetone	8,000,000	ug/kg	7 BJ	14 U	56 B
F005	2-Butanone	4,000,000	ug/kg	9 BJ	14 U	21 B
	SEMIVOLATILES					
U165	Naphthalene	300,000	ug/kg	230 J	29 J	33 J
	2-Methylnaphthalene	NS	ug/kg	330 J	29 J	550 U
	Acenaphthylene	NS	ug/kg	310 J	110 J	140 J
	Acenaphthene	5,000,000	ug/kg	86 J	150 J	150 J
	Dibenzofuran	NS	ug/kg	170 J	90 J	84 J
U088	Diethyl phthalate	60,000,000	ug/kg	62 BJ	63 BJ	55 BJ
	Fluorene	3,000,000	ug/kg	240 J	210 J	220 J
	Phenanthrene	NS	ug/kg	2000	1700	2100
	Anthracene	20,000,000	ug/kg	350 J	300 J	370 J
	Carbazole	NS	ug/kg	270 J	170 J	180 J
	Di-n-butyl phthalate	8,000,000	ug/kg	89 J	89 J	29 J
U120	Fluoranthene	3,000,000	ug/kg	3000	2900	3500
	Pyrene	2,000,000	ug/kg	2700 D	2500	3000
U018	Benzo(a)anthracene	220	ug/kg	2000	1400	1600
U050	Chrysene	NS	ug/kg	2000	1300	1600
U028	Bis(2-ethylhexyl) phthalate	50000	ug/kg	180 BJ	230 BJ	120 BJ
	Benzo(b)fluoranthene	NS	ug/kg	2700	1400	1700
	Benzo(k)fluoranthene	NS	ug/kg	1800	1200	1500
U022	Benzo(a)pyrene	61	ug/kg	2000	1200	1500
U137	Indeno(1,2,3-cd)pyrene	NS	ug/kg	1600	770	970
U063	Dibenzo(a,h)anthracene	14	ug/kg	800	390 J	500 J
	Benzo(ghi)perylene	NS	ug/kg	1800	780	1000
	PESTICIDES					
P059	Heptachlor	160	ug/kg	1.4 JP	0.58 JP	0.30 JP
	4,4'-DDE	2,100	ug/kg	2.3 JP	3.2 JP	2.3 JP
P050	Endosulfan II	NS	ug/kg	21 U	2.8 JP	2.8 JP
U060	4,4'-DDD	2,900	ug/kg	21 U	1.1 JP	1.0 JP
U061	4,4'-DDT	2,100	ug/kg	3.8 J	6.4 JP	5.8 P
U247	Methoxychlor	400,000	ug/kg	110 U	4.3 JP	5.4 JP
	Endrin ketone	NS	ug/kg	10 J	3.7 JP	4.0 JP
	alpha-Chlordane	540	ug/kg	11 U	4.8 U	2.7 J
	gamma-Chlordane	540	ug/kg	11 U	0.69 JP	1.1 JP

(1) NYSDEC – Memorandum (11/16/92) – Determination of soil cleanup objectives and cleanup levels

Organic Data Qualifiers
- U – Indicates a compound was analyzed for but not detected.
- J – Indicates an estimated value.
- B – Indicates the analyte is found in the associated blank as well as in the sample.
- E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
- D – Indicates an analysis at a secondary dilution factor.
- P – Indicates a greater than 25% difference for detected concentrations between two GC columns for pesticide/Aroclor analytes.
- R – Indicates unuseable results.
- [ ] – Exceeds applicable standard or guidance value.

TABLE 4.4 (CONT.)
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SURFACE SOIL DATA SUMMARY

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	NATURAL (1) RANGE IN SOILS	FIELD ID: SAMPLED: UNITS:	SS001 04/26/93	SS002 04/26/93
	Aluminum – Total	700–100,000	mg/kg	4610	6340
D004	Arsenic – Total	0.1–100	mg/kg	6.0 N	5.3 N
D005	Barium – Total	10–500	mg/kg	45.0 B	104
D006	Cadmium – Total	0.01–7 *	mg/kg	0.66 BSN	1.1 BSN
	Calcium – Total	130–333,000	mg/kg	50100 B	29100
D007	Chromium – Total	1–2000	mg/kg	8.7	12.9
	Cobalt – Total	<3–70	mg/kg	5.1 B	6.6 U
	Copper – Total	1–700	mg/kg	91.3	30.4
	Iron – Total	100–100,000	mg/kg	18400	17100
D008	Lead – Total	<10–700	mg/kg	103	129
	Magnesium – Total	50–50,000	mg/kg	6600	5490
	Manganese – Total	<2–7,000	mg/kg	357	579
D009	Mercury – Total	0.02–0.5	mg/kg	0.52	0.20
	Nickel – Total	<5–7,000	mg/kg	14.7	18.9
	Potassium – Total	2,200–65,000	mg/kg	579 B	1620 B
	Vanadium – Total	20–500	mg/kg	10.7 B	11.6 B
	Zinc – Total	<5–3,500	mg/kg	140	158
F007–F012	Cyanide – Total	ND	mg/kg	1.5	2.0 U

(1) Schacklette and Boerngen, 1984.

* Booz, Allen, and Hamilton, 1983
** USEPA, 1983

Inorganic Data Qualifiers
- B – Indicates a value greater than or equal to the instruments detection limit but less than the contract required detection limit.
- U – Indicates element was analyzed for but not detected.
- E – Indicates a value estimated or not reported due to the presence of interference.
- S – Indicates a value determined by Method of Standard Addition.
- N – Indicates spike sample recovery is not within control limits.
- * – Indicates duplicate analysis is not within control limits.
- + – Indicates the correlation coefficient for method of standard addition is less than 0.995.
- M – Indicates duplicate injection results exceeded control limits.
- W – Post digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- G – The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
- L – The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
- R – Indicates unuseable results.
- [ ] – Exceeds applicable standard or guidance value.

TABLE 4.5
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SURFACE WATER DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	NYSDEC (1) Class C Surface Water STANDARDS	FIELD ID: SAMPLED: UNITS:	SW001 04/26/93	SW002 04/26/93	SW003 04/26/93	SW004 04/26/93
	VOLATILES						
F002	Methylene chloride	NS	ug/L	3 BJ	1 BJ	16 B	2 BJ
F003	Acetone	NS	ug/L	10 U	10 U	20 B	10 U
P022	Carbon Disulfide	NS	ug/L	10 U	10 U	3 J	10 U
F005	2-Butanone	NS	ug/L	10 U	8 BJ	10 B	10 U
	PESTICIDES						
	delta-BHC	NS	ug/L	0.050 U	0.050 U	0.31	0.050 U

(1) NYSDEC – Ambient Water Quality Standards and Guidance Values (11/22/93)
(S) – Standard
(G) – Guidance
* – Standard is Hardness Dependant (assume hardness of 150 ppm)

Organic Data Qualifiers
U – Indicates a compound was analyzed for but not detected.
J – Indicates an estimated value.
B – Indicates the analyte is found in the associated blank as well as in the sample.
E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
D – Indicates an analysis at a secondary dilution factor.
P – Indicates a greater than 25% difference for detected concentrations between two GC columns for pesticide/Aroclor analytes.
R – Indicates unuseable results.

TABLE 4.5 (CONT.)
NYSDEC - PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SURFACE WATER DATA SUMMARY

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	NYSDEC (1) Class C Surface Water STANDARDS	FIELD ID: SAMPLED: UNITS:	SW001 04/26/93	SW002 04/26/93	SW003 04/26/93	SW004 04/26/93
	Aluminum – Total	100 (S)	ug/L	360 *	290 *	640 *	350 *
D004	Arsenic – Total	190 (S)	ug/L	4.0 U	4.0 U	6.0 B	4.0 U
D005	Barium – Total	NS	ug/L	40.0 U	40.0 U	456	40.0 U
	Calcium – Total	NS	ug/L	24000 B	24400 B	77300	18200 B
	Iron – Total	300 (S)	ug/L	460 *	390 *	23200 *	790 *
	Magnesium – Total	NS	ug/L	7140	7360	19300	5270
	Manganese – Total	NS	ug/L	22.0	22.9	863	89.6
	Potassium – Total	NS	ug/L	1390 B	1380 B	4370 B	855 B
	Sodium – Total	NS	ug/L	11600	11500	11800	5040
	Zinc – Total	30 (S)	ug/L	10 U	10.4 B	25.1	10 U
F007–F012	Cyanide – Total	5.2 (S)	ug/L	10 U	17.1	10 U	10 U

(1) NYSDEC – Ambient Water Quality Standards and Guidance Values (11/22/93)
(S) – Standard
(G) – Guidance
* – Standard is Hardness Dependant (assume hardness of 150 ppm)

Inorganic Data Qualifiers
B – Indicates a value greater than or equal to the instruments detection limit but less than the contract required detection limit.
U – Indicates element was analyzed for but not detected.
E – Indicates a value estimated or not reported due to the presence of interference.
S – Indicates a value determined by Method of Standard Addition.
N – indicates spike sample recovery is not within control limits.
* – Indicates duplicate analysis is not within control limits.
+ – Indicates the correlation coefficient for method of standard addition is less than 0.995.
M – Indicates duplicate injection results exceeded control limits.
W – Post digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
G – The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
L – The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
R – Indicates unuseable results.
[ ] – Exceeds applicable standard or guidance value.

