



C&S Companies
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www.cscos.com

MEMORANDUM

SUB-SLAB SOIL VAPOR RESULTS

TO: Anthony L. Lopes, P.E.

FROM: Cody Martin

RE: 1360 Niagara Street Site
BCP Site No. C915302

FILE: C&S Project No. E67.018.002

DATE: July 20, 2017

C&S Engineers, Inc. (C&S) is providing this memorandum to present sub-slab soil vapor sampling results for the 1360 Niagara Street Site (BCP Site No. C915302). The work was conducted as per the New York State Department of Environmental Conservation's request and in an effort to more specifically document and demonstrate the condition of sub-slab soil vapor. Following the release of chlorinated solvents, the adjacent Chem-core Site was the subject of various remedial actions. The remedial action plan and protocol for the Chem-core Site was successful in removing all existing contaminated soils and the temporary operation of a groundwater pump and treatment system provided further reduction in contaminant concentrations in the groundwater. However, due to certain chlorinated solvents having been captured within the fractured bedrock positioned approximately 25 feet below ground surface, concentrations and sources of existing contamination are not accessible and cannot be extracted.

Methodology

On July 10, 2017 C&S collected sub-slab soil vapor samples inside the former Mentholatum Building. Samples were collected from locations described in the Sub-Slab Soil Vapor Work Plan dated June 23, 2017. **Figures 1 and 2** shows the locations of the samples and **Table 1** summarizes the analytical results.

One sub-slab air sample was collected within the basement/parking garage along the northern property line, and two samples were collected at the northern section of the single story slab-on-grade addition to the building. **Figures 1 and 2** shows the sample locations. The following approach was used to collect the sub-slab samples:

-) A hammer drill was used to puncture ½ inch hole through the concrete slab floor at the three locations shown on Figures 1 and 2.
-) Polyethylene tubing was inserted one to two inches into each hole and the floor penetration around the tubing will be sealed at each location using soft, pliable, VOC-free clay.
-) An enclosure was constructed around the sub-slab sampling point (e.g., plastic bag, plastic

SUB-SLAB SOIL VAPOR RESULTS

1360 Niagara Street Site

July 20, 2017

Page 2

bucket, etc.) and sealed to the sample point tubing in order to perform a tracer gas evaluation.

-) Each sub-slab sampling point was purged of 3 tubing volumes at a rate not to exceed 0.2 L/m to ensure that a representative sample of soil vapor will be obtained.
-) At the end of sampling, at least one inch of vacuum was left in the summa canister to meet data quality objectives.
-) After removing the tubing from holes in the floor, the floor was repaired with a quick drying cement mixture.

Results and Conclusions

Table 1 summarizes chlorinated volatile organic compound (CVOC) results regulated by the New York State Department of Health (NYSDOH). **Attachment 1** provides the laboratory analytical report. NYSDOH organizes CVOC standards in matrices based on analytes detected in sub-slab and indoor air samples (provided in **Attachment 2**). Indoor air samples were not requested for this assessment. Moreover, the building is undergoing major renovations; collecting indoor air samples at this time would not accurately represent the future indoor atmosphere while the building is occupied by tenants. Some CVOCs were detected in sub-slab samples; however, these concentrations are low and, based on the NYSDOH matrices, would not require further action.

These results corroborate an earlier study at the Site. On October 3, 2015 Watts Architecture & Engineering collected two air samples from the basement. A sub-slab sample was collected in the northwestern portion of the basement in the Boiler Room and an indoor air sample was collected at the northeastern portion of the basement. These samples were collected prior to renovations and when the building was operated by Garrett Leather. One analyte, methylene chloride, was detected in the indoor air sample above NYSDOH guidance; however, as noted in the Watts Report, the basement was used as wood shop and machine shop. Chemicals used in these areas could have impacted the indoor air sample. Additionally, methylene chloride is not one of the CVOCs of concern at the Chem-core Site.

Based on the previous indoor air sampling and the recent sub-slab vapor sampling, soil vapor intrusion is not a concern at the Site.

The likely reasons for the lack of soil vapor intrusion impacts at the Site relate to the depth of groundwater and the Site's geology. **Figures 3, 4 and 5** presents geological cross-sections of the Site. The following can be ascertained from the geological cross-sections:

-) Water levels are generally 25 feet below ground surface.
-) Top of bedrock is generally 10 – 11 feet below ground surface.
-) The water table exists approximately 15 feet into the bedrock.
-) Over the bedrock is dense clay soil that is approximately 6 – 8 feet thick.

SUB-SLAB SOIL VAPOR RESULTS

1360 Niagara Street Site

July 20, 2017

Page 3

The remaining contamination from the Chem-core Site is limited to the groundwater located in the fractured bedrock. Considering the depth of groundwater and dense impermeable clay layer over top of the bedrock, it is reasonable to conclude these geological characteristics will greatly reduce the potential for soil vapor intrusion from contaminated groundwater.

Figure 6 shows analytical results from groundwater monitoring conducted from July 2009 to June 2014. Groundwater monitoring during this time frame indicates significant reductions in CVOC concentrations on the 1360 Niagara Street Site; however, extremely high concentrations still exist on the Chem-core Site. The most recent groundwater sampling conducted by C&S indicates at the 1360 Niagara Street Site, many CVOC concentrations have significantly decreased.

The BCP Volunteer at the 1360 Niagara Street Site is intending to complete a Track 1 Cleanup at the Site. The present conditions at the Site support the conclusion that soil vapor intrusion for the Site will not be a health risk or concern in the future for the following reasons:

-) All SVI testing to date has shown no CVOC levels in excess of DOH action levels.
-) There are no sources of CVOCs on site.
-) There is no potable water use in the City of Buffalo.
-) The deep groundwater in bedrock and impermeable clay layer will act as a significant barrier to vapor intrusion.
-) The present project planned for the Site has a parking level at the ground floor, thus also eliminating soil vapor concerns for this building.

We respectfully request the Department's review of the soil vapor results contained herein. Please do not hesitate to contact us with any questions or comments.

Very truly yours,

C&S ENGINEERS, INC.



Cody Martin
Environmental Scientist



Daniel E. Riker, P.G.
Managing Geologist

SUB-SLAB SOIL VAPOR RESULTS

1360 Niagara Street Site

July 20, 2017

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Enclosed:

Figure 1 – Sub-slab Soil Vapor Sample Locations

Figure 2 – Sub-slab Soil Vapor Sample Locations

Figure 3 – Geological Cross-Section Locations

Figure 4 – Geological Cross-Section A – A'

Figure 5 – Geological Cross-Section B – B'

Figure 6 – Historic Groundwater Monitoring Data

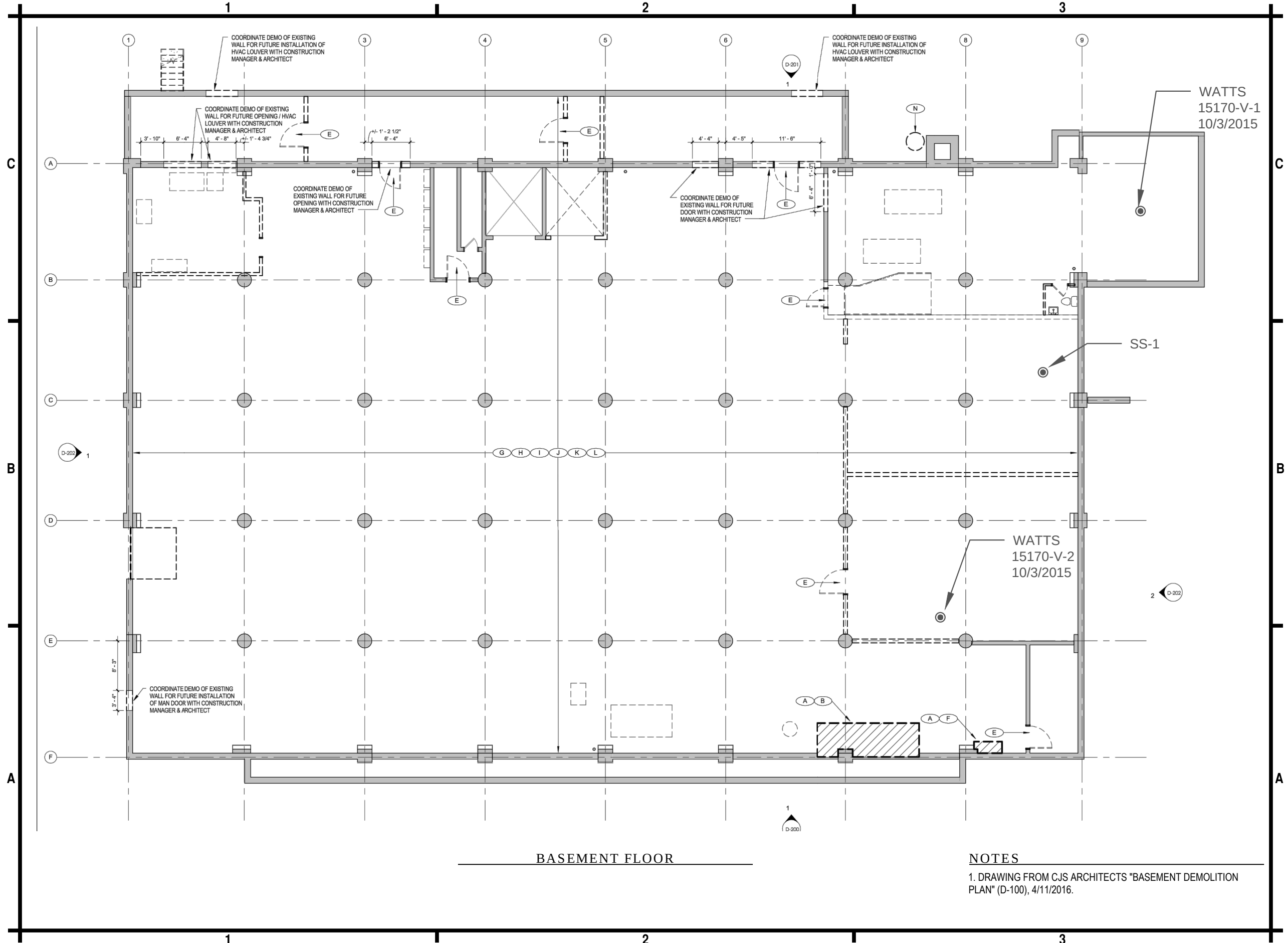
Table 1 – Soil Vapor Analytical Results

Attachment 1 – Laboratory Analytical Report

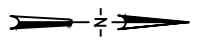
Attachment 2 – May 2017 NYSDOH Matrices

f:\project\67 - ciminelli development\67.018.002 - garrett leather bcp project\remediation\correspondence\memo - soil results.docx

