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Appendix B
Previous VI Investigations

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Report Name	Author	Date
Indoor Air Investigation - Southside High School	New York State Department of Health	7/28/2000
Air Investigation Update - Southside High School	New York State Department of Health	8/22/2000
Air Investigation Update - Southside High School	New York State Department of Health	10/18/2000
Health Consultation - Southside High School	New York State Department of Health	9/30/2003
Environmental Management Plan	Sterling Environmental	6/3/2009
Health Consultation - Southside High School	New York State Department of Health	3/3/2010

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New York State Department of Health
July 28, 2000

Indoor Air Investigation
Southside High School
Elmira, Chemung County

Summary

This report presents the findings of the May 22 and 23, 2000 indoor air investigation at the Southside High School (SHS) in Elmira NY. An indoor air testing program was developed to evaluate whether environmental contaminants were affecting indoor air in SHS. A total of 11 air samples were collected from various locations in and around SHS including three soil gas samples from under the school's concrete floor and an outdoor air sample. For comparison, three indoor air samples and an outdoor air sample were also collected at the Elmira Free Academy (EFA), another high school in Elmira. Fourteen of the fifteen samples were analyzed for a total of 69 volatile organic chemical compounds.

The indoor air testing results do not show a problem with chemical contamination in the school air. Most compounds were either not detected or were present at low levels. Several compounds were present at concentrations slightly higher than typical background, but their presence is not unusual and exposure at the reported levels is not expected to be a health concern.

The soil gas samples from under the SHS concrete floor contained several Freon and chlorinated solvent compounds at elevated levels but did not show petroleum vapor contamination. Most petroleum-related compounds in the soil gas samples were in the range of normal background for indoor air; several petroleum hydrocarbons were just slightly elevated above typical background levels in the soil gas samples. Pressure measurements in the school show that soil gas was not being drawn into the school at the time the samples were collected.

Carbon dioxide levels in several occupied classrooms suggested that outdoor air exchange could be improved. Several of the ventilation systems in SHS could be adjusted to increase the amount of outdoor air to decrease carbon dioxide levels during occupied periods. The school should consider instituting an indoor air quality action plan consistent with that recommended by the Environmental Protection Agency (EPA).

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Abbreviations:

SHS	-	Southside High School
EFA	-	Elmira Free Academy
NYSDEC	-	New York State Department of Environmental Conservation
NYSDOH	-	New York State Department of Health
PID	-	photoionization detector
eV	-	electron volts
IAQ	-	indoor air quality
psi	-	pounds per square inch
$\mu g/m^3$	-	micrograms per cubic meter
EPA	-	Environmental Protection Agency
ASHRAE	-	American Society of Heating, Refrigerating and Air Conditioning Engineers
ppm	-	parts per million

1.0 Background

In 1995, the New York State Department of Environmental Conservation (NYSDEC) investigated a report of petroleum contamination on Miller Pond in the City of Elmira. NYSDEC determined that the petroleum contamination was No. 4 fuel oil that may have been from underground petroleum storage tanks that existed on the site when it was an industrial property and that the contamination extended underneath the Southside High School about 15 feet below ground. However, investigations to date have not found any evidence of tanks on the property. NYSDEC conducted air sampling in the high school in July 1997 and in April 2000 to assess possible air quality impacts. The results of this air testing did not show an indoor air contamination problem at the school.

On April 8, 2000, the Elmira City School Board received a letter from parents expressing concern about a perceived unusual number of cancers among current and former students at SHS. The NYSDEC, the New York State Department of Health (NYSDOH) and the Chemung County Health Department attended a public meeting sponsored by the school board on May 2, 2000, and discussed concerns about cancer among students and provided information about environmental conditions in the area. The NYSDOH indicated that all available information on cancer in students at SHS will be evaluated. Characteristics of confirmed cases of cancer will be examined in order to identify any unusual patterns in the numbers and types of cancers found, and their timing and geographic distribution that might indicate the possibility of a common source will be addressed. In addition, NYSDOH and NYSDEC said they would further investigate environmental conditions in the school and the schoolyard. This report provides the findings of the indoor air investigation in the school.

2.0 Investigation and Methods

NYSDOH designed an investigation plan to determine whether subsurface contamination was present in soil gas under the SHS concrete floor and to further evaluate whether indoor air was affected. The investigation included installation and sampling of soil gas points in three areas in SHS and indoor and outdoor air testing at both SHS and EFA.

2.1 Sample Site Selection

A. Soil Gas

In late April 2000, soil gas wells were installed through the concrete floor in three rooms in the school building including the pool filter room, the boiler room and a storage area (Figure 1). These locations were selected because:

- they were located on the side of the building closest to the identified area of the underground petroleum contamination;
- they were in locations near mechanical equipment which could be a source of contamination and/or could produce a pressure difference that could draw sub-slab vapor into the school; and
- they were in areas less likely to be tampered with.

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B. Indoor Air

The day prior to sample collection at SHS, NYSDOH staff toured the various areas of the school with school officials to help select sampling sites. There are a total of 14 ventilation systems in the building. Seven indoor air sample locations were selected to represent various areas of the school and different ventilation systems. One outdoor location was sampled. Sample locations are shown on Figure 1. Below is a list of the locations and selection rationale:

- Classrooms 138, 148 and 127. These classrooms are located in different wings of the building and each is served by a different ventilation system;
- Library, gymnasium and cafeteria. These large non-classroom areas are located in different wings of the building and each is served by a different ventilation system;
- Gym Store Room. This room has a soil gas monitoring point in the floor and was tested to provide a direct comparison with the co-located soil gas point; and
- An outdoor air sample was collected from the courtyard area northwest of the gymnasium exit to provide a comparison with indoor air samples and the outdoor air sample at EFA.

Three indoor samples and one outdoor sample were collected at EFA. The sample locations were from similar areas as those chosen in SHS. Indoor sample locations at EFA included the library, the gymnasium, and classroom 122, each served by a different ventilation system.

2.2 Sample Site Preparation

A. Soil Gas

In late April 2000, soil gas wells were installed through the concrete floor in three rooms in the SHS building including the pool filter room, the boiler room and the gym storage area. The gym storage area is located under the pool bleachers. The wells were installed by drilling a ¾-inch hole with a rotary hammer drill through the concrete and into the sub-slab aggregate material. A ¼-inch internal diameter teflon tube was inserted through the hole into the aggregate material below the concrete floor slab. Eight to fifteen inches of tubing was left above the floor to allow sampling apparatus connection and sample collection. The space between the drill-hole annulus and the tube was sealed with a bentonite slurry to prevent air exchange between the soil gas and the room.

B. Air Sampling

The selected air sampling locations were inspected the afternoon prior to sample collection to ensure there were no materials or products present that might interfere with the sample analysis. A photoionization detector (PID) was used to "screen" areas for organic vapors at the time samplers were set up.

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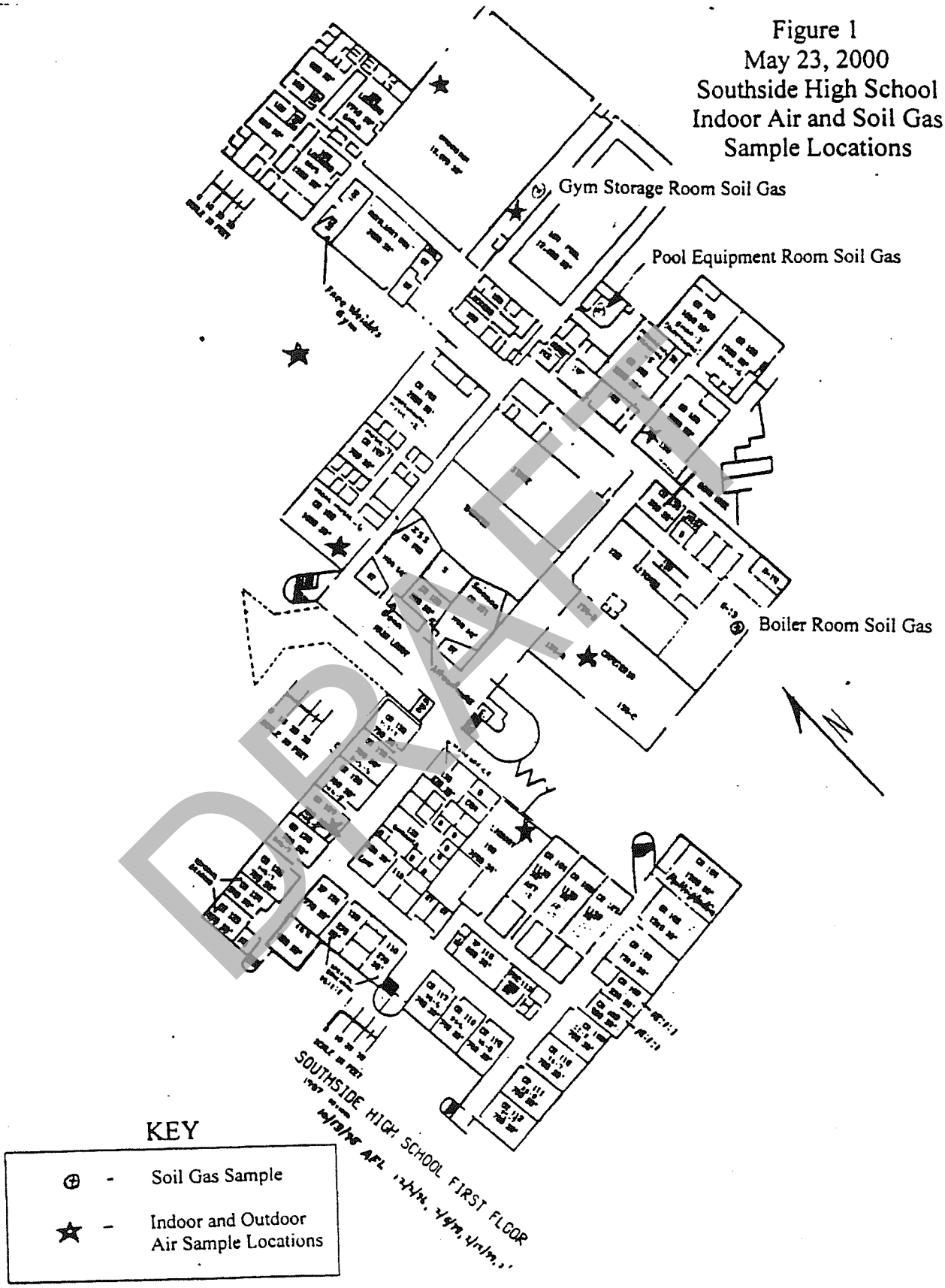
Figure 1
May 23, 2000
Southside High School
Indoor Air and Soil Gas
Sample Locations



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2.3 Sample Collection, Sampling Apparatus and Methods

A. Portable Photoionization Detector (PID)

Photovac™ 2020 portable PIDs with 10.6 eV lamp were utilized for the investigation. The PIDs provide real-time or instantaneous readings of total respondable organic vapors in parts per million (ppm). The PID responds to most petroleum compounds including benzene, toluene and xylene and some chlorinated solvents such as trichloroethene and tetrachloroethene. The PID does not respond well to methane, chloroform and Freon compounds. The instruments were calibrated with a 10-ppm isobutylene calibration gas standard and using outdoor air as the zero baseline. Water vapor that contains mineral salts can produce false positive readings on the PIDs.

Soil gas was monitored with the PID on several occasions beginning on April 28 after the soil gas wells were installed. Additional readings were obtained in two wells on May 2. All three soil gas wells were monitored on May 23 just prior to collecting samples for laboratory analysis. The PID, which draws approximately 0.3 liters per minute, was used to purge the soil gas tube prior to sample collection. The volume of a 24-inch long, ¼-inch internal diameter tube is approximately 77 cubic centimeters. Soil gas was drawn through the PID for about 1 minute (300 cubic centimeters) allowing for the purging of almost four tube volumes before each sample was collected. PID readings were recorded at the end of 1 minute before each Summa canister sample was collected.

B. Summa Canisters

Air sampling was performed in accordance with the NYSDOH Indoor Air Sampling and Analysis Protocol. Air samples were collected using 6-liter Summa canisters that were fitted with flow restrictors to collect air over a two-hour period. Samples are analyzed using the NYSDOH VOLA-CAN 3 and VOLA-CAN 4 methods for 69 volatile organic compounds (see Table 1). These methods are similar to the EPA TO-15 analytical method. The method involves direct injection of air from the Summa canister onto a gas chromatograph (GC) column with a mass spectrometer (MS) detector. Depending on the molecular weight of the compound, the reporting limits are generally 1 to 3 micrograms of chemical per cubic meter of air ($\mu g/m^3$). samples are analyzed for the 69 volatile organic compounds listed in Table 1.

Summa canisters were connected to the soil gas tubes with a stainless steel barbed fitting containing the flow restrictor. For the indoor air samples, the canisters were placed at typical breathing height at the selected locations. Outdoor samples were set to be away from likely contaminant sources such as parked cars.

C. Solomat™ IAQ Surveyor II

The Solomat™ IAQ Surveyor II indoor air quality monitor was used for several aspects of the investigation. The Solomat is capable of measuring general indoor air quality (IAQ) parameters including carbon dioxide, carbon monoxide, temperature and relative humidity. The meter can be fitted with a differential air pressure probe and can be used measure up to 7,000 pascals relative pressure difference between two points with a resolution of 0.1 pascals (1 inch water column = 263 pascals, 1 pound per square inch (psi) = 6,860 pascals). The probe has two lengths of ¼-inch tubing which can be placed in the two locations where the relative pressure is to be obtained (connected to a soil gas tubes or placed under a doorway, etc.). The meter provides the relative pressure reading and the direction of pressure gradient. Calibration involves connecting the two tubes and performing a zero adjustment.

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Table 1. List of volatile organic chemical analytes by the Summa canister method.

VolCan-3	VolCan-4
Dichlorodifluoromethane (Freon-12)	Ethyl Alcohol
1, 2-Dichlorotetrafluoroethane	Isoprene
Chloromethane	Acetone
Vinyl Chloride	Methyl-tert-Butyl Ether (MTBE)
Bromomethane	n-Hexane
Chloroethane	2, 4-Dimethylpentane
Trichlorofluoromethane (Freon-11)	2-Butanone (MEK)
1, 1, 2-Trichlorotrifluoroethane (Freon 113)	2, 3-Dimethylpentane
1,1-Dichloroethene	Tetrahydrofuran
Methylene Chloride (Dichloromethane)	Cyclohexane
1, 1-Dichloroethane	Isooctane
Cis-1, 2-Dichloroethene	n-Heptane
Chloroform	Benzene
1, 1, 1-Trichloroethane	Methylcyclohexane
Carbon Tetrachloride	Methylmethacrylate
1, 2-Dichloroethane	4-Methyl-2-Pentanone (MIBK)
Trichloroethene	n-Octane
1, 2-Dichloropropane	Toluene
Cis-1, 3-Dichloropropene	Ethylmethacrylate
Trans-1, 3 - Dichloropropene	Cycloheptane
1, 1, 2-Trichloroethane	Ethylcyclohexane
Tetrachloroethene	n-Nonane
1, 2-Dibromoethane (EDB)	Ethylbenzene
Chlorobenzene	m/p-Xylene
1, 1, 2, 2 - Tetrachloroethane	o-Xylene
1, 3-Dichlorobenzene	Styrene
1, 4-Dichlorobenzene	a-Pinene
1, 2-Dichlorobenzene	Isopropylbenzene (Cumene)
1, 2, 4-Trichlorobenzene	n-Decane
Hexachlorobutadiene (C-46)	n-Propylbenzene
	1, 3, 5-Trimethylbenzene
	tert-Butylbenzene
	1, 2, 4-Trimethylbenzene
	d-Limonene
	sec-Butylbenzene
	1, 2, 3-Trimethylbenzene
	n-Undecane
	n- Butylbenzene
	n- Dodecane

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General IAQ parameters were spot-checked in several areas on both May 22 and May 23 to get an indication of indoor air quality. On May 2 and again on May 23, differential pressure measurements between the building and the soil gas were obtained in soil gas wells with a Solomat IAQ Surveyor to determine whether there was a pressure gradient into the building. On May 23, the Solomat was also used to pressure map a number of areas of the SHS building.

3.0 Evaluation Criteria

A. Volatile Organic Chemicals

Results from the analysis of indoor and outdoor air and soil gas samples are compared to typical indoor and outdoor air background ranges. Background ranges are obtained from two databases. The United States Environmental Protection Agency (EPA) Volatile Organic Compounds database (March 1988 update) is a compilation of indoor and outdoor data from studies of homes and offices across the United States. The NYSDOH database is a summary of indoor and outdoor air sample results for control homes collected and analyzed by the NYSDOH from 1989 through 1996. These studies exclude sample locations where there were known spills or unusual sources of chemicals. The 25% to 75% ranges represent the middle half of the results in the databases. It is not uncommon for some results to be lower than the 25% level or higher than the 75% levels from either database.

For particular compounds where background indoor air database information was not available, outdoor air database information was used for comparison. Where background database information was not available or there were less than 10 data points comprising the statistics, the results from SHS were compared to the results from EFA.

B. General IAQ Parameters

1. Carbon Dioxide (CO_2)

One indicator used to assess indoor air quality is the level of CO_2 in rooms that have been normally occupied for an extended period. The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) 62-1999 Standard indicates that "[c]omfort (odor) criteria with respect to human bioeffluents are likely to be satisfied if the ventilation results in indoor CO_2 concentrations less than 700 ppm above the outdoor air concentration. The method used most often to control the buildup of CO_2 and other contaminants is the dilution of indoor air with outdoor air. The ASHRAE 62-1999 standard recommends 15 cubic feet per minute of outside air per person for a classroom. These recommendations are consistent with those recommended by the Environmental Protection Agency's (EPA) Tools for Schools Action Kit.

2. Temperature and Relative Humidity

ASHRAE Standard 55-1992 provides detailed guidelines for thermal comfort. In general, temperatures for winter conditions should be 68°F to 74°F and summer conditions temperatures should be between 73°F to 79°F with relative humidity levels ranging between 30% and 60%.

3. Carbon Monoxide

Carbon monoxide is a combustion by-product that can cause serious short-term health problems and death at high levels. Indoor air levels are typically similar to outdoor air levels unless there is a combustion source such as gas stoves or idling car in an attached garage. The National Ambient Air Quality Standard is 9 ppm.

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C. Pressure Differentials

Either natural or mechanically induced pressure gradients can cause soil gas to be drawn into a building. Measuring pressure differential can indicate the magnitude and direction of a pressure gradient between the soil gas and the building, different areas in a building and between the inside and outside of the building shell. Low level pressure differences of 0 to 4 pascals are common in a building. Ventilation systems, bathroom or other exhausts, wind, temperature changes and openings in the building shell such as doors and windows can affect pressure differentials in a building.

4.0 Results and Discussion

A. Soil Gas

1. PID Readings

PID readings of soil gas from under the SHS concrete floor through the ¼-inch teflon tubes are shown in Table 2. The readings, which were taken on the three different dates, varied slightly and were higher than ambient or general room air, indicating there may have been some type of organic vapors present in the soil gas. From the analytical results discussed below, it is notable that the pool filter room soil gas, where the PID reading was the lowest, contained higher levels of chloroform and Freon compounds. The PID does not respond well to chloroform or Freon compounds. The PID readings could be due to interference. Water vapor that contains mineral salts can produce false positive readings on the PIDs.

Table 2. PID readings (ppm) of soil gas at Southside High School.

Date	Location		
	Pool Filter Room	Boiler Room	Gym Storage Room
April 28, 2000	0	2.5	2.2
May 2, 2000	0.5	1.5	Not measured
May 23, 2000	0.8	2.3	1.8

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2. Volatile Organic Chemicals

Results from analysis of soil gas samples collected in Summa canisters on May 23 are shown in Table 3. Chemicals that were not detected are not listed in the table. Several groups of chemical compounds were detected in soil gas samples at levels above typical background for indoor air.

- Four aliphatic hydrocarbon compounds (2,3-dimethylpentane, n-decane, n-undecane and n-dodecane) were present at slightly elevated concentrations about 2 to 5 times typical background for indoor air. These compounds can be associated with petroleum. No aromatic hydrocarbons or other petroleum-related compounds were reported at elevated concentrations;

Table 3. Volatile organic chemicals (VOCs) in soil gas at Southside High School, Elmira, Chemung County. All results are micrograms per cubic meter ($\mu g/m^3$).

Compound	Southside High School			Background			
	Soil Gas			EPA Database[1]		NYSDOH Database[2]	
	Pool Filter Rm	Boiler Room	Gym Store Rm	Indoor[3]	Outdoor[3]	Indoor[3]	Outdoor[3]
ethyl alcohol	6.9	8.7	2.5	NA	NA	NA	NA
isoprene	<1.0	<1.0	<1.0	NA	NA	NA	NA
acetone	9.4	16	3.8	10.7 - 27	0 - 6.6	NA	NA
n-hexane	1.0 [PL]	<1.0	1.0 [PL]	ND - 4.0	2.9 - 10	<1.0 - 3.5	<1.0 - 1.8
2-butanone	1.4	2.2	1.0 [PL]	12.2 - 42	ND	NA	NA
2,3-dimethylpentane	9.6	3.3	3.4	NA	0.6 - 4.5	NA	NA
cyclohexane	*1.0 [PL]	<1.0	<1.0	1.5 - 8.0	0.6 - 2.5	NA	NA
n-heptane	1.9	1.2	<1.0	4.5 - 6.0	1.5 - 2.5	NA	NA
benzene	1.1	1.5	1.0 [PL]	3.3 - 21	2.0 - 11	1.6 - 5.0	0.9 - 4.9
4-methyl-2-pentanone	1.0 [PL]	1.0 [PL]	<1.0	NA	NA	NA	NA
toluene	1.5	1.0 [PL]	1.1	32	0.6 - 20	6.6 - 25	1.2 - 5.6
n-nonane	2.7	1.0 [PL]	1.4	0.4 - 6.3	0.7 - 3.2	NA	NA
m/p-xylene	1.1	1.0 [PL]	1.0 [PL]	6.4 - 25	2.3 - 14	2.2 - 9.5	0.8 - 5.0
o-xylene	1.0 [PL]	1.0 [PL]	1.0 [PL]	2.0 - 9.2	1.0 - 6.5	1.9 - 5.0	0.8 - 5.0
a-pinene	22	<1.0	<1.0	0.3 - 3.1	0.1 - 1.5	NA	NA
n-decane	10	5.9	10	0.5 - 4.1	0.3 - 4.0	NA	NA
1,2,4-trimethylbenzene	2.3	1.0 [PL]	1.4	0.6 - 4.0	2.8 - 7.4	2.2 - 7.0	0.5- 5.0
d-limonene	8.3	1.8	4.8	NA	NA	NA	NA
n-undecane	14	4.5	12	0.7 - 3.9	0 - 4.0	NA	NA
n-dodecane	15	9.9	5.9	0 - 2.3	0 - 2.9	NA	NA
dichlorodifluoromethane	140	450	23	NA	1.6 - 1.7	<1.0	<1.0
chloromethane	1.0 [PL]	1.5	1.0 [PL]	NA	1.3 - 1.5	0.5 - 1.0	0.5- 1.3
bromomethane	1.0 [PL]	6.5	1.1	NA	0.2 - 12	<1.0	<1.0
trichlorofluoromethane	7.3	50	2.1	NA	1.0 - 1.2	0.5 - 3.3	<1.0
1,1,2-trichlorotrifluoroethane	>1000	16	27	NA	0.5 - 2.5	<1.0	<1.0
1,1-dichloroethene	2.6	<1.0	<1.0	ND	ND	<1.0	<1.0
methylene chloride	3.2	1.0 [PL]	<1.0	NA	1.1 - 6.3	1.5 - 5.6	0.5 - 3.7
cis-1,2-dichloroethene	1.1	<1.0	<1.0	NA	ND	0.5 - 5.0	0.5 - 5.0
chloroform	>1000	1.0 [PL]	5.4	ND - 3.4	0.1 - 0.9	0.5 - 4.4	0.5 - 2.4
1,1,1-trichchloroethane	12	2.7	55	3.0 - 30	0.2 - 3.4	2.5 - 6.7	1.0 - 2.8
trichloroethene	325	150	14	ND - 4.5	0.1 - 2.6	0.5 - 2.7	0.5 - 2.7
tetrachloroethene	14	70	3.2	1.7 - 11	0.8 - 5.9	0.8 - 5.0	0.8 - 3.4

[1] The United States Environmental Protection Agency Volatile Organic Compounds Database (EPA database) was published in March1988. This database is a compilation of indoor and outdoor data from studies across the United States.

[2] The New York State Department of Health Database (NYSDOH Database) is a summary of indoor and outdoor air sample results in control homes collected and analyzed by the NYSDOH from 1989 through 1996.

[3] The levels are the 25th percentile to 75th percentile, (middle half), of the data from the EPA and NYSDOH databases. These databases are comprised of air testing results from studies where there were no known sources of chemicals or chemical spills.

< Means "less than". The number following a "less than sign" (<) is the lowest level the laboratory test can reliably measure (detection limit). If there is a "<" before any number, then the chemical was NOT detected in your sample.

[PL] - Present, but less than the level indicated.

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- Three Freon compounds [dichlorodifluromethane (Freon 12), trichloromethane (Freon 11) and trichlorotrifluromethane (Freon 113)] were detected at elevated concentrations in the three soil gas points. Freon 113 was reported at the highest concentration in soil gas from under the pool filter room. Freon compounds are typically used as refrigerants and as solvents; and

- Several chlorinated solvent compounds (chloroform; 1,1,1-trichloroethane; trichloroethene; and tetrachloroethene) were detected at elevated concentrations in the three soil gas points.

- Chloroform was reported at the highest concentration in soil gas from under the pool filter room.

3. Pressure Differentials

Pressure differential readings from the soil gas wells taken on both May 2 and May 23 were minimal (0 to 2 pascals) indicating that there were no substantial pressure gradients drawing soil gas into the building.

B. Indoor and Outdoor Air

1. PID Readings

No elevated PID readings were observed in areas of the school occupied by students. Some higher readings were observed near products in the boiler room. Readings of 5 ppm were observed directly above the fuel tank cap on a grass trimmer and up to 50 ppm near a container of floor stripper.

2. Volatile Organic Chemicals

Results from analysis of indoor and outdoor air samples collected in Summa Canisters on May 23 are shown in Table 4. Chemicals that were not detected are not listed in the table. Results are not reported for the outdoor air sample at EFA because the sampling canister was missing at the end of the sampling period, so there was no sample to analyze. Most compounds detected in both SHS and EFA were in the range of typical background. Several compounds were detected in indoor air samples at levels just slightly above typical background levels:

- 4-Methyl-2-pentanone, also known as methyl-iso-butyl-ketone or MIBK, was detected in three rooms in SHS and in the gym at EFA. Levels were slightly higher than the method detection limit and the levels in SHS were slightly higher than the level in the EFA gym. No typical background values available for this compound.

- N-decane and n-undecane, two aliphatic hydrocarbon compounds, were present at about twice background concentrations in the physics room. No aromatic or other petroleum-hydrocarbon compounds were reported at elevated concentrations in the indoor air samples.

- Dichlorodifluromethane (Freon 12) was detected in all samples from both schools including the SHS outdoor air sample. Most of the levels are similar to the outdoor background range reported in the EPA database. Levels were two to three times higher in the music room, library and in room 127 in SHS. Higher levels of this compound were found in the soil gas samples from under SHS.

- The two other Freon compounds and four chlorinated hydrocarbon compounds found in the soil gas samples were not present at levels above typical background in the indoor air.

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Table 4. Volatile organic chemicals (VOCs) in indoor air at Southside High School, Elmira, Chemung County. All results are micrograms per cubic meter ($\mu g/m^3$).

Compound	Southside High School								Elmira Free Academy			Background			
	Indoor Air								Indoor Air			EPA Database[1]		NYSDOH Database[2]	
	Gym Store Room	Gym	Physics Room 138	Music Room 148	Library	Room 127	Caleteria	Outdoor	Library	Room 122	Gym	Indoor[3]	Outdoor[3]	Indoor[3]	Outdoor[3]
ethyl alcohol	6.7	6.1	45	75	145	175	200	3.9	25	70	260	NA	NA	NA	NA
isoprene	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.3	2.7	1.0 [PL]	<1.0	1.0 [PL]	1.5	2	NA	NA	NA	NA
acetone	5.7	1.0 [PL]	8.4	12	15	15	1.0 [PL]	3.6	7.6	9.8	13	10.7 - 27	0 - 6.6	NA	NA
n-hexane	1.0 [PL]	<1.0	1.4	1.0 [PL]	1.0 [PL]	1.0 [PL]	<1.0	1.0 [PL]	1.0 [PL]	1.0 [PL]	35	ND - 4.0	2.9 - 10	<1.0 - 3.5	<1.0 - 1.8
2-butanone	<1.0	1.0 [PL]	1.3	1.0 [PL]	1.2	1.1	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.1	<1.0	12.2 - 42	ND	NA	NA
2,3-dimethylpentane	<1.0	<1.0	1.0 [PL]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0 [PL]	2.5	NA	0.6 - 4.5	NA	NA
cyclohexane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	1.5 - 8.0	0.6 - 2.5	NA	NA
n-heptane	1.0 [PL]	<1.0	1.9	1.0 [PL]	1.6	1.2	<1.0	1.0 [PL]	1.0 [PL]	2.4	6.4	4.5 - 6.0	1.5 - 2.5	NA	NA
benzene	<1.0	1.1	1.4	1.1	1.2	1.1	1.2	1.0 [PL]	1.0 [PL]	1.2	1.6	3.3 - 21	2.0 - 11	1.6 - 5.0	0.9 - 4.9
4-methyl-2-pentanone	3.8	<1.0	<1.0	1.0 [PL]	3.1	3.3	<1.0	<1.0	<1.0	<1.0	1.4	NA	NA	NA	NA
toluene	14	1.6	5.9	2.7	2.8	2.8	1.6	1.4	3.5	2.1	9.1	32	0.6 - 20	6.6 - 25	1.2 - 5.6
n-nonane	<1.0	<1.0	3.2	1.0 [PL]	<1.0	1.0 [PL]	<1.0	<1.0	<1.0	1.0 [PL]	1.0 [PL]	0.4 - 6.3	0.7 - 3.2	NA	NA
m/p-xylene	1.0 [PL]	1.0 [PL]	1.6	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.3	6.4 - 25	2.3 - 14	2.2 - 9.5	0.8 - 5.0
o-xylene	1.0 [PL]	1.0 [PL]	1.1	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	2.0 - 9.3	1.0 - 6.5	1.9 - 5.0	0.8 - 5.0
a-pinene	1.0 [PL]	<1.0	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	<1.0	<1.0	<1.0	<1.0	1.0 [PL]	0.3 - 3.1	0.1 - 1.5	NA	NA
n-decane	4.3	<1.0	7.8	1.9	4.7	2.5	1.7	<1.0	<1.0	3.4	2.9	0.5 - 4.1	0.3 - 4.0	NA	NA
1,2,4-trimethylbenzene	1.0 [PL]	1.0 [PL]	1.5	1.0 [PL]	1.1	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	0.6 - 4.0	2.8 - 7.4	2.2 - 7.0	0.5 - 5.0
d-limonene	1.0 [PL]	<1.0	1.2	1.2	1.7	3.4	3.2	<1.0	1.0 [PL]	1.1	5.9	NA	NA	NA	NA
n-undecane	1.2	<1.0	5.9	1.0 [PL]	1.3	1.8	1.0 [PL]	1.6	1.0 [PL]	2.6	2.1	0.7 - 3.9	0 - 4.0	NA	NA
n-dodecane	<1.0	1.0 [PL]	1.2	<1.0	<1.0	<1.0	<1.0	2.4	<1.0	<1.0	<1.0	0 - 2.3	0 - 2.9	NA	NA
dichlorodifluoromethane	2.5	2.2	4.7	6.1	8.7	6.5	2.7	2.1	2.2	2.1	3.9	NA	1.6 - 1.7	<1.0	<1.0
chloromethane	1.0 [PL]	1.0 [PL]	1.1	1.1	1.1	1.1	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.2	NA	1.3 - 1.5	0.5 - 1.0	0.5 - 1.3
bromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	0.2 - 12	<1.0	<1.0
trichlorofluoromethane	1.0 [PL]	1.0 [PL]	4.1	2.1	1.9	1.8	1.4	1.1	1.5	1.8	8.8	NA	1.0 - 1.2	0.5 - 3.3	<1.0
1,1,2-trichlorotrifluoroethane	1.0 [PL]	1.0 [PL]	<1.0	1.1	1.0 [PL]	1.0 [PL]	<1.0	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	NA	0.5 - 2.5	<1.0	<1.0
1,1-dichloroethene	<1.0	<1.0	1.0 [PL]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND	<1.0	<1.0
methylene chloride	<1.0	<1.0	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	1.0 [PL]	<1.0	1.0 [PL]	NA	1.1 - 6.3	1.5 - 5.6	0.5 - 3.7
cis-1,2-dichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0	1.0 [PL]	<1.0	<1.0	<1.0	<1.0	<1.0	NA	ND	0.5 - 5.0	0.5 - 5.0
chloroform	1.2	1.0 [PL]	2.6	1.6	1.0 [PL]	1.2	1.0 [PL]	<1.0	<1.0	<1.0	1.0 [PL]	ND - 3.4	0.1 - 0.9	0.5 - 4.4	0.5 - 2.4
1,1,1-trichchloroethane	1.0 [PL]	1.0 [PL]	2.1	1.0 [PL]	1.0 [PL]	1.0 [PL]	<1.0	<1.0	<1.0	<1.0	<1.0	3.0 - 30	0.2 - 3.4	2.5 - 6.7	1.0 - 2.8
trichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0	1.0 [PL]	<1.0	<1.0	<1.0	<1.0	<1.0	ND - 4.5	0.1 - 2.6	0.5 - 2.7	0.5 - 2.7
tetrachloroethene	<1.5	1.5 [PL]	1.5 [PL]	1.5 [PL]	<1.5	1.5 [PL]	1.5 [PL]	<1.5	<1.5	<1.5	<1.5	1.7 - 11	0.8 - 5.9	0.8 - 5.0	0.8 - 3.4

[1] The United States Environmental Protection Agency Volatile Organic Compounds Database (EPA database) was published in March1988. This database is a compilation of indoor and outdoor data from studies across the United States.

[2] The New York State Department of Health Database (NYSDOH Database) is a summary of indoor and outdoor air sample results in control homes collected and analyzed by the NYSDOH from 1989 through 1996.

[3] The levels are the 25th percentile to 75th percentile, (middle half), of the data from the EPA and NYSDOH databases. These databases are comprised of air testing results from studies where there were no known sources of chemicals or chemical spills.

< Means "less than". The number following a "less than sign" (<) is the lowest level the laboratory test can reliably measure (detection limit). If there is a "<" before any number, then the chemical was NOT detected in your sample.

[PL] - Present, but less than the level indicated.

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3. General IAQ Parameters

CO_2 readings in several occupied classrooms in SHS on the afternoon of May 22 ranged up to 1,200 ppm, slightly above the calculated ASHRAE guideline of 1,100 ppm (700 ppm above the outdoor concentration of 400 ppm). The classrooms were occupied with 14 to 20 students and are located in the southwest wing that is served by Air Handling Units (AHU) 12, AHU 13 and AHU 14. A CO_2 reading in the supply diffuser in Room 111 was 980 ppm indicating that there was minimal outdoor air in supply air at the time the measurements were taken. CO_2 readings ranged from about 400 to 650 ppm in unoccupiedclassrooms in the east wing where Rooms 137 to 147 are located. Additional readings taken on the morning of May 23 were lower. CO_2 readings in southwest wing classrooms were all less than 1,000 ppm. CO_2 readings in the gym while fully occupied ranged from 540 ppm to 600 ppm indicating adequate ventilation there.

Carbon monoxide levels were in the range of 0 to 2 ppm in SHS. Carbon monoxide levels were initially not detected and increased slightly throughout the morning. The levels were slightly higher near the kitchen. The use of gas cooking equipment there is the likely source of the carbon monoxide.

The temperature and relative humidity in the SHS classrooms ranged from 70°F to 72°F and 67% to 68% respectively. The relative humidity was slightly above that recommended by ASHRAE. Outdoor conditions at the time were humid and the heating, ventilating and air conditioning (HVAC) systems were not yet switched to air conditioning mode. In addition, there was positive air pressure from the poolroom, which can increase humidity levels. However, many of the readings were observed in the far end of the building away from the pool.

CO_2 readings in occupied classrooms in EFA were measured during the afternoon of May 23. Levels were generally below 1,100 ppm with the exception of a few locations. CO_2 readings were up to 1,250 ppm on the inside wall in Room 111 with 25 students in the room. The CO_2 readings were lower on the window side of Room 111 where the univent was located. Room 111 is a large classroom and it appears that there is less air circulation near the hallway side of the classroom. CO_2 readings up to 1,300 ppm were measured in the corridor during class change. This may be due to the short-term high occupant density during class change and the fact that ventilation is provided by individual classroom univents.

4. Pressure Mapping

Pressure differential readings between the inside and outside of the building showed that the building is slightly pressurized in most areas. Positive pressure differential minimizes the potential for drawing air from unplanned areas including soil gas. Most pressure differences between rooms and hallways and between areas served by different ventilation systems were minimal (less than 4 pascals). There were stronger pressure differences in the poolroom and the main gym into the hallway. The exterior walls of the poolroom and the main gym were on the windward side of the building and the increase in pressure differences may have been affected by the wind.

5.0 Conclusions

A. Chemicals in Indoor Air

To determine exposure to a chemical one must consider not just the presence of the chemical, but how a person might be exposed. Exposure requires direct contact with contaminated material by swallowing it (ingestion), breathing vapors (inhalation), or by absorbing it through the skin (dermal

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contact) following direct contact. In this situation, the most likely potential route of exposure to the petroleum present under SHS would be through inhaling petroleum vapors.

In order for indoor air in SHS to be affected by the petroleum contamination, several things would need to occur: (1) the petroleum must migrate near or under the school, (2) vapors from the petroleum must travel through the soil and then (3) be drawn into the school through openings in the foundation so people could breath the vapors. The NYSDEC determined that No. 4 fuel oil contamination extended under SHS about 15 feet below ground. The results of the soil gas testing did not show petroleum vapor contamination under the concrete floor of SHS. Most petroleum-related compounds in the soil gas samples were in the range of typical background for indoor air; several petroleum hydrocarbons were slightly elevated in the soil gas samples. Pressure differential readings between the soil gas wells and the indoor air were minimal indicating that there were no substantial pressure gradients drawing soil gas into the building. Most petroleum compounds were either not detected or were present at expected levels in the indoor air. Based on these findings, indoor air in SHS is not being affected by petroleum contamination that may be under the school. Several compounds were present in the school at concentrations slightly higher than typical background, but their presence is not unusual and exposure at the reported levels is not expected to be a health concern.

Several Freon and chlorinated solvent compounds were detected at elevated levels in the soil gas samples collected from under the SHS concrete floor. Freons are typically used as refrigerants and as cleaning solvents. Their presence may be related to their use at the school. Chloroform, which was found at the highest level under the pool filter room, may be a chlorination by-product and may be related to the swimming pool. 1,1,1-Trichloroethane; trichloroethene; and tetrachloroethene are typically used as cleaning solvents. Further investigation would be needed to identify the sources of these compounds in the soil gas.

B. General IAQ Parameters

Temperatures were generally within the thermal-comfort range considered acceptable by ASHRAE. Relative humidity was on the high end of the recommended range. The higher relative humidity may have resulted from humid outdoor conditions at the time and because the HVAC systems were not operating in air conditioning mode. In addition, the influx of air from the poolroom may increase relative humidity in adjoining areas.

Higher CO_2 readings in some classroom areas indicate there may not be adequate outdoor air exchange in some ventilation zones. The HVAC systems operate on a Variable-Air-Volume (VAV) system design. VAV systems typically provide conditioned air as necessary to individual areas to modulate temperature in accordance with a thermostat set point. The VAV systems may not be adjusted to provide minimum outdoor air to individual areas (consistent with the current ASHRAE recommended guideline of 15 cubic feet per minute per person) if there is inadequate demand for temperature modulation.

Slight increases in the levels of carbon monoxide in the school are most likely from the kitchen cooking equipment. The levels are below the National Ambient Air Quality Standard of 9 ppm and are not considered a health concern.

C. Pressure Differentials and Pressure Mapping

The school was slightly pressurized. Slight pressurization of a building minimizes unintended airflow from soil gas or other potential contaminant sources. Pressure differential readings between soil

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gas and indoor were minimal indicating that there were no substantial pressure gradients drawing soil gas into the building. The poolroom was pressurized and was permitting air movement into the hallway. This has the potential to increase relative humidity and chlorination by-products in air in adjoining areas. No data were collected to measure the magnitude of this potential effect.

6.0 Recommendations

1. HVAC systems should be more thoroughly evaluated to determine whether they provide outdoor air consistent with the current ASHRAE guideline of 15 cubic feet per minute per person. If necessary, adjustments could be made to increase the amount of outdoor air.

2. The school could consider instituting an indoor air quality action plan consistent with that recommended by the EPA. The Tools for Schools Action Kit provides information and guidance necessary for implementing a plan to prevent indoor air quality problems and resolve such problems if they do arise. Any school board member or school administrator can order a kit free of charge by calling 1-800-438-4318.

3. Further investigation of past and present chemical use may help to identify the sources of elevated levels of Freons and chlorinated solvents in soil gas.

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New York State Department of Health

Air Investigation Update
Southside High School
Elmira, Chemung County
August 22, 2000

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Introduction

This report provides the results of additional air sampling for PCBs conducted on July 20, 2000 in the Southside High School. Findings for the indoor air investigation conducted on May 22 and 23, 2000 are provided in the New York State Department of Health's (NYS DOH) July 28, 2000 report.

In July, the presence of PCB Aroclors 1248 and 1260 were reported in preliminary sample results from soil samples collected at the Southside High School. Concentrations of PCBs above typical background were reported in two sub-surface samples located near the north end of the school. The New York State Department of Environmental Conservation (NYSDEC) will provide the soil sample results in a separate report.

Investigation

NYS DOH staff collected a total of five air samples (three indoor and two outdoors) for PCB analysis. Below is a list of the locations and selection rationale:

- Classroom 138 and boy's locker room. These rooms are located in the north end of the building close to the area where the PCBs were detected in subsurface soils.
- Library. This large non-classroom area is in the opposite wing of the building and is served by a different ventilation system and was chosen to provide a comparison location to the other two indoor locations.
- Outdoor north end of school. This location is near where the PCBs were detected in subsurface soils.
- Outdoor courtyard. This outdoor location was in an area away from where PCBs were found in the soil.

Methods

Samples were collected using NYS DOH method 311-1, PCBs in Air. Air was drawn through florisil tubes for a four-hour period. Flow rates were measured at the beginning, middle and end of the sample period and the average flow rate was used to calculate volume. Samples were delivered to the NYS DOH Wadsworth Center for analysis. Samples were extracted with

hexane and analyzed on a gas chromatograph with an electron capture detector. The samples were re-analyzed a second time after concentrating the sample to obtain a lower detection limit of 0.02 micrograms per cubic meter. The method reports results for PCB Aroclors 1221, 1016/1242, 1248, 1254, and 1260.

Evaluation Criteria

Sample results are compared to background levels of PCBs in air. The Agency for Toxic Substance Disease Registry (ATSDR) indicates the mean atmospheric (outdoor) concentration for PCBs in urban settings is 0.005 micrograms PCBs per cubic meter of air and the range as 0.001 to 0.01 micrograms per cubic meter. ATSDR also indicates that indoor air levels tend to be about 10 times higher than outdoor air levels. Therefore, typical indoor background ranges would be expected to be between 0.01 and 0.1 micrograms per cubic meter.

Results and Discussion

No PCB Aroclors were detected in the five air samples at the detection limit of 0.02 micrograms per cubic meter.

Conclusions

PCB contamination was not found in indoor or outdoor air at the Southside High School.

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REFERENCES

Agnecy for Toxic Substances Disease Registry (ATSDR). 1997. Toxicological Profile for Polychlorinated Biphenyls (Update). U.S. Department of Health and Human Services. Atlanta, Georgia: U.S. Public Health Service.

NYS Department of Health. July 28, 2000. Indoor Air Investigation, Southside High School, Elmira, Chumung County.

Air Investigation Update
Southside High School
Elmira, Chemung County
October 18, 2000

Introduction

This report provides the results of additional air sampling for volatile organic compounds (VOCs) and PCBs conducted on August 31, 2000 in the Southside High School. Findings for the indoor air investigations conducted on May 22 and 23, and July 20, 2000 are provided in the New York State Department of Health's (NYS DOH) July 28, 2000 report and subsequent August 22, 2000 update. Methods and evaluation criteria used during this additional testing were consistent with those described in the previous reports.

During the August 23 public meeting, questions about air testing in sub-grade classrooms were raised. The initial testing was performed in areas located on the first floor of the school. Unbeknownst to NYS DOH investigators, classrooms 151 and 149 and a storage area are located sub-grade under the auditorium. Floor plans and ventilation zone diagrams show classrooms 149 and 151 located on the first floor and serviced by air handling unit (AHU) No. 8. Air samples from classroom 148, another location within AHU No. 8, were collected May 23, 2000 and showed typical background range results for the chemicals tested. Nevertheless, to address the concerns about the untested basement areas, additional testing of soil gas, indoor air and outdoor air was performed. The testing methods and parameters were consistent with those performed during previous testing events.

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Investigation

NYS DOH staff collected four air samples for volatile organic compounds (VOCs) (one soil gas, two indoor and one outdoor) and two air samples for PCBs, (one indoor and one outdoor). Below is a list of the locations and selection rationale:

- Basement storeroom soil gas. This room is located between and central to basement level classrooms 149 and 151. Soil gas from this location should be representative of the basement areas. The sample was analyzed for VOCs.

- Classroom 151. The basement level classroom. The samples were analyzed for VOCs and PCBs.

- Library. This large non-classroom area served by a different ventilation system (AHU No.13) was chosen to provide a comparison location to the other indoor

location. This location was tested on previous occasions. The sample was analyzed for VOCs.

- Outdoor courtyard. This location represents outdoor conditions. This location was tested on previous occasions. The sample was analyzed for VOCs and PCBs.

Methods

Soil Gas

In August, Tony LaSorte, Health and Safety Coordinator for the school installed a soil gas point through the concrete floor of the basement level storeroom. The point was installed by drilling a ¾ inch hole with a rotary hammer drill through the concrete. A ¼ inch ID teflon tube was inserted through the hole into the material below the concrete floor slab. Approximately 8 inches of tubing were left sticking out of the hole. Bentonite clay was used to seal the space between the hole and the tube to prevent gasses from passing around the tube.

A photoionization detector (PID) was used to "screen" areas for organic vapors at the time samplers were set out. In addition, the soil gas well was monitored with a differential pressure meter to monitor the pressure gradient between the soil gas region under the concrete floor and the basement interior.

Soil gas samples were collected using 6-liter Summa canisters that were fitted with flow restrictors to collect air over a two-hour period. The summa canisters were analyzed using gas chromatography with a mass spectral detector (GC/MS) for a total of 69 VOCs.

Air Sampling

The indoor air sample locations were selected to represent the basement classroom area and an area that had been sampled previously. The candidate locations were not inspected prior to testing.

A photoionization detector (PID) was used to "screen" areas for organic vapors at the time samplers were set out.

Air samples were collected using 6-liter Summa canisters that were fitted with flow restrictors to collect air over a two-hour period. The summa canisters were analyzed using GC/MS for a total of 69 VOCs. Air samples for PCBs were collected using NYS DOH method 311-1, PCBs in Air. The method reports results for PCB Aroclors 1221, 1016/1242, 1248, 1254, and 1260.

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Evaluation Criteria

The evaluation criteria are the same as that used to evaluate results in previous reports. Results from the analysis of VOCs in the indoor and outdoor air and soil gas samples are compared to typical indoor and outdoor air background ranges. Background ranges are obtained from two databases. The United States Environmental Protection Agency's Volatile Organic Compounds Database Update (EPA database, March 1988) is a compilation of indoor and outdoor data from studies of homes and offices across the United States. The New York State Department of Health Database (NYSDOH Database) is a summary of indoor and outdoor air sample results for control homes collected and analyzed by the NYSDOH from 1989 through 1996. PCB air sample results are compared to background levels of PCBs in air. The Agency for Toxic Substance Disease Registry (ATSDR) indicates the mean atmospheric (outdoor) concentration for PCBs in urban settings is 0.005 micrograms PCBs per cubic meter of air and the range as 0.001 to 0.01 micrograms per cubic meter. ATSDR also indicates that indoor air levels tend to be about 10 times higher than outdoor air levels. Therefore, typical indoor background ranges would be expected to be between 0.01 and 0.1 micrograms per cubic meter.

Results and Discussion

Soil Gas

The PID reading of soil gas from the tube under the basement storeroom was 0.0 ppm. The pressure gradient measured in the soil gas tube was zero with a fluctuation of less than 0.2 pascals, indicating that there were no substantial pressure gradients drawing soil gas into the building. Results from analysis of soil gas samples collected in Summa Canisters on August 31 are shown in the attached table. Several groups of chemical compounds were detected in soil gas samples at levels above background.

- Three Freon compounds including dichlorodifluromethane (Freon 12), trichlorofluoromethane (Freon 11) and trichlorotrifluromethane (F113) were detected at elevated concentrations.

- Several chlorinated solvent compounds were detected at elevated concentrations. 1,1,1-Trichloroethane and tetrachloroethene were slightly higher than the background ranges for outdoor air while trichloroethene was clearly higher than background.

These results were similar to what was found in the soil gas testing conducted in May, 2000.

Indoor Air

PID readings were not detected initially in the school ambient air in the basement storeroom and classroom 151. An increase in the PID reading to about 0.5 parts per million (ppm) was observed near the air fresheners in classroom 151, after which the

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meter showed a level 0.2 to 0.6 ppm. The meter was brought outdoors and the reading dropped to 0.0 ppm. Meter readings increased from 0.4 to 1.0 ppm upon entering the school and in the ambient air in the library. Inventory of the library showed a couple products that contain VOCs including correction fluid and sharpie permanent markers. No increase in PID readings was detected near these products and no direct causes for the readings were identified at that time.

Results from analysis of indoor and outdoor air samples collected in Summa Canisters on August 31 are shown in the attached table. Several groups of chemical compounds were detected in the indoor air samples at levels above background.

- Several petroleum-hydrocarbon compounds were reported at higher concentrations in the indoor air sample from the library. The levels ranged up to ten times the background range. The compounds are substituted aromatics. The occurrence of a group of chemicals that have similar chemical characteristics such as this likely indicates a product that contains an aromatic solvent such as paint or an adhesive.

- Acetone was found in both indoor air samples at a level slightly higher than the indoor background range. Acetone can be found in nail polish removers, some paint removers, some liquid or paste waxes and polishes and certain detergents and cleansers.

- Dichlorodifluromethane, also known as Freon 12, was detected in both indoor air samples and the outdoor air sample. The indoor air levels are slightly higher than the background ranges. Trichlorofluoromethane also known as Freon 11 was also found in classroom 151 at a level higher than the background range. Freons are typically used in air conditioning and refrigeration equipment.

No PCB Aroclors were detected in the indoor or outdoor air samples collected at the detection limit of 0.02 micrograms per cubic meter.

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Conclusions

The results of the sampling and pressure gradient testing of the soil gas well in the basement level storeroom were consistent with the previous findings. Freon compounds and some chlorinated solvent compounds were present in soil gas, but there is no measurable pressure gradient from the soil gas into the school. This is further supported by the fact that the chlorinated solvent compounds such as trichloroethene were not detected in the indoor air.

The presence of the aromatic compounds in the library is likely from some activity in the school. On the date the samples were collected, custodial staff indicated that they had been in the process of painting some lockers. A copy of the material safety data sheet for the paint being used shows a substantial percentage of trimethylbenzenes

and aromatic naphtha as hazardous ingredients. The paint is a likely source for the higher levels of aromatic compounds detected in the indoor air samples. Exposure to the aromatic hydrocarbons at the reported levels is not expected to be an acute health concern. As with any organic chemical, prudent measures should be taken to reduce exposures to the extent practicable.

Concentrations of solvent chemicals resulting from offgassing of products such as paints and polishes is expected to be highest immediately during and after application and decrease rapidly with time if ventilation is adequate. It is expected that the concentrations of chemicals associated with painting lockers would diminish with time.

PCB contamination was not found in indoor or outdoor air at the Southside High School.

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Agnecy for Toxic Substances Disease Registry (ATSDR). 1997. Toxicological Profile for Polychlorinated Biphenyls (Update). U.S. Department of Health and Human Services. Atlanta, Georgia: U.S. Public Health Service.

NYS Department of Health. July 28, 2000. Indoor Air Investigation, Southside High School, Elmira, Chumung County.

NYS Department of Health. August 22, 2000. Air Investigation Update, Southside High School, Elmira, Chemung County.

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Indoor Air Investigation Southside High School, Elmira, Chemung County on August 31, 2000. All results are micrograms per cubic meter ($\mu g/m^3$)

Compound	Southside High School							
	Indoor Air		Outdoor Air	Basement Soil Gas	EPA Database[1]		NYSDOH Database[2]	
	Basement Science Rm	Library			Indoor[3]	Outdoor[3]	Indoor[3]	Outdoor[3]
ethyl alcohol	30	25	1.9	<1.0	NA	NA	NA	NA
isoprene	1.4	1.2	1.1	<1.0	NA	NA	NA	NA
acetone	32	40	6.6	3.7	10.7 - 27	0 - 6.6	NA	NA
n-heptane	<1.0	1.1	1.9	<1.0	4.5 - 6.0	1.5 - 2.5	NA	NA
toluene	6.4	3.2	1.0 [PL]	1.0 [PL]	32	0.6 - 20	6.6 - 25	1.2 - 5.6
n-nonane	1.0 [PL]	1.0 [PL]	<1.0	<1.0	0.4 - 6.3	0.7 - 3.2	NA	NA
m/p-xylene	1.8	1.5	1.0 [PL]	1.0 [PL]	6.4 - 25[B]	2.3 - 14[B]	2.2 - 9.5	0.8 - 5.0
o-xylene	1.2	2.2	1.0 [PL]	1.0 [PL]	2.0 - 9.3	1.0 - 6.5	1.9 - 5.0	0.8 - 5.0
a-pinene	1.0 [PL]	4.9	<1.0	<1.0	0.3 - 3.1	0.1 - 1.5	NA	NA
isopropylbenzene	<1.0	1.3	<1.0	<1.0	ND - 0.8	ND	<10	<10
n-decane	1.9	2.7	<1.0	<1.0	0.5 - 4.1	0.3 - 4.0	NA	NA
n-propylbenzene	1.0 [PL]	6.1	1.0 [PL]	<1.0	ND	0.4 - 1.3	<10	<10
1,3,5-trimethylbenzene	1.7	19	<1.0	<1.0	ND - 5.4	0.2 - 2.5	<5.0	<5.0
tert-butylbenzene	1.2	8.3	<1.0	<1.0	ND	ND	<10	<10
1,2,4-trimethylbenzene	9.4	75	1.0 [PL]	<1.0	0.6 - 4.0	2.8 - 7.4	2.2 - 7.0	0.5- 5.0
d-limonene	1.2	1.9	<1.0	<1.0	NA	NA	NA	NA
1,2,3-trimethylbenzene	1.1	14	<1.0	<1.0	NA	NA	NA	NA
n-undecane	1.0 [PL]	4.9	<1.0	<1.0	0.7 - 3.9	0 - 4.0	NA	NA
dichlorodifluoromethane	12	8.7	2.6	280	NA	1.6 - 1.7	<1.0	<1.0
chloromethane	1.6	<1.0	<1.0	<1.0	NA	1.3 - 1.5	0.5 - 1.0	0.5 - 1.3
trichlorofluoromethane	12	2.9	2.1	8.9	NA	1.0 - 1.2	0.5 - 3.3	<1.0
1,1,2-trichlorotrifluoroethane	1.6	1.4	<1.0	65	NA	0.5 - 2.5	<1.0	<1.0
1,1,1-trichchloroethane	1.8	1.0 [PL]	<1.0	14	3.0 - 30	0.2 - 3.4	2.5 - 6.7	1.0 - 2.8
trichloroethene	<1.0	<1.0	<1.0	170	ND - 4.5	0.1 - 2.6	0.5 - 2.7	0.5 - 2.7
tetrachlorethene	1.5 [PL]	<1.5	<1.5	25	1.7 - 11	0.8 - 5.9	0.8 - 5.0	0.8 - 3.4

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[1] The United States Environmental Protection Agency s Volatile Organic Compounds Database (EPA database) was published in March1988. This database is a compilation of indoor and outdoor data from studies across the United States.

[2] The New York State Department of Health Database (NYSDOH Database) is a summary of indoor and outdoor air sample results in control homes collected and analyzed by the NYSDOH from 1989 through 1996.

[3] The levels are the 25th percentile to 75th percentile, (middle half), of the data from the EPA and NYSDOH databases. These databases are comprised of air testing results from studies where there were no known sources of chemicals or chemical spills.

< Means "less than". The number following a "less than sign" (<) is the lowest level the laboratory test can reliably measure (detection limit). If there is a "<" before any number, then the chemical was NOT detected in your sample.

[PL] - Present, but less than the level indicated.

28014 Suppt. Docs.
Elmira CSD.

New York State Department of Health
Center for Environmental Health

Health Consultation

SOUTHSIDE HIGH SCHOOL

City of Elmira
Chemung County, New York

DRAFT

September 30, 2003

Prepared under a Cooperative Agreement with

U.S. Department of Health & Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry

In an effort to reduce the costs of printing and postage, please notify us if you wish your name to be deleted from our mailing list or if your address has changed.

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DRAFT

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Flanigan Square, 547 River Street, Troy, New York 12180-2216

Antonia C. Novello, M.D., M.P.H., Dr.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

November 10, 2003

Dear Interested Party:

Enclosed is a copy of the final version of the Health Consultation for Southside High School in the city of Elmire, Chemung County. The New York State Department of Health (NYS DOH) developed this document in cooperation with the U.S. Agency for Toxic Substances and Disease Registry (ATSDR). This public health assessment summarizes environmental data, evaluates the public health implications of the site and makes recommendations for site-specific health activities.

The revised draft version of this public health assessment was distributed to area residents, environmental groups, and local officials in February, 2001. The public was invited to review the draft public health assessment and send comments to NYS DOH during the public comment period. The public comments and the NYS DOH responses are included in the final version of the document in Appendix G.

Also enclosed is a fact sheet on our updated examination of cancer incidence among current and former Southside High School students. The update includes the results of a survey sent to Southside alumni since the class of 1980, as well as to current students.

These reports will be discussed at a meeting of the Southside High School Citizens Advisory Committee at the High School on November 19 at 6:00 PM. In the meantime, if you have any questions about either report, please feel free to call us at the toll free number, 1-800-458-1158, extension 27850.

DRAFT

Sincerely,

G. Anders Carlson, Ph.D.
Director
Division of Environmental Health
Investigation
New York State Department of Health

Enclosures

P:\Users\gac01\southside.doc

SOUTHSIDE ADVISORY COMMITTEE MEETING: 11/19/03

AGENDA

1. Open - Mr. Kennedy

Reintroduction of the Citizens Advisory Committee

Purpose of the meeting

Format

Presentation

Questions

Action

2. Introduction of NYSDOH representatives

3. Presentation by NYSDOH

4. Committee Questions

5. Community Questions

6. Action Items

Committee dissolution.

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DOH

FACT SHEET
November 2003

UPDATE ON CANCER AMONG STUDENTS AT SOUTHSIDE HIGH SCHOOL, ELMIRA, NEW YORK, FOLLOWING AN ALUMNI SURVEY

Following a survey of alumni and current students, the New York State Department of Health (NYSDOH) has updated its study of cancer among current and former students of Southside High School in Elmira, New York. The original study was conducted in response to reports of an apparently high number of current and former students at the school who had cancer, and concerns over environmental contamination at the school and at a neighboring industrial property. The survey was undertaken in response to concerns that the previous study, which relied on reports from community members to identify former students who had developed cancer, may not have included some former students, especially if they had moved out of the area.

Alumni survey

The survey of Southside alumni and current students was undertaken in conjunction with the Elmira City School District. The school district contracted with Harris Publications Co., a company that compiles alumni directories, to obtain current address information on all Southside High School graduates since the school opened at its present location. Information obtained from Harris Publications was supplemented by school district information for alumni not listed or with no address listed in the Harris directory, current students, and students who had attended Southside High School between 1999 and 2002 but did not graduate from Southside.

Alumni survey

8477 surveys sent out
1918 returned as undeliverable
- 53 resent
1865 remained undeliverable

6612 surveys not returned as undeliverable (assumed to be delivered)

1748 surveys returned
7 ineligible

1741 eligible surveys received
20.5% of all surveys sent
26.3% of all not returned as undeliverable

The school district sent surveys to 8477 current and former students in April, 2002. The survey requested background information, and information on any diagnosis of cancer the student may have had. If reporting a cancer diagnosis, the student was also asked to provide information on physicians and hospitals treating the cancer, and to sign a medical release form authorizing the NYSDOH to obtain medical records, if necessary, from these health care providers. All students were asked to return the survey to the NYSDOH, whether or not they reported a diagnosis of cancer.

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Of the 8477 surveys sent out, 1918 were returned to the school district as undeliverable. Attempts were made to obtain additional address information, and 53 surveys were resent. This left a total of 6612 surveys sent out and not returned as undeliverable.

A total of 1748 surveys were returned to the NYSDOH by November 2002. Of these, seven were completed by individuals who had never attended Southside High School, or who had graduated prior to 1980, before the school had moved to its present location. This left a total of 1741 eligible surveys received, for a response rate of 20.5% out of all surveys sent, or 26.3% of surveys not returned as undeliverable.

Cancers reported

Cancer reports in the time covered by the update study were obtained from the alumni survey, as well as directly from students or their family members who contacted the NYSDOH or the Chemung County Health Department before the survey was sent out. In this period, 31 individuals were reported as having been diagnosed with cancer. Eighteen of these individuals were confirmed as having cancer based on information from the New York State Cancer Registry, which by law collects information on all individuals diagnosed with cancer in New York State. Five additional students were confirmed through medical records. Medical records obtained for six other individuals indicated that they did not have a reportable cancer (premalignant conditions such as cervical dysplasias, and the most common types of skin cancer are not reportable), and we were unable to obtain medical records for two.

Cancers reported: update period (August 2000 - November 2002)

31 reported from survey and directly
- **18 confirmed as cancer through Cancer Registry**
- **5 confirmed as cancer through medical records**
- **6 confirmed as not (reportable) cancer**
- **2 unable to confirm**

23 reported and confirmed
- **11 previously reported and confirmed**
- **12 not previously confirmed**
  - **2 out-of-state** (previously reported but unable to confirm)
  - **5 diagnosed prior to July 2000**
  - **5 diagnosed after July 2000**

Looking at those individuals reported and confirmed to have cancer during the update period, 11 had been reported and confirmed in our previous study, leaving 12 who had not previously been confirmed as having cancer. Of these, seven had first been diagnosed with cancer prior to the July 2000 cut-off date for the first study, including two who had been reported in the first study but not confirmed at that time since they were out-of-state residents. Five students were first diagnosed with cancer after the cut-off date.

Deceased students

To ensure that we had as complete a picture as possible of cancers among current and former students, it was necessary to obtain information on students who were deceased. Students known to be deceased were not sent surveys. Some student surveys were returned by the post office or by family members with the notation that the student was deceased. All students

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reported as deceased were therefore checked against New York State Vital Records death files to confirm the death and obtain information on its cause.

There were a total of 28 students reported as deceased. Twenty-four of these were New York State residents, and four had out-of-state addresses or the address was unknown. We were able to confirm the deaths and obtain information on cause of death for 20 of these individuals. While several of them had died of cancer, these were all individuals that we had been aware of through the previous investigation; there were no previously unknown deaths due to cancer.

Deceased students

28 reported as deceased
- **20 confirmed**
  - **NO previously unknown cancer deaths**
- **8 unable to confirm**
  - **4 NYS residents**
  - **4 out-of-state or unknown**

Combined cancer results

Information on cancers confirmed as a result of the alumni survey and from direct reports prior to the alumni survey was combined with information obtained in the previous investigation to obtain the most complete picture possible of cancer in current and former Southside High School students. This resulted in a total of 34 cancers reported and confirmed to be diagnosed in 33 individuals since the time they entered the high school (one individual was diagnosed with two separate cancers). The 34 cancers represented 14 different cancer types, with fewer than six cases of any one type (to protect patient confidentiality, exact numbers of cases of cancer can not be provided when they are fewer than six). The most frequently diagnosed cancer types included leukemias, lymphomas (both Hodgkin's disease and non-Hodgkin's lymphomas) and cervical cancer. These cancers are typically seen in young adults.

Combined cancer results

34 cancers in 33 students since first entering SHS (1980 - 2002)

14 different cancer types
- **leukemias, lymphomas, cervical most common**

56 expected 1980-2002

35 expected 1995-2002
- **26 cancers confirmed**

The total of 34 cancers confirmed compares with 56 cancers one would expect to be diagnosed in the time period 1980 through the first half of 2002, based on the sizes of the graduating and current classes. Looking at the most common cancer types separately, the numbers of confirmed cases were not statistically greater than what would be expected for any single cancer type. In the most recent time period studied, 1995 through the first half of 2002, a total of 35 cases were expected, while 26 were reported and confirmed. No single cancer type showed a statistical excess in this time period.

Testicular cancer has been of particular concern since the finding of an unusual number of young men with testicular cancer in the first study. The combined cancer results continue to show an unusual number of young men ages 15-19 diagnosed with testicular cancer in the most recent time period studied. Numbers of young men diagnosed with testicular cancer were not, however, statistically unusual for any other age group or time period.

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Summary

With the availability of results from a survey of alumni and current students, NYSDOH has updated its investigation of cancer among current and former students at Southside High School. The survey, when combined with direct reports received since the time of the first study, resulted in the identification of 12 additional students who have been confirmed to have developed cancer in the time since they entered Southside High School. No additional students with cancer were identified after following up on reports of students who were deceased. The total numbers of cancers diagnosed among current and former students and the numbers of the most common types of cancers were not statistically greater than expected in the entire time period studied, 1980-2002, or in the most recent period, 1995-2002. The previously noted excess in numbers of young men age 15-19 diagnosed with testicular cancer in the most recent time period was still observed, however no excess of testicular cancer was present in any other age group or time period.

For more information on this investigation or on cancer in general, or for a copy of the full report, please contact Aura Weinstein or Janice Rocklin of the Cancer Surveillance Program of the New York State Department of Health at (518) 474-2354 or (800) 458-1158 (ext. 42354)

11/2003

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Errata sheet

Health Consultation for Southside High School
September 30, 2003

Appendix G: Summary of Public Comments and Responses

Response 3.

Table footnotes should read as follows:

*e.g. construction or work on buried utilities
**Primary exposure through accidental ingestion, minor contribution through inhalation and dermal contact.
***In addition, maintenance workers or contractors involved in ground intrusive work may be exposed to contaminants.

Response 18

The following references were omitted:

Calabrese, E.J., R. Barnes, E.J. Stanek III, H. Pastides, C.E. Gilbert, P. Veneman, X. Wang, A. Lasztity and P.T. Kostecki. 1989. How much soil do young children ingest: An epidemiologic study. Reg. Tox. Pharm. 10: 123-137.

Davis, S., P. Waller, R. Buschbom, J. Ballou and P. White. 1990. Quantitative estimates of soil ingestion in normal children between the ages of 2 and 7 years: Population-based estimates using aluminum, silicon, and titanium as soil tracer elements. Arch. Env. Health 45: 112-122.

This errata sheet issued on November 19, 2003

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SUMMARY

The Southside High School is on South Main Street on land that straddles the border of the City of Elmira and the Village of Southport in Chemung County, New York. Since the 1880's, and prior to the school's construction in the late 1970's, the property was used by various industries. In 1995, fuel oil contamination was discovered on nearby Miller Pond, which is east of Southside High School. A New York State Department of Environmental Conservation (NYS DEC) investigation found that petroleum contamination extends from underneath the high school toward Miller Pond. The NYS DEC is using a technique called bioremediation to address the fuel oil contamination.

The Elmira City School Board received a letter from parents expressing concern about a perceived unusual number of cancers among current and former students at Southside High School. In responding to community concerns, the NYS DEC collected soil samples from the school grounds and the New York State Department of Health (NYS DOH) initiated a cancer study and collected indoor and ambient air samples inside the high school and soil gas samples under the school, assisted the NYS DEC with some soil sampling and evaluated data from the soil and air samples.

Three Freon compounds and several chlorinated solvents were detected at elevated concentrations in samples collected from three soil gas points. However, the indoor and ambient air testing results did not show a problem with chemical contamination. Most compounds were either not detected or were present at low levels. Several compounds were present at concentrations slightly higher than typical background, but their presence is not unusual and exposure at the reported levels is not expected to be a health concern.

The NYS DEC collected a total of 156 soil samples, including surface and subsurface soil, from the school grounds. To characterize potential exposures, surface soil samples were collected from areas of exposed soil, paths, high traffic areas or other areas where exposures were likely. Metals and low concentrations of volatile and semivolatile organic chemicals were detected in the surface soil samples collected from all areas. None of the metals detected in the surface soil sampling exceeded their public health assessment comparison values.

The average concentration of polychlorinated biphenyls (PCBs) in surface soil is higher than the range of average soil concentrations for total PCBs reported in a national soil monitoring program. Exposure to these soils could result in a somewhat higher level of exposure to these chemicals than would be expected from typical soils. The average concentrations of PCBs are less than public health assessment comparison values.

The average concentration of polycyclic aromatic hydrocarbons (PAHs) is somewhat below what was reported as the upper end of the range for urban background (1 to 3 milligrams per kilogram or mg/kg). Exposure to these soils could result in a level of exposure to these chemicals approaching the upper end of urban soils.

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Although elevated levels of arsenic, PAHs, and PCBs were detected in subsurface soil, chronic human contact to these contaminants is unlikely. Therefore, shallow subsurface soil at the Southside High School are not expected to pose a public health hazard. However, if these soils were brought to the surface and the contaminants were made available for long-term human contact, risks for adverse health effects for exposure to these contaminants could increase. Public exposures to shallow subsurface material can be minimized if precautions are taken when digging into subsurface material. These include minimizing direct contact with potentially contaminated material and not allowing subsurface soils to remain exposed at the surface.

Based on ATSDR's public health hazard category classification, the environmental conditions at Southside High School pose no apparent public health hazard. This classification is used because average levels of contaminants in surface soils do not exceed public health comparison values. Although a few samples exceed health comparison values, people are unlikely to be exposed frequently to soil at these locations and the associated health risks are unlikely to be significant. Nevertheless, because average levels of total PCBs exceed typical background levels and average levels of carcinogenic PAHs are somewhat below the upper range of background levels, exposures to these contaminants at Southside High School may be greater than those typically experienced from soil. Students, faculty, staff and the community are not currently being exposed to subsurface soil, although it contains chemicals at levels exceeding public health comparison values.

Several parents and members of the community have concerns about the incidence of cancer in the school. Several cancer types were cited, such as testicular cancer, colon cancer and leukemia. The NYS DOH investigated cancer among students attending the Southside High School from when the school opened in the Fall of 1979 to June 2000. The NYS DOH did not find an unusual pattern of cancer among current and former students, or among children living in the area served by the school. Although the number of cases is small, the study did confirm a higher than expected number of young men diagnosed with testicular cancer since 1997. The NYS DOH conducted a survey of past alumni of the school to update the study of cancer in current and former students of Southside High School. The NYS DOH plans to report on this activity in the fall of 2003.

This Health Consultation recommends that measures be taken to minimize the potential for human exposure to subsurface soils containing elevated concentrations of PCBs, PAHs, tetrachloroethene, and metals. These measures should include the development of a written soil management plan and possibly the institution of a deed notification or restriction. A soil management plan would provide protocols for the proper handling of soil during ground intrusive activities. This includes any activities that disturb material below paved areas and under buildings.

This Health Consultation also recommends that the school district review the recommendations in the indoor air investigation report to determine if additional actions may be warranted. For example, the report recommends that the school district consider instituting an indoor air quality

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action plan consistent with that recommended by the US EPA. The Tools for Schools Action Kit provides information and guidance for developing and implementing a plan to prevent indoor air quality problems and resolving such problems if they arise. The plan should address the possibility of contaminated soil gas being drawn into the building; one possible way of evaluating this is to include routine (e.g., seasonal) monitoring of pressure differentials between the soil gas and building interior.

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BACKGROUND AND STATEMENT OF ISSUES

Under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), the New York State Department of Health (NYS DOH) prepared this health consultation to evaluate the public health implications of exposures to soil at the Southside High School in the City of Elmira, Chemung County, New York. We also included information about the public health implications of indoor air samples collected at the Southside High School. The purpose of a health consultation is further outlined in the Forward.

On April 8, 2000, the Elmira City School Board received a letter from parents expressing concern about a perceived unusual number of cancers among current and former students at Southside High School. The school board asked the New York State Department of Environmental Conservation (NYS DEC) and the NYS DOH to attend a May 2, 2000 public meeting. At the meeting, the NYS DEC and NYS DOH explained what they knew about environmental conditions in the area near the school, discussed what actions they were planning to initiate and listened to concerns the community expressed. In responding to community concerns, the NYS DEC collected soil samples from the school grounds and the NYS DOH initiated a cancer study, collected indoor air samples inside the high school, assisted the NYS DEC with some soil sampling and evaluated data from the soil samples.

The Southside High School is on South Main Street on land that straddles the border of the City of Elmira and the Village of Southport in Chemung County, New York (See Figure 1, Appendix A). On the school property are the school building and grounds, including parking lots, a football/multiple use athletic field, baseball/soccer fields, tennis courts, volleyball courts, a basketball court and a playground.

Since the 1880's, and prior to the school's construction in the late 1970's, the property was used by various industrial facilities (URS Consultants, Inc., 2000). From 1887 to 1909, B.W. Payne & Sons produced high speed steam engines. Morrow Manufacturing made drill-chucks, machine parts, and a line of tools from 1909 to 1935. Remington Rand manufactured typewriter parts from 1936 until the facility closed in 1972. Westinghouse used the northern portion of the property mainly for warehousing from 1974 until 1977. Remington Rand deeded the property to the Southern Tier Economic Growth Agency in 1977. The new Southside High School was then built on the northern portion of the property.

In 1995, fuel oil contamination was discovered on nearby Miller Pond, which is east of Southside High School (Matrix Environmental Technologies, 1998). A NYS DEC investigation found that petroleum contamination extends from underneath the high school toward Miller Pond. On the school property, the petroleum contamination is at a depth of about 15 feet below the ground surface. The NYS DEC is using a technique called bioremediation to address the fuel oil contamination.

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The NYS DOH and NYS DEC collected soil gas samples, ambient air and indoor air samples at the school on several occasions. Three Freon compounds and several chlorinated solvents were detected at elevated concentrations in samples collected from three soil gas points. However, the indoor and ambient air testing results did not show a problem with chemical contamination. Most compounds were either not detected or were present at low levels. Several compounds were present at concentrations slightly higher than typical background, but their presence is not unusual and exposure at the reported levels is not expected to be a health concern. The reports on the soil gas and indoor air sampling are presented in Appendix B.

The NYS DOH investigated cancer among students attending Southside High School. The results of this investigation were presented at an August 2000 public meeting and are discussed in the health outcome data section of this health consultation. A complete report on the investigation is attached in Appendix C.

The Elmira Water Board supplies drinking water to the City of Elmira and surrounding area, including the school. The Elmira Water Board routinely tests the water, which meets all state and federal requirements for drinking water quality.

A. Site Visit

From May 9 to May 11, 2000, Mr. David Napier and Ms. Dawn Hettrick of the NYS DOH were at the Southside High School assisting NYS DEC staff collect soil samples from the school grounds. During that time, the weather was mostly sunny and warm so NYS DOH staff were able to observe many school-related and recreational activities on the school grounds. Throughout the day, students use the athletic facilities for physical education classes. After school, students use the various athletic fields for sports, members of the community use the school grounds to exercise, and community-based organizations (for example, Little League baseball) use the fields for sport activities. Some of the activities NYS DOH observed were people walking or running on the track, and sitting and stretching on the grass. NYS DOH staff also observed maintenance staff cutting the grass and grooming the athletic fields.

Large portions of the school property are covered by paved areas or the school building itself. Several other buildings, bleachers and the track cover other areas of the property. The majority of the rest of the property is covered by well-established grass. However, soil is exposed on well worn paths and on two old volleyball courts. The new volleyball court is covered with sand and areas on the baseball fields are covered with a reddish soil, which is different from surface soil on the remainder of the school property.

While assisting the NYS DEC in collecting soil samples, NYS DOH staff observed subsurface soil at the site. Based on visual observation, the top foot of soil across the school property appears to be topsoil. In most of the boreholes, a three to six inch layer of cinders was found from a depth ranging from about one foot to about three feet below the ground surface. Sporadically around the property, evidence of building material (such as brick) was found in

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subsurface soil. Discolored soils were also found in some of the boreholes. Ms. Hettrick also assisted NYS DEC with collecting soil samples on September 12 and 13, 2000. She observed similar soil conditions to those in May 2000. In addition, Dave Napier, NYS DOH, while attending a meeting of the Southside High School Citizens Advisory Committee in Elmira in October 2002, noted no major changes in conditions on the Southside High School Property.

B. Demographics

During the school year, the school serves grades 9 through 12 for the southern portion of the Elmira City School District. About 1300 students attended the school each year over the past several years. Based on enrollment data for the Southside High School, a total of about 9000 students attended the Southside High School at its present location. Also based on these data, the student population averages about 49% male and 51% female.

The NYS DOH estimated from the 1990 Census (US Bureau of the Census 1991) that 25,935 people live on the south side of the Elmira School District (that is, south of the Chemung River). This population is 94.3% white and 4.4% black. Based on the 1990 census, 8.9% of the population is under 6 years of age, 19.4% is 6-19 years of age, 56.8% is 20-64 years of age, and 14.9% is 65 years or older. In 1990, there were 5,573 females of reproductive age (ages 15-44) in the area. The median household income for the area was approximately $25,000 in 1989, with 13% of the population living below the poverty level (US Bureau of the Census 1992). The following chart compares these demographics with statewide averages.

	New York State	Elmira School District S.
Age Distribution		
<6	8.3%	8.9%
6-19	18.4%	19.4%
20-64	60.2%	56.8%
>64	13.1%	14.9%
Race Distribution		
White	74.4%	94.3%
Black	15.9%	4.4%
Other	9.7%	1.4%
Ethnicity Distribution		
Percent Hispanic	12.3%	1.6%
1989 Median Income	$32,965	$25,000
% Below Poverty Level	13.0%	13.0%

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DISCUSSION

A. Environmental Contamination

The NYS DEC collected 156 soil samples from the school grounds during five distinct sampling events from May to September 2000. Of these samples, 68 were surface soil samples and 88 were subsurface samples. The data from these samples are presented in Appendix D. Appendix D, Table 1 gives the sample location, the depth from which the sample was collected, and the date the sample was collected. Figure 1, Appendix D, shows where the sample was taken on the school grounds. The surface and subsurface soil data are summarized in Appendix E, Tables 1 and 2. This health consultation provides an evaluation of all the data presented in Appendix D. This health consultation does not evaluate data from off-site samples, for example, those collected from the adjacent American LaFrance or railroad properties. This health consultation also does not evaluate data from surface water (e.g., ponds) or groundwater samples. Likewise, data from the prior petroleum spill investigation are not evaluated in this health consultation.

Surface soil samples were collected from the ground surface to a depth of 3 inches. Based on visual evaluation of soil in each of the boreholes, soil to a depth of about one foot appears to be topsoil. The subsurface samples were collected from varying depths; most were collected from 6 inches to 12 feet with two more collected from a greater depth. Most subsurface soil samples were collected from soil that contained unusual material (cinders, stained soil, etc.). The presence of cinders and other visibly contaminated material is likely due to past industrial use of the property.

Environmental sampling data are compared to typical background levels and public health comparison values to help us determine whether contaminants should be evaluated further. When a chemical is at or below typical background levels, the chemical is generally not evaluated further. When a chemical is below health comparison values, the risks for experiencing adverse health effects are expected to be very low (cancer health effects) and minimal (non-cancer health effects) and the chemical is not evaluated further. For more information on health comparison values, please see Appendix F, *NYS DOH procedure for evaluating potential health risks for contaminants of concern.* Health comparison values are calculated for each contaminant medium and are dependent on the specific exposures appropriate to the setting. Because health comparison values are calculated for a specific exposure setting to evaluate potential health concerns from specific past, present or future exposures, they are often different from cleanup levels issued by other agencies. The specific assumptions used to calculate health comparison values are shown in the footnote to Table 1, Appendix E.

B. Exposure Pathways

To evaluate the potential exposures for students, staff, the community and visitors using the school grounds, the NYS DOH stipulated that surface soil samples should be collected from the

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surface to a maximum depth of three inches. Samples collected from the surface to a depth of three inches represent the zone to which the public could routinely be exposed under current site conditions. People would only be exposed to subsurface soils if they dig below the surface and if the subsurface soil is left at the surface. This section discusses surface soil (soil collected from the surface to a depth of 3 inches), shallow subsurface soil (soil collected from 6 inches below the surface to a depth of 4 feet) and deeper subsurface (soil collected from depths greater than 4 feet below the surface). The specific locations discussed in this section are shown on Figure1 (Appendix D).

Surface Soil

People using or maintaining the school property could be exposed to surface soils in all areas on the school grounds by sitting on the ground, playing, mowing the grass, landscaping, etc. Students or other members of the community using the various athletic fields could be exposed to surface soil through participating in football, track and field activities, playing baseball, soccer or other field sports, etc. Also, spectators sitting on the ground near and on these athletic areas may be exposed to surface soils. These exposures would be through direct contact with surface soil, inhalation of airborne dust generated from the surface soil or incidental ingestion of surface soil.

Since large portions of the school property are paved, the public would not be exposed to surface soil in these areas. The grass on most of the school property is thick and well-established. Well-established and maintained grass cover minimizes human exposures to soil by limiting direct contact with the soil. The only places that are not paved or covered with grass are well-worn paths near and around the athletic fields and other high traffic areas, and two areas in the rear of the school building that were used for volleyball in the past. The current volleyball court is covered with sand and infield areas on the baseball fields are covered with a reddish soil; these soils are not similar to surface soil across the rest of the site. To characterize potential exposures, surface soil samples were collected from areas of exposed soil, paths, high traffic areas or other areas where exposures were likely.

Metals and low concentrations of volatile and semivolatile organic chemicals were detected in the surface soil samples collected from all areas. The soil concentrations for each of the detected chemicals were compared to typical soil background concentrations (when available) and their public health assessment comparison values. The data for the 68 surface soil samples evaluated for this health consultation are summarized in Table 1 (Appendix E) along with relevant background concentrations and comparison values.

None of the metals detected in the surface soil sampling exceeded their typical background ranges except copper, chromium, nickel, and selenium. Nickel and selenium were detected slightly above their typical background ranges in five of 52 and 14 of 52 surface soil samples, respectively. Copper exceeded its typical background range in only one of 52 samples. Chromium was detected above its typical background range (10 to 60 milligrams per kilogram or

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mg/kg) (Clarke, et al., 1985; Connor et al., 1957; McGovern, 1988; Shacklette and Boerngen, 1984) in 10 of 52 surface soil samples. The highest concentration of chromium was 107 mg/kg. Although chromium was reported as total chromium in the soil data, the levels were evaluated as if all of the detected chromium were in the more toxic hexavalent form. None of the levels of copper, chromium, nickel or selenium exceed their public health assessment comparison values.

The average concentration of Aroclor 1248 and Aroclor 1260 in surface soil is 0.19 mg/kg and 0.04 mg/kg, respectively. In calculating this average, we used a concentration of 0.02 mg/kg of Aroclor 1248 and of Aroclor 1260 for samples in which the chemicals were not detected. We selected this value (0.02 mg/kg) since it is near the lowest reported concentration of the Aroclors for this data set. This average is higher than the range of average soil concentrations for total PCBs (less than 0.01 to 0.04 mg/kg) reported in a national soil monitoring program (ATSDR, 1997). Exposure to these soils could result in a somewhat higher level of exposure to these chemicals than would be expected from typical soils.

The average concentrations of Aroclor 1248 and Aroclor 1260 are less than the public health assessment comparison values of 1.2 mg/kg for Aroclor 1248 and 3.9 mg/kg for Aroclor 1260. The public health assessment comparison value for Aroclor 1248 was exceeded in 2 of 55 surface soil samples; the public health assessment comparison value for Aroclor 1260 was not exceeded in any sample. The public health assessment comparison values were calculated considering a residential setting and long-term exposure (exposure parameters are given on Table 1 in Appendix E). The average soil concentration for the school grounds is more likely to reflect long-term exposure than the concentration in one sample. People are unlikely to be exposed to soil at any specific location as described by the exposure parameters in Table 1. The concentration of Aroclor 1248 in the highest sample is about a factor of two greater than the public health assessment comparison value.

The average concentration of total carcinogenic polycyclic aromatic hydrocarbons (PAHs) in surface soil is 0.53 mg/kg. In calculating this average, we used a concentration of 0.04 mg/kg for each carcinogenic PAH for samples in which the chemicals were not detected. We selected this value (0.04 mg/kg) since it was about the lowest reported concentration for any carcinogenic PAH. This average is somewhat below what Menzie et al (1992) reported as the upper end of the range for urban background (1 to 3 mg/kg). Exposure to these soils could result in a level of exposure to these chemicals approaching the upper end of urban soils.

In a sample from the multipurpose athletic field at the northern portion of the school property, total carcinogenic PAHs were detected at 7.4 mg/kg. Two other samples, both located at the edge of the parking lot bordering the former American LaFrance site, had total carcinogenic PAHs at levels of 2.7 mg/kg and 1.6 mg/kg. These three are the only samples (out of 55) in which the levels of individual carcinogenic PAHs in surface soil exceed their public health assessment comparison value based on carcinogenic effects. Benzo(a)pyrene and dibenz(a,h)anthracene were detected in the athletic field sample at 1.4 mg/kg and 0.36 mg/kg, respectively, and benzo(a)pyrene was detected in the two samples near the American LaFrance

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site property at 0.45 mg/kg and 0.27 mg/kg. The comparison value for both benzo(a)pyrene and dibenz(a,h)anthracene is 0.25 mg/kg. The public health assessment comparison values were calculated considering a residential setting and long-term exposure (exposure parameters are given on Table 1 in Appendix E). The average soil concentration for the school grounds is more likely to reflect long-term exposure than the concentration in one sample. People are unlikely to be exposed to soil at any one location as much or as often as described in Table 1 (see footnote **).

Other than those discussed above, none of the concentrations of metals, volatile organic chemicals or semivolatile organic chemicals detected in surface soils at the Southside High School exceed cancer or noncancer public health assessment comparison values.

Shallow Subsurface Soil

Exposures to shallow subsurface soils might occur if someone (e.g., maintenance worker) digs below the surface soil, such as when planting a tree or installing a fence post. If subsurface soil is left at the surface, the public might then be exposed to soil that is currently under the surface.

The shallow subsurface soils (6 inches to 4 feet below grade surface) contained metals (i.e., antimony, arsenic, barium, chromium, cobalt, copper, lead, mercury, nickel, selenium and zinc) at concentrations that exceeded typical background ranges. A summary of the data for the shallow subsurface soil samples is included on Table 2 (Appendix E). Most of the metal concentrations in excess of typical background were isolated in a single sample collected on the Southside High School property between the east parking lot and the railroad tracks. This single sample contained arsenic at 56.2 mg/kg, which exceeds its residential public health comparison value for carcinogenic effects. The levels of seven polycyclic aromatic hydrocarbons (benz(a)anthracene (68 mg/kg), benzo(a)pyrene (57 mg/kg), benzo(b)fluoranthene (43 mg/kg), benzo(k)fluoranthene (40 mg/kg), chrysene (62 mg/kg), dibenz(a,h)anthracene (9.6 mg/kg) and indeno(1,2,3-c,d)pyrene (31 mg/kg)) detected in one shallow subsurface sample from the football field also exceed levels typically found in the environment and their residential public health comparison values for carcinogenic effects. Benzo(a)pyrene exceeded its comparison value in 19 of the 31 shallow subsurface soil samples in which it was detected. Many shallow subsurface soil samples contained elevated levels of the PCB mixture Aroclor 1248. In two shallow subsurface samples taken from the football field, Aroclor 1248 was detected at 160 mg/kg and 8.8 mg/kg. In shallow subsurface samples collected between the school and the railroad tracks, the levels of this PCB mixture were 9.4 and 8.3 mg/kg. These concentrations of Aroclor 1248 in shallow subsurface soil exceed its cancer and/or noncancer residential public health comparison values.

Since the elevated levels of arsenic, polycyclic aromatic hydrocarbons and PCBs are below the surface, chronic human contact (e.g., regular, long-term contact, the kind of exposure that forms the basis for the comparison values) to these contaminants is unlikely. Due to their location and given that exposure is unlikely, the detected levels of arsenic, polycyclic aromatic hydrocarbons

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and PCBs in shallow subsurface soil at the Southside High School are not expected to pose a public health hazard. However, if these soils were brought to the surface and the contaminants were made available for long-term human contact, risks for adverse health effects for exposure to these contaminants could increase. Public exposures to shallow subsurface material can be minimized if precautions are taken when digging into subsurface material. These include minimizing direct contact with potentially contaminated material and not allowing subsurface soils to remain exposed at the surface.

Deeper Subsurface Soil

Public exposures to deeper subsurface soil might occur if excavations occur on the school property, such as during construction of a building addition. The people exposed to subsurface soil in this manner should be limited to maintenance or construction workers.

Deeper subsurface soils (deeper than 4 feet) contain several metals (barium, cobalt, copper, nickel, selenium and zinc) at concentrations that exceed typical background, and low concentrations of volatile and semivolatile organic chemicals. A summary of the data for the deep subsurface soil samples is included on Table 2 (Appendix E). Except for Aroclor 1248 (detected at 74 mg/kg, 24 mg/kg and 3.3 mg/kg in separate samples), Aroclor 1260 (detected at 6.1 mg/kg), benzo(a)pyrene (detected at 1.3 mg/kg and 0.29 mg/kg in separate samples) and dibenz(a,h)anthracene (detected at 0.36 mg/kg) none of the concentrations of any metals, volatile organic chemicals or semivolatile organic chemicals detected in deeper subsurface soils at the Southside High School exceed cancer or noncancer public health comparison values for residential exposure. Long-term human exposure to these contaminants is unlikely because these contaminants are well below the surface. Public exposures to deep subsurface material can be minimized if precautions are taken when digging into subsurface soil. These precautionary measures include avoiding direct contact with potentially contaminated material and not allowing subsurface soil to remain exposed at the surface.

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C. Health Outcome Data

The NYS DOH investigated cancer among students attending the Southside High School in Elmira, New York from when the school opened in the Fall of 1979 to June 2000. A report on this investigation is attached in Appendix C. This investigation was spurred by reports of an unusual number of cases of cancer among students currently attending the school and attending the school since 1997.

The NYS DOH looked at the overall time period since the opening of Southside High School, and did not find an unusual pattern of cancer among current and former students, or among children living in the area served by the school. The numbers and types of cancers diagnosed were similar to what would be expected for this age group. Perceptions of a large number of persons with cancer at the school since 1997 may be explained by a small number of persons diagnosed with cancer at the time they were attending Southside High School, combined with the

presence of other students who had been diagnosed with cancer prior to entering high school, and still others who had been diagnosed with health conditions other than cancer. Although the actual number of cases is small, since 1997 an unusual number of young men were diagnosed with testicular cancer.

Compared with its incidence among adults, cancer is rare among children. However, it is the largest single cause of death from disease among children (American Cancer Society 2000). Of the various types of cancer affecting children, leukemia occurs most frequently and accounts for almost one third of all childhood cancers. Cancers of the brain and other parts of the nervous system, and lymphomas (including Hodgkin's disease and the non-Hodgkin's lymphomas) are the second and third most frequently occurring cancers in children (Miller 1996, NYS DOH 2000). Cancer occurs somewhat more frequently in young adults. Among people 20-34 years of age, lymphomas occur most frequently, followed by breast cancer in females and testicular cancer in males (NYS DOH 2000).

This study confirmed an unusual number of testicular cancer cases among young men since 1997. Although testicular cancer accounts for only about 1% of cancers in men of all ages, it is the most commonly occurring type of cancer in white males ages 20-34. It is the second most common type of cancer in white males ages 15-19 and 35-39. Testicular cancer occurs about six times as often in white males as in African-American males. Over the past twenty years, the incidence of testicular cancer has doubled in the United States, with most of the increase occurring among young men (Brown 1996, Schottenfeld 1996). The reason for this increase is unknown. The only known risk factor for testicular cancer in men under age 20 is undescended testis (Bernstein et al 1999). Evidence also suggests that a family history of testicular cancer, factors in the prenatal period such as high maternal hormone levels, viral infections and occupational exposures of the parents may also be important (Bernstein et al 1999). Among adult males, higher rates of testicular cancer have been observed among men working at a variety of different occupations (Brown 1996, Schottenfeld 1996), but few of these associations have been found consistently.

As a result of the elevated rate of testicular cancer among students at the Southside High school since 1997, NYS DOH conducted a follow up study in 2001 consisting of a medical records review and a community based study of testicular cancer in the area. A report on the follow up study is attached in Appendix C.

A medical records review was conducted of the young men who were confirmed as having testicular cancer in the previous study. The NYS DOH examined their medical records to look for any individual risk factors or any other factors that the young men had in common that may help account for their illness. Medical records were reviewed for information on the patient's growth and development, medical conditions since conception, behavior and possible exposures of the patient and his parents.

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No unusual conditions or exposures were shared by all of the young men, although limited information was available regarding parental occupational history or exposures. None of the men had a family history of the testicular cancer or a history of an undescended testicle, the biggest risk factor for the disease.

NYS DOH also conducted a review of testicular cancer in the community between 1980-1998. The number of cases of testicular cancer among men ages 20-34 residing in ZIP codes 14904, 14871 and 14894 was compared with the number of cases expected based on rates in New York state among men of similar ages.

The number of men diagnosed with testicular cancer between 1980 and 1998 was not statistically significantly different than the number expected overall nor were significant excesses of cases observed within any 5 year age group or within any of the 4 time periods examined.

The NYS DOH conducted a survey of past alumni of the school to update the study of cancer in current and former students of Southside High School. The NYS DOH plans to report on this activity in the fall of 2003.

D. Community Health Concerns Evaluation

Parents of students attending Southside High School expressed concerns about the number of cancers among students at the school. Staff from the NYS DOH, NYS DEC and Chemung County Health Department attended a May 2, 2000 public meeting. The NYS DOH and the Chemung County Health Department subsequently participated in 12 meetings of a citizen advisory committee between September 2000 and August 2001. At these meetings, parents, students and the community asked questions and expressed several concerns. A draft of this health consultation was released for public review and comment on February 23, 2001. A response to the comments that the NYS DOH and ATSDR received are in Appendix G.

- **Concern**: Several parents and members of the community have concerns about the incidence of cancer in the school. Several types were cited, such as testicular cancer, colon cancer and leukemia.

- **Response:** The cancer incidence study performed for the Southside High School population found that, except for testicular cancer, the incidence of cancer is within the levels that are expected for this population. Any new cancer cases that are reported will be verified and included with the cases used in the studies. The cancer surveillance program is examining the medical records of the young men confirmed to have testicular cancer. The incidence of testicular cancer will continue being monitored. The report is included in Appendix C. The results of these activities will be provided to the public when they are completed.

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- **Concern**: Several people expressed concern about the safety of drinking water.

- **Response**: The water is provided by the Elmira Water Board and meets all state and federal requirements for drinking water;

- **Concern**: Some people questioned whether staff at the school are experiencing health problems, such as cancer.

- **Response:** To date, NYS DOH staff have not heard any specific health concerns among the staff of Southside High School. Based on existing knowledge, the data evaluated in this health consultation indicate that exposure to chemicals in surface soils on the school property or air inside the school is unlikely to pose a health hazard.

- **Concern**: Parents asked if contaminants at the school may be contributing to their children's illness. Some examples were thyroid disease, autoimmune diseases, and Crohn's disease.

- **Response:** Based on existing knowledge, the data evaluated in this health consultation indicate that exposure to chemicals in surface soil and indoor air at the school does not pose a health hazard for these or other diseases.

CONCLUSIONS

1. Based on ATSDR's public health hazard category classification (Appendix H), the surface soil and indoor air data collected for the Southside High School, the environmental conditions at Southside High School pose no apparent public health hazard. This classification is used because average levels of contaminants in surface soils do not exceed public health comparison values. Although a few samples exceed health comparison values, people are unlikely to have long-term exposures to soil at any one location. Nevertheless, because average levels of total PCBs exceed typical background levels and average levels of carcinogenic PAHs are somewhat below the upper range of background levels, exposures to these contaminants at Southside High School may be greater than those typically experienced from soil.

   Students, faculty, staff and the community are not currently being exposed to subsurface soil, although it contains chemicals at levels exceeding public health comparison values.

2. Based on visual observation, the top foot of soil appears to be topsoil. There is layer of cinders at about a foot to three feet below the ground surface. Visibly contaminated soils at varying depths are likely due to past industrial use of the property. These observations are consistent with the chemical analyses of the soil samples.

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3. Levels of contaminants above public health comparison values were found in shallow subsurface soil at the Southside High School. However, currently there are no known public exposures to contamination in subsurface soil and the presence of these contaminants in shallow subsurface soil poses no public health hazard. However, if the contaminants were brought to the surface and made available for human contact, exposures and the potential for health effects may increase.

4. Levels of PCBs above public health comparison values were found in deeper subsurface soil near the school building. However, currently there are no known public exposures to contamination at depth and the presence of PCBs in deeper soil poses no public health hazard. However, if soils from greater than four feet of depth are brought to the surface and made available for human contact, exposures and the potential for health effects may increase.

5 As stated in the indoor air investigations report (Appendix B), most compounds were either not detected or were present at low levels. Several compounds were present at concentrations slightly higher than typical background, but their presence is not unusual and exposure at the reported levels is not expected to be a health concern. Three Freon compounds and several chlorinated solvents were detected at elevated concentrations in samples collected from three soil gas points. Pressure differential readings between soil gas and indoor air were minimal, indicating that there were no substantial pressure gradients drawing soil gas into the school building at the time samples were collected.

6 Municipal water is provided to the school. This water meets all state and federal requirements for drinking water and is, therefore, not a public health concern.

7 The NYS DOH did not find an unusual pattern of cancer among current and former students, or among children living in the area served by the school. Although the number of cases is small, the study did confirm a higher than expected number of young men diagnosed with testicular cancer since 1997.

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RECOMMENDATIONS

1. The NYS DOH, in consultation with the ATSDR, recommends, in accordance with prudent public health practice, that measures be taken to minimize the potential for human exposure to subsurface soils containing elevated concentrations of PCBs, tetrachloroethene, polycyclic aromatic hydrocarbons, and metals.

2. The school district or other appropriate governmental unit should develop a written soil management plan to minimize potential public exposures to contaminated subsurface material and may want to consider instituting a deed notification or restriction. A soil management plan would provide protocols for the proper handling of soil during ground

intrusive activities. This includes any activities that disturb material below paved areas and under buildings.

3 The school district should review the recommendations in the indoor air investigation report (Appendix B) to determine if additional actions may be warranted. For example, the report recommends that the school district consider instituting an indoor air quality action plan consistent with that recommended by the US EPA. The Tools for Schools Action Kit provides information and guidance for developing and implementing a plan to prevent indoor air quality problems and resolving such problems if they arise. The plan should address the possibility of contaminated soil gas being drawn into the building; one possible way of evaluating this is to include routine (e.g., seasonal) monitoring of pressure differentials between the soil gas and building interior.

4 If new data become available, the NYS DOH and ATSDR should update this health consultation or provide information to the public through fact sheets or other means.

5 The NYS DOH should provide the public with information about the survey of past alumni of the Southside High School.

PUBLIC HEALTH ACTION PLAN

The Public Health Action Plan (PHAP) for the Southside High School contains a description of the actions to be taken by the US EPA, ATSDR, and/or the NYS DOH at or near the site subsequent to the completion of this health consultation. The purpose of the PHAP is to ensure that this health consultation not only identifies public health hazards if they exist, but provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. Included is a commitment on the part of the ATSDR/NYS DOH to follow-up on this plan to ensure that it is implemented. The public health actions implemented or to be implemented follows:

1. The NYS DOH presented the findings of this health consultation to the public at a public meeting and school board meeting. A fact sheet summarizing this information was distributed to the public.

2. The NYS DOH will continue to be available to answer any questions that students, parents, staff, and the community may have about conditions at the school and provide guidance to the school district as needed.

3. The NYS DOH conducted a survey of past alumni of the school to update the study of cancer in current and former students of Southside High School. The NYS DOH plans to report on this activity in the fall of 2003.

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CERTIFICATION

The Health Consultation for Southside High School,Elmira, New York, was prepared by the New York State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the Health Consultation was initiated.

Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this Health Consultation and concurs with its findings.

Chief, SPS, SSAB, DHAC, ATSDR

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Appendix A
Figures

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Figure 1- Site Location

Appendix B
NYS DOH Indoor Air Investigations

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NYSDOH AIR INVESTIGATION UPDATES PREVIOUSLY PROVIDED IN APPENDIX B. REMOVED DUE TO REDUNDANCY.

Appendix C
Investigation of Cancer Among Students at Southside High School, Elmira, NY

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FACT SHEET
August 23, 2000

INVESTIGATION OF CANCER AMONG STUDENTS AT THE SOUTHSIDE HIGH SCHOOL, ELMIRA, NEW YORK

The New York State Department of Health has conducted an investigation of cancer among students attending the Southside High School in Elmira, New York. This investigation was spurred by reports of an unusual number of cases of cancer among students currently attending the school and attending the school since 1997. The community was also concerned over fuel oil contamination in the ground beneath the school, and over the adjacent former American LaFrance site, an industrial property that was the recent site of a voluntary environmental clean-up.

Cancer among current and former students

Case confirmation: Community concerns centered about reports that at least six students attending Southside High School in the spring of 2000 were diagnosed with cancer in the current school year, and at least 13 were diagnosed since 1997. To confirm these reports, information about current and former students believed to have cancer was collected from community members and compared with the various data sources available to the Department of Health. These include the New York State Cancer Registry, which collects information on all cases of cancer diagnosed in New York State, as mandated by law, and contacts with hospitals and physicians.

A total of 46 students who had ever attended Southside High School were reported to us as having cancer. We were able to confirm 25 of them as having cancer. Of the 21 students not confirmed, 10 were determined to have conditions other than a reportable cancer (the most common types of skin cancer are not required to be reported), eight had moved out of state prior to their diagnosis and could not be confirmed, and insufficient information was available to confirm a cancer diagnosis for the remaining three.

Of the 25 current and former students confirmed as having cancer, three had been diagnosed prior to entering Southside High School. Of the remaining 22, the most common types of cancer found were leukemias and lymphomas (including Hodgkin's disease and non-Hodgkin's lymphomas). Other types of

46 students reported as having cancer

35 found

25 had cancer
- 3 diagnosed before entering Southside High School
- 22 diagnosed while attending or after leaving Southside High School

10 had health conditions other than a reportable cancer

11 unable to confirm

8 moved out of state prior to reported date of diagnosis

3 not enough information to confirm diagnosis

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cancer found included testicular, cervical and brain cancers. (To protect patient confidentiality, if fewer than six persons were diagnosed with a particular type of cancer, we cannot provide the exact number.) Leukemia, lymphomas and brain cancer are the most common types of cancer found among children age 15-19.

Of seven students reported to have cancer while attending Southside High School in 1997 or later, fewer than six were confirmed as actually having cancer; the total number confirmed includes individuals who were diagnosed prior to entering high school. Those not confirmed as having cancer were confirmed to have other health conditions.

Among students who had ever attended Southside High School

48 cases expected 1980-2000

39 cases expected 1990-2000

22 reported and confirmed 1980-2000

Comparison with expected: The number of cancer cases that were confirmed was also compared with the number that would have been expected in all persons who had ever attended Southside High School. Enrollment figures from the time the school opened in the fall of 1979 were used to determine how many persons had ever attended Southside High School and how old they would be at different points in time. From this, it was calculated that 48 cases of cancer would have been expected to be diagnosed between 1980 and the first half of 2000 in all of the persons who had ever attended Southside High School. Thirty-nine of these cases would have been expected to have been diagnosed between 1990 and 2000. The total number of persons confirmed as having cancer was less than the total number of persons expected to be diagnosed with cancer in the time since the high school opened. This is also true for the most recent 10 years, when the majority of the confirmed cases were diagnosed. Looking at the most common types of cancer separately, the numbers of confirmed cases were not statistically greater than what would be expected in either time period for any particular type of cancer.

Geographic study

To account for persons with cancer who may not have been reported by community members, we also examined cancer incidence in the geographic area served by the high school based on information contained in the Cancer Registry. Children ages 0-19 who were diagnosed with cancer since 1980 and who lived in ZIP Code areas 14904 (Elmira), 14871 (Pine City) and 14894 (Wellsburg) at the time of diagnosis were identified from Cancer Registry files. These numbers were then compared with the numbers that would be expected given the population size, age and sex distribution of the ZIP Code areas, if cancer rates were the same as in all of New York State, exclusive of New York City.

Cancer cases diagnosed 1980-1998 among children living in ZIP Code areas 14904, 14871, 14894

Children ages 0-19
22 cases observed, 23 cases expected

Children ages 15-19
6 cases observed, 7 cases expected

A total of 22 children living in the area served by the high school were diagnosed with cancer from 1980 to 1998, compared with 23 expected. The most commonly observed types of cancer were leukemia, with nine cases observed (6 expected), cancers of the brain and

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other parts of the nervous system, and lymphomas. No particular type of cancer was statistically higher (or lower) than expected.

In the age group 15-19, which corresponds to persons attending high school or having just left school, six young people were diagnosed with cancer, compared with seven expected. There were no statistically significant differences between observed and expected numbers of cancer cases for any particular type of cancer in either males or females.

Cancer since 1997

Community members had expressed particular concern over an apparently high number of cases of cancer among students attending the high school since 1997. If information from the geographic study is combined with information from the case confirmation study for persons age 15-19 living in the geographic area served by Southside High School at the time of diagnosis, the total number of cases of cancer diagnosed is less than six, but greater than the approximately one case expected. The difference between the total number of cancer cases actually diagnosed and the number expected was not statistically significant, meaning that it could have occurred by chance. Looking at specific types of cancer, the majority of the cancer cases diagnosed in this time frame were cases of testicular cancer. The number of young men diagnosed with testicular cancer was statistically significantly greater than the number expected.

Summary

Looking at the overall time period since the opening of Southside High School, we did not find an unusual pattern of cancer among current and former students, or among children living in the area served by the school. The numbers and types of cancers diagnosed were similar to what would be expected for this age group. Perceptions of a large number of persons with cancer at the school since 1997 can be explained by a small number of persons diagnosed with cancer at the time they were attending Southside High School, combined with the presence of other students who had been diagnosed with cancer prior to entering high school, and still others who had been diagnosed with health conditions other than cancer. Although the actual number of cases is small, the study did confirm an unusual number of young men diagnosed with testicular cancer since 1997.

Next steps

The New York State Department of Health will continue to monitor cancer incidence in the area served by Southside High School. We will continue to receive and investigate reports of cancers among current and past students. We will also examine the finding of an unusual number of young men diagnosed with testicular cancer in greater depth. We will look more closely into the medical histories of these young men to determine whether they might have any known risk factors for the disease, as well as examine other possible factors.

For more information on the cancer investigation or a copy of the complete report on this investigation, please contact Aura Weinstein or Janice Rocklin of the Cancer Surveillance Program of the New York State Department of Health at (518) 474-2354 or (800) 458-1158 (ext. 42354).

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REPORT
September 2000

INVESTIGATION OF CANCER AMONG STUDENTS AT SOUTHSIDE HIGH SCHOOL ELMIRA, NEW YORK

This report presents the results of an investigation of cancer among students attending the Southside High School in Elmira, New York. The investigation was conducted in response to community concerns over what they believed to be an unusual number of current and former students diagnosed with cancer. The investigation was conducted in two parts: confirming community reports of an unusual number of current and former students with cancer, and examining cancer incidence among young people in the geographic area served by Southside High School.

Background

In April 2000, the Elmira School Board in the City of Elmira, Chemung County, New York, received a letter from parents expressing concern about the number of current and former students of Southside High School in Elmira who had been diagnosed with cancer. (Southside is one of two high schools serving the Elmira City School District.) The letter indicated that at least six students were diagnosed with cancer while attending Southside High School during the 1999-2000 school year. It also indicated that at least 13 students had been diagnosed with cancer since 1997. At the same time, the community was concerned about fuel oil contamination in the ground beneath the school, and the nearby American LaFrance industrial site, where a voluntary environmental clean-up recently took place.

The School Board requested that representatives of the New York State Department of Health (NYSDOH) and the New York State Department of Environmental Conservation (NYSDEC) meet with the community on May 2, 2000 to hear their concerns about cancer among students and provide information about environmental conditions in the area. At this meeting, concerns were also raised about cancer incidence among individuals who ever attended Southside High School. The New York State Department of Health agreed to review and evaluate available information on cancer among current and former students at Southside High School. This included information provided by the community, as well as information available to the NYSDOH. The investigation was designed to:

- attempt to confirm the reported high incidence of cancer among students at Southside High School,
- examine the number and types of cancer among students at the high school to identify unusual patterns or characteristics that might indicate a possible common source, and
- identify all cases of cancer among children living in the geographic area served by the high school to determine if their cancer incidence was different from what would be expected.

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Cancer among current and former students

Case confirmation: As indicated above, this investigation was conducted in response to community concerns over the number of current and former Southside High School students diagnosed with cancer. The first step in the investigation was to confirm the diagnosis of cancer in the students. This required identifying information on each person reported as having cancer so that they could be matched to a variety of data sources available to the Department of Health. This information (including full name, date of birth, date and type of cancer diagnosed, and name of the hospital and/or physician where they were diagnosed) was obtained from the individuals themselves, family members, or other members of the community. The information was reported to either the Chemung County Health Department (CCHD) or to the Cancer Surveillance Program of the NYSDOH.

A total of 46 people believed to have cancer who attended Southside High School were reported to the CCHD and NYSDOH. Complete information (including the name of the hospital and/or physician by whom they were treated) was available for 43 of these individuals. Of the 46 individuals reported, seven reportedly had cancer while attending Southside High School during 1997 or later. (This number differs from the 13 reported cases originally indicated in the letter from community members to the Elmira School Board.)

All 46 reported individuals were checked against the New York State Cancer Registry (NYSCR). If an individual's diagnosis could not be confirmed through the NYSCR, the two local hospitals (Arnot-Ogden Hospital and St. Joseph's Hospital) in Elmira, NY were contacted. This was to ensure that individuals who may have been diagnosed too recently to be reported to the NYSCR were included in the investigation. This step also allowed us to determine whether or not an individual had a reportable cancer. (The two most common types of skin cancer, basal and squamous cell carcinomas, are not reported to the NYSCR because of how frequently they occur and how easy they are to treat. Malignant melanoma, another type of skin cancer, is reported to the NYSCR because it occurs less frequently and is a much more serious form of cancer.) If an individual's cancer diagnosis could not be confirmed through the Cancer Registry or the local hospitals, the individual's physician (if known) was contacted to obtain information on the patient's condition.

