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November 6, 2015

Division of Environmental Remediation
Remedial Bureau E, 12th Floor
New York State Department of
Environmental Conservation
625 Broadway
Albany, New York 12233-7017

Attention: Joshua Haugh, Project Manager

Subject: **Soil Vapor Intrusion Investigation - Field Activities Plan Addendum 2**
Scobell Chemical – NYSDOT Site (828076) Remedial Design WA D007619-32.1
MACTEC Engineering and Consulting, P.C. Project No. 3617147328

Dear Mr. Haugh:

This Soil Vapor Intrusion (SVI) Investigation Field Activities Plan (FAP) Addendum has been prepared for the Scobell Chemical – New York State (NYS) Department of Transportation (NYSDOT) Site (828076) (Site) in the Town of Brighton, Monroe County, New York (Figure 1). This FAP provides the scope of work for activities conducted as part of the Site's Remedial Design work assignment D007619-32.1 on behalf of the NYS Department of Environmental Conservation (NYSDEC) under the state superfund program, including: 1) the investigation of groundwater and soil vapor conditions downgradient from the Scobell Chemical Site, and, 2) investigation and ongoing monitoring for SVI at potential receptors (i.e., collection of sub-slab vapor and indoor air samples.

INVESTIGATION OBJECTIVES

The objectives of the investigation are to evaluate the extent of site related contaminants in groundwater and soil vapor downgradient of the Site, as well as the potential for SVI into buildings in the vicinity of the groundwater plume.

This FAP Addendum presents a technical scope of work to conduct the SVI and shallow groundwater investigation activities off-site. Proposed activities include shallow bedrock monitoring well installation, groundwater sampling, installation and sampling of shallow soil vapor monitoring points, monitoring of previously sampled structures where mitigation or monitoring was recommended by the NYS Department of Health (NYSDOH), and the expanded SVI sampling (collection of sub-slab vapor and indoor air samples) at structures previously sampled. Work will be conducted in accordance with the NYSDEC DER-10 Guidance (NYSDEC, 2010), the MACTEC Engineering and Consulting, P.C. (MACTEC) Quality Assurance Program Plan (QAPP) (MACTEC, 2011a), the NYDOH vapor intrusion guidance (NHDOH, 2006), and this FAP.

SCOPE OF WORK

The Record of Decision for the Site includes long term monitoring of groundwater contamination, including the addition of monitoring wells downgradient of the Site to evaluate the extent of groundwater contamination and facilitate additional SVI investigations off-site, as necessary.

This FAP has been developed for the purpose of evaluating the extent of the shallow groundwater plume, and assessing the potential for site contaminants to migrate to receptors via the SVI pathway. Field activities to assess the potential down gradient exposures include:

- Installation of shallow overburden/bedrock downgradient monitoring wells, and one deeper bedrock well
- Installation of downgradient soil vapor implants paired with the shallow groundwater monitoring wells
- Collection of groundwater samples and soil vapor samples from new wells and soil vapor implants
- SVI sampling (collection of sub-slab vapor and indoor air samples) from downgradient structures

A summary of these field tasks and methodologies, sample identifications, and analytical program are described in more detail in Table 1, as well as in the following subsections. Proposed shallow groundwater wells, soil vapor points, and SVI sample locations are shown on Figure 2.

Subcontractors selected to support the SVI investigation include:

- Geologic, NY –Installation of shallow overburden/bedrock groundwater monitoring wells and soil vapor monitoring implants.
- Centek Laboratories – analytical services for soil vapor, sub-slab vapor, indoor air samples, and ambient air samples.
- ALS –analytical services for groundwater samples.
- Op-Tech - transport and disposal of investigation-derived waste (IDW).
- Popli Design Group –Site survey for the newly installed groundwater monitoring wells and soil vapor implants.
- Ground Penetrating Radar Systems, Inc – utility locating services for new boring/vapor implant locations.

Health and Safety. MACTEC anticipates that the fieldwork will be conducted in Level D personal protection. Specific investigation activities, utility clearance procedures, and required level of personal protection are set forth in the Site-specific Health and Safety Plan (HASP). Criteria for upgrading or downgrading the specified level of protection are also provided in the Site-specific HASP. Additional health and safety requirements are set forth in the Program HASP (MACTEC, 2011b). Should Site conditions pose a threat to those present on-Site, and/or should Site conditions warrant an upgrade from Level D, as defined by the HASP, work will stop and the situation will be reevaluated by the NYSDEC and MACTEC. The NYSDOH Community Air Monitoring Plan (CAMP) will also be followed, as outlined in the 2014 Site FAP (MACTEC, 2014). In addition, an exclusion zone will be clearly marked around the drilling equipment to prevent unauthorized access. High visibility vests will be used at all times, and cones will be used to cordon off areas within traffic zones (e.g., traffic controls within parking lots).

Access and Utility Clearance. Current proposed soil vapor implants and groundwater monitoring wells are located on private property, in the NYSDOT right of way (ROW), or potentially in the City of Rochester ROW (dependent on the location of underground utilities). MACTEC will assist the NYSDEC in coordinating access with the private property owners for field activities. MACTEC will work with Geologic, NY to obtain permits for drilling in the NYSDOT ROW and in the City of Rochester ROW. MACTEC will be responsible for marking locations in the field and Geologic, NY will coordinate utility clearance with Dig Safely – New York. MACTEC will confirm drilling locations and utility clearance prior to conducting drilling activities, as well as clearing utilities with a

private locating firm. Care will be taken when drilling to: minimized disturbance to property, avoid tracking of soil, and returning property to pre-drilling conditions.

Mobilization. Mobilization will include obtaining utility clearances for proposed locations, procurement of subcontractors, and the acquisition and coordination of supplies.

Investigation-Derived Wastes. With the exception of soil cuttings on the NYSDOT property, which can be spread on the ground, space allowing, all IDW generated will be containerized in 55-gallon drums. The method of disposing of IDW will be based upon whether the wastes are considered hazardous or non-hazardous. United States Department of Transportation approved 55-gallon containers filled during the field investigation will be transported to the Site upon completion of each location and staged in an area designated by the NYSDEC. Transport and disposal of these containers will be arranged by MACTEC on behalf of NYSDEC.

Well Installation. To evaluate the potential extent of chlorinated solvent contamination in shallow groundwater, seven shallow groundwater monitoring wells (MW-30S through MW-36S) will be installed approximately 250 to 400 feet apart north of the Site along Blossom Road and the access road to the Ellison Park Appartment Complex. Monitoring Wells will be advanced using a drilling rig to auger to bedrock using 4 ¼ inch inside diameter (ID) hollow stem augers and then continuing five feet into rock by rock coring using water. Drill cuttings and water will be containerized in 55-gallon drums and transported to the Site for staging. The shallow well borings will be completed with 2-inch ID schedule 40 polyvinyl chloride (PVC) screen and riser. The screen will be approximately 5 feet long with a 0.01 inch slot. Size 00 sandpack will extend approximately 2 feet above the well screen and will monitor the shallow bedrock/overburden interface, where shallow groundwater is anticipated to be present. The well will be sealed with approximately 2 feet of bentonite chips above the sandpack. Monitoring well MW-33S will be advanced approximately 15 feet into bedrock to allow the nesting of a deeper one-inch ID well (MW-33D) in the same boring. This boring may be advanced using air. If air is used, the borehole will be monitored with a PID to evaluate if vapors are potentially being generated that could result in vapor intrusion issues (this location is approximately 100 feet from the nearest occupied building). The deeper well will have a five foot long screen that is separated from the shallow boring by a two-foot bentonite seal. Installation details will be documented on a field data record.

Each boring will be completed with an 8-inch flush mount casing, with the exception of MW-30S along the NYSDOT ROW, which will be completed with a three foot stick up and locking cap. Well installation will be documented using a Field Data Record (QAPP Figures 4.7 or 4.8; MACTEC, 2011a). Upon completion of the installation, the driller will develop each well to remove fines. Development water will be containerized in 55-gallon drums and transported to the Site for staging.

The NYSDOH CAMP will be followed, as outlined in the 2014 Site FAP (MACTEC, 2014) at all drilling locations. This will include upwind and downwind monitoring, continuous checking/monitoring during the installations, and downloading of information at the end of the day and/or program.

Groundwater Sampling. Groundwater sampling of the wells will be conducted approximately two weeks after installation and development. Prior to groundwater sampling, a round of water levels (depth to groundwater) will be measured from area monitoring wells to evaluate groundwater flow direction.