F:\Project\IE67 - Ciminelli Development\IE67.018.002 - Garrett Leather BCP Project\Planning-Study\CADD\1 SOIL VAPOR SAMPLE LOCATIONS.dwg



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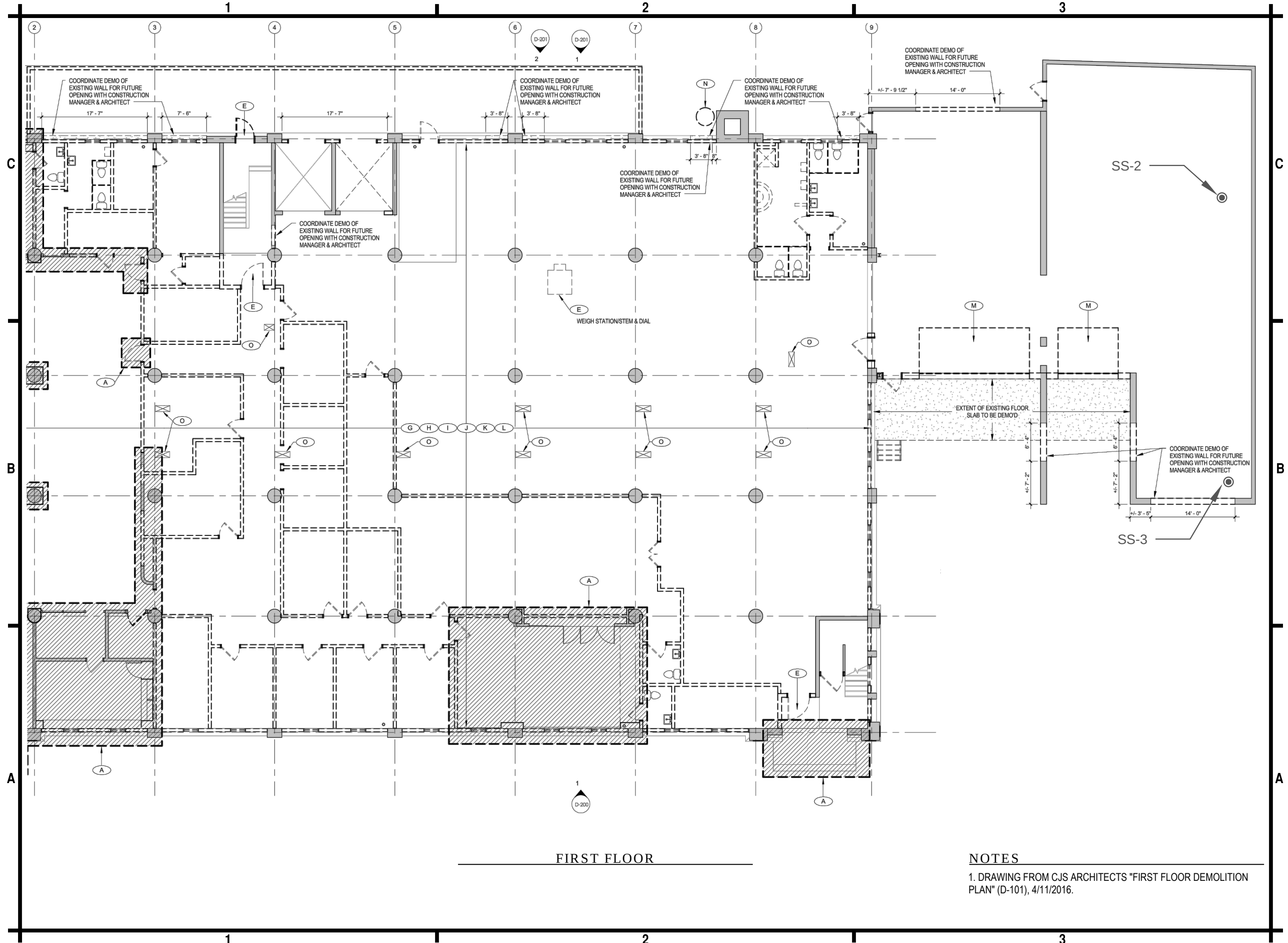
1360 NIAGARA STREET
REMEDIATION INVESTIGATION
BUFFALO, NEW YORK

MARK	DATE	DESCRIPTION
REVISIONS		
PROJECT NO: E67.018.002		
DATE: JULY 18, 2017		
DRAWN BY: C. MARTIN		
DESIGNED BY: C. MARTIN		
CHECKED BY: D. RIKER		
NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK EDUCATION LAW		

SUB-SLAB SOIL
VAPOR SAMPLING
LOCATIONS

FIGURE 1

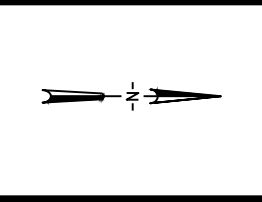
F:\Project\IE67 - Ciminelli Development\IE67.018.002 - Garrett Leather BCP Project\Planning-Study\CADD\2 SOIL VAPOR SAMPLE LOCATIONS.dwg



NOTES
1. DRAWING FROM CJS ARCHITECTS "FIRST FLOOR DEMOLITION PLAN" (D-101), 4/11/2016.



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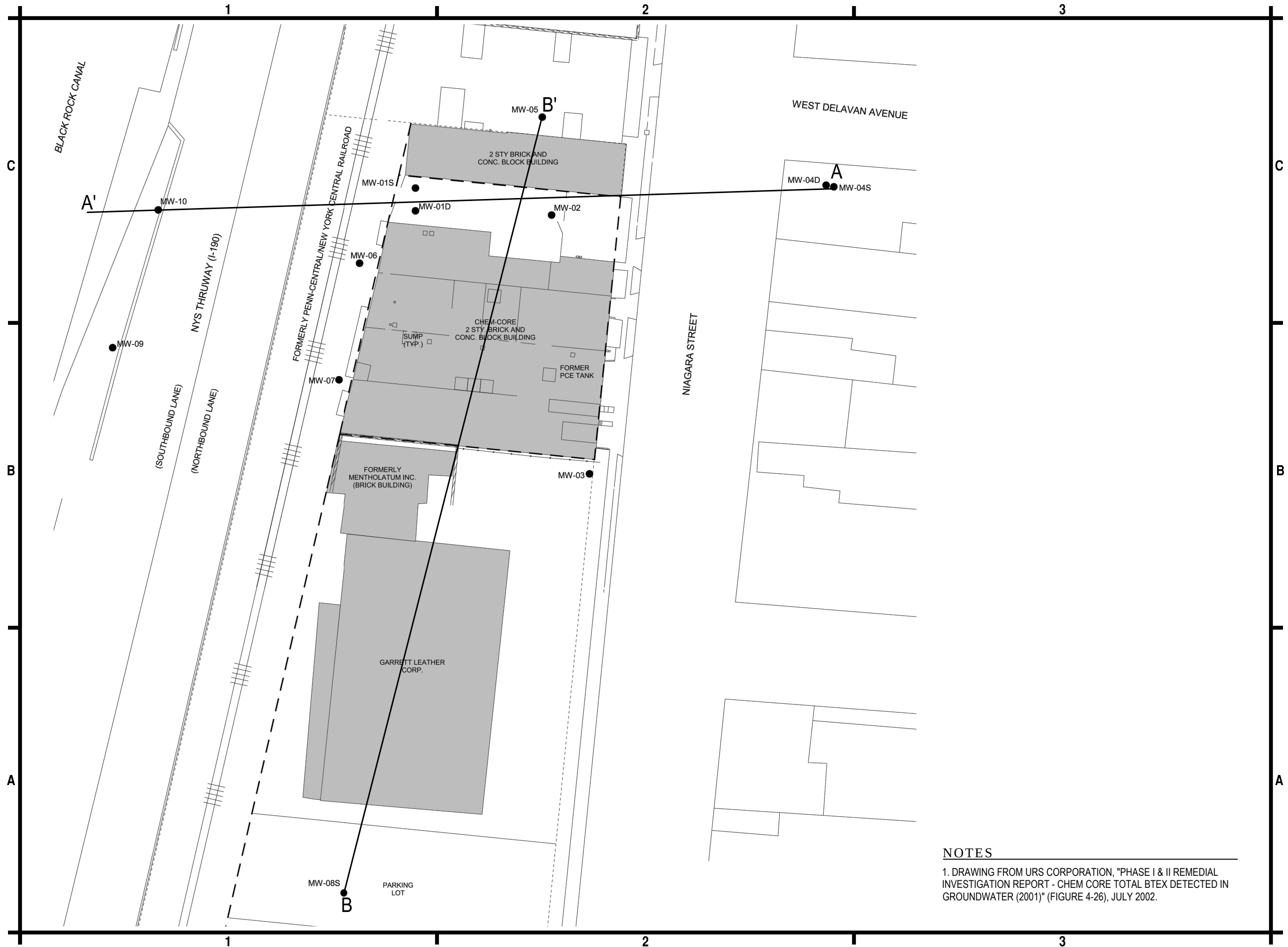
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SUB-SLAB SOIL
VAPOR SAMPLING
LOCATIONS

FIGURE 2

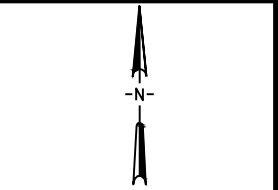
F:\Project\IE67 - Ciminelli Development\IE67.018.002 - Garrett Leather BCP Project\Planning-Study\CADD\13 CROSS-SECTION LOCATIONS.dwg



NOTES

1. DRAWING FROM URS CORPORATION, "PHASE I & II REMEDIAL INVESTIGATION REPORT - CHEM CORE TOTAL BTX DETECTED IN GROUNDWATER (2001)" (FIGURE 4-26), JULY 2002.

