

RESULTS OF INDOOR AIR AND SUB-SLAB CHARACTERIZATION

With the concurrence of the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH), Geosyntec collected indoor air samples at twenty three (23) locations in the SHS during the week of August 7, 2014. Sub-slab soil gas samples and high volume sampling tests (HVS) were completed near those twenty three (23) locations during the week of August 14, 2014. A summary of key preliminary results from this assessment program are provided in the following attached documents:

- Table 1 depicts the indoor and sub-slab TO-15 analytical results for the volatile organic compounds (VOCs) that are included in the New York State vapor intrusion guidance decision matrices (Matrix 1 and Matrix 2).
- Figure 1 depicts the concentration of trichloroethene (TCE) in the indoor air and sub-slab vapor samples.
- The concentration of TCE in the HVS samples and the projected radius of influence (to 1 Pascal vacuum) at each HVS test point are depicted in Figure 2.
- The location of the communication test points and the observed static vacuums associated with the HVS tests are depicted in Figure 3.
- The influence of operation of the heating ventilating and air conditioning (HVAC) system on establishing a positive differential pressure across the building floor is provided in Table 2.

TABLES

Table 1

Preliminary Matrix 1 and Matrix 2 TO-15 Analytical Results Elmira High School

Location				Hallway Near Main Entrance		Room 130		Room 127		Room 125		Room 124		Room 122		Room 120		Room 129 (Guidance)	
Field ID				SSHS-07-08-14-01		SSHS-07-08-14-02		SSHS-07-08-14-03		SSHS-07-08-14-04		SSHS-07-08-14-05		SSHS-07-08-14-06		SSHS-07-08-14-07		SSHS-07-08-14-08	
Type				Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab
Date	Units	EQL	DOH Matrix	7/8/2014	7/13/2014	7/8/2014	7/14/2014	7/8/2014	7/13/2014	7/8/2014	7/13/2014	7/8/2014	7/13/2014	7/8/2014	7/13/2014	7/8/2014	7/14/2014	7/8/2014	7/13/2014
1,1,1-trichloroethane	ug/m3	0.16	2	<0.17	42	<0.18	<25	<0.17	<120	<0.17	<15	<0.17	<50	<0.18	<60	<0.17	<63	<0.17	<6.3
1,1-dichloroethene	ug/m3	0.059	2	<0.063	<9	<0.064	<18	<0.063	<91	<0.061	<11	<0.063	<36	<0.064	<44	<0.063	<46	<0.063	<4.6
Carbon tetrachloride	ug/m3	6.9	1	-	<14	-	<28	-	<140	-	<18	-	<57	-	<69	-	<73	-	<7.3
cis-1,2-dichloroethene	ug/m3	0.12	2	<0.13	<9	<0.13	83	0.25	2000	<0.12	<11	<0.13	<36	<0.13	<44	<0.12	<46	<0.13	<4.6
Trichloroethene	ug/m3	0.16	2	<0.17	<12	0.51	7300	1.9	39000	0.28	390	0.18	2100	0.17	<59	<0.17	<62	0.44	<6.2
Tetrachloroethene	ug/m3	0.2	1	<0.22	<15	<0.22	<31	<0.22	<160	<0.21	<19	<0.22	<62	<0.22	<75	<0.21	<78	<0.22	<7.8
