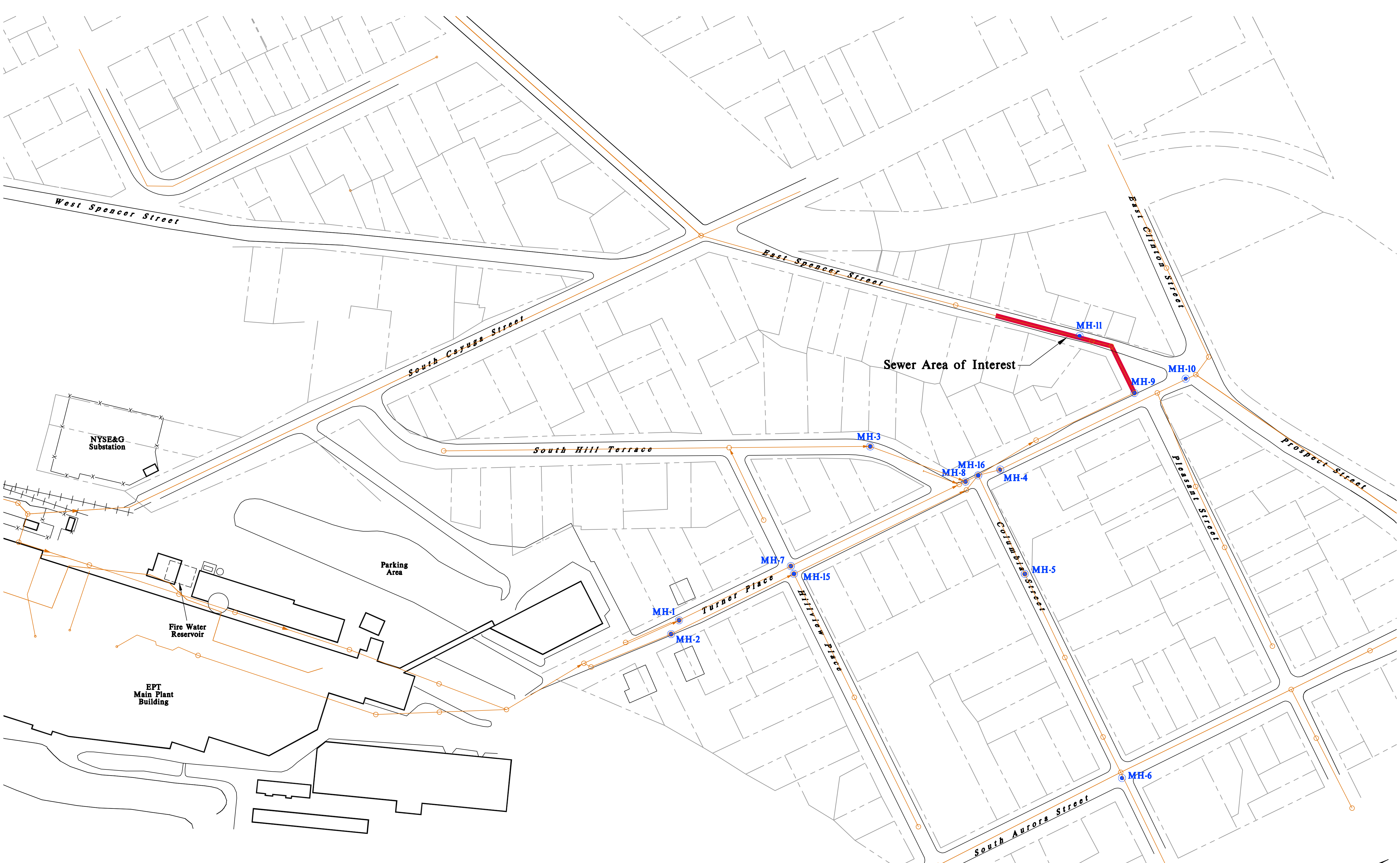

References:

1. Sanitary Sewer Location from City of Ithaca Water & Sewer Department, Sheets R17, S17, 154-A, 178, and 199.
2. Facility Drawing B-176219.
3. Town of Ithaca Contract Drawings, Sanitary Sewermain Replacement South Hill, Dated April 1994.

Drawn By: EGC
Checked: LKB
Approved: TMM
DWG Name: 127491390

EMERSON POWER TRANSMISSION
ITHACA, NEW YORK
PREPARED FOR
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Figure 3

SOUTH HILL SANITARY SEWER NETWORK

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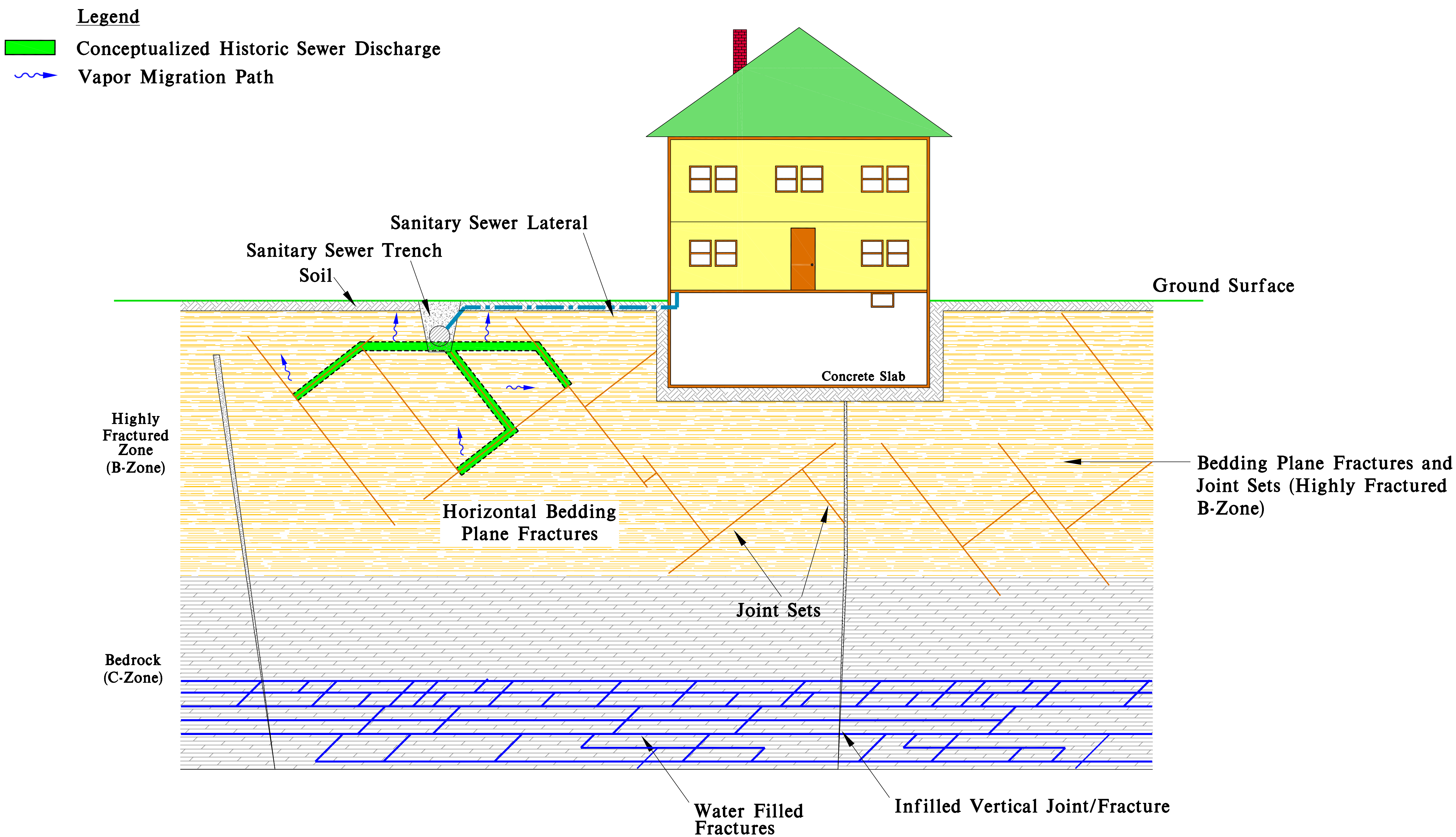

Figure 4

SOIL VAPOR MIGRATION PATHWAYS
CONCEPTUAL SITE MODEL

EMERSON POWER TRANSMISSION
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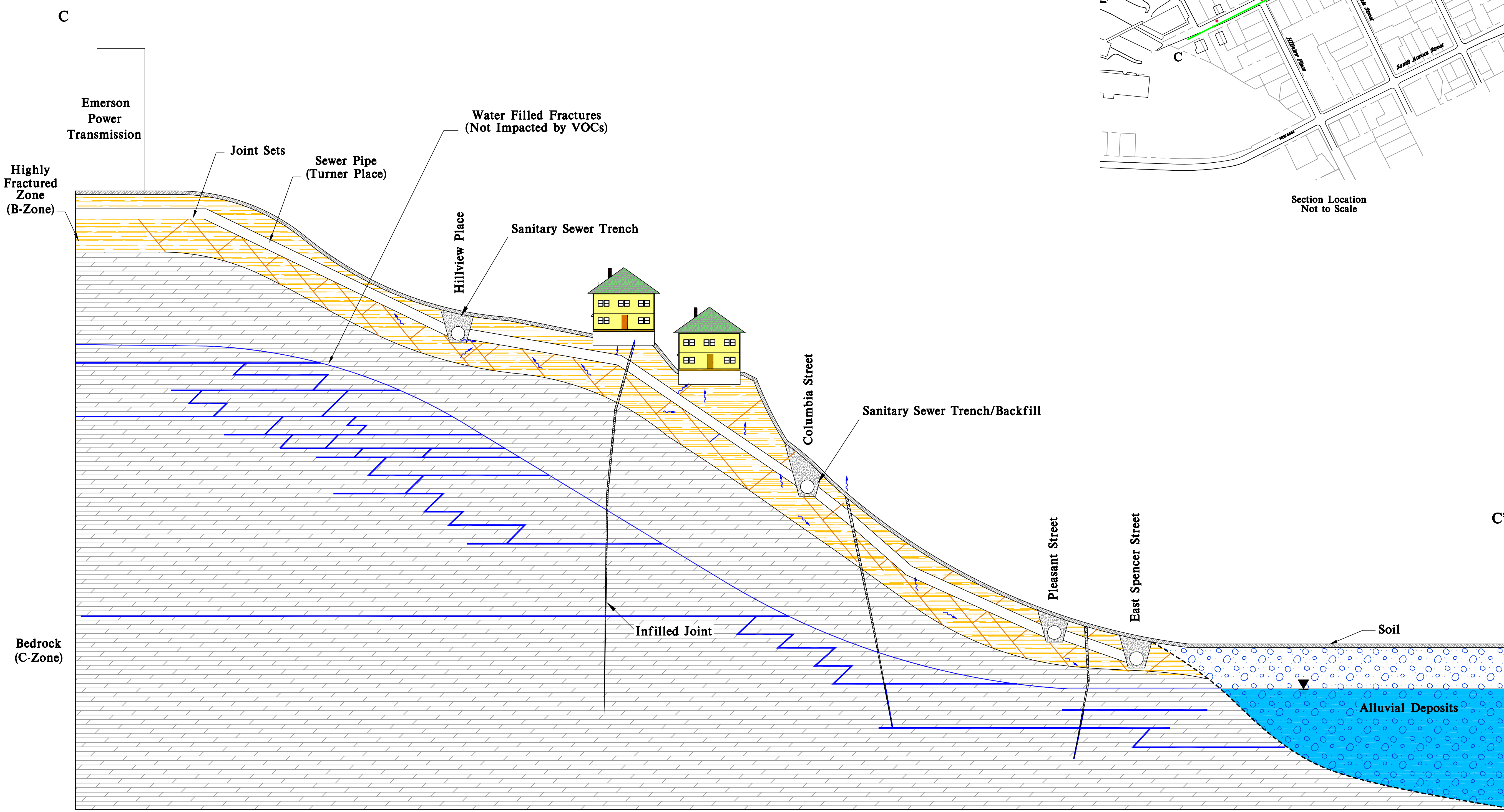
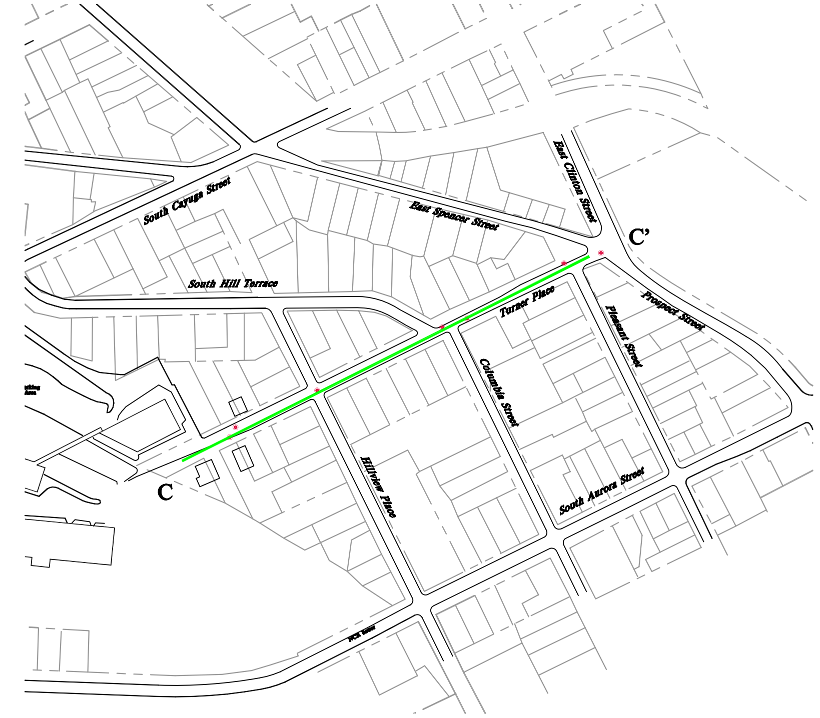
Legend

