2021 Hazardous Waste Scanning Project

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report.HW.932099.1990-08-01.Remedial_Investigation_Phase_1_2.pdf

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SCHRECK'S SCRAPYARD
NORTH TONAWAND, NEW YORK

SCHRECK'S SCRAPYARD
REMEDIAL INVESTIGATION
PHASE I AND II

RECEIVED
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DIVISION OF HAZARDOUS
WASTE REMEDIATION

FILE # 611-1
AUGUST, 1990

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Ann Arbor, Michigan
Locust Valley, New York
Madison, Wisconsin

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SCHRECK'S SCRAPYARD
NORTH TONAWANDA, NEW YORK

SCHRECK'S SCRAPYARD
REMEDIAL INVESTIGATION
PHASE I

PROJECT #611-1
AUGUST, 1989

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.
Ann Arbor, Michigan
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Madison, Wisconsin

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I. INTRODUCTION

1.1 Purpose of Report

This report summarizes available information and documents the Phase I remedial investigation (RI) activities undertaken at the Schreck Scrapyard site, North Tonawanda, New York. This initial investigation effort was undertaken as part of an engineering study to determine the best method for remediating environmental contamination at the site.

1.2 Site Background

1.2.1 Site Description

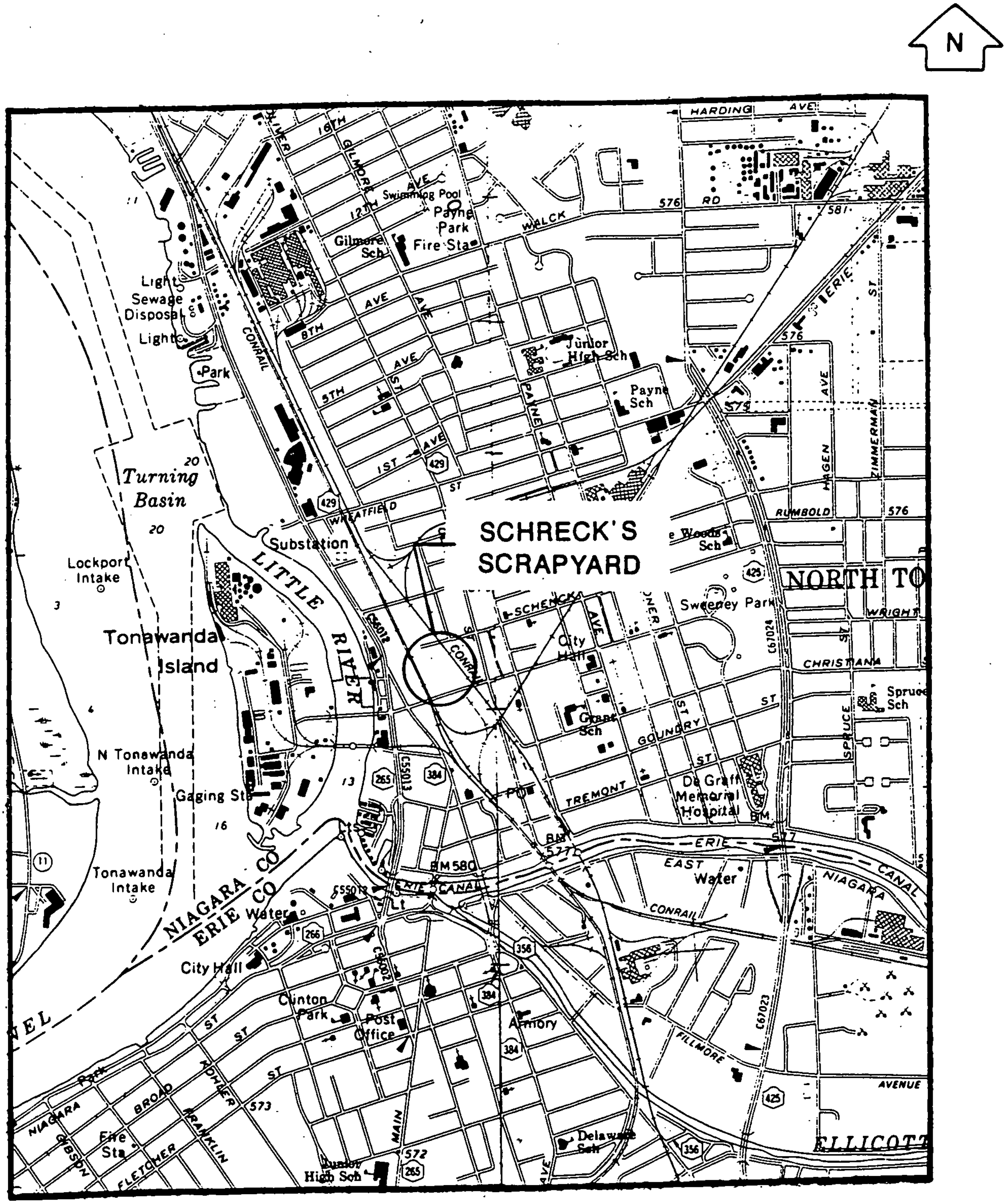
The Schreck Scrapyard site, located at 55 Schenck Street in North Tonawanda, New York is presently operated as an automotive scrapyard by VTJ Salvage Inc. Figure 1 shows the scrapyard's location with respect to the regional area.

The site is located in a mixed light industrial and residential area. The scrapyard is bordered on the north by Schenck Street and the Lawless Container Corporation located across the street (Figure 2). Lawless also borders the west side of the site and Tondisco Incorporated borders the south side of the site. The eastern border of the site consists of Conrail tracks. Across from these tracks is an empty lot which at one time was the location of a metal fabrication shop. Although no residential property is adjacent to the site, a dense residential neighborhood lies approximately one block east of the site.

The approximately 1.5 acre scrapyard is in a deteriorated condition. The fencing around the site is broken in various locations providing easy access to trespassers. The site contains three significant structures; a cinder block office building, a garage, and the frame of an abandoned bailer machine with a concrete foundation. The site has a soil base containing scrap material.

FIGURE 1

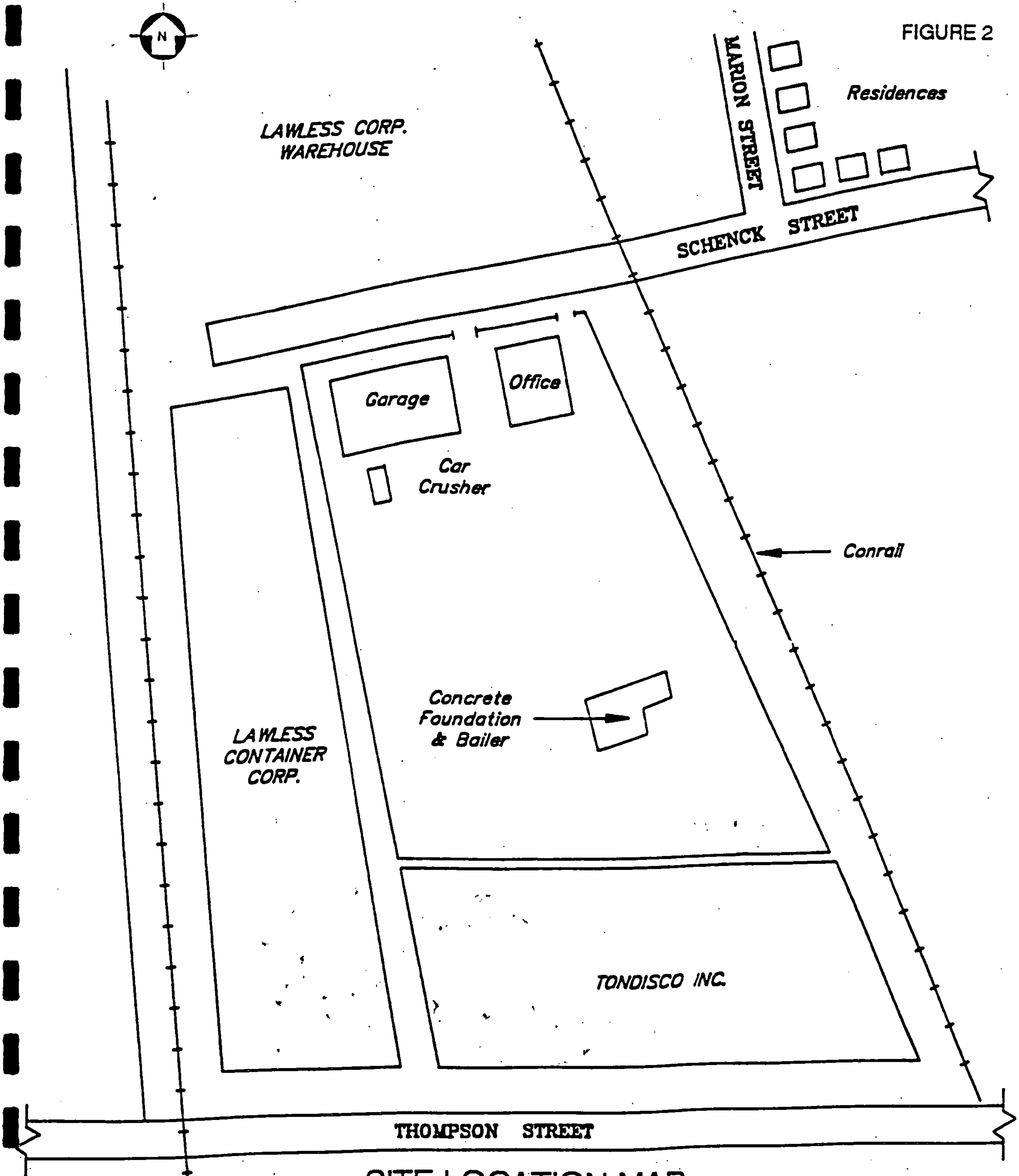
SCHRECK'S SCRAPYARD SITE
NORTH TONAWANDA, NEW YORK



SCALE : 1"=2000'

LOCATION MAP

FIGURE 2



SITE LOCATION MAP

SCHRECK'S SCRAPYARD
N. TONAWANDA, NEW YORK

It is oily and essentially void of vegetative growth. The scrapyard contains various piles of scrap (tires, cars, refrigerators) and is typically filled with junk cars and automotive parts.

1.2.2 Site History

Schreck's Iron and Metal Company operated a scrap iron business at this site from 1951 to 1953, site operations prior to 1951 are unknown. In 1953, the business was sold to Bengart and Menel, Inc., who reportedly operated a scrap metal business until 1977. In addition to the metal salvage operation, drums of phenolic waste from Occidental-Durez were reportedly brought to the site and were hauled by the facility's trucks to local waste disposal facilities between 1951 and 1975. If the drums were picked up late in the day the truck loaded with the drums would be kept at the site overnight. In 1965, reportedly 50-60 drums of phenolic wastes were landfilled in an abandoned press pit located at the south end of the property. Reportedly, the drums were placed into the approximately 18-20 feet deep concrete pit on top of building debris which partially filled the pit and then were covered with approximately 2 feet of soil.

From 1960 to 1975, transformers from Niagara Mohawk Power Corporation were routinely brought to the site for salvage. The metal carcasses were sheared and the oil was then allowed to spill onto the ground. Reportedly, the oil soaked soils were periodically excavated by a dozer and pushed towards the eastern property boundary.

In 1983 the Lawless Container Corporation retained RECRA Research, Inc. (RECRA) to conduct a prepurchase environmental audit of the property. Analysis of two composite soil samples revealed the presence of PCBs (18 and 66 mg/kg), elevated levels of metals, and the presence of cyanide, phenolics and volatile organic compounds.

Subsequently, the NYDEC retained RECRA to conduct a Phase I environmental assessment in 1986 to score the site for possible inclusion on the state and federal priority lists of uncontrolled hazardous waste sites. The site scored high enough for inclusion on both the state and national priority lists.

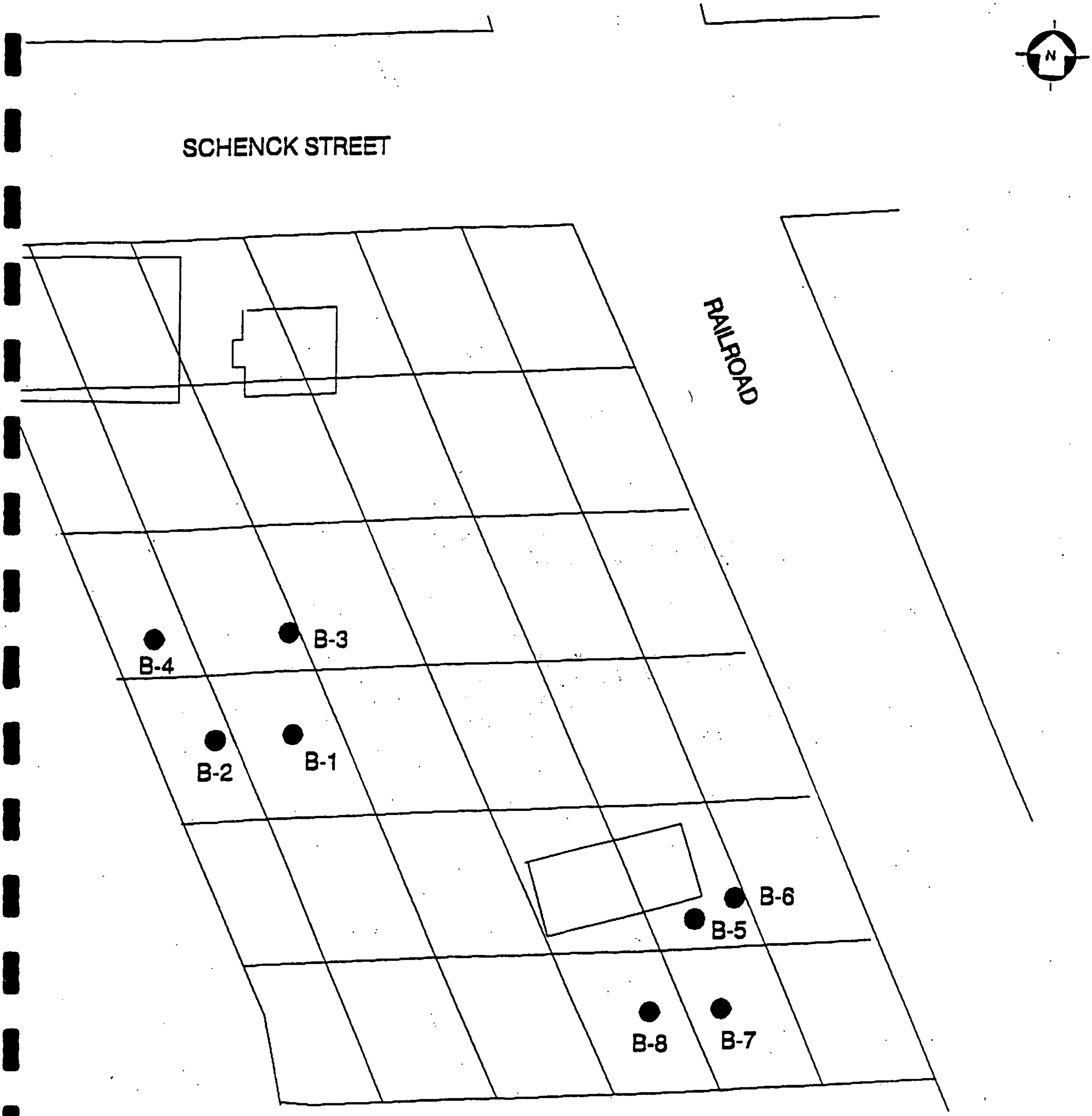
1.2.3 Previous Investigations

Two previous investigations have been undertaken to identify environmental conditions on the Schreck site. The first investigation was undertaken by Lawless Container Corporation in 1983 when they retained RECRA to conduct a prepurchase environmental audit of the property.

The investigation was limited in scope but included two four part composite soil samples which identified the presence of several contaminants at elevated concentrations in the site soils. Figure 3 identifies the location of the sampling points and Table 1 contains the analytical results. The presence of PCBs at remedial action trigger levels was particularly significant.

In 1986 RECRA was retained by the NYDEC to conduct a "Phase I" investigation, the purpose of which was to collect available information and score the site using standard ranking models to determine if the site was eligible for the state and/or federal priority list of uncontrolled hazardous material sites. No additional analytical data was collected during this investigation. The site did score high enough for inclusion on both the state and national priority lists.

FIGURE 3



1983 RECRA SAMPLE LOCATIONS

SCHRECK SCRAPYARD

TABLE 1
*LAWLESS CONTAINER CORPORATION
1983 SAMPLE RESULTS

Report Date: 6/24/83
Date Recieved: 5/31/83

PARAMETER	UNITS OF MEASURE	SAMPLE INDENTIFICATION: (DATE) BORING COMPOSITE 1-4 (5/31/83)	BORING COMPOSITE 5-8 (5/31/83)
Total Arsenic	ug/g dry	90	17
Total Cadmium	ug/g dry	21	35
Total Chromium	ug/g dry	300	470
Total Copper	ug/g dry	2,200	3,500
Total Lead	ug/g dry	7,300	2,100
Total Mercury	ug/g dry	2.5	4.1
Total Nickel	ug/g dry	330	360
Total Selenium	ug/g dry	< 0.08	< 0.1
Total Zinc	ug/g dry	2,600	9,500
Total Cyanide	ug/g dry	19	5.7
Total Recoverable Phenolics	ug/g dry	36	4.9
Total Recoverable Oil and Grease	ug/g dry	78	54
Volatile Organic Scan (FID)	ug/g dry as Carbon Benzene Standard	200,000	220,000
Volatile Halogenated Organic Scan (Couldon's)	ug/g dry as Chlorine	350	760
Halogenated Organic Scan (ECD)	ug/g dry as Chlorine Lindane Standard	32	28

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*Conducted by RECRA Environmental Laboratories

TABLE 1 - CONTINUED
*LAWLESS CONTAINER CORPORATION
1983 SAMPLE RESULTS

PARAMETER	UNITS OF MEASURE	SAMPLE INDENTIFICATION: (DATE) BORING COMPOSITE 1-4 (5/31/83)	SAMPLE INDENTIFICATION: (DATE) BORING COMPOSITE 5-8 (5/31/83)
Total Polychlorinated Biphenyls	ug/g dry as Aroclor 1248	32	48
	ug/g dry as Aroclor 1260	23	18
	ug/g dry Total	55	66
Dry Weight	%	89	86

II. STUDY AREA INVESTIGATION

Unless specified, all sample collection techniques and analytical procedures used in this investigation are described in the Phase I RI Work Plan and Quality Assurance Project Plan (QAPP).

2.1 Site Mapping

A site map was prepared using a combination of aerial photos, field measurements, and surveying, and is contained in Appendix A. This map will be refined during the second phase RI field investigation to include additional wells and other sampling locations. Surface contours have not been plotted since the surface of the site is essentially flat.

2.2 Contaminant Source Investigation

Two potential sources of contamination at the site were characterized; buried drums and on-site soils.

Shallow (approximately 3′ deep) transects were dug with a backhoe across the southern portion of the site in an attempt to locate the abandoned press pit and determine if drums were buried in the pit. The location and approximate extent of the press pit is identified in Appendix A. Several buried drums were found in the press pit. The drums were not stacked but, appeared to have been randomly dumped into the pit. Two of the drums were sampled where they were located in the excavation as well as soils from inside the excavated pit. Excavated soil was replaced on top of the pit and the area was secured to prevent contact with buried drums and associated soil.

On-site soils were characterized by collecting a series of samples from 22 nine foot deep on-site borings (Figure 4). Samples were analyzed for PCBs to determine the horizontal and vertical extent of contamination. In addition, soil samples were collected at three boring locations at the surface and at a depth of three feet, and analyzed for the full target compound list (TCL) parameters to determine the presence and approximate concentrations of other contaminants in surface and subsurface soils.

2.3 Off-Site Surface Contamination Investigation

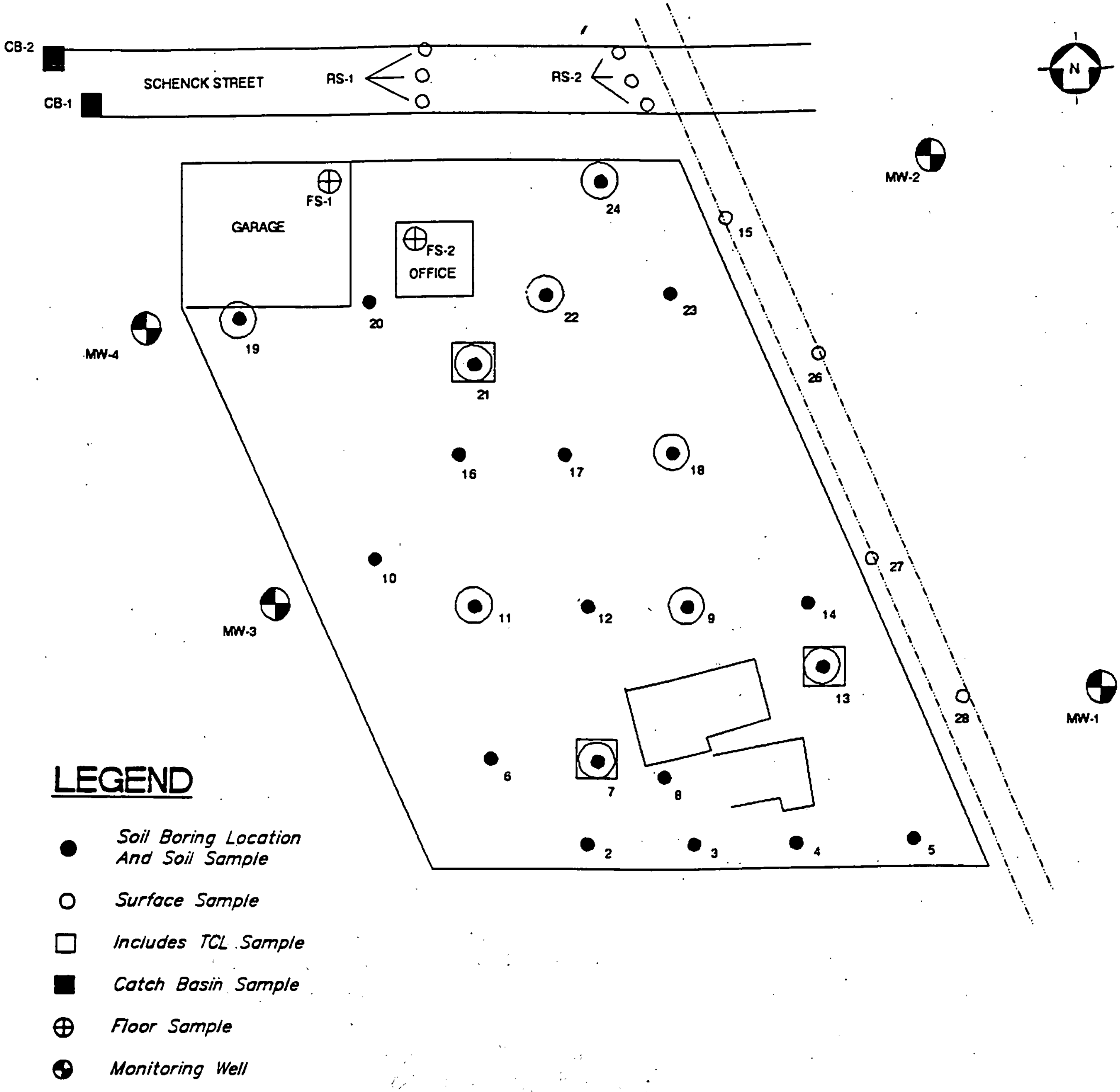
Samples were collected to determine if significant levels of PCBs have migrated from on-site soils into on-site buildings and off-site from surface runoff, vehicle and pedestrian tracking.

The floors immediately inside of the main entrance doorway to the site office building and the entrance doorway to the site garage were sampled and analyzed for PCBs. The office floor sample was collected as a wipe sample because there was insufficient material available for a bulk sample.

Off-site runoff appears to exit the site to the north onto Schenck Street and along the east onto the railroad tracks. A sediment sample was collected from each of the two catch basins on Schenck Street which could collect runoff storm water from the site to determine if significant levels of PCBs have entered the sewer system. Four surface soil samples were collected along the railroad tracks on the eastern border of the site to determine if significant levels of PCBs have migrated off of the site into this area by surface runoff.

Two 3-part composite samples were collected on Schenck Street adjacent to the site and analyzed for PCBs to determine the level of contaminants due to vehicle and pedestrian tracking. Each composite was made up of soil collected at each curb and from the center of the street.

FIGURE 4



SAMPLE LOCATION MAP

SCHRECK'S SCRAPYARD
NORTH TONAWANDA, NEW YORK

2.4 Hydrogeological Investigation

A hydrogeological investigation was undertaken to determine subsurface geological and hydrogeological conditions which could effect subsurface contaminant transport and potential subsurface remedial efforts.

Available hydrogeological information from the study area was reviewed by staff hydrogeologists and is summarized in this report.

The field hydrogeological investigation consisted of drilling one deep boring to bedrock and installing monitoring wells in four shallow borings. The borings were logged by a geologist to define the subsurface geological conditions at and around the site.

Groundwater measurements were obtained and samples collected from the four shallow monitoring wells to determine the direction of groundwater flow and groundwater quality. The elevations of the monitoring wells were surveyed and groundwater elevations determined on two occasions. The four wells were sampled and analyzed for the TCL parameters.

Two Shelby tube samples were collected to determine the permeability of the saturated unconsolidated zone.

2.4.1 Monitoring Well Installation

Four water table monitoring wells were installed between November 30 through December 2, 1988. The boring logs and construction information forms for these wells are included in Appendix D and a site plan locating the monitoring wells is presented in Figure 4.

Monitoring wells were drilled using 6-1/4" inside diameter, hollow stem augers. Soil samples were collected continuously to the end of each boring, using either a two-foot split spoon sampler or a 30-inch Shelby tube.

Well casing and screens were constructed of two-inch inside diameter, stainless steel pipe with flush threaded joints. All screens were five feet in length and had slot sizes of 0.010 inches. Ten-foot screens were not used because of the limited thickness of the water bearing zone. The top of the screen of each monitoring well was set approximately one to two feet above the water table.

American Materials No. 30 silica sand was used as a filter pack material around the screens. In some wells, the natural sand formation collapsed around all or a portion of the screen interval before the silica sand could be introduced. The filter packs and/or natural sand extended from the bottom of the boreholes to at least one foot above the top of the screens. The monitoring well annular space was sealed just above the filter pack with at least two feet of hydrated bentonite pellets. The remaining annular space above the filter pack was sealed with cement to the ground surface. A locking protective casing was installed at each well.

2.4.2 Monitoring Well Development

All wells were developed using a 1.7-inch hand pump on December 5, 1988. Well development forms are included in Appendix D. A minimum of 30 well volumes were removed from each well. Although over 125 well volumes of water were removed from monitoring well MW-1, the clarity of the water following development was not significantly better than the other three wells from which 30 to 40 well volumes were removed. Turbidity readings were not taken during the well development, however, it has been our experience that, for fine-grained water bearing formations such as those encountered at Schreck's, it is difficult, if not impossible, to develop a monitoring well to a point where the water is essentially free of turbidity.

2.4.3 Surveyed Elevations

The four groundwater monitoring wells were surveyed in December, 1988. A summary of surveyed elevations is presented in Table 2. Two benchmarks were established for this survey. Benchmark No. 1 was a railroad spike in the west face of power pole No. NM203r, located in the southwest corner of the scrapyard. Benchmark No. 2 was a railroad spike in the south face of power pole No. NYT6, located near the southwest corner of Schenck Street and North Marion Street. The elevations of these two benchmarks are 577.035 and 577.75 feet MSL, respectively.

SCRHRECK'S SCRAPYARD
NORTH TONAWANDA, NEW YORK
TABLE 2.
SURVEYED ELEVATIONS (MSL)

Monitoring Well No.	Top of Well Casing	Top of Protective Casing	Ground Surface	Depth to Water	Water Level Elevation
MW-1	580.14	580.27	577.12	11.50	568.64
MW-2	579.85	579.87	576.96	12.50	567.35
MW-3	578.51	578.56	575.72	10.75	567.76
MW-4	578.46	578.50	575.64	11.00	567.46

2.5 Air Monitoring

Prior to beginning the RI field work, the site was surveyed with a geiger counter to check for radiation. Radiation levels across the site were not above background.

Air monitoring for particulates, organic vapors and explosive atmospheres was conducted throughout the field investigation to protect the local population and on-site workers. Air monitoring did not identify any levels of concern for total organic vapors, particulates, and explosive atmosphere. Elevated levels of organic vapors were detected in subsurface bore holes. The air and explosive atmosphere monitoring results are presented in Appendix B.

III. PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 Soils

3.1.1 Niagara County

Niagara County is bordered on three sides by waterfronts. To the north is Lake Ontario, to the west is the Niagara River, and to the south are the Niagara River and Tonawanda Creek. The Niagara Escarpment divides the county into two drainage areas: the northern Ontario Plain drains northward into Lake Ontario and the southern Huron Plain drains southward into Tonawanda Creek, which flows into the Niagara River. Approximately half of Niagara County is used for fruit, vegetable, grain and dairy farming purposes. North Tonawanda, in which the site is located, is at the southernmost tip of the county in the Huron Plain where Tonawanda Creek meets the Niagara River.

Soils in the Huron Plain were primarily formed by glacial till and lake-laid silts, sands, and clays. Soils formed by glacial till are located near the lateral midsection of the county and primarily consist of the Hilton-Ovid-Ontario association, a deep and well-drained soil with a medium or moderately fine textured subsoil. Soils formed by lake-laid silts and fine sands are located along the southern border of the Huron Plain and primarily consist of the Canandaigua-Raynham-Rhinebeck association, a deep and poorly drained soil with medium to fine textured subsoil. A broad tract of soils formed by lake-laid clays and silts lay between the glacial till and lake-laid silts and fine sands. This tract consists of the Odessa-Lakemont-Ovid association, a deep and poorly drained soil with a fine or moderately fine textured subsoil.

3.1.2. Local Conditions

Brown and black silt and sand mixtures primarily comprises the site soil to a depth of 2 feet. At this depth interval, 57% of the soil borings encountered scrap such as metal, wood, and rubber debris.

Site soils at a depth interval of 2 - 4 feet are generally silt and sand mixtures with some rocks, scrap, and concrete debris intermixed. At the southern portion of the site near the press pit soils are primarily clay and sandy clay.

At a depth interval of 4 - 6 feet, approximately 20% of the site soil is sandy clay, 60% is clay, and 20% is a mixture of clay and sand. Black sludge was encountered at soil boring number 4 located south of the press pit.

At a depth interval of 6 - 8 feet, approximately 35% of the site soil is brown sandy clay, 30% is brown or gray clay, 10% is a mixture of sand and clay, 5% is black clay, and 20% is brown sand. The site is primarily clay at this interval except in an area immediately south of the office building which is primarily sand. Black sludge was encountered at soil boring number 14 located northeast of the bailer.

At a depth interval of 8 - 10 feet, approximately 64% of the site soil is clay, 20% is sandy clay, and 16% is sand. Soil Boring field data sheets are presented in Appendix C.

3.2 Geology and Hydrogeology

3.2.1 Regional Conditions

The Tonawanda study area consists of unconsolidated deposits comprised of clay, sand and till of Pleistocene and Holocene age. These deposits overlie Camillus Shale bedrock of Silurian age. The unconsolidated deposits in the area of Schreck's Scrapyard consist of Holocene lacustrine material comprised primarily of clay with stringers of sand and silt. Most stringers are less than three inches thick and are discontinuous throughout the area. Depending upon the depth to bedrock, the unconsolidated deposits range in thickness from 18 to 63 feet.

Two distinct aquifers are found in the study area. Water within the bedrock aquifer flows through the joints, fractures, and solution cavities within the unit. Industrial wells in the bedrock aquifer yield from 300 to 1200 gallons per minute. Regionally, this groundwater moves west and south. Groundwater in the shallow bedrock discharges into Tonawanda Creek, Ellicott Creek, and the Niagara River. Groundwater in the unconsolidated deposits is found within the clayey units and also in the stringers of permeable sand. The yield of groundwater from the stringers decreases as they are dewatered. The low vertical permeability (10E-06 to 10E-08 cm/sec) of the unconsolidated deposits causes a seasonally perched water table. Horizontal permeability may be orders of magnitude greater than vertical permeability. This groundwater discharges into areas of low topography and, eventually, into nearby surface water bodies.

Based on a review of a number of published reports, the hydrologic properties of the bedrock aquifer are as follows:

Transmissivity = 7000 to 70,000 gal/day/ft
Specific capacity = 4 to 84 gal/min/ft
Storage coefficient = 0.025 to 0.050

3.2.2 Local Conditions

Lacustrine deposits of silt, fine sand, and clay interbedded with stringers of gravel and sand and gravel were revealed by test drilling in the area of investigation. Typical subsoils consist of clayey silts and sands, fine to medium sands and gravel, clays, and fat clays. Unified soil classifications for these soils are ML, GW, CL, and CH respectively. A deep boring drilled adjacent to monitoring well MW-1 encountered the bedrock surface at approximately 40 feet below grade.

Samples of clay were collected at a depth of 14 to 16 feet below grade while drilling monitoring wells MW-2 and MW-3 and subjected to flexible wall permeability tests. The results revealed a permeability of approximately 1 X 10E-08 cm/sec.

The depth to groundwater in the area of investigation is approximately eight to nine feet below grade. The groundwater is perched above the clay/fat clay which was encountered at 10 to 14 feet below grade. Figure 5 shows the approximate water table contours on December 15, 1988. The data indicates that the general flow of groundwater is to the north/northwest, approximately parallel to Little River. Based on water level elevations collected on December 15, 1988, a water table gradient of 0.005 ft/ft was calculated between MW-1 and MW-2, and 0.002 ft/ft between MW-3 and MW-4.

Little River is that portion of the Niagara River which flows between Tonawanda Island and North Tonawanda. Since the direction of groundwater flow was based on water level elevations from a very limited number of monitoring wells, this information should be considered preliminary. Additional monitoring wells are needed to confirm the direction of groundwater flow. Regardless of the direction of flow, groundwater in the unconsolidated deposits in the vicinity of the site will discharge into areas of low topography and, eventually, into nearby surface water bodies, the nearest being Little River. Although the cities of Tonawanda, North Tonawanda, and Lockport obtain their water from the Niagara River, all three intakes are located in the main channel of the River, upstream of the expected point of shallow groundwater discharge from Schreck's Scrapyard. This will be examined in greater detail in the Phase II field investigation. Monitoring well installation field data sheets are presented in Appendix D.

