Magna Metals Site

NYSDEC Site No. 360003

CORTLANDT, NEW YORK

Soil Vapor Investigation Work Plan (Revised)

AKRF Project Number: 40256

Prepared for:

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FEBRUARY 2007

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FIGURES

APPENDICES

1.0 INTRODUCTION

Investigation at the Magna Metals Site, located in Cortlandt, New York, has been conducted to comply with a New York State Department of Environmental Conservation's (NYSDEC) Consent Order (Site No. 360003). In June 2006, Tetra Tech EC, Inc. (TTI) submitted a letter report to the NYSDEC that summarized the results of soil vapor sampling and additional groundwater sampling. In November 2006, the NYSDEC issued a correspondence requiring sampling of the office/warehouse building located east of the former Magna Metals building to confirm that soil vapor intrusion is not occurring. This Work Plan outlines a protocol for collection of sub-slab soil vapor samples and air samples to satisfy the NYSDEC requirements.

2.0 SITE DESCRIPTION

2.1 Site Location

The Magna Metals site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. A site location map is included in Figure 1. Nearby towns include Peekskill and Croton-on-Hudson, and the Hudson River is located 3 miles west of the site.

2.2 Site and Vicinity Characteristics

Locally, the site is part of a larger commercial property owned by Baker Properties, having several operating businesses which currently include Polymedco, Motion Labs, and Brook. The office/warehouse building was reported by the owner to include some manufacturing activities. Baker Properties acquired the property from ISC Properties, Inc. in 1982, and has leased it to various tenants. The identity of these tenants, their use of the property, and their waste disposal practices are unknown. The Croton Egg Farm and an inactive emery mine are located to the west and to the north-northwest of the site, respectively. To the north, south, and east of the project site are residential areas. A wetland area is located between the site and the residential area southwest of the site.

2.3 Site Geology, Hydrogeology and Subsurface Characteristics

Topography is variable throughout the 0.5-mile radius from the site. Elevations range from 300 to 600 feet above mean sea level (MSL). On the former Magna Metals site, topography ranges from 360 feet MSL along the eastern site boundary to 320 feet MSL along the western site boundary. Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary to Furnace Brook. The tributary flows south/southwest and discharges into a pond located in a large wetland area.

Stormwater on the former Magna Metals site leaves the site via overland flow and enters into the unnamed tributary. One catch basin was observed by TTI on the former site property. This basin is located in the central western portion of the site and collects discharge water from a roadway/parking area. The roadway is a mix of gravel and pavement. A search for the catch basin's outfall pipe was conducted along the unnamed tributary. An outfall pipe was not located. The stormwater collection system on Furnace Dock Road discharges into the unnamed tributary near the intersection of Furnace Dock Road and Gilman Lane.

The geologic characteristics of the subsurface conditions at the site consist primarily of a sandy to silty sand overburden unit, approximately 10 to 20 feet thick, overlying bedrock. The bedrock is mapped by the New York State Museum and Science Service as Hornblende Norite, which is a part of the Cortlandt Mafic Complex. Overburden groundwater exists in the form of a very shallow overburden aquifer (i.e., typically less than five feet in thickness). Groundwater flow from the site is in the western direction towards the stream and wetland area.

Results of the slug tests completed by TTI indicate a range in hydraulic conductivity values from 5.3 x 10^{-5} cm/sec (or 0.16 ft/day) at MW-1 in the higher portion of the site to 2.2 x 10^{-3} cm/sec (6.2 ft/day) at MW-3 in the lower portion of the leach pit area. Previous groundwater sampling by TTI indicates that some monitoring wells were observed to be dry during seasonal low groundwater conditions.

2.4 Review of Site History

Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operation, iron, lead, copper, nickel, and zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethylene (TCE) was drummed and removed.

2.5 Previous Studies

Between 1978 and 1984, site investigations were completed by the New York State Department of Health (NYSDOH), the NYSDEC, and William Cosulich to determine if property uses had resulted in contamination. The investigations concluded that soil, groundwater, sediment, and, surface water contamination existed at the site.

In 1998, Foster Wheeler Environmental Corporation (predecessor to TTI) completed a Remedial Investigation/Feasibility Study (RI/FS) to delineate the nature and extent of leach pit/septic tank/holding tank, surface water, sediment, surface soil, subsurface soil, and groundwater contamination at the site, such that an evaluation of (1) the nature and extent of site contamination, (2) the potential impacts, if any, and (3) the remedial measure options could be performed. The field investigation program consisted of the drilling of soil borings, the installation and development of monitoring wells, the performance of a habitat-based assessment, and the sampling and analysis of various environmental media including septic tank/leach pit sludge and water, surface soil, subsurface soil, surface water, sediment, and groundwater. A geophysical survey was added to the field investigation to improve location accuracy of the leach pit/septic tank/holding tank sampling.

