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NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

CONSTRUCTION COMPLETION REPORT

Off-Site Sub-Slab Depressurization System – 8 Adler Drive

Northern Circuits (Site No. 734124)

6 Adler Drive, Dewitt, New York

Work Assignment #D009804-8

February 2021

CONSTRUCTION COMPLETION REPORT

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Northern Circuits (Site No. 734124)
6 Adler Drive, Dewitt, New York

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Date:

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ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis of New York, Inc.
CCR	Construction Completion Report
DER	Division of Environmental Remediation
iwc	inches of water column
NYSDEC	New York State Department of Environmental Conservation
OMM	operation, maintenance, and monitoring
PLC	programmable logic controller
PVC	polyvinyl chloride
SSD	sub-slab depressurization
TCE	trichloroethene
VI	vapor intrusion

1 INTRODUCTION

On behalf of the New York State Department of Environmental Conservation (NYSDEC), Arcadis of New York, Inc. (Arcadis) has prepared this Construction Completion Report (CCR) to summarize the construction and startup of an off-site vapor intrusion (VI) mitigation system installed as an interim remedial measure (IRM) associated with a remedial investigation being completed at the former Northern Circuits Site No. 734124, located at 6 Adler Drive, Dewitt, New York (Figure 1). Based on the results of a VI investigation conducted at the adjacent property to the east (8 Adler Drive), a sub-slab depressurization (SSD) system was installed as an IRM to mitigate the potential for VI in a portion of that building. The 8 Adler Drive property is 1.2 acres and consists of an approximately 12,200-square-foot, one-story building with multiple commercial tenants. The portion of the building targeted for VI mitigation is indicated on Figure 2. Detections of trichloroethene (TCE) in sub-slab soil vapor at 8 Adler Drive are assumed to be related to historical activities at 6 Adler Drive, which include circuit board manufacturing, metal plating, and/or photograph development. The VI investigation results are summarized in the Remedial Investigation Report (Arcadis 2020).

Arcadis performed an SSD pilot test in January 2019 to assess the potential effectiveness of SSD at this building and to obtain pertinent design parameters (e.g., extraction point spacing, applied vacuum, and vapor extraction flow rate). The results of the pilot test indicated that SSD could be effective at creating a negative pressure (i.e., vacuum) in the sub-slab relative to indoor air, thereby mitigating the potential for sub-slab soil vapor to migrate into indoor air. Tables and figures summarizing the SSD pilot test results are included in Appendix A. Arcadis prepared an 8 Adler Drive SSDS Work Plan (Arcadis 2019), which included drawings and specifications, to guide the construction of the SSD system by a NYSDEC regional callout remedial construction contractor.

The SSD system installation was performed by Groundwater and Environmental Services, Inc., and its subcontractors. On behalf of NYSDEC, Arcadis provided construction management services, which consisted of construction oversight, submittals management, field quality control, and communication with the building owner and tenants. Construction activities were conducted during July 2020, and the SSD system began operation on July 31, 2020.

2 SSD SYSTEM DESIGN OVERVIEW

The SSD system consists of seven SSD extraction points; each extraction point includes an extraction sump (from which sub-slab soil vapor is extracted), a flow-control valve, a vacuum gauge, and conveyance piping connecting the extraction sump to one of three exterior-mounted inline fans. Inline fans are installed with vertical discharge stacks that exhaust sub-slab soil vapors to the atmosphere at a height of 3 feet above the building roofline. A layout of the SSD system, and a piping and instrumentation diagram, are included on Sheets 1 and 4 of Appendix B, respectively.

The SSD system is designed to operate continuously and includes both remote monitoring and remote control functionality. Vacuum monitoring points were installed throughout the target mitigation area to allow sub-slab differential pressure to be manually measured to confirm system effectiveness (i.e., SSD).

The SSD system qualifies as a “trivial” activity that is exempt from air permitting requirements (6 CRR-NY 201-3.3) because it will be operated in agreement with and under the supervision of the NYSDEC. As presented in Appendix A, an emissions evaluation was conducted using volatile organic compound concentrations from vapor samples collected during the SSD pilot test, as well as the maximum flow rate for each vertical discharge, showed that the SSD system emissions will be below Division of Air Resources-1 (DAR-1) policy Annual Guideline Concentrations and Short-Term Guideline Concentrations. As such, emission controls are not required for the SSD system. A summary of the emissions calculations is included in Appendix A.

3 SUMMARY OF CONSTRUCTION ACTIVITIES

This section summarizes SSD system construction activities, which were primarily conducted between July 6, 2020 and July 31, 2020. Record drawings are included in Appendix B. A photographic log depicting SSD system construction activities is included in Appendix C.

3.1 Extraction Points

Seven extraction points (EP-1A, EP-1B, EP-2A, EP-2B, EP-3A, EP-3B, and EP-3C) were installed by core-drilling a hole in the concrete slab, removing material from the area immediately beneath the slab to create a sump (approximately 2-foot diameter and 8 inches deep), and placing ¾-inch-diameter washed gravel up to the bottom of the slab (refer to Detail 1 on Sheet 2, Appendix B). An open-ended section of 3-inch-diameter Schedule 80 polyvinyl chloride (PVC) pipe was installed vertically into each sump, extending to a depth of 1 to 2 inches below the bottom of the concrete floor slab. Prior to installation of new concrete, 6-mil polyethylene sheeting was placed directly above the washed gravel. Concrete was installed flush with the surrounding floor surface.

3.2 Extraction Riser

Mechanical controls and monitoring accessories for each extraction point are installed on an extraction riser that extends vertically from the extraction sump. Riser pipes for the extraction points were constructed of Schedule 80 PVC pipe. Each riser pipe consists of the following components:

- An inline 3-inch-diameter Schedule 80 PVC flow-control butterfly valve.
- A vacuum gauge (-30 to 0 inches of water column [iwc] range for extraction points EP-2A, EP-2B, EP-3A, EP-3B, and EP-3C; and -60 to 0 iwc range for extraction points EP-1A and EP-1B).
- A direct-tap, ½-inch-diameter stainless steel ball valve to allow for air velocity measurements or extracted sub-slab soil vapor sampling, if required.

Extraction risers are depicted on Detail 3 of Sheet 2 (Appendix B).

An enclosure was built around the extraction riser for EP-3C, which is located in a conference room. The enclosure consists of wood framing and ½-inch-thick gypsum board panels. Access panels installed in the enclosure provide access to the inline butterfly valve and direct-tap ball valve for EP-3C. Finish work for the enclosure was left for the building owner to complete, per the building owner's request.

3.3 Inline Fans and Piping

Overhead conveyance piping was installed to connect each extraction riser to one of three exterior wall mounted inline fans (F-100, F-200, and F-300). Inline fans F-100 and F-200 (both RadonAway HS-5000E) were connected to extraction points EP-1A and EP-1B and extraction points EP-2A and EP-2B, respectively. Inline fan F-300 (Obar GBR76SOE) was connected to extraction points EP-3A, EP-3B, and EP-3C. Interior overhead conveyance piping was constructed of 3-inch- and 4-inch-diameter Schedule 40 PVC; 4-inch pipe was used for sections conveying vapor from more than one SSD extraction point. Conveyance piping was sloped such that any condensate water that may accumulate inside the piping

will flow by gravity back to the extraction point. Conveyance piping was installed above the drop-ceiling, where present. The SSD system layout, including conveyance piping routes and inline fan locations, is shown on Sheet 1 (Appendix B). An SSD extraction point schedule, including inline fan make/models and specifications (flow/vacuum and power ratings), is included in Table 1.

Each inline fan was installed with a 3-inch-diameter Schedule 40 PVC vertical discharge stack extending to a height of 3 feet above the building roofline. A zero-loss rain cap (Harrison 1034-WCB-03) was installed at the top of each discharge stack. Exterior piping was installed with 1-inch fiberglass insulation and aluminum jacketing. Each fan is rated for exterior use and includes a built-in condensate bypass that allows any condensate that may accumulate above the fan to be directed to the suction side of the fan (i.e., below the fan) where it may drain to the extraction point. For each inline fan, a makeup air assembly was installed on exterior conveyance piping on the suction side of the fan to allow for additional adjustment of applied vacuum at SSD extraction points. Each makeup air assembly consisted of 2-inch-diameter Schedule 40 PVC piping, a 2-inch-diameter Schedule 80 PVC ball valve, and an inlet air filter/silencer (Solberg FS-19P-150). Vertical discharge details are shown on Detail 1 on Sheet 3 (Appendix B).

Differential pressure transmitters (Ashcroft IX3 F02 42ST 50IW) with a range of 0 to 50 iwc were installed on conveyance piping for each inline fan (three transmitters total) to allow for monitoring of applied vacuum.

3.4 Vacuum Monitoring Points

Vacuum monitoring points were installed by hammer-drilling a 5/8-inch-diameter hole through the floor slab. Near the floor surface, a larger, 1.5-inch-diameter hole was installed roughly 1.75 inches into the slab to facilitate installation of a VaporPin® stainless steel probe and flush-mounted cover (Detail 3 on Sheet 3, Appendix B). A total of eight sub-slab vacuum monitoring points were installed throughout the target mitigation area (Figure 2).

3.5 Controls and Electrical

Single-phase 120-volt power was provided to an SSD system control panel from the building's existing electrical distribution system. From the control panel, power was distributed to each inline fan. An electric submeter was installed upstream from the control panel to allow measurement of electrical consumption. An electrical single-line diagram is included on Sheet 5 (Appendix B).

The outside door of the control panel includes hand-off-auto switches for each inline fan, a red alarm-indicating light, a white power-indicating light, an alarm reset button, an emergency stop switch, and a human machine interface (HMI) screen. The inside of the control panel includes a programmable logic controller (PLC) (MicroLogix™ 1100), cellular modem (Sierra Wireless RV50X), uninterruptable power supply, circuit breakers, motor starters, and associated electrical appurtenances. The differential pressure transmitters for each inline fan were connected to the PLC inside the control panel. A panel layout and panel wiring diagram are included on Sheet 6 and Sheets 7 through 10, respectively (Appendix B).

The control panel provides for remote alarm notification via email in the event of a system failure (e.g., a fan shutdown). Additionally, the control panel provides for the following functionality to both local and remote users:

- Start and stop controls for each inline fan.
- Monitoring of applied vacuum for each inline fan.
- Adjustment of high and low-vacuum alarm setpoints.
- Adjustment of remote alarm notification recipients.

The PLC is programmed so that an inline fan will automatically shut down if a high-vacuum alarm occurs. The fan will remain off until it is restarted by a user (either locally or remotely).

4 SYSTEM STARTUP

The SSD system began operation on July 31, 2020. Following basic testing of system components, initial system startup activities consisted of collecting monitoring data at multiple applied vacuums at extraction points (via makeup air and/or inline valve adjustment) to determine optimal operational settings. Due to the relatively shallow groundwater table at the site, an excessively negative pressure gradient (i.e., high applied vacuum) created at the extraction points could result in extraction points becoming inundated with water. Initial system startup data were collected on July 31, 2020, with additional data collected on August 13, 2020. Based on an evaluation of the initial startup data, and the shallow groundwater table, the SSD system was configured to operate at a reduced vacuum at the extraction points via makeup air settings. Initial startup data are included in Appendix D.

Shortly after startup of the SSD system, floor cracks were sealed at two locations identified as potential short-circuiting areas. Approximately 30 linear feet of cracks were sealed in the area of vacuum monitoring point VMP-1, and approximately 70 linear feet of cracks were sealed in the area near extraction points EP-3A and EP-3B. Cracks were sealed using polyurethane caulk. Additionally, a damaged portion of the existing block wall foundation was identified as a potential short-circuiting area on the building exterior near extraction point EP-1A. Repairs to the building's foundation were not conducted as part of this work.

During the first month of operation following the initial SSD system startup (i.e., startup phase), performance monitoring was conducted on a weekly basis. Performance monitoring events consisted of measuring sub-slab differential pressure at vacuum monitoring points, and recording applied vacuum and measuring flow rates at SSD extraction points. Performance monitoring data are summarized in Table 2.

4.1 Extraction Points

Applied vacuum at the SSD extraction points was adjusted during the startup phase, including:

- Following a high vacuum alarm that occurred for inline fan F-100 on August 5, 2020, as a result of water in extraction points EP-1A and EP-1B, makeup air was adjusted for inline fan F-100 to reduce the applied vacuum at extraction points EP-1A and EP-1B from 9.5 to 4.5 iwc.
- Following the observation of water in the extraction riser for extraction point EP-2A, the inline flow-control valve for EP-2A was adjusted on September 3, 2020, to reduce the applied vacuum from 6.5 to 0 iwc.

The SSD extraction points yielded relatively low air flow (11 standard cubic feet per minute or less per extraction point) during the startup phase, with applied vacuums ranging from 0.5 to 12.5 iwc. Variations in applied vacuum and flow rates during the startup phase may be attributable to slight changes in groundwater elevation.

4.2 Vacuum Monitoring Points

Differential pressures measured at vacuum monitoring points during the startup phase indicate that the SSD system is successfully achieving sub-slab vacuum influence (i.e., negative sub-slab differential pressure) across the target mitigation area except in the northwestern corner of the building (VMP-1).

As noted with extraction point readings, variations in differential pressure may be attributable to slight changes in groundwater elevation. Sub-slab differential pressure measurements from September 11, 2020 are shown on Figure 3.

On August 13, 2020, six temporary vacuum monitoring points were installed to delineate the extent of sub-slab vacuum influence in the northwestern portion of the building (i.e., in the vicinity of vacuum monitoring point VMP-1). The temporary monitoring points were installed at locations utilized during the SSD pilot test conducted in January 2019. These data are included in Appendix D and demonstrate that sub-slab vacuum influence extended to at least the middle of the northwesternmost room in the building (VMP-7-3). The locations of the temporary vacuum monitoring points are shown in the SSD pilot test data included in Appendix A. It should be noted that the pre-existing damaged block wall foundation and associated potential short-circuiting near extraction point EP-1A may be contributing to the lack of vacuum influence demonstrated at VMP-1.

5 FUTURE ACTIVITIES

NYSDEC will arrange for operation, maintenance, and monitoring (OMM) of the SSD system, including verification indoor air sampling to be conducted during the heating season. An OMM Plan outlining the recommended OMM tasks and associated frequencies will be prepared.

6 CERTIFICATION

I, Daniel J. Loewenstein, certify that I am currently an NYS registered professional engineer and that this report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that activities were performed in full accordance with the DER-approved plans and specifications.

Daniel J. Loewenstein, P.E.
New York #066594

7 REFERENCES

Arcadis. 2019. 8 Adler Drive SSDS Work Plan, Former Northern Circuits Site, 6 Adler Drive, Town of Dewitt, New York, Site #734124. August.

Arcadis. 2020. Remedial Investigation Report, Former Northern Circuits Site, 6 Adler Drive, East Syracuse, New York, Site #734124.