TABLE 4.6
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SEDIMENT DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	USEPA (1) HEALTH BASED STANDARDS	FIELD ID: SAMPLED: UNITS:	SD001 04/26/93	SD002 04/26/93	SD003 04/26/93	SD004 04/26/93
	VOLATILES						
F002	Methylene chloride	93,000	ug/kg	39 B	25 B	73 B	48 B
F003	Acetone	8,000,000	ug/kg	18 B	14 B	190 B	160 B
F005	2–Butanone	4,000,000	ug/kg	10 BJ	9 BJ	57 B	52 B
F005	Benzene	24,000	ug/kg	3 J	13 U	3 J	4 J
	SEMIVOLATILES						
U088	Diethyl phthalate	60,000,000	ug/kg	49 BJ	71 BJ	130 BJ	110 BJ
	Fluorene	3,000,000	ug/kg	500 U	430 U	850 U	44 J
	Phenanthrene	NS	ug/kg	86 J	150 J	850 U	270 J
	Anthracene	20,000,000	ug/kg	83 J	140 J	850 U	150 J
	Carbazole	NS	ug/kg	500 U	430 U	850 U	57 J
U120	Fluoranthene	3,000,000	ug/kg	120 J	180 J	130 J	570 J
	Pyrene	2,000,000	ug/kg	91 J	140 J	97 J	460 J
U018	Benzo(a)anthracene	224	ug/kg	45 J	50 J	850 U	300 J
U050	Chrysene	NS	ug/kg	70 J	95 J	850 U	380 J
U028	Bis(2–ethylhexyl) phthalate	50,000	ug/kg	37 BJ	430 U	850 U	800 U
	Benzo(b)fluoranthene	NS	ug/kg	53 J	53 J	66 J	270 J
	Benzo(k)fluoranthene	NS	ug/kg	31 J	64 J	79 J	310 J
U022	Benzo(a)pyrene	61	ug/kg	37 J	53 J	270 J	220 J
U137	Indeno(1,2,3–cd)pyrene	NS	ug/kg	500 U	34 J	850 U	150 J
	Benzo(ghi)perylene	NS	ug/kg	500 U	39 J	850 U	150 J
	PESTICIDES						
	4,4'–DDE	2,100	ug/kg	0.51 JP	4.3 U	1.0 JP	8.0 U
P050	Endosulfan II	NS	ug/kg	5.0 U	4.3 U	8.4 U	1.3 J
U060	4,4'–DDD	2,900	ug/kg	5.0 U	4.3 U	0.65 JP	8.0 U
U061	4,4'–DDT	2,100	ug/kg	0.38 JP	0.51 JP	8.4 U	8.0 U
	Endrin ketone	NS	ug/kg	5.0 U	4.3 U	8.4 U	1.6 J

(1) NYSDEC – Memorandum (11/16/92) – Determination of soil cleanup objectives and cleanup levels

Organic Data Qualifiers
- U – Indicates a compound was analyzed for but not detected.
- J – Indicates an estimated value.
- B – Indicates the analyte is found in the associated blank as well as in the sample.
- E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
- D – Indicates an analysis at a secondary dilution factor.
- P – Indicates a greater than 25% difference for detected concentrations between two GC columns for pesticide/Aroclor analytes.
- R – Indicates unuseable results.
- [ ] – Exceeds applicable standard or guidance value.

TABLE 4.6 (CONT.)
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SEDIMENT DATA SUMMARY

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	NATURAL [1] RANGE IN SOILS	FIELD ID: SAMPLED: UNITS:	SD001 04/26/93	SD002 04/26/93	SD003 04/26/93	SD004 04/26/93
	Aluminum – Total	700–100,000	mg/kg	5720	4720	7590	9530
D004	Arsenic – Total	0.1–100	mg/kg	3.9 SN	4.9 SN	23.7 N	9.2 N
D005	Barium – Total	10–500	mg/kg	34.5 B	34.6 B	275	99.9
D006	Cadmium – Total	0.01–7 *	mg/kg	0.22 BN	0.23 BN	0.73 BN	0.36 BN
	Calcium – Total	130–333,000	mg/kg	8000 B	15700	60000	5070
D007	Chromium – Total	1–2,000	mg/kg	7.9	7.6	10.3	13.4
	Copper – Total	1–700	mg/kg	21.7	13.9	26.0	22.8
	Iron – Total	100–100,000	mg/kg	17200	13300	54000	28700
D008	Lead – Total	<10–700	mg/kg	10.7	10.9	33.7	23.6 S
	Magnesium – Total	50–50,000	mg/kg	4720	5620	6690	3810
	Manganese – Total	<2–7,000	mg/kg	411	298	2230	521
	Nickel – Total	<5–7,000	mg/kg	13.7	10.3 B	25.8 U	20.9
	Potassium – Total	2,200–65,000	mg/kg	549 B	743 B	830 B	829 B
	Vanadium – Total	20–500	mg/kg	10.4 B	9.3 B	17.2 U	15.3 B
	Zinc – Total	5–3,500	mg/kg	60.0	68.6	232	85.6
F007–F012	Cyanide – Total	ND	mg/kg	1.6 U	2.9	5.7 U	3.2 U

(1) Schacklette and Boerngen, 1984.

* Booz, Allen, and Hamilton, 1983
** USEPA, 1983

Inorganic Data Qualifiers
- B – Indicates a value greater than or equal to the instruments detection limit but less than the contract required detection limit.
- U – Indicates element was analyzed for but not detected.
- E – Indicates a value estimated or not reported due to the presence of interference.
- S – Indicates a value determined by Method of Standard Addition.
- N – indicates spike sample recovery is not within control limits.
- * – Indicates duplicate analysis is not within control limits.
- + – Indicates the correlation coefficient for method of standard addition is less than 0.995.
- M – Indicates duplicate injection results exceeded control limits.
- W – Post digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- G – The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
- L – The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
- R – Indicates unuseable results.
- [ ] – Exceeds applicable standard or guidance value.

TABLE 4.7
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
LEACHATE DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	NYSDEC (1) Class C Surface Water STANDARDS	FIELD ID: SAMPLED: UNITS:	LC001 04/26/93	LC002 04/26/93	LC003 09/16/94
	VOLATILES					
F003	Acetone	NS	ug/l	31 B	37 B	10 U
F005	2-Butanone	NS	ug/l	10 B	12 B	10 U
P022	Carbon Disulfide	NS	ug/l	54	10 U	10 U
F002	Methylene chloride	NS	ug/l	20 B	14 B	10 U
	SEMIVOLATILES					
	Di-n-butyl phthalate	NS	ug/l	10 U	10 U	0.5 J
	PESTICIDES					
	delta-BHC	NS	ug/l	0.68 P	0.05 U	0.052 U
U129	gamma-BHC (Lindane)	NS	ug/l	0.033 JP	0.05 U	0.052 U

(1) NYSDEC – Ambient Water Quality Standards and Guidance Values (11/22/93)
(S) – Standard
(G) – Guidance
* – Standard is Hardness Dependant (assume hardness of 150 ppm)

Organic Data Qualifiers
U – Indicates a compound was analyzed for but not detected.
J – Indicates an estimated value.
B – Indicates the analyte is found in the associated blank as well as in the sample.
E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
D – Indicates an analysis at a secondary dilution factor.
P – Indicates a greater than 25% difference for detected concentrations between two GC columns for pesticide/Aroclor analytes.
R – Indicates unuseable results.

TABLE 4.7 (CONT.)
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
LEACHATE DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	NYSDEC (1) Class C Surface Water STANDARDS	FIELD ID: SAMPLED: UNITS:	LC001 04/26/93	LC002 04/26/93	LC003 09/16/94
	Aluminum – Total	100 (S)	ug/l	5930 *	200 U*	90 U
D004	Arsenic – Total	190 (S)	ug/l	13	4 U	8.8 BN
D005	Barium – Total	NS	ug/l	576	246	326
D006	Cadmium – Total	1.6	ug/l	0.9 BN	0.2 UN	5 U
	Calcium – Total	NS	ug/l	77800	71600	105000
	Copper – Total	17	ug/l	30	10 U	10 U
	Iron – Total	300	ug/l	261000 *	2380 *	996 E
D008	Lead – Total	5.4	ug/l	11.3 S	3 UW	2 U
	Magnesium – Total	NS	ug/l	16900	18800	20100
	Manganese – Total	NS	ug/l	2340	684	564 N
	Potassium – Total	NS	ug/l	4970 B	4230 B	6000
	Sodium – Total	NS	ug/l	9320	12400	12300
	Zinc – Total	30	ug/l	494	10 U	16.7 BE

(1) NYSDEC – Ambient Water Quality Standards and Guidance Values (11/22/93)
(S) – Standard
(G) – Guidance
* – Standard is Hardness Dependant (assume hardness of 150 ppm)

Inorganic Data Qualifiers
B – Indicates a value greater than or equal to the instruments detection limit but less than the contract required detection limit.
U – Indicates element was analyzed for but not detected.
E – Indicates a value estimated or not reported due to the presence of interference.
S – Indicates a value determined by Method of Standard Addition.
N – indicates spike sample recovery is not within control limits.
* – Indicates duplicate analysis is not within control limits.
+ – Indicates the correlation coefficient for method of standard addition is less than 0.995.
M – Indicates duplicate injection results exceeded control limits.
W – Post digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absor
G – The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
L – The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
R – Indicates unuseable results.
[ ] – Exceeds applicable standard or guidance value.

