CONRAD GEOSCIENCE CORP.
Environmental Scientists
One Civic Center Plaza, Suite 501, Poughkeepsie, New York 12601 • 845/454-2544 • fax: 845/454-2655
www.conradgeo.com

February 27, 2009

Wayne Mizerak
New York State Dept. of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7014

MAR 05 2009

Re: **January 2009 Vapor Intrusion Sampling Results;**
Apple Valley Shopping Center Superfund Site, LaGrange, New York
Index No. II-CERCLA-10224
NYSDEC Site #3-14-084
Conrad Geoscience File #AL030070

Dear Mr. Mizerak:

In January 2009, Conrad Geoscience Corp. conducted vapor intrusion sampling at the Apple Valley Shopping Center in LaGrange, New York (Figure 1). Field activities, procedures, and results are summarized below.

SUB-SLAB VAPOR AND INDOOR AIR QUALITY MONITORING

On January 15 and 16, 2009, Conrad Geoscience collected one sub-slab vapor sample from Pizza Pete's (formerly Absolute Pizza) and one sub-slab vapor sample from LaGrange Pharmacy. Prior to sample collection, each sampling port was purged by attaching a peristaltic sampling pump to the threaded coupling and evacuating the vapors into two 1-liter Tedlar® bags. The contents of each Tedlar® bag were screened with a photoionization detector (PID) and 4-gas meter: Percent oxygen (% O_2), percent of lower explosive limit (% LEL), carbon monoxide (CO), and hydrogen sulfide (H_2S).

After purging, Conrad Geoscience collected sub-slab vapor samples by connecting each sampling port to a flow controller with dedicated tubing. The flow controller is then connected to the 1-liter summa canister and sample collection begins. The flow controller is set to collect a 1-liter sample over a 24-hour period.

Simultaneous ambient indoor air samples were collected at the sub-slab sample locations using identical summa canisters. One ambient indoor air sample was collected in Pizza Pete's (IAAP-1) (Figure 2) and one ambient indoor air sample was collected in the LaGrange Pharmacy (IALP-1) (Figure 3).

A simultaneous ambient outdoor air sample was collected using a 1-liter summa canister. Outdoor Air Sample (OA-9) was collected in an upwind location along the western property boundary, behind Hong's Karate (Figure 3).

The sub-slab depressurization system in Pizza Pete's remained in operation during the sampling event. The Freshtown Marketplace was destroyed in a fire and is currently being rebuilt. Therefore the Freshtown sub-slab depressurization system is no longer operational and no indoor or sub-slab samples were collected in those locations.

On January 16, 2008, at the end of the 24-hour sampling period, summa canisters were shipped via overnight delivery to Paradigm Environmental Services in Rochester, New York, a NYSDOH-certified laboratory. Samples were analyzed for Tetrachloroethene (PCE); Trichloroethene (TCE); cis-1,2-Dichloroethene; and Vinyl Chloride via USEPA Method TO-15. Sample numbers are as follows:

Location	Sub-Slab Vapor	Indoor Air	Outdoor Air
Pizza Pete's	SVAP-1	IAAP-1	
LaGrange Pharmacy	SVLP-1	IALP-1	
West of Hong's Karate			OA-9

RESULTS

Sample results are summarized in Table 1. Copies of laboratory reports are attached.

Pizza Pete's

Sub-Slab Sample SVAP-1 contained no detectable concentrations of PCE; TCE; cis-1,2-Dichloroethene; or Vinyl Chloride.

Indoor Air Sample IAAP-1 contained no detectable concentrations of PCE; TCE; cis-1,2-Dichloroethene; or Vinyl Chloride.

LaGrange Pharmacy

Sub-Slab Sample SVLP-1 contained PCE (23.1 $\mu g/m^3$) and TCE (1.35 $\mu g/m^3$). Neither cis-1,2-Dichloroethene nor Vinyl Chloride were detected in the sub-slab vapor sample.

Indoor Air Sample IALP-1 contained PCE (1.03 $\mu g/m^3$). TCE; cis-1,2-Dichloroethene; and Vinyl Chloride were not detected in the indoor air sample.

Outdoor Air

Outdoor Air Sample OA-9 contained TCE (0.29 $\mu g/m^3$). PCE; cis-1,2-Dichloroethene; and Vinyl Chloride were not detected in the outdoor air sample.

DISCUSSION

Pizza Pete's

Analytical results from the January 2009 vapor monitoring event in Pizza Pete's indicate a decrease in PCE and TCE in both the sub-slab and indoor air samples, SVAP-1 and IAAP-1, when compared to the January 2008 monitoring event. Both cis-1,2-Dichloroethene and Vinyl Chloride remained undetected in both samples.

LaGrange Pharmacy

Analytical results from the January 2009 vapor monitoring event in LaGrange Pharmacy indicate a decrease in PCE and TCE in both the sub-slab and indoor air samples, SVLP-1 and IALP-1, when compared to the January 2008 vapor monitoring event. Both cis-1,2-Dichloroethene and Vinyl Chloride remained undetected in both samples.

Outdoor Air

Only TCE was detected in Outdoor Air Sample OA-9. In 2008, no COC were detected.

CONCLUSION

Continued operation of the groundwater remediation system and sub-slab depressurization systems has significantly lowered the VOC concentrations in the sub-slab and indoor air. According to the *Guidance for Evaluating Soil Vapor Intrusion*, NYSDOH October 2006, data indicates no further action is required at Pizza Pete's and LaGrange Pharmacy.

If you have any questions please feel free to contact me.

Sincerely,

CONRAD GEOSCIENCE CORP.