Vapor Migration Path





Section Location
Not to Scale

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Figure 5

CONCEPTUAL MODEL VAPOR
MIGRATION ALONG TURNER PLACE

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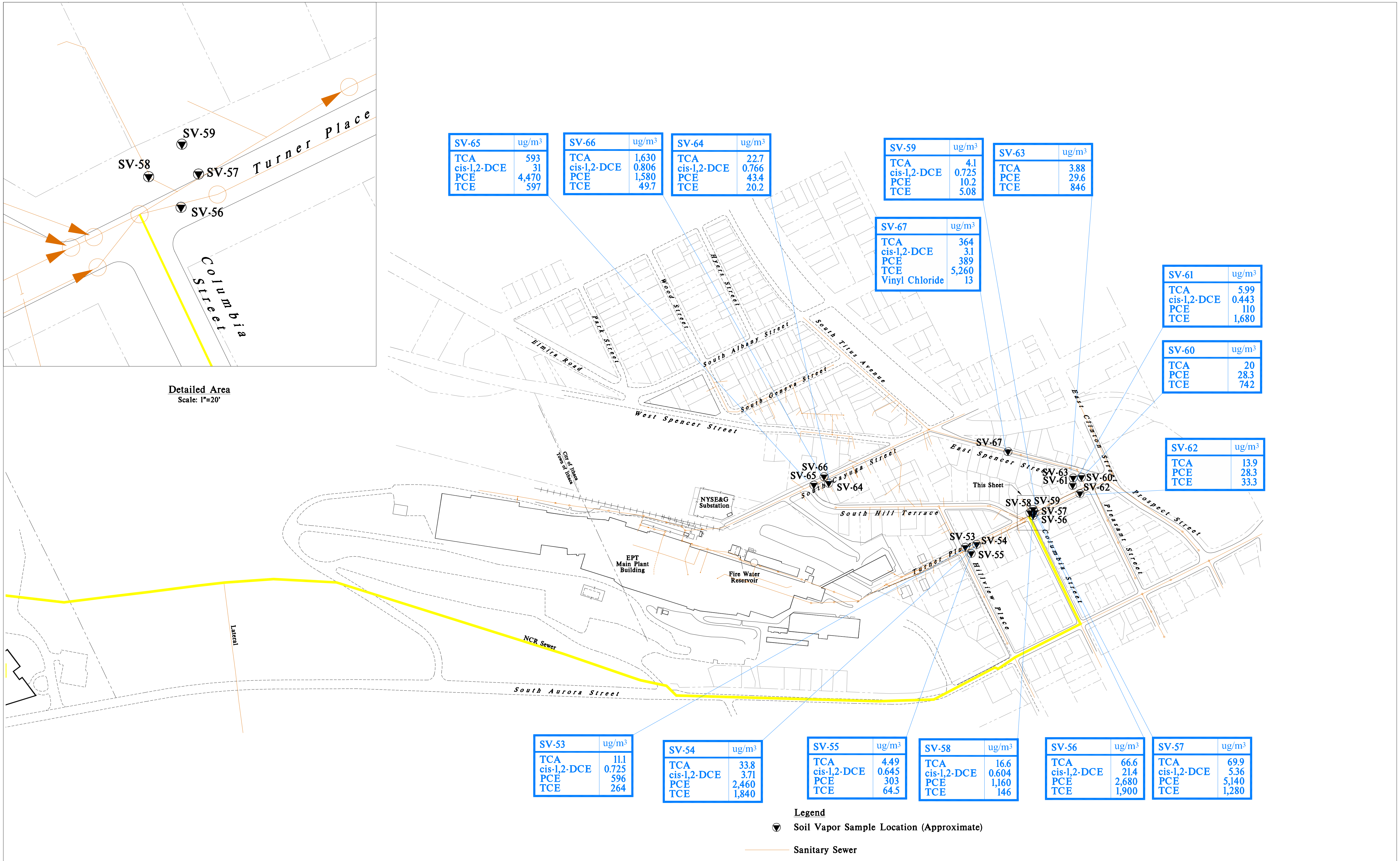

References:

1. Sanitary Sewer Location from City of Ithaca Water & Sewer Department, Sheets R17, S17, 154-A, 178, and 199.
2. Facility Drawing B-176219.
3. Town of Ithaca Contract Drawings, Sanitary Sewermain Replacement South Hill, Dated April 1994.

SOIL VAPOR POINT SAMPLE RESULTS
JULY 2008
EMERSON POWER TRANSMISSION
ITHACA, NEW YORK
PREPARED FOR
EMERSON

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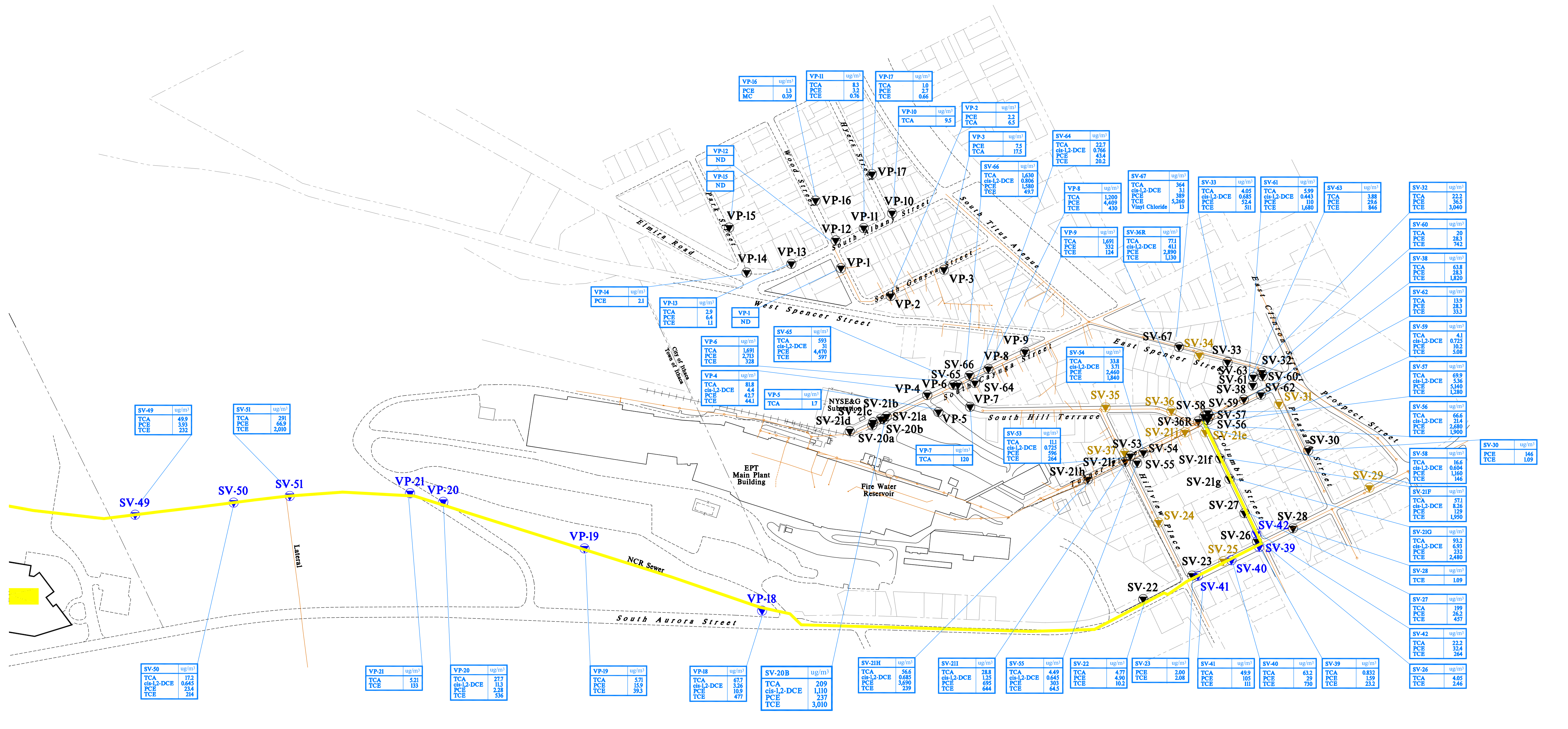
FIGURE 6

Drawing Number
08007438



Legend

- Soil Vapor Sample Location (Approximate)
- Sanitary Sewer
- Soil Vapor Sample Location Installed Near Former NCR Sewer Line as Part of Supplemental RI
- Soil Vapor Sample Location Not Completed Due to Shallow Bedrock Refusal or Utility Conflict

References:

1. Sanitary Sewer Location from City of Ithaca Water & Sewer Department, Sheets R17, S17, 154-A, 178, and 199.
2. Facility Drawing B-176219.
3. Town of Ithaca Contract Drawings, Sanitary Sewermain Replacement South Hill, Dated April 1994.