TABLE 4.8
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SUB–SURFACE SOIL BORING DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	USEPA (1) HEALTH BASED STANDARDS	FIELD ID: DEPTH: SAMPLED: UNITS:	MW1 0–20' 03/24/93	MW2 0–20' 03/25/93	MW2–DUP 0–20' 03/25/93	MW3 0–14' 03/26/93	MW4 0–10' 03/25/93	MW5 0–14' 03/26/93
	VOLATILES								
F003	Acetone	8,000,000	ug/kg	25 UJ	32 J	22	13 U	20 UJ	19 U
F005	Toluene	20,000,000	ug/kg	11 U	13 UJ	13 UJ	3 J	11 UJ	12 U
	SEMIVOLATILES								
U188	Phenol	50,000,000	ug/kg	370 U	430 U	47 J	420 U	380 U	400 U
F004	2–Methylphenol	NS	ug/kg	370 U	430 U	86 J	420 U	380 U	400 U
F004	4–Methylphenol	4,000,000	ug/kg	370 U	430 U	180 J	420 U	380 U	400 U
U101	2,4–Dimethylphenol	NS	ug/kg	370 U	430 U	200 J	420 U	380 U	400 U
U165	Naphthalene	300,000	ug/kg	370 U	120 J	5300 D	420 U	380 U	400 U
	2–Methylnaphthalene	NS	ug/kg	370 U	95 J	2400	420 U	380 U	400 U
	Acenaphthylene	NS	ug/kg	370 U	110 J	730	420 U	380 U	400 U
	Acenaphthene	5,000,000	ug/kg	370 U	220 J	2700	420 U	380 U	400 U
	Dibenzofuran	NS	ug/kg	370 U	250 J	3100	420 U	380 U	400 U
	Fluorene	3,000,000	ug/kg	370 U	550	4500 D	420 U	380 U	400 U
	Anthracene	20,000,000	ug/kg	370 U	800	5300 D	420 U	380 U	400 U
	Carbazole	NS	ug/kg	370 U	190 J	2400	420 U	380 U	400 U
	Di–n–butyl phthalate	8,000,000	ug/kg	44 J	430 U	49 J	420 U	74 J	23 J
U120	Fluoranthene	3,000,000	ug/kg	370 U	2600	11000 D	50 J	380 U	400 U
U018	Benzo(a)anthracene	220	ug/kg	370 U	1600 J	5400 D	420 U	380 U	400 U
U028	Bis(2–ethylhexyl) phthalate	50,000	ug/kg	140 J	62 J	420 U	51 J	37 J	400 U
	Benzo(b)fluoranthene	NS	ug/kg	370 U	1200 J	4000 D	420 U	380 U	400 U
U022	Benzo(a)pyrene	61	ug/kg	370 U	1200 J	4400 D	420 U	380 U	400 U
U137	Indeno(1,2,3–cd)pyrene	NS	ug/kg	370 U	860 J	2800	420 U	380 U	400 U
	Benzo(ghi)perylene	NS	ug/kg	370 U	820 J	2700	420 U	380 U	400 U
	PESTICIDES								
P059	Heptachlor	160	ug/kg	1.9 U	0.30 JP	0.24 JP	2.2 U	2.0 U	2.0 U
	Heptachlor epoxide	77	ug/kg	1.9 U	0.76 JP	0.55 JP	2.2 U	2.0 U	2.0 U
P050	Endosulfan I	NS	ug/kg	1.9 U	0.26 J	2.2 U	2.2 U	2.0 U	2.0 U
P051	Endrin	20,000	ug/kg	3.7 U	0.83 JP	4.2 U	4.2 U	3.8 U	4.0 U
P050	Endosulfan II	NS	ug/kg	2.0 JP	1.9 J	4.2 U	4.2 U	2.2 JP	4.0 U

(1) NYSDEC – Memorandum (11/16/92) – Determination of soil cleanup objectives and cleanup levels

Organic Data Qualifiers
- U – Indicates a compound was analyzed for but not detected.
- J – Indicates an estimated value.
- B – Indicates the analyte is found in the associated blank as well as in the sample.
- E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
- D – Indicates an analysis at a secondary dilution factor.
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- R – Indicates unuseable results.
- [ ] – Exceeds applicable standard or guidance value.

TABLE 4.8 (CONT.)
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
SUB-SURFACE SOIL BORING DATA SUMMARY

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	NATURAL [1] RANGE IN SOILS	FIELD ID: DEPTH: SAMPLED: UNITS:	MW1 0-20' 03/24/93	MW2 0-20' 03/25/93	MW3 0-14' 03/26/93	MW4 0-10' 03/25/93	MW5 0-14' 03/26/93
	Aluminum – Total	700-100,000	mg/kg	6880 J	8010 J	8950 J	6760 J	5450 J
D005	Barium – Total	10-500	mg/kg	23.5 J	28.9 J	58.4	39.5 J	22.9 J
D006	Cadmium – Total	0.01-7 *	mg/kg	0.57 J	0.58 J	0.14 J	0.26 J	0.53 J
	Calcium – Total	130-333,000	mg/kg	56400 J	46900 J	19300 J	14300 J	39600 J
D007	Chromium – Total	1-2000	mg/kg	10.8 J	11.7 J	12.5 J	8.3 J	8.3 J
	Cobalt – Total	<3-70	mg/kg	8 J	9.7 J	6.7 J	5.3 U	5.8 J
	Copper – Total	1-700	mg/kg	30.6	44.3	15.2	19.7	22.1
	Iron – Total	100-100,000	mg/kg	18400	27100	21000	18000	14700
D008	Lead – Total	<10-700	mg/kg	16.9 J	34.6 J	11.6 J	17.4 J	8.2 J
	Magnesium – Total	50-50,000	mg/kg	14200 J	14300 J	7300 J	5180 J	10800 J
	Manganese – Total	<2-7,000	mg/kg	395 J	468 J	334 J	336 J	297 J
	Nickel – Total	<5-7,000	mg/kg	26.8	27.6	18	16.7	18.3
	Potassium – Total	2,200-65,000	mg/kg	1380	1510	991 J	1100 J	1140 J
D011	Silver – Total	0.01-5 **	mg/kg	0.05 U	0.05 J	0.05 U	0.05 U	0.05 U
	Sodium – Total	<500-100,000	mg/kg	240 J	251 J	186 U	213 U	204 U
	Vanadium – Total	20-500	mg/kg	16.3	19.4	16.8	13.4	12 J
	Zinc – Total	<5-3,500	mg/kg	94.7 J	163 J	65.6 J	61.1 J	64.4 J

(1) Schacklette and Boerngen, 1984.

* Booz, Allen, and Hamilton, 1983
** USEPA, 1983

Inorganic Data Qualifiers
- B – Indicates a value greater than or equal to the instruments detection limit but less than the contract required detection limit.
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- N – indicates spike sample recovery is not within control limits.
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- + – Indicates the correlation coefficient for method of standard addition is less than 0.995.
- M – Indicates duplicate injection results exceeded control limits.
- W – Post digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- G – The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
- L – The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
- R – Indicates unuseable results.

TABLE 4.9
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
GROUNDWATER DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	NYSDEC (1) Class GA Water Quality STANDARDS	FIELD ID: SAMPLED: UNITS:	GW001 04/26/93	GW002 04/26/93	GW002-DUP 04/26/93	GW003 04/26/93	GW004 04/26/93	GW005 04/26/93	Brown (2) Residence
	VOLATILES									
F002	Methylene chloride	5 (S)	ug/L	14 B	1 BJ	2 BJ	8 BJ	10 B	5 BJ	1
F003	Acetone	50	ug/L	8 BJ	10 U	10 U	4 J	8 J	10 U	10 U
P022	Carbon Disulfide	NS	ug/L	10 U	10 U	10 U	10 U	2 J	10 U	NA
F005	2-Butanone	50	ug/L	11 B	10 U	10 U	8 J	10 U	6 BJ	10 U
	SEMIVOLATILES									
U028	Bis(2-ethylhexyl) phthalate	50 (S)	ug/L	1 J	0.8 J	0.7 J	10 U	10 U	0.7 J	30 U
	PESTICIDES/PCBS									
P059	Heptachlor	ND (S)	ug/L	0.050 U	0.014 JP	0.050 U	0.050 U	0.050 U	0.050 U	0.05 U
B007	Aroclor 1260	0.1 (S)	ug/L	1.0 U	1.0 U	0.32 J	1.0 U	1.0 U	1.0 U	0.05 U

(1) NYSDEC – Ambient Water Quality Standards and Guidance Values (11/22/93)
(S) – Standard
(G) – Guidance

(2) NYSDOH, 1991.