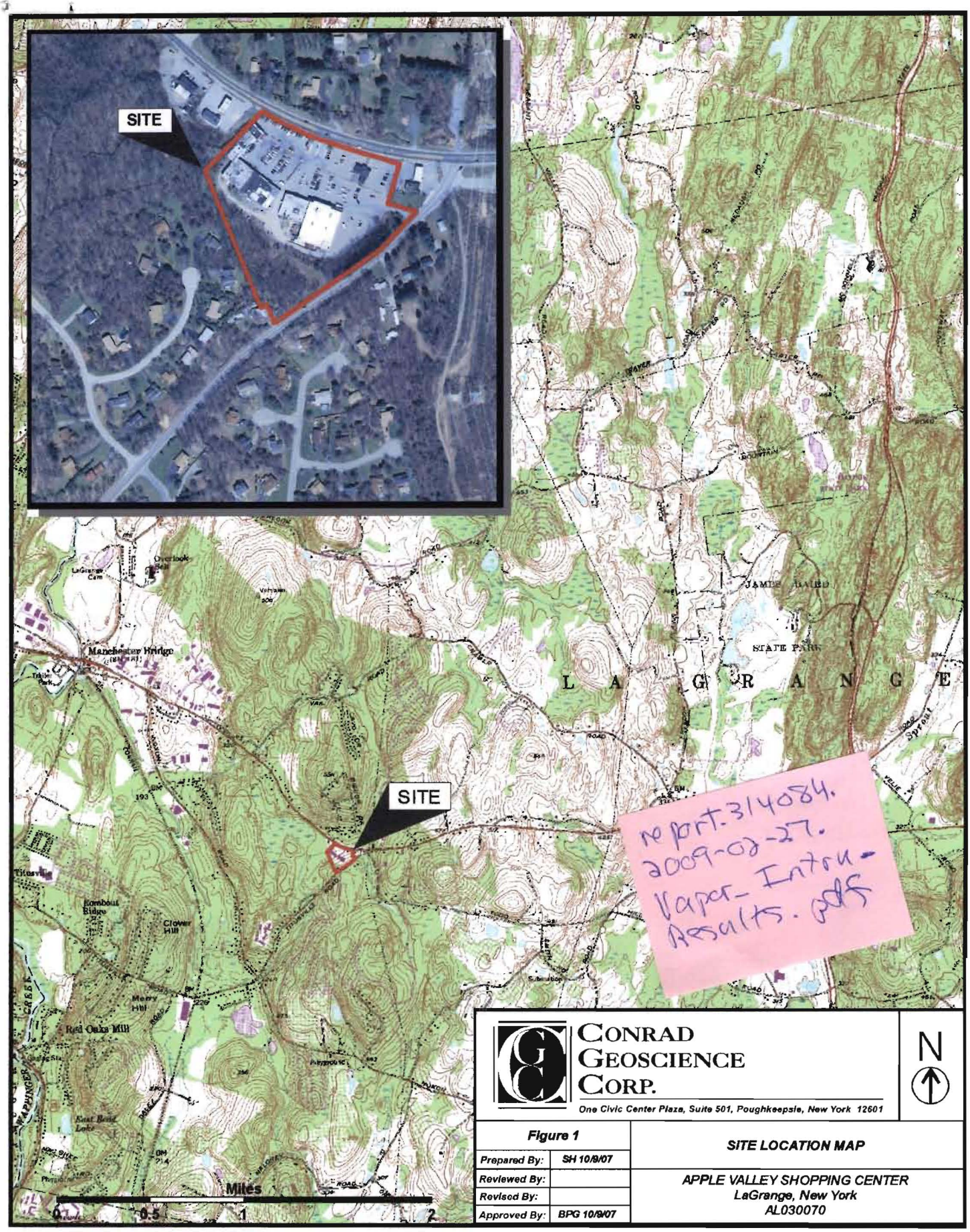
Stephanie P. LaRose

Stephanie P. LaRose
Geologist

SPL/seg

attachments

cc: D. Engel
J. Klein
M. Millspaugh
F. Navratil
D. MacDougal
J. Harmon



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Vapor-Intru-
Results.pdf

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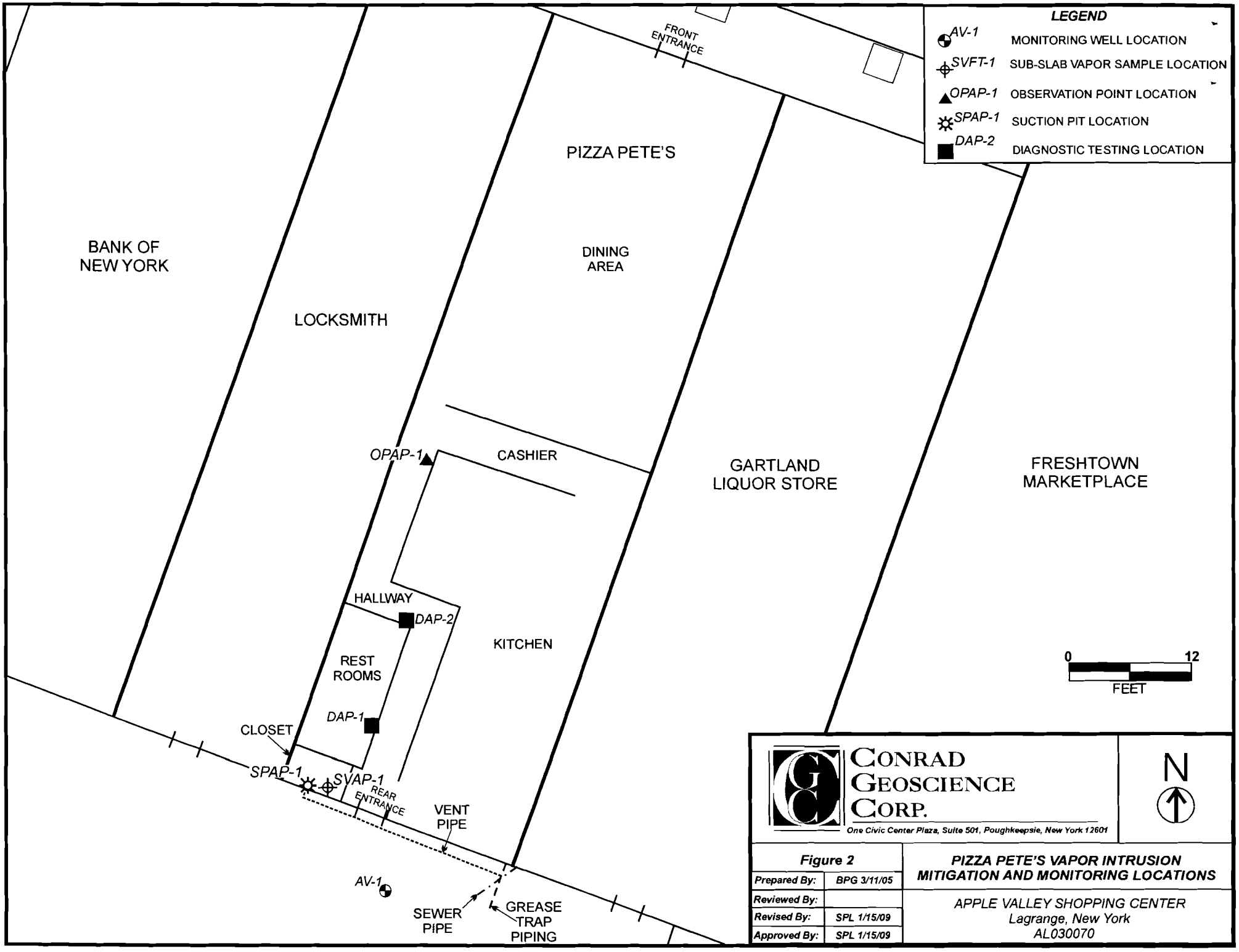
One Civic Center Plaza, Suite 501, Poughkeepsie, New York 12601

Figure 1		SITE LOCATION MAP
Prepared By:	SH 10/9/07	APPLE VALLEY SHOPPING CENTER LaGrange, New York AL030070
Reviewed By:		
Revised By:		
Approved By:	BPG 10/9/07	