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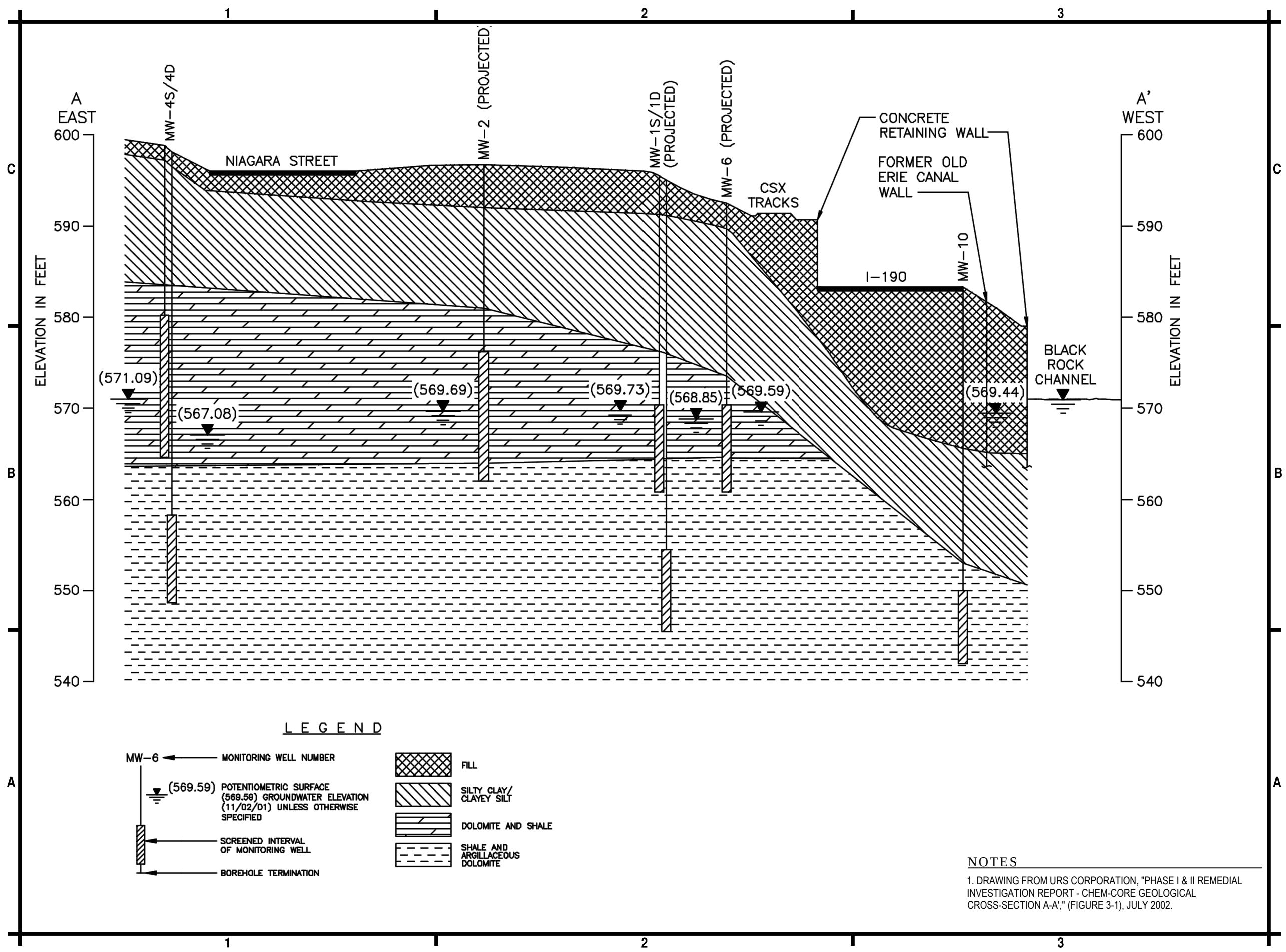
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CROSS-SECTION
LOCATIONS

FIGURE 3

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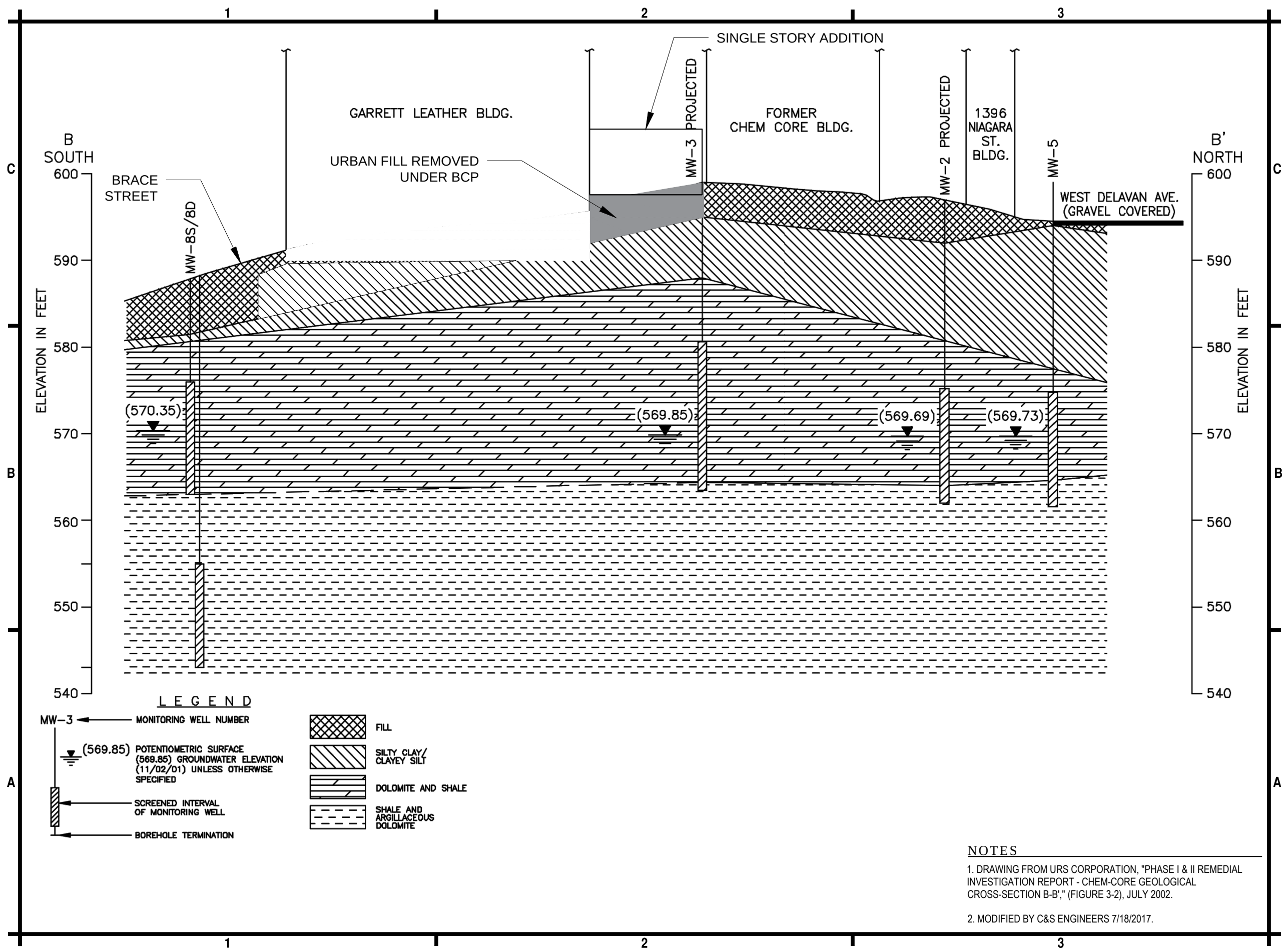
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GEOLOGICAL
CROSS-SECTION
A - A'