TABLES

Table 1
SSD Extraction Point Schedule
Off-Site Sub-Slab Depressurization System (8 Adler Drive)
Northern Circuits (Site No. 734124)
6 Adler Drive, Dewitt, New York

Extraction Point	Fan ID	Fan Make/Model	Fan Specifications
EP-1A	F-100	RadonAway HS-5000E	350 W, rated for 16 cfm at 35 iwc
EP-1B			
EP-2A	F-200	RadonAway HS-5000E	350 W, rated for 16 cfm at 35 iwc
EP-2B			
EP-3A	F-300	Obar Systems, Inc. GBR76SOE	320 W, rated for 90 cfm at 10 iwc
EP-3B			
EP-3C			

Notes:

- Abbreviations
  cfm = cubic feet per minute
  iwc = inches of water column
  W = watts

Table 2
System Performance Data
Off-Site Sub-Slab Depressurization System (8 Adler Drive)
Northern Circuits (Site No. 734124)
6 Adler Drive, Dewitt, New York

Locations		Parameter	Date				
			8/13/20	8/20/20	8/28/20	9/3/20	9/11/20
Extraction Points	EP-1A	Applied Vacuum (iwc)	9.5	4.5	4.5	4.5	4.5
		Flow Rate (scfm)	5	2	2	2	2
	EP-1B	Applied Vacuum (iwc)	9.5	4.5	4.5	4.5	4.5
		Flow Rate (scfm)	6	5	6	7	7
	EP-2A	Applied Vacuum (iwc)	4	2.5	6.5	0.5	0.5
		Flow Rate (scfm)	5	24	0[(a)]	11	10
	EP-2B	Applied Vacuum (iwc)	4	3	6.5	6.5	5
		Flow Rate (scfm)	7	6	7	10	8
	EP-3A	Applied Vacuum (iwc)	12.5	9.5	9.5	9.5	10
		Flow Rate (scfm)	6	2	4	2	2
	EP-3B	Applied Vacuum (iwc)	12.5	9.5	9.5	9.5	10
		Flow Rate (scfm)	7	5	2	5	4
	EP-3C	Applied Vacuum (iwc)	11.5	9.5	9	9	9.5
		Flow Rate (scfm)	8	4	4	5	5
Vacuum Monitoring Points	VMP-1	Differential Pressure (iwc)	0.000	0.000	0.000	0.000	0.001
	VMP-2		-0.002	-0.018	-0.008	-0.013	-0.013
	VMP-3		-0.220	-0.163	-0.268	-0.265	-0.216
	VMP-4		-0.220	-0.402	-0.002	-0.139	-0.132
	VMP-5		-0.006	-0.002	-0.007	-0.007	-0.007
	VMP-6		-0.010	-0.022	-0.009	-0.011	-0.010
	VMP-7		-0.062	-0.051	-0.051	-0.048	-0.050
	VMP-8		-0.012	-0.016	-0.008	-0.011	-0.009

Notes:

a) No air flow was measured at EP-2A on August 28, 2020 due to presence of water in extraction sump.

- The SSD system began operation on July 31, 2020.
- Applied vacuum values shown are based on extraction point vacuum gauge readings. Flow rates shown are based on anemometer measurements taken at extraction points and converted from acfm to scfm.
- Variations in applied vacuums, flow rates, and sub-slab differential pressure may be attributable to a fluctuating shallow water table beneath the building, as well as occasional adjustments to inline valves for extraction points and makeup air valves for inline fans to optimize system performance. Valve settings are not indicated in this table.
- Abbreviations

  acfm = actual cubic feet per minute

  iwc = inches of water column

  scfm = standard cubic feet per minute

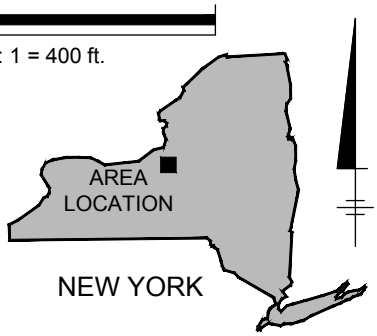
  SSD = sub-slab depressurization

FIGURES

REFERENCE: BASE MAP GOOGLE EARTH IMAGERY DATED 4/13/2017.

0 400' 800'

Approximate Scale: 1 = 400 ft.



NYSDEC SITE NO. 734124 (NORTHERN CIRCUITS)
6 ADLER DRIVE, DEWITT, NEW YORK

OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM - 8 ADLER DRIVE

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

C:\Users\roberlander\BIM 360\Arcadis\ANA - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\Project Files\Northern Circuits RIFS\2020\3005368901-DWG\SSDS-Fig 1-Site Location.dwg

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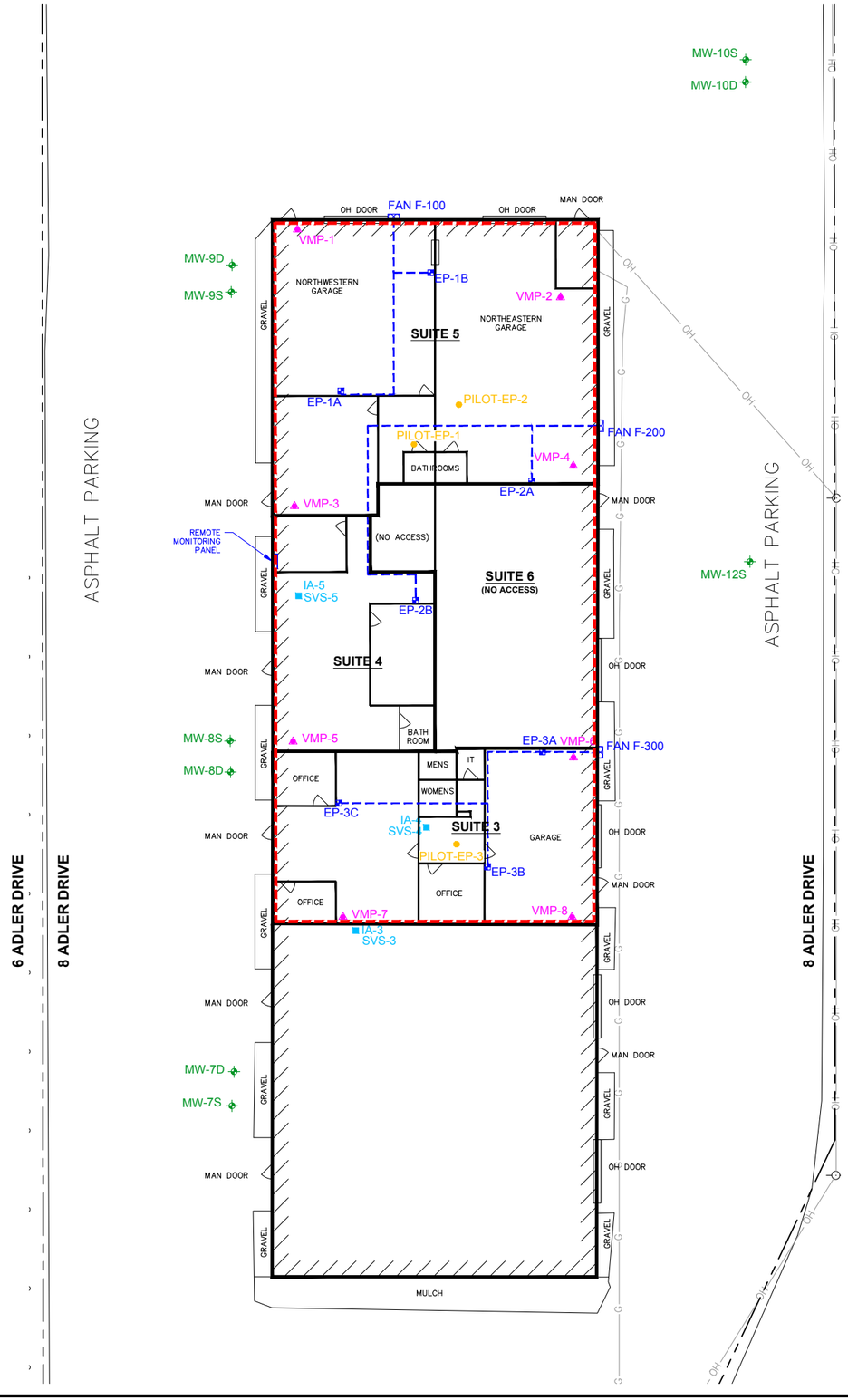

LEGEND:

- MONITORING WELL
- CO-LOCATED INDOOR AIR AND SUB-SLAB VAPOR SAMPLE LOCATION (ABANDONED)
- PILOT TEST SSD EXTRACTION POINT (ABANDONED)
- INLINE FAN/VERTICAL DISCHARGE
- SSD CONVEYANCE PIPING
- SSD EXTRACTION POINT/RISER
- SUB-SLAB VACUUM MONITORING POINT
- PROPERTY LINE
- OVERHEAD WIRE
- GAS LINE
- UTILITY POLE
- INTERIOR WALL
- (GROUND SURFACE TYPE TRANSITION)
- EXTERIOR/SUITE BOUNDARY WALL
- TARGET MITIGATION AREA EXTENTS

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY YEC, INC. DATED AUGUST 2015 AT A SCALE OF 1" = 20'. ADDITIONAL BASEMAP DATA DIGITIZED FROM GOOGLE EARTH AERIAL PHOTO DATED 6/2/2011.
2. ALL LOCATIONS ARE APPROXIMATE. NOT ALL BUILDING WALLS ARE SHOWN.

0 10 20
GRAPHIC SCALE

NYSDEC SITE NO. 734124 (NORTHERN CIRCUITS)
6 ADLER DRIVE, DEWITT, NEW YORK
OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM - 8 ADLER DRIVE

SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT

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FIGURE 2

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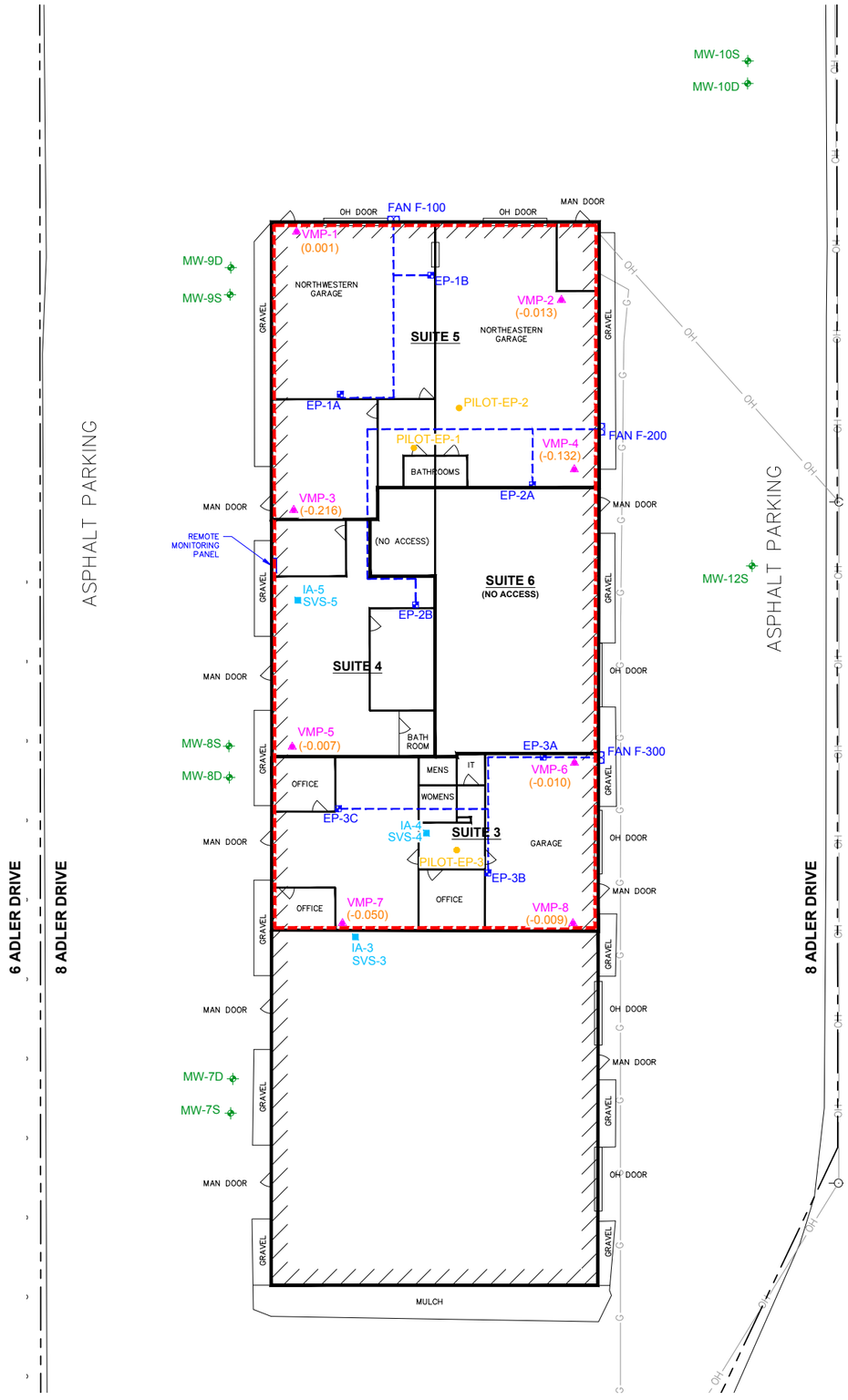

LEGEND:

- MONITORING WELL
- CO-LOCATED INDOOR AIR AND SUB-SLAB VAPOR SAMPLE LOCATION (ABANDONED)
- PILOT TEST SSD EXTRACTION POINT (ABANDONED)
- INLINE FAN/VERTICAL DISCHARGE
- SSD CONVEYANCE PIPING
- SSD EXTRACTION POINT/RISER
- SUB-SLAB VACUUM MONITORING POINT
- PROPERTY LINE
- OH — OVERHEAD WIRE
- G — GAS LINE
- UTILITY POLE
- INTERIOR WALL
- (GROUND SURFACE TYPE TRANSITION)
- EXTERIOR/SUITE BOUNDARY WALL
- TARGET MITIGATION AREA EXTENTS
- (-0.010) SUB-SLAB DIFFERENTIAL PRESSURE

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY YEC, INC. DATED AUGUST 2015 AT A SCALE OF 1" = 20'. ADDITIONAL BASEMAP DATA DIGITIZED FROM GOOGLE EARTH AERIAL PHOTO DATED 6/2/2011.
2. ALL LOCATIONS ARE APPROXIMATE. NOT ALL BUILDING WALLS ARE SHOWN.
3. UNITS OF DIFFERENTIAL PRESSURE ARE INCHES OF WATER COLUMN.

0 10 20
GRAPHIC SCALE

NYSDEC SITE NO. 734124 (NORTHERN CIRCUITS)
6 ADLER DRIVE, DEWITT, NEW YORK

OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM - 8 ADLER DRIVE

SUB-SLAB DIFFERENTIAL PRESSURE (SEPTEMBER 11, 2020)

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FIGURE 3

CITY: MINNEAPOLIS, MN DIV/GROUP: ENV/CAD DB: R. OBERLANDER PIC: D.LOEWENSTEIN PM: M. FLUSCHE TM: C. KASSEL C:\Users\roberlander\BIM 360\Acadis\ANA - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\Project Files\Northern Circuits RIFS\2020\3005368901-DWG\SSDS-Fig 3-Sub-Slab Differential Pressure Sept 2020.dwg LAYOUT: 3 SAVED: 11/9/2020 11:16 AM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 11/9/2020 11:16 AM BY: OBERLANDER, ROSEANNE
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APPENDIX A

SSD Pilot Test Results and Emissions Calculations

Table A-1
Pilot Test Results
Off-Site Sub-Slab Depressurization System (8 Adler Drive)
Northern Circuits (Site #734124)
6 Adler Drive, Dewitt, New York