Vinyl chloride	ug/m3	0.038	1	<0.041	<5.8	<0.041	<12	<0.041	<59	<0.039	<7.2	<0.041	<23	<0.041	<28	<0.04	<30	<0.041	<3
Location				Room 100 (Library)		Room 101		Room 115		Room 116		Room 111		Room 103 (Hallway)		Room 105		Auditorium	
Field ID				SSHS-07-08-14-09		SSHS-07-08-14-10		SSHS-07-08-14-11		SSHS-07-08-14-12		SSHS-07-08-14-13		SSHS-07-08-14-14		SSHS-07-08-14-15		SSHS-07-08-14-16	
Type				Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab
Date	Units	EQL	DOH Matrix	7/8/2014	7/13/2014	7/8/2014	7/14/2014	7/8/2014	7/14/2014	7/8/2014	7/14/2014	7/8/2014	7/14/2014	7/8/2014	7/14/2014	7/8/2014	7/14/2014	7/10/2014	7/14/2014
1,1,1-trichloroethane	ug/m3	0.16	2	<0.18	17	<0.17	<6.1	<0.17	14	<0.17	<25	<0.17	9	<0.18	<6.2	<0.18	<64	<0.17	<6.4
1,1-dichloroethene	ug/m3	0.059	2	<0.064	<4.3	<0.062	<4.5	<0.063	<4.3	<0.063	<18	<0.063	<4.5	<0.065	<4.5	<0.064	<46	<0.062	<4.6
Carbon tetrachloride	ug/m3	6.9	1	-	<6.9	-	<7.1	-	<6.9	-	<29	-	<7.2	-	<7.2	-	<74	-	<7.4
cis-1,2-dichloroethene	ug/m3	0.12	2	<0.13	<4.3	<0.12	<4.5	<0.13	<4.3	<0.12	<18	<0.12	<4.5	<0.13	<4.5	<0.13	<46	<0.12	<4.6
Trichloroethene	ug/m3	0.16	2	0.19	<5.9	<0.17	<6	<0.17	<5.9	<0.17	<24	<0.17	7.3	<0.18	11	<0.17	<63	<0.17	<6.3
Tetrachloroethene	ug/m3	0.2	1	<0.22	34	<0.21	7.7	<0.22	29	<0.21	<31	<0.21	24	<0.22	<7.7	<0.22	<80	<0.21	<8
Vinyl chloride	ug/m3	0.038	1	<0.041	<2.8	<0.04	<2.9	<0.041	<2.8	<0.04	<12	<0.04	<2.9	<0.042	<2.9	<0.041	<30	<0.04	<3
Location				Room 136A		Custodian Break Room (M14)		Room 138A		Room 142 (Wellness Center)		Room 145 (Nurses Office)		Room 171 (Auxillary Gym)		Room			
Field ID				SSHS-07-10-14-17		SSHS-07-10-14-18		SSHS-07-10-14-19		SSHS-07-10-14-20		SSHS-07-10-14-21		SSHS-07-10-14-22		SSHS-07-10-14-23			
Type				Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab	Indoor Air	Sub-Slab		
Date	Units	EQL	DOH Matrix	7/10/2014	7/14/2014	7/10/2014	7/14/2014	7/10/2014	7/14/2014	7/10/2014	7/14/2014	7/10/2014	7/14/2014	7/10/2014	7/14/2014	7/10/2014	7/14/2014		
1,1,1-trichloroethane	ug/m3	0.16	2	<0.17	<6.1	<0.17	<24	<0.17	<6.5	<0.17	40	<0.16	<6.1	<0.17	<12	<0.18	<6.2		
1,1-dichloroethene	ug/m3	0.059	2	<0.063	<4.4	<0.061	<18	<0.063	<4.7	<0.063	<4.6	<0.059	<4.4	<0.063	<9.1	<0.064	<4.5		
Carbon tetrachloride	ug/m3	6.9	1	-	<7	-	<28	-	<7.5	-	<7.3	-	<7	-	<14	-	<7.1		
cis-1,2-dichloroethene	ug/m3	0.12	2	<0.12	<4.4	<0.12	<18	<0.13	<4.7	<0.13	<4.6	<0.12	<4.4	<0.12	<9.1	<0.13	<4.5		
Trichloroethene	ug/m3	0.16	2	<0.17	<6	0.67	<24	<0.17	<6.4	<0.17	<6.2	<0.16	9.4	<0.17	<12	<0.17	<6.1		
Tetrachloroethene	ug/m3	0.2	1	<0.21	<7.6	<0.21	<30	<0.22	<8.1	<0.22	<7.8	<0.2	16	<0.21	<16	<0.22	<7.7		
Vinyl chloride	ug/m3	0.038	1	<0.04	<2.8	<0.039	<11	<0.041	<3	<0.041	<3	<0.038	<2.8	<0.04	<5.9	<0.041	<2.9		