Monitoring wells will be sampled using low-flow sampling procedures with a geopump as described in Section 4.5.4.3.2 of the QAPP (MACTEC, 2011a). If sufficient volume of water is present, field measurements for pH, temperature, specific conductivity, oxidation reduction potential, dissolved oxygen, and turbidity will be collected through a flow through cell (with the exception of turbidity) from each well during pre-sample purging to evaluate well stabilization, as well as to collect geochemical parameters for evaluation. Field measurements and groundwater sampling activities will be documented using a Low Flow Groundwater Data Record (QAPP Figure 4.17; MACTEC, 2011a). Upon stabilization, groundwater samples will be shipped to ALS for analysis of volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260, as described in the NYSDEC Analytical Services Protocol of June 2005 (NYSDEC, 2005).

Soil Vapor Implant Installation. To evaluate if chlorinated solvents are present in soil vapor along Blossom Road and the west side of the Ellison Park Apartments, seven permanent soil vapor implants (SVP-12 to SVP-18) will be installed approximately five feet from the monitoring wells using direct push tooling to create a two-inch ID hole. Six-inch stainless steel screens with attached Teflon tubing will then be installed approximately six feet below ground surface, surrounded by a size 00 sand pack to approximately six inches above the screen, a three foot bentonite seal, and native backfill to the

ground surface. A six-inch flush mount protective casing will be installed at the surface to contain the end of the tubing. Soil vapor implant details will be documented using a Soil Vapor Probe Construction Diagram (QAPP Figure 4.12; MACTEC, 2011a).

Soil Vapor Implant Sampling. Soil vapor from the implants will be sampled at the same time as the groundwater samples are collected (at least 24 hours after installation). The sample tubing will be purged (minimum of 3 implant volumes) with a photoionization detector (PID) (approximate purge rate of 200 ml/min) and PID readings will be recorded. In addition, oxygen and carbon dioxide will be measured using an RKI Eagle multi gas meter to compare outdoor ambient air to soil vapor concentrations. If oxygen and carbon dioxide concentrations in the soil vapor are similar to ambient air, it is likely that ambient air is being pulled into the sampling point and the integrity of the vapor implant seal is compromised. As an additional measure, helium will be used as a tracer gas by filling a shroud around the sampling port with helium (taking care not to pressurize the shroud). After purging the implant tubing, a helium detector will be used to ensure that less than 10% helium is present in the soil vapor. The sample vapor record will include weather, temperature, barometric pressure, and wind speed/direction.

Soil vapor implant samples will be collected using 1.4 liter Summa type canisters with a collection time of approximately 60 minutes (i.e., flow rate will be less than 0.2 liters per minute as per NYSDOH guidance to minimize potential outdoor air infiltration during soil vapor sampling). Samples will be analyzed for VOCs by USEPA Method TO-15.

SVI Sampling. SVI sampling will be conducted in accordance with NYSDOH Guidance for Evaluating SVI (NYSDOH, 2006) at properties adjacent to and north of the Site to: 1) monitor structures where sub-slab depressurization systems (SSDSs) were installed or where additional monitoring was recommended by NYSDOH as the result of one or more previous sampling event(s), and 2) evaluate the potential SVI pathway at other downgradient structures.

Mitigation System Monitoring. SSDSs were previously installed at six buildings in the vicinity of the Site. An evaluation of the systems will be conducted, including:

- Visual inspection of the system and its components, including but not limited to the fan, electrical switch, PVC piping, piping joints connections, warning device, vacuum manometer gauge and labeling on the system to ensure there are no defects in the system and that it is operating properly.
- Visual inspection of the condition of the basement floor inside the dwelling for additional or new cracks, holes, or utility penetrations.
- With the system operating, test floor joints, suction points and utility ports for potential leaks using a tracer smoke from a smoke tube.
- Inspect from the ground the condition of the exterior exhaust discharge point for potential air intakes, or potential issues (e.g., ice dams, cracks).
- Collection of indoor air samples at approximately the same location as the indoor air samples collected prior to the installation of the SSDSs, to compare pre and post installation indoor air concentrations. Samples will be obtained over an approximate 8 hour period for commercial properties, and 24 hour period for residential properties (flow rate will be less than 0.2 liters per minute as required by the (NYSDOH, 2006). Field measurements and sampling activities will be documented using an Indoor Air Sampling Form (QAPP Figure 4.19; MACTEC, 2011a).

SVI Monitoring at Previously Sampled Locations. Six structures where monitoring was recommended by NYSDOH as the result of previous sampling by the NYSDEC, as well as the western side of the structure on the property adjacent to the Site (80 Rockwood Place) will be sampled to evaluate if additional measures are necessary at these locations. Sub-slab vapor and indoor air samples will be collected from approximately the same locations as those collected previously (with the exception of the western side of 80 Rockwood, where SVI sampling was not previously completed because it was not occupied at the time the eastern side of the structure was evaluated [January 2012]).

Indoor air and sub-slab vapor samples will be obtained over an approximate 8 hour period (if commercial space) or 24 hour period (if residential dwelling). The sampling flow rate will be less than 0.2 liters per minute as required by NYSDOH. The samples will be collected as described below.

Prior to collecting air samples, an indoor air survey will be completed using the NYSDOH "Indoor Air Quality Questionnaire and Building Inventory" form. Sample collection procedures are further described in the QAPP (MACTEC, 2011a). Sub-slab vapor samples will be collected from below the structures' concrete slab using a temporary sampling point. A one-inch diameter hole will be drilled with a hammer drill two inches into the building floor, near the center of the basement/slab-on grade,

but away from any cracks or sumps. The hole will be continued with a 3/8-inch drill bit, until the building slab is penetrated. The hole will be continued approximately 2-inches below the slab. The hole will then be swept to remove drill cuttings/dust from the area. A ¼-inch piece of Teflon tubing will be placed into the hole, so that the bottom of the tubing is below the slab floor and the one-inch hole will be sealed with Van Aiken Plastalina (a sealant similar to modeling clay), forming a seal (ensuring that the bottom of the tubing does not become blocked with dirt/concrete at the bottom of the hole). Helium will be used within an enclosure around the sample point to leak test the location. One 60 cubic centimeter volume of air will be purged from the tubing with a polyethylene syringe (1 to 3 volumes). The syringe will be capped and the air released outside the building as to not interfere with the indoor air sample collection. The tubing will then be purged with a helium leak detector (25 milliliters/minute) to ensure that there is less than 10% helium in the sub-slab vapor prior to collecting the sample. A SUMMA®-type canister with an 8 or 24-hour flow valve (as described previously) will be connected to the tubing as described in the QAPP.

Indoor air samples will be collected in SUMMA®-type canisters from the vicinity of the sub-slab vapor sample collection points. MACTEC will collect the indoor air samples away from sumps, and if standing water is present it will be noted on the sampling form. Indoor air samples will be collected from approximately three to five feet above the floor level (if necessary, Teflon tubing will be extended from the canister to attain the proper intake height). Indoor air samples will be set up with 8 or 24-hour flow valve (will correspond with the sub-slab vapor sample duration).

Ambient air samples will be collected in SUMMA®-type canisters from the vicinity of the structures being sampled for indoor air and sub-slab vapor VOC contamination (multiple structures in close proximity to each other and being sampled for the same time duration can use a single ambient air sample). Samples will be collected from approximately three to five feet above ground surface. Ambient air samples will be set up with an 8 or 24-hour flow valve to correspond with the duration of the sub-slab and indoor air samples.

Once the sub-slab vapor sample canisters, indoor air sample canisters, and exterior ambient air canister have been set up for an individual location, the valves from all containers will be opened. The time of sample collection, canister vacuum (in inches Mercury), weather conditions, and barometric pressure will be recorded on the field data record.

Approximately 8-hour or 24 hours after the start of sample collection (depending on canister duration), the flow valve will be shut off. The time, remaining vacuum in the canister and barometric pressure will be noted on the field data record. The samples will be shipped to Centek for analyses of VOCs via USEPA Method TO-15 with a detection limit of 1 microgram per cubic meter ($\mu g/m^3$) for most compounds and a detection limit of 0.25 $\mu g/m^3$ for trichloroethene (TCE), vinyl chloride, and carbon tetrachloride in the indoor/ambient air samples.

Upon completion of the sampling, the tubing and stopper will be removed from the building floor and the holes will be filled completely with a fast drying hydraulic concrete (i.e. Quickcrete).