Extraction Point		Background	EP-1			EP-2				EP-3		
Vacuum Step			Step 1	Step 1	Step 2	Step 1	Step 1	Step 2	Step 3	Step 1	Step 1	Step 2
Date			1/23/2019									
Applied Vacuum at Extraction Point (iwc)		-	44	43	23	44	44	16	3	32	32	11
Flow Rate (scfm)		-	13	13	7	24	27	18	10	35	35	20
Differential Pressure at Monitoring Points (iwc)	7-7	0.001	-0.355	-0.365	-0.248	-0.077	-0.075	-0.043	-0.011	0.001	-	-
	7-8	0.002	0.000	0.000	0.000	0.002	0.001	0.002	0.002	0.002	-	-
	7-6	0.001	-0.836	-0.861	0.587	-3.575	-3.506	-1.741	-0.339	0.000	-	-
	7-5	0.001	-0.239	-0.246	-0.164	-0.521	-0.531	-0.208	-0.061	0.001	-	-
	7-3	0.002	-0.057	-0.057	-0.039	-0.159	-0.155	-0.083	-0.016	0.001	-	-
	7-1	0.000	-0.011	-0.011	-0.008	-0.054	-0.053	-0.028	-0.005	0.000	-	-
	7-2	0.003	0.055	0.004	0.004	0.004	0.003	0.004	0.004	0.003	-	-
	7-4	0.001	-0.018	-0.018	-0.012	-0.004	-0.004	-0.003	0.000	0.000	-	-
	8-1	0.004	0.005	0.004	0.002	-0.004	0.002	0.002	0.004	0.003	-	-
	8-2	0.003	0.002	0.002	0.002	-0.040	-0.032	-0.016	-0.001	0.002	-	-
	8-4	0.002	-0.007	-0.007	-0.005	-0.649	-0.627	-0.320	-0.077	0.001	-	-
	8-5	0.002	-0.018	-0.018	-0.012	-1.102	-1.031	-0.525	-0.088	0.001	-	-
	8-7	0.002	-0.154	-0.116	-0.111	-0.453	-0.795	-0.433	-0.137	0.001	-	-
	8-6	0.000	-0.002	-0.002	-0.002	-0.026	-0.026	-0.015	-0.004	0.001	-	-
	8-3	0.001	0.000	0.000	-0.001	-0.050	-0.048	-0.026	-0.006	0.000	-	-
	4-1	0.001	-0.009	-0.003	-0.005	-0.012	-0.011	-0.006	-0.001	0.001	0.001	0.002
	4-2	0.001	-0.051	-0.052	-0.038	-0.107	-0.104	-0.062	-0.022	-0.011	-0.011	-0.005
	4-3	0.001	-0.016	0.000	0.000	0.000	0.000	0.000	0.000	-0.001	0.002	0.001
	4-4	0.002	0.000	-0.016	-0.012	-0.030	-0.029	-0.018	-0.008	-0.018	-0.018	-0.010
	3-4	0.002	0.001	0.000	0.000	0.001	0.001	0.002	0.002	0.001	0.001	0.002
	3-5	0.001	0.000	-0.001	-0.001	-0.001	0.000	0.000	0.000	-0.015	-0.016	-0.007
	3-3	0.000	-0.003	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	-0.249	-0.262	-0.133
	3-2	0.001	-0.002	-0.001	-0.002	-0.002	-0.001	-0.001	0.000	-0.022	-0.023	-0.011
	3-1	0.001	-0.002	-0.002	-0.002	-0.002	0.000	-0.001	-0.001	0.000	0.000	0.000
	3-6	0.002	0.000	0.000	0.000	-0.001	0.001	0.002	0.001	0.001	0.001	0.001

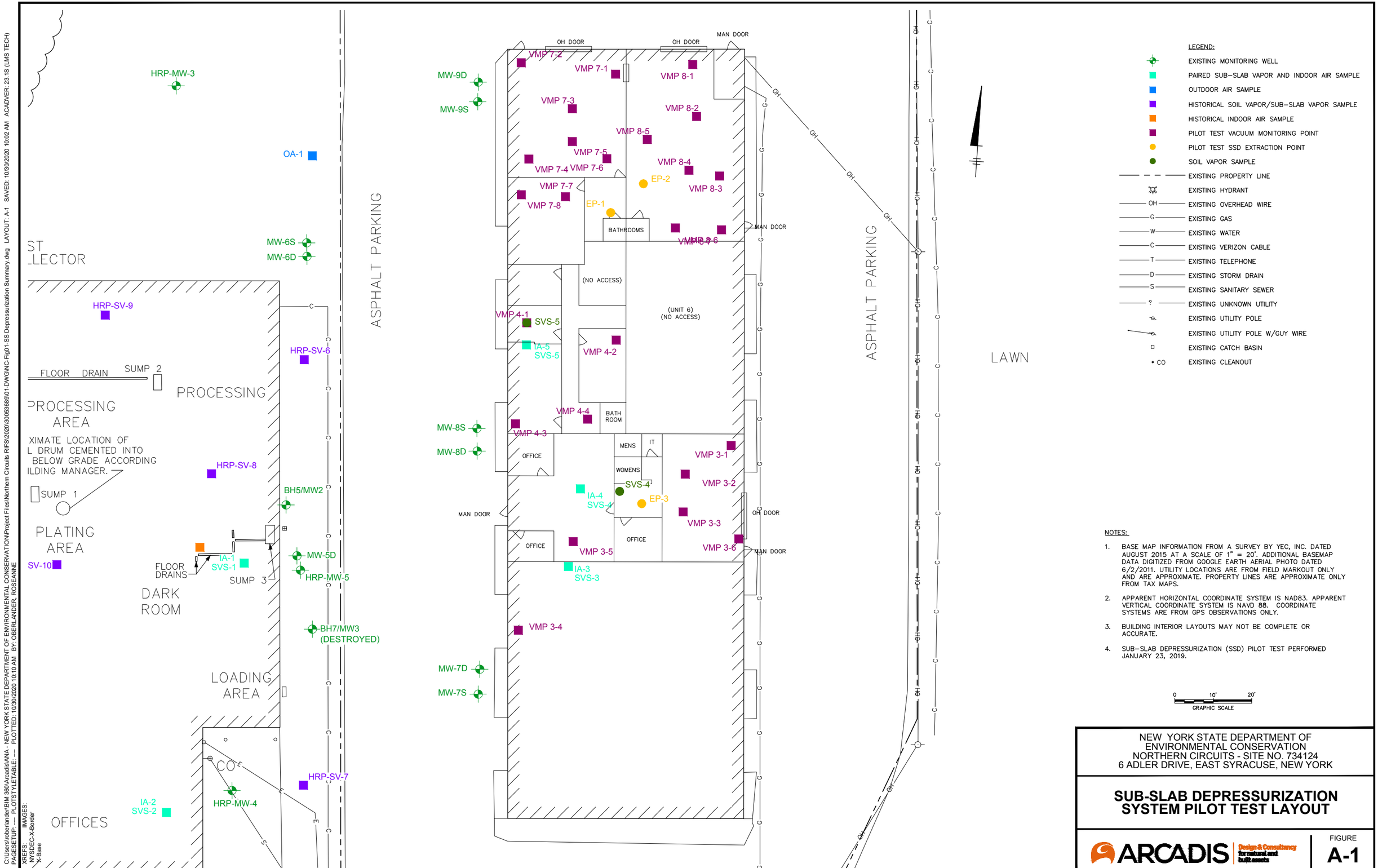
Notes:

- Extraction point constructed of 18-inch diameter by 8-inch thick void beneath slab.
- Monitoring points installed by drilling a 1/4-inch diameter hole through concrete slab and several inches into sub-slab material.
- Vacuum applied using 6.5-horsepower commerical wet/dry shop vacuum.
- Flow rate measured using Venturi-style inline flow meter and does not include makeup air.
- Monitoring point differential pressure readings indicating vacuum influence (i.e., at least 0.004 iwc of influence) are highlighted gray.
- Influent vapor samples collected during extraction from each extraction point. Samples do not include makeup air.
- Values indicating a sub-slab differential pressure ofat -0.004 iwc or lower (i.e., more negative), and at least 0.004 iwc below background, are highlighted gray.
- Abbreviations:
  iwc - inches of water column
  scfm - standard cubic feet per minute

Table A-2
Sub-Slab Depressurization System Emissions Calculations
Off-Site Sub-Slab Depressurization System (8 Adler Drive)
Northern Circuits (Site #734124)
6 Adler Drive, Dewitt, New York

Volatile Organic Compounds[1]	CAS Number	Pilot Test Extraction Sample Concentration (ug/m^3)[2]			Maximum Concentration (ug/m3)	Maximum Flow Rate Per Full-Scale SSDS Discharge Point (scfm)[3]			Total Maximum Flow Rate for Full-Scale SSDS (scfm)	Building Height (feet)	Stack Height (feet)	Maximum Emission Rate[4]		Actual Annual Impact (ug/m^3)[5]	AGC[6] (ug/m^3)	AGC Exceedance (Y/N)	Actual Short Term Impact (ug/m^3)[5]	SGC[6] (ug/m^3)	SGC Exceedance (Y/N)
		Pilot EP-1	Pilot EP-2	Pilot EP-3		EP-1	EP-2	EP-3				(lb/year)	(lb/hr)						
1,1,1-Trichloroethane	71-55-6	28	28	4	28							0.2227	0.0000	0.0020	5,000	No	0.0117	9,000	No
1,1-Dichloroethane	75-34-3	8	5	0.9	8							0.0636	0.0000	0.0006	0.63	No	0.0034	-	-
1,3,5-Trimethylbenzene	108-67-8	4	9	7	9							0.0716	0.0000	0.0006	6	No	0.0038	-	
2,2,4-Trimethylpentane	540-84-1	17	21	74	74							0.5886	0.0001	0.0052	3,300	No	0.0310	-	-
4-Ethyltoluene	622-96-8	4	7	3	7							0.0557	0.0000	0.0005	-	-	0.0029	-	-
Benzene	71-43-2	21	6	19	21							0.1670	0.0000	0.0015	0.13	No	0.0088	1,300	No
Bromodichloromethane	75-27-4	ND	ND	2	2							0.0159	0.0000	0.0001	70	No	0.0008	-	-
Carbon Tetrachloride	56-23-5	0.4	0.4	0.4	0.4							0.0032	0.0000	0.0000	0.17	No	0.0002	1,900	No
Chloroform	67-66-3	2	2	4	4							0.0318	0.0000	0.0003	14.7	No	0.0017	150	No
Cyclohexane	110-82-7	2	3	9	9							0.0716	0.0000	0.0006	6,000	No	0.0038	-	-
Dibromochloromethane	124-48-1	ND	ND	0.8	0.8							0.0064	0.0000	0.0001	-	-	0.0003	-	-
Dichlorodifluoromethane	75-71-8	3	3	6	6	44	44	155	243	14	17	0.0477	0.0000	0.0004	12,000	No	0.0025	-	-
Ethylbenzene	100-41-4	12	18	15	18							0.1432	0.0000	0.0013	1,000	No	0.0075	-	-
m,p-Xylenes	179601-23-1	53	76	73	76							0.6045	0.0001	0.0053	100	No	0.0318	22,000	No
Methylene Chloride	75-09-2	3	1	0.7	3							0.0239	0.0000	0.0002	60	No	0.0013	14,000	No
n-Heptane	142-82-5	5	5	10	10							0.0795	0.0000	0.0007	3,900	No	0.0042	210,000	No
n-Hexane	110-54-3	6	8	18	18							0.1432	0.0000	0.0013	700	No	0.0075	-	-
o-Xylene (1,2-Dimethylbenzene)	95-47-6	18	27	38	38							0.3023	0.0000	0.0027	100	No	0.0159	22,000	No
Tetrachloroethylene	127-18-4	5	3	9	9							0.0716	0.0000	0.0006	4	No	0.0038	300	No
Toluene	108-88-3	34	35	80	80							0.6363	0.0001	0.0056	5,000	No	0.0335	37,000	No
Trichloroethylene	79-01-6	1	0.8	0.5	1							0.0080	0.0000	0.0001	0.2	No	0.0004	20	No
Trichlorofluoromethane	75-69-4	2	3	3	3							0.0239	0.0000	0.0002	5,000	No	0.0013	9,000	No
Xylene (total)	-	70	110	110	110							0.8749	0.0001	0.0077	-	-	0.0461	-	-

Notes:
1. Only detected compounds are shown in this table.
2. SSD pilot test conducted on January 23, 2019. Vapor samples collected during extraction from each respective pilot test extraction point.
3. Maximum flow rates based on the maximum rated flow rate for inline fans selected for the full-scale SSDS for each discharge point, including a RadonAway HS-5000 fan for EP-1 and EP-2, and an Obar GBR 76 SOE fan for EP-3.
4. Maximum emission rate calculated using the maximum concentration of each compound from pilot test vapor extraction samples and the maximum flow rate per discharge point.
5. Actual impact calculated via Basic Cavity Impact Method as per the following formulas:
   $C_C(ug/m^3) = ((1.72 * Q_a) / (h_b)^2)$, where C_C is the worst case Annual Cavity Impact, Q_a is the annual emission rate in lbs/year, and h_b is the building height in feet
   $C_{CST}(ug/m^3) = ((90400 * Q) / (h_b)^2)$, where C_{CST} is the worst case Short-Term Cavity Impact, Q is the hourly emission rate in lbs/hour, and h_b is the building height in feet.
6. AGC and SGC values obtained from NYSDEC DAR-1 AGC/SGC Tables, dated July 14, 2016.
- Abbreviations:
  "-" = not applicable, or indicates no guideline as been established
  AGC = Annual Guideline Concentration
  lb/day = pounds per day
  ND = non-detect
  SGC = Short-term Guideline Concentration
  SSD = sub-slab depressurization
  SSDS = sub-slab depressurization system
  ug/m^3 = micrograms per cubic meter



LEGEND:

- EXISTING MONITORING WELL
- PAIRED SUB-SLAB VAPOR AND INDOOR AIR SAMPLE
- OUTDOOR AIR SAMPLE
- HISTORICAL SOIL VAPOR/SUB-SLAB VAPOR SAMPLE
- HISTORICAL INDOOR AIR SAMPLE
- PILOT TEST VACUUM MONITORING POINT
- PILOT TEST SSD EXTRACTION POINT
- SOIL VAPOR SAMPLE
- EXISTING PROPERTY LINE
- EXISTING HYDRANT
- OH — EXISTING OVERHEAD WIRE
- G — EXISTING GAS
- W — EXISTING WATER
- C — EXISTING VERIZON CABLE
- T — EXISTING TELEPHONE
- D — EXISTING STORM DRAIN
- S — EXISTING SANITARY SEWER
- ? — EXISTING UNKNOWN UTILITY
- EXISTING UTILITY POLE
- EXISTING UTILITY POLE W/GUY WIRE
- EXISTING CATCH BASIN
- CO — EXISTING CLEANOUT

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY YEC, INC. DATED AUGUST 2015 AT A SCALE OF 1" = 20'. ADDITIONAL BASEMAP DATA DIGITIZED FROM GOOGLE EARTH AERIAL PHOTO DATED 6/2/2011. UTILITY LOCATIONS ARE FROM FIELD MARKOUT ONLY AND ARE APPROXIMATE. PROPERTY LINES ARE APPROXIMATE ONLY FROM TAX MAPS.
2. APPARENT HORIZONTAL COORDINATE SYSTEM IS NAD83. APPARENT VERTICAL COORDINATE SYSTEM IS NAVD 88. COORDINATE SYSTEMS ARE FROM GPS OBSERVATIONS ONLY.
3. BUILDING INTERIOR LAYOUTS MAY NOT BE COMPLETE OR ACCURATE.
4. SUB-SLAB DEPRESSURIZATION (SSD) PILOT TEST PERFORMED JANUARY 23, 2019.

0 10' 20'
GRAPHIC SCALE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NORTHERN CIRCUITS - SITE NO. 734124
6 ADLER DRIVE, EAST SYRACUSE, NEW YORK

SUB-SLAB DEPRESSURIZATION SYSTEM PILOT TEST LAYOUT

ARCADIS Design & Consultancy for natural and built assets

FIGURE
A-1

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 200-47149-1

SDG Number: 200-47149-1

Job Description: Northern Circuits

For:
ARCADIS U.S. Inc
One Lincoln Center
110 West Fayette St, Suite 300
Syracuse, NY 13202

Attention: Mr. Chris Kassel

Approved for release.
Lori T Arnold
Manager of Project Management
2/4/2019 10:10 AM

Lori T Arnold, Manager of Project Management
30 Community Drive, South Burlington, VT, 05403
(802)923-1043
lori.arnold@testamericainc.com
02/04/2019

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Qualifiers

Air - GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

CASE NARRATIVE

Client: ARCADIS U.S. Inc

Project: Northern Circuits

Report Number: 200-47149-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 01/24/2019; the samples arrived in good condition.

VOLATILE ORGANIC COMPOUNDS

Samples EP-1-012319, EP-2-012319 and EP-3-012319 were analyzed for Volatile Organic Compounds in accordance with EPA Method TO-15. The samples were analyzed on 01/28/2019.

In the laboratory control sample (LCS) for analytical batch 200-139492, 3-Chloro-propene recovered above control limits. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported.