3.2.3 Local Groundwater Usage

According to Mr. Paul McDonough, Superintendent of the City of North Tonawanda Water Department, all of the City's Water is obtained from the Niagara River. The City does not utilize any groundwater supplies. The City also has a prohibition against the installation of private water supply wells for residential use. Mr. McDonough stated that the few private water supply wells that did exist were abandoned years ago. In addition, there are no high capacity industrial wells in North Tonawanda. In summary, groundwater in the North Tonawanda area is not used for drinking or industrial purposes. All water is obtained from the Niagara River.

eder associates
consulting engineers, p.c.

August 31, 1989
File #611-1

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New York State Department of
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Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
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Albany, New York 12233-7010

Dear Mr. Scharf:

I have enclosed one copy of the Draft RI for your review. Additional copies will follow.

If you have any questions or comments, please call me at our Michigan office.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Mike McLeod
Project Manager

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IV. NATURE AND EXTENT OF CONTAMINATION

The Phase I RI field investigation analytical results are presented in Tables 3 - 13. The QA/QC data validation report is contained in Appendix E. The laboratory data package documentation is on file with the New York Department of Environmental Conservation.

4.1 Buried Drums

Laboratory data indicates that the material contained within the drum excavated from the approximately 35' by 20' abandoned press pit, is similar to the contaminants found in the soils surrounding the drum. The drum and soils contained PCBs, pesticides, volatile organics, and semivolatile organics.

The contents of a buried drum (Sample OPP 1) was analyzed for TCL parameters. PCB was detected at 500,000 ppb (Table 3), and alpha-BHC at levels of 21,000 ppb. (Table 4).

Several aromatic volatile organic compounds were identified in the drum sample in high concentrations (Table 5):

COMPOUND	RESULTS (ppb)
benzene	18,300
toluene	61,600
xylenes	203,000
chlorobenzene	12,300
ethylbenzene	28,200
1,2-dichlorobenzene	99,100
1,3-dichlorobenzene	1,890
1,4-dichlorobenzene	49,600

Several semivolatile organic compounds were identified in the drum sample in high concentrations (Table 6):

COMPOUND	RESULTS (ppb)
phenol	670,000
naphthalene	95,000
2-methylnapthalene	180,000
2,4,6-trichlorophenol	290,000
dibenzofuran	2,100,000
fluorene	12,000
phenanthrene	32,000
di-n-butylphthalate	38,000
bis (2-ethylhexyl) phthalate	70,000

Inorganic compounds identified in the drum sample were (Table 7):

COMPOUND	RESULTS (ppm)
aluminum	165
arsenic	3.8
barium	49.2
beryllium	0.13
cadmium	0.89
calcium	2,460
chromium	11.5
copper	68.7
iron	3,830
lead	26.9
magnesium	256
manganese	31.6
mercury	0.1
nickel	5.1
potassium	634
selenium	2.5
silver	3.4

sodium	90.3
vanadium	1.9
zinc	74.8

A second drum was sampled but was characterized by the laboratory as consisting primarily of water which was insufficient in volume for analysis.

Two soil samples collected from the drum pit excavation were also analyzed for TCL parameters (Samples OPP 3 and OPP 4).

PCB and pesticide analyses indicated OPP 3 and OPP 4 contained concentrations of PCBs ranging from 2,100 ppb to 48,000 ppb (Table 3). Alpha-BHC was found in both samples at 3,100 ppb and 100 ppb respectively (Table 4).

Volatile organic compounds identified in OPP 3 and OPP 4, were respectively (Table 5):

COMPOUND	RESULTS (ppb)
benzene	52 and 28
toluene	172 and 44
xylenes	201 and 85
chlorobenzene	38 and 18
ethylbenzene	107 and 51
1,2-dichlorobenzene	12 and 4
1,3-dichlorobenzene	28 and 8
1,4-dichlorobenzene	242 and 89

Semivolatile organic compounds identified in OPP 3 and OPP 4 were respectively:

COMPOUND	RESULTS (ppb)
2-methylnapthalene	3,300 and 460
dibenzofuran	3,200 and 5,400
phenanthrene	3,600 and 1,300
di-n-butylphthalate	11,000 and 6,600

butylbenzylpthalate	2,400 and 1,200

Three compounds were detected in OPP 3 that were not detected in OPP 4. These compounds and their associated levels are: benzo(a)anthracene (1,700 ppb), bis (2-ethylhexyl) phthalate (4,800 ppb), and chrysene (2,300 ppb) (Table 6).

TABLE 3
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
CATCH BASIN							
CB-1	ND	ND	ND	ND	ND	2,600 J	ND
CB-2	ND	ND	ND	ND	ND	ND	ND
ROAD COMPOSITES							
RS-1	ND	ND	ND	ND	ND	16,000	ND
RS-2	ND	ND	ND	ND	ND	12,000	ND
BUILDING FLOORS							
FS-1	ND	ND	ND	ND	ND	37,000 C	ND
FS-2 (UG/100 CM2)	ND	ND	ND	ND	ND	170	ND
FS-2 DUPLICATE (UG/100 CM2)	ND	ND	ND	ND	ND	31	ND
BURIED DRUM EXCAVATION							
OPP 1 (a)	ND	ND	ND	500,000 E	ND	ND	ND
OPP 3 (b)	ND	ND	ND	48,000	ND	16,000 J	ND
OPP 4 (b)	ND	ND	ND	7,200	ND	2,100 J	ND
SOIL BORINGS							
B 15-0'	ND	ND	ND	ND	ND	6,000	ND
B 26-0'	ND	ND	ND	ND	ND	16,000	ND
B 27-0'	ND	ND	ND	ND	ND	2,200	ND
B 28-0'	ND	ND	ND	ND	ND	ND	ND
B 11-1' DUPLICATE	ND	ND	ND	ND	ND	51,000 C	ND
B 13-0' DUPLICATE	ND	ND	ND	ND	22,000	20,000	ND
B 14-1' DUPLICATE	ND	ND	ND	ND	ND	46,000 C	ND
B 17-3' DUPLICATE	ND	ND	ND	ND	ND	5,000	ND
B 21-0' DUPLICATE	ND	ND	ND	ND	ND	66,000 J	ND
B 2-0'	NA	NA	NA	NA	NA	NA	NA
B 2-1'	ND	ND	ND	ND	ND	750	ND
B 2-3'	ND	ND	ND	ND	ND	680	ND
B 2-5'	ND	ND	ND	ND	ND	ND	ND
B 2-7'	ND	ND	ND	ND	ND	ND	ND
B 2-9'	ND	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED DUE TO MATRIX INTERFERENCE
C: NO CALIBRATION DATA
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
NA: NOT ANALYZED
(a): BURIED DRUM
(b): SOIL FROM DRUM EXCAVATION

TABLE 3 CONTINUED
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
B 3-0'	ND	ND	ND	ND	ND	5,900	ND
B 3-1'	ND	ND	ND	ND	ND	3,400	ND
B 3-3'	ND	ND	ND	ND	ND	1,200 J	ND
B 3-5'	ND	ND	ND	ND	ND	1,000 J	ND
B 3-7'	ND	ND	ND	ND	ND	520 J	ND
B 3-9'	ND	ND	ND	ND	ND	ND	ND
B 4-0'	NA	NA	NA	NA	NA	NA	NA
B 4-1'	ND	ND	ND	ND	32,000 C	48,000 C	ND
B 4-3'	NA	NA	NA	NA	NA	NA	NA
B 4-5'	ND	ND	ND	ND	ND	1,700 J	ND
B 4-7'	ND	ND	ND	ND	ND	320	ND
B 4-9'	ND	ND	ND	ND	ND	190	ND
B 5-0'	NA	NA	NA	NA	NA	NA	NA
B 5-1'	ND	ND	ND	ND	ND	810	ND
B 5-3'	ND	ND	ND	ND	ND	ND	ND
B 5-5'	ND	ND	ND	ND	ND	ND	ND
B 5-7'	ND	ND	ND	ND	ND	ND	ND
B 5-9'	ND	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb

C: NO CALIBRATION DATA

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

NA: NOT ANALYZED

TABLE 3 CONTINUED
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
B 6-0'	ND	ND	ND	ND	ND	17,000	ND
B 6-1'	ND	ND	ND	ND	ND	3,700	ND
B 6-3'	ND	ND	ND	ND	ND	ND	ND
B 6-5'	ND	ND	ND	ND	ND	ND	ND
B 6-7'	ND	ND	ND	ND	ND	ND	ND
B 6-9'	ND	ND	ND	ND	ND	ND	ND
B 7-0'	ND	ND	ND	ND	ND	92,000 C	ND
B 7-1'	ND	ND	ND	ND	53,000 C	19,000 C	ND
B 7-3'	ND	ND	ND	ND	ND	830	ND
B 7-5'	ND	ND	ND	ND	ND	ND	ND
B 7-7'	ND	ND	ND	ND	ND	ND	ND
B 7-9'	ND	ND	ND	ND	ND	ND	ND
B 8-0'	NA	NA	NA	NA	NA	NA	NA
B 8-1'	ND	ND	ND	ND	ND	13,000	ND
B 8-3'	ND	ND	ND	ND	ND	2,800	ND
B 8-5'	NA	NA	NA	NA	NA	NA	NA
B 8-7'	ND	ND	ND	ND	ND	ND	ND
B 8-9'	ND	ND	ND	ND	670	420	ND

CONCENTRATION UNITS: ppb
C: NO CALIBRATION DATA
NA: NOT ANALYZED
ND: NOT DETECTABLE

TABLE 3 CONTINUED
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
B 9-0'	ND	ND	ND	ND	ND	30,000	ND
B 9-1'	ND	ND	ND	28,000	ND	17,000	ND
B 9-3'	ND	ND	ND	66,000	ND	ND	25,000
B 9-5'	NA	NA	NA	NA	NA	NA	NA
B 9-7'	NA	NA	NA	NA	NA	NA	NA
B 9-9'	NA	NA	NA	NA	NA	NA	NA
B 10-0'	ND	ND	ND	ND	ND	95,000 C	ND
B 10-1'	ND	ND	ND	31,000	ND	17,000	ND
B 10-3'	ND	ND	ND	ND	ND	1,300	ND
B 10-5'	ND	ND	ND	2,800	ND	1,700	ND
B 10-7'	ND	ND	ND	ND	ND	ND	ND
B 10-9'	ND	ND	ND	ND	ND	ND	ND
B 11-0'	ND	ND	ND	ND	ND	88,000 C	ND
B 11-1'	ND	ND	ND	ND	ND	3,200	ND
B 11-3'	ND	ND	ND	ND	ND	570 J	ND
B 11-5'	ND	ND	ND	ND	ND	ND	ND
B 11-7'	ND	ND	ND	ND	ND	ND	ND
B 11-9'	ND	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb

C: NO CALIBRATION DATA

NA: NOT ANALYZED

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 3 CONTINUED
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
B 12-0'	NA	NA	NA	NA	NA	NA	NA
B 12-1'	ND	ND	ND	ND	ND	7,000	ND
B 12-3'	ND	ND	ND	ND	15,000	20,000	ND
B 12-5'	ND	ND	ND	ND	ND	ND	ND
B 12-7'	ND	ND	ND	ND	ND	ND	ND
B 12-9'	ND	ND	ND	ND	ND	1,100	ND
B 13-0'	ND	ND	ND	ND	48,000	18,000 J	ND
B 13-1'	ND	ND	ND	ND	9,000	2,900	3,600
B 13-3'	ND	ND	ND	ND	11,000	31,000	ND
B 13-5'	ND	ND	ND	ND	4,800	ND	6,400
B 13-7'	ND	ND	ND	ND	ND	ND	ND
B 13-9'	ND	ND	ND	ND	ND	ND	ND
B 14-0'	NA	NA	NA	NA	NA	NA	NA
B 14-1'	ND	ND	ND	ND	ND	57,000 C	ND
B 14-3'	ND	ND	ND	ND	ND	ND	ND
B 14-5'	ND	ND	ND	ND	ND	79 J	ND
B 14-7'	ND	ND	ND	ND	ND	720	ND
B 14-9'	ND	ND	ND	ND	ND	640	ND

CONCENTRATION UNITS: ppb

C: NO CALIBRATION DATA

NA: NOT ANALYZED

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 3 CONTINUED
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
B 16-0'	NA	NA	NA	NA	NA	NA	NA
B 16-1'	ND	ND	ND	ND	ND	57,000 C	ND
B 16-3'	ND	ND	ND	ND	ND	11,000	ND
B 16-5'	ND	ND	ND	ND	ND	73 J	ND
B 16-7'	ND	ND	ND	ND	ND	ND	ND
B 16-9'	ND	ND	ND	ND	ND	300	ND
B 17-0'	NA	NA	NA	NA	NA	NA	NA
B 17-1'	ND	ND	ND	ND	ND	72,000 C	ND
B 17-3'	ND	ND	ND	ND	ND	5,800	ND
B 17-5'	ND	ND	ND	ND	ND	120	ND
B 17-7'	ND	ND	ND	ND	ND	ND	ND
B 17-9'	ND	ND	ND	ND	ND	ND	ND
B 18-0'	ND	ND	ND	ND	ND	17,000	ND
B 18-1'	ND	ND	ND	ND	ND	23,000 C	ND
B 18-3'	ND	ND	ND	ND	ND	1,100	ND
B 18-5'	ND	ND	ND	ND	ND	ND	ND
B 18-7'	ND	ND	ND	ND	ND	63 J	ND
B 18-9'	ND	ND	ND	ND	ND	360	ND

CONCENTRATION UNITS: ppb

NA: NOT ANALYZED

C: NO CALIBRATION DATA

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 3 CONTINUED
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
B 22-0'	ND	ND	ND	ND	ND	140,000 C	ND
B 22-1'	ND	ND	ND	ND	ND	ND	ND
B 22-3'	ND	ND	ND	ND	ND	ND	ND
B 22-5'	ND	ND	ND	ND	ND	ND	ND
B 22-7'	ND	ND	ND	ND	ND	ND	ND
B 22-9'	ND	ND	ND	ND	ND	ND	ND
B 23-0'	NA	NA	NA	NA	NA	NA	NA
B 23-1'	ND	ND	ND	120,000 C	ND	ND	ND
B 23-3'	ND	ND	ND	24,000	ND	8,500	ND
B 23-5'	ND	ND	ND	460	ND	210	ND
B 23-7'	ND	ND	ND	ND	ND	ND	ND
B 23-9'	NA	NA	NA	NA	NA	NA	NA
B 24-0'	NA	NA	NA	NA	NA	NA	NA
B 24-1'	ND	ND	ND	ND	ND	48,000 C	ND
B 24-3'	ND	ND	ND	ND	ND	140 J	ND
B 24-5'	ND	ND	ND	ND	ND	320	ND
B 24-7'	ND	ND	ND	ND	ND	ND	ND
B 24-9'	ND	ND	ND	ND	ND	1,000	ND

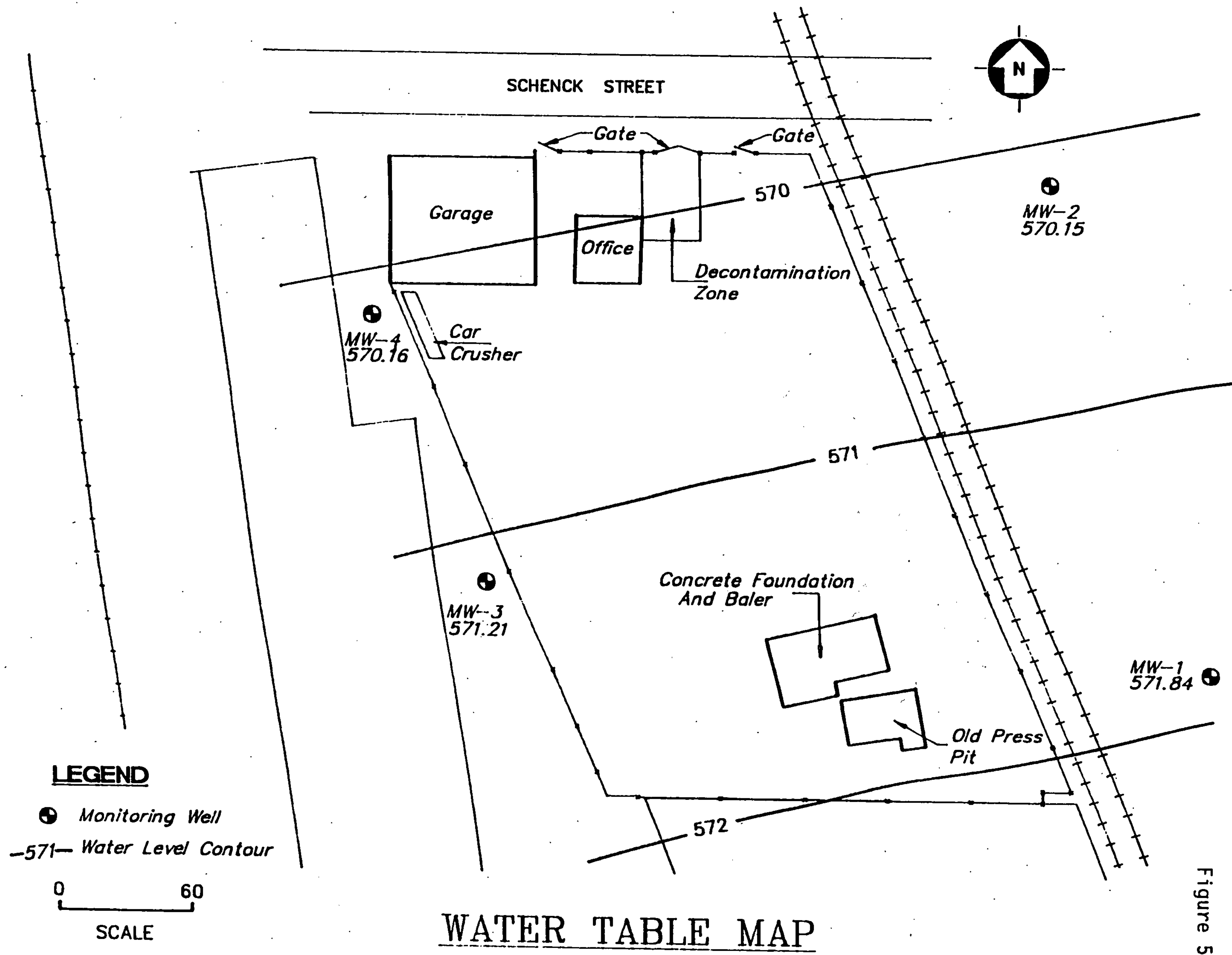
CONCENTRATION UNITS: ppb

NA: NOT ANALYZED

C: NO CALIBRATION DATA

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT



WATER TABLE MAP

SCHRECKS SCRAPYARD
NORTH TONAWANDA NEW YORK

SK611-1S

Figure 5

eder associates consulting engineers, p.c.

TABLE 3 CONTINUED
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
B 19-0'	ND	ND	ND	ND	ND	56,000 C	ND
B 19-1'	ND	ND	ND	ND	ND	29,000 C	ND
B 19-3'	ND	ND	ND	ND	ND	ND	ND
B 19-5'	ND	ND	ND	ND	ND	ND	ND
B 19-7'	ND	ND	ND	ND	ND	ND	ND
B 19-9'	ND	ND	ND	ND	ND	ND	ND
B 20-0'	NA	NA	NA	NA	NA	NA	NA
B 20-1'	ND	ND	ND	ND	ND	ND	ND
B 20-3'	ND	ND	ND	ND	ND	3,800 J	ND
B 20-5'	ND	ND	ND	ND	ND	8,700	ND
B 20-7'	ND	ND	ND	ND	ND	12,000	ND
B 20-9'	ND	ND	ND	ND	ND	3,600	ND
B 21-0'	ND	ND	ND	ND	ND	110,000 J C	ND
B 21-1'	ND	ND	ND	ND	ND	70,000 C	ND
B 21-3'	ND	ND	ND	ND	ND	4,200 J	ND
B 21-5'	ND	ND	ND	ND	ND	180	ND
B 21-7'	ND	ND	ND	ND	ND	ND	ND
B 21-9'	ND	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb

NA: NOT ANALYZED

C: NO CALIBRATION DATA

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 4
PESTICIDE ORGANIC ANALYSIS RESULTS

COMPOUND	B 7-0'	B 7-3'	B 13-0'	B 13-3'	B 14-3'	B 21-0'	B 21-3'	OPP 1 (a)	OPP 3 (b)	OPP 4 (b)	B 13-0' D	B 21-0' D
alpha-BHC	ND	750	ND	ND	76	160,000 C	1,500	21,000	3,100	100 J	ND	200,000 C
beta-BHC	ND	ND	ND	ND	350	220,000 C	ND	ND	ND	ND	ND	290,000 C
delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALDRIN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIELDRIN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	190	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN KETONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-CHLORDANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-CHLORDANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(a): BURIED DRUM
(b): SOIL FROM DRUM EXCAVATION
CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
C: NO CALIBRATION DATA
J: ESTIMATED VALUE. VALUE IS BELOW COMPOUND QUANTITATION LIMIT

TABLE 5
VOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	B 7-0'	B 7-3'	B 13-0'	B 13-3'	B 14-3'	B 21-0'	B 21-3'	OPP 1 (a)	OPP 3 (b)	OPP 4 (b)	B 13-0' D	B 21-0' D
* BENZENE	ND	3.2	ND	36	6.0	157	18	18,300	52	28	ND	30
* TOLUENE	ND	2.4	1.0	250 B	2.5	2,120	15	61,600	172	44	1.0	674
* CHLOROBENZENE	ND	1.9	ND	6.7	ND	140	26	12,300	38	18	ND	56
* ETHYLBENZENE	ND	ND	ND	160	ND	1,370	6	28,200	107	51	ND	567
* XYLENES (TOTAL)	ND	3.6	ND	1,300	2.9	8,470	32	203,000	201	85	ND	1,190
* 1,2-DICHLOROBENZENE	ND	ND	ND	35	ND	432	2	99,100	12	4	ND	311
* 1,3-DICHLOROLOBENZENE	ND	ND	ND	33	ND	ND	ND	1,890	28	8	ND	7
* 1,4-DICHLOROBENZENE	ND	2.9	ND	850	ND	2,240	12	49,600	242	89	ND	1,070
BROMODICHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	1.9	ND	6.7	ND	43	17	ND	81	18	ND	16
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROETHYLVINYL ETHER	C	C	C	C	C	ND	ND	ND	ND	ND	C	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb
(a): BURIED DRUM
(b): SOIL FROM DRUM EXCAVATION
ND: NOT DETECTABLE
B: COMPOUND ALSO FOUND IN BLANK
C: NO CALIBRATION DATA
NA: NOT ANALYZED
*: EPA METHOD 8020 USED FOR PARAMETER ANALYSES

TABLE 5 CONTINUED
VOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	B 7-0'	B 7-3'	B 13-0'	B 13-3'	B 14-3'	B 21-0'	B 21-3'	OPP 1 (a)	OPP 3 (b)	OPP 4 (b)	B 13-0' D	B 21-0' D
1,2-DICHLOROBENZENE	ND	ND	ND	35	ND	ND	5	ND	67	54	ND	140
1,3-DICHLOROBENZENE	ND	ND	ND	33	ND	ND	ND	ND	58	66	ND	22
1,4-DICHLOROBENZENE	ND	2.9	ND	850	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	3.3	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	69 B	78 B	8.8 B	54 B	5.5 B	1,100	270	ND	28	1,600	9.7 B	560
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	5.7	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND	ND	2.4	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	2.4	ND	36	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	ND	NA
VINYL CHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb

(a): BURIED DRUM

(b): SOIL FROM DRUM EXCAVATION

ND: NOT DETECTABLE

B: COMPOUND ALSO FOUND IN BLANK

C: NO CALIBRATION DATA

EPA METHOD 8010 USED FOR ALL PARAMETERS ANALYZED

TABLE 6
SEMIVOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	OPP 1 (a)	OPP 3 (b)	OPP 4 (b)	B 13-0'D	B 21-0'D
PHENOL	670,000 J	ND	ND	ND	ND
bis (2-CHLOROETHYL) ETHER	ND	ND	ND	ND	ND
2-CHLOROPHENOL	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND
BENZYL ALCOHOL	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND
2-METHYLPHENOL	ND	ND	ND	ND	ND
bis (2-CHLOROISOPROPYL) ETHER	ND	ND	ND	ND	ND
4-METHYLPHENOL	ND	ND	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	ND	ND	ND	ND	ND
HEXACHLOROETHANE	ND	ND	ND	ND	ND
NITROBENZENE	ND	ND	ND	ND	ND
ISOPHORONE	ND	ND	ND	ND	ND
2-NITROPHENOL	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	ND	ND	ND	ND	ND
BENZOIC ACID	ND	ND	ND	ND	ND
bis (2-CHLOROETHOXY) METHANE	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND

(a): BURIED DRUM

(b): SOIL FROM DRUM EXCAVATION

CONCENTRATION UNITS: ppb

B: COMPOUND ALSO FOUND IN BLANK

C: NO CALIBRATION DATA

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 6 CONTINUED
SEMIVOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	OPP 1 (a)	OPP 3 (b)	OPP 4 (b)	B 13-0'D	B 21-0'D
NAPTHALENE	95,000 J	ND	ND	ND	8,000 J
4-CHLOROANILINE	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	180,000 J	3,300 J	460 J	270 J	11,000 J
HEXACHLOROCYCLOPENTADIENE	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	290,000 J	ND	ND	ND	ND
2,4,5-TRICHLORLPHENOL	ND	ND	ND	ND	ND
2-CHLORONAPTHALENE	ND	ND	ND	ND	ND
2-NITROANILINE	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	ND	ND	ND	ND	ND
ACENAPHTHYLENE	ND	ND	ND	ND	ND
3-NITROANILINE	ND	ND	ND	ND	ND
ACENAPHTHENE	ND	ND	ND	510 J	ND
2,4-DINITROPHENOL	ND	ND	ND	ND	ND
4-NITROPHENOL	ND	ND	ND	ND	ND
DIBENZOFURAN	2,100,000	3,200 J	5,400 J	290 J	ND
2,4-DINITROTOLUENE	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE	ND	ND	ND	ND	ND
DIETHYLPHTHALATE	ND	ND	ND	ND	ND

(a): BURIED DRUM

(b): SOIL FROM DRUM EXCAVATION

CONCENTRATION UNITS: ppb

C: NO CALIBRATION DATA

B: COMPOUND ALSO FOUND IN BLANK

ND: NOT DETECTABLE

J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 6 CONTINUED
SEMIVOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	OPP 1 (a)	OPP 3 (b)	OPP 4 (b)	B 13-0' D	B 21-0' D
4-CHLOROPHENYL-PHENYLETHER	ND	ND	ND	ND	ND
FLUORENE	12,000 J	ND	ND	550 J	ND
4-NITROANILINE	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE (1)	ND	ND	ND	ND	ND
4-BROMOPHENYL-PHENYLETHER	ND	ND	ND	ND	ND
HEXACHLOROBENZENE	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	ND	ND	ND	ND	ND
PHENANTHRENE	32,000 J	3,600 J	1,300 J	5,900 J	ND
ANTHRACENE	ND	ND	ND	1,500 J	ND
DI-N-BUTYLPHTHALATE	38,000 J	11,000 J	6,600	3,600 B J	7,500 J
FLUORANTHENE	ND	ND	ND	8,300	ND
PYRENE	ND	ND	ND	8,000	ND
BUTYLBENZYLPHTHALATE	ND	2,400 J	1,200 J	39,000	ND
3,3'-DICHLOROBENZIDINE	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	ND	1,700 J	ND	4,000 J	2,200 J
bis (2-ETHYLHEXYL) PHTHALATE	70,000 J	4,800 B J	ND	3,900 J	24,000 B J
CHRYSENE	ND	2,300 J	ND	4,700 J	3,500 J
DI-N-OCTYL PHTHALATE	ND	ND	ND	ND	ND
BENZO (B) FLUORANTHENE	ND	ND	ND	2,700 J	ND
BENZO (K) FLUORANTHENE	ND	ND	ND	3,100 J	ND
BENZO (A) PYRENE	ND	ND	ND	2,700 J	ND
INDENO (1,2,3-CD) PYRENE	ND	ND	ND	ND	ND
DIBENZ (A,H) ANTHRACENE	ND	ND	ND	240 J	ND
BENZO (G,H,I) PERYLENE	ND	ND	ND	840 J	ND

(1) CANNOT BE SEPARATED FROM DIPHENYLAMINE
(a): BURIED DRUM
(b): SOIL FROM DRUM EXCAVATION
CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
B: COMPOUND ALSO FOUND IN BLANK

TABLE 6 CONTINUED
SEMIVOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	B 7-0'	B 7-3'	B 13-0'	B 13-3'	B 14-3'	B 21-0'	B 21-3'
PHENOL	510 J	ND	ND	3,300 J	1,500	2,300 J	ND
bis (2-CHLOROETHYL) ETHER	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	850 J	ND	ND	76 B J	970 J	ND
BENZYL ALCOHOL	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	27 J	580 J	ND
2-METHYLPHENOL	ND	1,200 J	ND	ND	1,300	ND	ND
bis (2-CHLOROISOPROPYL) ETHER	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	ND	ND	ND	3,200 J	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
NITROBENZENE	ND	ND	ND	ND	ND	ND	ND
ISOPHORONE	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	ND	ND	ND	ND	390 J	ND	ND
BENZOIC ACID	ND	ND	ND	ND	ND	ND	ND
bis (2-CHLOROETHOXY) METHANE	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	300 J	200 J	ND	1,200 J	82 J	1,400 J	97 J

CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
B: COMPOUND ALSO FOUND IN BLANK
C: NO CALIBRATION DATA

TABLE 6 CONTINUED
SEMIVOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	B 7-0'	B 7-3'	B 13-0'	B 13-3'	B 14-3'	B 21-0'	B 21-3'
NAPTHALENE	1800 J	ND	ND	3,100 J	560 J	6,200 J	ND
4-CHLOROANILINE	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	340 J	ND	ND	5,000 J	380 J	8,200 J	150 J
HEXACHLOROCYCLOPENTADIENE	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	ND	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLORLPHENOL	ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPTHALENE	ND	ND	ND	ND	ND	ND	ND
2-NITROANILINE	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	ND	ND	ND	ND	25 J	ND	ND
3-NITROANILINE	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	1600 J	ND	ND	6,100 J	ND	140 J	280 J
2,4-DINITROPHENOL	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	ND	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	2,200 J	ND	ND	4,500 J	200 J	ND	ND
2,4-DINITROTOLUENE	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE	ND	ND	ND	ND	ND	ND	ND
DIETHYLPHTHALATE	ND	ND	ND	ND	21 J	ND	ND

CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
B: COMPOUND ALSO FOUND IN BLANK
C: NO CALIBRATION DATA

TABLE 6 CONTINUED
SEMIVOLATILE ORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	B 7-0'	B 7-3'	B 13-0'	B 13-3'	B 14-3'	B 21-0'	B 21-3'
4-CHLOROPHENYL-PHENYLETHER	ND	ND	ND	ND	ND	ND	ND
FLUORENE	1,300 J	ND	ND	6,000 J	32 J	ND	ND
4-NITROANILINE	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE (1)	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL-PHENYLETHER	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBENZENE	620 J	ND	ND	480 J	ND	920 J	380 J
PENTACHLOROPHENOL	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	13,000	160 J	530 J	22,000	500 J	ND	5,400 J
ANTHRACENE	2,400 J	ND	ND	5,500 J	72 J	ND	1,300 J
DI-N-BUTYLPHTHALATE	2,500 B J	ND	3,900 B J	7,800 B	5,100	ND	5,400 J
FLUORANTHENE	15,000	ND	ND	17,000	540 J	ND	6,300 J
PYRENE	14,000	ND	1,100 J	19,000	550 J	ND	4,800 J
BUTYLBENZYLPHTHALATE	4,400 J	ND	46,000	18,000	ND	ND	ND
3,3'-DICHLOROBENZIDINE	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	5,600 J	ND	500 J	6,200 J	290 J	ND	2,400 J
bis (2-ETHYLHEXYL) PHTHALATE	12,000	ND	6,000 J	30,000	500 B J	18,000 B	1,400 B J
CHRYSENE	6,300 J	250 J	1,700 J	7,500 J	370 J	2,800 J	2,600 J
DI-N-OCTYL PHTHALATE	ND	ND	550 J	ND	ND	ND	ND
BENZO (B) FLUORANTHENE	3,600 J	ND	590 J	4,300	400 J	ND	2,000 J
BENZO (K) FLUORANTHENE	5,500 J	ND	350 J	4,000 J	250 J	ND	1,600 J
BENZO (A) PYRENE	4,400 J	ND	370 J	ND	210 J	ND	1,600 J
INDENO (1,2,3-CD) PYRENE	1,700 J	ND	ND	ND	99 J	ND	730 J
DIBENZ (A,H) ANTHRACENE	420 J	ND	ND	ND	25 J	ND	220 J
BENZO (G,H,I) PERYLENE	1,400 J	ND	ND	660 J	88 J	ND	520 J

(1) CANNOT BE SEPARATED FROM DIPHENYLAMINE
CONCENTRATION UNITS: ppb
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
ND: NOT DETECTABLE
B: COMPOUND ALSO FOUND IN BLANK

TABLE 7
INORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	OPP - 1 (a)	OPP - 3 (b)	OPP - 4 (b)	BACKGROUND SOIL
ALUMINUM	165	2,600	5,300	4,800
ANTIMONY	ND	ND	ND	ND
ARSENIC	3.8	15.5	ND	ND
BARIUM	49.2 N	333	190	134
BERYLLIUM	0.13 B N	6.7	5.9	1.5
CADMIUM	0.89 N	5.7	5.3	0.99
CALCIUM	2,460	11,800	6,400	36,700
CHROMIUM	11.5 N	213	211	19.5
COBALT	ND	7.0 N	4.8 N	4.1 N
COPPER	68.7 N	404	368	128
IRON	3,830 N	211,000	196,000	27,000
LEAD	26.9	280	264	99.2
MAGNESIUM	256 B	1,940	1,470	9,460
MANGANESE	31.6 N	933	1,080	1,070
MERCURY	0.1	4.4 *	7.0	NA
NICKEL	5.1 B N	143	120	26.5
POTASSIUM	634	151	202	403
SELENIUM	2.5	ND	ND	ND
SILVER	3.4	0.79	1.1	0.66
SODIUM	90.3 B	ND	235	678
THALLIUM	ND	ND	ND	ND
VANADIUM	1.9	18.8	19.2	25.8
ZINC	74.8 N	1,890	10,300	139

CONCENTRATION UNITS: ppm
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
B: INDICATES A VALUE GREATER THAN OR EQUAL TO THE INSTRUMENT DETECTION LIMIT BUT LESS THAN THE CONTRACT REQUIRED DETECTION LIMIT
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
* INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS
NA: NOT ANALYZED
(a): BURIED DRUM
(b): SOIL FROM DRUM EXCAVATION.