In 2004, TTI completed a Draft Supplemental RI/FS to perform horizontal and vertical delineation of the soil and groundwater contamination in the potential source area of the site, the leach pit area. The investigation included a geophysical and excavation survey to locate leach pits, leach pit excavation, a homeowner well survey, installation of overburden monitoring wells and a bedrock monitoring well, and collection of soil, groundwater, surface water and sediment samples. Based on the data compiled in the supplemental investigation, TTI concluded the following:

- Concentrations and distributions of contaminant compounds and analytes detected during the Supplemental RI are consistent with contaminant concentrations and distributions detected during previous investigations.
- Xylenes, semivolatile organic compounds (SVOCs), and metals were detected in leach pit sludge samples. Xylenes were detected in soil samples collected below the leach pits
- TCE was detected in the groundwater sample collected from MW-04 and MW-04D.
- Media sampled were affected by inorganic contaminants of concern at concentrations above soil cleanup criteria. In particular, chromium, copper, mercury, nickel, and zinc are

potentially site related compounds that were detected at concentrations exceeding applicable criteria.

- Thirteen leach pits/septic pits had been discovered at the Magna Metals site.
- There appeared to have been two phases of leach pit/septic tank construction at the site. The first and older set of leach pits was constructed of concrete cinder blocks with a soil or gravel bottom. The second phase of leach pits was constructed of prefabricated concrete cylinders with perforated sides and apparently soil or gravel bottoms. Sludge or sludge cakes were still present in twelve of the thirteen pits at the site.
- Based on inorganic analytical results (particularly copper) for the surface water, groundwater, and surface soil samples collected downgradient of the leach pit area and the former Magna Metals building, it appeared that the wetlands east of Furnace Brook and the unnamed tributary may have been impacted by contaminated groundwater or surface runoff originating in the vicinity of the leach pit area and site building.
- Impacts to pelagic and benthic aquatic life were observed in indigenous and laboratory based analyses. The primary environmental media of concern were surface waters and sediments of Furnace Brook, its unnamed tributary, and the palustrine wetlands associated with the site.

In 2006, TTI completed an additional investigation, which included the collection of groundwater samples from existing wells and two new wells next to the former Magna Metals building, and soil vapor samples from three exterior locations along western side of office/warehouse building, five exterior locations within the area containing the leach pits, and one interior sub-slab sample from the building south of the Magna Metals building and the office/warehouse building.

The sampling results indicated that groundwater collected from the two new monitoring wells did not contain contaminants above NYSDEC water quality standards and the overall samples were consistent with previous data. The soil gas sample results documented that VOCs were detected at concentrations ranging from 1 to 1,900 micrograms per cubic meter. A site map showing the soil gas sampling locations and the laboratory sampling results is included as Figure 2. TTI concluded that the sampling results were consistent with the findings of the current and previous sampling and did not indicate there were unknown sources.

In November 2006, the NYSDEC issued correspondence requiring the sampling of sub-slab soil vapor from the on-site office/warehouse building to the east of the Magna Metals building to confirm that soil vapor intrusion was not occurring. This was in response to a TCE concentration of 59 micrograms per cubic meter in one soil vapor sample (SV-03) that was collected next to the office/warehouse building.

3.0 FIELD PROGRAM

The objectives of the field-sampling program are to confirm that soil vapor intrusion is not occurring in office/warehouse building located east of the former Magna Metals building. This work plan has been prepared to implement the associated sampling activities in accordance with NYSDOH's requirements (NYSDOH, 2006). The field program is outlined in Section 3.1, and the subsequent sections give the detailed methodologies for implementation.

3.1 Field Program Summary

It is AKRF's understanding that site access for the property and study building has been agreed upon between ISCP Properties and the property owner/manager through a signed access agreement. Sub-slab soil-gas samples and indoor air samples will be collected at five locations from the lowest level in the office/warehouse building participating in this study. Figure 3 shows the project site building, the adjacent buildings, and the approximate locations for soil gas sampling. However, the exact position and the total number of these sampling locations will be determined in the field after completing a pre-sampling survey. The pre-sampling survey is described in Section 3.6 of this work plan.

3.2 Sub-Slab Soil Vapor Sampling

Soil gas samples will be collected using a stainless steel probe, consisting of a drive point and internal perforated sampling port with a retractable tip, connected to Teflon sampling tubing. The sampling tubing will extend from the sampling port through a drive casing to above grade. Collectively, the retractable tip, sampling port and sampling tube are referred to as the "soil gas sampler". The soil gas sampling (and concurrent indoor air sampling) will be conducted during the normal 8-hour workday at the facility. Eight-hour flow regulators will be used for the sampling. Soil gas samples will be collected using the following procedures:

3.2.1 Sampling Point Installation

1. Prepare the sampling point location by drilling through the building slab using a concrete drill equipped with a 2-inch diameter drill bit.
2. Attach new, clean $^{3}/_{16}$-inch inside diameter Teflon tubing to the sampling probe.
3. Drive the sampling probe and attached tubing to a depth of two inches below the bottom of the concrete slab.
4. Backfill the soil gas sampler with 2-inches of clean sand filter pack to prevent intake clogging.
5. Retract the drive casing to expose the perforated sampling port.
6. Record total depths (interval below grade) to which probe is advanced and withdrawn for sample collection.
7. Seal the annulus at the surface (between the building concrete slab and tubing) by placement of portland cement and let set overnight.