Technical Notes
New York State Cancer Registry

The Cancer Registry contains information on all individuals diagnosed with cancer in New York State, as required by law. Under the law, hospitals must report individuals diagnosed with cancer to the NYSCR within 180 days (6 months) of their diagnosis. While the major source of information is hospitals, information is also received from laboratories, physicians, and the NYS vital records system (death certificates). In addition, the NYSCR has reciprocal reporting agreements with many other states, including all bordering states. These agreements allow for the exchange of information about NYS residents diagnosed with cancer in hospitals outside of New York. The Cancer Registry was recently certified by the North American Association of Central Cancer Registries as over 95% complete for 1997. This means that over 95% of the New York State residents diagnosed with cancer in 1997 were reported to the Registry within the required time frame. Currently, information for residents diagnosed in 1998 is being finalized, but is available for use by Cancer Surveillance Program staff. Information on individuals diagnosed with cancer in 1999 and 2000 is also available for review, but is not complete because of the 180 day (6 month) time period hospitals and other health care providers have to file their reports.

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A total of 25 of the 46 individuals reported to have cancer were confirmed through this process. Of the 21 people not confirmed, we determined that 10 had conditions other than a reportable cancer. These conditions included non-reportable skin cancers, cervical dysplasia (an abnormal growth of cells on the lower, narrow end of the uterus that may be pre-cancerous) and other non-cancerous conditions. Eight of the people reported moved out of New York State before their cancer diagnosis. (While the NYSCR has reporting agreements with many other states, they apply only to New York State residents who go out of state for diagnosis and/or treatment. Individuals who have permanently moved out of New York State at or before the time of their diagnosis are not covered by these agreements.) Therefore, we were unable to confirm the diagnosis of these eight people. Finally, for three people, we did not have enough information to identify a hospital or physician to confirm their diagnosis.

Of the 25 individuals confirmed as having a reportable cancer, three were first diagnosed with cancer prior to entering Southside High School. Among the remaining 22 people, the most frequently diagnosed types of cancer were leukemias and lymphomas, including both Hodgkin's disease and non-Hodgkin's lymphomas. Other diagnoses included testicular, cervical and brain cancers, as well as other less frequently occurring types. (To protect patient privacy, if fewer than six people were diagnosed with any particular type of cancer, we cannot provide the exact number.) The confirmed cases were diagnosed between the mid-1980's and 2000, with most diagnosed since the mid-1990's. The ages of the people diagnosed with cancer since first entering Southside High School ranged from the mid-teens to the mid-30's, with individuals diagnosed up to 15 years after they had left high school.

Of the seven students reported to have cancer while attending Southside High School since 1997, fewer than six were confirmed to have cancer, including students who were diagnosed before entering the high school. All of those not confirmed as having cancer were confirmed to have conditions other than cancer.

Comparison with expected: To determine whether cancer incidence among current and former students at Southside High School was unusual, we calculated the total number and types of cancers that would be expected to occur in this group. The calculations took into account the number of students who ever attended the high school, their ages at different points in time, and changes in the cancer rates among people of different ages.

The calculations showed that 48 students would be expected to be diagnosed with cancer between the time Southside High School opened and June 2000. The most common types of cancer expected were lymphomas (10 expected), female breast cancer (5 expected), and testicular cancer (5 expected).

The calculations also showed that 39 of these students would be expected to be diagnosed with cancer between 1990 and 2000. This is because cancer becomes more common as people age and the number of people who ever attended Southside High School continues to increase.

The 22 people confirmed as having cancer was less than the total number of people expected to be diagnosed with cancer in the time since the high school opened. This was also true for the most recent 10 years, when the majority of the confirmed cases were diagnosed. We also examined the most common types of cancer individually. The number of confirmed cases was not statistically significantly greater than what would be expected for any particular

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type of cancer. This was true for the entire time period and also for the 1990-2000 time period. The largest number of cases occurred in the oldest age groups, as would be expected.

As mentioned above, eight individuals had moved out of state prior to being diagnosed with cancer. Therefore, we were unable to confirm their cancer diagnoses. If we assume that all of these students were diagnosed with the type of cancer reported, the total number of students who had ever attended Southside High School who had been diagnosed with cancer (22 + 8 = 30) would still be less than the total expected. Also, the number of confirmed cases of any particular type of cancer would still not be statistically greater than expected. This would be true for the entire time period (1980-2000) and for 1990-2000.

Technical Notes
Calculation of Expected Cases
Among Current and Former Students

Numbers of expected cases were calculated in a person-years at risk approach. Numbers of students in each grade since the school opened in fall 1979 were obtained from the NYS Education Department. For simplicity of calculation, it was assumed that all ninth graders were age 15, tenth graders age 16, eleventh graders age 17, and twelfth graders age 18. It was also assumed that handicapped students, who were not assigned to a grade but included with the enrollment figures, were equally distributed among the ages. Starting with the enrollment of the 1979-1980 school year, each student contributed one person-year at the age of that grade for that year. For each succeeding year, persons in each grade (or age level for those out of school) were aged one year and a number of persons equal to the ninth grade class for that year was added to the 15-19 year age group. Total person-years at risk were obtained for the five-year age groups 15-19 and 20-24 and the ten-year age groups 25-34 and 35-44, which is the oldest age group possible for someone graduating high school in 1980 at the age of 18. Person-years at risk in each age group were totaled for each year, and then summed over the periods 1980-1984, 1985-1989 and 1990-1999 to get total person-years at risk for each age group for each time period. The number of persons in each age group in 2000 was divided by two to obtain the person-years for this year since only cancers diagnosed in the first half of this year would have occurred yet.

To obtain numbers of cases expected for each time period, the numbers of person-years at risk in each age group were multiplied by standard cancer incidence rates for that time period and age group for New York State, exclusive of New York City. The standard rates were obtained from the New York State Cancer Registry. For the most recent time period, the standard rate for the years 1990-1997 was calculated and applied to the person-years at risk between 1990 and the first half of 2000 since Cancer Registry data for 1998 and subsequent years were not yet available to include in the calculation of the standard rates. Total numbers of cases expected in each age group and time period were then summed to get the total number of cases expected in all age groups between 1980 and 2000. These calculations were done for all types of cancer combined and for the most common types of cancer separately. Since school enrollment figures for males and females separately were only available for school years 1992-1993 and later, the calculation of expected numbers was done for males and females combined for persons attending school prior to this year, and for males and females separately for persons attending school in this school year or later.

A statistical test based on the Poisson distribution was used to determine the likelihood of any differences between observed and expected numbers of cases being due to chance (1). If the likelihood of the result occurring purely due to random variation was 5% or less, the result was considered to be statistically significant.

Geographic Study

The case confirmation study was supplemented by examining cancer incidence among children living in the geographic area served by Southside High School. Southside High School serves the part of the Elmira City School District located south of the Chemung River (see attached map). This part of the investigation was based on information from the NYSCR, allowing us to take into account people with cancer who may not have been reported by community members. Using the NYSCR, all children ages 0-19 who were diagnosed with cancer between 1980 and 1998 and who lived in ZIP Codes 14904 (Elmira), 14871 (Pine City) and 14894 (Wellsburg) at the time of diagnosis were identified. This area closely corresponds to the area served by Southside High School. The total number of children with cancer in this group,

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as well as the number with each type of cancer, were compared to the numbers expected. The expected numbers were calculated based on the number, age and sex of children living in the three ZIP Code areas and the rates of specific types of cancer for children in New York State, excluding New York City. Calculations were done for all types of cancer combined, and for the most common types of childhood cancer separately.

Technical Notes
Calculation of Expected Cases
for Geographic Study

Numbers of males and females in the five-year age groups 0-4, 5-9, 10-14 and 15-19 were obtained from population estimates for the years 1980, 1990 and 1999 provided by Claritas, Inc., a commercial vendor. The Claritas estimates for 1980 and 1990 are quite similar to the population estimates provided by the U.S. Census for those years. The numbers of cases expected in each sex and age group were calculated for the time periods 1980-1984, 1985-1989, and 1990-1998 by applying age- and sex-specific incidence rates for total cancers in children and the most common individual types of cancer for New York State, exclusive of New York City to age- and sex-specific population estimates for the midpoint of the time interval. These midpoint population estimates were obtained by linear interpolation between the 1980, 1990 and 1999 population estimates, as appropriate. Total numbers of expected cases were obtained by summing over all age groups and time periods.

A total of 22 children, ages 0-19, living in ZIP Code areas 14904, 14871 and 14894 and diagnosed with cancer from 1980-1998 were identified through the NYSCR ("observed"). A total of 23 cases were expected. Eleven cases were observed among males (12 expected) and 11 cases were observed among females (11 expected). In examining specific types of cancer, the most commonly observed types of cancer were leukemia (9 cases observed, 6 expected), brain and other nervous system (fewer than 6 cases observed, 4 expected) and lymphomas (fewer than 6 cases observed, 4 expected). No particular type of cancer among either males or females showed a statistically significant difference between the observed and expected number of cases.

Cancer incidence in the 15-19 year age group was also examined. This age grouping closely corresponds to those attending high school or having just graduated. A total of six cases of cancer was observed, compared with 7 expected. The number of observed cases was similar to the number expected among both males and females. There were no statistically significant differences between the observed and expected number of cases for any particular type of cancer in either males or females.

Cancer incidence since 1997

At the beginning of this investigation, community members expressed particular concern over the number of cases of cancer diagnosed among students attending the high school since 1997. To address this concern, we combined information from the geographic study and the case confirmation study for people ages 15-19. This was done because the most recently diagnosed cases may not yet have been reported to the Cancer Registry. The number of cases of cancer among children 15-19 identified through the NYSCR was combined with the number of confirmed cases of cancer from the case confirmation study who lived in the three ZIP Code areas serving Southside High School. These were compared with the numbers and types of cancers expected for the three ZIP Codes.

The total number of children ages 15-19 living in the three ZIP Code area serving Southside High School who were diagnosed with cancer from 1997 through the first half of 2000 was less than six, but greater than the approximately 1 case expected. This excess was

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not statistically significant. The majority of the individuals diagnosed in this time frame were young men diagnosed with testicular cancer. The number of cases of testicular cancer was significantly greater than the number of cases expected. Numbers of cases for other types of cancer were not significantly different from what was expected.

Discussion

Findings: This study was conducted in response to community concerns over the number of current and former Southside High School students diagnosed with cancer. Of the 46 students who had ever attended the school and were reported to us as having cancer, only 25 were confirmed as having a reportable cancer. An additional 10 students were confirmed to have either a nonreportable (skin) cancer or a precancerous or noncancerous condition. Of the 25 students confirmed to have reportable cancers, three were diagnosed with cancer before they entered Southside High School. Their illness, therefore, could not have been caused by any exposures unique to the high school.

There were a total of 22 students diagnosed with cancer since entering Southside High School. When the number of cancer cases expected to be diagnosed among all students ever attending Southside High School was calculated, the 22 confirmed and reported cases was much less than the 48 cases expected. Even if all of the eight people who had moved out of state before being diagnosed with cancer were included, the total is still less than the number expected. The number of cancers reported to us and confirmed to be diagnosed since 1990 was also much less than the 39 cases that were expected to be diagnosed in that time period.

An important limitation to the case confirmation study was its dependence on members of the community to report information on people who may have cancer. If the community was not aware that a former student had developed cancer, and the student chose not to report their own diagnosis, the student was not included in the study. To overcome this limitation, a geographically defined study was conducted in which cancer cases were identified through the NYSCR, a source where case reporting is mandated by law. In the geographic study, the number of children of all ages and of high-school age who were diagnosed with cancer between 1980 and 1998 was very close to the number expected. The types of cancer that the children developed were similar to the types expected among children in these age groups.

Particular concern was raised by the community about the number of students attending Southside High School since 1997 who had cancer. In the case confirmation study, names were provided for only seven students attending Southside High School since 1997 who were believed to have cancer. The letter sent to the school board stated there were at least 13 Southside students diagnosed with cancer since 1997. The geographic study was based on data from the NYSCR, where reporting by hospitals, physicians and laboratories is mandated by law. The geographic study did not include cases diagnosed after 1998 since all of the case reports for the later years (1999 and 2000) may not yet have been processed into the main NYSCR files. To overcome the limitation of community knowledge to report cases in the case confirmation study and the issue of the reporting delay allowed under the NYSCR law, information from both studies was combined to examine cancer incidence among students since 1997. This allowed us to obtain as much information as possible regarding high school age children living in the area served by Southside High School who were diagnosed with cancer since 1997. When this was done, the number of cases identified was less than six, but greater than the number expected. The difference between the observed and expected

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numbers of all types of cancer combined was not statistically significant and could have occurred by chance. When the individual types of cancer were examined, there was a statistically significant excess in the number of testicular cancer cases among young men.

The perception that a large number of people attending or who attended Southside High School since 1997 have been diagnosed with cancer may be explained by a number of factors. First, there was an unusual number of young men diagnosed with a specific type of cancer, even though the actual number of cases was small. Second, some people attending Southside High School in 1997 or later were diagnosed with cancer before they even entered the school. Since cancer is a chronic disease, meaning that it tends to produce illness over a long period of time, a student diagnosed with cancer before entering the high school might still be undergoing treatment years later. His or her illness, therefore, might be known to classmates and others.

Third, a number of students attending the high school since 1997 were diagnosed with conditions other than (a reportable) cancer. These conditions included the most common forms of skin cancer (not reported to the NYSCR or any other cancer registry), as well as other pre-cancerous and noncancerous conditions. Although certain of these illnesses, especially skin cancers and some pre-cancerous conditions, are not as serious as other cancers, they arouse anxiety among the students and their families. The combination of a small number of students diagnosed with a reportable cancer while attending the high school, with students diagnosed with cancer prior to entering the school and students dealing with other health conditions may have led to the perception that cancer incidence among current and former students at Southside High School was unusual.

Cancer in children: Compared with its incidence among adults, cancer is rare among children. However, it is the largest single cause of death from disease among children (2). Of the various types of cancer affecting children, leukemia occurs most frequently and accounts for almost one third of all childhood cancers. Cancers of the brain and other parts of the nervous system, and lymphomas (including Hodgkin's disease and the non-Hodgkin's lymphomas) are the second and third most frequently occurring cancers in children (3,4). Cancer occurs somewhat more frequently in young adults. Among people 20-34 years of age, lymphomas occur most frequently, followed by breast cancer in females and testicular cancer in males (4).

This study confirmed an unusual number of testicular cancer cases among young men since 1997. Although testicular cancer accounts for only about 1% of cancers in men of all ages, it is the most commonly occurring type of cancer in white males ages 20-34. It is the second most common type of cancer in white males ages 15-19 and 35-39. Testicular cancer occurs about six times as often in white males as in African-American males. Over the past twenty years, the incidence of testicular cancer has doubled in the United States, with most of the increase occurring among young men (5,6). The reason for this increase is unknown. The only known risk factor for testicular cancer in men under age 20 is undescended testis (7). Evidence also suggests that a family history of testicular cancer, factors in the prenatal period such as high maternal hormone levels, viral infections and occupational exposures of the parents may also be important (7). Among adult males, higher rates of testicular cancer have been observed among men working at a variety of different occupations (5,6), but few of these associations have been found consistently.

Statistical considerations: There are a number of statistical issues that should be taken into account when interpreting the results of this study. First, the statistical tests do not take into

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account that the time period from 1997 on was considered separately due to reports of an unusual number of students with cancer in this time frame. This prior knowledge may have created a bias toward finding a statistically significant difference in the short time frame. When the entire twenty-year period from the opening of the school was examined as a whole, the number of testicular cancer cases was not unusual. Therefore, the finding of statistical significance for testicular cancer should be interpreted with some caution.

Another consideration is that statistical significance is a tool for detecting unusual patterns of cases. It can not tell us whether the cases truly have something in common or are linked to an environmental cause. Finally, even though the excess in the number of cases of testicular cancer was statistically significant, we need to remember that the finding was based statistically on a small number of cases. This makes the findings somewhat uncertain, as adding or subtracting one case could dramatically affect the statistical significance of the findings.

Summary and next steps

In summary, since the time Southside High School began operation, this investigation did not find an excess number of cancer cases among current and former students at the school or among children living in the area served by the school. An excess number of cases of testicular cancer among young men was found in the most recent three year time period.

To further investigate this finding, the New York State Department of Health will examine the medical records of these young men to look for any individual risk factors or other factors that may account for their illness. The NYSCR will be used to continue monitoring cancer incidence in the Southside area and the case confirmation study will be updated with any additional information supplied by members of the community. Finally, we will examine the incidence of testicular cancer among young adults in the area.

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Appendix D
Southside High School Tables of Raw Data

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Introduction to Southside High School Tables of Raw Data

The following tables contain data from the laboratory that analyzed soil samples collected by the NYS DEC and the NYS DOH between May 2000 and September 2000. These samples were analyzed at Columbia Analytical Services, a commercial laboratory in Rochester, New York. Columbia Analytical Services is certified by the NYS DOH Environmental Laboratory Approval Program (ELAP). These data were evaluated for quality assurance and quality control (QA/QC) by the laboratory and by the QA Unit of the Technology Section of NYS DEC's Division of Environmental Remediation.

The tables are organized with information identifying the sample at the top of the column and the results of the analyses listed below. The chemicals for which the sample were analyzed are listed to the left of the page. Each result is indicated by a number that may or may not be followed by a letter/symbol known as a qualifier. The qualifiers, as provided by the laboratory, are shown below. A "na" indicates that the sample was not analyzed for a particular chemical.

Please note that most of the results are followed by a "U". The "U" indicates that the chemical was not detected in the sample at or above the "detection limit" indicated. The "detection limit" is the lowest level that the laboratory test can reliably measure the chemical.

Data Qualifiers used in the Southside High School Soil Sample Raw Data Table

Organic Chemicals

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and ALL concentration values reported on that Form I are flagged with the "D" flag.

Inorganic Chemicals

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

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N - Spiked sample recovery not within control limits.

W - Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.

* - Duplicate analysis not within control limits.

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Table 1: Soil Samples Collected in May and June

location		B26	B27	B28	B28	B29	B30	B30	B32	B34	B34
depth		4-6 ft	2-3 ft	4-8 ft	8-12 ft	1-4 ft	1-4 ft	4-8 ft	1-4 ft	1-4 ft	4-6 ft
sample#		B23426	B23427	B23428	B23429	B23430	B23431	B23432	B23433	B23434	B23435
colletion date		05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/09/00	05/09/00
ACENAPHTHENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
ACENAPHTHYLENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
ANTHRACENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
BENZO(A)ANTHRACENE	UG/KG	340 U	35000 U	370 U	390 U	43 J	62 J	380 U	350 U	360 U	370 U
BENZO(A)PYRENE	UG/KG	340 U	35000 U	370 U	390 U	55 J	63 J	380 U	350 U	360 U	370 U
BENZO(B)FLUORANTHENE	UG/KG	340 U	35000 U	370 U	390 U	47 J	58 J	380 U	350 U	360 U	370 U
BENZO(G,H,I)PERYLENE	UG/KG	340 U	35000 U	370 U	390 U	44 J	48 J	380 U	350 U	360 U	370 U
BENZO(K)FLUORANTHENE	UG/KG	340 U	35000 U	370 U	390 U	39 J	68 J	380 U	350 U	360 U	370 U
BENZYL ALCOHOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
BUTYL BENZYL PHTHALATE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
DI-N-BUTYLPHTHALATE	UG/KG	340 U	35000 U	370 U	390 U	64 J	360 U	64 J	42 J	360 U	83 J
CARBAZOLE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
INDENO(1,2,3-CD)PYRENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	42 J	380 U	350 U	360 U	370 U
4-CHLOROANILINE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2-CHLORONAPHTHALENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2-CHLOROPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
CHRYSENE	UG/KG	340 U	35000 U	370 U	390 U	62 J	73 J	380 U	350 U	360 U	370 U
DIBENZO(A,H)ANTHRACENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
DIBENZOFURAN	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
1,3-DICHLOROBENZENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
1,2-DICHLOROBENZENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
1,4-DICHLOROBENZENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
3,3'-DICHLOROBENZIDINE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2,4-DICHLOROPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
DIETHYLPHTHALATE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
DIMETHYL PHTHALATE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2,4-DIMETHYLPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2,4-DINITROPHENOL	UG/KG	1800 U	180000 U	1900 U	2000 U	1900 U	1900 U	2000 U	1800 U	1800 U	1900 U
2,4-DINITROTOLUENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2,6-DINITROTOLUENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
FLUORANTHENE	UG/KG	340 U	35000 U	370 U	390 U	68 J	130 J	380 U	350 U	360 U	370 U
FLUORENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
HEXACHLOROBENZENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
HEXACHLOROBUTADIENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
HEXACHLOROETHANE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
ISOPHORONE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2-METHYLNAPHTHALENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1800 U	180000 U	1900 U	2000 U	1900 U	1900 U	2000 U	1800 U	1800 U	1900 U
4-CHLORO-3-METHYLPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2-METHYLPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
4-METHYLPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
NAPHTHALENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2-NITROANILINE	UG/KG	1800 U	180000 U	1900 U	2000 U	1900 U	1900 U	2000 U	1800 U	1800 U	1900 U
3-NITROANILINE	UG/KG	1800 U	180000 U	1900 U	2000 U	1900 U	1900 U	2000 U	1800 U	1800 U	1900 U

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Table 1: Soil Samples Collected in May and June

location		B26	B27	B28	B28	B29	B30	B30	B32	B34	B34
depth		4-6 ft	2-3 ft	4-8 ft	8-12 ft	1-4 ft	1-4 ft	4-8 ft	1-4 ft	1-4 ft	4-6 ft
sample#		B23426	B23427	B23428	B23429	B23430	B23431	B23432	B23433	B23434	B23435
colletion date		05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/09/00	05/09/00
4-NITROANILINE	UG/KG	1800 U	180000 U	1900 U	2000 U	1900 U	1900 U	2000 U	1800 U	1800 U	1900 U
NITROBENZENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2-NITROPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
4-NITROPHENOL	UG/KG	1800 U	180000 U	1900 U	2000 U	1900 U	1900 U	2000 U	1800 U	1800 U	1900 U
N-NITROSODIMETHYLAMINE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
N-NITROSODIPHENYLAMINE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
DI-N-OCTYL PHTHALATE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
PENTACHLOROPHENOL	UG/KG	840 U	85000 U	890 U	940 U	870 U	880 U	920 U	840 U	860 U	900 U
PHENANTHRENE	UG/KG	340 U	35000 U	370 U	390 U	56 J	74 J	380 U	350 U	360 U	370 U
PHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
PYRENE	UG/KG	340 U	35000 U	370 U	390 U	87 J	140 J	380 U	350 U	360 U	370 U
1,2,4-TRICHLOROBENZENE	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2,4,6-TRICHLOROPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
2,4,5-TRICHLOROPHENOL	UG/KG	340 U	35000 U	370 U	390 U	360 U	360 U	380 U	350 U	360 U	370 U
ALDRIN	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
ALPHA-BHC	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
BETA-BHC	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
DELTA-BHC	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
GAMMA-BHC (LINDANE)	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
ALPHA-CHLORDANE	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
GAMMA-CHLORDANE	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
4,4'-DDD	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
4,4'-DDE	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
4,4'-DDT	UG/KG	3.4 U	35 U	3.7 U	3.9 U	3.6 U	3.6 U	3.8 U	3.5 U	3.6 U	3.7 U
DIELDRIN	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
ALPHA-ENDOSULFAN	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
BETA-ENDOSULFAN	UG/KG	3.4 U	35 U	3.7 U	3.9 U	3.6 U	3.6 U	3.8 U	3.5 U	3.6 U	3.7 U
ENDOSULFAN SULFATE	UG/KG	3.4 U	35 U	3.7 U	3.9 U	3.6 U	3.6 U	3.8 U	3.5 U	3.6 U	3.7 U
ENDRIN	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
ENDRIN ALDEHYDE	UG/KG	3.4 U	35 U	3.7 U	3.9 U	3.6 U	3.6 U	3.8 U	3.5 U	3.6 U	3.7 U
ENDRIN KETONE	UG/KG	3.4 U	35 U	3.7 U	3.9 U	3.6 U	3.6 U	3.8 U	3.5 U	3.6 U	3.7 U
HEPTACHLOR	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
HEPTACHLOR EPOXIDE	UG/KG	1.8 U	18 U	1.9 U	2.0 U	1.9 U	1.9 U	2.0 U	1.8 U	1.8 U	1.9 U
METHOXYCHLOR	UG/KG	6.9 U	70 U	7.3 U	7.7 U	7.2 U	7.2 U	7.6 U	6.9 U	7.1 U	7.4 U
TOXAPHENE	UG/KG	34 U	350 U	37 U	39 U	36 U	36 U	38 U	35 U	36 U	37 U
PCB 1016	UG/KG	34 U	35 U	37 U	39 U	36 U	36 U	38 U	35 U	36 U	37 U
PCB 1221	UG/KG	34 U	35 U	37 U	39 U	36 U	36 U	38 U	35 U	36 U	37 U
PCB 1232	UG/KG	34 U	35 U	37 U	39 U	36 U	36 U	38 U	35 U	36 U	37 U
PCB 1242	UG/KG	34 U	35 U	37 U	39 U	36 U	36 U	38 U	35 U	36 U	37 U
PCB 1248	UG/KG	34 U	1500 D	37 U	39 U	2400 D	9400 D	38 U	8300 D	3400 D	24000 D
PCB 1254	UG/KG	34 U	35 U	37 U	39 U	36 U	36 U	38 U	35 U	36 U	37 U
PCB 1260	UG/KG	34 U	700 JD	37 U	39 U	520	3600 JD	38 U	450 E	260	720 E
ANTIMONY	MG/KG	6 UN	6.2 UN	6.4 UN	6.8 UN	6.5 UN	6.5 UN	6.8 UN	6.2 UN	1.1 UN	1.1 UN
BARIUM	MG/KG	40.3	135	44.0	30.8	59.4	121	24.9	32.6	165	78.4
BERYLLIUM	MG/KG	0.5 U	0.52 U	0.53 U	0.57 U	0.54 U	0.54 U	0.57 U	0.52 U	0.530 U	0.560 U
CADMIUM	MG/KG	0.5 U	0.52 U	0.53 U	0.57 U	0.54 U	0.54 U	0.57 U	0.52 U	0.530 U	0.560 U

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Southside High School Raw Data

Table 1: Soil Samples Collected in May and June

location		B26	B27	B28	B28	B29	B30	B30	B32	B34	B34
depth		4-6 ft	2-3 ft	4-8 ft	8-12 ft	1-4 ft	1-4 ft	4-8 ft	1-4 ft	1-4 ft	4-6 ft
sample#		B23426	B23427	B23428	B23429	B23430	B23431	B23432	B23433	B23434	B23435
colletion date		05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/08/00	05/09/00	05/09/00
CHROMIUM	MG/KG	10.8	7.5	6.7	7.6	12.2	15.7	10.3	6.3	40.5	7.30
COPPER	MG/KG	25.4 *	30.3 *	24.1 *	20.6 *	56.0 *	57.7 *	18.9 *	17.8 *	56.7 *N	31.3 *N
LEAD	MG/KG	14.8 *	102 *	9.9 *	9.8 *	31.0 *	45.4 *	8.7 *	7.30 *	240 *N	21.9 *N
NICKEL	MG/KG	22.4 *	43.7 *	14.4 *	15.3 *	43.9 *	51.5 *	16.4 *	13.0 *	212 N	255 N
SELENIUM	MG/KG	0.5 U	0.52 U	0.53 U	0.57 U	0.54 U	0.54 U	0.57 U	0.52 U	0.53 UW	0.54 U
SILVER	MG/KG	1 U	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.1 U	1.1 U
THALLIUM	MG/KG	1 U	1.0 U	1.1 U	1.2 U	1.0 U	1.0 U	1.1 U	1.0 U	1.1 U	1.1 U
ZINC	MG/KG	54.1	59.4	70.1	61.6	83.5	82.4	61.2	47.6	98.2 N	60.3 N
VANADIUM	MG/KG	12.7	12.3	13.1	13.4	16.5	18.5	13.0	10.8	18.8	8.20
COBALT	MG/KG	5.5	5.2 U	6.3	6.3	6.90	8.7	6.5	5.2 U	8.20	5.6 U
TIN	MG/KG	50.2 U	51.9 U	53.5 U	56.8 U	54.0 U	54.3 U	56.7 U	51.8 U	53.0 U	56.2 U
MERCURY	MG/KG	0.05 U	0.05 U	0.05 U	0.06 U	0.05 U	0.05 U	0.06 U	0.05 U	0.0600 N	0.05 UN
ARSENIC	MG/KG	3.6 N	2.6 N	6.2 N	5.1 N	5.9 N	6.8 N	4.9 N	2.5 N	4.50 *N	2.60 *N
ACETONE	UG/KG	21 U	21 U	22 U	23 U	22 U	22 U	23 U	21 U	22 U	22 U
BENZENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
BROMODICHLOROMETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
BROMOFORM	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
BROMOMETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
2-BUTANONE (MEK)	UG/KG	10 U	11 U	11 U	12 U	11 U	11 U	12 U	10 U	11 U	11 U
CARBON DISULFIDE	UG/KG	10 U	3.4 J	11 U	12 U	11 U	11 U	12 U	10 U	11 U	11 U
CARBON TETRACHLORIDE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
CHLOROBENZENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
CHLOROETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
CHLOROFORM	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	1.5 J	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
CHLOROMETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
DIBROMOCHLOROMETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
1,1-DICHLOROETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
1,2-DICHLOROETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
1,1-DICHLOROETHENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
CIS-1,2-DICHLOROETHENE	UG/KG	5.2 U	20	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
TRANS-1,2-DICHLOROETHENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
1,2-DICHLOROPROPANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
CIS-1,3-DICHLOROPROPENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
ETHYLBENZENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
2-HEXANONE	UG/KG	10 U	11 U	11 U	12 U	11 U	11 U	12 U	10 U	11 U	11 U
METHYLENE CHLORIDE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	4.3 J	1.1 J	1.2 J	5.2 U	5.4 U	5.6 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	10 U	11 U	11 U	12 U	11 U	11 U	12 U	10 U	11 U	11 U
STYRENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
TETRACHLOROETHENE	UG/KG	1.5 J	23	5.6 U	5.9 U	2.9 J	5.5 U	5.8 U	5.2 U	2.4 J	2.2 J
TOLUENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	10	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
1,1,1-TRICHLOROETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
1,1,2-TRICHLOROETHANE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
TRICHLOROETHENE	UG/KG	14	20	5.6 U	5.9 U	51	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
VINYL CHLORIDE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
O-XYLENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	5.5 U	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
M+P-XYLENE	UG/KG	5.2 U	5.3 U	5.6 U	5.9 U	1.4 J	5.5 U	5.8 U	5.2 U	5.4 U	5.6 U
TOTAL CYANIDE	MG/KG	1.04 U	1.06 U	1.11 U	1.17 U	1.09 U	1.10 U	1.16 U	1.05 U	2.06	1.40

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Southside High School Raw Data

Table 1: Soil Samples Collected in May and June

location		B25	B25	B24	B23	B23	B23	B23	B35	B35	B25
depth		1-4 ft	8-12 ft	1-4 ft	1-4 ft	4-8 ft	8-12 ft	surface	surface	2-4 ft	surface
sample#		B23436	B23437	B23438	B23439	B23440	B23441	B23442	B23443	B23444	B23445
collection date		05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00
4-NITROANILINE	UG/KG	1800 U	2000 U	2000 U	2200 U	2000 U	2100 U	2000 U	2100 U	2100 U	2000 U
NITROBENZENE	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
2-NITROPHENOL	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
4-NITROPHENOL	UG/KG	1800 U	2000 U	2000 U	2200 U	2000 U	2100 U	2000 U	2100 U	2100 U	2000 U
N-NITROSODIMETHYLAMINE	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
N-NITROSODIPHENYLAMINE	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
DI-N-OCTYL PHTHALATE	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
PENTACHLOROPHENOL	UG/KG	860 U	950 U	930 U	1000 U	960 U	1000 U	940 U	990 U	970 U	920 U
PHENANTHRENE	UG/KG	350 U	390 U	62 J	430 U	410	410 U	340 J	180 J	1100	380 U
PHENOL	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
PYRENE	UG/KG	350 U	390 U	50 J	430 U	330 J	410 U	900	440	910	57 J
1,2,4-TRICHLOROBENZENE	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
2,4,6-TRICHLOROPHENOL	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
2,4,5-TRICHLOROPHENOL	UG/KG	350 U	390 U	380 U	430 U	400 U	410 U	390 U	410 U	400 U	380 U
ALDRIN	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
ALPHA-BHC	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
BETA-BHC	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
DELTA-BHC	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
GAMMA-BHC (LINDANE)	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
ALPHA-CHLORDANE	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
GAMMA-CHLORDANE	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
4,4'-DDD	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
4,4'-DDE	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
4,4'-DDT	UG/KG	3.5 U	3.9 U	3.8 U	4.3 U	4 U	4.1 U	3.9 U	4.1 U	4 U	3.8 U
DIELDRIN	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
ALPHA-ENDOSULFAN	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
BETA-ENDOSULFAN	UG/KG	3.5 U	3.9 U	3.8 U	4.3 U	4 U	4.1 U	3.9 U	4.1 U	4 U	3.8 U
ENDOSULFAN SULFATE	UG/KG	3.5 U	3.9 U	3.8 U	4.3 U	4 U	4.1 U	3.9 U	4.1 U	4 U	3.8 U
ENDRIN	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
ENDRIN ALDEHYDE	UG/KG	3.5 U	3.9 U	3.8 U	4.3 U	4 U	4.1 U	3.9 U	4.1 U	4 U	3.8 U
ENDRIN KETONE	UG/KG	3.5 U	3.9 U	3.8 U	4.3 U	4 U	4.1 U	3.9 U	4.1 U	4 U	3.8 U
HEPTACHLOR	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
HEPTACHLOR EPOXIDE	UG/KG	1.8 U	2.0 U	2.0 U	2.2 U	2 U	2.1 U	2.0 U	2.1 U	2.1 U	2.0 U
METHOXYCHLOR	UG/KG	7.1 U	7.9 U	7.7 U	8.6 U	7.9 U	8.3 U	7.7 U	8.2 U	8 U	7.6 U
TOXAPHENE	UG/KG	35 U	39 U	38 U	43 U	40 U	41 U	39 U	41 U	40 U	38 U
PCB 1016	UG/KG	35 U	39 U	38 U	43 U	40 U	41 U	39 U	41 U	40 U	38 U
PCB 1221	UG/KG	35 U	39 U	38 U	43 U	40 U	41 U	39 U	41 U	40 U	38 U
PCB 1232	UG/KG	35 U	39 U	38 U	43 U	40 U	41 U	39 U	41 U	40 U	38 U
PCB 1242	UG/KG	35 U	39 U	38 U	43 U	40 U	41 U	39 U	41 U	40 U	38 U
PCB 1248	UG/KG	1500 D	39 U	700 D	43 U	350	41 U	790 D	330	250	86
PCB 1254	UG/KG	35 U	39 U	38 U	43 U	40 U	41 U	39 U	41 U	40 U	38 U
PCB 1260	UG/KG	140	39 U	140	43 U	83	41 U	100	97	40 U	38 U
ANTIMONY	MG/KG	1.0 UN	1.2 N	4.50 N	1.3 UN	1.2 UN	1.2 UN	1.16 N	1.2 UN	1.20 UN	1.11 UN
BARIUM	MG/KG	43.3	26.6	434	68.1	307	224	113	131	138	115
BERYLLIUM	MG/KG	0.520 U	0.590 U	0.990	0.630 U	0.590 U	0.950	0.580 U	0.610 U	0.600 U	0.560 U
CADMIUM	MG/KG	0.520 U	0.590 U	0.580 U	0.630 U	0.590 U	0.620 U	0.580 U	0.610 U	0.600 U	0.560 U

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Southside High School Raw Data

Table 1: Soil Samples Collected in May and June

location		B24	B21	B21	B22	B20	B28	B33	B19	B15	B15
depth		surface	surface	1-4 ft	2-4 ft	5-7 ft	surface	surface	1-4 ft	4-5 ft	surface
sample#		B23446	B23447	B23448	B23449	B23450	B23451	B23452	B23453	B23454	B23455
colletion date		05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/09/00	05/10/00	05/10/00
ACENAPHTHENE	UG/KG	390 U	400 U	380 U	44 J	380 U	400 U	350 U	370 U	390 U	430 U
ACENAPHTHYLENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	220 J	430 U
ANTHRACENE	UG/KG	390 U	400 U	380 U	150 J	67 J	400 U	350 U	370 U	260 J	430 U
BENZO(A)ANTHRACENE	UG/KG	59 J	400 U	130 J	360 J	190 J	400 U	350 U	54 J	960	140 J
BENZO(A)PYRENE	UG/KG	77 J	400 U	120 J	330 J	160 J	400 U	350 U	51 J	1300	160 J
BENZO(B)FLUORANTHENE	UG/KG	82 J	400 U	110 J	280 J	140 J	400 U	350 U	45 J	1900	170 J
BENZO(G,H,I)PERYLENE	UG/KG	73 J	400 U	93 J	290 J	120 J	400 U	350 U	41 J	960	140 J
BENZO(K)FLUORANTHENE	UG/KG	64 J	400 U	120 J	260 J	120 J	400 U	350 U	42 J	1200	150 J
BENZYL ALCOHOL	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
BUTYL BENZYL PHTHALATE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
DI-N-BUTYLPHTHALATE	UG/KG	120 J	400 U	380 U	370 U	59 J	400 U	350 U	370 U	140 J	430 U
CARBAZOLE	UG/KG	390 U	400 U	380 U	42 J	380 U	400 U	350 U	370 U	180 J	430 U
INDENO(1,2,3-CD)PYRENE	UG/KG	61 J	400 U	78 J	240 J	110 J	400 U	350 U	370 U	870	120 J
4-CHLOROANILINE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2-CHLORONAPHTHALENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2-CHLOROPHENOL	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
CHRYSENE	UG/KG	93 J	400 U	160 J	370	230 J	400 U	350 U	66 J	1500	200 J
DIBENZO(A,H)ANTHRACENE	UG/KG	390 U	400 U	380 U	100 J	56 J	400 U	350 U	370 U	360 J	43 J
DIBENZOFURAN	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
1,3-DICHLOROBENZENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
1,2-DICHLOROBENZENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
1,4-DICHLOROBENZENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
3,3'-DICHLOROBENZIDINE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2,4-DICHLOROPHENOL	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
DIETHYLPHTHALATE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
DIMETHYL PHTHALATE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2,4-DIMETHYLPHENOL	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2,4-DINITROPHENOL	UG/KG	2000 U	2000 U	2000 U	1900 U	2000 U	2100 U	1800 U	1900 U	2000 U	2200 U
2,4-DINITROTOLUENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2,6-DINITROTOLUENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	190 J	400 U	66 J	40 J	240 J	400 U	350 U	370 U	340 J	59 J
FLUORANTHENE	UG/KG	150 J	55 J	230 J	750	360 J	400 U	350 U	79 J	1100	280 J
FLUORENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
HEXACHLOROBENZENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
HEXACHLOROBUTADIENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
HEXACHLOROETHANE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
ISOPHORONE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2-METHYLNAPHTHALENE	UG/KG	390 U	400 U	380 U	370 U	40 J	400 U	350 U	370 U	67 J	430 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	2000 U	2000 U	2000 U	1900 U	2000 U	2100 U	1800 U	1900 U	2000 U	2200 U
4-CHLORO-3-METHYLPHENOL	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
2-METHYLPHENOL	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
4-METHYLPHENOL	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	390 U	430 U
NAPHTHALENE	UG/KG	390 U	400 U	380 U	370 U	380 U	400 U	350 U	370 U	60 J	430 U
2-NITROANILINE	UG/KG	2000 U	2000 U	2000 U	1900 U	2000 U	2100 U	1800 U	1900 U	2000 U	2200 U
3-NITROANILINE	UG/KG	2000 U	2000 U	2000 U	1900 U	2000 U	2100 U	1800 U	1900 U	2000 U	2200 U

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Southside High School Raw Data

Table 1: Soil Samples Collected in May and June

location depth sample# colletion date		B24 surface B23446 05/09/00	B21 surface B23447 05/09/00	B21 1-4 ft B23448 05/09/00	B22 2-4 ft B23449 05/09/00	B20 5-7 ft B23450 05/09/00	B28 surface B23451 05/09/00	B33 surface B23452 05/09/00	B19 1-4 ft B23453 05/09/00	B15 4-5 ft B23454 05/10/00	B15 surface B23455 05/10/00
CHROMIUM	MG/KG	21.1	13.2	20.8	14.7	13.1	21.5	11.0	14.5	21.4	15.5
COPPER	MG/KG	35.3 *N	16.1 *N	90.2 *N	59.7 *N	45.8 *N	18.8 *N	15.8 *N	65.0 *N	85.2	18.5
LEAD	MG/KG	31.7 *N	16.8 *N	176 *N	77.9 *N	151 *N	20.0 *N	13.1 *N	51.9 *N	149	21.0
NICKEL	MG/KG	25.9 N	20.6 N	87.8 N	36.4 N	74.2 N	23.5 N	18.8 N	49.4 N	38.0	20.8
SELENIUM	MG/KG	0.59 U	0.60 U	0.94	0.55 U	0.58 U	0.59 U	0.52 U	0.77	0.89	0.63 UW
SILVER	MG/KG	1.1 U	1.20 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U	1.1 U	1.30 U
THALLIUM	MG/KG	1.2 U	1.20 U	1.1 U	1.1 U	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.30 U
ZINC	MG/KG	99.1 N	88.3 N	128 N	86.3 N	88.3 N	77.2 N	58.6 N	84.2 N	205	68.8
VANADIUM	MG/KG	19.9	18.8	20.5	18.8	17.0	20.4	16.0	19.9	18.1	18.2
COBALT	MG/KG	10.5	10.2	10.1	7.90	7.10	10.7	9.60	8.20	8.40	9.60
TIN	MG/KG	56.7 U	60.1 U	57.1 U	54.4 U	56.5 U	59.1 U	52.9 U	55.0 U	57.3 U	65.0 U
MERCURY	MG/KG	0.06 UN	0.06 UN	0.19 N	0.07 N	0.05 UN	0.06 UN	0.05 UN	0.05 UN	0.06 U	0.06 U
ARSENIC	MG/KG	4.40 *N	4.90 *N	13.7 *N	8.80 *N	5.90 *N	5.20 *N	5.60 *N	4.70 *N	9.10	4.40
ACETONE	UG/KG	24 U	24 U	23 U	22 U	21 J	24 U	21 U	22 U	23 U	26 U
BENZENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
BROMODICHLOROMETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
BROMOFORM	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
BROMOMETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
2-BUTANONE (MEK)	UG/KG	12 U	12 U	12 U	11 U	5.0 J	12 U	11 U	11 U	12 U	13 U
CARBON DISULFIDE	UG/KG	12 U	12 U	1.6 J	11 U	2.5 J	12 U	11 U	11 U	12 U	13 U
CARBON TETRACHLORIDE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
CHLOROBENZENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
CHLOROETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
CHLOROFORM	UG/KG	1.4 J	1.4 J	5.8 U	2.1 J	1.3 J	1.5 J	1.3 J	1.9 J	5.8 U	6.5 U
CHLOROMETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
DIBROMOCHLOROMETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
1,1-DICHLOROETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
1,2-DICHLOROETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
1,1-DICHLOROETHENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
CIS-1,2-DICHLOROETHENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
TRANS-1,2-DICHLOROETHENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
1,2-DICHLOROPROPANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
CIS-1,3-DICHLOROPROPENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
ETHYLBENZENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
2-HEXANONE	UG/KG	12 U	12 U	12 U	11 U	12 U	12 U	11 U	11 U	12 U	13 U
METHYLENE CHLORIDE	UG/KG	6.0 U	6.0 U	5.8 U	1.3 J	5.8 U	6.1 U	3.2 J	3.8 J	5.8 U	6.5 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	12 U	12 U	12 U	11 U	12 U	12 U	11 U	11 U	12 U	13 U
STYRENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
TETRACHLOROETHENE	UG/KG	55	8.9	5.8 U	25	5.8 U	8.0	7.2	28	12	16
TOLUENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
1,1,1-TRICHLOROETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
1,1,2-TRICHLOROETHANE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
TRICHLOROETHENE	UG/KG	6.0 U	6.0 U	5.8 U	3.9 J	5.8 U	6.1 U	5.3 U	6.7	5.8 U	6.5 U
VINYL CHLORIDE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
O-XYLENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
M+P-XYLENE	UG/KG	6.0 U	6.0 U	5.8 U	5.6 U	5.8 U	6.1 U	5.3 U	5.6 U	5.8 U	6.5 U
TOTAL CYANIDE	MG/KG	1.19 U	1.20 U	1.16 U	1.12 U	1.15 U	1.22 U	1.06 U	1.11 U	15.0	1.30 U

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Southside High School Raw Data

Table 1: Soil Samples Collected in May and June

location		SS1	B16	SS2	B17	B18	B11	B11	B10	B10	B13
depth		surface	1-2 ft	surface	1-3 ft	1-3 ft	1-3 ft	surface	surface	2-3 ft	surface
sample#		B23456	B23457	B23458	B23459	B23460	B23461	B23462	B23463	B23464	B23465
colletion date		05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00
4-NITROANILINE	UG/KG	2600 U	1900 U	2400 U	2100 U	1900 U	1900 U	2200 U	2400 U	2100 U	23000 U
NITROBENZENE	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
2-NITROPHENOL	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
4-NITROPHENOL	UG/KG	2600 U	1900 U	2400 U	2100 U	1900 U	1900 U	2200 U	2400 U	2100 U	23000 U
N-NITROSODIMETHYLAMINE	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
N-NITROSODIPHENYLAMINE	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
DI-N-OCTYL PHTHALATE	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
PENTACHLOROPHENOL	UG/KG	1200 U	910 U	1100 U	1000 U	890 U	910 U	1000 U	1100 U	970 U	11000 U
PHENANTHRENE	UG/KG	500 U	93 J	470 U	410 U	590	47 J	430 U	470 U	94 J	1400 J
PHENOL	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
PYRENE	UG/KG	500 U	160 J	470 U	410 U	700	100 J	430 U	470 U	210 J	460 J
1,2,4-TRICHLOROBENZENE	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
2,4,6-TRICHLOROPHENOL	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
2,4,5-TRICHLOROPHENOL	UG/KG	500 U	380 U	470 U	410 U	370 U	380 U	430 U	470 U	400 U	4400 U
ALDRIN	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
ALPHA-BHC	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
BETA-BHC	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
DELTA-BHC	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
GAMMA-BHC (LINDANE)	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
ALPHA-CHLORDANE	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
GAMMA-CHLORDANE	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
4,4'-DDD	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
4,4'-DDE	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
4,4'-DDT	UG/KG	5 U	3.8 U	4.7 U	4.1 U	3.7 U	3.8 U	4.3 U	4.7 U	4 U	4.4 U
DIELDRIN	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
ALPHA-ENDOSULFAN	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
BETA-ENDOSULFAN	UG/KG	5 U	3.8 U	4.7 U	4.1 U	3.7 U	3.8 U	4.3 U	4.7 U	4 U	4.4 U
ENDOSULFAN SULFATE	UG/KG	5 U	3.8 U	4.7 U	4.1 U	3.7 U	3.8 U	4.3 U	4.7 U	4 U	4.4 U
ENDRIN	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
ENDRIN ALDEHYDE	UG/KG	5 U	3.8 U	4.7 U	4.1 U	3.7 U	3.8 U	4.3 U	4.7 U	4 U	4.4 U
ENDRIN KETONE	UG/KG	5 U	3.8 U	4.7 U	4.1 U	3.7 U	3.8 U	4.3 U	4.7 U	4 U	4.4 U
HEPTACHLOR	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
HEPTACHLOR EPOXIDE	UG/KG	2.6 U	1.9 U	2.4 U	2.1 U	1.9 U	1.9 U	2.2 U	2.4 U	2.1 U	2.3 U
METHOXYCHLOR	UG/KG	10 U	7.5 U	9.3 U	8.2 U	7.3 U	7.5 U	8.5 U	9.4 U	8 U	8.8 U
TOXAPHENE	UG/KG	50 U	38 U	47 U	41 U	37 U	38 U	43 U	47 U	40 U	44 U
PCB 1016	UG/KG	50 U	38 U	47 U	41 U	37 U	38 U	43 U	47 U	40 U	44 U
PCB 1221	UG/KG	50 U	38 U	47 U	41 U	37 U	38 U	43 U	47 U	40 U	44 U
PCB 1232	UG/KG	50 U	38 U	47 U	41 U	37 U	38 U	43 U	47 U	40 U	44 U
PCB 1242	UG/KG	50 U	38 U	47 U	41 U	37 U	38 U	43 U	47 U	40 U	44 U
PCB 1248	UG/KG	50 U	38 U	47 U	41 U	74	190	43 U	47 U	40 U	150
PCB 1254	UG/KG	50 U	38 U	47 U	41 U	37 U	38 U	43 U	47 U	40 U	44 U
PCB 1260	UG/KG	50 U	38 U	47 U	41 U	37 U	150	43 U	47 U	40 U	44 U
ANTIMONY	MG/KG	1.70 N	1.1 UN	1.4 UN	1.2 UN	1.1 UN	1.1 UN	1.3 UN	1.70 N	1.2 UN	1.3 UN
BARIUM	MG/KG	111	207	124	118	69.6	79.3	107	104	54.8	75.5
BERYLLIUM	MG/KG	0.740 U	0.560 U	0.690 U	0.600 U	0.540 U	0.560 U	0.640 U	0.700 U	0.600 U	0.660 U
CADMIUM	MG/KG	0.740 U	0.560 U	0.690 U	0.600 U	0.540 U	0.560 U	0.640 U	0.700 U	0.600 U	0.660 U

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Table 1: Soil Samples Collected in May and June

location		B13	B12	B12	SS3	B14	B14	B9	SS4	B8	B8
depth		1-2 ft	surface	1-4 ft	surface	5-6 ft	surface	2-3 ft	surface	4-5 ft	surface
sample#		B23466	B23467	B23468	B23469	B23470	B23471	B23482	B23483	B23484	B23485
colletion date		05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/11/00	05/11/00	05/11/00	05/11/00
ACENAPHTHENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
ACENAPHTHYLENE	UG/KG	620 J	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
ANTHRACENE	UG/KG	430 J	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
BENZO(A)ANTHRACENE	UG/KG	1100 J	420 U	380 U	460 U	360 U	430 U	99 J	430 U	370 U	410 U
BENZO(A)PYRENE	UG/KG	1200 J	420 U	380 U	81 J	360 U	430 U	98 J	50 J	370 U	410 U
BENZO(B)FLUORANTHENE	UG/KG	1200 J	420 U	380 U	97 J	360 U	430 U	140 J	46 J	370 U	410 U
BENZO(G,H,I)PERYLENE	UG/KG	1400 J	420 U	380 U	94 J	360 U	430 U	76 J	46 J	370 U	410 U
BENZO(K)FLUORANTHENE	UG/KG	1100 J	420 U	380 U	74 J	360 U	430 U	140 J	430 U	370 U	410 U
BENZYL ALCOHOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
BUTYL BENZYL PHTHALATE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
DI-N-BUTYLPHTHALATE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	40 J	430 U	53 J	44 J
CARBAZOLE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
INDENO(1,2,3-CD)PYRENE	UG/KG	1100 J	420 U	380 U	75 J	360 U	430 U	70 J	430 U	370 U	410 U
4-CHLOROANILINE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2-CHLORONAPHTHALENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2-CHLOROPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
CHRYSENE	UG/KG	1400 J	420 U	43 J	59 J	360 U	430 U	180 J	48 J	370 U	410 U
DIBENZO(A,H)ANTHRACENE	UG/KG	410 J	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
DIBENZOFURAN	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
1,3-DICHLOROBENZENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
1,2-DICHLOROBENZENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
1,4-DICHLOROBENZENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
3,3'-DICHLOROBENZIDINE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2,4-DICHLOROPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
DIETHYLPHTHALATE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
DIMETHYL PHTHALATE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2,4-DIMETHYLPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2,4-DINITROPHENOL	UG/KG	20000 U	2200 U	2000 U	2400 U	1900 U	2200 U	1900 U	2200 U	1900 U	2100 U
2,4-DINITROTOLUENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2,6-DINITROTOLUENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	3800 U	420 U	48 J	460 U	360 U	430 U	360 U	430 U	68 J	410 U
FLUORANTHENE	UG/KG	1500 J	420 U	380 U	59 J	360 U	430 U	280 J	84 J	42 J	49 J
FLUORENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
HEXACHLOROBENZENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
HEXACHLOROBUTADIENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
HEXACHLOROETHANE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
ISOPHORONE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2-METHYLNAPHTHALENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	20000 U	2200 U	2000 U	2400 U	1900 U	2200 U	1900 U	2200 U	1900 U	2100 U
4-CHLORO-3-METHYLPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2-METHYLPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
4-METHYLPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
NAPHTHALENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2-NITROANILINE	UG/KG	20000 U	2200 U	2000 U	2400 U	1900 U	2200 U	1900 U	2200 U	1900 U	2100 U
3-NITROANILINE	UG/KG	20000 U	2200 U	2000 U	2400 U	1900 U	2200 U	1900 U	2200 U	1900 U	2100 U

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Table 1: Soil Samples Collected in May and June

location		B13	B12	B12	SS3	B14	B14	B9	SS4	B8	B8
depth		1-2 ft	surface	1-4 ft	surface	5-6 ft	surface	2-3 ft	surface	4-5 ft	surface
sample#		B23466	B23467	B23468	B23469	B23470	B23471	B23482	B23483	B23484	B23485
colletion date		05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/11/00	05/11/00	05/11/00	05/11/00
4-NITROANILINE	UG/KG	20000 U	2200 U	2000 U	2400 U	1900 U	2200 U	1900 U	2200 U	1900 U	2100 U
NITROBENZENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2-NITROPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
4-NITROPHENOL	UG/KG	20000 U	2200 U	2000 U	2400 U	1900 U	2200 U	1900 U	2200 U	1900 U	2100 U
N-NITROSODIMETHYLAMINE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
N-NITROSODIPHENYLAMINE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
DI-N-OCTYL PHTHALATE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
PENTACHLOROPHENOL	UG/KG	9300 U	1000 U	930 U	1100 U	880 U	1000 U	880 U	1000 U	880 U	1000 U
PHENANTHRENE	UG/KG	590 J	420 U	380 U	460 U	360 U	430 U	38 J	430 U	370 U	410 U
PHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
PYRENE	UG/KG	1700 J	420 U	380 U	65 J	360 U	430 U	220 J	66 J	370 U	410 U
1,2,4-TRICHLOROBENZENE	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2,4,6-TRICHLOROPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
2,4,5-TRICHLOROPHENOL	UG/KG	3800 U	420 U	380 U	460 U	360 U	430 U	360 U	430 U	370 U	410 U
ALDRIN	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
ALPHA-BHC	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
BETA-BHC	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
DELTA-BHC	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
GAMMA-BHC (LINDANE)	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
ALPHA-CHLORDANE	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
GAMMA-CHLORDANE	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
4,4'-DDD	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
4,4'-DDE	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
4,4'-DDT	UG/KG	3.8 U	4.2 U	3.8 U	4.6 U	3.6 U	4.3 U	3.6 U	4.3 U	3.7 U	4.1 U
DIELDRIN	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	29	1.9 U	2.2 U	1.9 U	2.1 U
ALPHA-ENDOSULFAN	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
BETA-ENDOSULFAN	UG/KG	3.8 U	4.2 U	3.8 U	4.6 U	3.6 U	4.3 U	3.6 U	4.3 U	3.7 U	4.1 U
ENDOSULFAN SULFATE	UG/KG	3.8 U	4.2 U	3.8 U	4.6 U	3.6 U	4.3 U	3.6 U	4.3 U	3.7 U	4.1 U
ENDRIN	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
ENDRIN ALDEHYDE	UG/KG	3.8 U	4.2 U	3.8 U	4.6 U	3.6 U	4.3 U	3.6 U	4.3 U	3.7 U	4.1 U
ENDRIN KETONE	UG/KG	3.8 U	4.2 U	3.8 U	4.6 U	3.6 U	4.3 U	3.6 U	4.3 U	3.7 U	4.1 U
HEPTACHLOR	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
HEPTACHLOR EPOXIDE	UG/KG	2 U	2.2 U	2.0 U	2.4 U	1.9 U	2.2 U	1.9 U	2.2 U	1.9 U	2.1 U
METHOXYCHLOR	UG/KG	7.7 U	8.4 U	7.6 U	9.2 U	7.3 U	8.6 U	7.3 U	8.6 U	7.3 U	8.3 U
TOXAPHENE	UG/KG	38 U	42 U	38 U	46 U	36 U	43 U	36 U	43 U	37 U	41 U
PCB 1016	UG/KG	38 U	42 U	38 U	46 U	36 U	43 U	36 U	43 U	37 U	41 U
PCB 1221	UG/KG	38 U	42 U	38 U	46 U	36 U	43 U	36 U	43 U	37 U	41 U
PCB 1232	UG/KG	38 U	42 U	38 U	46 U	36 U	43 U	36 U	43 U	37 U	41 U
PCB 1242	UG/KG	38 U	42 U	38 U	46 U	36 U	43 U	36 U	43 U	37 U	41 U
PCB 1248	UG/KG	38 U	42 U	38 U	730 D	36 U	43 U	760 D	43 U	3300 D	230
PCB 1254	UG/KG	38 U	42 U	38 U	460 U	36 U	43 U	36 U	43 U	37 U	41 U
PCB 1260	UG/KG	38 U	42 U	38 U	250	36 U	43 U	150	43 U	170	54
ANTIMONY	MG/KG	1.1 UN	1.2 UN	1.1 UN	1.4 UN	6.5 UN	7.7 UN	6.5 UN	7.8 UN	6.4 UN	7.3 UN
BARIUM	MG/KG	93.2	120	105	134	48.8	114	486	110	426	116
BERYLLIUM	MG/KG	0.570 U	0.620 U	0.550 U	0.680 U	0.540 U	0.640 U	0.540 U	0.650 U	0.530 U	0.610 U
CADMIUM	MG/KG	0.570 U	0.620 U	0.550 U	0.680 U	0.540 U	0.640 U	0.700	0.650 U	0.530 U	0.610 U

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Southside High School Raw Data

Table 1: Soil Samples Collected in May and June

location		B13	B12	B12	SS3	B14	B14	B9	SS4	B8	B8
depth		1-2 ft	surface	1-4 ft	surface	5-6 ft	surface	2-3 ft	surface	4-5 ft	surface
sample#		B23466	B23467	B23468	B23469	B23470	B23471	B23482	B23483	B23484	B23485
colletion date		05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/10/00	05/11/00	05/11/00	05/11/00	05/11/00
CHROMIUM	MG/KG	12.6	15.8	11.1	14.3	8.30	12.3	21.3	20.8	12.9	13.8
COPPER	MG/KG	51.1	14.9	21.7	14.6	24.4	14.8	79.0	20.5	243	17.1
LEAD	MG/KG	46.8	17.7	19.1	18.4	24.2	17.9	165	23.5	286	17.3
NICKEL	MG/KG	19.5	20.8	15.1	21.8	14.1	19.3	71.0	21.3	202	22.3
SELENIUM	MG/KG	0.86	0.64 UW	0.56 U	0.68 U	0.540 U	0.640 U	0.770	0.650 U	0.530 U	0.610 U
SILVER	MG/KG	1.1 U	1.2 U	1.1 U	1.4 U	1.1 U	1.3 U	1.1 U	1.30 U	1.1 U	1.2 U
THALLIUM	MG/KG	1.1 U	1.3 U	1.1 U	1.4 U	1.0 U	1.3 U	1.0 U	1.30 U	1.1 U	1.2 U
ZINC	MG/KG	66.6	61.4	69.4	62.7	121	58.4	306	68.0	145	62.5
VANADIUM	MG/KG	20.0	19.1	17.7	17.8	15.4	17.3	17.3	20.2	17.3	19.8
COBALT	MG/KG	5.7 U	10.2	6.80	9.90	6.20	9.80	10.1	10.4	5.90	10.3
TIN	MG/KG	57.1 U	62.4 U	55.1 U	67.6 U	54.4 U	64.2 U	54.0 U	65.2 U	53.2 U	60.8 U
MERCURY	MG/KG	0.09	0.06 U	0.06 U	0.70 U	0.05 U	0.06 U	0.07	0.06 U	0.05 U	0.06 U
ARSENIC	MG/KG	12.4	4.20	4.50	4.00	5.10	6.20	7.40	6.80	7.40	6.40
ACETONE	UG/KG	23 U	25 U	23 U	28 U	22 U	26 U	22 U	26 U	22 U	25 U
BENZENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
BROMODICHLOROMETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
BROMOFORM	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
BROMOMETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
2-BUTANONE (MEK)	UG/KG	12 U	13 U	12 U	14 U	11 U	13 U	11 U	13 U	11 U	13 U
CARBON DISULFIDE	UG/KG	12 U	13 U	12 U	14 U	11 U	13 U	11 U	13 U	11 U	13 U
CARBON TETRACHLORIDE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
CHLOROBENZENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
CHLOROETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
CHLOROFORM	UG/KG	1.3 J	6.4 U	5.8 U	7.0 U	1.2 J	2.9 J	3.2 J	2.1 J	1.3 J	1.5 J
CHLOROMETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
DIBROMOCHLOROMETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
1,1-DICHLOROETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
1,2-DICHLOROETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
1,1-DICHLOROETHENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
CIS-1,2-DICHLOROETHENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
TRANS-1,2-DICHLOROETHENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
1,2-DICHLOROPROPANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
CIS-1,3-DICHLOROPROPENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
ETHYLBENZENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
2-HEXANONE	UG/KG	12 U	13 U	12 U	14 U	11 U	13 U	11 U	13 U	11 U	13 U
METHYLENE CHLORIDE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	12 U	13 U	12 U	14 U	11 U	13 U	11 U	13 U	11 U	13 U
STYRENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
TETRACHLOROETHENE	UG/KG	3.6 J	6.4 U	1.6 J	3.6 J	3.5 J	25	26	4.0 J	2.9 J	15
TOLUENE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
1,1,1-TRICHLOROETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
1,1,2-TRICHLOROETHANE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	3.7 J	6.3 U
TRICHLOROETHENE	UG/KG	9.8	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	4.1 J	6.5 U	2.2 J	6.3 U
VINYL CHLORIDE	UG/KG	5.8 U	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
O-XYLENE	UG/KG	1.4 J	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
M+P-XYLENE	UG/KG	1.5 J	6.4 U	5.8 U	7.0 U	5.5 U	6.5 U	5.5 U	6.5 U	5.5 U	6.3 U
TOTAL CYANIDE	MG/KG	1.17 U	1.27 U	1.16 U	1.39 U	1.10 U	1.30 U	1.10 U	1.30 U	1.11 U	1.25 U

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Table 1: Soil Samples Collected in May and June

location		B6	B4	B2	B3	FB1	FB1	FB1	FB2	FB3	FB4
depth		1-3 ft	2-4 ft	1-2 ft	4-8 ft	0.5-2 ft	6-8 ft	16-18 ft	0.5-1 ft	3-4 ft	3-4 ft
sample#		B23486	B23487	B23488	B23489	B23493	B23494	B23495	B23496	B23497	B23498
colletion date		05/11/00	05/12/00	05/12/00	05/12/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00
ACENAPHTHENE	UG/KG	360 U	4000 U	410 U	420 U	230 J	400 U	410 U	300 J	380 U	1100 U
ACENAPHTHYLENE	UG/KG	42 J	4000 U	410 U	60 J	160 J	400 U	410 U	170 J	45 J	1400
ANTHRACENE	UG/KG	360 U	4000 U	410 U	60 J	720	400 U	410 U	800	42 J	1400
BENZO(A)ANTHRACENE	UG/KG	240 J	4000 U	410 U	280 J	1900	41 J	410 U	1600	100 J	3300
BENZO(A)PYRENE	UG/KG	350 J	4000 U	410 U	290 J	1700	42 J	410 U	1300	380 U	3400
BENZO(B)FLUORANTHENE	UG/KG	320 J	4000 U	410 U	260 J	1300	44 J	410 U	1100	380 U	2600
BENZO(G,H,I)PERYLENE	UG/KG	310 J	4000 U	410 U	250 J	1300	400 U	410 U	1000	380 U	1900
BENZO(K)FLUORANTHENE	UG/KG	280 J	4000 U	410 U	240 J	1300	43 J	410 U	1200	380 U	2800
BENZYL ALCOHOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
BUTYL BENZYL PHTHALATE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
DI-N-BUTYLPHTHALATE	UG/KG	44 J	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
CARBAZOLE	UG/KG	360 U	4000 U	410 U	420 U	300 J	400 U	410 U	400 U	380 U	260 J
INDENO(1,2,3-CD)PYRENE	UG/KG	280 J	4000 U	410 U	220 J	1300	400 U	410 U	990	380 U	1900
4-CHLOROANILINE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2-CHLORONAPHTHALENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2-CHLOROPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
CHRYSENE	UG/KG	280 J	4000 U	410 U	270 J	2000	52 J	410 U	1600	230 J	3600
DIBENZO(A,H)ANTHRACENE	UG/KG	96 J	4000 U	410 U	78 J	450	400 U	410 U	390 J	380 U	680 J
DIBENZOFURAN	UG/KG	360 U	4000 U	410 U	420 U	140 J	400 U	410 U	280 J	380 U	1100 U
1,3-DICHLOROBENZENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
1,2-DICHLOROBENZENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	730	380 U	1100 U
1,4-DICHLOROBENZENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
3,3'-DICHLOROBENZIDINE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2,4-DICHLOROPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
DIETHYLPHTHALATE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
DIMETHYL PHTHALATE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2,4-DIMETHYLPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2,4-DINITROPHENOL	UG/KG	1900 U	21000 U	2100 U	2200 U	1900 U	2000 U	2100 U	2100 U	2000 U	5800 U
2,4-DINITROTOLUENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2,6-DINITROTOLUENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	360 U	4000 U	410 U	590	120 J	400 U	410 U	68 J	380 U	160 J
FLUORANTHENE	UG/KG	330 J	4000 U	410 U	570	3600	53 J	410 U	3100	120 J	5600
FLUORENE	UG/KG	360 U	4000 U	410 U	420 U	200 J	400 U	410 U	310 J	380 U	1100 U
HEXACHLOROBENZENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
HEXACHLOROBUTADIENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
HEXACHLOROETHANE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
ISOPHORONE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2-METHYLNAPHTHALENE	UG/KG	360 U	4000 U	410 U	420 U	100 J	400 U	410 U	470	41 J	130 J
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1900 U	21000 U	2100 U	2200 U	1900 U	2000 U	2100 U	2100 U	2000 U	5800 U
4-CHLORO-3-METHYLPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2-METHYLPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
4-METHYLPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
NAPHTHALENE	UG/KG	360 U	4000 U	410 U	420 U	100 J	400 U	410 U	360 J	380 U	370 J
2-NITROANILINE	UG/KG	1900 U	21000 U	2100 U	2200 U	1900 U	2000 U	2100 U	2100 U	2000 U	5800 U
3-NITROANILINE	UG/KG	1900 U	21000 U	2100 U	2200 U	1900 U	2000 U	2100 U	2100 U	2000 U	5800 U

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Table 1: Soil Samples Collected in May and June

location		B6	B4	B2	B3	FB1	FB1	FB1	FB2	FB3	FB4
depth		1-3 ft	2-4 ft	1-2 ft	4-8 ft	0.5-2 ft	6-8 ft	16-18 ft	0.5-1 ft	3-4 ft	3-4 ft
sample#		B23486	B23487	B23488	B23489	B23493	B23494	B23495	B23496	B23497	B23498
colletion date		05/11/00	05/12/00	05/12/00	05/12/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00
4-NITROANILINE	UG/KG	1900 U	21000 U	2100 U	2200 U	1900 U	2000 U	2100 U	2100 U	2000 U	5800 U
NITROBENZENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2-NITROPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
4-NITROPHENOL	UG/KG	1900 U	21000 U	2100 U	2200 U	1900 U	2000 U	2100 U	2100 U	2000 U	5800 U
N-NITROSODIMETHYLAMINE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
N-NITROSODIPHENYLAMINE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
DI-N-OCTYL PHTHALATE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
PENTACHLOROPHENOL	UG/KG	870 U	9700 U	1000 U	1000 U	1900 U	2000 U	2100 U	2100 U	2000 U	5800 U
PHENANTHRENE	UG/KG	80 J	4000 U	410 U	150 J	2800	400 U	410 U	2800	100 J	1500
PHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
PYRENE	UG/KG	300 J	4000 U	410 U	420 J	2900	60 J	410 U	2900	120 J	4800
1,2,4-TRICHLOROBENZENE	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2,4,6-TRICHLOROPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
2,4,5-TRICHLOROPHENOL	UG/KG	360 U	4000 U	410 U	420 U	380 U	400 U	410 U	400 U	380 U	1100 U
ALDRIN	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
ALPHA-BHC	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
BETA-BHC	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
DELTA-BHC	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
GAMMA-BHC (LINDANE)	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
ALPHA-CHLORDANE	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
GAMMA-CHLORDANE	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
4,4'-DDD	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
4,4'-DDE	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
4,4'-DDT	UG/KG	3.6 U	4 U	4.1 U	4.2 U	38 U	40 U	4.1 U	4 U	38 U	38 U
DIELDRIN	UG/KG	1.9 U	2.1 U	19	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
ALPHA-ENDOSULFAN	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
BETA-ENDOSULFAN	UG/KG	3.6 U	4 U	4.1 U	4.2 U	38 U	40 U	4.1 U	4 U	38 U	38 U
ENDOSULFAN SULFATE	UG/KG	3.6 U	4 U	4.1 U	4.2 U	38 U	40 U	4.1 U	4 U	38 U	38 U
ENDRIN	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
ENDRIN ALDEHYDE	UG/KG	3.6 U	4 U	4.1 U	4.2 U	38 U	40 U	4.1 U	4 U	38 U	38 U
ENDRIN KETONE	UG/KG	3.6 U	4 U	4.1 U	4.2 U	38 U	40 U	4.1 U	4 U	38 U	38 U
HEPTACHLOR	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
HEPTACHLOR EPOXIDE	UG/KG	1.9 U	2.1 U	2.1 U	2.2 U	19 U	20 U	2.1 U	2.1 U	20 U	19 U
METHOXYCHLOR	UG/KG	7.2 U	8 U	8.3 U	8.4 U	76 U	79 U	8.2 U	8 U	77 U	75 U
TOXAPHENE	UG/KG	36 U	40 U	41 U	42 U	380 U	400 U	41 U	40 U	380 U	380 U
PCB 1016	UG/KG	36 U	40 U	41 U	42 U	38 U	40 U	41 U	40 U	38 U	38 U
PCB 1221	UG/KG	36 U	40 U	41 U	42 U	38 U	40 U	41 U	40 U	38 U	38 U
PCB 1232	UG/KG	36 U	40 U	41 U	42 U	38 U	40 U	41 U	40 U	38 U	38 U
PCB 1242	UG/KG	36 U	40 U	41 U	42 U	38 U	40 U	41 U	40 U	38 U	38 U
PCB 1248	UG/KG	36 U	40 U	41 U	42 U	2100 D	40 U	41 U	130	330	8800 D
PCB 1254	UG/KG	36 U	40 U	41 U	42 U	38 U	40 U	41 U	40 U	38 U	38 U
PCB 1260	UG/KG	36 U	40 U	41 U	42 U	840 D	40 U	41 U	40 U	150	300
ANTIMONY	MG/KG	6.4 UN	7.0 UN	7.3 UN	7.3 UN	1.4	1.19 U	1.22 U	1.17 U	1.6	1.5
BARIUM	MG/KG	174	169 *	136 *	92.4	165	66.6	163	76.4	73.9	187
BERYLLIUM	MG/KG	0.530 U	0.58 U	0.61 U	0.61 U	0.55 U	0.6 U	0.61 U	0.65	0.58 U	0.56 U
CADMIUM	MG/KG	0.530 U	0.58 U	0.61 U	0.61 U	0.55 U	0.6 U	0.61 U	0.59 U	0.58 U	0.56 U

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Table 1: Soil Samples Collected in May and June

location		B6	B4	B2	B3	FB1	FB1	FB1	FB2	FB3	FB4
depth		1-3 ft	2-4 ft	1-2 ft	4-8 ft	0.5-2 ft	6-8 ft	16-18 ft	0.5-1 ft	3-4 ft	3-4 ft
sample#		B23486	B23487	B23488	B23489	B23493	B23494	B23495	B23496	B23497	B23498
collection date		05/11/00	05/12/00	05/12/00	05/12/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00
CHROMIUM	MG/KG	10.2	14.4	14.0	23.5	134	6.3	13.3	12.9	14.6	12.2
COPPER	MG/KG	29.2	85.0	15.9	27.4	92.6	32.5	64.7	17	142	49
LEAD	MG/KG	50.3	118	16.7	31.8	123	64	74.1	16.4	125	76
NICKEL	MG/KG	19.5	29.2	23.3	13.3	62.2	11.9	114	22.4	23.4	28.1
SELENIUM	MG/KG	0.600	0.58 U	0.61 U	0.61 U	0.74	1.4	0.6 U	0.6 U	0.67	0.55 U
SILVER	MG/KG	1.1 U	1.2 U	1.2 U	1.2 U	1.1 U	1.19 U	1.22 U	1.17 U	1.16 U	1.12 U
THALLIUM	MG/KG	1.1 U	1.2 U	1.2 U	1.2 U	1.14 U	1.2 U	1.2 U	1.19 U	1.14 U	1.1 U
ZINC	MG/KG	108	120 *	73.1 *	75.5 *	148	62.1	161	60.5	117	138
VANADIUM	MG/KG	18.7	19.5	20.9	24.5	19.4	10.6	19.2	18.2	35.4	21.1
COBALT	MG/KG	6.50	7.1	11.3	6.6	7.6	5.95 U	11.5	10.4	11.4	8.7
TIN	MG/KG	53.5 U	58.0 U	60.8 U	60.7 U	55 U	59.5 U	61 U	58.6 U	58 U	56 U
MERCURY	MG/KG	2.7	0.09	0.06 U	0.11	0.26	0.21	0.06 U	0.06 U	0.07	1
ARSENIC	MG/KG	6.00	7.1	7.0	5.7	7.3	9	8.8	5.7	9.9	7.9
ACETONE	UG/KG	22 U	24 U	25 U	25 U	6.4 J	8.9 J	25 U	8.9 J	10 J	7.7 J
BENZENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
BROMODICHLOROMETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
BROMOFORM	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
BROMOMETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
2-BUTANONE (MEK)	UG/KG	11 U	12 U	13 U	13 U	11 U	1.8 J	12 U	12 U	12 U	11 U
CARBON DISULFIDE	UG/KG	11 U	12 U	13 U	13 U	11 U	1.2 J	12 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
CHLOROBENZENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
CHLOROETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
CHLOROFORM	UG/KG	1.3 J	7.2	6.3 U	6.0 J	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
CHLOROMETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
DIBROMOCHLOROMETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
1,1-DICHLOROETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
1,2-DICHLOROETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
1,1-DICHLOROETHENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
CIS-1,2-DICHLOROETHENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	3.2 J
TRANS-1,2-DICHLOROETHENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
1,2-DICHLOROPROPANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
CIS-1,3-DICHLOROPROPENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
ETHYLBENZENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
2-HEXANONE	UG/KG	11 U	12 U	13 U	13 U	11 U	3.8 J	12 U	12 U	12 U	11 U
METHYLENE CHLORIDE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	11 U	12 U	13 U	13 U	11 U	2.5 J	12 U	12 U	12 U	11 U
STYRENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	1.3 J	6.2 U	6 U	5.8 U	5.7 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
TETRACHLOROETHENE	UG/KG	8.6	6.1 U	6.3 U	6.4 U	13	3.5 J	5.2 J	2.9 J	3.4 J	27
TOLUENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
1,1,1-TRICHLOROETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	1.7 J	5.8 U	5.7 U
1,1,2-TRICHLOROETHANE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
TRICHLOROETHENE	UG/KG	1.4 J	6.1 U	6.3 U	1.4 J	24	6 U	6.2 U	7	8.6	140
VINYL CHLORIDE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
O-XYLENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	6 U	5.8 U	5.7 U
M+P-XYLENE	UG/KG	5.5 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U	6.2 U	1.3 J	5.8 U	5.7 U
TOTAL CYANIDE	MG/KG	1.09 U	1.22 U	1.25 U	12.7 U	1.14 U	47.5	14.4	1.21 U	1.16 U	13

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Southside High School Raw Data

Table 1: Soil Samples Collected in May and June

location		FB5	FB5	FB6	FB6	FB7	FB8	FB8	FB9	FB10	FB11
depth		2-4 ft	6-8 ft	1-2 ft	17-19 ft	1-3 ft	1-3 ft	4-6 ft	1-2 ft	1-3 ft	1-3 ft
sample#		B23499	B23400	B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408
colletion date		06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00
ACENAPHTHENE	UG/KG	390 U	380 U	5300	370 U	51 J	370 U	3900 U	410 U	70 J	390 U
ACENAPHTHYLENE	UG/KG	390 U	380 U	26000	370 U	400 U	370 U	3900 U	610	290 J	390 U
ANTHRACENE	UG/KG	390 U	380 U	69000 D	370 U	150 J	55 J	3900 U	540	400	47 J
BENZO(A)ANTHRACENE	UG/KG	50 J	380 U	68000 D	100 J	280 J	160 J	3900 U	1100	1100	110 J
BENZO(A)PYRENE	UG/KG	390 U	380 U	57000	370 U	240 J	130 J	3900 U	1100	1100	99 J
BENZO(B)FLUORANTHENE	UG/KG	47 J	380 U	43000	370 U	190 J	130 J	3900 U	1000	810	110 J
BENZO(G,H,I)PERYLENE	UG/KG	390 U	380 U	29000	370 U	140 J	110 J	3900 U	840	930	71 J
BENZO(K)FLUORANTHENE	UG/KG	390 U	380 U	40000	370 U	180 J	130 J	3900 U	1000	950	98 J
BENZYL ALCOHOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
BUTYL BENZYL PHTHALATE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
DI-N-BUTYLPHTHALATE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
CARBAZOLE	UG/KG	390 U	380 U	7300	370 U	400 U	370 U	3900 U	64 J	100 J	390 U
INDENO(1,2,3-CD)PYRENE	UG/KG	390 U	380 U	31000	370 U	140 J	75 J	3900 U	810	840	67 J
4-CHLOROANILINE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2-CHLORONAPHTHALENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2-CHLOROPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
CHRYSENE	UG/KG	90 J	380 U	62000	210 J	320 J	210 J	890 J	1400	1300	220 J
DIBENZO(A,H)ANTHRACENE	UG/KG	390 U	380 U	9600	370 U	53 J	53 J	3900 U	300 J	290 J	390 U
DIBENZOFURAN	UG/KG	390 U	380 U	23000	370 U	400 U	370 U	3900 U	410 U	60 J	53 J
1,3-DICHLOROBENZENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
1,2-DICHLOROBENZENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
1,4-DICHLOROBENZENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
3,3'-DICHLOROBENZIDINE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2,4-DICHLOROPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
DIETHYLPHTHALATE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
DIMETHYL PHTHALATE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2,4-DIMETHYLPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2,4-DINITROPHENOL	UG/KG	2000 U	2000 U	20000 U	1900 U	2100 U	1900 U	20000 U	2100 U	2000 U	2000 U
2,4-DINITROTOLUENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2,6-DINITROTOLUENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	44 J	67 J	390 U
FLUORANTHENE	UG/KG	83 J	380 U	190000 D	370 U	620	250 J	3900 U	1700	1800	280 J
FLUORENE	UG/KG	390 U	380 U	22000	370 U	41 J	370 U	3900 U	410 U	71 J	390 U
HEXACHLOROBENZENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
HEXACHLOROBUTADIENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
HEXACHLOROETHANE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
ISOPHORONE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2-METHYLNAPHTHALENE	UG/KG	92 J	380 U	13000	370 U	400 U	70 J	3900 U	54 J	96 J	270 J
4,6-DINITRO-2-METHYLPHENOL	UG/KG	2000 U	2000 U	20000 U	1900 U	2100 U	1900 U	20000 U	2100 U	2000 U	2000 U
4-CHLORO-3-METHYLPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2-METHYLPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
4-METHYLPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
NAPHTHALENE	UG/KG	440	380 U	22000 D	370 U	400 U	54 J	3900 U	74 J	110 J	140 J
2-NITROANILINE	UG/KG	2000 U	2000 U	20000 U	1900 U	2100 U	1900 U	20000 U	2100 U	2000 U	2000 U
3-NITROANILINE	UG/KG	2000 U	2000 U	20000 U	1900 U	2100 U	1900 U	20000 U	2100 U	2000 U	2000 U

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Table 1: Soil Samples Collected in May and June

location		FB5	FB5	FB6	FB6	FB7	FB8	FB8	FB9	FB10	FB11
depth		2-4 ft	6-8 ft	1-2 ft	17-19 ft	1-3 ft	1-3 ft	4-6 ft	1-2 ft	1-3 ft	1-3 ft
sample#		B23499	B23400	B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408
colletion date		06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00
4-NITROANILINE	UG/KG	2000 U	2000 U	20000 U	1900 U	2100 U	1900 U	20000 U	2100 U	2000 U	2000 U
NITROBENZENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2-NITROPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
4-NITROPHENOL	UG/KG	2000 U	2000 U	20000 U	1900 U	2100 U	1900 U	20000 U	2100 U	2000 U	2000 U
N-NITROSODIMETHYLAMINE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
N-NITROSODIPHENYLAMINE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
DI-N-OCTYL PHTHALATE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
PENTACHLOROPHENOL	UG/KG	2000 U	2000 U	20000 U	1900 U	2100 U	1900 U	20000 U	2100 U	2000 U	2000 U
PHENANTHRENE	UG/KG	120 J	380 U	150000 D	370 U	530	240 J	3900 U	540	1100	370 J
PHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
PYRENE	UG/KG	58 J	380 U	140000 D	370 U	460	180 J	3600 J	1600	1700	180 J
1,2,4-TRICHLOROBENZENE	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2,4,6-TRICHLOROPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
2,4,5-TRICHLOROPHENOL	UG/KG	390 U	380 U	4000 U	370 U	400 U	370 U	3900 U	410 U	390 U	390 U
ALDRIN	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
ALPHA-BHC	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
BETA-BHC	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
DELTA-BHC	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
GAMMA-BHC (LINDANE)	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
ALPHA-CHLORDANE	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
GAMMA-CHLORDANE	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
4,4'-DDD	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
4,4'-DDE	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
4,4'-DDT	UG/KG	3.9 U	3.8 U	40 U	3.7 U	40 U	37 U	39 U	41 U	39 U	39 U
DIELDRIN	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
ALPHA-ENDOSULFAN	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
BETA-ENDOSULFAN	UG/KG	3.9 U	3.8 U	40 U	3.7 U	40 U	37 U	39 U	41 U	39 U	39 U
ENDOSULFAN SULFATE	UG/KG	3.9 U	3.8 U	40 U	3.7 U	40 U	37 U	39 U	41 U	39 U	39 U
ENDRIN	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
ENDRIN ALDEHYDE	UG/KG	3.9 U	3.8 U	40 U	3.7 U	40 U	37 U	39 U	41 U	39 U	39 U
ENDRIN KETONE	UG/KG	3.9 U	3.8 U	40 U	3.7 U	40 U	37 U	39 U	41 U	39 U	39 U
HEPTACHLOR	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
HEPTACHLOR EPOXIDE	UG/KG	2 U	2 U	20 U	1.9 U	21 U	19 U	20 U	21 U	20 U	20 U
METHOXYCHLOR	UG/KG	7.8 U	7.6 U	79 U	7.5 U	80 U	74 U	78 U	81 U	77 U	79 U
TOXAPHENE	UG/KG	39 U	38 U	400 U	37 U	400 U	370 U	390 U	410 U	390 U	390 U
PCB 1016	UG/KG	39 U	38 U	40 U	37 U	40 U	37 U	39 U	41 U	39 U	39 U
PCB 1221	UG/KG	39 U	38 U	40 U	37 U	40 U	37 U	39 U	41 U	39 U	39 U
PCB 1232	UG/KG	39 U	38 U	40 U	37 U	40 U	37 U	39 U	41 U	39 U	39 U
PCB 1242	UG/KG	39 U	38 U	40 U	37 U	40 U	37 U	39 U	41 U	39 U	39 U
PCB 1248	UG/KG	39 U	38 U	940 D	37 U	100000 D	37 U	39 U	41 U	2700 D	330
PCB 1254	UG/KG	39 U	38 U	40 U	37 U	40 U	37 U	39 U	41 U	39 U	39 U
PCB 1260	UG/KG	39 U	38 U	66	37 U	4200 E	37 U	39 U	68	190	120
ANTIMONY	MG/KG	1.15 U	1.11 U	1.15 U	1.12 U	1.18 U	1.09 U	1.15 U	1.21 U	1.11 U	1.19 U
BARIUM	MG/KG	63	93.9	68.6	21.6	115	171	245	102	118	189
BERYLLIUM	MG/KG	0.58 U	0.55 U	0.58 U	0.56 U	0.59 U	0.54 U	0.58 U	0.6 U	0.56 U	0.74
CADMIUM	MG/KG	0.58 U	0.55 U	0.58 U	0.56 U	0.59 U	0.54 U	0.58 U	0.6 U	0.56 U	0.6 U

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Table 1: Soil Samples Collected in May and June

location		FB5	FB5	FB6	FB6	FB7	FB8	FB8	FB9	FB10	FB11
depth		2-4 ft	6-8 ft	1-2 ft	17-19 ft	1-3 ft	1-3 ft	4-6 ft	1-2 ft	1-3 ft	1-3 ft
sample#		B23499	B23400	B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408
colletion date		06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00	06/29/00
CHROMIUM	MG/KG	6.5	9.9	10.4	4.6	11.6	9.3	9.7	11	10.2	14.5
COPPER	MG/KG	30.6	15.1	55.7	12.4	54.9	23.8	103	56.2	25.2	172
LEAD	MG/KG	24.4	23.3	36.6	8.1	82	29.9	144	63.9	62.3	76.2
NICKEL	MG/KG	9.9	14.1	21.5	9.7	44.6	49.7	12.4	20.5	16.6	27.5
SELENIUM	MG/KG	0.85	0.55 U	0.99	0.55 U	0.59 U	0.67	0.57 U	0.6 U	0.57 U	0.91
SILVER	MG/KG	1.15 U	1.11 U	1.15 U	1.12 U	1.18 U	1.09 U	1.15 U	1.21 U	1.11 U	1.19 U
THALLIUM	MG/KG	1.18 U	1.11 U	1.2 U	1.11 U	1.18 U	1.11 U	1.14 U	1.21 U	1.13 U	1.18 U
ZINC	MG/KG	18.5	64.7	98	37.3	69.3	97.2	110	97.6	82.2	160
VANADIUM	MG/KG	17.7	17.7	17.2	8.2	16.3	18.4	15.7	17	16.5	25.8
COBALT	MG/KG	5.76 U	7.1	7.4	5.6 U	7	10	5.76 U	6.5	6.6	8.4
TIN	MG/KG	57.6 U	55.3 U	57.7 U	56 U	59.1 U	54.4 U	57.6 U	60.4 U	55.6 U	59.5 U
MERCURY	MG/KG	0.07	0.74	0.08	0.05 U	0.07	0.05 U	0.06 U	0.07	0.24	0.21
ARSENIC	MG/KG	6.3	3.7	8.2	2.3	6.4	7.1	2.3	6.1	6.6	12.6
ACETONE	UG/KG	2900 U	120 U	24 U	53 J	24 U	170	830	25 U	23 U	24 U
BENZENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	1.3 J	29 U	6.2 U	5.8 U	6 U
BROMODICHLOROMETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
BROMOFORM	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
BROMOMETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
2-BUTANONE (MEK)	UG/KG	1500 U	58 U	12 U	14 J	12 U	35	190	12 U	12 U	12 U
CARBON DISULFIDE	UG/KG	1500 U	58 U	12 U	57 U	12 U	3.6 J	59 U	12 U	12 U	12 U
CARBON TETRACHLORIDE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
CHLOROBENZENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
CHLOROETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
CHLOROFORM	UG/KG	730 U	29 U	1.8 J	28 U	6.1 U	2.5 J	29 U	6.2 U	5.8 U	6 U
CHLOROMETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
DIBROMOCHLOROMETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
1,1-DICHLOROETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
1,2-DICHLOROETHANE	UG/KG	730 U	29 U	14	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
1,1-DICHLOROETHENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
CIS-1,2-DICHLOROETHENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
TRANS-1,2-DICHLOROETHENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
1,2-DICHLOROPROPANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
CIS-1,3-DICHLOROPROPENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
ETHYLBENZENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
2-HEXANONE	UG/KG	1500 U	58 U	12 U	57 U	12 U	11 U	59 U	12 U	12 U	12 U
METHYLENE CHLORIDE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	1.5 J	29 U	6.2 U	5.8 U	6 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	1500 U	58 U	12 U	57 U	12 U	11 U	59 U	12 U	12 U	12 U
STYRENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
TETRACHLOROETHENE	UG/KG	730 U	12 J	25	26 J	6.1 U	17	150	30	10	3.1 J
TOLUENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
1,1,1-TRICHLOROETHANE	UG/KG	730 U	29 U	11	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
1,1,2-TRICHLOROETHANE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
TRICHLOROETHENE	UG/KG	110000 D	11000 D	140	28 U	6.1 U	11	7.3 J	6.2 U	35	24
VINYL CHLORIDE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
O-XYLENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	29 U	6.2 U	5.8 U	6 U
M+P-XYLENE	UG/KG	730 U	29 U	6 U	28 U	6.1 U	5.6 U	9.6 J	6.2 U	5.8 U	6 U
TOTAL CYANIDE	MG/KG	1.18 U	1.15 U	1.2 U	1.13 U	1.22 U	1.12 U	11.5	1.23 U	1.17 U	1.19 U

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Table 2: Soil Samples collected in July 2000

location		near B24	near B25	near B15	near B15	near SS1	near SS2
depth		surface	surface	1-1.5 ft	surface	surface	surface
sample#		B23402	B23403	B23404	B23405	B23406	B23407
colletion date		7/27/00	7/27/00	7/27/00	7/27/00	7/27/00	7/27/00
NITROBENZENE	UG/KG	na	na	370 U	na	na	na
2-NITROPHENOL	UG/KG	na	na	370 U	na	na	na
4-NITROPHENOL	UG/KG	na	na	1900 U	na	na	na
N-NITROSODIMETHYLAMINE	UG/KG	na	na	370 U	na	na	na
N-NITROSODIPHENYLAMINE	UG/KG	na	na	370 U	na	na	na
DI-N-OCTYL PHTHALATE	UG/KG	na	na	370 U	na	na	na
PENTACHLOROPHENOL	UG/KG	na	na	1900 U	na	na	na
PHENANTHRENE	UG/KG	na	na	370 U	na	na	na
PHENOL	UG/KG	na	na	370 U	na	na	na
4-BROMOPHENYL-PHENYLETHER	UG/KG	na	na	370 U	na	na	na
4-CHLOROPHENYL-PHENYLETHER	UG/KG	na	na	370 U	na	na	na
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	na	na	370 U	na	na	na
PYRENE	UG/KG	na	na	370 U	na	na	na
1,2,4-TRICHLOROBENZENE	UG/KG	na	na	370 U	na	na	na
2,4,6-TRICHLOROPHENOL	UG/KG	na	na	370 U	na	na	na
2,4,5-TRICHLOROPHENOL	UG/KG	na	na	370 U	na	na	na
ALDRIN	UG/KG	na	na	na	na	na	na
ALPHA-BHC	UG/KG	na	na	na	na	na	na
BETA-BHC	UG/KG	na	na	na	na	na	na
DELTA-BHC	UG/KG	na	na	na	na	na	na
GAMMA-BHC (LINDANE)	UG/KG	na	na	na	na	na	na
ALPHA-CHLORDANE	UG/KG	na	na	na	na	na	na
GAMMA-CHLORDANE	UG/KG	na	na	na	na	na	na
4,4'-DDD	UG/KG	na	na	na	na	na	na
4,4'-DDE	UG/KG	na	na	na	na	na	na
4,4'-DDT	UG/KG	na	na	na	na	na	na
DIELDRIN	UG/KG	na	na	na	na	na	na
ALPHA-ENDOSULFAN	UG/KG	na	na	na	na	na	na
BETA-ENDOSULFAN	UG/KG	na	na	na	na	na	na
ENDOSULFAN SULFATE	UG/KG	na	na	na	na	na	na
ENDRIN	UG/KG	na	na	na	na	na	na
ENDRIN ALDEHYDE	UG/KG	na	na	na	na	na	na
ENDRIN KETONE	UG/KG	na	na	na	na	na	na
HEPTACHLOR	UG/KG	na	na	na	na	na	na
HEPTACHLOR EPOXIDE	UG/KG	na	na	na	na	na	na
METHOXYCHLOR	UG/KG	na	na	na	na	na	na
TOXAPHENE	UG/KG	na	na	na	na	na	na
PCB 1016	UG/KG	na	na	37 U	na	na	na
PCB 1221	UG/KG	na	na	37 U	na	na	na
PCB 1232	UG/KG	na	na	37 U	na	na	na
PCB 1242	UG/KG	na	na	37 U	na	na	na
PCB 1248	UG/KG	na	na	110	na	na	na
PCB 1254	UG/KG	na	na	37 U	na	na	na
PCB 1260	UG/KG	na	na	37 U	na	na	na
ANTIMONY	UG/KG	na	na	na	na	na	na
BARIUM	UG/KG	na	na	na	na	na	na
BERYLLIUM	UG/KG	na	na	na	na	na	na
CADMIUM	UG/KG	na	na	na	na	na	na
CHROMIUM	UG/KG	na	na	na	na	na	na
COPPER	UG/KG	na	na	na	na	na	na

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Table 2: Soil Samples collected in July 2000

location		near B24	near B25	near B15	near B15	near SS1	near SS2
depth		surface	surface	1-1.5 ft	surface	surface	surface
sample#		B23402	B23403	B23404	B23405	B23406	B23407
colletion date		7/27/00	7/27/00	7/27/00	7/27/00	7/27/00	7/27/00
LEAD	UG/KG	na	na	na	na	na	na
NICKEL	UG/KG	na	na	na	na	na	na
SELENIUM	UG/KG	na	na	na	na	na	na
SILVER	UG/KG	na	na	na	na	na	na
THALLIUM	UG/KG	na	na	na	na	na	na
ZINC	UG/KG	na	na	na	na	na	na
VANADIUM	UG/KG	na	na	na	na	na	na
COBALT	UG/KG	na	na	na	na	na	na
TIN	UG/KG	na	na	na	na	na	na
MERCURY	UG/KG	na	na	na	na	na	na
ARSENIC	UG/KG	na	na	na	na	na	na
ACETONE	UG/KG	25 U	23 U	22 U	23 U	27 U	26 U
BENZENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
BROMODICHLOROMETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
BROMOFORM	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
BROMOMETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
2-BUTANONE (MEK)	UG/KG	12 U	11 U	11 U	11 U	13 U	13 U
CARBON DISULFIDE	UG/KG	12 U	11 U	11 U	11 U	13 U	13 U
CARBON TETRACHLORIDE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
CHLOROBENZENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
CHLOROETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
CHLOROFORM	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
CHLOROMETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
DIBROMOCHLOROMETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
DICHLORODIFLUOROMETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
1,1-DICHLOROETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
1,2-DICHLOROETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
1,1-DICHLOROETHENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
CIS-1,2-DICHLOROETHENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
TRANS-1,2-DICHLOROETHENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
1,2-DICHLOROPROPANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
CIS-1,3-DICHLOROPROPENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
ETHYLBENZENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
FREON 113	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
2-HEXANONE	UG/KG	12 U	11 U	11 U	11 U	13 U	13 U
METHYLENE CHLORIDE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	12 U	11 U	11 U	11 U	13 U	13 U
STYRENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
TETRACHLOROETHENE	UG/KG	6.2 U	5.6 U	5.6 U	1.1 J	6.7 U	6.6 U
TOLUENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
1,1,1-TRICHLOROETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
1,1,2-TRICHLOROETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
TRICHLOROETHENE	UG/KG	6.2 U	1.9 J	5.6 U	1.6 J	6.7 U	6.6 U
TRICHLOROFLUOROMETHANE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
VINYL CHLORIDE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
O-XYLENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U
M+P-XYLENE	UG/KG	6.2 U	5.6 U	5.6 U	5.7 U	6.7 U	6.6 U

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Table 2: Soil Samples collected in July 2000

location		near B24	near B25	near B15	near B15	near SS1	near SS2
depth		surface	surface	1-1.5 ft	surface	surface	surface
sample#		B23402	B23403	B23404	B23405	B23406	B23407
colletion date		7/27/00	7/27/00	7/27/00	7/27/00	7/27/00	7/27/00
ACENAPHTHENE	UG/KG	na	na	370 U	na	na	na
ACENAPHTHYLENE	UG/KG	na	na	370 U	na	na	na
ANTHRACENE	UG/KG	na	na	370 U	na	na	na
BENZO(A)ANTHRACENE	UG/KG	na	na	370 U	na	na	na
BENZO(A)PYRENE	UG/KG	na	na	370 U	na	na	na
BENZO(B)FLUORANTHENE	UG/KG	na	na	370 U	na	na	na
BENZO(G,H,I)PERYLENE	UG/KG	na	na	370 U	na	na	na
BENZO(K)FLUORANTHENE	UG/KG	na	na	370 U	na	na	na
BENZYL ALCOHOL	UG/KG	na	na	370 U	na	na	na
BUTYL BENZYL PHTHALATE	UG/KG	na	na	370 U	na	na	na
DI-N-BUTYLPHTHALATE	UG/KG	na	na	370 U	na	na	na
CARBAZOLE	UG/KG	na	na	370 U	na	na	na
INDENO(1,2,3-CD)PYRENE	UG/KG	na	na	370 U	na	na	na
4-CHLOROANILINE	UG/KG	na	na	370 U	na	na	na
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	na	na	370 U	na	na	na
BIS(2-CHLOROETHYL)ETHER	UG/KG	na	na	370 U	na	na	na
2-CHLORONAPHTHALENE	UG/KG	na	na	370 U	na	na	na
2-CHLOROPHENOL	UG/KG	na	na	370 U	na	na	na
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	na	na	370 U	na	na	na
CHRYSENE	UG/KG	na	na	370 U	na	na	na
DIBENZO(A,H)ANTHRACENE	UG/KG	na	na	370 U	na	na	na
DIBENZOFURAN	UG/KG	na	na	370 U	na	na	na
1,3-DICHLOROBENZENE	UG/KG	na	na	370 U	na	na	na
1,2-DICHLOROBENZENE	UG/KG	na	na	370 U	na	na	na
1,4-DICHLOROBENZENE	UG/KG	na	na	370 U	na	na	na
3,3'-DICHLOROBENZIDINE	UG/KG	na	na	370 U	na	na	na
2,4-DICHLOROPHENOL	UG/KG	na	na	370 U	na	na	na
DIETHYLPHTHALATE	UG/KG	na	na	370 U	na	na	na
DIMETHYL PHTHALATE	UG/KG	na	na	370 U	na	na	na
2,4-DIMETHYLPHENOL	UG/KG	na	na	370 U	na	na	na
2,4-DINITROPHENOL	UG/KG	na	na	1900 U	na	na	na
2,4-DINITROTOLUENE	UG/KG	na	na	370 U	na	na	na
2,6-DINITROTOLUENE	UG/KG	na	na	370 U	na	na	na
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	na	na	370 U	na	na	na
FLUORANTHENE	UG/KG	na	na	370 U	na	na	na
FLUORENE	UG/KG	na	na	370 U	na	na	na
HEXACHLOROBENZENE	UG/KG	na	na	370 U	na	na	na
HEXACHLOROBUTADIENE	UG/KG	na	na	370 U	na	na	na
HEXACHLOROCYCLOPENTADIENE	UG/KG	na	na	370 U	na	na	na
HEXACHLOROETHANE	UG/KG	na	na	370 U	na	na	na
ISOPHORONE	UG/KG	na	na	370 U	na	na	na
2-METHYLNAPHTHALENE	UG/KG	na	na	370 U	na	na	na
4,6-DINITRO-2-METHYLPHENOL	UG/KG	na	na	1900 U	na	na	na
4-CHLORO-3-METHYLPHENOL	UG/KG	na	na	370 U	na	na	na
2-METHYLPHENOL	UG/KG	na	na	370 U	na	na	na
4-METHYLPHENOL	UG/KG	na	na	370 U	na	na	na
NAPHTHALENE	UG/KG	na	na	370 U	na	na	na
2-NITROANILINE	UG/KG	na	na	1900 U	na	na	na
3-NITROANILINE	UG/KG	na	na	1900 U	na	na	na
4-NITROANILINE	UG/KG	na	na	1900 U	na	na	na

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Table 2: Soil Samples collected in July 2000

location		near B24	near B25	near B29	near B30	near B15	near SS1	near SS2	near B15	near B24
depth		2-2.5 ft	surface	surface	surface	.75-1 ft	surface	surface	surface	2-2.5 fr
sample#		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408	B23401
colletion date		7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/27/00
LEAD	UG/KG	307 *	na	na	na	na	na	na	na	274 *
NICKEL	UG/KG	80.9 N	na	na	na	na	na	na	na	70.6 N
SELENIUM	UG/KG	1	na	na	na	na	na	na	na	2.9
SILVER	UG/KG	1.1 U	na	na	na	na	na	na	na	1.1 U
THALLIUM	UG/KG	1.1 U	na	na	na	na	na	na	na	1.1 UW
ZINC	UG/KG	77	na	na	na	na	na	na	na	87.8 N
VANADIUM	UG/KG	20.1	na	na	na	na	na	na	na	19.2
COBALT	UG/KG	6.1	na	na	na	na	na	na	na	5.9
TIN	UG/KG	55.4 U	na	na	na	na	na	na	na	56.3 U
MERCURY	UG/KG	0.06 UN	na	na	na	na	na	na	na	0.06 U
ARSENIC	UG/KG	21.2	na	na	na	na	na	na	na	25.6 *
ACETONE	UG/KG	23 U	23 U	23 U	23 U	23 U	26 U	26 U	24 U	23 U
BENZENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
BROMODICHLOROMETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
BROMOFORM	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
BROMOMETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
2-BUTANONE (MEK)	UG/KG	11 U	11 U	12 U	12 U	12 U	13 U	13 U	12 U	11 U
CARBON DISULFIDE	UG/KG	11 U	11 U	12 U	12 U	12 U	13 U	13 U	12 U	2 J
CARBON TETRACHLORIDE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
CHLOROBENZENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
CHLOROETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
CHLOROFORM	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
CHLOROMETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
DIBROMOCHLOROMETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
DICHLORODIFLUOROMETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
1,1-DICHLOROETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
1,2-DICHLOROETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
1,1-DICHLOROETHENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
CIS-1,2-DICHLOROETHENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
TRANS-1,2-DICHLOROETHENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
1,2-DICHLOROPROPANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
CIS-1,3-DICHLOROPROPENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
ETHYLBENZENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
FREON 113	UG/KG	5.6 U	1.4 J	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
2-HEXANONE	UG/KG	11 U	11 U	12 U	12 U	12 U	13 U	13 U	12 U	11 U
METHYLENE CHLORIDE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	11 U	11 U	12 U	12 U	12 U	13 U	13 U	12 U	11 U
STYRENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
TETRACHLOROETHENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
TOLUENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
1,1,1-TRICHLOROETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
1,1,2-TRICHLOROETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
TRICHLOROETHENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
TRICHLOROFLUOROMETHANE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
VINYL CHLORIDE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
O-XYLENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U
M+P-XYLENE	UG/KG	5.6 U	5.7 U	5.8 U	5.8 U	5.8 U	6.5 U	6.5 U	6.1 U	5.7 U

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Table 2: Soil Samples collected in July 2000

location		near B24	near B25	near B29	near B30	near B15	near SS1	near SS2	near B15	near B24
depth		2-2.5 ft	surface	surface	surface	.75-1 ft	surface	surface	surface	2-2.5 fr
sample#		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408	B23401
colletion date		7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/27/00
NITROBENZENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2-NITROPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
4-NITROPHENOL	UG/KG	1900 U	na	2000 U	2000 U	2000 U	na	na	na	2000 U
N-NITROSODIMETHYLAMINE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
N-NITROSODIPHENYLAMINE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
DI-N-OCTYL PHTHALATE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
PENTACHLOROPHENOL	UG/KG	1900 U	na	2000 U	2000 U	2000 U	na	na	na	2000 U
PHENANTHRENE	UG/KG	89 J	na	380 U	80 J	380 U	na	na	na	120 J
PHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
PYRENE	UG/KG	120 J	na	72 J	250 J	46 J	na	na	na	66 J
1,2,4-TRICHLOROBENZENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2,4,6-TRICHLOROPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2,4,5-TRICHLOROPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
ALDRIN	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
ALPHA-BHC	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
BETA-BHC	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
DELTA-BHC	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
GAMMA-BHC (LINDANE)	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
ALPHA-CHLORDANE	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
GAMMA-CHLORDANE	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
4,4'-DDD	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
4,4'-DDE	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
4,4'-DDT	UG/KG	3.7 U	na	3.8 U	3.8 U	3.8 U	na	na	na	na
DIELDRIN	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
ALPHA-ENDOSULFAN	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
BETA-ENDOSULFAN	UG/KG	3.7 U	na	3.8 U	3.8 U	3.8 U	na	na	na	na
ENDOSULFAN SULFATE	UG/KG	3.7 U	na	3.8 U	3.8 U	3.8 U	na	na	na	na
ENDRIN	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
ENDRIN ALDEHYDE	UG/KG	3.7 U	na	3.8 U	3.8 U	3.8 U	na	na	na	na
ENDRIN KETONE	UG/KG	3.7 U	na	3.8 U	3.8 U	3.8 U	na	na	na	na
HEPTACHLOR	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
HEPTACHLOR EPOXIDE	UG/KG	1.9 U	na	2 U	2 U	2 U	na	na	na	na
METHOXYCHLOR	UG/KG	7.5 U	na	7.6 U	7.7 U	7.6 U	na	na	na	na
TOXAPHENE	UG/KG	37 U	na	38 U	38 U	38 U	na	na	na	na
PCB 1016	UG/KG	37 U	na	38 U	38 U	38 U	na	na	na	na
PCB 1221	UG/KG	37 U	na	38 U	38 U	38 U	na	na	na	na
PCB 1232	UG/KG	37 U	na	38 U	38 U	38 U	na	na	na	na
PCB 1242	UG/KG	37 U	na	38 U	38 U	38 U	na	na	na	na
PCB 1248	UG/KG	57	na	360	180	42	na	na	na	na
PCB 1254	UG/KG	37 U	na	38 U	38 U	38 U	na	na	na	na
PCB 1260	UG/KG	37 U	na	55	71	38 U	na	na	na	na
ANTIMONY	UG/KG	1.7 N	na	na	na	na	na	na	na	1.1 UN
BARIUM	UG/KG	471 *N	na	na	na	na	na	na	na	222 *N
BERYLLIUM	UG/KG	0.696	na	na	na	na	na	na	na	1
CADMIUM	UG/KG	0.55 U	na	na	na	na	na	na	na	0.56 U
CHROMIUM	UG/KG	16.6	na	na	na	na	na	na	na	14.7 N
COPPER	UG/KG	195	na	na	na	na	na	na	na	169

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Table 2: Soil Samples collected in July 2000

location		near B24	near B25	near B29	near B30	near B15	near SS1	near SS2	near B15	near B24
depth		2-2.5 ft	surface	surface	surface	.75-1 ft	surface	surface	surface	2-2.5 fr
sample#		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408	B23401
colletion date		7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/11/00	7/27/00
ACENAPHTHENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
ACENAPHTHYLENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
ANTHRACENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
BENZO(A)ANTHRACENE	UG/KG	72 J	na	380 U	100 J	380 U	na	na	na	39 J
BENZO(A)PYRENE	UG/KG	54 J	na	45 J	160 J	380 U	na	na	na	380 U
BENZO(B)FLUORANTHENE	UG/KG	61 J	na	47 J	170 J	380 U	na	na	na	380 U
BENZO(G,H,I)PERYLENE	UG/KG	370 U	na	40 J	120 J	380 U	na	na	na	380 U
BENZO(K)FLUORANTHENE	UG/KG	46 J	na	43 J	190 J	380 U	na	na	na	380 U
BENZYL ALCOHOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
BUTYL BENZYL PHTHALATE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
DI-N-BUTYLPHTHALATE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
CARBAZOLE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
INDENO(1,2,3-CD)PYRENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
4-CHLOROANILINE	UG/KG	370 U	na	380 U	120 J	380 U	na	na	na	380 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2-CHLORONAPHTHALENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2-CHLOROPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
CHRYSENE	UG/KG	110 J	na	57 J	120 J	380 U	na	na	na	78 J
DIBENZO(A,H)ANTHRACENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
DIBENZOFURAN	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
1,3-DICHLOROBENZENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
1,2-DICHLOROBENZENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
1,4-DICHLOROBENZENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
3,3'-DICHLOROBENZIDINE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2,4-DICHLOROPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
DIETHYLPHTHALATE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
DIMETHYL PHTHALATE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2,4-DIMETHYLPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2,4-DINITROPHENOL	UG/KG	1900 U	na	2000 U	2000 U	2000 U	na	na	na	2000 U
2,4-DINITROTOLUENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2,6-DINITROTOLUENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	370 U	na	920	62 J	380 U	na	na	na	380 U
FLUORANTHENE	UG/KG	110 J	na	71 J	240 J	49 J	na	na	na	54 J
FLUORENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
HEXACHLOROBENZENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
HEXACHLOROBUTADIENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
HEXACHLOROETHANE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
ISOPHORONE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2-METHYLNAPHTHALENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	78 J
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1900 U	na	2000 U	2000 U	2000 U	na	na	na	2000 U
4-CHLORO-3-METHYLPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
2-METHYLPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
4-METHYLPHENOL	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	380 U
NAPHTHALENE	UG/KG	370 U	na	380 U	380 U	380 U	na	na	na	40 J
2-NITROANILINE	UG/KG	1900 U	na	2000 U	2000 U	2000 U	na	na	na	2000 U
3-NITROANILINE	UG/KG	1900 U	na	2000 U	2000 U	2000 U	na	na	na	2000 U
4-NITROANILINE	UG/KG	1900 U	na	2000 U	2000 U	2000 U	na	na	na	2000 U