TABLE 7 CONTINUED
INORGANIC COMPOUND ANALYSIS RESULTS

COMPOUND	B 7-0'	B 7-3'	B 13-0'	B 13-0' D	B 13-3'	B 14-3'	B 21-0'	B 21-0' D	B 21-3'
ALUMINUM	10,940	17,100	11,200	23,500	6,620	3,780	6,000	5,880	9,260
ANTIMONY	ND	ND	ND	ND	ND	ND	ND	3.7	ND
ARSENIC	37.2	19.8	34.3	39.8	47.9	0.93	18.9	ND	7.9
BARIUM	1,160	534	2,130	1,360	1,850	42.6	1,120	1,080	219
BERYLLIUM	0.7	2.2	ND	ND	ND	0.45	3.9	4.2	1.5
CADMIUM	24.1	3.3	38.8	31.2	49.9	0.28	9.3	10.4	1.7
CALCIUM	30,204	69,200	18,800	25,300	28,400	4,180	30,500	24,400	55,700
CHROMIUM	340	31.8	933	662	205	15.7	95.0	204	20.2
COBALT	57.8	20.0	89.1	79.2	263	3.7 N	5.1 N	4.2 N	4.7 N
COPPER	6,540	5,230	6,760	10,080	9,500	14.8	974	956	157
IRON	362,000	52,700	469,000	374,000	434,000	7,800	133,000	125,000	27,000
LEAD	2,034	464	2,130	1,900	2,720	3.0	1,460	1,630	218
MAGNESIUM	9,240	10,650	5,620	4,990	9,230	1,860	9,660	6,920	8,560
MANGANESE	2,170	1,260	2,780	3,120	1,720	127	465	471	383
MERCURY	79.2	2.3	16.7	18.4	29.9	ND	202	144 *	40.4
NICKEL	391	409	1,640	1,082	358	6.2	101	100	55. 7
POTASSIUM	670	2,660	245	286	630	357	206	216	754
SELENIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND
SILVER	8.9	4.2	14.4	12.0	9.3	ND	2.3	2.0	1.4
SODIUM	963	1,650	586	781	2,059	ND	596	334	602
THALLIUM	ND	ND	ND	ND	ND	ND	ND	ND	1.0
VANADIUM	79.4	17.7	31.6	45.8	20.6	11.0	19.5	21.0	17.2
ZINC	55.0	8.9	31,200	29,700	100,240	55.2	2,250	2,920	475
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA

CONCENTRATION UNITS: ppm
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
B: INDICATES A VALUE GREATER THAN OR EQUAL TO THE INSTRUMENT DETECTION LIMIT BUT LESS THAN THE CONTRACT REQUIRED DETECTION LIMIT
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
* INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS
NA: NOT ANALYZED

Inorganic compounds detected in OPP 3 and OPP 4 (Table 7) were respectively:

COMPOUND	RESULTS (ppb)
aluminum	2,600 and 5,300
arsenic	15.5 and ND
barium	333 and 190
beryllium	6.7 and 5.9
cadmium	5.7 and 5.3
calcium	11,800 and 6,400
chromium	213 and 211
cobalt	7.0 and 4.8
copper	404 and 368
iron	211,000 and 196,000
lead	280 and 264
magnesium	1,940 and 1,470
manganese	933 and 1,080
mercury	4.4 and 7.0
nickel	143 and 120
potassium	151 and 202
silver	0.79 and 1.1
sodium	ND and 235
vanadium	18.8 and 19.2
zinc	1,890 and 10,300

4.2 On-site Soil Contamination

Twenty two soil borings nine feet deep were augered on the site to determine the three dimensional extent of soil contamination. Samples were collected at 1′, 3′, 5′, 7′, and 9′ depths (Samples B2 through B14, and B16 through B-24), and at the surface at selected boring locations.

4.2.1 Soil Borings

The 22 soil borings were augered from November 30 through December 6, 1988. The boring logs are included in Appendix C and a site plan locating the soil borings is presented in Figure 4.

The soil borings were drilled using 6-1/4" inside diameter hollow stem augers. Soils samples were collected continuously to a depth of 10 feet below grade in each boring, using a two-foot split spoon sampler. Following collection of each soil sample, borehole vapor readings were obtained by inserting the probe from an organic vapor analyzer (OVA) into the open top of the hollow stem auger (Table 8). Very low concentrations of organic vapors were detected between zero and two feet below grade. The highest concentrations of organic vapors were consistently detected between two and four feet below grade. Organic vapor concentrations decreased with depth between four and ten feet at most of the borings.

The on-site soils consist of two to four feet of fill material (black silt and sand, scrap metal and wood, and rubble) followed by a mixture of brown clay, silt and fine sand. A black sludge-like material was encountered between five and six feet below grade in boring B-4 and between four and 10 feet in boring B-14.

TABLE 8
SCHRECK'S SCRAPYARD
NORTH TONAWANDA, NEW YORK
SOIL BORING ORGANIC VAPOR ANALYZER (OVA) SCREENING RESULTS (1)

BORING NO.	DEPTH BELOW GRADE (FEET) 0-2	2-4	4-6	6-8	8-10
B-2	<0.5	2	20	1	1
B-3	100	>1000	>1000	50	200
B-4	3	300	600	2	200
B-5	<0.5	15	15	60	100
B-6	<0.5	200	40	15	15
B-7	300	>1000	1	20	10
B-8	2	>1000	3	70	100
B-9	20 (2)	--	--	--	--
B-10	100	1000	100	5	2
B-11	40	>1000	30	70	50
B-12	1	300	150	300	100
B-13	3	70	10	120	20
B-14	<0.5	>1000	500	250	100
B-16	15	400	50	200	20
B-17	100	400	100	30	30
B-18	<0.5	>1000	300	100	150
B-19	30	100	30	15	30
B-20	<0.5	20	5	>1000	200
B-21	200	>1000	300	100	80
B-22	<0.5	>1000	40	35	100
B-23	5	500	>1000	200	70
B-24	4	20	70	400	20

NOTES:

(1) : The OVA is calibrated to read in parts per million relative to methane

(2) : B-9 terminated at 2.5 feet due to auger refusal

4.2.2. Results

Soil boring PCB analytical results indicate that several aroclors are present; aroclor 1254 was significantly more widespread throughout the site than either aroclor 1248 or aroclor 1242, which were also detected frequently (Table 2). This data indicates that high levels of PCB are contained in the upper three feet of soil, with trace levels present at lower depths. All samples taken at 5 feet and below contained less than 10 ppm of PCBs with the exception of soil boring 20 which contained 12 ppm of PCBs at seven feet.

Soil samples B-2, B-3, B-4 and B-5 were collected south of the old press pit. PCBs were detected in the B-3 surface sample at 5,900 ppb. PCB levels at the one foot depth ranged from 750 ppb to 80,000 ppb, and at the three foot depth ranged from 680 ppb to 1,700 ppb. Soil borings B-3 and B-4 contained PCBs at detectable concentrations deeper than three feet. At a depth of five feet the levels were 1,000 ppb and 1,700 ppb, and at seven feet 520 ppb and 320 ppb, respectively. The nine foot deep sample at B-4 contained PCBs at 190 ppb.

Soil samples (B-6, B-7, B-8, B-9, B-11, B-12, B-13, B-14) collected adjacent to and North of the old press pit and concrete foundation contain greater concentrations of PCBs than those located south of press pit. The following table summarize PCBs concentrations and depths:

DEPTH	RANGE (ppb)
Surface	17,000 to 92,000
1′	2,900 to 72,000
3′	830 to 91,000
5′	79 to 11,200
9′	ND to 1,100

The seven foot deep soil sample from B-14 contained 720 ppb. Soil from B-13, B-9 and B-7 contained higher concentrations of PCBs than soil from B-6, B-8, B-11, B-12, and B-14.

The remainder of the soil borings (B-10, B-16, B-17, B-18, B-19, B-20 B-21, B-22, B-23, B-24) located on the Northern and central portion of the site typically contained high levels of PCBs at the surface and one foot depths with trace amounts found at lower levels. The following table summarizes PCB concentrations and depths:

DEPTH	RANGE (ppb)
Surface	17,000 to 140,000
1′	ND to 120,000
3′	ND to 24,000
5′	ND to 8,700
7′	ND to 12,000
9′	ND to 3,600

Soil from B-7, B-13, and B-21 were also analyzed for TCL parameters at the surface and a depth of three feet. The three foot deep soil sample from B-14 was inadvertently analyzed for TCL parameters. Sample locations B-7 and B-13 were selected due to their proximity to the bailer and old press pit. B-21 was located in the suspected transformer shearing operations area. The B-21 samples were analyzed for selected volatile organic compounds.

In addition to the PCB analytical results, these TCL analyses indicated that alpha-BHC was present. Alpha-BHC was found at 160,000 ppb in the B-21 surface soil sample; concentrations in the three foot deep samples ranged from 76 ppb to 1,500 ppb. Beta-BHC was detected in the surface of soil sample at B-21 at 220,000 ppb, and in the B-14 three foot deep soil sample at 350 ppb. 4,4′-DDT was found at 190 ppb in the B-14 three foot deep soil sample.

Low concentrations of volatile organic compounds were identified in several soil borings. Methylene chloride, a common laboratory contaminant also detected in the blank analysis, was found at concentrations ranging from 8.8 ppb to 69 ppb in the surface samples. The B-7 surface soil sample contained 69 ppb of methylene chloride. The B-13 surface soil sample contained methylene chloride at 8.8 ppb and trace amounts of toluene at levels of 1.0 ppb. The B-21 surface soil sample contained the following (Table 5):

COMPOUND	RESULTS (pbb)
benzene	157
toluene	2,120
xylenes	8,470
chlorobenzene	140
1-1-ethylbenzene	1,370
1,2-dichlorobenzene	432
1,4-dichlorobenzene	2,240

Volatile organic compounds were detected in all the three foot deep samples at contamination ranging from:

COMPOUND	RESULTS (pbb)
benzene	3.2 to 36
toluene	2.4 to 250
xylenes	2.9 to 1,300
chlorobenzene	1.9 to 26
1-1-ethylbenzene	6 to 160
1,2-dicholorobenzene	2 to 35
1,3-dichlorobenzene	ND to 33
1,4-dichlorobenzene	2.9 to 850
dichloroethane	ND to 3.3
methylene chloride	5.5 to 78

The B-3 three foot sample also contained tetrachloroethene at 5.7 ppb, 1,1,1-trichloroethane at 2.4 ppb, and trichloroethene at 2.4 ppb (Table 5).

Semivolatile organic compounds identified in surface soils were similar to those found in the buried drum, although the soil borings typically contained a more diverse range of contaminants than the drum sample. The following table shows compound concentrations results:

COMPOUND	RANGE (ppb)
phenol	ND to 2,300
1,2,4-trichloorbenzene	ND to 1,400
1,2-dichorobenzene	ND to 580
naphthalene	ND to 6,200
2-methylnapthalene	ND to 8,200
acenapthene	ND to 1,600
hexachlorobenzene	ND to 920
phenanthrene	ND to 13,000
di-n-butylphthalate	ND to 3,900
pyrene	ND to 14,000
butylbenzylphthalate	ND to 46,000
benzo(a)anthracene	ND to 5,600
bis(2-ethylhexyl)phthalate	6,000 to 18,000
chrysene	1,700 to 6,300
di-n-octylphthalate	ND to 550
benzo(b)fluoranthene	ND to 3,600
benzo(k)fluoranthene	ND to 5,500
benzo(a)pyrene	ND to 4,400

The following compounds were detected in the B-7 surface sample only (Table 6):

COMPOUND	RESULTS (ppb)
anthracene	2,400 ppb
fluoranthene	15,000 ppb
ideno(1,2,3-CD)pyrene	1,700 ppb
dibenz(a,h)anthracene	420 ppb
benzo(g,h,i)perylene	1,400 ppb
dibenzofuran	2,200 ppb
fluorene	1,300 ppb

Semivolatile organic compounds identified in the three foot depth sample of B-7 generally are present at lower concentrations than in the B-7 surface sample.

This trend was identified at samples B-21 and B-13, however, a large number of compounds are found in the depth sample at either a concentration greater than in the surface sample, or that were not-detectable at the surface. Semivolatile organic compounds identified in the B-7, B-13, B-14, and B-21 three foot samples ranged from (Table 6):

COMPOUND	RANGE (ppb)
Phenol	ND to 3,300
1,4-dichlorobenzene	ND to 850
2-methylphenol	ND to 1,300
1,2,4-trichlorobenzene	82 to 1,200
naphthalene	ND to 3,100
2-methylnaphthalene	ND to 5,000
acenaphthene	ND to 6,100
dibenzofuran	ND to 4,500
fluorene	ND to 6,000
hexachlorobenzene	ND to 480
phenanthrene	160 to 22,000
anthracene	ND to 5,500
di-n-butylphthalate	ND to 7,800
fluoranthene	ND to 17,000
pyrene	ND to 19,000
benzo(a)anthracene	ND to 6,200
bis(2-ethylhexyl)phthalate	ND to 30,000
chrysene	250 to 7,500
benzo(b)fluoranthene	ND to 4,300
benzo(k)fluoranthene	ND to 4,000
benzo(a)pyrene	ND to 1,600
indeno(1,2,3-cd)pyrene	ND to 730
dibenz(a,h)anthracene	ND to 220
benzo(g,h,i)perylene	ND to 660

The following compounds are present in the B-13 three foot depth sample only:

COMPOUND	RESULTS (ppb)
4-methylphenol	3,200
butylbenzylphthalate	18,000

The following compounds were present in the B-14 three foot depth sample only:

COMPOUND	RESULTS (ppb)
2,4 dimethylphenol	390
acenaphthylene	25
diethylphthalate	21
1,2-dichlorobenze	27

Di-n-butylphthalate was the only semi-volatile organic compound detected in the blank sample.

Inorganic compound analysis of B-7, B-13, B-14, and B-21 surface soil samples resulted in the following data (Table 7):

COMPOUND	RANGE (ppm)
aluminum	6,000 to 11,200
arsenic	18.9 to 37.2
barium	1,120 to 2,130
beryllium	ND to 3.9
cadmium	9.3 to 38.8
calcium	18,800 to 30,500
chromium	95.0 to 933
cobalt	5.1 to 89.1
copper	974 to 6,760
iron	133,000 to 469,000
lead	1,460 to 2,130
magnesium	5,620 to 9,660
manganese	465 to 2,780
mercury	16.7 to 202
nickel	101 to 1,640
potassium	206 to 670

silver	2.3 to 14.4
sodium	586 to 963
vanadium	19.5 to 79.4
zinc	55.0 to 31,200

Inorganic compound analysis of B-7, B-13, B-14, and B-21 three foot depth samples resulted in the following data (Table 7):

COMPOUND	RANGE (ppm)
aluminum	3,780 to 17,100
arsenic	0.93 to 47.9
barium	42.6 to 1,850
beryllium	ND to 2.2
cadmium	0.28 to 49.9
calcium	4,180 to 69,200
chromium	15.7 to 205
cobalt	3.7 to 263
copper	14.8 to 9,500
iron	7,800 to 434,000
lead	3.0 to 2,720
magnesium	1,860 to 10,650
manganese	127 to 1,720
mercury	2.3 to 40.4
nickel	6.2 to 409
potassium	357 to 2,660
silver	ND to 9.3
sodium	ND to 2,059
vanadium	11.0 to 20.6
zinc	8.9 to 100,240

A background soil sample (Background) was collected from the center of a residential backyard and analyzed for inorganic parameters. In general, the sample contained lower concentrations of inorganic compounds than did the soil boring samples.

In general, the on-site soils were found to contain high levels of PCB (>10 mg/kg) in the upper three feet and low to non-detectable levels of PCB below three feet. At the boring locations analyzed for TCL compounds, the soils contained significant levels of PNAs, chlorobenzenes, pesticides, and several metals. These contaminants were found at elevated levels in both the surface and three foot depth horizons. Only low levels of VOCs were encountered.

4.3 On-Site Building Contamination

An office floor wipe sample and caked material from the garage floor were collected at the building entrances and analyzed for PCBs to determine whether PCB contamination has migrated into the buildings from tracking of soil and/or oils (Samples FS-1 and FS-2). PCB was detected in the office building at a level of 170 ug/100 cm2. The garage floor PCB sample contained 37,000 ppb (Table 3).

4.4 Off Site Surface Contamination

Two catch basins along Schenck Street were sampled and analyzed for PCBs to determine the impact of storm water runoff on the sewer system. Catch basin 1 sediments were found to contain 2,600 ppb PCBs, and PCBs were not detected in the catch basin 2 sediments.

Four surface samples (Samples B 15-0′, B 26-0′, B 27-0′, B 28-0′) collected along the railroad tracks on the eastern border of the site were analyzed for PCBs to determine if PCBs have been carried off site by surface runoff. Soil sample 26 contained concentrations of PCBs at 16,000 ppb, samples 15 and 27 contained levels of 6,000 ppb and 2,200 ppb, respectively. No PCBs were detected in sample 28 (Table 3).

Two three part composite samples (Samples RS-1 and RS-2) were collected on Schenck Street in front of the site to determine if significant levels of PCBs have been tracked into the public street by vehicles and pedestrian traffic. Road sample 1, the western most composite, contained 16,000 ppb. Road sample 2 contained 12,000 ppb PCB.

4.5 Groundwater Contamination

Four shallow groundwater monitoring wells were installed at the site and groundwater samples were collected and analyzed for TCL parameters.

No PCBs were found in the groundwater samples (Table 9). Low levels of beta-BHC were detected non-detectible ppb to 1.4 ppb), gamma-BHC (Lindane) was detected in monitoring well 4 at 0.13 ppb. 4,4′-DDD and 4,4-DDT were detected in monitoring well 2 at 4.7 and 0.81 ppb, respectively (Table 10).

Low levels of toluene (5.4 ppb) and xylenes (17 ppb) were detected in monitoring well 4, located west of the car crusher and garage area. Other volatile organic compounds identified in the groundwater samples were also identified in the blank analysis; methylene chloride ranged from non-detectibles to 3.7 ppb, and 1,1,1-trichloroethane ranged from 1.4 to 1.5 ppb (Table 11).

Bis(2-ethylhexyl)phthalate was found in the groundwater samples and the blank analysis at concentrations ranging from 11 ppb to 16 ppb (Table 12).

A summary of the inorganic analysis results presented in Table 13 follows:

COMPOUND	RESULTS (ppb)
aluminum	339,000 to 555,000
arsenic	129 to 229
barium	2,190 to 4,680
beryllium	42.0 to 65.0

cadmium	13.0 to 22.0
calcium	1,500,000 to 1,790,000
chromium	450 to 680
cobalt	299 to 495
copper	541 to 1,370
iron	479,000 to 725,000
lead	420 to 806
magnesium	331,000 to 545,000
manganese	10,700 to 13,000
mercury	ND to 0.5
nickel	485 to 740
potassium	20,500 to 33,000
sodium	7,110 to 68,500
vanadium	1,210 to 1,860
zinc	1,650 to 3,140

Silver was found at levels of 12.0 ppb in MW-1 only (Table 13).

A water sample (MW-OFH) was collected from a fire hydrant from which decon water was obtained at the site. The sample contained no PCBs or pesticides, low levels of volatile and semi-volatile organic compounds, and lower levels of inorganic compounds than did the four groundwater samples (Tables 9 through 13).

TABLE 9
GROUNDWATER PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
MW - 1	ND	ND	ND	ND	ND	ND	ND
MW - 2	ND	ND	ND	ND	ND	ND	ND
MW - 3	ND	ND	ND	ND	ND	ND	ND
MW - 4	ND	ND	ND	ND	ND	ND	ND
MW - 4 D	ND	ND	ND	ND	ND	ND	ND
MW - OFH	ND	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb

ND: NOT DETECTABLE

NA: NOT ANALYZED

TABLE 10
GROUNDWATER PESTICIDE ORGANICS ANALYSIS RESULTS

COMPOUND	MW - 1	MW - 2	MW - 3	MW - 4	MW - 4 D	MW - OFH
alpha-BHC	ND	ND	ND	ND	ND	ND
beta-BHC	0.18	ND	1.4	0.051 J	0.038 J	ND
delta-BHC	ND	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND	0.13	0.13	ND
HEPTACHLOR	ND	ND	ND	ND	ND	ND
ALDRIN	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	ND	ND	ND	ND	ND	ND
ENDOSULFAN I	ND	ND	ND	ND	ND	ND
DIELDRIN	ND	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND
ENDRIN	ND	ND	ND	ND	ND	ND
ENDOSULFAN II	ND	ND	ND	ND	ND	ND
4,4'-DDD	ND	4.7	ND	ND	ND	ND
ENDOSULFAN SULFATE	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	0.81	ND	ND	ND	ND
METHOXYCHLOR	ND	ND	ND	ND	ND	ND
ENDRIN KETONE	ND	ND	ND	ND	ND	ND
alpha-CHLORDANE	ND	ND	ND	ND	ND	ND
gamma-CHLORDANE	ND	ND	ND	ND	ND	ND
TOXAPHENE	ND	ND	ND	ND	ND	ND

(a): BURIED DRUM
(b): SOIL FROM DRUM EXCAVATION
CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
C: NO CALIBRATION DATA

TABLE 11
VOLATILE ORGANIC COMPOUNDS
GROUNDWATER ANALYSIS RESULTS

COMPOUND	MW - 1	MW - 2	MW - 3	MW - 4	MW - 4 D	MW-OFH
*BENZENE	ND	ND	ND	ND	ND	ND
*TOULENE	ND	ND	ND	5.4	7.3	ND
*CHLOROBENZENE	ND	ND	ND	ND	ND	ND
*ETHYLBENZENE	ND	ND	ND	ND	ND	ND
*XYLENES (TOTAL)	ND	ND	ND	17	19	ND
*1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
*1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
*1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE	ND	ND	ND	ND	ND	6.1
BROMOFORM	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND
CHLOROETHANE	ND	ND	ND	ND	ND	ND
2-CHLOROETHYLVINYL ETHER	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	12
CHLOROMETHANE	ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE	ND	ND	ND	ND	ND	2.6

CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
B: COMPOUND ALSO FOUND IN BLANK
C: NO CALIBRATION DATA

* EPA Method 8020 used for Parameter Analyses

TABLE 11 CONTINUED
VOLATILE ORGANIC COMPOUNDS
GROUNDWATER ANALYSIS RESULTS

COMPOUND	MW - 1	MW - 2	MW - 3	MW - 4	MW - 4 D	MW-OFH
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND
trans-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND
cis-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND
trans-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	3.7 B	ND	2.8 B	2.1 B	1.9 B	12 B
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	ND	ND	ND
1,1,1-TRICHLOROETHANE	1.5 B	1.4 B	1.4 B	1.5 B	1.5 B	1.8 B
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	ND	ND	ND	ND	ND	ND

ND: NOT DETECTABLE

CONCENTRATION UNITS: ppb

B: COMPOUND ALSO FOUND IN BLANK

C: NO CALIBRATION DATA

TABLE 12
SEMIVOLATILE ORGANIC COMPOUNDS GROUNDWATER ANALYSIS RESULTS

COMPOUND	MW - 1	MW - 2	MW - 3	MW - 4	MW - 4 D	MW-OFH
PHENOL	ND	ND	ND	ND	ND	ND
bis (2-CHLOROETHYL) ETHER	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
BENZYL ALCOHOL	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	ND	ND	ND	ND	ND	ND
bis (2-CHLOROISOPROPYL) ETHER	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	ND	ND	ND	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE	ND	ND	ND	ND	ND	ND
NITROBENZENE	ND	ND	ND	ND	ND	ND
ISOPHORONE	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	ND	ND	ND	ND	ND	ND
BENZOIC ACID	ND	ND	ND	ND	ND	ND
bis (2-CHLOROETHOXY) METHANE	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
B: COMPOUND ALSO FOUND IN BLANK
C: NO CALIBRATION DATA

TABLE 12 CONTINUED
SEMIVOLATILE ORGANIC COMPOUNDS GROUNDWATER ANALYSIS RESULTS

COMPOUND	MW - 1	MW - 2	MW - 3	MW - 4	MW - 4 D	MW - OFH
4-CHLOROPHENYL-PHENYLETHER	ND	ND	ND	ND	ND	ND
FLUORENE	ND	ND	ND	3 J	5 J	ND
4-NITROANILINE	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE (1)	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL-PHENYLETHER	ND	ND	ND	ND	ND	ND
HEXACHLOROBENZENE	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	ND	ND	ND	ND	ND	ND
PHENANTHRENE	ND	ND	ND	5 J	8 J	ND
ANTHRACENE	ND	ND	ND	ND	ND	ND
DI-N-BUTYLPHTHALATE	ND	ND	ND	ND	ND	ND
FLUORANTHENE	ND	ND	ND	ND	ND	ND
PYRENE	ND	ND	ND	ND	ND	ND
BUTYLBENZYLPHTHALATE	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	ND	ND	ND	ND	ND	ND
bis (2-ETHYLHEXYL) PHTHALATE	11 B J	16 B	13 B	15 B	11 B J	7 B J
CHRYSENE	ND	BD	ND	ND	ND	ND
DI-N-OCTYL PHTHALATE	ND	ND	ND	ND	ND	ND
BENZO (B) FLUORANTHENE	ND	ND	ND	ND	ND	ND
BENZO (K) FLUORANTHENE	ND	ND	ND	ND	ND	ND
BENZO (A) PYRENE	ND	ND	ND	ND	ND	ND
INDENO (1,2,3-CD) PYRENE	ND	ND	ND	ND	ND	ND
DIBENZ (A,H) ANTHRACENE	ND	ND	ND	ND	ND	ND
BENZO (G,H,I) PERYLENE	ND	ND	ND	ND	ND	ND

(1) CANNOT BE SEPARATED FROM DIPHENYLAMINE
CONCENTRATION UNITS: ppb
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
ND: NOT DETECTABLE
B: COMPOUND ALSO FOUND IN BLANK

TABLE 12 CONTINUED
SEMIVOLATILE ORGANIC COMPOUNDS GROUNDWATER ANALYSIS RESULTS

COMPOUND	MW - 1	MW - 2	MW - 3	MW - 4	MW - 4 D	MW - OFH
NAPTHALENE	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLORLPHENOL	ND	ND	ND	ND	ND	ND
2-CHLORONAPTHALENE	ND	ND	ND	ND	ND	ND
2-NITROANILINE	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	ND	ND	ND	ND	ND	ND
3-NITROANILINE	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	ND	ND	ND	0.3 J	ND	ND
2,4-DINITROTOLUENE	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE	ND	ND	ND	ND	ND	ND
DIETHYLPHTHALATE	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: ppb
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
B: COMPOUND ALSO FOUND IN BLANK
C: NO CALIBRATION DATA

TABLE 13
INORGANIC COMPOUNDS
GROUNDWATER ANALYSIS RESULTS

COMPOUND	MW-1	MW-2	MW-3	MW-4	MW-4 D	MW-OFH
ALUMINUM	505,000	339,000	555,000	342,000	489,000	452
ANTIMONY	ND	ND	ND	ND	ND	200
ARSENIC	229	129	184	207	304	20.0
BARIUM	4680	2,800 N	3,720 N	2,190 N	2,830	45.0 N
BERYLLIUM	61.0	42.0	65.0	45.0	66.0	1.0
CADMIUM	19.0	14.0	22.0	13.0	25.0	3.0
CALCIUM	1,790,000	1,520,000 E	1,700,000 E	1,500,000 E	2,510,000	32,400 E
CHROMIUM	642	450	680	473	667	10.0
COBALT	421	306	495	299	335	13.0
COPPER	1,370	541	929	1,040	1,380	54.0
IRON	675,000	479,000	725,000	510,000	760,000	319
LEAD	759	420	732	806	834	20.0
MAGNESIUM	545,000	331,000 E	445,000 E	476,000 E	800,000	7,110 E
MANGANESE	12,600	10,700	13,300	11,300	17,300	15.0
MERCURY	0.4	ND	0.4	0.5	1.7	0.2
NICKEL	732	485	740	539	722	40.0
POTASSIUM	33,000	22,500	33,000	20,500	30,500	1,200
SELENIUM	ND	ND	ND	ND	ND	20.0 B
SILVER	12.0	ND	ND	ND	19.0	10.0
SODIUM	68,500	7,110 E	26,400 E	11,700 B E	16,300	8,600 E
THALLIUM	ND	ND	ND	ND	ND	20.0
VANADIUM	1,860	1,210	1,770	1,560	2,420	16.0
ZINC	3,140	1,650	2,120	2,470	3,440	29.0
CYANIDE	ND	ND	ND	ND	ND	NA

CONCENTRATION UNITS: ppb
NA: NOT ANALYZED
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
B: INDICATES A VALUE GREATER THAN OR EQUAL TO THE INSTRUMENT DETECTION LIMIT BUT LESS THAN THE CONTRACT REQUIRED DETECTION LIMIT
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
° INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS

V. CONTAMINANT FATE AND TRANSPORT

Contaminant fate and transport evaluations are based on the site physical characteristics, and the known extent and nature of indicator chemical contamination. This section addresses the site and the immediate area around the site, other transport mechanisms may be included after the phase II data base is developed which could include off-site groundwater and surface water if potential impacts are identified.

5. 1 Potential Routes of Migration

Four primary routes of potential contaminant migration exist at this site: groundwater, storm water runoff, air, and surface tracking.

There are no waterways on, through, or adjacent to the site. Storm water runoff is directed off-site to two catch basins on Schenck Street, and to the railroad tracks east of the site. Storm water runoff could carry surficial non-volatile and semi-volatile contaminants off-site. Non-volatile and semi-volatile contaminants could be tracked off-site by vehicle and pedestrian traffic. Volatile contaminants would probably not be carried off-site efficiently by storm water runoff or tracking due to the mixing created by micro-turbulence associated with these modes of transport. Volatile contaminants could migrate off-site in air by volatilization. Non-volatile and semi-volatile contaminants could migrate off-site by the fugitive emission of airborne particulate matter.

All indicator chemicals could migrate off-site in groundwater, however, the presence of extensive deposits of low permeability clay in the unconsolidated aquifer will significantly restrict the downward movement of contaminated groundwater into the underlying bedrock aquifer. Clay attenuates of metals, PCBs, some semi-volatile organic compounds, and pesticides by adsorption because of its uniform small pores which produce efficient mixing and maximize soil/contaminant interaction. These processes will further restrict the movement

A chemical's water solubility measures the extent to which it is soluble in water and can be used to indicate how efficiently the chemical may be transported through the hydrologic cycle. Water solubility can also affect the chemical's tendency to oxidize, reduce, photolyze, and hydrolyze. In general, chemicals that are relatively water soluble are more likely to desorb from soil particles and are less likely to volatilize from water.

A chemical's octanol/water partition coefficient is the ratio of the concentration at which it reaches equilibrium in a mixture of octanol and water. The octanol/water partition coefficient can be useful in predicting the extent to which a chemical may adsorb onto a soil particle, and its tendency to be stored in animal fat cells and move through the food chain. In general, the greater the octanol/water partition coefficient, the more readily that chemical will sorb onto soil particles or bioaccumulate.

The vapor pressure, water solubility, and octanol/water partition coefficients for the selected indicator chemicals (Section 6.1) are shown in Table 14. As indicated, the chemicals can be grouped according to their tendency to migrate or persist in the environment.

5.2.1 PCBs

PCBs have a low water solubility, low vapor pressure, and high octanol/water partition coefficient. They are persistent in the environment, adsorb readily onto soil particles, do not readily volatilize, and accumulate in mammalian tissue. PCBs are not expected to degrade without an outside influence to catalyze dechlorination.

PCBs can sorb onto soil particles and become airborne under dry, breezy weather conditions, especially in areas with little or no vegetation to stabilize the soil. Although the site is not vegetated, the site soil is relatively heavy with

TABLE 14.
FATE AND TRANSPORT EVALUATION PARAMETERS

PARAMETER	WATER SOLUBILITY (mg/L)	VAPOR PRESSURE (mmHg)	* LOG K_{OCT}
SEMI-VOLATILES			
BENZO(A)PYRENE	1.2E-03	5.6E-09	NA
BENZO(A)ANTHRACENE	5.7E-03	2.2E-08	NA
DIBENZ(A,H)ANTHRACENE	5.0E-04	1.0E-01	NA
HEXACHLOROBENZENE	6.0E-03	1.1E-05	NA
BIS(2-ETHYLHEXYL)PTHALATE	NA	NA	NA
VOLATILE ORGANICS			
BENZENE	1.8E+03	9.5E+01	NA
CHLOROFORM	8.20E+03	1.51E+02	1.97
PCBs			
AROCLOR 1242	1.0E-01	NA	4.11
AROCLOR 1248	5.4E-02	4.0E-04	5.76
AROCLOR 1254	5.7E-02	7.7E-05	6.04
AROCLOR 1260	8.0E-02	4.1E-05	7.15
METALS			
ARSENIC	3.0E-02	NA	NA
BARIUM	** INSOLUBLE	NA	NA
CADMIUM	** INSOLUBLE	NEGLIGIBLE	NA
COPPER	** INSOLUBLE	NEGLIGIBLE	NA
LEAD	** INSOLUBLE	NEGLIGIBLE	NA
MERCURY	2.5E-01	2.0E-03	NA
NICKEL	** INSOLUBLE	NEGLIGIBLE	NA
SILVER	** INSOLUBLE	NEGLIGIBLE	NA
ZINC	** INSOLUBLE	NEGLIGIBLE	NA
PESTICIDES			
ALPHA-BHC	1.6E+00	2.5E-05	NA
BETA-BHC	2.4E-01	2.8E-07	NA

* LOG OCTANOL/WATER PARTITION COEFFICIENT

** SOLUBILITY DEPENDANT UPON METAL COMPLEX

NA NOT AVAILABLE

grease and oil which makes soil particles less likely to become airborne and more likely to adhere and adsorb onto tracking surfaces such as the soles of shoes or vehicle tires.