3.2.2 Sample Set-up

1. Install a 2-foot by 2-foot 6-mil plastic shroud over sampling point, seal to concrete floor using duct tape along the perimeter, and pull the Teflon soil gas sampling tubing through the shroud to allow for sampling collection.
2. Pierce the plastic shroud, insert one of new tubing into the shroud, and connect the other end of the tubing to the helium tank.
3. Install new flexible hose to a peristaltic pump and connect the Teflon sample tubing to the hose. Connect the other end (discharge end) of the flexible tubing to a 0.5-liter Tedlar bag. Purge the soil gas sampler of approximately three sampler volumes (0.4 liters) by activating the pump to fill the Tedlar bag to near capacity (see Appendix B for sampler volume calculations). The air withdrawal flow rate shall be 0.2 liters/minute or less.
4. During purging, a flow of helium gas will be introduced into the plastic shroud overlying the soil gas sampling point. The Tedlar bag will be analyzed in the field using a Marks Model 9822 helium detector to check for short-circuiting of outside air into the sampling port. If helium is detected at a concentration of greater than 10 percent, then the soil gas point will be

resealed with hydrated bentonite. The point will then be retested to ensure that the helium concentration is less than 10 percent.

5. Disconnect the sample tubing from the peristaltic pump and connect it to the inlet of a labeled 1-liter Summa canister.
6. Repeat procedure for all sampling locations.

3.2.3 Sample Collection

1. After Summa canisters are set up at all of the sampling locations, record the vacuum reading from the vacuum gauge on the canister at the beginning of the 8-hour sampling period. Open the valve of the canister and record the time in the field book.
2. At the end of the 8-hour sampling period, close the valve, remove the flow-rate controllers and vacuum gauges, install caps on canisters, and record the time at the end of the sampling period.
3. Place canisters in shipping containers for transportation to laboratory.
4. Repeat procedure for all sampling locations.

3.2.4 Miscellaneous

1. Decontaminate the stainless steel sampling probe by the following measures:
    a. Scrub using tap water/Alkanox® mixture and bristle brush.
    b. Rinse with tap water.
    c. Scrub again with tab water/Alkanox® and bristle brush.
    d. Rinse with tap water.
    e. Rinse with distilled water.
    f. Air dry equipment.
2. Dispose of the sample tubing.
3. Document sample locations and measurements in the field logbook or on field data sheets.

3.3 Indoor Air Sampling

1. The indoor air sampling is to be conducted concurrently with the soil gas sampling.
2. Place a labeled 1-liter Summa canister at the breathing zone level (4.5 to 5 feet above ground surface) in the designated sampling location adjacent to the soil gas sampling location.
3. Record the vacuum reading from the vacuum gauge on the canister at the beginning of the 8-hour sampling period.
4. Open the valve of the canister and record the time in the field book. At the end of the 8-hour sampling period, close valve, remove flow-rate controllers and vacuum gauges, install caps on canisters, and record time.
5. Place canisters in shipping containers for transportation to laboratory.
6. Repeat procedure for all of the sampling locations.

3.4 Laboratory Methods

The samples will be analyzed for VOCs by EPA Method TO-15 with a detection limit of 1 ug/m^3 for all compounds, except for trichloroethylene, which will have a detection limit of 0.25 ug/m^3 for indoor air samples. All sample analysis will be performed in a New York State Department of Health Environmental Laboratory Approval Program (NYSDOH-ELAP) laboratory certified to perform NYSDEC Analytical Services Protocol (ASP). The laboratory will produce Category B deliverables. Samples will be shipped to the laboratory with appropriate chain of custody documentation.

3.5 Quality Assurance / Quality Control

In addition to the laboratory analysis of the field samples, additional analysis will be included for quality control measures. These samples will include one field blank and one blind duplicate to be analyzed for VOCs by EPA Method TO-15. The field blank will consist of collecting an air sample via the soil gas sampler exposed to ambient conditions. Category B deliverables will be produced for this project.

3.6 Pre-Sampling Survey

A pre-sampling survey will be conducted prior to initiating the soil vapor sampling program. The survey will be completed to document any factors that may affect indoor air quality. The survey will include interviews with building owners and/or building occupants. Documentation will be compiled of the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, building operations, product inventory, and any other known factors that may affect indoor air quality. When conducting the survey, a PPB RAE or equivalent photoionization detector (PID) will be used to detect VOCs in parts per billion (ppb). The exact location and quantity of sampling locations will be determined in the field after completing the pre-sampling survey and consultation with the NYSDEC and/or NYSDOH. A NYSDOH Indoor Air Quality Questionnaire and Building Inventory form will be used to document the results of the survey. The NYSDOH form is attached as Appendix B.