SVI sampling activities will be documented using a Soil Vapor Sampling Record (QAPP Figure 4-11, MACTEC, 2011a).

Expanded SVI Sampling. Based on the results of the shallow groundwater sampling, the soil vapor implant sampling, and the air sampling at previously sampled monitoring locations, additional SVI (indoor air and sub-slab vapor) sampling may be conducted.

The additional sampling locations, if conducted, will be chosen in consultation with the NYSDEC and NYSDOH project managers. MACTEC will work with the NYSDEC to obtain property owner information and secure access to collect the samples.

Expanded SVI sampling will be completed as described in the sub-section above.

Survey. Prudent Engineering, will survey the new monitoring wells and soil vapor implants. Horizontal locations and vertical elevation data will be presented to MACTEC in a database to be used with geographic information system software. Sample locations will be presented on an aerial photograph of the Site and surrounding area. Horizontal locations will be tied to the NYS Plane Coordinate System using North American Datum of 1983 to an accuracy of 0.1 foot. Vertical elevations of groundwater wells will be tied to existing monitoring well data, which is based on mean sea level, using North American Vertical Datum of 1988, and measured to an accuracy of 0.01 feet.

Interim Pilot Test Groundwater Sampling. Groundwater samples will be collected from five monitoring/injection wells in the vicinity of where zero valent iron (ZVI) injections were completed as

part of the pilot study that is currently on hold per NYSDEC direction. The samples will be collected to evaluate if the addition of ZVI to the bedrock fracture zone targeted has affected groundwater quality (i.e., degredation of the TCE and reducing conditions) in the vicinity of the injections. Samples from the five monitoring/injection wells (MW-3D, MW-16D, MW-17D, IW-3, and IW-6), will be collected, if accessible, using low flow methods and will be analyzed for the same analytes as for the pre-injection groundwater sampling, which included the following parameters:

- VOCs
- Alkalinity
- Chloride, nitrate, and sulfate
- Iron, calcium, magnesium, and manganese
- Ethene, ethane, and methane
- Total organic carbon

Field measurements and groundwater sampling activities will be documented using a Low Flow Groundwater Data Record (QAPP Figure 4.17; MACTEC, 2011a).

Results will be reviewed to evaluate changes in groundwater chemistry as a result of the injections, and to monitor for increased degradation of the TCE. Existing monitoring well details are presented in Table 4.3 in the FAP (MACTEC, 2014).

Analytical Methods and Data Objectives: Soil vapor, indoor air, and groundwater samples will be collected for laboratory analysis. The following analytical methods will be completed.

- VOCs in air by TO-15
- VOCs in groundwater by USEPA Method 8260C
- Alkalinity by Method 2320B
- Chloride, Nitrate, Sulfate by Method 9056A
- Iron, calcium, magnesium, and manganese by USEPA Method 6010C
- Ethene, ethane, and methane by Method RSK-175
- Total organic carbon by Method SM5310C

Laboratory results will be reported in a Category B deliverable. A summary of target analytes and reporting limits for these methods is presented in Attachment A. TICs will not be reported for the VOC air or groundwater samples.

Soil vapor and indoor air samples will be compared to the SVI matrices (NYSDOH, 2006 and NYSDOH, 2015). Groundwater samples will be compared to the Class GA groundwater standards and guidance values in the Technical and Operational Guidance Series 1.1.1.

Laboratory data review levels are specified for each media below. Data review includes Category A review or Data Usability Summary Report (DUSR). The DUSR review will be completed based on NYSDEC DER-10 guidance (NYSDEC, 2010). Quality Control (QC) limits found in USEPA Region 2 validation guidelines in combination with the referenced analytical methods will be used during the data validation. The DUSR review includes the following evaluations:

- Lab Report Narrative Review
- Data Package Completeness and COC records
- Sample Preservation and Holding Times
- Initial/Continuing Calibration (including tunes for Gas chromatography/Mass spectrometry)
- QC Blanks
- Laboratory Control Samples
- Matrix Spike/Matrix Spike Duplicates
- Surrogate Spikes (if applicable)
- Internal Standard Response and Retention Times
- Field Duplicates
- Target Analyte Identification and Quantitation
- Raw Data Checks, Calculation Checks, and Transcription Verifications
- Reporting Limits
- Electronic Data Qualification and Verification

Category A reviews are specified for sample data where a minimum level of evaluation is appropriate due to data use objectives. The Category A review is similar to a Stage 1 review specified in USEPA guidelines for Superfund Sites (USEPA, 2009). The Category A review includes the following evaluations:

- Lab Report Narrative Review
- Data Package Completeness and COC records (Table 1 verification)
- Sample Preservation and Holding Times
- QC Blanks
- Field Duplicate Evaluation (if available)

- Matrix spike and Matrix Spike Duplicate Evaluation (if available)
- Reporting Limits
- Electronic Data Qualification and Verification

The following data quality reviews will be completed on laboratory data collected during this investigation:

- Soil Vapor Implants - DUSR
- Sub-slab Vapor - DUSR
- Indoor Air - DUSR
- New Well Groundwater - DUSR
- Interim Pilot-Study Groundwater – Category A Review

DELIVERABLES

Data obtained as part of the SVI Investigation will be reviewed and incorporated into the following reports:

- Soil Vapor Investigation Report – will summarize results of the groundwater and soil vapor implant sampling.
- SVI Monitoring Report – will summarize the 2015 monitoring (including air sampling and, if applicable, mitigation system monitoring) at structures where previous sampling resulted in monitoring or mitigation being recommended by NYSDOH.
- Expanded SVI Report– will present the results of the SVI sampling at structures that are sampled as a result of the other investigations listed above.

The pilot test groundwater sampling will be tabulated for discussion purposes and for inclusion in the Pilot Test Report (report pending completion of pilot test program or direction from the NYSDEC).

The reports will include a comparison of laboratory analytical results to applicable NYS groundwater standards (NYS, 1999) and NYSDOH indoor air guidance values (NYSDOH, 2006 and NYSDOH, 2015). Field data records and environmental sampling data will be included as appendices to the reports.

The reports will be submitted in draft to the NYSDEC for review and comment. Upon receipt of NYSDEC comments, MACTEC will address the comments and submit a final report in portable

document format (PDF) format. Analytical data will be uploaded to EQuIS and laboratory deliverables will also be submitted electronically (PDF and electronic data deliverable) with the report at the completion of the investigations.

Please feel free to contact us if you have any questions.

Sincerely,
MACTEC Engineering and Consulting, P.C.

Chuck R. Staples
Task Leader

Jayme P. Connolly
Project Manager

Enclosures (1)

Attachment A: Laboratory Methods, Target Analytes, and Detection Limits

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

CAMP	Community Air Monitoring Plan
DUSR	Data Usability Summary Report
FAP	Field Activities Plan
HASP	Health and Safety Plan
ID	inside diameter
IDW	investigation-derived wastes
MACTEC	MACTEC Engineering and Consulting, P.C.
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
PDF	portable document format
PID	photoionization detector
PVC	polyvinyl chloride
QAPP	Quality Assurance Program Plan
QC	Quality Control
ROW	right of way
Site	Scobell Chemical– NYSDOT Site
SSDS	sub-slab depressurization system
SVI	soil vapor intrusion

GLOSSARY OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

TCE	trichloroethene
$\mu g/m^3$	microgram(s) per cubic meter
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
ZVI	zero valent iron

REFERENCES

MACTEC Engineering and Consulting, P.C. (MACTEC), 2014. Field Activities Plan – Scobell Chemical – NYSDOT Site No 828076 Prepared for the New York State Department of Environmental Conservation, Albany, New York. October 2014.

MACTEC, 2011a. Program Quality Assurance Program Plan. Prepared for the New York State Department of Environmental Conservation, Albany, New York. June 2011.

MACTEC, 2011b. Program Health and Safety Plan. Prepared for New York State Department of Environmental Conservation, Albany, New York. June 2011.

NYS, 1999. New York Codes, Rules, and Regulations, Title 6, Part 700-705 Water Quality Regulations Surface Water and Groundwater Classifications and Standards. Amended August 1999.

NYSDEC, 2010. DER-10, Technical Guidance for Site Investigation and Remediation. May 3, 2010.

NYSDEC, 2005. "Analytical Services Protocols"; 7/05 Edition; July 2005.

NYSDOH, 2015. Thrichloroethene in Indoor and Outdoor Air, August 2015 Fact Sheet. August 2015.