Although PCBs are not water soluble, they may be carried off-site by storm water runoff due to their tendency to adsorb onto the mineral phase of the soil matrix. This mechanism provides the PCBs an additional means of off-site migration.

PCBs can migrate off-site by tracking, storm water runoff, and fugitive air emissions.

5.2.2 Semi-Volatile Organic Compounds

Semi-volatile chemicals have a broad range of water solubilities, vapor pressures, and octanol/water partition coefficients and can be categorized according to other physicochemical parameters. Each of the indicator chemicals that is a semi-volatile organic compound can be categorized as a polynuclear aromatic hydrocarbon (PNA), a chlorinated benzene, or a phthalate.

PNAs (benzo(a)pyrene, benzo(a)anthracene, and dibenz(a,h)anthracene) have low solubilities, low vapor pressures, and high octanol/water partition coefficients. They tend to adsorb onto the mineral or organic phase of the soil matrix rather than entering the air or water phases. PNAs can be transported off-site by sorbing onto soil particles that become airborne, or by adhering and sorbing onto tracking surfaces (shoe soles, vehicle tires). Some PNAs can be biodegraded by oil oxidizing microorganisms and photo-oxidation. Although they have low solubilities, they can be carried off-site in storm water runoff that carries soil particles to which PNAs have adsorbed.

The chlorinated benzene group includes hexachlorobenzene, which has a low water solubility, a low vapor pressure, and a high octanol/water partition coefficient. Hexachlorobenzene tends to adsorb onto the mineral and organic phases of the soil matrix, rather than be present in the water or air phases. Hexachlorobenzene bioaccumulates, and can migrate off-site by means of storm water runoff in which soil particles are carried, tracking surfaces to which soil particles have adsorbed or adhere, and fugitive air emissions which carry airborne soil particles.

5.2.3 Volatile Organic Compounds

The indicator chemicals that are volatile organic compounds (VOCs) are benzene, and chloroform. The octanol/water partition coefficients are relatively low indicating a low tendency for these VOCs to adsorb onto the organic or mineral phases of the soil matrix. Instead, as indicated by the high solubilities, the VOCs can dissolve in the water phase of the soil matrix and be transported to subsurface soils or migrate off-site in a groundwater solution. The relatively high vapor pressures allow the VOCs in surficial soil to readily volatilize into the air phase of the soil matrix and into the atmosphere. Although these VOCs are soluble, they would probably not migrate off-site efficiently by storm water runoff because the mixing created by micro-turbulence would promote volatilization of the VOCs from solution into the atmosphere.

VOCs can be transported off-site primarily by groundwater or by volatilization into the atmosphere.

5.2.4 Metals

Metals generally have low water solubilities, low vapor pressures, and high octanol/water partition coefficients. Metals are persistent in the environment since they are elemental. They do not readily volatilize, adsorb readily onto soil particles, and may accumulate in mammalian tissue. The oxidation state of a metal can change its ability to be mobile in the environment.

The metals of concern at the site are arsenic, barium, cadmium, copper, lead, mercury, nickel, and silver. The migration of these metals can be compared to that of PCBs in that metals can sorb onto soil particles and become airborne under dry, breezy weather conditions, especially in areas with little or no vegetation to stabilize the soil. Although the site is not vegetated, the site soil is relatively heavy with grease and oil which makes soil particles less likely to become airborne and more likely to adhere and adsorb onto tracking surfaces.

Metals are typically not water soluble and will not go into solution in the water phase of the soil matrix, but their tendency to adsorb onto soil particles that may be carried off-site by storm water runoff provides the metals a means of off-site transport.

Metals can migrate off-site primarily by tracking, storm water runoff, and fugitive particulate emissions.

5.2.5. Pesticides

Hexachlorocyclohexane isomers (alpha-BHC and beta-BHC) are the pesticide indicator chemicals. They are not soluble in water relative to other indicator chemical categories, and have low vapor pressures. Although the octanol/water partition coefficients of the isomers are not available, it is known that pesticides are persistent in the environment and can accumulate in mammalian tissue.

Similar to PCBs, pesticides can adhere and adsorb onto tracking surfaces and adsorb onto soil particles that may be carried off-site by storm water runoff.

Pesticides can migrate off-site primarily by tracking, storm water runoff, and fugitive particulate emissions.

5.2.6. Summary

In general pesticides, metals, PCBs, and hexachlorobenzene can be transported off-site by tracking, storm water runoff, and fugitive air emissions; VOCs can be transported off-site by groundwater, or by volatilization and vapor dispersion; and PNAs can be transported off-site by groundwater or storm water runoff.

It should be noted that although a contaminants characteristics will generally predict its fate in the environment, it does not preclude some small fraction of the contaminant from undergoing additional transport mechanisms. For example, although lead's low solubility would not predict transport by groundwater, if present in the soil in large enough concentrations some the lead may be present in the groundwater.

VI. BASELINE RISK ASSESSMENT

The baseline risk assessment addresses the potential impacts to human health and the environment associated with past waste disposal practices at the site. The baseline analysis evaluates current site conditions to estimate long term health and environmental impacts under the assumption that no remedial actions take place.

This assessment was conducted in accordance with US EPA Superfund Public Health Evaluation and Exposure Assessment procedures. Results of the assessment are not intended to be estimates of the actual risk to humans and the environment, but instead to represent an upperbound estimate of these risks. Actual risks are likely to be lower than the upperbound values presented in this assessment.

This assessment is based on data collected in December, 1988. Data collected during the Phase II RI will be evaluated at a later date.

6.1 Identification of Indicator Chemicals

Indicator chemicals are chemicals that have been identified during the RI and that pose the greatest potential public health risk at a site. Indicator chemicals focus the baseline risk assessment on those chemicals that best represent the upper bound potential risks. The selection process was based on each chemical's toxicity, mobility, persistence, and observed concentrations.

The data evaluation was based on several considerations and assumptions.

- The concentrations of a chemical in primary and duplicate samples at one sample location were averaged and considered to be one observation.

- The upper limit of the concentration range of a chemical in a medium was considered to be the peak concentration.

- The representative concentration of chemical i in medium j was the arithmetic mean. Concentrations below the detection limit and reported by the laboratory as "not detected" were considered to be equal to zero. Concentrations below the detection limit and reported by the laboratory as an estimated concentration but, "below quantitation limits" were included. For cases in which depth and subsurface soil samples were collected, all available horizons were used to calculate the representative concentrations. Off-site and on-site sample concentrations were used to calculate the representative PCB concentration. Background concentrations were not included.

- Parameters detected by both the semi-volatile organic and volatile organic analyses were 1,2-dichlorobenzene, 1,3-dichlorobenzene and 1,4-dichlorobenzene. For these parameters the volatile organic analysis results were used to calculate the representative concentration because these quantitative results were measured and considered to be moreaccurate than the semi-volatile analysis quantitative results which were estimated.

- Two sets of chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene data were collected. The greater of the two concentrations was used to calculate the representative concentration when a difference in quantitative results occurred.

The selection of indicator chemicals was based on each chemical's toxicity and ability to be released into the environment.

- Water solubility influences a chemical's ability to leach from soil, migrate via water pathways, and biodegrade.

- Vapor pressure influences a chemical's rate of vaporization into the atmosphere.

- Henry's Law constant is a function of a chemical's volatility and considers vapor pressure, solubility, and molecular weight.

- A chemical's organic carbon partition coefficient, K_{oc}, is the measure of its ability to adsorb onto the organic carbon in a medium.

- Persistence is the measure of a chemical's half-life in a medium.

- The toxicity of a non-carcinogen is measured by a chemical-specific constant derived from the minimum effective dose for chronic effects and a severity of effect factor.

- The toxicity of a potential carcinogen is a chemical-specific constant derived from the dose at which a 10% incremental carcinogenic response is observed.

- An indicator score used to rank detected chemicals is assigned to each chemical according to the algorithm

$$IS_i = \text{SUM}_j^n \text{ OF } [C_{ij} * T_{ij}]; \quad \text{where}$$

IS_i = indicator score for chemical i
C_{ij} = concentration of chemical i in medium j
T_{ij} = toxicity constant for chemical i in medium j

Worksheets 1 through 5 (Appendix F) document calculations. The list of indicator chemicals is presented in Table 15.

As shown on Worksheet 5, DDD, DDT, and gamma-BHC were not selected as indicator chemicals and yet have a higher indicator score than some chemicals that were selected. These three chemicals were not selected because 1) the number of observations was extremely low, and/or 2) the concentrations were extremely low.

Benzene and chloroform were selected as representative volatile organic potential carcinogens. Benzo(a)pyrene had the smallest indicator score of those non-carcinogens selected and was chosen as a cut off point; the next smallest indicator score was an order of magnitude lower.

TABLE 15.

SCHRECK'S SCRAPYARD SITE
NORTH TONAWANDA, NEW YORK

LIST OF INDICATOR CHEMICALS

Potential Carcinogens	Non-Carcinogens
Arsenic	Arsenic
PCBs	Barium
BHC (A, B)	Cadmium
Benzo(a)pyrene	Copper
Benzo(a)anthracene	Lead
Dibenz(a,h)anthracene	Mercury
Hexachlorobenzene	Nickel
Benzene	Silver
Chloroform	Zinc
	Benzo(a)pyrene

6.2 Exposure Assessment

An exposure assessment was performed which estimated the potential human exposure to indicator chemicals in the absence of remedial action. The assessment identifies potential human exposure pathways, estimates exposure point (the point at which human contact with contaminated medium can potentially occur) indicator chemical concentrations, and compares exposure point concentrations with Applicable or Relevant and Appropriate Requirements (ARARs).

6.2.1 Exposure Pathways

An exposure pathway is defined by four elements: a release source, such as leaching or volatilization; a transport medium, such as groundwater or air; and exposure point, such as a child or worker; and an exposure route, such as ingestion or inhalation. An exposure pathway is considered to be complete if all four elements are present. (Release sources and transport are discussed in Section V, Contaminant Fate and Transport.) The total risk posed by the site is a composite of individual exposure pathway risks. Tables 16 and 17 summarize exposure pathways.

On-site soil is a complete exposure pathway. Under current land use trespassers and workers could potentially be exposed to contaminants by dermal adsorption and incidental ingestion. Exposure to children is not considered reasonable under current conditions because the property is fenced, and the presence of children in the vicinity of trucks and heavy equipment during site operations is unreasonable. Under future land use conditions (assumed to be continued scrapyard operations or residential use) workers trespassers, residents, and children could potentially be exposed to contaminants in soil through the same exposure routes.

Off-site soil is a complete exposure pathway. Children and off-site adults could potentially be exposed to contaminants by dermal adsorption and incidental ingestion.

TABLE 16

EXPOSURE PATHWAYS UNDER CURRENT SITE LAND USE CONDITIONS

Release Source	Transport Medium	Primary Exposure Point	Exposure Route	Pathway Complete
Contaminated Soil	On-site Soil	Workers, Trespassers	Dermal absorption, Incidental ingestion	Yes
Contaminated Soil	Off-site Tracking/ Storm water runoff	Children, Off-site Adults	Dermal absorption, Incidental ingestion	Yes
Fugitive Dust	Air	Workers, Children, Off-site Adults	Inhalation	Yes
Leachate	Groundwater	None	None	No
Surface water	Storm water runoff	None	None	No
Volitilization	Air	None	None	No

TABLE 17

EXPOSURES PATHWAYS UNDER *FUTURE SITE LAND USE CONDITIONS

Release Source	Transport Medium	Primary Exposure Point	Exposure Route	Pathway Complete
Contaminated Soil	On-site Soil	Workers, Trespassers	Dermal absorption, Incidental ingestion	Yes
Contaminated Soil	Off-site Tracking/ Storm water Runoff	Children, Off-site Adults	Dermal absorption, Incidental ingestion	Yes
Fugitive Dust	Air	Children, Workers, Off-site Adults	Inhalation	Yes
Leachate	Groundwater	None	None	No
Surface Water	Storm water Runoff	None	None	No
Volitization	Air	None	None	No

*Future site land use assumes the possibility of continued scrapyard operations, residential and or day care activities.

Fugitive dust is a complete exposure pathway. Children, off-site adults and workers could potentially be exposed to contaminants by inhalation.

Groundwater is not a complete exposure pathway. Currently, water for potable and industrial uses is supplied by the municipality. Reportedly, there are no groundwater supply wells within a three mile radius of the site. Reasonable and plausible future site land use does not include the development of groundwater supply wells because North Tonawanda prohibits the installation of private residential use water supply wells.

Storm water runoff is not a complete exposure pathway. A surface water body is not present at the site, and storm water runoff is directed off-site toward the railroad tracks east of the site and to the sewer catch basins which lead to the city WWTP. Contaminants carried off-site by storm water runoff are deposited without entering surface waters and are therefore considered to be included as part of the contaminated soil which is already considered in the off-site soil exposure pathway.

Volatilization is not a complete exposure pathway. Air monitoring during the Phase I RI field investigation (Appendix B) indicated that total organic vapors were not emanating from the site surface soils at significant concentrations.

6.2.2 Concentrations of Indicator Chemicals at Exposure Points

Indicator chemicals concentrations at exposure points along complete exposure pathways were estimated. For each pathway the average case and the maximum case were calculated. The average case uses representative contaminant concentrations and typifies likely concentrations at exposure points. The maximum case uses peak contaminant concentrations and represents a worst case scenario. The differences emphasizes the variability of exposure point concentrations under different scenarios.

Exposure point contaminant concentrations were estimated for on-site and off-site dermal contact and incidental ingestion of soil, and inhalation of fugitive dust.

Exposure point contaminant concentration estimates for incidental ingestion, dermal contact, and inhalation were based on by several considerations and assumptions.

- All assumptions stated in Section 6.1, Identification of Indicator Chemicals, apply.
- Chemical concentrations detected during the Phase I RI field investigation are applied to current use and future use scenarios and are considered to be a steady state condition.
- Adult body weight = 70 kg; breathing rate = 1 m^3/hr; exposed skin surface area while wearing trousers, shoes, short sleeved shirt = 2940 cm^2; ingestion rate = 0.1 gm soil/day for 70 years.
- Child body weight = 17 kg; breathing rate = 1.7 m^3/hr; exposed skin surface area (unclothed) = 9400 cm^2; ingestion rate = 1 gm soil/day; ingestion rate for pica child = 5 gm soil/day.
- Oral absorption factor = 0.15 - 0.5 for PCBs and 1 for all other chemicals.

6.2.2.1 Dermal Exposure Route

On-site worker exposure concentrations by dermal contact with soil under current land use conditions were calculated for all indicator chemicals. Off-site adult and child exposure calculations only included PCBs because off-site samples were analyzed only for PCBs in this phase of the work. The future land use scenario considered on-site adults and children could be exposed to all indicator chemicals and off-site adults and children could only be exposed to PCBs.

The model used to calculate the estimates (USEPA, 1988) (presented) below is conservative (yields an exaggerated estimate) because it assumes that all of the contaminants bound to the soil particle are absorbed through the skin. Actually only a percentage of the total mass adsorbed onto the skin may be available for absorption through the skin surface. Data on dust adherence to skin is limited. The USEPA recommends using two values reported by the Toxic Substance Control Commission of the State of Michigan, and calculate a range of values. However, due to the oily nature of the on-site soils, the calculation applied to this assessment uses only the more conservative estimate.

Dermal exposure contaminant concentrations were calculated according to the model

$$DEX = C_i*AV*DA*F/BW/(25600 \text{ days per lifetime});\quad \text{where}$$

DEX = dermal exposure
C_i = weight fraction of chemical i in soil
AV = exposed skin surface area
DA = dust adherence = 2.77 mg/cm^2 (US EPA, 1988)
F = frequency of exposure events per lifetime
BW = body weight

Present use dermal exposure frequency assumes adult workers are on the site for 1.65 days (i.e, five 8 hour days) for 52 weeks per year for 30 years, which equals approximately 2,600 days per lifetime. Present dermal exposure scenario frequencies assume adult residents live in the community 24 hours per day for 70 years (approximately 25,600 days per lifetime), and child residents live in the community 24 hours per day for 10 years (approximately 3,650 days per lifetime).

Worksheets documenting the calculations are presented in Appendix F. Table 18 summarizes dermal exposure point concentrations.

TABLE 18
DERMAL EXPOSURE
CURRENT USE
MG/KG/DAY

	ADULT AVE CONC	ADULT MAX CONC	CHILD AVE CONC	CHILD MAX CONC
ON-SITE EXPOSURE				
POTENTIAL CARCINOGENS				
PCB	1.78E-04	1.65E-03		
ARSENIC	2.31E-04	5.66E-04		
BENZO(A)PYRENE	1.02E-05	5.20E-05		
BENZO(A)ANTHRACENE	2.57E-05	7.33E-05		
DIBENZ(A,H)ANTHRACENE	1.03E-06	4.96E-06		
BETA-BHC	3.36E-07	3.01E-06		
BIS(2-ETHYLHEXYL)PHTHALATE	9.80E-05	3.54E-04		
HEXACHLOROBENZENE	2.55E-06	7.33E-06		
ALPHA-BHC	2.43E-07	2.13E-06		
BENZENE	3.11E-07	1.10E-06		
CHLOROFORM	3.54E-09	2.84E-08		
NON-CARCINOGENS				
ARSENIC	2.31E-04	5.66E-04		
BARIUM	9.42E-03	2.19E-02		
NICKEL	3.87E-03	1.61E-02		
COPPER	4.15E-02	1.12E-01		
LEAD	1.25E-02	3.21E-02		
ZINC	1.92E-01	1.18E+00		
SILVER	5.39E-05	1.56E-04		
CADMIUM	1.77E-04	5.90E-04		
MERCURY	4.64E-04	9.36E-04		
BENZO(A)PYRENE	1.02E-05	5.20E-05		
OFF-SITE EXPOSURE				
PCBS	1.65E-04	1.89E-04	4.36E-04	4.98E-04

6.2.2.2 Ingestion Exposure Route

On-site worker exposure concentrations by ingestion of soil under current land use conditions were calculated for all indicator chemicals. Off-site adult and child exposure calculations only included PCBs because off-site samples were analyzed only for PCBs in this phase of the work. The future land use scenario considered on-site adults and children would be exposed to all indicator chemicals.

Ingestion exposure estimated were calculated according to the model

$$E_I = C_i*I/BW; \quad \text{where}$$

E_I = exposure by the ingestion exposure route
C_i = concentration of chemical i
I = ingestion rate
BW = body weight

Worksheets documenting the calculations are presented in Appendix F. Table 19 summarizes ingestion exposure point concentrations.

6.2.2.3 Inhalation Exposure Route

To accurately estimate the exposure point concentrations of inhalable fugitive dust emissions involves extremely complex modeling of numerous site specific variables. To overcome this problem modelers (USEPA Document No. 60014-83-007) recommend using a more simplistic modeling approach which assumes unrealistic worst case conditions as a screening procedure. If this screening approach results in unacceptable exposure point concentrations, then a more realistic and complex modeling effort can be undertaken to determine if an unacceptable health

TABLE 19

INGESTION EXPOSURE
CURRENT USE
MG/KG/DAY

	ADULT AVE CONC	ADULT MAX CONC	CHILD AVE CONC	CHILD MAX CONC	PICA AVE CONC	PICA MAX CONC
ON-SITE EXPOSURE						
POTENTIAL CARCINOGENS						
PCB	1.08E-05	1.00E-04				
ARSENIC	2.79E-05	6.84E-05				
BENZO(A)PYRENE	1.23E-06	6.29E-06				
BENZO(A)ANTHRACENE	3.10E-06	8.86E-06				
DIBENZ(A,H)ANTHRACENE	1.24E-07	6.00E-07				
BETA-BHC	4.06E-08	3.64E-07				
BIS(2-ETHYLHEXYL)PHTHALATE	1.18E-05	4.29E-05				
HEXACHLOROBENZENE	3.09E-07	8.86E-07				
ALPHA-BHC	2.94E-08	2.57E-07				
BENZENE	3.76E-08	1.34E-07				
CHLOROFORM	4.29E-10	3.43E-09				
NON-CARCINOGENS						
ARSENIC	2.79E-05	6.84E-05				
BARIUM	1.14E-03	2.64E-03				
NICKEL	4.67E-04	1.94E-03				
COPPER	5.02E-03	1.36E-02				
LEAD	1.51E-03	3.89E-03				
ZINC	2.32E-02	1.43E-01				
SILVER	6.51E-06	1.89E-05				
CADMIUM	2.14E-05	7.13E-05				
MERCURY	5.62E-05	1.13E-04				
BENZO(A)PYRENE	1.23E-06	6.29E-06				
OFF-SITE EXPOSURE						
PCBS	1.00E-05	1.14E-05	4.12E-04	4.71E-04	2.06E-03	2.35E-03

risk is posed by the fugitive dust emissions. Or, if the simplistic model does not result in unacceptable exposure point concentrations, then this exposure route can simply be dismissed.

For the purpose of an initial screening model of conditions at this site we have assumed that site soils are unvegetated sands without obstructions for a worst case estimate. This assumption essentially models the site as a portion of open desert which is obviously unrealistic. In addition, the exposure point concentration model assumes no particulate fallout which dramatically increases the exposure concentrations since in reality most particles which become airborne by the wind quickly fall out and do not remain suspended for inhalation. This assumption essentially predicts the concentrations in a cloud of dust which constantly increases in density as it moves across the site.

Inhalation exposure concentrations under current and future land use conditions are based on fugitive dust emissions calculations, climatic data, and analytical data. Erosion and climatic information was obtained from the Soil Conservation Service Office and the National Environmental Satellite, Data, and Information Service, National Climatic Data Center, and Agricultural Handbook Number 346.

Fugitive dust emissions were estimated according to the US Soil Conservation Service functional equation

$$E = f(I', C', K', L', V'); \quad \text{where}$$

E = fugitive dust emissions as a function;

I′ = soil erodibility index as a function of particle size distribution. The soil erodibility chosen index was 310 to represent a worst case scenario of dust generation. This index corresponds to very fine sand, fine sand, sand or coarse sand; the most easily eroded soil;

K′ = soil ridge roughness as a function of height, width, and spacing of clods and furrows. According to the Soil Conservation Service, since the site is flat, the soil ridge roughness can be assumed to be unity;

C′ = local wind erosion climatic factor, an average of wind erosion climatic factors indicative of an annual loss of soil based on each month of the year;

L′ = field length along the prevailing wind direction; and

V′= the equivalent vegetative cover (assumed to be zero at hazardous waste sites USEPA 1988).

The total volume of fugitive dust generated from the site was estimated to be 28 short tons/year. Of this, only a portion is suspendible and transportable over significant distances by wind. Considerable discussion of the cut-off point for suspendible soil particle size exists in the literature (Sehmel 1980, USEPA 1983 a, b); in general, particles having a diameter less than or equal to 100 micrometers aerodynamic equivalent can be suspended by and transported in the wind. Particles having a diameter less than 10 micrometers in diameter are considered inhalable (US EPA 1988). In addition, it is expected that the actual volume of fugitive dust generated from Schreck's scrapyard is less than the estimated volume because of the oily nature of the on-site soil, and because there are many obstructions (scrap material debris) on the site that inhibit the suspension of soil particles. Of the estimated 28 short tons/years, only a portion is transportable and only a fraction is inhalable. For the purposes of this screening evaluation, 50% of the estimated contaminated fugitive dust is considered respirable (14 short tons/year).

Residents and site workers inhalation exposure was estimated using a dispersion model (US EPA Document number 600/4-83-007) and climatic data. Inhalation exposures were evaluated at a distance of 0 meters for on-site workers, and for off-site adults and children a distance of 60 meters from the site (the distance to the nearest residence is 60 meters from the site). Exposures were evaluated for northeast winds and for north winds; northeast winds prevail and were considered the average case, and north winds are the most stable and were considered the worst case.

The dispersion model used to evaluate inhalation exposure is

$$X(d,\mathrm{THETA}) = \mathrm{EA}\ \mathrm{SUM}_{i}^{N_i}\ \mathrm{OF}\ G_i(x) f_i\ \mathrm{SUM}_{j}^{N_j}\ \mathrm{OF}\ f_{ij}/u_j \quad \text{where}$$

X = inhalation exposure as a function of distance d from the emission source, and THETA, the direction of the wind

EA = emission rate

G_i = a function of the distance of the receptor from the source, the width of the fugitive dust plume, and the wind stability index

f_i = frequency of wind stability class i

f_{ij} = frequency of a windspeed class j coming from the direction THETA for a stability class i

u_j = is the mean windspeed for windspeed class j.

This model applies several assumptions.

- The emissions rate is assumed to be a steady state loading rate. The model does not allow for fallout, therefore the ambient concentration of a contaminant at a downwind distance from the site is a direct function of the rate at which it is released from the site, windspeed, wind direction, and wind stability.

- Crosswind dispersions are averaged over the width of the source, so the emissions plume is considered to be the same width as the site.

- Short term mean and peak concentrations were applied to long term exposure evaluations.

TABLE 20

INHALATION EXPOSURE
CURRENT USE
MG/KG/DAY

	ADULT				CHILD			
*WIND DIRECTION CONCENTRATION	NORTH MEAN	NORTH EAST MEAN	NORTH PEAK	NORTH EAST PEAK	NORTH MEAN	NORTH EAST MEAN	NORTH PEAK	NORTH EAS PEAK
ON-SITE EXPOSURE								
POTENTIAL CARCINOGENS								
PCB	1.08E-07	3.64E-08	1.00E-06	3.38E-07				
ARSENIC	1.40E-07	4.71E-08	3.43E-07	1.16E-07				
BENZO(A)PYRENE	6.17E-09	2.08E-09	3.15E-08	1.06E-08				
BENZO(A)ANTHRACENE	1.55E-08	5.24E-09	4.44E-08	1.50E-08				
DIBENZ(A,H)ANTHRACENE	6.23E-10	2.10E-10	3.01E-09	1.01E-09				
BETA-BHC	2.03E-10	6.86E-11	1.83E-09	6.16E-10				
BIS(2-ETHYLHEXYL)PHTHALATE	5.94E-08	2.00E-08	2.15E-07	7.24E-08				
HEXACHLOROBENZENE	1.55E-09	5.22E-10	1.55E-09	5.22E-10				
ALPHA-BHC	1.48E-10	4.97E-11	1.29E-09	4.35E-10				
BENZENE	1.88E-10	6.35E-11	6.70E-10	2.26E-10				
CHLOROFORM	2.15E-12	7.24E-13	1.72E-12	5.80E-13				
NON-CARCINOGENS								
ARSENIC	4.20E-07	4.71E-08	3.43E-07	1.16E-07				
BARIUM	5.71E-06	1.92E-06	1.32E-05	4.47E-06				
NICKEL	2.34E-06	7.90E-07	9.75E-06	3.29E-06				
COPPER	2.51E-05	8.48E-06	6.80E-05	2.29E-05				
LEAD	7.59E-06	2.56E-06	1.95E-05	6.57E-06				
ZINC	1.16E-04	3.92E-05	7.18E-04	2.42E-04				
SILVER	3.27E-08	1.10E-08	9.45E-08	3.19E-08				
CADMIUM	1.08E-07	3.63E-08	3.57E-07	1.20E-07				
MERCURY	2.82E-07	9.49E-08	5.67E-07	1.91E-07				
BENZO(A)PYRENE	6.17E-09	2.08E-09	3.15E-08	1.06E-08				
OFF-SITE EXPOSURE								
POTENTIAL CARCINOGENS								
PCB	5.10E-07	9.59E-08	4.75E-06	8.92E-07	3.57E-06	6.72E-07	3.32E-05	6.25E-06
ARSENIC	6.62E-07	1.24E-07	1.62E-06	3.05E-07	4.63E-06	8.71E-07	1.14E-05	2.14E-06
BENZO(A)PYRENE	2.92E-08	5.49E-09	1.49E-07	2.80E-08	2.04E-07	3.84E-08	1.04E-06	1.96E-07
BENZO(A)ANTHRACENE	7.36E-08	1.38E-08	2.10E-07	3.95E-08	5.15E-07	9.68E-08	1.47E-06	2.77E-07
DIBENZ(A,H)ANTHRACENE	2.95E-09	5.54E-10	1.42E-08	2.68E-09	2.06E-08	3.88E-09	9.97E-08	1.87E-08
BETA-BHC	9.63E-10	1.81E-10	8.65E-09	1.63E-09	6.74E-09	1.27E-09	6.05E-08	1.14E-08
BIS(2-ETHYLHEXYL)PHTHALATE	2.81E-07	5.29E-08	1.02E-06	1.91E-07	3.85E-03	4.26E-04	7.12E-06	1.34E-06
HEXACHLOROBENZENE	7.32E-09	1.38E-09	7.32E-09	1.38E-09	5.13E-08	9.64E-09	5.13E-08	9.64E-09
ALPHA-BHC	6.98E-10	1.31E-10	6.10E-09	1.15E-09	4.89E-09	9.19E-10	4.27E-08	8.03E-09
BENZENE	8.92E-10	1.68E-10	3.17E-09	5.96E-10	6.24E-09	1.17E-09	2.22E-08	4.17E-09
CHLOROFORM	1.02E-11	1.91E-12	8.14E-12	1.53E-12	7.12E-11	1.34E-11	5.70E-11	1.07E-11
NON-CARCINOGENS								
ARSENIC	6.62E-07	1.24E-07	1.62E-06	3.05E-07	4.63E-06	8.71E-07	1.14E-05	2.14E-06
BARIUM	2.70E-05	5.08E-06	6.27E-05	1.18E-05	1.89E-04	3.56E-05	4.39E-04	8.25E-05
NICKEL	1.11E-05	2.08E-06	4.61E-05	8.67E-06	7.76E-05	1.46E-05	3.23E-04	6.07E-05
COPPER	1.19E-04	2.24E-05	3.22E-04	6.05E-05	8.33E-04	1.57E-04	2.25E-03	4.24E-04
LEAD	3.59E-05	6.76E-06	9.22E-05	1.73E-05	2.52E-04	4.73E-05	6.46E-04	1.21E-04
ZINC	5.50E-04	1.03E-04	3.40E-03	6.39E-04	3.85E-03	7.24E-04	2.38E-02	4.47E-03
SILVER	1.55E-07	2.91E-08	4.48E-07	8.41E-08	1.08E-06	2.03E-07	3.13E-06	5.89E-07
CADMIUM	5.09E-07	9.57E-08	1.69E-06	3.18E-07	3.56E-06	6.70E-07	1.18E-05	2.23E-06
MERCURY	1.33E-06	2.50E-07	2.69E-06	5.05E-07	9.33E-06	1.75E-06	1.88E-05	3.53E-06
BENZO(A)PYRENE	2.92E-08	5.49E-09	1.49E-07	2.80E-08	2.04E-07	3.84E-08	1.04E-06	1.96E-07

*NORTHEAST WINDS PREVAIL,
NORTH WINDS ARE THE MOST STABLE

Worksheets documenting the calculations and climatic information are presented in Appendix F. Table 20 summarizes inhalation exposure concentrations.

- The exposure frequency of off-site residents is greater than on-site workers (24 hours per day and 8 hours per day respectively);

- The volume of soil in air, and consequently the volume of contamination in air, and how far it travels is a function of stability, wind speed, and wind direction. Six wind stability classes exist, and each is assigned a multiplier; C_i. The multiplier increases as the wind stability increases. At this site, although northeast winds occur more frequently than north winds, north winds are generally more stable than northeast winds. Therefore, the frequency at which greater wind stability multipliers occur in the model is greater for north winds than for northeast winds. (See Appendix F, page F-17.)

6.2.3 Exposure Point Concentrations and ARARs

The only identified ARAR concentration standard which is applicable to the exposure point concentrations is the USEPA TSCA soil cleanup level for PCBs in soils which is 10 mg/kg. All calculations used the following PCB soil concentrations for the site:

On site Average	15 mg/kg
On-site Maximum	140 mg/kg
Off-site Average	14 mg/kg
Off-site Maximum	16 mg/kg

These levels all exceed the PCB soil cleanup standard.

6.3 Toxicity Assessment

For risk assessment purposes, the indicator chemicals are separated into two categories of chemical toxicity depending on whether they exhibit non-carcinogen or carcinogenic effects. For the purpose of assessing risks associated with potential carcinogens, EPA has adopted the scientific position that a small number of molecular events can cause changes in a single cell or a small number of cells that can lead to a tumor formation. In the case of chemicals that exhibit non-carcinogen effects, it is believed that organisms have protective mechanisms that must be overcome before toxic end point is reached.

6.3.1 Health Effects Criteria for Non-carcinogens

Health effects criteria for non-carcinogens are generally developed using verified risk reference doses (RFDs) reported by the EPA. The RFD, expressed in units of mg/kg/day, is an estimate of the daily human exposure that is unlikely to be associated with an appreciable risk during a lifetime. The RFD provides a benchmark to which chemical intakes by other routes may be compared.

6.3.2 Health Effects Criteria for Potential Carcinogens

Cancer potency factors (CPFs), reported by the EPA's Carcinogen Assessment Group (CAG) for potentially carcinogenic chemicals, are derived from the results of human epidemiological studies or chronic animal bioassays. The units for potency factors are $(mg/kg/day)^{-1}$. EPA assigns weight-of-evidence classifications to potential carcinogens. Chemicals are classified as either Group A, Group B1, Group C, Group D, or Group E.

Group A - Human carcinogens - there is sufficient evidence to support the casual association between exposure to the chemical and cancer in humans.

Group B1 - Probable human carcinogens - limited evidence of carcinogenicity from human studies but sufficient evidence of carcinogenicity from animal studies.

Group B2 - Probable human carcinogen - inadequate evidence of carcinogenicity from human studies but sufficient evidence of carcinogenicity from animal studies.

Group C - Possible human carcinogens - limited evidence of carcinogenicity in animals.

Group D - Not classified as human carcinogens - inadequate human and animal evidence of carcinogenicity or for which no data are available.

Group E - Evidence of non-carcinogenicity in humans - no evidence in adequate human or animal studies of carcinogenicity.

(EPA, 1986)

The cancer potency factor is used to estimate the excess lifetime carcinogenic risk associated with a low dose exposure to a potential carcinogen. These potency factors generally provide 95% upper-bound estimates of excess lifetime cancer risks. The actual risks are unlikely to be higher than the estimated risks, and they could be significantly lower.

6.3.4 Indicator Chemicals Toxicity Profiles and ARARs

ALPHA-BHC/BETA-BHC

Has been implicated in aplastic anemia. A toxic organochlorine pesticide which is persistent in the environment and bioaccumulates. The isomers have different actions. The alpha isomer is a central nervous system stimulant, with the principal symptoms being convulsions. The beta isomer is a central nervous system depressant.