4.0 REPORTING REQUIREMENTS

4.1 Soil Vapor Investigation Report

Upon completion of all field work and receipt of laboratory analytical results, a Soil Vapor Investigation Report (SVIR) will be prepared that will: document field activities; present field and laboratory data; evaluate exposure and risks to human health; and discuss conclusions and recommendations drawn from the results of the investigation.

4.2 Schedule of Work

A tentative schedule for implementing the Soil-Vapor Investigation Work Plan is provided below:

Date	Activity
January 10, 2007	Submit Work Plan to NYSDEC & NYSDOH
January 26, 2007	Receive comments from NYSDEC & NYSDOH
February 26, 2007	Implement field program for soil vapor and air sampling
March 30, 2007	Submit Soil Vapor Investigation Report to NYSDEC & NYSDOH

5.0 REFERENCES

Foster Wheeler Environmental Corporation; *Remedial Investigation/Feasibility Study (RI/FS), Magna Metals Site,* Cortlandt, New York; June 1998.

Tetra Tech FS, Inc.; *Draft Supplements Remedial Investigation Report, Magna Metals Site,* Cortlandt, New York; August 2004.

Tetra Tech EC, Inc.; *Data Findings From the Additional Data Collection Activities for the Former Magna Metals Site (NYSDEC Site No. 360003),* Cortlandt, New York; June 2006.

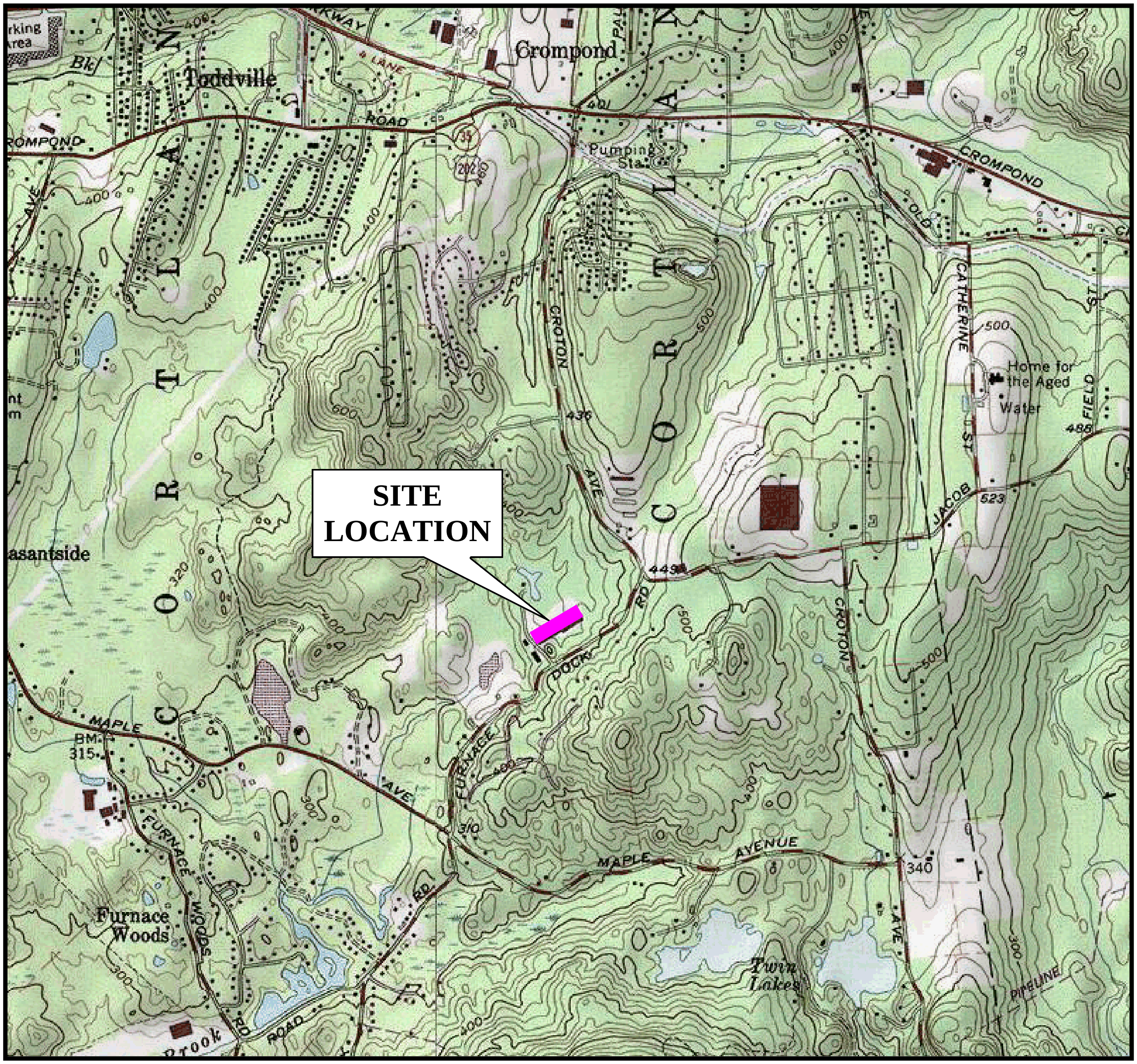
New York State Department of Health, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, October 2006.