REVISIONS

REV	DESCRIPTION

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SOIL VAPOR POINT SAMPLE RESULTS 2004 TO 2008

EMERSON POWER TRANSMISSION
ITHACA, NEW YORK

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FIGURE 7

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EMERSON POWER TRANSMISSOIN

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Figure 8

MONITORING AND MITIGATION AREA

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Tables

Table 1

Soil Vapor Sample Results
July 2008
Emerson Power Transmission
Ithaca, New York

Sample ID:	**SV-53**	**SV-54**	**SV-55**	**SV-56**	**SV-57**	**SV-58**	**SV-59**	**SV-60**	**SV-61**	**SV-62**	**SV-63**	**SV-64**	**SV-65**	**SV-66**	**SV-66**	**SV-67**
Sample Type:															**DUP**	
Sampling Date:	**7/29/2008**	**7/29/2008**	**7/29/2008**	**7/29/2008**	**7/29/2008**	**7/29/2008**	**7/29/2008**	**7/30/2008**	**7/30/2008**	**7/30/2008**	**7/30/2008**	**7/30/2008**	**7/30/2008**	**7/30/2008**	**7/30/2008**	**7/30/2008**
Site-Related VOCs (μg/m^3)																
1,1,1-Trichloroethane	11.1 C	33.8	4.49 S	66.6 S	69.9 SI	16.6 CI	4.1 I	20 C	5.99	13.9	3.88	22.7 I	593 SI	1,630 I	1,290 I	364 CI
cis-1,2-Dichloroethylene	0.725	3.71	0.645 S	21.4 S	5.36 S	0.604	0.725	0.604 U	0.443 J	0.604 U	0.604 U	0.766	31 SI	0.806	0.806	3.14 SI
Methylene chloride	0.53 U	2.19	1.24 S	0.53 U	0.53 U	1.69	0.53 U	0.812	0.918	0.812	0.777	0.671	0.53 U	1.09	1.06	0.53 U
Tetrachloroethene	596	2,460	303 S	2,680 SI	5,140 SI	1,160 I	10.2 I	28.3 I	110 I	28.3	29.6 I	43.4 I	4,470 SI	1,580 I	1,210 I	389 SI
trans-1,2-Dichloroethene	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	6.13 C
Trichloroethene	264	1,840	64.5 S	1,900 S	1,280 SI	146 I	5.08 I	742	1,680	33.3	846	20.2 I	597 SI	49.7 I	55.2 I	5,260 SI
Vinyl chloride	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	13 SI
Other VOCs (μg/m^3)																
Acetone	114	43	21.5 S	293 JC	410 S	46.6	131	17.9	32.4	9.42	33.6	23.4	211 SI	43.2	46.4	36.7 SI
Benzene	24	25	1.04 S	25 S	37 SI	19.5 I	29.5 I	3.93 I	3.44	1.14	3.12	1.1 I	62.7 SI	22.7 I	25 I	8.12 SI
2-Butanone	12.3	1.25 U	1.77 S	24.3 S	17.4 S	7.49 J	10	1.8	5.34	1.89	3.21	3.06	0.899 U	6.59 J	7.49 J	5.31 S
Carbon disulfide	34.2 C	37.7 C	0.601 C	3.67 C	5.86 C	3.26 C	13 C	9.81 C	1.14 C	1.36 C	1.96 C	0.506 C	33.2 C	12.3 C	13.3 C	8.55 C
Carbon tetrachloride	0.256 U	0.256 U	0.256 U	0.256 U	0.256 U	0.256 U	0.256 U	0.767	0.256 U	0.256 U	2.24	0.256 U	0.256 U	0.256 U	0.256 U	28.8 SI
Chloroethane	0.805	0.402 U	0.402 S	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	1.82 SI	0.322 J	0.295 J	0.402 U
Chloroform	274	298 C	16.9 S	381 S	472 S	58.1	24.8	22.8	73.5	66	8.74	230	1,050 SI	155	155	482 J
Cyclohexane	50.4 C	67.2 C	0.77 S	61.6 S	196 S	22	46.5	1.92	0.525 U	0.525 U	2.62	1.08	0.525 U	40.6 C	43 C	16.8 S
1,4-Dichlorobenzene	0.917 U	0.917 U	2.38 S	0.917 U	0.917 U	1.35	0.917 U	0.917 U	0.917 U	0.917 U	1.59	0.917 U	0.917 U	2.69	3.48	0.917 U
Dichlorodifluoromethane	4.57	2.31	1.71 S	1.56 S	1.46 S	1.61	1.66	1.91	1.96	0.754 U	1.91	1.51	1.26 S	1.96	1.86	1.66 S
Ethylbenzene	3.53	2.3	0.662 U	79.4 SI	46.8 SI	11 I	5.3 I	0.75 I	1.02 I	0.53 J	1.32 I	0.485 JI	40.6 SI	5.08 I	5.38 I	13.2 SI
4-ethyltoluene	4.1	3.1	1.2 S	47 SI	50 SI	4.7 I	6.85 I	0.6 J	1.05 I	0.75	0.849 I	0.55 JI	13.5 SI	3.9 I	4.8 I	86.9 SI
Freon 113	1.64 C	1.64	1.17 UC	1.17 UC	2.57 S	1.17 UC	1.17 UC	1.17 UC	1.17 UC	1.01 JC	1.17 UC	1.17 UC	1.17 UC	1.17 UC	1.17 UC	1.17 UC
n-Heptane	140	69.1	1.54 S	220 S	275 SI	78.3	619	4.08	4.42	1.5	6.96	2 I	9,310 SI	183 I	185 I	22.1 SI
n-Hexane	139	78.8	1.29 S	298 S	319 J	57.3	300	3.04	6.59	1.76	7.59	2.01	20,700 SI	165	158	60.5 SI
Isopropanol	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	3.27	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
Methyl isobutylketone (MIBK)	130	62	1.33 S	162 SI	208 SI	67 I	618 I	3.21 I	3.62 I	1.37	6.04 I	1.62 I	9,110 SI	168 I	170 I	16.2 SI
Toluene	27.2	19.5	1.53 S	41.8 SI	74.3 SI	39.5 I	0.575 U	5.71 I	2.83 I	1.57	14.6 I	2.22 I	0.575 U	34.5 I	36.8 I	13.8 SI
Trichlorofluoromethane	1.71	1.26	0.8 J	1.03 S	0.742 J	0.971	1.03	0.971	1.2	2.28	0.971	0.742 J	0.857 S	1.66	1.66	0.971 S
1,2,4-trimethylbenzene	11.5	9.64	3.2 S	76.4 SI	73.9 SI	10.5 I	15 I	2.35 I	2.8 I	3.15	2.1 I	2 I	25.5 SI	18 I	14.5 I	296 SI
1,3,5-trimethylbenzene	7.5	6.35	2.6 S	38 SI	41.5 SI	7.7 I	10 I	2.05 I	2.4 I	2.15	2.05 I	1.8 I	9.09 SI	8.39 I	8.84 I	66.5 SI
2,2,4-trimethylpentane	5.6	2.99	0.712 U	2.9 S	6.46 S	3.56	10.9	0.712 U	0.712 U	0.712 U	0.712 U	0.712 U	96.4 S	4.23	1.42	2.85 S
o-Xylene	4.81	3.09	0.662 U	207 SI	76.4 SI	6.93 I	8.39 I	1.5 I	1.19 I	1.02	1.59 I	0.839 I	15 SI	5.25 I	5.69 I	25.2 SI
m&p Xylenes	9.27	8.74	1.46 S	505 SI	230 SI	23.4 I	20.7 I	3.4 I	3.22 I	1.99	5.56 I	2.65 I	33.5 SI	16.3 I	16.8 I	43.3 SI

a/ U - not detected
J - estimated concenration
C - analyte exceeds calibration criteria; quantitation estimated
S - analyte estimated due to elevated surrogate standard recovery.
I - associated internal standard criteria not met, estimated result.
DUP - duplicate sample

Table 2

All Soil Vapor Sample Results
Emerson Power Transmission Site
Ithaca, New York

Sample ID:	**VP-1**	**VP-2**	**VP-3**	**VP-4**	**VP-5**	**VP-6**	**VP-7**	**VP-8**	**VP-9**	**VP-10**	**VP-11**	**VP-12**	**VP-13**	**VP-14**	**VP-15**	**VP-16**	**VP-17**	**VP-18**
Sample Type:																		
Sampling Date:	**07/28/05**	**06/17/04**	**06/17/04**	**06/17/04**	**06/17/04**	**06/17/04**	**06/17/04**	**06/01/04**	**06/17/04**	**07/28/05**	**07/28/05**	**07/28/05**	**07/28/05**	**07/28/05**	**07/28/05**	**07/28/05**	**07/28/05**	**11/18/05**
Site Related VOCs (µg/m3)																		
1,1,1-Trichloroethane	11.5 U	6.5	17.5	81.8	1.7 U	1,691	120	1,200	1,691	9.5	8.3	0.83 U	2.9	0.83 U	0.83 U	0.83 U	1	67.7 C
1,2-Dichloroethane	8.3 U	1.2 U	2.4 U	12 U	1.3 U	38 U	56 U	38 U	13 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.617 U
cis-1,2-Dichloroethylene	8.3 U	1.2 U	2.4 U	4.4	1.3 U	38 U	56 U	38 U	13 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	3.26 C
Methylene chloride	18.8 U	2.6 U	5.2 U	2.7 U	2.8 U	83 U	125 U	83 U	28 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.39	0.53 U	6.96
Tetrachloroethene	14.2 U	2.2	7.5	42.7	2.2 U	2,713	95 U	4,409	332	1 U	3.2	1 U	6.4	2.1	1 U	1.3	2.7	10.9
trans-1,2-Dichloroethene	8.3 U	1.2 U	2.4 U	1.2 U	1.3 U	38 U	56 U	38 U	13 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.604 U
Trichloroethene	11.3 U	1.6 U	3.2 U	44.1	1.7	328	75 U	430	124	0.82 U	0.76	0.82 U	1.1	0.82 U	0.82 U	0.82 U	0.66	477
Vinyl chloride	5.4 U	0.8 U	1.5 U	0.8 U	0.8 U	25 U	36 U	25 U	8 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Non Site Related VOCs (µg/m3)																		
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-ethyltoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Freon 113	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropanol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl isobutylketone (MIBK)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyltert-butylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Heptane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Hexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2,4-trimethylpentane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2