Acute Exposure

The signs and symptoms of acute poisoning are: excitation, hyperirritability, loss of equilibrium, and later depression.

Chronic Exposure

Dermatitis and potentially other manifestations based on sensitivity represents a chronic, though probably not systemic intoxication, which has been observed in humans.

Studies on occupationally exposed persons have been inconclusive in showing that arsenic causes an increase in mortality from cardiac disease. However, the EPA has estimated carcinogenic risks for both air and water exposures to arsenic.

Mutagenicity

The evidence that arsenic compounds cause mutations and allied effects in bacteria is inconclusive. However, arsenic compounds induce chromosomal aberrations and morphological transformation in mammalian cells (IARC 1980).

Teratogenicity

There is no information available on the teratogenicity effects on humans, but sodium arsenate has been found to cause birth defects in chicks and mice (CAG 1980).

Carcinogenicity

There is substantial evidence that atmospheric arsenic is a human carcinogen.

Applicable Standard, Criteria and Guidelines

Background soil arsenic levels range from less than 1 ppm to over 40 ppm. Air levels of arsenic in the United States generally do not exceed 0.1 mg/m 3 The USEPA proposed primary drinking water standards as of February 1989 are 0.05 mg/l. The MCL for arsenic in United States public water supplies is 0.05 mg/l. In general, arsenic is not found in drinking water at levels exceeding this MCL. Arsenic is ingested and stored in crustaceans and other marine life in complex organoarsenical forms which are assimilated by man.

Applicable Standards, Criteria and Guidelines

The current OSHA standard for soluble barium compounds is 0.5 milligram of soluble barium compounds per cubic meter of air (mg/m^3) averaged over an eight hour work shift. The US EPA proposed primary drinking water standards for barium are 1.0 mg/l. The typical concentration range of barium in natural soils is 100-3,000 ppm.

BENZENE

Routes of Exposure

Benzene may cause adverse health effects following exposure via inhalation, ingestion or dermal and eye contact.

Acute Exposure

Exposure to benzene can cause dizziness, euphoria, giddiness, headache, nausea, staggering gait, weakness, drowsiness, respiratory irritation, pulmonary edema, and pneumonia, gastrointestinal irritation, convulsions, and paralysis. Benzene can also cause irritation to the skin, eyes, and mucous membranes.

Chronic Exposure

Exposure to benzene can cause fatigue, nervousness, irritability, blurred vision, and labored breathing. Repeated contact can cause blistering, redness, and dry, scaly dermatitis.

Applicable Standards, Criteria and Guidelines

The current Occupation Safety and Health Administration (OSHA) permissible exposure limit (PEL) for benzene is 1 part of benzene per million parts of air as a time weighted average over an eight hour workshift. For any 15 minute sampling period, the short-term exposure limit is 5 ppm. The NIOSh recommended exposure limit is 0.1 ppm as an 8 hour time weighted average and 1 ppm as a ceiling in any 15 minute sampling period.

CADMIUM

Exposure Routes

The main routes of exposure to cadmium are typically via inhalation and ingestion.

Acute Exposure Effects

Cadmium dust may cause irritation of the nose and throat. If inhalation is significant, a person may develop cough, chest pain, sweating, chills, shortness of breath, and weakness, after a delay of several hours. Cadmium ingestion, especially in soluble salt form, may cause nausea, vomiting, diarrhea and abdominal cramps. Acute intoxication can result in death.

Chronic Exposure Effects

Chronic exposure to cadmium dust may cause loss of sense of smell, ulceration of the nose, shortness of breath (emphysema), kidney damage, and mild anemia. An increased incidence of prostate cancer in man has been reported, due to prolonged exposure of cadmium, also, extreme back and leg pain may result due to chronic cadmium exposure. Injections of cadmium sulfate in animals have been reported to cause malformations in their offspring.

Mutagenicity

Cadmium salts increase the frequency of point and chromosomal mutations. They induce in-vitro mammalian cellular transformations and enhance transformations of virus-infected mammalian cells. These mutagenic effects are correlated with cadmium's ability to induce carcinogenic effects.

Teratogenicity

Due to limited examination of teratogenic studies in humans, the question of human teratogenicity cannot be adequately addressed. In animal studies, cadmium was found to be teratogenic to mice at 10 ppm in the drinking water. In rats, oral doses of cadmium given during gestation caused skeletal, kidney and heart abnormalities, stillborn offspring and increased fetal resorption. However, due to dosage and route of administration in these experiments and the poor dietary absorption, it has been suggested that cadmium should not be a significant factor in human teratogenesis.

Applicable Standards, Criteria and Guidance

The current OSHA standard for cadmium dust is 0.2 milligram of cadmium dust per cubic meter of air (mg/m^3) averaged over an 8 hour work shift, with a ceiling level of 0.6 mg/m^3. NIOSH has recommended that the permissible exposure limit be reduced to 40 mg/m^3 averaged over a work shift of up to 10 hours a day, 40 hours per week, with a ceiling level of 200 mg/m^3 averaged over a 15 minute period (OSHA, 1978).

The USEPA proposed February, 1989 primary drinking water standard for cadmium is 0.01 mg/l.

The typical range of cadmium found in natural soils is 0.01-0.7 ppm (USEPA, 1983).

CHLOROFORM

Routes of Exposure

Chloroform can affect the body if it is inhaled or if it comes in contact with eyes or skin. It can also affect the body if it is swallowed.

Acute Exposure

Chloroform vapor may cause headache drowsiness, vomiting, dizziness, unconsciousness, irregular heartbeat, and death. Liver and kidney damage may also result from exposure to vapor. Chloroform causes pain and irritation when it contacts the eye. Swallowing chloroform causes severe burning of the mouth and throat, pain in the chest and abdomen, and vomiting. Loss of consciousness and liver damage may follow.

Chronic Exposure

Prolonged exposure to chloroform may cause liver and kidney damage. Prolonged or repeated skin contact with the liquid may produce skin irritation.

Chloroform vapor is a central nervous system depressant and is toxic to the liver and kidneys. It has been largely abandoned as an anesthetic agent due to cardiac arrest during surgery.

Applicable Standards, Guidelines and Criteria

The current OSHA Standard for chloroform is a ceiling level of 50 parts of chloroform per million parts of air. This may also be expressed as 240 mg of chloroform per cubic meter of air. NIOSH recommends that the permissible exposure limit be reduced to a ceiling level of 2 ppm averaged over a one hour period, and that chloroform be regulated as an occupational carcinogen.

COPPER

Exposure Routes

Copper is frequently found in surface water and some groundwater. In soils, copper concentration varies with the parent rock, weathering, drainage, pH and organic content.

Another source of copper to humans is through the food chain. Copper content in commonly consumed vegetables and leafy plants ranges from 10 - 15 ppm. Grains and seed contain in the vicinity of 20 - 40 ppm cooper. Generally, dairy products are extremely low in copper content, while cereals and roots contain higher levels. Oysters, clams, crustacea, and the liver and kidneys of animals contain upwards of 200 - 400 ppm.

Human exposure to copper may also be through inhalation of copper dusts generated by copper processing operations. Copper dusts or mists can affect the body if they come in contact with the eyes or skin, or if they are swallowed.

Acute Exposure Effects

Acute exposure to copper via inhalation or ingestion may cause nausea, vomiting, diarrhea, stomach pain, and irritation of the upper respiratory tract, with occasional ulceration and perforation of the nasal septum. A metallic taste and green or blue saliva may appear in the mouth, and in severe cases, anemia, hypotension and coma can occur.

When skin is exposed it may become irritated. Contact with metal solutions can cause swelling, itching and discoloration. Eye contact with copper in any form may cause irritation. Toxic levels of copper ingested are promptly absorbed from the upper gut, and the copper level in the blood is rapidly increased, primarily because of its accumulation in the blood cells.

Chronic Exposure Effects

There is not much information available to adequately discuss the chronic toxicity of copper to man. Problems associated with copper levels in drinking water are controlled because of the metallic taste produced due to the presence of high copper levels, and the surface scum that develops in water due to the formation of insoluble copper compounds. However, repeated or prolonged exposure to copper dusts or mists may cause skin irritation or discoloration of the skin or hair. (OSHA, 1978).

Mutagenicity

Data for the mutagenic potential of high copper intakes have generally shown negative results in microbial essays. There is no data supporting mutagenicity in humans (USEPA 1985). However, there is some evidence that copper may increase the mutagenic activity of other compounds.

Teratogenicity

Copper is considered an experimental teratogen.

Carcinogenicity

There is very little evidence in the literature to suggest that copper has a carcinogenic effect in either animals or humans.

Applicable Standard, Criteria and Guidelines

Copper is frequently found in surface water and some groundwater with concentrations commonly in the 100 mg/l range. Copper concentrations in surface water are generally below 20 mg/l.

Copper content in commonly consumed vegetables and leafy plants ranges from 10 - 15 ppm. Grains and seed contain in the vicinity of 20 - 40 ppm cooper. Generally, dairy products are extremely low in copper content, while cereals and roots contain higher levels. Oysters, clams, crustacea, and the liver and kidneys of animals contain upwards of 200 - 400 ppm.

Copper concentrations in ambient air range between 0.01 mg/m 3 and 0.257 mg/m 3 for both urban and rural areas (USEPA 1985). The current OSHA standard for copper dusts or mists is 1 mg/m^3 of air averaged over an eight-hour work shift (OSHA, 1978). The typical range of copper concentrations in natural soils is 2-100 ppm (USEPA, 1983).

HEXACHLOROBENZENE

Limited information was found in available literature regarding the toxicity effects of hexachlorobenzene. Hexachlorobenzene is a fungicide. A human poison by a unspecified route. An experimental carcinogen, neoplastigen and teratogen. A suspected human carcinogen. Mildly toxic by inhalation. Rats which were fed hexachlorobenzene exhibited symptoms such as slight skin twitching and nervousness, increase in liver and kidney weight, neurotoxic symptoms, and porphyria. Hexachlorobenzene has been found to effect reproduction of the rat. Weanling rats from dams fed HCB contained HCB residues, had enlarged livers with increased hepatic aniline hydroxylase activity. No gross abnormalities were observed in the pups (Verschueren, 1983).

LEAD

Exposure Routes

The main routes of exposure to lead are typically via ingestion of food and water, with lesser exposures occurring via inhalation. Lead is naturally present in food and water, but excessive levels found in air in most urban areas are considered unnatural.

Acute Exposure Effects

Inhalation exposure to lead fumes and dusts may result in delayed effects. Fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains and decreased appetite can result from lead inhalation. These effects are reversible and complete recovery is possible. Inhaling large amounts of lead can lead to seizures, coma and death. Lead contact with skin and/or eyes may cause irritation.

Chronic Exposure Effects

Lead accumulation in the body can occur over a period of time. Buildup can contribute to more severe side effects. These may include anemia, pale skin, a blue line at the gum margin, decreased hand-grip strength, abdominal pain, severe constipation, nausea, vomiting, and paralysis of the wrist joint. Kidney damage can occur from prolonged exposure. In cases where high exposures have occurred over a period of time, the nervous system may be affected, causing severe headaches, convulsions, coma, delirium and death. Recovery is slow and not always complete. Prolonged exposure can also cause increased chances of birth defects and miscarriage in humans.

Mutagenicity

Pertinent data could not be located in the available literature concerning the mutagenicity of lead.

Teratogenicity

There is little information in the literature to suggest that lead has a teratogenic effect in man. However, lead had been shown repeatedly to have teratogenic effects in experimental animals.

Carcinogenicity

Lead has been shown to be carcinogenic in some species of laboratory animals. Males seem to be more susceptible to tumors in rats, and a dose-related effect is clearly evident.

Applicable Standard, Criteria and Guidelines

The proposed USEPA primary drinking water standard (Feb., 1989) for lead is 0.05 mg/l. Lead levels in water supplies are usually less than 50 mg/m 3. In soils, lead concentrations generally range in the vicinity of 2 - 200 mg/Kg. Near heavily traveled thoroughfares, lead concentrations in grass may be as high as 250 mg/Kg, dropping off as the distance from the roadway increases.

Lead is found in condiments, fish and seafood, meat and eggs, grain and vegetables, and milk as well as other foods, and varies in concentrations from 0.2 - 2.5 mg/Kg (5 - 12 mg/m 3 for milk).

Lead levels in ambient air have been found to average 1 - 3 mg/m 3 in urban areas, 0.1 - 0.5 mg/m 3 in suburban areas, and less than 0.05 mg/m 3 in rural areas except for locations in the vicinity of heavy traffic. Lead concentrations in ambient air have been found to be heavily influenced by vehicular traffic. The current OSHA permissible exposure limit (PEL) for inorganic lead is 50 mg/m3 of air as a time weighted average (TWA) concentration over an 8 hour work shift. NIOSH recommended exposure limit (REL) is 100 mg/m^3 as a TWA for up to a 10 hour work shift, 40 hour work week. The American Conference of Governmental Industrial Hygienist (ACGIH) threshold limit value (TLV) is 150 mg/m^3 as a TWA for an 8 hour workday and 40 hour work week (OSHA, 1988).

MERCURY

Exposure Routes

Mercury can affect the body if it is inhaled or if it comes in contact with the eyes or skin. It may enter the body through the skin.

Acute Exposure Effects

Inhaled mercury vapor may cause headaches, cough, chest tightness, and difficulty in breathing. It may also cause chemical pneumonitis. In addition, it may cause soreness of the mouth, loss of teeth, nausea, and diarrhea. Liquid mercury may irritate the skin (OSHA, 1978)

Chronic Exposure Effects

Repeated or prolonged exposure to mercury liquid or vapor causes effects which develop gradually. The first to occur are often fine shaking of the hands, eyelids, lips, tongue, or jaw. Other effects are allergic skin rash, headache, sores in the mouth, sore and swollen gums, loose teeth, insomnia, excess salivation, personality change, irritability, indecision, loss of memory, and intellectual deterioration (OSHA, 1978).

Mutagenicity

Human mutagenic data has been reported (Sax and Lewis, 1989).

Teratogenicity

Mercury is an experimental teratogen (Sax and Lewis, 1989).

Carcinogenicity

Intraperitoneal injection in rats resulted in sarcomas at the point of contact (OSHA 1978).

Applicable Standard, Criteria and Guidelines

The current OSHA standard for mercury is a ceiling level of 0.1/mg of mercury per cubic meter of air (mg/m^3). NIOSH has recommended that the permissible exposure limit be changed to 0.05 mg/m^3 averaged over an 8 hour work day. Typical mercury concentrations in natural soils range from 0.01-0.3 ppm. The USEPA proposed primary drinking water standards for mercury are 0.05 mg/l.

NICKEL

Exposure Routes

Metallic nickel or soluble nickel compounds can affect the body if they are inhaled or if they come in contact with the eyes or skin. They can also affect the body if they are swallowed (OSHA, 1978).

Effects of Overexposure

Nickel fumes are respiratory irritants and may cause pneumonitis. Skin contact may cause an allergic skin rash. Nickel and its compounds have been reported to cause cancer of the lungs and sinuses. Nickel itself is not very toxic if swallowed, but it's soluble salts are quite toxic and, if swallowed, may cause giddiness and nausea. Exposure to nickel carbonyl (by inhalation or skin absorption) may cause both initial and delayed symptoms. Initial symptoms include headache, dizziness, shortness of breath, and vomiting. These symptoms generally disappear when the worker is exposed to fresh air. The delayed symptoms may develop 12 to 36 hours after exposure. The shortness of breath returns, a blue color of the skin may appear, and a fever may develop. The exposed person may become delirious. In some cases the symptoms may run together (OSHA, 1978).

Mutagenicity

Various inorganic compounds of nickel have been tested for mutagenicity and other genotoxic effects in a variety of test systems. From these tests it appears that nickel may induce gene mutations in bacteria and cultured mammalian cells; however, the evidence is fairly weak.

Teratogenicity

Nickel is considered an experimental teratogen (Sax and Lewis, 1989).

Carcinogenicity

In nickel refinery workers, and excess risk of nasal and lung cancers has been demonstrated (OSHA, 1978). In animals, finely divided metallic nickel was carcinogenic when introduced into the pleural cavity, muscle tissue and subcutaneous tissues; rats and guinea pigs exposed to a concentration of 15 mg/m^3 of powdered metallic nickel developed malignant pulmonary neoplasms.

Applicable Standards, Criteria of Guidance

The current OSHA standard for nickel metal of soluble nickel compounds is 1 milligram of nickel metal of soluble nickel compounds per cubic meter of air (mg/m3) averaged over an 8 hour work shift. NIOSH has recommended that the permissible exposure limit for nickel be reduced to 0.015 mg/m^3 averaged over a work shift of up to 10 hours per day, 40 hours per week, and that nickel be regulated as an occupational carcinogen. (OSHA, 1978.) The typical concentration of nickel in natural soils ranges from 5-500 ppm (EPA, 1983).

PAHs

(benzo(a)pyrene, benzo(a)anthracene, dibenz(a,h) anthracene)

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds that are formed during the incomplete combustion or pyrolysis of organic materials containing carbon and hydrogen. (EPA, 1984)

Routes of Exposure

PAHs can affect the body through ingestion and inhalation.

Acute Overexposure

Acenaphthylene administered orally to rats resulted in considerable body weight loss, unspecified changes in the peripheral blood pattern, changes in renal function, and increased serum aminotransferase activities. Additionally, rats exposed to acenaphthylene had mild morphological damage to the liver and kidneys, changes consistent with mild bronchitis, and localized inflammation of peribronchial tissue. (Knobloch et al., 1969)

Chronic nonspecific pneumonia in male rats following inhalation of acenaphthylene at a concentration of 18 mg/m^3 or acenaphthylene at 12 mg/m^3 for 4 hrs/day, 6 days/wk, for 5 months. (Reshetyuk et. al. 1970).

Chronic Overexposure

No adequate studies of oral or inhaled PAHs could be located in the literature (U.S. EPA, 1984)

Teratogenicity

Studies have resulted in teratogenic effects observed upon oral administration of Benzo(a)pyrene to rats. Pertinent data regarding the teratogenic effects resulting from inhalation exposure to PAHs could not be located in available literature (EPA, 1984)

Carcinogenicity

Numerous epidemiologic studies of human populations (primarily worker groups) have shown a clear association between exposure to PAHs containing mixtures (soots, tars, oils, etc.) and increased cancer risk (Santaondonato et al., 1981, IARC 1973, 1983; U.S. EPA, 1981).

Applicable Standards, Criteria of Guidelines

Exposure criteria have been developed for PAHs as a class, as well as for several individual PAHs. OSHA has set an 8-hour TWA concentration limit of 0.2 mg/m^3 for the benzene soluble fraction of coal tar pitch volatiles (anthracene, BAP, phenanthrene, acridine, chrysene, pyrene) (CFR, 1981). NIOSH (1977) recommends a concentration limit for coal tar, coal tar pitch, creosote and mixtures of these substances at 0.1 mg/m^3 of the cyclohexane-extractable fraction of the samples determined as a 10 hour TWA.

Environmental quality criteria for PAHs have been recommended for ambient water, which specify concentration limits intended to protect humans against adverse health effects. The U.S. EPA (1980c)has recommended a concentration limit of 28 mg/l for the sum of all carcinogen PAHs in ambient water.

PCBs (polychlorinated biphenols)

Exposure Routes

Moderately toxic by ingestion. Some are poisons by other routes. Experimental reproductive effects.

Human Exposure Characteristics

The chlorinated diphenyls have two distinct actions on the body, namely a skin effect and a toxic action on the liver. This hepatotoxic action of the chlorinated diphenyls appears to be increased if there is exposure to carbon tetrachloride at the same time. The higher the chlorine content of the diphenyl compound, the more toxic it is liable to be. Oxides of chlorinated diphenyls are more toxic than the unoxidized materials.

Carcinogenicity

Suspected human carcinogens. Experimental carcinogens and tumorigens. Hepatomas were produced in 170 of 184 examined female rats fed Aroclor 1260 at 100 ppm from 3-4 to 23 months of age (Niosh, Occupational Exposure to PCBs).

Mutagenicity

Although PCBs themselves have little mutagenic potential, they may alter the mutagenicity and carcinogenicity of other compounds by stimulating microsomal enzyme activities (NIOSH).

Teratogenicity

PCBs have been found in embryonic and fetal tissues of humans and experimental animals after introduction of PCBs into the maternal body, demonstrating that the potential for direct teratogenic effects exists.

Applicable Standards, Criteria of Guidance

The ACGIH TWA is 0.5 - 1 mg/m^3 for dermal contact and the STEL is 1 - 2 mg/m^3. PCB cleanup performance standards for spills on surfaces are: residential = 10 ug/100cm^2; low contact = 100 ug/100 cm^2. TSCA has promulgated a performance standard for PCBs in soils of 10 mg/kg.

SILVER

Human Exposure Routes:

Silver can affect living systems through inhalation, or if they come in contact with the eyes of skin, or if swallowed.

Effects of overexposure

Human systemic effects by inhalation: skin effects. Inhalation of dusts can cause argyrosis. (Sax and Lewis,1989)

Silver Applicable Standards, Criteria, and Guidelines

The current OSHA Standard for silver metal and soluble silver compounds is 0.01 milligram of silver metal and soluble silver compounds per cubic meter of air (mg/m^3) averaged over an 8 hour work shift. The American Conference of Governmental Industrial Hygienists has issued a Notice of Intended Changes of its recommended Threshold Limit Value for silver metal and soluble silver compounds from 0.01 mg/m^3 to 0.1 mg/m^3. The typical element concentration range of silver in natural soils is 0.01-5ppm. The US EPA proposed primary drinking water standards are 0.05 mg/l.

Carcinogenicity

An experimental tumorigen.

ZINC

Human Health Toxicity Profile

Zinc can cause cough, dypspnea and sweating by ingestion. It is a human skin irritant. Pure zinc powder, dust, fume is relatively non-toxic to humans by inhalation. The difficulty arises from oxication of zinc fumes immediately prior to inhalation or presence of impurities such as cadmium, lead, arsenic, or antimony. Inhalation may cause sweet taste, throat dryness, cough, weakness, generalized aches, chills, fever, nausea, and vomiting (Sax and Lewis, 1989).

Applicable Standards, Criteria, and Guidelines

Zinc concentrations in natural soils range from 10 to 2,000 mg/kg with a typical medium of 54 mg/kg (Ure, A. M. and Berrow, M.L., 1983).

6.4 Risk Characterization

A quantitative risk characterization must be completed for each complete exposure pathway because potential ARARs are not available for some of the chemicals in each environmental medium under consideration.

For potential carcinogens, excess upperbound lifetime cancer risks are obtained by multiplying the chronic daily intake (CDI) or exposure concentrations of the chemical under consideration by its cancer potency factor. A risk level of 10^{-6}, representing an upperbound probability that one excess cancer case would result in 1,000,000 individuals exposed to the potential carcinogen, is often used as a benchmark by regulatory agencies.

$$CR = CDI \times CPF$$ (EPA, 1986 a)

Where

CR = Cancer Risk

CDI = Chronic Daily Intake (mg/kg/day)

CPF = Carcinogenic Potency Factor $(mg/kg/day)^{-1}$

Potential risks for non-carcinogen are obtained by dividing the chronic daily intake by the acceptable daily intake (or reference dose). The sum of all of the ratios of chemicals under consideration is called the hazard index (HI). In general, hazard indices that are less than 1 are not likely to be associated with any health risks and are therefore less likely to be of concern than hazard indices greater than 1.

$$HI = \frac{CDI}{RFD}$$ (EPA, 1986 a)

Where

HI = Hazard Index

CDI = Chronic Daily Intake (mg/kg/day)

RFD = Reference Dose (mg/kg/day)

In accordance with EPA' s guidelines for evaluating the potential toxicity of complex mixtures, it is assumed that the toxic effects of the chemicals of concern would be additive. This approach does not take into account synergistic or antagonistic interactions of particular combinations of chemicals. All of the indicator chemicals did not have hazard indices or carcinogenic potency factors associated with them in the Health Effects Assessment Summary tables, and consequently, some chemicals were not included in the estimate of total risk.

6.4.1 Current Land-Use

The health risk associated with exposure to on-site and off-site soils under the current land use scenario were estimated using the chronic daily intake average and maximum values calculated in the Exposure Assessment under the assumption that no remedial actions take place. A summary of current land use risks is contained in Table 21. Table 22, 23 and 24 contain the risk characterization for current dermal exposure, ingestion and inhalation exposure, respectively

These long term health risk characterizations are not intended to be estimates of the actual risk to humans, but instead to represent an upperbound estimate of the risks. Acute risks are expected to be lower than the upperbound values presented in this Risk Characterization.

The estimated risks due to fugitive dust emissions are for screening purposes only since the modeling used to determine exposure point concentrations grossly exaggerates potential emissions. Unacceptable inhalation risks only suggest the potential for a problem to exist which would require more detailed environmental modeling to determine realistic health risks.

TABLE 23

RISK CHARACTERIZATION SUMMARY - CURRENT SITE USE

SCENARIO	NON-CARCINOGENIC HAZARD INDEX	CARCINOGENICITY RISK FACTOR
INGESTION, AVERAGE CONTAMINANT CONCENTRATION		
On-site adult worker	1.59E+00	8.35E-05
Off-site adult resident	NA	NA
Off-site child resident	NA	NA
Off-site pica resident	NA	NA
INGESTION, MAXIMUM CONTAMINANT CONCENTRATION		
On-site adult worker	4.46E+00	7.72E-04
Off-site adult resident	NA	NA
Off-site child resident	NA	NA
Off-site pica resident	NA	NA
DERMAL CONTACT, AVERAGE CONTAMINANT CONCENTRATION		
On-site adult worker	1.32E+01	1.38E-03
Off-site adult resident	NA	NA
Off-site child resident	NA	NA
DERMAL CONTACT, MAXIMUM CONTAMINANT CONCENTRATION		
On-site adult worker	3.69E+01	1.28E-02
Off-site adult resident	NA	NA
Off-site child resident	NA	NA

TABLE 23 CONTINUED

RISK CHARACTERIZATION SUMMARY - CURRENT SITE USE

SCENERIO	NON-CARCINOGENIC HAZARD INDEX	CARCINOGENICITY RISK FACTOR
INHALATION, AVERAGE CONTAMINANT CONCENTRATION, PREVAILING WINDS (NORTHEAST)		
On-site adult worker	< 1	3.24E-06
Off-site adult resident	< 1	8.53E-06
Off-site child resident	< 1	5.99E-05
INHALATION, MAXIMUM CONTAMINANT CONCENTRATION, PREVAILING WINDS (NORTHEAST)		
On-site adult worker	< 1	9.30E-06
Off-site adult resident	< 1	2.45E-05
Off-site child resident	1.11E+00	1.72E-04
INHALATION, AVERAGE CONTAMINANT CONCENTRATION, STABLE WINDS (NORTH)		
On-site adult worker	< 1	9.63E-06
Off-site adult resident	< 1	4.55E-05
Off-site child resident	2.48E+00	3.18E-04
INHALATION, MAXIMUM CONTAMINANT CONCENTRAION, STABLE WINDS (NORTH)		
On-site adult worker	< 1	2.75E-05
Off-site adult resident	< 1	1.30E-04
Off-site child resident	5.89E+00	9.13E-04

TABLE 22

RISK CHARACTERIZATION
DERMAL EXPOSURE ROUTE
CURRENT USE

	ADULT AVE CONC	ADULT MAX CONC	CHILD AVE CONC	CHILD MAX CONC
ON-SITE				
CARCINOGENICITY				
PCB	1.37E-03	1.27E-02		
ARSENIC				
BENZO(A)PYRENE				
BENZO(A)ANTHRACENE				
DIBENZ(A,H)ANTHRACENE				
BETA-BHC				
BIS(2-ETHYLHEXYL)PHTHALATE	1.37E-06	4.96E-06		
HEXACHLOROBENZENE	4.34E-06	1.25E-05		
ALPHA-BHC				
BENZENE	9.01E-09	3.20E-08		
CHLOROFORM	2.16E-11	1.73E-10		
CADMIUM				
LEAD				
NICKEL				
TOTAL RISK	1.38E-03	1.28E-02		
HAZARD INDEX				
ARSENIC	0.00E+00	0.00E+00		
BARIUM	1.88E-01	4.37E-01		
NICKEL	1.93E-01	8.04E-01		
COPPER	1.12E+00	3.03E+00		
LEAD	8.95E+00	2.30E+01		
ZINC	9.59E-01	5.92E+00		
SILVER	1.80E-02	5.20E-02		
CADMIUM	1.77E-01	5.90E-01		
MERCURY	1.55E+00	3.12E+00		
BENZO(A)PYRENE	0.00E+00	0.00E+00		
TOTAL RISK	1.32E+01	3.69E+01		

TABLE 23

RISK CHARACTERIZATION INGESTION EXPOSURE ROUTE

CURRENT USE

	ADULT AVE	ADULT MAX	CHILD AVE	CHILD MAX	PICA AVE	PICA MAX
ON-SITE						
CARCINOGENICITY RISK FACTOR						
PCB	8.28E-05	7.70E-04				
ARSENIC						
BENZO(A)PYRENE						
BENZO(A)ANTHRACENE						
DIBENZ(A,H)ANTHRACENE						
BETA-BHC						
BIS(2-ETHYLHEXYL)PHTHALATE	1.66E-07	6.00E-07				
HEXACHLOROBENZENE	5.25E-07	1.51E-06				
ALPHA-BHC						
BENZENE	1.09E-09	3.87E-09				
CHLOROFORM	2.61E-12	2.09E-11				
CADMIUM						
LEAD						
NICKEL						
TOTAL RISK	8.35E-05	7.72E-04				
NON-CARCINOGENIC HAZARD INDEX						
ARSENIC						
BARIUM	2.28E-02	5.29E-02				
NICKEL	2.34E-02	9.72E-02				
COPPER	1.36E-01	3.67E-01				
LEAD	1.08E+00	2.78E+00				
ZINC	1.16E-01	7.16E-01				
SILVER	2.17E-03	6.29E-03				
CADMIUM	2.14E-02	7.13E-02				
MERCURY	1.87E-01	3.77E-01				
BENZO(A)PYRENE						
TOTAL RISK	1.59E+00	4.46E+00				

TABLE 24 CONTINUED

RISK CHARACTERIZATION
INHALATION EXPOSURE ROUTE

	NON-CARCINOGENIC HAZARD INDEX				NON-CARCINOGENIC HAZARD INDEX			
	ADULT				CHILD			
*WIND DIRECTION CONCENTRATION	NORTH MEAN	NORTHEAST MEAN	NORTH PEAK	NORTHEAST PEAK	NORTH MEAN	NORTH EAST MEAN	NORTH PEAK	NORTH E PEAK
ON-SITE								
ARSENIC	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
BARIUM	5.71E-02	1.92E-02	1.32E-01	4.47E-02				
NICKEL	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
COPPER	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
LEAD	1.77E-02	5.95E-03	4.53E-02	1.53E-02				
ZINC	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
SILVER	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
CADMIUM	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
MERCURY	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
BENZO(A)PYRENE	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
TOTAL RISK	7.48E-02	2.52E-02	1.77E-01	6.00E-02				
OFF-SITE								
ARSENIC	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
BARIUM	2.70E-01	5.08E-02	6.27E-01	1.18E-01	1.89E+00	3.56E-01	4.39E+00	8.25E-0
NICKEL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
COPPER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
LEAD	8.35E-02	1.57E-02	2.14E-01	4.02E-02	5.86E-01	1.10E-01	1.50E+00	2.81E-0
ZINC	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
SILVER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
CADMIUM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
MERCURY	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
BENZO(A)PYRENE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
TOTAL RISK	3.53E-01	6.65E-02	8.41E-01	1.58E-01	2.48E+00	4.66E-01	5.89E+00	1.11E+0

* NORTHEAST WINDS PREVAIL,
NORTH WINDS ARE THE MOST STABLE

TABLE 24

RISK CHARACTERIZATION
INHALATION EXPOSURE ROUTE
CURRENT USE

	CARCINOGENICITY RISK FACTOR				CARCINOGENICITY RISK FACTOR			
	ADULT				CHILD			
WIND DIRECTION CONCENTRATION	NORTH MEAN	NORTH EAST MEAN	NORTH PEAK	NORTH EAST PEAK	NORTH MEAN	NORTH EAST MEAN	NORTH PEAK	NORTH E PEAK
ON-SITE								
PCB								
ARSENIC	7.00E-06	2.36E-06	1.72E-05	5.80E-06				
BENZO(A)PYRENE								
BENZO(A)ANTHRACENE								
DIBENZ(A,H)ANTHRACENE								
BETA-BHC								
BIS(2-ETHYLHEXYL)PHTHALATE								
HEXACHLOROBENZENE	2.64E-09	8.87E-10	2.64E-09	8.87E-10				
ALPHA-BHC								
BENZENE	5.45E-12	1.84E-12	1.94E-11	6.55E-12				
CHLOROFORM	1.74E-13	5.86E-14	1.39E-13	4.70E-14				
CADMIUM	6.59E-07	2.21E-07	2.18E-06	7.32E-07				
LEAD								
NICKEL	1.97E-06	6.64E-07	8.19E-06	2.76E-06				
TOTAL RISK	9.63E-06	3.24E-06	2.75E-05	9.30E-06				
OFF-SITE								
PCB								
ARSENIC	3.31E-05	6.20E-06	8.10E-05	1.53E-05	2.32E-04	4.36E-05	5.70E-04	1.07E-0
BENZO(A)PYRENE								
BENZO(A)ANTHRACENE								
DIBENZ(A,H)ANTHRACENE								
BETA-BHC								
BIS(2-ETHYLHEXYL)PHTHALATE								
HEXACHLOROBENZENE	1.24E-08	2.35E-09	1.24E-08	2.35E-09	8.72E-08	1.64E-08	8.72E-08	1.64E-0
ALPHA-BHC								
BENZENE	2.59E-11	4.87E-12	9.19E-11	1.73E-11	1.81E-10	3.39E-11	6.44E-10	1.21E-1
CHLOROFORM	8.26E-13	1.55E-13	6.59E-13	1.24E-13	5.77E-12	1.09E-12	4.62E-12	8.67E-1
CADMIUM	3.10E-06	5.84E-07	1.03E-05	1.94E-06	2.17E-05	4.09E-06	7.20E-05	1.36E-0
LEAD								
NICKEL	9.32E-06	1.75E-06	3.87E-05	7.28E-06	6.52E-05	1.23E-05	2.71E-04	5.10E-0
TOTAL RISK	4.55E-05	8.53E-06	1.30E-04	2.45E-05	3.18E-04	5.99E-05	9.13E-04	1.72E-0

*NORTHEAST WINDS PREVAIL,
NORTH WINDS ARE THE MOST STABLE

6.4.2 Summary

The risk characterization at the Schreck site indicates that contaminated on-site soils pose unacceptable long term public health threats to on-site workers and would pose an unacceptable risk if the property was used for residential purposes. Soils adjacent to the site exceed USEPA cleanup criteria for PCBs in soil.