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Table 3: Soil Samples Collected in August

location		FB7	near FB6	FB5	3' N/o FB5	FB7	FB6	FB5	4' NE/o FB5
depth		surface	surface	surface	surface	1.5-2.0 ft	1.0-1.5 ft	1.0-1.5 ft	surface
sample #		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408
date collected		08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00
ACENAPHTHENE	UG/KG	na	440 U	na	na	na	130 J	na	na
ACENAPHTHYLENE	UG/KG	na	440 U	na	na	na	170 J	na	na
ANTHRACENE	UG/KG	na	440 U	na	na	na	440	na	na
BENZO(A)ANTHRACENE	UG/KG	na	440 U	na	na	na	950	na	na
BENZO(A)PYRENE	UG/KG	na	440 U	na	na	na	790	na	na
BENZO(B)FLUORANTHENE	UG/KG	na	440 U	na	na	na	670	na	na
BENZO(G,H,I)PERYLENE	UG/KG	na	440 U	na	na	na	560	na	na
BENZO(K)FLUORANTHENE	UG/KG	na	440 U	na	na	na	760	na	na
BENZYL ALCOHOL	UG/KG	na	440 U	na	na	na	380 U	na	na
BUTYL BENZYL PHTHALATE	UG/KG	na	440 U	na	na	na	380 U	na	na
DI-N-BUTYLPHTHALATE	UG/KG	na	440 U	na	na	na	380 U	na	na
CARBAZOLE	UG/KG	na	440 U	na	na	na	120 J	na	na
INDENO(1,2,3-CD)PYRENE	UG/KG	na	440 U	na	na	na	520	na	na
4-CHLOROANILINE	UG/KG	na	440 U	na	na	na	380 U	na	na
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	na	440 U	na	na	na	380 U	na	na
BIS(2-CHLOROETHYL)ETHER	UG/KG	na	440 U	na	na	na	380 U	na	na
2-CHLORONAPHTHALENE	UG/KG	na	440 U	na	na	na	380 U	na	na
2-CHLOROPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	na	440 U	na	na	na	380 U	na	na
CHRYSENE	UG/KG	na	46 J	na	na	na	900	na	na
DIBENZO(A,H)ANTHRACENE	UG/KG	na	440 U	na	na	na	240 J	na	na
DIBENZOFURAN	UG/KG	na	440 U	na	na	na	99 J	na	na
1,3-DICHLOROBENZENE	UG/KG	na	440 U	na	na	na	380 U	na	na
1,2-DICHLOROBENZENE	UG/KG	na	440 U	na	na	na	380 U	na	na
1,4-DICHLOROBENZENE	UG/KG	na	440 U	na	na	na	380 U	na	na
3,3'-DICHLOROBENZIDINE	UG/KG	na	440 U	na	na	na	380 U	na	na
2,4-DICHLOROPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
DIETHYLPHTHALATE	UG/KG	na	440 U	na	na	na	380 U	na	na
DIMETHYL PHTHALATE	UG/KG	na	440 U	na	na	na	380 U	na	na
2,4-DIMETHYLPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
2,4-DINITROPHENOL	UG/KG	na	2300 U	na	na	na	2000 U	na	na
2,4-DINITROTOLUENE	UG/KG	na	440 U	na	na	na	380 U	na	na
2,6-DINITROTOLUENE	UG/KG	na	440 U	na	na	na	380 U	na	na
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	na	63 J	na	na	na	380 U	na	na
FLUORANTHENE	UG/KG	na	58 J	na	na	na	1700	na	na
FLUORENE	UG/KG	na	440 U	na	na	na	160 J	na	na
HEXACHLOROBENZENE	UG/KG	na	440 U	na	na	na	380 U	na	na
HEXACHLOROBUTADIENE	UG/KG	na	440 U	na	na	na	380 U	na	na
HEXACHLOROCYCLOPENTADIENE	UG/KG	na	440 U	na	na	na	380 U	na	na
HEXACHLOROETHANE	UG/KG	na	440 U	na	na	na	380 U	na	na

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Table 3: Soil Samples Collected in August

location		FB7	near FB6	FB5	3' N/o FB5	FB7	FB6	FB5	4' NE/o FB5
depth		surface	surface	surface	surface	1.5-2.0 ft	1.0-1.5 ft	1.0-1.5 ft	surface
sample #		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408
date collected		08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00	08/14/00
ISOPHORONE	UG/KG	na	440 U	na	na	na	380 U	na	na
2-METHYLNAPHTHALENE	UG/KG	na	440 U	na	na	na	44 J	na	na
4,6-DINITRO-2-METHYLPHENOL	UG/KG	na	2300 U	na	na	na	2000 U	na	na
4-CHLORO-3-METHYLPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
2-METHYLPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
4-METHYLPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
NAPHTHALENE	UG/KG	na	440 U	na	na	na	380 U	na	na
2-NITROANILINE	UG/KG	na	440 U	na	na	na	58 J	na	na
3-NITROANILINE	UG/KG	na	2300 U	na	na	na	2000 U	na	na
4-NITROANILINE	UG/KG	na	2300 U	na	na	na	2000 U	na	na
NITROBENZENE	UG/KG	na	2300 U	na	na	na	2000 U	na	na
2-NITROPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
4-NITROPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
N-NITROSODIMETHYLAMINE	UG/KG	na	2300 U	na	na	na	2000 U	na	na
N-NITROSODIPHENYLAMINE	UG/KG	na	440 U	na	na	na	380 U	na	na
DI-N-OCTYL PHTHALATE	UG/KG	na	440 U	na	na	na	380 U	na	na
PENTACHLOROPHENOL	UG/KG	na	2300 U	na	na	na	380 U	na	na
PHENANTHRENE	UG/KG	na	440 U	na	na	na	2000 U	na	na
PHENOL	UG/KG	na	440 U	na	na	na	1300	na	na
4-BROMOPHENYL-PHENYLETHER	UG/KG	na	440 U	na	na	na	380 U	na	na
4-CHLOROPHENYL-PHENYLETHER	UG/KG	na	440 U	na	na	na	380 U	na	na
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	na	440 U	na	na	na	380 U	na	na
PYRENE	UG/KG	na	67 J	na	na	na	380 U	na	na
1,2,4-TRICHLOROBENZENE	UG/KG	na	440 U	na	na	na	1600	na	na
2,4,6-TRICHLOROPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
2,4,5-TRICHLOROPHENOL	UG/KG	na	440 U	na	na	na	380 U	na	na
PCB 1016	UG/KG	46 U	na	na	na	40 U	na	na	na
PCB 1221	UG/KG	46 U	na	na	na	40 U	na	na	na
PCB 1232	UG/KG	46 U	na	na	na	40 U	na	na	na
PCB 1242	UG/KG	46 U	na	na	na	40 U	na	na	na
PCB 1248	UG/KG	190	na	na	na	160000 D	na	na	na
PCB 1254	UG/KG	46 U	na	na	na	40 U	na	na	na
PCB 1260	UG/KG	46 U	na	na	na	40 U	na	na	na

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Table 3: Soil Samples Collected in August

location depth sample # date collected		FB7 surface B23401 08/14/00	near FB6 surface B23402 08/14/00	FB5 surface B23403 08/14/00	3' N/o FB5 surface B23404 08/14/00	FB7 1.5-2.0 ft B23405 08/14/00	FB6 1.0-1.5 ft B23406 08/14/00	FB5 1.0-1.5 ft B23407 08/14/00	4' NE/o FB5 surface B23408 08/14/00
ACETONE	UG/KG	na	na	29 U	27 U	na	na	24 U	30 U
BENZENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
BROMODICHLOROMETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
BROMOFORM	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
BROMOMETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
2-BUTANONE (MEK)	UG/KG	na	na	14 U	14 U	na	na	12 U	15 U
CARBON DISULFIDE	UG/KG	na	na	14 U	14 U	na	na	12 U	15 U
CARBON TETRACHLORIDE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
CHLOROBENZENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
CHLOROETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
CHLOROFORM	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
CHLOROMETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
DIBROMOCHLOROMETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
DICHLORODIFLUOROMETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
1,1-DICHLOROETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
1,2-DICHLOROETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
1,1-DICHLOROETHENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
CIS-1,2-DICHLOROETHENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
TRANS-1,2-DICHLOROETHENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
1,2-DICHLOROPROPANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
CIS-1,3-DICHLOROPROPENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
ETHYLBENZENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
FREON 113	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
2-HEXANONE	UG/KG	na	na	14 U	14 U	na	na	12 U	15 U
METHYLENE CHLORIDE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	na	na	14 U	14 U	na	na	12 U	15 U
STYRENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
TETRACHLOROETHENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
TOLUENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
1,1,1-TRICHLOROETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
1,1,2-TRICHLOROETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
TRICHLOROETHENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
TRICHLOROFLUOROMETHANE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
VINYL CHLORIDE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
O-XYLENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U
M+P-XYLENE	UG/KG	na	na	7.2 U	6.9 U	na	na	6 U	7.4 U

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Table 4: Soil Samples Collected in September

sample location		B36	B37	B37	B38	B39	B40	SS5	SS6	SS7	SS8	SS9
depth		0.5-2.5 ft	0.5-2.5 ft	8-10 ft	1 & 4.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface	surface	surface	surface
sample #		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408	B23409	B23410	B23411
sample collected		09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00
ACENAPHTHENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
ACENAPHTHYLENE	UG/KG	350 U	340 U	350 U	1800 U	220 J	1900 U	450 U	470 U	440 U	470 U	450
ANTHRACENE	UG/KG	350 U	340 U	350 U	2200	1800 U	1900 U	450 U	470 U	440 U	470 U	450
BENZO(A)ANTHRACENE	UG/KG	350 U	340 U	350 U	4800	360 J	1900 U	450 U	470 U	440 U	470 U	450
BENZO(A)PYRENE	UG/KG	350 U	340 U	350 U	4200	460 J	1900 U	450 U	470 U	440 U	470 U	450
BENZO(B)FLUORANTHENE	UG/KG	350 U	340 U	350 U	2700	400 J	1900 U	450 U	470 U	48 J	470 U	450
BENZO(G,H,I)PERYLENE	UG/KG	350 U	340 U	350 U	2300	620 J	1900 U	450 U	470 U	440 U	470 U	450
BENZO(K)FLUORANTHENE	UG/KG	350 U	340 U	350 U	3300	370 J	1900 U	450 U	470 U	440 U	470 U	450
BENZYL ALCOHOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
BUTYL BENZYL PHTHALATE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
DI-N-BUTYLPHTHALATE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
CARBAZOLE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
INDENO(1,2,3-CD)PYRENE	UG/KG	350 U	340 U	350 U	2400	420 J	1900 U	450 U	470 U	440 U	470 U	450
4-CHLOROANILINE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
BIS(2-CHLOROETHYL)ETHER	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2-CHLORONAPHTHALENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2-CHLOROPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
CHRYSENE	UG/KG	350 U	340 U	350 U	4000	390 J	1900 U	450 U	470 U	45 J	470 U	450
DIBENZO(A,H)ANTHRACENE	UG/KG	350 U	340 U	350 U	1800 U	190 J	1900 U	450 U	470 U	440 U	470 U	450
DIBENZOFURAN	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
1,3-DICHLOROBENZENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
1,2-DICHLOROBENZENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
1,4-DICHLOROBENZENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
3,3'-DICHLOROBENZIDINE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2,4-DICHLOROPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
DIETHYLPHTHALATE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
DIMETHYL PHTHALATE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2,4-DIMETHYLPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2,4-DINITROPHENOL	UG/KG	1800 U	1800 U	1800 U	9500 U	9200 U	9500 U	2300 U	2400 U	2300 U	2400 U	2300
2,4-DINITROTOLUENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2,6-DINITROTOLUENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	50 J	470 U	450
FLUORANTHENE	UG/KG	350 U	500	350 U	11000	650 J	1900 U	450 U	470 U	71 J	470 U	450
FLUORENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
HEXACHLOROBENZENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
HEXACHLOROBUTADIENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
HEXACHLOROCYCLOPENTADIENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
HEXACHLOROETHANE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
ISOPHORONE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2-METHYLNAPHTHALENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
4,6-DINITRO-2-METHYLPHENOL	UG/KG	1800 U	1800 U	1800 U	9500 U	9200 U	9500 U	2300 U	2400 U	2300 U	2400 U	2300
4-CHLORO-3-METHYLPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2-METHYLPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
4-METHYLPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
NAPHTHALENE	UG/KG	350 U	340 U	350 U	1800 U	270 J	1900 U	450 U	470 U	440 U	470 U	450
2-NITROANILINE	UG/KG	1800 U	1800 U	1800 U	9500 U	9200 U	9500 U	2300 U	2400 U	2300 U	2400 U	2300
3-NITROANILINE	UG/KG	1800 U	1800 U	1800 U	9500 U	9200 U	9500 U	2300 U	2400 U	2300 U	2400 U	2300
4-NITROANILINE	UG/KG	1800 U	1800 U	1800 U	9500 U	9200 U	9500 U	2300 U	2400 U	2300 U	2400 U	2300

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Table 4: Soil Samples Collected in September

sample location		B36	B37	B37	B38	B39	B40	SS5	SS6	SS7	SS8	SS9
depth		0.5-2.5 ft	0.5-2.5 ft	8-10 ft	1 & 4.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface	surface	surface	surface
sample #		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408	B23409	B23410	B23411
sample collected		09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00
NITROBENZENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2-NITROPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
4-NITROPHENOL	UG/KG	1800 U	1800 U	1800 U	9500 U	9200 U	9500 U	2300 U	2400 U	2300 U	2400 U	2300
N-NITROSODIMETHYLAMINE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
N-NITROSODIPHENYLAMINE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
DI-N-OCTYL PHTHALATE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
PENTACHLOROPHENOL	UG/KG	1800 U	1800 U	1800 U	9500 U	9200 U	9500 U	2300 U	2400 U	2300 U	2400 U	2300
PHENANTHRENE	UG/KG	350 U	410	350 U	5700	380 J	1900 U	450 U	470 U	440 U	470 U	450
PHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
4-BROMOPHENYL-PHENYLETHER	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
PYRENE	UG/KG	350 U	430	370	8400	530 J	1900 U	450 U	470 U	440 U	470 U	450
1,2,4-TRICHLOROBENZENE	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	56 J	470 U	450
2,4,6-TRICHLOROPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
2,4,5-TRICHLOROPHENOL	UG/KG	350 U	340 U	350 U	1800 U	1800 U	1900 U	450 U	470 U	440 U	470 U	450
ALDRIN	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
ALPHA-BHC	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
BETA-BHC	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
DELTA-BHC	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
GAMMA-BHC (LINDANE)	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
ALPHA-CHLORDANE	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
GAMMA-CHLORDANE	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
4,4'-DDD	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
4,4'-DDE	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
4,4'-DDT	UG/KG	3.5 U	3.4 U	3.5 U	3.7 U	3.6 U	3.7 U	4.5 U	4.7 U	4.4 U	4.7 U	4.5
DIELDRIN	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
ALPHA-ENDOSULFAN	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
BETA-ENDOSULFAN	UG/KG	3.5 U	3.4 U	3.5 U	3.7 U	3.6 U	3.7 U	4.5 U	4.7 U	4.4 U	4.7 U	4.5
ENDOSULFAN SULFATE	UG/KG	3.5 U	3.4 U	3.5 U	3.7 U	3.6 U	3.7 U	4.5 U	4.7 U	4.4 U	4.7 U	4.5
ENDRIN	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
ENDRIN ALDEHYDE	UG/KG	3.5 U	3.4 U	3.5 U	3.7 U	3.6 U	3.7 U	4.5 U	4.7 U	4.4 U	4.7 U	4.5
ENDRIN KETONE	UG/KG	3.5 U	3.4 U	3.5 U	3.7 U	3.6 U	3.7 U	4.5 U	4.7 U	4.4 U	4.7 U	4.5
HEPTACHLOR	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
HEPTACHLOR EPOXIDE	UG/KG	1.8 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3 U	2.4 U	2.3 U	2.4 U	2.3
METHOXYCHLOR	UG/KG	7.0 U	6.9 U	7.0 U	7.4 U	7.2 U	7.4 U	9.0 U	9.3 U	8.8 U	9.4 U	9.0
TOXAPHENE	UG/KG	35 U	34 U	35 U	37 U	36 U	37 U	45 U	47 U	44 U	47 U	45
PCB 1016	UG/KG	35 U	34 U	35 U	37 U	36 U	37 U	45 U	47 U	44 U	47 U	45
PCB 1221	UG/KG	35 U	34 U	35 U	37 U	36 U	37 U	45 U	47 U	44 U	47 U	45
PCB 1232	UG/KG	35 U	34 U	35 U	37 U	36 U	37 U	45 U	47 U	44 U	47 U	45
PCB 1242	UG/KG	35 U	34 U	35 U	37 U	36 U	37 U	45 U	47 U	44 U	47 U	45
PCB 1248	UG/KG	280 D	34 U	46	740 D	36 U	1200 D	53	47 U	44 U	47 U	220
PCB 1254	UG/KG	35 U	34 U	35 U	37 U	36 U	37 U	45 U	47 U	44 U	47 U	45
PCB 1260	UG/KG	100	34 U	35 U	130	36 U	110	45 U	47 U	44 U	47 U	45
ANTIMONY	MG/KG	1.06 U	1.04 U	1.06 U	1.11 U	1.09 U	1.12 U	1.36 U	1.42 U	1.31 UN	1.43 U	1.36
BARIUM	MG/KG	50.9	39.1	42.2	87.2	83.8	91.4	97.4	95.8	93.4 *	105	102
BERYLLIUM	MG/KG	0.532 U	0.521 U	0.530 U	0.557 U	0.544 U	0.561 U	0.682 U	0.708 U	0.66 U	0.714 U	0.682
CADMIUM	MG/KG	0.532 U	0.521 U	0.530 U	0.557 U	0.544 U	0.561 U	0.682 U	0.708 U	0.72	0.714 U	0.745
CHROMIUM	MG/KG	8.74	6.24	7.49	11.6	10.1	14.0	89.5	103	73.9	74.6	106
COPPER	MG/KG	24.9	18.4	15.9	26.5	34.4	43.0	28.2	26.6	25.8 *N	24.4	27.6

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Table 4: Soil Samples Collected in September

sample location		B36	B37	B37	B38	B39	B40	SS5	SS6	SS7	SS8	SS9
depth		0.5-2.5 ft	0.5-2.5 ft	8-10 ft	1 & 4.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface	surface	surface	surface
sample #		B23401	B23402	B23403	B23404	B23405	B23406	B23407	B23408	B23409	B23410	B23411
sample collected		09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00
LEAD	MG/KG	14.3	5.49	6.02	29.4	56.0	50.2	20.5	21.5	59.1	21.0	22.8
NICKEL	MG/KG	13.4	11.3	13.9	18.2	22.6	25.7	21.1	21.5	20.5	22.4	23.3
SELENIUM	MG/KG	0.930	1.43	1.32	0.721	1.57	1.68	1.58	1.44	0.67 U	1.07	1.43
SILVER	MG/KG	1.06 U	1.04 U	1.06 U	1.11 U	1.09 U	1.12 U	1.36 U	1.42 U	1.3 U	1.43 U	1.36
THALLIUM	MG/KG	1.06 U	1.04 U	1.06 U	1.11 U	1.09 U	1.12 U	1.36 U	1.42 U	1.3 U	1.43 U	1.36
ZINC	MG/KG	55.2	58.3	44.8	77.4	70.9	81.5	83.2	85.6	81.5	77.0	86.5
VANADIUM	MG/KG	14.5	10.1	11.3	16.7	16.3	16.7	17.2	17.0	15.5	17.4	18.6
COBALT	MG/KG	6.32	5.21 U	5.87	7.03	7.07	7.16	9.22	9.35	9	9.67	9.86
TIN	MG/KG	53.2 U	52.1 U	53.0 U	55.7 U	54.4 U	56.1 U	68.2 U	70.8 U	65.6 U	71.4 U	68.2
MERCURY	MG/KG	0.0532 U	0.0521 U	0.0530 U	0.0764	1.98	0.245	0.158	0.0812	0.0934	0.164	0.142
ARSENIC	MG/KG	8.98	2.56	3.55	5.76	5.16	5.82	5.28	5.58	7	4.01	4.62
ACETONE	UG/KG	21 U	21 U	21 U	22 U	22 U	22 U	27 U	28 U	11 J	29 U	27
BENZENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
BROMODICHLOROMETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
BROMOFORM	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
BROMOMETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
2-BUTANONE (MEK)	UG/KG	11 U	10 U	11 U	11 U	11 U	11 U	14 U	14 U	13 U	14 U	14
CARBON DISULFIDE	UG/KG	11 U	10 U	11 U	11 U	11 U	11 U	14 U	14 U	13 U	14 U	14
CARBON TETRACHLORIDE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
CHLOROBENZENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
CHLOROETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
CHLOROFORM	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
CHLOROMETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
DIBROMOCHLOROMETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
DICHLORODIFLUOROMETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
1,1-DICHLOROETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
1,2-DICHLOROETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
1,1-DICHLOROETHENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
CIS-1,2-DICHLOROETHENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
TRANS-1,2-DICHLOROETHENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
1,2-DICHLOROPROPANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
CIS-1,3-DICHLOROPROPENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
TRANS-1,3-DICHLOROPROPENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
ETHYLBENZENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
FREON 113	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
2-HEXANONE	UG/KG	11 U	10 U	11 U	11 U	11 U	11 U	14 U	14 U	13 U	14 U	14
METHYLENE CHLORIDE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
4-METHYL-2-PENTANONE (MIBK)	UG/KG	11 U	10 U	11 U	11 U	11 U	11 U	14 U	14 U	13 U	14 U	14
STYRENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
TETRACHLOROETHENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	7.9	7.1 U	36	10	37
TOLUENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
1,1,1-TRICHLOROETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
1,1,2-TRICHLOROETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
TRICHLOROETHENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	6.3	6.8 U	7.1 U	6.7 U	7.1 U	6.8
TRICHLOROFLUOROMETHANE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
VINYL CHLORIDE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
O-XYLENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
M+P-XYLENE	UG/KG	5.3 U	5.2 U	5.3 U	5.6 U	5.4 U	5.6 U	6.8 U	7.1 U	6.7 U	7.1 U	6.8
TOTAL CYANIDE	MG/KG	1.06 U	1.04 U	1.06 U	1.11 U	1.78	1.12 U	1.36 U	1.42 U	1.34 U	1.43 U	1.36

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Table 4: Soil Samples Collected in September

sample location			SS10	SS11	SS12	SS13	SS14	B36	B37	B38	B39	B40
depth			surface	surface	surface	surface	surface	surface	surface	surface	surface	surface
sample #			B23412	B23413	B23414	B23415	B23416	B23417	B23418	B23419	B23420	B23421
sample collected			09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00
ACENAPHTHENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
ACENAPHTHYLENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
ANTHRACENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BENZO(A)ANTHRACENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BENZO(A)PYRENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BENZO(B)FLUORANTHENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BENZO(G,H,I)PERYLENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BENZO(K)FLUORANTHENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BENZYL ALCOHOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BUTYL BENZYL PHTHALATE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
DI-N-BUTYLPHTHALATE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
CARBAZOLE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
INDENO(1,2,3-CD)PYRENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
4-CHLOROANILINE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2-CHLORONAPHTHALENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2-CHLOROPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
CHRYSENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
DIBENZO(A,H)ANTHRACENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
DIBENZOFURAN	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
1,3-DICHLOROBENZENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
1,2-DICHLOROBENZENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
1,4-DICHLOROBENZENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
3,3'-DICHLOROBENZIDINE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2,4-DICHLOROPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
DIETHYLPHTHALATE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
DIMETHYL PHTHALATE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2,4-DIMETHYLPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2,4-DINITROPHENOL	UG/KG	U	1900 U	1900 U	2000 U	2000 U	2100 U	1900 U	1900 U	2000 U	2100 U	2100 U
2,4-DINITROTOLUENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2,6-DINITROTOLUENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
FLUORANTHENE	UG/KG	U	560	380	400 U	600	410 U	370 U	45 J	380 U	420 U	410 U
FLUORENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
HEXACHLOROBENZENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
HEXACHLOROBUTADIENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
HEXACHLOROETHANE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
ISOPHORONE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2-METHYLNAPHTHALENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	U	1900 U	1900 U	2000 U	2000 U	2100 U	1900 U	1900 U	2000 U	2100 U	2100 U
4-CHLORO-3-METHYLPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2-METHYLPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
4-METHYLPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
NAPHTHALENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2-NITROANILINE	UG/KG	U	1900 U	1900 U	2000 U	2000 U	2100 U	1900 U	1900 U	2000 U	2100 U	2100 U
3-NITROANILINE	UG/KG	U	1900 U	1900 U	2000 U	2000 U	2100 U	1900 U	1900 U	2000 U	2100 U	2100 U
4-NITROANILINE	UG/KG	U	1900 U	1900 U	2000 U	2000 U	2100 U	1900 U	1900 U	2000 U	2100 U	2100 U

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Table 4: Soil Samples Collected in September

sample location			SS10	SS11	SS12	SS13	SS14	B36	B37	B38	B39	B40
depth			surface	surface	surface	surface	surface	surface	surface	surface	surface	surface
sample #			B23412	B23413	B23414	B23415	B23416	B23417	B23418	B23419	B23420	B23421
sample collected			09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00
NITROBENZENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2-NITROPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
4-NITROPHENOL	UG/KG	U	1900 U	1900 U	2000 U	2000 U	2100 U	1900 U	1900 U	2000 U	2100 U	2100 U
N-NITROSODIMETHYLAMINE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
N-NITROSODIPHENYLAMINE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
DI-N-OCTYL PHTHALATE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
PENTACHLOROPHENOL	UG/KG	U	1900 U	1900 U	2000 U	2000 U	2100 U	1900 U	1900 U	2000 U	2100 U	2100 U
PHENANTHRENE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
PHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
PYRENE	UG/KG	U	440	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
1,2,4-TRICHLOROBENZENE	UG/KG	U	370 U	370 U	400 U	410	410 U	370 U	370 U	380 U	420 U	410 U
2,4,6-TRICHLOROPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
2,4,5-TRICHLOROPHENOL	UG/KG	U	370 U	370 U	400 U	390 U	410 U	370 U	370 U	380 U	420 U	410 U
ALDRIN	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
ALPHA-BHC	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
BETA-BHC	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
DELTA-BHC	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
GAMMA-BHC (LINDANE)	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
ALPHA-CHLORDANE	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
GAMMA-CHLORDANE	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
4,4'-DDD	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
4,4'-DDE	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
4,4'-DDT	UG/KG	U	3.7 U	3.7 U	4.0 U	3.9 U	41 U	37 U	3.7 U	38 U	42 U	41 U
DIELDRIN	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
ALPHA-ENDOSULFAN	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
BETA-ENDOSULFAN	UG/KG	U	3.7 U	3.7 U	4.0 U	3.9 U	41 U	37 U	3.7 U	38 U	42 U	41 U
ENDOSULFAN SULFATE	UG/KG	U	3.7 U	3.7 U	4.0 U	3.9 U	41 U	37 U	3.7 U	38 U	42 U	41 U
ENDRIN	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
ENDRIN ALDEHYDE	UG/KG	U	3.7 U	3.7 U	4.0 U	3.9 U	41 U	37 U	3.7 U	38 U	42 U	41 U
ENDRIN KETONE	UG/KG	U	3.7 U	3.7 U	4.0 U	3.9 U	41 U	37 U	3.7 U	38 U	42 U	41 U
HEPTACHLOR	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
HEPTACHLOR EPOXIDE	UG/KG	U	1.9 U	1.9 U	2.0 U	2.0 U	21 U	19 U	1.9 U	20 U	21 U	21 U
METHOXYCHLOR	UG/KG	U	7.4 U	7.3 U	7.9 U	7.9 U	83 U	75 U	7.3 U	76 U	83 U	82 U
TOXAPHENE	UG/KG	U	37 U	37 U	40 U	39 U	410 U	370 U	37 U	380 U	420 U	410 U
PCB 1016	UG/KG	U	37 U	37 U	40 U	39 U	41 U	37 U	37 U	38 U	42 U	41 U
PCB 1221	UG/KG	U	37 U	37 U	40 U	39 U	41 U	37 U	37 U	38 U	42 U	41 U
PCB 1232	UG/KG	U	37 U	37 U	40 U	39 U	41 U	37 U	37 U	38 U	42 U	41 U
PCB 1242	UG/KG	U	37 U	37 U	40 U	39 U	41 U	37 U	37 U	38 U	42 U	41 U
PCB 1248	UG/KG		630 D	580 D	2800 D	190	110	79	37 U	38 U	42 U	160
PCB 1254	UG/KG	U	37 U	37 U	40 U	39 U	41 U	37 U	37 U	38 U	42 U	41 U
PCB 1260	UG/KG	U	100	150	240	39 U	41 U	37 U	37 U	38 U	42 U	41 U
ANTIMONY	MG/KG	U	1.12 U	1.11 U	1.20 U	1.19 U	1.26 U	1.13 U	1.1 UN	1.16 U	1.26 U	1.24 U
BARIUM	MG/KG		92.7	99.6	119	63.1	110	80.4	59.4 *	108	89.3	111
BERYLLIUM	MG/KG	U	0.559 U	0.554 U	0.601 U	0.595 U	0.628 U	0.566 U	0.54 U	0.588	0.631 U	0.620 U
CADMIUM	MG/KG		0.559 U	0.554 U	0.601 U	0.864	0.628 U	0.566 U	0.54 U	0.578 U	0.631 U	0.620 U
CHROMIUM	MG/KG		11.6	12.2	14.5	12.7	16.2	10.9	5.8	20.7	21.5	73.1
COPPER	MG/KG		19.4	20.1	18.0	14.6	862	15.6	6.8 *N	18.8	14.8	22.8

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Table 4: Soil Samples Collected in September

sample location			SS10	SS11	SS12	SS13	SS14	B36	B37	B38	B39	B40
depth			surface	surface	surface	surface	surface	surface	surface	surface	surface	surface
sample #			B23412	B23413	B23414	B23415	B23416	B23417	B23418	B23419	B23420	B23421
sample collected			09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00
LEAD	MG/KG		23.4	25.8	22.1	24.6	78.6	24.2	9.7	23.2	15.3	26.3
NICKEL	MG/KG		18.1	19.2	21.0	15.0	31.4	14.3	7.6	21.0	17.6	28.6
SELENIUM	MG/KG		1.02	0.732	1.06	1.26	1.22	0.908	0.54 U	1.64	0.871	1.15
SILVER	MG/KG	U	1.12 U	1.11 U	1.20 U	1.19 U	1.26 U	1.13 U	1.1 U	1.16 U	1.26 U	1.24 U
THALLIUM	MG/KG	U	1.12 U	1.11 U	1.20 U	1.19 U	1.26 U	1.13 U	1.1 U	1.16 U	1.26 U	1.24 U
ZINC	MG/KG		72.6	70.1	64.4	58.3	151	59.1	27.7	70.5	56.3	77.7
VANADIUM	MG/KG		15.4	16.6	15.6	11.6	16.5	12.3	6.6	17.2	17.0	17.2
COBALT	MG/KG		7.86	8.19	8.87	6.93	9.36	6.43	8.3	9.66	8.11	8.98
TIN	MG/KG	U	55.9 U	55.4 U	60.1 U	59.5 U	62.8 U	56.6 U	53.9 U	57.8 U	63.1 U	62.0 U
MERCURY	MG/KG		0.147	0.113	0.0601 U	0.0998	0.157	0.0618	0.05 U	0.0578 U	0.0631 U	0.0757
ARSENIC	MG/KG		5.91	6.63	5.25	4.08	5.35	5.91	3.5	5.16	5.03	5.01
ACETONE	UG/KG	U	22 U	22 U	24 U	24 U	25 U	23 U	6.9 J	23 U	25 U	25 U
BENZENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
BROMODICHLOROMETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
BROMOFORM	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
BROMOMETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
2-BUTANONE (MEK)	UG/KG	U	11 U	11 U	12 U	12 U	13 U	11 U	11 U	12 U	13 U	12 U
CARBON DISULFIDE	UG/KG	U	11 U	11 U	12 U	12 U	13 U	11 U	11 U	12 U	13 U	12 U
CARBON TETRACHLORIDE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
CHLOROBENZENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
CHLOROETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
CHLOROFORM	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
CHLOROMETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
DIBROMOCHLOROMETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
DICHLORODIFLUOROMETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
1,1-DICHLOROETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
1,2-DICHLOROETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
1,1-DICHLOROETHENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
CIS-1,2-DICHLOROETHENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
TRANS-1,2-DICHLOROETHENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
1,2-DICHLOROPROPANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
CIS-1,3-DICHLOROPROPENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
ETHYLBENZENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
FREON 113	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	2.7 J	5.8 U	6.3 U	6.2 U
2-HEXANONE	UG/KG	U	11 U	11 U	12 U	12 U	13 U	11 U	11 U	12 U	13 U	12 U
METHYLENE CHLORIDE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	U	11 U	11 U	12 U	12 U	13 U	11 U	11 U	12 U	13 U	12 U
STYRENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
TETRACHLOROETHENE	UG/KG		27	5.5 U	13	6.0 U	21	11	16	5.8 U	6.3 U	6.2 U
TOLUENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
1,1,1-TRICHLOROETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
1,1,2-TRICHLOROETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
TRICHLOROETHENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
TRICHLOROFLUOROMETHANE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
VINYL CHLORIDE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
O-XYLENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
M+P-XYLENE	UG/KG	U	5.6 U	5.5 U	6.0 U	6.0 U	6.3 U	5.7 U	5.6 U	5.8 U	6.3 U	6.2 U
TOTAL CYANIDE	MG/KG	U	1.12 U	1.11 U	1.20 U	1.19 U	1.26 U	1.13 U	1.11 U	1.16 U	1.26 U	1.24 U

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Table 4: Soil Samples Collected in September

sample location		B41	B42	B43	B41	B42	B43	B44	B45	B46	B44	B45
depth		surface	surface	surface	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface
sample #		B23422	B23423	B23424	B23425	B23426	B23427	B23428	B23429	B23430	B23431	B23432
sample collected		09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/13/00	9/13/00	9/13/00	9/13/00	09/13/00
ACENAPHTHENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
ACENAPHTHYLENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
ANTHRACENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BENZO(A)ANTHRACENE	UG/KG	390 U	110 J	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BENZO(A)PYRENE	UG/KG	390 U	130 J	370 U	370 U	810	400 U	360 U	370 U	370 U	420 U	430
BENZO(B)FLUORANTHENE	UG/KG	390 U	120 J	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BENZO(G,H,I)PERYLENE	UG/KG	390 U	110 J	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BENZO(K)FLUORANTHENE	UG/KG	390 U	130 J	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BENZYL ALCOHOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BUTYL BENZYL PHTHALATE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
DI-N-BUTYLPHTHALATE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
CARBAZOLE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
INDENO(1,2,3-CD)PYRENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
4-CHLOROANILINE	UG/KG	390 U	110 J	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BIS(2-CHLOROETHYL)ETHER	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2-CHLORONAPHTHALENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2-CHLOROPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
CHRYSENE	UG/KG	390 U	130 J	370 U	370 U	1100	400 U	360 U	370 U	370 U	420 U	47
DIBENZO(A,H)ANTHRACENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
DIBENZOFURAN	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
1,3-DICHLOROBENZENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
1,2-DICHLOROBENZENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
1,4-DICHLOROBENZENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
3,3'-DICHLOROBENZIDINE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2,4-DICHLOROPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
DIETHYLPHTHALATE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
DIMETHYL PHTHALATE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2,4-DIMETHYLPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2,4-DINITROPHENOL	UG/KG	2000 U	2100 U	1900 U	1900 U	3800 U	2000 U	1900 U	1900 U	1900 U	2200 U	2200
2,4-DINITROTOLUENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2,6-DINITROTOLUENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
FLUORANTHENE	UG/KG	390 U	170 J	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	57
FLUORENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
HEXACHLOROBENZENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
HEXACHLOROBUTADIENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
HEXACHLOROCYCLOPENTADIENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
HEXACHLOROETHANE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
ISOPHORONE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2-METHYLNAPHTHALENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
4,6-DINITRO-2-METHYLPHENOL	UG/KG	2000 U	2100 U	1900 U	1900 U	3800 U	2000 U	1900 U	1900 U	1900 U	2200 U	2200
4-CHLORO-3-METHYLPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2-METHYLPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
4-METHYLPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
NAPHTHALENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2-NITROANILINE	UG/KG	2000 U	2100 U	1900 U	1900 U	3800 U	2000 U	1900 U	1900 U	1900 U	2200 U	2200
3-NITROANILINE	UG/KG	2000 U	2100 U	1900 U	1900 U	3800 U	2000 U	1900 U	1900 U	1900 U	2200 U	2200
4-NITROANILINE	UG/KG	2000 U	2100 U	1900 U	1900 U	3800 U	2000 U	1900 U	1900 U	1900 U	2200 U	2200

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Table 4: Soil Samples Collected in September

sample location		B41	B42	B43	B41	B42	B43	B44	B45	B46	B44	B45
depth		surface	surface	surface	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface
sample #		B23422	B23423	B23424	B23425	B23426	B23427	B23428	B23429	B23430	B23431	B23432
sample collected		09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/13/00	9/13/00	9/13/00	9/13/00	09/13/00
NITROBENZENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2-NITROPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
4-NITROPHENOL	UG/KG	2000 U	2100 U	1900 U	1900 U	3800 U	2000 U	1900 U	1900 U	1900 U	2200 U	2200
N-NITROSODIMETHYLAMINE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
N-NITROSODIPHENYLAMINE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
DI-N-OCTYL PHTHALATE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
PENTACHLOROPHENOL	UG/KG	2000 U	2100 U	1900 U	1900 U	3800 U	2000 U	1900 U	1900 U	1900 U	2200 U	2200
PHENANTHRENE	UG/KG	390 U	66 J	370 U	370 U	2000	400 U	360 U	370 U	370 U	420 U	430
PHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
4-BROMOPHENYL-PHENYLETHER	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
4-CHLOROPHENYL-PHENYLETHER	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
PYRENE	UG/KG	390 U	200 J	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
1,2,4-TRICHLOROBENZENE	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	59
2,4,6-TRICHLOROPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
2,4,5-TRICHLOROPHENOL	UG/KG	390 U	410 U	370 U	370 U	750 U	400 U	360 U	370 U	370 U	420 U	430
ALDRIN	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
ALPHA-BHC	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
BETA-BHC	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
DELTA-BHC	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
GAMMA-BHC (LINDANE)	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
ALPHA-CHLORDANE	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
GAMMA-CHLORDANE	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
4,4'-DDD	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
4,4'-DDE	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
4,4'-DDT	UG/KG	3.9 U	4.1 U	37 U	37 U	37 U	4.0 U	3.6 U	3.7 U	3.7 U	42 U	4.3
DIELDRIN	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
ALPHA-ENDOSULFAN	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
BETA-ENDOSULFAN	UG/KG	3.9 U	4.1 U	37 U	37 U	37 U	4.0 U	3.6 U	3.7 U	3.7 U	42 U	4.3
ENDOSULFAN SULFATE	UG/KG	3.9 U	4.1 U	37 U	37 U	37 U	4.0 U	3.6 U	3.7 U	3.7 U	42 U	4.3
ENDRIN	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
ENDRIN ALDEHYDE	UG/KG	3.9 U	4.1 U	37 U	37 U	37 U	4.0 U	3.6 U	3.7 U	3.7 U	42 U	4.3
ENDRIN KETONE	UG/KG	3.9 U	4.1 U	37 U	37 U	37 U	4.0 U	3.6 U	3.7 U	3.7 U	42 U	4.3
HEPTACHLOR	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
HEPTACHLOR EPOXIDE	UG/KG	2.0 U	2.1 U	19 U	19 U	19 U	2.0 U	1.9 U	1.9 U	1.9 U	22 U	2.2
METHOXYCHLOR	UG/KG	7.8 U	8.1 U	73 U	74 U	75 U	7.9 U	7.3 U	7.4 U	7.3 U	84 U	8.6
TOXAPHENE	UG/KG	39 U	41 U	370 U	370 U	370 U	40 U	36 U	37 U	37 U	420 U	43
PCB 1016	UG/KG	39 U	41 U	37 U	37 U	37 U	40 U	36 U	37 U	37 U	42 U	43
PCB 1221	UG/KG	39 U	41 U	37 U	37 U	37 U	40 U	36 U	37 U	37 U	42 U	43
PCB 1232	UG/KG	39 U	41 U	37 U	37 U	37 U	40 U	36 U	37 U	37 U	42 U	43
PCB 1242	UG/KG	39 U	41 U	37 U	37 U	37 U	40 U	36 U	37 U	37 U	42 U	43
PCB 1248	UG/KG	39 U	56	37 U	37 U	37 U	390	36 U	37 U	320	42 U	43
PCB 1254	UG/KG	39 U	41 U	37 U	37 U	37 U	40 U	36 U	37 U	37 U	42 U	43
PCB 1260	UG/KG	39 U	41 U	37 U	37 U	37 U	40 U	36 U	37 U	37 U	42 U	43
ANTIMONY	MG/KG	1.18 U	1.2 UN	1.11 U	1.12 U	3.93	1.20 U	1.10 U	1.11 U	1.11 U	1.28 U	1.31
BARIUM	MG/KG	101	113 *	64.5	146	153	241	81.5	62.4	103	101	106
BERYLLIUM	MG/KG	0.619	0.61 U	0.554 U	0.601	1.12	0.600 U	0.550 U	0.557 U	0.568	0.679	0.65
CADMIUM	MG/KG	0.591 U	0.61 U	0.554 U	0.562 U	0.612	0.600 U	0.550 U	0.557 U	0.555 U	0.639 U	0.65
CHROMIUM	MG/KG	32.0	28.9	8.82	16.5	74.1	10.5	10.0	8.36	8.88	16.1	15
COPPER	MG/KG	14.3	21.4 *N	9.50	60.1	4080	36.5	22.2	23.1	19.4	14.2	17.4

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Table 4: Soil Samples Collected in September

sample location		B41	B42	B43	B41	B42	B43	B44	B45	B46	B44	B45
depth		surface	surface	surface	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface
sample #		B23422	B23423	B23424	B23425	B23426	B23427	B23428	B23429	B23430	B23431	B23432
sample collected		09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/12/00	09/13/00	9/13/00	9/13/00	9/13/00	09/13/00
LEAD	MG/KG	19.4	23.4	11.2	110	783	2210	23.8	26.1	29.9	15.1	19.3
NICKEL	MG/KG	18.9	23.7	13.1	22.0	517	16.0	14.7	13.5	13.3	20.7	20.8
SELENIUM	MG/KG	0.591 U	0.59 U	0.879	1.73	3.43	0.600 U	1.43	0.994	1.33	0.810	0.63
SILVER	MG/KG	1.18 U	1.2 U	1.11 U	1.12 U	1.13 U	1.20 U	1.10 U	1.11 U	1.11 U	1.28 U	1.3
THALLIUM	MG/KG	1.18 U	1.2 U	1.11 U	1.12 U	1.13 U	1.20 U	1.10 U	1.11 U	1.11 U	1.28 U	1.3
ZINC	MG/KG	71.6	70.4	48.1	138	844	70.0	53.5	53.0	45.9	62.6	63.1
VANADIUM	MG/KG	16.3	16.5	11.8	19.3	35.9	16.1	16.9	16.1	17.1	18.9	17.5
COBALT	MG/KG	9.17	9.4	6.43	7.11	14.6	6.82	7.18	6.67	7.20	9.95	9.8
TIN	MG/KG	59.1 U	60.9 U	55.4 U	56.2 U	137	60.0 U	55.0 U	55.7 U	55.5 U	63.9 U	65.3
MERCURY	MG/KG	0.227	0.06 U	0.0554 U	0.124	0.103	0.0617	0.0636	0.0557 U	0.0555 U	0.0639 U	0.06
ARSENIC	MG/KG	5.50	5.4	4.54	8.93	32.1	7.02	5.06	7.28	6.63	5.40	6.5
ACETONE	UG/KG	24 U	25 U	22 U	22 U	23 U	24 U	22 U	22 U	22 U	26 U	26
BENZENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
BROMODICHLOROMETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
BROMOFORM	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
BROMOMETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
2-BUTANONE (MEK)	UG/KG	12 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	13 U	13
CARBON DISULFIDE	UG/KG	12 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	13 U	1.4
CARBON TETRACHLORIDE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
CHLOROBENZENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
CHLOROETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
CHLOROFORM	UG/KG	5.9 U	1.5 J	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
CHLOROMETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
DIBROMOCHLOROMETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
DICHLORODIFLUOROMETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
1,1-DICHLOROETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
1,2-DICHLOROETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
1,1-DICHLOROETHENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
CIS-1,2-DICHLOROETHENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
TRANS-1,2-DICHLOROETHENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
1,2-DICHLOROPROPANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
CIS-1,3-DICHLOROPROPENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
TRANS-1,3-DICHLOROPROPENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
ETHYLBENZENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
FREON 113	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
2-HEXANONE	UG/KG	12 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	13 U	13
METHYLENE CHLORIDE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
4-METHYL-2-PENTANONE (MIBK)	UG/KG	12 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	13 U	13
STYRENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
TETRACHLOROETHENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
TOLUENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
1,1,1-TRICHLOROETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
1,1,2-TRICHLOROETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
TRICHLOROETHENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
TRICHLOROFLUOROMETHANE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
VINYL CHLORIDE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
O-XYLENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
M+P-XYLENE	UG/KG	5.9 U	6.2 U	5.5 U	5.6 U	5.7 U	6.0 U	5.5 U	5.6 U	5.5 U	6.4 U	6.5
TOTAL CYANIDE	MG/KG	1.18 U	1.23 U	1.11 U	1.12 U	1.13 U	1.20 U	1.10 U	1.11 U	1.11 U	1.28 U	1.31

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Table 4: Soil Samples Collected in September

sample location			B46	B47	B48	B49	B46	B47	B48	B49	B50	B50
depth			surface	surface	surface	surface	8-10 ft	3-5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	4-7 ft
sample #			B23433		B23435	B23436	B23437	B23438	B23439	B23440	B23441	B23442
sample collected			9/13/00	09/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00
ACENAPHTHENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
ACENAPHTHYLENE	UG/KG	U	430 U	440	440 U	410 U	340 U	360 U	380 U	630	370 U	370 U
ANTHRACENE	UG/KG	U	430 U	370 J	440 U	410 U	340 U	360 U	380 U	530	370 U	370 U
BENZO(A)ANTHRACENE	UG/KG	U	430 U	1100	440 U	410 U	340 U	360 U	380 U	1300	370 U	370 U
BENZO(A)PYRENE	UG/KG	U	430 U	1400	440 U	410 U	340 U	360 U	380 U	1600	370 U	370 U
BENZO(B)FLUORANTHENE	UG/KG	U	430 U	1100	440 U	410 U	340 U	360 U	380 U	1300	370 U	370 U
BENZO(G,H,I)PERYLENE	UG/KG	U	430 U	1200	440 U	410 U	340 U	360 U	380 U	2000	370 U	370 U
BENZO(K)FLUORANTHENE	UG/KG	U	430 U	1100	440 U	410 U	340 U	360 U	380 U	1500	370 U	370 U
BENZYL ALCOHOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
BUTYL BENZYL PHTHALATE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
DI-N-BUTYLPHTHALATE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
CARBAZOLE	UG/KG	U	430 U	54 J	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
INDENO(1,2,3-CD)PYRENE	UG/KG	U	430 U	1000	440 U	410 U	340 U	360 U	380 U	1500	370 U	370 U
4-CHLOROANILINE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2-CHLORONAPHTHALENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2-CHLOROPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
CHRYSENE	UG/KG	U	430 U	1300	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
DIBENZO(A,H)ANTHRACENE	UG/KG	U	430 U	360 J	440 U	410 U	340 U	360 U	380 U	1300	370 U	370 U
DIBENZOFURAN	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	480	370 U	370 U
1,3-DICHLOROBENZENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
1,2-DICHLOROBENZENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
1,4-DICHLOROBENZENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
3,3'-DICHLOROBENZIDINE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2,4-DICHLOROPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
DIETHYLPHTHALATE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
DIMETHYL PHTHALATE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2,4-DIMETHYLPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2,4-DINITROPHENOL	UG/KG	U	2200 U	2200 U	2300 U	2100 U	1800 U	1800 U	2000 U	1900 U	1900 U	1900 U
2,4-DINITROTOLUENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2,6-DINITROTOLUENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
FLUORANTHENE	UG/KG	J	430 U	1300	440 U	410 U	340 U	360 U	380 U	2500	370 U	370 U
FLUORENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
HEXACHLOROBENZENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
HEXACHLOROBUTADIENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
HEXACHLOROETHANE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
ISOPHORONE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2-METHYLNAPHTHALENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	U	2200 U	2200 U	2300 U	2100 U	1800 U	1800 U	2000 U	1900 U	1900 U	1900 U
4-CHLORO-3-METHYLPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2-METHYLPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
4-METHYLPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
NAPHTHALENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	610	370 U	370 U
2-NITROANILINE	UG/KG	U	2200 U	2200 U	2300 U	2100 U	1800 U	1800 U	2000 U	1900 U	1900 U	1900 U
3-NITROANILINE	UG/KG	U	2200 U	2200 U	2300 U	2100 U	1800 U	1800 U	2000 U	1900 U	1900 U	1900 U
4-NITROANILINE	UG/KG	U	2200 U	2200 U	2300 U	2100 U	1800 U	1800 U	2000 U	1900 U	1900 U	1900 U

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Table 4: Soil Samples Collected in September

sample location			B46	B47	B48	B49	B46	B47	B48	B49	B50	B50
depth			surface	surface	surface	surface	8-10 ft	3-5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	4-7 ft
sample #			B23433		B23435	B23436	B23437	B23438	B23439	B23440	B23441	B23442
sample collected			9/13/00	09/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00
NITROBENZENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2-NITROPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
4-NITROPHENOL	UG/KG	U	2200 U	2200 U	2300 U	2100 U	1800 U	1800 U	2000 U	1900 U	1900 U	1900 U
N-NITROSODIMETHYLAMINE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
N-NITROSODIPHENYLAMINE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
DI-N-OCTYL PHTHALATE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
PENTACHLOROPHENOL	UG/KG	U	2200 U	2200 U	2300 U	2100 U	1800 U	1800 U	2000 U	1900 U	1900 U	1900 U
PHENANTHRENE	UG/KG	U	430 U	280 J	440 U	410 U	340 U	360 U	380 U	1200	370 U	370 U
PHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
PYRENE	UG/KG	J	430 U	1600	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
1,2,4-TRICHLOROBENZENE	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	1900	370 U	370 U
2,4,6-TRICHLOROPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
2,4,5-TRICHLOROPHENOL	UG/KG	U	430 U	430 U	440 U	410 U	340 U	360 U	380 U	380 U	370 U	370 U
ALDRIN	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
ALPHA-BHC	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
BETA-BHC	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
DELTA-BHC	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
GAMMA-BHC (LINDANE)	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
ALPHA-CHLORDANE	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
GAMMA-CHLORDANE	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
4,4'-DDD	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
4,4'-DDE	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
4,4'-DDT	UG/KG	U	43 U	4.3 U	44 U	41 U	3.4 U	3.6 U	38 U	38 U	3.7 U	3.7 U
DIELDRIN	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
ALPHA-ENDOSULFAN	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
BETA-ENDOSULFAN	UG/KG	U	43 U	4.3 U	44 U	41 U	3.4 U	3.6 U	38 U	38 U	3.7 U	3.7 U
ENDOSULFAN SULFATE	UG/KG	U	43 U	4.3 U	44 U	41 U	3.4 U	3.6 U	38 U	38 U	3.7 U	3.7 U
ENDRIN	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
ENDRIN ALDEHYDE	UG/KG	U	43 U	4.3 U	44 U	41 U	3.4 U	3.6 U	38 U	38 U	3.7 U	3.7 U
ENDRIN KETONE	UG/KG	U	43 U	4.3 U	44 U	41 U	3.4 U	3.6 U	38 U	38 U	3.7 U	3.7 U
HEPTACHLOR	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	UG/KG	U	22 U	2.2 U	23 U	21 U	1.8 U	1.8 U	20 U	19 U	1.9 U	1.9 U
METHOXYCHLOR	UG/KG	U	87 U	8.7 U	88 U	82 U	6.8 U	7.1 U	76 U	76 U	7.5 U	7.5 U
TOXAPHENE	UG/KG	U	430 U	43 U	440 U	410 U	34 U	36 U	380 U	380 U	37 U	37 U
PCB 1016	UG/KG	U	43 U	43 U	44 U	41 U	34 U	36 U	38 U	38 U	37 U	37 U
PCB 1221	UG/KG	U	43 U	43 U	44 U	41 U	34 U	36 U	38 U	38 U	37 U	37 U
PCB 1232	UG/KG	U	43 U	43 U	44 U	41 U	34 U	36 U	38 U	38 U	37 U	37 U
PCB 1242	UG/KG	U	43 U	43 U	44 U	41 U	34 U	36 U	38 U	38 U	37 U	37 U
PCB 1248	UG/KG	U	1700 D	43 U	44 U	41 U	34 U	36 U	38 U	38 U	37 U	37 U
PCB 1254	UG/KG	U	43 U	43 U	44 U	41 U	34 U	36 U	38 U	38 U	37 U	37 U
PCB 1260	UG/KG	U	130	43 U	44 U	41 U	34 U	36 U	38 U	38 U	37 U	37 U
ANTIMONY	MG/KG	UN	1.31 U	1.3 IN	1.33 U	1.25 U	1.04 U	1.08 U	1.16 U	1.15 U	1.1 UN	1.13 U
BARIUM	MG/KG	*	110	125 *	115	106	34.1	26.8	58.5	213	112 *	65.9
BERYLLIUM	MG/KG	U	0.656 U	0.65 U	0.664 U	0.688	0.518 U	0.539 U	0.578 U	1.03	0.57 U	0.566 U
CADMIUM	MG/KG	U	0.656 U	0.65 U	0.664 U	0.624 U	0.518 U	0.539 U	0.578 U	0.573 U	0.57 U	0.566 U
CHROMIUM	MG/KG		14.3	16.6	14.6	16.9	6.26	6.70	8.02	11.8	13.9	9.17
COPPER	MG/KG	*N	13.5	16.3 *N	13.8	17.4	16.5	16.8	8.18	39.1	42.7 *N	24.5

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Table 4: Soil Samples Collected in September

sample location			B46	B47	B48	B49	B46	B47	B48	B49	B50	B50
depth			surface	surface	surface	surface	8-10 ft	3-5 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	4-7 ft
sample #			B23433		B23435	B23436	B23437	B23438	B23439	B23440	B23441	B23442
sample collected			9/13/00	09/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00
LEAD	MG/KG		16.1	18.3	17.5	18.6	9.84	6.15	8.15	179	22.2	7.97
NICKEL	MG/KG		17.6	20.1	18.6	21.8	12.0	12.9	12.0	24.1	20.6	15.4
SELENIUM	MG/KG	U	0.656 U	0.63 U	0.883	0.840	0.518 U	0.539 U	0.578 U	0.647	0.57 U	0.680
SILVER	MG/KG	U	1.31 U	1.3 U	1.33 U	1.25 U	1.04 U	1.08 U	1.16 U	1.15 U	1.1 U	1.13 U
THALLIUM	MG/KG	U	1.31 U	1.3 U	1.33 U	1.25 U	1.04 U	1.08 U	1.16 U	1.15 U	1.1 U	1.13 U
ZINC	MG/KG		57.1	63	55.8	70.8	41.5	98.8	39.4	164	63.2	61.5
VANADIUM	MG/KG		16.0	16	18.1	19.4	11.1	11.6	14.2	22.9	16.9	14.3
COBALT	MG/KG		8.66	9.1	9.16	10.3	5.78	5.59	5.78 U	10.6	9.5	6.48
TIN	MG/KG	U	65.6 U	65.1 U	66.4 U	62.4 U	51.8 U	53.9 U	57.8 U	57.3 U	56.8 U	56.6 U
MERCURY	MG/KG	U	0.0656 U	0.06 U	0.0664 U	0.132	0.0518 U	0.0539 U	0.0578 U	0.294	0.05 U	0.0566 U
ARSENIC	MG/KG		5.84	5.7	5.83	5.62	4.51	5.22	4.07	5.22	6.1	6.46
ACETONE	UG/KG	U	26 U	26 U	27 U	25	21 U	22 U	23 U	23 U	8.7 J	23 U
BENZENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
BROMODICHLOROMETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
BROMOFORM	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
BROMOMETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
2-BUTANONE (MEK)	UG/KG	U	13 U	13 U	13 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
CARBON DISULFIDE	UG/KG	J	13 U	13 U	13 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
CARBON TETRACHLORIDE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
CHLOROBENZENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
CHLOROETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
CHLOROFORM	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
CHLOROMETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
DIBROMOCHLOROMETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
DICHLORODIFLUOROMETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
1,1-DICHLOROETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
1,2-DICHLOROETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
1,1-DICHLOROETHENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
CIS-1,2-DICHLOROETHENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
TRANS-1,2-DICHLOROETHENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
1,2-DICHLOROPROPANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
CIS-1,3-DICHLOROPROPENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
ETHYLBENZENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
FREON 113	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
2-HEXANONE	UG/KG	U	13 U	13 U	13 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
METHYLENE CHLORIDE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	U	13 U	13 U	13 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
STYRENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
TETRACHLOROETHENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
TOLUENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
1,1,1-TRICHLOROETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
1,1,2-TRICHLOROETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
TRICHLOROETHENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
TRICHLOROFLUOROMETHANE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
VINYL CHLORIDE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
O-XYLENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
M+P-XYLENE	UG/KG	U	6.6 U	6.6 U	6.6 U	6.2 U	5.2 U	5.4 U	5.8 U	5.7 U	5.7 U	5.7 U
TOTAL CYANIDE	MG/KG	U	1.31 U	1.32 U	1.33 U	1.25 U	1.04 U	1.08 U	1.16 U	1.15 U	1.14 U	1.13 U

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Table 4: Soil Samples Collected in September

sample location		B51	B52	B52	B50	B51	B52	B53	B54	B55	B53	B54
depth		0.5-2.5 ft	0.5-2.5 ft	4-6 ft	surface	surface	surface	surface	surface	surface	0.5-2.5 ft	0.5-2.5 ft
sample #		B23443	B23444	B23445	B23446	B23447	B23448	B23449	B23450	B23451	B23452	B23453
sample collected		9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00
ACENAPHTHENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
ACENAPHTHYLENE	UG/KG	2800	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
ANTHRACENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BENZO(A)ANTHRACENE	UG/KG	4400	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BENZO(A)PYRENE	UG/KG	5400	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BENZO(B)FLUORANTHENE	UG/KG	5200	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BENZO(G,H,I)PERYLENE	UG/KG	4900	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BENZO(K)FLUORANTHENE	UG/KG	4600	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BENZYL ALCOHOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BUTYL BENZYL PHTHALATE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
DI-N-BUTYLPHTHALATE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
CARBAZOLE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
INDENO(1,2,3-CD)PYRENE	UG/KG	4000	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
4-CHLOROANILINE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BIS(2-CHLOROETHYL)ETHER	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2-CHLORONAPHTHALENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2-CHLOROPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
CHRYSENE	UG/KG	5100	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
DIBENZO(A,H)ANTHRACENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	56 J	360 U	2100
DIBENZOFURAN	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
1,3-DICHLOROBENZENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
1,2-DICHLOROBENZENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
1,4-DICHLOROBENZENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
3,3'-DICHLOROBENZIDINE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2,4-DICHLOROPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
DIETHYLPHTHALATE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
DIMETHYL PHTHALATE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2,4-DIMETHYLPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2,4-DINITROPHENOL	UG/KG	9300 U	1800 U	1800 U	2200 U	1900 U	2400 U	2300 U	2300 U	2400 U	1900 U	10000
2,4-DINITROTOLUENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2,6-DINITROTOLUENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
FLUORANTHENE	UG/KG	5900	360 U	360 U	420 U	370 U	49 J	440 U	440 U	67 J	360 U	2900
FLUORENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
HEXACHLOROBENZENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
HEXACHLOROBUTADIENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
HEXACHLOROCYCLOPENTADIENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
HEXACHLOROETHANE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
ISOPHORONE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2-METHYLNAPHTHALENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
4,6-DINITRO-2-METHYLPHENOL	UG/KG	9300 U	1800 U	1800 U	2200 U	1900 U	2400 U	2300 U	2300 U	2400 U	1900 U	10000
4-CHLORO-3-METHYLPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2-METHYLPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
4-METHYLPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
NAPHTHALENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2-NITROANILINE	UG/KG	9300 U	1800 U	1800 U	2200 U	1900 U	2400 U	2300 U	2300 U	2400 U	1900 U	10000
3-NITROANILINE	UG/KG	9300 U	1800 U	1800 U	2200 U	1900 U	2400 U	2300 U	2300 U	2400 U	1900 U	10000
4-NITROANILINE	UG/KG	9300 U	1800 U	1800 U	2200 U	1900 U	2400 U	2300 U	2300 U	2400 U	1900 U	10000

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Table 4: Soil Samples Collected in September

sample location		B51	B52	B52	B50	B51	B52	B53	B54	B55	B53	B54
depth		0.5-2.5 ft	0.5-2.5 ft	4-6 ft	surface	surface	surface	surface	surface	surface	0.5-2.5 ft	0.5-2.5 ft
sample #		B23443	B23444	B23445	B23446	B23447	B23448	B23449	B23450	B23451	B23452	B23453
sample collected		9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00
NITROBENZENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2-NITROPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
4-NITROPHENOL	UG/KG	9300 U	1800 U	1800 U	2200 U	1900 U	2400 U	2300 U	2300 U	2400 U	1900 U	10000
N-NITROSODIMETHYLAMINE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
N-NITROSODIPHENYLAMINE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
DI-N-OCTYL PHTHALATE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
PENTACHLOROPHENOL	UG/KG	9300 U	1800 U	1800 U	2200 U	1900 U	2400 U	2300 U	2300 U	2400 U	1900 U	10000
PHENANTHRENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	3200
PHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
4-BROMOPHENYL-PHENYLETHER	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
4-CHLOROPHENYL-PHENYLETHER	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
PYRENE	UG/KG	8600	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
1,2,4-TRICHLOROBENZENE	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	61 J	360 U	2100
2,4,6-TRICHLOROPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
2,4,5-TRICHLOROPHENOL	UG/KG	1800 U	360 U	360 U	420 U	370 U	460 U	440 U	440 U	460 U	360 U	1900
ALDRIN	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
ALPHA-BHC	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
BETA-BHC	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
DELTA-BHC	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
GAMMA-BHC (LINDANE)	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
ALPHA-CHLORDANE	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
GAMMA-CHLORDANE	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
4,4'-DDD	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
4,4'-DDE	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
4,4'-DDT	UG/KG	36 U	36 U	3.6 U	42 U	3.7 U	4.6 U	4.4 U	4.4 U	4.6 U	3.6 U	3.9
DIELDRIN	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
ALPHA-ENDOSULFAN	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
BETA-ENDOSULFAN	UG/KG	36 U	36 U	3.6 U	42 U	3.7 U	4.6 U	4.4 U	4.4 U	4.6 U	3.6 U	3.9
ENDOSULFAN SULFATE	UG/KG	36 U	36 U	3.6 U	42 U	3.7 U	4.6 U	4.4 U	4.4 U	4.6 U	3.6 U	3.9
ENDRIN	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
ENDRIN ALDEHYDE	UG/KG	36 U	36 U	3.6 U	42 U	3.7 U	4.6 U	4.4 U	4.4 U	4.6 U	3.6 U	3.9
ENDRIN KETONE	UG/KG	36 U	36 U	3.6 U	42 U	3.7 U	4.6 U	4.4 U	4.4 U	4.6 U	3.6 U	3.9
HEPTACHLOR	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
HEPTACHLOR EPOXIDE	UG/KG	19 U	18 U	1.8 U	22 U	1.9 U	2.4 U	2.3 U	2.3 U	2.4 U	1.9 U	2.0
METHOXYCHLOR	UG/KG	72 U	72 U	7.1 U	84 U	7.4 U	9.1 U	8.8 U	8.9 U	9.2 U	7.2 U	7.7
TOXAPHENE	UG/KG	360 U	360 U	36 U	420 U	37 U	46 U	44 U	44 U	46 U	36 U	39
PCB 1016	UG/KG	36 U	36 U	36 U	42 U	37 U	46 U	44 U	44 U	46 U	36 U	39
PCB 1221	UG/KG	36 U	36 U	36 U	42 U	37 U	46 U	44 U	44 U	46 U	36 U	39
PCB 1232	UG/KG	36 U	36 U	36 U	42 U	37 U	46 U	44 U	44 U	46 U	36 U	39
PCB 1242	UG/KG	36 U	36 U	36 U	42 U	37 U	46 U	44 U	44 U	46 U	36 U	39
PCB 1248	UG/KG	36 U	36 U	36 U	150	37 U	46 U	44 U	44 U	46 U	36 U	39
PCB 1254	UG/KG	36 U	36 U	36 U	42 U	37 U	46 U	44 U	44 U	46 U	36 U	39
PCB 1260	UG/KG	36 U	36 U	36 U	42 U	37 U	46 U	44 U	44 U	46 U	36 U	39
ANTIMONY	MG/KG	1.09 U	1.08 U	1.08 U	1.27 U	1.12 U	1.3 UN	1.33 U	1.35 U	1.3 UN	1.10 U	1.17
BARIUM	MG/KG	98.9	61.2	24.3	121	36.8	144 *	92.3	133	124 *	51.3	112
BERYLLIUM	MG/KG	0.545 U	0.542 U	0.538 U	0.635 U	0.558 U	0.66 U	0.666 U	0.673 U	0.67 U	0.549 U	0.587
CADMIUM	MG/KG	0.545 U	0.542 U	0.538 U	0.635 U	0.558 U	0.66 U	0.770	0.907	0.67 U	0.549 U	0.587
CHROMIUM	MG/KG	10.1	12.1	4.63	16.9	13.2	37.9	58.2	91.4	39.5	6.77	11.0
COPPER	MG/KG	28.6	30.3	12.6	18.7	7.38	19.2 *N	22.4	23.1	19.8 *N	12.1	12.8

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Table 4: Soil Samples Collected in September

sample location		B51	B52	B52	B50	B51	B52	B53	B54	B55	B53	B54
depth		0.5-2.5 ft	0.5-2.5 ft	4-6 ft	surface	surface	surface	surface	surface	surface	0.5-2.5 ft	0.5-2.5 ft
sample #		B23443	B23444	B23445	B23446	B23447	B23448	B23449	B23450	B23451	B23452	B23453
sample collected		9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00
LEAD	MG/KG	14.8	10.5	3.27	16.6	5.51	17.3	16.0	20.2	34	11.2	16.2
NICKEL	MG/KG	17.2	19.6	8.39	22.2	5.27	21.9	22.8	27.6	21.9	9.78	14.0
SELENIUM	MG/KG	0.618	0.777	1.40	1.57	0.558 U	0.66 U	1.62	1.47	0.7 U	0.67	0.68
SILVER	MG/KG	1.09 U	1.08 U	1.08 U	1.27 U	1.12 U	1.3 U	1.33 U	1.35 U	1.3 U	1.10 U	1.17
THALLIUM	MG/KG	1.09 U	1.08 U	1.08 U	1.27 U	1.12 U	1.3 U	1.33 U	1.35 U	1.4 U	1.10 U	1.17
ZINC	MG/KG	69.7	61.8	27.3	64.1	26.6	67.9	68.7	84.4	77.3	39.8	46.6
VANADIUM	MG/KG	16.1	17.4	7.84	17.9	27.6	17.6	16.6	19.9	16.5	10.7	16.4
COBALT	MG/KG	7.79	9.06	5.38 U	10.3	5.58 U	10.2	10.2	10.9	9.9	5.49 U	6.44
TIN	MG/KG	54.5 U	54.2 U	53.8 U	63.5 U	55.8 U	66.5 U	66.6 U	67.3 U	67.2 U	54.9 U	58.7
MERCURY	MG/KG	0.0545 U	0.0542 U	0.0538 U	0.0635 U	0.0558 U	0.07 U	0.0666 U	0.0673 U	0.236	0.0549 U	0.111
ARSENIC	MG/KG	7.76	8.28	2.33	5.67	3.90	5.8	4.78	5.72	5.8	3.38	2.35
ACETONE	UG/KG	22 U	22 U	22 U	25 U	22 U	28 U	27 U	27 U	28 U	22 U	23
BENZENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
BROMODICHLOROMETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
BROMOFORM	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
BROMOMETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
2-BUTANONE (MEK)	UG/KG	11 U	11 U	11 U	13 U	11 U	14 U	13 U	13 U	14 U	11 U	12
CARBON DISULFIDE	UG/KG	11 U	11 U	11 U	13 U	11 U	14 U	13 U	13 U	14 U	11 U	12
CARBON TETRACHLORIDE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
CHLOROBENZENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
CHLOROETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
CHLOROFORM	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	8.3	5.5 U	5.9
CHLOROMETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
DIBROMOCHLOROMETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
DICHLORODIFLUOROMETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
1,1-DICHLOROETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
1,2-DICHLOROETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
1,1-DICHLOROETHENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
CIS-1,2-DICHLOROETHENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
TRANS-1,2-DICHLOROETHENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
1,2-DICHLOROPROPANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
CIS-1,3-DICHLOROPROPENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
TRANS-1,3-DICHLOROPROPENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
ETHYLBENZENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
FREON 113	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	1.7 J	5.5 U	5.9
2-HEXANONE	UG/KG	11 U	11 U	11 U	13 U	11 U	14 U	13 U	13 U	14 U	11 U	12
METHYLENE CHLORIDE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
4-METHYL-2-PENTANONE (MIBK)	UG/KG	11 U	11 U	11 U	13 U	11 U	14 U	13 U	13 U	14 U	11 U	12
STYRENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
1,1,2,2-TETRACHLOROETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
TETRACHLOROETHENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
TOLUENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
1,1,1-TRICHLOROETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
1,1,2-TRICHLOROETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
TRICHLOROETHENE	UG/KG	32	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
TRICHLOROFLUOROMETHANE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
VINYL CHLORIDE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
O-XYLENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
M+P-XYLENE	UG/KG	5.5 U	5.4 U	5.4 U	6.3 U	5.6 U	6.9 U	6.7 U	6.7 U	7 U	5.5 U	5.9
TOTAL CYANIDE	MG/KG	1.09 U	1.08 U	1.08 U	1.27 U	1.12 U	1.38 U	1.33 U	1.35 U	1.4 U	1.10 U	1.17

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Table 4: Soil Samples Collected in September

sample location			B54	B55	B56	B57	B56	B57	B58	B58	B59	B59
depth			4-6 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface	surface	0.5-2.5	surface	0.5-2.5
sample #			B23454	B23455	B23456	B23457	B23458	B23459	B23460	B23461	B23462	B23463
sample collected			9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00	9/13/00	9/13/00
ACENAPHTHENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
ACENAPHTHYLENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
ANTHRACENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BENZO(A)ANTHRACENE	UG/KG	U	380 U	780	350 U	400	420 U	400 U	380 U	380 U	390 U	360 U
BENZO(A)PYRENE	UG/KG	U	380 U	880	350 U	410	420 U	400 U	380 U	380 U	390 U	360 U
BENZO(B)FLUORANTHENE	UG/KG	U	380 U	800	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BENZO(G,H,I)PERYLENE	UG/KG	U	380 U	710	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BENZO(K)FLUORANTHENE	UG/KG	U	380 U	720	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BENZYL ALCOHOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BUTYL BENZYL PHTHALATE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
DI-N-BUTYLPHTHALATE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
CARBAZOLE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
INDENO(1,2,3-CD)PYRENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
4-CHLOROANILINE	UG/KG	U	380 U	650	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BIS(-2-CHLOROETHOXY)METHANE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BIS(2-CHLOROETHYL)ETHER	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2-CHLORONAPHTHALENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2-CHLOROPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
CHRYSENE	UG/KG		380 U	940	350 U	390	420 U	400 U	380 U	380 U	390 U	360 U
DIBENZO(A,H)ANTHRACENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
DIBENZOFURAN	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
1,3-DICHLOROBENZENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
1,2-DICHLOROBENZENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
1,4-DICHLOROBENZENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
3,3'-DICHLOROBENZIDINE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2,4-DICHLOROPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
DIETHYLPHTHALATE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
DIMETHYL PHTHALATE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2,4-DIMETHYLPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2,4-DINITROPHENOL	UG/KG	U	2000 U	1900 U	1800 U	1800 U	2200 U	2100 U	1900 U	1900 U	2000 U	1800 U
2,4-DINITROTOLUENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2,6-DINITROTOLUENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	U	380 U	910	350 U	350 U	44 J	400 U	380 U	380 U	390 U	360 U
FLUORANTHENE	UG/KG		380 U	1800	350 U	630	420 U	630	380 U	380 U	390 U	360 U
FLUORENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
HEXACHLOROBENZENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
HEXACHLOROBUTADIENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
HEXACHLOROETHANE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
ISOPHORONE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2-METHYLNAPHTHALENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	U	2000 U	1900 U	1800 U	1800 U	2200 U	2100 U	1900 U	1900 U	2000 U	1800 U
4-CHLORO-3-METHYLPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2-METHYLPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
4-METHYLPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
NAPHTHALENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2-NITROANILINE	UG/KG	U	2000 U	1900 U	1800 U	1800 U	2200 U	2100 U	1900 U	1900 U	2000 U	1800 U
3-NITROANILINE	UG/KG	U	2000 U	1900 U	1800 U	1800 U	2200 U	2100 U	1900 U	1900 U	2000 U	1800 U
4-NITROANILINE	UG/KG	U	2000 U	1900 U	1800 U	1800 U	2200 U	2100 U	1900 U	1900 U	2000 U	1800 U

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Table 4: Soil Samples Collected in September

sample location			B54	B55	B56	B57	B56	B57	B58	B58	B59	B59
depth			4-6 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface	surface	0.5-2.5	surface	0.5-2.5
sample #			B23454	B23455	B23456	B23457	B23458	B23459	B23460	B23461	B23462	B23463
sample collected			9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00	9/13/00	9/13/00
NITROBENZENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2-NITROPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
4-NITROPHENOL	UG/KG	U	2000 U	1900 U	1800 U	1800 U	2200 U	2100 U	1900 U	1900 U	2000 U	1800 U
N-NITROSODIMETHYLAMINE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
N-NITROSODIPHENYLAMINE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
DI-N-OCTYL PHTHALATE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
PENTACHLOROPHENOL	UG/KG	U	2000 U	1900 U	1800 U	1800 U	2200 U	2100 U	1900 U	1900 U	2000 U	1800 U
PHENANTHRENE	UG/KG		380 U	500	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
PHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
PYRENE	UG/KG		380 U	1500	350 U	620	420 U	430	380 U	380 U	390 U	360 U
1,2,4-TRICHLOROBENZENE	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2,4,6-TRICHLOROPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
2,4,5-TRICHLOROPHENOL	UG/KG	U	380 U	380 U	350 U	350 U	420 U	400 U	380 U	380 U	390 U	360 U
ALDRIN	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
ALPHA-BHC	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
BETA-BHC	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
DELTA-BHC	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
GAMMA-BHC (LINDANE)	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
ALPHA-CHLORDANE	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
GAMMA-CHLORDANE	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
4,4'-DDD	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
4,4'-DDE	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
4,4'-DDT	UG/KG	U	3.8 U	3.8 U	3.5 U	3.5 U	4.2 U	4 U	3.8 U	3.8 U	39 U	3.6 U
DIELDRIN	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
ALPHA-ENDOSULFAN	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
BETA-ENDOSULFAN	UG/KG	U	3.8 U	3.8 U	3.5 U	3.5 U	4.2 U	4 U	3.8 U	3.8 U	39 U	3.6 U
ENDOSULFAN SULFATE	UG/KG	U	3.8 U	3.8 U	3.5 U	3.5 U	4.2 U	4 U	3.8 U	3.8 U	39 U	3.6 U
ENDRIN	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
ENDRIN ALDEHYDE	UG/KG	U	3.8 U	3.8 U	3.5 U	3.5 U	4.2 U	4 U	3.8 U	3.8 U	39 U	3.6 U
ENDRIN KETONE	UG/KG	U	3.8 U	3.8 U	3.5 U	3.5 U	4.2 U	4 U	3.8 U	3.8 U	39 U	3.6 U
HEPTACHLOR	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
HEPTACHLOR EPOXIDE	UG/KG	U	2.0 U	1.9 U	1.8 U	1.8 U	2.2 U	2.1 U	1.9 U	1.9 U	20 U	1.8 U
METHOXYCHLOR	UG/KG	U	7.6 U	7.5 U	6.9 U	6.9 U	8.5 U	8 U	7.5 U	7.5 U	79 U	7.2 U
TOXAPHENE	UG/KG	U	38 U	38 U	35 U	35 U	42 U	40 U	38 U	38 U	390 U	36 U
PCB 1016	UG/KG	U	38 U	38 U	35 U	35 U	42 U	40 U	38 U	38 U	39 U	36 U
PCB 1221	UG/KG	U	38 U	38 U	35 U	35 U	42 U	40 U	38 U	38 U	39 U	36 U
PCB 1232	UG/KG	U	38 U	38 U	35 U	35 U	42 U	40 U	38 U	38 U	39 U	36 U
PCB 1242	UG/KG	U	38 U	38 U	35 U	35 U	42 U	40 U	38 U	38 U	39 U	36 U
PCB 1248	UG/KG	U	38 U	38 U	35 U	35 U	42 U	40 U	38 U	38 U	39 U	36 U
PCB 1254	UG/KG	U	38 U	38 U	35 U	35 U	42 U	40 U	38 U	38 U	39 U	36 U
PCB 1260	UG/KG	U	38 U	38 U	35 U	53	42 U	78	38 U	38 U	39 U	36 U
ANTIMONY	MG/KG	U	1.15 U	1.14 U	1.05 U	1.05 U	1.29 U	1.2 UN	1.14 U	1.14 U	1.19 U	1.09 U
BARIUM	MG/KG		47.1	94.4	39.2	32.4	112	84.2 *	43.4	98.9	109	68.8
BERYLLIUM	MG/KG	U	0.575 U	0.570 U	0.524 U	0.526 U	0.644 U	0.58 U	0.571 U	0.569 U	0.652	0.544 U
CADMIUM	MG/KG	U	0.575 U	0.570 U	0.524 U	0.526 U	0.654	0.58	0.630	0.569 U	0.597 U	0.544 U
CHROMIUM	MG/KG		7.77	8.30	7.01	7.45	51.2	39.1	15.9	10.4	19.2	9.71
COPPER	MG/KG		16.1	27.7	20.2	26.6	18.3	19.3 *N	8.07	28.4	19.3	21.8

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Table 4: Soil Samples Collected in September

sample location			B54	B55	B56	B57	B56	B57	B58	B58	B59	B59
depth			4-6 ft	0.5-2.5 ft	0.5-2.5 ft	0.5-2.5 ft	surface	surface	surface	0.5-2.5	surface	0.5-2.5
sample #			B23454	B23455	B23456	B23457	B23458	B23459	B23460	B23461	B23462	B23463
sample collected			9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	09/13/00	9/13/00	9/13/00	9/13/00	9/13/00
LEAD	MG/KG		8.90	174	5.79	13.3	17.0	20.2	5.06	16.6	16.2	9.82
NICKEL	MG/KG		14.6	13.9	12.6	13.7	20.1	21.6	5.62	14.7	24.8	17.6
SELENIUM	MG/KG		1.56	1.60	0.717	0.526 U	1.18	0.59 U	0.967	1.22	0.962	0.959
SILVER	MG/KG	U	1.15 U	1.14 U	1.05 U	1.05 U	1.29 U	1.2 U	1.14 U	1.14 U	1.19 U	1.09 U
THALLIUM	MG/KG	U	1.15 U	1.14 U	1.05 U	1.05 U	1.29 U	1.2 U	1.14 U	1.14 U	1.19 U	1.09 U
ZINC	MG/KG		72.2	86.1	66.0	76.7	67.4	66	25.5	72.1	67.5	62.5
VANADIUM	MG/KG		11.7	14.7	11.0	11.1	14.7	17	33.4	19.2	20.5	18.6
COBALT	MG/KG		6.28	6.36	5.51	5.99	9.06	9.2	6.32	6.94	10.0	7.88
TIN	MG/KG	U	57.5 U	57.0 U	52.4 U	52.6 U	64.4 U	58.1 U	57.1 U	56.9 U	59.7 U	54.4 U
MERCURY	MG/KG		0.0575 U	0.112	0.0524 U	0.0526 U	0.0644 U	0.06 U	0.0571 U	0.0658	0.0597 U	0.0544 U
ARSENIC	MG/KG		3.82	7.07	3.86	3.05	4.76	5.3	5.23	4.91	5.36	6.76
ACETONE	UG/KG	U	23 U	23 U	21 U	21 U	26 U	24 U	23 U	23 U	24 U	22 U
BENZENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
BROMODICHLOROMETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
BROMOFORM	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
BROMOMETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
2-BUTANONE (MEK)	UG/KG	U	11 U	11 U	10 U	11 U	13 U	12 U	11 U	11 U	12 U	11 U
CARBON DISULFIDE	UG/KG	U	11 U	11 U	10 U	11 U	13 U	12 U	11 U	11 U	12 U	11 U
CARBON TETRACHLORIDE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
CHLOROBENZENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
CHLOROETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
CHLOROFORM	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
CHLOROMETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
DIBROMOCHLOROMETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
DICHLORODIFLUOROMETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
1,1-DICHLOROETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
1,2-DICHLOROETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
1,1-DICHLOROETHENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
CIS-1,2-DICHLOROETHENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
TRANS-1,2-DICHLOROETHENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
1,2-DICHLOROPROPANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
CIS-1,3-DICHLOROPROPENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
ETHYLBENZENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
FREON 113	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	2.3 J	5.7 U	5.7 U	6.0 U	5.4 U
2-HEXANONE	UG/KG	U	11 U	11 U	10 U	11 U	13 U	12 U	11 U	11 U	12 U	11 U
METHYLENE CHLORIDE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
4-METHYL-2-PENTANONE (MIBK)	UG/KG	U	11 U	11 U	10 U	11 U	13 U	12 U	11 U	11 U	12 U	11 U
STYRENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
1,1,2,2-TETRACHLOROETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
TETRACHLOROETHENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	1.8 J	5.7 U	5.7 U	6.0 U	5.4 U
TOLUENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
1,1,1-TRICHLOROETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
1,1,2-TRICHLOROETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
TRICHLOROETHENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
TRICHLOROFLUOROMETHANE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
VINYL CHLORIDE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
O-XYLENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
M+P-XYLENE	UG/KG	U	5.7 U	5.7 U	5.2 U	5.3 U	6.4 U	6 U	5.7 U	5.7 U	6.0 U	5.4 U
TOTAL CYANIDE	MG/KG	U	1.15 U	1.14 U	1.05 U	1.05 U	1.29 U	1.21 U	1.14 U	1.14 U	1.19 U	1.09 U

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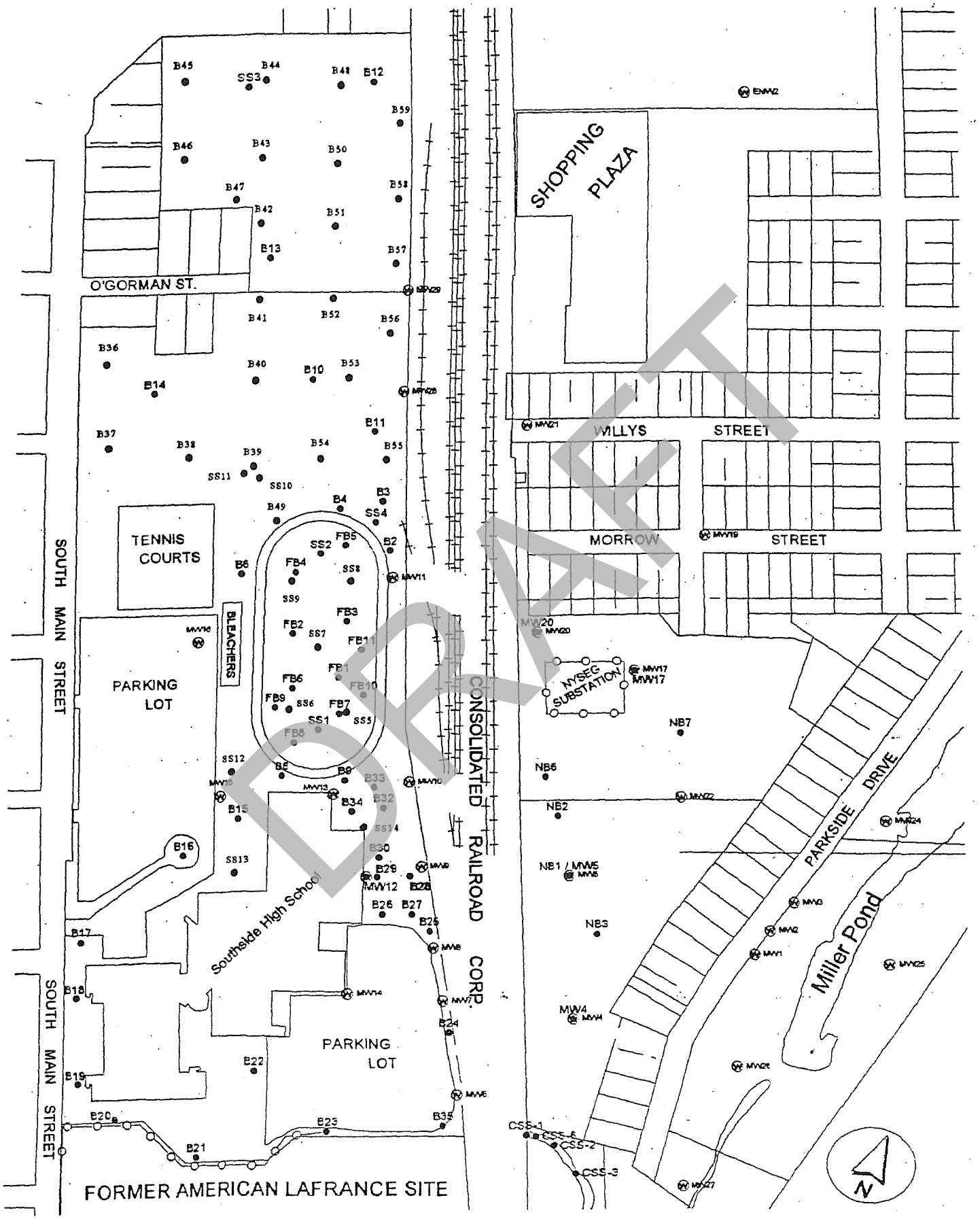
Location of Soil Samples Collected by NYS DEC & NYS DOH at Southside High School



From the NYS DEC, February 2000

Appendix E
Tables

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Table 1

Sampling Results, Typical Background Levels and Public Health Assessment Comparison Values for Chemicals Detected in Surface Soil at the Southside High School Property

[All values in milligrams per kilogram (mg/kg)]

Chemicals	Range of Detection	Frequency of Detection	Typical Background Level*	Comparison Values**			
				Noncancer	Basis***	Cancer	Basis***
Metals							
antimony	1.16 - 1.7	4/52	< 1 - 2	77	EPA RfD	none	none
arsenic	3.2 - 7.0	52/52	2 - 20	58	EPA RfD	1.65	EPA CPF
barium	36.8 - 144	52/52	200 - 400	14,000	EPA RfD	none	none
beryllium	0.59 - 0.69	5/52	< 1 - 1.5	390	EPA RfD	none	none
cadmium	0.58 - 0.91	8/52	< 0.5 - 1.5	140	NYS RfG	none	none
chromium	5.8 - 107	52/52	10 - 60	580	EPA RfD	none	none
cobalt	6.3 - 10.9	51/52	3 - 15	12,000	EPA PV	none	none
copper	6.8 - 862	52/52	2 - 40	7,700	HEAST	none	none
lead	5.1 - 78.6	52/52	10 - 300	400	NYS RfG	none	none
mercury	0.062 - 0.24	14/52	0.01- 0 1.0	58	EPA RfD	none	none
nickel	5.3 - 31.4	52/52	<5 - 25	3,900	EPA RfD	none	none
selenium	0.73 - 1.64	23/52	< 0.1 - 1	970	EPA RfD	none	none
vanadium	6.6 - 33.4	52/52	30 - 70	1,400	HEAST	none	none
zinc	25.5 - 151	52/52	20 - 200	58,000	EPA	none	none

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Table 1 (continued)

Chemicals	Range of Detection	Frequency of Detection	Typical Background Level*	Comparison Values** Noncancer	Basis***	Cancer	Basis***
Volatile Organic Chemicals							
acetone	0.0066 - 0.025	4/66	not available	19,000	EPA	none	none
carbon disulfide	0.0014	1/66	not available	19,000	EPA	none	none
chloroform	0.0013 - 0.0083	12/66	not available	1,900	EPA RfD	405	EPA CPF
freon 113	0.0014 - 0.0027	4/48	not available	58,000	EPA RfD	none	none
methylene chloride	0.0032	1/66	not available	12,000	EPA RfD	330	EPA CPF
tetrachloroethene	0.0011 - 0.082	26/66	not available	1,900	EPA RfD	47.6	EPA PV
trichloroethene	0.0016 - 0.0019	2/66	not available	1,900	EPA RfD	225	EPA PV
Semivolatile Organic Chemicals/Pesticides/Polychlorinated Biphenyls							
acenaphthylene	0.044 - 0.44	2/55	--[a]	12,000	--[b]	none	none
anthracene	0.093 - 0.37	2/55	--[a]	58,000	EPA RfD	none	none
Aroclor 1248	0.023 - 2.8	23/55	< 0.01 - 0.04[c]	3.9	--[d]	1.2	US EPA
Aroclor 1260	0.054 - 0.25	11/55	< 0.01 - 0.04[c]	3.9	--[d]	5.0	US EPA
benz(a)anthracene	0.059 - 1.1	7/55	--[e]	5,800	--[f]	2.5	--[g]
benzo(a)pyrene	0.041 - 1.4	11/55	--[e]	5,800	--[f]	0.25	NYS CPF
benzo(b)fluoranthene	0.041 - 1.1	12/55	--[e]	5,800	--[f]	2.5	--[g]
benzo(g,h,i)perylene	0.04 - 1.2	11/55	--[a]	5,800	--[f]	none	none
benzo(k)fluoranthene	0.039 - 1.1	10/55	--[e]	5,800	--[f]	25	--[g]
bis(2-ethylhexyl)phthalate	0.04 - 0.92	12/55	not available	3,900	EPA RfD	177	EPA CPF

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Table 1 (continued)

Chemicals	Range of Detection	Frequency of Detection	Typical Background Level*	Comparison Values**			
				Noncancer	Basis***	Cancer	Basis***
carbazole	0.054	1/55	not available	none	none	120	HEAST
chrysene	0.045 - 1.3	16/55	--[e]	5,800	--[f]	25	--[g]
dibenz(a,h)anthracene	0.043 - 0.36	4/55	--[e]	5,800	--[f]	0.25	--[g]
dibenzofuran	0.66	1/55	not available	770	EPA PV	none	none
di-n-butylphthalate	0.044 - 0.12	3/55	not available	19,000	EPA RfD	none	none
dieldrin	0.029	1/54	0.001 - 0.05[h]	10	EPA RfD	0.065	NYS CPF
fluoranthene	0.045 - 1.3	24/55	--[a]	7,700	EPA RfD	none	none
indeno(1,2,3-cd)pyrene	0.061 - 1.0	8/55	--[e]	5,800	--[f]	2.5	--[g]
2-methylnaphthalene	1.9	1/55	not available	3,900	--[i]	none	none
naphthalene	1.8	1/55	not available	3,900	EPA RfD	none	none
phenanthrene	0.048 - 1.4	8/55	--[a]	5,800	--[f]	none	none
pyrene	0.042 - 1.6	21/55	--[a]	5,800	EPA RfD	none	none
total PAHs (calculated)	0.042 - 12.6	25/55	1 - 13[a]	not deter.	not deter.	not deter.	not deter.
total carcinogenic PAHs (calculated)	0.046 - 7.4	16/55	1 - 3[e]	not deter.	not deter.	not deter.	not deter.

Data based upon soil samples collected by New York State Department of Environmental Conservation in May through September, 2000.

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Table 1 (continued)

* **References:**

Clarke, L., C. Hudson, G. Lacetti, W. Stone and B. Ungerman. 1985. Study of metal concentrations in soil and surface sand of seven New York counties. Albany: New York State Department of Health, Bureau of Toxic Substance Assessment. September, 1985.

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Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soil and other surficial materials of the conterminous United States. U.S. Geological Survey Professional Paper 1270. Washington DC: U.S. Government Printing Office.

** Noncancer comparison values assume a 13.2 kg child ingests 80 milligrams of soil per day, 5 days per week, 6 months per year and 40 milligrams of indoor dust with an outdoor soil source per day, 7 days per week, 12 months per year. Cancer comparison values assume an average body weight of 47.7 kg for the first 30 years of a 70 year lifetime and an average lifetime soil ingestion rate of 19.3 milligrams per day.

*** EPA CPF: United States Environmental Protection Agency Cancer Potency Factor
EPA HEAST: United States Environmental Protection Agency Health Effects Assessment Summary Tables

EPA PV: Provisional value from United States Environmental Protection Agency Superfund Technical Support Center. National Center for Environmental Assessment
EPA RfD: United States Environmental Protection Agency Reference Dose
NYS CPF: New York State Department of Health Cancer Potency Factor
NYS RfG: New York State Department of Health Risk Reference Guideline
US EPA: United States Environmental Protection Agency. 1996. PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures. National Center for Environmental Assessment. Office of Research and development. Washington, DC

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Table 1 (continued)

[a] No information available for individual PAHs. Refer to reported background level for total PAHs of 1-13 mg/kg (Edwards, 1983).

[b] Based on acenaphthene RfD.

[c] Total PCBs; Agency for Toxic Substances and Disease Registry (ATSDR), 1997.

[d] Based on Aroclor 1254 RfD.

[e] No information available for individual PAHs. Refer to reported background level for total carcinogenic PAHs of 1-3 mg/kg (Menzie, et al., 1992).

[f] The oral reference dose for pyrene may be used as a possible surrogate for polycyclic aromatic hydrocarbons (PAHs) that do not have a chemical specific reference dose.

[g] The relative potency factors applied to carcinogenic PAHs other than benzo(a)pyrene are: 0.1 for benz(a)anthracene, 0.1 for benzo(b)fluoranthene, 0.01 for benzo(k)fluoranthene, 0.01 for chrysene, 1.0 for dibenz(a,h)anthracene and 0.1 for indeno(1,2,3-cd)pyrene.

[h] Agency for Toxic Substances and Disease Registry. 1993. Toxicological Profile for Aldrin/Dieldrin. US Department of Health and Human Services. Public Health Service. Atlanta, Georgia.

[i] Based on naphthalene RfD.

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Table 2
Sampling Results for Chemicals Detected in Shallow and Deep Subsurface Soil at the Southside High School Property
[All values in milligrams per kilogram (mg/kg)]

Chemicals	Shallow Subsurface (< 4 ft)		Deep Subsurface (> 4 ft)	
	Range of Detection	Frequency of Detection	Range of Detection	Frequency of Detection
Metals				
antimony	1.4 - 4.5	6/60	1.2	1/23
arsenic	2.4 - 56.2	60/60	2.3 - 13	23/23
barium	26.8 - 486	60/60	21.6 - 611	23/23
beryllium	0.57 - 1.12	9/60	0.95	1/23
cadmium	0.61 - 1.1	3/60	not detected	
chromium	6.2 - 134	60/60	4.6 - 23.5	23/23
cobalt	5.5 - 19	52/60	5.5 - 15.8	18/23
copper	8.2 - 4080	60/60	12.4 - 243	23/23
lead	5.5 - 3940	60/60	3.3 - 286	23/23
mercury	0.06 - 2.7	31/60	0.11 - 0.74	4/23
nickel	7.3 - 761	60/60	8.4 - 255	23/23
selenium	0.6 - 3.43	36/60	0.67 - 1.6	8/23
thallium	1.2	1/60	not detected	
tin	137	1/60	not detected	
vanadium	10.1 - 51.8	60/60	7.8 - 26.4	23/23
zinc	8.5 - 844	60/60	27.3 - 205	23/23

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Table 2 (continued)	Shallow Subsurface (< 4 ft)		Deep Subsurface (> 4 ft)	
Chemicals	Range of Detection	Frequency of Detection	Range of Detection	Frequency of Detection
Volatile Organic Chemicals				
acetone	0.0064 - 0.17	6/63	0.0064 - 0.83	7/23
benzene	0.0013	1/63	not detected	
2-butanone	0.035	1/63	0.0018 - 0.19	6/23
carbon disulfide	0.0016 - 0.0036	5/63	0.0012 - 0.0034	3/23
chloroform	0.0013 - 0.0072	13/63	0.0012 - 0.006	7/23
1,2-dichloroethane	0.014	1/63	not detected	
cis-1,2-dichloroethene	0.0032 - 0.02	2/63	not detected	
2-hexanone	not detected		0.0038	1/23
methylene chloride	0.0011 - 0.0043	8/63	0.0012 - 0.0014	2/23
4-methyl-2-pentanone	not detected		0.0025	1/23
styrene	not detected		0.0013	1/23
tetrachloroethene	0.0016 - 0.075	26/63	0.0015 - 0.15	12/23
toluene	0.0014 - 0.01	3/63	not detected	
1,1,1-trichloroethane	0.0017 - 0.011	2/63	not detected	
1,1,2-trichloroethane	not detected		0.0037	1/23
trichloroethene	0.0014 - 110	24/63	0.0014 - 11	5/23
m+*p*-xylene	0.0013 - 0.0015	3/63	0.0096	1/23
o-xylene	0.0014	1/63	not detected	
total cyanide	1.78 - 13	3/58	1.35 - 47.5	7/23

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Table 2 (continued)	Shallow Subsurface (< 4 ft)		Deep Subsurface (> 4 ft)	
Chemicals	Range of Detection	Frequency of Detection	Range of Detection	Frequency of Detection
Semivolatile Organic Chemicals/Pesticides/Polychlorinated Biphenyls				
acenaphthene	0.044 - 5.3	9/63	not detected	
acenaphthylene	0.039 - 26	14/63	0.06 - 0.22	2/23
anthracene	0.042 - 69	17/63	0.06 - 0.26	4/23
Aroclor 1248	0.015 - 160	31/62	0.046 - 74	6/23
Aroclor 1260	0.053 - 4.2	23/62	0.083 - 6.1	4/23
benz(a)anthracene	0.039 - 68	33/63	0.041 - 0.96	6/23
benzo(a)pyrene	0.051 - 57	31/63	0.042 - 1.3	5/23
benzo(b)fluoranthene	0.045 - 43	30/63	0.044 - 1.9	5/23
benzo(g,h,i)perylene	0.041 - 29	28/63	0.1 - 0.96	4/23
benzo(k)fluoranthene	0.039 - 40	29/63	0.043 - 1.2	5/23
beta-BHC	0.0068	1/60	not detected	
bis(2-ethylhexyl)phthalate	0.04 - 0.91	11/63	0.048 - 0.59	6/23
carbazole	0.042 - 7.3	9/63	0.18	1/23
chrysene	0.043 - 62	37/63	0.052 - 1.5	7/23
dibenz(a,h)anthracene	0.053 - 9.6	16/63	0.047 - 0.36	4/23
dibenzofuran	0.053 - 23	7/63	0.062	1/23
di-n-butylphthalate	0.037 - 0.11	6/63	0.053 - 0.14	5/23
1,2-dichlorobenzene	0.73	1/63	not detected	
dieldrin	0.019	1/60	not detected	
fluoranthene	0.045 - 190	38/63	0.042 - 1.1	6/23

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Table 2 (continued)	Shallow Subsurface (< 4 ft)		Deep Subsurface (> 4 ft)	
Chemicals	Range of Detection	Frequency of Detection	Range of Detection	Frequency of Detection
fluorene	0.041 - 22	8/63	0.045	1/23
indeno(1,2,3-cd)pyrene	0.042 - 31	26/63	0.087 - 0.87	4/23
2-methylnaphthalene	0.041 - 13	13/63	0.04 - 0.14	3/23
naphthalene	0.04 - 22	15/63	0.06 - 0.089	2/23
phenanthrene	0.038 - 150	35/63	0.15 - 0.41	4/23
Pyrene	0.046 - 140	37/63	0.06 - 3.6	7/23
total PAHs (calculated)	0.043 - 963.9	40/63	0.042 - 12.63	9/23
total carcinogenic PAHs	0.043 - 310.6	37/63	0.222 - 8.09	7/23

Data based upon soil samples collected by New York State Department of Environmental Conservation in May through September, 2000.

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Appendix F
New York State Department of Health Procedure for Evaluating Potential Health Risks for Contaminants of Concern

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NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Southside High School, the New York State Department of Health assessed the risks for cancer and noncancer health effects. The NYS DOH calculated health comparison values for these health effects, for each contaminant and exposure pathway of concern.

Increased cancer risks were estimated by using site-specific information on exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by the US EPA or, in some cases, by the NYS DOH. The following qualitative ranking of cancer risk estimates, developed by the NYS DOH, was then used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low", then the excess lifetime cancer risk from that exposure is in the range of greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Excess Lifetime Cancer Risk

Risk Ratio	Qualitative Descriptor
equal to or less than one per million	very low
greater than one per million to less than one per ten thousand	low
one per ten thousand to less than one per thousand	moderate
one per thousand to less than one per ten	high
equal to or greater than one per ten	very high

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to that contaminant.

There is insufficient knowledge of cancer mechanisms to decide if there exists a level of exposure to a cancer-causing agent below which there is no risk of getting cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk.

There is general consensus among the scientific and regulatory communities on what level of estimated excess cancer risk is acceptable. An increased lifetime cancer risk of one in one million or less is generally not considered a significant public health concern. Health comparison values for cancer health effects are set at this level of risk. Cancer risks greater than one per ten thousand usually trigger actions to lower exposures.

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For noncarcinogenic health risks, the contaminant intake was estimated using exposure assumptions for the site conditions. This dose was then compared to a risk reference dose (estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects) developed by the US EPA, ATSDR and/or NYS DOH. The resulting ratio was then compared to the following qualitative scale of health risk:

Qualitative Descriptions for
Noncarcinogenic Health Risks

Ratio of Estimated Contaminant Intake to Risk Reference Dose	Qualitative Descriptor
equal to or less than the risk reference dose	minimal
greater than one to five times the risk reference dose	low
greater than five to ten times the risk reference dose	moderate
greater than ten times the risk reference dose	high

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Noncarcinogenic effects unlike carcinogenic effects are believed to have a threshold, that is, a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed-effect-level (NOEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOEL is then divided by an uncertainty factor to yield the risk reference dose. The uncertainty factor is a number which reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive subpopulations (for example, children or the elderly), extrapolation from animals to humans, and the incompleteness of available data. Thus, the risk reference dose is not expected to cause health effects because it is selected to be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for noncancer health effects to occur in an individual is expressed as a ratio of estimated contaminant intake to the risk reference dose. A ratio equal to or less than one is generally not considered a significant public health concern. Health comparison values for noncancer health effects are set at this level. If exposure to the contaminant exceeds the risk reference dose, there may be concern for potential noncancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the risk reference dose, the greater the level of concern. This level of concern depends upon an evaluation of a number of factors such as the actual potential for exposure, background exposure, and the strength of the toxicologic data.

Appendix G
Summary of Public Comments and Responses

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Summary of Public Comments and Responses
Southside High School Health Consultation

This summary was prepared to address comments and questions on the public comment draft of the Southside High School Health Consultation. The public was invited to review the draft during the public comment period which ran from February 23, 2001 to April 16, 2001. We received two sets of written comments. Similar comments may be consolidated or grouped together and some statements reworded to clarify the comment. If you have any questions about this summary, you may contact Mr. Mark VanValkenburg of the New York State Department of Health (NYS DOH) at the toll-free number: 1-800-458-1158.

Comment 1: This health consultation cannot be fully evaluated without a comprehensive report on the New York State Department of Environmental Conservation (NYS DEC) investigation. A comprehensive report should include a data validation report, boring logs and field notes, operational history of the site, discussion of the demolition of the facility, preparation of the site and construction of the school and summary of environmental conditions at adjacent sites.

Response 1: NYS DOH staff worked closely with the NYS DEC to develop a sampling plan for the property and were present during much of the sampling. NYS DEC contracted-out analyses of the samples to a NYS DOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. The NYS DEC provided the analytical results for the samples to NYS DOH. These data were evaluated and provided in Appendix G of the draft document (see Appendix D in this final document). NYS DEC staff reviewed the quality of the data and determined that they were properly validated. We believe the amount and quality of the data presented in the health consultation are sufficient to evaluate the public health implications of environmental contamination. The NYS DEC finalized a report in September of 2001 on the investigations that were used in preparing this health consultation.

Comment 2: This health consultation should look at off-site contamination at the adjacent American LaFrance site and Miller Pond.

Response 2: Health consultations focus on a specific health concern related to environmental issues at a specific location. This health consultation evaluated the public health implications of chemicals in surface and subsurface soils at the Southside High School. The adjacent American LaFrance site is fenced and has been remediated by the current owner. Students, staff and the general community are not currently being exposed to contaminants at the former American LaFrance site from their activities at the Southside High School. Although exposure to chemicals from the American LaFrance property may have occurred in the past, exposures through trespassing by Southside students, staff or the general community would likely have been limited. Assessing these potential past exposures is beyond the scope of this health consultation.

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Comment 3: A site model/exposure route model should be provided. These types of models are necessary to understand the relationships between the data for the different media, the levels of contaminants in a particular media and specific exposure pathways. Contaminant sources, exposure pathways, and potential receptors must be included in this model.

Response 3: Health consultations are intended to identify some or all, depending on the objectives of the health consultation, potential and completed exposure pathways associated with past, present and future uses of the subject property. An exposure pathway is the process by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: (1) a contaminant source; (2) environmental media and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population.

The source of contamination is the source of contaminant release to the environment (any waste disposal area or point of discharge). If the original source is unknown, the contaminant source is considered to be the environmental media (soil, air, biota, water) which are contaminated at the point of exposure. Environmental media and transport mechanisms carry contaminants from the source to points where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (i.e., ingestion, inhalation, dermal absorption). The receptor population is the persons who are exposed or may be exposed to contaminants at a point of exposure.

Two types of exposure pathways are evaluated in the health consultation. A completed exposure pathway exists when the criteria for all five elements of an exposure pathway are documented. A potential exposure pathway exists when the criterion for any one of the five elements comprising a exposure pathway is not met. An exposure pathway is considered to be eliminated when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future.

For Southside High School, the source of the contamination is the subsurface soil and groundwater contaminated by industrial disposal practices and spills at the site before the school was built. The environmental media affected are the shallow subsurface and the deeper subsurface soil and groundwater. Contamination can be transported from the soil by vapor movement in the air space in the soil (often called the soil gas) and human activities (e.g,. excavation, hauling). Typically, contamination moves with the groundwater in the direction of groundwater flow, but often at a rate slower than groundwater flow (depending on the chemical). Although groundwater is not used at the school, it can also be a source of contamination in soil gas. A summary of the exposure pathways is shown on the following table:

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Contaminated media	Transport mechanism	Exposure point	Route of exposure	Potential receptor population
Shallow subsurface soil	human activity	soil exposed by human activity *	accidental ingestion **	students, faculty, and neighbors using school grounds ***
Deeper subsurface soil	soil gas	indoor air potentially affected by soil gas	inhalation	students and faculty
Deeper subsurface soil	human activity	soil exposed by human activity	accidental ingestion**	students, faculty and neighbors using school grounds ***
Groundwater	soil gas	indoor air affected by soil gas	inhalation	students and faculty

*e.g. construction or work on buried utilities
* Primary exposure through accidental ingestion, minor contribution through inhalation and dermal contact.
** In addition, maintenance workers or contractors involved in ground intrusive work may be exposed to contaminants.

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Comment 4: Provide a more detailed explanation how the ATSDR definition of "no apparent public health hazard" category was concluded for the Southside High School.

Response 4: The Health Consultation states in the *Conclusions* that: ". . . the Southside High School poses no apparent public health hazard . . . because average levels of contaminants in surface soils do not exceed public health comparison values." Appendix H contains ATSDR's definitions of the public health hazard categories. Category D is "No Apparent Public Health Hazard" and the definition for this category is given as "This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past and/or may occur in the future, but the exposure is not expected to cause any adverse health effects". At Southside High School, the average concentrations of contaminants in surface soil are below health comparison values. Health comparison values are the amount of a chemical in a media, such as soil, that, upon exposure, represents a very low risk for cancer health effects or a minimal risk for noncancer health effects (see response number 18 for more information on health comparison values). Therefore, exposures to contaminants in soil at the school are not

expected to cause adverse health effects. Although contaminants were present at concentrations above the respective health comparison values in a few samples, the average concentration of surface soil is more likely to reflect the long-term exposure of people using the high school than the highest concentrations. Also, short-term exposure to the highest levels of any of the contaminants found in surface soil at the Southside High School is very unlikely to result in acute adverse health effects.

Comment 5: What is the basis for the "typical background surface soil".

Response 5: References for the typical background concentrations are in the footnotes of Table 1. These background concentration ranges were obtained through a review of the documents cited in these footnotes, not through direct analysis of soil samples in the area near the high school.

Comment 6: The 'ranges of detection' and "frequency of detection" do not provide sufficient information.

Response 6: For a more complete presentation of the data, see Appendix D which shows all data for all of the samples collected during the NYS DEC investigation in 2000.

Comment 7: What is considered surface soil?

Response 7: For this investigation, we defined surface soil as the soil that is below any vegetative cover (e.g., grass) to a depth of three inches.

Comment 8: Exposed soil areas may be pathways for exposure. The consultation should discuss, quantify and analyze the exposed surface areas.

Response 8: Exposed soil is areas where no grass or other material covers the soil. People can be exposed to soil where there is no cover. To examine potential exposures to surface soils, we looked at locations where the highest exposures were likely, such as exposed soil or where we anticipated frequent student activity. The only places that were not paved or covered with grass, and, therefore, exposed, were well-worn foot paths near and around the athletic fields and other high traffic areas, and two areas in the rear of the school building that were used for volleyball in the past. Samples representing these areas were collected and the data from the exposed soil were included in the surface soil data.

The surface soil data were examined as a group to determine the average and the range of the entire set. The data were also examined individually to evaluate any unusual contamination. All surface soil samples were evaluated for human exposures as if the soil was exposed and available for contact.

We concluded that average levels of contaminants in surface soils do not exceed public health comparison values. Although a few samples exceed health comparison values, people are

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unlikely to be exposed frequently to soil at these locations. Nevertheless, because average levels of total PCBs exceed typical background levels and average levels of carcinogenic PAHs are somewhat below the upper range of background levels, exposures to these contaminants at Southside High School may be greater than those typically experienced from soil.

Comment 9: The health consultation indicates that cinders were found in most boreholes in the surface soil zone. What is the significance of cinders in surface soil?

Response 9: Cinders were not found in surface soil (defined as 0 to 3 inches below surface) but rather in a layer, varying in thickness from 3" to 6", about one to three feet below the surface. The cinders are a layer of material that is not natural soil and indicate the boundary between imported top soil and existing material influenced by previous land use.

Comment 10: Why was the PCB data averaged when the highest levels were not included in August 2000 draft of the health consultation.

Response 10: The two samples that contained Aroclor 1248 (a PCB) at levels in excess of the health comparison value were collected in September 2000, after the first draft of the health consultation was released. Aroclor 1248 was not discussed in the August 2000 draft health consultation because the samples collected previously did not contain PCBs above health comparison values. Contaminants that are below health comparison values are not evaluated further in health consultations. The two samples that were collected in September 2000 exceeded public health comparison values for PCBs; therefore, we discussed them further in the February 2001 revised health consultation. As part of this discussion, we calculated an average of PCBs, which is likely to reflect the long-term exposure of people using the high school.

Comment 11: Disposal of hexavalent and trivalent chromium on the site has been documented. The known impacts of chromium contamination and related health risks should be discussed.