The continuing calibration verification (CCV) associated with batch 200-139492 recovered above the upper control limit for Bromoform. This analyte was not detected in the samples associated with this CCV; therefore, the data have been reported. The following samples are impacted: EP-1-012319, EP-2-012319 and EP-3-012319.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Northern Circuits

TestAmerica Job ID: 200-47149-1
SDG: 200-47149-1

Client Sample ID: EP-1-012319 — Lab Sample ID: 200-47149-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	0.51		0.50	0.20	ppb v/v	1		TO-15	Total/NA
Trichlorofluoromethane	0.40		0.20	0.062	ppb v/v	1		TO-15	Total/NA
Methylene Chloride	0.84		0.50	0.20	ppb v/v	1		TO-15	Total/NA
n-Hexane	1.8		0.20	0.16	ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethane	1.9		0.20	0.026	ppb v/v	1		TO-15	Total/NA
Chloroform	0.34		0.20	0.052	ppb v/v	1		TO-15	Total/NA
1,1,1-Trichloroethane	5.1		0.20	0.068	ppb v/v	1		TO-15	Total/NA
Cyclohexane	0.69		0.20	0.063	ppb v/v	1		TO-15	Total/NA
Carbon tetrachloride	0.068	J	0.20	0.024	ppb v/v	1		TO-15	Total/NA
2,2,4-Trimethylpentane	3.6		0.20	0.088	ppb v/v	1		TO-15	Total/NA
Benzene	6.5		0.20	0.071	ppb v/v	1		TO-15	Total/NA
n-Heptane	1.1		0.20	0.14	ppb v/v	1		TO-15	Total/NA
Trichloroethene	0.27		0.20	0.030	ppb v/v	1		TO-15	Total/NA
Toluene	9.1		0.20	0.069	ppb v/v	1		TO-15	Total/NA
Tetrachloroethene	0.72		0.20	0.029	ppb v/v	1		TO-15	Total/NA
Ethylbenzene	2.9		0.20	0.073	ppb v/v	1		TO-15	Total/NA
m,p-Xylene	12		0.50	0.070	ppb v/v	1		TO-15	Total/NA
Xylene, o-	4.2		0.20	0.071	ppb v/v	1		TO-15	Total/NA
Xylene (total)	16		0.70	0.14	ppb v/v	1		TO-15	Total/NA
4-Ethyltoluene	0.86		0.20	0.069	ppb v/v	1		TO-15	Total/NA
1,3,5-Trimethylbenzene	0.81		0.20	0.058	ppb v/v	1		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	3		2	1	ug/m3	1		TO-15	Total/NA
Trichlorofluoromethane	2		1	0.3	ug/m3	1		TO-15	Total/NA
Methylene Chloride	3		2	0.7	ug/m3	1		TO-15	Total/NA
n-Hexane	6		0.7	0.6	ug/m3	1		TO-15	Total/NA
1,1-Dichloroethane	8		0.8	0.1	ug/m3	1		TO-15	Total/NA
Chloroform	2		1	0.3	ug/m3	1		TO-15	Total/NA
1,1,1-Trichloroethane	28		1	0.4	ug/m3	1		TO-15	Total/NA
Cyclohexane	2		0.7	0.2	ug/m3	1		TO-15	Total/NA
Carbon tetrachloride	0.4	J	1	0.2	ug/m3	1		TO-15	Total/NA
2,2,4-Trimethylpentane	17		0.9	0.4	ug/m3	1		TO-15	Total/NA
Benzene	21		0.6	0.2	ug/m3	1		TO-15	Total/NA
n-Heptane	5		0.8	0.6	ug/m3	1		TO-15	Total/NA
Trichloroethene	1		1	0.2	ug/m3	1		TO-15	Total/NA
Toluene	34		0.8	0.3	ug/m3	1		TO-15	Total/NA
Tetrachloroethene	5		1	0.2	ug/m3	1		TO-15	Total/NA
Ethylbenzene	12		0.9	0.3	ug/m3	1		TO-15	Total/NA
m,p-Xylene	53		2	0.3	ug/m3	1		TO-15	Total/NA
Xylene, o-	18		0.9	0.3	ug/m3	1		TO-15	Total/NA
Xylene (total)	70		3	0.6	ug/m3	1		TO-15	Total/NA
4-Ethyltoluene	4		1	0.3	ug/m3	1		TO-15	Total/NA
1,3,5-Trimethylbenzene	4		1	0.3	ug/m3	1		TO-15	Total/NA

Client Sample ID: EP-2-012319 — Lab Sample ID: 200-47149-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	0.51		0.50	0.20	ppb v/v	1		TO-15	Total/NA
Trichlorofluoromethane	0.56		0.20	0.062	ppb v/v	1		TO-15	Total/NA
Methylene Chloride	0.31	J	0.50	0.20	ppb v/v	1		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: EP-2-012319 (Continued)

Lab Sample ID: 200-47149-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
n-Hexane	2.2		0.20	0.16	ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethane	1.3		0.20	0.026	ppb v/v	1		TO-15	Total/NA
Chloroform	0.49		0.20	0.052	ppb v/v	1		TO-15	Total/NA
1,1,1-Trichloroethane	5.1		0.20	0.068	ppb v/v	1		TO-15	Total/NA
Cyclohexane	0.80		0.20	0.063	ppb v/v	1		TO-15	Total/NA
Carbon tetrachloride	0.062	J	0.20	0.024	ppb v/v	1		TO-15	Total/NA
2,2,4-Trimethylpentane	4.6		0.20	0.088	ppb v/v	1		TO-15	Total/NA
Benzene	1.8		0.20	0.071	ppb v/v	1		TO-15	Total/NA
n-Heptane	1.3		0.20	0.14	ppb v/v	1		TO-15	Total/NA
Trichloroethene	0.14	J	0.20	0.030	ppb v/v	1		TO-15	Total/NA
Toluene	9.2		0.20	0.069	ppb v/v	1		TO-15	Total/NA
Tetrachloroethene	0.38		0.20	0.029	ppb v/v	1		TO-15	Total/NA
Ethylbenzene	4.1		0.20	0.073	ppb v/v	1		TO-15	Total/NA
m,p-Xylene	18		0.50	0.070	ppb v/v	1		TO-15	Total/NA
Xylene, o-	6.2		0.20	0.071	ppb v/v	1		TO-15	Total/NA
Xylene (total)	24		0.70	0.14	ppb v/v	1		TO-15	Total/NA
4-Ethyltoluene	1.4		0.20	0.069	ppb v/v	1		TO-15	Total/NA
1,3,5-Trimethylbenzene	1.8		0.20	0.058	ppb v/v	1		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	3		2	1	ug/m3	1		TO-15	Total/NA
Trichlorofluoromethane	3		1	0.3	ug/m3	1		TO-15	Total/NA
Methylene Chloride	1	J	2	0.7	ug/m3	1		TO-15	Total/NA
n-Hexane	8		0.7	0.6	ug/m3	1		TO-15	Total/NA
1,1-Dichloroethane	5		0.8	0.1	ug/m3	1		TO-15	Total/NA
Chloroform	2		1	0.3	ug/m3	1		TO-15	Total/NA
1,1,1-Trichloroethane	28		1	0.4	ug/m3	1		TO-15	Total/NA
Cyclohexane	3		0.7	0.2	ug/m3	1		TO-15	Total/NA
Carbon tetrachloride	0.4	J	1	0.2	ug/m3	1		TO-15	Total/NA
2,2,4-Trimethylpentane	21		0.9	0.4	ug/m3	1		TO-15	Total/NA
Benzene	6		0.6	0.2	ug/m3	1		TO-15	Total/NA
n-Heptane	5		0.8	0.6	ug/m3	1		TO-15	Total/NA
Trichloroethene	0.8	J	1	0.2	ug/m3	1		TO-15	Total/NA
Toluene	35		0.8	0.3	ug/m3	1		TO-15	Total/NA
Tetrachloroethene	3		1	0.2	ug/m3	1		TO-15	Total/NA
Ethylbenzene	18		0.9	0.3	ug/m3	1		TO-15	Total/NA
m,p-Xylene	76		2	0.3	ug/m3	1		TO-15	Total/NA
Xylene, o-	27		0.9	0.3	ug/m3	1		TO-15	Total/NA
Xylene (total)	110		3	0.6	ug/m3	1		TO-15	Total/NA
4-Ethyltoluene	7		1	0.3	ug/m3	1		TO-15	Total/NA
1,3,5-Trimethylbenzene	9		1	0.3	ug/m3	1		TO-15	Total/NA

Client Sample ID: EP-3-012319

Lab Sample ID: 200-47149-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	1.1		0.50	0.20	ppb v/v	1		TO-15	Total/NA
Trichlorofluoromethane	0.51		0.20	0.062	ppb v/v	1		TO-15	Total/NA
Methylene Chloride	0.20	J	0.50	0.20	ppb v/v	1		TO-15	Total/NA
n-Hexane	5.0		0.20	0.16	ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethane	0.23		0.20	0.026	ppb v/v	1		TO-15	Total/NA
Chloroform	0.81		0.20	0.052	ppb v/v	1		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: EP-3-012319 (Continued)

Lab Sample ID: 200-47149-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	0.82		0.20	0.068	ppb v/v	1		TO-15	Total/NA
Cyclohexane	2.5		0.20	0.063	ppb v/v	1		TO-15	Total/NA
Carbon tetrachloride	0.064	J	0.20	0.024	ppb v/v	1		TO-15	Total/NA
2,2,4-Trimethylpentane	16		0.20	0.088	ppb v/v	1		TO-15	Total/NA
Benzene	5.9		0.20	0.071	ppb v/v	1		TO-15	Total/NA
n-Heptane	2.4		0.20	0.14	ppb v/v	1		TO-15	Total/NA
Trichloroethene	0.084	J	0.20	0.030	ppb v/v	1		TO-15	Total/NA
Bromodichloromethane	0.27		0.20	0.094	ppb v/v	1		TO-15	Total/NA
Toluene	21		0.20	0.069	ppb v/v	1		TO-15	Total/NA
Tetrachloroethene	1.3		0.20	0.029	ppb v/v	1		TO-15	Total/NA
Dibromochloromethane	0.089	J	0.20	0.071	ppb v/v	1		TO-15	Total/NA
Ethylbenzene	3.5		0.20	0.073	ppb v/v	1		TO-15	Total/NA
m,p-Xylene	17		0.50	0.070	ppb v/v	1		TO-15	Total/NA
Xylene, o-	8.7		0.20	0.071	ppb v/v	1		TO-15	Total/NA
Xylene (total)	26		0.70	0.14	ppb v/v	1		TO-15	Total/NA
4-Ethyltoluene	0.68		0.20	0.069	ppb v/v	1		TO-15	Total/NA
1,3,5-Trimethylbenzene	1.5		0.20	0.058	ppb v/v	1		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dichlorodifluoromethane	6		2	1	ug/m3	1		TO-15	Total/NA
Trichlorofluoromethane	3		1	0.3	ug/m3	1		TO-15	Total/NA
Methylene Chloride	0.7	J	2	0.7	ug/m3	1		TO-15	Total/NA
n-Hexane	18		0.7	0.6	ug/m3	1		TO-15	Total/NA
1,1-Dichloroethane	0.9		0.8	0.1	ug/m3	1		TO-15	Total/NA
Chloroform	4		1	0.3	ug/m3	1		TO-15	Total/NA
1,1,1-Trichloroethane	4		1	0.4	ug/m3	1		TO-15	Total/NA
Cyclohexane	9		0.7	0.2	ug/m3	1		TO-15	Total/NA
Carbon tetrachloride	0.4	J	1	0.2	ug/m3	1		TO-15	Total/NA
2,2,4-Trimethylpentane	74		0.9	0.4	ug/m3	1		TO-15	Total/NA
Benzene	19		0.6	0.2	ug/m3	1		TO-15	Total/NA
n-Heptane	10		0.8	0.6	ug/m3	1		TO-15	Total/NA
Trichloroethene	0.5	J	1	0.2	ug/m3	1		TO-15	Total/NA
Bromodichloromethane	2		1	0.6	ug/m3	1		TO-15	Total/NA
Toluene	80		0.8	0.3	ug/m3	1		TO-15	Total/NA
Tetrachloroethene	9		1	0.2	ug/m3	1		TO-15	Total/NA
Dibromochloromethane	0.8	J	2	0.6	ug/m3	1		TO-15	Total/NA
Ethylbenzene	15		0.9	0.3	ug/m3	1		TO-15	Total/NA
m,p-Xylene	73		2	0.3	ug/m3	1		TO-15	Total/NA
Xylene, o-	38		0.9	0.3	ug/m3	1		TO-15	Total/NA
Xylene (total)	110		3	0.6	ug/m3	1		TO-15	Total/NA
4-Ethyltoluene	3		1	0.3	ug/m3	1		TO-15	Total/NA
1,3,5-Trimethylbenzene	7		1	0.3	ug/m3	1		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: EP-1-012319

Date Collected: 01/23/19 11:42
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Lab Sample ID: 200-47149-1

Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**0.51**		0.50	0.20	ppb v/v			01/28/19 18:18	1
1,2-Dichlorotetrafluoroethane	0.20	U	0.20	0.068	ppb v/v			01/28/19 18:18	1
Vinyl chloride	0.20	U	0.20	0.041	ppb v/v			01/28/19 18:18	1
1,3-Butadiene	0.20	U	0.20	0.065	ppb v/v			01/28/19 18:18	1
Bromomethane	0.20	U	0.20	0.062	ppb v/v			01/28/19 18:18	1
Chloroethane	0.50	U	0.50	0.21	ppb v/v			01/28/19 18:18	1
Bromoethene(Vinyl Bromide)	0.20	U	0.20	0.056	ppb v/v			01/28/19 18:18	1
Trichlorofluoromethane	**0.40**		0.20	0.062	ppb v/v			01/28/19 18:18	1
1,1-Dichloroethene	0.20	U	0.20	0.034	ppb v/v			01/28/19 18:18	1
3-Chloropropene	0.50	U *	0.50	0.27	ppb v/v			01/28/19 18:18	1
Methylene Chloride	**0.84**		0.50	0.20	ppb v/v			01/28/19 18:18	1
Methyl tert-butyl ether	0.20	U	0.20	0.061	ppb v/v			01/28/19 18:18	1
trans-1,2-Dichloroethene	0.20	U	0.20	0.074	ppb v/v			01/28/19 18:18	1
n-Hexane	**1.8**		0.20	0.16	ppb v/v			01/28/19 18:18	1
1,1-Dichloroethane	**1.9**		0.20	0.026	ppb v/v			01/28/19 18:18	1
cis-1,2-Dichloroethene	0.20	U	0.20	0.037	ppb v/v			01/28/19 18:18	1
1,2-Dichloroethene, Total	0.40	U	0.40	0.11	ppb v/v			01/28/19 18:18	1
Chloroform	**0.34**		0.20	0.052	ppb v/v			01/28/19 18:18	1
1,1,1-Trichloroethane	**5.1**		0.20	0.068	ppb v/v			01/28/19 18:18	1
Cyclohexane	**0.69**		0.20	0.063	ppb v/v			01/28/19 18:18	1
Carbon tetrachloride	**0.068**	**J**	0.20	0.024	ppb v/v			01/28/19 18:18	1
2,2,4-Trimethylpentane	**3.6**		0.20	0.088	ppb v/v			01/28/19 18:18	1
Benzene	**6.5**		0.20	0.071	ppb v/v			01/28/19 18:18	1
1,2-Dichloroethane	0.20	U	0.20	0.063	ppb v/v			01/28/19 18:18	1
n-Heptane	**1.1**		0.20	0.14	ppb v/v			01/28/19 18:18	1
Trichloroethene	**0.27**		0.20	0.030	ppb v/v			01/28/19 18:18	1
1,2-Dichloropropane	0.20	U	0.20	0.12	ppb v/v			01/28/19 18:18	1
Bromodichloromethane	0.20	U	0.20	0.094	ppb v/v			01/28/19 18:18	1
cis-1,3-Dichloropropene	0.20	U	0.20	0.098	ppb v/v			01/28/19 18:18	1
Toluene	**9.1**		0.20	0.069	ppb v/v			01/28/19 18:18	1
trans-1,3-Dichloropropene	0.20	U	0.20	0.12	ppb v/v			01/28/19 18:18	1
1,1,2-Trichloroethane	0.20	U	0.20	0.078	ppb v/v			01/28/19 18:18	1
Tetrachloroethene	**0.72**		0.20	0.029	ppb v/v			01/28/19 18:18	1
Dibromochloromethane	0.20	U	0.20	0.071	ppb v/v			01/28/19 18:18	1
1,2-Dibromoethane	0.20	U	0.20	0.069	ppb v/v			01/28/19 18:18	1
Ethylbenzene	**2.9**		0.20	0.073	ppb v/v			01/28/19 18:18	1
m,p-Xylene	**12**		0.50	0.070	ppb v/v			01/28/19 18:18	1
Xylene, o-	**4.2**		0.20	0.071	ppb v/v			01/28/19 18:18	1
Xylene (total)	**16**		0.70	0.14	ppb v/v			01/28/19 18:18	1
Bromoform	0.20	U	0.20	0.086	ppb v/v			01/28/19 18:18	1
1,1,2,2-Tetrachloroethane	0.20	U	0.20	0.076	ppb v/v			01/28/19 18:18	1
4-Ethyltoluene	**0.86**		0.20	0.069	ppb v/v			01/28/19 18:18	1
1,3,5-Trimethylbenzene	**0.81**		0.20	0.058	ppb v/v			01/28/19 18:18	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**3**		2	1	ug/m3			01/28/19 18:18	1
1,2-Dichlorotetrafluoroethane	1	U	1	0.5	ug/m3			01/28/19 18:18	1
Vinyl chloride	0.5	U	0.5	0.1	ug/m3			01/28/19 18:18	1
1,3-Butadiene	0.4	U	0.4	0.1	ug/m3			01/28/19 18:18	1