LEGEND
AV-1 MONITORING WELL LOCATION
SVFT-1 SUB-SLAB VAPOR SAMPLE LOCATION
OPAP-1 OBSERVATION POINT LOCATION
SPAP-1 SUCTION PIT LOCATION
DAP-2 DIAGNOSTIC TESTING LOCATION
FRONT ENTRANCE
PIZZA PETE'S
BANK OF NEW YORK
DINING AREA
LOCKSMITH
OPAP-1
CASHIER
GARTLAND LIQUOR STORE
FRESHTOWN MARKETPLACE
HALLWAY
DAP-2
KITCHEN
REST ROOMS
DAP-1
CLOSET
SPAP-1
SVAP-1
REAR ENTRANCE
VENT PIPE
AV-1
SEWER PIPE
GREASE TRAP PIPING
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FEET
N
CONRAD GEOSCIENCE CORP.
One Civic Center Plaza, Suite 501, Poughkeepsie, New York 12601
Figure 2
PIZZA PETE'S VAPOR INTRUSION MITIGATION AND MONITORING LOCATIONS
Prepared By: BPG 3/11/05
Reviewed By:
Revised By: SPL 1/15/09
Approved By: SPL 1/15/09
APPLE VALLEY SHOPPING CENTER
Lagrange, New York
AL030070

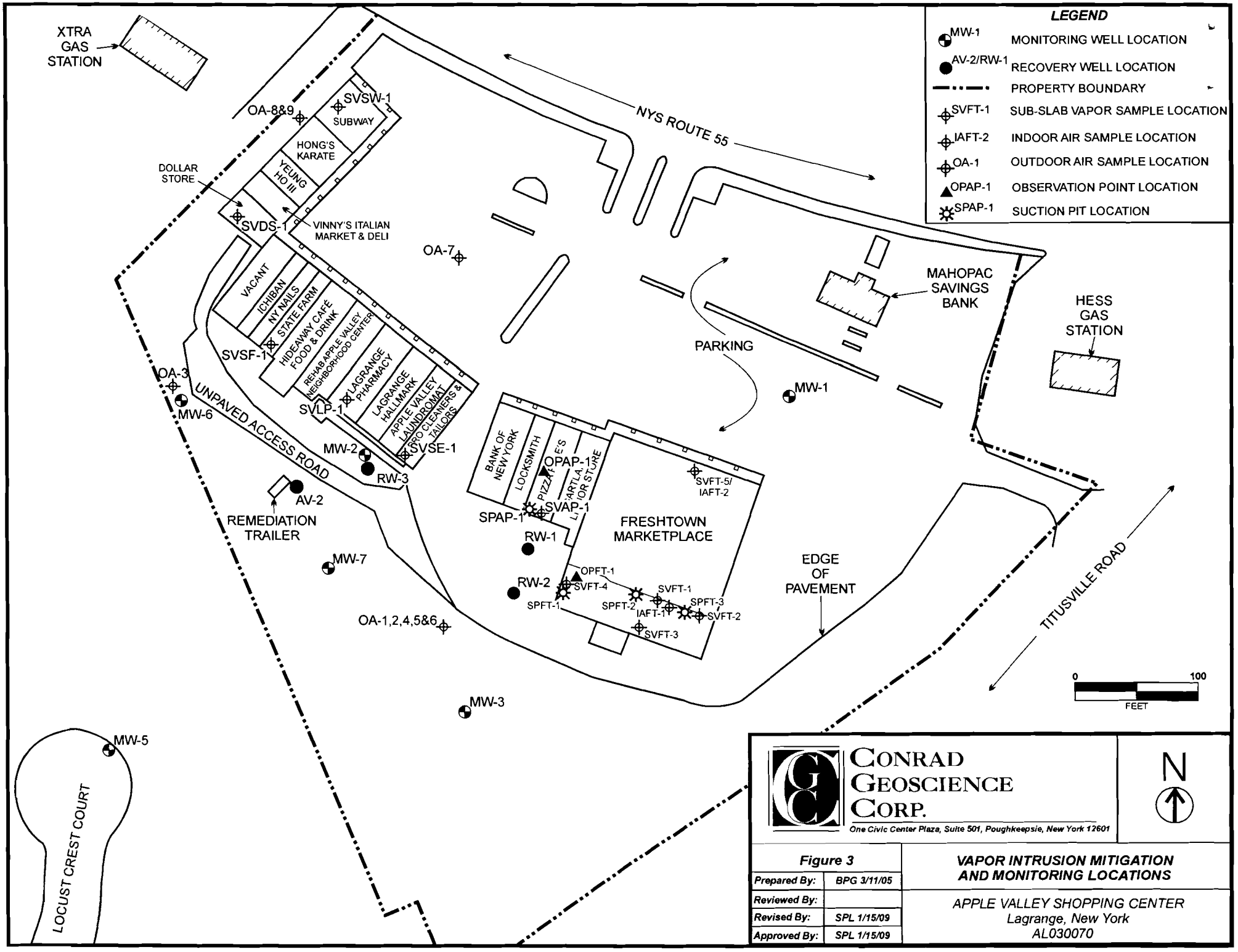
LEGEND
MW-1 MONITORING WELL LOCATION
AV-2/RW-1 RECOVERY WELL LOCATION
PROPERTY BOUNDARY
SVFT-1 SUB-SLAB VAPOR SAMPLE LOCATION
IAFT-2 INDOOR AIR SAMPLE LOCATION
OA-1 OUTDOOR AIR SAMPLE LOCATION
OPAP-1 OBSERVATION POINT LOCATION
SPAP-1 SUCTION PIT LOCATION
XTRA GAS STATION
NYS ROUTE 55
OA-8&9
SVSW-1
SUBWAY
HONG'S KARATE
YEUNG HO III
DOLLAR STORE
SVDS-1
VINNY'S ITALIAN MARKET & DELI
OA-7
MAHOPAC SAVINGS BANK
HESS GAS STATION
PARKING
VACANT
ICHIBAN
NY NAILS
STATE FARM
HIDEAWAY CAFÉ FOOD & DRINK
REHAB APPLE VALLEY NEIGHBORHOOD CENTER
LAGRANGE PHARMACY
LAGRANGE HALLMARK
APPLE VALLEY LAUNDROMAT
PRO CLEANERS & TAILORS
SVSF-1
SVLP-1
SVSE-1
OA-3
MW-6
UNPAVED ACCESS ROAD
MW-2
RW-3
AV-2
REMEDIATION TRAILER
BANK OF NEW YORK
LOCKSMITH
PIZZA
LAUNDROMAT
SVAP-1
SPAP-1
OPAP-1
SVFT-5/ IAFT-2
FRESHTOWN MARKETPLACE
RW-1
MW-1
MW-7
RW-2
OPFT-1
SVFT-4
SVFT-1
SPFT-1
SPFT-2
SPFT-3
IAFT-1
SVFT-2
SVFT-3
OA-1,2,4,5&6
EDGE OF PAVEMENT
TITUSVILLE ROAD
MW-3
MW-5
LOCUST CREST COURT
0
100
FEET
N
CONRAD GEOSCIENCE CORP.
One Civic Center Plaza, Suite 501, Poughkeepsie, New York 12601
Figure 3
VAPOR INTRUSION MITIGATION AND MONITORING LOCATIONS
Prepared By: BPG 3/11/05
Reviewed By:
Revised By: SPL 1/15/09
Approved By: SPL 1/15/09
APPLE VALLEY SHOPPING CENTER
Lagrange, New York
AL030070