NYSDOH, 2006. Guidance for Evaluating Soil Vapor Intrusion in the State of New York. October 2006.

USEPA, 2009. "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use"; Office of Solid Waste and Emergency Response; EPA-540-R-08-005; January 2009.

Table 1: Proposed Field Tasks and Methodology SVI Investigation

Methodology and Rationale	Loc I.D.	Medium	Depth bgs ft.	Sample I.D.	VOCs 8260C	VOCs TO-15	Special Par. See Note
To evaluate shallow groundwater, install seven shallow monitoring wells 5 feet into bedrock. One shallow well will be nested with a deeper well set 15 feet into bedrock to evaluate vertical gradients and contamination. The wells will be installed, using Hollow Stem Auger, casing, coring, or tri-cone techniques. No soil sampling to be conducted.	MW-30S, MW-31S, MW-32S, MW-32D, MW-33S, and MW-34S, MW-35S, MW-36S	Soil/Rock	15 feet, with one deep boring to 25 feet bgs (MW-32D).	NA			
To evaluate soil vapor downgradient from the site, install and sample soil vapor monitoring points in shallow soils above the water table. Locations to be collocated with shallow monitoring wells above.	SV-12, SV-13, SV-14, SV-15, SV-16, SV-17, and SV-18	Soil Vapor	5-6 feet (depth indicated by last number in sample ID)	828076-SVP12005		1	
				828076-SVP13005		1	
				828076-SVP14005		1	
				828076-SVP15005		1	
				828076-SVP16005		1	
				828076-SVP17005		1	
				828076-SVP18005		1	
				828076-SVP___D		1	
To check function and evaluate effectiveness of in-place SSDS and evaluate ambient air conditions, collect indoor air samples. Ambient air sample numbers as place holders and will also to be used with soil vapor intrusion sampling below.	IA-001,-002,-003B1,-003B2,-003B10, -004/ AA-001,-002,-003,-004,-005,-006,-007,-008,-009,010 AA-1,2,3,4,5,6,7,8,9,10	Indoor Air and Ambient Air (24 hour samples assumed, unless noted)	3-5 feet above ground	828076-IA-001-01		1	(8 hour)
				828076-IA-001-02		1	(8 hour)
				828076-IA-001-03		1	(8 hour)
				828076-IA-002-01		1	
				828076-IA-002-02		1	
				828076-IA-003B1-01		1	
				828076-IA-003B1-02		1	
				828076-IA-003B2-01		1	
				828076-IA-003B2-02		1	
				828076-IA-003B10-01		1	
				828076-IA-003B10-02		1	
				828076-IA-004-01		1	(8 hour)
				828076-IA-004-02		1	(8 hour)
				828076-AA-001-01		1	
				828076-AA-002-01		1	
				828076-AA-003-01		1	
				828076-AA-004-01		1	
				828076-AA-005-01		1	
				828076-AA-006-01		1	
				828076-AA-007-01		1	
				828076-AA-008-01		1	
				828076-AA-009-01		1	
				828076-AA-010-01		1	
				828076-IA-___-D		1	

Table 1: Proposed Field Tasks and Methodology SVI Investigation

Methodology and Rationale	Loc I.D.	Medium	Depth bgs ft.	Sample I.D.	VOCs 8260C	VOCs TO-15	Special Par. See Note
Collect sub-slab soil vapor and indoor air samples to evaluate locations previously recommended for continued monitoring and assess whether additional action is necessary.	IA/SS-001, -003B3, -003B4, -003B5, -003B6, -003B8, -003B9	Sub-Slab Vapor/ Air	Sub-Slab Vapor-1 foot below ground. Indoor Air - 3-5 feet above ground.	828076-SS-001-04		1	(8 hour)
				828076-IA-001-04		1	(8 hour)
				828076-SS-001-05		1	(8 hour)
				828076-IA-001-05		1	(8 hour)
				828076-SS-001-06		1	(8 hour)
				828076-IA-001-06		1	(8 hour)
				828076-SS-001-06		1	(8 hour)
				828076-IA-001-06		1	(8 hour)
				828076-SS-003B3-01		1	
				828076-IA-003B3-01		1	
				828076-SS-003B3-02		1	
				828076-IA-003B3-02		1	
				828076-SS-003B3-03		1	
				828076-IA-003B3-03		1	
				828076-SS-003B4-01		1	
				828076-SS-003B4-01D		1	
				828076-IA-003B4-01		1	
				828076-SS-003B4-02		1	
				828076-IA-003B4-02		1	
				828076-SS-003B4-03		1	
				828076-IA-003B4-03		1	
				828076-SS-003B5-01		1	
				828076-IA-003B5-01		1	
				828076-SS-003B5-02		1	
				828076-IA-003B5-02		1	
				828076-SS-003B6-01		1	
				828076-IA-003B6-01		1	
				828076-SS-003B6-02		1	
				828076-IA-003B6-02		1	
				828076-SS-003B8-01		1	
				828076-IA-003B8-01		1	
				828076-SS-003B8-02		1	
				828076-IA-003B8-02		1	
				828076-SS-003B9-01		1	
				828076-IA-003B9-01		1	
				828076-SS-003B9-02		1	
				828076-IA-003B9-02		1	

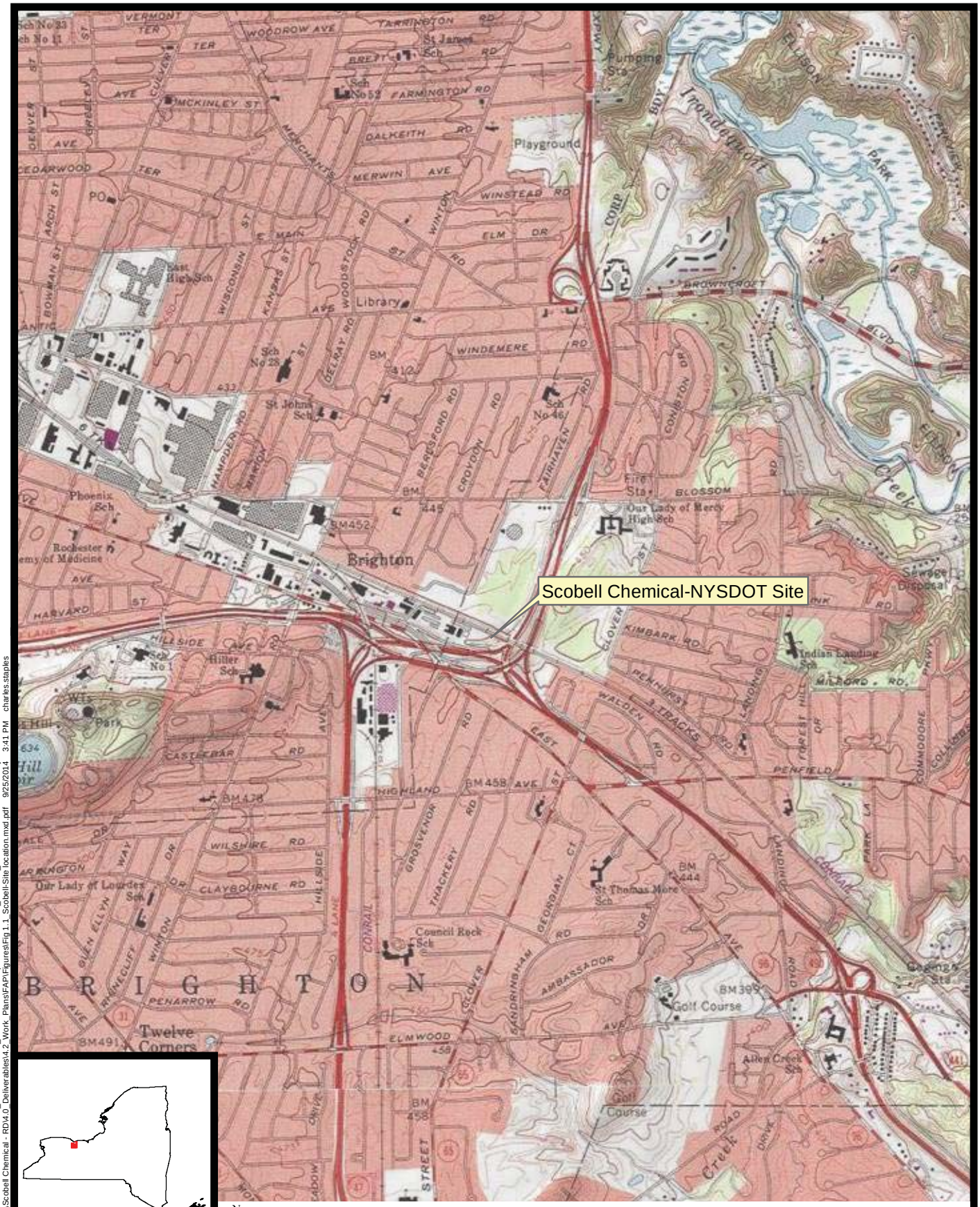
Table 1: Proposed Field Tasks and Methodology SVI Investigation