Response 11: We are unaware of any "disposal" of hexavalent or trivalent chromium on the school property. The health consultation states that chromium is present above "typical" background concentrations. None of the levels found in surface soil exceed the health comparison value for chromium, which assumes that all the chromium found in the soil is in the more toxic hexavalent form. Since none of the levels of chromium are above the health comparison value, no health effects are expected.

Comment 12: Inhalation of chromium contaminated dust was not considered.

Response 12: Chromium was detected above its typical background range (10 to 60 milligrams per kilogram (mg/kg)) in 10 of 52 surface soil samples. The highest concentration of chromium was 107 mg/kg. The areas where chromium was detected in surface soil above typical background levels are heavily vegetated (the multiple use athletic area, a baseball outfield); therefore, exposures to significant amounts of chromium contaminated dust are unlikely.

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Although chromium was reported as total chromium in the soil data, the levels were evaluated as if all of the detected chromium was in the more toxic hexavalent form. None of the levels of chromium exceed their public health assessment comparison values. Incidental ingestion is the primary exposure route considered for soil when a health comparison value is calculated, and constitutes the bulk of the contaminant dose. The contribution of inhaled dust to the total contaminant dose is minimal (less than one percent of the contaminant dose from ingestion).

Comment 13: Locations of discolored soil should be indicated.

Response 13: Since discolored soil was only encountered in subsurface soil, exposure to contaminants in discolored soil is unlikely. Therefore, we did not note discolored soil locations on maps included in this health consultation. The school district may wish to consider mapping these locations during the development of its soil management plan.

Comment 14: One subsurface sample contained lead at a concentration of 3490 milligrams per kilogram. Based on the experience of the person who commented, this sample would fail Toxicity Characteristic Leaching Procedure (TCLP), would be considered hazardous waste by the NYS DEC and would need to be remediated.

Response 14: This sample was not analyzed for TCLP; therefore, we do not know if it would have failed TCLP. Other samples collected nearby did not contain high concentrations of lead. NYS DEC would not necessarily consider one sample failing TCLP to be an indication of hazardous waste and would not necessarily require remediation given the lower levels of lead detected in nearby soil samples.

Since this is a subsurface sample, exposure is unlikely except for disturbance caused by maintenance or construction work. Therefore, ATSDR and NYS DOH recommend in this health consultation that the school district or other appropriate governmental unit develop a written soil management plan to minimize potential public exposures to contaminated subsurface materials.

Comment 15: Why doesn't NYS DOH recommend removing hot-spots?

Response 15: Sample results from surface soil do not indicate a need to remove any soil. Sample results from subsurface soil indicated contaminant levels high enough for us to recommend that the school develop a soil management plan to help avoid bringing contaminated subsurface soil to the surface and leaving it on the surface where exposures are more likely. A soil management plan should be an integral part of school property maintenance.

Comment 16: Indoor air at the school should be periodically monitored for VOCs.

Response 16: The NYS DOH sampled soil gas and indoor air several times; the results did not indicate a need for further indoor air sampling. However, as indicated in the indoor air

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investigation report, either natural or mechanically induced pressure gradients can cause soil gas to be drawn into a building. Measuring pressure differentials can indicate the magnitude and direction of a pressure gradient between the soil gas and the building. Ventilation systems, bathroom or other exhausts, wind, temperature changes and openings in the building shell (such as doors and windows) can affect pressure differentials in a building.

The ATSDR and NYS DOH recommend that the school district should review the recommendations in the indoor air investigation report to determine if additional actions may be warranted. For example, the report recommends that the school district consider instituting an indoor air quality action plan consistent with that recommended by the US EPA. The Tools for Schools Action Kit provides information and guidance for developing and implementing a plan to prevent indoor air quality problems and resolving such problems if they arise. The plan should address the possibility of contaminated soil gas being drawn into the building; one possible way of evaluating this is to include routine (e.g., seasonal) monitoring of pressure differentials between the soil gas and building interior.

Comment 17: The health consultation does not use an exposure scenario for student athletes to evaluate risks. These are the people who are likely to use the athletic fields. Instead a residential scenario is used. Why was a residential exposure scenario used to evaluate risks for the school property?

Response 17: We assumed that potential exposures at the high school were similar to a residential scenario. The residential exposure scenario was chosen because on average, the long-term intake of soil under this scenario is expected to be greater than for a high school scenario. This is primarily related to the approximate 4-fold difference in body weight between toddlers (considered in the residential scenario) and high school students, which results in a greater, long-term soil dose (expressed in milligrams of soil per kilogram of body weight) in the residential scenario and should compensate for short-term increases in soil ingestion rates for high school students that might occur through athletic activities. The potential exposures to contaminants in soil are well below exposure levels known to cause health effects for the contaminants detected in surface soil at the Southside High School. If additional information on this question would be useful, please call the New York State Department of Health at the toll-free number 1-800-458-1158.

Comment 18: The document does not provide an adequate explanation of the comparison values. NYS DOH should include an explanation for the comparison values, how they are derived, justification for the exposure assumptions, and an explanation for how the comparison values are used to evaluate the soil levels at the Southside High School.

Response 18: The exposure assumptions for the comparison values were included in the footnotes of Table 1 of the health consultation.

The noncancer comparison values assume a 13.2 kilogram child (i.e., a 29-pound toddler) ingests 80 milligrams of soil per day, 5 days per week, 6 months per year and 40 milligrams of

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soil-derived indoor dust per day, 7 days per week, 12 months per year. The body weight is taken from the US EPA Exposure Factors Handbook (US EPA, 1999). The exposure duration and frequency are selected to reflect a reasonably conservative, yet typical, estimate of these parameters for children at a residential property in New York State. The soil ingestion rates for children are based on studies by Calabrese et al. (1989) and Davis et al. (1990).

The cancer comparison values assume a time-weighted average body weight of 47.7 kilograms based on nine different stages up to age 30. The body weights for each stage were taken from the US EPA Exposure Factors Handbook (1999). The average soil ingestion rate over the period of exposure of 19.3 milligrams per day is also a weighted average for nine life stages. Children through age five are assumed to be exposed as described for the noncancer comparison values. For ages six through adulthood, the soil ingestion rate is 82 mg/day (based on Hawley (1985) and Calabrese et al. (1990)) for two days per week, for five months per year.

For both the noncancer and cancer evaluations, we assumed that one-half of the soil and dust ingested indoors originates from an outdoor source (Allott et al., 1992; Chaney et al., 1986). Additional details are presented below.

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Method for Calculating Health Comparison Values and Potential Health Risks

Noncancer Soil Comparison Values

A noncancer soil comparison value is defined as the concentration of a chemical in soil (expressed in milligrams of contaminant per kilogram of soil (mg/kg_{soil}) that provides a contaminant intake equivalent to the chemical's reference dose. Reference doses are derived by the United States Environmental Protection Agency (US EPA) and other health organizations. The reference dose (expressed in milligrams of contaminant per kilogram body weight per day (mg/kg/day)) is an estimate of a daily intake of a chemical that is likely to be without an appreciable risk of noncancer health effects. Reference doses are usually derived by dividing no-observed-effect-levels (NOELs) or lowest-observed-effect levels (LOELs) by uncertainty or "safety" factors. A NOEL is an exposure level (dose) for a specific chemical in an animal or human study at which there are no statistically or biologically significant increases in the frequency or severity of health effects between an exposed group and an unexposed group. A LOEL is the lowest exposure level (dose) at which a statistically or biologically significant effect is observed in an exposed group compared to an unexposed group. Uncertainty factors, which typically are in multiples of 10 and range from 100 to 1000 are used to account for

- Variations in sensitivity among the members of the human population
- The uncertainty in extrapolating animal data to humans

- The uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure to lifetime exposure
- The uncertainty using a LOEL rather than a NOEL to derive the reference dose
- The uncertainty associated with the lack of complete toxicological information on the chemical

The actual uncertainty factors used depends on the quality and quantity of the toxicological information for the specific chemical. Since the comparison values are derived from reference doses, they are typically set at a level corresponding to exposures 100 to 1000 times lower than the NOEL or LOEL.

We calculate noncancer soil comparison values from reference doses using specific exposure assumptions. For residential exposure, we assumed that a 13.2 kg child ingests 80 mg of soil per day, five days per week for six months of the year, and 40 mg per day of indoor dust with an outdoor soil source everyday.

A time-weighted soil/dust ingestion rate is calculated as follows:

$$80\frac{mg_{soil}}{day} \times \frac{5\frac{days}{week}}{7\frac{days}{week}} \times \frac{180\frac{days}{year}}{365\frac{days}{year}} + 40\frac{mg_{soil}}{day} \times \frac{7\frac{days}{week}}{7\frac{days}{week}} \times \frac{365\frac{days}{year}}{365\frac{days}{year}} = 68.2\frac{mg_{soil}}{day}$$

The comparison value for dieldrin, for example, which has a reference dose of 0.00005 mg/kg/day, may be calculated as follows:

$$0.00005\frac{mg}{kg/day} \times 13.2kg \times \frac{day}{68.2mg_{soil}} \times 10^6\frac{mg_{soil}}{kg_{soil}} = 10\frac{mg}{kg_{soil}}$$

In summary, a noncancer soil comparison value is equivalent to an expression of the reference dose as a soil concentration that takes into account specific exposure conditions and assumptions. Chemicals having a high degree of noncancer chemical toxicity (as expressed by the reference dose) have relatively low comparison values compared to chemicals with a lesser degree of noncancer toxicity.

Cancer Soil Comparison Values

A cancer comparison value is the concentration of a chemical that has caused cancer in animals or humans in soil that provides a contaminant intake equivalent to the dose (intake) of the

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chemical that is associated with an increased lifetime cancer risk of one-in-one million. This dose is usually estimated from studies of animals exposed to carcinogenic chemicals. Less frequently, the one-in-one-million dose is estimated from studies of humans exposed to the chemical. Estimates of this dose for various carcinogenic chemicals are made by the US EPA and health organizations.

The calculation of cancer comparison values is similar to that of noncancer comparison values, except that the one-in-one-million risk dose is used instead of the reference dose, and the exposure parameters are adjusted to reflect exposure over the first 30 years of a person's life. For the residential exposure scenario, we assumed that a person's average body weight for the first 30 years of a 70-year lifetime is 47.7 kg, and that he/she ingests an average of 19.3 mg per day. The cancer comparison value for Aroclor 1248, for example, is calculated from its one-in-one-million risk dose (0.0000005 mg/kg/day) as follows:

$$5\times10^{-7}\frac{mg}{kg\text{-}day} \times 47.7kg \times \frac{day}{19.3mg_{soil}} \times 10^{6}\frac{mg_{soil}}{kg_{soil}} = 1.2\frac{mg}{kg_{soil}}$$

In summary, a cancer soil comparison value is equivalent to an expression of the one-in-one-million risk dose as a soil concentration that takes into account specific exposure conditions and assumptions. Chemicals having a high degree of carcinogenic potency (as expressed by the one-in-one million risk dose) have relatively low comparison values compared to chemicals with a low degree of carcinogenic potency.

How Soil Comparison Values are Used

Soil comparison values are not remedial goals ("clean-up levels"), nor are they meant to represent a bright line between soil concentrations that cause health effects and those that do not. Rather, they are used primarily as screening tools to evaluate soil sampling results. Since the comparison values express the reference dose or the one-in-one million dose as a soil concentration, they can be directly compared with soil sampling results. Soil sampling results less than noncancer or cancer comparison values are generally not considered a health concern. Sampling results that exceed a noncancer or cancer comparison value are not necessarily a health concern, but indicate a need for further evaluation. The degree of concern (i.e., whether or not actions to reduce exposures should be taken) when a noncancer or cancer comparison value is exceeded depends on an evaluation of several factors, including (among others) the margins of exposure, actual potential for exposure, levels of the chemical we would typically expect to find in the environment, other sources of exposure to the chemical, and the strength and quality of the available toxicological information on the chemical.

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Evaluating Noncancer Risks with Soil Comparison Values

To evaluate the noncancer risks, a ratio of the soil sampling result to the comparison value is calculated for each chemical. This process is equivalent to calculating a hazard index, or the ratio of the estimated contaminant dose to the reference dose. The value of the hazard index is then given a qualitative descriptor for noncancer risk, as described in Appendix F of the health consultation.

For example, if dieldrin is detected in surface soil at a concentration of 20 mg/kg (and this result is likely to reflect the potential exposure), the hazard index is calculated as follows:

$$Hazard\ Index = \frac{Soil\ Concentration}{Comparison\ Value} = \frac{20\frac{mg}{kg}}{10\frac{mg}{kg}} = 2$$

Based on the categories in Appendix F of the health consultation, the qualitative descriptor for noncancer risk would be low.

When the comparison value is exceeded (as in this example), the estimated exposure is further evaluated by calculating the margin of exposure. The margin of exposure is the difference between the estimated exposure (contaminant dose) for a chemical and the exposure level known to cause health effects (e.g., the LOEL). The margin of exposure based on the LOEL may be calculated by the following equation:

$$Margin\ of\ Exposure = \frac{LOEL}{Estimated\ Exposure}$$

A margin of exposure can also be calculated based on the NOEL. This margin of exposure is the difference between the estimated exposure (contaminant dose) for a chemical and the exposure level at which no health effects are known to occur (e.g., the NOEL):

$$Margin\ of\ Exposure = \frac{NOEL}{Estimated\ Exposure}$$

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A large margin of exposure means that the estimated exposure to the chemical (e.g., from soil at a hazardous waste site) is much lower than the NOEL or LOEL. A small margin of exposure means that the estimated exposure is similar to the NOEL or LOEL.

In this example with dieldrin, the measured soil concentration is twice the comparison value, which means that the estimated exposure is twice that of the reference dose. Although the reference dose and comparison value are exceeded, the margin of exposure based on the LOEL is 500:

$$\textit{Margin of Exposure} = \frac{\textit{LOEL}}{\textit{Estimated Exposure}} = \frac{0.05\frac{mg}{kg\text{-}day}}{0.0001\frac{mg}{kg\text{-}day}} = 500$$

This margin of exposure based on the LOEL means that the estimated exposure to dieldrin at a soil level of 20 mg/kg_{soil} is 500 times smaller than the lowest dose of dieldrin known to cause health effects in animals or humans. This also assumes that the exposure takes place according to the assumptions used to derive the comparison value. Thus, we would not expect the exposure to result in adverse noncancer health effects.

Estimating Cancer Risks with Soil Comparison Values

For carcinogenic contaminants, an estimate of the increased lifetime cancer risk is made using the chemical's cancer comparison value. The increase in cancer risk is then given a qualitative descriptor as described in Appendix F of the health consultation. In our example, if Aroclor 1248 is detected in surface soil at a concentration of 10 mg/kg, and this is judged to be representative of long-term exposure, the estimated increased lifetime cancer risk is calculated as follows:

$$\textit{Estimated Cancer Risk} = \frac{\textit{Soil Concentration}}{\textit{Comparison Value}} \times 10^{-6} = \frac{10\frac{mg}{kg}}{1.2\frac{mg}{kg}} \times 10^{-6} = 8 \times 10^{-6}$$

An estimated lifetime increased risk of 8×10^{-6} is equivalent to a risk (or probability) of eight-in-one million, and based on the categories in Appendix F of the health consultation, the qualitative descriptor for this estimated cancer risk would be low.

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Sampling results that exceed a cancer comparison value are also not necessarily a health concern, but indicate a need for further evaluation because the estimated exposure may result in an increased lifetime cancer risk greater than one-in-one million. Cancer risks of one-in-one million or less usually are not considered a public health concern, while cancer risks greater than one-in-ten thousand usually trigger actions to reduce exposures.

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Comment 19: Soil comparison values for volatile organic chemicals based on soil ingestion alone are not appropriate because they do not account for inhalation exposure.

Response 19: The comment is correct in stating that the comparison values take into account exposure by the soil ingestion pathway and do not take into account inhalation exposure. We use the comparison values as a means to evaluate contaminants in soil and generally soil ingestion will lead to a larger dose than inhalation. We agree that other exposure routes, such as inhalation, should also be evaluated if they are likely to contribute significantly to the potential health risks. There are two ways people could potentially be exposed to soil contaminants by inhalation. One is inhalation of soil particulates that have contaminants bound to them. The other is inhalation of volatile chemicals that are released from the soil matrix into the air.

There is limited chemical-specific information on the relative contribution of the inhalation of suspended soil particulates to the total contaminant dose from soil. However, the available estimates indicate that the soil ingestion pathway dominates over the pathway for inhalation of particulates. For example, an estimate of the contaminant dose from inhalation of suspended particulates can be made assuming that at a soil contaminant concentration of 1 milligrams per kilogram of soil (mg/kg),

- The concentration of particulate matter in air is equal to the current annual PM_{10} (particulate matter less than 10 micrometers in diameter) standard (50 micrograms per cubic meter (mcg/m^3)) and this concentration is in the breathing zone (the annual average PM_{10} concentrations in Elmira ranged from 15 to 25 mcg/m^3 from 1990 to 1996 (NYS DEC, 2003).
- A 13.2 kg child (about 29 pounds) inhales 10 cubic meters of air per day.
- One half of the suspended particulate matter is from soil and 75% of this is retained in the lungs (Hawley, 1985).
- The retained fraction is completely absorbed (Hawley, 1985).

The contaminant dose from inhalation of suspended particulates estimated in this manner is about 800 times smaller than the contaminant dose from ingestion at the same soil concentration. Thus, the contribution of inhaled suspended soil particulates to the total contaminant dose would be minimal.

The relative contribution for the contaminant dose from direct inhalation of vapors released from soil can be estimated using a mathematical model. This model estimates an air concentration which is converted to a contaminant dose using several exposure assumptions. We can estimate the contaminant concentration in the air in two different ways (US EPA, 1992). One way is by assuming tetrachloroethene (as an example) is present in soil gas (the air spaces in the soil) near the ground surface at 70 mcg/m^3 (the highest sub-slab soil gas level found on the school property during the indoor air monitoring study), and the gas is emitted into the air above the ground. Another way is to assume that tetrachloroethene is uniformly present in the soil itself at 0.082 mg/kg (the highest detected level of this volatile organic chemical at the school property), and that the chemical is transferred to the soil gas and emitted into the air above the ground. For each estimate, we also assumed that:

- A 13.2 kg (29 pounds) child plays in an area of 400 square feet (roughly the area of a baseball pitcher's mound).
- The contaminant is released from the soil into a "box of air" above the play area. Air passes through this box at an average wind speed of 11 miles per hour.
- The child plays in the area of contaminated soil at a moderate activity level for three hours per day (US EPA, 1999), five days per week, six months per year.

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- The child's inhalation rate during moderate activity is 1.2 cubic meters/hour (US EPA, 1999).

The contaminant dose from direct inhalation estimated using these methods is about six to 50 times smaller than the contaminant dose estimated from soil ingestion at the same soil concentration (0.082 mg/kg).[1] Thus, the contribution of directly inhaled volatile soil contaminants to the total contaminant dose is estimated to be small. Regardless of the route of exposure, all of the estimated exposures for the volatile organic contaminants found in surface soil at the Southside High School are well below levels associated with adverse health effects.

Exposure to volatile contaminants in the subsurface soil, via soil gas infiltration into the school, was evaluated by the Department's indoor air study. The indoor and ambient air testing results did not show a problem with chemical contamination. Most compounds were either not detected or were present at low levels. Several compounds were present at concentrations slightly higher than typical background, but their presence is not unusual and exposure at the reported levels is not expected to be a health concern.

Footnote:

[1] The model used to estimate the contaminant level in air that is available for direct inhalation has limitations. For example, the estimate of the contaminant level in air due to volatilization from the soil assumes that the contaminant concentration is uniform throughout the play area. Based on the available data, contaminant levels in soil vary throughout the site. This approach also considers only volatilization from soil and not from groundwater, however no tetrachloroethene was detected in the groundwater at the Southside High School property. The model where we estimated contaminant levels in air from soil gas measurements would account for both volatilazation from soil and groundwater. Both methods assume a constant source of contamination available for volatilization to a small, fixed volume of air, and both methods are likely to over-estimate the contaminant dose by inhalation of volatile organic compounds.

Comment 20: The source of the oral cancer potency factor for benzo(a)pyrene is not referenced.

Response 20: The benzo(a)pyrene cancer potency factor, which serves at the basis for the cancer comparison value, was derived by the New York State Department of Health (NYS DOH). It is based on the incidence of forestomach tumors in male rats in a study by Brune et al. (1981) and was derived using methods consistent with the US EPA's guidance on cancer risk assessment (US EPA (1996)). The value (10 $(mg/kg/day)^{-1}$) is higher than the current potency factor listed by the US EPA on the Integrated Risk Information System (US EPA (2001)) by a factor of about 1.4. Use of the NYS DOH cancer potency factor results in comparison values 25 percent lower than those derived from the current US EPA value. Cancer risk estimates using the NYS DOH potency factor are about 1.4 times higher than those estimated using the current US EPA value. For additional information on the derivation of the NYS DOH cancer potency factor, please contact Dr. Thomas Johnson of the NYS DOH at 1-800-458-1158.

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Comment 21: The document uses comparison values to evaluate the health risks rather than TAGM 4046 values. Why aren't the TAGM values used?

Response 21: The TAGM 4046 values refer to recommended soil clean-up objectives in the NYS DEC Technical and Administrative Guidance Memorandum 4046 (HRA-94-4046, 1/24/94 (Revised)). This guidance document was developed to assist NYS DEC staff in carrying out regulatory programs with respect to inactive hazardous waste sites. The recommended soil clean-up objectives in TAGM 4046 were not intended to be final and universal remedial goals, but, according to the guidance memorandum, "should be utilized in the development of final cleanup levels through the feasibility study process."

The basis for the recommended soil clean-up objectives in TAGM 4046 is not the same for every contaminant, and do not, in all cases, estimate human health risks from ingesting contaminated soil. As such, they were not used in the health consultation. For most metals, the recommended soil clean-up objectives are presented as typical background levels for the contaminant.

For organic chemicals the recommended soil clean-up objective (TAGM 4046) is the lowest value of several options, including values based on protection of groundwater quality, cancer health effects, noncancer health effects, background levels and detection limits. For the majority of the organic contaminants (roughly two-thirds) the recommended soil clean-up objectives are based on protection of groundwater quality. Most of the remaining recommended soil clean-up objectives for organic contaminants are based on cancer health effects derived from generic exposure parameters for ingesting soil that include no site-specific information. Since the time these values were derived in 1994, several toxicity values (which provided the basis of the comparison values) have been revised and updated, and additional studies on the soil ingestion patterns of adults and children have become available. Information from these studies, as well as site-specific exposure information (e.g., exposure for six months of the year to account for frozen soil and snow cover) were incorporated into the comparison values used in the health consultation. We used the most recently available toxicity and exposure information to calculate comparison values for each chemical of concern, and evaluated the potential health risks for the levels of these chemicals detected in surface and subsurface soil at the Southside High School.

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Appendix H
Public Health Hazard Categories

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INTERIM PUBLIC HEALTH HAZARD CATEGORIES

CATEGORY / DEFINITION	DATA SUFFICIENCY	CRITERIA
A. Urgent Public Health Hazard This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.
B. Public Health Hazard This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.
C. Indeterminate Public Health Hazard This category is used for sites in which "*critical*" data are *insufficient* with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.	This determination represents a professional judgement that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.	The health assessor must determine, using professional judgement, the "criticality" of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.
D. No Apparent Public Health Hazard This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.
E: No Public Health Hazard This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.	Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future	

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**Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans.*

Sterling Environmental Engineering, P.C.

ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL
ELMIRA, NEW YORK

ENVIRONMENTAL MANAGEMENT PLAN

DRAFT

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Revised June 19, 2009

Elmira City School District
Southside High School
Elmira, New York

Environmental Management Plan (EMP)

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1.0 INTRODUCTION

1.1 SOUTHSIDE HIGH SCHOOL PROPERTY BACKGROUND

1.1.1 Location and Description

The Environmental Management Plan (EMP) is for the Southside High School property located at 777 South Main Street, Elmira, Chemung County, New York (SHS property), which is owned by the Elmira City School District (School District). The SHS property is approximately 34 acres in area and is bounded by South Main Street to the east, Figgie Properties Inc. property to the south, and the Consolidated Rail Corp. property to the west and vacant land to the north. Miller Pond is located approximately 1,000 feet east of the SHS property. A Property Location Map is provided as Figure 1-1. The SHS property features and property boundaries are presented on Figure 1-2.

1.1.2 History

According to background information reported in the September 2003 New York State Department of Health (NYSDOH) Health Consultation Report the SHS property was occupied by various industrial facilities:

- From 1887 to 1909, B.W. Payne & Sons produced high speed steam engines.
- From 1909 to 1935, Morrow Manufacturing manufactured drill chucks, machine parts and tools.
- From 1936 until 1972, Remington Rand manufactured typewriter parts.
- From 1974 to 1977, Westinghouse utilized the northern portion of the SHS property mainly for warehousing.
- In 1977, Remington Rand deeded the SHS property to the Southern Tier Economic Growth Agency.
- In 1979, Southside High School was built on the northern portion of the original 83-acre parcel of property.

In 1995, fuel oil contamination was discovered on Miller Pond east of the SHS property. Subsequent investigations by the New York State Department of Environmental Conservation (NYSDEC) revealed a petroleum contaminated plume approximately fifteen (15) feet below grade, extending from underneath the SHS property toward Miller Pond. On April 8, 2000, the Elmira City School Board received a letter from parents in the community regarding a perceived unusual number of occurrences of cancer in current and former students of the Southside High School. The School Board subsequently requested that the NYSDEC and NYSDOH attend a public meeting on May 2, 2000. During the public meeting historical environmental conditions in the area and proposed actions for investigation of the environment and perceived trends in cancer occurrences were presented by the NYSDEC and NYSDOH. As a result of the expressed public concern, the NYSDEC collected soil samples from the SHS property and the NYSDOH initiated a cancer study, collected indoor air samples from inside the high school, and assisted the NYSDEC in collecting soil samples. The data results and conclusions of these investigations are discussed in the September 2003 NYSDOH Health Consultation Report.

1.1.3 Geologic Conditions

Observations made during previous investigations of the soil conditions for the SHS property indicate the following overburden units are present.

A stratigraphic layer comprised of reworked native soils and fill material is located on the SHS property at a depth of approximately zero (0) to six (6) feet below ground surface (bgs) (thickness varies). The fill

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unit is composed primarily of medium to fine sand with silt and medium to fine gravel and includes some red brick, concrete fragments, and wood debris.

Two (2) naturally occurring continuous stratigraphic units underlie the fill unit. The upper unit is post-glacial outwash. This unit consists of gray-brown fine sand and subrounded to rounded coarse to fine gravel. The post-glacial outwash unit extends from approximately six (6) feet below grade to approximately thirty-eight (38) feet below grade.

The second unit is a glacio-lacustrine silt and clay. This unit is relatively impermeable and consists of soft, gray-brown silt and clay, and extends from approximately thirty-eight (38) feet to approximately seventy-eight (78) feet below grade in undisturbed areas. The top of weathered bedrock underlies the lacustrine unit and overlays competent shale which dips slightly to the north.

Previous investigations conducted for the SHS property indicate that general groundwater flow direction in the local area is to the east in the overburden water bearing zone.

1.2 PURPOSE OF EMP

1.2.1 Management of Environmental Issues at Southside High School

The SHS property was used by various industries since the late 1800s to the 1970s and contamination from industrial operations has impacted the soil, groundwater and sub-surface soil vapor for some areas of the SHS property. In addition, the source of a fuel oil spill reported in 1995 to the east of the SHS property at Miller Pond was identified as petroleum contamination that extends from under the High School building. The purpose of the EMP is to prevent construction personnel and the general community from exposure to impacted soil, groundwater and soil vapor.

This EMP provides specific procedures and safety precautions to guide the School District Health and Safety Office (SDHSO) and the designated Project Manager through various activities that may occur at the SHS property.

The EMP is comprised of several plans described in Section 1.3. For each proposed construction activity or for the operation, maintenance and monitoring of a particular system, the SDHSO will determine which portions of the EMP are applicable for each project.

1.2.2 2003 NYSDOH Health Consultation Report Conclusions & Recommendations

As a result of concerns submitted to the Elmira City School Board in April 2000, with regards to a perceived unusual number of cancer cases reported for current and former students of SHS, an environmental investigation was conducted by the NYSDEC in 2000 and a cancer survey was conducted in 2002 by the NYSDOH. A public health assessment that summarized environmental data, evaluated public health implications and provided recommendations for specific health related actions pertaining to the SHS property was completed by the NYSDOH, in conjunction with U.S. Agency for Toxic Substances and Disease Registry (ATSDR), and results were published in the NYSDOH Health Consultation Report (September 30, 2003). A copy of the 2003 NYSDOH Report is provided in Appendix 2A.

Conclusions from the NYSDOH Health Consultation Report found that environmental conditions, including indoor air quality and surface soils, pose no apparent public health hazard. Analytical data collected for shallow and deeper sub-surface soil samples report some parameters that exceed the public health comparison values, however the general community is not exposed to the impacted sub-surface

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soils. The potential for exposure to impacted sub-surface soils exists if ground-intrusive activities occur at the SHS property. Municipal water that meets all State and Federal drinking water standards is provided to the High School, and therefore direct contact by the general public with the contaminated groundwater is not expected.

Recommendations provided by the NYSDOH Health Consultation Report include developing and implementing a Soils Management Plan (SMP) to provide measures to minimize the potential for human exposure to subsurface soils and an indoor air quality action plan (IAQAP) to address the potential of impacted soil vapor migrating into the High School building.

1.2.3 Remedial Actions

In 1995, fuel oil contamination was discovered on Miller Pond, approximately 1,000 feet east of the SHS property (NYSDEC Spill #94-16668). Subsequent investigations of the soil and groundwater media in the surrounding area between 1995 through 1998 indicated that the most likely source of the fuel oil contamination was the former oil storage tanks located in the current location of the SHS gymnasium. Additional investigations of the SHS property conducted after 1998 support this location as the likely source of fuel oil contamination. The following remedial actions were performed to address the fuel oil contamination plume:

Between July 2000 and November 2001, an Oxygen-Injection System (OIS) operated on the SHS property. The OIS was installed by Marcor Remediation, Inc. (Marcor) in response to the reported concentrations of petroleum contaminants during previous investigations of the overburden groundwater aquifer and soil conditions in the area on and around the SHS property. The purpose of the OIS was to facilitate the growth of a contaminant degrading microbes within the subgrade soil and groundwater media. The system was comprised of a grid of forty-three (43) injection point immediately east of the SHS gymnasium. Marcor performed operation and maintenance (O&M) on the OIS during the period of operation. During the period in which the OIS was in place, Marcor extracted a total of 200 gallons of petroleum contaminated water and petroleum product from groundwater monitoring wells MW-10 and MW-32. In November 2001, the system was shutdown and removed from the SHS property at the request of the NYSDEC.

In September 2003, the NYSDEC began operating a twenty-four (24) point OIS in the southern portion of the football field on the SHS property. The system was comprised of four (4) horizontal runs, each containing six (6) injection zones spaced approximately forty-five (45) feet apart. The OIS was operated until August 2006.

In August 2006, Empire Geo Services, Inc. (Empire) began operating a seventeen (17) point OIS to remediate the area around monitoring wells MW-10, MW-32, and MW-33, northeast of the SHS building. The system is ongoing and no termination date has been established. Analytical data of groundwater samples collected in 2007 suggest that Diesel Range Organic (DRO) and Gasoline Range Organic (GRO) concentrations have stabilized and degradation of contaminant compounds has occurred.

1.3 COMPONENTS OF EMP

1.3.1 Soils Management Plan (SMP)

The Soils Management Plan (SMP) (see Section 2.0) addresses issues relating to the management of soil during future development or construction on the property. It provides a chronology and overview of soil investigations performed on and near the SHS property. The SMP also summarizes soil conditions on the SHS property, including the nature and extent of soil contamination, and identifies Contaminants of

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Concern (COCs) based on analytical results from 2000 to 2007. Proposed and existing cover systems used to prevent human contact with residually contaminated soil and to reduce the potential for contaminated surface water runoff from the SHS property are described. The SMP establishes guidelines and procedures for management of soil/fill and cover systems, including site preparation, excavations, underground storage tank (UST)/buried drum handling, soil characterization procedures, and composite soils sampling. The requirements for the use of off-property fill soils and re-use of excavated soils on the SHS property are also described. Specifications for soil cover systems including soil, asphalt, and concrete are established. The SMP indentifies temporary and permanent erosion controls and dust control practices to be followed during development activities on the SHS property.

1.3.2 Groundwater Management Plan (GMP)

The Groundwater Management Plan (GMP) (see Section 3.0) provides a general overview of the groundwater conditions on and near the SHS property, including depth to groundwater, flow direction, surface water conditions, and COCs in the overburden aquifer. The GMP summarizes the groundwater investigations performed between 1997 and 2007, including details of monitoring well construction, analytical results of historical groundwater samples, and the nature and extent of groundwater contamination. Historic and current remedial activities are described. Protocols for groundwater monitoring well sampling, repair, replacement, and decommissioning are established. The GMP also provides guidelines for managing and handling groundwater encountered during excavations on the SHS property.

1.3.3 Indoor Air Quality Action Plan (IAQAP)

The Indoor Air Quality Action Plan (IAQAP) provides an overview of previous investigations and actions to address the potential for exposures related to soil vapor intrusion in existing and future buildings at the property. The IAQAP (see Section 4.0) also addresses issues and conditions contributing to indoor air quality inside the Main Building. A summary of chemicals that contain volatile organic compounds (VOCs) at various locations within the building, are described. The IAQAP assesses the potential of soil and groundwater as sources of VOCs in the sub-slab soil vapor below the Main Building and ranks soil, groundwater, and soil vapor in terms of the potential for exposure. The IAQAP describes potential preferential pathways of VOC migration through the soil and inside the building, and the procedures to monitor differential pressures between the indoor air and sub-slab vapor in the Main Building. The IAQAP establishes a program for sampling and evaluating indoor air and sub-slab vapor in the Main Building. Past, present, and future steps for the protection of indoor air quality are discussed including:

- Heating Ventilation/Air Conditioning (HVAC) System (Positive Pressure System) – *Present and Future*
- Sub-Slab Depressurization System – *Future*
- Vapor Barriers – *Present and Future*
- Air and Vapor Monitoring – *Past and Future*
- Chemical Storage – *Past, Present, and Future*

1.3.4 Operations, Monitoring and Maintenance (OM&M) Plan (Engineering Controls)

In response to low levels of contamination from industrial activities on the SHS property, certain engineering controls have been implemented including a soil cover system, a vapor barrier system, and sub-slab depressurization. These engineering controls are briefly described in the Operation, Monitoring, and Maintenance (OM&M) Plan (see Section 5.0) and procedures for inspecting, evaluating, and maintaining the systems are presented. Guidance is provided on the information that will be presented in

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annual soil cover system reports. The OM&M Plan describes sampling requirements and procedures for both short-term (up to 48 hours) and long-term (more than 48 hours) shutdowns of the sub-slab depressurization system. A summary of procedures for inspecting, evaluating, and maintaining the groundwater remediation system on the SHS property is also included in the OM&M Plan.

1.3.5 Documentation and Reporting Requirements (Institutional Controls)

System inspections are required to ensure mitigation of previous contamination. The Documentation and Reporting Plan (see Section 6.0) establishes notification requirements and inspection report deadlines for all inspections of the engineering control systems. It explains the function of annual certification process of engineering controls. The Documentation and Reporting Plan provides details on the date by which an annual report will be submitted to the Elmira City School District Board of Education and the contents of the annual report.

1.3.6 Health and Safety Plan (HASP)

The Health and Safety Plan (HASP) (see Section 7.0) identifies known and suspected hazardous conditions and substances on the SHS property. The HASP describes measures to be taken to ensure that the work conditions do not pose potential risks to the health and safety of construction workers conducting field activities and the general community. It designates responsibility among the individuals responsible for implementing the requirements and procedures set forth in the plan. Health and safety concerns and hazards are addressed with respect to potential exposure to COCs, noise hazards, slip, trip and fall hazards, equipment hazards, and natural and weather related hazards. The HASP addresses other health and safety concerns including public access to the work zone, air monitoring methods, and recommended and required uses of Personal Protective Equipment (PPE). Table 7-2 summarizes airborne exposure limits and odor thresholds for COCs at the SHS property. The HASP designates excavation and sampling work zones and provides guidance on observing symptoms and treating exposures to natural hazards such as heat/cold stress and insect/plant reactions. An Emergency Action Plan is included, as well as decontamination and disposal procedures in cases of contact with hazardous substances.

1.3.7 Community Air Monitoring Plan (CAMP)

The Community Air Monitoring Plan (CAMP) (see Section 8.0) describes conditions, locations, and activities on the SHS property for which periodic or continuous air monitoring of VOCs and particulates is required. The CAMP is intended to provide a measure of protection for the downwind community (i.e., building occupants and the general public) from potential airborne contaminant releases as a direct result of ground-intrusive work activities. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Response levels and actions are described for specified concentrations of VOCs and particulates detected in the ambient air of the downwind perimeter of the Exclusion Zone (as defined in Section 7.3.10). Requirements and recommendations are established for indoor work, including air monitoring for VOCs and particulates around a room perimeter and for adjacent rooms, engineering controls, and activity planning and timing. The CAMP provides specific guidance for air monitoring requirements in work areas within twenty (20) feet of potentially exposed populations or occupied structures.

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2.0 SOILS MANAGEMENT PLAN (SMP)

2.1 INTRODUCTION AND PURPOSE

2.1.1 Overview and Objectives

The SMP is for the SHS property located at 777 South Main Street, Elmira, Chemung County, New York, which is owned by the School District. The SHS property is approximately 34 acres in area. Surface and subsurface soils were characterized during an extensive environmental investigation performed in 2000 by the NYSDEC. The environmental investigation was conducted in conjunction with the NYSDOH Health Consultation that evaluated exposure to contaminants at the SHS property. The Health Consultation Report prepared by the NYSDOH (dated September 30, 2003) provides a summary of the 2000 NYSDEC environmental investigation and the NYSDOH 2002 exposure evaluation. A copy of the Health Consultation Report is included on a compact disc (CD) in Appendix 2A.

The objective of the existing SMP is to provide guidelines to the School District for management of soils during future activities that will breach existing cover systems and for new cover systems that may be installed at the SHS property. The School District is responsible for implementing and certifying that the SMP has been followed for ground intrusive activities.

The SMP follows New York State environmental policy guidelines and the NYSDEC and NYSDOH are available to provide technical assistance to the NYSED. The School District will contact the NYSED for technical assistance with regards to the SMP when necessary, however the State agencies do not have direct regulatory authority over the School District.

The SMP is not intended to serve as a design document for construction activities related to redevelopment activities. It is the School District's responsibility to obtain design documents incorporating the requirements for cover and soil management as set forth in this SMP.

Previous environmental investigation reports are summarized in this SMP and the following reports are provided on a CD in Appendix 2A:

- Subsurface Environmental Assessment Report, 777 South Main Street to Parkside Drive, prepared by Matrix Environmental Technologies, November 9, 1998 for Spill 94-16668.
- Soil Sample Results for Southside High School and Adjacent Properties (November 13, 2000) (marked DRAFT).
- Site Remedial Data, August-October 18, 2001 (Letter Report) to NYSDEC Region 8 from Marcor Remediation, Inc.
- Site Remedial Data, November 16, 2001-June 2002 (Letter Report) to NYSDEC Region 8 from Marcor Remediation, Inc.
- Health Consultation Report/Southside High School prepared by NYSDOH (dated September 30, 2003).
- IIWA Report on Groundwater Chlorinated Solvent Investigation, Southside High School and Adjacent Properties, prepared by the NYSDEC Region 8 for the NYSDEC Central Office (March 2004).

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- Soil Sample Results/Test Boring Logs for Proposed Addition Area (Letter Report) to Elmira City School District c/o Keystone Associates from CME Associates, Inc., August 28, 2007.

- Groundwater Sampling and Remediation System Performance Summary through March 2007 (Letter Report) to the NYSDEC Region 8 from Empire Geo Services, Inc., February 18, 2008.

- Soil Characterization Report by Sterling Environmental Engineering, P.C., July 14, 2008.

2.1.2 Site History

According to background information reported in the NYSDOH Health Consultation Report, dated September 2003, the SHS property was occupied by various industrial facilities:

- From 1887 to 1909, B.W. Payne & Sons produced high speed steam engines.

- From 1909 to 1935, Morrow Manufacturing manufactured drill chucks, machine parts and tools.

- From 1936 until 1972, Remington Rand manufactured typewriter parts.

- From 1974 to 1977, Westinghouse utilized the northern portion of the SHS property mainly for warehousing.

- In 1977, Remington Rand deeded the Site to the Southern Tier Economic Growth Agency.

- In 1979, the Southside High School was built on the northern portion of the property.

2.2 PREVIOUS INVESTIGATIONS

2.2.1 Chronology

The following is a chronological summary of the significant investigations performed at the Site.

- October 1996-July 1998: A Subsurface Environmental Assessment was prepared for NYSDEC Spill #94-16668 for the area from South Main Street to Parkside Drive. The assessment included test pits, soil borings and monitoring well installation and soil and groundwater sampling. The source of the petroleum spill plume was tentatively identified as seven (7) underground storage tanks (USTs) and an oil pump house formerly located at the present location of the Southside High School (High School) building. The plume boundaries were identified from the assessment and a separate phase petroleum layer and dissolved phase petroleum plume were also identified. Groundwater flow in the overburden aquifer was reported to be to the east from the SHS property towards Miller Pond with a gradient of 0.4%.

- May-October 2000: The NYSDEC conducted an investigation in conjunction with the NYSDOH Health Exposure Evaluation. Results are discussed in Section 2.2.2.

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- August 2001-June 2002: Ongoing sampling of monitoring wells and maintenance of the Oxygen Injection System (OIS) with regards to Spill #94-16668 by Marcor Remediation, Inc.

- April-May 2003: A Groundwater Chlorinated Solvent Investigation was conducted to determine the source of chlorinated solvents detected in April 2002 in two (2) shallow monitoring wells located east of the High School building. The Investigation Report (dated March 2004) concluded no on-site chlorinated solvent source was identified on the Southside High School property and there was no significant threat to public health or the environment.

- July 2007: Three (3) soil borings and one (1) test pit were installed in the area of the proposed addition to the High School. Analytical results for soil samples are discussed in Section 2.2.2.

- August 2005-2007: Ongoing monitoring and remedial assessment for Spill #94-16668. Network of Injection wells installed in areas of MW-10, MW-32 and MW-33 (the system was fully operational since August 2006). On-going remedial actions are discussed in Section 2.2.2.1.

- June 2008: A Soil Characterization Investigation for the area of the proposed addition for the High School was conducted in June 2008 at a depth of 0-3 feet. Results indicate Polychlorinated Biphenyls (PCBs) levels for four (4) composite soil samples exceed the Soil Management Objectives (SMOs) (see Table 2-1), however are at levels that are classified non-hazardous for disposal at a permitted facility.

2.2.2 Nature and Extent of Contamination

2.2.2.1 Soils

The Health Consultation Report dated September 2003 for the Southside High School was developed by the NYSDOH in cooperation with the U.S. Agency for Toxic Substances and Disease Registry (ATSDR).

The Health Consultation Report indicates the NYSDEC collected a total of 156 soil samples from the SHS property from May to October 2000. In addition, three (3) soil borings were installed in July 2007 at the boundaries of the proposed addition for the High School and soil samples were collected from the borings designated B1 and B3. Analytical results for soil samples from B1 and B3 report PCBs at 4.5 parts per million (ppm) for B1 and 32 ppm for B3 at a depth of 0-6 feet below ground surface (bgs). At a depth of 6-12 feet bgs, PCBs are reported at "non-detect" (<0.2 mg/kg) for B1 and at 87 ppm for B3 (No soil samples were analyzed from B2).

Based on analytical results from the 2000 and 2007 sampling events, the following potential Contaminants of Concern (COCs) are identified for surface, shallow subsurface and deeper subsurface soils located on the SHS property:

Surface Soils (0 to 3 inches bgs)

- Copper, Chromium, Nickel and Selenium
- PCB Aroclor 1248
- PCB Aroclor 1260
- Polycyclic Aromatic Hydrocarbons (PAHs)

According to the Health Consultation Report, the average concentration of PCBs in surface soils at the SHS property is higher than the range of average concentrations for Total PCBs reported for a National

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soil monitoring program. Exposure to these soils could result in a somewhat higher level of exposure to PCBs relative to that expected from typical soils. The average concentrations of PCBs in the SHS surface soils are less than the public health assessment comparison values.

According to the Health Consultation Report, the average concentration of PAHs in SHS property surface soils are below the higher range of background concentrations for urban soils. Exposure to these soils could result in a level of exposure to PAHs that approach the upper limit of the range of urban soils.

Shallow Subsurface Soils (6 inches to 4 feet bgs)

- Antimony, Arsenic, Barium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Zinc
- PAHs
- PCB Aroclor 1248

Deep Subsurface Soils (> 4 feet bgs)

- Barium, Cobalt, Copper, Nickel, Selenium, Zinc
- PCBs Aroclor 1248 and 1260
- Benzo(a)pyrene

The existing SHS cover systems include vegetated soil, concrete, and asphalt. The potential for exposure to SHS property surface soils, subsurface soils and soil vapor may occur at times when an existing cover system is removed for construction purposes.

Potential migration routes for contaminants that may be present in groundwater and soil vapor in unconsolidated material overlying bedrock, include materials that have higher permeability values and connected pore spaces. These materials include utility bedding material such as gravel or stone that may be present around subsurface utility pipes.

Potential exposure pathways during ground-intrusive work include inhalation of airborne soil particles and soil vapor and ingestion of soil particles. Preventative measures to reduce the potential for exposure to workers and the SHS community are provided in the Health and Safety Plan (HASP) (see Section 7.0) and the Community Air Monitoring Plan (CAMP) (see Section 8.0) when major ground-intrusive activities occur on the SHS property. Major ground intrusive activities are defined as excavations that are greater than 20 cubic yards (cy) of soil. For minor/routine ground intrusive activities (< 20 cy), the CAMP and portions of the HASP will be implemented as determined by the School District Health and Safety Officer (SDHSO).

The COCs for soil consist primarily of metals, PAHs, PCBs Aroclor 1248 and PCB Aroclor 1260. Results of groundwater sampling indicate constituents in the soil/fill material have not significantly impacted groundwater quality; however this does imply the existing groundwater contamination is not insignificant.

Reported levels of contaminants in groundwater collected from 1997 to 2007 from monitoring wells located on the SHS property and adjacent properties indicate the COCs for groundwater are chlorinated organic compounds. Detected compounds include tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-Dichloroethene, vinyl chloride, 1,1,1 Trichloroethane, Acetone, Methylene Chloride, Freon 113 and Freon 123A. The State continues to monitor groundwater for chlorinated Volatile Organic Compounds (VOCs). The Health Consultation Report provided in Appendix 2A indicates extensive

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sampling has been completed to evaluate potential contaminant exposures and to investigate preferential pathways for exposure. Additional soil sampling may be required for SHS property areas that lack sufficient analytical soil data if ground intrusive activities are proposed in "data gap" areas.

In 1995, fuel oil contamination was reported on the surface of Miller Pond, which is approximately 915 feet east of the SHS property. The reported Spill #94-16668 is registered on the NYSDEC Spills Database as "not-closed" status. Results from the investigation coordinated by the NYSDEC in 1998 reported the petroleum plume extends from under the SHS building towards Miller Pond. COCs include Diesel Range Organics (DRO) characteristic of fuel oil contamination. An OIS was installed east of the High School gymnasium in 2000 to reduce the petroleum contamination plume. The OIS was subsequently moved to the football field and is currently located near the northeast corner of the High School gymnasium. The OIS will continue to operate until DRO concentrations are reduced to acceptable levels.

2.3 CONTEMPLATED USE

The SHS property is comprised of a public education building with associated recreational fields and parking areas. Use includes typical activities associated with a secondary school, such as sporting events involving the congregation of students and the general public.

2.4 SUMMARY OF ENVIRONMENTAL MANAGEMENT STRATEGIES

The environmental management strategies presented in Section 2.5 for SHS property soils with residual contamination follow the 6 NYCRR Part 375 Environmental Remedial Program regulations (Part 375) only as a basis for design. The environmental management strategies are consistent with Part 375, provided that the following conditions apply:

- Residual levels of contamination do not represent source areas of contamination.
- Cover systems are maintained to prevent exposures.

The SMOs for the SHS property are based, for design purposes only, on the Part 375-6.4 Restricted Residential Use Soil Cleanup Objectives (SCOs) for the protection of public health.

The human health and environmental risks are identified in the Health Consultation Report (see Appendix 2A) and are discussed in Section 2.2.2.1. Based on the contemplated public use, the purpose of the existing and proposed cover systems is to minimize potential exposure to SHS property surface soils, subsurface soils, and groundwater.

Soil excavated for previous SHS construction activities was disposed as non-hazardous soil to a permitted facility. This included the construction of the new food storage unit, the new freezer at the loading dock and the new fence installed between the track and the baseball field.

In addition, an OIS is part of the ongoing remediation action for the petroleum plume contamination discussed in Section 2.2.2.1.

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2.4.1 Cover Systems

The purpose of the existing and proposed cover systems is to eliminate the potential for human contact with residually contaminated soil and to eliminate the potential for contaminated surface water runoff from the SHS property. When new cover systems are installed for future construction activities at SHS the following criteria should apply:

- Soil:
  Twenty-four (24) inches of vegetated soil cover underlain by a demarcation layer.

- Asphalt:
  A minimum of six (6) inches of material (asphalt and subbase material) in areas that will become roads, sidewalks, and parking lots. Actual cross-section thickness will be determined based on the intended use of the area.

- Concrete:
  A minimum of six (6) inches of material (concrete and subbase material) in areas that will become slab-on-grade structures or for roads, sidewalks, and parking lots in lieu of asphalt. Actual cross-section thickness will be determined based on the intended use of the area.

2.5 MANAGEMENT OF SOIL/FILL AND LONG TERM MAINTENANCE OF COVER SYSTEMS

Guidelines for management of subsurface soil/fill and the repair/replacement of the cover systems during future intrusive work breaching the cover systems are summarized as follows. Whenever possible, major ground intrusive activities at the Site should be conducted when the High School is not in session.

2.5.1 Site Preparation

Prior to any excavation, DigSafely.New York (1-800-962-7962) must be contacted for a utility location request for the proposed excavation area.

As part of redevelopment or future intrusive activities, the SHS property may require grading prior to cover system replacement. Trees, shrubs, roots, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences, etc. will be removed and properly disposed to permitted facilities whenever contaminated soil can adhere to the material. Prior to cover system replacement, protruding material will be removed from the ground surface. Burning will not be allowed on the SHS property.

2.5.2 Excavation Below the Cover Systems

During SHS construction or maintenance activities, the excavation of soil/fill material may be necessary for the construction of footings, foundation structures, utility corridors and/or other activities. For excavation work below the cover system, a Professional Engineer or representative with construction/remediation experience, representing the SHS property owner or developer, will monitor soil/fill excavations or disturbances. The Professional Engineer must also provide a stamped/signed certification that excavation work below the cover system and subsequent repair/replacement of the cover system was conducted in a manner consistent with this SMP. The Professional Engineer certification must be included in the Annual Certification Report discussed in Section 2.8.

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2.5.2.1 Buried Drums or Underground Storage Tanks

If buried drums or USTs or grossly contaminated media are encountered during soil excavation activities, the excavation activity at that location will cease and the NYSDEC Spills Emergency Response Program (NYS Spills Hotline (800) 457-7362) will be immediately notified. All drums and/or USTs encountered will be evaluated and a removal plan will be prepared for NYSDEC approval. Appropriately trained personnel will excavate all of the drums and/or USTs while following all applicable Federal, State, and local regulations. Removed drums and USTs will be properly characterized and disposed to a permitted facility. The soil/fill surrounding the buried drums or USTs will be considered potentially contaminated and will be stockpiled and characterized.

2.5.3 Characterization Procedures for Excavated Soil

Procedures for characterizing excavated soils from the SHS property are summarized on Figure 2-1 "Characterization Flowchart for Excavated Soils" and are discussed in Sections 2.5.3.1 through 2.5.3.4.

Historic contaminant levels for SHS property soils are summarized in Figures 2-2 through 2-4 and Plates 2A through 2C. Figures 2-2 through 2-4 are provided as reference maps to quickly determine if an area on the SHS property is a potential management area with regards to contamination or if data gaps exist for the area. Plates 2A through 2C, which are enlarged copies of Figures 2-2 through 2-4, are provided to review contaminant types and concentration levels. Contamination levels for VOCs, Semi-Volatile Organic Compounds (SVOCs), PCBs and Metals are provided for soils at varying depths. Historical environmental data provided in reports from previous investigations (see Appendix 2A) can also be reviewed to assist in the appropriate utilization and characterization of excavated soils. These reports, summary figures and plates for soil are intended to provide information that will assist to protect against both short and long term exposures during ground-intrusive activities.

Soil excavated from the SHS property must be characterized to determine whether it can be reused as a soil cover system (zero (0) to two (2) feet bgs), as fill material below a cover system, or disposed to a permitted facility. Excavated soil may be reused as a soil cover system, or as backfill in landscaping berms, provided that soil concentrations do not exceed the SMOs, as provided in Table 2-1.

All excavated soil, regardless of condition, must be placed on polyethylene sheeting (sheeting) and covered with sheeting to reduce precipitation infiltration and dust migration.

All soil samples that require analysis will be submitted to a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory and analytical results will be data validated by an independent third party to insure accuracy of sampling, testing and data reporting procedures.

2.5.3.1 Characterization of Excavated Soil Disposed at a Permitted Facility

Excavated soils that are not being considered for reuse on the SHS property will be stockpiled as described in Section 2.5.3 and composite soil sample(s) will be collected as described in Section 2.5.3.5. The composite sample(s) will be analyzed for the parameters specified in Table 2-2 "Permitted Disposal Facilities-Soil Sampling Requirements Summary", and any additional parameters required by the permitted transporter. The number of composite samples collected will depend on the volume of soil excavated and the permitted disposal facility requirements. NO SSHS SOILS (regardless of analytical data) WILL BE DISPOSED OF AT LOCATIONS OTHER THAN PERMITTED DISPOSAL FACILITIES.

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2.5.3.2 Characteristics of Potentially Contaminated Soil

Soil observed to be stained, discolored, tinted, dyed, unnaturally mottled, or has a sheen or produces elevated photoionization detector (PID) readings (i.e., sustained 10 ppm or greater) will be considered potentially contaminated and stockpiled for further assessment.

Potentially contaminated soil defined as a source level of contamination includes soil that contains contaminant concentrations sufficient to be a potential exposure to public health or the environment, or can release contaminants to another environmental medium. Analytical methods to determine if contaminant levels are source levels include testing impacted soil for ignitability, corrosivity, reactivity and toxicity. Toxicity can be measured by conducting the Toxicity Characteristics Leaching Procedure (TCLP) for soil as outlined in 6 NYCRR 371.3(e).

2.5.3.3 Reuse of Excavated Soil Not Considered Potentially Contaminated

If excavated soil does not have characteristics of potentially contaminated soil, as described in Section 2.5.3.2, it may be reused on the SHS property as fill beneath an approved cover system and no analytical characterization is required.

If excavated soil does not have characteristics of potentially contaminated soil and is planned for reuse as an approved soil cover system, a composite soil sample must be collected for every 500 cy of excavated soil, following procedures in Section 2.5.3.5. The composite soil sample(s) will be analyzed for parameters provided in Table 2-1; however analysis for VOCs is not required, as a basis for achieving the SMOs. If analytical results indicate that the SMOs are not exceeded, the soil may be used as a soil cover system (0-2 feet thick) or as fill material beneath an approved cover system. If SMOs are exceeded and reported concentrations are not considered source levels of contamination, the soil may be reused as backfill beneath an approved cover system or for disposal at a permitted facility (see Section 2.5.3.1).

2.5.3.4 Reuse of Excavated Soil Considered Potentially Contaminated

If excavated soil has characteristics of potentially contaminated soil, as described in Section 2.5.3.2, and is being considered for reuse as a soil cover system or as fill beneath an approved cover system, a composite soil sample must be collected for every 100 cy of excavated soil following procedures in Section 2.5.3.5. For stockpiles considered potentially contaminated with VOCs as described above or referenced in Plate 2A and Figure 2-2 for Potential VOCs management areas, one (1) grab sample will also be collected from the stockpile sample location with the highest PID measurement and will be analyzed only for VOCs, as listed in Table 2-1. Composite soil sample(s) will be analyzed for parameters (excluding VOCs) provided in Table 2-1 as a basis for achieving the Site SMOs.

If analytical results indicate any of the SMOs are exceeded, the excavated soil may not be reused as a soil cover system. However, the soil may be considered for use as fill beneath an approved cover system if reported concentrations are not considered source levels of contamination, as defined in Section 2.5.3.2, or for disposal to a permitted facility.

2.5.3.5 Procedures for Collecting Soil Samples

Soil sampling procedures are provided in Appendix 2B.

A composite soil sample will be collected from each stockpile (either 100 or 500 cy stockpiles) from five (5) locations within each stockpile. A duplicate sample will also be collected for every twenty (20) composite soils collected. PID measurements will be recorded for each of the five (5) individual

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locations. For stockpiles considered potentially contaminated with VOCs, one (1) grab sample will also be collected from the stockpile sample location with the highest PID measurement. If none of the five (5) individual sample locations exhibit PID readings, one (1) location will be selected at random. Grab soil sample(s) will be analyzed only for the VOCs listed in Table 2-1 and composite soil samples will be analyzed for all parameters listed in Table 2-1, except for VOCs.

Soil samples will be composited by placing equal portions of fill/soil from each of the five (5) composite sample locations from one (1) soil stockpile (either 100 or 500 cy) into a clean, stainless steel or Pyrex glass mixing bowl. The soil/fill will be thoroughly homogenized using a stainless steel scoop or trowel and transferred to jars provided by the laboratory. Sample jars will then be labeled and a Chain-of-Custody form will be prepared.

2.5.4 Requirements for Use of Off-Property Soils as Grading or Fill Material on SHS Property

Subgrade material from off property locations used to backfill excavations to increase SHS property grades or to increase elevation shall meet the following criteria:

- Off-property borrow soils will be documented as having originated from locations having no evidence of disposal or release of hazardous, toxic or radioactive substances, wastes or petroleum products.

- Off-property soils intended for use as SHS property backfill cannot be defined as a solid waste in accordance with 6 NYCRR Part 360-1.2(a).

- If an off-property soil source is designated as "virgin" soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use.

- Virgin soils should be subject to collection of one (1) representative composite sample and one (1) grab sample per source.

- Non-virgin soils will be tested by collecting one (1) composite sample and one (1) grab sample per 500 cy of material from each source area. If more than 1,000 cy of soil are borrowed from a given off-Property non-virgin soil source area, and both samples of the first 1,000 cy meet the SMOs, the sample collection frequency will be reduced to one (1) composite sample and one (1) grab sample for every 2,500 cy of additional soils from the same source, up to 5,000 cy. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one (1) composite sample and one (1) grab sample per 5,000 cy, provided all earlier samples meet the SMOs.

- Composite soil samples should be analyzed for parameters listed in Table 2-1, except for VOCs, and grab soil samples should be analyzed only for the VOCs listed in Table 2-1. Soil will be acceptable for use as backfill provided that all parameters meet the SMOs provided in Table 2-1.

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2.5.5 Cover System Specifications

Approved cover systems for the SHS property include a vegetated soil layer, asphalt and concrete. The cover systems are intended to provide protection from exposure of potentially impacted soil/fill materials. Each of the approved cover systems must meet the criteria specified below.

2.5.5.1 Soil

Cover system soil must meet the specifications outlined in Sections 2.5.3.3, 2.5.3.4 and 2.5.4. In addition, the following criteria must also be followed

- The soil cover system must be two (2) feet thick and vegetated.
- The topsoil used for the final cover shall conform to the specification of 713-01 of the New York State Department of Transportation's (NYSDOT's) most recent version of the standard specifications. The topsoil will be fertile, friable, natural loam surface soil, capable of sustaining plant growth, and free of clods or hard earth, plants or roots, sticks or other extraneous material harmful to plant growth.
- Grassed areas will be seeded with a sustainable perennial mixture with appropriate erosion control measures taken until the perennial grasses are established.
- To reduce the disturbance of the surface cover material, berms will be constructed with soil that meets the SMOs in areas where shallow-rooted trees and shrubs will be planted. The berms will be of sufficient thickness to allow the excavation to be deep enough to plant the tree or shrub root ball. The berm material will contain sufficient organic material to allow tree and/or shrub growth, and will be of sufficient strength to support trees and/or shrubs at their maximum height.

2.5.5.2 Asphalt

Where asphalt pavement is proposed for roads, sidewalks, and parking lots, the asphalt pavement will represent an approved cover system that will have a minimum cross-sectional thickness of six (6) inches of material (asphalt and clean subbase material). The actual cross-section of the asphalt cover (i.e., thickness of the asphalt and subbase material) will be determined based on the intended use in each paved area.

2.5.5.3 Concrete

Where concrete pavement is proposed for slab-on-grade structures, utilities, footings, foundations, or signs, or if concrete is used instead of asphalt for roads, sidewalks, and parking lots, it will represent an approved cover system that will have a minimum cross-sectional thickness of six (6) inches of material (concrete and clean subbase material). A vapor barrier consisting of polyethylene sheeting with a minimum thickness of eight (8)-mils and an active sub-slab depressurization system will be installed under all newly constructed structures.

2.5.6 Requirements for Minor Routine or Emergency Soil Excavation Projects

Minor routine excavation projects are defined as projects that will generate less than 20 cy of excavated soil. Emergency soil excavation projects are defined as projects that must occur immediately to address subsurface maintenance emergency (e.g. damaged utility pipes).

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Contaminants reported for soils are summarized in Figures 2-2 through 2-4 and Plates 2A through 2C. The figures and plates should be reviewed to determine if the area to be excavated is located in a potentially contaminated area and to identify the potential type, concentration, and depth of contaminant.

DigSafely.New York (1-800-962-7962) must be contacted prior to ground intrusive activities if the project will potentially affect underground utility lines.

Excavated soil must be stockpiled on polyethylene sheeting. Soil must also be covered if it remains on the ground for more than one (1) workday.

Soil that does not appear contaminated may be returned to the excavation following project completion. The disturbed cover system must be replaced and restored to its original condition following procedures outlined in Section 2.5.7.2.

If odors, stained soils, liquid product or groundwater are encountered in an excavation, the activity should be stopped immediately and the School District should contact a certified environmental professional and follow soil characterization procedures for potentially contaminated soils as outlined in Section 2.5.3.2.

Minor routine and emergency excavation projects must be recorded and submitted as part of the Annual Certification Report and include the information outlined in Section 2.8.

2.5.7 Erosion Control and Permitting

When development at the SHS property requires disturbing more than one (1) acre of land, Federal and State laws require that the project obtain coverage under the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Discharges from Construction Activities, Permit #GP-0-08-001 (Construction Storm Water General Permit) effective December 9, 2002. Requirements for coverage under the Construction Storm Water General Permit include the submittal of a Notice of Intent (NOI) form and the development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must fulfill all permit requirements and will provide the following information:

- Background discussion of the scope of the construction project.
- Statement of the storm water management objectives.
- Evaluation of post-construction runoff conditions.
- Description of proposed storm water control measures.
- Description of the type and frequency of maintenance activities required to support the control measure.

The SWPPP must address issues such as erosion prevention, sedimentation control, hydraulic loading, pollutant loading, ecological protection, SHS property characteristics that impact design, and SHS property management planning. All descriptions of proposed features and structures will include a description of structure placement, supporting engineering data and calculations, construction scheduling, and references to established detailed design criteria. The SWPPP will conform to all requirements as established by applicable regulatory agencies.

Proven soil conservation practices will be incorporated in the construction and development plans to mitigate soil erosion, off-Property sediment migration, and water pollution from erosion. The use of appropriate temporary erosion control measures such as silt fencing and/or hay bales will be required around all soil/fill stockpiles and unvegetated soil surfaces during construction activities. These methods

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are described in Section 2.5.7.1. Stockpiles shall be graded and compacted as necessary for positive surface water runoff and dust control. Stockpiles of soil/fill will be placed a minimum of 50 feet from the SHS property boundary.

2.5.7.1 Temporary Erosion Control Measures

Temporary erosion and sedimentation control measures and Best Management Practices (BMPs) will be employed during active construction stages. Prior to any construction activity, temporary erosion and sediment control measures shall be installed and maintained until such time that installed permanent erosion control measures are effective. Silt fencing and filter fabric inlet protection will be incorporated into construction activities.

As sediment collects along the silt fences, the silt fences will be cleaned to maintain the desired performance and to prevent structural failure of the fence. Accumulated sediment will be removed when bulges develop in the silt fence. Removed sediment will be stockpiled and characterized in accordance with Section 2.5.3. The perimeter silt fences will remain in place until construction activities in the area are completed and vegetative cover or other erosion control measures are adequately established. Silt fences will be provided and installed in accordance with the New York Guidelines for Urban Erosion and Sediment Control.

2.5.7.2 Permanent Erosion Control Measures

Permanent erosion control measures and BMPs will be incorporated during cover system construction and during construction for long-term erosion protection. Permanent measures, as discussed below, will be installed as early as possible during construction phases. Parking and building systems associated with redevelopment shall not include dry wells or other subsurface injections/disposal piping unless they are located in areas where a subsurface investigation has reported contamination levels do not exceed groundwater standards.

Soils management practices involve the installation of an approved cover system including asphalt, concrete, or vegetated soil over all or portions of the SHS property that are under construction. Permanent erosion control measures incorporate a combination of design features to limit overall erosion and sediment problems to practical design limits, and the placement of permanent facilities during restoration for long term erosion protection.

Design features incorporated into the construction plans to control erosion will include limiting steep slopes, routing runoff to surface water collection channels, limiting flow velocities in the collection channels to the extent practical, and lining collection channels, where appropriate. In areas where flow will be concentrated (i.e.; collection channels) the channel slopes and configuration will be designed to maintain channel stability.

Any final slopes greater than 33% will be reinforced, and will have a demarcation layer under the clean cover to indicate if erosion has extended to the subgrade. Following the placement of final cover soils over regraded areas, a revegetation program will be implemented to establish permanent vegetation. Vegetation serves to reduce erosion, enhance evapotranspiration, and improve runoff water quality. Areas with slopes greater than 33% will be seeded in stages as construction is completed with 100 lbs./acre of seed of a sustainable perennial mixture.

In addition to the above seed mixture, mulch, mulch blankets, or synthetic fabric will be placed to prevent erosion during turf establishment.

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Mulch will be placed on all slopes less than 15% and a mulch blanket on all slopes greater than 15%. Synthetic erosion control fabric will be placed in drainage ditches and swales.

2.5.8 Dust Control

Particulate monitoring will be performed in accordance with the CAMP (see Section 8.0) when ground-intrusive activities are conducted, including excavation, grading, and soil handling activities.

Dust suppression techniques that may be used at the SHS property include applying water on roadways, wetting equipment and excavation faces, spraying water on buckets during excavating and dumping, hauling materials in properly covered or watertight containers, restricting vehicle speed to ten (10) miles per hour (mph), covering excavated areas and material after excavating activities cease, establishing vegetative cover immediately after placement of cover soil, and reducing the excavation size and/or number of excavations. The use of atomizing sprays is recommended so that excessively wet areas will not be created, however fugitive dust will be suppressed.

2.5.9 Construction Water Management

Air monitoring for VOCs will be conducted during pumping of groundwater from an excavation and will follow procedures outlines in Section 8.1. If pumping of water from an excavation is necessary (i.e., groundwater and/or storm water that has accumulated in an excavation), this will be performed in such a manner as to prevent the migration of particulates, soil/fill, or unsolidified concrete materials, and to prevent damage to the existing subgrade. Water pumped from excavations will be managed properly in accordance with all applicable regulations so as to prevent endangerment of public health, property, or any portion of the construction area (see Section 3.5).

Existing data for parameters reported at concentrations that exceed the applicable water quality standards and areas of potential groundwater management areas are summarized on Figures 3-1 through 3-3 and Plates 3A through 3C in the Groundwater Management Plan (see Section 3.0).

In areas where groundwater may be contaminated, the groundwater in excavations will be field screened for VOCs and observed for any visible sheens. Water in the excavations will not be discharged to the ground surface if staining or PID measurements above background are observed in the excavation, or a sheen is present on the water surface.

If any of these conditions exist, the water pumped from the excavations will be containerized in drums, totes or Frac tanks and will be analyzed in accordance with the Surface Water and Ground Water Quality Standards set forth in 6 NYCRR Part 703.5 and the local sewer authority discharge permit. If the water meets the surface water and groundwater quality standards, it may be discharged to the ground surface. If the water does not meet the surface water and groundwater quality standards, it may be discharged to the local sewer authority under a discharge permit. If the water quality is such that the local sewer authority discharge permit requirements will be exceeded, or the local sewer authority will not approve the discharge to a sewer, it will be transported to a permitted facility or treated on the SHS property via a treatment system that has been approved by the NYSDEC.

Runoff from surface discharges shall be controlled. No discharges shall enter a surface water body without proper permits.

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2.5.10 Access Controls

Access to soil/fill on the property must be controlled until final cover is placed to prevent direct contact with subgrade materials. Stockpiled soil/fill must be covered to limit access to that material and the construction area must be restricted with temporary fencing posted with "no trespassing" signs.

2.6 HEALTH AND SAFETY

Invasive work performed at the SHS property will be performed in accordance with all applicable local, State, and Federal regulations to protect the health and safety of construction personnel and the general community.

Any workers (including School District staff and construction personnel) whom may be exposed to contaminated media (soil, groundwater or vapor) will be informed by the School District or the District's consultant of the nature or type of contaminants that may be encountered. Workers responsible for the handling of contaminated media will be directed by the District or the District's consultant, regarding the established safe handling practices and the appropriate personal protective equipment that may be required for an activity, as well as appropriate decontamination procedures.

If intrusive work is expected to breach the cover systems at the SHS property, all contractors hired by the School District performing redevelopment or major maintenance activities will be required to review the HASP provided in Section 7.0 and to prepare a project specific HASP. The project specific HASP must also include provisions for protection of the community, as described in Section 2.6.2.

2.6.1 Construction Personnel Protection

Construction personnel (contractor) engaged in subsurface construction or maintenance activities (e.g., foundation and utility workers) will be required to implement appropriate health and safety procedures. These procedures will involve, at a minimum, wearing adequate personal protective equipment, performing appropriate air monitoring, and implementing other engineering controls as necessary to mitigate potential ingestion, inhalation and contact with residual constituents in the soils. Recommended health and safety procedures include, however may not be limited to, the following:

1. While conducting invasive work at the SHS property, the contractor shall provide safe and healthful working conditions. The contractor shall comply with all New York State Department of Labor (NYSDOL) regulations and published recommendations and regulations promulgated under the Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and with laws, rules, and regulations of other authorities having jurisdiction. Compliance with governmental requirements is mandated by law and considered only a minimum level of safety performance. The contractor shall ensure that all work is performed in accordance with recognized safe work practices.

2. The contractor shall be responsible for the safety of the contractor's employees and the public. The contractor shall be solely responsible for the adequacy and safety of all construction methods, materials and equipment.

3. The contractor is responsible to ensure that all project personnel have been trained in accordance with 29 CFR 1910.120.

4. The contractor shall provide a project-specific HASP, written in accordance with 29 CFR 1910.120 and 1926.65, prepared, signed and sealed by a safety professional. A safety

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professional and/or a trained safety representative(s) shall be present whenever work is in progress. An effective and documented safety training program shall be provided to all personnel working on the SHS property and a safety work method checklist system shall be implemented.

5. Recognition as a safety professional shall be based on a minimum certification by the Board of Certified Safety Professionals as a Certified Safety Professional or Certified Industrial Hygienist (CIH) with similar credentials and five (5) years of professional safety management experience in similar types of construction and conditions expected to be encountered on the SHS property.

6. All personnel employed by the contractor or subcontractors, or any visitors entering the project area, shall be required to wear appropriate personal protection equipment.

2.6.2 Community Air Monitoring Program (CAMP)

Air monitoring will be performed during all ground-intrusive work in accordance with the CAMP prepared for the SHS property, which is included in Section 8.0. All air monitoring readings will be recorded and will be available for review, if requested, by the NYSDEC, NYSDOH and the Chemung County Health Department.

2.7 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

2.7.1 Analytical Data

All characterization samples collected for the SHS property redevelopment activities will be analyzed using the most recent NYSDEC Analytical Services Protocol (ASP), consistent with Section 2.0 of DER-10, the NYSDEC's Technical Guidance Document for Site Investigation and Remediation.

The laboratory proposed to perform analyses for samples will be certified through the NYSDOH ELAP to perform Contract Laboratory Program (CLP) analysis and Solid Waste and Hazardous Waste Analytical testing for all media to be sampled during this investigation. The laboratory will maintain this certification for the duration of the project.

The laboratory detection limit for compounds listed in Table 2-1 shall be equal to or less than the noted action level.

Sampling and decontamination procedures are presented in Appendix 2B and in Section 7.6. Procedures for Chain-of-Custody, laboratory instrumentation calibration, laboratory analyses, reporting of data, internal quality control, and corrective actions shall follow the NYSDEC ASP and the laboratory's Quality Assurance Plan. Where appropriate, trip blanks, field blanks, field duplicates, matrix spike, and matrix spike duplicate shall be performed at a rate of 5% (1 per 20 samples) and will be used to assess the quality of the data. The laboratory's in-house QA/QC limits will be utilized whenever they are more stringent than those suggested by the USEPA analytical methods.

2.8 NOTIFICATION AND REPORTING

All construction that results in the disturbance or excavation of the SHS property, which compromises the integrity of the cover system or that could result in human exposure to contaminated soils, must implement the SMP and it is the School District's responsibility to ensure all construction work is in compliance with the SMP.

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The following minimum notification and reporting requirements shall be followed by the School District prior to and following Site development, as appropriate:

- If buried drums or USTs are encountered during soil excavation activities, excavation at that location will cease and the NYSDEC Spills Emergency Response Program will be immediately notified (1-800-457-7362).

- The SHS SDHSO shall complete and submit a copy of the Annual Certification Report by January 15th of each year to the School District Board of Education and a courtesy copy to the NYSED, NYSDEC and NYSDOH. The Annual Certification Report shall certify that the School District implemented the SMP and that it is effective; that protective covers have been maintained; and conditions at the SHS property are fully protective of public health and the environment.

  A copy of the Annual Certification Report will be available for downloading from the School District's website for public review and notification will be placed in the High School newsletter.

- If the cover systems have been breached, the School District shall include the following in the Annual Certification Report:

  - Certification that all work was performed in conformance with the SMP.
  - Plans showing areas and depths of fill removal.
  - Copies of daily inspection reports for soil-related issues.
  - Description of erosion control measures.
  - A narrative describing the excavation activities performed, health and safety monitoring performed (includes community air monitoring), quantities and locations of soil/fill excavated, disposal locations for the soil/fill, soil sampling locations and results, a description of any issues encountered, location and acceptability of test results for backfill sources, and other pertinent information necessary to document that the activities were carried out properly.

- If the disturbed area exceeds one (1) acre, the following must also be included in the Annual Certification Report:

  - SPDES Permit and Storm Water Pollution Prevention Plan (SWPPP) (see Section 2.5.7).
  - Plans showing before and after survey elevations on a 100-foot grid system to document the thickness of the clean soil cover system.

Advisory Contacts:

State Education Department
89 Washington Avenue
Room 1060 EBA
Albany, New York 12234
(518) 474-3906
Attention: Mr. Carl Thurnau

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NYSDEC Region 8
Hazardous Waste Remedial Program
6274 E. Avon-Lima Road
Avon, New York 14414-9519
(585) 226-5353
Attention: Hazardous Waste Remediation Engineer (Mr. Bart Putzig)

NYSDOH
Bureau of Environmental Exposure Investigation
547 River Street
Troy, New York 12180
(800) 458-1158 ext. 27860
Attention: Ms. Krista Anders

3.0 GROUNDWATER MANAGEMENT PLAN (GMP)

3.1 GENERAL DESCRIPTION OF GROUNDWATER CHARACTERISTICS

Groundwater elevations in the overburden aquifer range from approximately three (3) to fifteen (15) feet. Groundwater in the overburden aquifer flows to the east at an approximate gradient of 0.4% and discharges into Miller Pond, located approximately 1,000 feet east of the SHS property. During investigations of the shallow overburden aquifer in the area around and upgradient of Miller Pond in 1995, the NYSDEC identified a petroleum plume that originated from the SHS property. Subsequent investigations of the shallow overburden aquifer identified Gasoline Range Organics (GROs), Diesel Range Organics (DROs), and chlorinated solvents reported at concentrations above applicable standards, or guidance values. Chlorinated solvents have also been detected in samples collected from the deep overburden aquifer, reported at concentrations above applicable groundwater standards or guidance values.

3.2 SUMMARY OF GROUNDWATER INVESTIGATIONS AND REMEDIAL ACTIONS

Groundwater management areas based on analytical results for groundwater samples collected from monitoring wells located on the SHS property are summarized in Figures 3-1 through 3-3. Larger versions of these figures are provided as Plates 3A through 3C, which list the individual parameters and reported concentrations that exceed the applicable groundwater standard for each monitoring well location.

Groundwater investigations began in September 1997, in response to the discovery of fuel oil contamination on Miller Pond in 1995. During the initial groundwater investigation, Matrix Environmental Technologies (Matrix) collected samples from five (5) groundwater monitoring wells (MW-1 through MW-5) west of Miller Pond and downgradient of the SHS property. Concentrations above applicable standards, criteria, or guidance values for Total Petroleum Hydrocarbons (TPHs) were detected in samples collected from all five (5) locations. Concentrations above the groundwater standards for vinyl chloride and cis-1,2-Dichloroethene (cis-1,2-DCE) were reported for the MW-5 sample, which was the closest sampling location to the SHS building for this sampling event. Polychlorinated Biphenyls (PCBs) were not detected in any of the samples, suggesting that they are not a component of the existing petroleum plume.

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Matrix collected twenty (20) additional groundwater samples from new and existing monitoring wells in December 1997. During this round of sampling, petroleum product was observed in fifteen (15) of the wells sampled. Diesel Range Organics (DROs) were detected in sixteen (16) of the samples collected. Five (5) wells were sampled for VOCs during this sampling event including MW-5, where VOCs were detected during the September 1997 sampling event, and four (4) other locations closest to the school building. Trichloroethene (TCE) was detected in the sample collected from MW-5 at a concentration above applicable groundwater standard. Trace concentrations of TCE and 1,1,2-Trichloroethane (1,1,2-TCA) were detected in samples collected from monitoring well locations closest to the SHS property. Free petroleum product was observed in MW-8. The petroleum product in MW-8 was identified as fuel oil and motor oil was also detected.

In 2000, two (2) groundwater samples on the SHS property and five (5) downgradient groundwater samples located off the SHS property were sampled and analyzed. Concentrations above the applicable groundwater standards for Chromium and Lead were detected in samples collected from the SHS property. Analysis of samples collected from downgradient locations identified high concentrations of TCE and vinyl chloride. Cis-1,2-DCE and Lead were also detected in samples collected from downgradient locations during this round of sampling.

Between July 2000 and November 2001, an OIS was operated on the SHS property, east of the gymnasium. The OIS was comprised of a forty-three (43) injection point grid immediately east of the gymnasium. The purpose of the OIS was to facilitate the growth of a contaminant degrading microbes in the subsurface soils and shallow overburden aquifer. During the period in which the OIS was in place, Marcor performed O&M inspections every two (2) weeks, including monitoring of dissolved oxygen (DO) in all injection points, and monitoring DO, free petroleum product thickness, and groundwater elevation in groundwater monitoring wells within and immediately surrounding the remediation area (MW-8 through MW-10, MW-12, and MW-30 through MW-34). Samples from these monitoring wells were analyzed for DROs on a monthly basis during the period in which the OIS was in place. One (1) preliminary round of samples was analyzed from these monitoring wells in March 2000. Post-remediation groundwater samples were collected and analyzed for DROs in January, April, and June 2002. On October 11, 2001, Marcor extracted 200 gallons of contaminated water and petroleum product from groundwater monitoring wells MW-10 and MW-32.

In April 2002, groundwater samples were collected by the NYSDEC from monitoring wells MW-1 through MW-3, MW-5, MW-8 through MW-10, MW-12, MW-13 and MW-30 through MW-34, to assess the ongoing remediation of the petroleum source area. Chlorinated solvents were detected in samples collected from shallow on-site monitoring wells MW-8 and MW-30, and shallow off-site monitoring well MW-5. The NYSDEC collected additional groundwater samples in June and July 2002. Analysis of these samples confirmed the presence of chlorinated solvents on the SHS property, including Tetrachloroethene (PCE), TCE, cis-1,2-DCE, and Freon 113. Chlorinated solvents, vinyl chloride and cis-1,2-DCE were detected in a sample collected from off-site monitoring well MW-5 during this round of sampling.

In May and September 2003, the NYSDEC collected additional groundwater samples from monitoring wells. Twelve (12) existing shallow overburden groundwater monitoring wells (MW-4 through MW-5, MW-7 through MW-9, MW-11, MW-12, MW-15, MW-17, MW-22, MW-30 and MW-31) and three (3) deep overburden groundwater monitoring wells (MW-11D, MW-15D, and MW-D) were sampled. Several chlorinated solvents were detected in samples collected from the shallow wells during this round of sampling. Freon 113 and cis-1,2-DCE were detected in samples collected from one (1) deep well (MW-D).

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In September 2003, the NYSDEC collected samples from five (5) shallow overburden groundwater monitoring wells (MW-5, MW-8, MW-12, MW-30 and MW-31) and all three (3) deep groundwater monitoring wells. The shallow wells were selected based on the presence of detectable concentrations of chlorinated solvents during the previous round of sampling. Freon 113 was detected in samples collected from MW-5, MW-8, MW-12, MW-30, and MW-D. Cis-1,2-DCE was detected in samples collected from MW-8 and MW-30.

The NYSDEC began operating a twenty-four (24) point OIS in the southern portion of the football field in September 2003. The system was comprised of four (4) horizontal runs, each containing six (6) injection zones spaced approximately forty-five (45) feet apart. The OIS was operated until August 2006.

In August 2005, Empire Geo Services, Inc. (Empire) performed periodic monitoring of groundwater in preparation for the OIS operation on the SHS property. GROs, DROs, and petroleum related VOCs were analyzed in samples collected quarterly from the SHS property and downgradient monitoring wells. The OIS is comprised of seventeen (17) injection points in the area around MW-10, MW-32, and MW-33, near the northeast corner of the high school building. The system supplies oxygen (O_2) to the soil and groundwater media in order to facilitate the growth of a contaminant degrading microbes. Dissolved oxygen (DO) and temperature are measured and recorded periodically during the remediation system operations. The system is fully operational, starting in August 2006. Analytical data of samples collected in 2007 suggest that DRO and GRO concentrations have stabilized in the groundwater and degradation of contaminant compounds has occurred. Analysis of quarterly samples for GROs and VOCs was terminated in 2007 as directed by the NYSDEC. Quarterly sampling of groundwater for DROs is ongoing. Operation of the OIS remains ongoing and no date of termination for the system has been established by the NYSDEC.

3.3 SUMMARY OF POTENTIAL EXPOSURE ROUTES TO GROUNDWATER CONTAMINANTS

Exposure to contaminated groundwater can occur through sampling of monitoring wells or encountering groundwater in excavations. In order to reduce exposure to contaminated groundwater, workers who are responsible for sampling monitoring wells should wear appropriate protective gear including a disposable outer garment, protective gloves and eye safety glasses. Procedures for managing groundwater encountered in excavations are provided in Section 3.5.

3.4 GROUNDWATER MONITORING WELLS

All sampling, repair, replacement and decommissioning of existing monitoring wells located on the SHS Property are managed by the NYSDEC Region 8 Division of Environmental Remediation, Bureau of Spill Prevention & Response. Implementation of these procedures is not the responsibility of the School District, and Sections 3.4.2 and 3.4.3 are provided for informational purposes only.

3.4.1 Locations and Descriptions

Groundwater monitoring well locations for all wells located on the SHS property are presented in Figure 3-4. Between December 1996 and July 1998, Matrix Environmental Technologies (Matrix) observed the installation of twenty-nine (29) monitoring well locations in the shallow overburden aquifer. Two (2) monitoring wells (MW-15 and MW-16) are located northwest of the SHS building, upgradient from the source of the petroleum plume. Twenty-seven (27) monitoring wells were installed in the area around the school and downgradient, in order to determine the approximate horizontal boundaries of the existing petroleum plume. All of the monitoring wells were installed in the shallow overburden aquifer, and their total depths ranged from twelve (12) to twenty-six (26) feet below grade. The well construction details of

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each of these monitoring wells are presented as an appendix from Matrix's November 9, 1998 Subsurface Environmental Assessment Report (see Appendix 2A).

In addition, three (3) existing monitoring wells (EMW1-3) were previously installed by the City of Elmira north-northeast of the SHS property for an unrelated project. Well construction details are not available for these monitoring wells.

In April/May 2003, the NYSDEC and Earth Tech Environmental and Infrastructure, Inc. (Earth Tech) observed the installation of three (3) additional groundwater monitoring wells at depths of 44.0 feet (MWD), 76.5 feet (MW-15D), and 78.5 feet (MW-11D) below grade. In order to determine the vertical extent of the existing petroleum plume and assess the groundwater quality of the deep overburden aquifer.

3.4.2 Monitoring Well Sampling Protocol

According to the NYSDEC, groundwater samples collected on the SHS property should comply with the procedures and protocols outlined in Section 6.4 and Appendix N of the NYSDEC Spill Guidance Manual (SGM) that is provided on the NYSDEC website. According to the SGM, newly installed wells must be developed prior to sample collection. Water level and product level should be measured to the nearest hundredth of a foot prior to sampling. The SGM states that three (3) to five (5) full volumes of standing well water should be purged, or ten (10) percent or less variability in three (3) consecutive measurements of pH, temperature, and specific conductance should be achieved, prior to sampling. If a well is incapable of producing a sustained yield and does not yield sufficiently during purging, it should be allowed to recover sixty (60) to eighty (80) percent of the original volume prior to sample collection. According to the SGM, sampling devices should be constructed of stainless steel, non-flexible PVC, Teflon, or another inert material. Sampling equipment should not come into contact with soil or drilling fluids and the sampling technique implemented should suite the contaminants of interest.

3.4.3 Monitoring Well Repair, Replacement and Decommissioning

Guidance for decommissioning of monitoring wells is provided in the NYSDEC Division of Environmental Remediation, June 2008 Groundwater Monitoring Well Decommissioning Procedures Manual. According to the manual, in general, if a riser for an overburden groundwater monitoring well can be pulled out while grouting, that is the preferred method for well decommissioning and abandonment. In cases where the riser cannot be pulled, it is recommended that the riser be grouted in place. When a monitoring well is grouted in place, any above-grade appurtenances should be removed. The filter pack around the riser should be excavated so that native soil is exposed on all sides. The riser should be cut down to allow for a minimum one (1) foot deep grout or cement seal and the well should be filled with grout/cement mix. A procedure selection flow diagram for decommissioning groundwater monitoring wells is provided in Figure 3-5.

3.5 MANAGEMENT PROCEDURES FOR GROUNDWATER ENCOUNTERED IN EXCAVATIONS

If an excavation intersects the groundwater table, and ponded groundwater on the excavation floor interferes with further excavation, the following procedures must be implemented:

- Create a temporary sump in the lowest section of the excavation by removing additional material in this area where groundwater can collect.

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- If the temporary sump cannot contain the collected groundwater volume during excavating, groundwater must be pumped and containerized in 55-gallon drums. Drums must be dated, labeled and stored in a secure area.

- A composite sample must be collected from all drums and analyzed for parameters specified by a permitted facility that accepts impacted groundwater. Arrangements must be made with the disposal facility for transport and disposal following receipt of the analytical results for the composite sample.

- All workers involved with managing groundwater in excavations and sampling containerized water must wear disposable outer garments, protective gloves and eyewear.

4.0 INDOOR AIR QUALITY ACTION PLAN (IAQAP)

4.1 SUMMARY OF PREVIOUS INVESTIGATION RESULTS

4.1.1 Soil Investigations

The soil investigations are summarized in the Soil Management Plan, Section 2.0.

4.1.2 Groundwater Investigations

The groundwater investigations are summarized in the Groundwater Management Plan, Section 3.0.

4.1.3 Indoor Air and Soil Vapor Investigations

Indoor air has been sampled on multiple occasions from 1997 to 2000.

Indoor air samples were obtained by SHS personnel on November 4, 1997 at various locations throughout the Main Building (see Appendix 4A and Tables 4-5 through Table 4-13). The VOCs tested include:

- 1,1,1-Trichloroethane (TCA)
- 1,1-Dichloroethene (1,1-DCE)
- cis-1,2-Dichloroethene (cis-1,2-DCE)
- m&p-Xylene
- o-Xylene
- Tetrachloroethene (PCE); and
- Trichloroethene (TCE)

Four (4) indoor air samples were obtained (see Appendix 4A). All four (4) indoor air samples contained detectable concentrations of m&p-Xylene. The detected concentrations of m&p-Xylene ranged from 1.22 to 21.78 ug/m^3. All of the samples contained detectable concentrations of o-Xylene and the concentrations ranged from 0.45 to 7.51 ug/m^3. Three (3) indoor air samples contained detectable concentrations of PCE and the concentrations ranged from 0.11 to 3.57 ug/m^3. Two (2) samples contained detectable concentrations of TCA ranging from 0.01 to 0.04 ug/m^3. Three (3) samples contained detectable concentrations of TCE ranging from 0.05 to 0.15 ug/m^3. None of the samples collected contained detectable concentrations of 1,1-DCE or cis-1,2-DCE.

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The NYSDOH obtained indoor air and sub-slab vapor samples on May 23, 2000 (see Appendix 4B, and Tables 4-5 through Table 4-13). The VOCs tested include:

- 1,1,2-Trichlorotrifluoroethane (Freon 113)
- 1,1-DCE
- Acetone
- cis-1,2-DCE
- m&p-Xylene
- o-Xylene
- PCE
- TCA; and
- TCE

All three (3) sub-slab vapor samples contained detectable concentrations of Freon 113, Acetone, m&p-Xylene, o-Xylene, PCE, TCA, and TCE. The detected concentrations of these parameters ranged from 16 to >1,000 ug/m^3 for Freon 113, 3.8 to 16 ug/m^3 for Acetone, <1 to 1.1 ug/m^3 for m&p-Xylene, 3.2 to 70 ug/m^3 for PCE, 2.7 to 55 ug/m^3 for TCA, and 14 to 325 ug/m^3 for TCE. The detected concentrations of o-Xylene were <1 ug/m^3 for all three (3) sub-slab vapor samples. One (1) sub-slab vapor sample contained a detectable concentration of 1,1-DCE and one (1) sample contained a detectable concentration of cis-1,2-DCE, 1,1-DCE was detected at a concentration of 2.6 ug/m^3 and cis-1,2-DCE was detected at a concentration of 1.1 ug/m^3.

Seven (7) indoor air samples were collected in May 2000 by the NYSDOH. All seven (7) indoor air samples contained detectable concentrations of Acetone, m&p-Xylene, and o-Xylene. The detected concentrations of these parameters ranged from <1 to 16 ug/m^3 for Acetone, <1 to 1.0 ug/m^3 for m&p-Xylene, and <1 to 1.1 ug/m^3 for o-Xylene. Six (6) of the indoor air samples contained detectable concentrations of TCA and the concentrations ranged from <1 to 2.1 ug/m^3. Five (5) of the samples contained detectable concentrations of PCE and Freon 113. PCE was detected at concentrations of <1.5 ug/m^3. The range of detected concentrations of Freon 113 was <1 to 1.1 ug/m^3. One (1) sample contained detectable concentrations of 1,1-DCE, cis-1,2-DCE, and TCE at <1 ug/m^3 for all three parameters.

Two (2) additional indoor air samples and one (1) additional sub-slab gas sample were obtained by the NYSDOH on August 31, 2000 (see Appendix 4B and Tables 4-5 through Table 4-13). The sub-slab sample contained the following concentrations: 65 ug/m^3 for Freon 113, 3.7 ug/m^3 for Acetone, <1 ug/m^3 for m&p-Xylene, <1 ug/m^3 for o-Xylene, 25 ug/m^3 for PCE, 14 ug/m^3 for TCA, and 170 ug/m^3 for TCE.

The two (2) indoor air samples contained the following concentrations: 1.4 and 1.6 ug/m^3 for Freon 113, 32 and 46 ug/m^3 for Acetone, 1.5 and 1.8 ug/m^3 for m&p-Xylene, 1.2 and 2.2 ug/m^3 for o-Xylene, <1.5 ug/m^3 for PCE, and <1.0 and 1.8 ug/m^3 for TCA. Neither of the indoor air samples contained detectable concentrations of TCE.

After consideration of these results in the Health Consultation Report dated September 30, 2003, the NYSDOH recommended that the Elmira City School District consider instituting an IAQAP consistent with the most recent USEPA guidance.

Based on a review of the air results, as well as the soil and groundwater data at the property, the NYSDEC and NYSDOH have recommended that additional air samples be collected from within and beneath the Main Building (with emphasis placed on areas where preferential pathways may exist) and

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that the heating, ventilation/air conditioning (HVAC) system in the Main Building continues to operate in a positive-pressure mode.

4.2 SUMMARY OF RESPONSE ACTIONS

As a result of the contamination found in the sub-slab gas and indoor air samples, as well as the contamination found in soil and groundwater, the Elmira CSD has taken and will take several actions including:

1. Preparation of this Indoor Air Quality Action Plan (IAQAP).

2. An inventory and use evaluation has been performed of products used within the school that may contain VOCs.

3. The sources and pathways of VOCs with the potential to enter the entire high school building were reviewed and assessed.

4. Inventory, monitoring and mitigation programs were established to assess and ensure a reduced exposure of the occupants for the entire high school building to VOCs. One of the main methods for mitigating the sub-slab gas exposure pathway in the Main Building is the application of positive air pressure in the building, created by the HVAC system during the period of each day that the Main Building is occupied. The other method for mitigating the exposure pathway in the Main Building is monitoring and maintenance of the concrete floor slab to ensure no new cracks, crevices or penetrations are allowed.

5. For any new construction, including the planned construction of the Science Addition, several means of mitigating potential VOC infiltration will be instituted including:

    - A vapor barrier.
    - A sub-slab depressurization system.
    - During operating hours, a pressurized HVAC system.

The features of these actions are addressed in the following sections.

4.3 SUMMARY OF POTENTIAL SOURCES AND FACTORS THAT MAY IMPACT INDOOR AIR QUALITY

The two (2) primary potential sources impacting indoor air quality are:

a. chemicals or products containing VOCs that are used inside the building, and
b. contaminated sub-slab vapors.

A principal secondary source of VOCs is construction or exterior activities that can alter the two (2) primary sources or create new exposures to contamination.

4.3.1 Building Chemicals- Inventory and Use Evaluation

The School District Health and Safety Hygienist maintains an on-going inventory of all products containing chemicals and a library of Material Safety Data Sheets (MSDSs) for these chemicals. The Health and Safety Hygienist and Sterling Environmental Engineering, P.C. (STERLING) reviewed the

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products that could potentially be sources of VOCs and assembled an inventory of these chemicals that contain VOCs.

On January 21, 2009, STERLING staff and the Health and Safety Hygienist completed the inventory by assessing storage conditions, container integrity and condition, and by testing the air adjacent to the lids and covers of the containers for VOCs with a PID. One (1) box of twelve (12) eight (8) oz. containers of Ross rubber cement in the Art Room had a measurable PID reading of 8.5 ppm. One (1) box of six (6) eleven (11) oz. containers of Krylon UV-resistant acrylic coating in the Art Room had a measureable PID reading of 25.1 ppm. These containers appeared to have small residuals on the threads even though each container was tightly closed. Given the adhesive quality of the contents, having the user wipe the threads with a towel will result in approximately the same volatilization of the material into the indoor air. The materials do not appear to have a substitute with acceptable performance characteristics. Therefore, no changes are recommended to the use of these minor number of containers.

The chemicals are used in the following locations within the Main Building:

a. Art room
b. Chemistry Classroom 230
c. Storeroom 229
d. Custodial Storeroom M-10
e. Wood Shop Finish Room
f. Boiler Room (M-13)
g. Custodial Cleaning Chemicals

A copy of the complete inventory is provided in Table 4-1.

4.3.2 Contaminated Sub-Slab Vapor

Contaminated soil vapor can reach the building sub-slab directly from soil and groundwater contaminant sources, abandoned or existing underground storage tanks (USTs) or utility structures, as well as indirectly through preferential migration pathways such as underground utility conduits and bedding.

4.3.2.1 Contaminated Soil Source

The previous soil and related groundwater investigations that have produced data on soil contamination are summarized in Section 2.2.

As noted in Section 2.2, certain metals, PCB arochlors, Polycyclic Aromatic Hydrocarbons (PAHs) and Benzo(a)pyrene have been found in the soil. VOCs were not detected above the detection limits. Therefore sampling has not determined soil to be a significant source of soil vapor containing VOCs.

4.3.2.2 Groundwater Investigations

Groundwater adjacent to the SHS property contains VOCs. Specifically TCE, TCA, Vinyl Chloride and cis-1,2-Dichloroethene (cis-1,2-DCE) have been detected at a number of wells. In biologically active soils, PCE is reductively dechlorinated to TCE, then to Dichloroethene and finally to Vinyl Chloride ("Remediation Engineering of Contaminated Soils" by Donald Lee Wise. 2000. CRC Press). Given that the same chlorinated compounds and their daughter products are found in both groundwater and in soil gas, apparently the chlorinated VOCs are volatilizing from the groundwater into the soil gas.

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4.3.2.3 Potential Preferential Pathways of Contaminant Migration

A preferential pathway of soil vapor contaminant migration is a natural or artificial route through which vapors can migrate more easily than through surrounding materials. Naturally existing routes include fractured rock or soil. Artificial routes include open slab penetrations, open slab cracks, former tank locations, buried utilities and crushed stone beneath footers, slabs or other concrete structures.

At the SHS property, a six (6) inch diameter water line passes beneath the Science Addition in an alignment approximately forty-six (46) feet from and parallel with the adjacent wall of the Main Building. A thirty-six (36) inch diameter reinforced concrete sewer pipe line passes beneath the Science Addition approximately thirty-two (32) feet east from the six (6) inch diameter waterline. Water, gas, electric and other sanitary sewage utility pipelines that pass into the Main Building and stormwater pipelines that approach the Main Building as shown on Plate 4A.

All these utility pipelines are suspected to be bedded in gravel. Gravel bedding could conduct contaminated soil vapor or groundwater providing pathways that could promote the migration of contaminants below the floor slabs of the Main Building or the Science Addition.

In addition to these utility pipelines that are presently in use, the SHS property has former utility pipeline trenches from its former use as an industrial site. When the High School was constructed, these pipelines were required to be removed, however the gravel trench bedding could still remain. The major legacy utility trench appears to be the former steam lines. One (1) of these appears to be located between the cafeteria area and the area of classrooms to the south of the library. Furthermore, the former industrial use of the property involved similar utility pipelines and potential sources of contamination such as tanks or wastewater treatment facilities. The potential sources and preferential pathways located using the Sanborn Fire Insurance Maps (see Appendix 4E) are presented on Plate 4A.

4.3.3 Construction or Exterior Activities

Construction or exterior activities have the potential to cause vapor migration or to affect the migration of VOC contamination beneath the floor slabs, or have the potential to create holes, cracks or gaps in the floor slabs and/or vapor barrier that raise the risk of migration of sub-slab VOC contamination into the interior occupied space.

The construction of a new pipeline with associated bedding material could allow contaminated groundwater or vapors to migrate at a much faster rate than would otherwise occur in the soil before the pipe bedding material is placed.

Similarly, drilling or creating a new hole through a slab and, if present, the vapor barrier, could greatly increase the ability of sub-slab vapors to enter a building, especially if the hole is large and left uncovered (i.e., a sump pit without a sump cover or an unprotected floor drain). Proper precautions while drilling new holes, such as prompt sealing of sub-slab vapor sample collection ports, minimize the likelihood for soil vapor migration. Installing drangers (a ball valve on the lower tip of a "J' shaped drain tube) are recommended for floor drains to prevent vapors from entering through drainage pipes.

The School District will carefully consider all construction projects and will conduct regular monitoring to ensure construction or exterior activities have not increased the likelihood of exposure to the building occupants.

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4.3.4 Heating, Ventilation and Air Conditioning (HVAC) Zones

The Main Building has fifteen (15) HVAC zones presently. This system will be reconstructed and will divide the Main Building into seven (7) HVAC zones on the ground floor by mid-2010. The present HVAC zones are as follows:

1. Locker Rooms and the North End
2. Ancillary Gym
3. Gym
4. Pool
5. Nurses Suite
6. Fitness Room and Shop
7. Cafeteria
8. Kitchen
9. Music Suite
10. Auditorium and Front Lobby
11. Portion A of Classrooms in Southwest Wing
12. Portion B of Classrooms in Southwest Wing
13. Portion C of Classrooms in Southwest Wing
14. Library
15. Main Office

Ducts from these zones heat adjacent hallways. The hallways are distributed throughout the entire Main Building and permit air movement among adjacent HVAC zones.

4.4 INVENTORY, MONITORING AND MITIGATION PROGRAMS

Staff at the SHS property will continue to inventory products containing VOCs in use at the School and will also ensure products with no or low VOCs are purchased, stored and used at the property in the future.

Outdoor air, indoor air and sub-slab samples will be obtained at the Main Building to assess the VOC concentrations at these locations, and to determine the proper response to any VOC concentrations. Similarly, the difference between indoor air pressures and pressures outdoors and below the slabs will be measured in both the Main Building and the Science Addition.

Mitigation at the Science Addition consists of the following:

- a vapor barrier
- a sub-slab depressurization system
- building pressurization by the HVAC system during the daily hours that the building is occupied.

The details of the monitoring and mitigation programs at the SHS property are presented in the subsequent sections.

4.4.1 Indoor Air and Sub-Slab Chemical Monitoring Programs

In this program indoor air or sub-slab vapor, is drawn into a Summa canister. The sample canisters are submitted to a laboratory where the collected gas is analyzed for VOCs.

The details of the monitoring program through this means follow in the succeeding sections.

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4.4.1.1 Historical and Preplanned Chemical Monitoring Locations

Within the Main Building, sample ports were placed in the concrete floor slab to facilitate the obtaining of sub-slab vapor samples. The locations (see Figure 4-1B, which also shows the results by VOC compound and sample dates) are as follows:

- Room 151A;
- Pool Filter Room;
- Boiler Room (M-13); and
- Gym Storage.

In the 1997 sampling event and the three (3) events in 2000, certain rooms were selected in the Main Building for indoor air sampling. These rooms (see Figure 4-1A, which also shows the results by VOC compound and sample dates) are:

- Room 127;
- Room 148;
- Library;
- Cafeteria;
- Room 151A;
- Room 138;
- Gym Storage; and
- Gym.

In Figure 4-1C, the sampling results for all these locations are shown together with the color coding illustrating whether the sample was sub-slab vapor or indoor air.

4.4.1.2 Slab Penetrations Survey Methods

A pre-sampling inspection will be performed prior to each sampling event to identify and minimize conditions that may interfere with the proposed testing. The inspection will take into account the type of structure, floor layout, air flows and physical conditions of the area of the building(s) being studied. This information, along with information on the sources of potential exposures to indoor air, will be identified on a Building Inventory Form.

The Building Inventory Form is located in Appendix B of the "NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006.

Items to be included in the building inventory include the following:

- construction characteristics, including foundation joints, cracks and utility penetrations or other openings that may serve as preferential pathways for vapor intrusion;
- presence of an attached garage;
- recent renovations or maintenance to the building (e.g., fresh paint, new carpet or furniture);
- mechanical equipment that can affect pressure gradients (e.g., heating systems, clothes dryers or exhaust fans);
- use or storage of petroleum products (e.g., fuel containers); and
- recent use of petroleum-based finishes or products containing volatile chemicals.

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Each room on the floor being tested and on lower floors, if possible, will be inspected. This is important because even products stored in another area of a building can affect the air of the room being tested.

The presence and description of odors (e.g., solvent, moldy) and portable vapor monitoring equipment readings (e.g., PID) will be noted and used to aid in evaluating potential sources. This includes obtaining readings near products stored or used in the building. Where applicable, readings will be provided in units that denote the calibration gas as well as the reading (e.g., Isobutylene-equivalent ppm, Benzene-equivalent ppm, etc.).

Potential interference from products or activities releasing volatile chemicals will be controlled to the extent practicable. Removing the source from the indoor environment prior to testing is the most effective means of reducing interference. Ensuring that containers are tightly sealed may be sufficient. When testing for VOCs, containers will be tested with portable vapor monitoring equipment to determine whether compounds are leaking. The inability to eliminate potential interference may be justification for not testing, especially when testing for compounds at low levels that are similar in the sub-slab environment and the potential interfering source. The possibility that chemicals may adsorb onto porous materials and may take time to dissipate will be considered when sources are removed prior to testing.

In some cases, the goal of the testing is to evaluate the impact from products used or stored in the building (e.g., pesticide applications in contravention of the pesticide label, school renovation projects). If the goal of the testing is to determine whether products are an indoor volatile chemical contaminant source, removing these sources will not apply.

Once interfering conditions are corrected (if applicable), ventilation may be appropriate prior to sampling to minimize residual contamination in the indoor air. If ventilation is appropriate after indoor source removal, it will be completed twenty-four (24) hours or more prior to the scheduled sampling time. Where applicable, ventilation can be accomplished by operating the building's HVAC system to maximize outside air intake. Opening windows and doors, and operating exhaust fans may also help.

If air samples are designed to represent typical exposure in a mechanically ventilated building, the operation of HVAC systems during sampling will be noted on the building inventory form. When samples are collected, the building's HVAC system will be operating in a manner consistent with normal operating conditions when the building is occupied (e.g., schools, businesses, etc.). Unnecessary building ventilation will be avoided within twenty-four (24) hours prior to and during sampling. Heating systems will be operating to maintain normal indoor air temperatures (i.e., 65 – 75 °F) for at least twenty-four (24) hours prior to and during the scheduled sampling time.

Depending upon the goal of the indoor air sampling, some situations may warrant deviation from the above protocol regarding building ventilation. In such cases, building conditions and sampling efforts will be understood and noted within the framework and scope of the investigation.

To avoid potential interferences and dilution effects, occupants will be instructed to make a reasonable effort to avoid the following for twenty-four (24) hours prior to sampling:

- opening any windows, openings or vents;
- operating ventilation fans unless special arrangements are made;
- smoking in the building (which is banned at all times);
- painting;
- using any auxiliary heating equipment (e.g., kerosene heater);
- operating or storing any automobile in the building;

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- allowing containers of gasoline or oil to remain within the building, except for any existing fuel oil tanks;
- cleaning, waxing or polishing furniture, floors or other woodwork with petroleum- or oil-based products;
- using air fresheners, scented candles or odor eliminators;
- engaging in any hobbies that use materials containing volatile chemicals;
- using cosmetics including hairspray, nail polish, nail polish removers, perfume/cologne, etc.;
- lawn mowing, paving with asphalt, or snow blowing;
- applying pesticides;
- using building repair or maintenance products, such as caulk or roofing tar; and
- bringing freshly dry-cleaned clothing or furnishings into the building.

4.4.1.3 Methods for Selecting Additional Chemical Sampling Locations

The following conditions and considerations were used to select the sampling locations for sub-slab vapor and indoor air samples in the Main Building to characterize the contamination:

Sub-Slab Vapor Chemical Sample Locations:

- Since the sub-slab vapor and groundwater data does not provide complete evidence of an intact plume for solvents, locations were selected over zones of preferential pathways to and beneath the Main Building, as these preferential pathways could allow contaminated soil vapor to spread from the potentially dispersed sources of these contaminants (see Plate 4A).

- To address the petroleum spill that is being remediated, locations were selected nearest to, and along preferential pathways from the petroleum spill.

- The highest TCE sub-slab vapor concentration discovered to date is at the Pool Filter Room, located with the range, produces the recommendation to mitigate in the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, no matter the indoor air concentration. Therefore, one (1) sub-slab sample location has been placed at Room 154C.

- Nearly nine (9) years have elapsed since the last sampling effort, therefore sub-slab vapor locations were selected to ensure the plume of TCE soil vapor and other detected VOCs are tracked.

Indoor Air Chemical Sample Locations:

- Certain locations were selected on the west side of the Main Building to determine the extent of TCE soil vapor contamination, as the study performed in 2000 did not cover this area.

- One (1) indoor air sampling location was selected at the lowest elevation floor area that is a lowest occupied space (Room 151A). Another was placed at the Pool Filter Room as it is a local low elevation area that is lower than the surrounding rooms however not the lowest room in the entire building.

- The most recent indoor air concentrations were measured in 2000, therefore the remaining locations were selected to evaluate indoor air concentration trends.

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The selected indoor air sample locations were reviewed and found acceptable given the following:

- the hallways provide significant opportunities for air movement between zones;
- the most critical zones, such as at low points in the floor or in contact with preferential pathways, are already selected for sampling; and
- the indoor air sample locations distribution is widely dispersed among the HVAC zones.

Sub-slab vapor sample locations are provided in Table 4-2 and include the reasons for each location selection.

The indoor air sample locations are provided in Table 4-3.

The sub-slab vapor and indoor air sample locations are depicted on Plate 4A.

Also, seven (7) sample ports will be installed in the Science Addition and will be located in:

- Room K04, K07, K08, K10, K15 and K18; and
- Hallway Adjacent to K02.

The locations of these chemical sampling points are shown on the revised Sheet EM000 and are revised from the locations shown on Sheet EM000 in the Soil Vapor Mitigation Design Plan (see Appendix 4C). The sub-slab vapor sampling ports will be installed in conformance with Detail 1 "Sample Collection Port" on Sheet EM002 of the Soil Vapor Mitigation Design Plan. Sheets EM001 and EM002 provide the details of these sampling points and other details related to Sheet EM000.

4.4.1.4 Analytical Parameter List

All of the sub-slab, indoor, and outdoor chemical samples will be analyzed at a NYSDOH ELAP certified laboratory for a range of VOCs listed in Table 4-4 because an industrial facility was located on the property and the exact solvents and chemicals used are unknown. Table 4-4 provides the minimum reporting limit for each VOC. The Matrix 1 VOCs are provided with the lower reporting limit as required in the "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006, prepared by the NYSDOH.

4.4.1.5 Chemical Sampling Schedule, Sampling Protocol and Analytical Methods

The chemical sampling schedule for the Main Building will consist of an initial chemical sampling investigation for sub-slab vapor, indoor air, and outdoor air, and differential pressure. The initial sampling investigation may require additional rounds of sampling depending on analytical results. The initial sampling investigation will be followed by a long-term chemical monitoring program of the same types of media. The long-term chemical monitoring program may require fewer sampling locations once the distribution and behavior of contaminated soil gas is understood. Similarly, the schedule of chemical sampling in the long term chemical monitoring program will be will be based upon the results of the initial soil vapor intrusion investigation.

The initial chemical sampling will be scheduled for the Main Building in the first 45 days of the heating season. Sampling protocol for indoor air, outdoor air, and sub-slab vapor samples for the Main Building will adhere to the "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York,"

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October 2006, prepared by the NYSDOH. Summa canisters will be attached to permanent sampling ports or will collect indoor air or outdoor air samples and indoor air samples will be collected at the same time the sub-slab samples are obtained.