Table 1. **Volatile Organic Compounds (VOCs) in Sub-Slab Vapor, Ambient Indoor Air, and Ambient Outdoor Air Samples;** USEPA TO-15; collected **January 2005 through January 2009;** Apple Valley Shopping Center, Lagrange, New York; Conrad Geoscience File #AL030070

Sample Identification		Dates Sampled	Constituent			
			Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
Volatile Organic Compounds						
Freshtown Marketplace	SVFT-1	1-26-05	***2,500***	13	ND < 0.82	ND < 0.82
		4-29-05	***1,400***	17	ND < 1.2	ND < 1.2
		6-1-06	48.2	4.14	ND < 7.46	ND < 4.82
		1-28-08	43.7 E	***13.1***	ND< 0.424	ND< 0.274
	SVFT-2	4-29-05	8.7	ND < 0.71	ND < 0.71	ND < 0.71
		6-1-06	10.7	2.84	ND < 1.11	ND < 0.715
		1-28-08	13.8	3.01	ND< 0.400	ND< 0.259
	SVFT-3	4-29-05	86	3.8	ND < 0.70	ND < 0.70
		6-1-06	47.6	***7.07***	ND < 7.46	ND < 4.82
		1-16-07	24.4	1.33	ND < 0.522	ND < 0.337
		1-28-08	18.8	4.00	ND< 0.393	ND< 0.254
	SVFT-4	4-29-05	***7,200***	***210***	260	ND < 14
		6-1-06	***386***	ND < 0.771	ND < 14.3	ND < 9.23
		1-16-07	16.4	ND < 0.249	ND < 0.392	ND < 0.253
		1-28-08	85.9 E	1.48	ND< 0.393	ND< 0.254

Notes
All units are ug/m^3 unless otherwise noted;
Boldface and italic type indicates need for ongoing monitoring or other action,
IA prefix represents ambient indoor air samples,
OA prefix represents ambient outdoor air samples;
SV prefix represents sub-slab vapor samples;
E = Exceeds calibration range.

Table 1 cont'd. **Volatile Organic Compounds (VOCs) in Sub-Slab Vapor, Ambient Indoor Air, and Ambient Outdoor Air Samples;** USEPA TO-15; collected **January 2005 through January 2009;** Apple Valley Shopping Center, Lagrange, New York; Conrad Geoscience File #AL030070

Sample Identification		Dates Sampled	Constituent			
			Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
Volatile Organic Compounds						
Freshtown Marketplace	SVFT-5	6-1-06	***354***	***12.2***	ND < 7.46	ND < 4.82
		1-16-07	44.1	4.27	ND < 0.656	ND < 0.423
		1-28-08	59.4 E	6.11	ND< 0.404	ND< 0.261
	IAFT-1	1-26-05	***9.7***	ND < 0.97	ND < 0.97	ND < 0.97
		4-29-05	***8.6***	ND < 0.74	ND < 0.74	ND < 0.74
		6-1-06	***3.47***	***0.267***	ND < 0.393	ND < 0.254
		1-16-07	1.70	ND < 0.249	ND < 0.391	ND < 0.252
		1-28-08	2.05	***1.35***	ND< 0.392	ND< 0.253
	IAFT-2	6-1-06	***3.47***	***0.276***	ND < 0.393	ND < 0.254
		1-16-07	2.09	ND < 0.250	ND < 0.393	ND < 0.254
		1-28-08	2.28	ND< 0 256	ND< 0.404	ND< 0.261

Notes:
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Table 1 cont'd. **Volatile Organic Compounds (VOCs) in Sub-Slab Vapor, Ambient Indoor Air, and Ambient Outdoor Air Samples;** USEPA TO-15; collected **January 2005 through January 2009;** Apple Valley Shopping Center, Lagrange, New York; Conrad Geoscience File #AL030070

Sample Identification		Dates Sampled	Constituent			
			Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
Volatile Organic Compounds						
Pizza Pete's (formerly Absolute Pizza)	SVAP-1	1-26-05	***160***	3.6	ND < 0.79	ND < 0.79
		1-17-06	***307,000 E***	***8,990 E***	277	ND < 1.27
		6-1-06	***119,000 E***	***3,550 E***	269	ND < 5.07
		8-7-06	***20,800 E***	***643 E***	34.5	ND < 7.25
		1-16-07	2.86	0.316	ND < 0.483	ND < 0.312
		1-28-08	6.59	1.85	ND< 0.412	ND< 0.266
		1-15-09	ND<0.671	ND<0.250	ND<0.393	ND<0.254
	IAAP-1	1-26-05	***26***	ND < 0.84	ND < 0.84	ND < 0.84
		1-17-06	***584 E***	***7.39***	ND < 1.96	ND < 1.27
		6-1-06	***57.1***	***1.38***	ND < 2.49	ND < 1.61
		8-7-06	***44.7***	ND < 4.05	ND < 11.2	ND < 7.25
		1-16-07	1.82	ND < 0.294	ND < 0.463	ND < 0.299
		1-28-08	2.67	0.329	ND< 0.400	ND< 0.259
		1-15-09	ND<0.669	ND<0.249	ND<0.392	ND<0.253

Notes:
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SV prefix represents sub-slab vapor samples;
E = Exceeds calibration range.

Table 1 cont'd. **Volatile Organic Compounds (VOCs) in Sub-Slab Vapor, Ambient Indoor Air, and Ambient Outdoor Air Samples;** USEPA TO-15; collected **January 2005 through January 2009;** Apple Valley Shopping Center, Lagrange, New York; Conrad Geoscience File #AL030070

Sample Identification		Dates Sampled	Constituent			
			Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
Volatile Organic Compounds						
Pro Cleaners and Tailors	SVSE-1	1-26-05	14	ND < 0.64	ND < 0.64	ND < 0.64
		6-1-06	64.8	8.67	ND < 7.85	ND < 5.07
		1-16-07	9.59	0.442	ND < 0.393	ND < 0.254
	IASE-1	1-26-05	ND < 0.69	ND < 0.69	ND < 0.69	ND < 0.69
		6-1-06	1.23	0.248	ND < 0.392	ND < 0.253
		1-16-07	ND < 8.92	ND < 3.33	ND < 5.22	ND < 3.37
Lagrange Pharmacy	SVLP-1	1-26-05	***220***	10	ND < 0.85	ND < 0.85
		1-17-06	***166***	***42.1***	4.67	ND < 1.27
		6-1-06	***235***	***17.0***	ND < 7.85	ND < 5.07
		1-16-07	***213***	***7.44***	ND < 7.46	ND < 4.82
		1-28-08	**219 E**	***11.0***	ND< 0.475	ND< 0.307
		1-15-09	23.1	1.35	ND<0.393	ND<0.254
	IALP-1	1-26-05	1.5	ND < 1.5	ND < 1.5	ND < 1.5
		1-17-06	***172***	4.62	ND < 1.96	ND < 1.27
		6-1-06	1.18	***0.261***	ND < 0.392	ND < 0.253
		1-16-07	***22.9***	***0.457***	1.16	ND < 0.330
		1-28-08	2.14	***4.26***	ND< 0.561	ND< 0.363
		1-15-09	1.03	ND<0.256	ND<0.400	ND<0.259