Client Sample ID: EP-1-012319

Lab Sample ID: 200-47149-1

Date Collected: 01/23/19 11:42
Matrix: Air
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	0.8	U	0.8	0.2	ug/m3			01/28/19 18:18	1
Chloroethane	1	U	1	0.6	ug/m3			01/28/19 18:18	1
Bromoethene(Vinyl Bromide)	0.9	U	0.9	0.2	ug/m3			01/28/19 18:18	1
Trichlorofluoromethane	**2**		1	0.3	ug/m3			01/28/19 18:18	1
1,1-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 18:18	1
3-Chloropropene	2	U *	2	0.8	ug/m3			01/28/19 18:18	1
Methylene Chloride	**3**		2	0.7	ug/m3			01/28/19 18:18	1
Methyl tert-butyl ether	0.7	U	0.7	0.2	ug/m3			01/28/19 18:18	1
trans-1,2-Dichloroethene	0.8	U	0.8	0.3	ug/m3			01/28/19 18:18	1
n-Hexane	**6**		0.7	0.6	ug/m3			01/28/19 18:18	1
1,1-Dichloroethane	**8**		0.8	0.1	ug/m3			01/28/19 18:18	1
cis-1,2-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 18:18	1
1,2-Dichloroethene, Total	2	U	2	0.4	ug/m3			01/28/19 18:18	1
Chloroform	**2**		1	0.3	ug/m3			01/28/19 18:18	1
1,1,1-Trichloroethane	**28**		1	0.4	ug/m3			01/28/19 18:18	1
Cyclohexane	**2**		0.7	0.2	ug/m3			01/28/19 18:18	1
Carbon tetrachloride	**0.4**	**J**	1	0.2	ug/m3			01/28/19 18:18	1
2,2,4-Trimethylpentane	**17**		0.9	0.4	ug/m3			01/28/19 18:18	1
Benzene	**21**		0.6	0.2	ug/m3			01/28/19 18:18	1
1,2-Dichloroethane	0.8	U	0.8	0.3	ug/m3			01/28/19 18:18	1
n-Heptane	**5**		0.8	0.6	ug/m3			01/28/19 18:18	1
Trichloroethene	**1**		1	0.2	ug/m3			01/28/19 18:18	1
1,2-Dichloropropane	0.9	U	0.9	0.6	ug/m3			01/28/19 18:18	1
Bromodichloromethane	1	U	1	0.6	ug/m3			01/28/19 18:18	1
cis-1,3-Dichloropropene	0.9	U	0.9	0.4	ug/m3			01/28/19 18:18	1
Toluene	**34**		0.8	0.3	ug/m3			01/28/19 18:18	1
trans-1,3-Dichloropropene	0.9	U	0.9	0.5	ug/m3			01/28/19 18:18	1
1,1,2-Trichloroethane	1	U	1	0.4	ug/m3			01/28/19 18:18	1
Tetrachloroethene	**5**		1	0.2	ug/m3			01/28/19 18:18	1
Dibromochloromethane	2	U	2	0.6	ug/m3			01/28/19 18:18	1
1,2-Dibromoethane	2	U	2	0.5	ug/m3			01/28/19 18:18	1
Ethylbenzene	**12**		0.9	0.3	ug/m3			01/28/19 18:18	1
m,p-Xylene	**53**		2	0.3	ug/m3			01/28/19 18:18	1
Xylene, o-	**18**		0.9	0.3	ug/m3			01/28/19 18:18	1
Xylene (total)	**70**		3	0.6	ug/m3			01/28/19 18:18	1
Bromoform	2	U	2	0.9	ug/m3			01/28/19 18:18	1
1,1,2,2-Tetrachloroethane	1	U	1	0.5	ug/m3			01/28/19 18:18	1
4-Ethyltoluene	**4**		1	0.3	ug/m3			01/28/19 18:18	1
1,3,5-Trimethylbenzene	**4**		1	0.3	ug/m3			01/28/19 18:18	1

Client Sample ID: EP-2-012319

Lab Sample ID: 200-47149-2

Date Collected: 01/23/19 13:25
Matrix: Air
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**0.51**		0.50	0.20	ppb v/v			01/28/19 19:13	1
1,2-Dichlorotetrafluoroethane	0.20	U	0.20	0.068	ppb v/v			01/28/19 19:13	1

Client Sample ID: EP-2-012319

Date Collected: 01/23/19 13:25
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Lab Sample ID: 200-47149-2

Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.20	U	0.20	0.041	ppb v/v			01/28/19 19:13	1
1,3-Butadiene	0.20	U	0.20	0.065	ppb v/v			01/28/19 19:13	1
Bromomethane	0.20	U	0.20	0.062	ppb v/v			01/28/19 19:13	1
Chloroethane	0.50	U	0.50	0.21	ppb v/v			01/28/19 19:13	1
Bromoethene(Vinyl Bromide)	0.20	U	0.20	0.056	ppb v/v			01/28/19 19:13	1
Trichlorofluoromethane	**0.56**		0.20	0.062	ppb v/v			01/28/19 19:13	1
1,1-Dichloroethene	0.20	U	0.20	0.034	ppb v/v			01/28/19 19:13	1
3-Chloropropene	0.50	U *	0.50	0.27	ppb v/v			01/28/19 19:13	1
Methylene Chloride	**0.31**	**J**	0.50	0.20	ppb v/v			01/28/19 19:13	1
Methyl tert-butyl ether	0.20	U	0.20	0.061	ppb v/v			01/28/19 19:13	1
trans-1,2-Dichloroethene	0.20	U	0.20	0.074	ppb v/v			01/28/19 19:13	1
n-Hexane	**2.2**		0.20	0.16	ppb v/v			01/28/19 19:13	1
1,1-Dichloroethane	**1.3**		0.20	0.026	ppb v/v			01/28/19 19:13	1
cis-1,2-Dichloroethene	0.20	U	0.20	0.037	ppb v/v			01/28/19 19:13	1
1,2-Dichloroethene, Total	0.40	U	0.40	0.11	ppb v/v			01/28/19 19:13	1
Chloroform	**0.49**		0.20	0.052	ppb v/v			01/28/19 19:13	1
1,1,1-Trichloroethane	**5.1**		0.20	0.068	ppb v/v			01/28/19 19:13	1
Cyclohexane	**0.80**		0.20	0.063	ppb v/v			01/28/19 19:13	1
Carbon tetrachloride	**0.062**	**J**	0.20	0.024	ppb v/v			01/28/19 19:13	1
2,2,4-Trimethylpentane	**4.6**		0.20	0.088	ppb v/v			01/28/19 19:13	1
Benzene	**1.8**		0.20	0.071	ppb v/v			01/28/19 19:13	1
1,2-Dichloroethane	0.20	U	0.20	0.063	ppb v/v			01/28/19 19:13	1
n-Heptane	**1.3**		0.20	0.14	ppb v/v			01/28/19 19:13	1
Trichloroethene	**0.14**	**J**	0.20	0.030	ppb v/v			01/28/19 19:13	1
1,2-Dichloropropane	0.20	U	0.20	0.12	ppb v/v			01/28/19 19:13	1
Bromodichloromethane	0.20	U	0.20	0.094	ppb v/v			01/28/19 19:13	1
cis-1,3-Dichloropropene	0.20	U	0.20	0.098	ppb v/v			01/28/19 19:13	1
Toluene	**9.2**		0.20	0.069	ppb v/v			01/28/19 19:13	1
trans-1,3-Dichloropropene	0.20	U	0.20	0.12	ppb v/v			01/28/19 19:13	1
1,1,2-Trichloroethane	0.20	U	0.20	0.078	ppb v/v			01/28/19 19:13	1
Tetrachloroethene	**0.38**		0.20	0.029	ppb v/v			01/28/19 19:13	1
Dibromochloromethane	0.20	U	0.20	0.071	ppb v/v			01/28/19 19:13	1
1,2-Dibromoethane	0.20	U	0.20	0.069	ppb v/v			01/28/19 19:13	1
Ethylbenzene	**4.1**		0.20	0.073	ppb v/v			01/28/19 19:13	1
m,p-Xylene	**18**		0.50	0.070	ppb v/v			01/28/19 19:13	1
Xylene, o-	**6.2**		0.20	0.071	ppb v/v			01/28/19 19:13	1
Xylene (total)	**24**		0.70	0.14	ppb v/v			01/28/19 19:13	1
Bromoform	0.20	U	0.20	0.086	ppb v/v			01/28/19 19:13	1
1,1,2,2-Tetrachloroethane	0.20	U	0.20	0.076	ppb v/v			01/28/19 19:13	1
4-Ethyltoluene	**1.4**		0.20	0.069	ppb v/v			01/28/19 19:13	1
1,3,5-Trimethylbenzene	**1.8**		0.20	0.058	ppb v/v			01/28/19 19:13	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**3**		2	1	ug/m3			01/28/19 19:13	1
1,2-Dichlorotetrafluoroethane	1	U	1	0.5	ug/m3			01/28/19 19:13	1
Vinyl chloride	0.5	U	0.5	0.1	ug/m3			01/28/19 19:13	1
1,3-Butadiene	0.4	U	0.4	0.1	ug/m3			01/28/19 19:13	1
Bromomethane	0.8	U	0.8	0.2	ug/m3			01/28/19 19:13	1
Chloroethane	1	U	1	0.6	ug/m3			01/28/19 19:13	1

Client Sample ID: EP-2-012319

Lab Sample ID: 200-47149-2

Date Collected: 01/23/19 13:25
Matrix: Air
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromoethene(Vinyl Bromide)	0.9	U	0.9	0.2	ug/m3			01/28/19 19:13	1
Trichlorofluoromethane	**3**		1	0.3	ug/m3			01/28/19 19:13	1
1,1-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 19:13	1
3-Chloropropene	2	U *	2	0.8	ug/m3			01/28/19 19:13	1
Methylene Chloride	**1**	**J**	2	0.7	ug/m3			01/28/19 19:13	1
Methyl tert-butyl ether	0.7	U	0.7	0.2	ug/m3			01/28/19 19:13	1
trans-1,2-Dichloroethene	0.8	U	0.8	0.3	ug/m3			01/28/19 19:13	1
n-Hexane	**8**		0.7	0.6	ug/m3			01/28/19 19:13	1
1,1-Dichloroethane	**5**		0.8	0.1	ug/m3			01/28/19 19:13	1
cis-1,2-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 19:13	1
1,2-Dichloroethene, Total	2	U	2	0.4	ug/m3			01/28/19 19:13	1
Chloroform	**2**		1	0.3	ug/m3			01/28/19 19:13	1
1,1,1-Trichloroethane	**28**		1	0.4	ug/m3			01/28/19 19:13	1
Cyclohexane	**3**		0.7	0.2	ug/m3			01/28/19 19:13	1
Carbon tetrachloride	**0.4**	**J**	1	0.2	ug/m3			01/28/19 19:13	1
2,2,4-Trimethylpentane	**21**		0.9	0.4	ug/m3			01/28/19 19:13	1
Benzene	**6**		0.6	0.2	ug/m3			01/28/19 19:13	1
1,2-Dichloroethane	0.8	U	0.8	0.3	ug/m3			01/28/19 19:13	1
n-Heptane	**5**		0.8	0.6	ug/m3			01/28/19 19:13	1
Trichloroethene	**0.8**	**J**	1	0.2	ug/m3			01/28/19 19:13	1
1,2-Dichloropropane	0.9	U	0.9	0.6	ug/m3			01/28/19 19:13	1
Bromodichloromethane	1	U	1	0.6	ug/m3			01/28/19 19:13	1
cis-1,3-Dichloropropene	0.9	U	0.9	0.4	ug/m3			01/28/19 19:13	1
Toluene	**35**		0.8	0.3	ug/m3			01/28/19 19:13	1
trans-1,3-Dichloropropene	0.9	U	0.9	0.5	ug/m3			01/28/19 19:13	1
1,1,2-Trichloroethane	1	U	1	0.4	ug/m3			01/28/19 19:13	1
Tetrachloroethene	**3**		1	0.2	ug/m3			01/28/19 19:13	1
Dibromochloromethane	2	U	2	0.6	ug/m3			01/28/19 19:13	1
1,2-Dibromoethane	2	U	2	0.5	ug/m3			01/28/19 19:13	1
Ethylbenzene	**18**		0.9	0.3	ug/m3			01/28/19 19:13	1
m,p-Xylene	**76**		2	0.3	ug/m3			01/28/19 19:13	1
Xylene, o-	**27**		0.9	0.3	ug/m3			01/28/19 19:13	1
Xylene (total)	**110**		3	0.6	ug/m3			01/28/19 19:13	1
Bromoform	2	U	2	0.9	ug/m3			01/28/19 19:13	1
1,1,2,2-Tetrachloroethane	1	U	1	0.5	ug/m3			01/28/19 19:13	1
4-Ethyltoluene	**7**		1	0.3	ug/m3			01/28/19 19:13	1
1,3,5-Trimethylbenzene	**9**		1	0.3	ug/m3			01/28/19 19:13	1

Client Sample ID: EP-3-012319

Lab Sample ID: 200-47149-3

Date Collected: 01/23/19 16:08
Matrix: Air
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**1.1**		0.50	0.20	ppb v/v			01/28/19 20:07	1
1,2-Dichlorotetrafluoroethane	0.20	U	0.20	0.068	ppb v/v			01/28/19 20:07	1
Vinyl chloride	0.20	U	0.20	0.041	ppb v/v			01/28/19 20:07	1
1,3-Butadiene	0.20	U	0.20	0.065	ppb v/v			01/28/19 20:07	1

Client Sample ID: EP-3-012319

Date Collected: 01/23/19 16:08
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Lab Sample ID: 200-47149-3

Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	0.20	U	0.20	0.062	ppb v/v			01/28/19 20:07	1
Chloroethane	0.50	U	0.50	0.21	ppb v/v			01/28/19 20:07	1
Bromoethene(Vinyl Bromide)	0.20	U	0.20	0.056	ppb v/v			01/28/19 20:07	1
Trichlorofluoromethane	**0.51**		0.20	0.062	ppb v/v			01/28/19 20:07	1
1,1-Dichloroethene	0.20	U	0.20	0.034	ppb v/v			01/28/19 20:07	1
3-Chloropropene	0.50	U *	0.50	0.27	ppb v/v			01/28/19 20:07	1
Methylene Chloride	**0.20**	**J**	0.50	0.20	ppb v/v			01/28/19 20:07	1
Methyl tert-butyl ether	0.20	U	0.20	0.061	ppb v/v			01/28/19 20:07	1
trans-1,2-Dichloroethene	0.20	U	0.20	0.074	ppb v/v			01/28/19 20:07	1
n-Hexane	**5.0**		0.20	0.16	ppb v/v			01/28/19 20:07	1
1,1-Dichloroethane	**0.23**		0.20	0.026	ppb v/v			01/28/19 20:07	1
cis-1,2-Dichloroethene	0.20	U	0.20	0.037	ppb v/v			01/28/19 20:07	1
1,2-Dichloroethene, Total	0.40	U	0.40	0.11	ppb v/v			01/28/19 20:07	1
Chloroform	**0.81**		0.20	0.052	ppb v/v			01/28/19 20:07	1
1,1,1-Trichloroethane	**0.82**		0.20	0.068	ppb v/v			01/28/19 20:07	1
Cyclohexane	**2.5**		0.20	0.063	ppb v/v			01/28/19 20:07	1
Carbon tetrachloride	**0.064**	**J**	0.20	0.024	ppb v/v			01/28/19 20:07	1
2,2,4-Trimethylpentane	**16**		0.20	0.088	ppb v/v			01/28/19 20:07	1
Benzene	**5.9**		0.20	0.071	ppb v/v			01/28/19 20:07	1
1,2-Dichloroethane	0.20	U	0.20	0.063	ppb v/v			01/28/19 20:07	1
n-Heptane	**2.4**		0.20	0.14	ppb v/v			01/28/19 20:07	1
Trichloroethene	**0.084**	**J**	0.20	0.030	ppb v/v			01/28/19 20:07	1
1,2-Dichloropropane	0.20	U	0.20	0.12	ppb v/v			01/28/19 20:07	1
Bromodichloromethane	**0.27**		0.20	0.094	ppb v/v			01/28/19 20:07	1
cis-1,3-Dichloropropene	0.20	U	0.20	0.098	ppb v/v			01/28/19 20:07	1
Toluene	**21**		0.20	0.069	ppb v/v			01/28/19 20:07	1
trans-1,3-Dichloropropene	0.20	U	0.20	0.12	ppb v/v			01/28/19 20:07	1
1,1,2-Trichloroethane	0.20	U	0.20	0.078	ppb v/v			01/28/19 20:07	1
Tetrachloroethene	**1.3**		0.20	0.029	ppb v/v			01/28/19 20:07	1
Dibromochloromethane	**0.089**	**J**	0.20	0.071	ppb v/v			01/28/19 20:07	1
1,2-Dibromoethane	0.20	U	0.20	0.069	ppb v/v			01/28/19 20:07	1
Ethylbenzene	**3.5**		0.20	0.073	ppb v/v			01/28/19 20:07	1
m,p-Xylene	**17**		0.50	0.070	ppb v/v			01/28/19 20:07	1
Xylene, o-	**8.7**		0.20	0.071	ppb v/v			01/28/19 20:07	1
Xylene (total)	**26**		0.70	0.14	ppb v/v			01/28/19 20:07	1
Bromoform	0.20	U	0.20	0.086	ppb v/v			01/28/19 20:07	1
1,1,2,2-Tetrachloroethane	0.20	U	0.20	0.076	ppb v/v			01/28/19 20:07	1
4-Ethyltoluene	**0.68**		0.20	0.069	ppb v/v			01/28/19 20:07	1
1,3,5-Trimethylbenzene	**1.5**		0.20	0.058	ppb v/v			01/28/19 20:07	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**6**		2	1	ug/m3			01/28/19 20:07	1
1,2-Dichlorotetrafluoroethane	1	U	1	0.5	ug/m3			01/28/19 20:07	1
Vinyl chloride	0.5	U	0.5	0.1	ug/m3			01/28/19 20:07	1
1,3-Butadiene	0.4	U	0.4	0.1	ug/m3			01/28/19 20:07	1
Bromomethane	0.8	U	0.8	0.2	ug/m3			01/28/19 20:07	1
Chloroethane	1	U	1	0.6	ug/m3			01/28/19 20:07	1
Bromoethene(Vinyl Bromide)	0.9	U	0.9	0.2	ug/m3			01/28/19 20:07	1
Trichlorofluoromethane	**3**		1	0.3	ug/m3			01/28/19 20:07	1

Client Sample ID: EP-3-012319

Date Collected: 01/23/19 16:08
Date Received: 01/24/19 09:49
Sample Container: Summa Canister 6L

Lab Sample ID: 200-47149-3

Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 20:07	1
3-Chloropropene	2	U *	2	0.8	ug/m3			01/28/19 20:07	1
Methylene Chloride	**0.7**	**J**	2	0.7	ug/m3			01/28/19 20:07	1
Methyl tert-butyl ether	0.7	U	0.7	0.2	ug/m3			01/28/19 20:07	1
trans-1,2-Dichloroethene	0.8	U	0.8	0.3	ug/m3			01/28/19 20:07	1
n-Hexane	**18**		0.7	0.6	ug/m3			01/28/19 20:07	1
1,1-Dichloroethane	**0.9**		0.8	0.1	ug/m3			01/28/19 20:07	1
cis-1,2-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 20:07	1
1,2-Dichloroethene, Total	2	U	2	0.4	ug/m3			01/28/19 20:07	1
Chloroform	**4**		1	0.3	ug/m3			01/28/19 20:07	1
1,1,1-Trichloroethane	**4**		1	0.4	ug/m3			01/28/19 20:07	1
Cyclohexane	**9**		0.7	0.2	ug/m3			01/28/19 20:07	1
Carbon tetrachloride	**0.4**	**J**	1	0.2	ug/m3			01/28/19 20:07	1
2,2,4-Trimethylpentane	**74**		0.9	0.4	ug/m3			01/28/19 20:07	1
Benzene	**19**		0.6	0.2	ug/m3			01/28/19 20:07	1
1,2-Dichloroethane	0.8	U	0.8	0.3	ug/m3			01/28/19 20:07	1
n-Heptane	**10**		0.8	0.6	ug/m3			01/28/19 20:07	1
Trichloroethene	**0.5**	**J**	1	0.2	ug/m3			01/28/19 20:07	1
1,2-Dichloropropane	0.9	U	0.9	0.6	ug/m3			01/28/19 20:07	1
Bromodichloromethane	**2**		1	0.6	ug/m3			01/28/19 20:07	1
cis-1,3-Dichloropropene	0.9	U	0.9	0.4	ug/m3			01/28/19 20:07	1
Toluene	**80**		0.8	0.3	ug/m3			01/28/19 20:07	1
trans-1,3-Dichloropropene	0.9	U	0.9	0.5	ug/m3			01/28/19 20:07	1
1,1,2-Trichloroethane	1	U	1	0.4	ug/m3			01/28/19 20:07	1
Tetrachloroethene	**9**		1	0.2	ug/m3			01/28/19 20:07	1
Dibromochloromethane	**0.8**	**J**	2	0.6	ug/m3			01/28/19 20:07	1
1,2-Dibromoethane	2	U	2	0.5	ug/m3			01/28/19 20:07	1
Ethylbenzene	**15**		0.9	0.3	ug/m3			01/28/19 20:07	1
m,p-Xylene	**73**		2	0.3	ug/m3			01/28/19 20:07	1
Xylene, o-	**38**		0.9	0.3	ug/m3			01/28/19 20:07	1
Xylene (total)	**110**		3	0.6	ug/m3			01/28/19 20:07	1
Bromoform	2	U	2	0.9	ug/m3			01/28/19 20:07	1
1,1,2,2-Tetrachloroethane	1	U	1	0.5	ug/m3			01/28/19 20:07	1
4-Ethyltoluene	**3**		1	0.3	ug/m3			01/28/19 20:07	1
1,3,5-Trimethylbenzene	**7**		1	0.3	ug/m3			01/28/19 20:07	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	RL	MDL	Units	Method
1,1,1-Trichloroethane	0.20	0.068	ppb v/v	TO-15
1,1,1-Trichloroethane	1.1	0.4	ug/m3	TO-15
1,1,2,2-Tetrachloroethane	0.20	0.076	ppb v/v	TO-15
1,1,2,2-Tetrachloroethane	1.4	0.5	ug/m3	TO-15
1,1,2-Trichloroethane	0.20	0.078	ppb v/v	TO-15
1,1,2-Trichloroethane	1.1	0.4	ug/m3	TO-15
1,1-Dichloroethane	0.20	0.026	ppb v/v	TO-15
1,1-Dichloroethane	0.81	0.1	ug/m3	TO-15
1,1-Dichloroethene	0.20	0.034	ppb v/v	TO-15
1,1-Dichloroethene	0.79	0.1	ug/m3	TO-15
1,2-Dibromoethane	0.20	0.069	ppb v/v	TO-15
1,2-Dibromoethane	1.5	0.5	ug/m3	TO-15
1,2-Dichloroethane	0.20	0.063	ppb v/v	TO-15
1,2-Dichloroethane	0.81	0.3	ug/m3	TO-15
1,2-Dichloroethene, Total	0.40	0.11	ppb v/v	TO-15
1,2-Dichloroethene, Total	1.6	0.4	ug/m3	TO-15
1,2-Dichloropropane	0.20	0.12	ppb v/v	TO-15
1,2-Dichloropropane	0.92	0.6	ug/m3	TO-15
1,2-Dichlorotetrafluoroethane	0.20	0.068	ppb v/v	TO-15
1,2-Dichlorotetrafluoroethane	1.4	0.5	ug/m3	TO-15
1,3,5-Trimethylbenzene	0.20	0.058	ppb v/v	TO-15
1,3,5-Trimethylbenzene	0.98	0.3	ug/m3	TO-15
1,3-Butadiene	0.20	0.065	ppb v/v	TO-15
1,3-Butadiene	0.44	0.1	ug/m3	TO-15
2,2,4-Trimethylpentane	0.20	0.088	ppb v/v	TO-15
2,2,4-Trimethylpentane	0.93	0.4	ug/m3	TO-15
3-Chloropropene	0.50	0.27	ppb v/v	TO-15
3-Chloropropene	1.6	0.8	ug/m3	TO-15
4-Ethyltoluene	0.20	0.069	ppb v/v	TO-15
4-Ethyltoluene	0.98	0.3	ug/m3	TO-15
Benzene	0.20	0.071	ppb v/v	TO-15
Benzene	0.64	0.2	ug/m3	TO-15
Bromodichloromethane	0.20	0.094	ppb v/v	TO-15
Bromodichloromethane	1.3	0.6	ug/m3	TO-15
Bromoethene(Vinyl Bromide)	0.20	0.056	ppb v/v	TO-15
Bromoethene(Vinyl Bromide)	0.87	0.2	ug/m3	TO-15
Bromoform	0.20	0.086	ppb v/v	TO-15
Bromoform	2.1	0.9	ug/m3	TO-15
Bromomethane	0.20	0.062	ppb v/v	TO-15
Bromomethane	0.78	0.2	ug/m3	TO-15
Carbon tetrachloride	0.20	0.024	ppb v/v	TO-15
Carbon tetrachloride	1.3	0.2	ug/m3	TO-15
Chloroethane	0.50	0.21	ppb v/v	TO-15
Chloroethane	1.3	0.6	ug/m3	TO-15
Chloroform	0.20	0.052	ppb v/v	TO-15
Chloroform	0.98	0.3	ug/m3	TO-15
cis-1,2-Dichloroethene	0.20	0.037	ppb v/v	TO-15
cis-1,2-Dichloroethene	0.79	0.1	ug/m3	TO-15
cis-1,3-Dichloropropene	0.20	0.098	ppb v/v	TO-15
cis-1,3-Dichloropropene	0.91	0.4	ug/m3	TO-15
Cyclohexane	0.20	0.063	ppb v/v	TO-15
Cyclohexane	0.69	0.2	ug/m3	TO-15

Default Detection Limits

Client: ARCADIS U.S. Inc
Project/Site: Northern Circuits

TestAmerica Job ID: 200-47149-1
SDG: 200-47149-1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	RL	MDL	Units	Method
Dibromochloromethane	0.20	0.071	ppb v/v	TO-15
Dibromochloromethane	1.7	0.6	ug/m3	TO-15
Dichlorodifluoromethane	0.50	0.20	ppb v/v	TO-15
Dichlorodifluoromethane	2.5	1	ug/m3	TO-15
Ethylbenzene	0.20	0.073	ppb v/v	TO-15
Ethylbenzene	0.87	0.3	ug/m3	TO-15
m,p-Xylene	0.50	0.070	ppb v/v	TO-15
m,p-Xylene	2.2	0.3	ug/m3	TO-15
Methyl tert-butyl ether	0.20	0.061	ppb v/v	TO-15
Methyl tert-butyl ether	0.72	0.2	ug/m3	TO-15
Methylene Chloride	0.50	0.20	ppb v/v	TO-15
Methylene Chloride	1.7	0.7	ug/m3	TO-15
n-Heptane	0.20	0.14	ppb v/v	TO-15
n-Heptane	0.82	0.6	ug/m3	TO-15
n-Hexane	0.20	0.16	ppb v/v	TO-15
n-Hexane	0.70	0.6	ug/m3	TO-15
Tetrachloroethene	0.20	0.029	ppb v/v	TO-15
Tetrachloroethene	1.4	0.2	ug/m3	TO-15
Toluene	0.20	0.069	ppb v/v	TO-15
Toluene	0.75	0.3	ug/m3	TO-15
trans-1,2-Dichloroethene	0.20	0.074	ppb v/v	TO-15
trans-1,2-Dichloroethene	0.79	0.3	ug/m3	TO-15
trans-1,3-Dichloropropene	0.20	0.12	ppb v/v	TO-15
trans-1,3-Dichloropropene	0.91	0.5	ug/m3	TO-15
Trichloroethene	0.20	0.030	ppb v/v	TO-15
Trichloroethene	1.1	0.2	ug/m3	TO-15
Trichlorofluoromethane	0.20	0.062	ppb v/v	TO-15
Trichlorofluoromethane	1.1	0.3	ug/m3	TO-15
Vinyl chloride	0.20	0.041	ppb v/v	TO-15
Vinyl chloride	0.51	0.1	ug/m3	TO-15
Xylene (total)	0.70	0.14	ppb v/v	TO-15
Xylene (total)	3.0	0.6	ug/m3	TO-15
Xylene, o-	0.20	0.071	ppb v/v	TO-15
Xylene, o-	0.87	0.3	ug/m3	TO-15

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 200-139492/6
Matrix: Air
Analysis Batch: 139492