Major chemical contaminants found in concentrations sufficient to pose an unacceptable health risk to on-site workers exposed to soil can be summarized as follows:

- o carcinogenic, dermal - PCB and hexachlorobenzene;
- o non-carcinogenic, dermal - lead, zinc, and mercury;
- o carcinogenic, ingestion - PCB and hexachlorobenzene; and
- o non-carcinogenic, ingestion - lead.

Major chemical contaminants found in soil at concentration sufficient to pose an unacceptable health risk if the site is used for residential purposes can be summarized as follows:

- o carcinogenic, dermal - PCB, hexachlorobenzene and bis(2-ethylhexyl)phthalate;
- o non-carcinogenic, dermal - barium, nickel, copper, lead, zinc, cadmium and mercury;
- o carcinogenic, ingestion - PCB, hexachlorobenzene, and bis(2-etylhexyl)phthalate; and
- o non-carcinogenic, ingestion - barium, nickel, copper, lead, zinc, cadmium, and mercury.

Estimated future site use exposures and risk characterizations are contained in Table 25 through 29.

TABLE 21
DERMAL EXPOSURE
FUTURE USE
MG/KG/DAY

ON-SITE

	ADULT AVE CONC	ADULT MAX CONC	CHILD AVE CONC	CHILD MAX CONC
POTENTIAL CARCINOGENS				
PCB	1.75E-03	1.63E-02	3.29E-03	3.06E-02
ARSENIC	2.27E-03	5.57E-03	4.26E-03	1.05E-02
BENZO(A)PYRENE	1.00E-04	5.12E-04	1.88E-04	9.61E-04
BENZO(A)ANTHRACENE	2.53E-04	7.21E-04	4.74E-04	1.35E-03
DIBENZ(A,H)ANTHRACENE	1.01E-05	4.89E-05	1.90E-05	9.17E-05
BETA-BHC	3.30E-06	2.97E-05	6.20E-06	5.57E-05
BIS(2-ETHYLHEXYL)PHTHALATE	9.65E-04	3.49E-03	1.81E-03	6.55E-03
HEXACHLOROBENZENE	2.51E-05	7.21E-05	4.72E-05	1.35E-04
ALPHA-BHC	2.40E-06	2.09E-05	4.50E-06	3.93E-05
BENZENE	3.06E-06	1.09E-05	5.74E-06	2.04E-05
CHLOROFORM	3.49E-08	2.79E-07	6.55E-08	5.24E-07
NON-CARCINOGENS				
ARSENIC	2.27E-03	5.57E-03	4.26E-03	1.05E-02
BARIUM	9.27E-02	2.15E-01	1.74E-01	4.04E-01
NICKEL	3.81E-02	1.58E-01	7.14E-02	2.97E-01
COPPER	4.08E-01	1.11E+00	7.67E-01	2.07E+00
LEAD	1.23E-01	3.16E-01	2.32E-01	5.94E-01
ZINC	1.89E+00	1.17E+01	3.54E+00	2.19E+01
SILVER	5.31E-04	1.54E-03	9.96E-04	2.88E-03
CADMIUM	1.75E-03	5.81E-03	3.28E-03	1.09E-02
MERCURY	4.57E-03	9.21E-03	8.58E-03	1.73E-02
BENZO(A)PYRENE	1.00E-04	5.12E-04	1.88E-04	9.61E-04

TABLE 22 20

INGESTION EXPOSURE
FUTURE USE
MG/KG/DAY

	ADULT AVE CONC	ADULT MAX CONC	CHILD AVE CONC	CHILD MAX CONC	PICA AVE CONC	PICA MAX CONC
ON-SITE EXPOSURE						
POTENTIAL CARCINOGENS						
PCB	1.08E-05	1.00E-04	4.43E-04	4.12E-03	2.21E-03	2.06E-02
ARSENIC	2.79E-05	6.84E-05	1.15E-03	2.82E-03	5.74E-03	1.41E-02
BENZO(A)PYRENE	1.23E-06	6.29E-06	5.06E-05	2.59E-04	2.53E-04	1.29E-03
BENZO(A)ANTHRACENE	3.10E-06	8.86E-06	1.28E-04	3.65E-04	6.39E-04	1.82E-03
DIBENZ(A,H)ANTHRACENE	1.24E-07	6.00E-07	5.12E-06	2.47E-05	2.56E-05	1.24E-04
BETA-BHC	4.06E-08	3.64E-07	1.67E-06	1.50E-05	8.35E-06	7.50E-05
BIS(2-ETHYLHEXYL)PHTHALATE	1.18E-05	4.29E-05	4.88E-04	1.76E-03	2.44E-03	8.82E-03
HEXACHLOROBENZENE	3.09E-07	8.86E-07	1.27E-05	3.65E-05	6.35E-05	1.82E-04
ALPHA-BHC	2.94E-08	2.57E-07	1.21E-06	1.06E-05	6.06E-06	5.29E-05
BENZENE	3.76E-08	1.34E-07	1.55E-06	5.50E-06	7.74E-06	2.75E-05
CHLOROFORM	4.29E-10	3.43E-09	1.76E-08	1.41E-07	8.82E-08	7.06E-07
NON-CARCINOGENS						
ARSENIC	2.79E-05	6.84E-05	1.15E-03	2.82E-03	5.74E-03	1.41E-02
BARIUM	1.14E-03	2.64E-03	4.69E-02	1.09E-01	2.34E-01	5.44E-01
NICKEL	4.67E-04	1.94E-03	1.92E-02	8.01E-02	9.62E-02	4.00E-01
COPPER	5.02E-03	1.36E-02	2.07E-01	5.59E-01	1.03E+00	2.79E+00
LEAD	1.51E-03	3.89E-03	6.24E-02	1.60E-01	3.12E-01	8.00E-01
ZINC	2.32E-02	1.43E-01	9.55E-01	5.90E+00	4.77E+00	2.95E+01
SILVER	6.51E-06	1.89E-05	2.68E-04	7.76E-04	1.34E-03	3.88E-03
CADMIUM	2.14E-05	7.13E-05	8.83E-04	2.94E-03	4.42E-03	1.47E-02
MERCURY	5.62E-05	1.13E-04	2.31E-03	4.66E-03	1.16E-02	2.33E-02
BENZO(A)PYRENE	1.23E-06	6.29E-06	5.06E-05	2.59E-04	2.53E-04	1.29E-03

TABLE 27

RISK CHARACTERIZATION SUMMARY - FUTURE SITE USE

SCENARIO	NON-CARCINOGENIC HAZARD INDEX	CARCINOGENICITY RISK FACTOR
INGESTION, AVERAGE CONTAMINANT CONCENTRATION		
On-site adult resident	1.59E+00	8.35E-05
On-site child resident	6.55E+01	3.44E-03
On-site pica resident	3.27E+02	1.72E-02
INGESTION, MAXIMUM CONTAMINANT CONCENTRATION		
On-site adult resident	4.46E+00	7.72E-04
On-site child resident	1.84E+02	3.18E-02
On-site pica resident	9.19E+02	1.59E-01
DERMAL CONTACT, AVERAGE CONTAMINANT CONCENTRATION		
On-site adult resident	1.30E+02	1.35E-02
On-site child resident	2.43E+02	2.54E-02
DERMAL CONTACT, MAXIMUM CONTAMINANT CONCENTRATION		
On-site adult resident	3.63E+02	1.26E-01
On-site child resident	6.82E+02	2.36E-01

TABLE 28

RISK CHARACTERIZATION
DERMAL EXPOSURE ROUTE
FUTURE USE

	ADULT AVE CONC	ADULT MAX CONC	CHILD AVE CONC	CHILD MAX CONC
ON-SITE				
CANCER RISK				
PCB	1.35E-02	1.25E-01	2.53E-02	2.35E-01
ARSENIC				
BENZO(A)PYRENE				
BENZO(A)ANTHRACENE				
DIBENZ(A,H)ANTHRACENE				
BETA-BHC				
BIS(2-ETHYLHEXYL)PHTHALATE	1.35E-05	4.89E-05	2.54E-05	9.17E-05
HEXACHLOROBENZENE	4.27E-05	1.23E-04	8.02E-05	2.30E-04
ALPHA-BHC				
BENZENE	8.87E-08	3.15E-07	1.67E-07	5.92E-07
CHLOROFORM	2.13E-10	1.70E-09	4.00E-10	3.20E-09
CADMIUM				
LEAD				
NICKEL				
TOTAL CANCER RISK	1.35E-02	1.26E-01	2.54E-02	2.36E-01
HAZARD INDEX				
ARSENIC				
BARIUM	1.85E+00	4.30E+00	3.48E+00	8.08E+00
NICKEL	1.90E+00	7.92E+00	3.57E+00	1.49E+01
COPPER	1.10E+01	2.99E+01	2.07E+01	5.61E+01
LEAD	8.81E+01	2.26E+02	1.65E+02	4.24E+02
ZINC	9.44E+00	5.83E+01	1.77E+01	1.09E+02
SILVER	1.77E-01	5.12E-01	3.32E-01	9.61E-01
CADMIUM	1.75E+00	5.81E+00	3.28E+00	1.09E+01
MERCURY	1.52E+01	3.07E+01	2.86E+01	5.77E+01
BENZO(A)PYRENE				
TOTAL RISK	1.30E+02	3.63E+02	2.43E+02	6.82E+02

TABLE 29

RISK CHARACTERIZATION
INGESTION EXPOSURE ROUTE
FUTURE USE

	ADULT AVE	ADULT MAX	CHILD AVE	CHILD MAX	PICA AVE	PICA MAX
ON-SITE						
CARCINOGENICITY RISK FACTOR						
PCB	8.28E-05	7.70E-04	3.41E-03	3.17E-02	1.70E-02	1.59E-01
ARSENIC						
BENZO(A)PYRENE						
BENZO(A)ANTHRACENE						
DIBENZ(A,H)ANTHRACENE						
BETA-BHC						
BIS(2-ETHYLHEXYL)PHTHALATE	1.66E-07	6.00E-07	6.83E-06	2.47E-05	3.42E-05	1.24E-04
HEXACHLOROBENZENE	5.25E-07	1.51E-06	2.16E-05	6.20E-05	1.08E-04	3.10E-04
ALPHA-BHC						
BENZENE	1.09E-09	3.87E-09	4.49E-08	1.60E-07	2.24E-07	7.98E-07
CHLOROFORM	2.61E-12	2.09E-11	1.08E-10	8.61E-10	5.38E-10	4.31E-09
CADMIUM						
LEAD						
NICKEL						
TOTAL RISK	8.35E-05	7.72E-04	3.44E-03	3.18E-02	1.72E-02	1.59E-01
NON-CARCINOGENIC HAZARD INDEX						
ARSENIC						
BARIUM	2.28E-02	5.29E-02	9.38E-01	2.18E+00	4.69E+00	1.09E+01
NICKEL	2.34E-02	9.72E-02	9.62E-01	4.00E+00	4.81E+00	2.00E+01
COPPER	1.36E-01	3.67E-01	5.58E+00	1.51E+01	2.79E+01	7.55E+01
LEAD	1.08E+00	2.78E+00	4.46E+01	1.14E+02	2.23E+02	5.71E+02
ZINC	1.16E-01	7.16E-01	4.77E+00	2.95E+01	2.39E+01	1.47E+02
SILVER	2.17E-03	6.29E-03	8.94E-02	2.59E-01	4.47E-01	1.29E+00
CADMIUM	2.14E-02	7.13E-02	8.83E-01	2.94E+00	4.42E+00	1.47E+01
MERCURY	1.87E-01	3.77E-01	7.71E+00	1.55E+01	3.85E+01	7.76E+01
BENZO(A)PYRENE						
TOTAL RISK	1.59E+00	4.46E+00	6.55E+01	1.84E+02	3.27E+02	9.19E+02

Preliminary air modeling indicates that on-site soils may pose a risk to on-site workers and the immediate surrounding population. Complex modeling would be required to quantify risk more accurately. Since on-site soils require remediation due to other risks, any threat posed by the air route will be mitigated during the remedial action and additional air quality modeling is not necessary.

6.5 Environmental Assessment

The assessment of impacts to fish and wildlife exposed to chemical pollutants requires the identification of potential receptors, and the assessment of receptor-specific toxicity and exposure. Because natural systems operate on several different levels: organismal, population, and community, risks to each of these components should be assessed. A typical ecosystem wide environmental assessment would be very complex, however, due to the fact that Schreck's scrapyard in located in an urban environment, this assessment will be less involved, and mostly qualitative, as there are no natural systems affected at the site.

6.5.1 Potential Receptors

The Schreck's scrapyard site cannot be classified by means of typical habitat types due to the fact that it is situated in an industrial/commercial/residential area. There are no parks in the immediate vicinity of the scrapyard, and for the purposes of this analysis, we will assume the only potential environmental receptors to be the animals observed directly on site: rats, and stray cats. Birds are not considered potential receptors from the site, because of their ability to migrate seasonally, and their ability to widely range over a large area to nest, feed, and mate.

Surface water runoff from Schreck's Scrapyard exits via catchbasins that merge with sewer lines directed to the wastewater treatment plant. Therefore, Eder

Associates assumes for the purpose of this Phase I, remedial investigation, that surface water is not a potential exposure medium for fish or other aquatic organisms near Schreck's.

There are no endangered species or habitats affected by this scrapyard (Recra, 1986).

6.5.2 Potential Exposure Pathways

The various routes by which an individual, population, community, or ecosystem might encounter the chemicals of potential concern are exposure pathways. Exposure pathways may be indirect or direct in nature. Direct pathways include exposure routes resulting in the direct contact, ingestion, or inhalation of contaminated media such as air, water, soil or sediment. For the purpose of this assessment, indirect pathways are those in which an animal ingests other previously contaminated organisms.

Direct pathways of exposure would be through the inhalation of airborne particulates or through the ingestion of contaminated soil. Exposure often occurs through behavioral activities in mammals, such as burrowing, and grooming. The primary indirect pathway of exposure would be through the ingestion of contaminated prey or vegetation.

6.5.3 Risk Characterization

The only potential species at risk of exposure from the Schreck's Scrapyard are rats and neighborhood cats that may live or roam on site property. Since the Schreck Scrapyard is void of vegetation, the only possible exposure route for these two species is through ingestion of contaminated surface soils through grooming and through inhalation. Because rats have little economic or aesthetic value, and the exposure of cats to the site is limited, the potential risks to these organisms is insignificant when viewed in light of the potential threat to human populations.

VII. IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

All potential Applicable or Relevant and Appropriate Requirements (ARARs) were reviewed for applicability to Schreck's scrapyard. The applicability of Federal and State ARARs are presented in Tables 30 and 31 respectively. All ARARs listed were assumed to be applicable until such time when investigation of each ARAR eliminated two Federal ARARs and five State and local ARARs.

The Federal Safe Drinking Water Act is not applicable to this site because the Act serves as a reference by which to judge the suitability of a water source for the designated purpose of human consumption.

The Federal Clean Air Act is not applicable to this site because the Act applies National Ambient Air Quality Standards to stationary emission sources.

The State 10 ppt criterion for TCDD in fish flesh does not apply to the site because fish are not impacted by the Schreck's scrapyard.

The State Sanitary Code, Part 5, Appendices 5-A (Recommended Standards for Water Works) and 5-B (Rural Water Supply) do not apply to the site because the site is not located on or near a rural water supply source, and water works standards are not applicable to site operations.

The Draft Limits on the Disposal of Radioactive Materials into Sewer Systems and the Tolerance Levels for EDB in food do not apply to Schreck's scrapyard because these parameters were not detected at the site.

The applicable Federal, state and local standards, guidelines, and limits are presented in Tables 30, 31, 32 and 33.

TABLE 30

FEDERAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CITATION	CRITERIA	APPLICABLE
42 U.S.C. 300g	Safe Drinking Water Act	No
40 CFR Part 141	National Primary Drinking Water Standards	Yes
40 CFR Part 143	National Secondary Drinking Water Standards	Yes
Pub.L.No. 99-339, 100 Stat. 642 (1986)	Maximum Contaminant Level Goals	Yes
33 USC 1251-1376	Clean Water Act	Yes
40 CFR Part 131	Water Quality Criteria	Yes
42 USC 7401-7642	Clean Air Act	No
40 CFR Part 50	National Primary and Secondary Ambient Air Quality Standards	Yes

TABLE 31

STATE AND LOCAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CITATION	CRITERIA	APPLICABLE
6 NYCRR Part 703	NYSDEC Groundwater Quality Regulation	Yes
6 NYCRR Parts 701, 702, 704	Surface Water Quality Standards	Yes
85-W-40 July 12, 1985	Analytical Detectability for Toxic Pollutants	NA
1.1.1 April 1, 1987	Ambient Water Quality Standards & Guidance Values	NA
6 NYCRR Part 200 (2006)	General Provisions - Air Pollution Control Regulations	Yes
6 NYCRR Part 201	Permits & Certificates - Air Pollution Control Regulations	Yes
6 NYCRR Part 257	Air Quality Standards	Yes
Air Guide 1	Guidelines for the Control of Toxic Ambient Air Contaminants	Yes
NYSDOH PWS 69	Organic Chemical Action Steps for Drinking Water	Yes
NYSDOH PWS 159	Responding to Organic Chemical Concerns at Public Water Systems	Yes
10 ppt criterion for 2, 3, 7, 8	TCDD in fish flesh	No
Binghamton State Office Building	Cleanup criteria for PCDDs, PCDFs and PCBs	Yes
Part 5, State Sanitary Code	Drinking Water Supplies	Yes

NA : Not Available

TABLE 31 CONTINUED

STATE AND LOCAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CITATION	CRITERIA	APPLICABLE
Part 170, Title 10, NYCRR	Water Supply Sources	Yes
Appendix 5-A, Part 5, State Sanitary Code	Recommended Standards for Water Works	No
Appendic 5-B, Part 5, State Sanitary Code	Rural Water Supply	No
Five Environmental Health Manual Items dealing with Chemical Contaminationof Public Drinking Water Supplies		Yes
Draft Documentation for the Generic Organic Chemical Standards in Drinking Water		Yes
Part 16 Draft Limits on the Disposal of Radioactive Materials into Sewer Systems		No

TABLE 32

FEDERAL CRITERIA AND STANDARDS APPLICABLE TO INDICATOR CHEMICALS

INDICATOR CHEMICAL	PRIMARY DRINKING WATER STANDARD (mg/l)	SECONDARY DRINKING WATER STANDARD (mg/l)	WATER QUALITY CRITERIA (mg/l)		AMBIENT AIR QUALITY STANDARD (ug/m3)
			A	B	
ARSENIC	0.05	-	-	-	-
BARIUM	1.00	-	-	1.0	-
CADMIUM	0.01	-	.01	.01	-
COPPER	-	1.0	1.0	-	-
LEAD	0.05	-	.05	.5	1.5
MERCURY	0.002	-	.1	.000144	-
NICKEL	-	-	.0154	.0134	-
SILVER	0.05	-	.05	.05	-
ZINC	-	5.0	5	-	-
CHLOROFORM	*0.10	-	-	-	-
BIS (-ETHYLHEXYL) PTHALATE	-	-	21	1.5	-
BENZENE	.005	-	-	-	-

- : Not Applicable
* : Total Trihalomethanes
A : Ingestion of drinking water only
B : Ingestion of drinking water and aquatic organisms

TABLE 33

STATE AND LOCAL CRITERIA AND STANDARDS APPLICABLE TO INDICATOR CHEMICALS

INDICATOR CHEMICAL	ORGANIC CHEMICAL ACTION STEPS FOR DRINKING WATER (mg/l)	STATE SANITARY CODE PART 5 (mg/l)	*AIR QUALITY STANDARD (ug/m3)	AIR GUIDE 1 (ug/m3)
ARSENIC	-	0.05	-	0.67
BARIUM	-	1.0	-	0.67
CADMIUM	-	0.01	-	2.0
COPPER	-	1.0	-	20 (dust)
LEAD	-	0.05	1.5	1.5
MERCURY	-	0.002	-	0.33
NICKEL	-	-	-	3.3
SILVER	-	0.05	-	-
ZINC	-	5.0	-	0.03
CHLOROFORM	-	-	-	167
HEXACHLORBENZENE	-	-	-	0.03
BENZENE	0.005	-	-	100
ALPHA-BHC	-	-	-	1.67
PCBs	0.001	-	-	1.67

- : Not Applicable

* : TOTAL HYDROCARBONS (NON-METHANE) 0.24 PPM (g/m3)

TABLE 33 CONTINUED

STATE AND LOCAL CRITERIA AND STANDARDS APPLICABLE TO INDICATOR CHEMICALS

INDICATOR CHEMICAL	NYSDEC GROUNDWATER QUALITY (mg/l)	NYCRR WATER SUPPLY SOURCE (mg/l)	NYCRR SURFACE WATER QUALITY STANDARDS (mg/L)		
			*LITTLE RIVER	**TONAWANDA CREEK	**ELLICOTT CREEK
ARSENIC	0.025	0.05	50	190	360
BARIUM	1.0	1.0	1000	-	-
CADMIUM	0.01	0.01	10	HA	HA
COPPER	1.0	< 0.2	200	HA	HA
LEAD	0.025	< 0.05	50	HA	HA
MERCURY	0.002	0.005	2	-	-
NICKEL	-	-	-	HA	HA
SILVER	0.05	0.05	50	0.1	HA
ZINC	5.0	< 0.3	300	30	HA
CHLOROFORM	0.1	-	0.2	-	-
HEXACHLORBENZENE	0.00035	-	-	-	-
BENZENE	ND	-	-	-	-
BENZO (A) PYRENE	ND	-	-	-	-
BIS (2-ETHYLHEXYL) PTHALATE	-	-	-	0.6	-
PCBs	0.00001	-	0.01	0.001	0.001

- : Not Applicable

* : HUMAN USE

** : AQUATIC USE

HA : CHANGES WITH HARDNESS ACCORDING TO FORMULA, EXPONENT (CONSTANT [CONCENTRATION IN PPM HARDNESS] + CONSTANT)

VIII. SUMMARY AND CONCLUSIONS

8.1 Summary

8.1.1 Nature and Extent of Contamination

The phase I sampling results indicate that the Schreck Scrapyard site is contaminated with PCBs and a variety of organic compounds and metals. PCB concentration in the upper three feet of on-site soils generally exceeds the USEPA cleanup criteria of 10 mg/kg over most of the site. Surficial soils of the site characteristically contain tens to low hundreds of mg/kg of PCBs.

The entrance way floors of the two on-site buildings, Schenk Street in front of the site and soils along the railroad tracks east of the site are contaminated by PCBs at levels which exceed the USEPA cleanup criteria. Soil samples from the street and railroad area are only slightly elevated above the cleanup level of 10 mg/kg.

Soil samples were collected at depths up to three feet in four boring locations on the site and analyzed for an array of chemicals known as the "Target Compound List" (TCL). The primary group of chemicals of concern found at the site include heavy metals, polynuclear aromatic hydrocarbons (PNAs), chlorinated benzenes, and lindane isomers.

An abandoned press pit was excavated and found to contain deteriorated drums. A sample from one of the drums contained high concentrations of PCBs, semi-volatile organics, and lower concentrations of a lindane isomer and volatile organics. The contaminants found in the drum were sufficiently similar to those found in the on-site soils to suggest a common source.

Four shallow groundwater wells and a deep boring confirmed the regional description of the geology at the site. The shallow groundwater under the site flows northward. Even though there are not wells directly downgradient of the site, low concentrations of volatile organics and pesticides were found in the groundwater.

8.1.2 Fate and Transport

The contaminants found at the site generally persist in the environment. The PCBs, metals, pesticides, and some of the semi-volatile organics can be tracked from the site on vehicle tires and shoes, as well as migrating via soils runoff along drainage routes. The PCBs found off-site in the Phase I sampling indicate that off-site tracking has transported contaminants into Schenk Street and the storm water runoff has resulted in the desposition of PCBs along the railroad track which receives drainage from the site.

Trace quantities of PCB were found in a catch basin on Schenk Street, indicating that the migration of PCBs in storm water runoff along the street and into the sewer is probably not a significant route. The sewer eventually discharges into the city WWTP.

The absence of vegetation on the site would be generally expected to increase the potential that contaminants attached to soils would become airborne and migrate from the site. However, the oil and grease entrained in the soil coupled with the density of near surface obstacles reduce the potential that contaminants would migrate in fugitive dust. The low volatility of the major compounds of concern and their tendency to adhere to soil would minimize their presence in the air and in dust.

The groundwater data base is not sufficiently developed to determine the extent of groundwater contamination. The site is underlain by extensive layers of low permeability clay which would inhibit the vertical migration of groundwater at the site and groundwater contamination would be expected to be generally contained in the shallow groundwater. The major contaminants which are of concern are relatively insoluble and would not be expected to be found in high concentrations in the groundwater unless they are present in a floating layer.

8.1.3 Risk Assessment

PCBs and several metals and organic compounds in on-site soils pose an unacceptable long term risk to site workers and the site soils would be unacceptable for residential use. Although the soil risk is unacceptable, the risk levels are not excessively high and do not appear to pose any significant immediate health risk. The primary risk is due to the potential long term carcinogenic risk posed by PCBs.

PCBs in the upper three feet of on-site soil on the floors of the two on-site buildings, along Schenk Street in front of the site, and along part of the railroad tracks which border the eastern boundary of the site exceed the Federal cleanup standard. These soils and surfaces will require remediation.

Other hazardous chemicals found at risk levels such as chlorinated benzene and heavy metals, were found in areas that would require remediation associated with the PCB contamination and the occurance of PCBs indicates the extent of overall contamination identified at the site.

The concrete press pit containing buried drums is an evident public health threat which will require remediation.

A program to remediate PCB contaminated surface soils and building surfaces should also be sufficient to remidiate the currently known extent of other significant contamination.

Other than human health concerns, no significant environmental endangerments were identified.

8.2 Conclusions

8.2.1 Data Limitations and Recommendations for Future Work

The Phase I field investigation determined the extent of PCB contamination in on-site soils and indicated that PCB contamination extends off-site. The Phase I study found drums buried on the site and characerized the nature and extent of a number of contaminants in the upper three feet of on-site soil. The on-site building surfaces are contaminated by PCBs.

At the conclusion of the Phase I study, the data base is not sufficient to support the development of a comprehensive remediation plan. A Phase II field investigation will provide the following information:

- establish the boundary or lateral extent of PCB contamination in off-site soils and on and adjacent to area roadways;
- establish the extent of PCB contamination in on-site building floors and walls;

- establish the extent of soil contamination not related to PCBs;
- Characterize the nature and extent of buried sludge found in soil borings 4 and 14;
- determine the presence of asbestos in on-site soil and the soil's E.P. Toxicity characteristic;
- install additional groundwater wells to determine the extent of groundwater contamination from the buried drums and on-site soils; and,
- a number of chlorinated aromatic compounds were identified on the site, and soil should be screened for TCDD compounds.

8.2.2 Recommended Remedial Action Objectives

Based on the Phase I data base, a remedial program would include at least the upper three feet of on-site soils, surficial soils along part of the railroad track, soils on Schenk Street in front of the site, and at least a portion of the floors in the on-site buildings. The Federal PCB cleanup criteria is the remedial objective.

Drums found in the abandoned press pit must to be removed from the site.

Additional remedial actions may be required after the Phase II data base is available.

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SCHRECK'S SCRAPYARD
NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PHASE II RI REPORT
FOR
SCHRECK'S SCRAPYARD

FILE #611-1

JULY, 1990

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.
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#SCHPHII

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I. INTRODUCTION

1.1 Purpose of Report

This report summarizes the activities and data collected during the Phase II Remedial Investigation (RI) of the Schreck Scrapyard site, North Tonawanda, New York. The Phase II RI was implemented to fill data gaps identified in the Phase I RI (August 1989) and complete the characterization of the nature and extent of contamination at the site. The overall objectives of the Phase I and II RIs is to develop information to support the selection of the best remedial alternative as determined in the Feasibility Study.

Site background information is presented in the Phase I RI report.

II. STUDY AREA INVESTIGATION

Unless otherwise specified, all sample collection techniques and analytical procedures used in this investigation are described in the Phase II RI Work Plan and Quality Assurance Project Plan (QAPP).

2.1 Site Mapping

A site map was prepared using a combination of aerial photos, field measurements, and surveying. The current site map is located in Appendix A. This map is updated to include Phase II RI wells and sampling locations. Surface contours have not been plotted since the surface of the site is essentially flat.

2.2 Contaminant Source Investigation

The two onsite contamination sources were characterized in the Phase I RI; buried drums and on-site soils.

2.2.1 On-Site Soil Contamination Investigation

Two soil samples were collected and analyzed for TCL parameters from the borehole in which MW-6 was installed. Subsurface soil samples were collected from 0-6" at three locations and analyzed for dioxin (2,3,7,8-TCDD); four 0-6" samples and one 0-3′ sample were collected and analyzed for asbestos and E.P. Toxicity metals.

2.3 Off-Site Surface Contamination Investigation

Samples were collected and analyzed to determine how far significant levels of contaminants have migrated from the site.

Off-site runoff appears to exit the site to the north onto Schenck Street and to the east onto the railroad tracks. A sediment sample was collected from each of the two catch basins on Schenck Street, which could collect storm water runoff from the site, and analyzed to determine if significant levels of PCBs and metals have entered the sewer system. Three surface soil samples (RR-1,2 and 3) were collected along the railroad tracks, (0-6 inches in depth), on the eastern border of the site and analyzed for semivolatiles, pesticides and metals.

Eight surface soil samples (SS-1 through 8) were collected around the perimeter of the site and from soils adjacent to the curbs along Schenck Street to determine if PCBs and metals had otherwise migrated or been tracked offsite. Sample locations are shown in Figure 1.

2.4 Hydrogeological Investigation

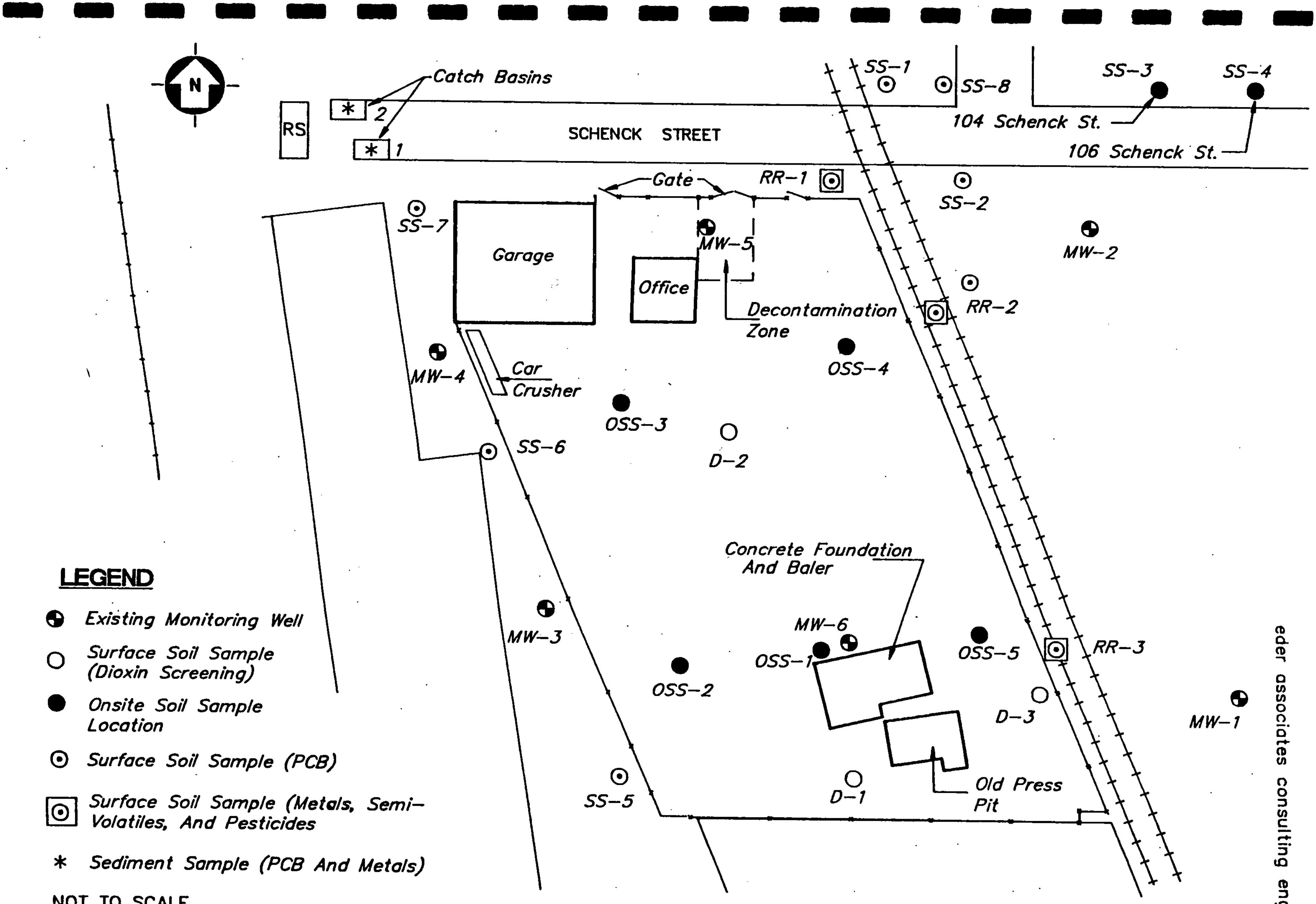
The hydrogeological investigation attempted to determine subsurface geological and hydrogeological conditions which could impact subsurface contaminant transport and potential subsurface remedial efforts. Two wells were installed in Phase II RI to complete this characterization; the monitoring well immediately downgradient of the buried drums and the monitoring well downgradient of the site.

The borings were logged by a geologist to define the subsurface geological conditions.

All six monitoring wells were sampled and analyzed for TCL parameters. The two new monitoring wells were surveyed and groundwater elevations for all six were measured.

2.5 Air Monitoring

Air monitoring for organic vapors and explosive atmospheres was conducted throughout the field investigation as a precaution to the local population and to determine the appropriate protection for on-site workers. Air monitoring did not identify any total organic vapors and explosive atmospheres at levels of concern. Elevated levels of organic vapors were detected in subsurface bore holes. Air monitoring data are contained in Appendix B.