Organic Data Qualifiers
U – Indicates a compound was analyzed for but not detected.
J – Indicates an estimated value.
B – Indicates the analyte is found in the associated blank as well as in the sample.
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D – Indicates an analysis at a secondary dilution factor.
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TABLE 4.9 (CONT.)
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
GROUNDWATER DATA SUMMARY

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	NYSDEC (1) Class GA Water Quality STANDARDS	FIELD ID: SAMPLED: UNITS:	GW001 04/26/93	GW002 04/26/93	GW003 04/26/93	GW004 04/26/93	GW005 04/26/93	Brown (2) Residence
D004	Aluminum – Total	NS	ug/L	4930 *	2020 *	15700 *	14500 *	4720 *	100 U
D005	Arsenic – Total	25 (S)	ug/L	7.0 B	4.0 U	7.0 B	13.0	4.0 BW	10 U
D006	Barium – Total	1000 (S)	ug/L	114 B	40.0 U	214	332	178 B	51
	Cadmium – Total	10 (S)	ug/L	0.60 BN	0.20 UWN	0.50 BN	0.80 BN	1.3 BN	5 U
D007	Calcium – Total	NS	ug/L	153000 B	21900 B	71400	167000 B	206000 B	62100
	Chromium – Total	50 (S)	ug/L	10 U	10 U	18.8	28.4	10 U	5 U
	Copper – Total	200 (S)	ug/L	10 U	10 U	17.6 B	48.2	14.1 B	5 U
D008	Iron – Total	300 (S)	ug/L	17600 *	3080 *	28300 *	49900 *	16700 *	543
	Lead – Total	25 (S)	ug/L	8.0	3.0 UW	17.0	25.0 W	6.4 S	10 U
	Magnesium – Total	35,000 (G)	ug/L	31400	6680	19600	35700	37600	15400
	Manganese – Total	300 (S)	ug/L	589	85.7	861	3490	1880	17
	Nickel – Total	NS	ug/L	30.0 U	30.0 U	30.0 U	66.3	40.1	5
	Potassium – Total	NS	ug/L	4480 B	1370 B	5960	6590	7440	1300
	Sodium – Total	20,000 (S)	ug/L	9360	5470	5950	15700	6110	25000
	Vanadium – Total	NS	ug/L	20.0 U	20.0 U	27.0 B	37.7 B	20.0 U	5 U
	Zinc – Total	300 (S)	ug/L	735	60.3	92.6	221	668	14

(1) NYSDEC – Ambient Water Quality Standards and Guidance Values (11/22/93)
(S) – Standard
(G) – Guidance

(2) NYSDOH, 1991.

Inorganic Data Qualifiers
B – Indicates a value greater than or equal to the instruments detection limit but less than the contract required detection limit.
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N – Indicates spike sample recovery is not within control limits.
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+ – Indicates the correlation coefficient for method of standard addition is less than 0.995.
M – Indicates duplicate injection results exceeded control limits.
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G – The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
L – The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
R – Indicates unuseable results.
[ ] – Exceeds applicable standard or guidance value.

TABLE 4.10
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
TEST PIT DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	USEPA (1) HEALTH BASED STANDARDS	FIELD ID: DEPTH: SAMPLED: UNITS:	TP003003 3' 09/13/94	TP003003 DUP 3' 09/13/94	TP-010-003 3' 09/15/94	TP-010-010 10' 09/15/94
	VOLATILES						
F003	Acetone	8,000,000	UG/KG	18 U	18 U	130	1500 U
F005	2-Butanone	4,000,000	UG/KG	18 U	18 U	38	1500 U
	Ethyl benzene	8,000,000	UG/KG	18 U	18 U	2 J	1400 J
F002	Methylene chloride	93,000	UG/KG	4 J	2 J	12 U	1500 U
F005	Toluene	20,000,000	UG/KG	18 U	18 U	2 J	650 J
F003	Total Xylenes	200,000,000	UG/KG	18 U	18 U	35	5900
F001	Trichloroethene	64,000	UG/KG	46	3 J	12 U	1500 U
	SEMIVOLATILES						
	Acenaphthene	5,000,000	UG/KG	6 J	15 J	410 U	400 U
	Acenaphthylene	NS	UG/KG	27 J	81 J	50 J	400 U
	Anthracene	20,000,000	UG/KG	50 J	520 U	27 J	400 U
U018	Benzo(a)anthracene	220	UG/KG	250 J	360 J	100 J	400 U
U022	Benzo(a)pyrene	61	UG/KG	210 J	340 J	110 J	400 U
	Benzo(b)fluoranthene	NS	UG/KG	300 J	440 J	210 J	10 J
	Benzo(ghi)perylene	NS	UG/KG	58 J	190 J	45 J	400 U
	Benzo(k)fluoranthene	NS	UG/KG	130 J	220 J	120 J	5 J
U028	Bis(2-ethylhexyl) phthalate	50,000	UG/KG	520 U	520 U	180 BJ	110 BJ
	Butyl benzyl phthalate	20,000,000	UG/KG	520 U	520 U	21 J	400 U
	Carbazole	NS	UG/KG	23 J	64 J	410 U	400 U
	4-Chloro-3-methylphenol	NS	UG/KG	520 U	520 U	410 U	9 J
U050	Chrysene	NS	UG/KG	270 J	370 J	130 J	400 U
	Di-n-butyl phthalate	8,000,000	UG/KG	120 BJ	190 BJ	370 BJ	72 BJ
U063	Dibenzo(a,h)anthracene	14	UG/KG	26 J	63 J	410 U	400 U
	Dibenzofuran	NS	UG/KG	14 J	61 J	410 U	400 U
U088	Diethyl phthalate	60,000	UG/KG	4 J	6 J	410 U	400 U
U101	2,4-Dimethylphenol	NS	UG/KG	520 U	520 U	410 U	11 J
U120	Fluoranthene	3,000,000	UG/KG	280 J	860	180 J	400 U
	Fluorene	3,000,000	UG/KG	31 J	87 J	410 U	400 U
U137	Indeno(1,2,3-cd)pyrene	NS	UG/KG	95 J	260 J	67 J	400 U
	2-Methylnaphthalene	NS	UG/KG	6 J	32 J	28 J	400 U
F004	4-Methylphenol	4,000,000	UG/KG	520 U	520 U	410 U	42 J
P082	N-nitrosodiphenylamine	NS	UG/KG	520 U	520 U	410 U	32 J
U165	Naphthalene	300,000	UG/KG	10 J	90 J	190 J	400 U
	Phenanthrene	NS	UG/KG	240 J	600	84 J	12 J
	Pyrene	2,000,000	UG/KG	360 J	660	160 J	14 J
	PESTICIDES/PCBs						
U060	4,4'-DDD	2,900	UG/KG	5.3 U	5.2 U	34 P	4 U
B007	Aroclor 1242	1,000	UG/KG	53 U	52 U	42 U	36 J
B007	Aroclor 1254	1,000	UG/KG	71	160	230	21 J

(1) NYSDEC – Memorandum (11/16/92) – Determination of soil cleanup objectives and cleanup levels

Organic Data Qualifiers
- U – Indicates a compound was analyzed for but not detected.
- J – Indicates an estimated value.
- B – Indicates the analyte is found in the associated blank as well as in the sample.
- E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
- D – Indicates an analysis at a secondary dilution factor.
- P – Indicates a greater than 25% difference for detected concentrations between two GC columns for pesticide/Aroclor analytes.
- R – Indicates unuseable results.
- [ ] – Exceeds applicable standard or guidance value.

TABLE 4.10
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
TEST PIT DATA SUMMARY

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	USEPA [1] HEALTH BASED STANDARDS	FIELD ID: DEPTH: SAMPLED: UNITS:	TP003003	TP003003 DUP	TP-010-003	TP-010-010
	Aluminum – Total	700–100,000	MG/KG	11100	9200	7750	10700
D004	Arsenic – Total	0.1–100	MG/KG	18.3 N	11.2 N	5.4 N	6.1 N
D005	Barium – Total	10–500	MG/KG	283	277	64.2	44.6 B
D006	Cadmium – Total	0.01–7 *	MG/KG	11.4	9.1	1.2 U	1.2 U
	Calcium – Total	130–333,000	MG/KG	35300	27400	5090	2470
D007	Chromium – Total	1–2000	MG/KG	19.6	27.2	10.9	13.4
	Cobalt – Total	<3–70	MG/KG	12.3 B	9.1 B	9.1 B	10.3 B
	Copper – Total	1–700	MG/KG	447	383	19.3	20.6
	Iron – Total	100–100,000	MG/KG	39700 E	30800 E	23400 E	21600 E
D008	Lead – Total	<10–700	MG/KG	511 EN	554 EN	26.9 EN	16.2 EN
	Magnesium – Total	50–50,000	MG/KG	7460	5700	3240	3660
	Manganese – Total	<2–7,000	MG/KG	618 N	571 N	865 N	409 N
D009	Mercury – Total	0.02–0.5	MG/KG	.23	.38	.11 U	.11 U
	Nickel – Total	<5–7,000	MG/KG	32.8	41.5	23.1	21
	Potassium – Total	2,200–65,000	MG/KG	2810	2210	630 B	764 B
D011	Silver – Total	0.01–5 **	MG/KG	3.8 N	3.4 N	2.5 UN	2.4 UN
	Sodium – Total	<500–100,000	MG/KG	597 B	543 B	282 B	379 B
	Vanadium – Total	20–500	MG/KG	20.2	17.2	15.2	16.2
	Zinc – Total	<5–3,500	MG/KG	2640 E	2030 E	134 E	93.7 E
	WASTE CHARASTERICS						
	Flashpoint (Ignitability)		F	200	200	200	200
	Leachable PH (Corrosivity)		S.U.	7.14	7.16	7.4	7.18
	H2S Released from Waste (Reactivity)		MG/KG	10 U	10 U	10 U	10 U
	HCN Released from Waste (Reactivity)		MG/KG	10 U	10 U	10 U	10 U

(1) Schacklette and Boerngen, 1984.

* Booz, Allen, and Hamilton, 1983
** USEPA, 1983

Inorganic Data Qualifiers
- B – Indicates a value greater than or equal to the instruments detection limit but less than the contract required detection limit.
- U – Indicates element was analyzed for but not detected.
- E – Indicates a value estimated or not reported due to the presence of interference.
- S – Indicates a value determined by Method of Standard Addition.
- N – indicates spike sample recovery is not within control limits.
- * – Indicates duplicate analysis is not within control limits.
- \+ – Indicates the correlation coefficient for method of standard addition is less than 0.995.
- M – Indicates duplicate injection results exceeded control limits.
- W – Post digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- G – The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
- L – The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
- R – Indicates unuseable results.
- [ ] – Exceeds applicable standard or guidance value.