FIGURE 4

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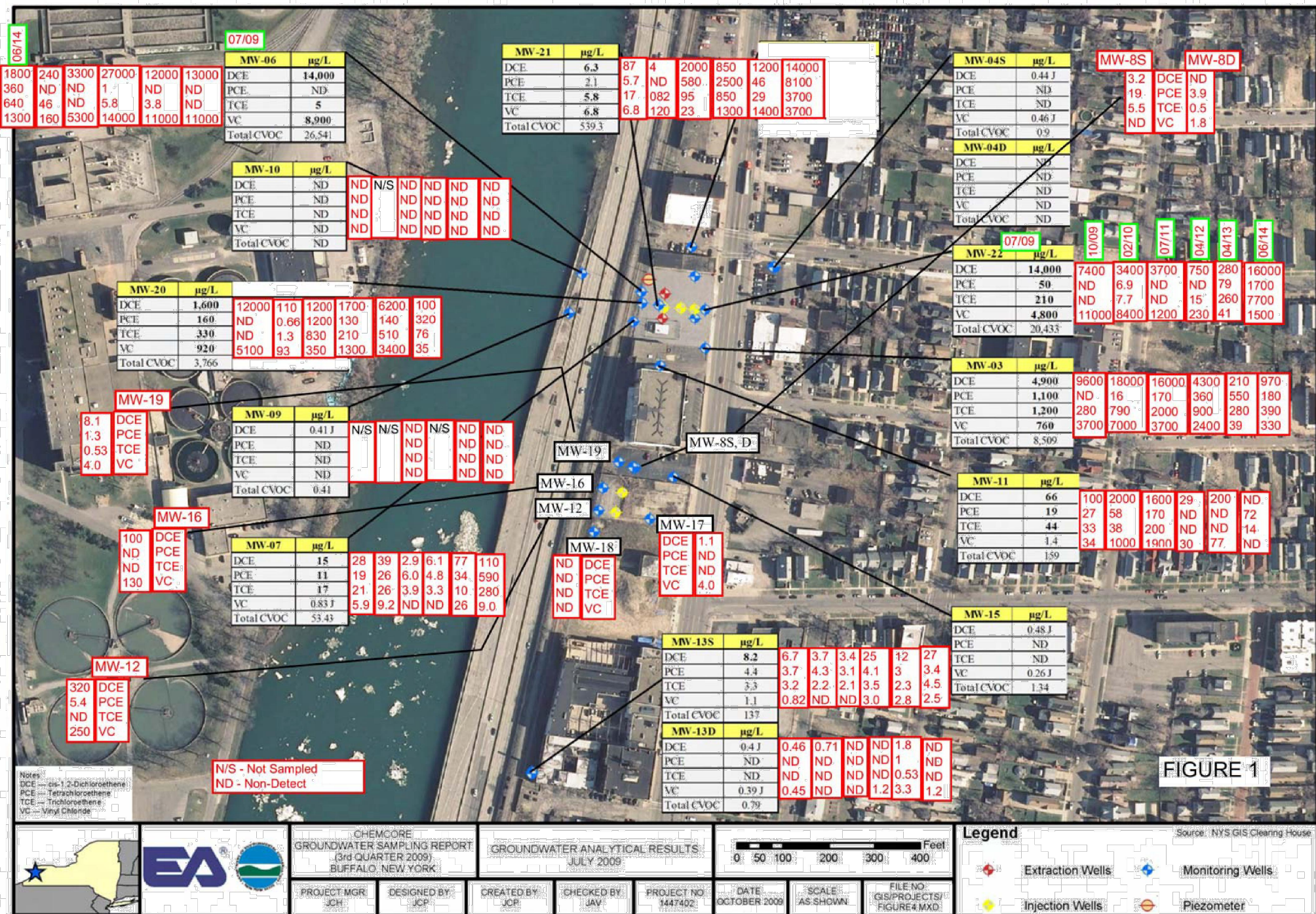
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GEOLOGICAL
CROSS-SECTION
B - B'

FIGURE 5

F:\Project\IE67 - Ciminelli Development\IE67 018.002 - Garrett Leather BCP Project\Planning-Study\CADD\6 CVOC DATA.dwg



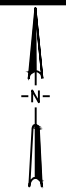
The pump and treat system was turned off in Sept. 2011 after approximately five years of operation. The November 2011 injections were done in 3 infiltration galleries (1 drum each) and MW-3, 6, 11, 20 (1 drum equally distributed). August 2012 injections were done in 3 infiltration galleries (1 drum each); MW-3, 6, 20, 21 and 22 (1.5 drum equally distributed) and MW-11, 12, 16 and 19 (0.5 drum equally distributed). June 2013 injections were in 3 infiltration galleries (2 drums each), MW-6, 20 and 21 (two drums each), MW-3 and 22 (one drum each), and MW-7, 11, 12, 16 and 19 (0.5 drum each).

NOTES

1. DRAWING FROM EMPIRE GEOSERVICES, INC., "APRIL 2013 EVALUATION OF POST-TREATMENT GROUNDWATER DATA," SEPTEMBER 25, 2014.



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HISTORIC
GROUNDWATER
MONITORING DATA

FIGURE 6

**TABLE 1: SOIL VAPOR SAMPLING
1360 NIAGARA STREET REMEDIAL INVESTIGATION
BUFFALO, NEW YORK**

Location ID	SS-1	SS-2	SS-3	15170-V-1 (Boiler Room)	15170-V-2 (Basement)
Sample Depth	Beneath Slab	Beneath Slab	Beneath Slab	Beneath Slab	Indoor Air
Date Sampled	02/21/2017	02/21/2017	02/21/2017	10/03/2015	10/03/2015
Sample Matrix	Air	Air	Air	Air	Air
Units	ug/m ³	ug/m ³	ug/m ³	ug/m ³	ug/m ³
VOCs					
1,1,1-Trichloroethane	6.7	0.82	1.7	--	--
1,1-Dichloroethene	ND	ND	ND	--	--
Cis-1,2-Dichloroethylene	ND	ND	ND	--	--
Carbon Tetrachloride	1	0.69	0.69	ND	0.415
Methylene Chloride	4.2	3.2	3.2	13.2	18.4
Tetrachloroethylene (PCE)	6.2	4.8	5	7.12	5.99
Trichloroethylene (TCE)	ND	1	2	ND	0.129
Vinyl Chloride	ND	ND	ND	0.752	ND

Analytical Data compared to Part 375 Standards and DER-10

ND indicates analyte was not detected.

Blank space indicates analyte was not analyzed for in that sample.

Only analytes detected in at least one sample are shown.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than MDL. The concentration given is an approximate value.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%. (Organics) - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference. (Inorganics) - The sample/duplicate %RPD was above the control limit.

D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

M - Matrix spike recoveries outside QC limits. Matrix bias indicated.



CENTEK LABORATORIES, LLC

143 Midler Park Drive * Syracuse, NY 13206

Phone (315) 431-9730 * Emergency 24/7 (315) 416-2752

NYSDOH ELAP

Certificate No. 11830

Analytical Report

Cody Martin
C&S Companies
141 Elm St., Suite 100
Buffalo, NY 14203

Friday, July 14, 2017
Order No.: C1707032

TEL: (716) 847-1630

FAX

RE: 1360 Niagara St

Dear Cody Martin:

Centek Laboratories, LLC received 3 sample(s) on 7/13/2017 for the analyses presented in the following report.

I certify that this data package is in compliance with the terms and conditions of the Contract, both technically and for completeness. Release of the data contained in this hardcopy data package and/or in the computer readable data submitted has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Centek Laboratories performs all analyses according to EPA, NIOSH or OSHA-approved analytical methods. Centek Laboratories is dedicated to providing quality analyses and exceptional customer service. All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objective except as indicated in the case narrative. All samples were received and analyzed within the EPA recommended holding times. Test results are not Method Blank (MB) corrected for contamination.

We do our best to make our reporting format clear and understandable and hope you are thoroughly satisfied with our services. Please contact your client service representative at (315) 431-9730 or myself, if you would like any additional information regarding this report.

Thank you for using Centek Laboratories. This report can not be reproduced except in its entirety, without prior written authorization.

Sincerely,

William Dobbin
Lead Technical Director

Disclaimer: The test results and procedures utilized, and laboratory interpretations of the data obtained by Centek as contained in this report are believed by Centek to be accurate and reliable

for sample(s) tested. In accepting this report, the customer agrees that the full extent of any and all liability for actual and consequential damages of Centek for the services performed shall be equal to the fee charged to the customer for the services as liquidated damages. ELAP does not offer certification for the following parameters by this method at present time, they are: 4-ethyltoluene, ethyl acetate, propylene, tetrahydrofuran, 4-PCH, sulfur derived and silicon series compounds.

Centek Laboratories, LLC Terms and Conditions

Sample Submission

All samples sent to Centek Laboratories should be accompanied by our Request for Analysis Form or Chain of Custody Form. A Chain of Custody will be provided with each order shipped for all sampling events, or if needed, one is available at our website www.CentekLabs.com. Samples received after 3:00pm are considered to be a part of the next day's business.

Sample Media

Samples can be collected in an canister or a Tedlar bag. Depending on your analytical needs, Centek Laboratories may receive a bulk, liquid, soil or other matrix sample for headspace analysis.

Blanks

Every sample is run with a surrogate or tracer compound at a pre-established concentration. The surrogate compound run with each sample is used as a standard to measure the performance of each run of the instrument. If required, a Minican can be provided containing nitrogen to be run as a trip blank with your samples.

Sampling Equipment

Centek Laboratories will be happy to provide the canisters to carry-out your sampling event at no charge. The necessary accessories, such as regulators, tubing or personal sampling belts, are also provided to meet your sampling needs. The customer is responsible for all shipping charges to the client's destination and return shipping to the laboratory. Client assumes all responsibility for lost, stolen and any damages of equipment.

Turn Around time (TAT)

Centek Laboratories will provide results to its clients in one business-week by 6:00pm EST after receipt of samples. For example, if samples are received on a Monday they are due on the following Monday by 6:00pm EST. Results are faxed or emailed to the requested location indicated on the Chain of Custody. Non-routine analysis may require more than the one business-week turnaround time. Please confirm non-routine sample turnaround times.

Reporting

Results are emailed or faxed at no additional charge. A hard copy of the result report is mailed within 24 hours of the faxing or emailing of your results. Cat "B" like packages are within 3-4 weeks from time of analysis. Standard Electronic Disk Deliverables (EDD) is also available at no additional charge.

Payment Terms

Payment for all purchases shall be due within 30 days from date of invoice. The client agrees to pay a finance charge of 1.5% per month on the overdue balance and cost of collection, including attorney fees, if collection proceedings are necessary. You must have a completed credit

application on file to extend credit. Purchase orders or checks information must be submitted for us to release results

Rush Turnaround Samples

Expedited turn around times is available. Please confirm rush turnaround times with Client Services before submitting samples.