An outdoor ambient air sample will be obtained approximately ten (10) feet upwind of one of the air intakes or the Main Building or the Science Addition, selected at random on the date of sampling. (The wind direction will be noted on the sample date).

The chemical sampling period, at a minimum, will span the entire period of occupancy of the building in one day (approximately 17 hours). All chemical sampling will be completed in the heating season.

At each indoor sample location, an indoor air sample will be obtained. Sample preparation, collection and handling methodology will be the same as described for the sub-slab locations with the exception of installing and connecting to a sampling port.

Chemical sampling procedures and protocols are presented in Appendix 4D.

The VOC analytical parameters determined for each chemical sample are listed in Table 4-4 and will be analyzed by Method TO-15. Table 4-4 consists of all the VOCs included in the NYSDEC Final DER TO-15VI General Soil Vapor Parameter List plus Acetone. The compound Acetone was added because the parameter exceeded Standards, Criteria, and Guidance Levels in soil and/or groundwater at the Southside High School property.

4.4.1.6 QA/QC Requirements

Appropriate QA/QC procedures will be followed during all aspects of sample collection and analysis to ensure that sampling error is minimized and high quality data are obtained. Sampling personnel will avoid actions (e.g., fueling vehicles, using permanent marking pens, wearing freshly dry-cleaned clothing or personal fragrances, etc.) that can cause sample interference in the field. Field instruments will be properly maintained, calibrated and tested to ensure validity of measurements. Air sampling equipment will be stored and transported in a manner consistent with the best environmental consulting practices to minimize field contamination and cross-contamination. Disposable sampling tubing will be discarded after a single use. Summa canisters and regulators will be pre-cleaned or decontaminated respectively by an ELAP approved laboratory prior to use. The end of the tubing connected to the purge pump will be clipped with a clean tubing shear prior to being connected to the Summa canister.

As stated earlier, samples will be collected using certified clean sample devices. Tracer gas (Helium) screening will be performed in the field prior to and immediately following collecting sub-slab vapor samples and will not be analyzed in the laboratory on the samples from Summa canisters. Samples will meet sample holding times and temperatures, and will be delivered to the analytical laboratory as soon as possible after collection. In addition, laboratory accession procedures will be followed, including field documentation (sample collection information and locations), chain of custody, field blanks, field sample duplicates and laboratory duplicates, as appropriate.

Duplicate samples will be collected in accordance with the requirements of the sampling and analytical methods being implemented. A minimum of ten (10) percent duplicate samples will be obtained to assess errors. Calibration samples will be analyzed as appropriate for the analytical method and as per ELAP requirements. The selected laboratory will provide written and electronic results and QA/QC data for review.

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4.4.1.7 Notification/Contact List

The notification of sampling results will be provided by the Elmira CSD staff to the Elmira City School District Board of Education. Both the District staff and the Board of Education will coordinate to create a contact list.

The contact list will contains names, addresses and telephone numbers of individuals and organizations with interest or involvement in the property. The individuals and organizations on the contact list may be affected by or interested in the property, or have information that staff needs to make effective remedial or mitigative decisions.

The contact list will include residents near the property, elected officials, appropriate Federal, State, and local government contacts, local media, and organized environmental groups, as well as local businesses, civic and recreational groups, religious facilities, School District officials, and all staff (NYSED, NYSDEC, NYSDOH, County Health Department, USEPA, etc.) involved at the property. The checklist provided in the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006 (see Appendix G.1), will be used to identify who will be included in the property's contact list.

With respect to soil vapor intrusion, the property contact list will be used to:

- send a fact sheet announcing any proposed investigation in the area, a major project decision or proposal, the project's status or progress, a public meeting or availability session, or the availability of documents in the identified repositories;
- inform building occupants of sampling dates and times and to transmit sampling results (in written form and/or verbally); and
- provide community members with verbal updates on the project's status or progress.

Development and revision of the contact list will be ongoing on an annual basis.

4.4.1.8 Exposure Assessment and Action Determination

The School District will evaluate air data in consultation with New York State's *"Final Guidance for Evaluating Soil Vapor Intrusion"* (NYSDOH 2006) and the NYSED, NYSDEC and NYSDOH. Based on that evaluation, appropriate actions to address exposures related to soil vapor intrusion will be identified and implemented as necessary.

4.4.1.9 Mitigation Methods and Post-Mitigation and Pre-Termination Sampling Procedures

Two (2) types of mitigation are, have been or will be implemented for the SHS building:

- A vapor mitigation system consisting of a vapor barrier and a sub-slab depressurization system will be installed in the Science Addition, with intermittent mitigation provided by the HVAC system pressurization.
- A vapor mitigation system consisting of a vapor barrier provided by the sealed concrete slab and intermittent mitigation provided by the HVAC system pressurization in the Main Building.

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Some natural attenuation may be occurring. In addition to highly chlorinated compounds being present, such as PCE and TCE, the less chlorinated daughter compounds are present at lower concentrations.

Other mitigation methods may be adopted depending on the results of the scheduled indoor air and sub-slab vapor chemical sampling events.

The chemical sampling and differential pressure procedures specified in Sections 4.4.1.5 and 4.4.2 for the Main Building will also be the Post-Mitigation Sampling Procedures because maintenance of the concrete floor slab and part-time pressurization of the building interior by the HVAC system constitute mitigation. Similarly, for the Science Addition, the procedures specified in the Soil Vapor Intrusion Mitigation Design Plan in Appendix 4C and in the Operations, Maintenance, and Monitoring Plan in Section 5.0 will also be the Post-Mitigation Sampling Procedures because the sub-slab depressurization system and the pressurization of the building interior by the HVAC system constitute mitigation.

If any new mitigation is initiated, a differential pressure and chemical sampling program will also be initiated. The goal will be to verify the continued effectiveness of the mitigation measures, however the program may better characterize the potential sources of contamination and evaluate the nature and extent of subsurface environmental contamination.

If any form of mitigation over time is suspected to have resulted in the sub-slab vapors meeting levels at which mitigation is no longer required to protect the building occupants, then:

- Initial pre-termination sampling will be conducted after all active sub-slab depressurization systems have been turned off for a week to ensure that the subsurface soil vapors have reached a state of natural equilibrium before chemical sampling.

- Additional pre-termination sampling may be required to ensure that a rebound in soil vapor contamination has not occurred. Sufficient chemical sampling will be completed to evaluate the potential for rebounding effects associated with the termination of the system.

4.4.2 Differential Pressure Monitoring Program

The SHS property will use a differential pressure monitoring system to monitor the operation of the HVAC system. In the Main Building, positive air pressure provided by the existing HVAC system appears to provide adequate vapor mitigation. In the Science Addition, the sub-slab depressurization system will provide adequate vapor mitigation without the influence of the HVAC system. In both cases, the differential air pressure between the structure interior and the sub-slab prevents the soil vapor from entering the interior air space. Details of the monitoring programs are outlined in the following sections.

4.4.2.1 Present and Planned Pressure Monitoring Locations

The sub-slab pressure monitoring points utilized in the past in the Main Building consist of the same sampling points that the samples were obtained. These sampling points have been filled with caulk. The permanent pressure monitoring points in the Main Building will be installed near however not through the locations of former sub-slab pressure monitoring points and will be monitored on a weekly basis. Permanent pressure monitoring points in the Science Addition will be installed and pressure data will be recorded weekly. The points will be installed in conformance with Detail 1 "Sample Collection Port" on Sheet EM002 of the Soil Vapor Mitigation Design Plan (see Appendix 4C).

The indoor air pressure within the Main Building was compared to the pressure beneath the slab and outside the building in 2000. Whenever the HVAC was operating the pressure within the building was

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adequate to mitigate sub-slab vapor from entering the building through small holes, cracks and gaps within the floor slab..

There are five (5) sub-slab differential monitoring points in the Science Addition, these locations are discussed in the Soil Vapor Mitigation Plan (see Appendix 4C). The five (5) differential pressure monitoring points will be monitored once at the completion of construction, and subsequently, the two (2) points with permanent monitors will be monitored, assuming the two (2) points are representative of the differential pressure of all five (5) points.

4.4.2.2 Differential Pressure Monitoring Schedule

The differential pressure will be monitored quarterly in the Main Building.

The Science Addition is monitored continuously at two (2) points by the electronic pressure monitors. The pressure value will be read once per week and will be recorded.

4.5 MITIGATION OF POTENTIAL INDOOR AIR QUALITY IMPACTS

The School District will make all reasonable efforts to mitigate potential impacts to indoor air quality. This will be accomplished through the use of the HVAC system, the sub-slab depressurization system, vapor barriers, air and vapor chemical monitoring and inventory of chemical storage. Details of these systems are outlined in the following sections. Details on the operation of the HVAC System, the Sub-Slab Depressurization System, and the Vapor Barrier are provided in the OM&M Manual in Section 5.0.

4.5.1 Heating Ventilation/Air Conditioning (HVAC) System (Positive Pressure System)

During its operation, the HVAC system pressurizes the interior space of the Main Building and the Science Addition relative to the sub-slab and outdoor pressure and creates a pressure gradient that tends to force interior air through any gaps in the floor slab.

Because the HVAC system does not operate throughout the night, this is only a supplemental mitigation measure that augments the vapor barrier and the sub-slab depressurization systems. The HVAC system will operate in the same manner and schedule as it is presently at least until some form of mitigation has reduced the sub-slab concentrations sufficiently that mitigation is no longer required.

4.5.2 Sub-Slab Depressurization System

The sub-slab depressurization system will operate to create a pressure that is higher in the interior space and lower in the sub-slab creating a gradient inducing flow toward the sub-slab thereby preventing sub-slab vapors from entering the Science Addition (see the Soil Vapor Mitigation Design in Appendix 4C).

4.5.3 Vapor Barriers

The Science Addition will have an engineered vapor barrier designed to block the movement of sub-slab vapors into the interior space. This consists of polyethylene sheets overlain by a concrete slab with joint sealers (see the Soil Vapor Mitigation Design in Appendix 4C).

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4.5.4 Air and Vapor Monitoring

The chemical monitoring of indoor air and sub-slab, vapor (in locations without active sub-slab depressurizations), provides data to the School District to monitor the functioning of the physical mitigation systems and make adjustments as required.

4.5.5 Chemical Use and Storage

Control of chemicals coming into the SHS building, and proper storage, handling and inventory of the chemicals that are kept in the building, prevents building occupants from being unnecessarily exposed to VOCs. A chemical inventory will be conducted annually and will include PID monitoring to verify individual container closure and condition.

5.0 OPERATIONS, MONITORING AND MAINTENANCE (OM& M) PLAN (ENGINEERING CONTROLS)

5.1 INTRODUCTION AND PURPOSE OF ENGINEERING CONTROLS

The SHS property has low levels of contamination in soil, groundwater and soil vapor from industrial activities that are reported in Sections 1.0 through 3.0. In response to this contamination, certain engineering controls have been implemented and these controls include cover systems (soil, asphalt and concrete), a vapor barrier system and a sub-slab depressurization system.

The cover systems assist in preventing casual physical contact with contaminated soil and thereby reduce the potential for exposure by dermal, inhalation and ingestion routes.

The SHS property cover systems include building slabs, concrete, asphalt and vegetated soil. The potential for exposure to contaminated surface soils and subsurface soils may occur during the period when the cover systems are removed for construction purposes. Potential exposure pathways include inhalation of airborne soil particles and ingestion of soil particles. The potential for exposure to contaminated soil exists if the precautionary steps identified in the EMP are not taken.

The Science Addition vapor barrier system and sub-slab depressurization system will minimize the intrusion of contaminated soil vapor into the building, thereby blocking the inhalation exposure route.

The OM&M Plan serves as an effective guide for the operation, maintenance and monitoring of the SHS property cover systems.

5.2 EXISTING ENGINEERING CONTROLS

In the following sections, the plans for operating, monitoring and maintaining each of the engineering controls is described.

5.2.1 OM&M for Cover Systems

This section includes inspection procedures, evaluation of existing and final cover systems, repair of any deficiencies, inspection reporting and maintenance procedures.

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5.2.1.1 Introduction and Purpose

The cover systems at the SHS property, including building slabs, concrete, asphalt and vegetated soil prevent casual contact with ingestion of and inhalation of the COCs.

5.2.1.2 Contaminants of Concern (COCs)

The known COCs for soil are metals, Polycyclic Aromatic Hydrocarbons (PAHs), PCBs Aroclor 1248 and Aroclor 1260. Results of groundwater sampling indicate the constituents that remain in the soil/fill material have not significantly impacted groundwater quality.

Reported levels of contaminants in groundwater collected from 1997 to 2007 from monitoring wells located on the SHS property and adjacent properties indicate the COCs for groundwater are chlorinated organic compounds and the constituents of fuel oil. Detected compounds include PCE, TCE, cis 1-2 Dichloroethene, Vinyl Chloride, 1,1,1 Trichloroethane, Acetone, Methylene Chloride, Freon 113, Freon 123A, and TPH (Total Petroleum Hydrocarbon) compounds.

5.2.1.3 Inspection and Maintenance Procedures for Cover Systems

The following procedures are necessary to maintain the function of the existing and final cover systems to repair of any deficiencies to maintain inspection reporting and to ensure maintenance procedures are implemented.

During ground intrusive work on the SHS property, existing cover systems should be inspected to determine if the specifications for approved cover systems, provided in Section 2.4.1, are satisfied. If existing cover systems do not meet the specifications, the appropriate actions must be taken following completion of the ground intrusive activity to meet the specifications for approved cover systems.

An Inspection Form for the SHS property cover systems will be completed by School District personnel or a designated consultant on a semi-annual basis. The Inspection Form is provided in Appendix 6A. Inspection of outdoor cover systems should be conducted when snow/ice are absent. Cover systems to be inspected include asphalt, concrete, gravel areas, mulched planting areas, vegetated areas and building slab foundations. Specific items to be examined for each cover system are noted on the Inspection Form. The Inspection Form will also be utilized to record deficiencies and proposed corrective actions.

In the event that vegetative, concrete, asphalt or slab floor covers are damaged, the School District will arrange for prompt and appropriate repairs. If footpaths on the SHS property are bare soil and appear to be eroding, these areas should be paved. In the event that the vegetation cover is observed to be inadequate, reseeding and mulching will be performed. Routine mowing by School District personnel is required to maintain the integrity of the short rooted vegetative cover.

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5.2.2 Vapor Barrier System

This section includes inspection procedures, evaluation of the vapor barrier system, inspection, reporting and maintenance procedures. The vapor barrier system includes polyethylene sheets, beneath the concrete floor slab in the Science Addition, the mastic used to seal the sheets to the concrete slab in the Science Addition and joint sealers applied to joints and cracks at both the Science Addition and the Main Building.

During work that may penetrate the vapor barrier system, actions should be taken to ensure the integrity of the vapor barrier is returned to its original condition. Repairs may include the use of polyethylene sheet patches with sealant between the patch and the intact vapor barrier sheet. Joint sealer may be applied at new joints, cracks or penetrations. Other methods may be utilized provided such do not impede the function of the vapor barrier system or the sub-slab depressurization system. All repair methods to the vapor barrier will require the prior approval of the School District, with assistance from a Professional Engineer.

5.2.2.1 Inspection Procedures for Vapor Barrier System

The floor of the Science Addition will be inspected annually for openings, cracks, penetrations or breaches that might impact the performance of the vapor barrier system. The slab will be inspected for cracks, holes or objects penetrating the surface that were not intentionally installed during the construction of the addition or during an approved remodeling effort. All visible joints, cracks and penetrations will be inspected to determine if there are gaps between the joint sealer and the slab or penetrating component, such as a pipe or conduit.

5.2.2.2 Maintenance Procedures for Vapor Barrier System

If a breach of the vapor barrier is observed, repair of the components will be undertaken as long as there is an available repair method that will not impede the function of the vapor barrier or the sub-slab depressurization system. If the plastic sheeting is penetrated or damaged such that a seal is not maintained, holes will be drilled at close spacing to allow pressure grouting or sealing with a material that will come into intimate contact with the sheeting. If a patch of sheeting is used against the original polyethylene sheeting, the patch will be sealed to a boot that will be placed on any pipe, conduit or other component intersecting the polyethylene sheeting. Similarly, pressure grouting may need to seal to another component, or may be brought into intimate contact with the pipe, conduit or other component intersecting the polyethylene sheeting. In most cases the concrete slab will be repaired with replacement concrete or concrete patch materials. In these cases, the visible joints at the top of the concrete must be sealed with elastomeric joint sealer or its equivalent.

5.2.3 Sub-Slab Depressurization System

Most sub-slab depressurization systems, including the one in the Science Addition, depend on the functioning of the static components, such as solid and perforated pipes, and on mechanical components, such as the fan. Each must be monitored and maintained in order to ensure the sub-slab depressurization system performs effectively. The following maintenance procedures apply to any such sub-slab depressurization system. If a dissimilar design is installed for a sub-slab depressurization system on the property, then these procedures may have to be modified or supplemented.

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5.2.3.1 Fan Operation

This electrical/mechanical unit must be maintained in correct operation to ensure sub-slab depressurization.

5.2.3.1.1 Inspection Procedures for Fan and Exhaust

Within the first 45 days of heating season (November 1st) and within the first 45 days of the cooling season every year, the inspector (a qualified HVAC technician) must obtain access to the roof to approach the fan unit. The operation of the fan should be verified by listening for the sound or feeling the vibration of the unit on the outer housing. The exhaust opening should be examined to ensure that air is coming out and that nothing is obstructing the exhaust (such as bird nests). The area surrounding the exhaust should be examined to ensure that no air intakes are within ten (10) feet of the exhaust point.

5.2.3.1.2 Maintenance Procedures for Fan and Exhaust Line

If the fan is not operating, the circuit breaker will be checked to determine if the breaker has tripped and created a lack of power to the fan. If the breaker has tripped, the electrical circuit should be investigated by a qualified electrician to determine is repairs are necessary. Blockages in the exhaust will be removed immediately.

5.2.3.2 Gas Permeable Layer

The gas permeable layer and the negative pressure piping are critical components in the sub-slab depressurization system.

5.2.3.2.1 Inspection Gas Permeable Layer and Negative Pressure Piping

The negative pressure solid pipe that emerges from the slab, travels upward through the interior of the building, penetrates the roof and is connected to the base of the fan should be inspected within the building and above the roof to ensure no holes, cracks or penetrations have occurred that could allow building air or outside air to infiltrate the system, thereby reducing the negative pressure gradient withdrawing air from the sub-slab gas permeable layer.

The remaining components of the negative pressure system will be inspected to ensure that a negative pressure is maintained at the sub-slab monitoring locations by monitoring the permanently installed manometer, the duct and the sub-slab differential pressure gauges. The differential pressure must be a maintained negative pressure of at least 0.020 inch water column (wc) or five (5) Pascals (Pa) at both pressure monitoring points.

The manometer that monitors the fiberglass duct connecting the plenum to the exhaust fan must be inspected within the first 45 days of the heating season and within the first 45 days of the cooling season.

5.2.3.2.2 Maintenance Procedures for the Gas Permeable Layer and Negative Pressure System

If a hole, crack or penetration occurs in the negative pressure portion of the solid pipe, it will be repaired. Any penetrating item will be removed. The damaged portion of pipe will be removed and

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a new pipe portion will be installed with slip collars glued in place at the new joints. If the damaged pipe area is relatively small, caulk or a plug may be inserted into the gap as long as care is taken not to create a significant obstruction in the pipe that could hinder air flow. After repairs, the system will be restarted. Nontoxic smoke will be generated near the repair, with a small, handheld smoke tube, to visually confirm that the smoke is entering the pipe and the former gap is completely sealed.

Whenever negative pressure in the system is not achieved, the first focus will be on the fan. However, if the fan is working properly, attention will be turned to the negative pressure portion of the solid pipes. If the solid portion of the pipe is fully intact and the fan is operating properly, then a hole, crack or gap in the vapor barrier system is most likely preventing air pressure from reaching the monitoring points, or the pressure gauges at the sub-slab monitoring points have failed. Since a simultaneous failure of both gauges is unlikely, the inspection of the vapor barrier should be conducted first. If the vapor barrier appears intact, then the pressure gauges should be removed and inspected.

5.2.3.3 System Shutdown

To perform maintenance on the sub-slab depressurization system, it may need to be shutdown for a short term. Also, at some point in the future, contaminated soil vapors may be sufficiently mitigated so that the system can be shutdown long-term and potentially terminated, after careful monitoring has demonstrated it is no longer needed. The need for air sampling after shutdown or after system restart will be determined based on the period of time the system was offline, the reason for temporary shutdown, the continued operation of supplemental mitigation measures and other factors, and any air sampling will be completed in a manner consistent with Section 4.4.1.

5.2.4 HVAC Positive Pressure System

Both the Main Building and the Science Addition each have an HVAC system that provides positive pressure relative to the building exterior and sub-slab when it is operating. The HVAC systems do not operate at night in the summer to save energy. However, they do operate whenever the buildings are occupied and during that time they provide pressure differential that acts to prevent soil vapor from entering the building through cracks, holes and gaps in the slab.

5.2.4.1 HVAC System Monitoring and Inspection

The School District will record when the HVAC systems are turned on and off either in a log or with an automatic recording system. The School District will also measure the differential pressure between the indoor air in the Main Building and the outdoor air regularly at locations to be determined after the initial chemical sampling and the initial differential pressure monitoring has been completed and interpreted.

The following components of the HVAC systems will be inspected as per the manufacturers' specifications for function and condition, based on the manufacturers recommended frequency:

- Fan Blades
- Fan Motors
- Belts (if any)
- Filters
- Intake Openings
- Exhaust Openings
- Dampers

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- Thermostats
- Cycle Controls and Timers

One advantage of HVAC systems is that malfunctions beyond a certain degree become noticeable to the building occupants and complaints will be directed to the maintenance supervisor.

5.2.5 Groundwater Remediation System

The past and current OIS employed on the SHS property for groundwater remediation purposes are described in Section 3.0 of this report. Further inquiries regarding these systems should be directed to:

Mr. Chad Kehoe
Environmental Engineer II
Spill Response
NYSDEC, Region 8 Sub-Office
276 Sing Sing Road, Suite 1
Horseheads, New York 14845

6.0 DOCUMENTATION AND REPORTING PLAN (INSTITUTIONAL CONTROLS)

6.1 INTRODUCTION AND PURPOSE OF INSTITUTIONAL CONTROLS

The institutional controls for the SHS property address the health and safety of the occupants. Institutional Control means any non-physical means of enforcing a restriction on the use of real property that limits human and environmental exposure, restricts the use of groundwater, provides notice to potential owners, operators, or members of the public, or prevents actions that would interfere with the effectiveness of a remedial program or with the effectiveness and/or integrity of OM&M activities at or pertaining to a remedial site. As described in more detail below, there are a number of critical system inspections that must occur throughout the year to minimize the potential exposures related to soil vapor intrusion. In order to demonstrate that the inspection process and results are fully transparent, an Annual Report, also discussed below, will be submitted by the School District staff to the School Board of Education.

6.2 INSPECTIONS AND NOTIFICATIONS

Inspections of the SHS engineering controls and notification to the School Board are instrumental to ensure engineering controls are functioning. Details of inspection and notification procedures follow.

6.2.1 Inspection Schedules and Forms for SHS Property Systems

The inspection schedule for the SHS engineering controls is specified in the OM&M Plan (see Section 5.0). This plan includes schedules for inspection of the cover systems (soil, asphalt, concrete), building slabs, vapor barrier, sub-slab depressurization and the HVAC system. Inspection forms for the SHS property systems are provided in Appendix 6A.

6.2.2 Notification Requirements

All inspection forms will be submitted by the School District to the School Board of Education on an annual basis. If during an inspection a potential exposure related to soil vapor intrusion is discovered, the

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School District will take action to address the health and safety of the building's occupants and notify the School Board of the potential exposure and the corrective action to be completed in a timely manner.

6.3 REPORTING PLAN

A reporting plan has been developed for the SHS property to ensure that inspection results are easily available for proper review. Details of the reporting plan follow.

6.3.1 Certification of Engineering Controls

A Professional Engineer will annually inspect all cover systems, vapor barriers and the sub-slab depressurization system and will prepare a Certified Annual Inspection Report for the School District. The Annual Report will also include notification of any changes, modifications or terminations of any engineering controls maintained by the State. A certified heating ventilation or air conditioning technician will prepare an annual certification of the HVAC system. These certifications will assure the School District that the engineering controls are functioning as designed and continue to mitigate exposures to contamination at the property. The NYSDEC supervises the operation of the groundwater remediation systems.

6.3.2 Annual Report

An Annual Report will be submitted by the School District to the Elmira City School District Board of Education by January 22nd. The Annual Report will include copies of the inspection forms provided in Appendix 6A and a narrative description of maintenance and repair work performed on the SHS property cover systems, vapor barrier system, sub-slab depressurization system and HVAC system. For any repair work completed on the systems, "before," "during," and "after" photographs will be included. The Annual Report will also contain copies of the required Professional Engineer and HVAC certifications.

7.0 HEALTH AND SAFETY PLAN (HASP)

7.1 GENERAL INFORMATION

The HASP identifies hazardous substances and conditions known or suspected to be present on the SHS property and specific measures to be taken to ensure hazardous substances or conditions do not adversely impact the health and safety of construction personnel and the general community (public). The HASP is intended to identify potential hazards and appropriate precautions as defined by OSHA 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response).

All construction personnel working on this project must read this HASP, acknowledge understanding of this plan, and abide by its requirements.

In general, construction personnel are responsible for complying with all regulations and policies applicable to the work they are performing. The SDHSO for the Elmira CSD or the Project Manager are authorized to stop work if any construction personnel/subcontractor fails to adhere to the required health and safety procedures. The HASP Certification Form is provided as Appendix 7A.

In addition to this HASP, each contractor must provide a HASP that addresses minimum training requirements for activities specific to the project and identifies potential hazards specific to the project that are not discussed herein.

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Additionally, the project specific HASP provided by the contractor must outline minimum training requirements for workers, supervisors and trainers as specified in 29 CFR 1910.120(e)(3-9), which include:

Initial Training

1. General workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities that expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction, and a minimum of three (3) days of actual field experience under the direct supervision of a trained experienced supervisor.

2. Workers who are on the SHS property only occasionally for a specific limited task (such as, however not limited to, groundwater monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits, shall receive a minimum of 24 hours of instruction, and a minimum of one (1) day actual field experience under the direct supervision of a trained, experienced supervisor.

3. Workers regularly working in areas that have been monitored and fully characterized indicating that exposures are under permissible and published exposure limits, and where respirators are not necessary, and the characterization indicates that there are no health hazards or no possibility of an emergency developing, shall receive a minimum of 24 hours of instruction, and a minimum of one (1) day actual field experience under the direct supervision of a trained, experienced supervisor.

4. Workers with 24 hours of training who are originally covered under Items 2 or 3 and who become general workers as defined in Item 1, or who are required to wear respirators, shall have the additional 16 hours and two (2) days of training necessary to total the training specified in Item 1.

Management and Supervisor Training

5. Managers and supervisors directly responsible for, or who supervise workers engaged in hazardous waste operations, shall receive 40 hours initial training, and three (3) days of supervised field experience (the training may be reduced to 24 hours and one (1) day if the only area of their responsibility is supervising workers covered by Items 2 and 3 and have had at least eight (8) additional hours of specialized training at the time of job assignment on such topics as, however not limited to, the contractor's HASP (inclusive of employees training program), personal protective equipment program, spill containment program, and health hazard monitoring procedures and techniques.

Qualifications for Trainers

6. Trainers shall be qualified to instruct workers regarding the subject matter presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

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Training Certification

7. Workers and supervisors who have received and successfully completed the training and field experience shall be certified by their instructor or the head instructor and trained supervisor as having completed the necessary training. A written certificate shall be provided to each certified person. Any person who has not been certified or who does not meet the requirements of Item 10 shall be prohibited from engaging in hazardous waste operations.

Emergency Response

8. Workers who are engaged in responding to hazardous emergency situations that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.

Refresher Training

9. Workers, managers and supervisors shall receive eight (8) hours of refresher training annually on the items specified in 29 CFR 1910.120(e)(2) and/or (e)(4) and shall review incidents that occurred in the past year that can serve as training examples of related work, and other relevant topics.

Equivalent Training

10. Workers who can show by documentation or certification that their experience and/or training has resulted in training equivalent to that training required in 29 CFR 1910.120(e)(1-4) shall provide a copy of the certification or documentation upon request. However, certified workers with equivalent training upon initial assignment to the SHS property shall receive appropriate, specific training before entering restricted areas and shall have the appropriate number of supervised field days. Equivalent training includes any academic training or training that existing workers might have already received from actual hazardous waste site experience.

Project specific logs of assigned SHS workers and their associated training/refresher certifications will be kept for each activity where potential exposures to contaminants exist.

7.2 DESIGNATION OF RESPONSIBILITIES

The responsibility for implementing this HASP is shared by the Project Manager and SDHSO. The individuals serving in these roles are provided below. The Project Manager will be designated by the SDHSO and can be the contractor hired for a particular project or an independent consultant hired by the School District.

The SDHSO will recommend policy on all matters to the Project Manager and will provide the necessary resources to conduct the project safely.

The SDHSO is responsible for developing safety procedures and training programs, and is the final decision point for determination of health and safety policies and protocols for all projects. The SDHSO is responsible for establishing operating standards and coordinating all safety and technical activities.

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KEY PERSONNEL		
Title of Officer	**Name**	**Telephone #**
SDHSO	Mr. Tony LaSorte	Office: 607/735-3992 Cell: 607/426-7233
Project Manager	TO BE DETERMINED	

The SDHSO has the authority to:

- Suspend field activities or otherwise limit exposures if the health or safety of any person appears to be endangered. This authority includes suspension of work due to adverse weather conditions, fire or other emergency.
- Direct the Project Manager or contractor personnel to alter work practices that are deemed not properly protective of human health or the environment.
- Suspend an individual from field activities for infraction of the requirements in this HASP.

The Project Manager is responsible for:

- Ensuring the availability, use, and proper maintenance of specified personal protective equipment, decontamination, and other health or safety equipment.
- Maintaining a high level of safety awareness among construction personnel/subcontractors and communicating pertinent matters promptly.
- Ensuring all field activities are performed in a manner consistent with this HASP.
- Monitoring for dangerous conditions during field activities.
- Ensuring proper decontamination of personnel and equipment.
- Coordinating with emergency response personnel and medical support facilities.
- Initiating immediate corrective actions in the event of an emergency or unsafe condition.
- Notifying the SDHSO of any emergency, unsafe condition, problem encountered, or exception to the requirements of this HASP.
- Recommending improved health and safety measures to the SDHSO.

The SDHSO or Project Manager must be present for all intrusive investigative activities on the SHS property. However, the presence of the SDHSO or Project Manager shall in no way relieve any person or company of its obligations to comply with the requirements of the HASP and all applicable Federal, State and local laws and regulations.

All personnel involved in the project must be familiar with and conform to the safety protocols prescribed in this HASP, and communicate any relevant experience or observations to the SDHSO or the Project Manager to ensure that these valuable inputs improve overall safety. Individual project members are the

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key elements in ensuring health and safety compliance. Every project member is considered responsible for implementing and following this HASP.

7.3 SHS PROPERTY SPECIFIC HEALTH AND SAFETY CONCERNS

7.3.1 Airborne Exposure Limits

Table 7-1 lists the published airborne exposure limits for those substances that are known or suspected to be present at the SHS property.

Unknown or unexpected materials of a hazardous nature may be encountered during ground intrusive activities. No work will be conducted if field measurements or observations indicate there is potential uncontrolled exposure to undefined hazards, or that exposures may exceed protection afforded by the requirements in this HASP.

7.3.2 Explosive Gas

Explosive gas, including hydrogen sulfide (H_2S), may be present in the subsurface pore spaces and therefore any major ground intrusive activity must be monitored with a gas unit that measures the Lower Explosive Limit (LEL) in percent and H_2S in parts per million (ppm). Action levels for explosive gas and H_2S are provided in Table 7-2. If the measured LEL and H_2S levels are between 10-20% and 5-10 ppm, respectively, and the SHS building is occupied, work will halt and the area will be allowed to ventilate until levels are less than 10% LEL and 5 ppm H_2S. If LEL and H_2S levels are between 10-20% and 5-10 ppm, respectively, and the SHS building is unoccupied, a warning will be issued and work will continue with continuous monitoring.

7.3.3 Personal Protective Equipment (PPE)

Table 7-2 provides a summary of potential airborne hazards that may be encountered by workers during ground intrusive and construction activities, action levels and corresponding required actions and the PPE level required for workers. Specific types of PPE for levels C and D are also listed on Table 7-2.

No work is anticipated requiring Level B or A PPE and very limited work in Level C. If air monitoring results require PPE upgrades from Level D, then only medically qualified, trained personnel experienced in the use and limitations of air purifying or supplied air respirators will be used. Air purifying respirators with High-Efficiency Particulate Air (HEPA) filters, capable of removing particles of 0.3 micron or larger from air at 99.97% or greater efficiency, should be used when exposure to dust is a potential risk.

Unless the SDHSO directs otherwise, respirators used for organic vapors or particulates should have cartridges changed after eight (8) hours of use, or at the end of each shift, or when any indication of breakthrough or excessive resistance to breathing is detected. OSHA regulations require a Respiratory Protection Program for companies that require employees to enter areas where respirators are required and such Respiratory Protection Programs must address the requirements for replacement of cartridges.

7.3.4 Suspected Safety Hazards

Suspected safety hazards include those inherent with the operation of heavy equipment such as drill rigs or excavators, and proximity to excavations. Inspections to ensure appropriate safety measures are in place and the use of lockout and tagout procedures during maintenance of this equipment will control these inherent hazards. Personal protective equipment (PPE) including hard hats, safety shoes and eye protection will be worn to augment other safety precautions.

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Drill rigs and excavators must not operate closer than thirty (30) feet to any overhead lines, measured directly between any part of the equipment and the lines themselves except where electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work, or where insulating barriers have been erected to prevent physical contact with the lines. If drilling or excavating is required within thirty (30) feet of any overhead lines, a written work plan must be provided by the contractor or other equipment operator that includes special measures designed to mitigate the risks and is in accordance with 29 CFR 1926.550(a)(15). The work plan must be reviewed and approved by written signature by the SDHSO.

Care must be taken to ensure loose clothing does not get tangled in any moving equipment associated with drill rigs or excavators.

There may be slip or trip hazards associated with rough, slippery or elevated work surfaces.

There is also the possibility of organic vapors being encountered during ground intrusive activities due to the presence of petroleum compound soils and groundwater. The Project Manager or SDHSO will use continuous monitoring instruments that measure total VOCs while each task is being conducted to determine ambient levels of contaminants. Procedures for monitoring VOCs and airborne particulates are provided in Section 8.0.

All excavations will be maintained to prevent access by unauthorized persons and will be filled or fenced off by the end of the workday. Absolutely no one will be permitted in the excavations, except the operator of equipment where the operator is always located above ground level. If equipment breaks down within the excavation, the equipment will have to be towed out of the excavation for repair. All subsurface samples will be obtained by operation of the excavating equipment and will be collected from the excavator bucket.

7.3.5 Excavator and Drill Rig Operations

Excavations will be performed with a track-mounted excavator or backhoe. To conduct soil borings, a hollow-stem auger or direct push drill rig will be used. Working with or near this equipment poses potential hazards, including being struck by or pinched/caught by equipment, potentially resulting in serious physical bodily harm.

In particular, the following precautions will be used to reduce the potential for injuries and accidents:

- The inspection of excavator and drill rig brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be conducted prior to the initial mobilization and checked routinely throughout the project.

- Excavator and drill rig cabs will be kept free of all nonessential items and all loose items will be secured.

- Excavators and drill rigs will be provided with necessary safety equipment, including seat belts.

- Drill rig cables and auger flight connections will be inspected for evidence of wear. Frayed or broken cables or defective connections will be replaced immediately.

- Parking brakes will be set before shutting off any heavy equipment or vehicle.

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All employees will be briefed on the potential hazards prior to the start of each excavation or drilling project.

7.3.6 Adverse Weather

Drilling or excavating is dangerous during electrical storms. All field activity must terminate during thunderstorms. Extreme heat and cold, ice and heavy rain can produce unsafe conditions for drilling work. Such conditions, when present, will be evaluated on a case-by-case basis to determine if work shall terminate.

7.3.7 Fire and Explosion

Use of gasoline or diesel powered equipment increases the risk of fire and explosion hazards. Contractors will be required to store diesel fuel and gasoline in metal cans with self-closing lids and flash arrestors.

7.3.8 Requirement to Conduct Utility Mark Out

Prior to the start of any subsurface work, underground utilities and piping that may pose a potential hazard will be identified and located. DigSafely.NewYork or equivalent service will be contacted and underground utilities will be located and marked. Also, the location of privately owned utility lines will be determined.

In the event a pipe or line is struck, work will stop and the Emergency Action Plan (see Section 7.5) will be implemented.

7.3.9 Confined Space Entry

Confined space entry is not anticipated for excavating and sampling activities. If a project requires confined space entry, a specific HASP will be implemented.

"Confined Space" is defined as a space that:

1) is large enough and so configured that an employee can bodily enter and perform assigned work;
2) has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
3) is not designed for continuous employee occupancy.

7.3.10 Excavation and Sampling Work Zones

One of the basic elements of an effective HASP is the delineation of work zones for each ground intrusive location. The purpose of establishing work zones is to:

- Reduce the accidental spread of hazardous substances by workers or equipment from the contaminated areas to the clean areas;
- Confine work activities to the appropriate areas, thereby minimizing the likelihood of accidental exposures;
- Facilitate the location and evacuation of personnel in case of an emergency; and
- Prevent unauthorized personnel from entering controlled areas.

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Although a work site may be divided into as many zones as necessary to ensure minimal employee exposure to hazardous substances, this HASP uses the three (3) most frequently identified zones: the Exclusion Zone, Decontamination Zone, and Support Zone. Movement of personnel and equipment between these zones should be minimized and restricted to specific access control points to minimize the spreading of contamination.

- **Exclusion Zone**

  During investigative work, the Exclusion Zone is the immediate excavation, test pit, borehole, or other area where contamination is either known or expected to occur and where the greatest potential for exposure exists. The following protective measures will be taken in the Exclusion Zone.

  Unprotected onlookers will be restricted from the excavation location so that they are at least twenty-five (25) feet upwind or fifty (50) feet downwind of excavation or drilling activities.

  Workers conducting activities and sampling in the Exclusion Zone will wear the applicable PPE. The actions to be taken and PPE to be worn in the Exclusion Zone if VOCs are above background levels are described in Table 7-2.

- **Decontamination Zone**

  During investigative work, a Decontamination Zone will be established at the perimeter of the Exclusion Zone, and will include the personnel, equipment and supplies that are needed to decontaminate equipment. The size will be selected by the SDHSO or Project Manager to conduct the necessary decontamination activities. Personnel and equipment in the Exclusion Zone must pass through this zone before leaving or entering the Support Zone. The necessary decontamination must be completed in this zone and the requirements are described in Section 7.6.1 and Appendix 7B. This zone should always be established and maintained upwind of the Exclusion Zone.

- **Support Zone**

  During investigative work, the areas located beyond the Decontamination Zone will be considered the Support Zone. Break areas, operational direction and support facilities will be located in this area. Eating and drinking will be allowed only in the Support Zone.

7.3.11 Natural Hazards

Work that takes place in the natural environment may be affected by plants and animals known to be hazardous to humans. Spiders, bees, wasps, hornets, ticks, poison oak and poison ivy are only some of the hazards that may be encountered. Individuals who may potentially be exposed to these hazards should be made aware of their existence and instructed in their identification. Emergencies resulting from contact with a natural hazard should be handled through the normal medical emergency channels. Individuals who are sensitive or allergic to these types of natural hazards should indicate their susceptibility to the SDHSO.

7.3.12 Heat and Cold Stress Hazards

If work is to be conducted during the winter, cold stress is a concern to the health and safety of personnel. Because disposal clothing such as Tyvek does not "breathe", perspiration does not evaporate and the suits

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can become wet. Wet clothes combined with cold temperatures can lead to hypothermia. If the air temperature is less than 40 degrees Fahrenheit (°F) and a worker's clothes become wet due to perspiration, the worker must change to dry clothes.

Signs and Symptoms of Cold Stress

- **Incipient frostbite:** is a mild form of cold stress characterized by sudden blanching or whitening of the skin.

- **Chilblain:** is an inflammation of the hands and feet caused by exposure to cold moisture. It is characterized by a reoccurring localized itching, swelling, and painful inflammation of the fingers, toes, or ears. Such a sequence produces severe spasms, accompanied by pain.

- **Second-degree frostbite** is manifested by skin which has a white, waxy appearance and is firm to the touch. Individuals with this condition are generally not aware of its seriousness, because the underlying nerves are frozen and unable to transmit signals to warm the body. Immediate first aid and medical treatment are required.

- **Third-degree frostbite** will appear as blue, blotchy skin. This tissue is cold, pale and solid. Immediate medical attention is required.

- **Hypothermia** develops when body temperature falls below a critical level. In extreme cases, cardiac failure and death may occur. Immediate medical attention is warranted when the following symptoms are observed:

  - Involuntary shivering;
  - Irrational behavior;
  - Slurred speech;
  - Sluggishness; and
  - Loss of consciousness.

Preventing Cold Related Illness/Injury

- Train personnel to identify the signs and symptoms of cold stress. Require field personnel to wear proper clothing for cold, wet and windy conditions, including layers that can be adjusted to changing weather conditions. It is important to keep hands and feet dry.

- Field personnel working in extremely cold conditions must take frequent short breaks in warm, dry shelters to allow their body temperature to increase. If possible, field work should be scheduled during the warmest part of the day. The buddy system should be used so that personnel can assist each other in recognizing signs of cold stress.

- Drink warm, sweet beverages and avoid drinks with caffeine and alcohol. Eat warm, high-calorie foods.

- Personnel with medical conditions such as diabetes, hypertension or cardiovascular disease or who take certain medications, may be at increased risk for cold stress.

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Treatment of Cold Related Injuries

If cold stress symptoms are evident, the affected person must move into a warm, dry sheltered area and all wet clothing should be removed and replaced with dry clothing. If frostbite is suspected, the affected person should be treated by trained medical personnel.

Signs and Symptoms of Heat Stress

Wearing PPE also puts a worker at a considerable risk for developing heat stress. This can result in health effects ranging from heat fatigue to serious illness or death. Consequently, regular monitoring, remaining hydrated and other precautions are vital.

- **Heat Rash** may result from continuous exposure to heat and humid air.

- **Heat Cramps** are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

  - Muscle spasms; and
  - Pain in the hands, feet and abdomen.

- **Heat Exhaustion** occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

  - Pale, cool, and moist skin;
  - Heavy sweating; and
  - Dizziness, fainting, and nausea.

- **Heat Stroke** is the most serious form of heat stress. Temperature regulation fails, and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained. Signs and symptoms are:

  - Red, hot, and unusually dry skin;
  - Lack of or reduced perspiration;
  - Dizziness and confusion;
  - Strong, rapid pulse; and
  - Loss of consciousness.

Preventing Heat Related Illness/Injury

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or heat exhaustion that person may be predisposed to additional heat injuries. To avoid heat stress, the following steps should be taken:

- Have workers drink 16 oz. (0.5 liter) of fluid (preferably water or diluted drinks) before beginning work. Urge workers to drink one to two (1 to 2) cups every fifteen (15) to twenty (20)

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minutes, or at each monitoring break. A total of 1 to 1.6 gallons (four (4) to six (6) liters) of fluid per day are recommended, however more may be necessary to maintain bodyweight.

- If possible, adjust work schedules to avoid the hottest parts of the day.
- Encourage workers to maintain an optimal level of physical fitness.
- Shelter (air-conditioned, if possible) or shaded areas should be provided to protect personnel during rest periods.
- Train workers to recognize, identify, and treat heat stress.

For workers wearing standard work clothes, recommendations for monitoring and work/rest schedules are those approved by American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute of Occupational Safety and Health (NIOSH). Workers wearing semi-permeable PPE or impermeable PPE should be monitored when the temperature in the work area is above 70°F.

7.3.13 Noise Hazards

Work that involves the use of heavy equipment such as a drill rig or excavator can expose workers to noise during field activities that can result in noise-induced hearing loss. The SDHSO or Project Manager will monitor the noise exposure and will determine whether noise protection is warranted for each of the workers. The SDHSO or Project Manager will ensure either ear muffs or disposable foam earplugs are available and are used by the workers in the immediate vicinity of the field operation as required.

7.3.14 Slip, Trip and Fall Hazards

Ground intrusive locations can contain a number of slip, trip and fall hazards for workers, such as:

- Holes, pits, or ditches
- Excavation faces
- Slippery surfaces
- Steep grades
- Uneven grades
- Snow and ice
- Sharp objects

All workers must be instructed to keep back three (3) feet from the top edge of excavation faces.

Drill auger sections will be stored on the transport vehicle as long as possible to avoid creating a trip hazard. Drill auger sections and other tools will be stored in neat arrangements convenient to the driller, however sufficiently distant from the immediate area around the drill rig to minimize trip hazards.

Workers will be instructed to look for potential safety hazards and immediately inform the SDHSO or Project Manager regarding any new hazards. If the hazard cannot be immediately removed, actions must be taken to warn workers about the hazard.

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7.3.15 Modifications to this Plan

Requirements and guidelines in this HASP are subject to modification by the Project Manager or the SDHSO in response to additional information obtained during field work regarding the potential for exposure to hazards.

7.4 MEDICAL SURVEILLANCE PROGRAM

7.4.1 General

Workers who participate in field activities that meet the following criteria will be included in the Medical Surveillance Program:

- All who may be exposed to hazardous substances or health hazards at or above permissible exposure limits, without regard to the use of respirators, for thirty (30) days or more per year, as required by 29 CFR 1926.65(f)(2)(i-iv).
- All who wear a respirator for thirty (30) days or more every year as required by 29 CFR 1926.62(f)(2)(i-iv).
- All who are injured because of overexposure from an incident involving hazardous substances or health hazards.

7.4.2 Frequency of Medical Exams

Medical examinations and consultations will be provided on the following schedule to the workers who meet qualifications outlines in Section 7.4.1:

- Prior to assignment to a work site, if any of the criteria noted in Section 7.4.1 are anticipated.
- At least once every twelve (12) months, unless the physician believes a longer interval (not greater than two (2) years) is appropriate.
- As soon as possible upon notification that a worker has developed signs or symptoms indicating possible overexposure to hazardous materials.

7.5 EMERGENCY ACTION PLAN

Workers will use the following standard emergency procedures. The SDHSO will be notified of any emergency and be responsible for ensuring that the appropriate procedures are followed and the Project Manager is notified. A first aid kit, an eye wash unit that can provide a minimum flow rate of 0.4 GPM for fifteen (15) minutes, and a fire extinguisher rated 20A-B-C (or higher) will be readily available to workers. All workers will be trained in use of emergency supplies. Questions regarding procedures and practices described in the HASP should be directed to the SDHSO.

7.5.1 Notification

Any symptoms of adverse health, regardless of the suspected cause, are to be immediately reported to the SDHSO.

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Upon the occurrence of an emergency, including an unplanned chemical release, fire or explosion, workers will be alerted and the area evacuated immediately. The Project Manager or SDHSO will notify the ambulance service, fire department and/or police department, as required. Emergency contact telephone numbers are provided in Section 7.5.4. Re-entry to the work area will be limited to those required to assist injured workers or for firefighting or spill control. Anyone entering the work area following an emergency incident must wear appropriate protective equipment.

The following alarm systems will be utilized to alert workers to evacuate the restricted area:

- Direct Verbal Communication
- Radio Communication or Equivalent
- Portable or Fixed Telephone

The following standard hand signals will also be used as necessary:

Hand Signal	**Message**
Hand gripping throat	Can't breathe/out of air
Grip co-worker's wrist	Leave area immediately, no debate!
Hands on top of head	Need assistance
Thumbs up	Yes/O.K.
Thumbs down	No/Problem

Upon activation of an alarm, workers will proceed to a designated assembly area. The designated assembly area will be determined on a daily basis by the SDHSO or Project Manager and updated as necessary depending upon work conditions, weather, air monitoring, etc. The location of the designated assembly area will be clearly marked and communicated to employees daily or upon relocation of the area. Workers gathered in the designated assembly area will remain there until their presence has been noted. A tally of workers on the daily restricted area access roster will be made as necessary to ensure all workers have been properly evacuated and accounted for.

Workers may return to the designated work area following authorization by the SDSHO or Project Manager.

7.5.2 Personal Injury

If anyone within a work area is injured and cannot leave the restricted area without assistance, emergency medical services will be notified (see Section 7.5.4) and appropriate first aid will be administered by certified Emergency Medical Technicians (EMTs).

7.5.3 Fire/Explosion

Upon the occurrence of a fire beyond the incipient stage (where SHS property personnel could respond to extinguish), or an explosion anywhere on the SHS property, the fire department will be alerted and all personnel moved to a safe distance from the involved area.

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7.5.4 Emergency Services

Emergency Services	Telephone Number
Owner: Elmira City School District (Superintendent)	607-735-3010
Fire Department	911 or 607-735-8600
Police Department	911 or 607-735-8600
Ambulance	911 or 607-734-5017
St. Joseph's Hospital	607-733-6541
Poison Control Center	800-333-0542
NYSDEC Spills Emergency Response Program	800-457-7362

A map showing the preferred route to the hospital with written directions is presented in Figure 7-1; and written directions are also included on the map.

7.5.5 Equipment Failure

If any equipment fails to operate properly, the Project Manager and/or SDHSO will determine the effect of this failure on continuing operations. If the failure affects the safety of workers (e.g., failure of monitoring equipment) or prevents completion of the planned tasks, all workers will leave the work area until appropriate corrective actions have been taken.

7.5.6 Record Keeping

The SDHSO will maintain records of reports concerning occupational injuries and illnesses in accordance with 29 CFR 1904.

7.6 DECONTAMINATION METHODS

7.6.1 Contamination Prevention Methods

The SDHSO will make all workers aware of the potential for contamination. The following procedures will be established to minimize contact with waste:

- Workers will not walk through areas obvious of contamination;
- Workers will not directly touch potentially hazardous substances;
- Workers will wear gloves when touching soil or waste;
- Workers will wear disposable outer garments where appropriate; and
- Excavated soils will be placed on plastic sheeting and covered with plastic sheeting at the end of the workday.

7.6.2 Decontamination Methods

All workers, clothing, and equipment leaving designated contaminated areas must be decontaminated, as presented in Appendix 7B, Equipment Cleaning and Decontamination Procedures. Decontamination of equipment will be the responsibility of the Project Manager.

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8.0 COMMUNITY AIR MONITORING PLAN (CAMP)

The Community Air Monitoring Plan (CAMP) provides for real-time monitoring of VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when ground-intrusive activities are implemented at the SHS property. The CAMP was developed from the NYSDOH Generic CAMP that is provided in the DER-10 Technical Guidance for Site Investigation and Remediation (December 2002). The CAMP provides a measure of protection for the downwind community (potential receptors include the school community, residences, businesses, and workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The CAMP also addresses ground intrusive activities within twenty (20) feet of a potentially exposed population or occupied structure and for indoor air monitoring activities. Contractors should employ Best Management Practices (BMPs) and common sense measures to minimize VOCs, dust, and odors around work areas.

Table 8-1 provides action levels and corresponding required actions for VOCs and particulate monitoring that include increased monitoring, corrective actions to abate emissions, and/or work shutdown.

8.1 VOLATILE ORGANIC COMPOUND (VOC) MONITORING, RESPONSE LEVELS AND ACTIONS

Real time air monitoring for VOCs and/or particulate levels is required at the perimeter of the Exclusion Zone.

Periodic monitoring for VOCs will be required during minor ground intrusive (< 20 cubic yards) or non-intrusive activities, such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic VOC monitoring of the breathing space area during a sample collection event will occur upon arrival at a sample location, while opening a well cap or overturning soil, during well baling/purging, and prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring will be required during sampling activities. Examples of such situations include groundwater sampling adjacent to or within twenty (20) feet of structures.

Continuous monitoring for VOCs and particulates will be required for all major ground intrusive activities (> 20 cubic yards) of excavated soil and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, however are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

VOCs will be monitored at the downwind perimeter of the immediate work area on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring equipment must be appropriate to measure the types of contaminants known or suspected to be present. The equipment must be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment must be capable of calculating fifteen (15) minute running average concentrations, which will be compared to the following levels:

- If the ambient air concentration of total VOCs at the downwind perimeter of the work area exceeds five (5) ppm above the determined background level for the fifteen (15) minute average, work activities must be temporarily halted and monitoring continued. If the total VOC level decreases rapidly to less than five (5) ppm over background, work activities can resume with continued monitoring.

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- If total VOC levels at the downwind perimeter of the work area persist at levels in excess of five (5) ppm over background however less than twenty-five (25) ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided the total organic vapor level 200 feet downwind of the Exclusion Zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - however in no case less than twenty (20) feet, is below five (5) ppm over background for the fifteen (15) minute average.

- If the organic vapor level is above twenty-five (25) ppm at the perimeter of the Exclusion Zone, activities must be halted.

- All fifteen (15) minute readings must be recorded and should be available for review by the NYSDOH, NYSDEC and Chemung County Health Department, if requested. Instantaneous readings, if any, used for decision purposes should also be recorded.

8.2 PARTICULATE MONITORING, RESPONSE LEVELS AND ACTIONS

Periodic monitoring for particulates will be required during minor ground intrusive activities (< 20 cubic yards) and will include monitoring the breathing space for workers and at the downwind perimeter of the designated work area. Continuous monitoring will be required during sampling activities if ground intrusive activities occur within twenty (20) feet of a structure or if they are in the proximity of individuals potentially exposed.

Particulate concentrations must be monitored continuously for all major ground intrusive activities (> 20 cy) at the upwind and downwind perimeters of the work area at temporary particulate monitoring stations. The particulate monitoring must use real time monitoring equipment capable of measuring particulate matter that are less than ten (10) micrometers in size (PM-10) and is capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m^3) greater than background (upwind perimeter) for the fifteen (15) minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with the implemented dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area. See Section 2.5.8 of the SMP for a description of dust suppression techniques.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 ug/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m^3 of the upwind level and in preventing visible dust migration.

- All readings must be recorded and be available for review by the NYSDOH, NYSDEC and Chemung County Health Department, if requested.

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8.3 INDOOR WORK REQUIREMENTS

Unless a self-contained, negative pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must vacate the room in which the work will occur. When work areas are within twenty (20) feet of potentially exposed populations or occupied rooms, the continuous monitoring locations for VOCs and particulates will be based on the nearest potentially exposed individuals and the location of ventilation system intakes for adjacent occupied rooms.

Additionally, the location of all exhaust vents in the room and the associated discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, will be identified and the air monitoring locations established accordingly. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices will be used to create negative air pressure within the work area during remedial activities which will prevent exposures related to the work activities and to control dust and odors. Consideration will be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends, school vacations or evening hours.

- If total VOC readings exceed one (1) ppm at locations that are next to the walls of occupied rooms or next to intake vents, monitoring will also occur within the adjacent occupied room(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels and response actions. Background readings in the occupied rooms must be measured prior to commencement of the planned work. Any background readings that are greater than one (1) ppm should be discussed with the NYSDEC and NYSDOH prior to commencement of the work.

- If total particulate readings exceed 150 ug/m^3 next to the walls of adjacent occupied room(s) or next to intake vents, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 ug/m^3 or less at the monitoring point. Particulate response levels and actions should be predetermined.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored.

8.4 GENERAL RECOMMENDATIONS FOR WORK AREAS WITHIN 20 FEET OF POTENTIALLY EXPOSED POPULATIONS OR OCCUPIED STRUCTURES

When work areas are within twenty (20) feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must be based on the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices will be considered to prevent exposures related to the work activities and to control dust and odors. Consideration will be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends, school vacations or evening hours.

- If total VOC readings exceed one (1) ppm at locations that are next to the walls of occupied rooms or next to intake vents, monitoring will also occur within the adjacent occupied room(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient

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sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels and response actions. Background readings in the occupied rooms must be measured prior to commencement of the planned work. Any background readings that are greater than one (1) ppm should be discussed with the NYSDEC and NYSDOH prior to commencement of the work.

- If total particulate readings exceed 150 ug/m^3 next to the walls of adjacent occupied room(s) or next to intake vents, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 ug/m^3 or less at the monitoring point. Particulate response levels and actions should be pre-determined.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored.

28014/Environmental Management Plan Text.doc

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FIGURES

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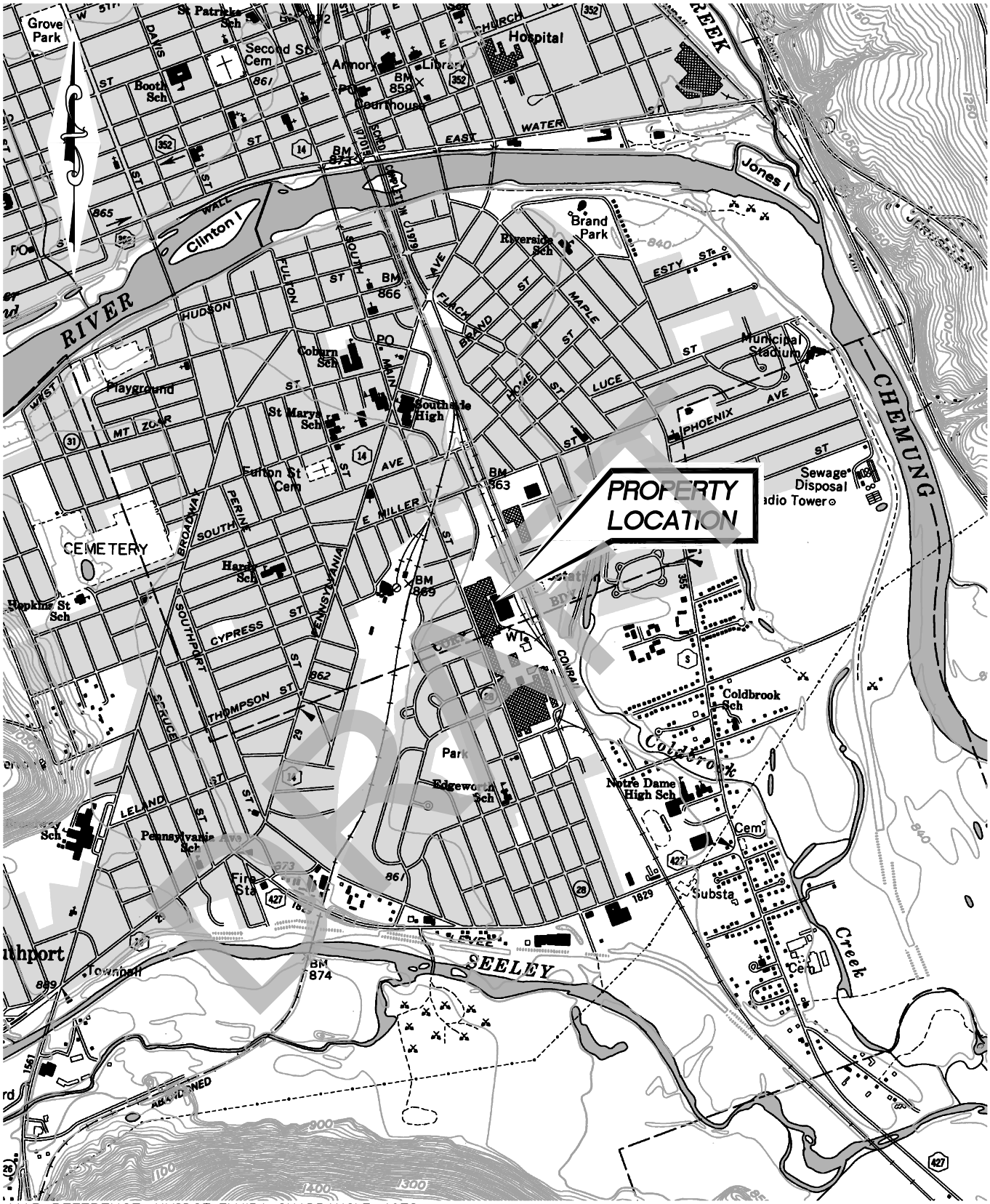

MAP REFERENCE: NYSDOT ELMIRA QUADRANGLE, 1978.

FIGURE 1-1

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PROPERTY LOCATION MAP
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET

CITY OF ELMIRA — CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	6–13–08	SCALE:	1" = 2000'	DWG. NO.	28014001	FIGURE	1–1

FIGURE 1-2

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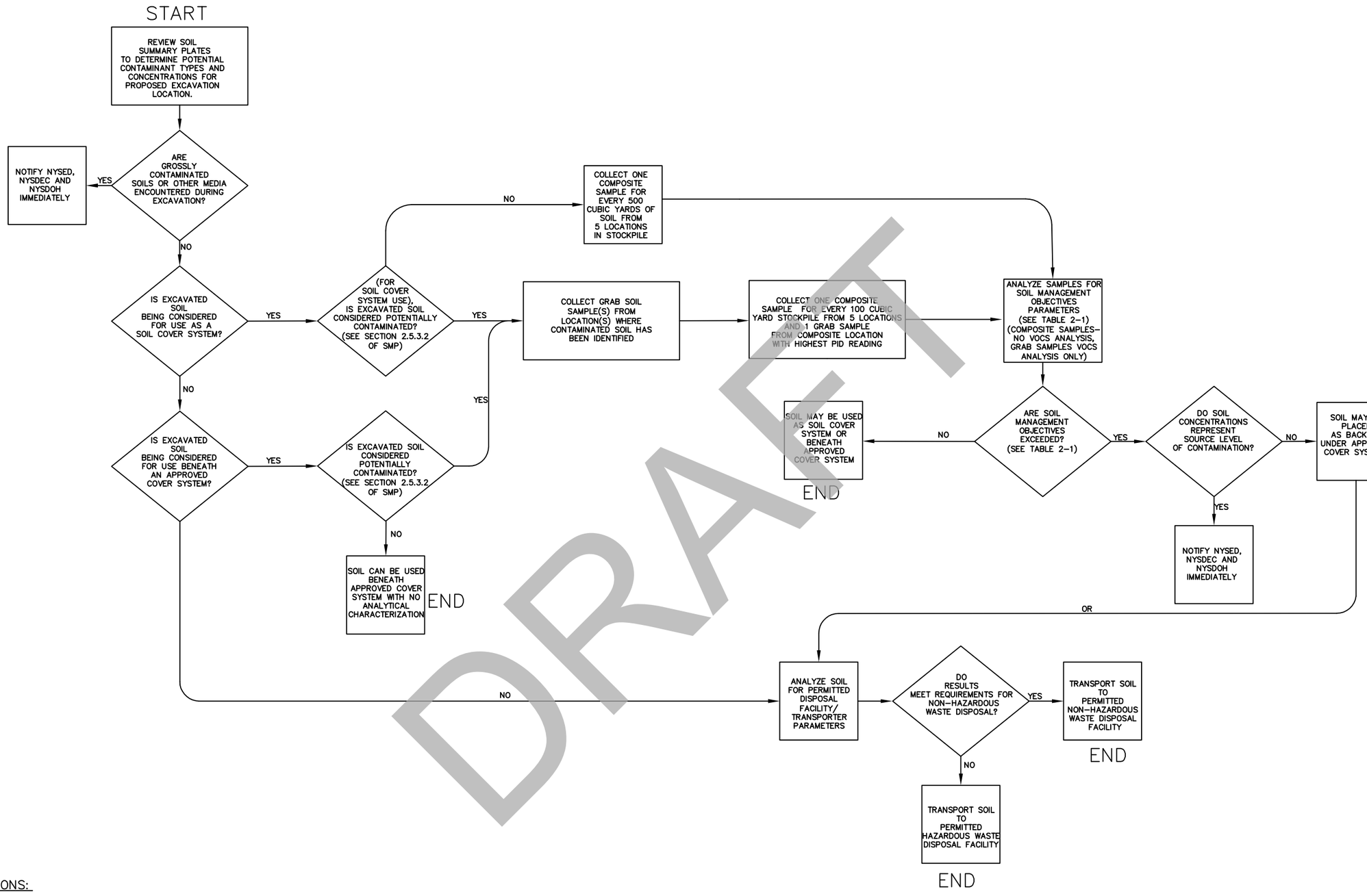
PROPERTY FEATURES

ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET

CITY OF ELMIRA — CHEMUNG CO., N.Y.

PROJ. No.:	DATE:	SCALE:	DWG. NO.	FIGURE
28014	2-11-09	1"=400'	28014005	1-2



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DEFINITIONS:

APPROVED COVER SYSTEMS: 1) 2 FT. LAYER OF SOIL THAT DOES NOT EXCEED SOIL MANAGEMENT OBJECTIVES (SEE TABLE 2A)
2) 6" ASPHALT+CLEAN SUB-BASE MATERIAL LAYER
3) 6" CONCRETE+CLEAN SUB-BASE MATERIAL LAYER

SOURCE LEVEL OF CONTAMINATION-CONCENTRATION OF A CONTAMINANT IN A MEDIUM THAT IS SUFFICIENT TO MIGRATE IN THE MEDIUM OR TO RELEASE SIGNIFICANT LEVELS OF THE CONTAMINANT TO ANOTHER ENVIRONMENTAL MEDIUM, WHICH COULD RESULT IN A POTENTIAL EXPOSURE TO PUBLIC HEALTH OR THE ENVIRONMENT. (FROM NYCRR 375-1.2(AU))

FIGURE 2-1

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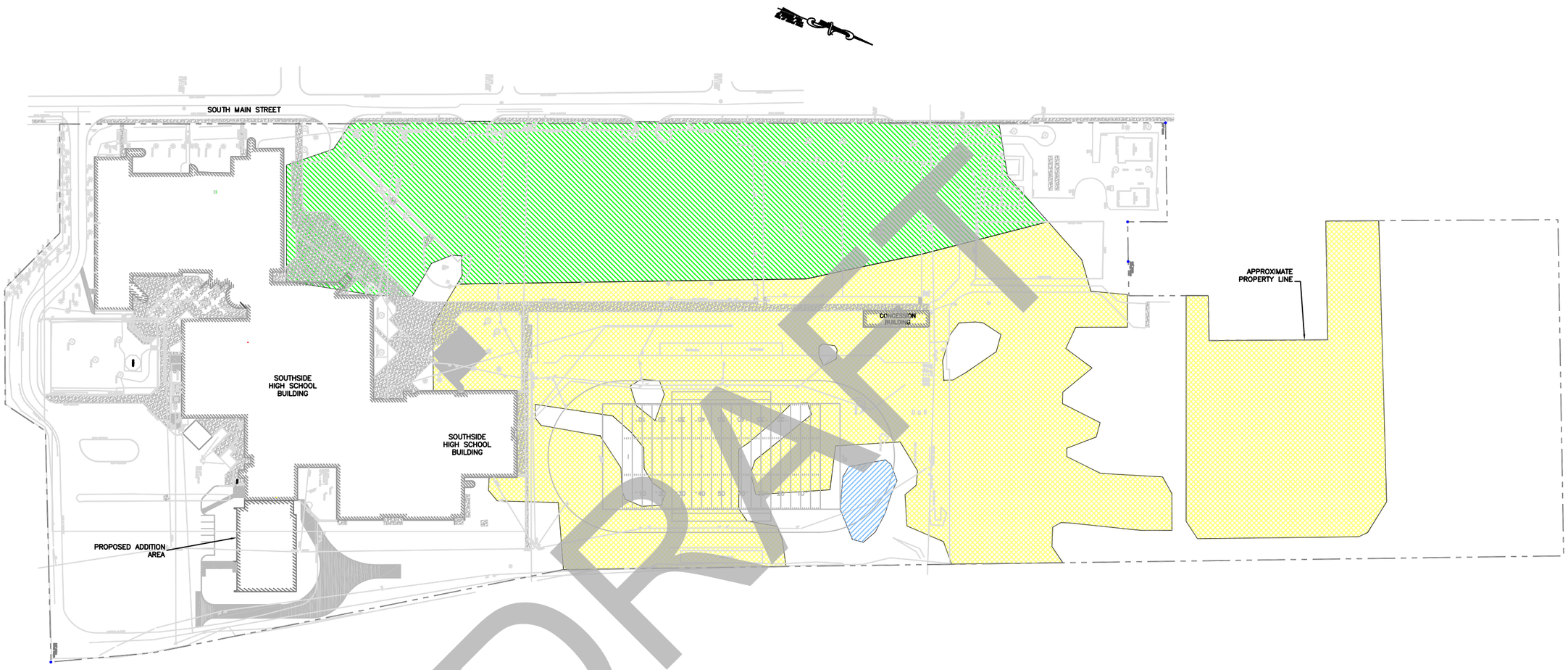
CHARACTERIZATION FLOWCHART FOR EXCAVATED SOILS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	1-8-09	SCALE:		DWG. NO.	28014039	FIGURE	2-1



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NOTES:

SOIL BORING LOCATIONS, DETECTED VOLATILE ORGANIC COMPOUNDS (VOCs) AND SEMI–VOLATILE ORGANIC COMPOUNDS PARAMETERS AND REPORTED CONCENTRATIONS ARE ON PLATE 2A

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. ENTITLED: "ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL", DATED FEBRUARY 12, 2008.

REFERENCES FOR VOCS AND SVOCS SUMMARY TABLES:

SOIL CHARACTERIZATION REPORT
STERLING ENVIRONMENTAL ENGINEERING, P.C.
JULY 14, 2008

JULY 2007 SOIL INVESTIGATION FOR 9,600 S.F. BUILDING ADDITION AND MECHANICAL EQUIPMENT PADS AT SOUTHSIDE HIGH SCHOOL
CME ASSOCIATES, INC.
AUGUST 28, 2007

IRWA REPORT ON GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH 2004

MAY–OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER 2001

KEY:

- POTENTIAL SVOCs MANAGEMENT AREA
- POTENTIAL VOCs MANAGEMENT AREA
- AREA THAT MEETS SOIL MANAGEMENT OBJECTIVES
- DATA GAP AREA

FIGURE 2-2

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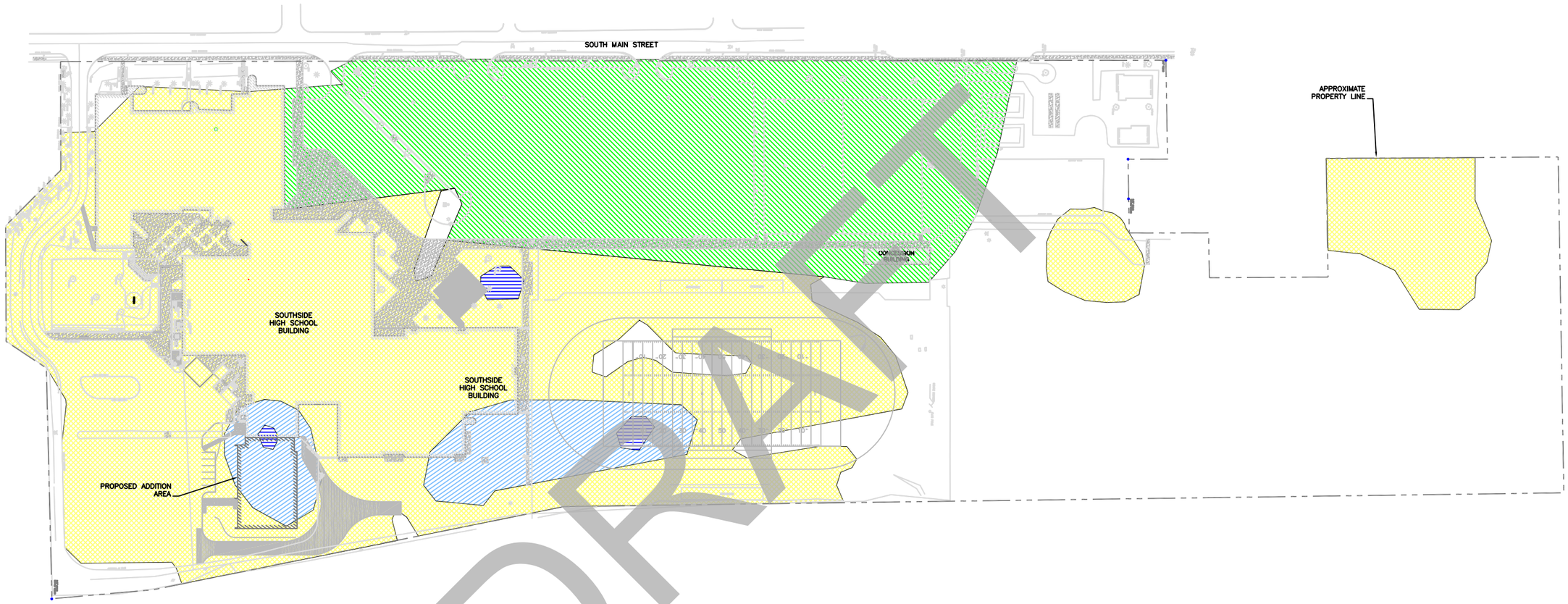
SUMMARY OF VOLATILE ORGANIC COMPOUNDS (VOCS) AND SEMI–VOLATILE COMPOUNDS (SVOCS) REPORTED FOR SOILS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	12–3–08	SCALE:	1"=2000'	DWG. NO.	28014038	FIGURE	2–2



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NOTES:

SOIL BORING LOCATIONS, DETECTED POLYCHLORINATED BIPHENYLS PARAMETERS AND REPORTED CONCENTRATIONS ARE PROVIDED ON PLATE 2B

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. ENTITLED: "ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL", DATED FEBRUARY 12, 2008.

REFERENCES FOR PCBs SUMMARY TABLES:

SOIL CHARACTERIZATION REPORT
STERLING ENVIRONMENTAL ENGINEERING, P.C.
JULY 14, 2008

JULY 2007 SOIL INVESTIGATION FOR 9600 S.F. BUILDING ADDITION AND MECHANICAL EQUIPMENT PADS AT SOUTHSIDE HIGH SCHOOL
CME ASSOCIATES, INC.
AUGUST 28, 2007

MAY–OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER 2001

KEY:

- POTENTIAL PCBs MANAGEMENT AREA >50,000 ug/Kg
- POTENTIAL PCBs MANAGEMENT AREA 10,000–50,000 ug/Kg
- POTENTIAL PCBs MANAGEMENT AREA 1,000–10,000 ug/Kg
- AREA THAT MEETS SOIL MANAGEMENT OBJECTIVES
- DATA GAP AREA

FIGURE 2-3

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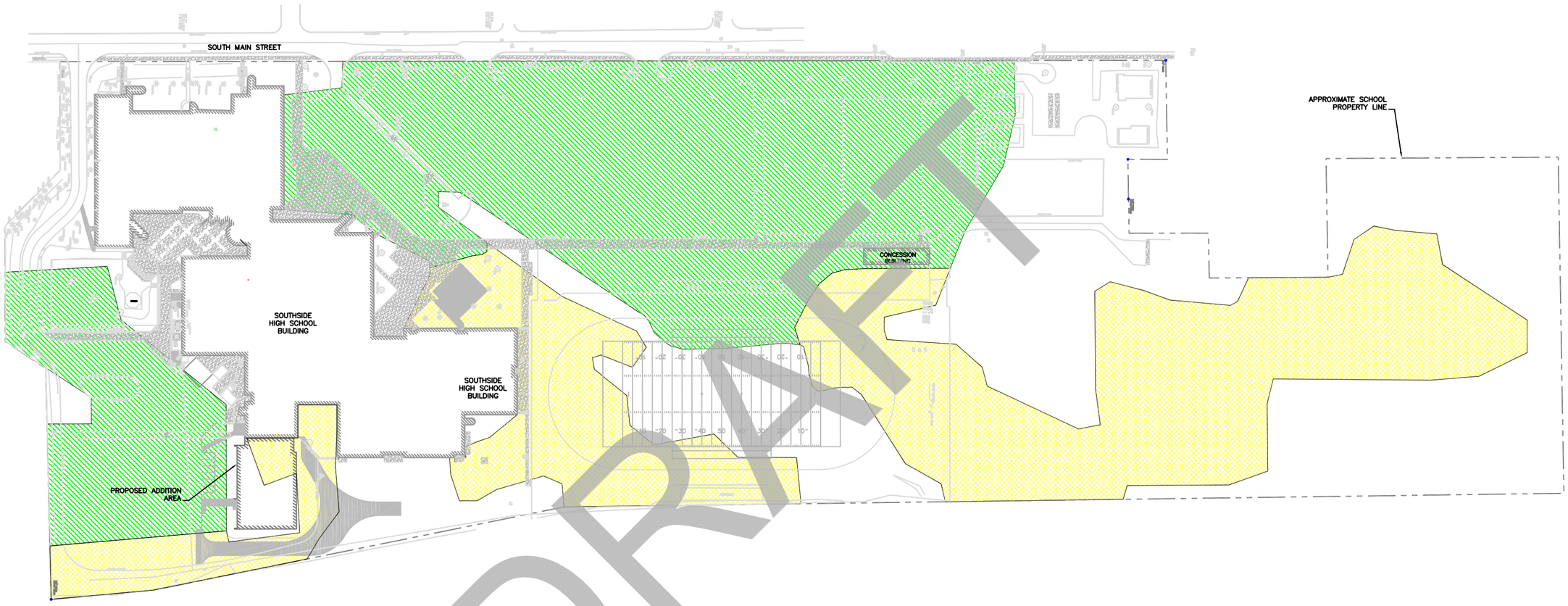
SUMMARY OF POLYCHLORINATED BIPHENYLS (PCBs) REPORTED FOR SOILS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	12–3–08	SCALE:	1"=2000'	DWG. NO.	28014037	FIGURE	2–3



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NOTES:

SOIL BORING LOCATIONS, DETECTED METAL PARAMETERS AND REPORTED CONCENTRATIONS ARE PROVIDED ON PLATE 2C

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. ENTITLED: "ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL", DATED FEBRUARY 12, 2008.

REFERENCES FOR METALS SUMMARY TABLES:

SOIL CHARACTERIZATION REPORT
STERLING ENVIRONMENTAL ENGINEERING, P.C.
JULY, 14 2008

JULY 2007 SOIL INVESTIGATION FOR 9,600 S.F. BUILDING ADDITION AND MECHANICAL EQUIPMENT PADS AT SOUTHSIDE HIGH SCHOOL
CME ASSOCIATES, INC.
AUGUST 28, 2007

GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH, 2004

MAY–OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER, 2001

SUBSURFACE ENVIRONMENTAL ASSESSMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

KEY:

- POTENTIAL METALS MANAGEMENT AREA
- AREA THAT MEETS SOIL MANAGEMENT OBJECTIVES
- DATA GAP AREA

FIGURE 2-4

STERLING
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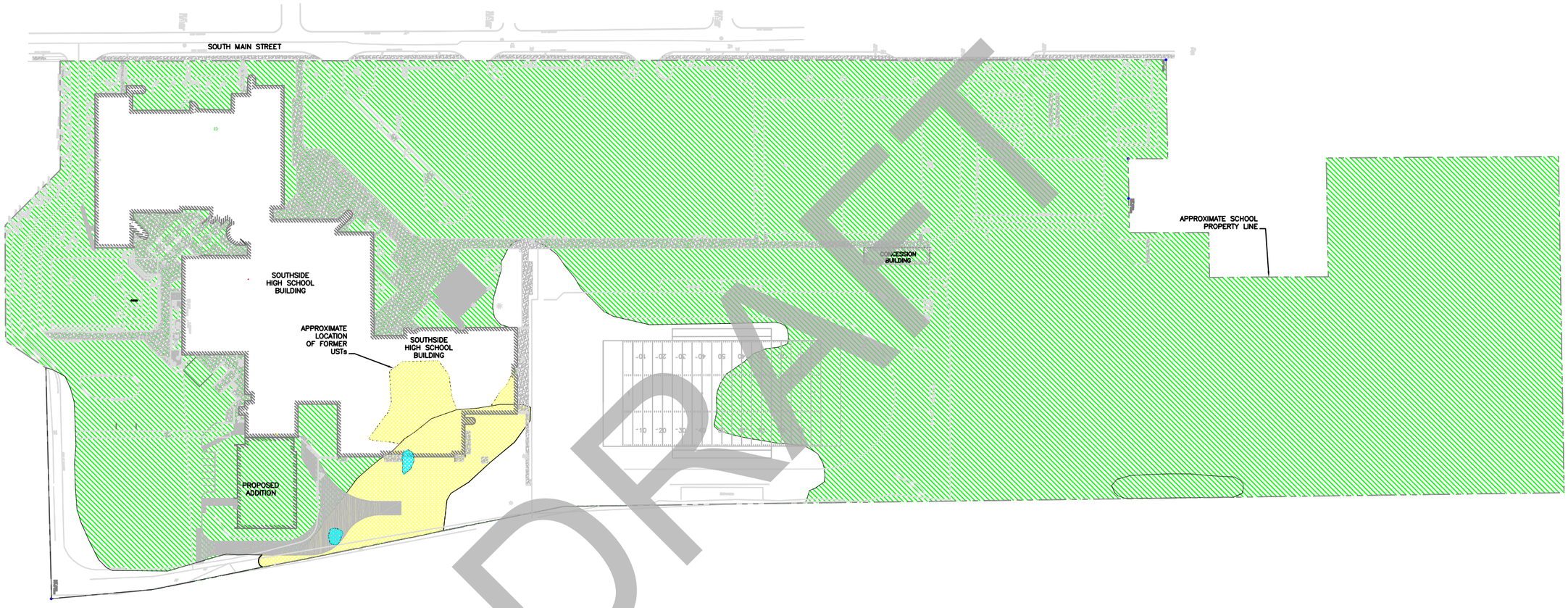
SUMMARY OF METALS REPORTED FOR SOILS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	12–3–08	SCALE:	1"=2000'	DWG. NO.	28014036	FIGURE	2–4



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NOTES:

MONITORING WELL LOCATIONS, DETECTED VOLATILE ORGANIC COMPOUNDS (VOCs) AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) PARAMETERS AND REPORTED CONCENTRATIONS ARE PROVIDED ON PLATE 3A

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC., ENTITLED: ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL, DATED FEBRUARY 12, 2008.

REFERENCES FOR GROUNDWATER DATA SUMMARY TABLES:

GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH 2004

SITE REMEDIAL DATA, NOVEMBER 16, 2001 THROUGH JUNE 2002
NYSDEC MILLER'S POND/SOUTHSIDE HIGH SCHOOL
MARCOR ENVIRONMENTAL
JULY 22, 2002

MAY-OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER 2001

SUBSURFACE ENVIRONMENTAL ASSESSMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

KEY:

- POTENTIAL MANAGEMENT AREA FOR VOCs
- POTENTIAL MANAGEMENT AREA FOR SVOCs
- AREA THE MEETS GROUNDWATER MANAGEMENT OBJECTIVES
- DATA GAP AREA

FIGURE 3-1

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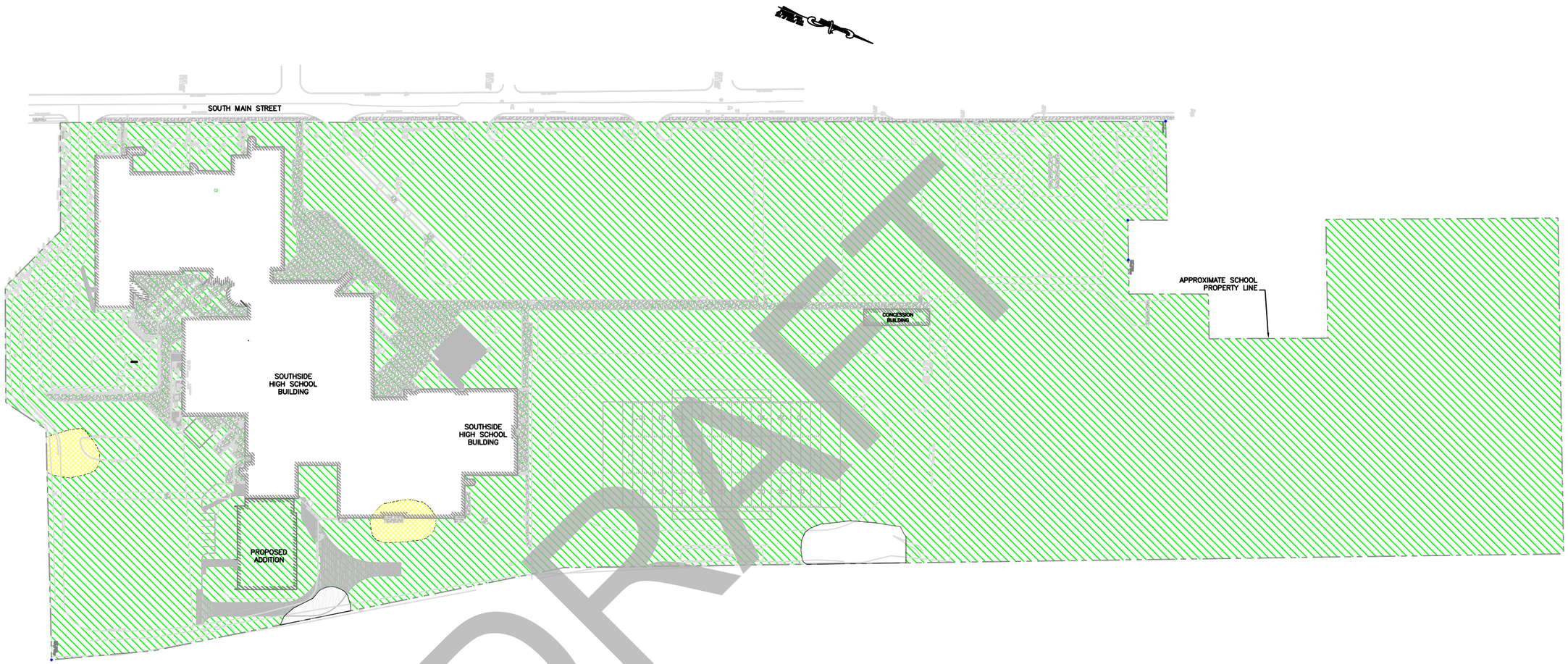
SUMMARY OF VOLATILE ORGANIC COMPOUNDS (VOCs) AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) REPORTED FOR GROUNDWATER

ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	12-3-08	SCALE:	1"=2000'	DWG. NO.	28014035	FIGURE	3-1



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NOTES:

MONITORING WELL LOCATIONS, DETECTED METALS AND POLYCHLORINATED BIPHENYLS (PCBS) PARAMETERS AND REPORTED CONCENTRATIONS ARE PROVIDED ON PLATE 3B

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC., ENTITLED: ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL, DATED FEBRUARY 12, 2008.

REFERENCES FOR METALS AND PCBS SUMMARY TABLES:

IIWA REPORT ON GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH, 2004

MAY–OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER, 2001

SUBSURFACE ENVIRONMENTAL ASSESSMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

KEY:

- POTENTIAL MANAGEMENT AREA FOR METALS
- AREA THAT MEET GROUNDWATER MANAGEMENT OBJECTIVES
- DATA GAP AREA

FIGURE 3-2

STERLING
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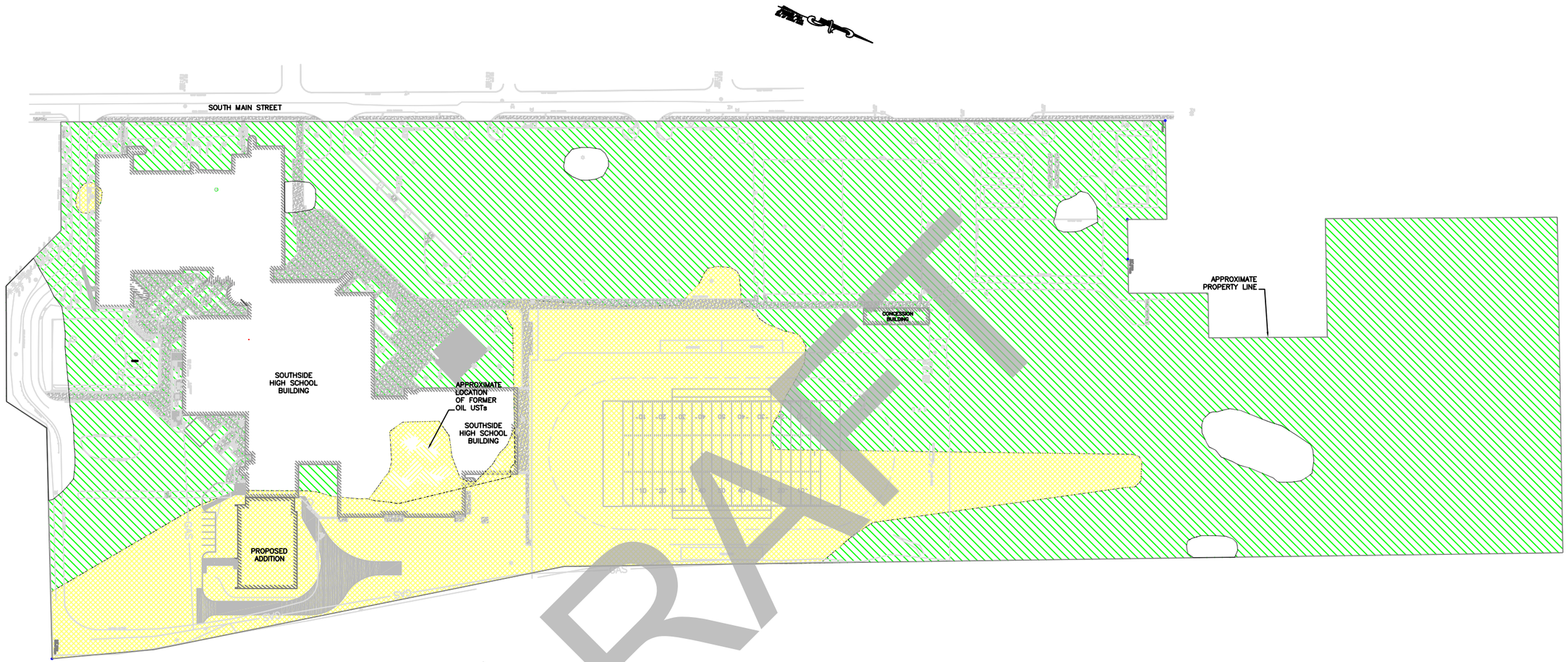
SUMMARY OF METALS AND POLYCHLORINATED BIPHENYLS (PCBS) REPORTED FOR GROUNDWATER
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	12–3–08	SCALE:	1"=2000'	DWG. NO.	28014034	FIGURE	3–2



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NOTES:

MONITORING WELL LOCATIONS, DETECTED PETROLEUM PARAMETERS AND REPORTED CONCENTRATIONS ARE PROVIDED ON PLATE 3C

USTs–UNDERGROUND STORAGE TANKS

REFERENCES FOR PETROLEUM COMPOUNDS SUMMARY TABLES:

SITE REMEDIAL, DATA, NOVEMBER 16, 2001 THROUGH JUNE 2002
NYSDEC MILLER'S POND/SOUTHSIDE HIGH SCHOOL
MARCOR ENVIRONMENTAL
JULY 22, 2002

SUBSURFACE ENVIRONMENTAL ASSESSEMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

KEY:

- POTENTIAL MANAGEMENT AREA FOR PETROLEUM COMPOUNDS
- AREA OF REPORTED NON–DETECTABLE LEVELS FOR PETROLEUM COMPOUNDS
- DATA GAP AREA

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC., ENTITLED: ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL, DATED FEBRUARY 12, 2008.

LOCATION OF FORMER USTs IS SHOWN ON THE 1931 SANBORN FIRE INSURANCE MAP, PROVIDED IN MATRIX ENVIRONMENTAL TECHNOLOGIES REPORT, NOVEMBER 9, 1998

FIGURE 3-3

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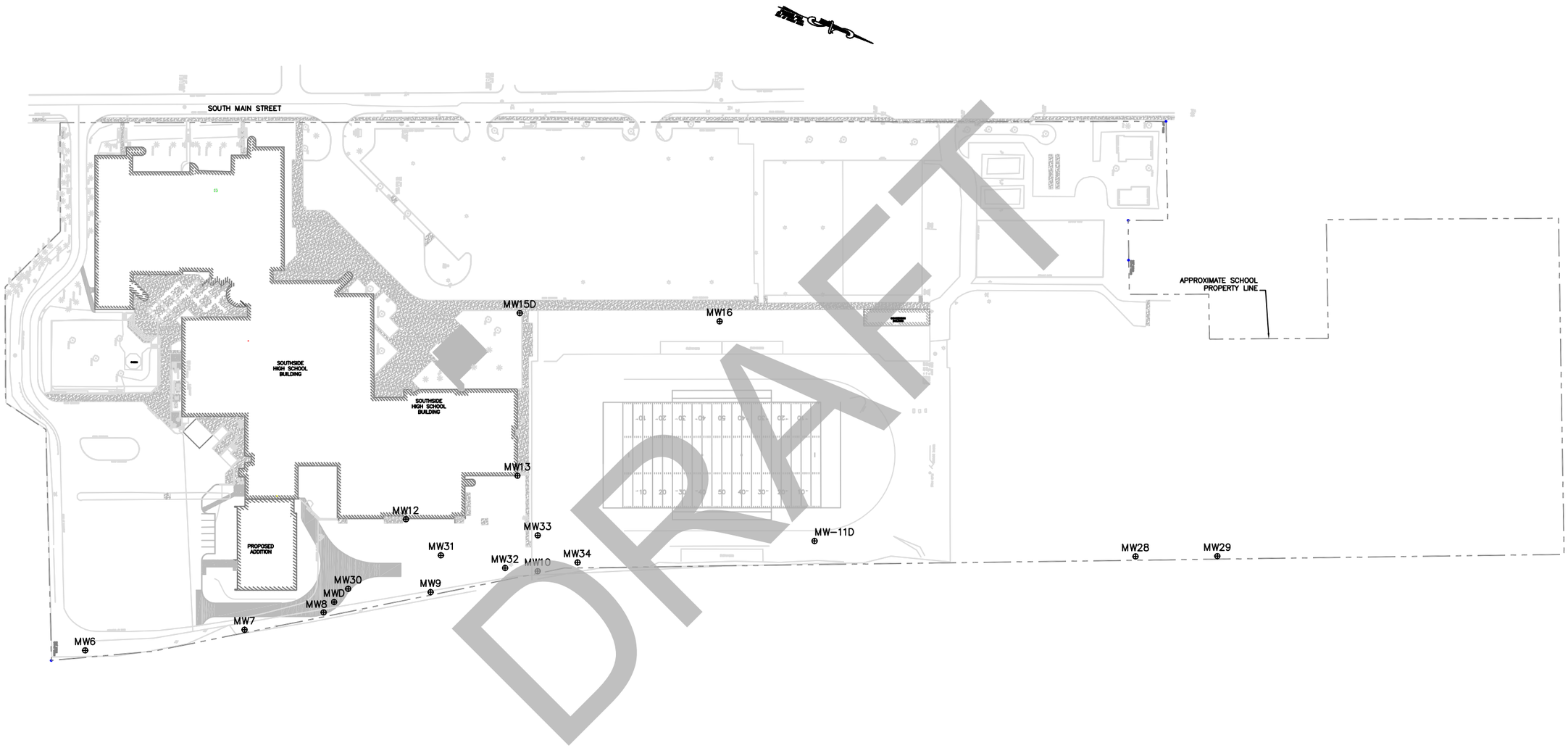
SUMMARY OF PETROLEUM COMPOUNDS REPORTED FOR GROUNDWATER
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	12–3–08	SCALE:	1"=2000'	DWG. NO.	28014033	FIGURE	3–3



DRAFT

FIGURE 3-4

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS,
ENGINEERS AND SURVEYORS, LLC.,ENTITLED:
ADDITION AND RENOVATIONS
TO SOUTHSIDE HIGH SCHOOL, DATED FEBRUARY 12, 2008.

LEGEND:

MW-# ⊕ MONITORING WELL LOCATION

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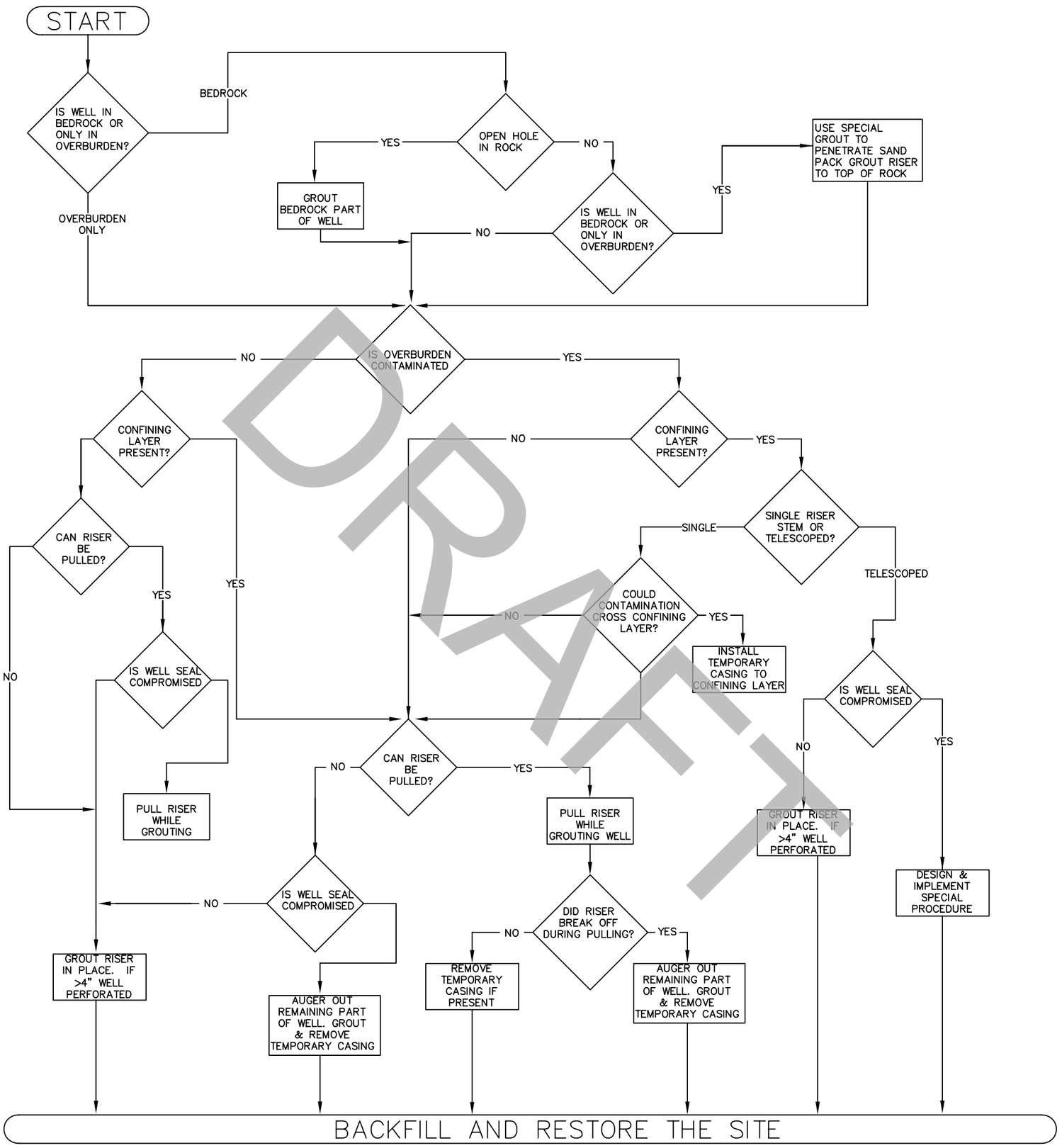
GROUNDWATER MONTORING
WELL LOCATIONS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	12-3-08	SCALE:	1"=2000'	DWG. NO.	28014040	FIGURE	3-4



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REFERENCE:

GROUNDWATER MONITORING WELL DECOMMISSIONING PROCEDURES, NYSDEC DIVISION OF ENVIRONMENTAL REMEDIATION, JUNE 2008.

FIGURE 3-5

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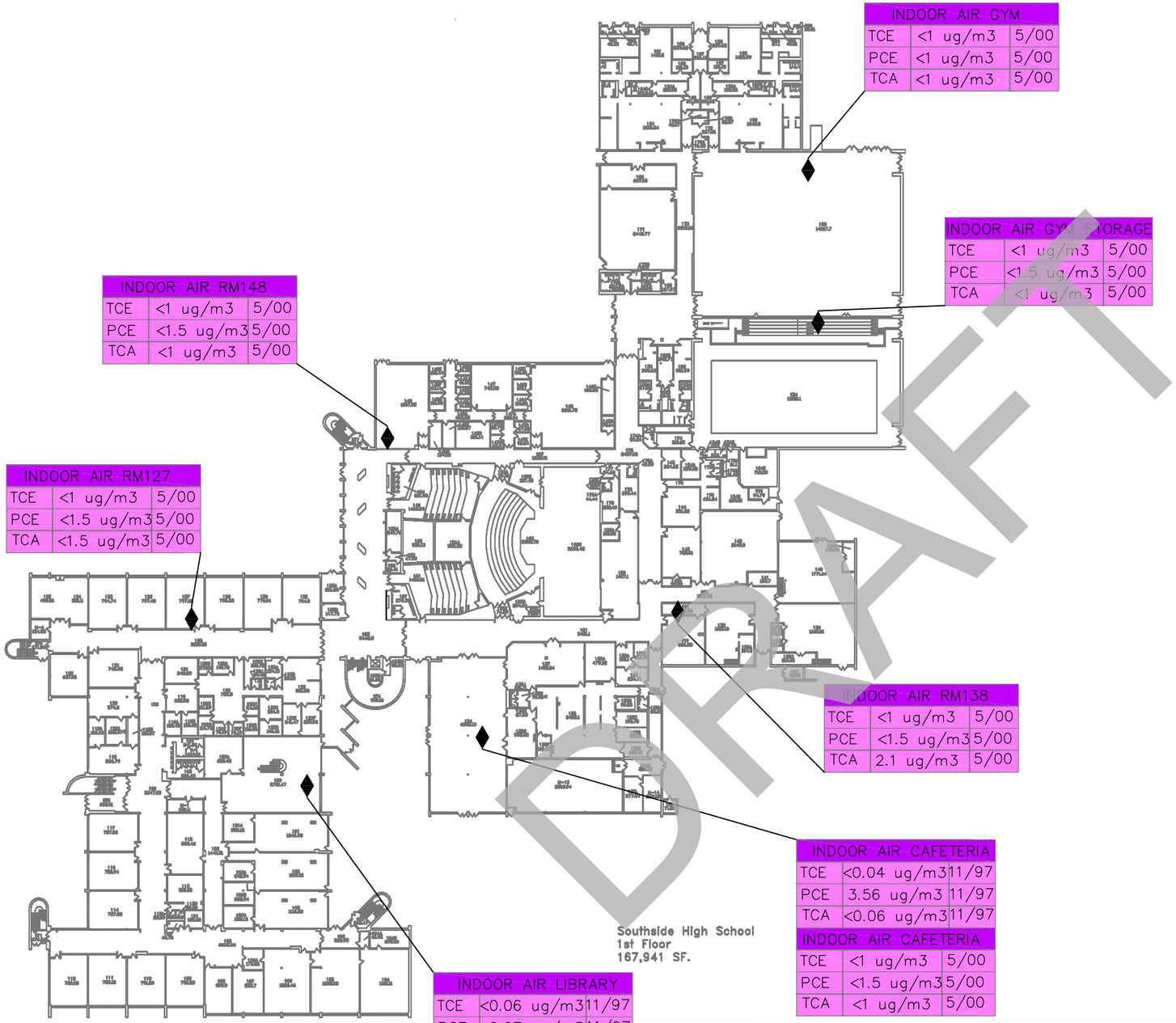
MONITORING WELL
DECOMMISSIONING PROCEDURES
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	2-3-08	SCALE:	N.T.S.	DWG. NO.	28014042	FIGURE	3-5



KEY:

SAMPLE TYPE AND LOCATION		
VOLATILE ORGANIC COMPOUNDS	CONCENTRATION	MONTH/ YEAR

TCE–TRICHLOROETHENE
PCE–TETRACHLOROETHENE
TCA–1,1,1–TRICHLOROETHANE

LEGEND:

♦ INDOOR AIR SAMPLE LOCATION

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FIGURE 4-1A

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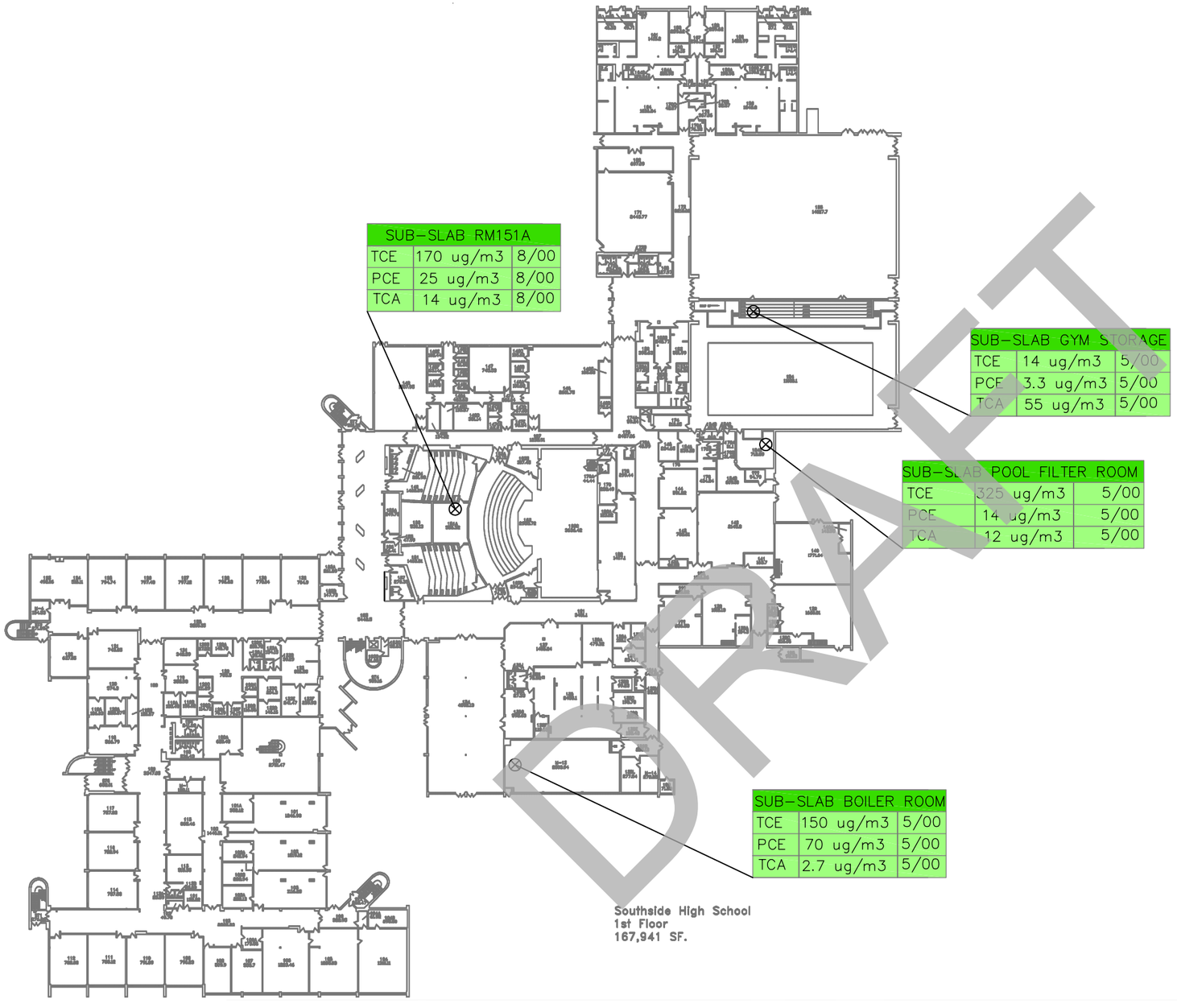
INDOOR AIR
SAMPLING LOCATIONS AND RESULTS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHENANGO CO., N.Y.

PROJ. No.:	28014	DATE:	6–19–09	SCALE:	1"=80'	DWG. NO.	28014051	FIGURE	4–1A



KEY:

SAMPLE TYPE AND LOCATION		
VOLATILE ORGANIC COMPOUNDS	CONCENTRATION	MONTH/ YEAR

TCE–TRICHLOROETHENE
PCE–TETRACHLOROETHENE
TCA–1,1,1–TRICHLOROETHANE

LEGEND:

⊗ SOIL GAS SAMPLE LOCATION

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FIGURE 4-1B

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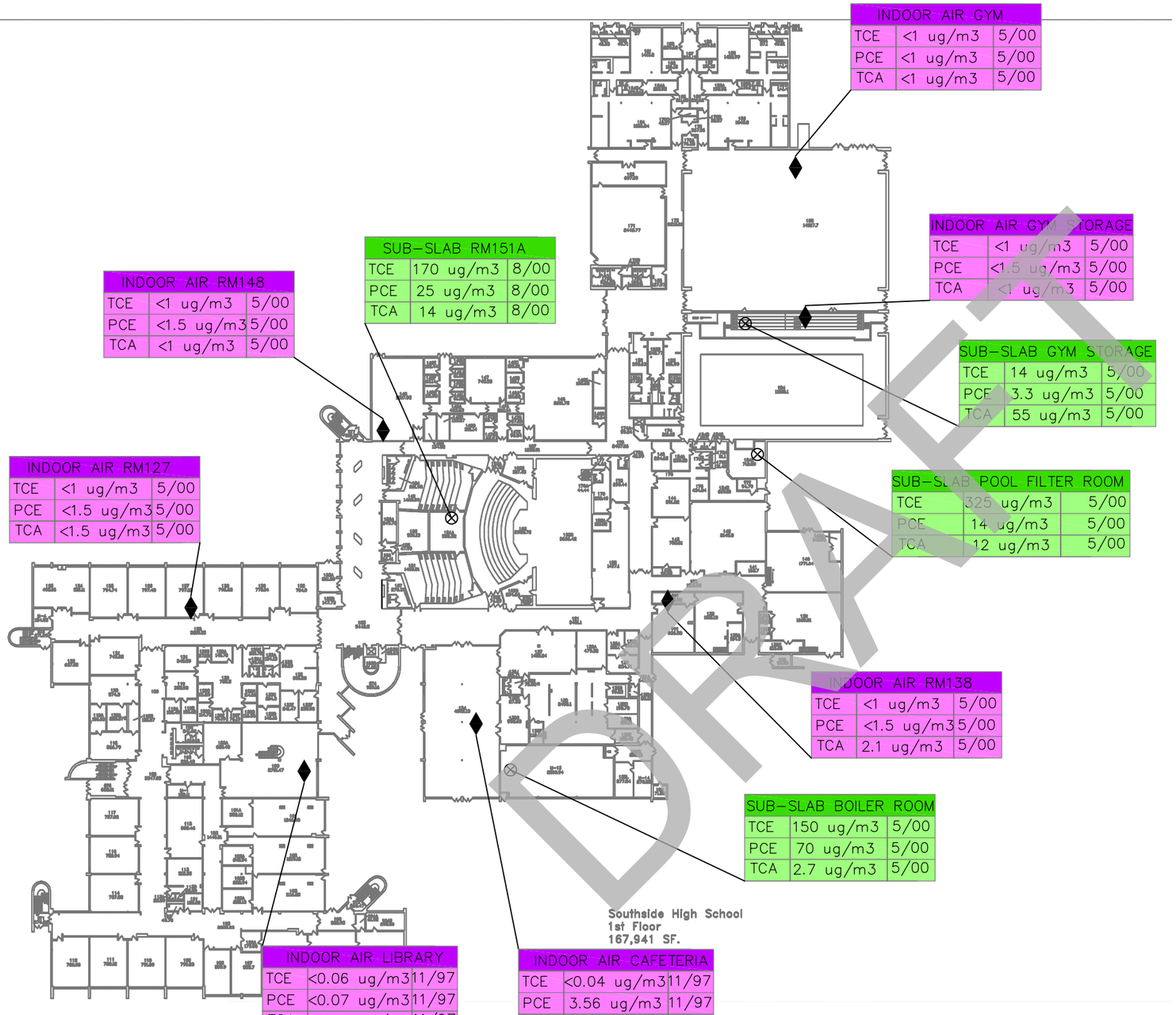
SUB-SLAB
SAMPLING LOCATIONS AND RESULTS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHENANGO CO., N.Y.