Notes:
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OA prefix represents ambient outdoor air samples;
SV prefix represents sub-slab vapor samples,
E = Exceeds calibration range

Table 1 cont'd. **Volatile Organic Compounds (VOCs) in Sub-Slab Vapor, Ambient Indoor Air, and Ambient Outdoor Air Samples;** USEPA TO-15; collected **January 2005 through January 2009;** Apple Valley Shopping Center, Lagrange, New York; Conrad Geoscience File #AL030070

Sample Identification		Dates Sampled	Constituent			
			Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
Volatile Organic Compounds						
State Farm	SVSF-1	11-29-05	ND < 3.35	ND < 2.66	ND < 1.96	ND < 1.27
		6-1-06	ND < 13.4	12.5	ND < 7.85	ND < 5.07
		1-16-07	ND < 0.731	0.395	ND < 0.428	ND < 0.276
	IASF-1	11-29-05	ND < 3.35	ND < 2.66	ND < 1.96	ND < 1.27
		6-1-06	6.77	ND < 0.0212	ND < 0.392	ND < 0.253
		1-16-07	ND < 0.805	ND < 0.301	ND < 0.471	ND < 0.304
Dollar Store	SVDS-1	11-29-05	ND < 3.35	ND < 2.66	ND < 1.96	ND < 1.27
		6-1-06	3.82	***9.15***	ND < 1.45	ND < 0.938
		1-16-07	ND < 0.765	ND < 0.286	ND < 0.448	ND < 0.289
	IADS-1	11-29-05	ND < 3.35	ND < 2.66	ND < 1.96	ND < 1.27
		6-1-06	0.420	***1.41***	4.87	ND < 0.254
		1-16-07	ND < 0.704	ND < 0.262	ND < 0.412	ND < 0.266
Subway	SVSW-1	11-29-05	3.94	ND < 2.66	ND < 1.96	ND < 1.27
		6-1-06	ND < 12.7	5.15	ND < 7.46	ND < 4.82
	IASW-1	11-29-05	ND < 3.35	ND < 2.66	ND < 1.96	ND < 1.27
		6-1-06	1.53	ND < 0.221	ND < 0.408	ND < 0.264

Notes:
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Boldface and italic type indicates need for ongoing monitoring or other action,
IA prefix represents ambient indoor air samples;
OA prefix represents ambient outdoor air samples;
SV prefix represents sub-slab vapor samples;
E = Exceeds calibration range.

Table 1 cont'd. **Volatile Organic Compounds (VOCs) in Sub-Slab Vapor, Ambient Indoor Air, and Ambient Outdoor Air Samples;** USEPA TO-15; collected **January 2005 through January 2009;** Apple Valley Shopping Center, Lagrange, New York; Conrad Geoscience File #AL030070

Sample Identification		Dates Sampled	Constituent			
			Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
Volatile Organic Compounds						
Outdoor Air	OA-1	1-26-05	ND < 0.69	ND < 0.69	ND < 0.69	ND < 0.69
	OA-2	4-29-05	ND < 0.72	ND < 0.72	ND < 0.72	ND < 0.72
	OA-3	11-29-05	ND < 3.35	ND < 2.66	ND < 1.96	ND < 1.27
	OA-4	1-17-06	10.5	ND < 2.66	ND < 1.96	ND < 1.27
	OA-5	6-1-06	530	12.4	ND < 7.85	ND < 5.07
	OA-6	8-7-06	1.77	ND < 0.242	ND < 0.671	ND < 0.434
	OA-7	1-16-07	ND < 0.669	ND < 0.249	ND < 0.392	ND < 0.253
	OA-8	1-28-08	ND< 0.691	ND< 0.256	ND< 0.404	ND< 0.261
	OA-9	1-15-09	ND<0.704	0.29	ND<0.412	ND<0.266

Notes:
All units are ug/m^3 unless otherwise noted;
Boldface and italic type indicates need for ongoing monitoring or other action.
IA prefix represents ambient indoor air samples;
OA prefix represents ambient outdoor air samples;
SV prefix represents sub-slab vapor samples;
E = Exceeds calibration range

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report Cover Page

Conrad Geoscience

For Lab Project # 09-0262
Issued January 28, 2009
This report contains a total of 10 pages

The reported results relate only to the samples as they have been received by the laboratory.

Any noncompliant QC parameters having impact on the data are flagged or documented on the final report.

All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of frequently used data flags and their meaning:

"ND" = analyzed for but not detected.
"E" = Result has been estimated, calibration limit exceeded.
"D" = Duplicate results outside QC limits. May indicate a non-homogenous matrix.
"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.
"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

PARADIGM
ENVIRONMENTAL SERVICES, INC.

LAB PROJECT NARRATIVE

CLIENT: Conrad Geoscience
PROJECT ID: Apple Valley Shopping Center LaGrange
LAB PROJECT #: 09-0262
DATE: 1/28/09

Five air canisters were received from Conrad Geoscience on 1/16/09. The samples were submitted for volatile organics analysis by EPA Method TO-15. Four compounds were specified for reporting: Tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, and vinyl chloride.

The sample reports are submitted with results in both ppb(V) and ug/m3 units of concentration. Where concentrations of analytes exceeded the instrumental calibration range (including any dilution), they have been noted with an "E" qualifier, indicating an estimated value.

The desired project sampling time was specified to the laboratory as 24 hours, and the regulators were set to the appropriate flow prior to shipment. As described by the client, in the field, one canister (C-1022, sample "SVLP-1) filled faster than expected (i.e it was full as observed on the vacuum gauge upon returning for sample pick-up). Subsequent verification of the flow rate in the lab for the same regulator (#518) showed that the actual fill time was about 22 hours. From an analytical data usability perspective, the shorter sampling period does not present a problem. The collected sample is completely acceptable. The DOH guideline explicitly allows sampling periods as low as 1 hour, to 24 hours, confirming the usability of the sample collection ranges encountered here.

PARADIGM
ENVIRONMENTAL SERVICES, INC. 179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Air

Client: **Conrad Geoscience**

Client Job Site:	Apple Valley Shopping Center LaGrange	**Lab Project Number:**	09-0262
		Lab Sample Number:	1420
Client Job Number:	AL030070		
Field Location:	SVLP-1	**Date Sampled:**	01/15/2009
Field ID Number:	C-1022	**Date Received:**	01/19/2009
Sample Type:	Air	**Date Analyzed:**	01/26/2009

Halocarbons	PPBv	ug / m3
cis-1,2-Dichloroethene	ND< 0.100	ND< 0.393
Tetrachloroethene	3.45	23.1
Trichloroethene	0.253	1.35
Vinyl Chloride	ND< 0.100	ND< 0.254
ELAP Number 10958	Method: EPA TO-15	Data File: A3943A.d

Comments: ND denotes Non Detect
PPBv = Parts per Billion volume
ug / m3 - Microgram per cubic meter.