New York State Department of Environmental Conservation, Division of Environmental Remediation, *DER-13/Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York*, October 2006.

New York State Department of Environmental Conservation, Division of Environmental Remediation, *Draft DER-10/Technical Guidance for Site Investigation and Remediation*, December 2002.

New York State Museum and Science Service Geological Survey, Map and Chart Series No. 15; *Geologic Map of New York, Lower Hudson Sheet, New York*; 1970; Reprinted 1995.

FIGURES



SCALE IN FEET

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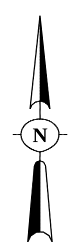


SOURCE:

7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: MOHEGAN LAKE, NY 1981

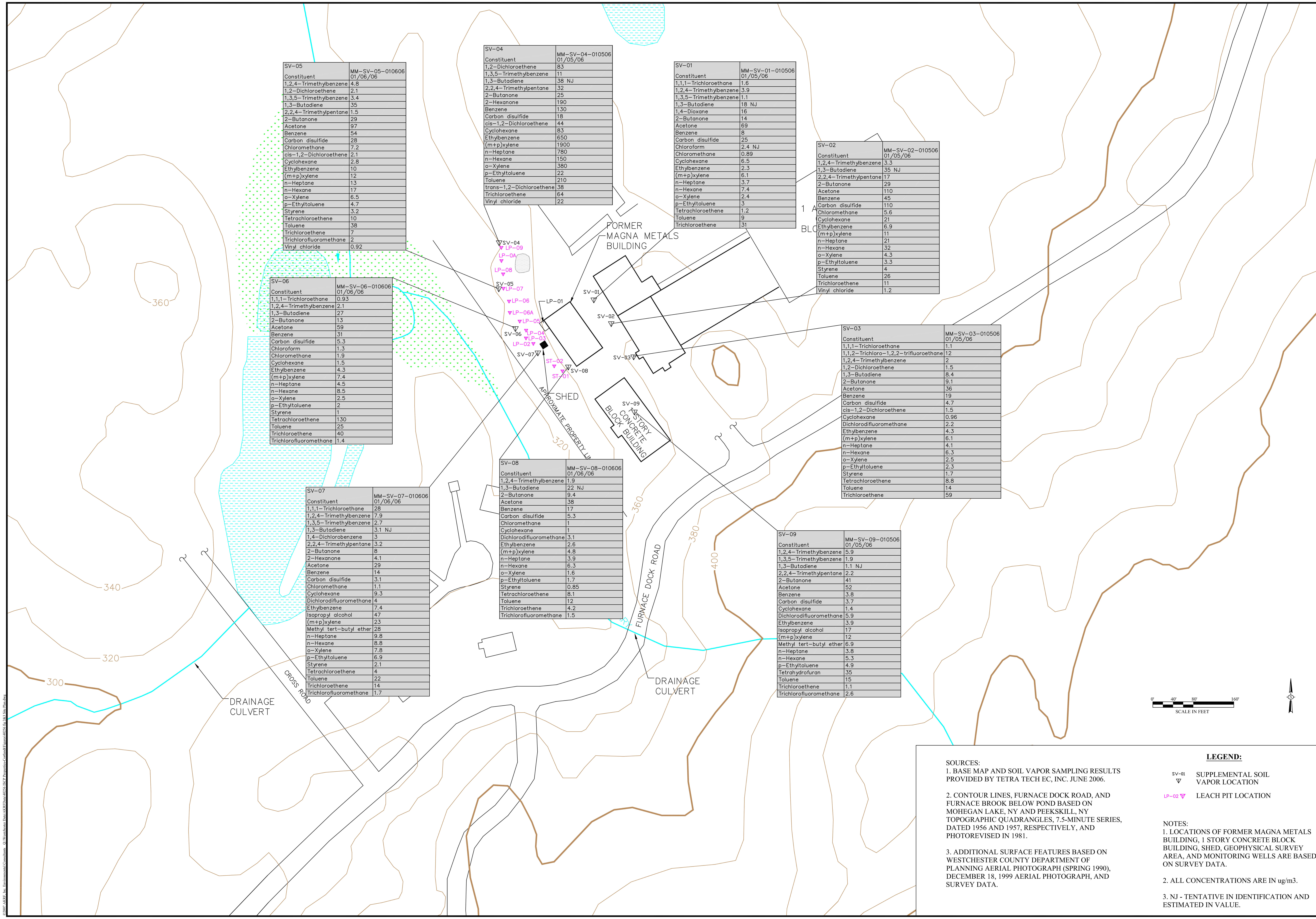
MAGNA METALS
CORTLANDT, NEW YORK

PROJECT SITE LOCATION

AKRF

Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE	**1.08.06**
PROJECT No.	**40256**
SCALE	**AS SHOWN**
FIGURE	**1**