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	0.50	U	0.50	0.20	ppb v/v			01/28/19 15:36	1
1,2-Dichlorotetrafluoroethane	0.20	U	0.20	0.068	ppb v/v			01/28/19 15:36	1
Vinyl chloride	0.20	U	0.20	0.041	ppb v/v			01/28/19 15:36	1
1,3-Butadiene	0.20	U	0.20	0.065	ppb v/v			01/28/19 15:36	1
Bromomethane	0.20	U	0.20	0.062	ppb v/v			01/28/19 15:36	1
Chloroethane	0.50	U	0.50	0.21	ppb v/v			01/28/19 15:36	1
Bromoethene(Vinyl Bromide)	0.20	U	0.20	0.056	ppb v/v			01/28/19 15:36	1
Trichlorofluoromethane	0.20	U	0.20	0.062	ppb v/v			01/28/19 15:36	1
1,1-Dichloroethene	0.20	U	0.20	0.034	ppb v/v			01/28/19 15:36	1
3-Chloropropene	0.50	U	0.50	0.27	ppb v/v			01/28/19 15:36	1
Methylene Chloride	0.50	U	0.50	0.20	ppb v/v			01/28/19 15:36	1
Methyl tert-butyl ether	0.20	U	0.20	0.061	ppb v/v			01/28/19 15:36	1
trans-1,2-Dichloroethene	0.20	U	0.20	0.074	ppb v/v			01/28/19 15:36	1
n-Hexane	0.20	U	0.20	0.16	ppb v/v			01/28/19 15:36	1
1,1-Dichloroethane	0.20	U	0.20	0.026	ppb v/v			01/28/19 15:36	1
cis-1,2-Dichloroethene	0.20	U	0.20	0.037	ppb v/v			01/28/19 15:36	1
1,2-Dichloroethene, Total	0.40	U	0.40	0.11	ppb v/v			01/28/19 15:36	1
Chloroform	0.20	U	0.20	0.052	ppb v/v			01/28/19 15:36	1
1,1,1-Trichloroethane	0.20	U	0.20	0.068	ppb v/v			01/28/19 15:36	1
Cyclohexane	0.20	U	0.20	0.063	ppb v/v			01/28/19 15:36	1
Carbon tetrachloride	0.20	U	0.20	0.024	ppb v/v			01/28/19 15:36	1
2,2,4-Trimethylpentane	0.20	U	0.20	0.088	ppb v/v			01/28/19 15:36	1
Benzene	0.20	U	0.20	0.071	ppb v/v			01/28/19 15:36	1
1,2-Dichloroethane	0.20	U	0.20	0.063	ppb v/v			01/28/19 15:36	1
n-Heptane	0.20	U	0.20	0.14	ppb v/v			01/28/19 15:36	1
Trichloroethene	0.20	U	0.20	0.030	ppb v/v			01/28/19 15:36	1
1,2-Dichloropropane	0.20	U	0.20	0.12	ppb v/v			01/28/19 15:36	1
Bromodichloromethane	0.20	U	0.20	0.094	ppb v/v			01/28/19 15:36	1
cis-1,3-Dichloropropene	0.20	U	0.20	0.098	ppb v/v			01/28/19 15:36	1
Toluene	0.20	U	0.20	0.069	ppb v/v			01/28/19 15:36	1
trans-1,3-Dichloropropene	0.20	U	0.20	0.12	ppb v/v			01/28/19 15:36	1
1,1,2-Trichloroethane	0.20	U	0.20	0.078	ppb v/v			01/28/19 15:36	1
Tetrachloroethene	0.20	U	0.20	0.029	ppb v/v			01/28/19 15:36	1
Dibromochloromethane	0.20	U	0.20	0.071	ppb v/v			01/28/19 15:36	1
1,2-Dibromoethane	0.20	U	0.20	0.069	ppb v/v			01/28/19 15:36	1
Ethylbenzene	0.20	U	0.20	0.073	ppb v/v			01/28/19 15:36	1
m,p-Xylene	0.50	U	0.50	0.070	ppb v/v			01/28/19 15:36	1
Xylene, o-	0.20	U	0.20	0.071	ppb v/v			01/28/19 15:36	1
Xylene (total)	0.70	U	0.70	0.14	ppb v/v			01/28/19 15:36	1
Bromoform	0.20	U	0.20	0.086	ppb v/v			01/28/19 15:36	1
1,1,2,2-Tetrachloroethane	0.20	U	0.20	0.076	ppb v/v			01/28/19 15:36	1
4-Ethyltoluene	0.20	U	0.20	0.069	ppb v/v			01/28/19 15:36	1
1,3,5-Trimethylbenzene	0.20	U	0.20	0.058	ppb v/v			01/28/19 15:36	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	2	U	2	1	ug/m3			01/28/19 15:36	1
1,2-Dichlorotetrafluoroethane	1	U	1	0.5	ug/m3			01/28/19 15:36	1
Vinyl chloride	0.5	U	0.5	0.1	ug/m3			01/28/19 15:36	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 200-139492/6
Matrix: Air
Analysis Batch: 139492

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Butadiene	0.4	U	0.4	0.1	ug/m3			01/28/19 15:36	1
Bromomethane	0.8	U	0.8	0.2	ug/m3			01/28/19 15:36	1
Chloroethane	1	U	1	0.6	ug/m3			01/28/19 15:36	1
Bromoethene(Vinyl Bromide)	0.9	U	0.9	0.2	ug/m3			01/28/19 15:36	1
Trichlorofluoromethane	1	U	1	0.3	ug/m3			01/28/19 15:36	1
1,1-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 15:36	1
3-Chloropropene	2	U	2	0.8	ug/m3			01/28/19 15:36	1
Methylene Chloride	2	U	2	0.7	ug/m3			01/28/19 15:36	1
Methyl tert-butyl ether	0.7	U	0.7	0.2	ug/m3			01/28/19 15:36	1
trans-1,2-Dichloroethene	0.8	U	0.8	0.3	ug/m3			01/28/19 15:36	1
n-Hexane	0.7	U	0.7	0.6	ug/m3			01/28/19 15:36	1
1,1-Dichloroethane	0.8	U	0.8	0.1	ug/m3			01/28/19 15:36	1
cis-1,2-Dichloroethene	0.8	U	0.8	0.1	ug/m3			01/28/19 15:36	1
1,2-Dichloroethene, Total	2	U	2	0.4	ug/m3			01/28/19 15:36	1
Chloroform	1	U	1	0.3	ug/m3			01/28/19 15:36	1
1,1,1-Trichloroethane	1	U	1	0.4	ug/m3			01/28/19 15:36	1
Cyclohexane	0.7	U	0.7	0.2	ug/m3			01/28/19 15:36	1
Carbon tetrachloride	1	U	1	0.2	ug/m3			01/28/19 15:36	1
2,2,4-Trimethylpentane	0.9	U	0.9	0.4	ug/m3			01/28/19 15:36	1
Benzene	0.6	U	0.6	0.2	ug/m3			01/28/19 15:36	1
1,2-Dichloroethane	0.8	U	0.8	0.3	ug/m3			01/28/19 15:36	1
n-Heptane	0.8	U	0.8	0.6	ug/m3			01/28/19 15:36	1
Trichloroethene	1	U	1	0.2	ug/m3			01/28/19 15:36	1
1,2-Dichloropropane	0.9	U	0.9	0.6	ug/m3			01/28/19 15:36	1
Bromodichloromethane	1	U	1	0.6	ug/m3			01/28/19 15:36	1
cis-1,3-Dichloropropene	0.9	U	0.9	0.4	ug/m3			01/28/19 15:36	1
Toluene	0.8	U	0.8	0.3	ug/m3			01/28/19 15:36	1
trans-1,3-Dichloropropene	0.9	U	0.9	0.5	ug/m3			01/28/19 15:36	1
1,1,2-Trichloroethane	1	U	1	0.4	ug/m3			01/28/19 15:36	1
Tetrachloroethene	1	U	1	0.2	ug/m3			01/28/19 15:36	1
Dibromochloromethane	2	U	2	0.6	ug/m3			01/28/19 15:36	1
1,2-Dibromoethane	2	U	2	0.5	ug/m3			01/28/19 15:36	1
Ethylbenzene	0.9	U	0.9	0.3	ug/m3			01/28/19 15:36	1
m,p-Xylene	2	U	2	0.3	ug/m3			01/28/19 15:36	1
Xylene, o-	0.9	U	0.9	0.3	ug/m3			01/28/19 15:36	1
Xylene (total)	3	U	3	0.6	ug/m3			01/28/19 15:36	1
Bromoform	2	U	2	0.9	ug/m3			01/28/19 15:36	1
1,1,2,2-Tetrachloroethane	1	U	1	0.5	ug/m3			01/28/19 15:36	1
4-Ethyltoluene	1	U	1	0.3	ug/m3			01/28/19 15:36	1
1,3,5-Trimethylbenzene	1	U	1	0.3	ug/m3			01/28/19 15:36	1

Lab Sample ID: LCS 200-139492/4
Matrix: Air
Analysis Batch: 139492

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorodifluoromethane	10.0	10.6		ppb v/v		106	68 - 128
1,2-Dichlorotetrafluoroethane	10.0	10.7		ppb v/v		107	78 - 138

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 200-139492/4
Matrix: Air
Analysis Batch: 139492

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	10.0	10.5		ppb v/v		105	62 - 125
1,3-Butadiene	10.0	10.3		ppb v/v		103	59 - 125
Bromomethane	10.0	10.4		ppb v/v		104	68 - 128
Chloroethane	10.0	10.1		ppb v/v		101	65 - 125
Bromoethene(Vinyl Bromide)	10.0	10.8		ppb v/v		108	67 - 127
Trichlorofluoromethane	10.0	10.9		ppb v/v		109	67 - 127
1,1-Dichloroethene	10.0	9.91		ppb v/v		99	67 - 127
3-Chloropropene	10.0	14.0	*	ppb v/v		140	53 - 133
Methylene Chloride	10.0	9.73		ppb v/v		97	62 - 122
Methyl tert-butyl ether	10.0	10.4		ppb v/v		104	67 - 127
trans-1,2-Dichloroethene	10.0	10.0		ppb v/v		100	72 - 132
n-Hexane	10.0	10.1		ppb v/v		101	71 - 131
1,1-Dichloroethane	10.0	9.52		ppb v/v		95	66 - 126
cis-1,2-Dichloroethene	10.0	9.86		ppb v/v		99	67 - 127
Chloroform	10.0	10.3		ppb v/v		104	69 - 129
1,1,1-Trichloroethane	10.0	11.3		ppb v/v		113	70 - 130
Cyclohexane	10.0	10.8		ppb v/v		108	69 - 129
Carbon tetrachloride	10.0	11.1		ppb v/v		111	62 - 143
2,2,4-Trimethylpentane	10.0	10.6		ppb v/v		106	67 - 127
Benzene	10.0	10.5		ppb v/v		105	67 - 127
1,2-Dichloroethane	10.0	10.6		ppb v/v		106	67 - 132
n-Heptane	10.0	10.5		ppb v/v		105	62 - 130
Trichloroethene	10.0	10.4		ppb v/v		104	68 - 128
1,2-Dichloropropane	10.0	10.2		ppb v/v		102	67 - 127
Bromodichloromethane	10.0	11.3		ppb v/v		113	69 - 129
cis-1,3-Dichloropropene	10.0	11.2		ppb v/v		112	70 - 130
Toluene	10.0	11.0		ppb v/v		110	67 - 127
trans-1,3-Dichloropropene	10.0	11.7		ppb v/v		117	69 - 129
1,1,2-Trichloroethane	10.0	10.7		ppb v/v		107	69 - 129
Tetrachloroethene	10.0	11.1		ppb v/v		111	70 - 130
Dibromochloromethane	10.0	12.2		ppb v/v		122	66 - 130
1,2-Dibromoethane	10.0	11.3		ppb v/v		113	70 - 130
Ethylbenzene	10.0	11.2		ppb v/v		112	68 - 128
m,p-Xylene	20.0	23.2		ppb v/v		116	68 - 128
Xylene, o-	10.0	11.8		ppb v/v		118	67 - 127
Bromoform	10.0	13.4		ppb v/v		134	34 - 170
1,1,2,2-Tetrachloroethane	10.0	11.2		ppb v/v		112	69 - 129
4-Ethyltoluene	10.0	12.3		ppb v/v		123	69 - 129
1,3,5-Trimethylbenzene	10.0	12.1		ppb v/v		121	65 - 125

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorodifluoromethane	49	52.5		ug/m3		106	68 - 128
1,2-Dichlorotetrafluoroethane	70	74.9		ug/m3		107	78 - 138
Vinyl chloride	26	26.7		ug/m3		105	62 - 125
1,3-Butadiene	22	22.8		ug/m3		103	59 - 125
Bromomethane	39	40.4		ug/m3		104	68 - 128
Chloroethane	26	26.8		ug/m3		101	65 - 125
Bromoethene(Vinyl Bromide)	44	47.4		ug/m3		108	67 - 127

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 200-139492/4
Matrix: Air
Analysis Batch: 139492

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichlorofluoromethane	56	61.4		ug/m3		109	67 - 127
1,1-Dichloroethene	40	39.3		ug/m3		99	67 - 127
3-Chloropropene	31	43.9	*	ug/m3		140	53 - 133
Methylene Chloride	35	33.8		ug/m3		97	62 - 122
Methyl tert-butyl ether	36	37.4		ug/m3		104	67 - 127
trans-1,2-Dichloroethene	40	39.7		ug/m3		100	72 - 132
n-Hexane	35	35.7		ug/m3		101	71 - 131
1,1-Dichloroethane	40	38.5		ug/m3		95	66 - 126
cis-1,2-Dichloroethene	40	39.1		ug/m3		99	67 - 127
Chloroform	49	50.5		ug/m3		104	69 - 129
1,1,1-Trichloroethane	55	61.4		ug/m3		113	70 - 130
Cyclohexane	34	37.3		ug/m3		108	69 - 129
Carbon tetrachloride	63	70.1		ug/m3		111	62 - 143
2,2,4-Trimethylpentane	47	49.6		ug/m3		106	67 - 127
Benzene	32	33.6		ug/m3		105	67 - 127
1,2-Dichloroethane	40	43.0		ug/m3		106	67 - 132
n-Heptane	41	43.1		ug/m3		105	62 - 130
Trichloroethene	54	55.6		ug/m3		104	68 - 128
1,2-Dichloropropane	46	47.3		ug/m3		102	67 - 127
Bromodichloromethane	67	75.8		ug/m3		113	69 - 129
cis-1,3-Dichloropropene	45	50.6		ug/m3		112	70 - 130
Toluene	38	41.3		ug/m3		110	67 - 127
trans-1,3-Dichloropropene	45	53.1		ug/m3		117	69 - 129
1,1,2-Trichloroethane	55	58.3		ug/m3		107	69 - 129
Tetrachloroethene	68	75.5		ug/m3		111	70 - 130
Dibromochloromethane	85	104		ug/m3		122	66 - 130
1,2-Dibromoethane	77	87.1		ug/m3		113	70 - 130
Ethylbenzene	43	48.4		ug/m3		112	68 - 128
m,p-Xylene	87	101		ug/m3		116	68 - 128
Xylene, o-	43	51.2		ug/m3		118	67 - 127
Bromoform	100	138		ug/m3		134	34 - 170
1,1,2,2-Tetrachloroethane	69	77.0		ug/m3		112	69 - 129
4-Ethyltoluene	49	60.6		ug/m3		123	69 - 129
1,3,5-Trimethylbenzene	49	59.4		ug/m3		121	65 - 125

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Northern Circuits

TestAmerica Job ID: 200-47149-1
SDG: 200-47149-1

Air - GC/MS VOA

Analysis Batch: 139492

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-47149-1	EP-1-012319	Total/NA	Air	TO-15	
200-47149-2	EP-2-012319	Total/NA	Air	TO-15	
200-47149-3	EP-3-012319	Total/NA	Air	TO-15	
MB 200-139492/6	Method Blank	Total/NA	Air	TO-15	
LCS 200-139492/4	Lab Control Sample	Total/NA	Air	TO-15	

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Northern Circuits

TestAmerica Job ID: 200-47149-1
SDG: 200-47149-1

Client Sample ID: EP-1-012319
Date Collected: 01/23/19 11:42
Date Received: 01/24/19 09:49

Lab Sample ID: 200-47149-1
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		1	139492	01/28/19 18:18	K1P	TAL BUR

Client Sample ID: EP-2-012319
Date Collected: 01/23/19 13:25
Date Received: 01/24/19 09:49

Lab Sample ID: 200-47149-2
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		1	139492	01/28/19 19:13	K1P	TAL BUR

Client Sample ID: EP-3-012319
Date Collected: 01/23/19 16:08
Date Received: 01/24/19 09:49

Lab Sample ID: 200-47149-3
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		1	139492	01/28/19 20:07	K1P	TAL BUR

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Northern Circuits

TestAmerica Job ID: 200-47149-1
SDG: 200-47149-1

Laboratory: TestAmerica Burlington

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10391	04-01-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
TO-15		Air	1,2-Dichloroethene, Total
TO-15		Air	4-Ethyltoluene

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Northern Circuits

TestAmerica Job ID: 200-47149-1
SDG: 200-47149-1

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL BUR

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Northern Circuits

TestAmerica Job ID: 200-47149-1
SDG: 200-47149-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
200-47149-1	EP-1-012319	Air	01/23/19 11:42	01/24/19 09:49
200-47149-2	EP-2-012319	Air	01/23/19 13:25	01/24/19 09:49
200-47149-3	EP-3-012319	Air	01/23/19 16:08	01/24/19 09:49

Shipping and Receiving Documents

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403-6809
phone 802.660.1990 fax 802.660.1919

Canister Samples Chain of Custody Record

200-47149 Chain of Custody

TestAmerica Laboratories, Inc.