Soil Vapor/Indoor Air Minimum Actions Matrix (NYSDOH, 2006)

	No further action
	Take reasonable and practical actions to identify source(s) and reduce exposure.
	Monitor
	Monitor/Mitigate
	Mitigate

Source: Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, 2006)

Table 2
Elmira High School Differential Pressure Monitoring Results

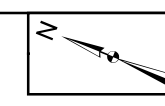
Elmira High School Differential Pressure Monitoring Results		
Location	Measurement Date	HVAC Running
		Delta P (Pascals)
Hallway Near Main Entrance	7/17/2014	0.7
Room 130	7/17/2014	5.7
Room 127	7/17/2014	6.9
Room 125	7/17/2014	8.8
Room 124	7/17/2014	1.2
Room 122	7/17/2014	4
Room 120	7/17/2014	3.3
Room 129C (Guidance Office)	7/17/2014	0
Hallway Outside Guidance Area	7/17/2014	0.4
Hallway Outside Library	7/17/2014	0.3
Room 101	7/17/2014	2.6
Room 115	7/17/2014	1.1
Room 116	7/17/2014	6.3
Room 111	7/17/2014	8
Room 106	7/17/2014	4.5
Room 104	7/17/2014	NV
Back Stage Area	7/17/2014	0.6
Hallway Outside Room 136A	7/17/2014	NM
Mechanical Storage Room (M14)	7/17/2014	NV2
Room 138A	7/17/2014	1.1
Room 142 (Welness Ctr)	7/17/2014	0.6
Room 145 Nurses Office	7/17/2014	0
Room 171 (Aux Gym)	7/17/2014	2.4
Room 156 (Girls Locker Room)	7/17/2014	1.7

Note: Delta P refers to the differential pressure between the interior air space in the room and the sub-slab below it. Positive values indicate that the pressure within the room is greater than the pressure below.

NV- The measured delta P was -0.2 Pa but is not considered a valid representation of HVAC conditions because the outside door was open.

NV2 The measured delta P was 0.0 Pa but is not considered a valid representation of HVAC conditions because the outside door was open and NM - The hallway was beside a large open door where a ventilation fan was running, so no measurement was attempted.

FIGURES



Legend

- Indoor Air Sample Location
- Sub-Slab Soil Vapor Sample Location

Notes
 All results presented in micrograms per meter-cubed ($\mu\text{g}/\text{m}^3$)
 All sample locations are approximate and results are preliminary.
 School layout drawings provided by Keystone Associates Architects, Engineers and Surveyors, LLC (27 March 2009).