PROJ. No.:	28014	DATE:	6-19-09	SCALE:	1"=80'	DWG. NO.	28014052	FIGURE	4-1B



KEY:

SAMPLE TYPE AND LOCATION		
VOLATILE ORGANIC COMPOUNDS	CONCENTRATION	MONTH/ YEAR

INDOOR AIR

SUB-SLAB VAPOR

TCE-TRICHLOROETHENE
PCE-TETRACHLOROETHENE
TCA-1,1,1-TRICHLOROETHANE

LEGEND:

⊗ SOIL GAS SAMPLE LOCATION

♦ INDOOR AIR SAMPLE LOCATION

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FIGURE 4-1C

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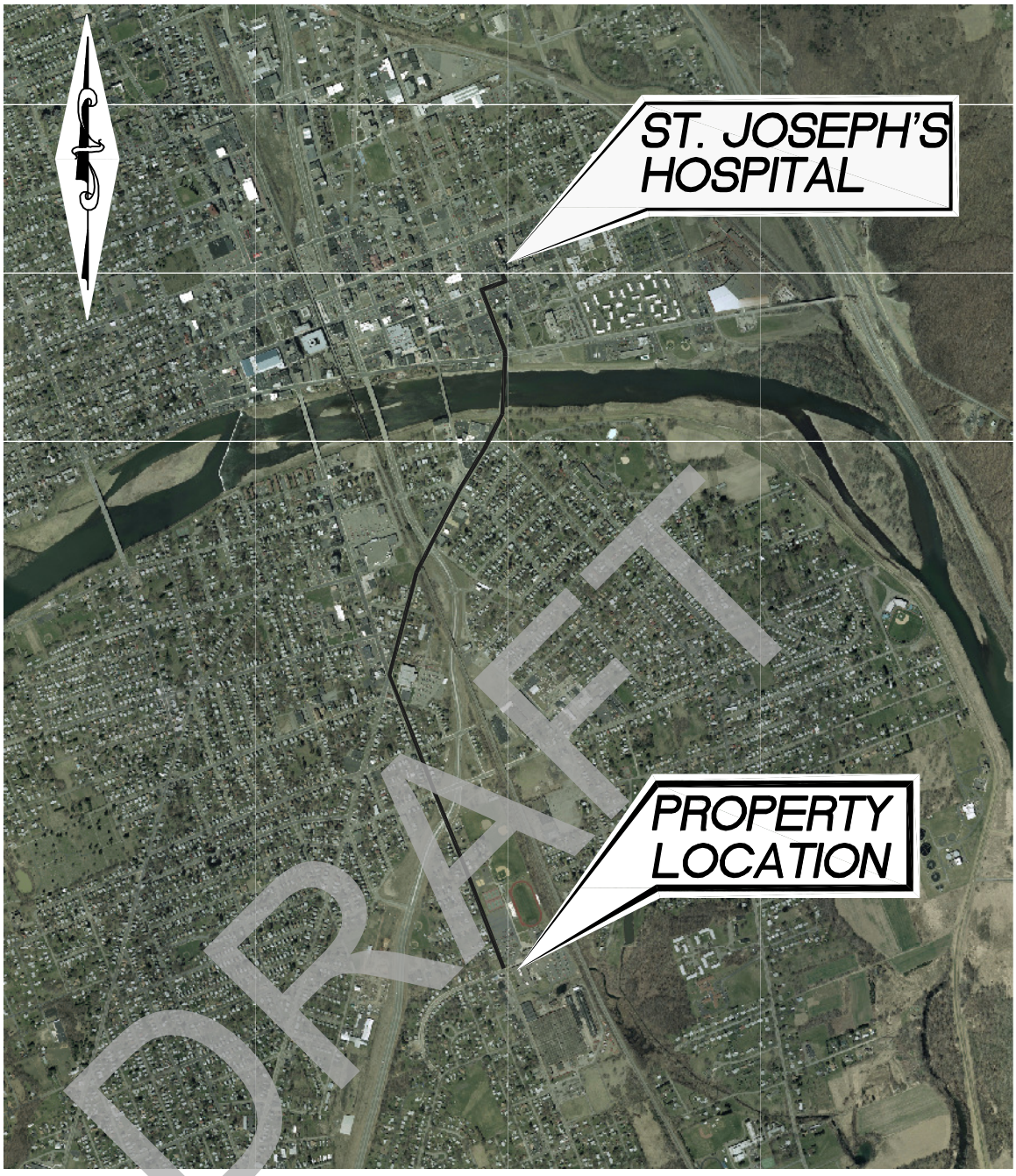
INDOOR AIR AND SUB-SLAB SAMPLING LOCATIONS AND RESULTS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHENANGO CO., N.Y.

PROJ. No.:	28014	DATE:	6-19-09	SCALE:	1"=80'	DWG. NO.	28014053	FIGURE	4-1C



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MAP REFERENCE: AERIAL PHOTOGRAPH FROM NEW YORK STATE GIS WEBSITE, 2002

DIRECTIONS:

1. EXIT THE SHS PROPERTY BY TAKING A RIGHT ONTO SOUTH MAIN STREET (HEADING NORTH) (0.7 MILE)
2. SLIGHT RIGHT AT PENNSYLVANIA AVENUE (0.4 MILE)
3. CONTINUE ON SLY STREET (0.2 MILE)
4. CONTINUE ON MADISON AVENUE (0.2 MILE)
5. TURN RIGHT ON E. MARKET STREET (469 FEET)
6. ARRIVE AT ST. JOSEPH'S HOSPITAL

FIGURE 7-1

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HOSPITAL ROUTE MAP

ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET

CITY OF ELMIRA — CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	6-26-08	SCALE:	1"=2000'	DWG. NO.	28014017	FIGURE	7-1

TABLES

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TABLE 2-1

SOIL MANAGEMENT OBJECTIVES

SOUTHSIDE HIGH SCHOOL
ELMIRA CITY SCHOOL DISTRICT

Parameter	Soil Management Objectives [1] (ppm)
Metals (Composite Soil Samples):	
Antimony	NA
Arsenic	16
Barium	400
Beryllium	72
Cadmium	4.3
Chromium (hexavalent)	110
Chromium (trivalent)	180
Cobalt	NA
Copper	270
Total Cyanide	27
Lead	400
Manganese	2,000
Mercury	0.81
Nickel	310
Selenium	180
Silver	180
Zinc	10,000

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NA = Not available.
[1] As provided in 6 NYCRR Part 375-6.8(b) – Restricted Residential Use, Protection of Health

PCBs/Pesticides (Composite Soil Samples):	
2,4,5-TP Acid (Silvex)	100
4,4'-DDE	8.9
4,4'-DDT	7.9
4,4'-DDD	13
Aldrin	0.097
alpha-BHC	0.48
beta-BHC	0.36
Chlordane (alpha)	4.2
delta-BHC	100
Dibenzofuran	59
Dieldrin	0.2
Endosulfan I	24
Endosulfan II	24
Endosulfan sulfate	24
Endrin	11
Heptachlor	2.1
Lindane	1.3
Polychlorinated biphenyls	1
SVOCs (Composite Soil Samples):	
Acenaphthene	100
Acenapthylene	100
Anthracene	100

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NA = Not available.

(1) As provided in 6 NYCRR Part 375-6.8(b) – Restricted Residential Use, Protection of Health

Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(g,h,i)perylene	100
Benzo(k)fluoranthene	3.9
Chrysene	3.9
Dibenz(a,h)anthracene	0.33
Fluoranthene	100
Fluorene	100
Indeno(1,2,3-cd)pyrene	0.5
m-Cresol	100
Naphthalene	100
o-Cresol	100
p-Cresol	100
Pentachlorophenol	6.7
Phenanthrene	100
Phenol	100
Pyrene	100
VOCs (Grab Soil Samples Only):	
1,1,1-Trichloroethane	100
1,1-Dichloroethane	26
1,1-Dichloroethene	100
1,2-Dichlorobenzene	100
1,2-Dichloroethane	3.1

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NA = Not available.

(1) As provided in 6 NYCRR Part 375-6.8(b) – Restricted Residential Use, Protection of Health

cis-1,2-Dichloroethene	100
trans-1,2-Dichloroethene	100
1,3-Dichlorobenzene	49
1,4-Dichlorobenzene	13
1,4-Dioxane	13
Acetone	100
Benzene	4.8
Butylbenzene	100
Carbon tetrachloride	2.4
Chlorobenzene	100
Chloroform	49
Ethylbenzene	41
Hexachlorobenzene	1.2
Methyl ethyl ketone	100
Methyl tert-butyl ether	100
Methylene chloride	100
n-Propylbenzene	100
sec-Butylbenzene	100
tert-Butylbenzene	100
Tetrachloroethene	19
Toluene	100
Trichloroethene	21
1,2,4-Trimethylbenzene	52

NA = Not available.

(1) As provided in 6 NYCRR Part 375-6.8(b) – Restricted Residential Use, Protection of Health

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1,3,5-Trimethylbenzene	52
Vinyl chloride	0.9
Xylene (mixed)	100

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NA = Not available.
(1) As provided in 6 NYCRR Part 375-6.8(b) – Restricted Residential Use, Protection of Health

TABLE 2-2

PERMITTED DISPOSAL FACILITIES
SOIL SAMPLING REQUIREMENTS SUMMARY

Required Parameters/Methods for Soil Disposal to Hyland, Ontario, Seneca Meadows, and Model City Landfills:

1. Toxicity Characteristic Leaching Procedure (TCLP) Metals – Method SW-846-1311/SW-846-6010

   - Arsenic,
   - Barium,
   - Cadmium,
   - Chromium,
   - Lead, and
   - Silver.

Mercury by Method SW-846-1311/SW-846-7470
Selenium by Method SW-846-1311/SW-846-7740

2. TCLP Volatiles (VOCs) – Method SW-846-1311/SW-84-8260

   - Benzene,
   - Carbon Tetrachloride,
   - Chlorobenzene,
   - Chloroform,
   - 1,2, Dichloroethane,
   - 1,1 Dichloroethylene,
   - Methyl Ethyl Ketone,
   - Tetrachloroethylene,
   - Trichloroethylene, and
   - Vinyl Chloride.

3. TCLP Semi-Volatiles (SVOCs) (Base Neutral Compounds) – Method SW-846-1311/SW-846-8270

   - 1,4 Dichlorobenzene,
   - Hexachlorobenzene,
   - Hexachlorobutadiene,
   - Hexachloroethane,
   - Nitrobenzene,
   - Pyridine, and
   - 2,4-Dinitrotoluene

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4. TCLP Semi-Volatiles (SVOCs) (Acid Compounds) – Method SW-846-1311/SW-846-8270\

- o-Cresol,
- m-Cresol,
- p-Cresol,
- Cresol (Total),
- Pentachlorophenol,
- 2,4,5-Trichlorophenol, and
- 2,4,6-Trichlorophenol.

5. TCLP Herbicides – Method SW-846-1311/SW-846-8080

- 2,4-D, and
- 2,4,5-TP (Silvex).

6. TCLP Pesticides – Method SW-846-1311/SW-846-8080

- Chlordane,
- Endrin,
- Heptachlor,
- Lindane,
- Methoxychlor, and
- Toxaphene.

7. Other

- PCBs (Total) by Method SW-846-8080,
- pH by Method SW-846-9045,
- Flashpoint by Method SW-846-C7,
- Reactivity,
- Corrosivity,
- % Solids, and
- Free Liquids by Method SW-846-9095

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Number of Samples Required:

- Hyland, Ontario and Model City Landfills require one (1) composite soil sample for the estimated 570 tons of contaminated soil being disposed.

- Seneca Meadows requires two (2) composite soil samples for the estimated 570 tons of contaminated soil being disposed.

Table 4-1
Inventory and Use Evaluation for Products Containing Volatile Organic Compounds (VOCs)
for Southside High School - Elmira City School District

Location	Product Description	Size (units)	Condition	Chemical Ingredients	Field Instrument Reading (units)
Chemistry Classroom 230,Storeroom 229	Lab Grade n-Amyl Alcohol	1 X 100 mL	U	n-Amyle alcohol	0
Chemistry Classroom 230,Storeroom 229	Lab Grade n-Butyric Acid	1 X 100 mL	U	n-Butyric acid	0
Chemistry Classroom 230,Storeroom 229	Lab Grade Octyl Alcohol	1 X 100mL	U	Octyl alcohol	0
Custodial Storeroom M-10	Science Grade Acetone	2 X 500 mL	U	Acetone	0
Custodial Storeroom M-10	Lab Grade Octyl Alcohol	1 X 100 mL	UO	Octyl alcohol	0
Custodial Storeroom M-10	Lab Grade n-Amyl Alcohol	1 X 100 mL	U	n-Amyle alcohol	0
Custodial Storeroom M-10	Reagent Grade Methanol	1 X 4 L	U	Methanol	0
Custodial Storeroom M-10	99% Isopropyl Alcohol	1 X 500 mL, 1 X 1 gal., 1 X 4 L	U	Isopropyl alcohol	0
Custodial Storeroom M-10	Denatured Ethanol	1 X 4 L	U	Ethanol	0
Custodial Storeroom M-10	Denatured Anhydrous Reagent Alcohol	1 X 1 gal.	U	Alcohol	0
Custodial Storeroom M-10	Simoniz Cleaner Degreaser	1 X 5 gal.	U	2-Butoxy ethanol, Water	0
Custodial Storeroom M-10	Spartan Dust Mop Treatment	1 X 5 gal.	U	Ethylene glycol, Mineral seal oil	0
Custodial Storeroom M-10	Spray Pak Lemon Furniture Polish	1 X 17 oz.	U	Butane, Propane and Isoparaffin hydrocarbons	0
Custodial Storeroom M-10	Allstar Classic Shine Wax Polish	1 X 19 oz.	U	Petroleum distillates, Isobutane and Propane	0
Custodial Storeroom M-10	Allstar Bayberry Dry Deodorizer	1 X 10 oz.	U		0
Wood Shop, Finish Room	Don Jer Suede Tex	5 X 1 pint	U		0
Wood Shop, Finish Room	MinWax Wipe On Paste Finishing Wax	2 X 1 lb	U	Aliphatic hydrocarbons	0
Wood Shop, Finish Room	Deft Danish Oil Finish	1 X 16 oz	U	Petroleum distillates, Tung oil	0
Wood Shop, Finish Room	RaeCo Syntol Paint Thinner	1 X 1 gal	U	Mineral sprits	0
Wood Shop, Finish Room	Min Wax Wood Finish	1 X 1 qt	U	Aliphatic hydrocarbons	0
Wood Shop, Finish Room	Glidden Interior Spread Wood Stain	3 X 32 oz	U	Petroleum distillates	0
Wood Shop, Finish Room	Watco Danish Oil Finish	1 X 1 gal	U	Petroleum distillates	0
Wood Shop, Finish Room	Naz Dar #5550 Thinner Retarder	1 X 32 oz.	U	Petroleum distillates	0
Wood Shop, Finish Room	Carver Tripp Color Rich Wood Stain	1 X 32 oz.	U	Mineral spirits, Glycol	0
Wood Shop, Finish Room	Glidden Spread Gloss All Purpose Enamel	7 X 32 oz.	U	Mineral spirits	0
Wood Shop, Finish Room	MinWax Wood Conditioner	1 X 1 pint	U	Mineral spirits	0
Wood Shop, Finish Room	AquaZar Clear Wood Finish	1 X 1 gal.	U	Water-based polyurethane	0
Wood Shop, Finish Room	Deft Semi-Gloss Clear Wood Finish	1 X 1 gal	U	Petroleum distillates, Butyl cellosolve	0
Wood Shop, Finish Room	Klean Strip Paint Thinner	1 X 1 gal	U	Mineral spirits	0
Wood Shop, Finish Room	EZ Cast Polyester Coating Resin	2 X 1 gal	U	Styrene monomer	0
Wood Shop, Finish Room	W.E.P. Resinal Polyester Resin	2 X 1 gal	U	Styrene, Di-methyl aniline	0
Wood Shop, Finish Room	System 3 Resin, Epoxy Part A	1 X 1 gal.	U		0
Wood Shop, Finish Room	Interlux Clipper Clear Varnish	1 X 1 qt.	U	Mineral spirits, High flash naptha	0
Wood Shop, Finish Room	Bondex Natural Plastic Wood	2 X 5 oz.	U	Acetone	0
Wood Shop, Finish Room	MinWax Wood Putty	5 X 3.75 oz.	U		0
Wood Shop, Finish Room	Sherwin Williams Chemical Coating Opex Industrial Lacquer Light Green	1 X 1 gal.	U	Aliphatic and Aromatic hydrocarbons, Esters, Alcohols and Ketones	0
Wood Shop, Finish Room	True Value Weatherall 100% Acrylic Latex Neutral Base	1 X 112 fl. oz.	U		0
Wood Shop, Finish Room	Speedhide Int. Wall Flat-Latex Deep Tone Mixing Base	1 X 122 fl. oz.	U	Acrylate copolymeremulsion	0
Wood Shop, Finish Room	System 3 Part B Hardener	1 X 1 qt.	U		0
Wood Shop, Finish Room	American Accents Smooth Finish	1 X 12 oz.	U	Xylene, Toluene and Acetone	0
Art Room 102	Krylon Color Creations Acrylic Enamel	1 X 8 oz.	U	2 (2-Methoxyethoxy) ethanol	0
Art Room 102	Blair Spray Adhesive 82489	2 X 11 oz.	U	Propane, Butane, Heptane and Acetone	0
Art Room 102	Zinsser Bulls Eye Shellac Sealer and Finish Spray	1 X 12 oz.	U	Shellac resins, Ketones, Alcohols, and Aliphatic hydrocarbons	0
Art Room 102	Nybco Clear Shellac	1 X 11 oz.	U	Ethyl alcohol, Acetone and Butyl cellosolve	0

Notes:

UO Denotes Unopened Chemicals
U Denotes Used Chemicals
D Denotes Deteriorated Chemicals

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Table 4-1
Inventory and Use Evaluation for Products Containing Volatile Organic Compounds (VOCs)
for Southside High School - Elmira City School District

Location	Product Description	Size (units)	Condition	Chemical Ingredients	Field Instrument Reading (units)
Art Room 102	Sureguard #951 McDonald Pro-tecta-cote Retouch	1 X 14 oz.	U	Toluene, Isobutyl acetate, Methyl ethyl ketone, Methyl n-amyl ketone	0
Art Room 102	Sherwin Williams Classic 99 Int. Flat Latex Antique	1 X 1 gal.	U	Crystalline silica	0
Art Room 102	Krylon Int.-Ext. Spray Paint	1 X 12 oz.	U	Ketones, Hydrocarbon propellants, Xylene, Acetates, Ethylbenzene and Toluene	0
Art Room 102	Beacon Styrofoam Glue	1 X 2 oz.	U		0
Art Room 102	Maid-o-Metal Liver of Sulphur	1 X 4 oz.	UO		0
Art Room 102	Blow-Off Air Duster	1 X 9 oz.	U	1,1,1,2 Tetrafluoroethane petroleum hydrocarbon	0
Art Room 102	Allstar Classic Shine Wax Polish	1 X 19 oz.	U	Petroleum distillate, Isobutane and Propane	0
Art Room 102	Expo Original Dry Erase Board Cleaner	2 X 8 oz.	U	2 Butoxy ethanol and Isopropyl alcohol	0
Art Room 102	Loreal Paris Hairspray	1 X 8 oz.	U	Alcohol denat, Polyurethane-6, Vinyl butyl benzoate/crotonates copolymer	0
Art Room 102	Ross Super Glue	1 X 14 oz.	U	Cyanoacrylate	0
Art Room 102	Devcon 5-Minute Epoxy Hardener	2 X .5 oz.	U	2,4,6 Tri(Dimethylaminomethyl) phenol and Polymer	0
Art Room 102	House Beautiful Int. Latex White Semi-Gloss	1 X 1 qt.	U	Acrylic copolymer, Titanium dioxide, Propylene glycol, Silicon dioxide, Ester-alcohol and Silica	0
Art Room 102	Ace Acrylic Latex Semi-Gloss Enamel 186A216 Red	2 X 29 oz.	U	Acrylic resin and Glycols	0
Art Room 102	Olesen Acrylic Stage Paint Orange	1 X 1 qt.	U	Acrylic vinyl resin	0
Art Room 102	Marshall's Pre-Color Spray	1 X 11 oz.	U	Acetone, Propane, Isobutane, Toluene, Acrylic copolymer	0
Art Room 102	Colorplace Int./Ext. Spray Paint	2 X 10 oz.	U	Aliphatic hydrocarbons, Ketones and Toluene	0
Art Room 102	Sherwin Williams Color To Go Extra White	1 X 31 oz.	U	Crystalline silica	0
Custodial Cleaning Chemicals	Buckeye True Seven pH Neutral Cleaner	1 X 5 gal.	U	Alcohol ethoxylate	0
Custodial Cleaning Chemicals	Buckeye RAM Heavy-Duty Degreaser	1 X 5 gal.	U	Sodium metasilicate, Alcohol ethoxylate	0
Custodial Cleaning Chemicals	Buckeye Star Spray Glass Cleaner	1 X 5 gal.	U	Propylene glycol methyl ether	0
Custodial Cleaning Chemicals	Buckeye Terminator One-Step Disinfectant	1 X 5 gal.	U	Dialkyldimethyl ammonium chloride	0
Boiler Room	Glidden Latex Low Luster Enamel – 5880 Deep Tint Base	2 X 120 fl. oz.	U	1,2 Propanediol, Heavy paraffinic petroleum distillates, Acetic acid ethenyl ester	0
Boiler Room	Glidden Latex Low Luster Enamel – 5887 Interior Tint	2 X 122 fl. oz.	U	1,2 Propanediol	0
Boiler Room	Painter Hi Gel Latex Flat Wall Paint – 5072 Antique	1 X 1 gal.	U	Talc, Water, Vinyl acrylic copolymer, TiO_2	0
Boiler Room	Latex Flat Wall Paint - 5380 Deep Tint Base	1 X 120 fl. oz.	U	1 Phenoxy 2 propanol, Water, Acetic acid ethenyl ester	0
Boiler Room	Pittsburgh Paints Interior Enamel Semi-Gloss Acrylic Latex Neutral Mixing Base 6-517	1 X 118 fl. oz.	U	Propylene glycol, Water, Acrylic vinyl polymer	0
Boiler Room	Interior Enamel Semi-Gloss Latex 5-510 White and Pastel Mixing Base	1 X 1 gal.	U		0
Boiler Room	Interior Wall Flat Latex Neutral Mixing Base 80-587	1 X 118 fl. oz.	U	Water, Propylene glycol, Acrylic resin	0
Boiler room	Unknown Paint	2 X 1 gal.	U		0
Boiler Room	Sherwin Williams Pro Max 400 Interior Latex Flat Pure White 6781-99993	1 X 1 gal.	U	Water, TiO_2, Vinyl polymer	0
Boiler Room	Pro Max 400 Interior Latex Semi-Gloss Pure White (Base X) 4070-99993	1 X 1 gal.	U	Water, Vinyl polymer, Ethylene glycol, 2 (2 Butoxyethoxy) ethanol, TiO2	0
Boiler Room	Classic 99 Interior Semi-Gloss Latex Deep Tone Base-Z 2858-99993	1 X 118 fl. oz.	U	Ethylene glycol, Water, Vinyl polymer, TiO_2	0
Boiler Room	Benjamin Moore Regal Aqua Glo Latex Semi-Gloss Base 5 333 5A	3 X 118 fl. oz.	U	Water, Propylene glycol, TiO_2, Vinyl acrylic polymer	0
Boiler Room	Regal Wall Satin Latex Interior Flat Base 5 2155A	1 X 118 fl. oz.	U	Water, Glycols, TiO_2, Vinyl acrylic resin	0
Boiler Room	Sherwin Williams Pro Max 200 Interior Latex Semi-Gloss B31-W-02251	1 X 1 gal.	U	Water, TiO_2, Ethylene glycol, 2(2 Butoxyethoxy) ethanol	0

Notes:

UO Denotes Unopened Chemicals
U Denotes Used Chemicals
D Denotes Deteriorated Chemicals

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Table 4-1
Inventory and Use Evaluation for Products Containing Volatile Organic Compounds (VOCs)
for Southside High School - Elmira City School District

Location	Product Description	Size (units)	Condition	Chemical Ingredients	Field Instrument Reading (units)
Boiler Room	Muralo Georgetown Exterior Latex House Paint 3991 Clear Base	1 X 116 fl. oz.	U	Vinyl acrylic resin, Glycols, Water, Ethers	0
Boiler Room	Ace Acrylic Semi-Gloss Latex House and Trim 159A 211 Clear Base E	1 X 116 fl. oz.	U	TiO_2, Glycols, Water, Acrylic resin and Tetrachloroisophthalnitrile	0
Boiler Room	Sherwin Williams ProMax 200 Interior Latex Semi-Gloss B31-W-2251 6403-54213	8 X 124 fl. oz.	U	Water, Vinyl polymer, TiO_2, Ethylene glycol, 2(2 Butoxyethoxy) ethanol	0
Boiler Room	Pro Mar 400 Interior Flat Latex 6405-10111 Extra White B30-W-451	1 X 124 fl. oz.	U	Water, TiO_2, Vinyl polymer	0
Boiler Room	Pittsburgh Paints Manor Hall Exterior Premium Eggshell Latex 79-300 Deep Rustic Base	2 X 116 fl. oz	U	Water, Acrylic resin, Dipropylene glycol monobutyl ether, Ethylene glycol, N-Methyl 2 pyrrolidone	0
Boiler Room	Manor Hall Int./Ext. Gloss Latex 52-300 Neutral Base	3 X 116 fl. oz.	U	Water, Acrylic resin, Di n butyl phthalate, Isobutyrate ester, Ethylene glycol, Diprop gly monobut ether	0
Boiler Room	Speedhide Ext. Flat Latex Deep Rustic Base 6-653	1 X 116 fl. oz.	U	Water, Acrylic resin, Alkyd resin	0
Boiler Room	Speedhide Int. Flat Latex Neutral Base 6-87	2 X 116 fl. oz.	U	Water, Propylene glycol, Isobutyrate ester	0
Boiler Room	Speedhide Int./Ext. Flat Latex Black 6-753	2 X 1 gal.	U	Water, Quartz, Acrylic resin	0
Boiler Room	Speedhide Int. Enamel Semi-Gloss Acrylic Latex Neutral	2 X 116 fl. oz.	U	Water, Acrylic vinyl polymer, Acrylic resin, Propylene	0
Boiler Room	100% Acrylic Latex Enamel Satin Finish Urethane	3 X 126 fl. oz.	U	Ethylene glycol, Acrylic resin, Water, TiO_2	0
Boiler Room	100% Int. Gloss Enamel Latex Acrylic Neutral Base 6-8537	1 X 116 fl. oz.	U	Water, Propylene glycol, Isobutyrate ester	0
Boiler Room	Int. Eggshell Latex Enamel Mixing Base 6-411	1 X 126 fl. oz.	U	Water, Acrylic vinyl polymer, TiO_2	0
Boiler Room	Int./Ext. Urethane Modified Industrial Enamel Gloss- Oil Deep Rustic Base 7-817	2 X 116 fl. oz.	U	Naptha, Ethyl benzene, Xylenes, Soybean oil	0
Boiler Room	Int. Semi-Gloss Acrylic Latex Enamel Neutral Base 6-517	1 X 116 fl. oz.	U	Water, Acrylic resin, Prop gly octaphenyl ether	0
Boiler Room	PPG Pitt. Tech 100% Acrylic High Gloss DTM Industrial	1 X 116 fl. oz.	U	Diethylene glycol monomethyl ether, TiO_2, Water, Acrylic	0
Boiler Room	Simoniz Terra Brite Plus Acrylic Polymer Floor Finish	6 X 5 gal.	U	Diethylene glycol ethy ether, Water, Acrylate copolymer, Olefin-acrylate polymer	0
Boiler Room	Spartan Chemical Co. Dust Mop Dust Cloth Treatment	5 X 5 gal.	U	Water, Ethylene glycol, Mineral seal oil	0
Boiler Room	Unknown	1 X 5 gal.	U		0
Boiler Room	MPC Aqua Treat Mop Treatment	2 X 5 gal.	U	Ethylene glycol, Water, n Amyl acetate	0
Boiler Room	Simoniz Z Strip Non-Ammoniated Wax Stripper	4 X 5 gal.	U	Water, 2 Butoxy ethanol	0
Boiler Room	Ammonia in Water Solution $NH_4^+OH^-$	24 X 1 gal.	UO	NH_4^+ OH^-	0
Boiler Room	Spartan SSE Carpet Prespray and Spotter	2 X 1 gal.	U	Water, 1 Methoxy 2 propanol	0
Boiler Room	Spray Pak Lemon Furniture Polish	22 X 17 oz.	UO	Butane, Propane, Isoparaffine hydrocarbons, Water, Fragrance	0
Boiler Room	DuPont Centri-LP Refrigerant	2 X 200 lbs., 1 X 100 lbs.	U	Dichlorotrifluoroethane	0
Boiler Room	Simoniz Cleaner Degreaser	2 X 5 gal.	U	Butoxy ethanol	0
Boiler Room	Spartan Citro Shield Furniture Polish	4 X 1 lb. 2 oz.	UO		0
Boiler Room	Mobil Super HP High Performance Motor Oil 10W-40	1 X 1 qt.	U		0
Boiler Room	Wolf's Head SAE30 Hydraulic and Compression Oil	1 X 32 oz.	U		0
Boiler Room	Rotella T Multigrade SAE 15W-40 Heavy Duty Motor Oil with Advanced Soot Control	1 X 1 gal.	U		0
Art Room 102	Ross Rubber Cement	31 X 8 oz., 3 X 1 gal.	U	Hexane	8.5 ppm
Art Room 102	Best-Test Rubber Cement	4 X 8 oz.	U	Heptane	0
Art Room 102	Best-Test Rubber Cement Thinner	1 X 16 oz.	U	Heptane	0
Art Room 102	Sax Workable Fixative	7 X 11 oz.	U	Isobutane, Propane, Acetone, Butyl benzyl phthalate	0
Art Room 102	Premier Dry Mount	4 X 11 oz.	U	Cyclohexane, Liquefied petroleum gas	0
Art Room 102	Dick Blick Matte Fixative	9 X 13 oz.	U	Acetone, Xylene	0
Art Room 102	Spray Workable Fixative	7 X 12 oz.	U	Propane, Butane, Acetone, Isopropanol, Propylene glycol monomethyl ether acetate	0
Art Room 102	Pure Gum Turpentine	1 X 1 qt.	U	Turpentine	0
Art Room 102	Krylon UV-resistant Acrylic Coating	6 X 11 oz.	U	Acetone, Xylene, Toluene, Petroleum distillates, Propane, Butane	25.1 ppm

Notes:

UO Denotes Unopened Chemicals
U Denotes Used Chemicals
D Denotes Deteriorated Chemicals

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SUB-SLAB VAPOR SAMPLING LOCATIONS AND GOALS
MAIN BUILDING

TABLE 4-2

Sub-Slab Vapor Sampling Location	Goals
Room 113B	• Determine Extent of TCE Plume • Monitor Potential Preferential Pathway of Former Steam Line, Existing Utilities and Sanitary Sewer Line
Room 127	• Determine Extent of TCE Plume
Room 140	• Determine Extent of TCE Plume • Monitor Potential Preferential Pathway of Former Steam Line, Former Gas Line and Existing Utilities
Room 146	• Determine Extent of TCE Plume • Monitor Potential Preferential Pathway of Former Steam Line and Existing Utilities
Room 151A	• Apparent Lowest Elevation of Building Floor • Monitor TCE Plume • Monitor PCE Plume and TCA Detections
Room 159	• Determine Extent of Petroleum Plume • Monitor Preferential Pathway of Water Line
Boiler Room	• Monitor TCE Plume • Monitor PCE and TCA Detections
Gym	• Determine Extent of TCE Plume • Monitor Potential Preferential Pathway of Former Steam Line
Gym Storage	• Determine Extent of Petroleum Plume • Monitor TCE, PCE and TCA Detections
Hallway and Side Gym	• Determine Extent of TCE Plume • Monitor Potential Preferential Pathway of Former Steam Line
Library	• Determine Extent of TCE Plume • Monitor Potential Preferential Pathway of Former Steam Line • Monitor Prior PCE Detections
Pool Filter Room	• Apparent Local Lowest Elevation of Building Floor • Monitor Location of Past Highest TCE Concentration

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INDOOR AIR SAMPLING LOCATIONS AND GOALS
MAIN BUILDING

TABLE 4-3

Sub-Slab Vapor Sampling Location	Goals
Room 127	• Determine Presence and Concentration of TCE and Other VOCs • Assist in Determining Proper Action
Room 138	• Monitoring Apparent Past TCA Detection • Determine Presence and Concentration of TCE and Other VOCs • Assist in Determining Proper Action
Room 151A	• Replaces Room 148 • Determine Presence and Concentration of TCE and Other VOCs • Monitor Apparent Lowest Elevation of Building • Assist in Determining Proper Action
Cafeteria	• Determine Presence and Concentration of TCE and Other VOCs • Monitor Apparent Past PCE Detection • Compare to Sub-Slab Vapor Results at Boiler Room • Assist in Determining Proper Action
Gym	• Determine if VOCs from Petroleum are Detectable • Compare to Sub-Slab Vapor Results at Gym Storage • Assist in Determining Proper Action
Library	• Determine Presence and Concentration of TCE and Other VOCs • Assist in Determining Proper Action
Pool Filter Room	• Monitor Apparent Local Lowest Elevation of Building Floor • Monitor Indoor Air at Location of Past Highest Concentration of TCE in Sub-Slab • Assist in Determining Proper Action

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Table 4-4

Soil Vapor and Indoor Air Parameters of Concern

Parameter	CAS #	Analytical Method	Sub-Slab Vapor Sample Method Reporting Limit ($\mu g/m^3$)	Indoor/Outdoor Air Sample Method Reporting Limit ($\mu g/m^3$)
1,1,1-Trichloroethane	71-55-6	EPA TO-15	1.0	1.0
1,1,2,2-Tetrachloroethane	79-34-5	EPA TO-15	1.0	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	EPA TO-15	1.0	1.0
1,1,2-Trichloroethane	79-00-5	EPA TO-15	1.0	1.0
1,1-Dichloroethane	75-35-3	EPA TO-15	1.0	1.0
1,1-Dichloroethene	75-35-4	EPA TO-15	1.0	1.0
1,2,4-Trichlorobenzene	120-82-1	EPA TO-15	1.0	1.0
1,2,4-Trimethylbenzene	95-63-6	EPA TO-15	1.0	1.0
1,2-Dibromoethane	106-93-4	EPA TO-15	1.0	1.0
1,2-Dichlorobenzene	95-50-1	EPA TO-15	1.0	1.0
1,2-Dichloroethane	107-06-2	EPA TO-15	1.0	1.0
1,2-Dichloropropane	78-87-5	EPA TO-15	1.0	1.0
1,3,5-Trimethylbenzene	108-67-8	EPA TO-15	1.0	1.0
1,4-Dichlorobenzene	106-46-7	EPA TO-15	1.0	1.0
1,4-Dioxane	123-91-1	EPA TO-15	1.0	1.0
2-Butanone (MEK)	78-93-3	EPA TO-15	1.0	1.0
1,3-Dichlorobenzene	541-73-1	EPA TO-15	1.0	1.0
2,2,4-Trimethylpentane	540-84-1	EPA TO-15	1.0	1.0
Acetone	67-64-1	EPA TO-15	1.0	1.0
Benzene	71-43-2	EPA TO-15	1.0	1.0
Benzyl Chloride	100-44-7	EPA TO-15	1.0	1.0
Bromodichloromethane	75-27-4	EPA TO-15	1.0	1.0
Bromoform	75-25-2	EPA TO-15	1.0	1.0
Bromomethane	74-83-9	EPA TO-15	1.0	1.0

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Carbon tetrachloride	56-23-5	EPA TO-15	1.0	0.25
Chlorobenzene	108-90-7	EPA TO-15	1.0	1.0
Chloroethane	75-00-3	EPA TO-15	1.0	1.0
Chloroform	67-66-3	EPA TO-15	1.0	1.0
Cyclohexane	110-82-7	EPA TO-15	1.0	1.0
Chloromethane	74-87-3	EPA TO-15	1.0	1.0
cis-1,2-Dichloroethene	156-59-2	EPA TO-15	1.0	1.0
cis-1,3-Dichloropropene	10061-01-5	EPA TO-15	1.0	1.0
Dibromochloromethane	124-48-1	EPA TO-15	1.0	1.0
Dichlorodifluoromethane (Freon 12)	75-71-8	EPA TO-15	1.0	1.0
Ethanol	64-17-5	EPA TO-15	1.0	1.0
Ethylbenzene	100-41-4	EPA TO-15	1.0	1.0
1,2-Dichlorotetrafluoroethane (Freon 114)	76-14-2	EPA TO-15	1.0	1.0
n-Hexane	110-54-3	EPA TO-15	1.0	1.0
Hexachloro-1,3-butadiene	87-68-3	EPA TO-15	1.0	1.0
4-Methyl-2-pentanone (MIBK)	108-10-1	EPA TO-15	1.0	1.0
Methyl t-Butyl Ether	1634-04-4	EPA TO-15	1.0	1.0
Methylene Chloride	75-09-2	EPA TO-15	1.0	1.0
Styrene	100-42-5	EPA TO-15	1.0	1.0
t-Butyl Alcohol (TBA)	75-65-0	EPA TO-15	1.0	1.0
Tetrachloroethene	127-18-4	EPA TO-15	1.0	1.0
Toluene	108-88-3	EPA TO-15	1.0	1.0
m,p-Xylenes	108-38-3, 106-42-3	EPA TO-15	1.0	1.0
o-Xylene	95-47-6	EPA TO-15	1.0	1.0
Trans-1,2-Dichloroethene	156-60-5	EPA TO-15	1.0	1.0
Trans-1,3-Dichloropropene	10061-02-6	EPA TO-15	1.0	1.0
Trichloroethene	79-01-6	EPA TO-15	1.0	0.25
Trichlorofluoromethane (Freon 11)	75-69-4	EPA TO-15	1.0	1.0
Vinyl Chloride	75-01-4	EPA TO-15	1.0	0.25

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Table 4-5: Indoor Air and Sub-Slab Vapor Concentration: 1,1,1-Trichloroethane (TCA) in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria	<0.055	Error	<1.0				
Library	<0.055	0.2	<1.0	<1.0			
Outside		0.1					
Outside Room 111	0.0108						
Outside Loading Dock	0.0359						
Gym Store Room			<1.0			55	
Gym		Error	<1.0				
Physics Room 138			2.0				
Music Room 148			<1.0				
Room 127			<1.0				
Basement Science Room				1.8			14
Pool Filter Room						12	
Pool		<0.10					
Boiler Room						2.7	

Table 4-6: Indoor Air and Sub-Slab Vapor Concentration: 1,1,2-Trichlorotrifluoroethane (Freon 113) in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria			<1.0				
Library			<1.0	1.4			
Outside							
Outside Room 111							
Outside Loading Dock							
Gym Store Room			<1.0			27	
Gym			<1.0				
Physics Room 138			<1.0				
Music Room 148			1.1				
Room 127			<1.0				
Basement Science Room				1.6			65
Pool Filter Room						>1,000	
Pool							
Boiler Room						16	

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Notes for Tables 4-5 through 4-13:

Blanks in the Tables indicate a sample was not obtained

< Indicates the parameter was not detected at the laboratory detection limit shown.

Table 4-7: Indoor Air and Sub-Slab Vapor Concentration: 1,1-Dichloroethene (1,1-DCE) in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria	<0.04	Error	<1.0				
Library	<0.04	<0.098	<1.0				
Outside		<0.10					
Outside Room 111	<0.04						
Outside Loading Dock	<0.04						
Gym Store Room			<1.0			<1.0	
Gym		Error	<1.0				
Physics Room 138			<1.0				
Music Room 148			<1.0				
Room 127			<1.0				
Basement Science Room							
Pool Filter Room						2.6	
Pool		<0.098					
Boiler Room						<1.0	

Table 4-8: Indoor Air and Sub-Slab Vapor Concentration: Acetone in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria			<1.0				
Library			15	46			
Outside							
Outside Room 111							
Outside Loading Dock							
Gym Store Room			5.7			3.8	
Gym			<1.0				
Physics Room 138			11.4				
Music Room 148			12				
Room 127			16				
Basement Science Room				32			3.7
Pool Filter Room						9.4	
Pool							
Boiler Room						16	

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Notes for Tables 4-5 through 4-13:
Blanks in the Tables indicate a sample was not obtained
< Indicates the parameter was not detected at the laboratory detection limit shown.

Table 4-9: Indoor Air and Sub-Slab Vapor Concentration: cis-1,2-Dichloroethene (cis-1,2-DCE) in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria	<0.04	Error	<1.0				
Library	<0.04	<0.098	<1.0				
Outside		<0.10					
Outside Room 111	<0.04						
Outside Loading Dock	<0.04						
Gym Store Room			<1.0			<1.0	
Gym		Error	<1.0				
Physics Room 138			<1.0				
Music Room 148			<1.0				
Room 127			<1.0				
Basement Science Room							
Pool Filter Room						1.1	
Pool		<0.098					
Boiler Room						<1.0	

Table 4-10: Indoor Air and Sub-Slab Vapor Concentration: m&p-Xylene in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria	1.21712	Error	<1.0				
Library	21.78	0.8	<1.0	1.5			
Outside		0.7					
Outside Room 111	1.5614						
Outside Loading Dock	1.70774						
Gym Store Room			<1.0			<1.0	
Gym		Error	<1.0				
Physics Room 138			1.0				
Music Room 148			<1.0				
Room 127			<1.0				
Basement Science Room				1.8			<1.0
Pool Filter Room						1.1	
Pool		2.2					
Boiler Room						<1.0	

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Notes for Tables 4-5 through 4-13:

Blanks in the Tables indicate a sample was not obtained

< Indicates the parameter was not detected at the laboratory detection limit shown.

Table 4-11: Indoor Air and Sub-Slab Vapor Concentration: o-Xylene in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria	0.44527	Error	<1.0				
Library	7.51	0.3	<1.0	2.2			
Outside		0.2					
Outside Room 111	0.6012						
Outside Loading Dock	0.65444						
Gym Store Room			<1.0			<1.0	
Gym		Error	<1.0				
Physics Room 138			1.1				
Music Room 148			<1.0				
Room 127			<1.0				
Basement Science Room				1.2			<1.0
Pool Filter Room						<1.0	
Pool		0.8					
Boiler Room						<1.0	

Table 4-12: Indoor Air and Sub-Slab Vapor Concentration: Tetrachloroethene (PCE) in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria	3.56989	Error	<1.5				
Library	<0.07	0.2	<1.5	<1.5			
Outside		0.1					
Outside Room 111	0.1776						
Outside Loading Dock	0.10851						
Gym Store Room			<1.5			3.2	
Gym		Error	<1.5				
Physics Room 138			<1.5				
Music Room 148			<1.5				
Room 127			<1.5				
Basement Science Room				<1.5			25
Pool Filter Room						14	
Pool		0.1					
Boiler Room						70	

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Notes for Tables 4-5 through 4-13:

Blanks in the Tables indicate a sample was not obtained

< Indicates the parameter was not detected at the laboratory detection limit shown.

Table 4-13: Indoor Air and Sub-Slab Vapor Concentration: Trichloroethene (TCE) in ug/m^3							
Sample Type	Indoor Air				Sub-Slab		
Location	Nov. 4 1997	Apr. 19 2000	May 23 2000	Aug. 31 2000	Nov. 4 1997	May 23 2000	Aug. 31 2000
Cafeteria	0.04635	Error	<1.0				
Library	<0.05	0.3	<1.0	<1.0			
Outside		<0.098					
Outside Room 111	<0.05						
Outside Loading Dock	0.15446						
Gym Store Room			<1.0				
Gym		Error	<1.0				
Physics Room 138			<1.0				
Music Room 148			<1.0				
Room 127			<1.0				
Basement Science Room				<1.0			170
Pool Filter Room						325	
Pool		<0.098					
Boiler Room						150	

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Notes for Tables 4-5 through 4-13:

Blanks in the Tables indicate a sample was not obtained

< Indicates the parameter was not detected at the laboratory detection limit shown.

Table 7-1

Published Airborne Exposure Limits or Odor Thresholds in Parts Per Million (PPM) in Air for Substances Known or Suspected to be Present in Soil and Groundwater

Substance	OSHA PEL/STEL/C	NIOSH REL/STEL	ACGIH TLV/STEL	IDLH	Cancer Causing	Odor Threshold *
Soils-VOCs, SVOCs:						
Benzo(a)anthracene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Benzo(a)pyrene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Benzo(b)fluranthene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Benzo(ghi)perlyne	-/-/-	-/-	-/-	-	N	-
Benzo(k)fluoranthene	-/-/-	-/-	-/-	-	N	-
Chrysene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Dibenzo(a,h)anthracene	-/-/-	-/-	-/-	-	N	-
Fluoranthene	-/-/-	-/-	-/-	-	N	-
Indeno(1,2,3-cd)pyrene	-/-/-	-/-	-/-	-	N	-
Phenanthrene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Pyrene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Freon	-/-/-	-/-	-/-	-	N	-
Trichloroethene	100/-/200	25/-	50/100	1000	Y	1.36
Soils-Metals:						
Arsenic	0.010/-/-	0.002/-	0.01/-	5	Y	-
Barium	0.5/-/-	0.5/-	0.5/-	50	N	-
Beryllium	0.002/0.025/0.005	0.005/-	0.002/0.01	4	Y	-
Cadmium	0.005/-/-	0.05/-	0.01/-	9	Y	-
Chromium	0.5/-/-	0.50/-	0.5/-	250	N	-
Copper	0.1/-/-	0.1/-	0.2/-	100	N	-
Cyanide	5/-/-	-/5	5/-	50	N	-
Lead	0.050/ -- / --	0.50/-	5/-	100	Y	-
Manganese	5/-/5	1/3	0.2/-	500	N	-
Mercury (Total)	0.1/-/-	0.1/-	0.025/-	10	N	-
Nickel	1/-/-	0.015/-	1.5/-	10	Y	-

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Table 7-1 (Cont.)						
Substance	**OSHA PEL/STEL/C**	**NIOSH REL/STEL**	**ACGIH TLV/STEL**	**IDLH**	**Cancer Causing**	**Odor Threshold ***
Selenium	0.2/-/-	0.2/-	0.2/-	1	Y	-
Silver	0.01/-/-	0.01/-	0.1/-	10	N	-
Zinc	1/-/-	1/2	1/2	50	N	-
PCBs-Aroclor 1248	1/-/-	0.001/-	-/-	5	Y	-
PCBs-Aroclor 1260	0.5/-/-	0.001/-	-/-	5	Y	-
Groundwater-VOCs, SVOCs:						
Acetone	1000/-/-	250/-	500/750	2500	N	4.58
Cis-1,2-Dichloroethene (cis-1,2-DCE)	200/-/-	200/-	200/-	1000	N	19.1
1,1 Dichloroethene	5/-/-	1/-	-/-	-	N	35.5
Trans 1,3-Dichloropropene	-/-/-	1/-	1/-	-	Y	-
Freon 113	1000/-/-	1000/1250	1000/1250	2000	N	487
1,1,1 Trichloroethane	350/450/800	350 / -	350 / 450	700	N	22.4
Tetrachloroethene	100/-/200	25/-	25/100	150	Y	6.17
Benzo(a)anthracene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Chrysene	0.2/-/-	0.1/-	0.2/-	80	Y	-
Groundwater-Petroleum Products:						
Benzene	1/5/25	0.1/1	0.5/2.5	500	Y	8.65
Toluene	200/150/300	100/150	50/-	500	N	0.16
Ethylbenzene	100/-/-	100/125	100/125	800	N	2.3
Total Xylenes (m,p,o)	100/ -	100/150	100/150	900	N	o-xylene: 0.851 m-xylene: 0.324 p-xylene: 0.49

DRAFT

Definitions of PEL, REL, STEL, TLV, C and IDLH are discussed below:

PEL — The Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limit for airborne contaminants as a time-weighted average for an eight (8) hour work shift, as listed in 29 CFR 1910.1000.

REL — The National Institute for Occupational Safety and Health's (NIOSH) Recommended Exposure Level for a work shift.

STEL	A Short Term Exposure Limit as a 15-minute time-weighted average (No more than four (4) exposures per shift).
TLV	The American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Value for airborne concentrations to which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects.
C	Ceiling Concentration – The concentration that should not be exceeded during any part of the working exposure.
IDLH	The Immediately Dangerous to Life and Health maximum concentration from which one could escape within 30 minutes without experiencing any escape–impairing or irreversible health effects. (Note: Level C air-purifying respirators do not adequately protect an individual exposed to these concentrations.) These IDLH values were established by NIOSH and have not been peer reviewed. Caution is recommended with their application.

* Reference: Ernest Orlando Lawrence, Berkeley National Laboratory Environmental Health and Safety Division – Chemical Hygiene and Safety Plan Odor Threshold Table for Chemicals. http://www.lbl.gov/ehs/chsp/html/odor_threshold.shtml

DRAFT

TABLE 7-2

AIR MONITORING METHODS, ACTION LEVELS, AND PROTECTIVE LEVELS FOR WORKERS

Hazard	Monitoring Unit	Action Level	Protective Levels/Action	Monitoring Schedule
Organic Vapors (2)	PID	1 to 2 ppm above background in the breathing zone	Level D-Continue Work	Continuous for ground intrusive activities. (3)
		2 to 6 ppm above background in the breathing zone	Level D and Test for Benzene with Drager Tube (4)	
		6 to 60 ppm above background in the breathing zone	Level C-Continue Work	
		> 60 ppm above background in the breathing zone	STOP WORK EVACUATE AREA (1)	
Oxygen-Deficient Atmosphere	Q-RAE 4-Gas Meter or Equivalent	19.5 to 23.5%	Level D-Continue Work	Continuous for ground intrusive activities.
		< 19.5%	Do not enter Confined Space, STOP WORK EVACUATE AREA (1)	
		> 23.5%	Fire explosion hazard; EVACUATE AREA (1)	
Explosive Gas (LEL)	Q-RAE 4-Gas Meter or Equivalent	< 10% LEL	Level D-Continue Work	Continuous for ground intrusive activities.
		10 to 20% LEL	If school building is occupied, stop work (1). If school building is unoccupied, issue warning.	
		> 20% LEL	EVACUATE AREA (1)	
Hydrogen Sulfide (H_2S) (2)	Q-RAE 4-Gas Meter or Equivalent	< 5 ppm	Level D-Continue Work	Continuous for ground intrusive activities.
		5 to 10 ppm	If school building is occupied, stop work (1). If school building is unoccupied, issue warning.	
		> 10 ppm	STOP WORK EVACUATE AREA (1)	
Dust	Particulate Monitor Miniram or Equivalent	< 5 mg/m^3 above background in the breathing zone	Level D-Continue Work	Continuous for ground intrusive activities.
		5 to 10 mg/m^3 above background in the breathing zone.	Level C-Continue Work	
		> 10 mg/m^3 above background in the breathing zone.	STOP WORK EVACUATE AREA (1)	

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Protection Levels:

Level D - Required PPE: Safety goggles, hard hat, safety boots (steel toe/shank) and work clothes or coveralls.

Level C - Required Personal Protective Equipment (PPE): Full face, air purifying respirator or 1/2 face air purifying respirator with safety goggles, chemical resistant clothing, inner and outer chemical resistant gloves, safety boots (steel toe/shank with chemical resistant overboots), hard hat and hearing protection (if warranted).

Notes:

LEL - Lower Explosive Limit

ppm= parts per million

(1) For all circumstances where work is stopped, the School District Health and Safety Officer (SDHSO) must be notified.

(2) Action levels provided for organic vapors and dust represent fifteen (15) minute average values.

(3) Continuous indicates the monitoring unit will continuously collect readings from the workers' breathing space area over a fifteen (15) minute period, and the average for each period will be used to determine the action level.

(4) Test breathing space for Benzene with Drager Tube, if concentration is one (1) ppm or greater, move to Level C PPE.

Table 8-1 - Air Monitoring Action Levels at Downwind Perimeter of Exclusion Zone		
Parameter/ Instrument	**Action Level**	**Action**
VOCs/PID	The 15-minute average of continuous readings for Total VOCs at downwind perimeter of Exclusion Zone exceeds 5 ppm above the determined background level.	Work activities are temporarily halted and VOCs monitoring continued. If downwind Exclusion Zone VOC readings decrease to < 5 ppm above background level, work can resume with continuous monitoring.
VOCs/PID	The 15-minute average of continuous readings is greater than 5 ppm but less than 25 ppm over the background level at the downwind perimeter of the Exclusion Zone.	Work activities must be halted, the source of vapors must be identified and corrective actions taken to abate emissions. Following these steps, work may continue if air monitoring readings indicate the Total VOCs level is 5 ppm or less over background for the 15-minute average at 200 feet downwind of the Exclusion Zone, or at half the distance to the nearest potential receptor or building, whichever is less (but in no case less than 20 feet).
VOCs/PID	The 15-minute average of continuous reading is 25 ppm or greater over the background level at the downwind perimeter of the Exclusion Zone.	Stop Work. Reevaluate work conditions and procedures. Contact School District Health and Safety Officer (SDHSO) for authorization prior to resuming work.
Particulates/ Monitor Unit and Direct Observation	PM-10 particulate level is 100 micrograms per cubic meter (ug/m3) or greater than the background level for the 15-minute period at the downwind edge of the Exclusion Zone or visible dust is leaving the Exclusion Zone.	Suppress particulates by spraying the dusty area with water, work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the Exclusion Zone.
Particulates/ Monitor Unit and Direct Observation	After implementation of dust suppression techniques, downwind PM-10 particulate levels at the downwind edge of the exclusion zone are greater than 150 ug/m^3 above the upwind level.	Work must be stopped and the SDHSO must be notified. Re-evaluate dust suppression techniques. Workers are required to use full face respirators with NIOSH approved P100 cartridges or combination cartridges. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m^3 of the upwind level and in preventing visible dust migration.

DRAFT

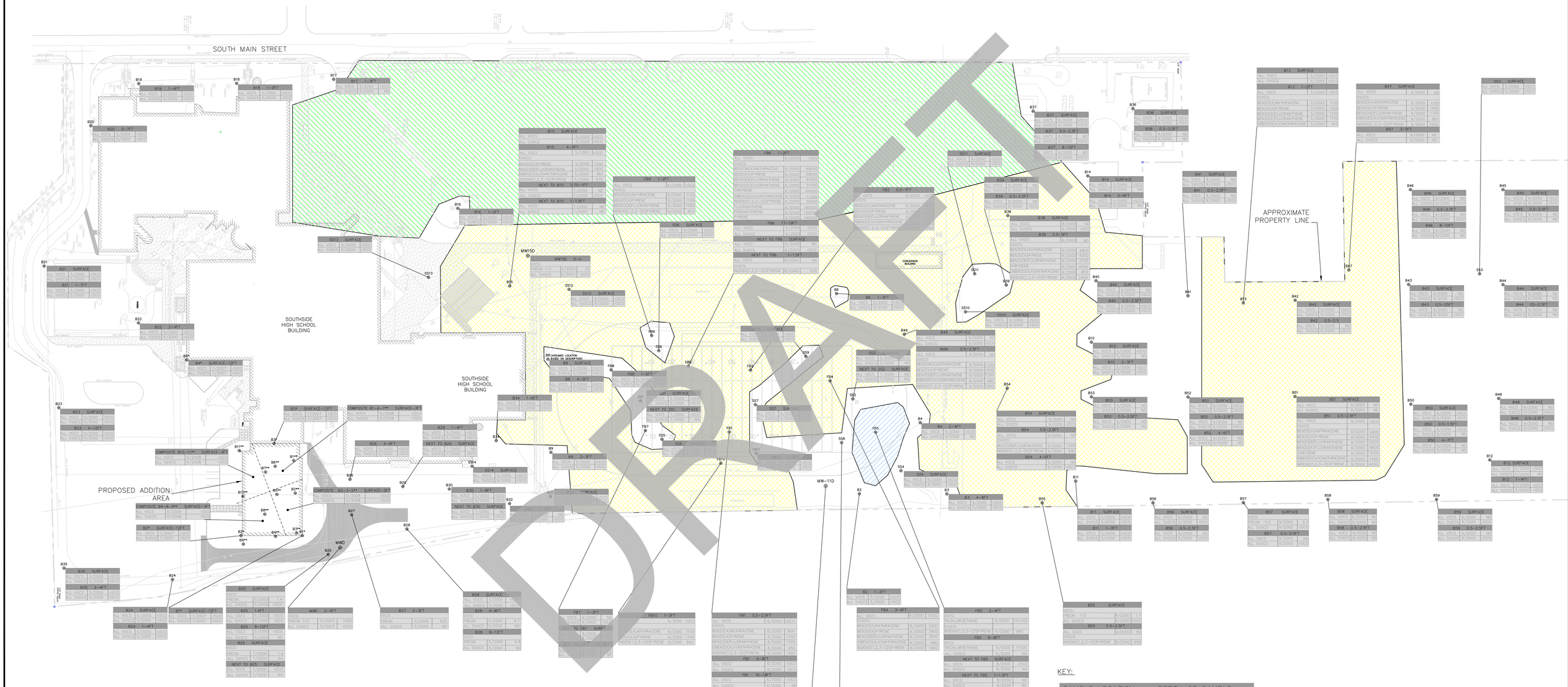
References:

Draft DER-10 Technical Guidance for Site Investigation and Remediation, NYSDOH Generic Community Air Monitoring Plan (December 2002)

Soils Management Plan, Elmira City School District, Southside High School, Elmira, New York, prepared by Sterling Environmental Engineering, P.C., February 10, 2009

PLATES

DRAFT



DRAFT

VOCS

6NYCRR PART 375-6 SCOs FOR VOCs	ug/Kg
TRICHLORETHENE	21,000
FREON	---

VOC PARAMETERS LISTED FOR SAMPLE LOCATIONS HAVE REPORTED CONCENTRATIONS THAT EXCEED 6NYCRR PART 375-6 REMEDIAL PROGRAM SOIL CLEANUP OBJECTIVES (SCOs) FOR PROTECTION OF PUBLIC HEALTH, RESTRICTED RESIDENTIAL USE.

SVOCS

6NYCRR PART 375-6 SCOs FOR SVOCs	ug/Kg
BENZO(A)ANTHRACENE	1,000
BENZO(A)PYRENE	1,000
BENZO(B)FLUORANTHENE	1,000
BENZO(G,H,I)PERYLENE	100,000
BENZO(K)FLUORANTHENE	3,900
CHRYSENE	3,900
DIBENZO(A,H)ANTHRACENE	330
FLUORANTHENE	100,000
INDENO(1,2,3-CD)PYRENE	500
PHENANTHRENE	100,000
PYRENE	100,000

SVOC PARAMETERS LISTED FOR SAMPLE LOCATIONS HAVE REPORTED CONCENTRATIONS THAT EXCEED 6NYCRR PART 375-6 REMEDIAL PROGRAM SOIL CLEANUP OBJECTIVES (SCOs) FOR PROTECTION OF PUBLIC HEALTH, RESTRICTED RESIDENTIAL USE.

NOTES:

- ● SOIL BORING LOCATION
- --- NOT AVAILABLE
- ---- APPROXIMATE QUADRANT BOUNDARIES FOR FOUR (4) COMPOSITE SOIL SAMPLES COLLECTED FOR JUNE 2008 INVESTIGATION
- D-U DEPTH UNKNOWN
- NA NOT ANALYZED
- ND NOT DETECTED
- <SCO ALL DETECTED VOCS AND SVOCS (ug/Kg) ARE REPORTED AT LEVELS LESS THAN 6NYCRR PART 375-6 SOIL CLEANUP OBJECTIVES (SCOS) FOR PROTECTION OF PUBLIC HEALTH, RESTRICTED RESIDENTIAL USE.
- B1* SAMPLE ID FOR CME ASSOCIATES, INC. AUGUST 28, 2007 REPORT
- B1** SAMPLE ID FOR STERLING ENVIRONMENTAL ENGINEERING, P.C. JULY 2008 SOIL CHARACTERIZATION REPORT

REFERENCES FOR VOCS AND SVOCS SUMMARY TABLES:

SOIL CHARACTERIZATION REPORT
STERLING ENVIRONMENTAL ENGINEERING, P.C.
JULY 14, 2008

JULY 2007 SOIL INVESTIGATION FOR
9,600 S.F. BUILDING ADDITION AND MECHANICAL EQUIPMENT PADS AT SOUTHSIDE HIGH SCHOOL
CME ASSOCIATES, INC.
AUGUST 28, 2007

IIWA REPORT ON GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH 2004

MAY-OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER 2001

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. ENTITLED: "ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL", DATED FEBRUARY 12, 2008.

KEY:

SAMPLE LOCATION		DEPTH OF SAMPLE (FEET BELOW GROUND SURFACE)
PARAMETER	SAMPLE DATE	REPORTED CONCENTRATION IN ug/Kg

- POTENTIAL SVOCs MANAGEMENT AREA
- POTENTIAL VOCs MANAGEMENT AREA
- AREA MEETS SOIL MANAGEMENT OBJECTIVES
- DATA GAP AREA

PLATE 2A

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR
1.	2-10-09	RE-FORMATTED NOTES AND KEY	JDC	EMD	

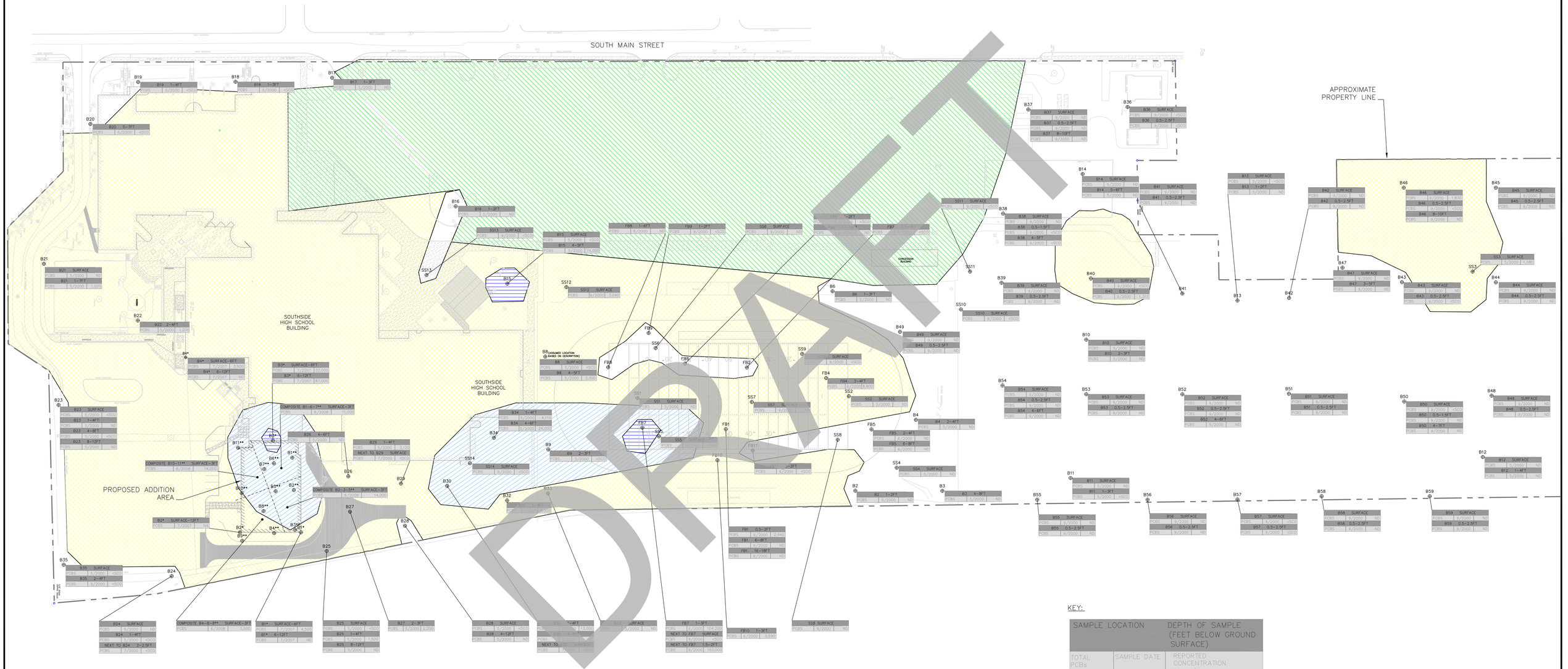
PROJECT

PROJ. ENGR.: R.L. Aldrich, P.E.
PROJ. NO.: 28014
PREPARED BY: E.M. Davis
DRAFTED BY: J.D. Croote
CHECKED BY: J.S. Kelly
APPROVED BY:
DATUM:
CONTOUR INTERVAL = FEET
0 150 300 600 1200
1" = 600'

SUMMARY OF VOLATILE ORGANIC COMPOUNDS (VOCS) AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCS) REPORTED FOR SOILS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road ● Latham, New York 12110

DATE: 8/19/08 | SCALE: 1" = 600' | DWG. NO. 28014020 | SHEET 1 OF 3



DRAFT

KEY:

SAMPLE LOCATION	DEPTH OF SAMPLE (FEET BELOW GROUND SURFACE)
TOTAL PCBs	SAMPLE DATE
REPORTED CONCENTRATION IN ug/Kg	

- POTENTIAL PCBs MANAGEMENT AREA >50,000 ug/Kg
- POTENTIAL PCBs MANAGEMENT AREA 10,000–50,000 ug/Kg
- POTENTIAL PCBs MANAGEMENT AREA 1,000–10,000 ug/Kg
- AREA MEETS SOIL MANAGEMENT OBJECTIVES
- DATA GAP AREA

PCBs

6NYCRR PART 375-6 SCO FOR PCBs	ug/Kg
TOTAL PCBs	1,000

TOTAL PCBs LISTED FOR SAMPLE LOCATIONS HAVE REPORTED CONCENTRATIONS THAT EXCEED THE 6NYCRR PART 375-6 REMEDIAL PROGRAM SOIL CLEANUP OBJECTIVE (SCO) FOR PROTECTION OF PUBLIC HEALTH, RESTRICTED RESIDENTIAL USE.

NOTES:

- ⊕ SOIL BORING LOCATION
- ----- APPROXIMATE QUADRANT BOUNDARIES FOR FOUR(4) COMPOSITE SOIL SAMPLES COLLECTED IN JUNE 2008.
- ND NOT DETECTED
- <SCO ALL DETECTED PCBs (ug/Kg) ARE REPORTED AT LEVELS LESS THAN 6NYCRR PART 375-6 SOIL CLEANUP OBJECTIVES (SCOS) FOR PROTECTION OF PUBLIC HEALTH, RESTRICTED RESIDENTIAL USE.
- B1* SAMPLE ID FOR CME ASSOCIATES, INC. AUGUST 28, 2007 REPORT
- B1** SAMPLE ID FOR STERLING ENVIRONMENTAL ENGINEERING, P.C. JULY 2008 SOIL CHARACTERIZATION REPORT

REFERENCES FOR PCBs SUMMARY TABLES:

MAY-OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER 2001

JULY 2007 SOIL INVESTIGATION FOR 9600 S.F. BUILDING ADDITION AND MECHANICAL EQUIPMENT PADS AT SOUTHSIDE HIGH SCHOOL
CME ASSOCIATES, INC.
AUGUST 28, 2007

SOIL CHARACTERIZATION REPORT
STERLING ENVIRONMENTAL ENGINEERING, P.C.
JULY 14, 2008

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. ENTITLED: "ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL", DATED FEBRUARY 12, 2008.

PLATE 2B

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR
1.	2-10-09.	RE-FORMATTED NOTES AND KEY	JDC	EMD	

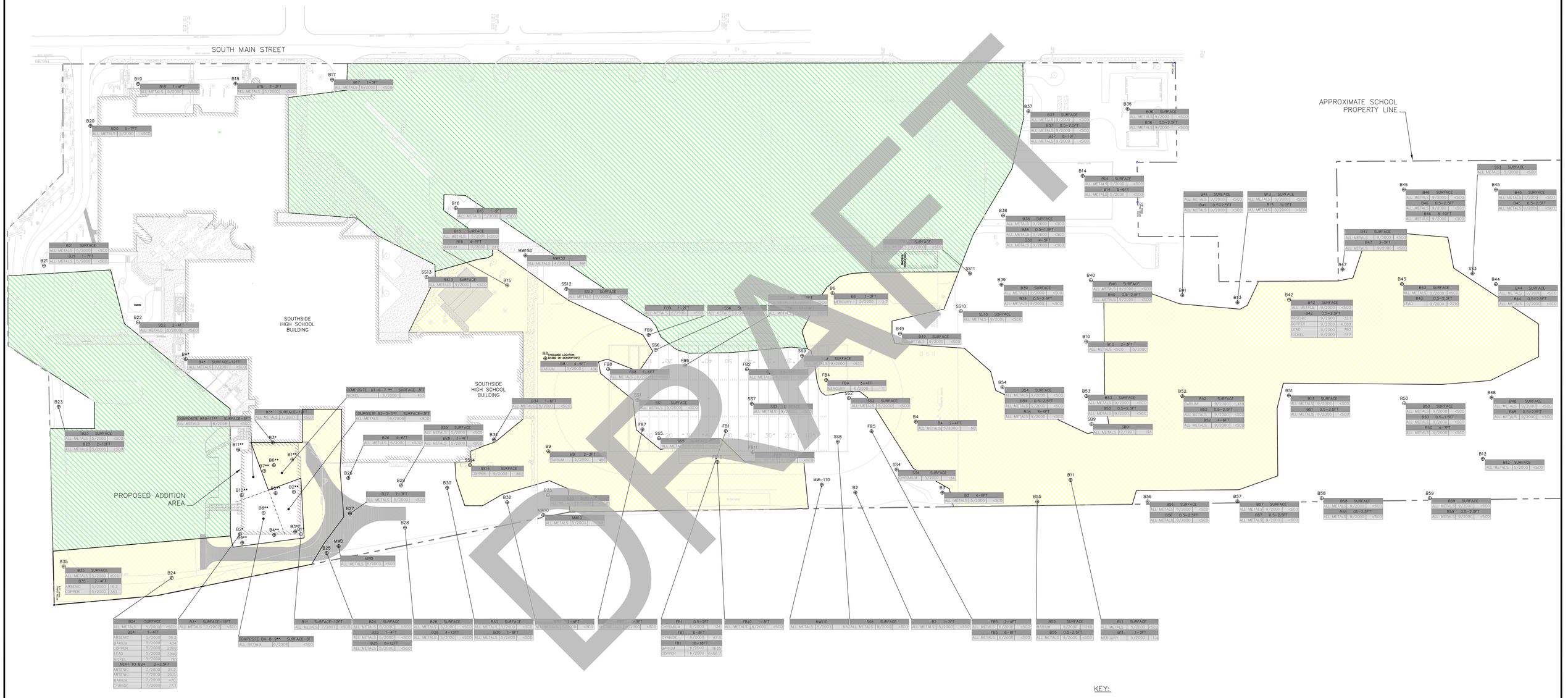
PROJECT	
PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	E.M. Davis
DRAFTED BY:	J.D. Croote
CHECKED BY:	J.S. Kelly
APPROVED BY:	
DATUM:	
CONTOUR INTERVAL =	FEET

0 150 300 600 1200
1" = 600'

SUMMARY OF POLYCHLORINATED BIPHENYLS (PCBs) REPORTED FOR SOILS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE: 9/02/08 | SCALE: 1" = 600' | DWG. NO: 28014019 | SHEET 2 OF 3



DRAFT

METALS

6NYCRR PART 375-6 SCO FOR METALS:	mg/Kg
ARSENIC	16
BARIUM	400
CHROMIUM (TOTAL)	110
COPPER	270
CYANIDE (TOTAL)	27
LEAD	400
MERCURY (TOTAL)	0.81
NICKEL	310

METALS PARAMETERS LISTED IN SUMMARY TABLES FOR SAMPLE LOCATIONS HAVE REPORTED CONCENTRATIONS THAT EXCEED 6NYCRR PART 375-6 SCOs FOR PROTECTION OF PUBLIC HEALTH, RESTRICTED RESIDENTIAL USE.

NOTES:

- ⊕ SOIL BORING LOCATION
- ----- APPROXIMATE QUADRANT BOUNDARIES FOR FOUR (4) COMPOSITE SOIL SAMPLES COLLECTED FOR JUNE 2008 INVESTIGATION.
- ND NOT DETECTED
- NA NOT ANALYZED
- <SCO ALL DETECTED METALS (mg/Kg) ARE REPORTED AT LEVELS LESS THAN 6NYCRR PART 375-6 SOIL CLEANUP OBJECTIVES (SCOS) FOR PROTECTION OF PUBLIC HEALTH, RESTRICTED RESIDENTAL USE.
- B1* SAMPLE ID FOR CME ASSOCIATES, INC. AUGUST 28, 2007 REPORT.
- B1** SAMPLE ID FOR STERLING ENVIRONMENTAL ENGINEERING, P.C. JULY 2008 SOIL CHARACTERIZATION REPORT.

REFERENCES FOR METALS SUMMARY TABLES:

SOIL CHARACTERIZATION REPORT
STERLING ENVIRONMENTAL ENGINEERING, P.C.
JULY, 14 2008

GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH, 2004

MAY-OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER, 2001

SUBSURFACE ENVIRONMENTAL ASSESSMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

JULY 2007 SOIL INVESTIGATION FOR 9,600 S.F. BUILDING ADDITION AND MECHANICAL EQUIPMENT PADS AT SOUTHSIDE HIGH SCHOOL
CME ASSOCIATES, INC.
AUGUST 28, 2007

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. ENTITLED: "ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL", DATED FEBRUARY 12, 2008.

KEY:

SAMPLE LOCATION	DEPTH OF SAMPLE (FEET BELOW GROUND SURFACE)
METALS PARAMETER	SAMPLE DATE	REPORTED CONCENTRATION IN mg/Kg

POTENTIAL METALS MANAGEMENT AREA

AREA MEETS SOIL MANAGEMENT OBJECTIVES

DATA GAP AREA

PLATE 2C

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR
1.	2-10-09	RE-FORMATTED NOTES AND KEY	JDC	EMD	

PROJECT	
PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	E.M. Davis
DRAFTED BY:	J.D. Croote
CHECKED BY:	J.S. Kelly
APPROVED BY:	
DATUM:	
CONTOUR INTERVAL =	FEET

0 150 300 600 1200
1" = 600'

SUMMARY OF METALS REPORTED FOR SOILS

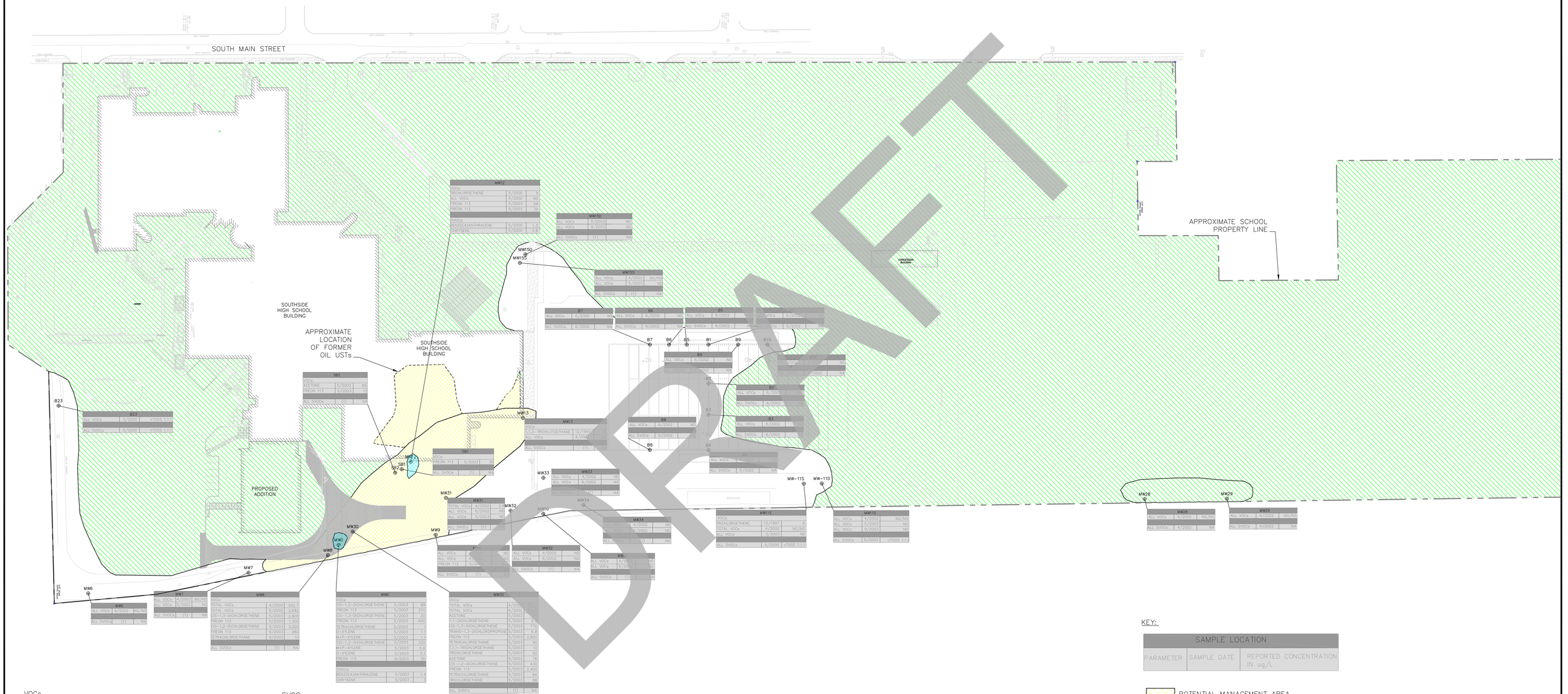
ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.

CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE: 9/3/08 | SCALE: 1" = 600' | DWG. NO. 28014021 | SHEET 3 OF 3



DRAFT

KEY:

SAMPLE LOCATION		
PARAMETER	SAMPLE DATE	REPORTED CONCENTRATION IN ug/L

POTENTIAL MANAGEMENT AREA FOR VOCs

POTENTIAL MANAGEMENT AREA FOR SVOCs

AREA MEETS GROUNDWATER MANAGEMENT OBJECTIVES

DATA GAP AREA

VOCs

NYSDEC TOGS 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES (JUNE 1998):	(ug/L)
ACETONE	50GV
CIS-1,2-DICHLOROETHENE	5
CIS-1,3-DICHLOROETHENE	---
1,1-DICHLOROETHENE	5
TRANS-1,3-DICHLOROPROPENE	---
FREON 113	---
1,1,1-TRICHLOROETHANE	5
TETRACHLOROETHANE	5
TRICHLOROETHENE	5
M+P XYLENE	5
O-XYLENE	5

VOC PARAMETERS LISTED FOR SAMPLE LOCATIONS HAVE REPORTED CONCENTRATIONS THAT EXCEED WATER QUALITY STANDARDS OR GUIDANCE VALUES PROVIDED IN NYSDEC TOGS 1.1.1 (JUNE 1998)

SVOCs

NYSDEC TOGS 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES (JUNE 1998):	(ug/L)
BENZO(A)ANTHRACENE	0.002 GV
CHRYSENE	0.002 GV

SVOC PARAMETERS LISTED IN SUMMARY TABLE FOR EACH SAMPLE LOCATION HAVE REPORTED CONCENTRATIONS THAT EXCEED WATER QUALITY STANDARDS OR GUIDANCE VALUES PROVIDED IN NYSDEC TOGS 1.1.1 (JUNE 1998)

NOTES:

⊕	SAMPLE LOCATION
---	NOT AVAILABLE
GV	GUIDANCE VALUE
ND	NOT DETECTED
NA	NOT ANALYZED
NG	NOT GAUGED
NS	NOT SAMPLED
<TOGS 1.1.1	ALL DETECTED VOCs OR SVOCs (ug/L) ARE REPORTED AT LEVELS LESS THAN THE TOGS 1.1.1 STANDARDS OR GUIDANCE VALUES.
(1)	SVOCs NOT ANALYZED BY METHOD 625 FOR ALL DATES (SEE PLATE 6 FOR PETROLEUM COMPOUNDS REPORTED FOR GROUNDWATER)

REFERENCES FOR VOCs AND SVOCs SUMMARY TABLES:

GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH 2004

SITE REMEDIAL DATA, NOVEMBER 16, 2001 THROUGH JUNE 2002
NYSDEC MILLER'S POND/SOUTHSIDE HIGH SCHOOL
MARCOR ENVIRONMENTAL
JULY 22, 2002

MAY-OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER 2001

SUBSURFACE ENVIRONMENTAL ASSESSMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC.,ENTITLED: ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL, DATED FEBRUARY 12, 2008.

PLATE 3A

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	E.M. Davis
DRAFTED BY:	J.D. Croote
CHECKED BY:	J.S. Kelly
APPROVED BY:	
DATUM:	NA
CONTOUR INTERVAL =	NA FEET

0 150 300 600 1200
1" = 600'

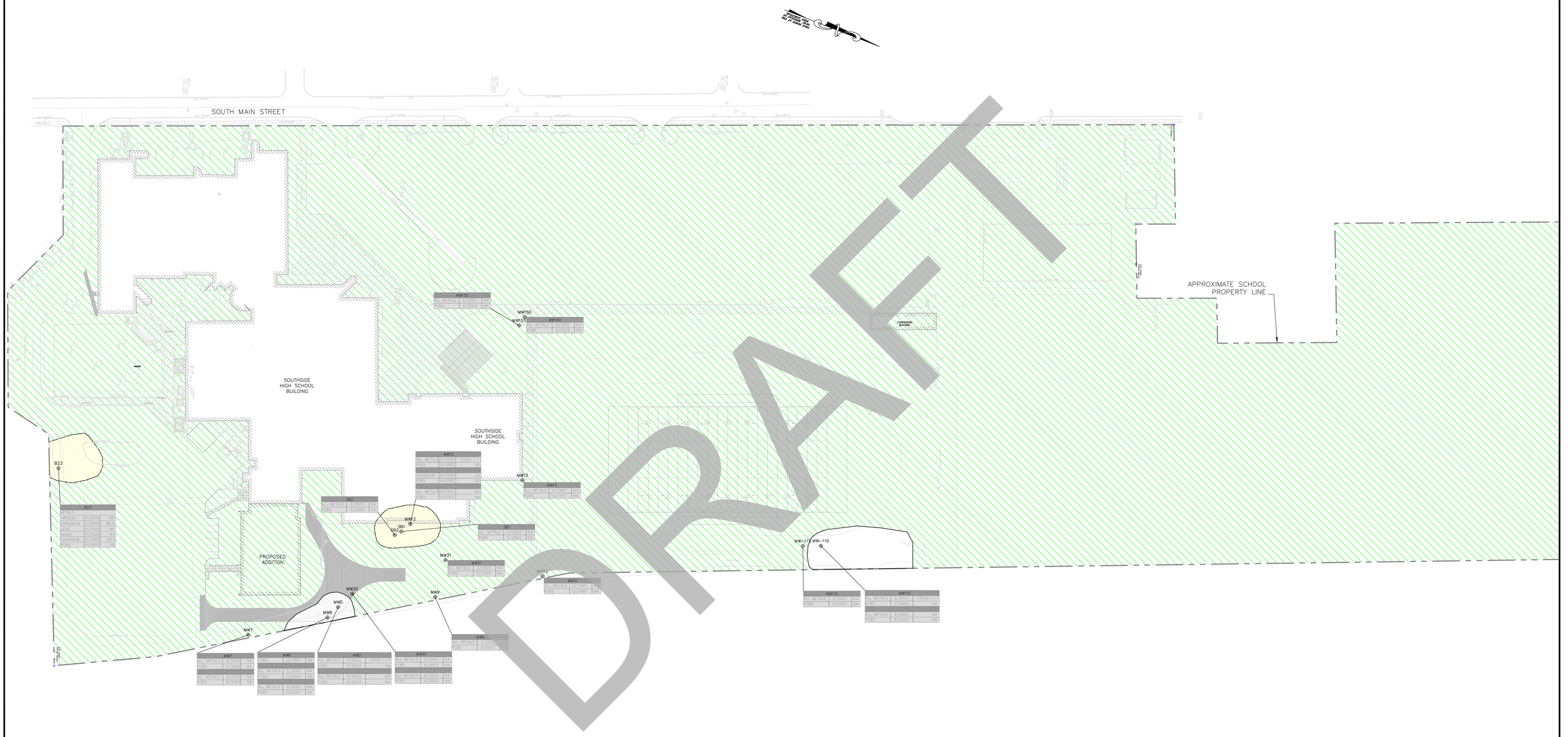
SUMMARY OF VOLATILE ORGANIC COMPOUNDS (VOCs) AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) REPORTED FOR GROUNDWATER

ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.
CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE: 9/3/08 | SCALE: 1" = 600' | DWG. NO. 28014022 | SHEET 1 OF 3



DRAFT

METALS AND PCBs

NYSDEC TOGS 1.1.1 WATER QUALITY STANDARDS AND GUIDANCE VALUES (JUNE 1198):	ug/L
ARSENIC	25
CHROMIUM	50
LEAD	25
NICKEL	100
VANADIUM	---
TOTAL POLYCHLORINATED BIPHENYLS (PCBs)	0.09

METALS OR PCBs LISTED FOR SAMPLE LOCATIONS HAVE REPORTED CONCENTRATIONS THAT EXCEED WATER QUALITY STANDARDS OR GUIDANCE VALUES PROVIDED IN NYSDEC TOGS 1.1.1 (JUNE 1998)

NOTES:

⊕	SAMPLE LOCATION
ND	NOT DETECTED
NA	NOT ANALYZED
---	NOT AVAILABLE
<TOGS 1.1.1	ALL DETECTED METALS OR PCBs (ug/L) ARE REPORTED AT LEVELS LESS THAN THE TOGS 1.1.1 STANDARDS AND GUIDANCE VALUES.

REFERENCES FOR METALS AND PCBS SUMMARY TABLES:

IIWA REPORT ON GROUNDWATER CHLORINATED SOLVENT INVESTIGATION
NYSDEC
MARCH, 2004

MAY–OCTOBER 2000 NYSDEC SAMPLING REPORT
NYSDEC
SEPTEMBER, 2001

SUBSURFACE ENVIRONMENTAL ASSESSMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC., ENTITLED: ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL, DATED FEBRUARY 12, 2008.

KEY:

SAMPLE LOCATION		
METALS PARAMETER OR TOTAL PCBs	SAMPLE DATE	REPORTED CONCENTRATION IN ug/L

POTENTIAL MANAGEMENT AREAS FOR METALS

AREA MEETS GROUNDWATER MANAGEMENT OBJECTIVES

DATA GAP AREA

PLATE 3B

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR

PROJECT

PROJ. ENGR.: R.L. Aldrich, P.E.
PROJ. NO.: 28014
PREPARED BY: E.M. Davis
DRAFTED BY: J.D. Croote
CHECKED BY: J.S. Kelly
APPROVED BY:
DATUM:
CONTOUR INTERVAL = FEET
0 150 300 600 1200
1" = 600'

SUMMARY OF METALS AND POLYCHLORINATED BIPHENYLS (PCBs) REPORTED FOR GROUNDWATER

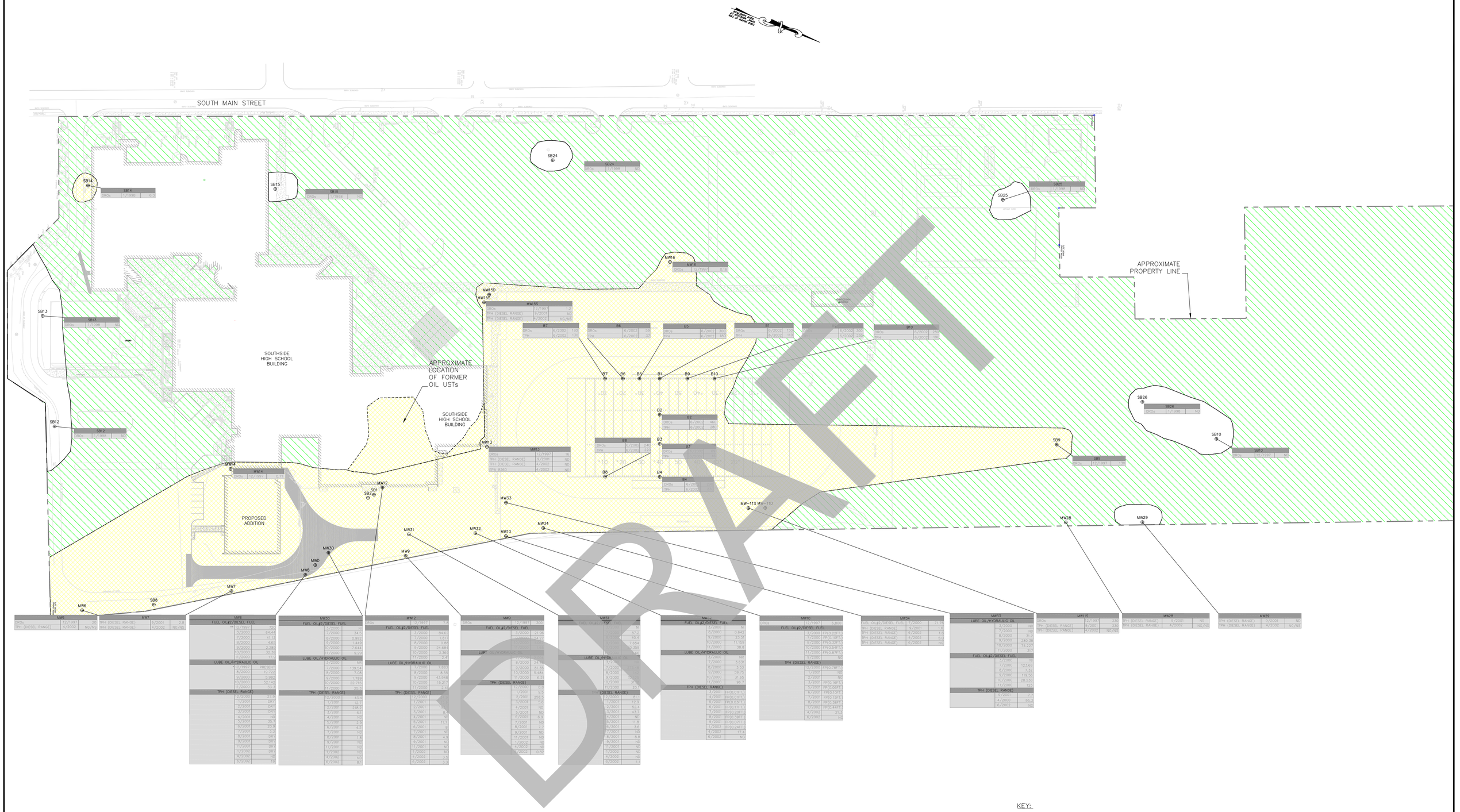
ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.

CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE: 9/3/08 SCALE: 1" = 600' DWG. NO. 28014025 SHEET 2 OF 3



SB14		
DROs	12/1998	6.6

SB15		
DROs	12/1998	ND

SB24		
DROs	12/1998	ND

SB25		
DROs	12/1998	ND

SB13		
DROs	12/1998	ND

SB12		
DROs	12/1998	ND

SB26		
DROs	12/1998	ND

SB10		
DROs	12/1997	0.5

SB9		
DROs	12/1997	1.55

MW16		
DROs	12/1997	6.6

MW15S		
DROs	12/199	1.2
TPH (DIESEL RANGE)	9/2001	ND
TPH (DIESEL RANGE)	6/2002	ND/NS

B7		
DROs	6/2002	180
TPH	6/2002	130

B6		
DROs	6/2002	59
TPH	6/2002	37

B5		
DROs	6/2002	300
TPH	6/2002	180

B1		
DROs	6/2002	1500
TPH	6/2002	1100

B9		
DROs	6/2002	300
TPH	6/2002	230

B10		
DROs	6/2002	280
TPH	6/2002	190

B2		
DROs	6/2002	460
TPH	6/2002	280

B3		
DROs	6/2002	1100
TPH	6/2002	750

B8		
DROs	6/2002	240
TPH	6/2002	220

B4		
DROs	6/2002	1100
TPH	6/2002	750

MW13		
DROs	12/1997	16
TPH (DIESEL RANGE)	9/2001	ND
TPH (DIESEL RANGE)	4/2002	ND
EPA 8260	6/2002	ND

MW14		
DROs	12/1997	0.72

MW12		
DROs	12/1997	7.6

MW33		
LUBE OIL/HYDRAULIC OIL		
	5/2000	NI
	7/2000	50
	8/2000	31.2
	9/2000	280.38
	10/2000	74.227
	11/2000	317
FUEL OIL#2/DIESEL FUEL		
	5/2000	NI
	7/2000	123.68
	8/2000	7.32
	9/2000	119.56
	10/2000	28.238
	11/2000	123
TPH (DIESEL RANGE)		
	9/2001	7.2
	4/2002	95.3
	6/2002	ND

MW11S		
DROs	12/199	330
TPH (DIESEL RANGE)	9/2001	330
TPH (DIESEL RANGE)	9/2002	ND/NS

MW28		
TPH (DIESEL RANGE)	9/2001	NS
TPH (DIESEL RANGE)	4/2002	NS/NG

MW29		
TPH (DIESEL RANGE)	9/2001	ND
TPH (DIESEL RANGE)	4/2002	NS/NG

MW6		
DROs	12/1997	20
TPH (DIESEL RANGE)	4/2002	NG/NS

MW7		
TPH (DIESEL RANGE)	9/2001	2.8
TPH (DIESEL RANGE)	4/2002	NG/NS

MW8		
FUEL OIL#2/DIESEL FUEL		
**	12/1997	720
	3/2000	64.44
	7/2000	41.12
	8/2000	4.63
	9/2000	2.259
	10/2000	32.38
	11/2000	17.4
LUBE OIL/HYDRAULIC OIL		
*	12/1997	PRESENT
	8/2000	19.722
	9/2000	5.982
	10/2000	52.142
	11/2000	33.1
TPH (DIESEL RANGE)		
	12/2000	27.1
	1/2001	DRY
	2/2001	DRY
	3/2001	DRY
	4/2001	ND
	5/2001	35.7
	6/2001	20.9
	7/2001	3.3
	8/2001	DRY
	9/2001	NS
	11/2001	DRY
	1/2002	DRY
	4/2002	ND
	6/2002	19

MW30		
FUEL OIL#2/DIESEL FUEL		
	3/2000	NI
	7/2000	34.5
	8/2000	0.992
	9/2000	1.449
	10/2000	7.644
	11/2000	9.29
LUBE OIL/HYDRAULIC OIL		
	3/2000	NR
	7/2000	139.54
	8/2000	7.08
	9/2000	1.789
	10/2000	22.715
	11/2000	25.3
TPH (DIESEL RANGE)		
	12/2000	43.4
	1/2001	12.7
	2/2001	218.2
	3/2001	6.1
	4/2001	ND
	5/2001	2.9
	6/2001	4.2
	7/2001	ND
	8/2001	1.8
	9/2001	ND
	11/2001	ND
	1/2002	ND
	4/2002	ND
	6/2002	8.1

MW12		
DROs	12/1997	7.6
FUEL OIL#2/DIESEL FUEL		
	3/2000	84.62
	7/2000	1.817
	8/2000	0.88
	9/2000	24.684
	10/2000	3.369
	11/2000	3.41
LUBE OIL/HYDRAULIC OIL		
	7/2000	7.883
	8/2000	8.55
	9/2000	43.948
	10/2000	15.237
	11/2000	2.57
TPH (DIESEL RANGE)		
	12/2000	4.8
	1/2001	2.5
	2/2001	4.2
	3/2001	6.1
	4/2001	NS
	5/2001	11.7
	6/2001	8
	7/2001	NS
	8/2001	4.4
	9/2001	NS
	11/2001	NS
	1/2002	NS
	4/2002	3.5
	6/2002	3.3

MW9		
DROs	12/1997	300
FUEL OIL#2/DIESEL FUEL		
	3/2000	NI
	7/2000	21.06
	8/2000	24.27
	9/2000	7.53
	10/2000	7.53
	11/2000	7.53
LUBE OIL/HYDRAULIC OIL		
*	12/1997	PRESENT
	8/2000	24.44
	9/2000	81.32
	10/2000	5.454
	11/2000	6.23
TPH (DIESEL RANGE)		
	12/2000	6.8
	1/2001	9.5
	2/2001	253.5
	3/2001	5.6
	4/2001	ND
	5/2001	ND
	6/2001	6.9
	7/2001	ND
	8/2001	7.7
	9/2001	ND
	11/2001	ND
	1/2002	ND
	4/2002	ND
	6/2002	0.82

MW31		
FUEL OIL#2/DIESEL FUEL		
	3/2000	NI
	7/2000	87.2
	8/2000	40.4
	9/2000	7.654
	10/2000	2.359
	11/2000	7.6
LUBE OIL/HYDRAULIC OIL		
	3/2000	NI
	7/2000	223.13
	9/2000	23.5
	10/2000	31.5
	11/2000	29.1
TPH (DIESEL RANGE)		
	12/2000	81.1
	1/2001	12.9
	2/2001	52.4
	3/2001	43.7
	4/2001	ND
	5/2001	11.8
	6/2001	3.6
	7/2001	ND
	8/2001	8.8
	9/2001	ND
	11/2001	ND
	1/2002	ND
	4/2002	ND
	6/2002	3.3

MW32		
FUEL OIL#2/DIESEL FUEL		
	3/2000	NI
	8/2000	0.642
	9/2000	23.51
	10/2000	11.159
	11/2000	38.8
LUBE OIL/HYDRAULIC OIL		
	3/2000	NR
	7/2000	3.631
	8/2000	3.53
	9/2000	59.75
	10/2000	31.65
	11/2000	96.7
TPH (DIESEL RANGE)		
	3/2001	FP(0.01FT.)
	4/2001	FP(0.01FT.)
	5/2001	FP(0.03FT.)
	6/2001	FP(0.17FT.)
	7/2001	FP(0.20FT.)
	8/2001	FP(0.39FT.)
	9/2001	FP(0.07FT.)
	1/2002	FP(0.24FT.)
	4/2002	17.4
	6/2002	NG

MW10		
DROs	12/1997	6,800
FUEL OIL#2/DIESEL FUEL		
	3/2000	FP(0.23FT.)
	7/2000	FP(0.10FT.)
	8/2000	FP(0.32FT.)
	10/2000	FP(0.54FT.)
	11/2000	FP(0.87FT.)
	9/2000	NG
TPH (DIESEL RANGE)		
	12/2000	FP(0.78FT.)
	1/2001	NG
	2/2001	NG
	3/2001	FP(0.16FT.)
	5/2001	FP(0.06FT.)
	6/2001	FP(0.10FT.)
	7/2001	FP(0.15FT.)
	8/2001	FP(0.38FT.)
	1/2002	FP(0.44FT.)
	4/2002	31.3
	6/2002	NG

MW34		
FUEL OIL#2/DIESEL FUEL	11/2000	71.79
TPH (DIESEL RANGE)	9/2001	1.6
TPH (DIESEL RANGE)	6/2002	1.6
TPH (DIESEL RANGE)	4/2002	5.0
TPH (DIESEL RANGE)	6/2002	ND

KEY:

SAMPLE LOCATION		
PETROLEUM PARAMETER	SAMPLE DATE	REPORTED CONCENTRATION IN mg/L

POTENTIAL MANAGEMENT AREA FOR PETROLEUM COMPOUNDS

AREA MEETS GROUNDWATER MANAGEMENT OBJECTIVES

DATA GAP AREA

NOTES:

⊕ SAMPLE LOCATION

DROs DIESEL RANGE ORGANICS

NS NOT SAMPLED

ND NOT DETECTED

NG NOT GAUGED

NI UNKNOWN DEFINITION, NOT PROVIDED IN LABORATORY REPORT

* REFERENCED AS MOTOR OIL IN REPORT

** REFERENCED AS FUEL OIL IN REPORT

TPH TOTAL PETROLEUM HYDROCARBONS

FP FREE PRODUCT

NR NOT REPORTED BY LABORATORY

USTs UNDERGROUND STORAGE TANKS

TOGS 1.1.1 (JUNE 1998) DOES NOT CONTAIN STANDARDS OR GUIDANCE VALUES FOR PETROLEUM PRODUCT CLASSIFICATIONS OR TPH.

REFERENCES FOR PETROLEUM COMPOUNDS SUMMARY TABLES:

SITE REMEDIAL, DATA, NOVEMBER 16, 2001 THROUGH JUNE 2002
NYSDEC MILLER'S POND/SOUTHSIDE HIGH SCHOOL
MARCOR ENVIRONMENTAL
JULY 22, 2002

SUBSURFACE ENVIRONMENTAL ASSESSEMENT REPORT
MATRIX ENVIRONMENTAL TECHNOLOGIES
NOVEMBER 9, 1998

MAP REFERENCE:

BASE MAP PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC., ENTITLED: ADDITION AND RENOVATIONS TO SOUTHSIDE HIGH SCHOOL, DATED FEBRUARY 12, 2008.

LOCATION OF FORMER USTs IS SHOWN ON THE 1931 SANBORN FIRE INSURANCE MAP, PROVIDED IN MATRIX ENVIRONMENTAL TECHNOLOGIES REPORT, NOVEMBER 9, 1998

PLATE 3C

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	E.M. Davis
DRAFTED BY:	J.D. Croote
CHECKED BY:	J.S. Kelly
APPROVED BY:	
DATUM:	
CONTOUR INTERVAL =	FEET

0 150 300 600 1200
1" = 600'

PETROLEUM COMPOUNDS REPORTED FOR GROUNDWATER

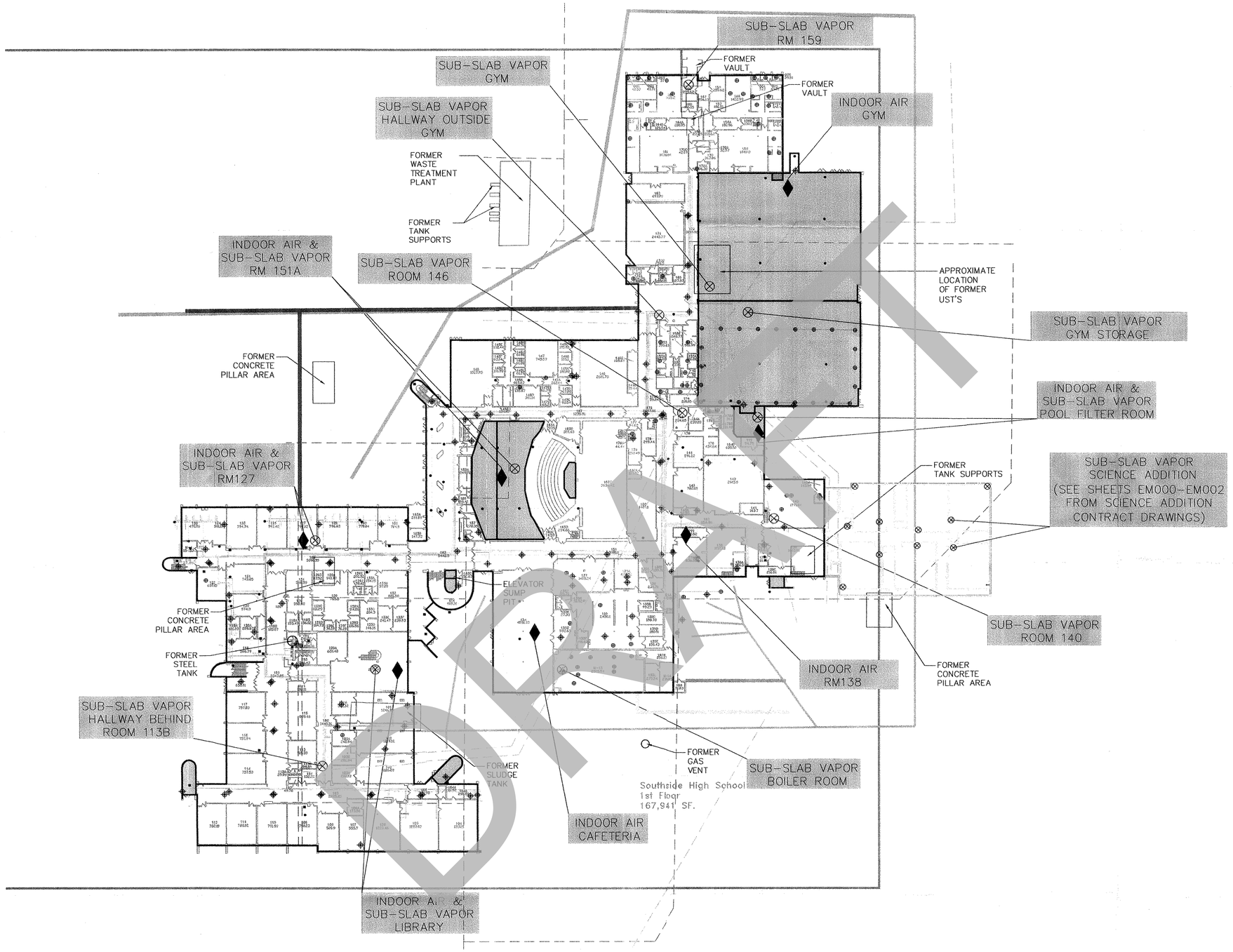
ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN ST.

CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE: 9/3/08 | SCALE: 1" = 600' | DWG. NO. 28014024 | SHEET 3 OF 3



KEY:

SAMPLE TYPE LOCATION

LEGEND:

- SOIL GAS CHEMICAL SAMPLE LOCATION
- INDOOR AND OUTDOOR AIR CHEMICAL SAMPLE LOCATION
- APPROXIMATE FORMER STEAM LINE LOCATION
- APPROXIMATE GAS LINE LOCATION
- APPROXIMATE ELECTRIC LINE LOCATION
- APPROXIMATE WATER LINE LOCATION
- APPROXIMATE SANITARY SEWER LINE LOCATION
- APPROXIMATE STORMWATER LINE LOCATION
- APPROXIMATE FLOOR DRAIN LOCATION
- APPROXIMATE DECK PLATE CLEAN-OUT LOCATION
- APPROXIMATE WALL PLATE CLEAN OUT LOCATION
- APPROXIMATE CLEAN OUT LOCATION
- APPROXIMATE HISTORICAL GAS LINE LOCATION
- APPROXIMATE HISTORICAL UNDERGROUND ELECTRIC LINES
- APPROXIMATE HISTORICAL WATERLINE LOCATION
- APPROXIMATE TILE SANITARY SEWER LINE LOCATION
- APPROXIMATE SLEEVE LOCATION THROUGH FOOTER WALL
- AREAS WITHIN THE PERIMETER FOOTER WALL WITH ENCIRCLING FOOTER WALLS
- SUB-SLAB DIFFERENTIAL PRESSURE MONITORING LOCATIONS

DRAFT

PLATE 4A

STATE OF NEW YORK · RODNEY L. ALDRICH · LICENSED PROFESSIONAL ENGINEER · NO. 059179

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR

PROJECT

PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	R.L. Aldrich, P.E.
DRAFTED BY:	J.D. Croote
CHECKED BY:	P.J. Kellerher, P.E.
APPROVED BY:	Rodney L Aldrich
DATUM:	
CONTOUR INTERVAL =	FEET

0 250 500 1000

1" = 500'

SUBSURFACE STRUCTURES AND PLANNED SAMPLING LOCATIONS STARTING IN 2009

ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET

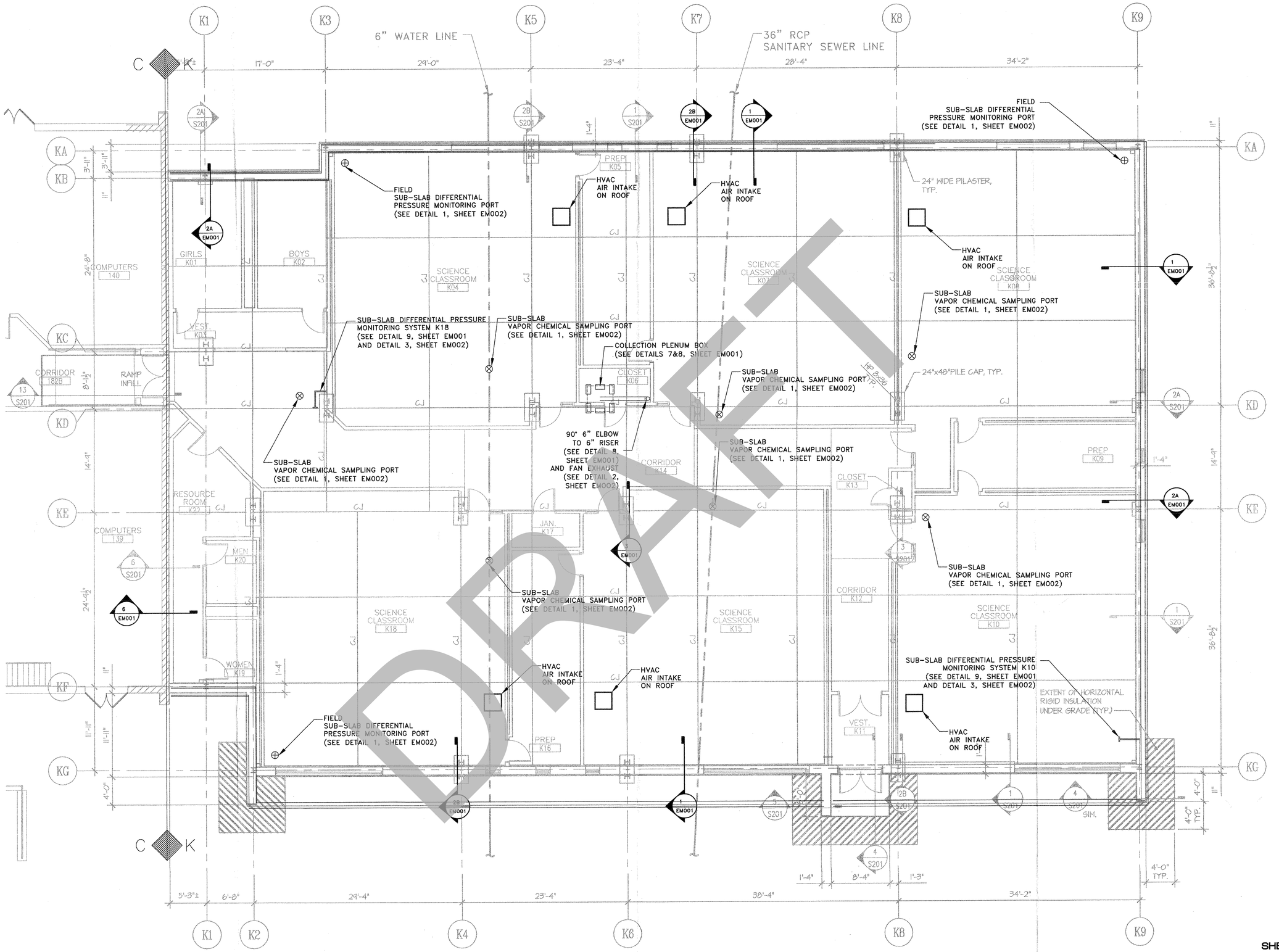
CITY OF ELMIRA CHENANGO CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE:	SCALE:	DWG. NO.	SHEET
4/24/09	1" = 500'	28014048	1 OF 2

SHEETS

DRAFT



DRAFT

SHEET EM000

NOTES:
1) SEE SHEET EM001 FOR PROFILES OF SUB-SLAB PIPE AND PLENUM.