Applicable Surcharges for Rush Turnaround Samples:

Same day TAT = 200%

Next business day TAT by Noon = 150%

Next business day TAT by 6:00pm = 100%

Second business day TAT by 6:00pm = 75%

Third business day TAT by 6:00pm = 50%

Fourth business day TAT by 6:00pm = 35%

Fifth business day = Standard

Statement of Confidentiality

Centek Laboratories, LLC is aware of the importance of the confidentiality of results to many of our clients. Your name and data will be held in the strictest of confidence. We will not accept business that may constitute a conflict of interest. We commonly sign Confidential Nondisclosure Agreements with clients prior to beginning work. All research, results and reports will be kept strictly confidential. Secrecy Agreements and Disclosure Statements will be signed for the client if so specified. Results will be provided only to the addressee specified on the Chain of Custody Form submitted with the samples unless law requires release. Written permission is required from the addressee to release results to any other party.

Limitation on Liability

Centek Laboratories, LLC warrants the test results to be accurate to the methodology and sample type for each sample submitted to Centek Laboratories, LLC. In no event shall Centek Laboratories, LLC be liable for direct, indirect, special, punitive, incidental, exemplary or consequential damages, or any damages whatsoever, even if Centek Laboratories, LLC has been previously advised of the possibility of such damages whether in an action under contract, negligence, or any other theory, arising out of or in connection with the use, inability to use or performance of the information, services, products and materials available from the laboratory or this site. These limitations shall apply notwithstanding any failure of essential purpose of any limited remedy. Because some jurisdictions do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of liability for consequential or incidental damages, the above limitations may not apply to you. This is a comprehensive limitation of liability that applies to all damages of any kind, including (without limitation) compensatory, direct, indirect or consequential damages, loss of data, income or profit and or loss of or damage to property and claims of third parties.



CENTEK LABORATORIES, LLC

Date: 18-Jul-17

CLIENT: C&S Companies

Project: 1360 Niagara St

Lab Order: C1707032

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Centek Laboratories, LLC SOP TS-80

Compendium of Methods for the Determination of Toxic Organic Compounds, Compendium Method TO-15, January 1999

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objective except as indicated in the corrective action report(s). All samples were received and analyzed within the EPA recommended holding times. Test results are not Method Blank (MB) corrected for contamination.

NYSDEC ASP samples:

Canisters should be evacuated to a reading of less than or equal to 50 millitorr prior to shipment to sampling personnel. The vacuum in the canister will be field checked prior to sampling, and must read 28" of Hg (± 2 ", vacuum, absolute) before a sample can be collected. After the sample has been collected, the pressure of the canister will be read and recorded again, and must be 5" of Hg (± 1 ", vacuum, absolute) for the sample to be valid. Once received at the laboratory, the canister vacuum should be confirmed to be 5" of Hg, ± 1 ". Please record and report the pressure/vacuum of received canisters on the sample receipt paperwork. A pressure/vacuum reading should also be taken just prior to the withdrawal of sample from the canister, and recorded on the sample preparation log sheet. All regulators are calibrated to meet these requirements before they leave the laboratory. However, due to environmental conditions and use of the equipment Centek can not guarantee that this criteria can always be achieved.



CENTEK LABORATORIES, LLC

Sample Receipt Checklist

Client Name C&S - BUFFALO

Date and Time Receive

7/13/2017

Work Order Number C1707032

Received by JDS

Checklist completed by

Signature

Date

Reviewed by

Initials

Date

Matrix:

Carrier name FedEx Ground

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☐

No ☐

Not Present ☒

Custody seals intact on sample bottles?

Yes ☐

No ☐

Not Present ☒

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Container/Temp Blank temperature in compliance?

Yes ☒

No ☐

Water - VOA vials have zero headspace?

No VOA vials submitted ☒

Yes ☐

No ☐

Water - pH acceptable upon receipt?

Yes ☐

No ☒

Adjusted?

Checked by

Any No and/or NA (not applicable) response must be detailed in the comments section below

Client contacted

Date contacted:

Person contacted

Contacted by:

Regarding:

Comments:

Corrective Action



CEN TEK LABORATORIES, LLC

Date: 18-Jul-17

CLIENT: C&S Companies
Project: 1360 Niagara St
Lab Order: C1707032

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
C1707032-001A	SS-1-071017	569,449	7/10/2017	7/13/2017
C1707032-002A	SS-2-071017	360,456	7/10/2017	7/13/2017
C1707032-003A	SS-3-071017	285,437	7/10/2017	7/13/2017

Lab Order: C1707032
Client: C&S Companies
Project: 1360 Niagara St

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCCLP Date	Prep Date	Analysis Date
C1707032-001A	SS-1-071017	7/10/2017	Air	lug/M3 by Method TO15			7/14/2017
C1707032-002A	SS-2-071017			lug/M3 by Method TO15			7/14/2017
				lug/M3 by Method TO15			7/14/2017
				lug/M3 by Method TO15			7/14/2017
C1707032-003A	SS-3-071017			lug/M3 by Method TO15			7/14/2017
				lug/M3 by Method TO15			7/14/2017
				lug/M3 by Method TO15			7/14/2017

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-001A

Client Sample ID: SS-1-071017
Tag Number: 569,449
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
FIELD PARAMETERS		FLD		Analyst:		
Lab Vacuum In	-4			"Hg		7/13/2017
Lab Vacuum Out	-30			"Hg		7/13/2017
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
1,1,1-Trichloroethane	1.2	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,1,2,2-Tetrachloroethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,1,2-Trichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,1-Dichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,1-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,2,4-Trichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,2,4-Trimethylbenzene	3.6	3.0		ppbV	20	7/14/2017 12:34:00 PM
1,2-Dibromoethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,2-Dichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,2-Dichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,2-Dichloropropane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,3,5-Trimethylbenzene	1.2	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,3-butadiene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,3-Dichlorobenzene	0.20	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,4-Dichlorobenzene	0.21	0.15		ppbV	1	7/14/2017 10:36:00 AM
1,4-Dioxane	< 0.30	0.30		ppbV	1	7/14/2017 10:36:00 AM
2,2,4-trimethylpentane	1.7	0.15		ppbV	1	7/14/2017 10:36:00 AM
4-ethyltoluene	0.79	0.15		ppbV	1	7/14/2017 10:36:00 AM
Acetone	39	6.0		ppbV	20	7/14/2017 12:34:00 PM
Allyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Benzene	3.2	3.0		ppbV	20	7/14/2017 12:34:00 PM
Benzyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Bromodichloromethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Bromoform	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Bromomethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Carbon disulfide	7.6	3.0		ppbV	20	7/14/2017 12:34:00 PM
Carbon tetrachloride	0.16	0.15		ppbV	1	7/14/2017 10:36:00 AM
Chlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Chloroethane	0.36	0.15		ppbV	1	7/14/2017 10:36:00 AM
Chloroform	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Chloromethane	0.35	0.15		ppbV	1	7/14/2017 10:36:00 AM
cis-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
cis-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Cyclohexane	5.0	3.0		ppbV	20	7/14/2017 12:34:00 PM
Dibromochloromethane	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Ethyl acetate	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-001A

Client Sample ID: SS-1-071017
Tag Number: 569,449
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15			TO-15		Analyst: RJP	
Ethylbenzene	1.8	0.15		ppbV	1	7/14/2017 10:36:00 AM
Freon 11	0.43	0.15		ppbV	1	7/14/2017 10:36:00 AM
Freon 113	0.36	0.15		ppbV	1	7/14/2017 10:36:00 AM
Freon 114	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Freon 12	0.57	0.15		ppbV	1	7/14/2017 10:36:00 AM
Heptane	5.6	3.0		ppbV	20	7/14/2017 12:34:00 PM
Hexachloro-1,3-butadiene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Hexane	7.0	3.0		ppbV	20	7/14/2017 12:34:00 PM
Isopropyl alcohol	4.4	3.0		ppbV	20	7/14/2017 12:34:00 PM
m&p-Xylene	9.0	6.0		ppbV	20	7/14/2017 12:34:00 PM
Methyl Butyl Ketone	< 0.30	0.30		ppbV	1	7/14/2017 10:36:00 AM
Methyl Ethyl Ketone	39	6.0		ppbV	20	7/14/2017 12:34:00 PM
Methyl Isobutyl Ketone	1.5	0.30		ppbV	1	7/14/2017 10:36:00 AM
Methyl tert-butyl ether	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Methylene chloride	1.2	0.15		ppbV	1	7/14/2017 10:36:00 AM
o-Xylene	3.4	3.0		ppbV	20	7/14/2017 12:34:00 PM
Propylene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Styrene	3.6	3.0		ppbV	20	7/14/2017 12:34:00 PM
Tetrachloroethylene	0.92	0.15		ppbV	1	7/14/2017 10:36:00 AM
Tetrahydrofuran	1.3	0.15		ppbV	1	7/14/2017 10:36:00 AM
Toluene	7.4	0.15		ppbV	1	7/14/2017 10:36:00 AM
trans-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
trans-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Trichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Vinyl acetate	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Vinyl Bromide	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Vinyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 10:36:00 AM
Surr: Bromofluorobenzene	117	70-130		%REC	1	7/14/2017 10:36:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-002A