TABLE 4.11
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
DRUM SAMPLE DATA SUMMARY

NYSDEC Hazardous Waste Codes	ORGANIC COMPOUNDS:	STANDARD	FIELD ID: SAMPLED: UNITS:	DR–010–001 09/15/94
	VOLATILES			
	Ethyl benzene		ug/kg	760 J
F005	Toluene		ug/kg	67 J
F003	Total Xylenes		ug/kg	35000
	SEMIVOLATILES			
U028	Bis(2–ethylhexyl) phthalate		ug/kg	17000 BD
	2–Methylnaphthalene		ug/kg	2500
U165	Naphthalene		ug/kg	6600 D
F027	Pentachlorophenol		ug/kg	1300
	Phenanthrene		ug/kg	16 J
	Pyrene		ug/kg	52 J
F027	2,4,6–Trichlorophenol		ug/kg	390 J
	PCBs			
B007	Aroclor 1254		ug/kg	8600 C

Organic data Qualifiers

J – Indicates an estimated value.
B – Indicates the analyte is found in the associated blank as well as in the sample.
E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
D – Indicates an analysis at a secondary dilution factor.
C – Indicates that the flag applies to pesticide result where identification is confirmed by GC/MS.

TABLE 4.11 (CONT.)
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
DRUM SAMPLE DATA SUMMARY

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	STANDARD	FIELD ID: SAMPLED: UNITS:	DR-010-001 09/15/94
	Aluminum – Total		mg/kg	3310
D004	Arsenic – Total		mg/kg	2.6 BN
D005	Barium – Total		mg/kg	127
	Calcium – Total		mg/kg	39100
D007	Chromium – Total		mg/kg	219
	Cobalt – Total		mg/kg	16.7
	Iron – Total		mg/kg	43400 E
D008	Lead – Total		mg/kg	1190 EN
	Magnesium – Total		mg/kg	1700
	Manganese – Total		mg/kg	343 N
	Nickel – Total		mg/kg	43
	Sodium – Total		mg/kg	551 B
	Vanadium – Total		mg/kg	5.1 B
	Zinc – Total		mg/kg	535 E

Organic data Qualifiers

J – Indicates an estimated value.
B – Indicates the analyte is found in the associated blank as well as in the sample.
E – Indicates compounds whose concentrations exceed the calibration range of the GC/MS instrument.
D – Indicates an analysis at a secondary dilution factor.
C – Indicates that the flag applies to pesticide result where identification is confirmed by GC/MS.

TABLE 4.11 (CONT.)
NYSDEC – PSA WORK ASSIGNMENTS
WARSAW SITE
Recra Environmental, Inc., Analytical Data
DRUM SAMPLE DATA SUMMARY
Extraction Procedure Toxicity Testing

NYSDEC Hazardous Waste Codes	INORGANIC COMPOUNDS:	STANDARD	FIELD ID: SAMPLED: UNITS:	A94–6424 09/15/94
D004	Arsenic – Dissolved	5000	ug/l	26
D005	Barium – Dissolved	100000	ug/l	1118
D006	Cadmium – Dissolved	1000	ug/l	39 J
D007	Chromium – Dissolved	5000	ug/l	48
D008	Lead – Dissolved	5000	ug/l	276 J
D009	Mercury – Dissolved	200	ug/l	R
D010	Selenium – Dissolved	1000	ug/l	32
D011	Silver – Dissolved	5000	ug/l	0.2 UJ

Organic Data Qualifiers
- U – Indicates a compound was analyzed for but not detected.
- J – Estimated Value
- R – Value rejected because of holding time exceedance.

SECTION 5

RECOMMENDATIONS

5.1 RECOMMENDATIONS

Although analytical data collected during this investigation indicate that contamination from industrial waste disposed on site may warrant concern, the background and analytical data do not establish the presence of hazardous waste on site as defined by 6NYCRR, Part 371. Additional site studies are not likely to provide sufficient information for listing of the site, because the PSA investigation has primarily addressed suspected areas identified in the background information. Therefore, Parsons ES recommends the following:

1. If applicable, the landfill should be properly closed in accordance with 6NYCRR, Part 360 requirements.
2. Periodic groundwater monitoring should be conducted using the monitoring wells installed during this PSA investigation. The monitoring program sh include, as a minimum, the following:
   - Collection of groundwater samples from monitoring wells MW-2, MW-3, MW-4, and MW-5; leachate samples from locations LC002 and LC003, and a surface water sample from SW002.
   - Minimum sampling frequency as follows:
     - Collection of samples the first year in the spring and in the fall to identify "worse case scenario";
     - Collection of samples once a year thereafter from the time of year with the highest concentrations;
     - Collection of samples for a total of five years
     - Evaluation of results after the fifth year on whether to continue monitoring program.
   - Based on the PSA analytical results and site history, analytical parameters should include, as a minimum:
     - benzene, toluene, ethylbenzene, and xylenes (BTEX);
     - polynuclear aromatic hydrocarbons (PAHs);
     - polychlorinated biphenyls (PCBs);
     - Target Analyte List (TAL) metals; and
     - cyanide.

SECTION 6

LIST OF REFERENCES

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ATSDR, 1991. Draft Toxicological Profile for Cyanide, dated October 1992. Agency for Toxic Substances and Disease Registry, Atlanta, Georgia

ATSDR, 1990. Draft Toxicological Profile for Carbon Disulfide, dated October 1992. Agency for Toxic Substances and Disease Registry, Atlanta, Georgia

Kammerer and Hobba, 1986. Groundwater Availability in the Genesee River Basin in New York and Pennsylvania - Water Resources Investigation Report 86-4048 (1986). United States Department of the Interior Geological Survey.

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NYSDEC, 1992b. Memorandum to Walter Demick (NYSDEC-Albany) from Gerald Pietraszek, dated September 3, 1991.. New York State Department of Environmental Conservation, Buffalo, New York.

NYSDEC, 1992c. Technical Work Plans December 4, 1992. New York State Department of Environmental Conservation, Buffalo, New York.

NYSDEC, 1992d. Part 701, Title 6, Chapter X, New York State Codes, Rules and Regulations, dated January 31, 1992. New York State Department of Environmental Conservation, Albany, New York.

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LIST OF REFERENCES

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NYSDEC, 1991c. Letter to Robert Stubley (Warsaw Superintendent of Public Works) from Gerald Pietraszek, dated May 22, 1991.. New York State Department of Environmental Conservation, Buffalo, New York.

NYSDEC, 1989. Inactive Hazardous Waste Disposal Sites in New York State (Volume 9) dated April 1989. New York State Department of Environmental Conservation, Albany, New York.

NYSDEC, 1988. Letter to the Honorable John Beresh (Village of Warsaw Mayor) from Robert Wozniak (NYSDEC-Region 9), dated February 29, 1988. New York State Department of Environmental Conservation, Buffalo, New York.

NYSDEC, 1985. "Community Right-To-Know Survey" (Volume III) - Past Hazardous Waste Disposal Practices, dated April 1985. New York State Department of Environmental Conservation, Albany, New York.

NYSDEC, 1984. Hazardous Waste Disposal Questionnaire, dated September 10, 1984. New York State Department of Environmental Conservation, Albany, New York.

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Parsons ES, 1993a. Memorandum to File dated July 22, 1993 documenting telephone conversation between Tom Abrams (Parsons ES) and Robert Wozniak (NYSDEC-Region 9). Parsons Engineering Science, Inc., Liverpool, New York.

Parsons ES, 1993b. Memorandum to File dated July 19, 1993 documenting telephone conversation between Tom Abrams (Parsons ES) and Gerald Miller (former superintendent for the Village of Warsaw Highway Department). Parsons Engineering Science, Inc., Liverpool, New York.

Parsons ES, 1993c. Memorandum to File dated July 19, 1993 documenting telephone conversation between Tom Abrams (Parsons ES) and Redford Parkhurst (former sanitation worker for the Village of Warsaw). Parsons Engineering Science, Inc., Liverpool, New York.

Parsons ES, 1993d. Field notes from site inspection conducted on March 24, 1993. Parsons Engineering Science, Inc., Liverpool, New York.