SV-05 Constituent	MM-SV-05-010606 01/06/06
1,2,4-Trimethylbenzene	4.8
1,2-Dichloroethene	2.1
1,3,5-Trimethylbenzene	3.4
1,3-Butadiene	35
2,2,4-Trimethylpentane	1.5
2-Butanone	29
Acetone	97
Benzene	54
Carbon disulfide	28
Chloromethane	7.2
cis-1,2-Dichloroethene	2.1
Cyclohexane	2.8
Ethylbenzene	10
(m+p)xylene	12
n-Heptane	13
n-Hexane	17
o-Xylene	6.5
p-Ethyltoluene	4.7
Styrene	3.2
Tetrachloroethene	10
Toluene	38
Trichloroethene	7
Trichlorofluoromethane	2
Vinyl chloride	0.92

SV-04 Constituent	MM-SV-04-010506 01/05/06
1,2-Dichloroethene	83
1,3,5-Trimethylbenzene	11
1,3-Butadiene	38 NJ
2,2,4-Trimethylpentane	32
2-Butanone	25
2-Hexanone	190
Benzene	130
Carbon disulfide	18
cis-1,2-Dichloroethene	44
Cyclohexane	83
Ethylbenzene	650
(m+p)xylene	1900
n-Heptane	780
n-Hexane	150
o-Xylene	380
p-Ethyltoluene	22
Toluene	210
trans-1,2-Dichloroethene	38
Trichloroethene	64
Vinyl chloride	22

SV-01 Constituent	MM-SV-01-010506 01/05/06
1,1,1-Trichloroethane	1.6
1,2,4-Trimethylbenzene	3.9
1,3,5-Trimethylbenzene	1.1
1,3-Butadiene	18 NJ
1,4-Dioxane	16
2-Butanone	14
Acetone	69
Benzene	8
Carbon disulfide	25
Chloroform	2.4 NJ
Chloromethane	0.89
Cyclohexane	6.5
Ethylbenzene	2.3
(m+p)xylene	6.1
n-Heptane	3.7
n-Hexane	7.4
o-Xylene	2.4
p-Ethyltoluene	3
Tetrachloroethene	1.2
Toluene	9
Trichloroethene	31

SV-02 Constituent	MM-SV-02-010506 01/05/06
1,2,4-Trimethylbenzene	3.3
1,3-Butadiene	35 NJ
2,2,4-Trimethylpentane	17
2-Butanone	29
Acetone	110
Benzene	45
Carbon disulfide	110
Chloromethane	5.6
Cyclohexane	21
Ethylbenzene	6.9
(m+p)xylene	11
n-Heptane	21
n-Hexane	32
o-Xylene	4.3
p-Ethyltoluene	3.3
Styrene	4
Toluene	26
Trichloroethene	11
Vinyl chloride	1.2

SV-06 Constituent	MM-SV-06-010606 01/06/06
1,1,1-Trichloroethane	0.93
1,2,4-Trimethylbenzene	2.1
1,3-Butadiene	27
2-Butanone	13
Acetone	59
Benzene	31
Carbon disulfide	5.3
Chloroform	1.3
Chloromethane	1.9
Cyclohexane	1.5
Ethylbenzene	4.3
(m+p)xylene	7.4
n-Heptane	4.5
n-Hexane	8.5
o-Xylene	2.5
p-Ethyltoluene	2
Styrene	1
Tetrachloroethene	130
Toluene	25
Trichloroethene	40
Trichlorofluoromethane	1.4

SV-03 Constituent	MM-SV-03-010506 01/05/06
1,1,1-Trichloroethane	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane	12
1,2,4-Trimethylbenzene	2
1,2-Dichloroethene	1.5
1,3-Butadiene	8.4
2-Butanone	9.1
Acetone	36
Benzene	19
Carbon disulfide	4.7
cis-1,2-Dichloroethene	1.5
Cyclohexane	0.96
Dichlorodifluoromethane	2.2
Ethylbenzene	4.3
(m+p)xylene	6.1
n-Heptane	4.1
n-Hexane	6.3
o-Xylene	2.5
p-Ethyltoluene	2.3
Styrene	1.7
Tetrachloroethene	8.8
Toluene	14
Trichloroethene	59

SV-08 Constituent	MM-SV-08-010606 01/06/06
1,2,4-Trimethylbenzene	1.9
1,3-Butadiene	22 NJ
2-Butanone	9.4
Acetone	38
Benzene	17
Carbon disulfide	5.3
Chloromethane	1
Cyclohexane	1
Dichlorodifluoromethane	3.1
Ethylbenzene	2.6
(m+p)xylene	4.8
n-Heptane	3.9
n-Hexane	6.3
o-Xylene	1.6
p-Ethyltoluene	1.7
Styrene	0.85
Tetrachloroethene	8.1
Toluene	12
Trichloroethene	4.2
Trichlorofluoromethane	1.5