Methodology and Rationale	Loc I.D.	Medium	Depth bgs ft.	Sample I.D.	VOCs 8260C	VOCs TO-15	Special Par. See Note
Collect sub-slab soil vapor and indoor air samples at new locations to further characterize soil vapor extent in downgradient residences/structures. Includes ten (10) associated ambient air monitoring samples.	IA/SS-5 to IA/SS-24 AA-11 to AA-20	Sub-Slab Vapor/ Air	Sub-Slab Vapor-1 foot below ground. Indoor Air - 3-5 feet above ground.	828076-IA-005		1	
				828076-SS-005		1	
				828076-IA-006		1	
				828076-SS-006		1	
				828076-IA-007		1	
				828076-SS-007		1	
				828076-IA-008		1	
				828076-SS-008		1	
				828076-IA-009		1	
				828076-SS-009		1	
				828076-IA-010		1	
				828076-SS-010		1	
				828076-IA-011		1	
				828076-SS-011		1	
				828076-IA-012		1	
				828076-SS-012		1	
				828076-IA-013		1	
				828076-SS-013		1	
				828076-IA-014		1	
				828076-SS-014		1	
				828076-IA-015		1	
				828076-SS-015		1	
				828076-IA-016		1	
				828076-SS-016		1	
				828076-IA-017		1	
				828076-SS-017		1	
				828076-IA-018		1	
				828076-SS-018		1	
				828076-IA-019		1	
				828076-SS-019		1	
				828076-IA-020		1	
				828076-SS-020		1	
				828076-IA-021		1	
				828076-SS-021		1	
				828076-IA-022		1	
				828076-SS-022		1	
				828076-IA-023		1	
				828076-SS-023		1	
				828076-IA-024		1	
				828076-SS-024		1	
				828076-SS-005D		1	
				828076-AA-011		1	
				828076-AA-012		1	
				828076-AA-013		1	
				828076-AA-014		1	
				828076-AA-015		1	
				828076-AA-016		1	
				828076-AA-017		1	
				828076-AA-018		1	
				828076-AA-019		1	
				828076-AA-020		1	

Table 1: Proposed Field Tasks and Methodology SVI Investigation

Methodology and Rationale	Loc I.D.	Medium	Depth bgs ft.	Sample I.D.	VOCs 8260C	VOCs TO-15	Special Par. See Note
To evaluate shallow groundwater quality, low flow groundwater samples will be collected from the newly installed shallow bedrock, bedrock/overburden monitoring wells discussed above.	MW-30S	Groundwater	12	828076-MW30S012	1		
	MW-31S	Groundwater	12	828076-MW31S012	1		
	MW-32S	Groundwater	12	828076-MW32S012	1		
	MW-32D	Groundwater	20	828076-MW32D020	1		
	MW-33S	Groundwater	12	828076-MW33S012	1		
	MW-34S	Groundwater	12	828076-MW34S012	1		
	MW-35S	Groundwater	12	828076-MW35S012	1		
	MW-36S	Groundwater	12	828076-MW36S012	1		
	MW-___	Groundwater	__	828076-MW_____D	1		
ZVI Pilot Test Groundwater							
To evaluate if the partial ZVI injections have affected groundwater quality by degradation of TCE and creating reducing conditions.	MW-3D	Groundwater	20-35	828076-MW3___	1		1
	MW-16D	Groundwater		828076-MW16B___	1		1
	MW-17D	Groundwater		828076-MW17B___	1		1
	MW-___	Groundwater		828076-MW_____D	1		1
	IW-6	Groundwater		828076-IW6___	1		1
	IW-3	Groundwater		828076-IW3___	1		1

Notes:
Sample ID:
828076 = NYSDEC Site No.; __ to be determined in field; Last two digits for groundwater samples indicate depth below ground surface
For SVI sampling: IA=indoor air; SS = sub-slab vapor, followed by property number and sample number per property (property 3 also includes Building Number - B1 to B10, but not B7)
AA = ambient air
8260C VOCs = Target Compound List Volatile Organic Compounds
TO-15 = TCL VOCs in air
Duplicates will be collected at a frequency of 5% (1:20 samples).
bgs = below ground surface
Special Parameters:
Chloride, Nitrate, Sulfate by Method 9056A
Alkalinity by USEPA Method 2320B
Ethene, ethane, and methane by RSK 175
TOC by USEPA Method SM5310C
Calcium, iron, manganese, and magnesium will be analyzed by USEPA Method 6010C
In addition, oxygen and reduction/oxidation potential and pH will be measured in the field.



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Prepared/Date: CRS 09/25/14
Checked/Date: BPN 09/25/14

SCOBELL CHEMICAL-NYSDOT SITE
BRIGHTON, NEW YORK

MACTEC

SITE LOCATION
Site 828076
Figure 1

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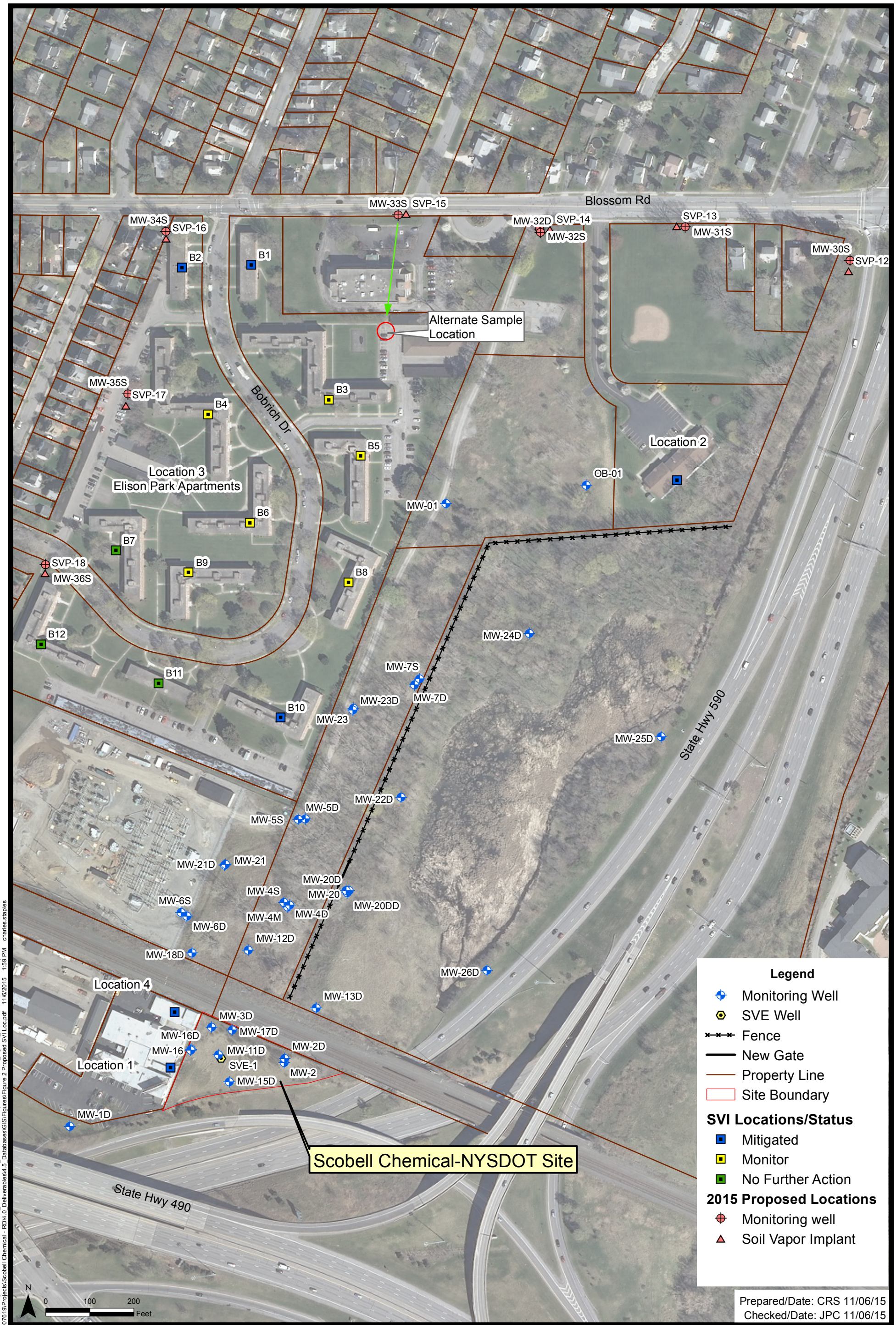