2) SEE SHEET EM001 FOR DETAILS AT WALLS AND PILE CAPS.

3) ROOF TOP EXHAUST MUST BE AT LEAST 25 FEET FROM ANY AIR INTAKE DEVICES.

4) CONTRACTOR TO FIELD ADJUST TO MEET SYSTEM LAYOUT AS SHOWN.

PLAN REFERENCES:
1) BASE PLAN: BY KEYSTONE ASSOCIATES ENTITLED FOUNDATION\FIRST FLOOR PLAN UNIT K, NOTES, DETAILS, SED PROJECT NUMBER 07-06-00-01-0-016-016, DATED OCTOBER 9, 2007.

2) DRAWING: BY KEYSTONE ASSOCIATES ENTITLED SANITARY WASTE & VENT PLAN-UNIT K, SED PROJECT NUMBER 07-06-00-01-0-016-016, DATED OCTOBER 9, 2007.

LEGEND:

- DIFFERENTIAL PRESSURE GAUGE PIPING
- 6" SOLID RIGID FIBERGLASS CLASS 0 OR 1 PER UL 181, WITH WET LAY-UP JOINTS
- 8"x8"x16" CONCRETE BLOCKS

STATE OF NEW YORK · ROBERT L. ALDRICH · NO. 98778 · LICENSED PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR
1.	4/3/09	ADDED HVAC AIR INTAKES, ADDED TO NOTE			
		CONCERNING RISER	JDC	PJK	RLA
2.	4/7/09	ADDED SUB-SLAB VAPOR SAMPLING PORTS IN			
		ROOMS K08 AND K10.	JDC	PJK	RLA
3.	4/7/09	REVISE PER NYSDEC AND NYSDOH COMMENTS	JDC	PJK	RLA
4.	6/3/09	REVISE LOCATIONS OF ARROWS TO HVAC LABELS	JDC	PJK	RLA

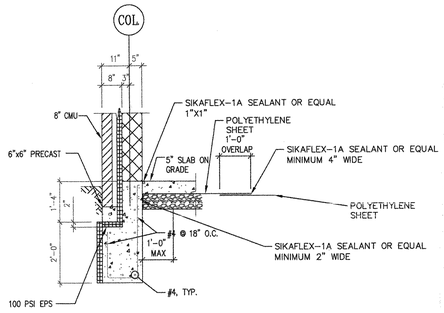
PROJECT	
PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	R.L. Aldrich, P.E.
DRAFTED BY:	J.D. Croote
CHECKED BY:	P.J. Kelleher, P.E.
APPROVED BY:	Robert L. Aldrich
DATUM:	
CONTOUR INTERVAL =	FEET

3/16"=1'-0"

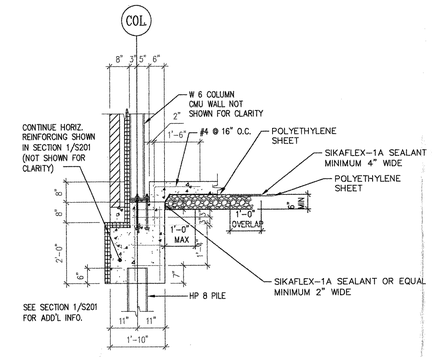
SUB-SLAB
DEPRESSURIZATION SYSTEM
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA — CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

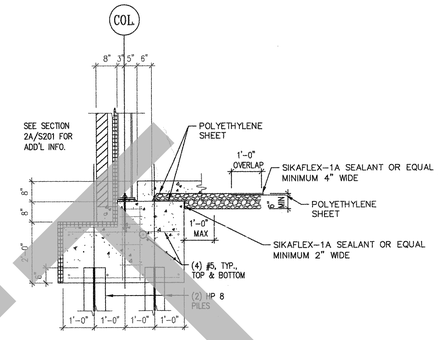
DATE:	SCALE:	DWG. NO.	SHEET
2/24/09	3/16"=1'-0"	28014045	1 OF 3



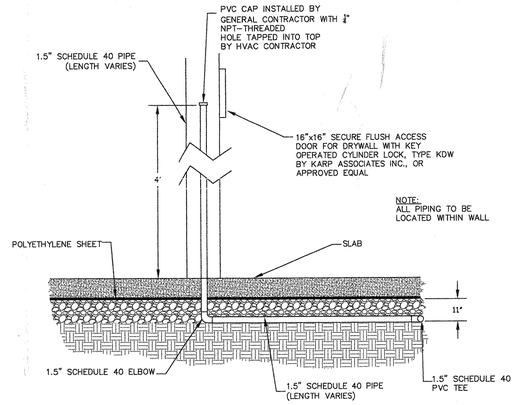
1 EM001 SECTION
SCALE: 1/2" = 1'-0"



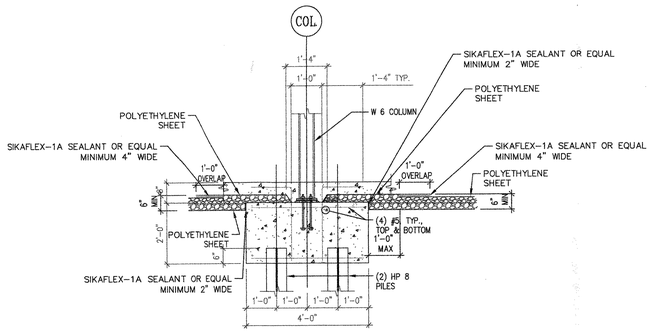
2A EM001 SECTION
SCALE: 1/2" = 1'-0"



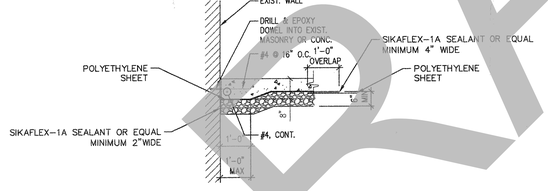
2B EM001 SECTION
SCALE: 1/2" = 1'-0"



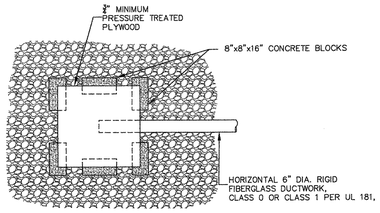
9 EM001 SUB-SLAB DIFFERENTIAL PRESSURE GAUGE STUB-OUT



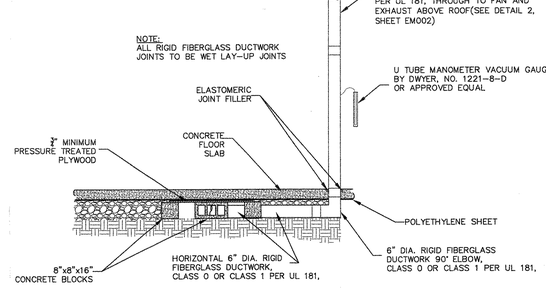
3 EM001 SECTION
SCALE: 1/2" = 1'-0"



6 EM001 SECTION AT EXIST. BUILDING
SCALE: 1/2" = 1'-0"



7 EM001 COLLECTION PLENUM BOX
PLAN VIEW



8 EM001 COLLECTION PLENUM BOX
PROFILE VIEW

DRAFT

NOTES:

1. FOR ALL SOLID PIPE AND FITTINGS, INCH DIMENSION REFERS TO NOMINAL DIAMETER.
2. POLYETHYLENE SHEET SHALL BE NEW AND A MINIMUM OF 6 MIL.
3. SIKAFLEX-1A ONE PART POLYURETHANE, ELASTOMERIC SEAL AND ADHESIVE OR EQUAL.

PLAN REFERENCES:

DETAILS 1, 2A, 2B, 3 AND 6 FROM DRAWING S201 BY KEYSTONE ASSOCIATES

LEGEND:

GAS PERMEABLE LAYER: CRUSHED STONE OR CRUSHED GRAVEL MEETING NYSDOT DESIGNATION 703-2 SIZE 2 ON TABLE 703-4

SHEET EM001

STATE OF NEW YORK · RODNEY L. ALDRICH · No. 058174 · REGISTERED PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR
1.	4/6/09	ADDED TO NOTE AT DUCTWORK, DETAIL 8.			
		AND ADDED U TUBE MANOMETER	JDC	PJK	
2.	4/16/09	RENAMED DETAIL 9.	JDC	PJK	

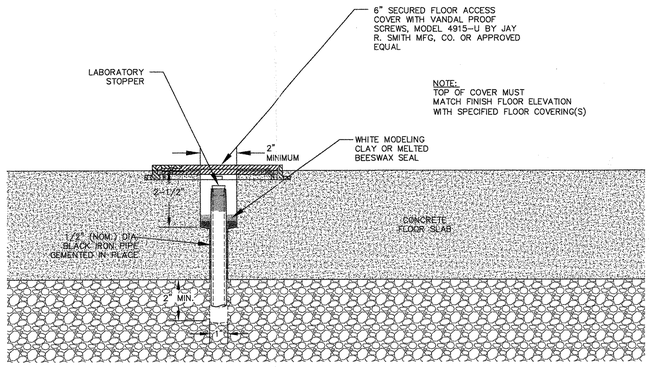
PROJECT	
PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	R.L. Aldrich, P.E.
DRAFTED BY:	J.D. Croote
CHECKED BY:	P.J. Kelleher, P.E.
APPROVED BY:	Rody L. Aldrich
DATUM:	
CONTOUR INTERVAL =	FEET

AS SHOWN

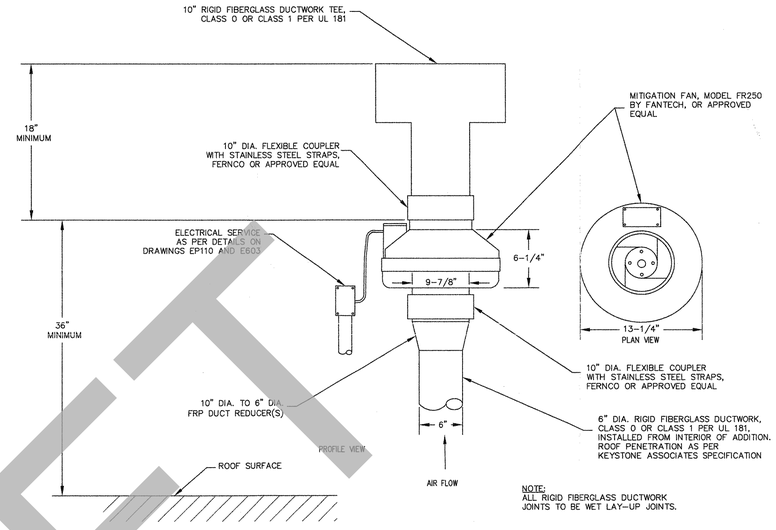
SUB-SLAB DEPRESSURIZATION SYSTEM
CROSS-SECTIONS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

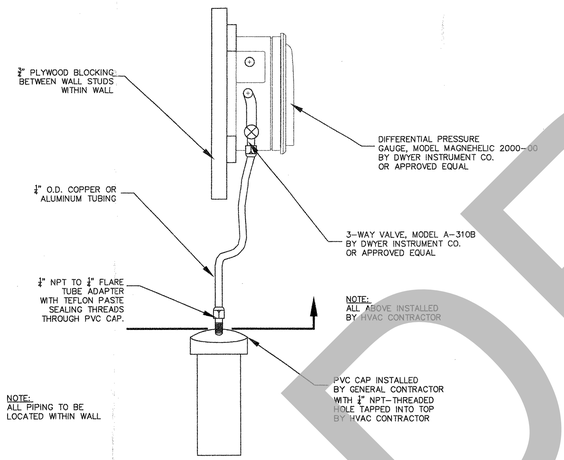
DATE: 2/24/09 | SCALE: AS SHOWN | DWG. NO. 28014046 | SHEET 2 OF 3



1 EM002 SUB-SLAB VAPOR CHEMICAL SAMPLING PORT & FIELD SUB-SLAB PRESSURE MONITORING PORT
PROFILE VIEW



2 EM002 FANTECH'S FR SERIES MODEL FR 250



3 EM002 SUB-SLAB DIFFERENTIAL PRESSURE GAUGE INSTALLATION

NOTES:

1. FOR ALL SOLID PIPE AND FITTINGS, INCH DIMENSION REFERS TO NOMINAL DIAMETER.
2. POLYETHYLENE SHEET SHALL BE NEW AND A MINIMUM OF 6 MIL.
3. SIKAFLEX-1A ONE PART POLYURETHANE, ELASTOMERIC SEAL AND ADHESIVE OR EQUAL.

LEGEND:

GAS PERMEABLE LAYER: CRUSHED STONE OR CRUSHED GRAVEL MEETING NYSDOT DESIGNATION 703-2 SIZE 2 ON TABLE 703-4

CONCRETE SLAB (AS SPECIFIED BY KEYSTONE ASSOCIATES)

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SHEET EM002

STATE OF NEW YORK · JEFFREY L. ALDRICH · 065875 · LICENSED PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR
1.	4/6/09	REVISED TITLE OF DETAIL 1	JDC	PJK	RLA
2.	4/16/09	REVISED TITLE OF DETAIL 1 AND 3	JDC	PJK	
3.	6/3/09	REVISED DETAIL 1	JDC	PJK	

PROJECT	
PROJ. ENGR.:	R.L. Aldrich, P.E.
PROJ. NO.:	28014
PREPARED BY:	R.L. Aldrich, P.E.
DRAFTED BY:	J.D. Croote
CHECKED BY:	P.J. Kelleher, P.E.
APPROVED BY:	
DATUM:	
CONTOUR INTERVAL =	FEET

N.T.S.

SUB-SLAB DEPRESSURIZATION SYSTEM
PROFILE DETAILS
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

DATE: 2/24/09 | SCALE: N.T.S. | DWG. NO. 28014047 | SHEET 3 OF 3

APPENDIX 2A

PREVIOUS SITE INVESTIGATION REPORTS (CD)

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APPENDIX 2B

STANDARD OPERATING PROCEDURES FOR SOIL SAMPLING

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Sterling Environmental Engineering, P.C.

STANDARD OPERATING PROCEDURES FOR SOIL SAMPLING

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Prepared By:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

February 11, 2009

STANDARD OPERATING PROCEDURES
FOR
SOIL SAMPLING

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28014/Reports/Environmental Management Report/Appendices/Appendix_2B_toc.doc

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1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to describe the procedures for the collection of representative soil samples. Analysis of soil samples may determine whether concentrations of specific pollutants exceed established action levels, or if the concentrations of pollutants present a risk to public health or the environment. These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon field conditions, equipment limitations or limitations imposed by the procedure. In all instances, the actual procedures used should be documented and described in an appropriate report.

2.0 METHOD SUMMARY

Soil samples may be collected using a variety of methods and equipment depending on the depth of the desired sample, the type of sample required (disturbed vs. undisturbed), and the soil type. Near-surface soils or stockpiled soils may be easily sampled using a spade, trowel, or scoop. Sampling at greater depths may be performed using a hand auger, continuous flight auger, a trier, a split-spoon, or, if required, a backhoe.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Chemical preservation of solids is not generally recommended. Samples should be stored in sterile glass containers in coolers with ice and protected from sunlight to minimize potential reaction and degradation.

4.0 SAMPLE INTEGRITY

There are two primary concerns associated with soil sampling: cross-contamination of samples and improper sample collection. Cross contamination can be eliminated or minimized through the use of dedicated sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary between sample locations. Improper sample collection can involve using contaminated equipment or inadequate homogenization of the samples where required, resulting in variable, non-representative results.

5.0 EQUIPMENT

Soil sampling equipment includes the following:

- Maps/plot plan
- Safety equipment, as specified in the Health and Safety Plan (HASP)
- Survey equipment or global positioning system (GPS) to locate sampling points
- Tape measure
- Survey stakes or flags
- Camera and film
- Stainless steel, plastic, or other appropriate homogenization bucket, bowl or pan
- Appropriate sized sample containers
- Ziploc plastic bags
- Logbook

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- Labels
- Chain of Custody records and custody seals
- Field data sheets and sample labels
- Cooler(s)
- Ice
- Decontamination supplies/equipment
- Canvas or plastic sheet
- Spade or shovel
- Spatula
- Scoop
- Plastic or stainless steel spoons
- Trowel(s)
- Continuous flight (screw) auger
- Bucket auger
- Post hole auger
- Extension rods
- T-handle
- Sampling trier
- Thin wall tube sampler
- Split spoons
- Tubes
- Points
- Drive head
- Drop hammer
- Puller jack and grip
- Backhoe

Specific equipment used from this list will depend on the selected soil sampling method.

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6.0 PROCEDURES

6.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies required.
2. Obtain necessary sampling and monitoring equipment.
3. Decontaminate or pre-clean equipment, and ensure that it is in working order.
4. Prepare schedules and coordinate with staff, client, and regulatory agencies, if appropriate.
5. Perform a general site survey prior to site entry in accordance with the HASP.
6. Use stakes, flagging, or buoys to identify and mark all sampling locations. Specific site factors, including extent and nature of contaminant, should be considered when selecting sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations should be utility-cleared by the School District prior to soil sampling; and utility clearance should always be confirmed before beginning work.

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6.2 Sample Collection

6.2.1 Surface Soil and Stockpile Samples

Collection of samples from near-surface soil can be accomplished with tools such as spades, shovels, trowels, and scoops. Surface material is removed to the required depth and a stainless steel or plastic scoop is then used to collect the sample. This method can be used in most soil types but is limited to sampling at or near the ground surface. Accurate, representative samples can be collected with this procedure depending on the care and precision demonstrated by the sample team member. A flat, pointed mason trowel to cut a block of the desired soil is helpful when undisturbed profiles are required. Tools plated with chrome or other materials should not be used. Plating is particularly common with garden implements such as potting trowels.

The following procedures are used to collect surface soil samples:

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.
2. Using a pre-cleaned, stainless steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.
3. If VOC analyses is to be performed, transfer the sample directly into an appropriately labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriately labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval or location into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriately labeled containers and secure the caps tightly.

6.2.2 Sampling at Depth with Augers and Thin Wall Tube Samplers

This system consists of an auger, or a thin-wall tube sampler, a series of extensions, and a "T" handle. The auger is used to bore a hole to a desired sampling depth, and is then withdrawn. The sample may be collected directly from the auger. If a core sample is to be collected, the auger tip is then replaced with a thin wall tube sampler. The system is then lowered down the borehole, and driven into the soil to the completion depth. The system is withdrawn and the core is collected from the thin wall tube sampler. Several types of augers are available; these include: bucket type, continuous flight (screw), and post-hole augers. Bucket type augers are better for direct sample recovery because they provide a large volume of sample in a short time. When continuous flight augers are used, the sample can be collected directly from the flights. The continuous flight augers are satisfactory when a composite of the complete soil column is desired. Post-hole augers have limited utility for sample collection as they are designed to cut through fibrous, rooted, swampy soil and cannot be used below a depth of approximately three (3) feet.

The following procedures are used for collecting soil samples with an auger:

1. Attach the auger bit to a drill rod extension, and attach the "T" handle to the drill rod.

2. Clear the area to be sampled of any surface debris (e.g., twigs, rocks, litter). It may be advisable to remove the first three (3) to six (6) inches of surface soil for an area approximately six (6) inches in radius around the drilling location.

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3. Begin augering, periodically removing and depositing accumulated soils onto a plastic sheet spread near the hole. This prevents accidental brushing of loose material back down the borehole when removing the auger or adding drill rods. It also facilitates refilling the hole, and avoids possible contamination of the surrounding area.

4. After reaching the desired depth, slowly and carefully remove the auger from the hole. When sampling directly from the auger, collect the sample after the auger is removed from the hole and proceed to Step 10 below.

5. Remove auger tip from the extension rods and replace with a pre-cleaned thin wall tube sampler. Install the proper cutting tip.

6. Carefully lower the tube sampler down the borehole. Gradually force the tube sampler into the soil. Do not scrape the borehole sides. Avoid hammering the rods as the vibrations may cause the boring walls to collapse.

7. Remove the tube sampler, and unscrew the drill rods.

8. Remove the cutting tip and the core from the device.

9. Discard the top of the core (approximately one (1) inch), as this possibly represents material collected before penetration of the layer of concern. Place the remaining core into the appropriately labeled sample container. Sample homogenization is not required.

10. If volatile organic analyses is to be performed, transfer the sample into an appropriately labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriately labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriately labeled containers and secure the caps tightly.

11. If another sample is to be collected in the same hole, but at a greater depth, reattach the auger bit to the drill and assembly, and follow Steps 3 through 11, making sure to decontaminate the auger and tube sampler between samples.

12. Abandon the hole according to applicable State regulations. Generally, shallow holes can simply be backfilled with the removed soil material.

6.2.3 Sampling at Depth with a Trier

The system consists of a trier (a tapered hollow tube), and a "T" handle. The auger is driven into the soil to be sampled and used to extract a core sample from the appropriate depth.

The following procedures are used to collect soil samples with a sampling trier:

1. Insert the trier into the material to be sampled at a 0° to 45° horizontal angle. This orientation minimizes the spillage of the sample.

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2. Rotate the trier once or twice to cut a core of material.

3. Slowly withdraw the trier, making sure that the slot is facing upward.

4. If VOC analyses are required, transfer the sample into an appropriately labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriately homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriately labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriately labeled containers and secure the caps tightly.

6.2.4 Sampling at Depth with a Split Spoon (Barrel) Sampler

Split spoon sampling is generally used to collect undisturbed soil cores of 18 or 24 inches in length. A series of consecutive cores may be extracted with a split spoon sampler to provide a complete soil column profile, or an auger may be used to drill down to the desired depth for sampling. The split spoon is then driven to its sampling depth through the bottom of the augured hole and the core extracted. When split spoon sampling is performed to gain geologic information, all work should be performed in accordance with ASTM D1586-98, "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils".

The following procedures are used for collecting soil samples with a split spoon:

1. Assemble the sampler by aligning both sides of barrel and then screwing the drive shoe on the bottom and the head piece on top.

2. Place the sampler in a perpendicular position on the sample material.

3. Using a well ring, drive the tube. Do not drive past the bottom of the head piece or compression of the sample will result.

4. Record in the site logbook or on field data sheets the length of the tube used to penetrate the material being sampled, and the number of blows required to obtain this depth.

5. Withdraw the sampler, and open by unscrewing the bit and head and splitting the barrel. The amount of recovery and soil type should be recorded on the boring log. If a split sample is desired, a cleaned, stainless steel knife should be used to divide the tube contents in half, longitudinally. This sampler is typically available in 2 and 3-1/2 inch diameters. A larger barrel may be necessary to obtain the required sample volume.

6. Without disturbing the core, transfer it to appropriately labeled sample container(s) and seal tightly.

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6.2.5 Test Pit/Trench Excavation

A backhoe can be used to remove sections of soil, when detailed examination of soil characteristics are required. This is probably the most expensive sampling method because of the relatively high cost of backhoe operation.

The following procedures are used for collecting soil samples from test pits or trenches:

1. Prior to any excavation with a backhoe, it is important to ensure that all sampling locations are clear of overhead and buried utilities.

2. Review the site specific HASP and ensure that all safety precautions including appropriate monitoring equipment are installed as required.

3. Using the backhoe, excavate a trench approximately three (3) feet wide and approximately one (1) foot deep below the cleared sampling location. Place excavated soils on plastic sheets. Trenches greater than five (5) feet deep must be sloped or protected by a shoring system, as required by OSHA regulations.

4. A shovel is used to remove a one (1) to two (2) inch layer of soil from the vertical face of the pit where sampling is to be performed.

5. Samples are obtained using a trowel, scoop, or coring device at the desired intervals. Be sure to scrape the vertical face at the point of sampling to remove any soil that may have fallen from above, and to expose fresh soil for sampling. In many instances, samples can be collected directly from the backhoe bucket.

6. If VOC analyses are required, transfer the sample into an appropriately labeled sample container with a stainless steel spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriately labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriately labeled containers and secure the caps tightly.

7. Abandon the pit or excavation according to applicable State regulations. Generally, shallow excavations can simply be backfilled with the removed soil material.

7.0 QUALITY ASSURANCE / QUALITY CONTROL

The following Quality Assurance/Quality Control (QA/QC) procedures apply:

1. All data must be documented on field data sheets or within site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

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8.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow USEPA, OSHA and the procedures specified in the HASP.

9.0 REFERENCES

United States Environmental Protection Agency Environmental Response Team, SOP#2012.

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APPENDIX 3A

MONITORING WELL CONSTRUCTION DETAILS

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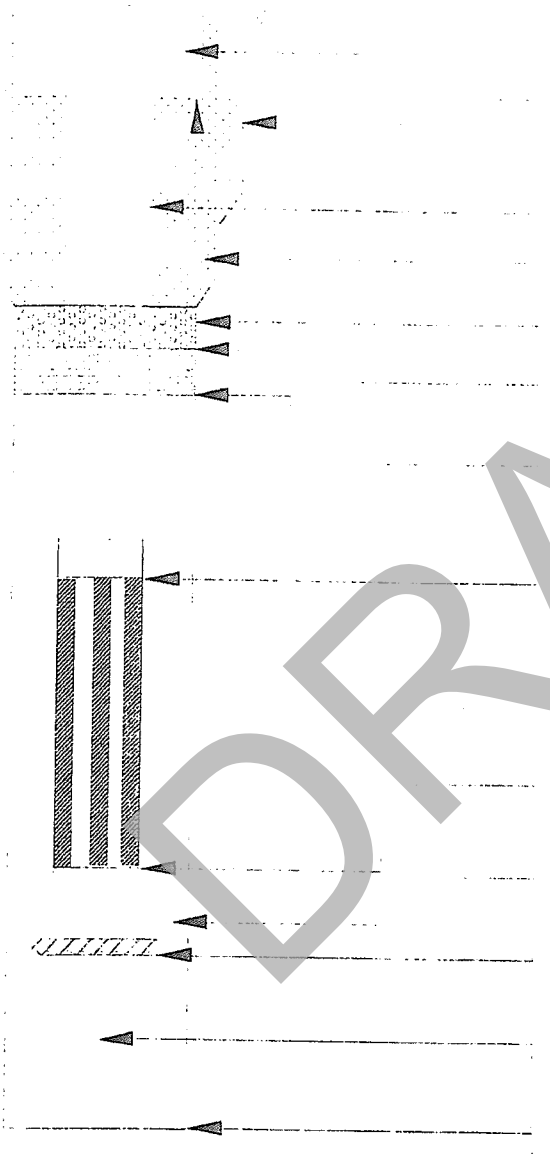
MATRIX
Environmental Technologies Inc.

WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW1
DATE COMPLETED:	12/19/96	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 852.51

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 4" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 10-1/4"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 8.0'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 10.0'
FILTER PACK MATERIAL: Morie #1 sand

TOP OF SCREEN Elevation/Depth: 12.0'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 21.5'

BOTTOM OF FILTER PACK
Elevation/Depth: 22.0'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 22.0'

TYPE OF FILLER
BELOW PLUGGED BLANK: None

BOTTOM OF BOREHOLE
Elevation/Depth: 22.0'

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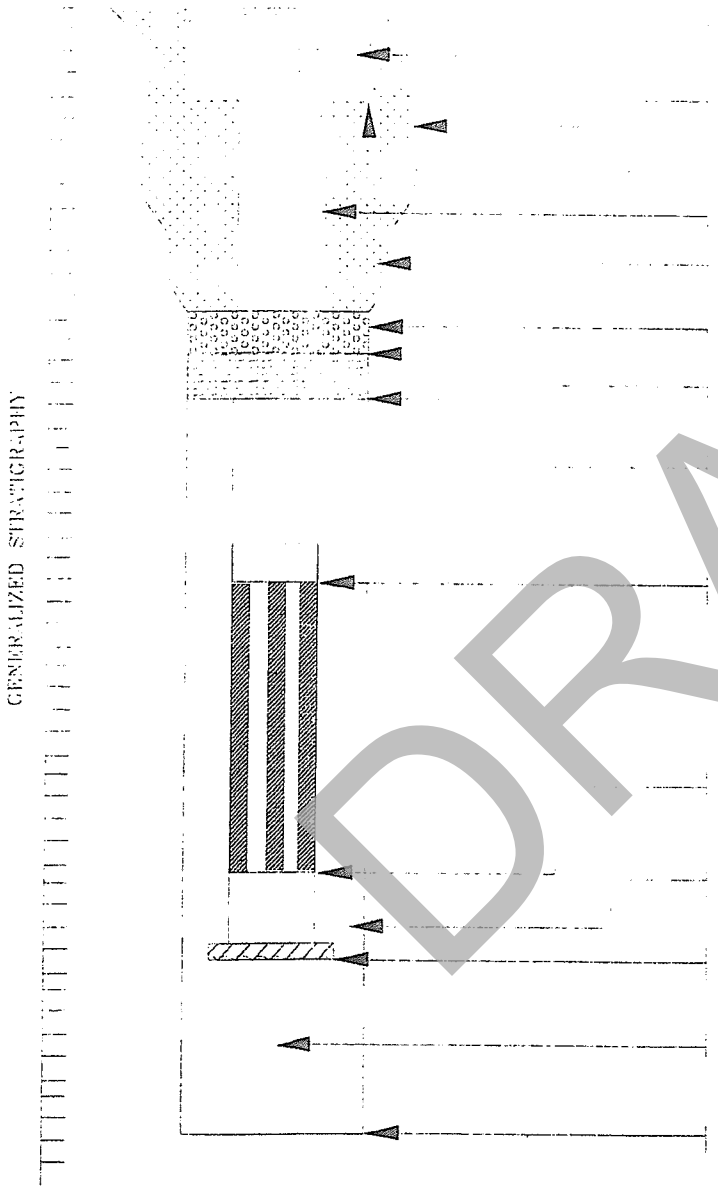
NOTES

MATRIX
Environmental Technologies

MATRIX
Environmental Technologies Inc.

WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW2
DATE COMPLETED:	12/19/96	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 852.48

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 6" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 12-1/4"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 10.0'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 12.0'
FILTER PACK MATERIAL: Morie #2 sand

TOP OF SCREEN Elevation/Depth: 15.0'
SCREEN SIZE/TYPE: .040 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 26.5'

BOTTOM OF FILTER PACK
Elevation/Depth: 27.0'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 25.0'

TYPE OF FILLER
BELOW PLUGGED BLANK: Morie #2 sand

BOTTOM OF BOREHOLE
Elevation/Depth: 27.0'

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NOTES

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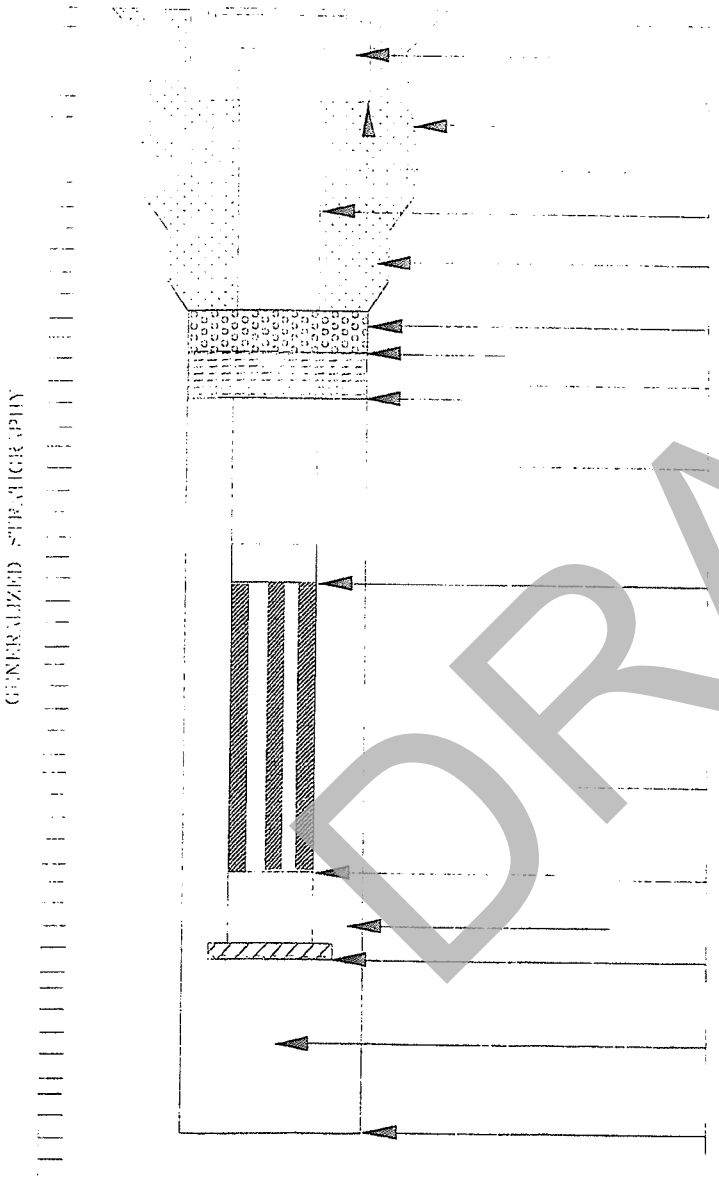
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW3
DATE COMPLETED:	12/20/96	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 852.49

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 4" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 10-1/4"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 8.0'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 10.0'
FILTER PACK MATERIAL: Morie #1 sand

TOP OF SCREEN Elevation/Depth: 12.0'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 21.5'

BOTTOM OF FILTER PACK
Elevation/Depth: 22.0'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 22.0'

TYPE OF FILLER
BELOW PLUGGED BLANK: None

BOTTOM OF BOREHOLE
Elevation/Depth: 22.0'

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NOTES

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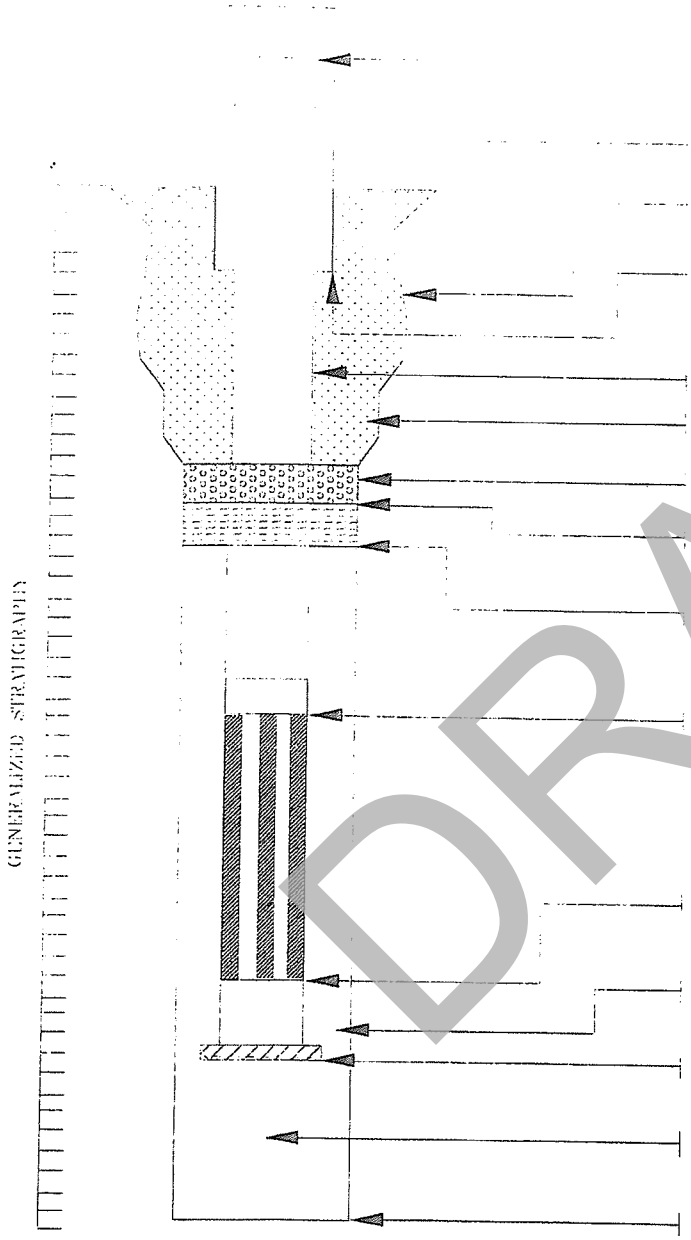
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW4
DATE COMPLETED:	4/10/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 845.96

SURFACE SEAL
Type/Depth: Concrete/2.00'

DEPTH OF SURFACE CASING: 2.00'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 6¼"

TYPE OF FILL: None

TOP OF SEAL Elevation/Depth: 2.15'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 3.15'
FILTER PACK MATERIAL: Morie #1 sand

TOP OF SCREEN Elevation/Depth: 3.65'
SCREEN SIZE/TYPE: 2" diameter .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 13.15'

BOTTOM OF FILTER PACK
Elevation/Depth: 13.65'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 13.65'

TYPE OF FILLER
BELOW PLUGGED BLANK: None

BOTTOM OF BOREHOLE
Elevation/Depth: 13.65'

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NOTES

MATRIX
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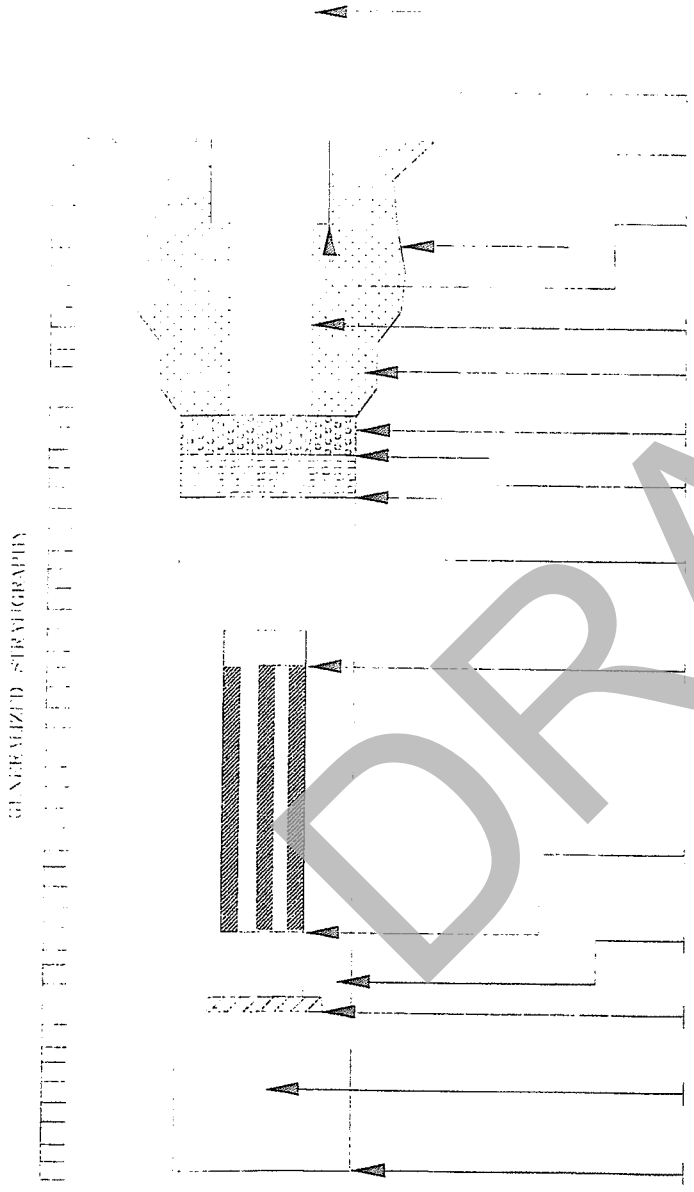
Environmental Technologies Inc.

WELL CONSTRUCTION DETAIL

PROJECT/LOCATION: NYSDEC/Miller Pond
PROJECT No. 96020
CLIENT: NYSDEC Region 8 - Scott Rodabaugh
WELL No. MW5
DATE COMPLETED: 4/9/97
SUPERVISED BY: Chris Treese



REFERENCE POINT
Elevation/Depth: 842.20'

SURFACE SEAL
Type/Depth: Concrete/2.00'

DEPTH OF SURFACE CASING: 2.00'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 6¼"

TYPE OF FILL: None

TOP OF SEAL Elevation/Depth: 2.00'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 2.40'
FILTER PACK MATERIAL: Morie #1 sand

TOP OF SCREEN Elevation/Depth: 2.90'
SCREEN SIZE/TYPE: 2" diameter .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 12.40'

BOTTOM OF FILTER PACK
Elevation/Depth: 12.90'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 12.90'

TYPE OF FILLER
BELOW PLUGGED BLANK: None

BOTTOM OF BOREHOLE
Elevation/Depth: 12.90'

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NOTES

MATRIX
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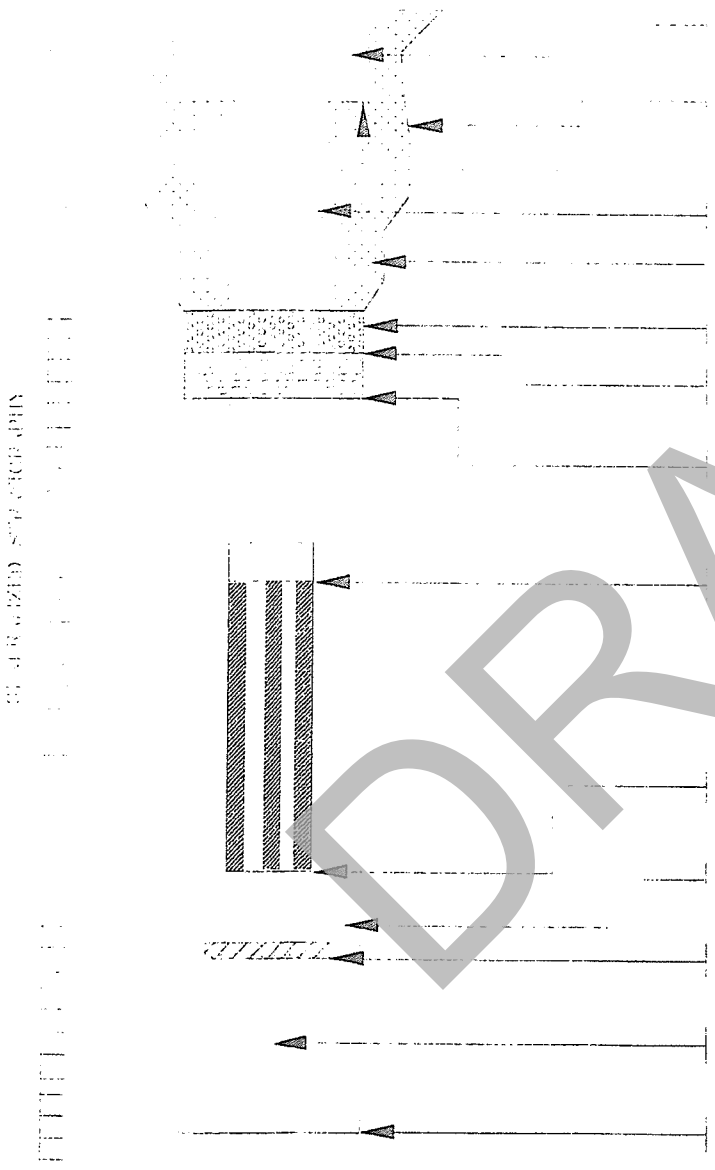
Environmental Technologies Inc.

WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW6
DATE COMPLETED:	11/9/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 849.68'

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: ¾" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: None

TOP OF SEAL Elevation/Depth: NA'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native

TOP OF SCREEN Elevation/Depth: 9.45'
SCREEN SIZE/TYPE: ¾" diam. .010 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 19.35'

BOTTOM OF FILTER PACK
Elevation/Depth: 19.45'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 19.45'

TYPE OF FILLER
BELOW PLUGGED BLANK: None

BOTTOM OF BOREHOLE
Elevation/Depth: 19.45'

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NOTES

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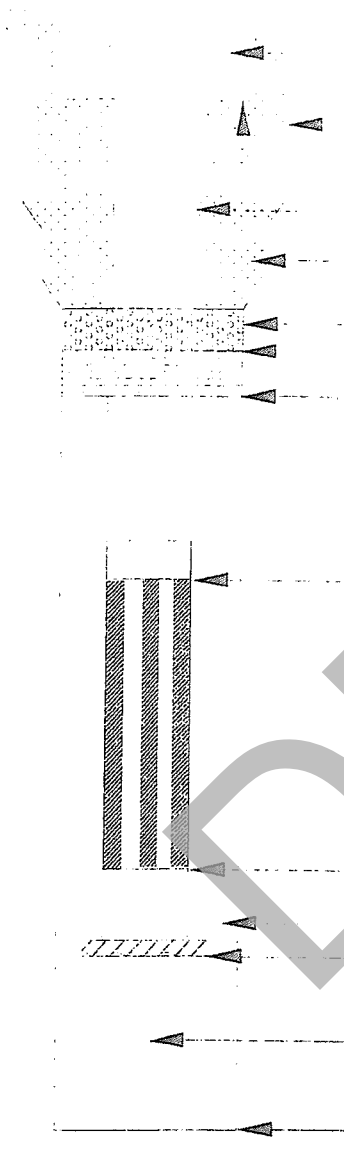
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW7
DATE COMPLETED:	12/9/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 852.21'

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: None

TOP OF SEAL Elevation/Depth: NA
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native

TOP OF SCREEN Elevation/Depth: 5.45'
SCREEN SIZE/TYPE: 3/4" diam. .010 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 15.45'

BOTTOM OF FILTER PACK
Elevation/Depth: 15.65'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 15.65'

TYPE OF FILLER
BELOW PLUGGED BLANK: None

BOTTOM OF BOREHOLE
Elevation/Depth: 15.65"

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WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96-020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW8
DATE COMPLETED:	12/8/97	SUPERVISED BY:	Chris Treese

REFERENCE POINT
Elevation/Depth: ____

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 5.30'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 6.30'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 7.30'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 16.80'

BOTTOM OF FILTER PACK
Elevation/Depth: 18.00'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 17.30'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 18.00'

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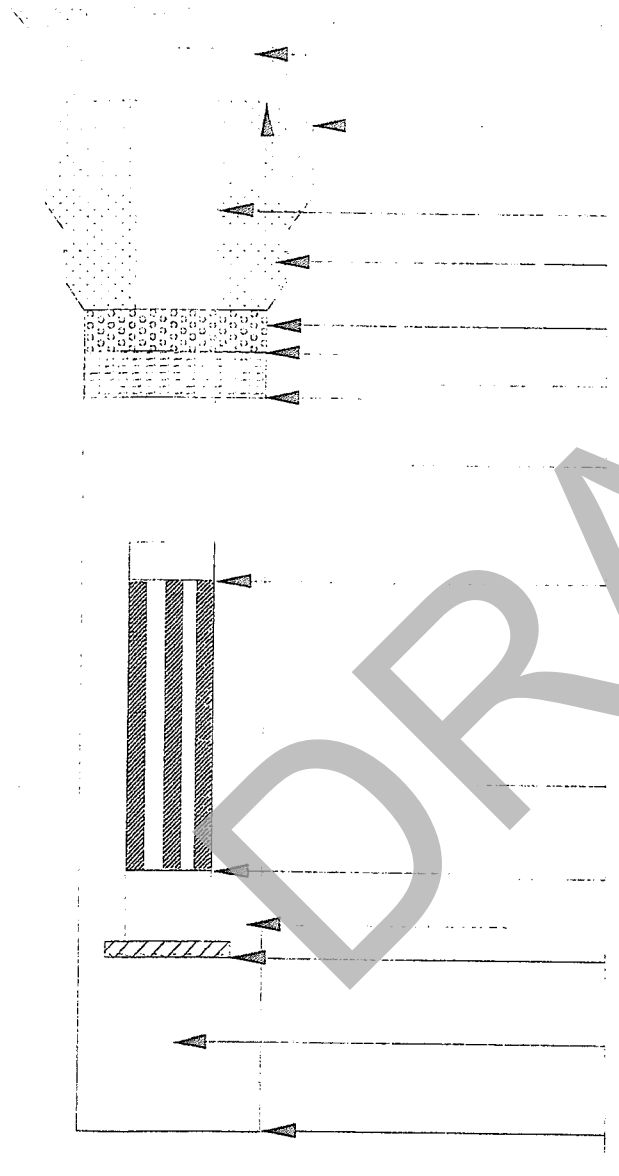
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW9
DATE COMPLETED:	12/9/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 853.66

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.00'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.00'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.00'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 18.50'

BOTTOM OF FILTER PACK
Elevation/Depth: 19.00'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 19.00'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 19.00'

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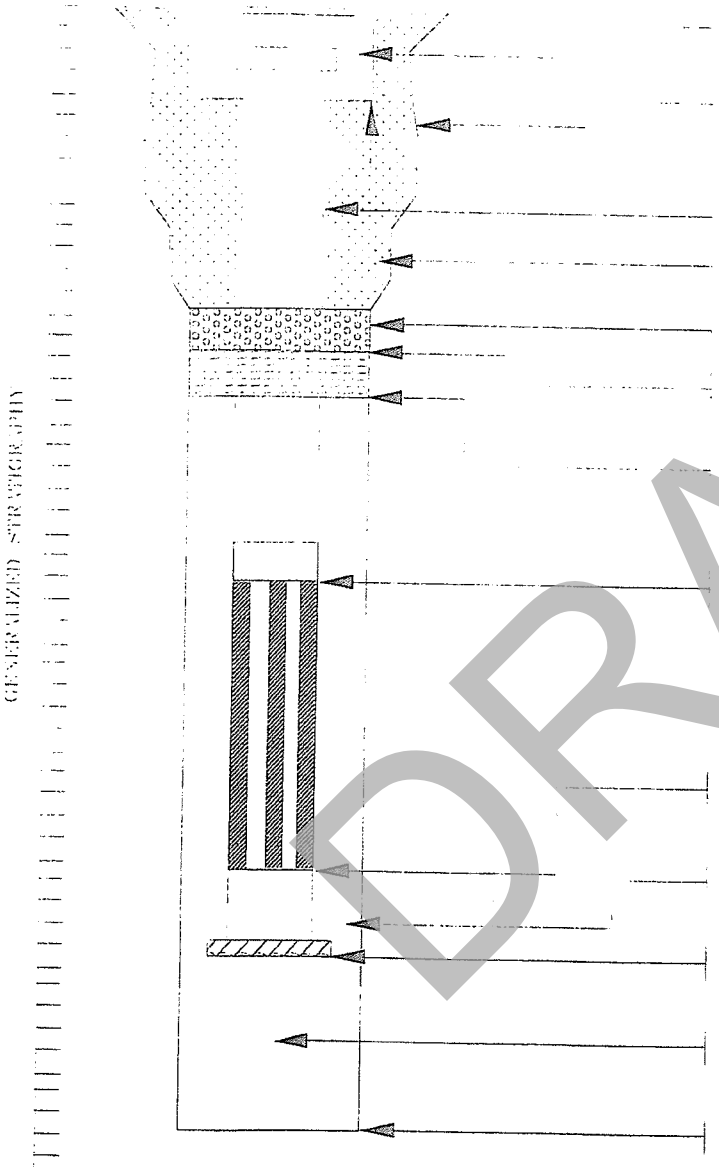
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW10
DATE COMPLETED:	12/9/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 853.04

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.00'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.00'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.00'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 18.50'

BOTTOM OF FILTER PACK
Elevation/Depth: 19.00'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 19.00'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 19.00'

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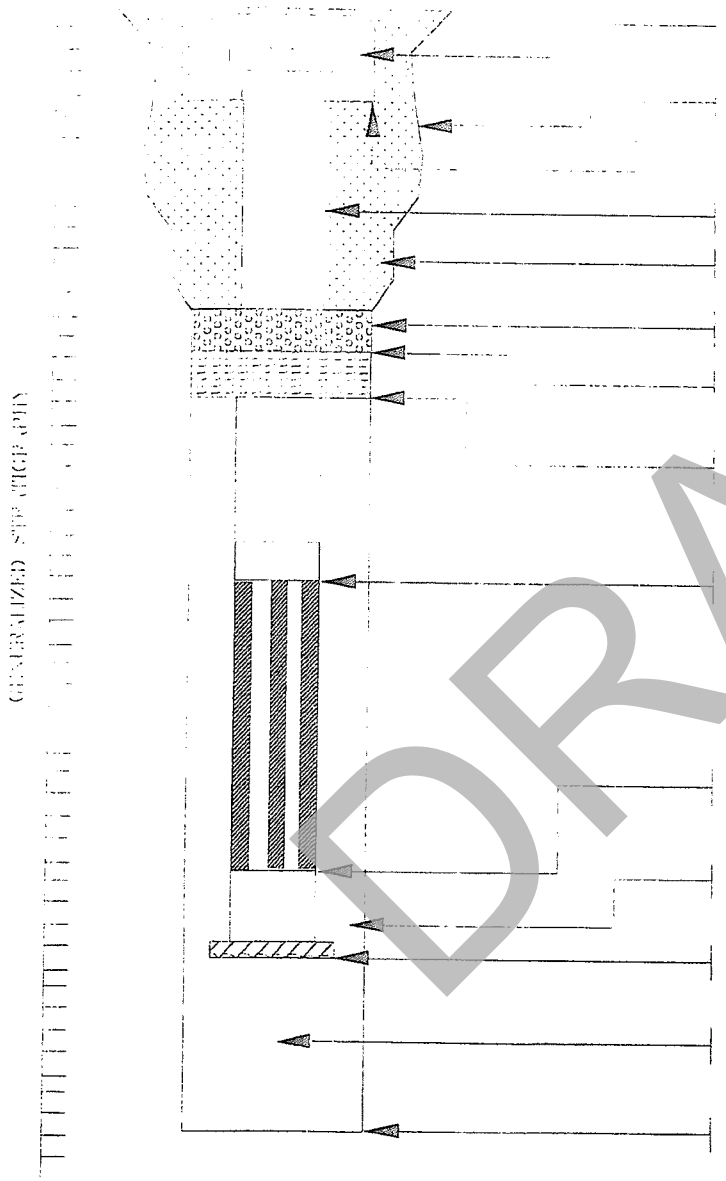
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW11
DATE COMPLETED:	12/10/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 854.53

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 19.50'

BOTTOM OF FILTER PACK
Elevation/Depth: 20.00'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 20.00'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 20.00'

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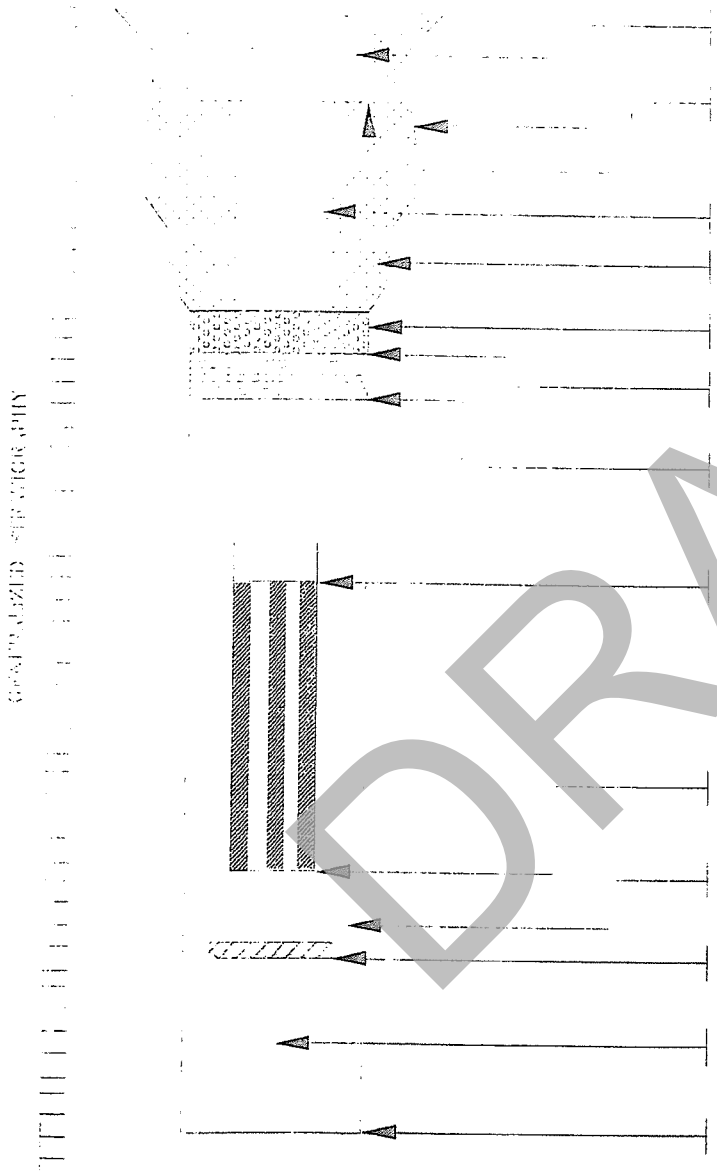
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW12
DATE COMPLETED:	12/10/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 854.47

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 18.85'

BOTTOM OF FILTER PACK
Elevation/Depth: 19.35'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 19.35'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 19.35'

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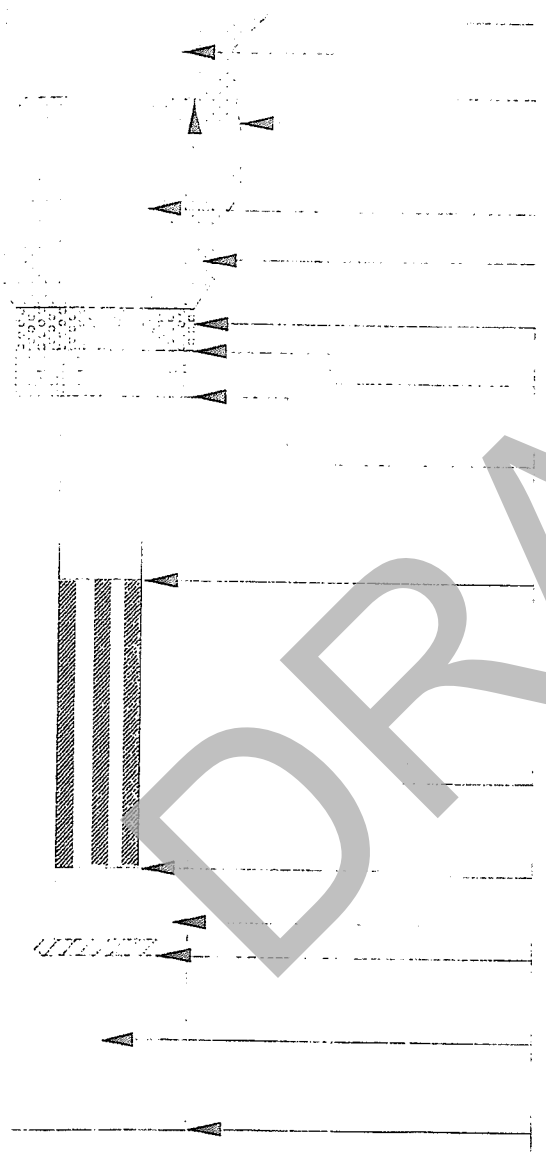
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW13
DATE COMPLETED:	12/10/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 854.60

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 20.50'

BOTTOM OF FILTER PACK
Elevation/Depth: 21.00'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 21.00'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 21.00'

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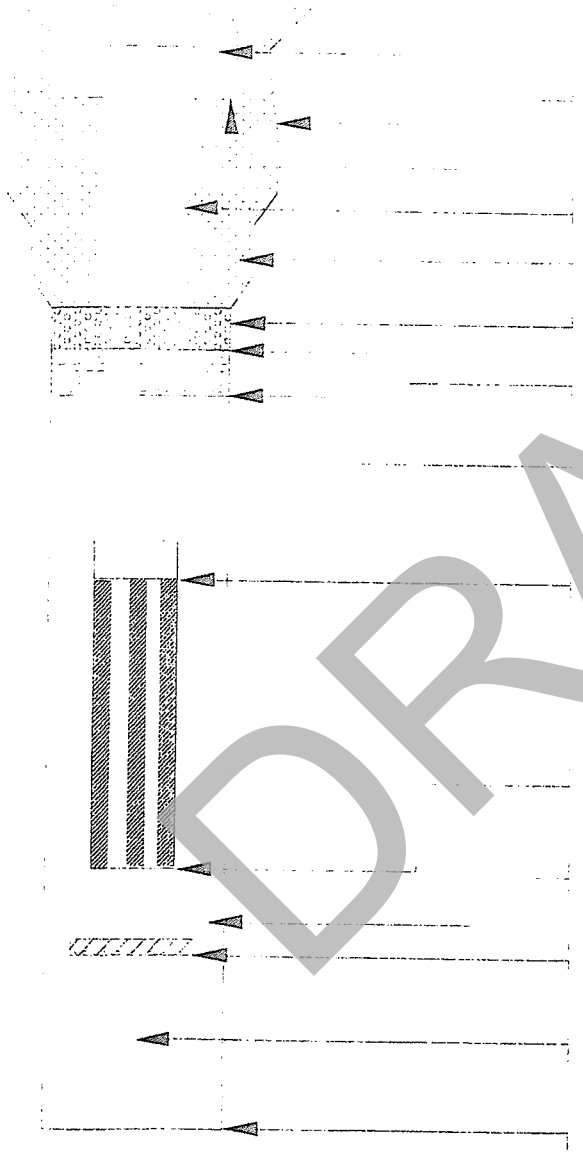
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW14
DATE COMPLETED:	12/11/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 853.73

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 20.50'

BOTTOM OF FILTER PACK
Elevation/Depth: 21.50'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 21.50'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 21.50'

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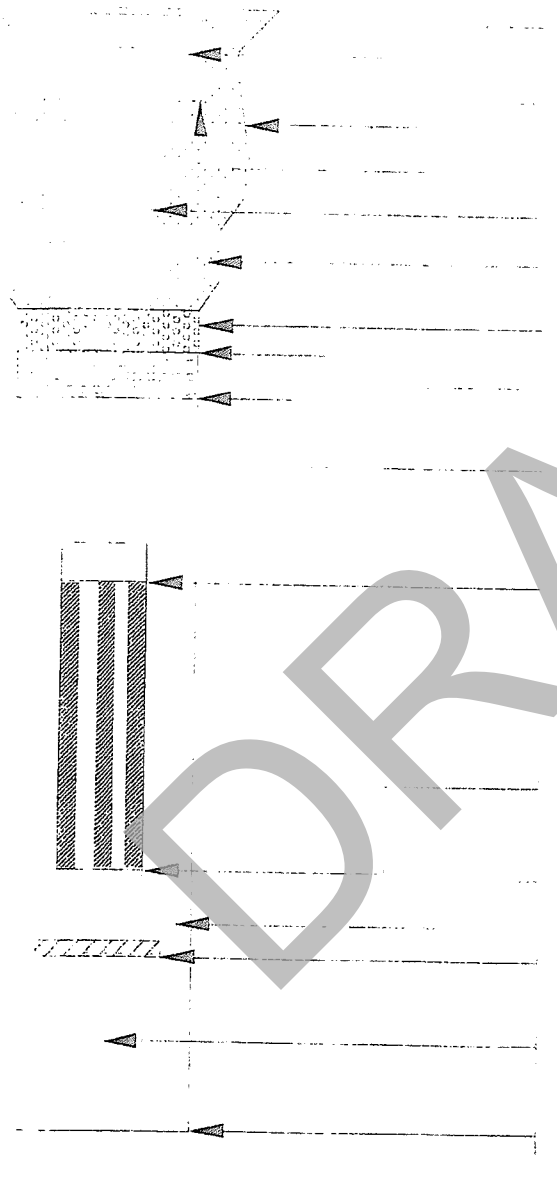
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION: NYSDEC/Miller Pond
PROJECT No. 96020
CLIENT: NYSDEC Region 8 - Scott Rodabaugh
WELL No. MW15
DATE COMPLETED: 12/11/97
SUPERVISED BY: Chris Treese



REFERENCE POINT
Elevation/Depth: 855.19

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 18.60'

BOTTOM OF FILTER PACK
Elevation/Depth: 19.10'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 19.10'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 19.10'

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WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW16
DATE COMPLETED:	12/11/97	SUPERVISED BY:	Chris Treese

REFERENCE POINT
Elevation/Depth: 854.37

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 8.25"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 20.00'

BOTTOM OF FILTER PACK
Elevation/Depth: 20.50'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 20.50'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 20.50'

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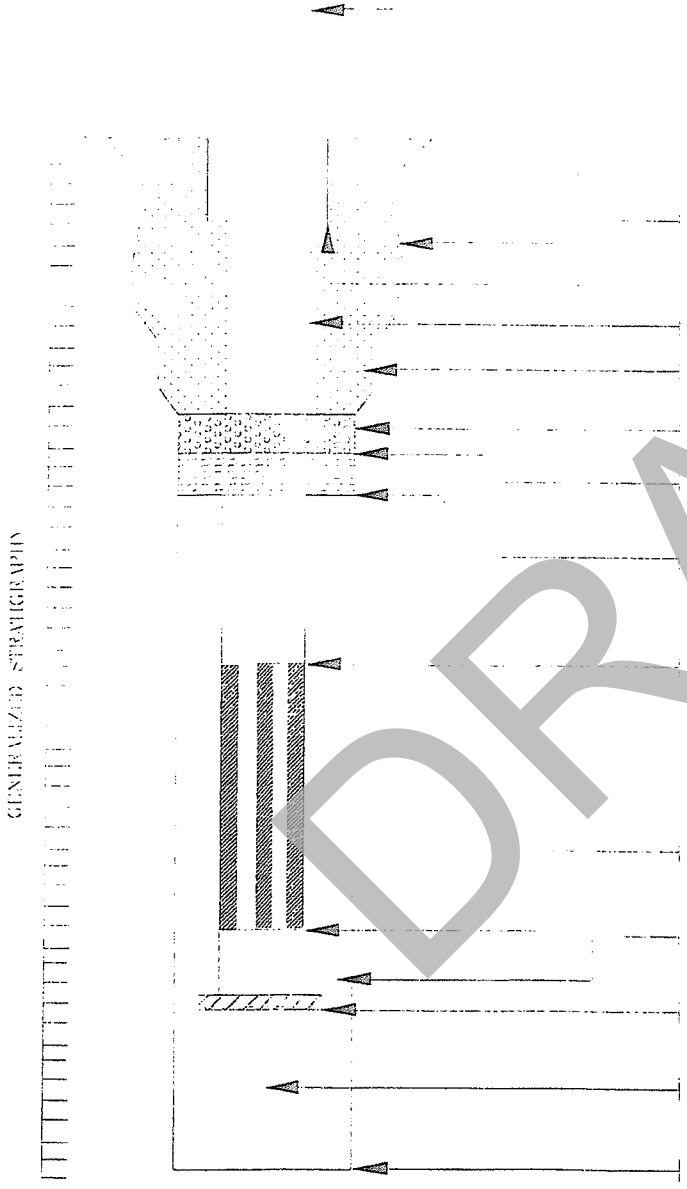
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW17
DATE COMPLETED:	12/12/97	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 852.27'

SURFACE SEAL
Type/Depth: Concrete/2.00'

DEPTH OF SURFACE CASING: 2.00'

RISER PIPE Size/Type: 2" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 6¼"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 10.80'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 11.80'
FILTER PACK MATERIAL: Morie #1 sand

TOP OF SCREEN Elevation/Depth: 12.80'
SCREEN SIZE/TYPE: 2" diameter .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 22.30'

BOTTOM OF FILTER PACK
Elevation/Depth: 22.80'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 22.80'

TYPE OF FILLER
BELOW PLUGGED BLANK: None

BOTTOM OF BOREHOLE
Elevation/Depth: 22.80'

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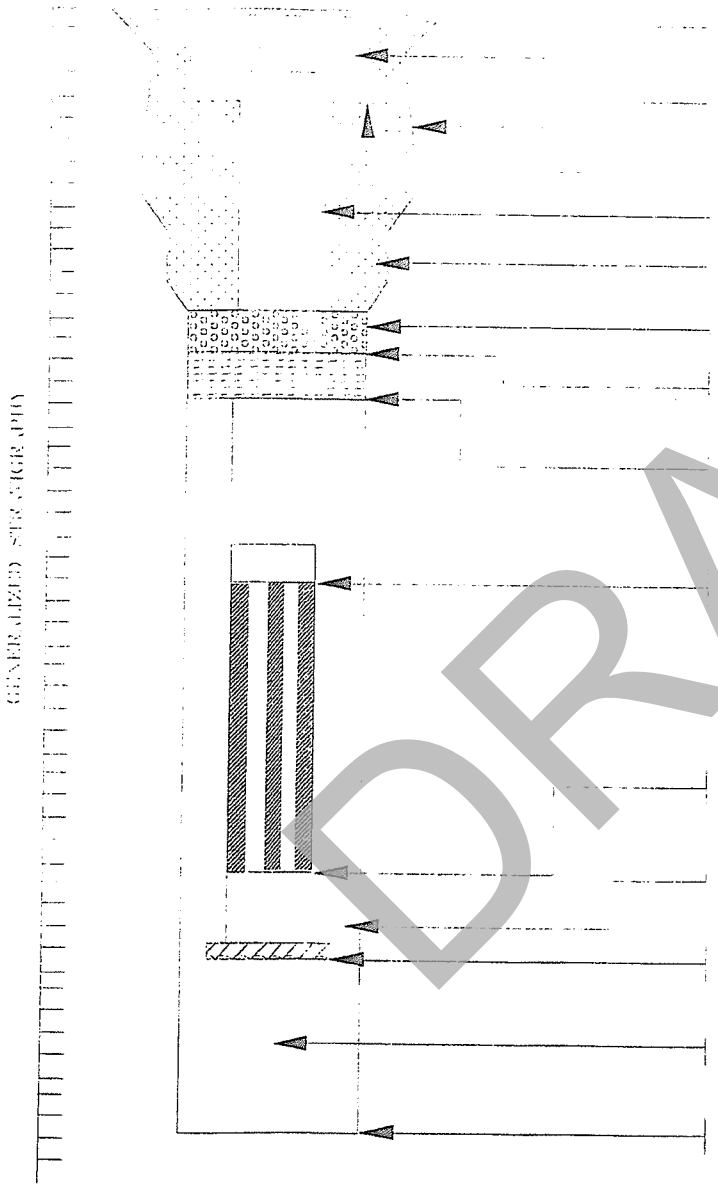
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW18
DATE COMPLETED:	7/7/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 851.37

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 14.30'

BOTTOM OF FILTER PACK
Elevation/Depth: 14.80'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 14.80'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 14.80'

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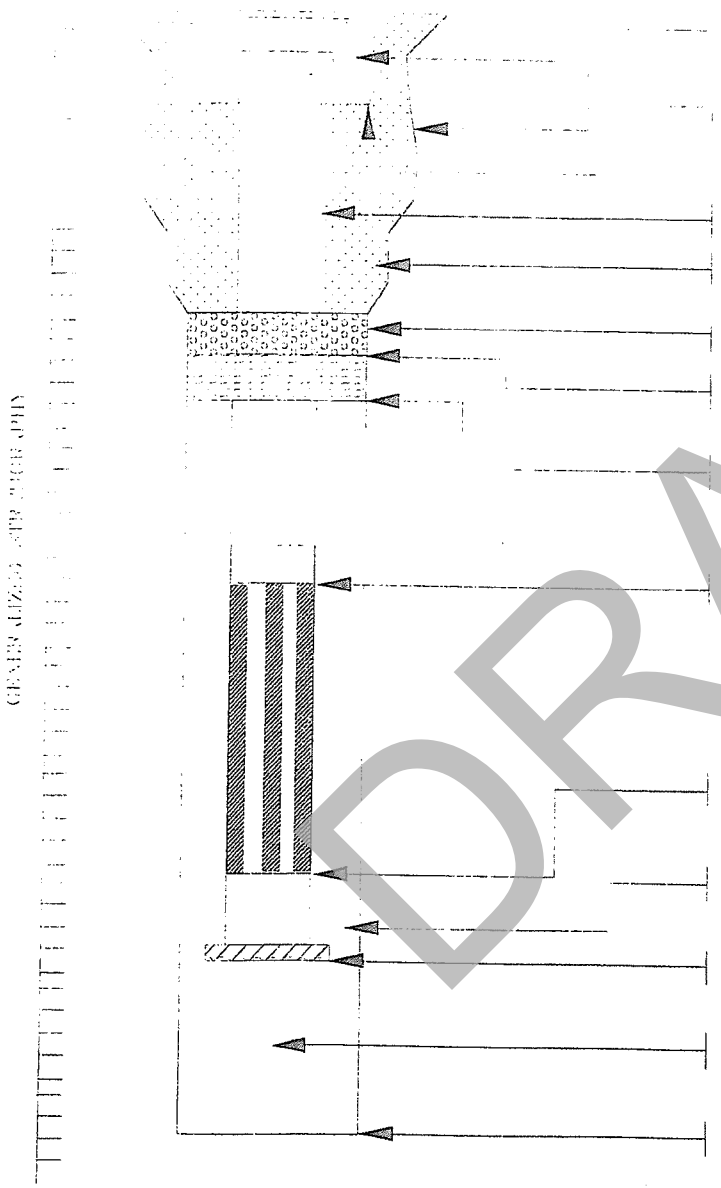
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW19
DATE COMPLETED:	7/7/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 851.30

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Drill cuttings

TOP OF SEAL Elevation/Depth: 7.50'
TYPE OF SEAL: Bentonite

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: #1 Sand

TOP OF SCREEN Elevation/Depth: 9.50'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 20.15'

BOTTOM OF FILTER PACK
Elevation/Depth: 20.65'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 20.65'

TYPE OF FILLER
BELOW PLUGGED BLANK: #1 Sand

BOTTOM OF BOREHOLE
Elevation/Depth: 20.65'

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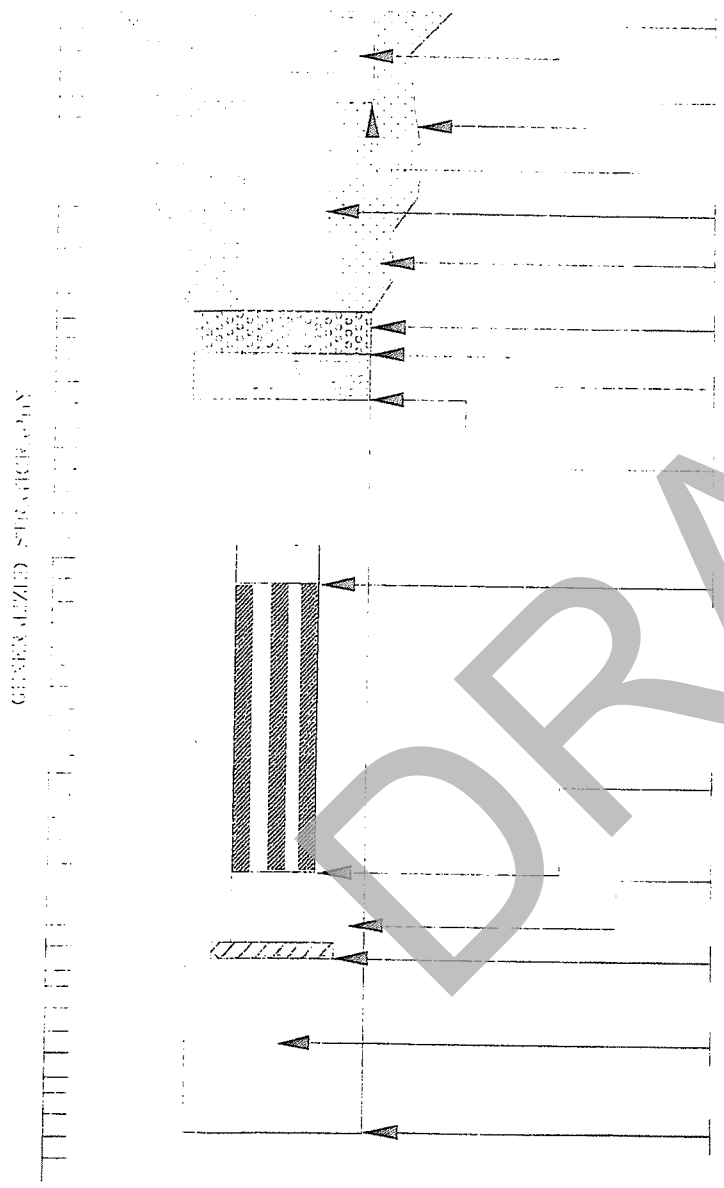
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW20
DATE COMPLETED:	7/8/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 852.00

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 80 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 8.50'
TYPE OF SEAL: Native soil

TOP OF FILTER PACK Elevation/Depth: 8.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 8.50'
SCREEN SIZE/TYPE: .020 slot SCH 80 PVC

BOTTOM OF SCREEN Elevation/Depth: 19.20'

BOTTOM OF FILTER PACK
Elevation/Depth: 19.70'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 19.70'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 19.70'

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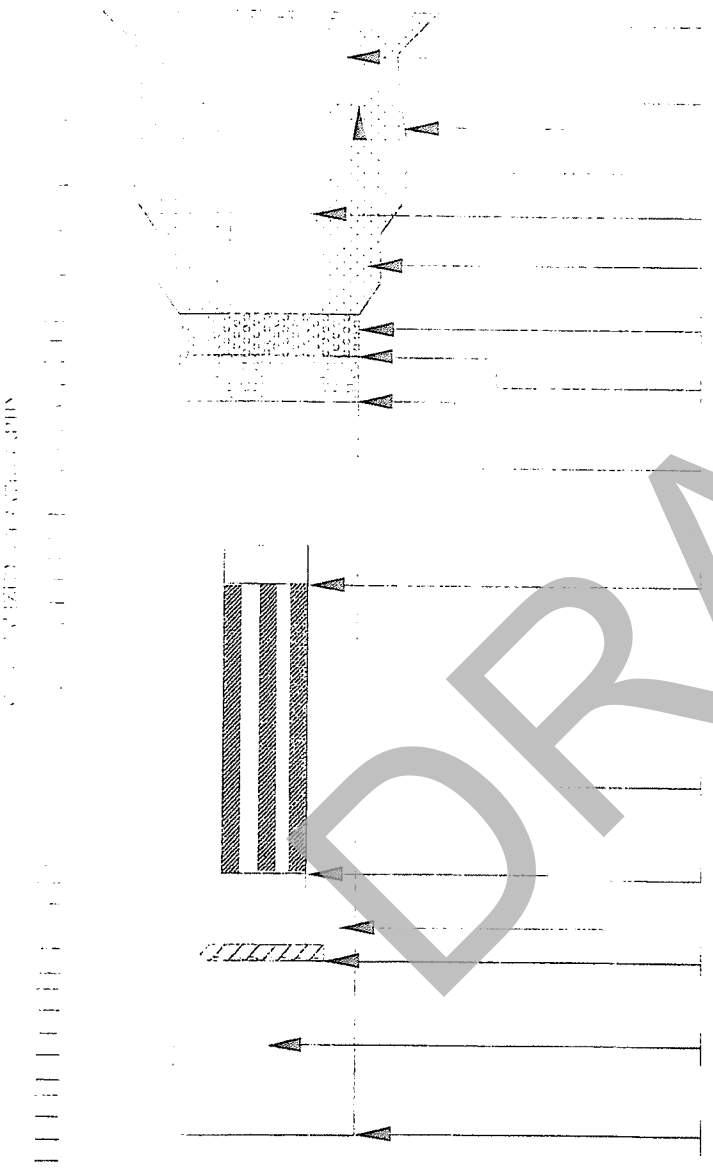
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW21
DATE COMPLETED:	7/16/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 852.83

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 12.35'
SCREEN SIZE/TYPE: .020 slot SCH 80 PVC

BOTTOM OF SCREEN Elevation/Depth: 20.85'

BOTTOM OF FILTER PACK
Elevation/Depth: 21.35'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 21.35'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 21.35'

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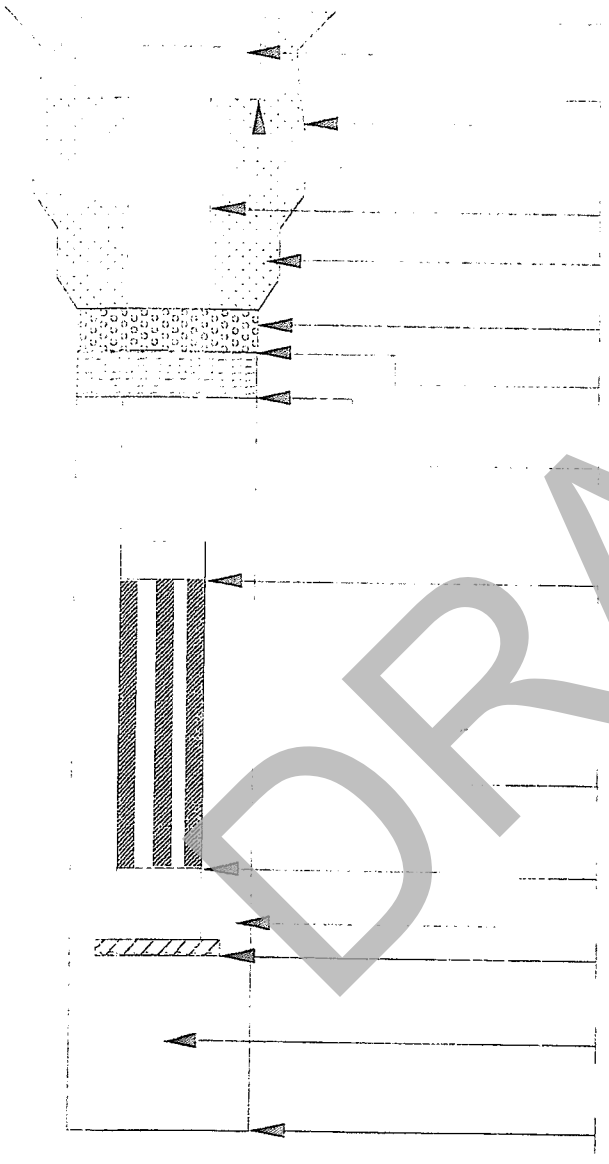
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW22
DATE COMPLETED:	7/16/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 842.52

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 11.60'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 21.10'

BOTTOM OF FILTER PACK
Elevation/Depth: 21.60'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 21.60'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 21.60'

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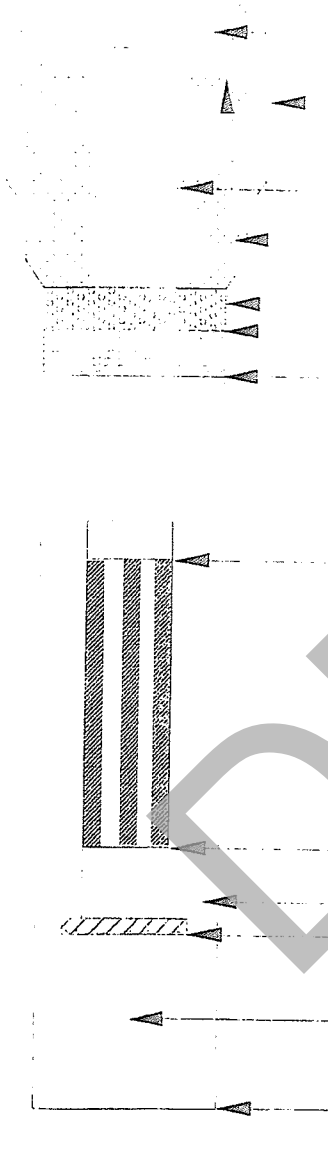
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW23
DATE COMPLETED:	7/16/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 838.80

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 8.70'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 18.20'

BOTTOM OF FILTER PACK
Elevation/Depth: 18.70'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 18.70'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 18.70'

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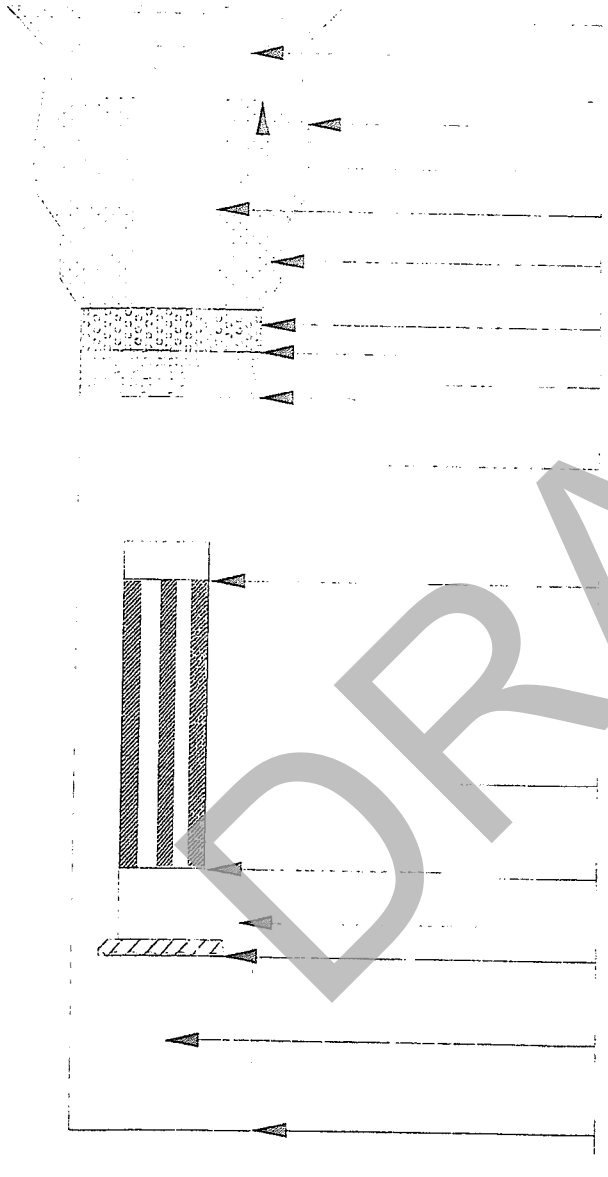
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96-020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW24
DATE COMPLETED:	7/16/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: _____

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 6.72'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 16.22'

BOTTOM OF FILTER PACK
Elevation/Depth: 16.72'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 16.72'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 16.72'

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WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW25
DATE COMPLETED:	7/17/98	SUPERVISED BY:	Chris Treese

REFERENCE POINT
Elevation/Depth: 841.16

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 9.25'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 18.75'

BOTTOM OF FILTER PACK
Elevation/Depth: 19.25'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 19.25'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 19.25'

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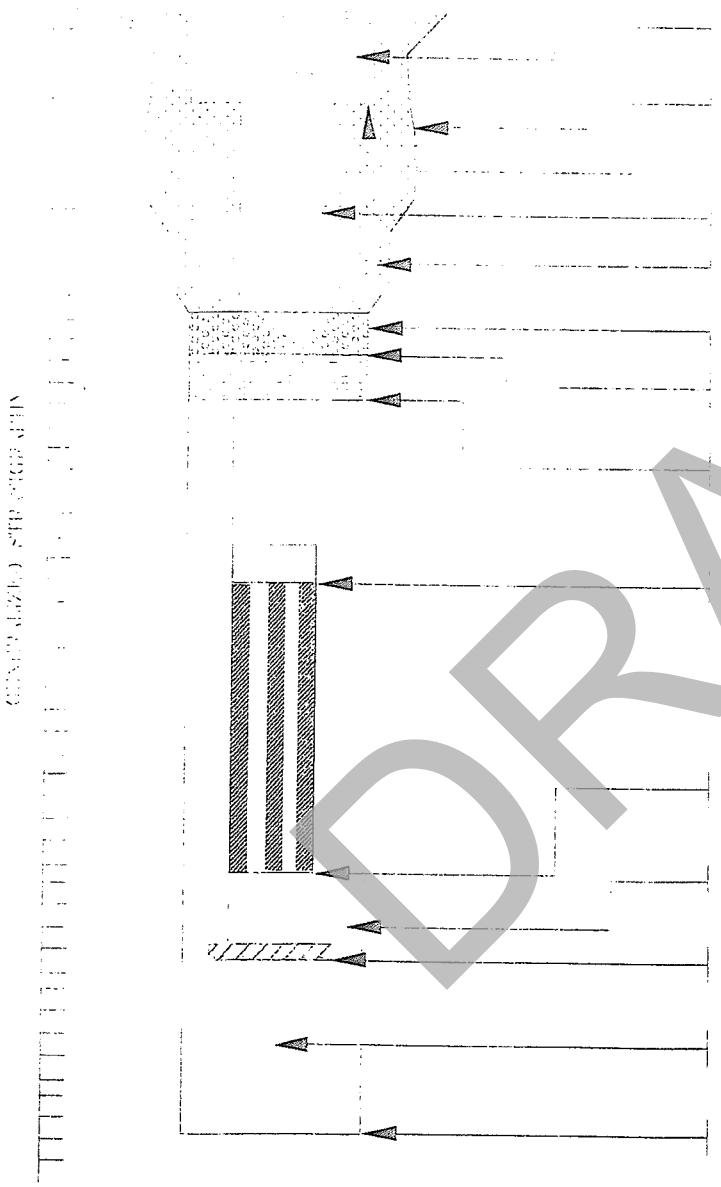
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION: NYSDEC/Miller Pond
PROJECT No. 96020
CLIENT: NYSDEC Region 8 - Scott Rodabaugh
WELL No. MW26
DATE COMPLETED: 7/17/98
SUPERVISED BY: Chris Treese



REFERENCE POINT
Elevation/Depth: 843.44

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 7.05'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 16.55'

BOTTOM OF FILTER PACK
Elevation/Depth: 17.05'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 17.05'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 17.05'

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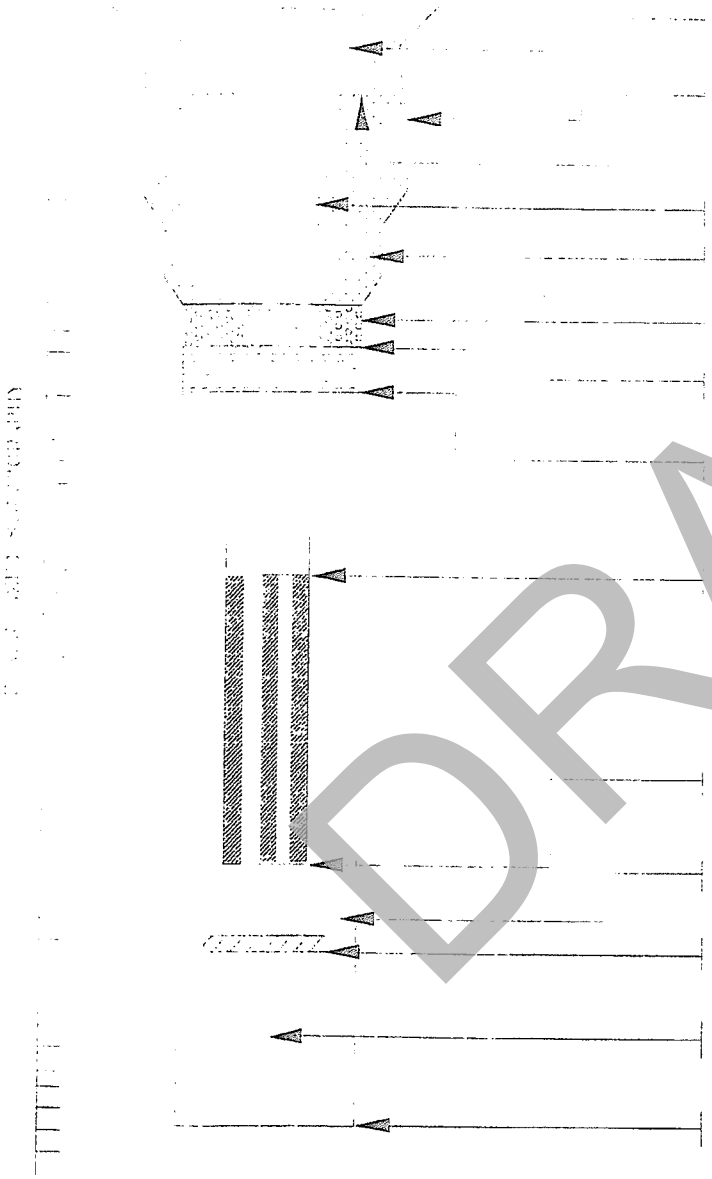
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW27
DATE COMPLETED:	7/17/98	SUPERVISED BY:	Chris Treese



REFERENCE POINT
Elevation/Depth: 840.38

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 6.30'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 15.80'

BOTTOM OF FILTER PACK
Elevation/Depth: 16.30'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 16.30'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 16.30'

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WELL CONSTRUCTION DETAIL

PROJECT/LOCATION:	NYSDEC/Miller Pond	PROJECT No.	96020
CLIENT:	NYSDEC Region 8 - Scott Rodabaugh	WELL No.	MW28
DATE COMPLETED:	7/17/98	SUPERVISED BY:	Chris Treese

REFERENCE POINT
Elevation/Depth: 851.30

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 12.00'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 21.50'

BOTTOM OF FILTER PACK
Elevation/Depth: 22.00'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 22.00'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 22.00'

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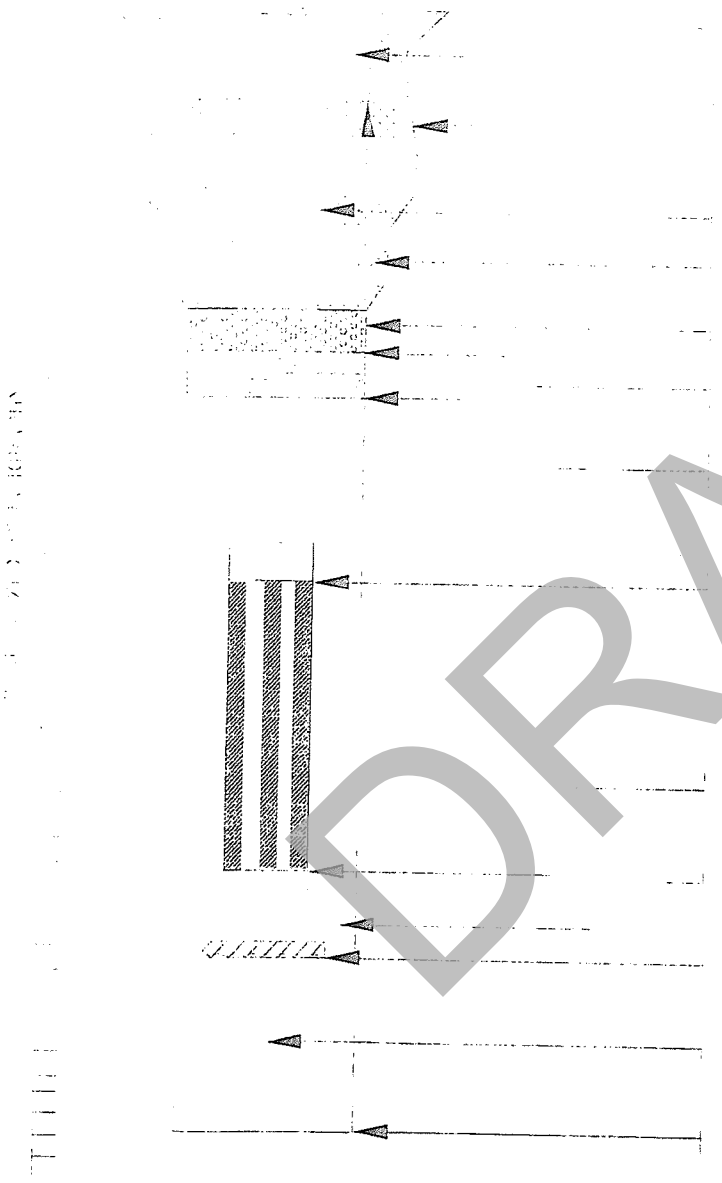
WELL CONSTRUCTION DETAIL

PROJECT/LOCATION: NYSDEC/Miller Pond
PROJECT No. 96020
CLIENT: NYSDEC Region 8 - Scott Rodabaugh
WELL No. MW29
DATE COMPLETED: 7/17/98
SUPERVISED BY: Chris Treese



REFERENCE POINT
Elevation/Depth: 851.46

SURFACE SEAL
Type/Depth: Concrete/1.5'

DEPTH OF SURFACE CASING: 1.0'

RISER PIPE Size/Type: 1" diameter SCH 40 PVC

DIAMETER OF BOREHOLE: 2.00"

TYPE OF FILL: Native soil

TOP OF SEAL Elevation/Depth: 1.50'
TYPE OF SEAL: None

TOP OF FILTER PACK Elevation/Depth: 1.50'
FILTER PACK MATERIAL: Native soil

TOP OF SCREEN Elevation/Depth: 11.90'
SCREEN SIZE/TYPE: .020 slot SCH 40 PVC

BOTTOM OF SCREEN Elevation/Depth: 21.40'

BOTTOM OF FILTER PACK
Elevation/Depth: 21.90'

BOTTOM OF PLUGGED BLANK SECTION
Elevation/Depth: 21.90'

TYPE OF FILLER
BELOW PLUGGED BLANK: Native soil

BOTTOM OF BOREHOLE
Elevation/Depth: 21.90'

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APPENDIX 4A

INDOOR AIR SAMPLES OBTAINED BY ELMIRA CITY SCHOOL DISTRICT (NOVEMBER 4, 1997)

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EXPRESSLAB PO Box 40 5611 Water Street Middlesex NY 14507

Tel: (716) 554-5347 Tel: (800) THE LABS Tel: (800) 843-5227 FAX: (716) 554-4114

SPECIALIZING IN ENVIRONMENTAL SOIL TESTS
NEW YORK STATE LABORATORY #11369

LABORATORY REPORT - METHOD TO-2

Cust ELMIRA CSD
Address 733 BENJAMIN ST.
ELMIRA, NY 14901
Attn: TONY LASORTE

Phone 607-735-3980
FAX 607-735-3979

PO Number:
Project Number:
Project Cust:
Project Site:
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = PPM
*See Individual Limit

Results shown are: Volatile Organic Analytes
Extraction Method: Supelco Crarbo Trap 300
Analysis Method: EPA TO-2

Sample ID (LAB)	15263				
Sample ID#1(CUST)	TRAIN #3 COLUME #1				
Sample ID#2(CUST)	CAFETERIA				
Matrix	AIR				
Sampled By	MIKE SHEFLIN				
Date Sampled	11/04/97	22:22			
Date Received	11/06/97	07:45			
Date Analyzed	11/10/97				
Date Reported	11/11/97			PEL(TWA)	ppm
	ug/M3	ppm	Det Limit*	OSHA	NIOSH
Vinyl Chloride	< DL(U)	< DL(U)	0.00002	1	CA*
1,1-Dichloroethene	< DL(U)	< DL(U)	0.00001		1
Methylene Chloride	< DL(U)	< DL(U)	0.00005	500	CA*
Chloroform	0.17560	0.00004	0.00001	2	CA*
1,2-Dichloroethane	< DL(U)	< DL(U)	0.00001	50	CA*
1,1,1-Trichloroethane	< DL(U)	< DL(U)	0.00001	350	350
Benzene	1.15173	0.00035	0.00001	1	0.1
Toluene	4.22136	0.00110	0.00001	200	100
Trichloroethene	0.04635	0.00001	0.00001	100	CA*
Tetrachloroethene	3.56989	0.00052	0.00001	100	CA*
m&p-Xylene	1.21712	0.00028	0.00002	100	100
o-Xylene	0.44527	0.00010	0.00001	100	100
trans-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001		CA*
cis-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001	200	CA*
Ethylbenzene	0.38401	0.00009	0.00001	100	100
~~1,2-Dichloroethane~~	~~< DL(U)~~	~~< DL(U)~~	~~0.00001~~	~~100~~	ERROR in printout

E=exceed calibration range

CA*= Indicates occupational carcinogen. Exposure to carcinogens must be limited to the lowest feasible concentration

* DL = Detection Limit

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NEW YORK STATE LABORATORY #11369

LABORATORY REPORT - METHOD TO-2

Cust ELMIRA CSD
Address 733 BENJAMIN ST.
ELMIRA, NY 14901
Attn: TONY LASORTE

Phone 607-735-3980
FAX 607-735-3979

PO Number:
Project Number:
Project Cust:
Project Site:
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = PPM
*See Individual Limit

Results shown are: Volatile Organic Analytes
Extraction Method: Supelco Crarbo Trap 300
Analysis Method: EPA TO-2

Sample ID (LAB)	15264				
Sample ID#1(CUST)	TRAIN #4 COLUME #6				
Sample ID#2(CUST)	LIBRARY				
Matrix	AIR				
Sampled By	MIKE SHEFLIN				
Date Sampled	11/04/97	22:15			
Date Received	11/06/97	07:45			
Date Analyzed	11/10/97				
Date Reported	11/11/97			PEL(TWA)	ppm
	ug/M3	ppm	Det Limit*	OSHA	NIOSH
Vinyl Chloride	< DL(U)	< DL(U)	0.00001	1	CA*
1,1-Dichloroethene	< DL(U)	< DL(U)	0.00001		1
Methylene Chloride	< DL(U)	< DL(U)	0.00004	500	CA*
Chloroform	< DL(U)	< DL(U)	0.00001	2	CA*
1,2-Dichloroethane	< DL(U)	< DL(U)	0.00001	50	CA*
1,1,1-Trichloroethane	< DL(U)	< DL(U)	0.00001	350	350
Benzene	< DL(U)	< DL(U)	0.00001	1	0.1
Toluene	111.77	0.03	0.00001	200	100
Trichloroethene	< DL(U)	< DL(U)	0.00001	100	CA*
Tetrachloroethene	< DL(U)	< DL(U)	0.00001	100	CA*
m&p-Xylene	21.78	0.00	0.00002	100	100
o-Xylene	7.51	0.00	0.00001	100	100
trans-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001		CA*
cis-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001	200	CA*
Ethylbenzene	10.36	0.00	0.00001	100	100
1,2-Dichloroethane	2.11	0.00	0.00001	100	

ERROR in printout

E=exceed calibration range

CA*= Indicates occupational carcinogen. Exposure to carcinogens must be limited to the lowest feasible concentration

* DL = Detection Limit

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SPECIALIZING IN ENVIRONMENTAL SOIL TESTS

NEW YORK STATE LABORATORY #11369

LABORATORY REPORT - METHOD TO-2

Cust ELMIRA CSD
Address 733 BENJAMIN ST.
ELMIRA, NY 14901
Attn: TONY LASORTE

Phone 607-735-3980
FAX 607-735-3979

PO Number:
Project Number:
Project Cust:
Project Site:
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = PPM
*See Individual Limit

Results shown are: Volatile Organic Analytes
Extraction Method: Supelco Crarbo Trap 300
Analysis Method: EPA TO-2

Sample ID (LAB)	15266				
Sample ID#1(CUST)	TRAIN #1 COLUME #5				
Sample ID#2(CUST)	OUTSIDE RM 111				
Matrix	AIR				
Sampled By	MIKE SHEFLIN				
Date Sampled	11/04/97	22:18			
Date Received	11/06/97	07:45			
Date Analyzed	11/10/97				
Date Reported	11/11/97			PEL(TWA)	ppm
	ug/M3	ppm	Det Limit*	OSHA	NIOSH
Vinyl Chloride	< DL(U)	< DL(U)	0.00002	1	CA*
1,1-Dichloroethene	< DL(U)	< DL(U)	0.00001		1
Methylene Chloride	< DL(U)	< DL(U)	0.00005	500	CA*
Chloroform	0.1634	0.00003	0.00001	2	CA*
1,2-Dichloroethane	< DL(U)	< DL(U)	0.00001	50	CA*
1,1,1-Trichloroethane	0.0108	0.00089	0.00001	350	350
Benzene	< DL(U)	< DL(U)	0.00001	1	0.1
Toluene	6.0972	0.00159	0.00001	200	100
Trichloroethene	< DL(U)	< DL(U)	0.00001	100	CA*
Tetrachloroethene	0.1776	0.00003	0.00001	100	CA*
m&p-Xylene	1.5614	0.00035	0.00002	100	100
o-Xylene	0.6012	0.00014	0.00001	100	100
trans-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001		CA*
cis-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001	200	CA*
Ethylbenzene	0.6538	0.00015	0.00001	100	100
~~1,2-Dichloroethane~~	~~< DL(U)~~	~~< DL(U)~~	~~0.00001~~	~~100~~	ERROR in printout

E=exceed calibration range

CA*= Indicates occupational carcinogen. Exposure to carcinogens must be limited to the lowest feasible concentration

* DL = Detection Limit

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NEW YORK STATE LABORATORY #11369

LABORATORY REPORT - METHOD TO-2

Cust ELMIRA CSD
Address 733 BENJAMIN ST.
ELMIRA, NY 14901
Attn: TONY LASORTE

Phone 607-735-3980
FAX 607-735-3979

PO Number:
Project Number:
Project Cust:
Project Site:
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = PPM
*See Individual Limit

Results shown are: Volatile Organic Analytes
Extraction Method: Supelco Carbo Trap 300
Analysis Method: EPA TO-2

Sample ID (LAB)	15262	
Sample ID#1(CUST)	TRAIN #5 COLUME #4	
Sample ID#2(CUST)	OUTSIDE LOADING DOCK	
Matrix	AIR	
Sampled By	MIKE SHEFLIN	
Date Sampled	11/04/97	22:10
Date Received	11/06/97	07:45
Date Analyzed	11/10/97	
Date Reported	11/11/97	

	ug/M3	ppm	Det Limit*	PEL(TWA) OSHA	ppm NIOSH
Vinyl Chloride	< DL(U)	< DL(U)	0.00002	1	CA*
1,1-Dichloroethene	< DL(U)	< DL(U)	0.00001		1
Methylene Chloride	< DL(U)	< DL(U)	0.00005	500	CA*
Chloroform	0.18946	0.00004	0.00001	2	CA*
1,2-Dichloroethane	0.04923	0.00001	0.00001	50	CA*
1,1,1-Trichloroethane	0.0359	0.00303	0.00001	350	350
Benzene	< DL(U)	< DL(U)	0.00001	1	0.1
Toluene	3.53854	0.00092	0.00001	200	100
Trichloroethene	0.15446	0.00003	0.00001	100	CA*
Tetrachloroethene	0.10851	0.00002	0.00001	100	CA*
m&p-Xylene	1.70774	0.00039	0.00002	100	100
o-Xylene	0.65444	0.00015	0.00001	100	100
trans-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001		CA*
cis-1,2-Dichloroethene	< DL(U)	< DL(U)	0.00001	200	CA*
Ethylbenzene	0.51140	0.00012	0.00001	100	100
1,2-Dichloroethane	0.04923	0.00001	0.00001	100	

ERROR in printout

E=exceed calibration range
CA*= Indicates occupational carcinogen. Exposure to carcinogens must be limited to the lowest feasible concentration
* DL = Detection Limit

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SPECIALIZING IN ENVIRONMENTAL SOIL TESTS
NEW YORK STATE LABORATORY #11369

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Address 733 BENJAMIN ST.
ELMIRA, NY 14901
Attn: TONY LASORTE

Phone 607-735-3980
FAX 607-735-3979

PO Number:
Project Number:
Project Cust:
Project Site:
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = PPM
*See Individual Limit

Results shown are: Volatile Organic Analytes
Extraction Method: Supelco Crarbo Trap 300
Analysis Method: EPA TO-2

Sample ID (LAB)		**15267**			
Sample ID#1(CUST)		**TRIP BLANK**			
Sample ID#2(CUST)					
Matrix		**AIR**			
Sampled By		**MIKE SHEFLIN**			
Date Sampled		**11/04/97**	**00:00**		
Date Received		**11/06/97**	**07:45**		
Date Analyzed		**11/10/97**			
Date Reported		**11/11/97**		**PEL(TWA)**	**ppm**
	ug/M3	**ppm**	**Det Limit***	**OSHA**	**NIOSH**
Vinyl Chloride	**< DL(U)**	**< DL(U)**	**0.00001**	**1**	**CA***
1,1-Dichloroethene	**< DL(U)**	**< DL(U)**	**0.00001**		**1**
Methylene Chloride	**< DL(U)**	**< DL(U)**	**0.00004**	**500**	**CA***
Chloroform	**< DL(U)**	**< DL(U)**	**0.00001**	**2**	**CA***
1,2-Dichloroethane	**< DL(U)**	**< DL(U)**	**0.00001**	**50**	**CA***
1,1,1-Trichloroethane	**< DL(U)**	**< DL(U)**	**0.00001**	**350**	**350**
Benzene	**< DL(U)**	**< DL(U)**	**0.00001**	**1**	**0.1**
Toluene	**< DL(U)**	**< DL(U)**	**0.00001**	**200**	**100**
Trichloroethene	**< DL(U)**	**< DL(U)**	**0.00001**	**100**	**CA***
Tetrachloroethene	**< DL(U)**	**< DL(U)**	**0.00001**	**100**	**CA***
m&p-Xylene	**< DL(U)**	**< DL(U)**	**0.00002**	**100**	**100**
o-Xylene	**< DL(U)**	**< DL(U)**	**0.00001**	**100**	**100**
trans-1,2-Dichloroethene	**< DL(U)**	**< DL(U)**	**0.00001**		**CA***
cis-1,2-Dichloroethene	**< DL(U)**	**< DL(U)**	**0.00001**	**200**	**CA***
Ethylbenzene	**< DL(U)**	**< DL(U)**	**0.00001**	**100**	**100**
1,2-Dichloroethane	**< DL(U)**	**< DL(U)**	**0.00001**	**100**	**100**

ERROR in printout

E=exceed calibration range

CA*= Indicates occupational carcinogen. Exposure to carcinogens must be limited to the lowest feasible concentration

* DL = Detection Limit

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RESULTS WHEN YOU WANT THEM

Tel: 1-716-554-5347 Tel: 1-800-THE LABS Tel: 1-800-843-5227 FAX 1-716-554-4114

NY STATE LABORATORY #11369 SPECIALIZING IN ENVIRONMENTAL SOILS TESTS

CLIENT NAME: Elmira CSD. LAB PROJECT ID: 15269-15276

CLIENT PROJECT: _____ SAMPLE TEMP ON RECEIPT: 5.3

SAMPLE DATE: 11/4 air ✓ SAMPLE RECEIVE DATE: 11/6

SAMPLE MATRIX: H2O___ SOIL/HAZ WASTE ____ PAGE___ OF___

CONDITION OF SAMPLES RECEIVED BY LAB	NA	YES	NO	COMMENTS
Cooler Intact	(NA)	YES	NO	
Samples Received Cool (2-6°C)	NA	YES	(NO)	5.3
Samples Received Intact	NA	(YES)	NO	
Sample Labels Match Chain of Custody	NA	(YES)	NO	
VOAs HCL Preserved per Label or Custody	(NA)	YES	NO	
VOAs w/out Bubbles, Septa TFE Side Down	NA	(YES)	NO	
Airbill Present, if by Common Carrier	(NA)	YES	NO	
Chain of Custody Signature Present	NA	(YES)	NO	
Subcontract Analysis Required (Sub COC)	NA	YES	(NO)	

PRESERVATION CHECK PERFORMED FOR AQUEOUS SAMPLES NEEDING Ph ADJUSTMENT

N/A = IF NOT APPLICABLE

LAB SAMPLE	FRACTION	PH MEASURED	OK	COMMENTS ON RECEIPT

Note: NA = Not Applicable or Not Available from Chain of Custody.