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APPENDIX A

SITE INSPECTION REPORT

USEPA FORM 2070-13

E P A	Potential Hazardous Waste Site Site Inspection Report Part 1 - Site Location and Inspection Information	I. Identification 01 State: NY 02 Site Number: 961006

II. Site Name and Location

01 Site Name (Legal, common, or descriptive name of site)	02 Street, Route No. or Specific Location Identifier
Warsaw Village Landfill	*Industrial Street*

03 City	04 State	05 Zip Code	06 County	07 County Code	08 CONG Dist
Warsaw	*NY*	*14569*	*Wyoming*		

09 Coordinates		10 Type of Ownership (Check one)		
Latitude	Longitude	__ A. Private	__ B. Federal _____	__C. State
__ D. County				
42° 43' 52"	*78° 07' 41*	*x* E. Municipal	__ F. Other_____	__ G. Unknown

III. Inspection Information

01 Date of Inspection	02 Site Status	03 Years of Operation	
10/29/92	___ Active	*1959 / 1974*	___ Unknown
Month/Day/Year	*x* Inactive	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 *Engineering Science Inc.* (Name of Firm) G. Other _____ (Specify)

05 Chief Inspector	06 Title	07 Organization	08 Telephone No.
Nicholas A. Smith	*Geologist*	*Engineering-Science, Inc.*	*(315) 451-9560*
09 Other Inspectors	**10 Title**	**11 Organization**	**12 Telephone No.**
Mark Schumacher	*Hydrogeologist*	*Engineering-Science, Inc.*	*(315) 451-9560*
Steve Perrigo	*Environmental Engineer*	*NYSDEC-Albany*	*(518) 457-9538*

13 Site Representatives Interviewed	14 Title	15 Address	16 Telephone No.
Robert Stubley	*DPW Supt.*	*Village of Warsaw*	*(716) 786-2120*

17 Access Gained By (Check One)	18 Time of Inspection	19 Weather Conditions
x Permission ___ Warrant	*11:20 p.m.*	*Cloudy, 50's*

IV. Information Available From

01 Contact	02 OF (Agency/Organization)	03 Telephone No.
Carl Hoffman	*NYSDEC*	*(518) 457-9538*

04 Person Responsible For Site Inspection Form	05 Agency	06 Organization	07 Telephone No.	08 Date
Tom Abrams		*Engineering-Science*	*(315) 451-9560*	*7/7/93*

EPA	Potential Hazardous Waste Site Site Inspection Report Part 2 - Waste Information	I. Identification 01 State 02 Site Number NY 961006

II. Waste States, Quantities, and Characteristics

01 Physical States (Check all that apply)

___ A. Solid ___ E. Slurry
___ B. Powder,Fines ___ F. Liquid
_X_ C. Sludge ___ G. Gas
_X_ D. Other *Misc-Municipal* (Specify)
Unknown

02 Waste Quantity At Site (Measures of waste quantities must be independent)

Tons *210*
Cubic Yards _____
No. of Drums *Unk*

03 Waste Characteristics (Check all that apply)

_X_ A. Toxic ___ E. Soluble ___ I. Highly Volatile
___ B. Corrosive ___ F. Infectious ___ J. Explosive
___ C. Radioactive ___ G. Flammable ___ K. Reactive
___ D. Persistent ___ H. Ignitable ___ L. Incompatible
___ M. Not Applicable ____

III. Waste Type

Category	Substance Name	01 Gross Amount	02 Unit of Measure	03 Comments
SLU	Sludge	210	tons	Reported by Almor Corp.
OLW	Oily Waste			
SOL	Solvents	Unk.		Indicated by background information
PSD	Pesticides			
OCC	Other Organic Chemicals	Unk.		Indicated by background information
IOC	Inorganic Chemicals	Unk.		Indicated by background information
ACD	Acids	Unk.		Indicated by background information
BAS	Bases			
MES	Heavy Metals	Unk.		Indicated by background information

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

Refer to attached

V. Feedstocks (See Appendix For CAS Numbers)

Category	01 Feedstock Name	02 CAS Number	Category	01 Feedstock Name	02 CAS Number

Not applicable.

VI. Sources of Information (Cite Specific References, e.g., state files, sample analysis reports)

Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., 1993.

IV. Hazardous Substances (See Appendix For Most Frequently Cited CAS Numbers)

01 Category	02 Substance Name	03 CAS Number	04 Storage/ Disposal Method	05 Max. Conc. Detected On-Site	Qualifier	06 Units
Subsurf. Soil	2,4-Dimethylphenol	105-67-9	NA	200	J	ug/kg
Sediment	2-Butanone	78-93-3	NA	57	B	ug/kg
Subsurf. Soil	2-Methylnaphthalene	91-57-6	NA	2,400		ug/kg
Subsurf. Soil	2-Methylphenol	95-48-7	NA	86	J	ug/kg
Surface Soil	4,4'-DDD	72-54-8	NA	1.1	JP	ug/kg
Surface Soil	4,4'-DDE	72-55-9	NA	3.2	JP	ug/kg
Surface Soil	4,4'-DDT	50-29-3	NA	6.4	JP	ug/kg
Subsurf. Soil	4-Methylphenol	106-44-5	NA	180	J	ug/kg
Subsurf. Soil	Acenaphthene	83-32-9	NA	2,700		ug/kg
Subsurf. Soil	Acenaphthylene	208-96-8	NA	730		ug/kg
Sediment	Acetone	67-64-1	NA	190	B	ug/kg
Sediment	Aluminum - Total	7429-90-5	NA	9,530,000		ug/kg
Subsurf. Soil	Anthracene	120-12-7	NA	5,300	D	ug/kg
Groundwater	Aroclor 1260	11096-82-5	NA	0.32	J	ug/L
Sediment	Arsenic - Total	7440-38-2	NA	23,700	N	ug/kg
Sediment	Barium - Total	7440-39-3	NA	275,000		ug/kg
Sediment	Benzene	71-43-2	NA	4	J	ug/kg
Subsurf. Soil	Benzo(a)anthracene	56-55-3	NA	5,400	D	ug/kg
Subsurf. Soil	Benzo(a)pyrene	50-32-8	NA	4,400	D	ug/kg
Subsurf. Soil	Benzo(b)fluoranthene	205-99-2	NA	4,000	D	ug/kg
Subsurf. Soil	Benzo(ghi)perylene	191-24-2	NA	2,700		ug/kg
Subsurf. Soil	Benzo(k)fluoranthene	207-08-9	NA	3,400	D	ug/kg
Surface Soil	Bis(2-ethylhexyl) phthalate	117-81-7	NA	230	BJ	ug/kg
Surface Soil	Cadmium - Total	7440-43-9	NA	1,100	BS	ug/kg
Sediment	Calcium - Total	7440-70-2	NA	60,000,000		ug/kg
Subsurf. Soil	Carbazole	86-74-8	NA	2,400		ug/kg
Leachate	Carbon Disulfide	75-15-0	NA	54		ug/L
Sediment	Chromium - Total	7440-47-3	NA	13,400		ug/kg
Subsurf. Soil	Chrysene	218-01-9	NA	4,600	D	ug/kg
Subsurf. Soil	Cobalt - Total	7440-48-4	NA	9,700	J	ug/kg
Surface Soil	Copper - Total	7440-50-8	NA	91,300		ug/kg
Sediment	Cyanide - Total	57-12-5	NA	2,900		ug/kg
Surface Soil	Di-n-butyl phthalate	84-74-2	NA	89	J	ug/kg
Surface Soil	Di-n-butyl phthalate	84-74-2	NA	89	J	ug/kg
Surface Soil	Dibenzo(a,h)anthracene	53-70-3	NA	800		ug/kg
Subsurf. Soil	Dibenzofuran	132-64-9	NA	3,100		ug/kg
Sediment	Diethyl phthalate	84-66-2	NA	130	BJ	ug/kg
Subsurf. Soil	Endosulfan I	959-98-8	NA	0.26	J	ug/kg
Surface Soil	Endosulfan II	33213-65-9	NA	2.8	JP	ug/kg
Subsurf. Soil	Endrin	72-20-8	NA	0.83	JP	ug/kg
Surface Soil	Endrin ketone	53494-70-5	NA	10	J	ug/kg
Subsurf. Soil	Fluoranthene	206-44-0	NA	11,000	D	ug/kg
Subsurf. Soil	Fluorene	86-73-7	NA	4,500	D	ug/kg
Surface Soil	Heptachlor	76-44-8	NA	1.4	JP	ug/kg
Subsurf. Soil	Heptachlor epoxide	1024-57-3	NA	0.76	JP	ug/kg
Subsurf. Soil	Indeno(1,2,3-cd)pyrene	193-39-5	NA	2,800		ug/kg
Sediment	Iron - Total	7439-89-6	NA	54,000,000		ug/kg
Surface Soil	Lead - Total	7439-92-1	NA	129,000		ug/kg
Subsurf. Soil	Magnesium - Total	7439-95-4	NA	14,300,000	J	ug/kg
Sediment	Manganese - Total	7439-96-5	NA	2,230,000		ug/kg
Surface Soil	Mercury - Total	7439-97-6	NA	520		ug/kg
Surface Soil	Methoxychlor	72-43-5	NA	5.4	JP	ug/kg
Sediment	Methylene chloride	75-09-2	NA	73	B	ug/kg
Subsurf. Soil	Naphthalene	91-20-3	NA	5,300	D	ug/kg
Subsurf. Soil	Nickel - Total	7440-02-0	NA	27,600		ug/kg
Subsurf. Soil	Phenanthrene	85-01-8	NA	17,000	D	ug/kg
Subsurf. Soil	Phenol	108-95-2	NA	47	J	ug/kg
Surface Soil	Potassium - Total	7440-09-7	NA	1,620,000	B	ug/kg
Subsurf. Soil	Pyrene	129-00-0	NA	13,000	D	ug/kg
Subsurf. Soil	Silver - Total	7440-22-4	NA	50	J	ug/kg
Subsurf. Soil	Sodium - Total	7440-23-5	NA	251,000	J	ug/kg
Subsurf. Soil	Toluene	108-88-3	NA	3	J	ug/kg
Subsurf. Soil	Vanadium - Total	7440-62-2	NA	19,400		ug/kg
Sediment	Zinc - Total	7440-66-6	NA	232,000		ug/kg
Surface Soil	alpha-Chlordane	5103-71-9	NA	2.7	J	ug/kg
Leachate	delta-BHC	319-86-8	NA	0.68	P	ug/L
Leachate	gamma-BHC (Lindane)	58-89-9	NA	0.033	JP	ug/L
Surface Soil	gamma-Chlordane	5103-74-2	NA	1.1	JP	ug/kg

E P A	Potential Hazardous Waste Site Site Inspection Report Part 3 - Description of Hazardous Conditions and Incidents	I. Identification 01 State 02 Site Number NY 961006

II. Hazardous Conditions and Incidents

01 _x_ **A. Groundwater Contamination** **02** _x_ **Observed (Date:** *4/27/93*) **__ Potential __ Alleged**
03 Population Potentially Affected: *Unk.* **04 Narrative Description**

Four VOCs (including three likely laboratory contaminants), one SVOC, one pesticide, one PCB, and 16 metals detected in groundwater sample.