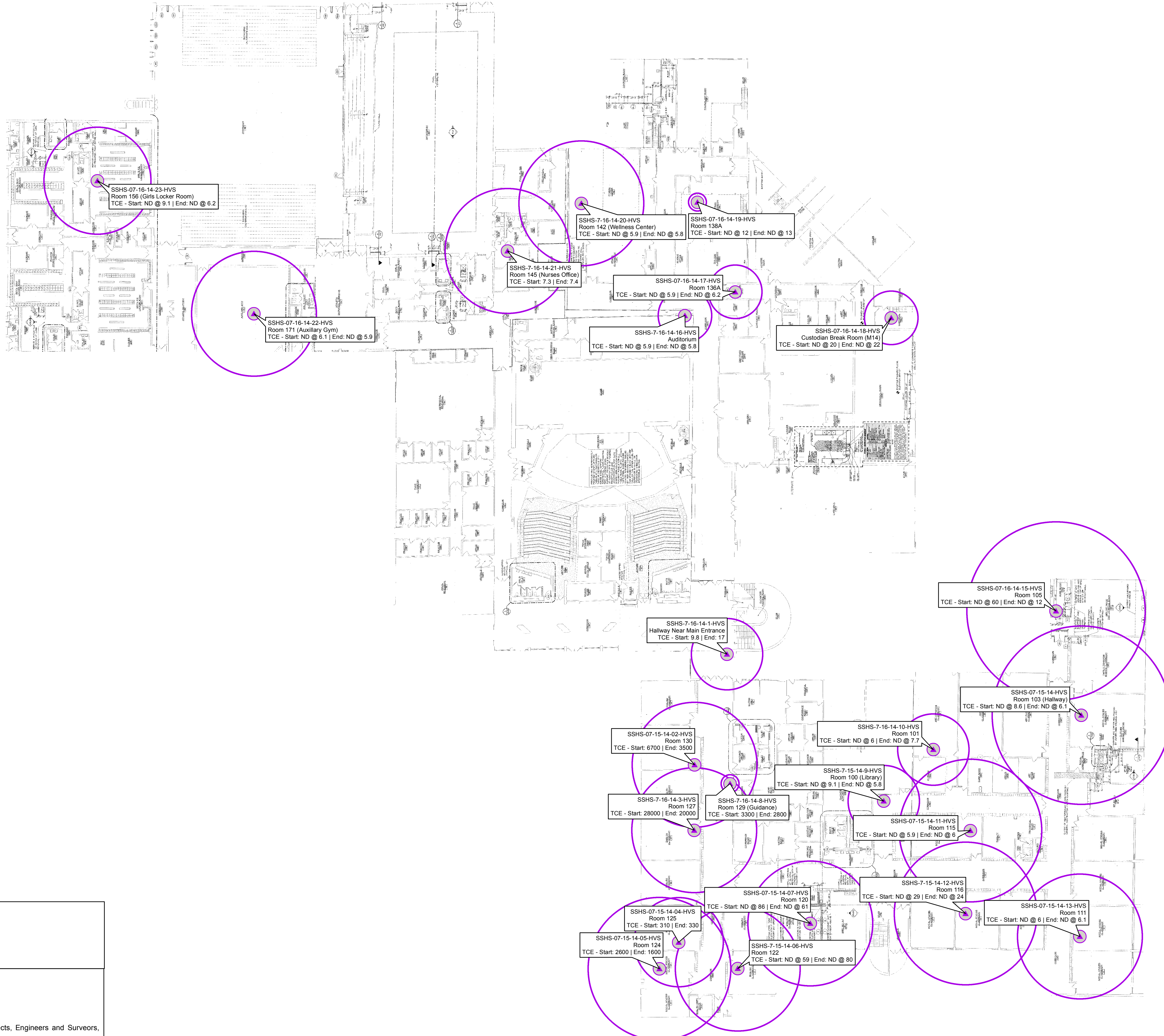
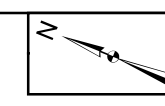
30 15 0 30 Feet

Indoor Air and Sub-Slab Soil Vapor Sample Locations and Trichloroethene Results
 Former Sperry Remington Facility
 Elmira, New York

Geosyntec
 consultants

Columbia, Maryland July 2014

Figure
1



Legend

- High-Volume Soil Vapor Sample Location
- High-Volume Sample Radius of Influence

Notes
 TCE - Trichloroethene
 All results presented in micrograms per meter-cubed (µg/m³)
 All sample locations are approximate.

School layout drawings provided by Keystone Associates Architects, Engineers and Surveyors, LLC (27 March 2009).