NOT TO SCALE

SITE PLAN PHASE II SAMPLING LOCATIONS

SCHRECKS SCRAPYARD
NORTH TONAWANDA NEW YORK

SK611-1V

eder associates consulting engineers, p.c.

III. PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 Soils

3.1.1. Local Conditions

The Phase II boring encountered essentially the same sequence of soil horizons as encountered in the Phase I RI (see Phase I RI for details) and logs of the borings are contained in Appendix C. Sludge material similar to that found during the Phase I RI at borings B-4 and B-14 was found during the installation of MW-6.

MW-6, constructed downgradient of the buried drums, was completed at 21′ in a stiff grey clay and is screened from 13 to 18 feet below grade in a silty clay, gravely zone. The fat clay found at 10 to 14 feet below grade was not found in MW-6 which had a total drilled depth of 21 feet. At about 5′ below grade a black, loose sludge material was brought up by the augers. None of the black sludge material was recovered in the split spoons.

3.2 Geology and Hydrogeology

3.2.1 Local Conditions

Lacustrine deposits of silt, fine sand, and clay interbedded with stringers of gravel and sand and gravel were revealed by test drilling in the area of investigation. Typical subsoils consist of clayey silts and sands, fine to medium sands and gravel, which overlie a fat clay. Unified soil classifications for these soils are ML, GW, CL, and CH, respectively. A deep boring drilled adjacent to monitoring well MW-1 encountered the bedrock surface at approximately 40 feet below grade.

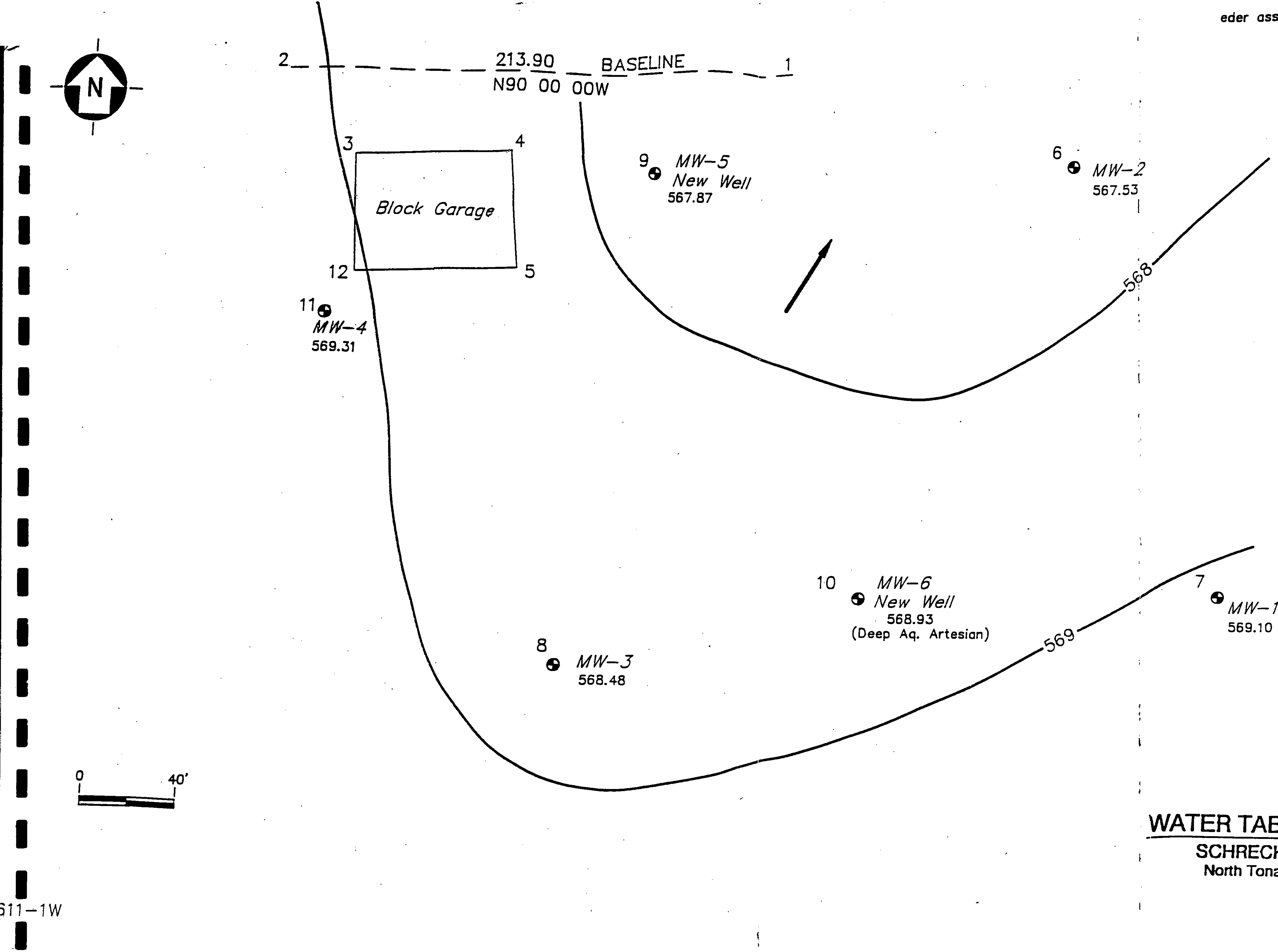
MW-5 was placed downgradient of the site and MW-6 was placed immediately downgradient of the buried drums, based on the Phase I data. MW-5 was completed at 14 feet below grade in the unconsolidated material above the fat clay zone.

The source of groundwater appeared to be a sand stringer at about 12 feet below grade. MW-6 was placed at a depth similar to that reported for the buried drums. Monitoring well installation field data sheets are presented in Appendix C.

Shallow groundwater at the site occurs in the surficial deposits of silty clay which contains lenses of saturated sand and gravel as well as fill materials. This surficial zone is 10 to 14 feet thick except in the vicinity of MW-6 where it is at least 21 feet thick (total depth of the boring). All shelby tube and split spoon samples of the underlying fat clay were usually moist but not saturated.

Since MW-1 through MW-6 are screened at about the same elevation, a watertable map was prepared based on water levels measured on November 17, 1989 (Figure 2). The overall groundwater direction is to the northeast, but the considerable variation in flow directions at the site may indicate a poorly connected groundwater system. This would agree with nature of groundwater occurrence at the site where the relatively thin saturated zones may not be areally extensive and also may be under varying degrees of confinement by the overlying silty clay zones. Water-level gradients also indicate hydraulic changes because the gradient between MW-3 and MW-2 is 0.003 ft/ft and 0.009 ft/ft between MW-4 and MW-5.

FIGURE 2



WATER TABLE CONTOURS

SCHRECKS SCRAPYARD
North Tonawanda, New York

IV. NATURE AND EXTENT OF CONTAMINATION

Analytical data results from the Phase II RI, are presented in Tables 1-20. The laboratory data package documentation and data validation report is on file with the New York Department of Environmental Conservation.

4.1 On-site Soil Contamination

A total of seven surface soil samples were collected at 0-6 inches in depth, four were analyzed for EP Toxicity and asbestos and three were analyzed for dioxin (2,3,7,8 TCDD). One soil boring (OSS-1) was sampled and analyzed for EP Toxicity and asbestos.

One boring (MW-6) was augured near the known subsurface sludge area and sampled at 5-9 feet and 17-19 feet below grade. The shallow sample was analyzed for semi-volatiles, PCBs, metals and VOC and the deeper sample was analyzed for semi-volatiles, PCBs and VOCs.

4.1.1 Soil Boring

The boring log for MW-6 is included in Appendix C and the well location is shown in Figure 1. The soil boring was drilled using 6-1/4" inside diameter hollow stem augers. Soil samples were collected at 5-9 feet and 17-19 feet below grade using a two-foot split spoon sampler. Following collection of each soil sample, borehole vapor readings were obtained by inserting the organic vapor analyzer (OVA) probe into the open top of the hollow stem auger. Very low concentrations of organic vapors were detected between zero and four feet below grade. The highest concentration of organic vapors was detected between five and seven feet below grade. A black sludge material was encountered at about five feet below grade which is approximately the same depth that similar material was identified in borings B-4 and B-14 during the Phase I RI.

4.1.2 Results

The results of the Laboratory analysis for E.P. Toxicity are shown in Table 1. The parameters and concentrations found for the 0-6 inch samples and the 0-3 foot sample are essentially the same. The soil sample collected at location OSS-3, located near the middle of the site, exceeded the RCRA toxicity limits, therefore the soil is a characteristic hazardous waste. The metals exceeding the standards are barium at 978 mg/l (100 mg/l limit), cadmium at 193 mg/l (1 mg/l limit), chromium at 32 mg/l (5 mg/l limit) and lead at 1,680 ppm (5 mg/l limit).

Asbestos was found in all 0-3 foot and 0-6 inches on-site soil samples except Soil Sample 5 (OSS 5) (Table 2). Asbestos was found in percentage levels in OSS 1 (3%), OSS 2 (2%), OSS 3 (5%) and OSS 4 (11%). These results characterize the soils as an asbestos containing material, as defined by 40 CFR, Part 763.83, ofthe Asbestos Hazard Emergency Response Act (AHERA).

TABLE 1
E.P. TOXICITY FOR METALS
ANALYSIS RESULTS

	On-site soil 1 0-3'	On-site soil 2 0-6"	On-site soil 3 0-6"	On-site soil 4 0-6"	On-site soil 5 0-6"	Concentration Limits
Arsenic	ND	ND	ND	ND	ND	5.0
Barium	1.25	1.78	978.0	24.3	1.6	100.0
Cadmium	0.452	0.0542	193.0	0.416	0.49	1.0
Chromium	0.0225	0.011	32.0	0.0253	0.0199	5.0
Lead	0.565	0.0183	1,680 S	0.903 S	0.0254	5.0
Mercury	ND	ND	ND	ND	ND	0.2
Selenium	ND	ND	ND	ND	ND	1.0
Silver	0.0116	ND	0.0119	0.0096 B	0.0069 B	5.0

Concentration Units: mg/l
S: determined by method of standard additions
B: compound also found in blank
ND: not detectable

The soil boring for MW-6 was sampled at 5-9 feet below grade. An additional sample was collected at 17-19 feet below grade. The volatiles analysis results are presented in Table 3 and summarized as follows:

COMPOUND	RESULTS (ug/kg) (5-9 feet)	RESULTS (ug/kg) (17-19 feet)
benzene	200	140
toluene	3 J	10
chlorobenzene	58	300 B
ethylbenzene	260	500
xylenes	260	41 BJ
2-butanone	9 J	24 BJ
methylene chloride	6 J	14
	J:estimated value	J:estimates values B:compound also found in blank

TABLE 2
ASBESTOS ANALYSIS RESULTS

	On-site soil 1	On-site soil 2	On-site soil 3	On-site soil 4	On-site soil 5
Chrysotile	3.0	2.0	5.0	8.0	TRACE
Amosite	TRACE	ND	TRACE	3.0	TRACE
Crocidolite	ND	ND	ND	ND	ND
Actinolite	ND	ND	ND	ND	ND
Tremolite	ND	ND	ND	ND	ND
Anthophylite	ND	ND	ND	ND	ND
Total Asbestos	3.0	2.0	5.0	11.0	TRACE

Concentration Units: percent of total material

ND: not detectable

TABLE 3
VOLATILE ORGANIC COMPOUNDS ANALYSIS RESULTS
MONITORING WELL 6 SOIL BORINGS

COMPOUND	On-site soil 1, 5-9'	On-site soil 1, 17-19'
BENZENE	200	140
TOULENE	3.0 J	10
CHLOROBENZENE	58	ND
ETHYLBENZENE	260	300 B
XYLENES (TOTAL(	260	500
ACETONE	ND	41BJ
CARBON DISULFIDE	ND	ND
1,2-DICHLOROETHANE	ND	ND
BROMODICHLOROMETHANE	ND	ND
BROMOFORM	ND	ND
BROMOMETHANE	ND	ND
CARBON TETRACHLORIDE	ND	ND
2-BUTANONE	9.0 BJ	24 BJ
CHLOROETHANE	ND	ND
VINYL ACETATE	ND	ND
CHLOROFORM	ND	ND
CHLOROMETHANE	ND	ND
DIBROMOCHLOROMETHANE	ND	ND

J: estimated value
Concentration Units: ug/kg
ND: not detectable
B: compound also found in blank

TABLE 3 (CONTINUED)
VOLATILE ORGANIC COMPOUNDS ANALYSIS RESULTS
MONITORING WELL 6 SOIL BORINGS

COMPOUND	On-site soil 1, 5-9'	On-site soil 1, 17-19'
STYRENE	ND	ND
2-HEXANONE	ND	ND
4-MYTHYL-2-PENTANONE	ND	ND
1,1-DICHLOROETHANE	ND	ND
1,2-DICHLOROETHANE	ND	ND
1,1-DICHLOROETHENE	ND	ND
trans-1,2-DICHLOROETHENE	ND	ND
1,2-DICHLOROPROPANE	ND	ND
cis-1,3-DICHLOROPROPENE	ND	ND
trans-1,3-DICHLOROPROPENE	ND	ND
METHYLENE CHLORIDE	6.0 BJ	14 BJ
1,1,2,2-TETRACHLOROETHANE	ND	ND
TETRACHLOROETHENE	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND
TRICHLOROETHENE	ND	ND
TRICHLOROFLUOROMETHANE	ND	ND
VINYL CHLORIDE	ND	ND

J: estimated value
Concentration Units: ug/kg
ND: not detectable
B: compound also found in blank

Semi-volatiles analysis results are presented in (from Table 4A) and summarized below:

COMPOUND	RESULTS (ug/kg)
phenanthrene	170 J
di-n-butylphthalate	170 JB
fluoranthene	210 J
pyrene	270 J
butylbenzylphthalate	490 J
benzo(a)anthracene	130 J
bis(2-ethylhexyl) phthalate	330 J
chrysene	150 J
benzo(b)fluoranthene	140 J
benzo(k)fluoranthene	110 J
benzo(a)pyrene	130 J
1,2,4-trichlorobenzene	95 J

J:estimated values
B:compound also found in blank

TABLE 4A
SEMIVOLATILE ORGANIC COMPOUNDS
MONITORING WELL 6 SOIL BORING ANALYSIS RESULTS

COMPOUND	On-site soil 1, 5-9'	On-site soil 1, 17-19'
NAPTHALENE	ND	ND
4-CHLOROANILINE	ND	ND
HEXACHLOROBUTADIENE	ND	ND
4-CHLORO-3-METHYLPHENOL	ND	ND
2-METHYLNAPHTHALENE	ND	ND
HEXACHLOROCYCLOPENTADIENE	ND	ND
2,4,6-TRICHLOROPHENOL	ND	ND
2,4,5-TRICHLORLPHENOL	ND	ND
2-CHLORONAPTHALENE	ND	ND
2-NITROANILINE	ND	ND
DIMETHYL PHTHALATE	ND	ND
ACENAPHTHYLENE	ND	ND
3-NITROANILINE	ND	ND
ACENAPHTHENE	ND	ND
2,4-DINITROPHENOL	ND	ND
4-NITROPHENOL	ND	ND
DIBENZOFURAN	ND	100 J
2,4-DINITROTOLUENE	ND	ND
2,6-DINITROTOLUENE	ND	ND
DIETHYLPHTHALATE	ND	400 J

Concentration Units: ug/kg
ND: not detectable
J: estimated value

TABLE 4A (CONTINUED)
SEMIVOLATILE ORGANIC COMPOUNDS
MONITORING WELL 6 SOIL BORING ANALYSIS RESULTS

COMPOUND	On-site soil 1, 5-9'	On-site soil 1, 17-19'
PHENOL	ND	ND
bis (2-CHLOROETHYL) ETHER	ND	ND
2-CHLOROPHENOL	ND	ND
1,3-DICHLOROBENZENE	180 J	ND
1,4-DICHLOROBENZENE	ND	ND
BENZYL ALCOHOL	ND	ND
1,2-DICHLOROBENZENE	ND	ND
2-METHYLPHENOL	ND	ND
bis (2-CHLOROISOPROPYL) ETHER	ND	ND
4-METHYLPHENOL	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	ND	ND
HEXACHLOROETHANE	ND	ND
NITROBENZENE	ND	ND
ISOPHORONE	ND	ND
2-NITROPHENOL	ND	ND
2,4-DIMETHYLPHENOL	ND	ND
BENZOIC ACID	560 J	ND
bis (2-CHLOROETHOXY) METHANE	ND	ND
2,4-DICHLOROPHENOL	ND	ND
1,2,4-TRICHLOROBENZENE	270 J	95.0 J

Concentration Units: ug/kg
ND: not detectable
J: estimated value

TABLE 4A (CONTINUED)
SEMIVOLATILE ORGANIC COMPOUNDS
MONITORING WELL & SOIL BORING ANALYSIS RESULTS

COMPOUND	On-site soil 1, 5-9'	On-site soil 1, 17-19'
4-CHLOROPHENYL-PHENYLETHER	ND	ND
FLUORENE	97.0 J	ND
4-NITROANILINE	ND	ND
4,6-DINITRO-2-METHYLPHENOL	ND	ND
N-NITROSODIPHENYLAMINE (1)	ND	ND
4-BROMOPHENYL-PHENYLETHER	ND	ND
HEXACHLOROBENZENE	200 J	ND
PENTACHLOROPHENOL	ND	ND
PHENANTHRENE	520 J	170 J
ANTHRACENE	180 J	ND
DI-N-BUTYLPHTHALATE	840 BJ	170 BJ
FLUORANTHENE	640 J	210 J
PYRENE	930	270 J
BUTYLBENZYLPHTHALATE	2700	490 J
3,3'-DICHLOROBENZIDINE	ND	ND
BENZO(A)ANTHRACENE	390 J	130 J
bis (2-ETHYLHEXYL) PHTHALATE	1400 B	330 BJ
CHRYSENE	420 J	180 J
DI-N-OCTYL PHTHALATE	ND	ND
BENZO (B) FLUORANTHENE	390 J	140 J
BENZO (K) FLUORANTHENE	420 J	110 J
BENZO (A) PYRENE	330 J	130 J
INDENO (1,2,3-CD) PYRENE	280 J	ND
DIBENZ (A,H) ANTHRACENE	140 J	ND
BENZO (G,H,I) PERYLENE	340 J	ND

(1) : cannot be separated from DIPHENYLAMINE
Concentration Units: ug/kg
ND: not detectable
J: estimated value
B: compound also found in blank

Metals analysis results are presented in Table 4B and summarized below:

COMPOUND	RESULTS (mg/kg)
aluminum	6,630.0
barium	179.0 N
cadmium	6.7 N
calcium	61,200.0
chromium	80.1 N
cobalt	13.7
copper	146.0 EN
iron	38,400.0
lead	30.7
magnesium	13,800.0
manganese	478.0 N
mercury	4.8 N
nickel	56.3 N
vanadium	16.5
zinc	1,850.0 E

E:indicates a value estimated or reported due to interference
N:indicates spike sample recovery is not within control limits

PCB analysis results are presented in Table 5 and summarized below:

COMPOUND	RESULTS (ug/kg) (5-9 feet)
aroclor-1016	1,800
aroclor-1254	13,000 J

J=estimated values

COMPOUND	RESULTS (ug/kg) (17-19 feet)
aroclor-1016	440 J
aroclor-1254	1,500 J

J=estimated values

TABLE 4B
INORGANIC COMPOUND ANALYSIS RESULTS
MONITORING WELL 6 SOIL BORINGS

COMPOUND	Soil Bore 1, 5-9'
ALUMINUM	6,630
ANTIMONY	ND
ARSENIC	ND
BARIUM	179 N*
BERYLLIUM	ND
CADMIUM	6.7 N*
CALCIUM	61,200
CHROMIUM	80.1 N*
COBALT	13.7
COPPER	146 EN*
IRON	38,400 *
LEAD	30.7 *
MAGNESIUM	13,800
MANGANESE	478 N*
MERCURY	4.8 N*
NICKEL	56.3 N*
POTASSIUM	ND
SELENIUM	ND
SILVER	ND
SODIUM	ND
THALLIUM	ND
VANADIUM	16.5
ZINC	1,850 E*
CYANIDE	ND

CONCENTRATION UNITS: MG/KG
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
S: VALUE DETERMINED BY THE METHOD OF STANDARD ADDITIONS
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
* INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS
NA: NOT ANALYZED

TABLE 5
PCB ANALYSIS RESULTS
MONITORING WELL 6 SOIL BORING

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
On-site soil 1, 5-9'	1800	ND	ND	ND	ND	13000 J	ND
On-site soil 1, 17-19'	440 J	ND	ND	ND	ND	1500 J	ND

Concentration Units: ug/kg
ND: not detectable
J: estimated value

4.1.3 Dioxin Soil Samples

Three surface soil samples were collected from 0-6 inches below grade and analyzed for dioxin 2,3,7,8-TCDD (Figure 1). Dioxin was not found in any of the samples.

TABLE 6
DIOXIN ANALYSIS RESULTS

Compound	D-1	D-2	D-3
2,3,7,8-TCDD	ND	ND	ND

CONCENTRATION UNITS: UG/KG
ND: not detected

4.2 Off Site Surface Contamination

Soil samples were collected to determine the extent of off site contamination. The samples were collected from the catch basins in the street, from the railroad tracks and adjacent to the curb along Schenck Street.

Sediment samples were collected from the two catch basins along Schenck Street and analyzed for PCBs and metals. PCB's were found in the Catch Basin samples at the following concentrations (from Table 7):

COMPOUNDS	RESULTS (ug/kg)	
	Catch Basin 1	Catch Basin 2
aroclor 1254	3,000 J	2,600 J
aroclor 1260	4,600	4,100

J:estimated values

TABLE 7
PCB ANALYSIS RESULTS
CATCH BASIN SAMPLES

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
Catch Basin 1	ND	ND	ND	ND	ND	3000 J	4600
Catch Basin 1D	ND	ND	ND	ND	ND	2500 J	3300
Catch Basin 2	ND	ND	ND	ND	ND	2600 J	4100
Catch Basin 2D	ND	ND	ND	ND	ND	1400 J	1800 J

Concentration Units: ug/kg
ND: not detectable
J: estimated value

Metals results are presented in Table 8 and summarized below:

COMPOUNDS	RESULTS (mg/kg)	
	Basin 1	Basin 2
aluminum	9,630.0	5,300.0
antimony	25.7 N	16.2 N
arsenic	ND	3.2
barium	ND	134.0 N
beryllium	ND	2.1
cadmium	ND	3.7 N*
calcium	31,800.0	154,000.0
chromium	13.3 N*	27.4 N*
copper	37.5 NE*	267.0 N*E
iron	10,400.0 *	15,900.0 *
lead	ND	567.0 *S
magnesium	12,900.0	57,800.0
manganese	195.0 N*	912.0 N*
mercury	ND	5.2 N*
nickel	ND	27.3 N*
silver	ND	3.6 N
vanadium	96.6	19.4
zinc	181.0 E*	397.0 *E

N:indicates spike sample recovery is not within control limits
E:indicates a value estimate or not reported due to interference
*:indicates duplicate analysis is not within control limits
S:value determined by the method of standard addition

TABLE 8
INORGANIC COMPOUND ANALYSIS RESULTS
CATCH BASIN SAMPLES

COMPOUND	Catch Basin 1	Catch Basin 2
ALUMINUM	9,630	5,300
ANTIMONY	25.7 N	16.2 N
ARSENIC	18.4	3.2
BARIUM	ND	134 N*
BERYLLIUM	ND	2.1
CADMIUM	ND	3.7 N*
CALCIUM	31,800	154,000
CHROMIUM	13.3 N*	27.4 N*
COBALT	ND	ND
COPPER	37.5 EN*	267 EN*
IRON	10,400 *	15,900 *
LEAD	51.2	567 S*
MAGNESIUM	12,900	57,800
MANGANESE	195 N*	912 N*
MERCURY	6.7	5.2 N*
NICKEL	ND	27.3 N*
POTASSIUM	ND	ND
SELENIUM	ND	ND
SILVER	ND	3.6 N
SODIUM	ND	ND
THALLIUM	ND	ND
VANADIUM	98.6	19.4
ZINC	181 E*	397 E*
CYANIDE	NA	NA

CONCENTRATION UNITS: MG/KG
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
S: VALUE DETERMINED BY THE METHOD OF STANDARD ADDITIONS
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
* INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS
NA: NOT ANALYZED

Three surface soil samples were collected around the railroad tracks east of the site (Figure 1) and analyzed for semi-volatiles, pesticides, PCB's and metals. The semi-volatiles analysis results presented in Table 9 and summarized below:

COMPOUNDS	RANGES (ug/kg)	
fluorene	ND-210	J
hexachlorobenzene	210-300	J
phenanthrene	1,400-2,100	
anthracene	710-800	J
di-n-butylphthalate	800-3,500	JB
fluoranthene	5,500-7,300	
pyrene	5,000-13,000	
butylbenzylphthalate	190-40,000	J
benzo(a)anthracene	4,100-7,400	
bis(2-ethylhexyl)phthalate	1,200-3,800	B
chrysene	4,600-8,200	B
di-n-octyl phthalate	ND-110	J
benzo(b) fluoranthene	5,300-9,600	
benzo(k)fluoranthene	3,900-7,200	
benzo(a)pyrene	3,800-6,200	
indeno(1,2,3-cd)pyrene	2,000-4,300	
dibenz(a,h)anthracene	830-1,400	J
benzo(g,h,i)perylene	1,900-4,300	
1,4-dichlorobenzene	ND-96	J
1,2-dichlorobenzene	ND-92	J
benzoic acid	ND-2,300	J
1,2,4-trichlorobenzene	ND-87	J

J:some results are estimated values
B:some results were also found in the blank

TABLE 9
SEMIVOLATILE ORGANIC COMPOUNDS SOIL ANALYSIS RESULTS
RAILROAD TRACK SAMPLES

COMPOUND	RR Tracks 1	RR Tracks 2	RR Tracks 3
PHENOL	ND	ND	ND
bis (2-CHLOROETHYL) ETHER	ND	ND	ND
2-CHLOROPHENOL	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND
1,4-DICHLOROBENZENE	ND	96.0 J	ND
BENZYL ALCOHOL	ND	ND	ND
1,2-DICHLOROBENZENE	ND	82.0 J	ND
2-METHYLPHENOL	ND	ND	ND
bis (2-CHLOROISOPROPYL) ETHER	ND	ND	ND
4-METHYLPHENOL	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	ND	ND	ND
HEXACHLOROETHANE	ND	ND	ND
NITROBENZENE	ND	ND	ND
ISOPHORONE	ND	ND	ND
2-NITROPHENOL	ND	ND	ND
2,4-DIMETHYLPHENOL	ND	ND	ND
BENZOIC ACID	ND	ND	2300 J
bis (2-CHLOROETHOXY) METHANE	ND	ND	ND
2,4-DICHLOROPHENOL	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	87.0 J

CONCENTRATION UNITS: UG/KG
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 9 (CONTINUED)
SEMIVOLATILE ORGANIC COMPOUNDS SOIL ANALYSIS RESULTS
RAILROAD TRACK SAMPLES

COMPOUND	RR Tracks 1	RR Tracks 2	RR Tracks 3
NAPTHALENE	ND	220 J	150 J
4-CHLOROANILINE	ND	ND	ND
HEXACHLOROBUTADIENE	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	ND	ND	ND
2-METHYLNAPHTHALENE	ND	240 J	180 J
HEXACHLOROCYCLOPENTADIENE	ND	ND	ND
2,4,6-TRICHLOROPHENOL	ND	ND	ND
2,4,5-TRICHLORLPHENOL	ND	ND	ND
2-CHLORONAPTHALENE	ND	ND	ND
2-NITROANILINE	ND	ND	ND
DIMETHYL PHTHALATE	ND	ND	190 J
ACENAPHTHYLENE	790 J	870 J	800 J
3-NITROANILINE	ND	ND	ND
ACENAPHTHENE	120 J	ND	180 J
2,4-DINITROPHENOL	ND	ND	ND
4-NITROPHENOL	ND	ND	ND
DIBENZOFURAN	240 J	230 J	150 J
2,4-DINITROTOLUENE	ND	ND	ND
2,6-DINITROTOLUENE	ND	ND	ND
DIETHYLPHTHALATE	ND	4.0 J	ND

CONCENTRATION UNITS: UG/KG
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 9 (CONTINUED)
SEMIVOLATILE ORGANIC COMPOUNDS SOIL ANALYSIS RESULTS
RAILROAD TRACK SAMPLES

COMPOUND	RR Tracks 1	RR Tracks 2	RR Tracks 3
4-CHLOROPHENYL-PHENYLETHER	ND	ND	ND
FLUORENE	180 J	ND	210 J
4-NITROANILINE	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	ND	ND	ND
N-NITROSODIPHENYLAMINE (1)	ND	ND	ND
4-BROMOPHENYL-PHENYLETHER	ND	ND	ND
HEXACHLOROBENZENE	210 J	220 J	300 J
PENTACHLOROPHENOL	ND	ND	ND
PHENANTHRENE	2000	1400	2100
ANTHRACENE	800 J	790 J	710 J
DI-N-BUTYLPHTHALATE	810 BJ	800 BJ	3500 B
FLUORANTHENE	7300	5800	5500
PYRENE	13000	7800	5000
BUTYLBENZYLPHTHALATE	190 J	1300	40000J
3,3'-DICHLOROBENZIDINE	ND	ND	ND
BENZO(A)ANTHRACENE	7400	4900	4100
bis (2-ETHYLHEXYL) PHTHALATE	1200 B	1400 B	3800
CHRYSENE	7500	4800	8200 B
DI-N-OCTYL PHTHALATE	ND	ND	110 J
BENZO (B) FLUORANTHENE	9800	8100	5300
BENZO (K) FLUORANTHENE	7200	4500	3900
BENZO (A) PYRENE	8200	4500	3800
INDENO (1,2,3-CD) PYRENE	4300	3900	2000
DIBENZ (A,H) ANTHRACENE	1400	1400	830 J
BENZO (G,H,I) PERYLENE	4300	3900	1900

(1) CANNOT BE SEPARATED FROM DIPHENYLAMINE
CONCENTRATION UNITS: UG/KG
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
ND: NOT DETECTABLE
B: COMPOUND ALSO FOUND IN BLANK

Pesticide analysis results for the RR Tracks samples 1-3 are presented in Table 10. 4,4'-DDT was found in sample RR1 at 1,2000 ug/kg. PCB analytical results are presented in Table 12. Aroclor-1254 was found at the following concentrations: RR1 3,100 ug/kg J, RR2 5,100 ug/kg, RR3 20,000 ug/kg (J:estimated value)

Metals analysis from RR Tracks samples 1-3 are presented in Table 11 and summarized below:

COMPOUNDS	RESULTS (mg/kg)		
	RR1	RR2	RR3
aluminum	7,200.0	3,930.0	4,520.0
antimony	ND	19.9 N	81.0 N
arsenic	45.4	195.0	37.6 S
barium	337.0 N*	380.0 N*	1,360.0 N*
beryllium	2.1	1.4	1.3
cadmium	4.9 N*	10.7 N*	51.1 N*
calcium	43,000.0	9,720.0	13,600.0
chromium	93.1 N*	230.0 N*	269.0 N*
cobalt	17.5	51.0	75.3
copper	315.0 EN*	531.0 EN*	1,320.0 EN*
iron	45,400.0 *	161,000.0 *	393,000.0 *
lead	604.0 *	919.0 *	2,870.0 *
magnesium	15,600.0	2,570.0 *	4,180.0
manganese	915.0 N*	1,380.0 N*	1,920.0 N*
mercury	12.4 N*	10.6 N*	8.0 N*
nickel	64.8 N*	261.0 N*	334.0 N*
selenium	1.4 S	1.3	ND
silver	ND	3.1 N	16.8 N
vanadium	24.5	24.6	16.3
zinc	922.0 E*	1,710.0 E*	9,250.0 E*
cyanide	1.4 *	1.4 *	2.1 *

N:indicates spike sample recovery is not within control limits
*:indicates duplicate analysis is not within control limits
E:indicates a value estimated or not reported due to interference
S:value determined by the method of standard additions

TABLE 10
SOIL PESTICIDE ORGANICS ANALYSIS RESULTS
RAILROAD TRACK SAMPLES

COMPOUND	RR Tracks 1	RR Tracks 2	RR Tracks 3
alpha-BHC	ND	ND	ND
beta-BHC	ND	ND	ND
delta-BHC	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND
HEPTACHLOR	ND	ND	ND
ALDRIN	ND	ND	ND
HEPTACHLOR EPOXIDE	ND	ND	ND
ENDOSULFAN I	ND	ND	ND
DIELDRIN	ND	ND	ND
4,4'-DDE	ND	ND	ND
ENDRIN	ND	ND	ND
ENDOSULFAN II	ND	ND	ND
4,4'-DDD	ND	ND	ND
ENDOSULFAN SULFATE	ND	ND	ND
4,4'-DDT	1200	ND	ND
METHOXYCHLOR	ND	ND	ND
ENDRIN KETONE	ND	ND	ND
alpha-CHLORDANE	ND	ND	ND
gamma-CHLORDANE	ND	ND	ND
TOXAPHENE	ND	ND	ND

Concentration Units: ug/kg
ND: not detectable

TABLE 11
INORGANIC COMPOUND ANALYSIS RESULTS
RAILROAD TRACK SAMPLES

COMPOUND	RR Tracks 1	RR Tracks 2	RR Tracks 3
ALUMINUM	7,200	3,930	4,520
ANTIMONY	ND	19.9 N	81.0 N
ARSENIC	45.4	195	37.6 S
BARIUM	337 N*	380 N*	1,360 N*
BERYLLIUM	2.1	1.4	1.3
CADMIUM	4.9 N*	10.7 N*	51.1 N*
CALCIUM	43,000	9,720	13,600
CHROMIUM	93.1 N*	230 N*	269 N*
COBALT	17.5	51.0	75.3
COPPER	315 EN*	531 EN*	1,320 EN*
IRON	45,400 *	161,000 *	393,000 *
LEAD	604 *	919 *	2,870 *
MAGNESIUM	15,600	2,570	4,180
MANGANESE	915 N*	1,380 N*	1,920 N*
MERCURY	12.4 N*	10.6 N*	8.0 N*
NICKEL	64.8 N*	261 N*	334 N*
POTASSIUM	ND	ND	ND
SELENIUM	1.4 S	1.3	ND
SILVER	ND	3.1 N	16.8 N
SODIUM	ND	ND	ND
THALLIUM	ND	ND	ND
VANADIUM	24.5	24.6	16.3
ZINC	922 E*	1,710 E*	9,250 E*
CYANIDE	1.4 *	1.4 *	2.1 *

CONCENTRATION UNITS: MG/KG
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
S: VALUE DETERMINED BY THE METHOD OF STANDARD ADDITIONS
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
* INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS
NA: NOT ANALYZED

TABLE 12
PCB ANALYSIS RESULTS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
RR Tracks 1	ND	ND	ND	ND	ND	3100 J	ND
RR Tracks 2	ND	ND	ND	ND	ND	5100	ND
RR Tracks 3	ND	ND	ND	ND	ND	20000	ND

Concentration Units: ug/kg
ND: not detectable
J: estimated value

Eight surface soil samples were collected around the site perimeter and along Schenck Street, (Figure 1), and analyzed for metals and PCB's. Two of the samples (SS-1 and SS-2) were also analyzed resulting in the following data (from Table 13):

COMPOUNDS	RESULTS (ug/kg)	
	SS1	SS2, 2D
4,4'-DDT	350	700
methoxychlor	ND	1,600 J

J:estimated value

Metals analysis results from soil samples 1-8 are presented in Table 14 and summarized below.