01 _x_ **B. Surface Water Contamination** **02** _x_ **Observed (Date:** *4/26/93*) **__ Potential __ Alleged**
03 Population Potentially Affected: *Unk.* **04 Narrative Description**

Four VOCs (including three common laboratory contaminants), 19 SVOC TICs in surface water; one pesticide in surface water and two pesticides in leachate samples; ten metals in surface water, and 13 metals in leachate; cyanide in surface water samples.

01 _x_ **C. Contamination of Air** **02 __ Observed (Date: _____)** **__ Potential __ Alleged**
03 Population Potentially Affected: _____ **04 Narrative Description**

None reported.

01 _x_ **D. Fire/Explosive Conditions** **02 __ Observed (Date: _____)** **__ Potential** _x_ **Alleged**
03 Population Potentially Affected: _____ **04 Narrative Description**

At least two uncontrolled fires have occurred in the past. Site is now covered and does not appear to be a threat at this time.

01 _x_ **E. Direct Contact** **02 __ Observed (Date: _____)** _x_ **Potential __ Alleged**
03 Population Potentially Affected: Unknown **04 Narrative Description**

Potential for exposure through direct contact with contaminated soil. Limited access restriction.

01 _x_ **F. Contamination of Soil** **02 __ Observed (Date:** *4/26/93*) **__ Potential __ Alleged**
03 Population Potentially Affected: _____ **04 Narrative Description**

Three VOCs (all three of which are common laboratory contaminants), 22 SVOCs (primarily PAH's and phthalates), nine pesticides (detected below quantitation limits), 17 metals, and cyanide were detected in surface soil samples. Two VOCs (one of which is a common laboratory contaminant), 25 SVOCs and 20 SVOC, TICs, five pesticides, and 18 metals were detected in subsurface soil samples.

01 _x_ **G. Drinking Water Contamination** **02 __ Observed (Date: _____)** _x_ **Potential __ Alleged**
03 Population Potentially Affected: _____ **04 Narrative Description**

Private residents using well water may be located north and northwest of site. No contamination was detected in a well north of the site.

01 _x_ **H. Worker Exposure/Injury** **02 __ Observed (Date: _____)** **__ Potential __ Alleged**
03 Population Potentially Affected: _____ **04 Narrative Description**

None reported.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 3 - Description of Hazardous Conditions and Incidents	I. Identification 01 State 02 Site Number NY 961006

01 ___ I. Population Exposure/Injury 02 ___ Observed (Date: _____) ___ Potential ___ Alleged
03 Population Potentially Affected: _____ 04 Narrative Description
None reported.

01 ___ J. Damage to Flora 02 ___ Observed (Date: _____) ___ Potential ___ Alleged
03 Population Potentially Affected: _____ 04 Narrative Description
None reported.

01 ___ K. Damage to Fauna 02 ___ Observed (Date: _____) ___ Potential ___ Alleged
03 Population Potentially Affected: _____ 04 Narrative Description
None reported.

II. Hazardous Conditions and Incidents (Continued)

01 _x_ L. Contamination of Food Chain 02 ___ Observed (Date: _____) _x_ Potential ___ Alleged
04 Narrative Description
Potential exists for contamination of food chain. Oatka Creek is a recreational fishing stream.

01 _x_ M. Unstable Containment of Wastes 02 _x_ Observed (Date: *10/29/92*) ___ Potential ___ Alleged
(Spills/Runoff/Standing Liquids/Leading drums) 04 Narrative Description
03 Population Potentially Affected: *Unk*
Leachate seeps and sheens located in diversion ditch east of the site.

01 _x_ N. Damage to Offsite Property 02 ___ Observed (Date: ____) ___ Potential ___ Alleged
04 Narrative Description
None reported.

01 _x_ O. Contamination of Sewers, Storm Drains, WWTPs 02 ___ Observed (Date: _____) _x_ Potential ___ Alleged
04 Narrative Description
None reported.

01 _x_ P. Illegal/Unauthorized Dumping 02 ___ Observed (Date: _____) ___ Potential _x_ Alleged
04 Narrative Description
Alleged reports of illegal dumping on-site by Mallory Timers former employee.

05 Description of Any Other Known, Potential or Alleged Hazards

III. Total Population Potentially Affected: *None reported.*

IV. Comments

V. Sources of Information (Cite specific references, e.g., state files, sample analysis, reports)
Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., August 1993.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 4 - Permit And Descriptive Information	I. Identification 01 State 02 Site Number NY 961006

II. Permit Information

01 Type of Permit Issued (Check all that apply)	02 Permit Number	03 Date Issued	04 Expiration Date	05 Comments
___ A. NPDES				
___ B. UIC				
___ C. Air				
___ D. RCRA				
___ E. RCRA Interim Status				
___ F. SPCC Plan				
___ G. State (Specify)				
___ H. Local (Specify)				
___ I. Other (Specify)				
___ J. None				

III. Site Description

01 Storage/Disposal (Check all that apply)	02 Amount	03 Unit of Measure	04 Treatment (Check all that apply)	05 Other
___ A. Surface Impoundment	____	____	___ A. Incineration	A. Buildings on Site
___ B. Piles	____	____	___ B. Underground Injection	*1*
___ C. Drums, above ground	____	____	___ C. Chemical/Physical	
___ D. Tank, above ground	____	____	___ D. Biological	
___ E. Tank, below ground	____	____	___ E. Waste Oil Processing	
_x_ F. Landfill	*55*	*acres*	___ F. Solvent Recovery	06 Area of Site
___ G. Landfarm	____	____	___ G. Other Recycling/Recovery	*55* (Acres)
___ H. Open Dump	____	____	___ H. Other _____ (Specify)	
___ I. Other _____ (Specify)	____	____		

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.

Significant quantities of leachate have been observed leaving site on a regular basis.

V. Accessibility

01 Waste Easily Accessible: ___ Yes _x_ No

02 Comments

The site does not have perimeter fencing; however, an access gate on Industrial Avenue restricts vehicular access. Wastes are covered.

VI. Sources of Information (Cite specific references, e.g., state files, sample analysis, reports)

Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., Liverpool, NY, 1993.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 5 - Water, Demographic, and Environmental Data	I. Identification 01 State 02 Site Number NY *961006*

II. Drinking Water Supply

01 Type of Drinking Water Supply (Check as applicable) | **02 Status** | **03 Distance To Site**

	Surface	Well	Endangered	Affected	Monitored	
Community	A. *x*	B. ___	A. ___	B. ___	C. *X*	A. *> 4* (Mi.)
Non-Community	C. ___	D. *x*	D. *x*	E. ___	F. ___	B. *> 0.25* (Mi.)

III. Groundwater

01 Groundwater Use In Vicinity (Check One)

___ A. Only Source For Drinking | ___ B. Drinking (Other Sources Available) Commercial, Industrial Irrigation (No other water sources available) | *x* C. Commercial, Industrial Irrigation (Limited other sources available) | ___ D. Not Used, Unusable

02 Population Served by Groundwater *Unk.* **03 Distance to nearest drinking water well** *> 1200* (ft)

04 Depth to Groundwater	05 Direction of Groundwater Flow	06 Depth to Aquifer of Concern	07 Potential Yield of Aquifer	08 Sole Source Aquifer
3-5 (ft)	*Dominant flow in vicinity of site appears to west to Oatka Creek. A localized radial flow may exist as a result of closure activities.*	*3-5* (ft)	*0.2-5 mil*(gpd)	___ Yes ___ No

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

Private wells located over one mile east and west of the site along Route 20. Wells are typically screened in the Pleistocene sand and gravel. Although village water is available to all residents, some may still use private wells.
Five groundwater monitoring wells installed in 1993 at the site and ranged in depth from 16-22 feet.

10 Recharge Area	11 Discharge Area
x Yes Comments	*x* Yes Comments
___ No *Appears to be radial flow from site.*	___ No *Appears to be radial flow from area.*

IV. Surface Water

01 Surface Water Use (Check One)

___ A. Reservoir, Recreation Drinking Water Source | *x* B. Irrigation, Economically Important Resources | ___ C. Commercial, Industrial | ___ D. Not Currently Used

02 Affected/Potentially Affected Bodies of Water	Affected	Distance To Site
Name: *Oatka Creek*	____	*adjacent* (mi) (adjacent to site)

V. Demographic and Property Information

01 Total Population Within

One (1) Mile of Site	Two (2) Miles of Site	Four (4) Miles of Site
A. *2,527*	B. *4,187*	C. *5,141*
No. of Persons	No. of Persons	No. of Persons

02 Distance To Nearest Population *0.25* (mi.)

03 Number of Buildings Within Two (2) Miles of Site *1,102*

04 Distance to Nearest Off-Site Building *0.25* (mi)

05 Population Within Vicinity of Site (Provide narrative description of nature of population within vicinity of site, e.g., rural, village densely populated urban area)

Site is located on southwestern edge of Village of Warsaw. Industrial property directly north, undeveloped hill to east, undeveloped land to the south, and two cemeteries to the west of the site.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 5 - Water, Demographic, and Environmental Data	I. Identification 01 State 02 Site Number NY 961006

VI. Environmental Information

01 Permeability of Unsaturated Zone (Check One)

__ A. 10^{-6}-10^{-8} cm/sec __ B. 10^{-4}-10^{-6} cm/sec _x_ C. 10^{-4}-10^{-3} cm/sec __ D. Greater than 10^{-3} cm/sec

02 Permeability of Bedrock (Check One)

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

03 Depth to Bedrock	04 Depth of Contaminated Soil Zone	05 Soil pH
0-100 (ft)	_____ (ft)	_____

06 Net Precipitation	07 One Year 24-Hour Rainfall	08 Slope Site Slope	Direction of Site Slope	Terrain Average Slope
13 (in)	2.5 (in)	0-3 %	to the west	0-3 %

09 Flood Potential **10**

Site is in 100 + year floodplain ____ Site is on Barrier Island, Coastal High Hazard Area, Riverine Floodway

11 Distance to Wetlands (5 acre minimum) Greater than one mile

Estuarine: A. ____ (mi)

Other: B. < 3 (mi)

12 Distance to Critical Habitat (of endangered species)

< 2 (mi)

Endangered Species: _____

13 Land Use In Vicinity

Distance To:

Commercial/Industrial	Residential Areas, National State Parks, Forests or Wildlife Reserves	Agricultural Lands Prime Ag Land	Ag Land
A. > 0.25 (mi.)	B. > 0.25 (mi.)	C. 0.25 (mi.)	D. 0.25 (mi.)