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC. 179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Air

Client: **Conrad Geoscience**

Client Job Site:	Apple Valley Shopping Center LaGrange	**Lab Project Number:**	09-0262
		Lab Sample Number:	1421
Client Job Number:	AL030070		
Field Location:	IALP-1	**Date Sampled:**	01/15/2009
Field ID Number:	C-1015	**Date Received:**	01/19/2009
Sample Type:	Air	**Date Analyzed:**	01/26/2009

Halocarbons	PPBv	ug / m3
cis-1,2-Dichloroethene	ND< 0.102	ND< 0.400
Tetrachloroethene	0.154	1.03
Trichloroethene	ND< 0.0481	ND< 0.256
Vinyl Chloride	ND< 0.102	ND< 0.259

ELAP Number 10958 Method: EPA TO-15 Data File: A3944.d

Comments: ND denotes Non Detect
PPBv = Parts per Billion volume
ug / m3 - Microgram per cubic meter.

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC. 179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Air

Client: **Conrad Geoscience**

Client Job Site:	Apple Valley Shopping Center LaGrange	**Lab Project Number:**	09-0262
		Lab Sample Number:	1422
Client Job Number:	AL030070		
Field Location:	SVAP-1	**Date Sampled:**	01/15/2009
Field ID Number:	C-1026	**Date Received:**	01/19/2009
Sample Type:	Air	**Date Analyzed:**	01/26/2009

Halocarbons	PPBv	ug / m3
cis-1,2-Dichloroethene	ND< 0.100	ND< 0.393
Tetrachloroethene	ND< 0.100	ND< 0.671
Trichloroethene	ND< 0.0470	ND< 0.250
Vinyl Chloride	ND< 0.100	ND< 0.254
ELAP Number 10958	Method: EPA TO-15	Data File: A3945.d

Comments: ND denotes Non Detect
PPBv = Parts per Billion volume
ug / m3 - Microgram per cubic meter.

Signature: _____
Bruce Hoogesteger, Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC. 179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Air

Client: Conrad Geoscience

Client Job Site:	Apple Valley Shopping Center LaGrange	**Lab Project Number:**	09-0262
		Lab Sample Number:	1423
Client Job Number:	AL030070		
Field Location:	IAAP-1	**Date Sampled:**	01/15/2009
Field ID Number:	C-1011	**Date Received:**	01/19/2009
Sample Type:	Air	**Date Analyzed:**	01/26/2009

Halocarbons	PPBv	ug / m3
cis-1,2-Dichloroethene	ND< 0.0998	ND< 0.392
Tetrachloroethene	ND< 0.0998	ND< 0.669
Trichloroethene	ND< 0.0469	ND< 0.249
Vinyl Chloride	ND< 0.0998	ND< 0.253

ELAP Number 10958 Method: EPA TO-15 Data File: A3946.d

Comments: ND denotes Non Detect
PPBv = Parts per Billion volume
ug / m3 - Microgram per cubic meter.

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC. 179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Air

Client: **Conrad Geoscience**

Client Job Site:	Apple Valley Shopping Center LaGrange	**Lab Project Number:**	09-0262
		Lab Sample Number:	1424
Client Job Number:	AL030070		
Field Location:	OA-9	**Date Sampled:**	01/15/2009
Field ID Number:	C-1023	**Date Received:**	01/19/2009
Sample Type:	Air	**Date Analyzed:**	01/26/2009

Halocarbons	PPBv	ug / m3
cis-1,2-Dichloroethene	ND< 0.105	ND< 0.412
Tetrachloroethene	ND< 0.105	ND< 0.704
Trichloroethene	0.0546	0.290
Vinyl Chloride	ND< 0.105	ND< 0.266

ELAP Number 10958 Method: EPA TO-15 Data File: A3947.d

Comments: ND denotes Non Detect
PPBv = Parts per Billion volume
ug / m3 - Microgram per cubic meter.

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 * (800) 724-1997

TO-15 CHAIN OF CUSTODY

REPORT TO:	INVOICE TO:	
COMPANY: Conrad Geoscience	COMPANY: SAME	LAB PROJECT #: 09-0262 / CLIENT PROJECT #: AL030070
ADDRESS: 1 Civic Center Plaza Suite 501	ADDRESS:	
CITY: Poughkeepsie STATE: NY ZIP: 12601	CITY: STATE: ZIP:	TURNAROUND TIME: (WORKING DAYS) STD / OTHER
PHONE: 845-454-2544 FAX: 845-454-2655	PHONE: FAX:	☐ 3 ☐ 5 ☒ 7 ☐
PROJECT NAME/SITE NAME: Apple Valley Shopping Center - LaGrange	ATTN: ↑	ATTN: Sara Goodwin
COMMENTS: Stephanie LaRose Report only PCE, TCE, DCE, VC		Quotation #

Sampling Procedure

DATE	SAMPLE LOCATION/FIELD ID	MATRIX	CANISTER	REGULATOR	START VACUUM	START TIME	END TIME	END DATE	END VACUUM	ANALYSIS: TO-15	ANALYSIS: Halo	ANALYSIS: Site Specific	RETURN VACUUM	PARADIGM LAB SAMPLE NUMBER
1/15/09	SVLP-1	AIR	C 1 0 2 2	R 5 1 8	30	948	851	1/16/09	0	X			0	14201
1/15/09	IALP-1	AIR	C 1 0 1 5	R 5 0 5	30	951	900	1/16/09	6	X			5	14211
1/15/09	SVAP-1	AIR	C 1 0 2 6	R 5 2 0	30	1116	1025	1/16/09	12	X			9	14222
1/15/09	IAAP-1	AIR	C 1 0 1 1	R 5 1 9	30	1120	1032	1/16/09	7	X			4	14213
1/15/09	OA-9	AIR	C 1 0 2 3	R 5 0 7	30	1035	953	1/16/09	14	X			10	14214
		AIR	C	R										
		AIR	C	R										
		AIR	C	R										
		AIR	C	R										
		AIR	C	R										

Remarks:

LAB USE ONLY BELOW THIS LINE

Sampled By	1-16-09/1100 Date/Time	Total Cost:
Relinquished By	1-16-09/1700 Date/Time	
Received By	Date/Time	P.I.F.
Elizabeth A. Honch	1/19/09 1200 Date/Time	
Received @ Lab By		

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 * (800) 724-1997

TO-15 EQUIPMENT CHAIN OF CUSTODY

REPORT TO:	INVOICE TO:	
COMPANY: Conrad Geoscience	COMPANY:	LAB PROJECT #: 09-0262 / CLIENT PROJECT #:
ADDRESS: 1 Civic Center Plaza Suite 501	ADDRESS:	
CITY: Poughkeepsie STATE: NY ZIP: 12601	CITY: STATE: ZIP:	TURNAROUND TIME: (WORKING DAYS)
PHONE: 845-454-2544 FAX: 845-454-2655	PHONE: FAX:	STD / OTHER
PROJECT NAME/SITE NAME:	ATTN: Stephanie LaRose	3 / 5 / [X] 7 /
	COMMENTS:	Quotation #

Equipment Tracking

CANISTER	SHIPPED VACUUM	CANISTER	SHIPPED VACUUM	CANISTER	SHIPPED VACUUM	REGULATOR	FLOW	REGULATOR	FLOW	REGULATOR	FLOW
C 10234	28	C 10344	28	C		R 508		R		R	
C 10067	28	C 10311	28	C		R 503		R		R	
C 10112	28	C		C		R 505		R		R	
C 10072	28	C		C		R 518		R		R	
C 10111	28	C		C		R 513		R		R	
C 10113	28	C		C		R 515		R		R	
C 10001	28	C		C		R 506		R		R	
C 10266	28	C		C		R 519		R		R	
C 10155	28	C		C		R 520		R		R	
C 10222	28	C		C		R 507		R		R	

1x - gauge

Remarks: All equipment returned in good condition EAH 1/19.