SV-07 Constituent	MM-SV-07-010606 01/06/06
1,1,1-Trichloroethane	28
1,2,4-Trimethylbenzene	7.9
1,3,5-Trimethylbenzene	2.7
1,3-Butadiene	3.1 NJ
1,4-Dichlorobenzene	3
2,2,4-Trimethylpentane	3.2
2-Butanone	8
2-Hexanone	4.1
Acetone	29
Benzene	14
Carbon disulfide	3.1
Chloromethane	1.1
Cyclohexane	9.3
Dichlorodifluoromethane	4
Ethylbenzene	7.4
Isopropyl alcohol	47
(m+p)xylene	23
Methyl tert-butyl ether	28
n-Heptane	9.8
n-Hexane	8.8
o-Xylene	7.8
p-Ethyltoluene	6.9
Styrene	2.1
Tetrachloroethene	4
Toluene	22
Trichloroethene	14
Trichlorofluoromethane	1.7

SV-09 Constituent	MM-SV-09-010506 01/05/06
1,2,4-Trimethylbenzene	5.9
1,3,5-Trimethylbenzene	1.9
1,3-Butadiene	1.1 NJ
2,2,4-Trimethylpentane	2.2
2-Butanone	41
Acetone	52
Benzene	3.8
Carbon disulfide	3.7
Cyclohexane	1.4
Dichlorodifluoromethane	5.9
Ethylbenzene	3.9
Isopropyl alcohol	17
(m+p)xylene	12
Methyl tert-butyl ether	6.9
n-Heptane	3.8
n-Hexane	5.3
p-Ethyltoluene	4.9
Tetrahydrofuran	35
Toluene	15
Trichloroethene	1.1
Trichlorofluoromethane	2.6

SOURCES:
1. BASE MAP AND SOIL VAPOR SAMPLING RESULTS PROVIDED BY TETRA TECH EC, INC. JUNE 2006.

2. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

LEGEND:

SV-01 — SUPPLEMENTAL SOIL VAPOR LOCATION

LP-02 — LEACH PIT LOCATION

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

2. ALL CONCENTRATIONS ARE IN ug/m3.

3. NJ - TENTATIVE IN IDENTIFICATION AND ESTIMATED IN VALUE.

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34 South Broadway, White Plains, N.Y. 10601