FIELD ACTIVITIES PLAN
SCOBELL CHEMICAL
ROCHESTER, NEW YORK

MACTEC

PROPOSED SVI INVESTIGATION LOCATIONS

Project 361714328 Figure 2

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ATTACHMENT A

LABORATORY METHODS, TARGET ANALYTES, AND DETECTION LIMITS

ATTACHMENT A

Soil Vapor Intrusion Investigation - Field Activities Plan Addendum 2

Scobell Chemical – NYSDOT Site (828076) Remedial Design WA D007619-32.1

MACTEC Engineering and Consulting, P.C. Project No. 3617147328

Laboratory Methods, Target Analytes, and Detection Limits

- ALS Rochester - Groundwater
- CENTEK - Air

ALS/ROCHESTER DATA QUALITY OBJECTIVES									
METHOD	ANALYTE	CAS No.	MATRIX	MDL	MRL	UNITS	LCS (%Rec.)	MS (%Rec.)	RPD
SM 2320B-	Alkalinity, Total		Water	0.22	2.0	mg/L	81-112	69-114	20
9056A	Chloride	16887-00-6	Water	0.099	0.20	mg/L	80-120	80-120	15
9056A	Nitrate as N	14797-55-8	Water	0.05	0.10	mg/L	80-120	80-120	15
9056A	Sulfate	14808-79-8	Water	0.02	0.2	mg/L	80-120	80-120	15
SM 5310C-	Total Organic Carbon	7440-44-0	Water	0.044	1.0	mg/L	81-118	48-135	20
6010C	Calcium	7440-70-2	Water	59	1000	ug/L	80-120	75-125	20
6010C	Iron	7439-89-6	Water	8.93	100	ug/L	80-120	75-125	20
6010C	Magnesium	7439-95-4	Water	9.6	1000	ug/L	80-120	75-125	20
6010C	Manganese	7439-96-5	Water	1.66	10	ug/L	80-120	75-125	20
8015C RSK	ETHANE	74-84-0	Water	0.1954	1.0	ug/L	75-118	61-124	30
8015C RSK	ETHYLENE	74-85-1	Water	0.1079	1.0	ug/L	73-129	53-148	30
8015C RSK	METHANE	74-82-8	Water	0.2023	1.0	ug/L	65-126	54-120	30
8260C LL	1,1,1,2-TETRACHLOROETHANE	630-20-6	Water	0.20	1.0	ug/L	80-119	77-126	30
8260C LL	1,1,1-TRICHLOROETHANE	71-55-6	Water	0.36	1.0	ug/L	74-120	74-127	30
8260C LL	1,1,2,2-TETRACHLOROETHANE	79-34-5	Water	0.20	1.0	ug/L	78-122	72-122	30
8260C LL	1,1,2-TRICHLORO-1,2,2-	76-13-1	Water	0.31	1.0	ug/L	75-124	59-131	30
8260C LL	1,1,2-TRICHLOROETHANE	79-00-5	Water	0.23	1.0	ug/L	82-118	79-119	30
8260C LL	1,1-DICHLOROETHANE	75-34-3	Water	0.20	1.0	ug/L	78-117	74-132	30
8260C LL	1,1-DICHLOROETHENE	75-35-4	Water	0.28	1.0	ug/L	74-135	74-139	30
8260C LL	1,1-DICHLOROPROPENE	563-58-6	Water	0.20	1.0	ug/L	73-127	78-147	30
8260C LL	1,2,3-TRICHLOROBENZENE	87-61-6	Water	0.20	1.0	ug/L	56-164	54-143	30
8260C LL	1,2,3-TRICHLOROPROPANE	96-18-4	Water	0.32	1.0	ug/L	68-136	75-122	30
8260C LL	1,2,4-TRICHLOROBENZENE	120-82-1	Water	0.23	1.0	ug/L	68-147	56-140	30
8260C LL	1,2,4-TRIMETHYLBENZENE	95-63-6	Water	0.20	1.0	ug/L	81-123	47-153	30
8260C LL	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	Water	0.74	2.0	ug/L	55-149	65-137	30
8260C LL	1,2-DIBROMOETHANE	106-93-4	Water	0.24	1.0	ug/L	81-125	80-117	30
8260C LL	1,2-DICHLORO-1,1,2-	354-23-4	Water	0.20	1.0	ug/L	76-140	67-156	30
8260C LL	1,2-DICHLOROBENZENE	95-50-1	Water	0.20	1.0	ug/L	80-119	77-120	30
8260C LL	1,2-DICHLOROETHANE	107-06-2	Water	0.20	1.0	ug/L	71-127	68-130	30
8260C LL	1,2-DICHLOROETHENE, TOTAL	540-59-0	Water	0.40	2.0	ug/L	75-121	75-128	30
8260C LL	1,2-DICHLOROPROPANE	78-87-5	Water	0.20	1.0	ug/L	80-119	79-124	30
8260C LL	1,3,5-TRIMETHYLBENZENE	108-67-8	Water	0.20	1.0	ug/L	79-123	49-149	30
8260C LL	1,3-DICHLOROBENZENE	541-73-1	Water	0.20	1.0	ug/L	79-121	74-125	30
8260C LL	1,3-DICHLOROPROPANE	142-28-9	Water	0.20	1.0	ug/L	83-119	81-120	30
8260C LL	1,4-DICHLOROBENZENE	106-46-7	Water	0.20	1.0	ug/L	79-119	72-124	30

8260C LL	1,4-DIOXANE	123-91-1	Water	18	40	ug/L	69-151	48-143	30
8260C LL	1-BUTANOL (N-BUTANOL)	109-69-3	Water	17	50	ug/L	51-153	34-161	30
8260C LL	2,2-DICHLORO-1,1,1-	306-83-2	Water	0.32	1.0	ug/L	76-130	66-147	30
8260C LL	2,2-DICHLOROPROPANE	594-20-7	Water	0.20	1.0	ug/L	57-130	30-133	30
8260C LL	2-BROMO-2-CHLORO-1,1,1-	151-67-7	Water	0.25	1.0	ug/L	63-125	73-128	30
8260C LL	2-BUTANONE (MEK)	78-93-3	Water	0.81	5.0	ug/L	61-137	46-141	30
8260C LL	2-CHLORO-1,3-BUTADIENE	126-99-8	Water	0.22	1.0	ug/L	67-127	44-165	30
8260C LL	2-CHLOROETHYLVINYL ETHER	110-75-8	Water	0.34	1.0	ug/L	49-145	10-179	30
8260C LL	2-CHLOROTOLUENE	95-49-8	Water	0.20	1.0	ug/L	81-121	74-124	30
8260C LL	2-HEXANONE	591-78-6	Water	0.73	5.0	ug/L	63-124	56-132	30
8260C LL	2-METHYL-1-PROPANOL	78-83-1	Water	8.0	40	ug/L	60-132	50-141	30
8260C LL	2-METHYL-2-PROPANOL	75-65-0	Water	6.0	40	ug/L	59-140	48-147	30
8260C LL	2-NITROPROPANE	79-46-9	Water	1.5	2.0	ug/L	39-140	39-148	30
8260C LL	2-PROPANOL	67-63-0	Water	8.5	40	ug/L	50-156	25-174	30
8260C LL	3-CHLORO-1-PROPENE (ALLYL	107-05-1	Water	0.25	1.0	ug/L	69-140	49-156	30
8260C LL	4-CHLOROTOLUENE	106-43-4	Water	0.24	1.0	ug/L	73-127	75-125	30
8260C LL	4-ISOPROPYLTOLUENE	99-87-6	Water	0.20	1.0	ug/L	77-131	64-144	30
8260C LL	4-METHYL-2-PENTANONE (MIBK)	108-10-1	Water	0.20	5.0	ug/L	66-124	60-141	30
8260C LL	ACETONE	67-64-1	Water	1.2	5.0	ug/L	40-161	29-151	30
8260C LL	ACETONITRILE	75-05-8	Water	3.7	10	ug/L	46-154	39-155	30
8260C LL	ACROLEIN	107-02-8	Water	3.0	10	ug/L	10-200	10-156	30
8260C LL	ACRYLONITRILE	107-13-1	Water	0.78	10	ug/L	71-130	69-131	30
8260C LL	BENZENE	71-43-2	Water	0.20	1.0	ug/L	76-118	76-129	30
8260C LL	BROMOBENZENE	108-86-1	Water	0.22	1.0	ug/L	79-121	78-119	30
8260C LL	BROMOCHLOROMETHANE	74-97-5	Water	0.32	1.0	ug/L	81-126	82-125	30
8260C LL	BROMODICHLOROMETHANE	75-27-4	Water	0.32	1.0	ug/L	78-126	76-127	30
8260C LL	BROMOFORM	75-25-2	Water	0.21	1.0	ug/L	71-136	58-133	30
8260C LL	BROMOMETHANE	74-83-9	Water	0.24	1.0	ug/L	42-166	10-162	30
8260C LL	CARBON DISULFIDE	75-15-0	Water	0.20	1.0	ug/L	65-127	34-162	30
8260C LL	CARBON TETRACHLORIDE	56-23-5	Water	0.45	1.0	ug/L	68-125	65-135	30
8260C LL	CHLOROBENZENE	108-90-7	Water	0.20	1.0	ug/L	80-121	76-125	30
8260C LL	CHLOROETHANE	75-00-3	Water	0.22	1.0	ug/L	70-127	70-140	30
8260C LL	CHLOROFORM	67-66-3	Water	0.20	1.0	ug/L	76-120	75-130	30
8260C LL	CHLOROMETHANE	74-87-3	Water	0.20	1.0	ug/L	69-145	55-160	30
8260C LL	CIS-1,2-DICHLOROETHENE	156-59-2	Water	0.20	1.0	ug/L	80-121	72-133	30
8260C LL	CIS-1,3-DICHLOROPROPENE	10061-01-5	Water	0.20	1.0	ug/L	74-126	52-134	30
8260C LL	CYCLOHEXANE	110-82-7	Water	0.25	1.0	ug/L	63-121	52-145	30