2 larger (1.4L) cans used as backup red ringed

LAB USE ONLY BELOW THIS LINE

Elizabeth A. Honck 1/7/09 1525
~~Picked up By~~ Sent By — Date/Time

Total Cost:

Returned By — Date/Time

Received By — Date/Time

P.I.F.

Elizabeth A. Honck 1/19/09 1200
Received @ Lab By — Date/Time

10/18

PARADIGM

ENVIRONMENTAL SERVICES, INC.

TO-15 Sampling Equipment Request

Client:	Conrad Geoscience	**Contact:**	Stephanie LaRosa
Ship to Address:		**Project :**	Apple Valley Shopping Center
Telephone:	914-475- (cell) 8957,		845-454-2544.

No dollars needed

Date Required	Return Date	# of Samples	Sample Type	Sample Collection	Turnaround
to send 1/8/09		7	☑ Ambient Air/ indoor 2 ☑ Soil Vapor/ Sub/slab 2	☐ Grab 6 regulators ☐ 2 hr comp. ☐ 8 hr comp. (**Standard**) ☑ 24 Hour Comp	☑ 5-7 Day (**Standard**) ☐ Rush Day

Analyte List	Canister QC	Reporting
☐ TCL 8260 Volatiles (**Standard**) includes 2 extra ☑ Other (please attach list)	☑ Batch QC (**Standard**) ☐ Individually Tested Canister QC	☑ **Standard** Paradigm Lab Report ☐ DUSR Ready Package (summary & raw data)

Date Required	Return Date	# of Samples	Sample Type	Sample Collection	Turnaround
			☐ Ambient Air ☐ Soil Vapor/ Sub/slab	☐ Grab ☐ 2 hr comp. ☐ 8 hr comp. (**Standard**) ☐ Hour Comp	☐ 5-7 Day (**Standard**) ☐ Rush Day

Analyte List	Canister QC	Reporting
☐ TCL 8260 Volatiles (**Standard**) ☐ Other (please attach list)	☐ Batch QC (**Standard**) ☐ Individually Tested Canister QC	☐ **Standard** Paradigm Lab Report ☐ DUSR Ready Package (summary & raw data)

- Any custom (non standard) item will need to be reviewed for pricing and availability.
- For Sub-slab and soil vapor sampling our regulators are set up to be utilized with ¼"OD tubing. The client is responsible for supplying the nut for the compression fitting unless otherwise agreed to by Paradigm.

Table 3.2 General format of a decision matrix

	Indoor Air Concentration of Volatile Chemical (mcg/m^3)		
Sub-slab Vapor Concentration of Volatile Chemical (mcg/m^3)	Concentration Range 1	Concentration Range 2	Concentration Range 3
Concentration Range 1	ACTION	ACTION	ACTION
Concentration Range 2	ACTION	ACTION	ACTION
Concentration Range 3	ACTION	ACTION	ACTION

Indoor air and sub-slab vapor concentration ranges in a matrix are selected based on a number of considerations in addition to health risks. For example, factors that are considered when selecting the ranges include, but are not limited to, the following:

a. human health risks (i.e., cancer and non-cancer health effects) associated with exposure to the volatile chemical in air;

b. the NYSDOH's guidelines for volatile chemicals in air [Table 3.1];

c. background concentrations of volatile chemicals in air [Section 3.2.4];

d. analytical capabilities currently available; and

e. attenuation factors (i.e., the ratio of indoor air to sub-slab vapor concentrations).

3.4.2 Matrices

The NYSDOH has developed two matrices, which are included at the end of Section 3.4, to use as tools in making decisions when soil vapor may be entering buildings. The first decision matrix was originally developed for TCE and the second for PCE. As summarized in Table 3.3, four chemicals have been assigned to the two matrices to date.

Table 3.3 Volatile chemicals and their decision matrices

Chemical	**Soil Vapor/Indoor Air Matrix***
Carbon tetrachloride	Matrix 1
Tetrachloroethene (PCE)	Matrix 2
1,1,1-Trichloroethane (1,1,1-TCA)	Matrix 2
Trichloroethene (TCE)	Matrix 1

*The decision matrices are available at the end of Section 3.4.

Because the matrices are risk management tools and consider a number of factors, the NYSDOH intends to assign chemicals to one of these two matrices, if possible. For example, if a chemical other than those already assigned to a matrix is identified as a chemical of concern during a soil vapor intrusion investigation, assignment of that chemical into one of the existing decision matrices will be considered by the NYSDOH. Factors that will be considered in assigning a chemical to a matrix include, but are not limited to, the following:

a. human health risks, including such factors as a chemical's ability to cause cancer, reproductive, developmental, liver, kidney, nervous system, immune system or other effects, in animals and humans and the doses that may cause those effects;

b. the data gaps in its toxicologic database;

c. background concentrations of volatile chemicals in indoor air [Section 3.2.4]; and

d. analytical capabilities currently available.

If the NYSDOH determines that the assignment of the chemical into an existing matrix is inappropriate, then the NYSDOH will either modify an existing matrix or develop a new matrix.

To use the matrices appropriately as a tool in the decision-making process, the following should be considered:

a. The matrices are generic. As such, it may be appropriate to modify a recommended action to accommodate building-specific conditions (e.g., dirt floor in basement, crawl spaces, etc.) and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, resampling may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Additionally, actions more protective of public health than those specified within the matrix may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action is usually undertaken for reasons other than public health (e.g., seeking community acceptance, reducing excessive costs, etc.).

b. Indoor air concentrations detected in samples collected from the building's basement or, if the building has a slab-on-grade foundation, from the building's lowest occupied living space should be used.

c. Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of vapor contamination, nor does it preclude remediating contaminated soil vapors or the source of soil vapor contamination.

d. When current exposures are attributed to sources other than vapor intrusion, the agencies should be provided documentation(e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix and to support assessment and follow-up by the agencies.

3.4.3 Description of recommended actions

Actions recommended in the matrix are based on the relationship between sub-slab vapor concentrations and corresponding indoor air concentrations. They are intended to address both potential and current human exposures and include the following:

a. *No further action*

When the volatile chemical is not detected in the indoor air sample and the concentration detected in the corresponding sub-slab vapor sample is not expected to substantially affect indoor air quality.

b. *Take reasonable and practical actions to identify source(s) and reduce exposures*

The concentration detected in the indoor air sample is likely due to indoor and/or outdoor sources rather than soil vapor intrusion given the concentration detected in the sub-slab vapor sample. Therefore, steps should be taken to identify potential source(s) and to reduce exposures accordingly (e.g., by keeping containers tightly capped or by storing volatile chemical-containing products in places where people do not spend much time, such as a garage or shed). Resampling may also be recommended to demonstrate the effectiveness of actions taken to reduce exposures.

d. *Monitor*

Monitoring, including sub-slab vapor, basement air, lowest occupied living space air, and outdoor air sampling, is appropriate to determine whether concentrations in the indoor air or sub-slab vapor have changed. Monitoring may also be appropriate to determine whether existing building conditions (e.g., positive pressure HVAC systems) are maintaining the desired mitigation endpoint and to determine whether changes are appropriate.