All Soil Vapor Sample Results
Emerson Power Transmission Site
Ithaca, New York

Sample ID:	**VP-19**	**VP-20**	**VP-21**	**SV-20B**	**SV-21F**	**SV-21F**	**SV-21G**	**SV-21H**	**SV-21I**	**SV-22**	**SV-23**	**SV-26**	**SV-27**	**SV-28**	**SV-30**	**SV-32**	**SV-33**	**SV-36R**
Sample Type:						**DUP**												
Sampling Date:	**11/18/05**	**11/18/05**	**11/18/05**	**08/22/07**	**08/22/07**	**08/22/07**	**08/22/07**	**08/23/07**	**08/23/07**	**08/28/07**	**08/29/07**	**08/28/07**	**08/22/07**	**08/29/07**	**08/29/07**	**08/22/07**	**08/23/07**	**08/30/07**
Site Related VOCs (µg/m3)																		
1,1,1-Trichloroethane	5.71 C	27.7 C	5.21 I	209	57.1	65.4	93.2	56.6	28.8	4.77 I	0.721 UJ	4.05 I	199	0.777 UJ	0.832 U	22.2	4.05	77.1
1,2-Dichloroethane	0.617 U	0.617 U	0.617 U	0.411 UJ	0.617 U	0.617 U	0.617 U	0.617 UI	0.617 UI	0.617 U	0.617 U	0.617 U	0.617 UI	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U
cis-1,2-Dichloroethylene	0.604 C	11.3 C	0.604 C	1,110	8.26	7.82	6.93	0.685	1.25	0.604 U	0.604 U	0.604 U	0.604 UI	0.604 U	0.604 U	0.604 U	0.685	41.1
Methylene chloride	3.81	6.67	6 I	1.09	0.777	0.706	0.565	1.45	3.39	0.424 U	0.671	0.53 U	0.53 UI	2.9 I	0.918 I	0.53	0.53	0.636
Tetrachloroethene	15.9	2.28 I	1.03 U	237	129	160	232	3,690	695	4.9 I	2	1.03 U	26.2	0.758 UJ	146 I	36.5	52.4	2,890
trans-1,2-Dichloroethene	0.604	2.22	0.604 U	6.85	0.604 U	0.604 U	0.604 U	0.604 UI	0.604 UI	0.604 UC	0.604 U	0.604 U	0.604 UI	0.604 U	0.604 U	0.604 U	0.604 U	0.604 U
Trichloroethene	39.3	536	133 I	3,010	1,950	2,420	2,480	239	644	10.2 I	2.08	2.46 I	457	1.09 I	1.09 I	3,040	511	1,130
Vinyl chloride	0.39 U	0.39 U	0.39 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 UI	0.104 UI	0.104 U	0.104 U	0.104 U	0.104 UI	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U
Non Site Related VOCs (µg/m3)																		
Acetone	NA	NA	NA	42.7	28	32.4	36.2	52.2	108	145 I	37.2	0.724 U	0.724 UI	122 I	47.3 I	28.7	69.5	96.6
Benzene	NA	NA	NA	5.2	2.63	2.44	2.11	6.33	61.7	1.36	8.44	0.487 U	53.3	7.53 I	2.6 I	1.56	1.53	32.8
Bromodichloromethane	NA	NA	NA	32 C	1.84 C	1.98	1.02 UC	15.5 C	13.9 C	1.02 U	1.02 U	1.02 U	23.2 C	1.02 U	2.04 I	1.02 UC	2.32 C	1.43
2-Butanone	NA	NA	NA	5.22	0.899 U	0.899 U	0.899 U	5.43	21	0.899 U	0.899 U	0.899 U	0.899 U	0.899 U	0.899 U	0.899 U	2.22	25.2
Carbon disulfide	NA	NA	NA	9.5	2.63	2.56	3.1	5.82	24.1	23.4 I	16.1	50 I	90.5	13.4 I	2.75 I	44.9	2.25	6.24
Carbon tetrachloride	NA	NA	NA	2.62 C	1.15 C	1.15	1.47 C	2.3 C	2.75 C	0.256 U	0.256 U	0.256 U	0.256 JC	0.256 U	0.256 U	2.37 C	3.07 C	7.42
Chloroethane	NA	NA	NA	0.402 U	0.402 U	0.402 U	0.402 U	0.402 UI	0.402 UI	0.402 U	0.402 U	0.402 U	0.402 UI	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U
Chloroform	NA	NA	NA	326	59.6	66	210	509	433	5.91 I	42.2	7.1 I	167	14.7 I	46.1 I	6.45	44.7	286
Chloromethane	NA	NA	NA	0.315 U	0.315 U	0.315 U	0.315 U	0.315 UI	0.315 UI	0.63 I	0.945	0.315 U	0.315 UI	1.15 I	0.315 U	0.315 U	0.315 U	0.315 U
Cyclohexane	NA	NA	NA	23.8	7.35	8.05	0.525 U	5.88	44.1	1.5 I	5.14	0.525 U	171	5.11 I	0.84 I	42	1.64	3.29
1,4-Dichlorobenzene	NA	NA	NA	0.917 U	0.917 U	0.795 U	0.795 U	0.917	0.795	0.917 U	0.917 U	0.917 U	0.795 UI	0.917 U	0.917 U	0.917 U	0.856 U	0.917 U
Dichlorodifluoromethane	NA	NA	NA	2.61	0.754 U	2.71	3.02	4.52	0.754	2.06 I	2.16	1.96 I	2.36	2.21 I	2.16 I	2.71	2.66	6.79
1,1-Dichloroethane	NA	NA	NA	0.617 U	0.617 U	0.617 U	0.617 U	0.617 UI	0.617 UI	0.617 UC	0.617 U	0.617 UC	0.617 UI	0.617 UC	0.617 UC	0.617 U	0.617 U	2.26
1,1-Dichloroethene	NA	NA	NA	0.645	0.605 U	0.605 U	0.605 U	0.605 UI	0.605 UI	0.605 U	0.605 U	0.605 U	0.605 UI	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Ethylbenzene	NA	NA	NA	34.4	4.37	4.28	1.9	12.4 UI	84.7 UI	15.4 I	43.7	15 I	2620	30.4 I	50.5 I	1.46	1.32	14.1
4-ethyltoluene	NA	NA	NA	61.5	2.9	2.8	1.05	3.5	25	9.99 I	21.5	5.15 I	54	13.2 I	52.4 I	0.7 U	0.6 U	4.9
Freon 113	NA	NA	NA	1.48	2.18	2.18	3.58	5.14	3.82	1.17 U	1.17 U	0.857 UJ	9.43	1.17 U	1.17 U	1.32	2.49	7.09
2-Hexanone	NA	NA	NA	1.25 U	1.25 U	1.25 U	1.25 U	1.25 UI	1.25 UI	1.25 U	1.25 U	1.25 U	1.25 UI	1.25 U	1.25 U	1.25 U	1.25 U	2.54
Isopropanol	NA	NA	NA	8	0.375 U	0.375 U	0.375 U	0.375 UI	0.375 UI	0.375 U	0.375 U	0.375 U	0.375 UI	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
Methyl isobutylketone (MIBK)	NA	NA	NA	1.25 U	1.25 U	1.25 U	1.25 U	1.25	1.25	1.25	1.25 U	1.25	1.25	0.874	1.25	1.25 U	1.25 U	1.08 U
Methyltert-butylether	NA	NA	NA	0.55 U	0.55 U	0.55 U	0.55 U	0.55 UI	5.31	2.75 C	2.68	0.55 UC	3.85	2.93 C	24.6 C	0.55 U	0.55 U	0.55 U
n-Heptane	NA	NA	NA	52.9	8.33	8.33	7.37	7.54	95	0.833 I	19.6	2,030 I	270	48.7 I	1.29 I	236	2.46	23.3
n-Hexane	NA	NA	NA	22.9	35.1	37.6	14.3	10.7	83.8	0.537 U	41.6	1,180 I	397	15.8 I	3.4 I	193	2.54	25.4
Styrene	NA	NA	NA	3.55	0.649 U	0.649 U	0.649 U	0.649 UI	0.649 UI	0.649 U	0.649 U	0.649 U	0.649 UI	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U
Toluene	NA	NA	NA	34.9	82.4	88.9	13.4	59.8	583	30.6 I	81.2	34.5 I	486	113 I	70.5 I	6.4	18.4	78.1
Trichlorofluoromethane	NA	NA	NA	1.66	1.66	1.6	1.88	2.23	2.11	1.77 I	1.6	1.54 I	1.88	2.4 I	1.43 I	1.66	1.6	2.11
1,2,4-trimethylbenzene	NA	NA	NA	1,700	16	18.5	5.6	15	90.9	44 I	95.9	31.5 I	145	62.4 I	172 I	3.95	2.85	30.5
1,3,5-trimethylbenzene	NA	NA	NA	248	5.85	6.05	3.4	5.8	28	11.5 I	28.5	13.5 I	84.9	18 I	41.6 I	2.65	2.2	7
2,2,4-trimethylpentane	NA	NA	NA	15.7	0.522 U	0.712 U	0.712 U	1.23	7.31	0.855 I	2.33	0.712 U	21.8	5.27 I	1.28 I	0.712 U	0.712 U	9.02
o-Xylene	NA	NA	NA	136	5.91	6.18	3.4	15	95.3	17.7 I	48.1	12.4 I	1,910	36.4 I	65.3 I	2.3	1.5	13.2
m&p Xylenes	NA	NA	NA	159	17.7	22.1	14.2	51.2	352	61.3 I	124	34 I	9,580	113 I	210 I	6.36	6.18	30.9