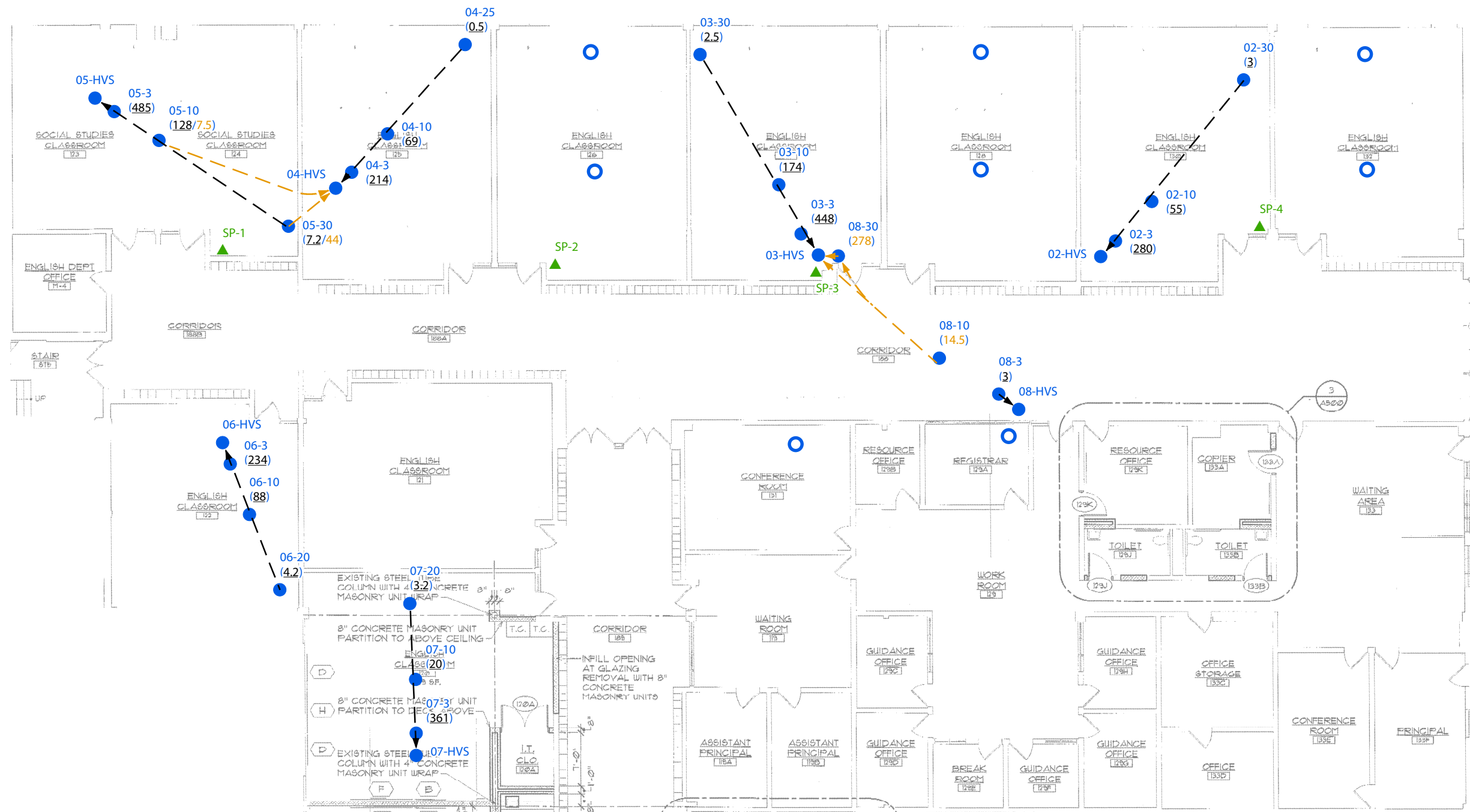
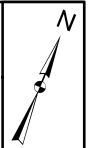
30 15 0 30 Feet

High-Volume Sample Locations and Trichloroethene Results
 Former Sperry Remington Facility
 Elmira, New York

Geosyntec
 consultants

Columbia, Maryland July 2014

Figure 2



Legend

- HVS Communication Point (Observed Static Vacuum Values [if applicable])
- New Communication Point
- ▲ Proposed Suction Point
- Direction of Vacuum During Same-Series HVS
- Direction of Vacuum During Neighboring HVS

Notes
 HVS - High Volume Sample

Underlined and black observed static vacuum values represent values for same-series vacuum events. Orange observed static vacuum values represent values for neighboring-series vacuum events. Absence of a static vacuum value represents 'zero'.

All sample locations are approximate.

School layout drawings provided by Keystone Associates Architects, Engineers and Surveyors, LLC (27 March 2009).

15 7.5 0 15 Feet

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Observed Static Vacuums and Flow Directions During HVS Tests Section F

Former Sperry Remington - North Portion #808022
Elmira, New York

Geosyntec
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Figure
3

Columbia, Maryland

August 2014