PARAMETERS	RANGE (mg/kg)	
aluminum	2,840-11,600	
antimony	ND-20.2	N
arsenic	4.1-112	S
barium	64.7-525	N*
beryllium	1.5-27	
cadmium	2-5.9	N*
calcium	19,300-170,000	
chromium	16-432	N*
cobalt	ND-29.6	
copper	30.2-787	EN*
iron	9,750-78,600	*
lead	57.2-2,690	S*
magnesium	7,160-73,900	
manganese	573-5,070	N*
mercury	0.24-11.2	N*
nickel	16.3-183	N*
selenium	ND-2.1	

silver	ND-7.7	N
vanadium	15.4-87.6	
zinc	191-1,090	E*
cyanide	ND	*

Notations apply to some or all the values within a range.
N:indicates spike sample recovery is not within control limits
E:indicates a value estimated or not reported due to interference
S:value determined by method of standard additions
*:indicates duplicate analysis is not within control limits

PCB analysis results (ppb) from soil samples 1-8 are presented in Table 15:

SAMPLE LOCATION	AROCLOR-1254	AROCLOR-1260	TOTAL PCB (ug/kg)
SS-1	1,200 J	ND	1,200
SS-2	3,300 J	ND	3,300
SS-3	2,500 J	2,700 J	5,200
SS-4	ND	ND	ND
SS-5	ND	ND	ND
SS-6	68 J	110 J	178
SS-7	4,600 J	7,200	11,800
SS-8	2,400 J	2,900 J	5,300

J:estimated value

TABLE 13
SOIL PESTICIDE ORGANICS ANALYSIS RESULTS
SURFACE SOIL SAMPLES

COMPOUND	Surface Soil 1	Surface Soil 2	Surface Soil 2D
alpha-BHC	ND	ND	ND
beta-BHC	ND	ND	ND
delta-BHC	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND
HEPTACHLOR	ND	ND	ND
ALDRIN	ND	ND	ND
HEPTACHLOR EPOXIDE	ND	ND	ND
ENDOSULFAN I	ND	ND	ND
DIELDRIN	ND	ND	ND
4,4'-DDE	ND	ND	ND
ENDRIN	ND	ND	ND
ENDOSULFAN II	ND	ND	ND
4,4'-DDD	ND	ND	ND
ENDOSULFAN SULFATE	ND	ND	ND
4,4'-DDT	350	ND	700
METHOXYCHLOR	ND	1600 J	ND
ENDRIN KETONE	ND	ND	ND
alpha-CHLORDANE	ND	ND	ND
gamma-CHLORDANE	ND	ND	ND
TOXAPHENE	ND	ND	ND

J:ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
CONCENTRATION UNITS: UG/KG
ND: NOT DETECTABLE

TABLE 14
INORGANIC COMPOUND ANALYSIS RESULTS
SURFACE SOIL SAMPLES

COMPOUND	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
ALUMINUM	2,840	5,230	7,650	8,200	11,600	8,130	10,500	10,100
ANTIMONY	19.2 N	ND	ND	ND	ND	ND	20.2 N	ND
ARSENIC	4.1	112	5.4	24.4 S	22.6	8.6 +	8.0 S	34.8 S
BARIUM	64.7 N*	276 N*	183 N*	526 N*	163 N*	101 N*	332 N*	253 N*
BERYLLIUM	1.5	1.8	2.0	1.6	2.4	1.7	2.7	2.0
CADMIUM	4.2 N*	5.9 N*	2.0 N*	3.3 N*	ND	ND	5.5 N*	4.1 N*
CALCIUM	170,000	19,300	55,800	40,700	48,500	53,600	83,600	61,800
CHROMIUM	22.8 N*	162 N*	71.7 N*	31.1 N*	18.3 N*	16.0 N*	432 N*	62.8 N*
COBALT	ND	23.1	ND	ND	ND	ND	29.6	16.8
COPPER	64.5 EN*	520 EN*	106 EN*	64.1 EN*	44.7 EN*	30.2 EN*	787 EN*	300 EN*
IRON	8,750 *	77,300 *	23,600 *	18,200 *	17,800 *	17,100 *	78,600 *	29,300 *
LEAD	183 S*	673 *	484 *	2,680 S*	134 *	57.2 *	1,080 *	539 *
MAGNESIUM	73,800	7,160	18,700	15,100	13,000	16,300	25,400	20,100
MANGANESE	660 N*	855 N*	850 N*	573 N*	804 N*	691 N*	5,070 N*	761 N*
MERCURY	1.9 N*	11.2 N*	1.3 N*	0.78 N*	0.24 N*	1.6 N*	3.9 N*	4.6 N*
NICKEL	21.1 N*	183 N*	28.2 N*	25.8 N*	18.9 N*	16.3 N*	160 N*	51.4 N*
POTASSIUM	ND	ND	ND	ND	ND	ND	ND	1,280
SELENIUM	ND	2.1	ND	1.3	ND	ND	ND	ND
SILVER	4.3 N	ND	ND	ND	ND	ND	7.7 N	2.5 N
SODIUM	ND	ND	ND	ND	ND	ND	ND	ND
THALLIUM	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	24.5	26.9	15.4	21.1	19.5	18.0	87.6	27.4
ZINC	380 E*	1,060 E*	422 E*	836 E*	191 E*	183 E*	863 E*	672 E*
CYANIDE	ND	ND	NA	NA	NA	NA	NA	NA

CONCENTRATION UNITS: MG/KG
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
S: VALUE DETERMINED BY METHOD OF STANDARD ADDITIONS
+ INDICATES CORRELATION COEFFICIENT FOR MSA IS LESS THAN 0.995
* INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS
NA: NOT ANALYZED

TABLE 15
PCB ANALYSIS RESULTS
SURFACE SOILS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
SS-1	ND	ND	ND	ND	ND	1200 J	ND
SS-2	ND	ND	ND	ND	ND	3300 J	ND
SS-3	ND	ND	ND	ND	ND	2500 J	2700 J
SS-4	ND	ND	ND	ND	ND	ND	ND
SS-5	ND	ND	ND	ND	ND	ND	ND
SS-6	ND	ND	ND	ND	ND	68 J	110 J
SS-7	ND	ND	ND	ND	ND	4600 J	7200
SS-8	ND	ND	ND	ND	ND	2400 J	2900J

Concentration Units: ug/kg
ND: not detectable
J: estimated value

4.3 Groundwater Contamination

4.3.1 Monitoring Well Installation

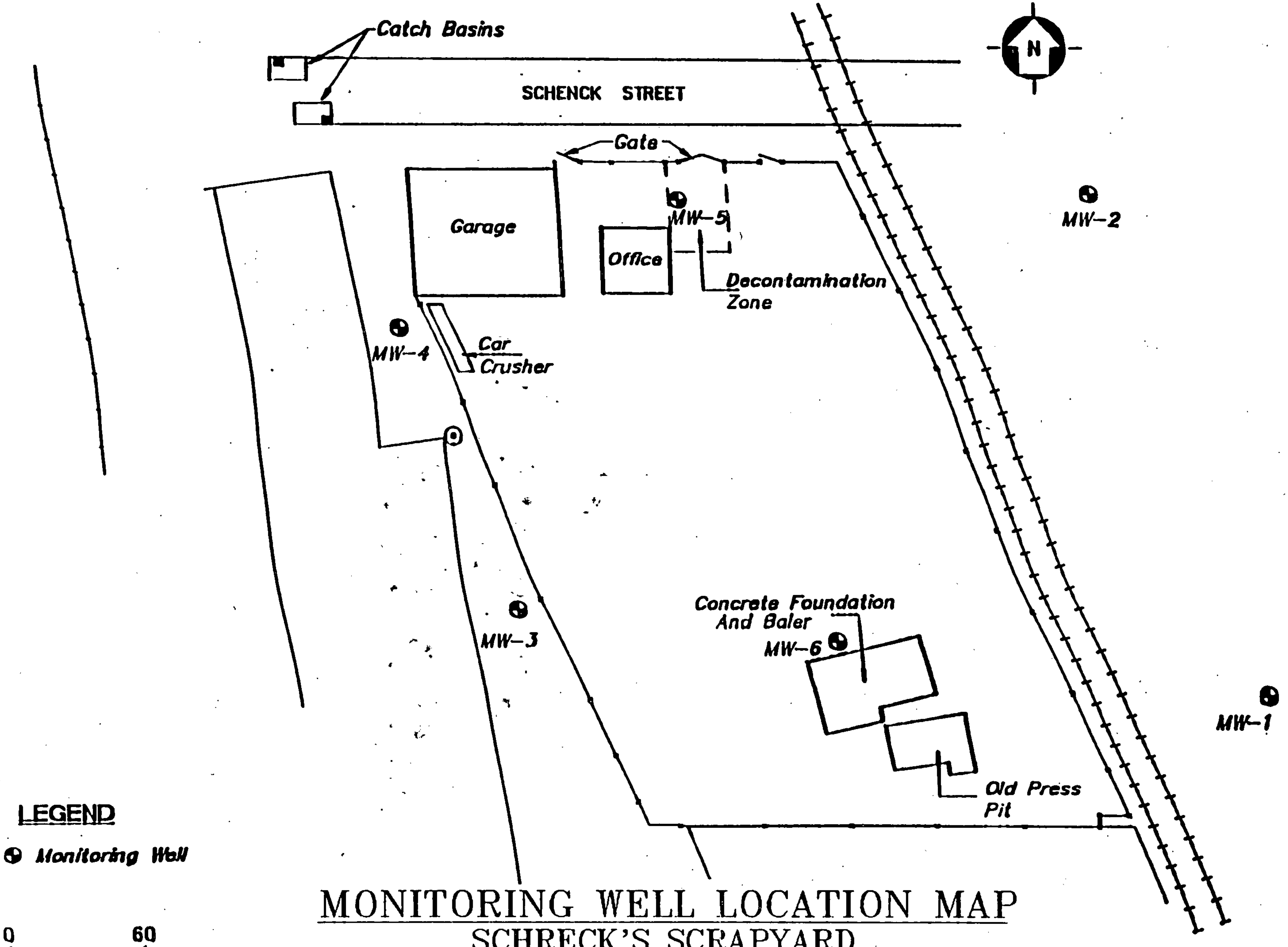
Monitoring wells MW-5 and 6 were installed at the site from November 13, through 17, 1989. Boring logs and well construction information forms are included in Appendix C. A site plan locating the monitoring wells is presented in Figure 3.

Monitoring wells were drilled using 6-1/4" inside diameter, hollow stem augers. Soil samples were collected continuously to the end of each boring, using a two-foot split spoon sampler.

Well casing and screens were constructed of two-inch inside diameter, stainless steel pipe with flush threaded joints. All screens were five feet in length and had slot sizes of 0.010 inches. Ten-foot screens were not used because of the limited thickness of the water bearing zone. The top of the screen MW-5 was set approximately one and one half feet above the water table. The screen in MW-6 was set within a confined aquifer and does not straddle a water table.

No. 4 quartz was used as a filter pack material around the screens. During the construction of MW-6, the auger was flushed out with potable water to remove the fat clay in the auger. This measure was used to insure construction of a competent filter pack. The filter packs extended from the bottom of the boreholes to at least two feet above the top of the screens. The monitoring well annular seals consisted of at least two feet of hydrated bentonite pellets placed just above the filter pack. The annular space between the filter pack and grade was sealed with a bentonite slurry with a cement plug extending above grade. A locking protective casing was installed at each well.

FIGURE 3



MONITORING WELL LOCATION MAP
SCHRECK'S SCRAPYARD
NORTH TONAWANDA, NEW YORK

4.3.2 Monitoring Well Development

All wells were developed using dedicated Teflon bailers by EA personnel on November 16, 1989. A minimum of 10 well volumes were removed from each well in accordance with the QAPP requirement. During the Phase I RI it was found that the fine-grained water bearing formations at the site could were not developed to the point where the water was free of turbidity.

4.3.3 Surveyed Elevations

The two new groundwater monitoring wells were surveyed to the two bench marks established during the Phase I RI. All six wells and the garage were surveyed and accurately located on a map (see Figure 2).

4.3.4 Results

Groundwater samples were collected from the six shallow monitoring wells installed at the site and analyzed for TCL parameters. Pesticides were not detected in MW-1,-2,-3 and -5 samples, low levels of pesticides were detected in MW-4 and -6 samples at the concentrations listed below.

COMPOUND	RESULTS (ug/l)	
	MW-4	MW-6
alpha-BHC	0.93	0.20
beta-BHC	0.80	0.67

VOCs were not detected in the samples from wells MW-1, 2, and 4 (Table 17) which are perimeter wells screened in the upper 10 feet of the water table. Toluene was detected at 5.4 ug/l in samples from well MW-3 which is also a perimeter well. Acetone was detected at 5 ug/l in the samples from well MW-5; MW-5 is a downgradient well screened in the upper 10 feet of the water table. Benzene (230 ug/l), chlorobenzene (120 ug/l), ethylbenzene (260 ug/l) and xylenes (1,800 ug/l) were detected in the sample from well MW-6. MW-6 is located downgradient from the buried drums and in screened fat clay zone. Semivolatile compounds were not detected in the MW-2 and -4 samples (Table 18). Semivolatiles were detected in the samples from wells MW-1,-3,-5, and -6, however, the concentrations could only be estimated because the levels were below the quantitation limit. Semivolatiles were also detected at an estimated level in the duplicate sample from well MW-1. The analysis for semivolatiles analytical results are summarized below.

COMPOUND	RANGES (ug/l)
di-n-butylphthalate	ND-3 J
chrysene	ND-12 J
1,3-dichlorobenzene	ND-6 J
1,4-dichlorobenzene	ND-3 J
1,2-dichlorobenzene	ND-2 J
2-methylphenol	ND-5 J
4-methylphenol	ND-2 J
2,4-methylphenol	ND-6 J
benzoic acid	ND-10 J
diethylphthalate	ND-4 J

J:all values were estimated

PCBs were not detected in any of the groundwater samples (Table 19).

TABLE 16
PESTICIDE ORGANICS ANALYSIS RESULTS
MONITORING WELL SAMPLES

COMPOUND	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
alpha-BHC	ND	ND	ND	0.93	ND	0.20
beta-BHC	ND	ND	ND	0.60	ND	0.067
delta-BHC	ND	ND	ND	ND	ND	ND
gamma-BHC (Lindane)	ND	ND	ND	ND	ND	ND
HEPTACHLOR	ND	ND	ND	ND	ND	ND
ALDRIN	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	ND	ND	ND	ND	ND	ND
ENDOSULFAN I	ND	ND	ND	ND	ND	ND
DIELDRIN	ND	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND
ENDRIN	ND	ND	ND	ND	ND	ND
ENDOSULFAN II	ND	ND	ND	ND	ND	ND
4,4'-DDD	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	ND	ND	ND	ND	ND	ND
ENDRIN KETONE	ND	ND	ND	ND	ND	ND
alpha-CHLORDANE	ND	ND	ND	ND	ND	ND
gamma-CHLORDANE	ND	ND	ND	ND	ND	ND
TOXAPHENE	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: UG/L
ND: NOT DETECTABLE

TABLE 17
VOLATILE ORGANIC COMPOUNDS ANALYSIS RESULTS
MONITORING WELL SAMPLES

COMPOUND	MW - 1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-6D
BENZENE	ND	ND	ND	ND	ND	ND	230
TOULENE	ND	ND	5.4	ND	ND	14	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	170	120 J
ETHYLBENZENE	ND	ND	ND	ND	ND	ND	260
XYLENES (TOTAL)	ND	ND	ND	ND	ND	ND	1,800
ACETONE	ND	ND	ND	ND	5.0	ND	ND
CARBON DISULFIDE	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND
BROMOFORM	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	ND	ND	ND	ND	ND	ND	ND
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
VINYL ACETATE	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	1.0 J	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND

J: ESTIMATED VALUE, VALUE BELOW THE COMPOUND QUANTITATION LIMIT
CONCENTRATION UNITS: UG/L
ND: NOT DETECTABLE

2VOL1.DRW

TABLE 18
SEMIVOLATILE ORGANIC COMPOUNDS
MONITORING WELL SAMPLES

COMPOUND	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
PHENOL	ND	ND	ND	ND	ND	ND
bis (2-CHLOROETHYL) ETHER	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	6.0 J	5.0 J
1,4-DICHLOROBENZENE	ND	ND	ND	ND	3.0 J	3.0 J
BENZYL ALCOHOL	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	2.0 J
2-METHYLPHENOL	ND	ND	ND	ND	ND	5.0 J
bis (2-CHLOROISOPROPYL) ETHER	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	ND	ND	ND	ND	ND	2.0 J
N-NITROSO-DI-N-PROPYLAMINE	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE	ND	ND	ND	ND	ND	ND
NITROBENZENE	ND	ND	ND	ND	ND	ND
ISOPHORONE	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	ND	ND	ND	ND	ND	6.0 J
BENZOIC ACID	ND	ND	3.0 J	ND	10.0 J	ND
bis (2-CHLOROETHOXY) METHANE	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: UG/L
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 18 (CONTINUED)
SEMIVOLATILE ORGANIC COMPOUNDS
MONITORING WELL SAMPLES

COMPOUND	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
NAPTHALENE	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLORLPHENOL	ND	ND	ND	ND	ND	ND
2-CHLORONAPTHALENE	ND	ND	ND	ND	ND	ND
2-NITROANILINE	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	ND	ND	ND	ND	ND	ND
3-NITROANILINE	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE	ND	ND	ND	ND	ND	ND
DIETHYLPHTHALATE	ND	ND	4.0 J	ND	3.0 J	2.0 J

CONCENTRATION UNITS: UG/L
ND: NOT DETECTABLE
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT

TABLE 18 (CONTINUED)
SEMIVOLATILE ORGANIC COMPOUNDS
MONITORING WELL SAMPLES

COMPOUND	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
4-CHLOROPHENYL-PHENYLETHER	ND	ND	ND	ND	ND	ND
FLUORENE	ND	ND	ND	ND	ND	ND
4-NITROANILINE	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE (1)	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL-PHENYLETHER	ND	ND	ND	ND	ND	ND
HEXACHLOROBENZENE	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	ND	ND	ND	ND	ND	ND
PHENANTHRENE	ND	ND	ND	ND	ND	ND
ANTHRACENE	ND	ND	ND	ND	ND	ND
DI-N-BUTYLPHTHALATE	ND	ND	ND	ND	3.0 BJ	3.0 BJ
FLUORANTHENE	ND	ND	ND	ND	ND	ND
PYRENE	ND	ND	ND	ND	ND	ND
BUTYLBENZYLPHTHALATE	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	ND	ND	ND	ND	ND	ND
bis (2-ETHYLHEXYL) PHTHALATE	ND	ND	ND	ND	ND	ND
CHRYSENE	ND	ND	ND	ND	ND	12.0 B
DI-N-OCTYL PHTHALATE	ND	ND	ND	ND	ND	ND
BENZO (B) FLUORANTHENE	ND	ND	ND	ND	ND	ND
BENZO (K) FLUORANTHENE	ND	ND	ND	ND	ND	ND
BENZO (A) PYRENE	ND	ND	ND	ND	ND	ND
INDENO (1,2,3-CD) PYRENE	ND	ND	ND	ND	ND	ND
DIBENZ (A,H) ANTHRACENE	ND	ND	ND	ND	ND	ND
BENZO (G,H,I) PERYLENE	ND	ND	ND	ND	ND	ND

(1) CANNOT BE SEPARATED FROM DIPHENYLAMINE
CONCENTRATION UNITS: UG/L
J: ESTIMATED VALUE. VALUE IS BELOW THE COMPOUND QUANTITATION LIMIT
ND: NOT DETECTABLE
B: COMPOUND ALSO FOUND IN BLANK

TABLE 19
PCB ANALYSIS RESULTS
MONITORING WELLS

SAMPLE	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260
MW-1	ND	ND	ND	ND	ND	ND	ND
MW-2	ND	ND	ND	ND	ND	ND	ND
MW-3	ND	ND	ND	ND	ND	ND	ND
MW-4	ND	ND	ND	ND	ND	ND	ND
MW-5	ND	ND	ND	ND	ND	ND	ND
MW-6	ND	ND	ND	ND	ND	ND	ND

Concentration Units: ug/l
ND: not detectable
J: estimated value

TABLE 20
INORGANIC COMPOUND ANALYSIS RESULTS
MONITORING WELL SAMPLES

COMPOUND	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
ALUMINUM	57,800 *	69,600 *	93,100 *	5,680 *	1,520 *	28,400 *
ANTIMONY	73.6 N	73.2 N	76.7 N	ND	ND	ND
ARSENIC	13.0 N	14.0 N	24.0 N	ND	ND	23.4 SN
BARIUM	850 N	806 N	779 N	ND	ND	369 N
BERYLLIUM	7.0	7.5	9.0	ND	ND	ND
CADMIUM	7.0	ND	7.6	ND	ND	6.0
CALCIUM	533,000	545,000	612,000	108,000	137,000	147,000
CHROMIUM	104 N*	124 N*	180 N*	17.3 N*	ND	78.7 N*
COBALT	83.6 N	98.3 N	119 N	ND	ND	ND
COPPER	268 EN*	206 EN*	320 EN*	82.8 EN*	ND	217 EN*
IRON	109,000 E*	132,000 E*	173,000 E*	11,400	2,690 E*	50,100 E*
LEAD	126	118 S	188	54.9	20.1	206 S
MAGNESIUM	126,000 N*	126,000 N*	142,000N*	27,800	51,000 N*	53,700 N*
MANGANESE	3050	4,400	5,100	806	485	1,140
MERCURY	ND	ND	0.27	4.3	94.7	0.92
NICKEL	160 EN*	171 EN*	232 EN*	ND	ND	89.8 EN*
POTASSIUM	12,600 EN*	20,700 EN*	13,100 EN*	ND	ND	23,500 EN*
SELENIUM	ND	ND	ND	ND	ND	ND
SILVER	20.5 N	17.5 N	25.0 N	ND	ND	10.3 N
SODIUM	43,300 N	29,800 N	25,600 N	16,600 N	74,500 N	66,400 N
THALLIUM	ND	ND	ND	ND	ND	ND
VANADIUM	132 EN*	154 EN*	197 EN*	ND	ND	86.3 EN*
ZINC	661 EN*	661 EN*	653 EN*	457 EN*	58.1 EN*	816 EN*
CYANIDE	ND	ND	ND	ND	ND	ND

CONCENTRATION UNITS: UG/KG
ND: NOT DETECTABLE
E: INDICATES A VALUE ESTIMATED OR NOT REPORTED DUE TO INTERFERENCE
S: VALUE DETERMINED BY THE METHOD OF STANDARD ADDITIONS
N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS
* INDICATES DUPLICATE ANALYSIS IS NOT WITHIN CONTROL LIMITS
NA: NOT ANALYZED

Groundwater sample inorganic analytical results are presented in Table 20 and summarized below :

PARAMETERS	RANGE (ug/l)	
aluminum	1,520-93,100	*
antimony	ND-76	N
arsenic	ND-24	NS
barium	ND-890	N
beryllium	ND-9	
cadmium	ND-7.6	
calcium	108,000-612,000	
chromium	ND-180	N*
cobalt	ND-119	N
copper	ND-320	EN*
iron	2,690-173,000	E*
lead	20.1-206	S
magnesium	27,900-142,000	N*
manganese	485-5,100	
mercury	ND-94.7	
nickel	ND-232	EN*
potassium	ND-23,500	EN*
silver	ND-25	N
sodium	16,600-74,500	N
vanadium	ND-197	EN*
zinc	59.1-756	EN*

Notations apply to some or all the values within a range.

N:indicates spike sample recovery is not within control limits

E:indicates a value estimated or not reported due to interference

S:value determined by method of standard additions

*:indicates duplicate analysis is not within control limits

V. SUMMARY AND CONCLUSIONS

5.1 Summary

5.1.1 Nature and Extent of Contamination

The phase II effort was aimed at filling data gaps identified in the phase I RI and complete the characterization of the nature and extent contamination at the site. This included defining the extent of subsurface contamination, determining if dioxin was present, E.P. Toxicity and asbestos levels in the site soil, installing a downgradient monitoring well at the site, a well downgradient of the drum burial area and examining the location and levels of off site surface soil contamination.

During the Phase I RI, 22 soil borings were drilled and samples were collected, screened and submitted for laboratory analysis. The purpose of the Phase II RI was to further define the subsurface soil conditions and provide additional information for the Feasibility Study. The sampling of subsurface soils was limited to one soil boring sampled at 5-9 feet below grade and at 17-19 feet below grade. The 17 to 19 foot sample was the same depth as the nearby buried drums. No pesticides were detected in the 5-9 foot sample. The results of the volatile analysis of the samples collected from the 5-9 foot sample contained VOCs at concentrations similar to, but slightly higher than the VOCs identified during the Phase I RI, less compounds were identified however, in the Phase II sample. Comparing the concentrations detected with the levels addressed in the baselines risk assessment it appears that the low levels of VOCs detected shall not pose significant health risk; semivolatiles, detected in low concentrations, would likely pose a health risk if these soils were ingested; low levels of PCB's detected at the 5-9 foot interval are above the TSCA 10 mg/kg cleanup action level and metals detected in low levels should not pose a significant health threat. In summary, the soils would require remediation due to slightly elevated levels of PCB and the semi-volatiles. Based upon the data, a map defining the depth of significant contamination for various areas of the site was created. Figure 4 indicates the required remediation depth range of one (1) foot to nine (9) feet.

A sample was collected 17-19 feet below grade, to assess the impact of the buried drums located at a similar depth upgradient of the boring. The concentrations identified in the 17-19 foot sample would not be expected to pose a significant health threat. However, some of the compounds are similar to the buried drum contents and this low level of contamination may be due to limited leaching from the drums.

Surface soil samples were collected across the site to further define the nature and extent of surface soil contamination. Three surface soil samples were analyzed for dioxin (2,3,7,8-TCDD) which was not identified. Five surface soil samples were analyzed for asbestos. Asbestos was identified at percentage levels which would classify the surface soils as asbestos containing material (ACM) subject to asbestos regulations. Five surface soil samples were analyzed for E.P. Toxicity (metals). Only one sample, near the middle of the site, exceeded the concentration limits for four of the eight metals and this soil would be classified as a hazardous waste.

Two monitoring wells were constructed; one downgradient of the site and one downgradient of the buried drums. Samples were collected from all six monitoring wells and analyzed for TCL parameters. The November 1989 groundwater levels were measured and a groundwater flow map prepared. MW-1,-3, and -4 are upgradient wells and shallow groundwater is flowing to the northeast. PCBs were not detected in any of the wells and pesticides were only detected in MW-4 and -6 at very low levels. Four aromatic volatile compounds were detected in concentrations ranging from 120 to 1,800 ppb in MW-6 downgradient of the buried drums. These compounds were all identified in the buried drums. Semi-volatiles analysis compounds were not detected in MW-2 and -4. Low estimated concentrations of semivolatile compounds were detected in MW-1,-3,-5 and -6. Groundwater metal concentrations were found at levels of concentrations similar to those found in the Phase I RI except for elevated mercury in MW-5. MW-5 is thought to be screened in a sand stringer and may represent only an isolated portion of the site. In summary, only low levels of contaminants were detected in the monitoring wells except for mercury in the downgradient well MW-5. MW-6, downgradient of the buried drums, contained low levels of contaminants which may represent materials leaching from the buried drums. Although some contaminant levels detected exceed drinking water criteria, the groundwater in this area is not used as a potable source and the low levels of contaminants should eventually discharge to surface water at insignificant concentrations.

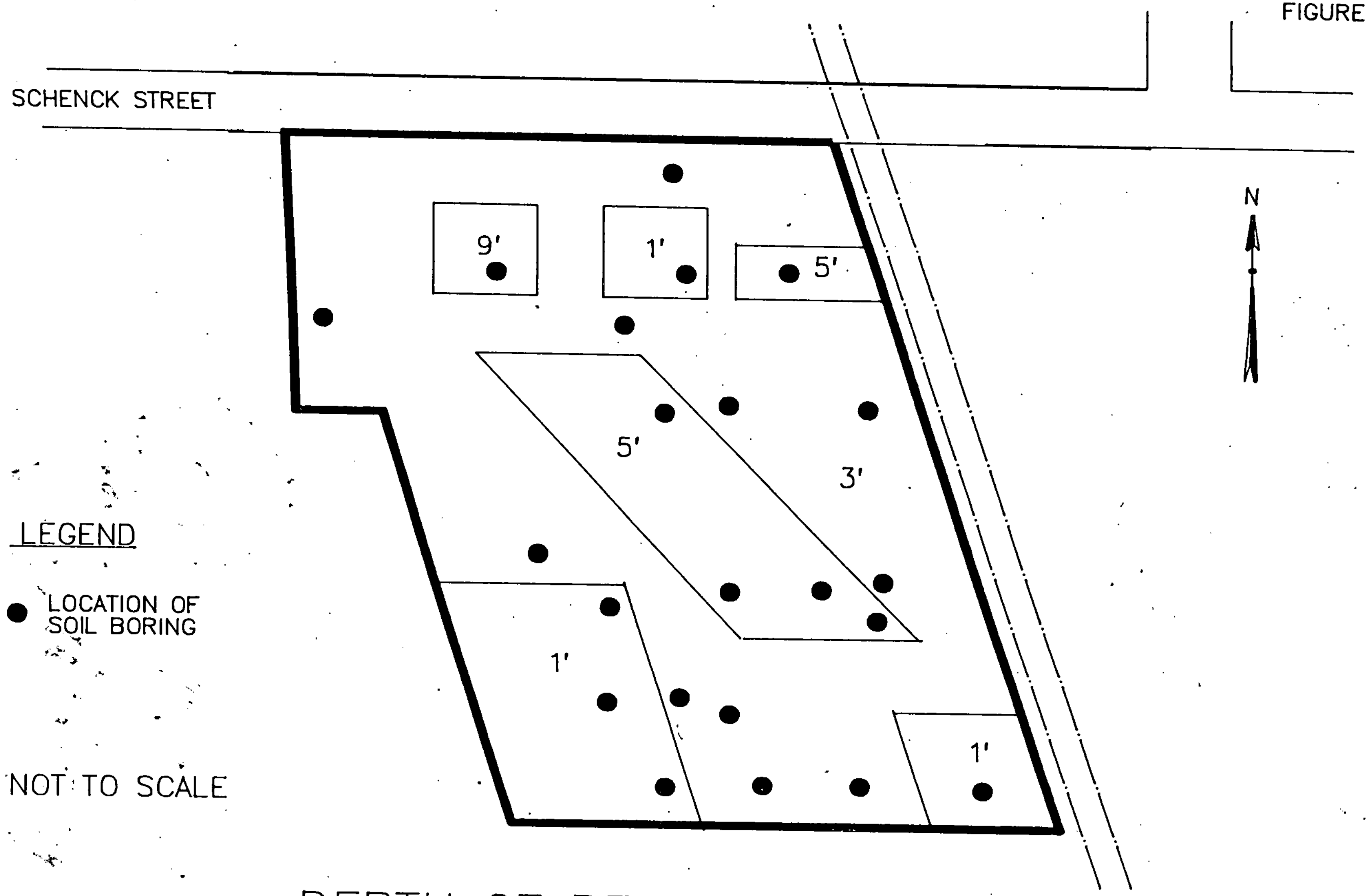
The area around the site was sampled to determine the off-site extent of contamination. Three samples were collected from the rail road tracks to the east of the site. Significant concentrations of heavy metals and PNAs were identified which would likely pose a significant enough health threat to require remediation. Since railroad operations are often sources of heavy metals and PNAs, additional evaluation should be made prior to remediation to determine the extent of these contaminants farther down the tracks.

The catch basins on Shenck Street were sampled to determine the effect of storm water runoff. Analytical results of the catch basin samples did not indicate that significant concentrations of contaminants were present.

Eight surface soil samples were collected around the site and along Schenck Street. Although, PCB's were detected in most of the samples, it was only identified slightly above the TSCA cleanup criteria of 10 mg/kg in the sample adjacent to the Schreck garage (SS-7). A sample collected on the railroad track at the east property line (RR-3) was also above the TSCA cleanup criteria at a concentration greater than the SS-7 sample. The SS-7 sample and the sample directly east of the railroad tracks (SS-2) contained elevated levels of metals which probably warrant remediation. These locations are directly adjacent to areas which already require remedial action. Sample SS-4 collected along Schenck street contains elevated levels of lead, however, this contamination is probably due to automotive pollutants and does not appear to be from the site.

Figure 4 illustrates the approximate extent of remediation required at the site based on the Phase I and II RI data bases.

FIGURE 4



DEPTH OF REQUIRED REMEDIATION
SCHRECK'S SCRAPYARD
NORTH TONAWANDA, NEW YORK

5.2 Conclusions

The Phase II RI identified additional information needed to develop a comprehensive remediation plan. The Phase II RI determined:

- the approximate boundaries of off-site contamination;
- that on-site soils are contaminated with asbestos in percentage levels and that some on-site soils exceed the E.P. Toxicity concentration limits and are hazardous waste;
- that downgradient groundwater is contaminated above drinking water criteria, however, the contamination is generally low and should not adversely impact public health and the environment under current uses; and,
- that no dioxin (2,3,7,8-TCDD) was identified on the site.

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