14 Description of Site In Relation To Surrounding Topography

Site is located in a north-south valley adjacent to the east side of Oatka Creek. On-site elevations range from 1030 to 1040 feet above sea level. Higher elevations east and west of the site range from 1400 to 1650 above sea level.

VII. Sources of Information (Cite specific references, e.g., state files, sample analysis, reports)

Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., 1993.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 6 - Sample And Field Information	I. Identification 01 State 02 Site Number NY 961006

II. Samples Taken

Sample Type	01 Number of Samples Taken	02 Samples Sent To	03 Estimated Date Results Available
Groundwater	5	*Recra Environmental, Inc.*	*Available, 1993*
Surface Water	4	*Recra Environmental, Inc.*	*Available, 1993*
Waste	2	*Ecology and Environment*	*Available, 1993*
Leachate	2	*Recra Environmental, Inc.*	*Available, 1993*
	3	*Weston*	*Available, 1993*
Runoff			
Spill			*Available, 1993*
Soil/Surface	2,2	*Recra Environmental, Inc.*	*Available, 1993 and 1986*
/Subsurface	5	*Recra Environmental, Inc.*	*Available, 1993*
Grain-Size Analysis	*Soils (5)*	*Huntingdon Empire Soils Investigations Inc.*	*Available, 1993*
Other - Sediment	4	*Recra Environmental, Inc.*	*Available, 1993*

III. Field Measurements Taken

01 Type	02 Comments
PID, Draeger Tubes	*No readings above background - 4/26/93.*

IV. Photographs And Maps

01 Type _x_ Ground _x_ Aerial 02 In Custody of *Engineering-Science, Inc.*
(Name of Organization or Individual)

03 Maps	02 Location of Maps
_x_ Yes	*Engineering-Science, Inc.*
___ No	

V. Other Field Data Collected (Provide Narrative Description)

pH, conductivity, temperature collected for all water samples.

VI. Sources of Information (Cite specific references, e.g., state files, sample analysis, reports)

Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., Liverpool, NY, 1993.

EPA	Potential Hazardous Waste Site Site Inspection Report Part 7 - Owner Information	I. Identification 01 State 02 Site Number NY *961006*

II. CURRENT OWNER(s) — **PARENT COMPANY (If Applicable)**

01 Name *Village of Warsaw*		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc) *15 South Main Street*		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc)		11 SIC Code	
05 City *Warsaw*	06 State *NY*	07 Zip Code *14569*		12 City	13 State	14 Zip Code	
01 Name		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc)		11 SIC Code	
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code	
01 Name		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc)		11 SIC Code	
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code	
01 Name		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc)		11 SIC Code	
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code	

III. PREVIOUS OWNER(s) (List most recent first) — **IV. REALTY OWNER(s)** (if applicable list most recent first)

01 Name *Same as above*		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc)		11 SIC Code	
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code	
01 Name		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc)		11 SIC Code	
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code	
01 Name		02 D+B Number		08 Name		09 D+B Number	
03 Street Address (P.O. Box, RFD #, etc)		04 SIC Code		10 Street Address (P.O. Box, RFD #, etc)		11 SIC Code	
05 City	06 State	07 Zip Code		12 City	13 State	14 Zip Code	

V. Sources of Information (Cite specific references, e.g., state files, sample analyses, reports)

Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., Liverpool, NY, August 1993.

EPA	Potential Hazardous Waste Site Site Inspection Report Part 8 - Operator Information	I. Identification 01 State 02 Site Number NY *961006*

II. CURRENT Operator (Provide if different from Owner)

01 Name: *Village of Warsaw*

02 D+B Number:

03 Street Address (P.O. Box, RFD #, etc): *15 South Main Street*

04 SIC Code:

05 City: *Warsaw*

06 State: *NY*

07 Zip Code: *14569*

08 Years of Operation:

09 Name of Owner:

OPERATOR'S PARENT COMPANY

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)

01 Name

02 D+B Number

03 Street Address (P.O. Box, RFD #, etc)

04 SIC Code

05 City

06 State

07 Zip Code

08 Years of Operation

09 Name of Owner During This Period

01 Name

02 D+B Number

03 Street Address (P.O. Box, RFD #, etc)

04 SIC Code

05 City

06 State

07 Zip Code

08 Years of Operation

09 Name of Owner During This Period

01 Name

02 D+B Number

03 Street Address (P.O. Box, RFD #, etc)

04 SIC Code

05 City

06 State

07 Zip Code

08 Years of Operation

09 Name of Owner During This Period

PREVIOUS OPERATORS' PARENT COMPANIES (If Applicable)

10 Name

11 D+B Number

12 Street Address (P.O. Box, RFD #, etc)

13 SIC Code

14 City

15 State

16 Zip Code

10 Name

11 D+B Number

12 Street Address (P.O. Box, RFD #, etc)

13 SIC Code

14 City

15 State

16 Zip Code

10 Name

11 D+B Number

12 Street Address (P.O. Box, RFD #, etc)

13 SIC Code

14 City

15 State

16 Zip Code

IV. Sources of Information (Cite specific references, e.g., state files, sample analysis, report(s))

Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., Liverpool, NY, August 1993.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 9 - Generator/Transporter Information	I. Identification 01 State 02 Site Number NY *961006*

II. On-Site Generator

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)

01 Name	02 D+B Number	01 Name	02 D+B Number
Almor Corporation		*Mallory Timers*	
03 Street Address (P.O. Box, RFD #, etc)	**04 SIC Code**	**03 Street Address** (P.O. Box, RFD #, etc)	**04 SIC Code**
220 So. Main Street			
05 City **06 State**	**07 Zip Code**	**05 City** **06 State**	**07 Zip Code**
Warsaw *NY*	*14569*	*Warsaw* *NY*	*14569*

IV. Transporter(s)

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)

Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., Liverpool, NY, August 1993.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 10 - Past Response Activities	I. Identification 01 State 02 Site Number NY *961006*

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 *x* E. Contaminated Soil Removed 02 Date *1983* 03 Agency _____
04 Description
Removal and off-site disposal of exposed refuse and repairs to the silty-loam cover by Tallamy, VanKuven, Gertis and Thielman.

01 *x* F. Waste Repacked 02 Date *1988* 03 Agency _____
04 Description
Two drums were overpacked and disposed off-site.

01 *x* G. Waste Disposed Elsewhere 02 Date *1988* 03 Agency _____
04 Description
Waste uncovered when drums were discovered; sent to Perry Landfill.

01 ___ H. On Site Burial 02 Date _____ 03 Agency _____
04 Description

01 ___ I. In Site Chemical Treatment 02 Date _____ 03 Agency _____
04 Description

01 ___ J. In Situ Biological Treatment 02 Date _____ 03 Agency _____
04 Description

01 ___ K. In Situ Physical Treatment 02 Date _____ 03 Agency _____
04 Description

01 ___ L. Encapsulation 02 Date _____ 03 Agency _____
04 Description

01 ___ M. Emergency Waste Treatment 02 Date _____ 03 Agency _____
04 Description

E P A	Potential Hazardous Waste Site Site Inspection Report Part 10 - Past Response Activities	I. Identification 01 State 02 Site Number NY *961006*

II. Past Response Activities (Continued)

01 ___ N. Cutoff Walls 02 Date _____ 03 Agency _____
04 Description

01 ___ O. Emergency Diking/Surface Water Diversion 02 Date _____ 03 Agency _____
04 Description

01 ___ P. Cutoff Trenches/Sump 02 Date _____ 03 Agency _____
04 Description

01 ___ Q. Subsurface Cutoff Wall 02 Date _____ 03 Agency _____
04 Description

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 _x_ 3. Other Remedial Activities 02 Date *1988* 03 Agency *Vil. of Warsaw*
04 Description
Landfill closure

III. Sources of Information (Cite specific references, e.g., state files, sample analysis, reports)
Preliminary Site Assessment, Warsaw Village Landfill, Engineering-Science, Inc., Liverpool, NY, August 1993.

E P A	Potential Hazardous Waste Site Site Inspection Report Part 11 - Enforcement Information	I. Identification 01 State 02 Site Number NY *961006*

II. Enforcement Information

01 Past Regulatory/Enforcement Action ___ Yes ___ No

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

III. Sources of Information (Cite specific references, e.g., state files, sample analysis, reports)