MAGNA METALS
CORTLANDT, NEW YORK

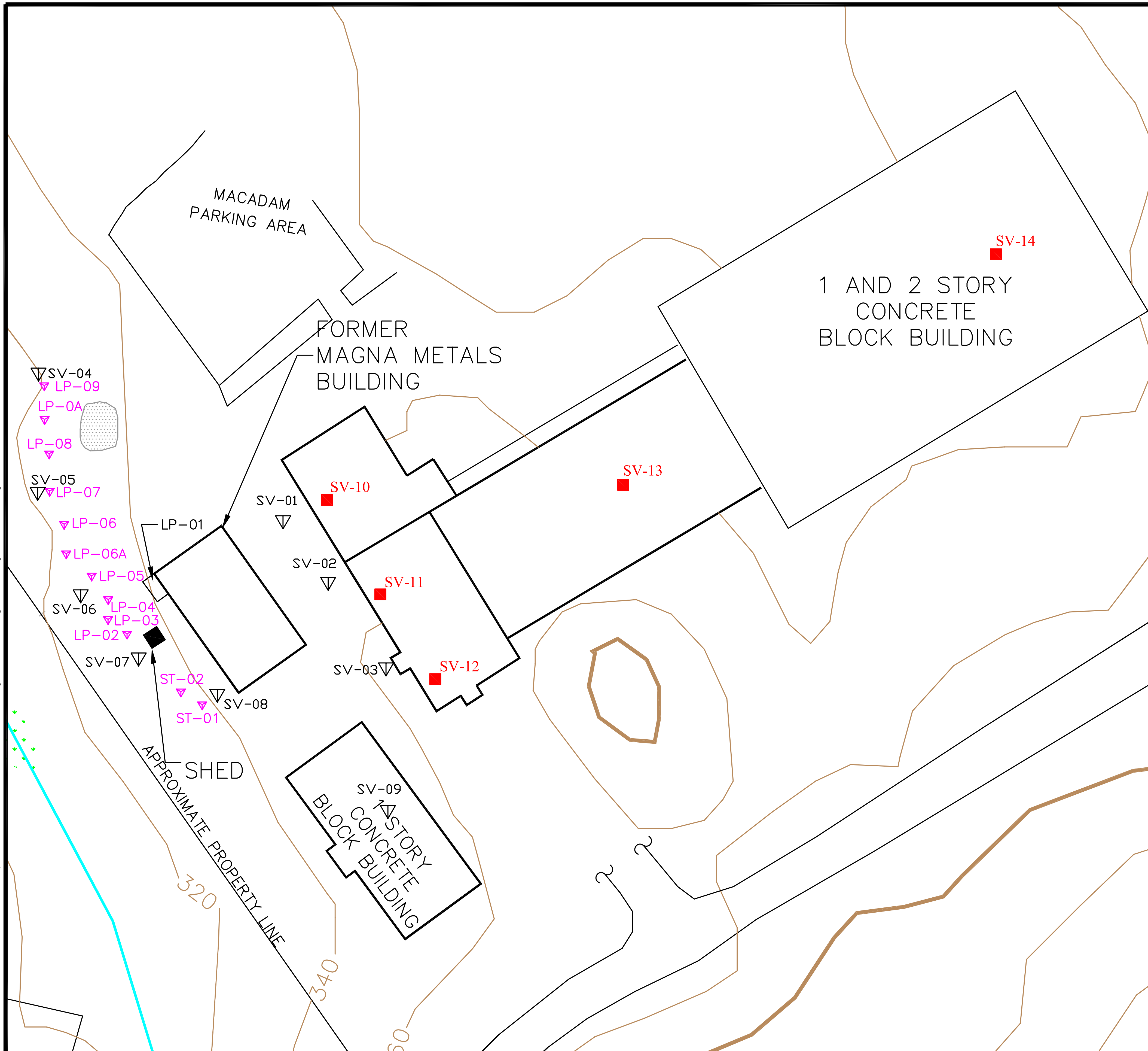
SOIL VAPOR SAMPLING RESULTS - JUNE 2006

DATE **1.09.06**

SCALE **1"=80'**

PROJECT No. **40256**

FIGURE **2**



SOURCES:
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2. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

LEGEND:

SV-14	PROPOSED SOIL VAPOR SAMPLING LOCATION
320	CONTOUR LINE (20 FT INTERVAL)
LP-02	LEACH PIT LOCATION
SV-03	JANUARY 2006 SOIL VAPOR SAMPLING LOCATION

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

0' 40' 80' 160'
SCALE IN FEET

N

AKRF
Environmental Consultants
34 South Broadway, White Plains, N.Y. 10601

MAGMA METALS
CORTLANDT, NEW YORK

PROPOSED SAMPLING LOCATIONS

DATE 1.09.07
PROJECT NO. 40256
SCALE 1"=80'
FIGURE 3

APPENDIX A

PURGE VOLUME CALCULATION

Soil Gas Sampler Purge Volume Calculation

Volume of Sampling Tip & Disturbed Boring

Inside Diameter =	2	in
Length (sampling tip + drive tube) =	2	in
V_1 = pi * [2/(2*12)]^2 * 6/12 =	3.6E-03	ft^3

Volume of Teflon Tubing

Inside Diameter = 3/16" = 0.1875"	0.1875	in
Length =	3	ft
V_2 = pi * [0.1875/(2*12)]^2 * 5 =	5.8E-04	ft^3

Total Volume of Sampler

$V = V_1 + V_2$ =	4.2E-03	ft^3 =	1.2E-01	liter
		3x volume =	0.4	liter

APPENDIX B

NYSDOH INDOOR AIR QUALITY QUESTIONNAIRE

AND BUILDING INVENTORY FORM

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name ______________________________ Date/Time Prepared ____________

Preparer's Affiliation ___________________________ Phone No.___________________

Purpose of Investigation____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____________________ First Name: _____________________

Address: ____

County: ______________

Home Phone: _________________ Office Phone: _________________

Number of Occupants/persons at this location ______ Age of Occupants __________________

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____________________First Name: _______________________

Address: ____

County: ______________

Home Phone: _________________ Office Phone: _________________

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: ______________

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:________________

If multiple units, how many? ________

If the property is commercial, type?

Business Type(s) ____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? ______

Other characteristics:

Number of floors______ Building age______

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

____

____

____

Airflow near source

____

____

____

Outdoor air infiltration

____

____

____

Infiltration into air ducts

____

____

____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other ________
c. Basement floor:	concrete	dirt	stone	other ________
d. Basement floor:	uncovered	covered	covered with _______________	
e. Concrete floor:	unsealed	sealed	sealed with _______________	
f. Foundation walls:	poured	block	stone	other ________
g. Foundation walls:	unsealed	sealed	sealed with _______________	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: ________(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

____

____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other __________

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: ____________________________

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other__________
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

____

____

____

____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	____
1st Floor	____
2nd Floor	____
3rd Floor	____
4th Floor	____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA
Please specify__________________

d. Has the building ever had a fire? Y / N When?__________________

e. Is a kerosene or unvented gas space heater present? Y / N Where? __________________

f. Is there a workshop or hobby/craft area? Y / N Where & Type? __________________

g. Is there smoking in the building? Y / N How frequently? __________________

h. Have cleaning products been used recently? Y / N When & Type? __________________

i. Have cosmetic products been used recently? Y / N When & Type? __________________

j. Has painting/staining been done in the last 6 months? Y / N Where & When? ______________

k. Is there new carpet, drapes or other textiles? Y / N Where & When? ______________

l. Have air fresheners been used recently? Y / N When & Type? ______________

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?___________

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?___________

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?______________

Are there odors in the building? Y / N
If yes, please describe: ____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? ____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: ___________
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _______
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _______

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: ______________________________

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: ______________________________

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.