Barbara Cook 11/6
Sample Custodian Signature Date

RESULTS WHEN YOU WANT THEM

DRAFT

EXPRESSLAB PO Box 40 5611 Water Street Middlesex NY 14507
Tel: 1-716-554-5347 Tel: 1-800-THE LABS Tel: 1-800-843-5227 FAX 1-716-554-4114
NY STATE LABORATORY #11369 SPECIALIZING IN ENVIRONMENTAL SOILS TESTS

Friday, November 07, 1997

MR. TONY LASORTE
ELMIRA CITY SCHOOL DISTRICT
733 BENJAMIN ST.
ELMIRA, NY 14901

Dear TONY:

The following is a typed written copy of my field notes concerning the air monitoring at Southside High School.

Sample Train # 1
Column # 5
Pump # 71
Pump Make: Environmetrics
Pump Serial #: 907657
Calibration Date:11/4/97
Calibration Method: Mini Buck Calibrator
Flow Rate: 1.34 liters per minute
Start Time: 16:27
Stop Time: 22:18
Total Flow: 467.7 liters
Post Calibration Date: 11/5/97
Post Calibration Rate: 1.31 liters per minute

==========

Sample Train # 2
Column # 3
Pump # 72
Pump Make: Environmetrics
Pump Serial # 907661
Calibration Date: 11/4/97
Calibration Method: Mini Buck Calibrator
Flow Rate:1.31 liters per minute
Start Time:16:19
Stop Time: 22:26
Total Flow: 480.7 liters
Post Calibration Date: 11/5/97
Post Calibration Rate: 1.33 liters per minute

==========

Sample Train # 3
Column # 1
Pump # 27
Pump Make: Gast
Pump Serial # 0690
Calibration Date: 11/4/97
Calibration Method: Mini Buck Calibrator
Flow Rate: 1.35 liters per minute
Start Time:16:02
Stop Time: 22:22
Total Flow: 513 liters
Post Calibration Date: 11/5/97
Post Calibration Rate: 1.32 liters per minute

==========

Sample Train # 4
Column # 6
Pump # 31
Pump Make: Gast
Pump Serial # 0591
Calibration Date: 11/4/97
Calibration Method: Mini Buck Calibration
Flow Rate: 1.29 liters per minute
Start Time: 16:10
Stop Time: 22:15
Total Flow: 470.9 liters
Post Calibration Date: 11/5/97
Post Calibration Rate: 1.29 liters per minute

==========

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Sample Train # 5
Column # 4
Pump # 35
Pump Make: Gast
Pump Serial # 1091
Calibration Date:11/4/97
Calibration Method:Mini Buck Calibrator

Flow Rate:1.32 liters per minute
Start Time:15:54
Stop Time: 22:10
Total Flow: 496.3 liters
Post Calibration Date: 11/5/97
Post Calibration Rate:1.33 liters per minute

Sincerely,

MIKE SHEFLIN
SALES MGR

DRAFT

EXPRESS LAB

15262 15263 15264 15265 15266 15267 WORK SHEET

S

WORKORDER

NY # 11369 NJ # 73744 CA # 2055 SC # 91011

CUSTOMER:	ELMIRA CSD
ADDRESS:	733 BENJAMIN ST
CITY:	ELMIRA
STATE/ZIP:	NY 14901
PHONE:	607 735 3980
FAX:	607 735 3979
CONTACT:	TONY LASALTE

PO NUMBER:	
PROJECT NO:	
PROJECT CUST:	
PROJECT SITE:	
SEND RESULTS:	☑ FAX ☐ EXPR MAIL
PHONE RESULTS:	☐ YES ☐ NO

SAMPLE DEMOGRAPHICS AND TESTS REQUIRED

8020 BTEX + MTBE	8270 (Stars)	FULL TCLP	
8021 + MTBE	625	TCLP LESS HERBS & PESTS	
503.1	PCB'S	TCLP VOLATILES	
TPH GASOLINE	602	TCLP SEMI-VOLATILES	
TPH DIESEL	624	8 RCRA METALS (TCLP)	
8240	TOX	HERBICIDES	
8260 (Stars)	LEAD ONLY	PESTICIDES	
8260		REACTIVITY	
8 RCRA METALS (DIRECT)		CORROSIVITY	(DIESEL)
		FLASH POINT	(GAS OR OIL)

SUSPECT :

SPECIAL INSTRUCTIONS: NEED FAST TAT ASAP

LIST ANALYSIS REQUIRED

DATE	TIME	SAMPLE DESCRIPTION / LOCATION / MATRIX	EXTEND LIST TO 2 TPH					
11/4/97	2210	TRAIN #5 COLUMN #4 OUTSIDE LOADING DOCK	X					
"	2222	TRAIN #3 COLUMN #1 CAFETERIA	X					
"	2215	TRAIN #4 COLUMN #6 LIBRARY	X					
"	2226	TRAIN #2 COLUMN #3 AUDITORIUM	X					
"	2218	TRAIN #1 COLUMN #5 OUTSIDE RM 111 HALLWAY	X					
"	-	TRIP BLANK		1				

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CHAIN OF CUSTODY RECORD

# of SAMPLES	6 # of CONTAINERS 6	SAMPLES RECEIVED BY:	ExpressLab
SAMPLED BY:	MIKE SHERMAN	SIGNATURE:	Barbara Catlin
SIGNATURE:		NAME:	Barbara Catlin
NAME:	Antonio Roberts, Jr.	DATE:	11/6/97 TIME: 7:45
DATED:	11/4/97 TIME: :	HOW RECD:	☑ EXP MAIL ☑ HAND CARRY
HOW SENT:	☐ EXP MAIL ☑ HAND CARRY	FREIGHT IN:	$
SIGNATURE 2:		LOGGED IN:	11/6/97 TIME: 7:45
NAME 2:		SAMPLE COND:	Sealed SAMPLE TEMP: 53
DATED 2:	/ / TIME: :	LAB NOTES:	
HOW SENT 2:	☐ EXP MAIL ☐ HAND CARRY		

White-Lab, Yellow-Customer, Hard-Lab

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expwo20doc

Tel: 1-716-554-5347 Tel: 1-800-THE LABS Tel: 1-800-843-5227 FAX 1-716-554-4114

NY STATE LABORATORY #11369 SPECIALIZING IN ENVIRONMENTAL SOILS TESTS

CLIENT NAME: Elmira C.S.D. LAB PROJECT ID: 15263-15267

CLIENT PROJECT: _____ SAMPLE TEMP ON RECEIPT: 5.3

SAMPLE DATE: 11/4 air ✓ SAMPLE RECEIVE DATE: 11/6

SAMPLE MATRIX: H2O___ SOIL/HAZ WASTE ____ PAGE___ OF ___

CONDITION OF SAMPLES RECEIVED BY LAB	NA	YES	NO	COMMENTS
Cooler Intact	(NA)	YES	NO	
Samples Received Cool (2-6°C)	NA	YES	(NO)	5.3
Samples Received Intact	NA	(YES)	NO	
Sample Labels Match Chain of Custody	NA	(YES)	NO	
VOAs HCL Preserved per Label or Custody	(NA)	YES	NO	
VOAs w/out Bubbles, Septa TFE Side Down	NA	(YES)	NO	
Airbill Present, if by Common Carrier	(NA)	YES	NO	
Chain of Custody Signature Present	NA	(YES)	NO	
Subcontract Analysis Required (Sub COC)	NA	YES	(NO)	

PRESERVATION CHECK PERFORMED FOR AQUEOUS SAMPLES NEEDING Ph ADJUSTMENT

NA = IF NOT APPLICABLE

LAB SAMPLE	FRACTION	PH MEASURED	OK	COMMENTS ON RECEIPT

Note: NA = Not Applicable or Not Available from Chain of Custody.

Barbara Cook 11/6
Sample Custodian Signature Date

RESULTS WHEN YOU WANT THEM

DRAFT

EXPRESSLAB PO Box 40 5611 Water Street Middlesex NY 14507
Tel: 1-716-554-5347 Tel: 1-800-THE LABS Tel: 1-800-843-5227 FAX 1-716-554-4114
NY STATE LABORATORY #11369 SPECIALIZING IN ENVIRONMENTAL SOILS TESTS

Friday, November 07, 1997

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ELMIRA CITY SCHOOL DISTRICT
733 BENJAMIN ST.
ELMIRA, NY 14901

Dear TONY:

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Pump Serial #: 907657	Post Calibration Date: 11/5/97
Calibration Date:11/4/97	Post Calibration Rate: 1.31 liters per minute
Calibration Method: Mini Buck Calibrator	

Sample Train # 2	Flow Rate:1.31 liters per minute
Column # 3	Start Time:16:19
Pump # 72	Stop Time: 22:26
Pump Make: Environmetrics	Total Flow: 480.7 liters
Pump Serial # 907661	Post Calibration Date: 11/5/97
Calibration Date: 11/4/97	Post Calibration Rate: 1.33 liters per minute
Calibration Method: Mini Buck Calibrator	

Sample Train # 3	Flow Rate: 1.35 liters per minute
Column # 1	Start Time:16:02
Pump # 27	Stop Time: 22:22
Pump Make: Gast	Total Flow: 513 liters
Pump Serial # 0680	Post Calibration Date: 11/5/97
Calibration Date: 11/4/97	Post Calibration Rate: 1.32 liters per minute
Calibration Method: Mini Buck Calibrator	

Sample Train # 4	Flow Rate: 1.29 liters per minute
Column # 6	Start Time: 16:10
Pump # 31	Stop Time: 22:15
Pump Make: Gast	Total Flow: 470.9 liters
Pump Serial # 0591	Post Calibration Date: 11/5/97
Calibration Date: 11/4/97	Post Calibration Rate: 1.29 liters per minute
Calibration Method: Mini Buck Calibration	

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APPENDIX 4B

NYSDOH INDOOR AIR INVESTIGATIONS (JULY 28, 2000)
AND
AIR INVESTIGATION UPDATE (OCTOBER 18, 2000)

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NYSDOH AIR INVESTIGATION UPDATES PREVIOUSLY PROVIDED IN APPENDIX B. REMOVED DUE TO REDUNDANCY.

APPENDIX 4C

SOIL VAPOR MITIGATION DESIGN PLAN

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STERLING
Sterling Environmental Engineering, P.C.

DRAFT

ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL
ELMIRA, NEW YORK

SOIL VAPOR MITIGATION DESIGN PLAN

Prepared for:

Elmira City School District
Building and Grounds Department
733 Benjamin Street
Elmira, New York 14901

Prepared by:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

February 25, 2009
Revised April 7, 2009

ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL
ELMIRA, NEW YORK

SOIL VAPOR MITIGATION DESIGN PLAN

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1.0 INTRODUCTION

The Southside High School is located at 777 South Main Street on land that is bisected by the border of the City of Elmira and the Town of Southport in Chemung County, New York (see Figure 1). Since the 1880s, and prior to the school's construction in the late 1970s, the property was used by various industries. In 1995, fuel oil contamination was discovered on nearby Miller Pond east of Southside High School. A New York State Department of Environmental Conservation (NYSDEC) investigation found that petroleum contamination extended from underneath the SHS property toward Miller Pond. The NYSDEC is using bioremediation to address the petroleum contamination.

Prior to 2000, the Elmira City School Board received a letter from parents expressing concern regarding a perceived unusual number of cancers among current and former students at SHS. In response to community concerns, the NYSDEC collected soil samples from the school grounds in 2000 and the New York State Department of Health (NYSDOH) initiated a cancer study in 2002. This study included the collection of indoor and ambient air samples at the SHS property and soil gas samples under the school. The NYSDOH also assisted the NYSDEC with minor soil sampling and evaluated data from the soil and air samples.

Three (3) Freon compounds and several chlorinated solvents were detected at concentrations characterized as elevated by the NYSDOH in sub-surface vapor samples collected from three (3) soil gas points. However, the indoor and ambient air testing results did not indicate chemical contamination. Most compounds were either not detected or were present at levels characterized as low by the NYSDOH. Several compounds were present at concentrations slightly higher than typical background, however their presence was not considered unusual and exposure at the reported levels is not expected to be a health concern.

The purpose of this Soil Vapor Mitigation Design Plan is to review the characterization of the soil vapor risk and to set forth the physical mitigation measures that respond to this risk, resulting in construction modifications to the addition to the High School. The Environmental Management Plan (EMP) (provided separately) sets forth how the vapor mitigation measures will be operated, monitored, and maintained.

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2.0 NYSDOH HEALTH CONSULTATION REPORT CONCLUSIONS AND RECOMMENDATIONS

Results provided in the NYSDOH Health Consultation Report (September 2003) (Report) were utilized to evaluate potential soil vapor impacts to occupants of the new addition. A summary of conclusions and recommendations made in the Report for soil vapor, indoor air and pressure differential are provided in Sections 2.1 through 2.3.

2.1 Conclusions and Recommendations Regarding Soil Vapor, Indoor Air and Ambient Air

With regards to petroleum compounds, the following conclusions were reached by the NYSDOH:

- The NYSDEC determined (in a separate report) that No. 4 fuel oil contamination extended vertically under the school building to approximately 15 feet below ground.
- Most petroleum-related compounds in the sub-slab soil gas were in the typical background range for indoor air.

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- Several petroleum-related compounds in the sub-slab soil gas were slightly elevated in the soil gas samples.

- Pressure differential readings between the soil gas sampling points and the indoor air were minimal, indicating that there were no substantial pressure gradients drawing soil gas into the building.

- Most petroleum compounds were either not detected or were present at expected levels in the indoor air.

- Several petroleum compounds were present in the school air at concentrations slightly higher than typical background, but their presence is not unusual, and exposure at the reported levels is not expected to be a health concern.

Concerning chlorinated and halogenated compounds, the following conclusions were reached:

- Several Freon and chlorinated solvent compounds were detected at elevated levels in the soil gas samples collected from under the existing building concrete floor.

- Freons are typically used as refrigerants and as cleaning solvents. Their presence may be related to their use at the school.

- Chloroform, which was found at the highest level under the pool filter room, may be a chlorination by-product related to the swimming pool.

- 1,1,1-Trichloroethane, trichloroethene, and tetrachloroethene are typically used as cleaning solvents. Further investigation would be needed to identify the sources of these compounds in the soil gas.

2.2 Conclusions and Recommendations Regarding Indoor Air

With regards to general indoor air quality parameters, the following conclusions were reached by the NYSDOH:

- The higher carbon dioxide reading in some of the classroom areas indicate there may not be adequate outdoor air exchange in some ventilation zones. The Variable-Air-Volume (VAV) operation of the Heating, Ventilation and Air Conditioning (HVAC) system is suspected of not providing the minimum outdoor air exchange to individual areas if there is inadequate demand for temperature modulation.

2.3 Conclusions and Recommendations Regarding Pressure Differentials

In consideration of pressure differentials and pressure mapping, the following conclusions were reached regarding the potential for sub-slab vapor to contaminate the indoor air:

- The existing school building is slightly positively pressurized.

- Slight positive pressurization of a building impedes unintended air flow from soil gas or other potential contaminant sources.

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- Pressure differential readings between sub-slab soil gas and indoor air were minimal indicating that there were no substantial pressure gradients drawing soil gas into the existing building.

The Health Consultation Report recommends the following:

- The HVAC system in the school should be more thoroughly evaluated to determine whether the system provides outdoor air consistent with the current American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) guideline of 15 cubic feet per minute per person. If necessary, adjustments may be appropriate to increase the amount of outdoor air.

- The Elmira City School District (ECSD) should institute an indoor air quality action plan consistent with that recommended by the United States Environmental Protection Agency's (USEPA's) Tools for Schools Action Kit. This publication provides information and guidance for developing and implementing a plan to prevent indoor air quality problems and resolving such problems if they arise. The plan should address the possibility of contaminated soil gas being drawn into the building. One possible way of evaluating this is to include routine (e.g., seasonal) monitoring of pressure differentials between the soil gas and building interior.

- Further investigation of past and present chemical uses on the SHS property may aid in identifying the sources of elevated levels of Freons and chlorinated solvents in soil gas.

2.4 Plans for Addition to Southside High School

The ECSD plans to build an addition of 12,000 square feet on the east side of the existing building as depicted on Sheet EM000. Given the recommendations of the Health Consultation Report prepared by the NYSDOH, Sterling Environmental Engineering, P.C. (STERLING) recommended that a soil vapor intrusion mitigation system be an integral part of the construction and that this system be operated, maintained and monitored in conformance with the Operation, Maintenance and Monitoring (OM&M) Plan. The New York State Education Department (NYSED), with the input of the NYSDOH and the NYSDEC, approved this recommendation.

3.0 SOIL VAPOR INTRUSION MITIGATION SYSTEM

The design of the floor of the addition is a concrete slab supported on pile caps. The Soil Vapor Mitigation Design (SVMD), which is stamped and signed by a professional engineer licensed to practice in New York State, provides for the installation of a vapor barrier and depressurization system beneath the slab that will evacuate soil vapor that rises from subsoil. This system will maintain a pressure gradient from the interior of the addition to the exterior of the building including the sub-slab depressurization system (SSDS). The vapor barrier is a companion component to the SSDSs and is recommended in most guidance documents. Such will aid in preventing contaminated soil vapors from entering the occupied space in the addition, creating an exposure potential to the occupants.

In addition, the HVAC system will operate from approximately 6:30 am to 10:00 pm (actual shutdown occurs at the conclusion of evening activities), Monday through Friday and for weekend events planned at the High School.

The New York State Education Department (NYSED) requires HVAC systems to meet the Mechanical Code of New York State, which requires the following minimum outside air ventilation

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rates, among others, in Chapter 4 Ventilation:

Classrooms = 15 Cubic Feet/Minute (CFM) / Occupant with 30 occupants/classroom

Laboratories = 20 CFM / Occupant with 30 occupants/classroom for normal size room and the designer must assume 50 occupants/1,000 SF for larger rooms

Gymnasium – Play Area = 20 CFM/Occupant

Office Space = 20 CFM/Occupant

These requirements are specified for the 2009 HVAC systems replacement in the Main Building, and in the 2009 construction of the Science Addition. The Code requires substantially more flow of outside air in a significant number of spaces than the ASHRAE requirements of 15 CFM that were considered by the NYSDOH at the time of the Health Consultation Report. The greater rates of outside air ventilation lower the risk of sub-slab vapors entering the interior space during occupancy hours.

During operation, the HVAC system provides a pressure differential from the building interior toward the exterior including the soil. While this operation does not constitute a program designed to be sufficiently protective of human health on its own, this operation does provide some protection.

3.1 Vapor Barrier

The vapor barrier will consist of six (6) mil (thousands of an inch) thick polyethylene sheets overlapped a minimum of twelve (12) inches with Sikaflex-1A sealant, applied a minimum of four (4) inches wide between the overlaps. The sheets are also sealed to the pile caps with the same sealant.

3.2 Depressurization System

The depressurization system will consist of a gas permeable layer consisting of a minimum of six (6) inches of crushed stone or crushed gravel meeting New York State Department of Transportation (NYSDOT) designation 703-2, Size 2 on Table 703-4 of the NYSDOT Standard Specifications (see Sheet EM001). The vapor barrier sheets will not be placed over the gas permeable layer until the gas permeable layer has been compacted as per the specifications for the concrete slab. A collection plenum will be installed in the gas permeable layer consisting of a 40-inch square void, the full thickness of the stone layer (see Collection Plenum details on Sheet EM001). The plenum is formed by six (6) 8 x 8 x 16-inch concrete blocks. These blocks support a ¾ inch minimum treated lumber plywood square. The top of the plywood box is immediately beneath the polyethylene sheet and the concrete slab. The soil gas and any vapors will enter the plenum space unobstructed, then enter a six (6) inch diameter solid wall fiberglass reinforced plastic (FRP) pipe (minimum wall thickness 0.1875 inch, buried duct designed per AWWA M-45 Standards and rated for H-20 Loading). This six (6) inch duct is connected by means of wet lay-up joints to a 90-degree elbow connected to a vertical riser passing through the slab, the interior of the addition and the roof of the addition. A u-tube pressure manometer will be placed in this riser so that the vacuum exerted by the fan will be evident at the manometer whenever the fan is operating normally. A Fantech Model FR-250 (or equivalent) fan (see Sheet EM002) is mounted above the roof at the termination of the riser to create a negative pressure through the duct and system beneath the concrete slab. The exhaust will be 44-inches above the roof of the building, is located above all eaves, is at least fifteen (15) feet above

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ground level, is at least ten (10) feet away from air intakes and is at least ten (10) feet from any openings that are less than two (2) feet below the exhaust point and is more than ten (10) feet from the adjoining Main Building.

3.3 Sub-Slab Depressurization System (SSDS) Monitoring

The slab is equipped with five (5) sub-slab pressure monitors (see Detail 3 Differential Pressure Gauge Installation on Sheet EM002). One of the monitoring points is at Sub-Slab Monitoring System K10 (see Sheet EM000) which is the furthest distance beneath the slab from the collection plenum box and is permanently monitored with a meter that is viewable behind a locked access panel door. This will determine whether depressurization is effective for the entire system. A second monitoring point with a similar permanent pressure monitor meter is at Sub-Slab Monitoring System K18 (see Sheet EM000), which is on the opposite side of a pile cap from the collection plenum box. This will determine whether the depressurization is effective around an obstacle in the gas permeable layer as the pile caps are four (4) feet wide. The other three (3) pressure monitoring points are at the remaining three (3) corners of the Science Addition and are labeled as field sub-slab monitoring points.

The pressure monitors with permanent pressure monitor meters consist of a one and one-half (1.5) inch diameter Schedule 40 PVC "tee" open on the two (2) opposing ends. The third end is connected to a one and one-half (1.5) inch diameter Schedule 40 PVC pipe leading to an elbow and a solid pipe that functions as a riser through the slab into an internal wall of the addition. Within the wall, the pipe will be capped by the General Contractor. The HVAC Contractor will penetrate the cap of the pipe with a tapped hole (see Detail 3 Differential Pressure Gauge Installation on Sheet EM002) and will connect one-fourth (1/4) inch outside diameter copper or aluminum tubing to the tap and connect the tubing to a valve. The valve will be connected to a differential pressure gauge. The gauge will be mounted to a metal or plywood panel affixed to the wall studs. The gauge can be viewed by opening a locking panel inserted in the face of the wall.

The three (3) field sub-slab monitor points will be constructed in the same manner as the sub-slab collection ports utilizing sealed iron pipes with six (6) inch secured floor access covers with vandal proof screws.

3.4 Interior Pressure System

Similar to the existing High School, the interior of the Science Addition will be pressurized by the HVAC system to create the pressure differential from the interior to the exterior whenever the building is occupied. In addition, the pressure differential between the addition and the Main Building will be maintained to minimize the movement of air between the Science Addition and the balance of the Main Building.

4.0 SOIL VAPOR INTRUSION MITIGATION SYSTEM INSTALLATION

The soil vapor intrusion mitigation system will be installed during the construction of the Science Addition. Effectiveness testing of the SSDS will occur immediately following the construction of the slab, prior to the construction of the structures above the slab.

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4.1 Sub-Slab Depressurization System (SSDS) Testing

After the following:

1. The removal of the concrete floor slab formwork.

2. The sealing of all joints, cracks or any penetrations of the concrete floor slab.

3. The placement of cover soils around the perimeter of the slab to the cover soils finish grade elevations.

and prior to the following:

1. The placement of any internal walls.

2. The placement of any obstructions that prevent viewing and access to any joints, cracks or any penetrations of the concrete floor slab.

the HVAC contractor will temporarily mount the Fantech Model FR-250 fan (or equivalent) on the six (6) inch vertical ductwork stub to conduct a depressurization field extension test and leak test of the SSDS. This test will be conducted by the HVAC contractor, under the observation of the Professional Engineer in charge of the depressurization system or a properly trained and supervised designee employed by the Professional Engineer.

The Model 2000-00 Magnehelic Differential Pressure Gauge (or equivalent) will be fitted with rigid tubing that will pass through a tightly fitted rubber plug inserted one at a time in each of the pipe stubs at the future gauge locations.

The second future pressure gauge stub will be plugged with rubber stoppers so the effectiveness of the negative pressure system can be tested. The gauges should be properly zeroed before taking the pressure reading. The differential pressure must be a maintained negative pressure of at least 0.020 inch water column (wc) or five (5) Pascals (Pa) at both pressure monitoring points. If this differential pressure cannot be attained, then actions will be taken to identify and plug leaks. If identifying and plugging leaks is unsuccessful then a fan with a larger flow and/or pressure capacity will be installed. After testing, all stub ends will be covered with protective tape and marked with fluorescent paint to help prevent accidental damage.

During the same pressurization test, reasonable and practical actions will be taken to identify and seal leaks as such can reduce the ability of the system to reduce the pressure in the sub-slab. With the depressurization system operating, smoke tubes will be used to check for leaks through concrete cracks, floor joints, at slab penetrations, and at the suction point. This testing will be conducted by the HVAC contractor, under the observation of the Professional Engineer in charge of the depressurization system or a properly trained and supervised designee employed by the Professional Engineer. Any leaks identified will be marked and resealed by the contractor responsible for the installation of the item where the leak is occurring until smoke is no longer observed flowing into the opening.

The depressurization field extension test will be repeated after the building is constructed but prior to post-construction occupancy with the HVAC system in normal operation mode and while not operating.

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5.0 VAPOR INTRUSION MITIGATION SYSTEM OPERATION AND MAINTENANCE

5.1 Vapor Intrusion Mitigation System

The vapor intrusion mitigation system will operate 24 hours a day, 7 days a week.

The operation, monitoring, and maintenance of the SVM System is described and specified in the OM&M Plan.

28014/Elmira\Reports\Soil Vapor Mitigation System Design\SVM System Design Text.doc

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FIGURE 1

SITE LOCATION MAP

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MAP REFERENCE: NYSDOT ELMIRA QUADRANGLE, 1978.

FIGURE 1

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STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

SITE LOCATION MAP
ELMIRA CITY SCHOOL DISTRICT
SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET
CITY OF ELMIRA CHEMUNG CO., N.Y.

PROJ. No.:	28014	DATE:	6-13-08	SCALE:	1" = 2000'	DWG. NO.	28014001	FIGURE	1

SHEETS EM000 – EM002

(REVISED COPIES PROVIDED IN ENVIRONMENTAL MANAGEMENT PLAN)

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APPENDIX 4D

CHEMICAL SAMPLING PROCEDURES AND PROTOCOLS

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APPENDIX 4D

CHEMICAL SAMPLING PROCEDURES AND PROTOCOLS

Sub-slab vapor, indoor air, and outdoor air chemical sampling procedures are summarized as follows:

a. For each chemical sample location, install an approximate one (1) inch diameter hole through the floor slab, and advance to approximately two (2) inches below the bottom of the floor slab. No vacuum will be utilized to remove the cuttings. A ½ to ¾ inch diameter black iron pipe will be installed and grouted in place.

b. Within the iron pipe, install and grout a Teflon-lined sampling tube. The diameter of the tube must be compatible with the sampling equipment (see Sheet EM002). Fill the gap between the top of the pipe and the sides of the one (1) inch diameter hole and the gap between the black iron pipe and the Teflon-lined sampling tube with beeswax or white, non-Volatile Organic Compound (VOC) modeling clay.

c. Place a six (6) liter Summa canister (provided by laboratory) adjacent to the sampling port and connect to the Teflon-lined sampling tube. Canisters must be certified as clean by the laboratory. Record the Summa canister pressure immediately prior to commencement of sampling and immediately after sampling completion. Use a "T" connector between the sampling tube and the Summa canister. The third leg of the "T" connects to a purge pump. Prior to sample collection, the purge pump withdraws air from the sample tube and port at a rate not to exceed 0.2 liter per minute.

d. Following purging, perform a tracer test at each sub-slab sampling point. Place a five (5) gallon bucket upside down over the sample area to create a confined area and to keep the tracer gas in contact with the sample probe. The bucket will have input and output holes on either side to allow ¼" polyethylene tubing to pass through. Connect one end of the input tubing to a Helium gas canister of known concentration and the other end will be open in the confined bucket area. The output tubing will connect to the probe and the other end will connect to a Helium gas monitoring unit outside of the confined area. Seal the input and output holes with beeswax or white, non-VOC modeling clay. Release Helium gas into the confined area surrounding the sampling apparatus. Once the helium gas is released into the confined area, pump sub-slab vapor from the probe and monitor for the tracer gas. If tracer gas is detected, all of the seals around the probe must be repaired or replaced. The tracer gas test must adhere to the "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York," October 2006, prepared by the New York State Department of Health (NYSDOH).

e. Following completion of the tracer test, collect the sub-slab sample into the Summa canister through a regulator. Collect the sample over a period as stated in Section 4.4.1.5 but in no case will the pumping rate exceed 0.2 liter per minute.

f. Analyze the Summa canister sample for VOCs using United States Environmental Protection Agency (USEPA) Method TO-15 with the method reporting limits set forth in the NYSDOH guidance document, and include the low reporting limits (achievable by Selective Ion Monitoring or SIM) for Matrix 1 compounds in Indoor Air (include, at a minimum, Carbon tetrachloride and Trichloroethene). All analytical services must be

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provided by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory.

g. Sample quality assurance/quality control (QA/QC) must consist of the following :

- At least ten (10) percent of indoor/outdoor air samples per sampling event will be collected in duplicate.
- At least ten (10) percent of sub-slab samples per sampling event will be collected in duplicate.

Additional QA/QC will be performed by the laboratory in accordance with the published methods.

h. At the time of sampling, note the weather conditions (wind speed, direction, barometric pressure, etc.).

i. Upon completion of the sample collection at each sub-slab location, perform a second tracer test to ensure that the seals around the probe were not compromised during sampling. Follow the steps for performing a tracer test presented in Procedure d. above. If a leak is detected the sample from that location will be discarded, the seals around the probe will be repaired or replaced and the sampling procedures will be repeated.

The protocols for sampling soil vapor and indoor and outdoor air and for conducting tracer gas testing of sub-slab vapor sampling probes are in conformance with the protocols provided in Section 2 of "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York," October 2006.

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APPENDIX 4E

SANBORN MAPS – 1930 AND 1950

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OIL UST'S and
OIL PUMP HOUSE

PRESENT LOCATION OF
HIGH SCHOOL

Figure 6

Sanborn Map - 1931

Note: North half on left, south half on right

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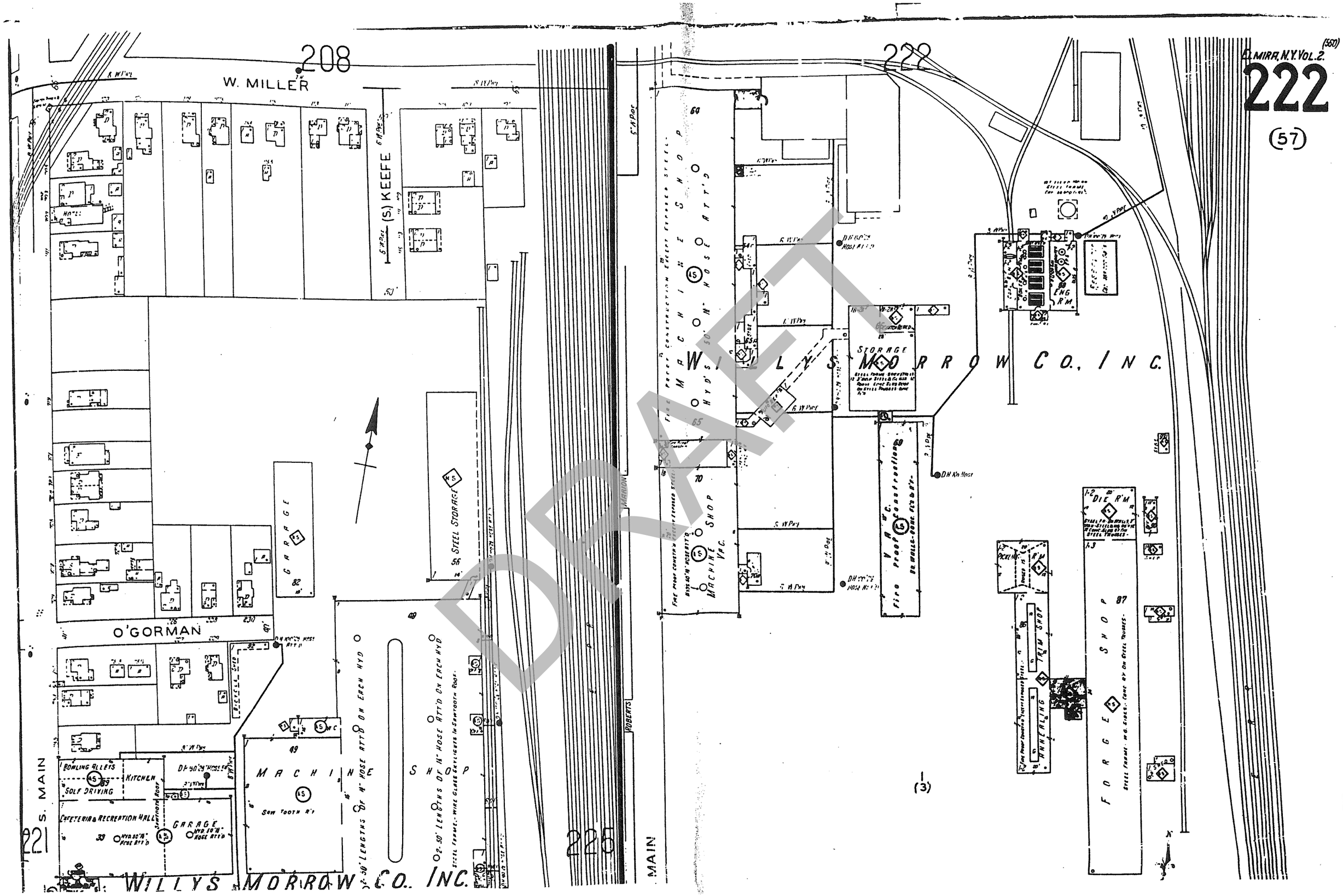

ELMIRA, N.Y. VOL. 2.
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222
W. MILLER
(S.) KEEFE
O'GORMAN
S. MAIN
MAIN
MARION
ROBERTS
WILLYS MORROW CO., INC.
WILLYS MORROW CO., INC.
MACHINE SHOP
MACHINE SHOP
MACHINE SHOP
STORAGE
STEEL STORAGE
GARAGE
GARAGE
BOWLING ALLEYS
KITCHEN
GOLF DRIVING
CAFETERIA & RECREATION HALL
SAW TOOTH R'F
ENG R'M
DIE R'M
PICKLING R'M
TRIM SHOP
ANNEALING
FORGE SHOP
DH No. Hose
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REMINGTON RAND INC.
M'FRS. OF TYPEWRITERS & BUSINESS OFF. MACHINES

FACTORY BLDG

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EMPLOYMENT OFF

FACTORY BLDG

FACTY BLDG

FACTY BLDG

MAINTENANCE DEPT.

FACTY BLDG

S. MAIN

A.S. GUARD HQ

FACTY BLDG

GARBAGE RM

INCINERATOR

TOWN OF SOUTHPORT

SUTTON

SOPER

ALLEN

SHANNON AV.

OAKDALE AV.

CURTIS

AUTO PARKING

PRESENT LOCATION OF HIGH SCHOOL

OIL PUMP HOUSE (UST'S NOT SHOWN)

TOWN OF SOUTHPORT

City of Elmira

Town of Southport

230

231

222

2

-2

-3

4

Figure 7

Sanborn Map - 1950

Note: North half on left, south half on right

EDR Sanborn, Inc.

This Sanborn™ map is a certified copy produced by EDR Sanborn, Inc. from its archives. Information on this map is derived from Sanborn field surveys conducted in:

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Year EDR Sanborn, Inc. Research Associate

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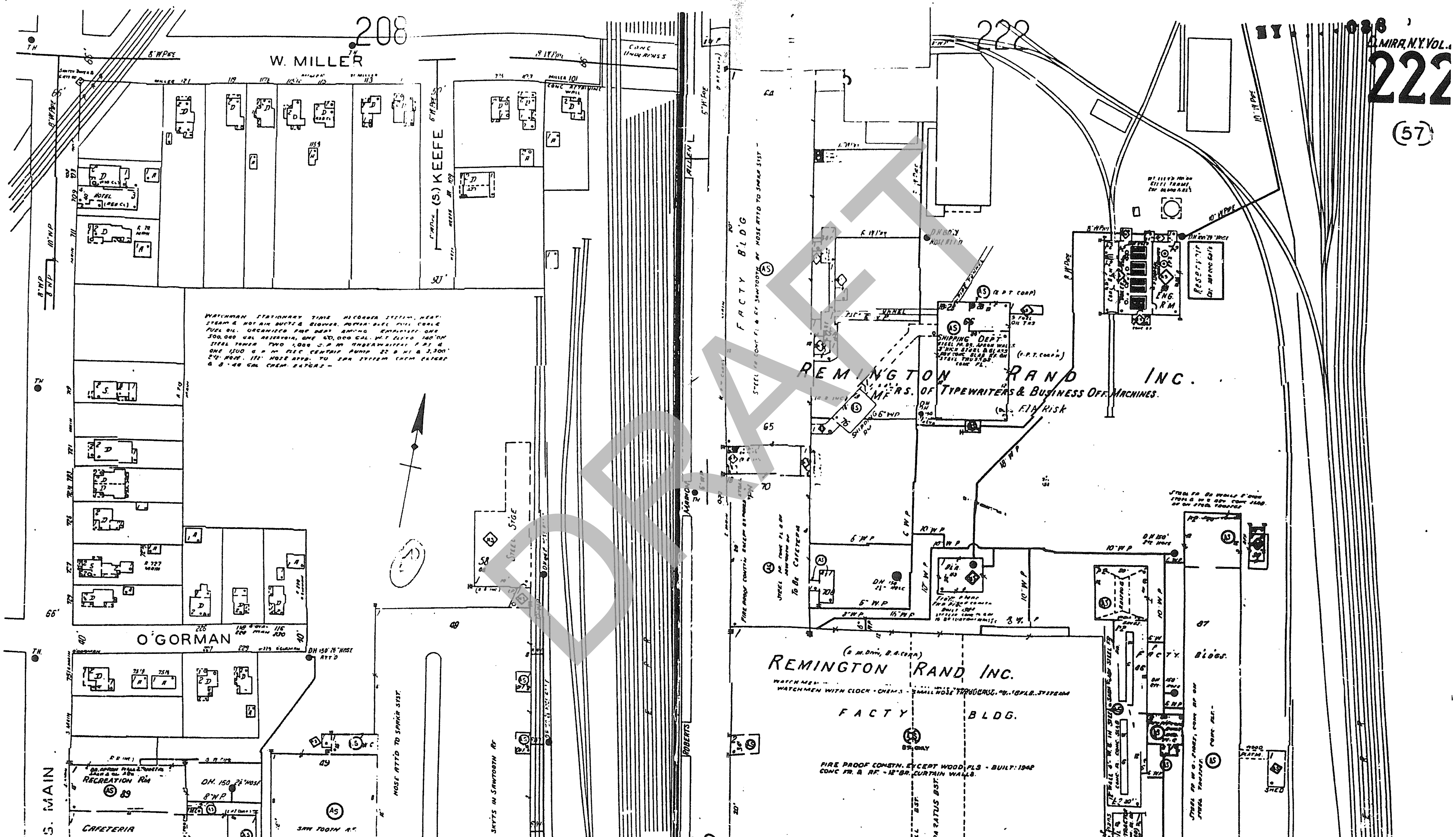
208
222
(57)
W. MILLER
(S.) KEEFE
ALLEN
MARION
ROBERTS
O'GORMAN
S. MAIN
HOTEL
WATCHMAN STATIONARY TIME RECORDER SYSTEM. HEAT: STEAM & HOT AIR DUCTS & BLOWER. POWER: ELEC. FUEL: COAL & FUEL OIL. ORGANIZED FIRE DEPT. AMONG EMPLOYEES. ONE 500,000 GAL. RESERVOIR, ONE 50,000 GAL. W.T. ELEV'D 140' ON STEEL TOWER. TWO 1,000 G.P.M. UNDERWRITERS F.P.S & ONE 1500 G.P.M. ELEC. CENTRIF. PUMP. 22 D.H.s & 3,300' 2½" HOSE. 172' HOSE ATT'D. TO SPR. SYSTEM. CHEM. EXTGRS. & 8-40 GAL. CHEM. EXTGRS.
FACTY B'LD'G
REMINGTON RAND INC.
MFRS. OF TYPEWRITERS & BUSINESS OFF. MACHINES
SHIPPING DEPT.
ENG. R'M
RESERVOIR
FIRE PROOF CONSTN.
TO BE CAFETERIA
REMINGTON RAND INC.
WATCHMEN WITH CLOCK. CHEMS. SMALL HOSE THROUGHOUT.
FACTY BLDG.
FIRE PROOF CONSTN. EXCEPT WOOD FLS. BUILT: 1942
CONC. FR. & RF. 12" BR. CURTAIN WALLS.
FACTY. BLDGS.
RECREATION R'M
CAFETERIA
SAW TOOTH R.F.
HOSE ATT'D TO SPKR. SYST.
2 SKYTS IN SAWTOOTH RF.
STEEL STGE
SHED
WOOD PLATM.
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APPENDIX 6A

ANNUAL INSPECTION FORMS

- Cover Systems
- Vapor Barrier System
- Exhaust Gas Permeable Layer and Negative Pressure Piping in Science Addition

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ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL
777 SOUTH MAIN STREET, ELMIRA, NEW YORK

ANNUAL INSPECTION FORM FOR COVER SYSTEMS

Inspector: _____ Date: _____

1. Describe cover system condition and list needed repairs and note location:

   a. Asphalt – Inspect for cracks, potholes, and other penetrations:
   _____
   _____

   b. Concrete – Inspect for cracks, spalling, and loose concrete:
   _____
   _____

   c. Gravel areas, mulched planting beds, and other soil cover areas – Inspect for signs of erosion and vermin burrows:
   _____
   _____

   d. Vegetated areas – Inspect for signs of erosion and bare soil:
   _____
   _____

   e. Building floor slabs – Inspect for cracks, new and unsealed penetrations of concrete floor-slab:
   _____
   _____

2. Indicate corrective actions taken for any and all deficiencies noted above, who accomplished the repair and date completed:
   _____
   _____
   _____

3. Attach photographs to this report and include a description of each photograph and date.
   _____
   _____
   _____

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ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL
777 SOUTH MAIN STREET, ELMIRA, NEW YORK

ANNUAL INSPECTION FORM FOR VAPOR BARRIER SYSTEM IN SCIENCE ADDITION

Inspector: _____ Date: _____

1. Describe vapor barrier condition, list needed repairs and note location:

   a. Concrete – Inspect for new cracks, spalling, loose concrete, holes, or objects newly penetrating concrete (Note Location):

   _____

   _____

   b. Concrete Joints – Inspect for gaps in joint sealer, crack sealer, and sealer at penetration (Note Location):

   _____

   _____

2. Indicate corrective actions taken for any and all deficiencies noted above, who accomplished the repair and date completed:

   _____

   _____

   _____

3. Attach photographs to this report and include a description of each photograph and date.

   _____

   _____

   _____

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ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL
777 SOUTH MAIN STREET, ELMIRA, NEW YORK

ANNUAL INSPECTION FORM FOR EXHAUST GAS PERMEABLE LAYER AND NEGATIVE PRESSURE PIPING IN SCIENCE ADDITION

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Inspector: _____ Date: _____

1. Describe component condition, list needed repairs and note location:

   a. Fan and Exhaust – Fan operation (vibration at housing, exhausting air), exhaust blocked? Have air intakes been added within ten (10) feet of exhaust?

   _____
   _____

   b. Gas Permeable Layer and Negative Pressure Piping – Holes, cracks or penetrations in pipe? Does duct manometer show vacuum? Do differential pressure gauges indicates negative pressure of at least 0.20 inch water column?

   _____
   _____

2. Indicate corrective actions taken for any and all deficiencies noted above, who accomplished the repair and date completed:

   _____
   _____
   _____

3. Attach photographs to this report and include a description of each photograph and date.

   _____
   _____
   _____

APPENDIX 7A

HASP CERTIFICATION FORM

DRAFT

HEALTH AND SAFTEY PLAN CERTIFICATION FORM

NAME OF FACILITY:	Southside High School
TYPE OF FACILITY:	Public High School
LOCATION OF FACILITY:	777 South Main Street Elmira, NY 14901
NAME AND ADDRESS OF OWNER:	Elmira City School District Building and Grounds Department 733 Benjamin Street Elmira, NY 14901

MANAGEMENT APPROVAL

This Plan will be implemented as herein described.

Signature _____

Name Antonio F. LaSorte, Jr.

Title Health and Safety Hygienist

CERTIFICATION

I hereby certify that I have examined the facility information collected under my direction and assembled in this document and being familiar with the applicable provisions of the Code of Federal Regulations (29 CFR Ch. XVII § 1910.120: 7-1-08 Edition), attest that this Plan has been prepared in accordance with good engineering practices.

_____
(Print Name and Title)
Sterling Environmental Engineering, P.C.

_____
Signature of Registered Professional Engineer

(Seal)

DATE: _____ Registration No. _____ State of New York

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APPENDIX 7B

EQUIPMENT CLEANING AND DECONTAMINATION PROCEDURES

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STANDARD OPERATING PROCEDURES

EQUIPMENT CLEANING AND DECONTAMINATION PROCEDURES

Summary

Equipment, tools and materials used in the investigation and collection of soil and groundwater samples as specified in the Soils Management Plan (Section 2.0 of the EMP) and the Health and Safety Plan (Section 7.0 of the EMP) must be properly prepared and cleaned/decontaminated during and after each sampling event. The degree of cleaning/decontamination depend upon property conditions and the nature and type of contamination, if present, the intent and goal(s) of the investigation, and data quality objectives, as well as other project-specific requirements.

Procedure

1. **Heavy Equipment Decontamination**

   All equipment, tools and materials associated with sampling events must be cleaned or decontaminated prior to usage. Items such as drill rigs, auger flights, trackhoes, and backhoes all present potential sources of contamination to environmental samples. Therefore, all heavy equipment utilized at the property must undergo the following decontamination procedures:

   - The sampling portion of the equipment will be high-pressure, hot washed or steam-cleaned with potable water; and,
   - The sampling portion of the equipment will be rinsed thoroughly with potable water.

   - Prior to leaving the property, the wheels of all vehicles that come in contact with excavated soil will be washed by the above described method.

   All decontamination fluids will be contained, collected and disposed of in accordance with project-specific requirements. The bucket of trackhoes and backhoes may be cleaned over the excavation allowing decontamination washwater to return to the excavation.

2. **Cleaning of Field Sampling Equipment**

   All equipment and tools used to collect samples for chemical analyses, including spatulas, spoons, scoops, trowels, split-spoons, augers, etc. will be decontaminated using the following procedures:

   - non-phosphate detergent wash;
   - potable water or distilled/deionized water rinse; and
   - air or oven-dry.

   If the sampling equipment will be stored for future use, allow it to dry and then wrap in aluminum foil (shiny-side out) or seal in plastic bags.

   Collect or dispose of all decontamination fluids in accordance with project-specific requirements.

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3. Personal Clothing Decontamination

All footwear worn in and around the contamination area will be dry-brushed or washed down using soap and water to remove soil or oily residue remnants. If disposable gloves, boots or suits (such as Tyvek® suits) are worn, these will be removed and disposed in a designated 55-gallon drum or garbage bag on-site for future disposal. Any other clothing that comes in contact with the potentially contaminated material should not be worn more than 24-hours and should be washed prior to wearing again.

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Letter Health Consultation

Evaluation of Exposures Related to Soil Vapor Intrusion Mitigation Verification — December 2009

SOUTHSIDE HIGH SCHOOL
ELMIRA, CHEMUNG COUNTY, NEW YORK

EPA FACILITY ID: NYD987025921

DRAFT

Prepared by
State of New York Department of Health

MARCH 4, 2010

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

DRAFT

You May Contact ATSDR TOLL FREE at
1-800-CDC-INFO
or
Visit our Home Page at: http://www.atsdr.cdc.gov

LETTER HEALTH CONSULTATION

Evaluation of Exposures Related to Soil Vapor Intrusion Mitigation Verification — December 2009

SOUTHSIDE HIGH SCHOOL

ELMIRA, CHEMUNG COUNTY, NEW YORK

EPA FACILITY ID: NYD987025921

DRAFT

Prepared By:

State of New York
Department of Health
Under a cooperative agreement with the
Agency for Toxic Substances and Disease Registry

STATE OF NEW YORK
INTERDEPARTMENTAL MEMORANDUM

DATE: March 3, 2010

TO: Mr. Carl Thurnau, Facilities Planning Coordinator
New York State Education Department

FROM: Ms. Krista M. Anders, Public Health Specialist Krista M. Anders
New York State Department of Health

RE: NYSDOH's Assessment of Air Results
Southside High School, Elmira, Chemung County, New York

Between January 28 and February 9, 2010, the New York State Department of Health's (NYS DOH's) Bureau of Environmental Exposure Investigation received a validated air data package from the Elmira City School District's consultant, Sterling Environmental Engineering, P.C. (Sterling), for the above-referenced property. The air samples were collected in December of 2009 to verify that mitigation actions currently being implemented at the school are continuing to be effective. These actions are intended to ensure that contaminants beneath the school are not being drawn into the building and affecting the indoor air quality. The NYS DOH, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), has completed our evaluation of the data in the context of prior air sampling completed at the school. The NYS DOH and ATSDR's goal is to make sure the New York State Education Department (NYS ED) has the information the NYS ED, Elmira City School District and Southside High School community need to understand the health effects associated with the chemicals found in the indoor air of the high school and what additional actions, if any, we recommend to reduce human exposures. The following is a summary of our assessment.

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BACKGROUND

Sterling collected the samples in accordance with the Elmira City School District's indoor air quality action plan, which the district developed in response to the NYS DOH's and ATSDR's recommendations presented in the *Health Consultation for Southside High School* (ATSDR 2003). In 1995, fuel oil contamination was discovered in nearby Miller Pond, which is east of Southside High School. Environmental investigations completed by the New York State Department of Environmental Conservation (NYS DEC) found that the petroleum contamination extends from beneath the school, at an approximate depth of 15 feet below ground, toward Miller Pond. During their investigations, the NYS DEC also discovered the presence of numerous contaminants, including chlorinated solvents, associated with prior industrial activities. As discussed in the health consultation, the NYS DEC and NYS DOH completed several indoor air investigations at the school in 1997 and 2000 to evaluate whether the subsurface environmental contaminants were affecting the indoor air quality due to soil vapor intrusion.

These previous air investigations identified several compounds in the indoor air at concentrations slightly higher than typical background—most likely due to indoor sources or activities, or due to their presence in the outdoor air that enters the school building. As discussed in the health consultation, their presence was not unusual and exposure at the reported levels was not expected to be a health concern. Relatively elevated concentrations of Freons and chlorinated solvents were found in the air beneath the building's slab (referred to as the sub-slab air). However, sampling demonstrated that human exposure to the contaminants was being minimized due to the operation of the building's heating, ventilating, and air-conditioning system. The system is operated in a manner intended to

minimize the potential for contaminants that are present beneath the building from being drawn into the building and affecting the indoor air quality (i.e., it is operated in a positive pressure mode).

The results of the NYS DEC and NYS DOH's sampling events in 1997 and 2000 did not show an indoor air contamination problem at the school. Overall, the results of Sterling's air sampling this past December are consistent with these previous findings.

STERLING's DECEMBER 2009 AIR SAMPLING

On December 17 and 18, 2009, Sterling collected 24 air samples at the school: 8 indoor air, 14 sub-slab air, and 2 outdoor air (duplicates from the same location). Samples were collected over a 24-hour time period. During this time period, the building's heating, ventilating, and air-conditioning system was operating in a positive pressure mode during times of occupancy (approximately 10 hours). Centek Laboratories, LLC, analyzed the air samples for a range of volatile organic compounds by using US EPA Method TO-15. The sampling locations, methods and analytical procedures are comparable to those implemented by the agencies during previous sampling events. Additional details regarding this sampling event can be found in the Elmira City School District's Indoor Air Quality Action Plan, which is included in the Environmental Management Plan for the school (Sterling 2009).

The results for all of the air samples are given in Tables 1 (indoor air), 2 (sub-slab air) and 3 (outdoor air). The sample locations and results for volatile organic compounds specifically identified in our exposure assessment are provided in Figure 1.

NYS DOH's EXPOSURE ASSESSMENT

Indoor Air

- As expected, volatile organic compounds were found in the air samples collected from inside the school. Based on a review of studies conducted to evaluate background levels of volatile chemicals in indoor air, most of the compounds present in the indoor air of the school are at concentrations consistent with levels usually found in the indoor air of buildings not affected by environmental contamination and do not represent a concern.
- Several compounds were detected at levels above those commonly found in indoor air (Table 4), but below applicable public health comparison values (Table 5):

  (a) Freon-12 and Freon-113, throughout the school: These compounds are typically used as refrigerants and as cleaning solvents. Their presence may be related to their use at the school, their presence in the outdoor air that enters the school, or due to soil vapor intrusion.

  (b) Chloroform, in the gym and the pool filter room: This compound is a known chlorination by-product and may be related to the swimming pool.

  (c) 1,1-Dichloroethene, throughout the school: This compound is most likely associated with its presence in the outdoor air that enters the school.

  (d) Trichloroethene, in Room-127: The concentration detected (2.4 micrograms per cubic meter) was higher than typical background levels, but lower than the NYS DOH's guideline of 5 micrograms per cubic meter. Its presence may be due to soil vapor intrusion.

  Overall, health effects from exposure to these compounds at the concentrations detected are unlikely (i.e., the health risks are minimal).

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Sub-slab Air

- Similar to previous sampling events, chlorinated solvents and Freons were found at relatively elevated levels in the air beneath the school. In particular, elevated concentrations of one or more compounds were found beneath a portion of the gym, the pool filter room, and Room-127. No one is coming into direct contact with this air.

Outdoor Air

- Based on a review of studies conducted to evaluate background levels of volatile chemicals in outdoor air, the concentrations of most of the volatile organic compounds detected in the outdoor air sample are consistent with typical outdoor air background levels and do not represent a concern. Two compounds, 1,1-dichloroethene and Freon-12, were present at levels above those commonly found in outdoor air (Table 6), but below applicable public health comparison values (Table 5). Health effects from exposure to the concentrations detected are unlikely (i.e., the health risks are minimal).

NYS DOH's CONCLUSIONS AND RECOMMENDATIONS

Overall, the NYS DOH and ATSDR conclude that breathing volatile organic compounds at the levels found in the indoor air at the Southside High is not expected to harm people's health. Consistent with previous investigations, the recent indoor air testing results do not show a problem with chemical contamination in the school's air. However, given the concentrations of Freons and chlorinated solvents found beneath the building, we recommend that

- the school's heating, ventilating and air-conditioning system continue to be operated in a manner to prevent sub-slab air from being drawn into the building (particularly at times when the school is occupied);
- routine monitoring (e.g., of the pressure differentials between the sub-slab and building interior) be continued to verify that this mitigation measure continues to be effective;
- additional sampling be completed to evaluate the indoor air quality and the pressure differentials between the inside and outside of the building in the area of Room-127. The samples should be collected during periods when the school's heating, ventilating and air-conditioning system is operating in a positive pressure mode to obtain a more representative sample of the exposure scenario; and
- if necessary, adjustments be made to the school's heating, ventilating and air-conditioning system in the area of Room-127 to reduce the concentration of trichloroethene in the indoor air to within background ranges.

We also recommend that reasonable and practical actions be taken to reduce exposures to those compounds that are present in the indoor air at levels above background and are used or stored within the building.

We understand that the district is planning to do some work on the floor and/or concrete slab in the gym before the next school year begins. Given the levels of volatile organic compounds found beneath the slab, they may want to consider installing a sub-slab depressurization system in this portion of the building. If the building's slab is to be breached during these activities, then we recommend that an indoor air-monitoring program be implemented to address the potential for exposure to volatile organic compounds and, if possible, that the intrusive activities be completed when the building is unoccupied.

DRAFT

CONTACT INFORMATION

If you have any questions regarding this assessment or the recommendations contained herein, please feel free to contact me at 518-402-7860 or as follows:

via email: BEEI@health.state.ny.us [RE: Southside High School Air Results]

via mail: Krista M. Anders, Ph.D.
Public Health Specialist
Bureau of Environmental Exposure Investigation
New York State Department of Health
547 River Street, Troy, NY 12180

ADDITIONAL INFORMATION

- For information on what we mean when using the term "exposure," please see the NYS DOH's fact sheet titled *What is Exposure?* (enclosed). This fact sheet is also available on the NYS DOH's website at http://www.nyhealth.gov/environmental/about/exposure.htm.

- Please see the NYS DOH's fact sheet titled *Soil Vapor Intrusion: Frequently Asked Questions* (enclosed) for additional information on the process referred to as "soil vapor intrusion." This fact sheet is also available on the NYS DOH's website at http://www.nyhealth.gov/environmental/indoors/vapor_intrusion/fact_sheets/.

- Please see the NYS DOH's fact sheet titled *Trichloroethene (TCE) in Indoor and Outdoor Air* (enclosed) for additional information on trichloroethene and the NYS DOH's guideline of 5 micrograms per cubic meter for trichloroethene in air. This fact sheet is also available on the NYS DOH's website at http://www.nyhealth.gov/environmental/investigations/soil_gas/svi_guidance/fs_tce.htm.

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- ATSDR (Agency for Toxic Substance and Disease Registry). 2003. Health Consultation for Southside High School, Elmira, Chemung County, New York. U.S. September 30, 2003. Prepared by the New York State Department of Health under a cooperative agreement with the Agency for Toxic Substance and Disease Registry.

- Sterling Environmental Engineering, P.C. 2009. Elmira City School District, Southside High School, Elmira, New York: Environmental Management Plan. June 19, 2009. Prepared for the Elmira City School District.

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Enclosures

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Table 1. Indoor Air Results (micrograms per cubic meter, mcg/m^3)

Southside High School, Elmira, NY — December 16-17, 2009

Volatile Organic Compound	IA-GYM Gymnasium	IA-PF Pool Filter Room	IA-DUP [5] Duplicate of Pool Filter Room	IA-151A Room 151A	IA-127 Room 127	IA-138 Room 138	IA-CAF Cafeteria	IA-LIB Library
Chloroform	28	55	65	1.8	0.94	4.2	0.69 J	0.94
Freon 12 (Dichlorodifluoromethane)	4.2	27 JDV	3.3 JDV	25	12	6.0 J	25	9.6
Freon 113 (Trichlorotrifluoroethane)	16	97 JDV	66 JDV	9.0	4.8	6.6	7.2	7.3
1,1-Dichloroethene	< 0.60	1.1	< 0.60	1.0	0.69	0.60	0.97	1.0
1,1,1-Trichloroethane	2.4	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83
Trichloroethene	0.22	1.4 JDV	1.0 JDV	0.44	2.4	0.27	0.33	0.49
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83
1,1-Dichloroethane	< 0.62	0.49 J	< 0.62	0.49 J	< 0.62	< 0.62	0.49 J	0.41 J
1,2,4-Trichlorobenzene	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
1,2,4-Trimethylbenzene	< 0.75	1.8 JDV	1.1 JDV	< 0.75	< 0.75	1.0	0.55 J	< 0.75
1,2-Dibromoethane	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
1,2-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,2-Dichloroethane	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62
1,2-Dichloropropane	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
1,3,5-Trimethylbenzene	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,3-Butadiene	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34
1,3-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,4-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,4-Dioxane	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
2,2,4-Trimethylpentane	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71
4-Ethyltoluene	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Acetone	17	37	37	18	14	23	17	16
Allyl Chloride	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48
Benzene	0.42 J	0.58	0.45 J	0.52	0.42 J	0.65	0.49	0.42 J
Benzyl Chloride	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Bromodichloromethane	< 1.0	1.0	0.9 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Bromomethane	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Carbon Disulfide	< 0.47	0.32 J	< 0.47	< 0.47	< 0.47	0.95	< 0.47	< 0.47
Carbon Tetrachloride	0.32	0.45	0.38	0.38	0.32	0.38	0.38	0.38
Chlorobenzene	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
Chloroethane	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Chloromethane	0.63	0.61	0.69	0.61	0.55	0.5	0.8	0.67
cis-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
cis-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Cyclohexane	< 0.52	< 0.52	< 0.52	< 0.52	< 0.52	1.5	< 0.52	< 0.52
Dibromochloromethane	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Ethanol	3.5 JN	3.7 JN	3.2 JN	7.1 JN	7.9 JN	12 JN	6.5 JN	13 JN
Ethyl Acetate	< 0.92	< 0.92	0.77 J	< 0.92	2.1	< 0.92	3.0	< 0.92
Ethylbenzene	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
Freon 11 (Trichlorofluoromethane)	0.80 J	1.4	1.1	2.5	0.91	2.0	2.5	1.0
Freon 114 (1,2-Dichlorotetrafluoroethane)	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Heptane	< 0.62	< 0.62	< 0.62	0.67	6.4	0.79	< 0.62	0.87
Hexachloro-1,3-Butadiene	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Hexane	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	0.79	< 0.54	0.97
Isopropyl Alcohol	3.6	5.0	5.2	10	11	< 0.37	4.3	24
m&p-Xylene	< 1.3	0.88 J	0.66 J,JDV	0.79 J	< 1.3	1.0 J	< 1.3	< 1.3
Methyl Butyl Ketone	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Methyl Ethyl Ketone	1.0	1.4	1.4	0.57 J	0.51 J	0.84 J	0.36 J	0.78 J
Methyl Isobutyl Ketone	1.0 J	< 1.2	< 1.2	< 1.2	< 1.2	1.3	< 1.2	1.1 J
Methyl tert-Butyl Ether	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
Methylene Chloride	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
o-Xylene	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
Propylene	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Styrene	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65	< 0.65
tert-Butyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	< 1.0	0.69 J	< 1.0	0.76 J	< 1.0	< 1.0	< 1.0	< 1.0
Tetrahydrofuran	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Toluene	2.3	9.2 J	8.8	2.1	6.6	4.6	1.0	1.3
trans-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
trans-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Vinyl Acetate	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54
Vinyl Bromide	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67
Vinyl Chloride	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

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NOTES:

Indoor air sample locations are illustrated in Figure 1.

< The parameter is not detected at the laboratory detection limit shown.

ND Not detected in tentatively identified compounds.

LABORATORY/DATA VALIDATION QUALIFIERS:

J Analyte detected at or below quantitation limits.

JN Non-routine analyte. Quantitation estimated.

JDV Value is estimated as a result of Data Validation.

Table 2. Sub-slab Vapor Results (micrograms per cubic meter, mcg/m^3)

Southside High School, Elmira, NY — December 16-17, 2009

Volatile Organic Compound	SV-WM Room 159	SV-GYM EAST East Side of Gymnasium	SV-GYM WEST West Side of Gymnasium	SV-GS Gymnasium Storage Room	SV-PF Pool Filter Room	SV-WS Room 139C	SV-DUP [5] Duplicate of Room 139C	SV-GL Hallway Outside of Gymnasium	SV-NR Room 146	SV-151A Room 151A	SV-127 Room 127	SV-HALL 113 Hallway Behind Room 113B	SV-LIB Library	SV-BR Boiler Room
Chloroform	18	79	32	27	1,100	4	4.1	5.3	4.7	5	7.9	4.8	15	1.9
Freon 12 (Dichlorodifluoromethane)	65	3,600	4.7	4.5	110	420	460	48	270	360	1,800	87	980	33
Freon 113 (Trichlorotrifluoroethane)	4.8	1,100	39	36	660	3.5 JDV	6.2 JDV	6.6	17	33	< 1.2	3	1.6	3.1
1,1-Dichloroethene	< 0.6	240	< 0.6	< 0.6	1.2	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,1-Trichloroethane	0.83 JDV	23,000	1.7	1.2	16	< 0.83	< 0.83	< 0.83	5.7 JDV	1.7	1.6 JDV	3.4 JDV	1.7 JDV	5
Trichloroethene	3.1 JDV	28	0.6 J	< 0.82	460	< 0.82	< 0.82	0.71 J	1.2 JDV	4.2	2,100	< 0.82	< 0.82	97
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83	< 0.83
1,1-Dichloroethane	3.9	85	< 0.62	< 0.62	1.7	0.62	0.70	< 0.62	1.1	1.7	1.3	2.1	< 0.62	< 0.62
1,2,4-Trichlorobenzene	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
1,2,4-Trimethylbenzene	1.6 JDV	2.4 JDV	1.2	0.60 J	4.1 JDV	2.2 JDV	2.3 JDV	0.75	5.3 JDV	4.5 JDV	4.2 JDV	4.6 JDV	2.5 JDV	3.7 JDV
1,2-Dibromoethane	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
1,2-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,2-Dichloroethane	0.53 J	< 0.62	< 0.62	< 0.62	0.62	< 0.62	< 0.62	< 0.62	< 0.62	0.62	0.45 J	0.95	< 0.62	< 0.62
1,2-Dichloropropane	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
1,3,5-Trimethylbenzene	< 0.75	0.65 J,JDV	< 0.75	< 0.75	1.4 JDV	0.65 J,JDV	0.65 J,JDV	< 0.75	1.2 JDV	1.1 JDV	0.85 JDV	1.1 JDV	< 0.75	0.85 JDV
1,3-Butadiene	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34
1,3-Dichlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92
1,4-Dichlorobenzene	< 0.92	1.2	< 0.92	< 0.92	0.67 J,JDV	< 0.92	< 0.92	< 0.92	1.1 JDV	< 0.92	< 0.92	< 0.92	< 0.92	0.67 J,JDV
1,4-Dioxane	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
2,2,4-Trimethylpentane	0.66 J,JDV	0.95 JDV	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	1.0 JDV	0.57 J,JDV	1.6 JDV	0.90 JDV	< 0.71
4-Ethyltoluene	< 0.75	0.60 J,JDV	< 0.75	< 0.75	1.4 JDV	0.70 J,JDV	0.80	< 0.75	1.3 JDV	1.2 JDV	1.0 JDV	0.95 JDV	< 0.75	0.95 JDV
Acetone	77	190	11	22	51	190	190	25	47	49	130	110	120	27
Allyl Chloride	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48
Benzene	1.9 JDV	17	0.36 J	0.42 J	1.4	0.58 JDV	0.75	1.8	1.2 JDV	1.7	1.4 JDV	30	1.8 JDV	0.81
Benzyl Chloride	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Bromodichloromethane	2.7 JDV	11	< 1.0	< 1.0	12	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Bromomethane	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Carbon Disulfide	13	15	0.76	< 0.47	3.5	2.7	2.3	1.2	3.6	3.4	1.2	2.3	3.9	0.92
Carbon Tetrachloride	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96
Chlorobenzene	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
Chloroethane	9.7	3.0	< 0.40	< 0.40	2.2	0.86	0.91	< 0.40	2.1	2.5	2.4	2.8	< 0.40	< 0.40
Chloromethane	0.27 J	< 0.31	0.69	1.0	< 0.31	< 0.31	< 0.31	0.69	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31
cis-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	3.2	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	300	< 0.60	< 0.60	< 0.60
cis-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Cyclohexane	< 0.52	< 0.52	< 0.52	< 0.52	2.6	< 0.52	< 0.52	< 0.52	< 0.52	2.9	< 0.52	< 0.52	< 0.52	< 0.52
Dibromochloromethane	< 1.3	2.0	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Ethanol	ND	ND	ND	3 JN	ND	8.3 JN	7.2 JN	2.7 JN	ND	ND	ND	ND	8.8 JN	ND
Ethyl Acetate	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	< 0.92	1.7	< 0.92	< 0.92	< 0.92	11	< 0.92	< 0.92
Ethylbenzene	1.5 JDV	3.4 JDV	< 0.66	0.53 J	0.97 JDV	1.6 JDV	1.9 JDV	1.7	2.8 JDV	2.9 JDV	2.6 JDV	3.3 JDV	1.3 JDV	2.0 JDV
Freon 11 (Trichlorofluoromethane)	0.69 J	21	0.86	1.5	3.8	1.3	1.3	0.86	34	1.9	0.86	1.3	1.0	4.2
Freon 114 (1,2-Dichlorotetrafluoroethane)	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Heptane	25	50	< 0.62	< 0.62	5.3	2.9	3.2	0.67	9.3	6.3	3.9	6.6	7.1	4.0
Hexachloro-1,3-Butadiene	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Hexane	54	65	< 0.54	< 0.54	6.8	< 0.54	< 0.54	< 0.54	8.1	7.1	< 0.54	< 0.54	22	< 0.54
Isopropyl Alcohol	< 0.37	< 0.37	2.8	2.2	3.2	< 0.37	9.5	3.1	< 0.37	< 0.37	< 0.37	< 0.37	< 0.37	2.9
m&p-Xylene	4.1 JDV	6.8 JDV	0.88 J	1.7	2.1 JDV	4 JDV	4.9 JDV	0.62 J	9.5 JDV	9.2 JDV	7.6 JDV	9.9 JDV	3.7 JDV	6.6 JDV
Methyl Butyl Ketone	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	3.0 JDV	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Methyl Ethyl Ketone	19	< 0.90	0.84 J	0.90	3.2	3.2	3.5	13	9.0	6.6 J	5.5	210	6.4	3.1
Methyl Isobutyl Ketone	7.2 JDV	7.0 JDV	0.92 J	2.2	< 1.2	0.54 J,JDV	0.58 J,JDV	< 1.2	< 1.2	1.3 JDV	1.8 JDV	1.4 JDV	2.0 JDV	0.71 J,JDV
Methyl tert-Butyl Ether	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
Methylene Chloride	0.88	< 0.53	< 0.53	< 0.53	3.4	< 0.53	< 0.53	1.5	< 0.53	0.42 J	0.46 J	1.9	0.42 J	< 0.53
o-Xylene	1.1 JDV	2.0 JDV	0.49 J	0.62 J	0.88 JDV	1.5 JDV	1.8 JDV	0.66	2.6 JDV	2.8 JDV	2.5 JDV	2.7 JDV	1.0 JDV	2.2 JDV
Propylene	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Styrene	< 0.65	2.3 JDV	< 0.65	< 0.65	1.0 JDV	< 0.65	< 0.65	16	1.9 JDV	1.2 JDV	1.3 JDV	0.87 JDV	0.43 J,JDV	1.1 JDV
tert-Butyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	< 1.0	54 JDV	< 1.0	< 1.0	7.4 JDV	< 1.0	< 1.0	< 1.0	1.2 JDV	1.1 JDV	2.6 JDV	< 1.0	3.1 JDV	1.9 JDV
Tetrahydrofuran	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
Toluene	16	39 JDV	1.7	5.8	7.1 JDV	37	31	2.9	21	31	29	45	14	19
trans-1,2-Dichloroethene	< 0.60	< 0.60	< 0.60	< 0.60	0.52 J	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	21 J	< 0.60	< 0.60	< 0.60
trans-1,3-Dichloropropene	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69
Vinyl Acetate	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54	< 0.54
Vinyl Bromide	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67
Vinyl Chloride	2.1	0.78	< 0.39	< 0.39	0.44	< 0.39	< 0.39	< 0.39	0.52	0.39	0.55	0.42	< 0.39	< 0.39

NOTES:

Indoor air sample locations are illustrated in Figure 1.

< The parameter is not detected at the laboratory detection limit shown.

ND Not detected in tentatively identified compounds.

LABORATORY/DATA VALIDATION QUALIFIERS:

J Analyte detected at or below quantitation limits.

JN Non-routine analyte. Quantitation estimated.

JDV Value is estimated as a result of Data Validation.

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Table 3. Outoor Air Results (micrograms per cubic meter, mcg/m^3)

Southside High School, Elmira, NY — December 16-17, 2009

Volatile Organic Compound	OA-UR	OA-DUP [5]
	Roof, Upwind	Duplicate of Roof, Upwind
Chloroform	0.60 J	< 0.74
Freon 12 (Dichlorodifluoromethane)	5.5 J	9.0
Freon 113 (Trichlorotrifluoroethane)	6.3	5.5
1,1-Dichloroethene	0.81	0.73
1,1,1-Trichloroethane	< 0.83	< 0.83
Trichloroethene	< 0.22	< 0.22
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0
1,1,2-Trichloroethane	< 0.83	< 0.83
1,1-Dichloroethane	< 0.62	< 0.62
1,2,4-Trichlorobenzene	< 1.1	< 1.1
1,2,4-Trimethylbenzene	< 0.75	< 0.75
1,2-Dibromoethane	< 1.2	< 1.2
1,2-Dichlorobenzene	< 0.92	< 0.92
1,2-Dichloroethane	< 0.62	< 0.62
1,2-Dichloropropane	< 0.70	< 0.70
1,3,5-Trimethylbenzene	< 0.75	< 0.75
1,3-Butadiene	< 0.34	< 0.34
1,3-Dichlorobenzene	< 0.92	< 0.92
1,4-Dichlorobenzene	< 0.92	< 0.92
1,4-Dioxane	< 1.1	< 1.1
2,2,4-Trimethylpentane	< 0.71	< 0.71
4-Ethyltoluene	< 0.75	< 0.75
Acetone	9.9	9.9
Allyl Chloride	< 0.48	< 0.48
Benzene	0.39 J	0.36 J
Benzyl Chloride	< 0.88	< 0.88
Bromodichloromethane	< 1.0	< 1.0
Bromoform	< 1.6	< 1.6
Bromomethane	< 0.59	< 0.59
Carbon Disulfide	< 0.47	< 0.47
Carbon Tetrachloride	< 0.26	< 0.26
Chlorobenzene	< 0.70	< 0.70
Chloroethane	< 0.40	< 0.40
Chloromethane	0.57	0.55
cis-1,2-Dichloroethene	< 0.60	< 0.60
cis-1,3-Dichloropropene	< 0.69	< 0.69
Cyclohexane	< 0.52	< 0.52
Dibromochloromethane	< 1.3	< 1.3
Ethanol	ND	ND
Ethyl Acetate	< 0.92	< 0.92
Ethylbenzene	< 0.66	< 0.66
Freon 11 (Trichlorofluoromethane)	1.7 JDV	0.91 JDV
Freon 114 (1,2-Dichlorotetrafluoroethane)	< 1.1	< 1.1
Heptane	< 0.62	< 0.62
Hexachloro-1,3-Butadiene	< 1.6	< 1.6
Hexane	< 0.54	< 0.54
Isopropyl Alcohol	< 0.37	< 0.37
m&p-Xylene	< 1.3	< 1.3
Methyl Butyl Ketone	< 1.2	< 1.2
Methyl Ethyl Ketone	< 0.90	< 0.90
Methyl Isobutyl Ketone	< 1.2	< 1.2
Methyl tert-Butyl Ether	< 0.55	< 0.55
Methylene Chloride	< 0.53	< 0.53
o-Xylene	< 0.66	< 0.66
Propylene	< 0.26	< 0.26
Styrene	< 0.65	< 0.65
tert-Butyl Alcohol	ND	ND
Tetrachloroethylene	< 1.0	< 1.0
Tetrahydrofuran	< 0.45	< 0.45
Toluene	0.50 J	< 0.57
trans-1,2-Dichloroethene	< 0.60	< 0.60
trans-1,3-Dichloropropene	< 0.69	< 0.69
Vinyl Acetate	< 0.54	< 0.54
Vinyl Bromide	< 0.67	< 0.67
Vinyl Chloride	< 0.10	< 0.10

DRAFT

NOTES:

Indoor air sample locations are illustrated in Figure 1.

< The parameter is not detected at the laboratory detection limit shown.

ND Not detected in tentatively identified compounds.

LABORATORY/DATA VALIDATION QUALIFIERS:

J Analyte detected at or below quantitation limits.

JN Non-routine analyte. Quantitation estimated.

JDV Value is estimated as a result of Data Validation.

Table 4. Summary of Indoor Air Results for Volatile Organic Compounds Found at Concentrations Above Typical Indoor Air Levels at the Southside High School

[All concentrations are reported in units of micrograms per cubic meter, mcg/m^3]

	LOCATION	Chloroform	Freon 12 (Dichlorodifluoromethane)	Freon 113 (Trichlorotrifluoroethane)	1,1-Dichloroethene	Trichloroethene
Southside High School	Gymnasium	28	4.2	16	< 0.60	0.2
	Pool Filter Room	55	27 JDV	97 JDV	1.1	1.4 JDV
	Duplicate of Pool Filter Room	65	3.3 JDV	66 JDV	< 0.60	1.0 JDV
	Room 151A	1.8	25	9.0	1.0	0.4
	Room 127	0.9	12	4.8	0.7	2.4
	Room 138	4.2	6.0 J	6.6	0.60	0.3
	Cafeteria	0.7 J	25	7.2	1.0	0.3
	Library	0.9	9.6	7.3	1.0	0.5
Typical Indoor Air Levels	NYS DOH Fuel Oil Study Database*					
	25th – 75th percentile	< 0.25 – 0.5	< 0.25 – 4.1	< 0.25 – 1.1	< 0.25 – < 0.25	< 0.25 - < 0.25
	95th percentile	4.6	26	3.4	0.7	0.8
	US EPA BASE Database**					
	25th – 75th percentile	< 0.4 - < 1.2	4.8 – 10.5	< 1.7 - < 3.0	< 0.9 - < 1.2	< 1.2 – 1.2
	95th percentile	1.4	32.9	9.4	< 1.4	6.5

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*The New York State Department of Health (NYS DOH) database is a summary of indoor and outdoor air results from samples collected from control homes in New York State that heat with fuel oil. The NYS DOH conducted this study between 1997 and 2003.

**The United State Environmental Protection Agency (US EPA) database is a summary of indoor and outdoor air results from samples collected from 100 randomly selected public and commercial office buildings across the United States. The US EPA conducted this study from 1994 through 1996.

NOTES:

< = The parameter is not detected at the laboratory detection limit shown.

J = Analyte detected at or below quantitation limits.

JDV = Value is estimated as a result of Data Validation.

Additional information about the levels of volatile organic compounds that are often found in residential and non-residential buildings is available on the NYS DOH's website at http://www.nyhealth.gov/environmental/investigations/soil_gas/svi_guidance/ — in Section 3.2.4 of the first bulleted item titled "Guidance for Evaluating Soil Vapor Intrusion in New York State", as well as in the fourth bulleted item titled "Appendix C – Background VOCs."

Table 5. Public Health Comparison Values for Volatile Organic Compounds Found at Concentrations Above Typical Indoor and/or Outdoor Air Levels at the Southside High School

[All concentrations are reported in units of micrograms per cubic meter, mcg/m^3]

Volatile Organic Compound	NYS Air Guideline	Public Health Comparison Values*			
		Cancer	Basis**	Noncancer	Basis**
Chloroform	--	167	Health Canada UR	240	US EPA Region 3 RfC
Freon 12 (Dichlorodifluoromethane)	--	--	--	3400	US EPA IRIS RfD
Freon 113 (Trichlorotrifluoroethane)	--	--	--	146,000	US EPA HEAST RfC
1,1-Dichloroethene	--	--	--	970	US EPA IRIS RfC
Trichloroethene	5[a]	3.4	NYS DOH UR[a]	49	NYS DOH CV[a]

* Noncancer and cancer comparison values assume a person inhales about 8 cubic meters of air per day, 180 days per year. The cancer comparison value is the air concentration that corresponds to an increased lifetime cancer risk of one-in-one million and is based on an exposure duration of 30 years of a 70 year lifetime.

** Health Canada UR: Health Canada Unit Risk

US EPA Region 3 RfC: United States Environmental Protection Agency Region 3 Reference Concentration

US EPA IRIS RfD: United States Environmental Protection Agency Integrated Risk Information System Reference Dose. The reference dose was converted to an air concentration assuming a 70 kg person inhales 20 cubic meters of air per day.

US EPA HEAST RfC: United States Environmental Protection Agency Health Effect Assessment Summary Tables Reference Concentration.

US EPA IRIS RfC: United States Environmental Protection Agency Integrated Risk Information System Reference Concentration.

NYS DOH UR: New York State Unit Risk. The cancer comparison value for TCE is based on the highest of several estimates of cancer potency derived by the New York State Department of Health.

NYS DOH CV: New York State Department of Health Criteria Value for non-cancer endpoints.

[a]NYSDOH. 2006. *Final Report: Trichloroethene (TCE) Air Criteria Document*. Center for Environmental Health, Bureau of Toxic Substance Assessment. Troy, NY.

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Table 6. Summary of Outdoor Air Results for Volatile Organic Compounds Found at Concentrations Above Typical Outdoor Air Levels at the Southside High School

[All concentrations are reported in units of micrograms per cubic meter, mcg/m^3]

	LOCATION	Freon 113 (Trichlorotrifluoroethane)	1,1-Dichloroethene
	Outdoor Air	6.3	0.81
	Duplicate Outdoor Air	5.5	0.73
Typical Outdoor Air Levels	NYS DOH Fuel Oil Study Database*		
	25th – 75th percentile	< 0.25 – 1.1	< 0.25 – < 0.25
	95th percentile	3.6	< 0.25
	US EPA BASE Database**		
	25th – 75th percentile	< 1.6 - < 2.0	< 1.0 - < 1.2
	95th percentile	1.8	< 1.4

*The New York State Department of Health (NYS DOH) database is a summary of indoor and outdoor air results from samples collected from control homes that heat with fuel oil. The NYS DOH conducted this study between 1997 and 2003.

**The United State Environmental Protection Agency (US EPA) database is a summary of indoor and outdoor air results from samples collected from 100 randomly selected public and commercial office buildings across the United States. The US EPA conducted this study from 1994 through 1996.

NOTES:

< = The parameter is not detected at the laboratory detection limit shown.

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Additional information about the levels of volatile organic compounds that are often found in residential and non-residential buildings is available on the NYS DOH's website at http://www.nyhealth.gov/environmental/investigations/soil_gas/svi_guidance/ — in Section 3.2.4 of the first bulleted item titled "Guidance for Evaluating Soil Vapor Intrusion in New York State", as well as in the fourth bulleted item titled "Appendix C – Background VOCs."

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RM 151A	
SV-151A	
$CHCL_3$	5
FR-12	360
FR-113	33
DCE	<0.6
TCA	1.7
TCE	4.2

ROOM 146	
SV-NR	
$CHCL_3$	4.7
FR-12	270
FR-113	17
DCE	<0.6
TCA	5.7 JDV
TCE	1.2 JDV

HALLWAY OUTSIDE GYM	
SV-GL	
$CHCL_3$	5.3
FR-12	48
FR-113	6.6
DCE	<0.6
TCA	<0.83
TCE	0.71 J

GYM	
SV-GYM WEST	
$CHCL_3$	32
FR-12	4.7
FR-113	39
DCE	<0.6
TCA	1.7
TCE	0.6 J

RM 159	
SV-WM	
$CHCL_3$	18
FR-12	65
FR-113	4.8
DCE	<0.6
TCA	0.83 JDV
TCE	3.1 JDV

GYM	
IA-GYM	
$CHCL_3$	28
FR-12	4.2
FR-113	16
DCE	<0.6
TCA	2.4
TCE	0.22

RM 151A	
IA-151A	
$CHCL_3$	1.8
FR-12	25
FR-113	9
DCE	1
TCA	<0.83
TCE	0.44

GYM-EAST	
SV-GYM EAST	
$CHCL_3$	79
FR-12	3,600
FR-113	1,100
DCE	240
TCA	23,000
TCE	28

RM 127	
IA-127	
$CHCL_3$	0.94
FR-12	12
FR-113	4.8
DCE	0.69
TCA	<0.83
TCE	2.4

GYM STORAGE	
SV-GS	
$CHCL_3$	27
FR-12	4.5
FR-113	36
DCE	<0.6
TCA	1.2
TCE	<0.82

RM 127	
SV-127	
$CHCL_3$	7.9
FR-12	1,800
FR-113	<1.2
DCE	<0.6
TCA	1.6 JDV
TCE	2,100

	POOL FILTER ROOM	
	IA-PF	IA-DUP
$CHCL_3$	55	65
FR-12	27 JDV	3.3 JDV
FR-113	97 JDV	66 JDV
DCE	1.1	<0.6
TCA	<0.83	<0.83
TCE	1.40 JDV	1.0 JDV

POOL FILTER ROOM	
SV-PF	
$CHCL_3$	1,100
FR-12	110
FR-113	660
DCE	1.2
TCA	16
TCE	460

HALLWAY BEHIND ROOM 113B	
SV-HALL 113	
$CHCL_3$	4.8
FR-12	87
FR-113	3
DCE	<0.6
TCA	3.4 JDV
TCE	<0.82

	RM 139C	
	SV-WS	SV-DUP
$CHCL_3$	4	4.1
FR-12	420	460
FR-113	3.5 JDV	6.2 JDV
DCE	<0.6	<0.6
TCA	<0.83	<0.83
TCE	<0.82	<0.82

	UPWIND, ROOF	
	OA-UR	OA-DUP
$CHCL_3$	0.60 J	<0.74
FR-12	5.50 J	9
FR-113	6.30	5.50
DCE	0.81	0.73
TCA	<0.83	<0.83
TCE	<0.22	<0.22

LIBRARY	
SV-LIB	
$CHCL_3$	15
FR-12	980
FR-113	1.6
DCE	<0.6
TCA	1.7 JDV
TCE	<0.82

LIBRARY	
IA-LIB	
$CHCL_3$	0.94
FR-12	9.6
FR-113	7.3
DCE	1
TCA	<0.83
TCE	0.49

CAFETERIA	
IA-CAF	
$CHCL_3$	0.69 J
FR-12	25
FR-113	7.2
DCE	0.97
TCA	<0.83
TCE	0.33

BOILER ROOM	
SV-BR	
$CHCL_3$	1.9
FR-12	33
FR-113	3.1
DCE	<0.6
TCA	5
TCE	97

RM 138	
IA-138	
$CHCL_3$	4.2
FR-12	6 J
FR-113	6.6
DCE	0.6
TCA	<0.83
TCE	0.27

KEY:

PARAMETERS	LOCATION SAMPLE ID/RESULTS IN ug/M^3
$CHCL_3$	CHLOROFORM
FR-12	FREON 12 (DICHLORODIFLUOROMETHANE)
FR-113	FREON 113 (TRICHLOROTRIFLUOROTETRAFLUOROETHANE)
DCE	1,1 DICHLOROETHENE
TCA	1,1,1 TRICHLOROETHANE
TCE	TRICHLOROETHENE

LEGEND:

- SV — SOIL VAPOR SAMPLE
- IA — INDOOR AIR SAMPLE
- OA — OUTDOOR AIR SAMPLE
- SOIL VAPOR SAMPLE LOCATION
- INDOOR AIR SAMPLE LOCATION
- OUTDOOR AIR SAMPLE LOCATION
- J — ANALYTE DETECTED AT OR BELOW QUANTITATION LIMITS
- JDV — ESTIMATED AS A RESULT OF DATA VALIDATION
- DUP — DUPLICATE SAMPLE AT ASSOCIATED LOCATION
- APPROXIMATE FORMER STEAM LINE LOCATION
- APPROXIMATE GAS LINE LOCATION
- APPROXIMATE ELECTRIC LINE LOCATION
- APPROXIMATE WATER LINE LOCATION
- APPROXIMATE SANITARY SEWER LINE LOCATION
- APPROXIMATE STORMWATER LINE LOCATION
- APPROXIMATE FLOOR DRAIN LOCATION
- APPROXIMATE DECK PLATE CLEANOUT LOCATION
- APPROXIMATE WALL PLATE CLEANOUT LOCATION
- APPROXIMATE CLEANOUT LOCATION
- APPROXIMATE HISTORICAL GAS LINE LOCATION
- APPROXIMATE HISTORICAL UNDERGROUND ELECTRIC LINES
- APPROXIMATE HISTORICAL WATER LINE LOCATION
- APPROXIMATE TILE SANITARY SEWER LINE LOCATION
- APPROXIMATE SLEEVE LOCATION THROUGH FOOTER WALL
- AREAS WITHIN THE PERIMETER FOOTER WALL WITH ENCIRCLING FOOTER WALLS

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PLATE 1

MAP REFERENCE:

BASE MAP PROVIDED BY QUE CENTER, ENTITLED SOUTHSIDE HIGH SCHOOL 1ST FLOOR DATED 1/06

UTILITY LINES BASED ON MAPS PROVIDED BY FAMMING-HOWEY ASSOCIATES, INC. ENTITLED:
FLOOR PLAN UNIT "A"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "B"PLUMBING, DATED 10-7-77,
FLOOR PLAN UNIT "C"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "D"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "E"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "F"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.
FLOOR PLAN UNIT "G"PLUMBING, DATED 10-7-77, LAST REVISED 4-12-78.

NO.	DATE	RECORD OF WORK	DRN	CKD	APPR

PROJECT

PROJ. ENGR.: R.L. Aldrich, P.E.
PROJ. NO.: 28014
PREPARED BY: R.L. Aldrich, P.E.
DRAFTED BY: J.D. Croote
CHECKED BY: P.J. Kellerher, P.E.
APPROVED BY:
DATUM:

0 25 50 100
1" = 50'

SUB-SLAB VAPOR, INDOOR AND OUTDOOR AIR SELECT SAMPLE RESULTS - DECEMBER 2009

ELMIRA CITY SCHOOL DISTRICT

SOUTHSIDE HIGH SCHOOL, 777 SOUTH MAIN STREET

CITY OF ELMIRA — CHEMUNG CO., N.Y.

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road ● Latham, New York 12110

DATE: 2/04/10 | SCALE: 1" = 50' | DWG. NO. 28014002 | SHEET 1 OF 1

New York State Department of Health

What is Exposure?

Exposure is contact. No matter how dangerous a substance or activity, without exposure, it cannot harm you.

Information Sheet

Amount of exposure:

Over 400 years ago, a scientist said "...nothing [is] without poisonous qualities. It is only the dose that makes a thing poison." The **dose** is the amount of a substance that enters or contacts a person. An important factor to consider in evaluating a dose is body weight. If a child is exposed to the same amount of chemical as an adult, the child (who weighs less) can be affected more than the adult. For example, children are given smaller amounts of aspirin than adults because an adult dose is too large for a child's body weight.

The greater the amount of a substance a person is exposed to, the more likely that health effects will occur. Large amounts of a relatively harmless substance can be toxic. For example, two aspirin tablets can help to relieve a headache, but taking an entire bottle of aspirin can cause stomach pain, nausea, vomiting, headache, convulsions or death.

Routes of exposure:

There are three major means by which a toxic substance can come into contact with or enter the body. These are called routes of exposure.

Inhalation (breathing) of gases, vapors, dusts or mists is a common route of exposure. Chemicals can enter and irritate the nose, air passages and lungs. They can become deposited in the airways or be absorbed through the lungs into the bloodstream. The blood can then carry these substances to the rest of the body.

Direct contact (touching) with the skin or eyes is also a route of exposure. Some substances are absorbed through the skin and enter the bloodstream. Broken, cut or cracked skin will allow substances to enter the body more easily.

Ingestion (swallowing) of food, drink, or other substances is another route of exposure. Chemicals that get in or on food, cigarettes, utensils or hands can be swallowed. Children are at greater risk of ingesting substances found in dust or soil because they often put their fingers or other objects in their mouths. Lead in paint chips is a good example. Substances can be absorbed into the blood and then transported to the rest of the body.
The route of exposure can determine whether or not the toxic substance has an effect. For example, breathing or swallowing lead can result in health effects, but touching lead is not usually harmful because lead is not absorbed particularly well through the skin.

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Length of exposure:

Short-term exposure is called **acute exposure**. Long-term exposure is called **chronic exposure**. Either may cause health effects that are immediate or health effects that occur days or years later.

Acute exposure is a short contact with a chemical. It may last a few seconds or a few hours. For example, it might take a few minutes to clean windows with ammonia, use nail polish remover or spray a can of paint. The fumes someone might inhale during these activities are examples of acute exposures.

Chronic exposure is continuous or repeated contact with a toxic substance over a long period of time (months or years). If a chemical is used every day on the job, the exposure would be chronic. Over time, some chemicals, such as PCBs and lead, can build up in the body and cause long-term health effects.

Chronic exposures can also occur at home. Some chemicals in household furniture, carpeting or cleaners can be sources of chronic exposure.

Sensitivity:

All people are not equally **sensitive** to chemicals, and are not affected by them in the same way. There are many reasons for this.

- People's bodies vary in their ability to absorb and break down or eliminate certain chemicals due to **genetic differences**.
- People may become **allergic** to a chemical after being exposed. Then they may react to very low levels of the chemical and have different or more serious health effects than nonallergic people exposed to the same amount. People who are allergic to bee venom, for example, have a more serious reaction to a bee sting than people who are not.
- Factors such as **age, illness, diet, alcohol use, pregnancy and medical or nonmedical drug use** can also affect a person's sensitivity to a chemical. Young children are often more sensitive to chemicals for a number of reasons. Their bodies are still developing and they cannot get rid of some chemicals as well as adults. Also, children absorb greater amounts of some chemicals (such as lead) into their blood than adults.

For more information:

New York State Department of Health
Center for Environmental Health
Flanigan Square
547 River Street, Room 316
Troy, NY 12180-2218
1-800-458-1158 (ext. 2-7530)

March 2001

DRAFT

NEW YORK STATE
DEPARTMENT OF HEALTH

SOIL VAPOR INTRUSION

Frequently Asked Questions

What is soil vapor intrusion?

The phrase "soil vapor intrusion" refers to the process by which volatile chemicals move from a subsurface source into the indoor air of overlying buildings.

Soil vapor, or soil gas, is the air found in the pore spaces between soil particles. Because of a difference in pressure, soil vapor enters buildings through cracks in slabs or basement floors and walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. Heating, ventilation or air-conditioning systems may create a negative pressure that can draw soil vapor into the building. This intrusion is similar to how radon gas seeps into buildings.

Soil vapor can become contaminated when chemicals evaporate from subsurface sources and enter the soil vapor. Chemicals that readily evaporate are called "volatile chemicals." Volatile chemicals include volatile organic compounds (VOCs). Subsurface sources of volatile chemicals may include contaminated soil and groundwater, or buried wastes. If soil vapor is contaminated, and enters a building as described above, indoor air quality may be affected.

When contaminated vapors are present in the zone directly next to or under the foundation of the building, vapor intrusion is possible. Soil vapor can enter a building whether it is old or new, or whether it has a basement, a crawl space, or is on a slab (as illustrated in the figure).

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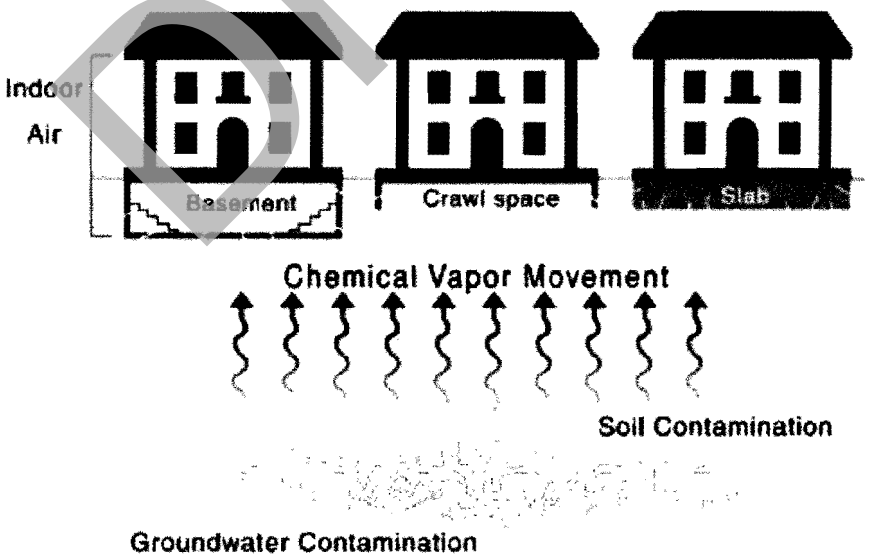

[Source: United States Environmental Protection Agency, Region 3]

How am I exposed to chemicals through soil vapor intrusion?

Humans can be exposed to soil vapor contaminated with volatile chemicals when vapors from beneath a building are drawn through cracks and openings in the foundation and mix with the indoor air. Inhalation is the route of exposure, or the manner in which the volatile chemicals actually enter the body, once in the indoor air.

Current exposures are when vapor intrusion is documented in an occupied building. *Potential* exposures are when volatile chemicals are present, or are accumulating, in the vapor phase beneath a building, but have not affected indoor air quality. Potential exposures also exist when there is a chance that contaminated soil vapors may move to existing buildings not currently affected or when there is a chance that new buildings can be built over existing subsurface vapor contamination. Both current and potential exposures are considered when evaluating soil vapor intrusion at a site that has documented subsurface sources of volatile chemicals.

In general, exposure to a volatile chemical does not necessarily mean that health effects will occur. Whether or not a person experiences health effects depends on several factors, including inhalation exposure, the length of exposure (short-term or acute versus long-term or chronic), the frequency of exposure, the toxicity of the volatile chemical, and the individual's sensitivity to the chemical.

What types of chemicals associated with environmental contamination may be entering my home via soil vapor intrusion?

Volatile organic compounds, or VOCs, are the most likely group of chemicals found in soil vapor, and which can move through the soil and enter buildings. Solvents used for dry cleaning, degreasing and other industrial purposes (e.g., tetrachloroethene, trichloroethene, 1,1,1-trichloroethane and Freon 113) are examples of VOCs. Examples of petroleum-related VOCs from petroleum spills are benzene, toluene, ethyl benzene, xylenes, styrene, hexane and trimethylbenzenes.

Is contaminated soil vapor the only source of volatile chemicals in my indoor air?

No. Volatile chemicals are also found in many household products. Paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing all contain VOCs. Household products are often more of a source of VOCs in indoor air in homes than contaminated soil vapor.

Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals are present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are important sources of VOCs to outdoor air.

What should I expect if soil vapor intrusion is a concern near my home?

If you live near a site that has documented soil, groundwater and/or soil vapor contaminated with volatile chemicals, you should expect that the potential for vapor intrusion is being, or has been, investigated. You may be contacted by the site owner or others working on the cleanup with information about the project. Your cooperation and consent would be requested before any testing/sampling would be done on your property. You may ask the person contacting you any questions about the work being done. You can also contact the NYSDOH's project manager for the site at 1-800-458-1158 (extension 2-7850) for additional information.

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How is soil vapor intrusion investigated at sites contaminated with volatile chemicals?

The process of investigating soil vapor intrusion typically requires more than one set of samples to determine the extent of vapor contamination. Furthermore, four types of environmental samples are collected: soil vapor samples, sub-slab vapor samples, indoor air samples and outdoor air (sometimes referred to as "ambient air") samples.

Soil vapor samples are collected to characterize the nature and extent of vapor contamination in the soil in a given area. They are often collected before sub-slab vapor and/or indoor air samples to help identify buildings or groups of buildings that need to be sampled. Soil vapor samples are used to determine the *potential* for human exposures. *Soil vapor* samples are not the same as *soil* samples.

Sub-slab vapor samples are collected to characterize the nature and extent of vapor contamination in the soil immediately beneath a building with basement foundations or a slab. Sub-slab vapor results are used to determine the potential for *current* and *future* human exposures. For example, an exposure could occur in the future if cracks develop in the building's foundation or changes in the operation of the building's heating, ventilation or air-conditioning system are made that make the movement of contaminated soil vapor into the building possible.

Indoor air samples are collected to characterize the nature and extent of air contamination within a building. Indoor air sample results help to evaluate whether there are *current* human exposures. They are also compared to sub-slab vapor and outdoor air results to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).

Outdoor air samples are collected to characterize site-specific background air conditions. Outdoor air results are used to evaluate the extent to which outdoor sources, such as automobiles, lawn mowers, oil storage tanks, gasoline stations, commercial/industrial facilities, and so forth, may be affecting indoor air quality.

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What should I expect if indoor air samples are collected in my home?

You should expect the following:

- Indoor air samples are generally collected from the lowest-level space in a building, typically a basement, during the heating season. Indoor air samples may also be collected from the first floor of living space. Indoor air is believed to represent the greatest exposure potential with respect to soil vapor intrusion.
- Sub-slab vapor and outdoor air samples are usually collected at the same time as indoor air samples to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).
- More limited sampling may be performed outside of the heating season. For example, sub-slab vapor samples without indoor air or outdoor air samples may be collected to identify buildings and areas where comprehensive sampling is needed during the heating season.
- An indoor air quality questionnaire and building inventory will be completed. The questionnaire includes a summary of the building's construction characteristics; the building's heating, ventilation and air-conditioning system operations; and potential indoor and outdoor sources of volatile chemicals. The building inventory describes products present in the building that might contain volatile chemicals. In addition, we take monitoring readings from a real-time organic vapor meter (also known as a photoionization detector or PID). The PID is an instrument that detects many VOCs in the air. When indoor air samples are collected, the PID is used to help determine whether

products containing VOCs might be contributing to levels that are detected in the indoor air.

What happens if soil vapor contamination or soil vapor intrusion is identified during investigation of a site?

Depending on the investigation results, additional sampling, monitoring or mitigation actions may be recommended. Additional sampling may be performed to determine the extent of soil vapor contamination and to verify questionable results. Monitoring (sampling on a recurring basis) is typically conducted if there is a significant potential for vapor intrusion to occur should building conditions change. Mitigation steps are taken to minimize exposures associated with soil vapor intrusion. Mitigation may include sealing cracks in the building's foundation, adjusting the building's heating, ventilation and air-conditioning system to maintain a positive pressure to prevent infiltration of subsurface vapors, or installing a sub-slab depressurization system beneath the building.

What is a sub-slab depressurization system?

A sub-slab depressurization system, much like a radon mitigation system, essentially prevents vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside (see illustration). The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also essentially prevents radon from entering a building, an added health benefit. The party responsible for cleaning up the source of the soil vapor contamination is usually responsible for paying for the installation of this system. If no responsible party is available, New York State will install the system. Once the contamination is cleaned up, the system should no longer be needed. In areas where radon is a problem, the NYSDOH recommends that these systems remain in place permanently.

What else can I do to improve my indoor air quality?

Household products and other factors, such as mold growth, carbon monoxide, and radon, can degrade the quality of air in your home. Consider the following tips to improve indoor air quality:

- Be aware of household products that contain VOCs. Do not buy more chemicals than you need at a time.
- Store unused chemicals in tightly-sealed containers in a well-ventilated location, preferably away from the living space in your home.
- Keep your home properly ventilated. Keeping it too air-tight may promote build up of chemicals in the air, as well as mold growth due to the build up of moisture.
- Fix all leaks promptly, as well as other moisture problems that encourage mold growth.
- Make sure your heating system, hot water, dryer and fireplaces are properly vented and in good condition. Have your furnace or boiler checked annually by a professional.
- Test your home for radon; take actions to reduce radon levels if needed.
- Install carbon monoxide detectors in your home; take immediate actions to reduce carbon monoxide levels if needed.

Where can I get more information?

For additional information about soil vapor intrusion, contact the NYSDOH's Bureau of Environmental Exposure Investigation at 1-800-458-1158 (extension 2-7850).

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NEW YORK STATE
DEPARTMENT OF HEALTH

Trichloroethene (TCE) in Indoor and Outdoor Air

FACT SHEET
February 2005

What is trichloroethene?

Trichloroethene is a manufactured, volatile organic chemical. It has been used as a solvent to remove grease from metal. Trichloroethene has also been used as a paint stripper, adhesive solvent, as an ingredient in paints and varnishes, and in the manufacture of other organic chemicals. Other names for trichloroethene include TCE and trichloroethylene. TCE is a common name for trichloroethene and will be used for the rest of this fact sheet.

TCE is a clear, colorless liquid, and has a somewhat sweet odor. It is non-flammable at room temperature and will evaporate into the air.

How can I be exposed to TCE?

People can be exposed to TCE in air, water and food. Exposure can also occur when TCE, or material containing TCE, gets on the skin.

TCE gets into the air by evaporation when it is used. TCE can also enter air and groundwater if it is improperly disposed or leaks into the ground. People can be exposed to TCE if they drink groundwater contaminated with TCE, and if the TCE evaporates from the contaminated drinking water into indoor air during cooking and washing. They may also be exposed if TCE evaporates from the groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. This process is called "soil vapor intrusion."

How can TCE enter and leave my body?

If people breathe air containing TCE, some of the TCE is exhaled unchanged from the lungs and back into the air. Much of the TCE gets taken into the body through the lungs and is passed into the blood, which carries it to other parts of the body. The liver changes most of the TCE taken into the blood into other compounds, called breakdown products, which are excreted in the urine in a day or so. However, some of the TCE and its breakdown products can be stored in the fat or the liver, and it may take a few weeks for them to leave the body after exposure stops.

What kinds of health effects are caused by exposure to TCE in air?

In humans, long term exposure to workplace air containing high levels of TCE (generally greater than about 40,000 micrograms of TCE per cubic meter of air (mcg TCE/m^3)) is linked to effects on the central nervous system (reduced scores on tests evaluating motor coordination, nausea, headaches, dizziness) and irritation of the mucous membranes. Exposure to higher levels (generally greater than 300,000 mcg TCE/m^3) for short periods of time can irritate the eyes and respiratory tract, and can cause effects on the central nervous system, including dizziness, headache, sleepiness, nausea, confusion, blurred vision and fatigue. In laboratory animals, exposure to high levels of TCE has damaged the central

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nervous system, liver and kidneys, and adversely affected reproduction and development of offspring. Lifetime exposure to high levels of TCE has caused cancer in laboratory animals.

Some studies of people exposed for long periods of time to high levels of TCE in workplace air, or elevated levels of TCE in drinking water, show an association between exposure to TCE and increased risks for certain types of cancer, including cancers of the kidney, liver and esophagus, and non-Hodgkin's lymphoma. One study showed an association between elevated levels of TCE in drinking water and effects on fetal development. Other studies suggest an association between workplace TCE exposure and reproductive effects (alterations in sperm counts) in men. We do not know if the effects observed in these studies are due to TCE or some other possible factor (for example, exposure to other chemicals, smoking, alcohol consumption, socioeconomic status, lifestyle choices). Because all of these studies have limitations, they only suggest, but do not prove, that exposure to TCE can cause cancer in humans and can cause developmental and reproductive effects as well.

What are background levels of TCE for indoor and outdoor air?

The exact meaning of background depends on how a study selected sampling locations and conditions. Generally, sampling locations are selected to be not near known sources of volatile chemicals (for example, a home not near a chemical spill, a hazardous waste site, a dry cleaner, or a factory). In some studies, the criteria for sampling indoor air may require checking containers of volatile chemicals to make sure they are tightly closed or removing those products before samples are taken. The New York State Department of Health (NYSDOH) has used several sources of information on background levels of TCE in indoor and outdoor air. One NYSDOH study of residences heated by fuel oil found that background concentrations of TCE in indoor and outdoor air are less than 1 mcg/m^3 in most cases. In this study, most homes did not have obvious sources of volatile organic compounds (VOCs). In those homes with VOC sources, samples were taken and the data are included in the study.

What are sources of TCE in air in homes?

TCE is found in some household products, such as glues, adhesives, paint removers, spot removers, rug cleaning fluids, paints, metal cleaners and typewriter correction fluid. These and other products could be potential sources for TCE in indoor air.

Another source of TCE in indoor air is contaminated groundwater that is used for household purposes. Common use of water, such as washing dishes or clothing, showering, or bathing, can introduce TCE into indoor air through volatilization from the water.

TCE may also enter homes through vapor intrusion as described on page 1 in the question "How can I be exposed to TCE?".

What is the level of TCE that people can smell in the air?

The reported odor threshold (the air concentration at which a chemical can be smelled) for TCE in air is about 540,000 mcg TCE/m^3. At this level, most people would likely be able to start smelling TCE in air. However, odor thresholds vary from person to person. Some people may be able to detect TCE at levels lower than the reported odor threshold and some people may only detect it at concentrations higher than the reported odor threshold.

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If I can't smell TCE in the air, am I being exposed?

Just because you can't smell TCE doesn't mean there is no exposure. Sampling and testing is the best way to know if TCE is present.

What is the NYSDOH's guideline for TCE in air?

After a review of the toxicological literature on TCE, the NYSDOH set a guideline of 5 mcg/m^3 for TCE in air. This level is lower than the levels that have caused health effects in animals and humans. In setting this level, the NYSDOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of TCE.

The guideline is not a bright line between air levels that cause health effects and those that do not. The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce TCE exposure. Reasonable and practical actions should be taken to reduce TCE exposure when indoor air levels are above background, even when they are below the guideline of 5 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline. In all cases, the specific corrective actions to be taken depend on a case-by-case evaluation of the situation. The goal of the recommended actions is to reduce TCE levels in indoor air to as close to background as practical.

Should I be concerned about health effects if I am exposed to air levels slightly above the guideline? Below the guideline?

The possibility of health effects occurring is low even at air levels slightly above the guideline. In addition, the guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for as long as a lifetime. This is rarely true for most people who are likely to be exposed for only part of the day and part of their lifetime.

How can I limit my exposure to TCE?

TCE can get into indoor air through household sources (for example, commercial products that contain TCE), from contaminated drinking water, or by vapor intrusion. As with any indoor air contaminant, removing household sources of TCE will help reduce indoor air levels of the chemical. Maintaining adequate ventilation will also help reduce the indoor air levels of TCE. If TCE is in the indoor air as a result of vapor intrusion, a sub-slab depressurization system, much like a radon mitigation system, will reduce exposures by minimizing the movement of vapors that are beneath a slab into a building. If TCE is in the water supply of a house, a carbon filter on the water supply to remove the TCE will minimize ingestion and inhalation exposures.

Is there a medical test that can tell me whether I have been exposed to TCE?

TCE can be measured in people's breath soon after they are exposed. TCE and some of its breakdown products can be measured in the urine and blood. These tests are not routinely available at a doctor's office. Urine and blood tests can indicate that you may have recently (within the last few days) been exposed to a large amount of the chemical. However, they cannot tell you the source of the exposure. Some of the breakdown products of TCE can also be formed from other chemicals.

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When should my children or I see a physician?

If you believe you or your children have symptoms that you think are caused by TCE exposure, you or your children should see a physician. You should tell the physician about the symptoms and about when, how and for how long you think you and/or your children were exposed to TCE.

What is the NYSDOH doing to educate physicians about TCE?

The NYSDOH maintains an Infoline (1-800-458-1158) that physicians or the public can call when they have questions related to various types of chemical exposures. A certified occupational and environmental health nurse is available to triage physicians' questions and to direct their inquiries to the appropriate staff member.

The NYSDOH also works closely with the federal Agency for Toxic Substances and Disease Registry (ATSDR), making their educational materials available to physicians upon request. One of these items is an environmental medicine case study entitled "Trichloroethylene (TCE) Toxicity," which provides the opportunity for physicians to earn continuing medical education credits from the Centers for Disease Control and Prevention. Physicians who would like to complete this training are encouraged to contact the NYSDOH for more information. A printed copy can be mailed to the physician or it can be accessed on-line at the following web site http://www.atsdr.cdc.gov/HEC/CSEM/tce/index.html.

Where can I get more information?

If you have any questions about the information in this fact sheet or would like to know more about TCE, please call the NYSDOH at 1-800-458-1158 or write to the following address:

New York State Department of Health
Bureau of Toxic Substance Assessment
Flanigan Square, 547 River Street
Troy, NY 12180-2216

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CERTIFICATION

The letter health consultation for the Southside High School—Evaluation of Exposures Related to Soil Vapor Intrusion Mitigation Verification Sampling — December 2009, was prepared by the New York State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the cooperative agreement partner.

Technical Project Officer, CAT, CAPEB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation, and concurs with its findings.

Team Leader, CAT, CAPEB, DHAC, ATSDR

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