Table 2

All Soil Vapor Sample Results
Emerson Power Transmission Site
Ithaca, New York

Sample ID:	**SV-38**	**SV-39**	**SV-39R**	**SV-40**	**SV-41**	**SV-42**	**SV-49**	**SV-50**	**SV-51**	**SV-53**	**SV-54**	**SV-55**	**SV-56**	**SV-57**	**SV-58**	**SV-59**	**SV-60**
Sample Type:			**DUP**														
Sampling Date:	**08/29/07**	**10/26/07**	**10/26/07**	**10/26/07**	**10/26/07**	**10/26/07**	**07/18/07**	**07/18/07**	**07/18/07**	**07/29/08**	**07/29/08**	**07/29/08**	**07/29/08**	**07/29/08**	**07/29/08**	**07/29/08**	**07/30/08**
Site Related VOCs (µg/m3)																	
1,1,1-Trichloroethane	63.8 I	0.832	0.777 UJ	63.2 I	49.9	22.2	49.9	17.2	291	11.1 C	33.8	4.49 S	66.6 S	69.9 SI	16.6 CI	4.1 I	20 C
1,2-Dichloroethane	0.617 U	1.17 U	1.17 U	1.17 U	1.17 U	1.17 U	0.617	0.535	0.617	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U
cis-1,2-Dichloroethylene	0.604 I	4.39	3.67	0.766	1.73	0.927	0.604 C	0.645 C	0.604 C	0.725	3.71	0.645 S	21.4 S	5.36 S	0.604	0.725	0.604 U
Methylene chloride	8.83 I	1.73	1.41	14.1	0.53 U	0.53 U	0.530	0.494	0.530	0.53 U	2.19	1.24 S	0.53 U	0.53 U	1.69	0.53 U	0.812
Tetrachloroethene	28.3 I	1.59 I	1.59 I	29 I	105 I	32.4 I	3.93	23.4	66.9	596	2,460	303 S	2,680 SI	5,140 SI	1,160 I	10.2 I	28.3 I
trans-1,2-Dichloroethene	0.604 U	0.604 U	0.604 U	0.604 U	0.604 U	0.604 U	0.604 U	0.604 U	0.604 U	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC
Trichloroethene	1,820 I	23.2	20.5	730 I	111	264	232	214	2,010	264	1,840	64.5 S	1,900 S	1,280 SI	146 I	5.08 I	742
Vinyl chloride	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U
Non Site Related VOCs (µg/m3)																	
Acetone	265	43.7	42	54.1	63.7	115	18.1	27.5	23.4	114	43	21.5 S	293 JC	410 S	46.6	131	17.9
Benzene	1.01	3.47	3.57	5.55 I	12	12.7	0.877	1.01	0.942	24	25	1.04 S	25 S	37 SI	19.5 I	29.5 I	3.93 I
Bromodichloromethane	4.02	1.98	1.77	12.4 I	2.66	3.54	4.56	1.57	5.93	4.29	1.02 U	1.02	22.5	12.3	5.86	1.02 U	2.79
2-Butanone	1.56	8.69	8.39	19.8	24.6	19.8	1.26	0.899 U	0.899 U	12.3	1.25 U	1.77 S	24.3 S	17.4 S	7.49 J	10	1.8
Carbon disulfide	29.4	3.67	3.51	28.5	3.89	5.76	0.348 UJ	14.6	13.3	34.2 C	37.7 C	0.601 C	3.67 C	5.86 C	3.26 C	13 C	9.81 C
Carbon tetrachloride	3.9	0.256 U	0.256 U	1.79	1.85	0.256 U	0.32	0.256	5.44	0.256 U	0.256 U	0.256 U	0.256 U	0.256 U	0.256 U	0.256 U	0.767
Chloroethane	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U	0.805	0.402 U	0.402 S	0.402 U	0.402 U	0.402 U	0.402 U	0.402 U
Chloroform	969	10.2	9.78	476	884	167	34.7	50.1	866	274	298 C	16.9 S	381 S	472 S	58.1	24.8	22.8
Chloromethane	0.315 U	0.315 U	0.315 U	1.24	0.315 U	0.315 U	0.315 U	0.315 J	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U
Cyclohexane	0.525 U	4.83	4.72	14 I	62.3	23.8	0.525 U	0.525 U	6.3	50.4 C	67.2 C	0.77 S	61.6 S	196 S	22	46.5	1.92
1,4-Dichlorobenzene	0.917 U	3.82	3.62	3.12	4.32	3.72	0.917 U	0.917 U	0.917 U	0.917 U	0.917 U	2.38 S	0.917 U	0.917 U	1.35	0.917 U	0.917 U
Dichlorodifluoromethane	4.32	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	2.46	2.82	5.18	4.57	2.31	1.71 S	1.56 S	1.46 S	1.61	1.66	1.91
1,1-Dichloroethane	0.494 U	0.411 UJ	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.535 UJ	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U
1,1-Dichloroethene	0.645	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Ethylbenzene	0.75	5.3 I	4.55 I	17.2 I	6.8 I	4.72 I	1.19	1.99	1.68	3.53	2.3	0.662 U	79.4 SI	46.8 SI	11 I	5.3 I	0.75 I
4-ethyltoluene	0.55 U	1.3 I	1.3 I	5.8 I	3.9 I	3.05 I	0.999	2	0.8	4.1	3.1	1.2 S	47 SI	50 SI	4.7 I	6.85 I	0.6 J
Freon 113	0.857 U	0.857 UJ	0.779 UJ	1.48	1.56	1.32	14.3	75.6	5.45	1.64 C	1.64	1.17 UC	1.17 UC	2.57 S	1.17 UC	1.17 UC	1.17 UC
2-Hexanone	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	4.33	0.833 UJ	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U
Isopropanol	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	3.27
Methyl isobutylketone (MIBK)	1.25 U						1.25 U	1.21 UJ	1.25 U	130	62	1.33 S	162 SI	208 SI	67 I	618 I	3.21 I
Methyltert-butylether	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U
n-Heptane	0.625 U	5.58	5.21	14.2 I	46.7	21.2	1.5	8.37	21.7	140	69.1	1.54 S	220 S	275 SI	78.3	619	4.08
n-Hexane	0.537 U	3.3	2.97	24.7	96.7	30.8	1.61	3.04	40.5	139	78.8	1.29 S	298 S	319 J	57.3	300	3.04
Styrene	0.649 U	4.5 I	3.77 I	0.649 U	1.43 I	0.649 U	0.649 U	0.649 U	0.52 UJ	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U
Toluene	4.94	8.5 I	8.08 I	14.9 I	67.4 I	26 I	6.7	6.51	7.89	27.2	19.5	1.53 S	41.8 SI	74.3 SI	39.5 I	0.575 U	5.71 I
Trichlorofluoromethane	3.2	1.48	1.48	1.43	1.66	1.31	1.71	2.23	1.88	1.71	1.26	0.8 J	1.03 S	0.742 J	0.971	1.03	0.971
1,2,4-trimethylbenzene	2.1	5.25 I	6.2 I	32.5 I	14.5 I	9.99 I	4.15	7.49	5.2	11.5	9.64	3.2 S	76.4 SI	73.9 SI	10.5 I	15 I	2.35 I
1,3,5-trimethylbenzene	0.75 U	1.3 I	2.7 I	10.1 I	9.19 I	5.9 I	0.75 U	3.2	0.75 U	7.5	6.35	2.6 S	38 SI	41.5 SI	7.7 I	10 I	2.05 I
2,2,4-trimethylpentane	0.712 U	0.855	0.855	0.712	1.38	1.04	0.712 U	0.712 U	0.712 U	5.6	2.99	0.712 U	2.9 S	6.46 S	3.56	10.9	0.712 U
o-Xylene	0.75	4.19 I	3.44 I	26.9 I	10 I	5.61 I	1.54	2.82	1.81	4.81	3.09	0.662 U	207 SI	76.4 SI	6.93 I	8.39 I	1.5 I
m&p Xylenes	3.18	13.7 I	11.4 I	75.9 I	29.6 I	17.2 I	5.43	7.46	5.34	9.27	8.74	1.46 S	505 SI	230 SI	23.4 I	20.7 I	3.4 I

Table 2

All Soil Vapor Sample Results
Emerson Power Transmission Site
Ithaca, New York

Sample ID:	**SV-61**	**SV-62**	**SV-63**	**SV-64**	**SV-65**	**SV-66**	**SV-66**	**SV-67**
Sample Type:							**DUP** (a)	
Sampling Date:	**07/30/08**	**07/30/08**	**07/30/08**	**07/30/08**	**07/30/08**	**07/30/08**	**07/30/08**	**07/30/08**
Site Related VOCs (µg/m3)								
1,1,1-Trichloroethane	5.99	13.9	3.88	22.7 I	593 SI	1,630 I	1,290 I	364 CI
1,2-Dichloroethane	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U
cis-1,2-Dichloroethylene	0.443 J	0.604 U	0.604 U	0.766	31 SI	0.806	0.806	3.14 SI
Methylene chloride	0.918	0.812	0.777	0.671	0.53 U	1.09	1.06	0.53 U
Tetrachloroethene	110 I	28.3	29.6 I	43.4 I	4,470 SI	1,580 I	1,210 I	389 SI
trans-1,2-Dichloroethene	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	0.604 UC	6.13 C
Trichloroethene	1,680	33.3	846	20.2 I	597 SI	49.7 I	55.2 I	5,260 SI
Vinyl chloride	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	0.104 U	13 SI
Non Site Related VOCs (µg/m3)								
Acetone	32.4	9.42	33.6	23.4	211 SI	43.2	46.4	36.7 SI
Benzene	3.44	1.14	3.12	1.1 I	62.7 SI	22.7 I	25 I	8.12 SI
Bromodichloromethane	3.20	1.02 U	0.681 U	10.3	1.02 U	2.11	2.25	11.7
2-Butanone	5.34	1.89	3.21	3.06	0.899 U	6.59 J	7.49 J	5.31 S
Carbon disulfide	1.14 C	1.36 C	1.96 C	0.506 C	33.2 C	12.3 C	13.3 C	8.55 C
Carbon tetrachloride	0.256 U	0.256 U	2.24	0.256 U	0.256 U	0.256 U	0.256 U	28.8 SI
Chloroethane	0.402 U	0.402 U	0.402 U	0.402 U	1.82 SI	0.322 J	0.295 J	0.402 U
Chloroform	73.5	66	8.74	230	1,050 SI	155	155	482 J
Chloromethane	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U	0.315 U
Cyclohexane	0.525 U	0.525 U	2.62	1.08	0.525 U	40.6 C	43 C	16.8 S
1,4-Dichlorobenzene	0.917 U	0.917 U	1.59	0.917 U	0.917 U	2.69	3.48	0.917 U
Dichlorodifluoromethane	1.96	0.754 U	1.91	1.51	1.26 S	1.96	1.86	1.66 S
1,1-Dichloroethane	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U	0.617 U
1,1-Dichloroethene	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Ethylbenzene	1.02 I	0.53 J	1.32 I	0.485 JI	40.6 SI	5.08 I	5.38 I	13.2 SI
4-ethyltoluene	1.05 I	0.75	0.849 I	0.55 JI	13.5 SI	3.9 I	4.8 I	86.9 SI
Freon 113	1.17 UC	1.01 JC	1.17 UC	1.17 UC	1.17 UC	1.17 UC	1.17 UC	1.17 UC
2-Hexanone	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U
Isopropanol	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
Methyl isobutylketone (MIBK)	3.62 I	1.37	6.04 I	1.62 I	9,110 SI	168 I	170 I	16.2 SI
Methyltert-butylether	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U	0.550 U
n-Heptane	4.42	1.5	6.96	2 I	9,310 SI	183 I	185 I	22.1 SI
n-Hexane	6.59	1.76	7.59	2.01	20,700 SI	165	158	60.5 SI
Styrene	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U	0.649 U
Toluene	2.83 I	1.57	14.6 I	2.22 I	0.575 U	34.5 I	36.8 I	13.8 SI
Trichlorofluoromethane	1.2	2.28	0.971	0.742 J	0.857 S	1.66	1.66	0.971 S
1,2,4-trimethylbenzene	2.8 I	3.15	2.1 I	2 I	25.5 SI	18 I	14.5 I	296 SI
1,3,5-trimethylbenzene	2.4 I	2.15	2.05 I	1.8 I	9.09 SI	8.39 I	8.84 I	66.5 SI
2,2,4-trimethylpentane	0.712 U	0.712 U	0.712 U	0.712 U	96.4 S	4.23	1.42	2.85 S
o-Xylene	1.19 I	1.02	1.59 I	0.839 I	15 SI	5.25 I	5.69 I	25.2 SI
m&p Xylenes	3.22 I	1.99	5.56 I	2.65 I	33.5 SI	16.3 I	16.8 I	43.3 SI

(a) U - not detected; NA - not analyzed; S - analyte estimated due to elevated surrogate standard recovery;
J - estimated concenration; I - associated internal standard criteria not met, estimated result;
C - analyte exceeds calibration criteria; quantitation estimated; DUP - duplicate sample.

Table 3

Chemical-Specific SCGs
Emerson Power Transmission Site
Ithaca, New York

Regulation	Citation	Potential Status	Summary of Requirements	Considerations in the Remedial Process/Action for Attainment
NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York	New York State Department of Health Center for Environmental Health Bureau of Environmental Exposure Investigation October 2006	Applicable	Provides guidance for evaluating soil vapor intrusion at a site	This guidance document is to be considered when evaluating a site with soil vapor intrusion.
NYSDEC Subpart 375-6 Restricted Use SCOs for Protection of Groundwater	6 NYCRR Part 375-3	To be considered	Provides a basis and procedure to determine soil cleanup levles, as appropriate, for sites when cleanup to pre-desposal conditions is not possible or feasible.	These values are to be considered in evaluating soil quality.

Table 4

Location-Specific SCGs
Emerson Power Transmission Site
Ithaca, New York

Regulation	Citation	Potential Status	Summary of Requirements	Considerations in the Remedial Process/Action for Attainment
Discharge of Dredge or Fill Material into Waters of the United States	40 CFR Part 230	To be considered	Requirements for discharge of fill material or dredge material into waters of the United States.	Activities resulting in the excavation of soil near Six Mile Creek may require a permit from the United States Army Corps of Engineers.
CWA - Discharge to Waters of the United States	Section 404	To be considered	Types of discharges regulated under the CWA include: discharge to surface water or ocean, indirect discharge to a POTW, and discharge of dredged or fill material into waters of the United States (including wetlands).	May be applicable for remediation alternatives addressing sanitary sewers that discharge to the local POTW.
Protection of Waters Program	6 NYCRR Part 608	To be considered	Protection of waters permit program regulates: 1) any disturbance of the bed or banks of a protected stream or water course; 2) construction and maintenance of dams; and 3) excavation or fill in waters of the state.	Remedial actions involving significant trenching or excavating near Six Mile Creek may require a permit issued by the NYSDEC.
City of Ithaca Building Department	Chapter 146 of the City of Ithaca Municipal Code	Applicable	Building permits are required for construction and alterations of buildings.	Remedial actions involving installation of buildings to house treatment equipment or installation of mitigation systems would require permitting by the City of Ithaca.
City of Ithaca	City of Ithaca Municipal Code	Applicable	Local regulations and requirements pertaining to construction work occurring in the public right of way.	Any sewer or road construction may require City of Ithaca permitting.