Client Sample ID: SS-2-071017
Tag Number: 360,456
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
FIELD PARAMETERS		FLD		Analyst:		
Lab Vacuum In	-1			"Hg		7/13/2017
Lab Vacuum Out	-30			"Hg		7/13/2017
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
1,1,1-Trichloroethane	0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,1,2,2-Tetrachloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,1,2-Trichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,1-Dichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,1-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,2,4-Trichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,2,4-Trimethylbenzene	3.6	3.0		ppbV	20	7/14/2017 1:10:00 PM
1,2-Dibromoethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,2-Dichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,2-Dichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,2-Dichloropropane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,3,5-Trimethylbenzene	1.0	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,3-butadiene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,3-Dichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,4-Dichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
1,4-Dioxane	< 0.30	0.30		ppbV	1	7/14/2017 11:16:00 AM
2,2,4-trimethylpentane	3.6	3.0		ppbV	20	7/14/2017 1:10:00 PM
4-ethyltoluene	0.72	0.15		ppbV	1	7/14/2017 11:16:00 AM
Acetone	45	6.0		ppbV	20	7/14/2017 1:10:00 PM
Allyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Benzene	1.4	0.15		ppbV	1	7/14/2017 11:16:00 AM
Benzyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Bromodichloromethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Bromoform	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Bromomethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Carbon disulfide	5.2	3.0		ppbV	20	7/14/2017 1:10:00 PM
Carbon tetrachloride	0.11	0.15	J	ppbV	1	7/14/2017 11:16:00 AM
Chlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Chloroethane	0.38	0.15		ppbV	1	7/14/2017 11:16:00 AM
Chloroform	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Chloromethane	0.56	0.15		ppbV	1	7/14/2017 11:16:00 AM
cis-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
cis-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Cyclohexane	8.4	3.0		ppbV	20	7/14/2017 1:10:00 PM
Dibromochloromethane	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Ethyl acetate	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-002A

Client Sample ID: SS-2-071017
Tag Number: 360,456
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
Ethylbenzene	1.9	0.15		ppbV	1	7/14/2017 11:16:00 AM
Freon 11	0.24	0.15		ppbV	1	7/14/2017 11:16:00 AM
Freon 113	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Freon 114	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Freon 12	0.54	0.15		ppbV	1	7/14/2017 11:16:00 AM
Heptane	7.6	3.0		ppbV	20	7/14/2017 1:10:00 PM
Hexachloro-1,3-butadiene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Hexane	10	3.0		ppbV	20	7/14/2017 1:10:00 PM
Isopropyl alcohol	2.8	3.0	J	ppbV	20	7/14/2017 1:10:00 PM
m&p-Xylene	7.2	6.0		ppbV	20	7/14/2017 1:10:00 PM
Methyl Butyl Ketone	6.0	6.0		ppbV	20	7/14/2017 1:10:00 PM
Methyl Ethyl Ketone	40	6.0		ppbV	20	7/14/2017 1:10:00 PM
Methyl Isobutyl Ketone	< 0.30	0.30		ppbV	1	7/14/2017 11:16:00 AM
Methyl tert-butyl ether	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Methylene chloride	0.93	0.15		ppbV	1	7/14/2017 11:16:00 AM
o-Xylene	3.2	3.0		ppbV	20	7/14/2017 1:10:00 PM
Propylene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Styrene	4.2	3.0		ppbV	20	7/14/2017 1:10:00 PM
Tetrachloroethylene	0.71	0.15		ppbV	1	7/14/2017 11:16:00 AM
Tetrahydrofuran	4.0	3.0		ppbV	20	7/14/2017 1:10:00 PM
Toluene	8.0	3.0		ppbV	20	7/14/2017 1:10:00 PM
trans-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
trans-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Trichloroethene	0.19	0.15		ppbV	1	7/14/2017 11:16:00 AM
Vinyl acetate	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Vinyl Bromide	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Vinyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 11:16:00 AM
Surr: Bromofluorobenzene	115	70-130		%REC	1	7/14/2017 11:16:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-003A

Client Sample ID: SS-3-071017
Tag Number: 285,437
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
FIELD PARAMETERS		FLD		Analyst:		
Lab Vacuum In	-2			"Hg		7/13/2017
Lab Vacuum Out	-30			"Hg		7/13/2017
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
1,1,1-Trichloroethane	0.31	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,1,2,2-Tetrachloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,1,2-Trichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,1-Dichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,1-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,2,4-Trichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,2,4-Trimethylbenzene	3.4	1.5		ppbV	10	7/14/2017 1:47:00 PM
1,2-Dibromoethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,2-Dichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,2-Dichloroethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,2-Dichloropropane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,3,5-Trimethylbenzene	0.99	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,3-butadiene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,3-Dichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,4-Dichlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
1,4-Dioxane	< 0.30	0.30		ppbV	1	7/14/2017 11:57:00 AM
2,2,4-trimethylpentane	4.3	1.5		ppbV	10	7/14/2017 1:47:00 PM
4-ethyltoluene	0.69	0.15		ppbV	1	7/14/2017 11:57:00 AM
Acetone	76	12		ppbV	40	7/14/2017 2:23:00 PM
Allyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Benzene	1.9	0.15		ppbV	1	7/14/2017 11:57:00 AM
Benzyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Bromodichloromethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Bromoform	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Bromomethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Carbon disulfide	4.7	1.5		ppbV	10	7/14/2017 1:47:00 PM
Carbon tetrachloride	0.11	0.15	J	ppbV	1	7/14/2017 11:57:00 AM
Chlorobenzene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Chloroethane	0.41	0.15		ppbV	1	7/14/2017 11:57:00 AM
Chloroform	0.10	0.15	J	ppbV	1	7/14/2017 11:57:00 AM
Chloromethane	0.39	0.15		ppbV	1	7/14/2017 11:57:00 AM
cis-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
cis-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Cyclohexane	21	1.5		ppbV	10	7/14/2017 1:47:00 PM
Dibromochloromethane	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Ethyl acetate	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-003A

Client Sample ID: SS-3-071017
Tag Number: 285,437
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15			TO-15		Analyst: RJP	
Ethylbenzene	1.9	0.15		ppbV	1	7/14/2017 11:57:00 AM
Freon 11	0.24	0.15		ppbV	1	7/14/2017 11:57:00 AM
Freon 113	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Freon 114	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Freon 12	0.51	0.15		ppbV	1	7/14/2017 11:57:00 AM
Heptane	11	1.5		ppbV	10	7/14/2017 1:47:00 PM
Hexachloro-1,3-butadiene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Hexane	31	6.0		ppbV	40	7/14/2017 2:23:00 PM
Isopropyl alcohol	3.9	1.5		ppbV	10	7/14/2017 1:47:00 PM
m&p-Xylene	6.4	3.0		ppbV	10	7/14/2017 1:47:00 PM
Methyl Butyl Ketone	5.9	3.0		ppbV	10	7/14/2017 1:47:00 PM
Methyl Ethyl Ketone	50	12		ppbV	40	7/14/2017 2:23:00 PM
Methyl Isobutyl Ketone	< 0.30	0.30		ppbV	1	7/14/2017 11:57:00 AM
Methyl tert-butyl ether	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Methylene chloride	0.92	0.15		ppbV	1	7/14/2017 11:57:00 AM
o-Xylene	2.7	1.5		ppbV	10	7/14/2017 1:47:00 PM
Propylene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Styrene	4.6	1.5		ppbV	10	7/14/2017 1:47:00 PM
Tetrachloroethylene	0.73	0.15		ppbV	1	7/14/2017 11:57:00 AM
Tetrahydrofuran	3.6	1.5		ppbV	10	7/14/2017 1:47:00 PM
Toluene	6.9	1.5		ppbV	10	7/14/2017 1:47:00 PM
trans-1,2-Dichloroethene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
trans-1,3-Dichloropropene	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Trichloroethene	0.37	0.15		ppbV	1	7/14/2017 11:57:00 AM
Vinyl acetate	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Vinyl Bromide	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Vinyl chloride	< 0.15	0.15		ppbV	1	7/14/2017 11:57:00 AM
Surr: Bromofluorobenzene	113	70-130		%REC	1	7/14/2017 11:57:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-001A

Client Sample ID: SS-1-071017
Tag Number: 569,449
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
1,1,1-Trichloroethane	6.7	0.82		ug/m3	1	7/14/2017 10:36:00 AM
1,1,2,2-Tetrachloroethane	< 1.0	1.0		ug/m3	1	7/14/2017 10:36:00 AM
1,1,2-Trichloroethane	< 0.82	0.82		ug/m3	1	7/14/2017 10:36:00 AM
1,1-Dichloroethane	< 0.61	0.61		ug/m3	1	7/14/2017 10:36:00 AM
1,1-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 10:36:00 AM
1,2,4-Trichlorobenzene	< 1.1	1.1		ug/m3	1	7/14/2017 10:36:00 AM
1,2,4-Trimethylbenzene	18	15		ug/m3	20	7/14/2017 12:34:00 PM
1,2-Dibromoethane	< 1.2	1.2		ug/m3	1	7/14/2017 10:36:00 AM
1,2-Dichlorobenzene	< 0.90	0.90		ug/m3	1	7/14/2017 10:36:00 AM
1,2-Dichloroethane	< 0.61	0.61		ug/m3	1	7/14/2017 10:36:00 AM
1,2-Dichloropropane	< 0.69	0.69		ug/m3	1	7/14/2017 10:36:00 AM
1,3,5-Trimethylbenzene	5.9	0.74		ug/m3	1	7/14/2017 10:36:00 AM
1,3-butadiene	< 0.33	0.33		ug/m3	1	7/14/2017 10:36:00 AM
1,3-Dichlorobenzene	1.2	0.90		ug/m3	1	7/14/2017 10:36:00 AM
1,4-Dichlorobenzene	1.3	0.90		ug/m3	1	7/14/2017 10:36:00 AM
1,4-Dioxane	< 1.1	1.1		ug/m3	1	7/14/2017 10:36:00 AM
2,2,4-trimethylpentane	8.0	0.70		ug/m3	1	7/14/2017 10:36:00 AM
4-ethyltoluene	3.9	0.74		ug/m3	1	7/14/2017 10:36:00 AM
Acetone	94	14		ug/m3	20	7/14/2017 12:34:00 PM
Allyl chloride	< 0.47	0.47		ug/m3	1	7/14/2017 10:36:00 AM
Benzene	10	9.6		ug/m3	20	7/14/2017 12:34:00 PM
Benzyl chloride	< 0.86	0.86		ug/m3	1	7/14/2017 10:36:00 AM
Bromodichloromethane	< 1.0	1.0		ug/m3	1	7/14/2017 10:36:00 AM
Bromoform	< 1.6	1.6		ug/m3	1	7/14/2017 10:36:00 AM
Bromomethane	< 0.58	0.58		ug/m3	1	7/14/2017 10:36:00 AM
Carbon disulfide	24	9.3		ug/m3	20	7/14/2017 12:34:00 PM
Carbon tetrachloride	1.0	0.94		ug/m3	1	7/14/2017 10:36:00 AM
Chlorobenzene	< 0.69	0.69		ug/m3	1	7/14/2017 10:36:00 AM
Chloroethane	0.95	0.40		ug/m3	1	7/14/2017 10:36:00 AM
Chloroform	< 0.73	0.73		ug/m3	1	7/14/2017 10:36:00 AM
Chloromethane	0.72	0.31		ug/m3	1	7/14/2017 10:36:00 AM
cis-1,2-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 10:36:00 AM
cis-1,3-Dichloropropene	< 0.68	0.68		ug/m3	1	7/14/2017 10:36:00 AM
Cyclohexane	17	10		ug/m3	20	7/14/2017 12:34:00 PM
Dibromochloromethane	< 1.3	1.3		ug/m3	1	7/14/2017 10:36:00 AM
Ethyl acetate	< 0.54	0.54		ug/m3	1	7/14/2017 10:36:00 AM
Ethylbenzene	7.6	0.65		ug/m3	1	7/14/2017 10:36:00 AM
Freon 11	2.4	0.84		ug/m3	1	7/14/2017 10:36:00 AM
Freon 113	2.8	1.1		ug/m3	1	7/14/2017 10:36:00 AM
Freon 114	< 1.0	1.0		ug/m3	1	7/14/2017 10:36:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-001A