The type and frequency of monitoring is determined on a site-specific and building-specific basis, taking into account applicable environmental data and building operating conditions.

e. *Mitigate*

Mitigation is appropriate to minimize current or potential exposures associated with soil vapor intrusion. Methods to mitigate exposures related to soil vapor intrusion are described in Section 4.

f. *Monitor / Mitigate*

Monitoring or mitigation may be recommended after considering the magnitude of sub-slab vapor and indoor air concentrations along with building- and site-specific conditions.

Soil Vapor/Indoor Air Matrix 1

October 2006

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)			
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 0.25	0.25 to < 1	1 to < 5.0	5.0 and above
< 5	1. No further action	2. Take reasonable and practical actions to identify source(s) and reduce exposures	3. Take reasonable and practical actions to identify source(s) and reduce exposures	4. Take reasonable and practical actions to identify source(s) and reduce exposures
5 to < 50	5. No further action	6. MONITOR	7. MONITOR	8. MITIGATE
50 to < 250	9. MONITOR	10. MONITOR / MITIGATE	11. MITIGATE	12. MITIGATE
250 and above	13. MITIGATE	14. MITIGATE	15. MITIGATE	16. MITIGATE

No further action:
Given that the compound was not detected in the indoor air sample and that the concentration detected in the sub-slab vapor sample is not expected to significantly affect indoor air quality, no additional actions are needed to address human exposures.

Take reasonable and practical actions to identify source(s) and reduce exposures:
The concentration detected in the indoor air sample is likely due to indoor and/or outdoor sources rather than soil vapor intrusion given the concentration detected in the sub-slab vapor sample. Therefore, steps should be taken to identify potential source(s) and to reduce exposures accordingly (e.g., by keeping containers tightly capped or by storing volatile organic compound-containing products in places where people do not spend much time, such as a garage or outdoor shed). Resampling may be recommended to demonstrate the effectiveness of actions taken to reduce exposures.

MONITOR:
Monitoring, including sub-slab vapor, basement air, lowest occupied living space air, and outdoor air sampling, is needed to determine whether concentrations in the indoor air or sub-slab vapor have changed. Monitoring may also be needed to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined on a site-specific and building-specific basis, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

MITIGATE:
Mitigation is needed to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system, and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

MONITOR / MITIGATE:
Monitoring or mitigation may be recommended after considering the magnitude of sub-slab vapor and indoor air concentrations along with building- and site-specific conditions.

See additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX 1

This matrix summarizes the minimum actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate building-specific conditions (e.g., dirt floor in basement, crawl spaces, etc.) and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, resampling may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Additionally, actions more protective of public health than those specified within the matrix may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action is usually undertaken for reasons other than public health (e.g., seeking community acceptance, reducing excessive costs, etc.).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of vapor contamination, nor does it preclude remediating contaminated soil vapors or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 0.25 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples, a minimum reporting limit of 5 micrograms per cubic meter is recommended for buildings with full slab foundations, and 1 microgram per cubic meter for buildings with less than a full slab foundation.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion to occur is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions may be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including the identified source of the volatile chemicals, the environmental remediation program, and site-specific and building-specific conditions. For example, to the extent that all site data and site conditions demonstrate that soil vapor intrusion is not occurring and that the potential for soil vapor intrusion to occur is not likely, the soil vapor intrusion investigation would be considered complete. In general, if indoor exposures represent a concern due to indoor sources, then the State will provide guidance to the property owner and/or tenant on ways to reduce their exposure. If indoor exposures represent a concern due to outdoor sources, then the NYSDEC will decide who is responsible for further investigation and any necessary remediation. Depending upon the outdoor source, this responsibility may or may not fall upon the party conducting the soil vapor intrusion investigation.

Soil Vapor/Indoor Air Matrix 2

October 2006

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)			
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 3	3 to < 30	30 to < 100	100 and above
< 100	1. No further action	2. Take reasonable and practical actions to identify source(s) and reduce exposures	3. Take reasonable and practical actions to identify source(s) and reduce exposures	4. Take reasonable and practical actions to identify source(s) and reduce exposures
100 to < 1,000	5. MONITOR	6. MONITOR / MITIGATE	7. MITIGATE	8. MITIGATE
1,000 and above	9. MITIGATE	10. MITIGATE	11. MITIGATE	12. MITIGATE

No further action:
Given that the compound was not detected in the indoor air sample and that the concentration detected in the sub-slab vapor sample is not expected to significantly affect indoor air quality, no additional actions are needed to address human exposures.

Take reasonable and practical actions to identify source(s) and reduce exposures:
The concentration detected in the indoor air sample is likely due to indoor and/or outdoor sources rather than soil vapor intrusion given the concentration detected in the sub-slab vapor sample. Therefore, steps should be taken to identify potential source(s) and to reduce exposures accordingly (e.g., by keeping containers tightly capped or by storing volatile organic compound-containing products in places where people do not spend much time, such as a garage or outdoor shed). Resampling may be recommended to demonstrate the effectiveness of actions taken to reduce exposures.

MONITOR:
Monitoring, including sub-slab vapor, basement air, lowest occupied living space air, and outdoor air sampling, is needed to determine whether concentrations in the indoor air or sub-slab vapor have changed. Monitoring may also be needed to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined on a site-specific and building-specific basis, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

MITIGATE:
Mitigation is needed to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system, and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

MONITOR / MITIGATE:
Monitoring or mitigation may be recommended after considering the magnitude of sub-slab vapor and indoor air concentrations along with building- and site-specific conditions.

See additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX 2

- This matrix summarizes the minimum actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate building-specific conditions (e.g., dirt floor in basement, crawl spaces, etc.) and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, resampling may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Additionally, actions more protective of public health than those specified within the matrix may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action is usually undertaken for reasons other than public health (e.g., seeking community acceptance, reducing excessive costs, etc.).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of vapor contamination, nor does it preclude remediating contaminated soil vapors or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 3 micrograms per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples, a minimum reporting limit of 5 micrograms per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion to occur is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions may be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including the identified source of the volatile chemicals, the environmental remediation program, and site-specific and building-specific conditions. For example, to the extent that all site data and site conditions demonstrate that soil vapor intrusion is not occurring and that the potential for soil vapor intrusion to occur is not likely, the soil vapor intrusion investigation would be considered complete. In general, if indoor exposures represent a concern due to indoor sources, then the State will provide guidance to the property owner and/or tenant on ways to reduce their exposure. If indoor exposures represent a concern due to outdoor sources, then the NYSDEC will decide who is responsible for further investigation and any necessary remediation. Depending upon the outdoor source, this responsibility may or may not fall upon the party conducting the soil vapor intrusion investigation.