Table 5

Action-Specific SCGs
Emerson Power Transmission Site
Ithaca, New York

Regulation	Citation	Potential Status	Summary of Requirements	Considerations in the Remedial Process/Action for Attainment
OSHA - General Industry Standards	20 CFR Part 1910	Applicable	These regulations specify the 8-hour time-weighted average concentration for worker exposure to various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 1910.120.	Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below these concentrations.
OSHA - Safety and Health Standards	29 CFR Part 1926	Applicable	These regulations specify the type of safety equipment and procedures to be followed during site remediation.	Appropriate safety equipment will be on site and appropriate procedures will be followed during remedial activities.
OSHA - Recordkeeping, Reporting, and Related Regulations	29 CFR Part 1904	Applicable	These regulations outline recordkeeping and reporting requirements for an employer under OSHA.	These regulations apply to the company(s) contracted to install, operate, and maintain remedial actions at hazardous waste sites.
RCRA - Preparedness and Prevention	40 CFR Parts 264.30 264.31	Relevant & Appropriate	These regulations outline requirements or safety equipment and spill control.	Safety and communication equipment will be installed at the site as necessary. Local authorities will be familiarized with the site.
RCRA - Contingency Plan and Emergency Procedures	40 CFR Parts 264.50 264.56	Relevant & Appropriate	Provides requirements for outlining emergency procedures to be used following explosions, fires, etc.	Plans will be developed and implemented during remedial design. Copies of the plan will be kept on site.

Table 5

Action-Specific SCGs
Emerson Power Transmission Site
Ithaca, New York

Regulation	Citation	Potential Status	Summary of Requirements	Considerations in the Remedial Process/Action for Attainment
CWA - Discharge to Waters of the U.S.	40 CFR Part 122, 125, 403, 230, and 402 CWA Section 404	To be considered	Establishes site-specific pollutant limitations and performance standards which are designed to protect surface water quality. Types of discharges regulated under CWA include: discharge to surface water or ocean, indirect discharge to a POTW, and discharge of dredged or fill material into U.S. waters.	May be relevant and appropriate for remediation alternatives because of close proximity to Six Mile Creek.
Land Disposal Facility Notice in Deed	40 CFR Parts 264/265 116-119(b)(1)	Applicable	Established provisions for a deed notation for closed hazardous waste disposal units to prevent land disturbance by future owners.	The regulations are potentially applicable because closed areas may be similar to closed RCRA units.
Identification and Listing of Hazardous Wastes	6 NYCRR Part 371	Applicable	Establishes procedures for identifying solid wastes that are subject to regulation as hazardous wastes.	Materials excavated/removed from the site will be handled in accordance with RCRA and New York State hazardous waste regulations, if appropriate.
RCRA - Regulated Levels for Toxic Characteristics Leaching Procedure (TCLP) Constituents	40 CFR Part 261	Applicable	These regulations specify the TCLP constituent levels for identification of hazardous wastes that exhibit the characteristics of toxicity.	Excavated soil/sediment may be sampled and analyzed for TCLP constituents prior to disposal to determine if the materials are hazardous based on the characteristic of toxicity.
Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities	6 NYCRR Part 372	Applicable	Provides guidelines relating to the use of the manifest system and its recordkeeping requirements. It applies to generators, transporters, and facilities in New York State.	This regulation will be applicable to any company(s) contracted to do treatment work at the site or to transport hazardous material from the site.

Table 5

Action-Specific SCGs
Emerson Power Transmission Site
Ithaca, New York

Regulation	Citation	Potential Status	Summary of Requirements	Considerations in the Remedial Process/Action for Attainment
Standards Applicable to Transporters of Applicable Hazardous Waste - RCRA Section 3003	40 CFR Parts 262 and 263 40 CFR Parts 170-179	Applicable	Establishes the responsibility of off-site transporters of hazardous waste in the handling, transportation, and management of the waste. Requires manifesting, recordkeeping, and immediate action in the event of a discharge.	These requirements will be applicable to any company(s) contracted to transport hazardous material from the site.
DOT Rules for Transportation of Hazardous Materials	49 CFR Parts 107, 171.1 - 172.558	Applicable	Outlines procedures for the packaging, labeling, manifesting, and transporting of hazardous waste.	Any company contracted to transport hazardous material from the site will be required to follow regulations.
New York Regulations for Transportation of Hazardous Waste	6 NYCRR Part 373.3 a-d	Applicable	Outlines procedures for the packaging, labeling, manifesting, and transporting of hazardous waste.	These requirements will be applicable to any company(s) contracted to transport hazardous material from the site.
Waste Transporter Permits	6 NYCRR Part 364	Applicable	Governs the collection, transport, and delivery of regulated waste within New York State.	Properly permitted haulers will be used if any waste materials are transported off-site.
New York Regulations for Hazardous Waste Management Facilities	6 NYCRR Parts 373-1.1 - 373-.1.8	Applicable	Provides requirements and procedures for obtaining a permit to operate a hazardous waste Treatment, Storage, and Disposal facility (TSDF). Also lists contents and conditions of permits.	Any off-site facility accepting waste from the site must be properly permitted.
USEPA - Administered Permit Program: The Hazardous Waste Permit Program	RCRA Section 3005 40 CFR 270.124	Applicable	Covers the basic permitting, application, monitoring, and reporting requirements for off-site hazardous waste management facilities.	Any off-site facility accepting waste from the site must be properly permitted. Implementation of the site remedy will include consideration of these requirements.

Table 5

Action-Specific SCGs
Emerson Power Transmission Site
Ithaca, New York

Regulation	Citation	Potential Status	Summary of Requirements	Considerations in the Remedial Process/Action for Attainment
Land Disposal Restrictions	40 CFR Part 368	Applicable	Restricts land disposal of hazardous wastes that exceeded specific criteria. Establishes Universal Treatment Standards (UTS) to which hazardous waste must be treated prior to land disposal.	Excavated soils that display the characteristics of hazardous waste or that are decharacterized after generation must be treated to 90% constituent concentration reduction capped at 10 times the UTS.
New York Hazardous Waste Management System - General	6 NYCRR Part 370	Relevant & Appropriate	Provides definitions of terms and general instructions for the Part 370 series of hazardous waste management.	Hazardous waste is to be managed according to this regulation.
RCRA - General Standards	40 CFR Part 264.111	Relevant & Appropriate	General performance standards requiring minimization of need for further maintenance and control; minimization or elimination of post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products. Also requires decontamination or disposal of contaminated equipment, structures, and soils.	Proper design considerations will be implemented to minimize the need for future maintenance. Decontamination actions and facilities will be included.
CAA-NAAQS	40 CFR Part 60	Relevant & Appropriate	Establishes ambient air quality standards for protection of public health.	Remedial operations will be performed in a manner that minimizes the production of air contamination and particulate matter.

Table 6

Identification and Qualitative Evaluation Matrix for Potential Remediation Technologies for the Sanitary Sewers
Emerson Power Transmission Site
Ithaca, New York

Remediation Technology	Qualitative Evaluation of Technical Benefits, Technical Limitations, and Cost			Relative Cost Range	Recommendation & Rationale
	Technical Benefits	Technical Limitations	Cost Considerations		
No Action	• None; the constituents in the sewers would not be addressed by any treatment technology • Does not achieve RAOs for the AOC	• None	• The no-action alternative does not require the implementation of any treatment technology	None	**Not Feasible**: RAOs would not be achieved
East Spencer Sewer Line Focused Excavation and Venting	• Removal of potential source material along sewer line • May prevent vapor intrusion and migration along the sewer trench from the surrounding formation by venting after potential source removal • Venting system requires very little or no maintenance compared to other mechanically based technologies	• Only soil vapor that migrates into the newly installed sewer trench would be addressed with venting system. Radius of venting influence may be minimal • Requires continued operation of sub-slab depressurization systems in residential properties to achieve all RAOs	• Moderate to high capital cost • May include periodic O&M costs associated with maintaining air- and water-tight joints in the sewer, and possible disruption during road construction events, etc.	Moderate to High	**Feasible**: Focused excavation, replacement of sewer lines and venting system is technically feasible and may achieve RAOs in the long-term.
Soil Vapor Extraction Along Sewer Lines	• Involves the installation of a soil vapor extraction (SVE) system on the sanitary sewer lines with the goal of removing any accumulated vapors located within the bedding material surrounding the sanitary sewer piping • Can achieve vapor containment by preventing migration of soil vapors along the sewer line	• May not be functional due to vacuum loss and short-circuiting through preferential pathways (other utility corridor, bedding materials, etc.) • Requires placement of treatment equipment at facility or in neighborhood on or adjacent to private property which is not feasible • Requires continued operation of sub-slab depressurization systems in residential properties to achieve all RAOs	• Capital and annual O&M costs can be high if large-scale vapor treatment equipment is required • Capital cost may increase if piping or equipment must be staged far from the sewer lines (i.e. larger blowers and large diameter piping) • High annual operating costs and O&M costs • Requires a significant amount of pre-design work and pilot testing to assess the appropriateness of full-scale implementation of this alternative	High	**Potentially Feasible:** SVE can reduce migration of soil vapors and may achieve RAOs if determined to be implementable based on pre-design investigation.
Soil Vapor Extraction Along Laterals Connected to Sewer Lines	• Involves the installation of an SVE system on the sanitary sewer line laterals with the goal of removing any accumulated vapors located within the bedding material surrounding the sanitary sewer laterals • Would prevent the migration of vapor to residential properties by way of the lateral pathways	• Does not address migration and mass of COCs along the sewer lines • Would require intrusive subsurface work on every residential property with sanitary sewer lateral connection • Would require access to private land to install treatment equipment. Treatment equipment would be housed in secured buildings throughout neighborhood with electrical service that is not feasible to install at each building. • Requires continued operation of sub-slab depressurization systems in residential properties to achieve all RAOs	• Capital and annual O&M costs can be high if large-scale vapor treatment equipment is required • Capital cost may increase if piping or equipment must be staged far from the sewer lines (i.e. larger blowers and large diameter piping) • High annual operating costs and O&M costs • Requires a significant amount of pre-design work and pilot testing to assess the appropriateness of full-scale implementation of this alternative	High	**Not Feasible:** SVE on the sewer laterals is not feasible because of the potential requirement for multiple systems and the place treatment equipment on private property is not feasible.
Blanket Mitigation of Homes	• Proven technology for eliminating vapor intrusion pathway into residential properties • Would address all residential properties in the community, regardless of indoor air concentrations of VOCs • Would effectively reduce or eliminate concentrations of VOCs in indoor air in both the short and long term	• Does not address the source or pathways of vapor migration • Effectiveness is limited to homeowner participation • Would not achieve the RAO of reducing utility worker exposure or mass removal; would require access restrictions or a notification system to prevent utility worker exposure	• Moderate to high cost to implement depending on number of homeowners that participate and complexity of installations • Moderate analytical costs associated with post-installation air sampling • Low O&M costs that include minimal electricity required for fan operation, annual inspections, and any necessary repairs	Moderate to High	**Potentially Feasible:** Blanket mitigation is implementable and would achieve all RAOs with the exception of mass removal

Table 6

Identification and Qualitative Evaluation Matrix for Potential Remediation Technologies for the Sanitary Sewers
Emerson Power Transmission Site
Ithaca, New York