Client Sample ID: SS-1-071017
Tag Number: 569,449
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
Freon 12	2.8	0.74		ug/m3	1	7/14/2017 10:36:00 AM
Heptane	23	12		ug/m3	20	7/14/2017 12:34:00 PM
Hexachloro-1,3-butadiene	< 1.6	1.6		ug/m3	1	7/14/2017 10:36:00 AM
Hexane	25	11		ug/m3	20	7/14/2017 12:34:00 PM
Isopropyl alcohol	11	7.4		ug/m3	20	7/14/2017 12:34:00 PM
m&p-Xylene	39	26		ug/m3	20	7/14/2017 12:34:00 PM
Methyl Butyl Ketone	< 1.2	1.2		ug/m3	1	7/14/2017 10:36:00 AM
Methyl Ethyl Ketone	110	18		ug/m3	20	7/14/2017 12:34:00 PM
Methyl Isobutyl Ketone	6.3	1.2		ug/m3	1	7/14/2017 10:36:00 AM
Methyl tert-butyl ether	< 0.54	0.54		ug/m3	1	7/14/2017 10:36:00 AM
Methylene chloride	4.2	0.52		ug/m3	1	7/14/2017 10:36:00 AM
o-Xylene	15	13		ug/m3	20	7/14/2017 12:34:00 PM
Propylene	< 0.26	0.26		ug/m3	1	7/14/2017 10:36:00 AM
Styrene	15	13		ug/m3	20	7/14/2017 12:34:00 PM
Tetrachloroethylene	6.2	1.0		ug/m3	1	7/14/2017 10:36:00 AM
Tetrahydrofuran	3.7	0.44		ug/m3	1	7/14/2017 10:36:00 AM
Toluene	28	0.57		ug/m3	1	7/14/2017 10:36:00 AM
trans-1,2-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 10:36:00 AM
trans-1,3-Dichloropropene	< 0.68	0.68		ug/m3	1	7/14/2017 10:36:00 AM
Trichloroethene	< 0.81	0.81		ug/m3	1	7/14/2017 10:36:00 AM
Vinyl acetate	< 0.53	0.53		ug/m3	1	7/14/2017 10:36:00 AM
Vinyl Bromide	< 0.66	0.66		ug/m3	1	7/14/2017 10:36:00 AM
Vinyl chloride	< 0.38	0.38		ug/m3	1	7/14/2017 10:36:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-002A

Client Sample ID: SS-2-071017
Tag Number: 360,456
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
1,1,1-Trichloroethane	0.82	0.82		ug/m3	1	7/14/2017 11:16:00 AM
1,1,2,2-Tetrachloroethane	< 1.0	1.0		ug/m3	1	7/14/2017 11:16:00 AM
1,1,2-Trichloroethane	< 0.82	0.82		ug/m3	1	7/14/2017 11:16:00 AM
1,1-Dichloroethane	< 0.61	0.61		ug/m3	1	7/14/2017 11:16:00 AM
1,1-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 11:16:00 AM
1,2,4-Trichlorobenzene	< 1.1	1.1		ug/m3	1	7/14/2017 11:16:00 AM
1,2,4-Trimethylbenzene	18	15		ug/m3	20	7/14/2017 1:10:00 PM
1,2-Dibromoethane	< 1.2	1.2		ug/m3	1	7/14/2017 11:16:00 AM
1,2-Dichlorobenzene	< 0.90	0.90		ug/m3	1	7/14/2017 11:16:00 AM
1,2-Dichloroethane	< 0.61	0.61		ug/m3	1	7/14/2017 11:16:00 AM
1,2-Dichloropropane	< 0.69	0.69		ug/m3	1	7/14/2017 11:16:00 AM
1,3,5-Trimethylbenzene	4.9	0.74		ug/m3	1	7/14/2017 11:16:00 AM
1,3-butadiene	< 0.33	0.33		ug/m3	1	7/14/2017 11:16:00 AM
1,3-Dichlorobenzene	< 0.90	0.90		ug/m3	1	7/14/2017 11:16:00 AM
1,4-Dichlorobenzene	< 0.90	0.90		ug/m3	1	7/14/2017 11:16:00 AM
1,4-Dioxane	< 1.1	1.1		ug/m3	1	7/14/2017 11:16:00 AM
2,2,4-trimethylpentane	17	14		ug/m3	20	7/14/2017 1:10:00 PM
4-ethyltoluene	3.5	0.74		ug/m3	1	7/14/2017 11:16:00 AM
Acetone	110	14		ug/m3	20	7/14/2017 1:10:00 PM
Allyl chloride	< 0.47	0.47		ug/m3	1	7/14/2017 11:16:00 AM
Benzene	4.5	0.48		ug/m3	1	7/14/2017 11:16:00 AM
Benzyl chloride	< 0.86	0.86		ug/m3	1	7/14/2017 11:16:00 AM
Bromodichloromethane	< 1.0	1.0		ug/m3	1	7/14/2017 11:16:00 AM
Bromoform	< 1.6	1.6		ug/m3	1	7/14/2017 11:16:00 AM
Bromomethane	< 0.58	0.58		ug/m3	1	7/14/2017 11:16:00 AM
Carbon disulfide	16	9.3		ug/m3	20	7/14/2017 1:10:00 PM
Carbon tetrachloride	0.69	0.94	J	ug/m3	1	7/14/2017 11:16:00 AM
Chlorobenzene	< 0.69	0.69		ug/m3	1	7/14/2017 11:16:00 AM
Chloroethane	1.0	0.40		ug/m3	1	7/14/2017 11:16:00 AM
Chloroform	< 0.73	0.73		ug/m3	1	7/14/2017 11:16:00 AM
Chloromethane	1.2	0.31		ug/m3	1	7/14/2017 11:16:00 AM
cis-1,2-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 11:16:00 AM
cis-1,3-Dichloropropene	< 0.68	0.68		ug/m3	1	7/14/2017 11:16:00 AM
Cyclohexane	29	10		ug/m3	20	7/14/2017 1:10:00 PM
Dibromochloromethane	< 1.3	1.3		ug/m3	1	7/14/2017 11:16:00 AM
Ethyl acetate	< 0.54	0.54		ug/m3	1	7/14/2017 11:16:00 AM
Ethylbenzene	8.2	0.65		ug/m3	1	7/14/2017 11:16:00 AM
Freon 11	1.3	0.84		ug/m3	1	7/14/2017 11:16:00 AM
Freon 113	< 1.1	1.1		ug/m3	1	7/14/2017 11:16:00 AM
Freon 114	< 1.0	1.0		ug/m3	1	7/14/2017 11:16:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-002A

Client Sample ID: SS-2-071017
Tag Number: 360,456
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
Freon 12	2.7	0.74		ug/m3	1	7/14/2017 11:16:00 AM
Heptane	31	12		ug/m3	20	7/14/2017 1:10:00 PM
Hexachloro-1,3-butadiene	< 1.6	1.6		ug/m3	1	7/14/2017 11:16:00 AM
Hexane	37	11		ug/m3	20	7/14/2017 1:10:00 PM
Isopropyl alcohol	6.9	7.4	J	ug/m3	20	7/14/2017 1:10:00 PM
m&p-Xylene	31	26		ug/m3	20	7/14/2017 1:10:00 PM
Methyl Butyl Ketone	25	25		ug/m3	20	7/14/2017 1:10:00 PM
Methyl Ethyl Ketone	120	18		ug/m3	20	7/14/2017 1:10:00 PM
Methyl Isobutyl Ketone	< 1.2	1.2		ug/m3	1	7/14/2017 11:16:00 AM
Methyl tert-butyl ether	< 0.54	0.54		ug/m3	1	7/14/2017 11:16:00 AM
Methylene chloride	3.2	0.52		ug/m3	1	7/14/2017 11:16:00 AM
o-Xylene	14	13		ug/m3	20	7/14/2017 1:10:00 PM
Propylene	< 0.26	0.26		ug/m3	1	7/14/2017 11:16:00 AM
Styrene	18	13		ug/m3	20	7/14/2017 1:10:00 PM
Tetrachloroethylene	4.8	1.0		ug/m3	1	7/14/2017 11:16:00 AM
Tetrahydrofuran	12	8.8		ug/m3	20	7/14/2017 1:10:00 PM
Toluene	30	11		ug/m3	20	7/14/2017 1:10:00 PM
trans-1,2-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 11:16:00 AM
trans-1,3-Dichloropropene	< 0.68	0.68		ug/m3	1	7/14/2017 11:16:00 AM
Trichloroethene	1.0	0.81		ug/m3	1	7/14/2017 11:16:00 AM
Vinyl acetate	< 0.53	0.53		ug/m3	1	7/14/2017 11:16:00 AM
Vinyl Bromide	< 0.66	0.66		ug/m3	1	7/14/2017 11:16:00 AM
Vinyl chloride	< 0.38	0.38		ug/m3	1	7/14/2017 11:16:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-003A