8260C LL	CYCLOHEXANONE	108-94-1	Water	8.1	20	ug/L	10-200	10-123	30
8260C LL	DECAMETHYLPENTASILOXANE	541-02-6	Water	NA	1.0	ug/L	44-138	44-138	30
8260C LL	DIBROMOCHLOROMETHANE	124-48-1	Water	0.20	1.0	ug/L	77-128	72-128	30
8260C LL	DIBROMOMETHANE	74-95-3	Water	0.22	1.0	ug/L	79-120	77-119	30
8260C LL	DICHLORODIFLUOROMETHANE	75-71-8	Water	0.21	1.0	ug/L	65-152	49-154	30
8260C LL	DICHLOROFLUOROMETHANE	75-43-4	Water	0.20	1.0	ug/L	63-145	53-163	30
8260C LL	DICHLOROMETHANE	75-09-2	Water	0.20	1.0	ug/L	73-122	75-121	30
8260C LL	DIETHYL ETHER	60-29-7	Water	0.22	1.0	ug/L	79-127	72-135	30
8260C LL	DIISOPROPYL ETHER (DIPE)	108-20-3	Water	0.20	1.0	ug/L	66-115	51-131	30
8260C LL	ETHYL METHACRYLATE	97-63-2	Water	0.20	2.0	ug/L	69-126	63-138	30
8260C LL	ETBE	637-92-3	Water	0.20	1.0	ug/L	68-109	61-116	30
8260C LL	ETHYLBENZENE	100-41-4	Water	0.20	1.0	ug/L	76-120	72-134	30
8260C LL	HEXACHLOROBUTADIENE	87-68-3	Water	0.44	2.0	ug/L	54-172	34-162	30
8260C LL	IODOMETHANE	74-88-4	Water	0.27	2.0	ug/L	18-160	14-159	30
8260C LL	ISOPROPYLBENZENE	98-82-8	Water	0.20	1.0	ug/L	78-126	76-136	30
8260C LL	M+P-XYLENE	179601-23-1	Water	0.26	2.0	ug/L	78-123	68-138	30
8260C LL	METHACRYLONITRILE	126-98-7	Water	0.50	2.0	ug/L	72-131	67-131	30
8260C LL	METHYL ACETATE	79-20-9	Water	0.25	2.0	ug/L	62-131	36-146	30
8260C LL	METHYL METHACRYLATE	80-62-6	Water	0.39	2.0	ug/L	71-127	74-130	30
8260C LL	METHYLCYCLOHEXANE	108-87-2	Water	0.27	1.0	ug/L	51-129	45-146	30
8260C LL	METHYL-TERT-BUTYL ETHER	1634-04-4	Water	0.20	1.0	ug/L	78-125	74-130	30
8260C LL	NAPTHALENE	91-20-3	Water	0.20	1.0	ug/L	55-166	57-153	30
8260C LL	N-BUTYLACETATE	123-86-4	Water	0.20	1.0	ug/L	62-129	38-141	30
8260C LL	N-BUTYLBENZENE	104-51-8	Water	0.20	1.0	ug/L	77-132	61-152	30
8260C LL	N-HEPTANE	142-82-5	Water	0.28	1.0	ug/L	57-134	32-162	30
8260C LL	N-PROPYLBENZENE	103-65-1	Water	0.20	1.0	ug/L	80-127	71-140	30
8260C LL	OCTAMETHYLTETRASILOXANE	556-67-2	Water		1.0	ug/L	36-160	50-150	30
8260C LL	O-XYLENE	95-47-6	Water	0.20	1.0	ug/L	80-120	68-134	30
8260C LL	PROPIONITRILE	107-12-0	Water	1.63	5.0	ug/L	69-133	63-146	30
8260C LL	SEC-BUTYLBENZENE	135-98-8	Water	0.20	1.0	ug/L	76-128	64-147	30
8260C LL	STYRENE	100-42-5	Water	0.20	1.0	ug/L	80-124	34-156	30
8260C LL	TAME	994-05-8	Water	0.20	1.0	ug/L	76-123	63-118	30
8260C LL	TERT-BUTYLBENZENE	98-06-6	Water	0.20	1.0	ug/L	76-126	63-143	30
8260C LL	TETRA HYDROFURAN	109-99-9	Water	0.66	2.0	ug/L	64-134	67-137	30
8260C LL	TETRACHLOROETHENE	127-18-4	Water	0.20	1.0	ug/L	78-124	51-146	30
8260C LL	TOLUENE	108-88-3	Water	0.20	1.0	ug/L	77-120	79-125	30
8260C LL	TRANS-1,2-DICHLOROETHENE	156-60-5	Water	0.20	1.0	ug/L	80-120	77-125	30

8260C LL	TRANS-1,3-DICHLOROPROPENE	10061-02-6	Water	0.20	1.0	ug/L	67-135	50-142	30
8260C LL	TRANS-1,4-DICHLORO-2-BUTENE	110-57-6	Water	0.52	1.0	ug/L	39-134	10-136	30
8260C LL	TRICHLOROETHENE	79-01-6	Water	0.20	1.0	ug/L	78-123	62-142	30
8260C LL	TRICHLOROFLUOROMETHANE	75-69-4	Water	0.20	1.0	ug/L	68-126	72-142	30
8260C LL	VINYL ACETATE	108-05-4	Water	0.8	2.0	ug/L	30-155	17-156	30
8260C LL	VINYL CHLORIDE	75-01-4	Water	0.22	1.0	ug/L	69-133	60-157	30
8260C LL	XYLENES, TOTAL	1330-20-7	Water	0.46	3.0	ug/L	78-121	68-137	30

Notes:
Laboratory Control Limitss are listed for LCS and MS. Project-specific control limits will be used during data quality reviews complete in the DUSR.