Remediation Technology	Qualitative Evaluation of Technical Benefits, Technical Limitations, and Cost			Relative Cost Range	Recommendation & Rationale
	Technical Benefits	Technical Limitations	Cost Considerations		
Air Sampling and Mitigation of Homes	• Proven technology for eliminating vapor intrusion pathway into residential properties • Would only address residential properties that require mitigation based on the results of continued indoor air sampling • Would effectively reduce or eliminate concentrations of VOCs in indoor air in both the short and long term	• Does not address the source or pathways of vapor migration • Effectiveness is limited to homeowner participation • Would not achieve the RAO of mass removal	• Moderate cost to implement depending on number of properties that require mitigation and the complexity of installations • Moderate analytical costs associated with pre-mitigation and post-mitigation air sampling • Low O&M costs that includes minimal electricity required for fan operation, annual inspections, and any necessary repairs	Moderate	**Potentially Feasible:** Air sampling and mitigation is implementable and would achieve all RAOs with the exception of mass removal
In-Situ Granular Activated Carbon	• Granular activated carbon (GAC) is suitable for the removal of VOCs in the vapor phase • GAC is a conventional and demonstrated technology • Conventional installation methods	• Difficult to direct affected soil vapors through a GAC barrier or dam without drawing vapors through the barrier • Soil vapors may migrate through other utility corridors or fractures and bypass GAC • Requires continued operation of sub-slab depressurization systems in residential properties	• May require numerous large, subsurface GAC units or expansive GAC barriers that will require extensive excavation • Moderate to high O&M costs because of the operation of a vacuum source to facilitate pass through of vapors and removal of spent GAC may be intrusive and extensive	Moderate to High	**Not Feasible:** GAC is not appropriate as an *in-situ* technology because it is not feasible to direct soil vapors through GAC units placed in the subsurface. RAOs would not be met with this technology
In-Situ Chemical Oxidation	• *In-situ* chemical oxidation (ISCO) can effectively reduce the concentration of VOCs if the correct oxidant is selected and applied under suitable subsurface conditions	• ISCO is not a technology suitable for addressing the vapor phase; primarily effective as a groundwater treatment technology • Does not achieve either RAO because ISCO would not effectively reduce subsurface soil vapor concentrations	• The cost of applying ISCO is typically moderate to high; however, this technology is not suitable for treating soil vapor	Moderate to High	**Not Feasible:** ISCO is not an appropriate technology for addressing COCs in soil vapor
Vapor Dam	• Vapor dams would be installed around sanitary sewer lines and/or laterals and transect the bedding material, which would involve much less complicated or extensive construction techniques • If placed correctly, a vapor dam could stop the movement of soil vapors along the sanitary or lateral sewer lines	• Soil vapor migration in the subsurface is not predictable and it is unknown if soil vapors will migrate around the vapor dam through other fractures and channels in the subsurface • Technology would not address mass removal unless a venting system was constructed with the vapor dams • Requires continued operation of sub-slab depressurization systems in residential properties	• Moderate cost to install vapor dams, depending on the number installed • Low to no O&M costs if the vapor dams were suitable for long-term subsurface installation	Moderate	**Not Feasible:** Vapor dams are not a feasible technology because soil vapors would continue to migrate around the vapor dams and through surrounding fractures in bedrock and would not be removed. Vapor dams with a venting system would have similar implementation issues as the SVE alternatives

Table 7

Evaluation Matrix for Potentially Feasible Remediation Technologies for the Sanitary Sewers
Emerson Power Transmission Site
Ithaca, New York

Potentially Feasible Technology	Site-Specific Technical Feasibility				Recommendation for Selection
	Long-term Effectiveness	Short-Term Effectiveness	Implementability	Estimated Time Frame	
East Spencer Sewer Line Focused Excavation and Venting	• Effective in the long-term because COCs present in materials around the sewer pipe would be removed and vapors remaining in the shallow unsaturated bedrock and in fractured bedrock would be addressed as they reenter the newly installed trench via venting • Achieves all RAOs with the continued operation of sub-slab depressurization systems in residential properties	• Would remove COC mass and eliminate migration of vapors in and along the section of sanitary sewer line excavated and replaced • Could potentially expose workers and the community to soil vapors during construction • Construction activities would have impacts to the community because of road closures, irritant noise from construction equipment, and general disruption of the neighborhood • Would require erosion measures because of significant slope of roadways in the area • Would take a moderate amount of time to construct because of the complexity of the sanitary sewer network along East Spencer Street	• Would require conventional construction measures • Would cause moderate inconvenience to residents of the area • Requires permission from the City of Ithaca to close streets in the neighborhood during construction. • Requires assistance and involvement from the City of Ithaca and possibly other agencies (e.g., NYSDOT) because it is a municipal sewer system and public roadway. City of Ithaca may perform sewer replacement simplifying implementation	1 year (with mitigation systems operating up to 15 years)	**Recommended:** This alternative is effective, implementable, and will meet the established RAOs
Soil Vapor Extraction Along Sewer Lines	• Long term effectiveness is unclear because it depends on the bedding material and the construction of the existing sewer lines • Short-circuiting may inhibit the effectiveness of an SVE system • The system would need to be operable for as long as the shallow bedrock formation yields vapors • Does not achieve all RAOs as a stand-alone technology; requires continued installation and operation of sub-slab depressurization systems in residential properties	• If effectively implemented, SVE would immediately remove soil vapors upon start up • Could potentially expose workers and the community to soil vapors during construction • Construction activities would have significant impacts to the community because of road closures, irritant noise from construction equipment, and general disruption of the neighborhood • Would require erosion measures because of significant slope of roadways in the area • Treatment equipment installed would be disruptive in both the short and long-term because of its size and noise	• Would require unconventional construction measures • May not be practical to install in the neighborhood because of the high level of noise associated with the blowers and other treatment equipment • Large-scale SVE system may require the equipment to be located on private property, which is not readily available. • Would require very large treatment equipment (i.e., vacuum blower(s)) and large-diameter conveyance piping if equipment is staged at the facility • Void space around the piping or large gaps in the piping construction may cause short-circuiting of the air flow • Surface water drainage that runs through the void space and bedding material of the sewer piping may prevent the SVE system from having an adequate and consistent vacuum and would create an additional discharge (aqueous phase) from the treatment system to be handled	Up to 5 years (with mitigation systems operating up to 15 years)	**Not Recommended:** Pending pre-design investigation results; may not be appropriate to apply SVE along all sewer lines, and may only be partially effective at addressing areas with highest concentrations of COCs. Not practical to install treatment equipment in the neighborhood

Table 7

Evaluation Matrix for Potentially Feasible Remediation Technologies for the Sanitary Sewers
Emerson Power Transmission Site
Ithaca, New York

Potentially Feasible Technology	Site-Specific Technical Feasibility				Recommendation for Selection
	Long-term Effectiveness	Short-Term Effectiveness	Implementability	Estimated Time Frame	
Blanket Mitigation of Homes	• The effectiveness of this alternative will continue indefinitely with continued operation and proper maintenance of the sub-slab depressurization system • Requires access to residential properties; without homeowner cooperation, this alternative cannot achieve the RAOs • Does not address the source or pathways of vapor migration or the source of COCs that may be present along the sewer lines • Does not achieve all RAOs as a stand-alone technology; would require provisions for utility workers accessing sanitary sewer lines	• Effective immediately upon installation and start-up of the sub-slab depressurization system • Installation of this alternative involves low risk to workers because exposure to elevated concentrations of COCs in the sub-slab or indoor air is limited; indoor air concentrations are not typically high enough to pose a significant threat to human health in the short-term • Disruptive to homeowners and residents in the short-term during installation of the system • Delayed access to properties by homeowners will lengthen the time for installation and operation of a system • City of Ithaca building permit requirements can slow the installation process	• Sub-slab depressurization systems can be implemented and have already been demonstrated to be effective in achieving acceptable indoor air concentrations • Installation of the systems is achieved through conventional means • Obtaining access to properties may inhibit installation process if homeowners select not to sign access agreements	Mitigation systems operating up to 15 years	**Potentially Recommended**: Effective and proven technology for achieving RAO of reducing indoor air concentrations of COCs; does not address RAO of utility worker exposure without specific access provisions. Does not address COC mass along sewer lines or vapor migration source or pathways.
Air Sampling and Mitigation of Homes	• The effectiveness of this alternative will continue indefinitely with continued operation and proper maintenance of the sub-slab depressurization system • Requires access to residential properties for sampling and installation; without homeowner cooperation, this alternative cannot achieve the RAOs • Homes that have indoor air concentrations of COCs exceeding standards would immediately be address • Does not address the source or pathways of vapor migration • Does not achieve all RAOs as a stand-alone technology; would require provisions for utility workers accessing sanitary sewer lines	• Effective immediately upon installation and start-up of the sub-slab depressurization system • Indoor air sampling poses no risk to homeowners or tenants • NYSDOH recommends air sampling only during the heating season (from November 15 to March 31). If a property cannot be sampled during a particular heating season for any reason, it would be a significant amount of time before sampling could proceed. • Installation of the systems involves low risk to workers because exposure to elevated concentrations of COCs in the sub-slab or indoor air is limited; indoor air concentrations are not typically high enough to pose a significant threat to human health in the short-term • Disruptive to homeowners and residents in the short-term during installation of the system • Delayed access to properties by homeowners will lengthen the time for installation and operation of a system • City of Ithaca building permit requirements can slow the installation process	• An indoor air sampling plan can be easily implemented • Sub-slab depressurization systems can be implemented and have already been demonstrated to be effective in achieving acceptable indoor air concentrations • Installation of the systems is achieved through conventional means • Obtaining access to properties may inhibit installation process if homeowners select not to sign access agreements	Mitigation systems operating up to 15 years	**Potentially Recommended**: Effective and proven technology for achieving RAO of reducing indoor air concentrations of COCs. Does not address COC mass along sewer lines or vapor migration source or pathways.

Table 8

Cost Estimate for Alternative 2 – East Spencer Sewer Line Focused Excavation and Venting
Emerson Power Transmission Site
Ithaca, New York

Item No.	Description	Estimated Quantities	Units	Unit Price	Estimated Amount
Replacement of Sewer Lines					
1	Investigation of Piping	1	LS	$ 10,000	$ 10,000
2	Investigation of Migration Pathways	1	LS	$ 10,000	$ 10,000
3	Mobilization/Demobilization	1	LS	$ 10,000	$ 10,000
4	Excavation	320	CY	$ 200	$ 64,000
5	Pipe Removal and Disposal	1	LS	$ 35,000	$ 35,000
6	Transportation and Disposal of Excavated Waste	544	TONS	$ 110	$ 59,840
7	Backfill with Select Fill	320	CY	$ 25	$ 8,000
8	Sanitary Sewer Piping	1	LS	$ 75,000	$ 75,000
9	Manhole Replacement	2	EACH	$ 5,000	$ 10,000
10	Venting System	1	LS	$ 40,000	$ 40,000
11	Permitting	1	LS	$ 20,000	$ 20,000
12	Road Closures	1	LS	$ 25,000	$ 25,000
13	Road Paving	1	LS	$ 30,000	$ 30,000
				Subtotal Capital Costs	**$ 396,840**
				Administrative and Engineering (30%)	**$ 119,052**
				Contingency (20%)	**$ 79,368**
				Total Estimated Capital Cost	**$ 595,260**
				Rounded To	**$ 596,000**
Operation and Maintenance of Vapor Mitigation Systems					
14	System Operation & Maintenance	47	EACH	$ 750	$ 35,250
				Subtotal O&M Costs	**$ 35,250**
				Contingency (20%)	**$ 7,050**
				Annual O&M Costs	**$ 42,300**
				Present Worth of O&M for 15 Years at 7% Discounted Rate	**$ 385,265**
				Rounded To	**$ 386,000**
				TOTAL PRESENT WORTH	**$ 982,000**

Assumptions:

1. Investigation of piping to verify existing conditions cost estimate includes excavation of test pits to verify the condition of the sewer pipes if adequate engineering drawings are not available.

2. Investigation of migration pathways cost estimate includes fully evaluating all possible migration pathways into residential properties; including, but not limited to, laterals, electrical lines, phone lines, and any other possible opening into the home.

3. Mobilization/demobilization estimate includes mobilization and demobilization of all labor, equipment, and materials necessary to complete the alternative.

4. Excavation cost estimate includes the cost of labor, materials, and equipment necessary to remove all pavement and soil necessary to expose the sewer piping and remove unconsolidated material around the pipe.