Client Sample ID: SS-3-071017
Tag Number: 285,437
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15		TO-15		Analyst: RJP		
1,1,1-Trichloroethane	1.7	0.82		ug/m3	1	7/14/2017 11:57:00 AM
1,1,2,2-Tetrachloroethane	< 1.0	1.0		ug/m3	1	7/14/2017 11:57:00 AM
1,1,2-Trichloroethane	< 0.82	0.82		ug/m3	1	7/14/2017 11:57:00 AM
1,1-Dichloroethane	< 0.61	0.61		ug/m3	1	7/14/2017 11:57:00 AM
1,1-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 11:57:00 AM
1,2,4-Trichlorobenzene	< 1.1	1.1		ug/m3	1	7/14/2017 11:57:00 AM
1,2,4-Trimethylbenzene	17	7.4		ug/m3	10	7/14/2017 1:47:00 PM
1,2-Dibromoethane	< 1.2	1.2		ug/m3	1	7/14/2017 11:57:00 AM
1,2-Dichlorobenzene	< 0.90	0.90		ug/m3	1	7/14/2017 11:57:00 AM
1,2-Dichloroethane	< 0.61	0.61		ug/m3	1	7/14/2017 11:57:00 AM
1,2-Dichloropropane	< 0.69	0.69		ug/m3	1	7/14/2017 11:57:00 AM
1,3,5-Trimethylbenzene	4.9	0.74		ug/m3	1	7/14/2017 11:57:00 AM
1,3-butadiene	< 0.33	0.33		ug/m3	1	7/14/2017 11:57:00 AM
1,3-Dichlorobenzene	< 0.90	0.90		ug/m3	1	7/14/2017 11:57:00 AM
1,4-Dichlorobenzene	< 0.90	0.90		ug/m3	1	7/14/2017 11:57:00 AM
1,4-Dioxane	< 1.1	1.1		ug/m3	1	7/14/2017 11:57:00 AM
2,2,4-trimethylpentane	20	7.0		ug/m3	10	7/14/2017 1:47:00 PM
4-ethyltoluene	3.4	0.74		ug/m3	1	7/14/2017 11:57:00 AM
Acetone	180	28		ug/m3	40	7/14/2017 2:23:00 PM
Allyl chloride	< 0.47	0.47		ug/m3	1	7/14/2017 11:57:00 AM
Benzene	6.1	0.48		ug/m3	1	7/14/2017 11:57:00 AM
Benzyl chloride	< 0.86	0.86		ug/m3	1	7/14/2017 11:57:00 AM
Bromodichloromethane	< 1.0	1.0		ug/m3	1	7/14/2017 11:57:00 AM
Bromoform	< 1.6	1.6		ug/m3	1	7/14/2017 11:57:00 AM
Bromomethane	< 0.58	0.58		ug/m3	1	7/14/2017 11:57:00 AM
Carbon disulfide	15	4.7		ug/m3	10	7/14/2017 1:47:00 PM
Carbon tetrachloride	0.69	0.94	J	ug/m3	1	7/14/2017 11:57:00 AM
Chlorobenzene	< 0.69	0.69		ug/m3	1	7/14/2017 11:57:00 AM
Chloroethane	1.1	0.40		ug/m3	1	7/14/2017 11:57:00 AM
Chloroform	0.49	0.73	J	ug/m3	1	7/14/2017 11:57:00 AM
Chloromethane	0.81	0.31		ug/m3	1	7/14/2017 11:57:00 AM
cis-1,2-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 11:57:00 AM
cis-1,3-Dichloropropene	< 0.68	0.68		ug/m3	1	7/14/2017 11:57:00 AM
Cyclohexane	72	5.2		ug/m3	10	7/14/2017 1:47:00 PM
Dibromochloromethane	< 1.3	1.3		ug/m3	1	7/14/2017 11:57:00 AM
Ethyl acetate	< 0.54	0.54		ug/m3	1	7/14/2017 11:57:00 AM
Ethylbenzene	8.1	0.65		ug/m3	1	7/14/2017 11:57:00 AM
Freon 11	1.3	0.84		ug/m3	1	7/14/2017 11:57:00 AM
Freon 113	< 1.1	1.1		ug/m3	1	7/14/2017 11:57:00 AM
Freon 114	< 1.0	1.0		ug/m3	1	7/14/2017 11:57:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Centek Laboratories, LLC

Date: 14-Jul-17

CLIENT: C&S Companies
Lab Order: C1707032
Project: 1360 Niagara St
Lab ID: C1707032-003A

Client Sample ID: SS-3-071017
Tag Number: 285,437
Collection Date: 7/10/2017
Matrix: AIR

Analyses	Result	**Limit	Qual	Units	DF	Date Analyzed
1UG/M3 BY METHOD TO15			TO-15		Analyst: RJP	
Freon 12	2.5	0.74		ug/m3	1	7/14/2017 11:57:00 AM
Heptane	45	6.1		ug/m3	10	7/14/2017 1:47:00 PM
Hexachloro-1,3-butadiene	< 1.6	1.6		ug/m3	1	7/14/2017 11:57:00 AM
Hexane	110	21		ug/m3	40	7/14/2017 2:23:00 PM
Isopropyl alcohol	9.6	3.7		ug/m3	10	7/14/2017 1:47:00 PM
m&p-Xylene	28	13		ug/m3	10	7/14/2017 1:47:00 PM
Methyl Butyl Ketone	24	12		ug/m3	10	7/14/2017 1:47:00 PM
Methyl Ethyl Ketone	150	35		ug/m3	40	7/14/2017 2:23:00 PM
Methyl Isobutyl Ketone	< 1.2	1.2		ug/m3	1	7/14/2017 11:57:00 AM
Methyl tert-butyl ether	< 0.54	0.54		ug/m3	1	7/14/2017 11:57:00 AM
Methylene chloride	3.2	0.52		ug/m3	1	7/14/2017 11:57:00 AM
o-Xylene	12	6.5		ug/m3	10	7/14/2017 1:47:00 PM
Propylene	< 0.26	0.26		ug/m3	1	7/14/2017 11:57:00 AM
Styrene	20	6.4		ug/m3	10	7/14/2017 1:47:00 PM
Tetrachloroethylene	5.0	1.0		ug/m3	1	7/14/2017 11:57:00 AM
Tetrahydrofuran	11	4.4		ug/m3	10	7/14/2017 1:47:00 PM
Toluene	26	5.7		ug/m3	10	7/14/2017 1:47:00 PM
trans-1,2-Dichloroethene	< 0.59	0.59		ug/m3	1	7/14/2017 11:57:00 AM
trans-1,3-Dichloropropene	< 0.68	0.68		ug/m3	1	7/14/2017 11:57:00 AM
Trichloroethene	2.0	0.81		ug/m3	1	7/14/2017 11:57:00 AM
Vinyl acetate	< 0.53	0.53		ug/m3	1	7/14/2017 11:57:00 AM
Vinyl Bromide	< 0.66	0.66		ug/m3	1	7/14/2017 11:57:00 AM
Vinyl chloride	< 0.38	0.38		ug/m3	1	7/14/2017 11:57:00 AM

Qualifiers:	**	Quantitation Limit	.	Results reported are not blank corrected
	B	Analyte detected in the associated Method Blank	E	Estimated Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limit
	JN	Non-routine analyte. Quantitation estimated.	ND	Not Detected at the Limit of Detection
	S	Spike Recovery outside accepted recovery limits		

Soil Vapor/Indoor Air Matrix A

May 2017

Analytes Assigned:

Trichloroethene (TCE), *cis*-1,2-Dichloroethene (c12-DCE), 1,1-Dichloroethene (11-DCE), Carbon Tetrachloride

SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m ³)	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m ³)		
	< 0.2	0.2 to < 1	1 and above
< 6	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	4. No further action	5. MONITOR	6. MITIGATE
60 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended 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 based on site-, building- and analyte-specific information, 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: We recommend mitigation 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.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX A

This matrix summarizes 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 analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples 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. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions 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 might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).
- [2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor 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 0.20 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.
- [4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion 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 might 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 but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor/Indoor Air Matrix B

May 2017

Analytes Assigned:

Tetrachloroethene (PCE), 1,1,1-Trichloroethane (111-TCA), Methylene Chloride

SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m ³)	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m ³)		
	< 3	3 to < 10	10 and above
< 100	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
100 to < 1,000	4. No further action	5. MONITOR	6. MITIGATE
1,000 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended 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 based on site-, building- and analyte-specific information, 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: We recommend mitigation 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.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX B

This matrix summarizes 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 analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples 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. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions 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 might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).
- [2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor 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 1 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.
- [4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion 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 might 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 but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor/Indoor Air Matrix C

May 2017

Analytes Assigned:

Vinyl Chloride

SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m ³)	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m ³)	
	< 0.2	0.2 and above
< 6	1. No further action	2. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	3. MONITOR	4. MITIGATE
60 and above	5. MITIGATE	6. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended 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 based on site-, building- and analyte-specific information, 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: We recommend mitigation 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.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX C

This matrix summarizes 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 analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples 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. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions 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 might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).
- [2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor 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 0.20 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.
- [4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion 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 might 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 but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.