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Parameter	Method	Units	MW	MDL/ppb	MDL/ugM3	PQL/ppb	SS / SV PQL/ugM3	Indoor Air PQL/ugM3*
1,1,1-Trichloroethane	TO-15	$\mu g/m^3$	133.42	0.017	0.0928	0.15	0.82	0.82
1,1,2,2-Tetrachloroethane	TO-15	$\mu g/m^3$	167.85	0.017	0.1167	0.15	1.03	1.03
1,1,2-Trichloroethane	TO-15	$\mu g/m^3$	133.42	0.018	0.0982	0.15	0.82	0.82
1,1-Dichloroethane	TO-15	$\mu g/m^3$	98.97	0.012	0.0486	0.15	0.61	0.61
1,1-Dichloroethene	TO-15	$\mu g/m^3$	96.95	0.039	0.1546	0.15	0.59	0.59
1,2,4-Trichlorobenzene	TO-15	$\mu g/m^3$	181.46	0.036	0.2672	0.15	1.11	1.11
1,2,4-Trimethylbenzene	TO-15	$\mu g/m^3$	120.19	0.017	0.0836	0.15	0.74	0.74
1,2-Dibromoethane	TO-15	$\mu g/m^3$	187.86	0.017	0.1306	0.15	1.15	1.15
1,2-Dichlorobenzene	TO-15	$\mu g/m^3$	147.01	0.015	0.0902	0.15	0.90	0.90
1,2-Dichloroethane	TO-15	$\mu g/m^3$	98.96	0.018	0.0729	0.15	0.61	0.61
1,2-Dichloropropane	TO-15	$\mu g/m^3$	112.99	0.035	0.1617	0.15	0.69	0.69
1,3,5-Trimethylbenzene	TO-15	$\mu g/m^3$	120.2	0.017	0.0836	0.15	0.74	0.74
1,3-butadiene	TO-15	$\mu g/m^3$	54.09	0.031	0.0686	0.15	0.33	0.33
1,3-Dichlorobenzene	TO-15	$\mu g/m^3$	147.07	0.015	0.0902	0.15	0.90	0.90
1,4-Dichlorobenzene	TO-15	$\mu g/m^3$	147.07	0.018	0.1083	0.15	0.90	0.90
1,4-Dioxane	TO-15	$\mu g/m^3$	88.11	0.04	0.1441	0.3	1.08	1.08
2,2,4-trimethylpentane	TO-15	$\mu g/m^3$	114.23	0.015	0.0701	0.15	0.70	0.70
4-ethyltoluene	TO-15	$\mu g/m^3$	120.2	0.028	0.1377	0.15	0.74	0.74
Acetone	TO-15	$\mu g/m^3$	58.08	0.041	0.0974	0.3	0.71	0.71
Allyl chloride	TO-15	$\mu g/m^3$	76.52	0.028	0.0876	0.15	0.47	0.47
Benzene	TO-15	$\mu g/m^3$	78.11	0.025	0.0799	0.15	0.48	0.48
Benzyl chloride	TO-15	$\mu g/m^3$	140.57	0.048	0.2760	0.15	0.86	0.86
Bromodichloromethane	TO-15	$\mu g/m^3$	163.83	0.018	0.1206	0.15	1.01	1.01
Bromoform	TO-15	$\mu g/m^3$	252.77	0.025	0.2585	0.15	1.55	1.55
Bromomethane	TO-15	$\mu g/m^3$	94.95	0.025	0.0971	0.15	0.58	0.58
Carbon disulfide	TO-15	$\mu g/m^3$	76.14	0.035	0.1090	0.15	0.47	0.47
Carbon tetrachloride	TO-15	$\mu g/m^3$	153.84	0.015	0.0944	0.15	0.94	0.25
Chlorobenzene	TO-15	$\mu g/m^3$	112.56	0.015	0.0691	0.15	0.69	0.69
Chloroethane	TO-15	$\mu g/m^3$	64.52	0.031	0.0818	0.15	0.40	0.40
Chloroform	TO-15	$\mu g/m^3$	119.39	0.015	0.0732	0.15	0.73	0.73
Chloromethane	TO-15	$\mu g/m^3$	50.49	0.03	0.0620	0.15	0.31	0.31

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Parameter	Method	Units	MW	MDL/ppb	MDL/ugM3	PQL/ppb	SS / SV PQL/ugM3	Indoor Air PQL/ugM3*
cis-1,2-Dichloroethene	TO-15	$\mu g/m^3$	96.94	0.017	0.0674	0.15	0.59	0.59
cis-1,3-Dichloropropene	TO-15	$\mu g/m^3$	110.97	0.039	0.1770	0.15	0.68	0.68
Cyclohexane	TO-15	$\mu g/m^3$	84.16	0.018	0.0620	0.15	0.52	0.52
Dibromochloromethane	TO-15	$\mu g/m^3$	208.29	0.025	0.2130	0.15	1.28	1.28
Ethyl acetate	TO-15	$\mu g/m^3$	88.11	0.05	0.1802	0.25	0.90	0.90
Ethylbenzene	TO-15	$\mu g/m^3$	106.17	0.017	0.0738	0.15	0.65	0.65
Freon 11	TO-15	$\mu g/m^3$	137.38	0.017	0.0955	0.15	0.84	0.84
Freon 113	TO-15	$\mu g/m^3$	187.39	0.017	0.1303	0.15	1.15	1.15
Freon 114	TO-15	$\mu g/m^3$	170.93	0.015	0.1049	0.15	1.05	1.05
Freon 12	TO-15	$\mu g/m^3$	120.92	0.025	0.1236	0.15	0.74	0.74
Heptane	TO-15	$\mu g/m^3$	100.2	0.025	0.1025	0.15	0.61	0.61
Hexachloro-1,3-butadiene	TO-15	$\mu g/m^3$	260.76	0.028	0.2986	0.15	1.60	1.60
Hexane	TO-15	$\mu g/m^3$	86.17	0.018	0.0634	0.15	0.53	0.53
Isopropyl alcohol	TO-15	$\mu g/m^3$	60.1	0.026	0.0639	0.15	0.37	0.37
m&p-Xylene	TO-15	$\mu g/m^3$	106.17	0.036	0.1563	0.3	1.30	1.30
Methyl Butyl Ketone	TO-15	$\mu g/m^3$	100.16	0.062	0.2540	0.3	1.23	1.23
Methyl Ethyl Ketone	TO-15	$\mu g/m^3$	72.11	0.012	0.0354	0.3	0.88	0.88
Methyl Isobutyl Ketone	TO-15	$\mu g/m^3$	100.16	0.024	0.0983	0.3	1.23	1.23
Methyl tert-butyl ether	TO-15	$\mu g/m^3$	88.15	0.024	0.0865	0.15	0.54	0.54
Methylene chloride	TO-15	$\mu g/m^3$	84.94	0.017	0.0591	0.15	0.52	0.52
o-Xylene	TO-15	$\mu g/m^3$	106.17	0.034	0.1476	0.15	0.65	0.65
Propylene	TO-15	$\mu g/m^3$	42.08	0.015	0.0258	0.15	0.26	0.26
Styrene	TO-15	$\mu g/m^3$	104.15	0.018	0.0767	0.15	0.64	0.64
Tetrachloroethylene	TO-15	$\mu g/m^3$	165.85	0.017	0.1153	0.15	1.02	1.02
Tetrahydrofuran	TO-15	$\mu g/m^3$	72.1	0.018	0.0531	0.15	0.44	0.44
Toluene	TO-15	$\mu g/m^3$	92.14	0.031	0.1168	0.15	0.57	0.57
trans-1,2-Dichloroethene	TO-15	$\mu g/m^3$	96.94	0.022	0.0872	0.15	0.59	0.59
trans-1,3-Dichloropropene	TO-15	$\mu g/m^3$	110.97	0.022	0.0999	0.15	0.68	0.68
Trichloroethene	TO-15	$\mu g/m^3$	131.39	0.025	0.1343	0.15	0.81	0.21
Vinyl acetate	TO-15	$\mu g/m^3$	86.09	0.046	0.1620	0.15	0.53	0.53
Vinyl Bromide	TO-15	$\mu g/m^3$	106.96	0.022	0.0962	0.15	0.66	0.66

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Parameter	Method	Units	MW	MDL/ppb	MDL/ugM3	PQL/ppb	SS / SV PQL/ugM3	Indoor Air PQL/ugM3*
Vinyl chloride	TO-15	$\mu g/m^3$	62.5	0.015	0.0383	0.15	0.38	0.10

Notes:
MDL = Method Detection Limit MDL=IDL
PQL = Practical Quantitation Limit
IDL = Instrument Detection Limit IDL=MDL
ppbv = parts per billion volume
ugM3 = microgram per cubic meter
SS / SV - Sub-slab / Soil Vapor
* Calibration modified for trichloroethene, vinyl chloride, and carbon tetrachloride to achieve RL ≤ 0.25 µg/m3.