5. Pipe removal and disposal cost estimate includes the cost of labor, materials, and equipment necessary to remove all of the identified sanitary sewer lines and properly dispose of the piping.

6. Transportation and disposal of excavated waste cost estimate includes the cost of transportation, and treatment and/or disposal of all soil and pavement excavated. This cost is dependent upon the waste classification of the excavated material and assumes that the waste is classified as non-hazardous. Assumes a conversion of 1.7 tons per cubic yard.

7. Backfill with select fill cost estimate includes the cost of labor, materials, and equipment necessary to fill all excavated areas surrounding the sanitary sewer piping with select fill.

8. Sanitary sewer piping cost estimate includes the cost of labor, materials, and equipment necessary to install the new replacement piping and reconnect to laterals.

9. Manhole replacement is the estimated cost for replacing manholes in all of the existing manhole locations and reconnecting to the sanitary sewer header.

10. Venting cost estimate assumes standpipes with wind driven turbines or barometric pressure actuated valving to induce a vacuum from the newly installed sewer line trench.

11. Permitting is the cost estimate for obtaining permits and access agreements for the construction work.

12. Road closures cost estimate includes the closure and securing all sections of road during the prescribed work period.

13. Road paving cost estimate includes the repaving of the sections of road which were removed to install the new sanitary sewer lines in compliance with applicable standards.

14. O&M cost estimate includes the assumed annual cost for maintenance, replacement parts, contractor repairs, electricity, and inspections for all existing mitigation systems that have currently been installed within the designated study area.

Table 9

Cost Estimate for Alternative 3 – Soil Vapor Extraction on Sewer Lines
Emerson Power Transmission Site
Ithaca, New York

Item No.	Description	Estimated Quantities	Units	Unit Price	Estimated Amount
Installation of SVE System on Sewer Lines					
1	SVE Pilot Test	1	LS	$ 50,000	$ 50,000
2	Investigation of Migration Pathways	1	LS	$ 10,000	$ 10,000
3	Mobilization/Demobilization	1	LS	$ 10,000	$ 10,000
4	Preparation and Trenching	1	LS	$ 100,000	$ 100,000
5	Transportation and Disposal of Excavated Soil	2,100	TONS	$ 110	$ 231,000
6	Backfill with Flowable or Select Fill	1	LS	$ 50,000	$ 50,000
7	Piping and Offsite Equipment	1	LS	$ 500,000	$ 500,000
8	Treatment System Equipment and Enclosures	1	LS	$ 400,000	$ 400,000
9	Permitting	1	LS	$ 20,000	$ 20,000
10	Road Closures	1	LS	$ 30,000	$ 30,000
11	Road Paving	1	LS	$ 75,000	$ 75,000
				Subtotal Capital Costs	**$ 1,476,000**
				Administrative and Engineering (30%)	**$ 442,800**
				Contingency (20%)	**$ 295,200**
				Total Estimated Capital Cost	**$ 2,214,000**
				Rounded To	**$ 2,214,000**
Operation and Maintenance of SVE System					
12	System Operation & Maintenance	1	LS	$ 75,000	$ 75,000
				Subtotal O&M Costs	**$ 75,000**
				Administrative and Engineering (30%)	**$ 22,500**
				Contingency (20%)	**$ 15,000**
				Annual O&M Costs	**$ 112,500**
				Present Worth of O&M for 5 Years at 7% Discounted Rate	**$ 461,272**
				Rounded To	**$ 462,000**
Operation and Maintenance of Vapor Mitigation Systems					
13	System Operation & Maintenance	47	EACH	$ 750	$ 35,250
				Subtotal O&M Costs	**$ 35,250**
				Contingency (20%)	**$ 7,050**
				Annual O&M Costs	**$ 42,300**
				Present Worth of O&M for 15 Years at 7% Discounted Rate	**$ 385,265**
				Rounded To	**$ 386,000**
				TOTAL PRESENT WORTH	**$ 3,062,000**

Assumptions:

1. SVE pilot test cost estimate includes all labor, materials and equipment necessary to perform the SVE pilot test and to evaluate the results of the pilot test.

2. Investigation of migration pathways cost estimate includes fully evaluating all possible migration pathways into residential properties; including, but not limited to, laterals, electrical lines, phone lines, and any other possible opening into the home.

3. Mobilization/demobilization cost estimate includes mobilization and demobilization of all labor, equipment, and materials necessary to complete the alternative.

4. Preparation and trenching cost estimate includes the cost of labor, materials, and equipment necessary to remove all pavement and soil to reach the depth necessary for installation of the SVE line.

5. Transportation and disposal of excavated waste cost estimate includes the cost of transportation, and treatment and/or disposal of all soil and pavement excavated. Assumes 1,240 cubic yards of material removed and conversion of 1.7 tons per cubic yard. This cost is dependent upon the waste classification of the excavated material and assumes that the waste is classified as non-hazardous.

6. Backfill with flowable or select fill cost estimate includes the cost of labor, materials, and equipment necessary to fill all excavated areas surrounding the SVE piping with flowable and/or select fill.

7. Piping and offsite equipment cost estimate includes the cost of labor, materials, and equipment necessary to install the SVE lines running parallel with the sewer line.

8. Treatment system equipment and enclosures cost estimate includes the cost of labor, materials, and equipment necessary for installing treatment systems and enclosures at the facility, as well as connecting treatment equipment to the SVE line.

9. Permitting is the cost estimate for obtaining permits and access agreements for the construction work.

10. Road closures cost estimate includes the closure and securing all sections of road during the prescribed work period.

11. Road paving cost estimate includes the repaving of the sections of road which were removed to install the new sanitary sewer lines in compliance with applicable standards.

12. The O&M cost estimate for the SVE system includes the cost of any annual costs associated with permits, rental fees, equipment maintenance, system sampling, and utilities associated with the SVE system.

13. O&M cost estimate includes the assumed annual cost for maintenance, replacement parts, contractor repairs, electricity, and inspections for all existing mitigation systems that have currently been installed within the designated study area.

Table 10

Cost Estimate for Alternative 4 – Blanket Mitigation
Emerson Power Transmission Site
Ithaca, New York

Item No.	Description	Estimated Quantities	Units	Unit Price	Estimated Amount
Vapor Mitigation					
1	Mitigation	58	EACH	$ 18,000	$ 1,044,000
2	Post-Mitigation Air Sampling	58	EACH	$ 3,000	$ 174,000
				Subtotal Capital Costs	**$ 1,218,000**
				Administrative and Engineering (30%)	**$ 365,400**
				Contingency (20%)	**$ 243,600**
				Total Estimated Capital Cost	**$ 1,827,000**
				Rounded To	**$ 1,827,000**
Operation and Maintenance of Vapor Mitigation Systems					
3	Operation & Maintenance	105	EACH	$ 750	$ 78,750
				Subtotal O&M Costs	**$ 78,750**
				Contingency (20%)	**$ 15,750**
				Annual O&M Costs	**$ 94,500**
				Present Worth of O&M for 15 Years at 7% Discounted Rate	**$ 860,698**
				Rounded To	**$ 861,000**
				TOTAL PRESENT WORTH	**$ 2,688,000**

Assumptions:

1. The mitigation cost estimate includes the total system installation cost including all permitting fees, labor, and materials for the total number of properties in the study area.

2. The post-mitigation air sampling cost estimate includes the cost of completing air sampling in each home in which a mitigation system was installed to ensure acceptable indoor air quality.

3. O&M cost estimate includes the assumed annual cost for maintenance, replacement parts, contractor repairs, electricity, and inspections for all existing mitigation systems that have currently been installed and all mitigation systems that will be installed as part of this alternative within the designated study area.

Table 11

Cost Estimate for Alternative 5 – Air Sampling and Mitigation
Emerson Power Transmission Site
Ithaca, New York

Item No.	Description	Estimated Quantities	Units	Unit Price	Estimated Amount
Vapor Mitigation					
1	Initial Sampling Event	58	EACH	$ 3,000	$ 174,000
2	Mitigation	18	EACH	$ 18,000	$ 324,000
3	Post-Mitigation Air Sampling	18	EACH	$ 3,000	$ 54,000
				Subtotal Capital Costs	**$ 552,000**
				Administrative and Engineering (30%)	**$ 165,600**
				Contingency (20%)	**$ 110,400**
				Total Estimated Capital Cost	**$ 828,000**
				Rounded To	**$ 828,000**
Operation and Maintenance of Vapor Mitigation Systems					
4	Operation & Maintenance	65	EACH	$ 750	$ 48,750
				Subtotal O&M Costs	**$ 48,750**
				Contingency (20%)	**$ 9,750**
				Annual O&M Costs	**$ 58,500**
				Present Worth of O&M for 15 Years at 7% Discounted Rate	**$ 532,813**
				Rounded To	**$ 533,000**
Indoor Air Sampling Cost					
5	Air Sampling	40	EACH	$ 3,000	$ 120,000
				Subtotal Air Sampling Costs	**$ 120,000**
				Contingency (20%)	**$ 24,000**
				Air Sampling Costs	**$ 144,000**
				Present Worth of Air Sampling at 7% Discounted Rate	**$ 344,019**
				Rounded To	**$ 345,000**
				TOTAL PRESENT WORTH	**$ 1,706,000**

Assumptions:

1. The initial sampling event cost estimate includes the cost for sampling indoor air in the 58 residential properties in the study area that do not have installed mitigation systems or are pending the installation of mitigation systems.

2. The mitigation cost includes the total cost for installing a mitigation system, including all permitting fees, labor, and materials, under the assumption that 18 properties will be offered mitigation following the initial sampling event and based on current standards.

3. The post-mitigation air sampling cost estimate includes the cost of completing air sampling in each home in which a mitigation system was installed to ensure acceptable indoor air quality.

4. O&M cost estimate includes the assumed annual cost for maintenance, replacement parts, contractor repairs, electricity, and inspections for all existing mitigation systems that have currently been installed and all mitigation systems that will be installed as part of this alternative within the designated study area.

5. The annual air sampling cost estimate includes the cost of completing air sampling in each home not receiving a mitigation system based on the original air sampling results every three years for years one through ten, and then year fifteen (i.e. years 3, 6, 9, and 15). It is assumed that all of these homes will test clean and will not require mitigation.

Appendix A – Laboratory Data package and QA/QC Summary Report (on CD)

Data Usability Summary Report
for Soil Vapor Study along Sanitary Sewer
EPT facility
Ithaca, New York
July 29 and 30, 2008

Introduction

This Data Usability Summary Report (DUSR) includes 16 soil vapor samples and a trip blank collected near the Emerson Power Transmission Facility in Ithaca, New York, from July 29 and 30, 2008. The samples were analyzed by Centek Laboratories, LLC of Syracuse, New York, for volatile organic compounds (VOCs), by U.S. Environmental Protection Agency (EPA) Method TO-15. The data were reviewed in accordance with the method and chain-of-custody criteria outlined in the National Functional Guidelines of Organic (October 1999) Data Review. The validated soil vapor analytical results are presented in Table 1 of the South Hill Sanitary Sewer Network Alternatives Analysis Report.

Volatile Organic Compounds

Sixteen soil vapor samples and a trip blank were analyzed for VOCs by EPA Method TO-15. The data were reviewed for surrogate recovery, matrix spike/matrix spike duplicate (MS/MSD) recovery, blank contamination, instrument performance, calibration, and calculation criteria. The data satisfied the criteria for MS/MSD recovery, blank contamination, instrument performance and calculation.

The positive or non-detectable results for several analytes were qualified “C”, as estimated because of exceedences in the continuing calibrations. Several positive sample results were qualified “I”, as estimated, because of elevated internal standard recoveries. Several positive sample results were qualified “S”, as estimated, because of elevated surrogate standard recovery.

Overall Assessment of the Data

The data presented are acceptable as qualified for site characterization activities.