Client Contact Information	Client Project Manager: Mark Flosche	Samples Collected By: Quinn Carnahan	COC No: 1 of 1 COCs
Company Name: Arcadis	Phone: 518 250 7300		
Address: 855 Route 146 Suite 210	Email: Mark.Flosche@arcadis-us.com		For Lab Use Only:
City/State/Zip: Clifton Park, NY 12065			Walk-in Client:
Phone: 518 250 7300	Site Contact: Chris Kassel		Lab Sampling:
FAX: 518 250 7301	Tel/Fax		
Project Name: Northern Circuits	Anaylsis Turnaround Time		Job / SDG No.:
Site/Location: East Syracuse	Standard (Specific):		(See below for Add'l Items)
P O # 00266424.0000	Rush (Specifiy):		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-14/15 (Standard / Low Level)	TO-15 SIM	EPA 3C	EPA 25C	ASTM D-1946	EPA 15/16	Other (Please specify in notes section)	Sample Type	Indoor Air/Ambient Air	Sub-Slab	Soil Gas	Soil Vapor Extraction (SVE)	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
EP-1-012319	1/23/19	1139	1142	-26.5	-6.3	NA	4100	X									X					
EP-2-012319	1/23/19	1320	1325	-26.3	-4.9	NA	4358	X									X					
EP-3-012319	1/23/19	1605	1608	-28.1	-5.1	NA	5671	X									X					
1-23-19 RS																						

Temperature (Fahrenheit)				
Start	Interior 65	Ambient 15		
Stop	65	40		

Pressure (inches of Hg)				
Start	Interior —	Ambient 29.90		
Stop	—	29.80		

Special Instructions/QC Requirements & Comments:
Method: TO15-Low Level List + MeCl2

Samples Shipped by: Quinn Carnahan	Date / Time: 1/23/2019 1745	Samples Received by: R English, Syr	Syracuse #225
Samples Relinquished by: Quinn Carnahan	Date / Time: 1/23/2019 1745	Received by: R English	
Relinquished by: R English	Date / Time: 1-23-19, 19:00	Received by: TA Burl 9:49 1/24/19	
Lab Use Only: Shipper Name:	Opened by:	Condition:	

ORIGIN ID:SYRA (315) 431-0171
SYR SERVICE CENTER
TESTAMERICA
118 BOSS RD

SYRACUSE, NY 13211
UNITED STATES US

SHIP DATE: 23JAN19
ACTWGT: 30.00 LB MAN
CAD: 251798/CAFE3211

BILL RECIPIENT

TO SAMPLE RECEIVING
TESTAMERICA BURLINGTON
30 COMMUNITY DRIVE SUITE 11

SOUTH BURLINGTON VT 05403
(802) 660-1990
REF: ARCADIS N.CIRCUITS 1BOX

FedEx Express

TRK# 0201 4651 0843 4641

THU - 24 JAN 10:30A
PRIORITY OVERNIGHT

NC BTVA

05403
VT-US BTV

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 200-47149-1
SDG Number: 200-47149-1

Login Number: 47149
List Number: 1
Creator: McNabb, Robert W

List Source: TestAmerica Burlington

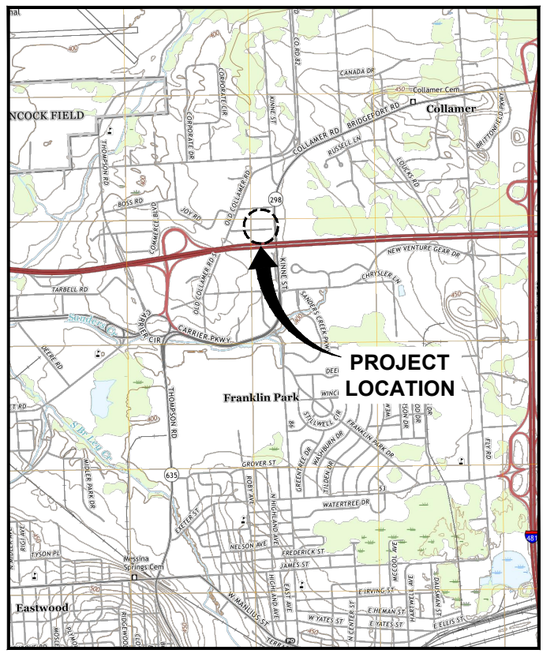
Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	N/A	Thermal preservation not required.
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	QC
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX B

Record Drawings

RECORD DRAWINGS

OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE, SYRACUSE EAST, NY 2019

LOCATION MAP

0 2000' 4000'

GRAPHIC SCALE

NORTHERN CIRCUITS (SITE NO. 734124)
6 ADLER DRIVE
DEWITT, NEW YORK

DATE ISSUED:

JANUARY 2021

PREPARED FOR:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ARCADIS | Design & Consultancy for natural and built assets

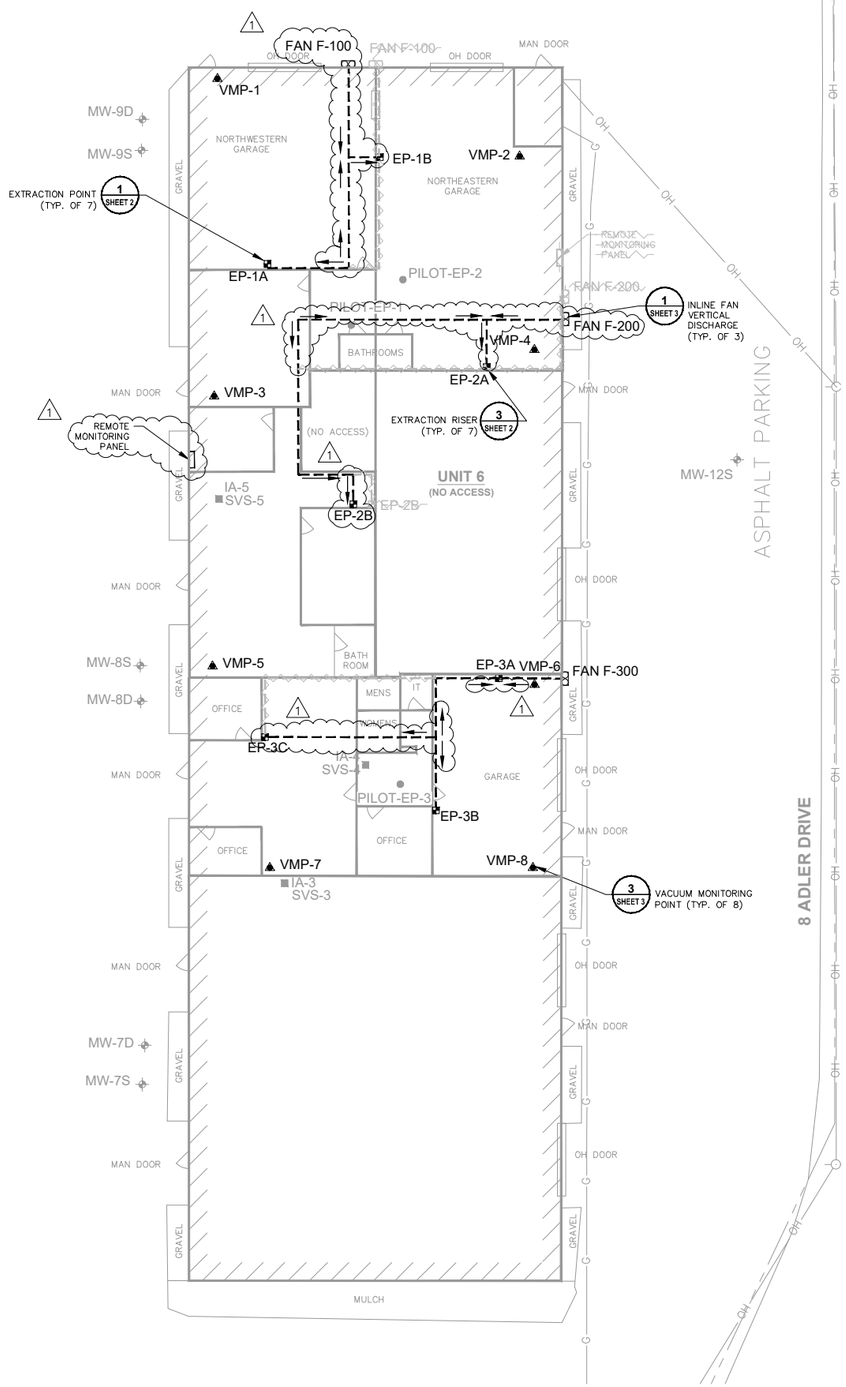
ARCADIS OF NEW YORK, INC.

DRAWING INDEX*

* THESE RECORD DRAWINGS HAVE BEEN PREPARED FOR THE INSTALLATION OF THE SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS) AT THE OFF-SITE PROPERTY AT 8 ADLER DRIVE, AS PER THE 8 ADLER DRIVE WORK PLAN (ARCADIS, AUGUST 2019). REVISIONS INDICATED HEREIN FOR SHEETS 1 THROUGH 10 ARE BASED ON FIGURES 2 THROUGH 11 FROM THE WORK PLAN.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE 02/05/2021 BY



LEGEND:

- MONITORING WELL
- CO-LOCATED INDOOR AIR AND SUB-SLAB VAPOR SAMPLE LOCATION (ABANDONED)
- PILOT TEST SSD EXTRACTION POINT (ABANDONED)
- INLINE FAN/VERTICAL DISCHARGE
- SSD CONVEYANCE PIPING
- SSD EXTRACTION POINT/RISER
- SUB-SLAB VACUUM MONITORING POINT
- PROPERTY LINE
- OH — OVERHEAD WIRE
- G — GAS LINE
- UTILITY POLE
- 1 — PIPE SLOPE
- INTERIOR WALL
- (GROUND SURFACE TYPE TRANSITION)
- EXTERIOR/SUITE BOUNDARY WALL

NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY YEC, INC. DATED AUGUST 2015 AT A SCALE OF 1" = 20'. ADDITIONAL BASEMAP DATA DIGITIZED FROM GOOGLE EARTH AERIAL PHOTO DATED 6/2/2011. UTILITY LOCATIONS ARE FROM FIELD MARKOUT ONLY AND ARE APPROXIMATE. PROPERTY LINES ARE APPROXIMATE ONLY FROM TAX MAPS.
2. EXISTING BUILDING FEATURES, INCLUDING INTERIOR WALL LAYOUT AND ROOM USAGE, ARE NOT GUARANTEED AND SHOULD BE FIELD VERIFIED BY CONTRACTOR TO THE EXTENT NECESSARY IN CONTRACTOR'S OPINION.
3. FANS SHALL BE MOUNTED ON OUTSIDE OF BUILDING AT ELEVATION HIGHER THAN 8 FEET ABOVE GROUND SURFACE AND BELOW THE ROOFLINE. VERTICAL DISCHARGES FOR EACH FAN SHALL EXTEND TO A HEIGHT OF 3 FEET ABOVE ROOFLINE AND BE LOCATED AT LEAST 15 FEET HORIZONTALLY FROM ANY AIR INTAKE.
4. PIPE ROUTES SHOWN ARE PROPOSED. ACTUAL LOCATIONS SHALL BE PROPOSED BY CONTRACTOR AND SUBJECT TO DEPARTMENT REVIEW AND APPROVAL.
5. PIPING SHALL BE INSTALLED WITH A MINIMUM 1% DOWNWARD SLOPE TOWARD EACH EXTRACTION POINT SUCH THAT ANY WATER THAT MAY ACCUMULATE IN CONVEYANCE PIPING WILL FLOW BY GRAVITY TO EXTRACTION POINT.
6. INSTALL CONVEYANCE PIPING ABOVE DROP-CEILING, WHERE PRESENT.
7. SELECT BASEMAP/BUILDING FEATURES HAVE BEEN UPDATED BASED ON FIELD OBSERVATIONS AND ARE NOT INDICATED AS REVISIONS.

RECORD DRAWINGS
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DATE 02/05/2021 BY

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X-Base
X-Border-C-LD-V2

12.5' 0 12.5' 25'
1"=12.5' SCALE(S) AS INDICATED

THIS BAR REPRESENTS ONE HALF INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	1/2021	RECORD DRAWINGS	SM	CMD

Professional Engineer's Name: DANIEL J. LOEWENSTEIN
Professional Engineer's No.: 066594
State: NY | Date Signed: 2/5/21 | Project Mgr.: MF
Designed by: CD | Drawn by: RTS | Checked by: SM

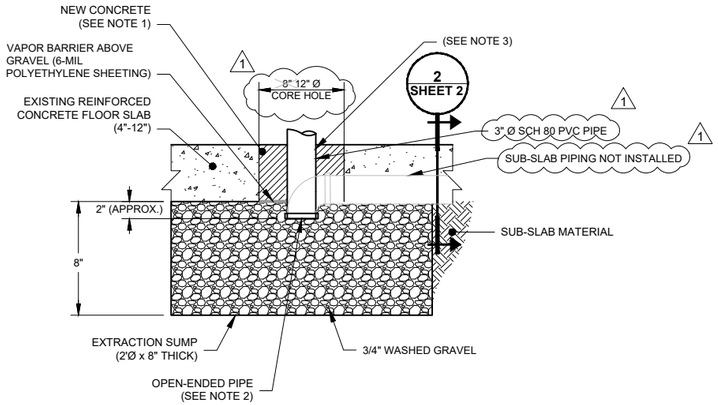
ARCADIS
Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT

ARCADIS Project No. 30053689
Date AUGUST 2019
ARCADIS
855 ROUTE 146
SUITE 210
CLIFTON PARK, NEW YORK
TEL. 518.250.7300

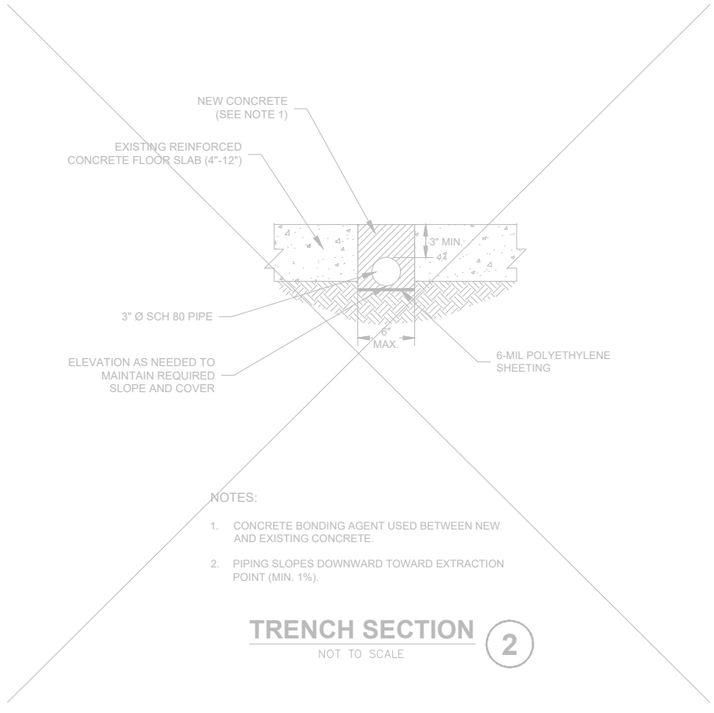
SHEET 1



NOTES:

1. CONCRETE BONDING AGENT USED BETWEEN NEW AND EXISTING CONCRETE.
2. INSTALL 1/2-INCH WIRE MESH OVER END OF PIPE.
3. IF HORIZONTAL SUB-SLAB PIPING IS NOT NEEDED TO ALLOW EXTRACTION SUMP TO AVOID BUILDING/COLUMN FOOTER (I.E., EXTRACTION SUMP IS ABLE TO BE INSTALLED IN THE SAME LOCATION AS RISER), THEN VERTICAL EXTRACTION RISER PIPE MAY EXTEND DIRECTLY EXTRACTION SUMP.
4. USE WET METHODS FOR ALL CONCRETE CUTTING WORK. VISUAL DUST SHALL NOT ALLOWED.
5. PERFORM AIR MONITORING WITH PHOTOIONIZATION DETECTOR ANYTIME SUB-SLAB SOIL IS EXPOSED.
6. SUB-SLAB MATERIAL SHALL NOT CONTACT FLOOR OR OTHER PROPERTY, CONTAINERIZE SUB-SLAB MATERIAL.

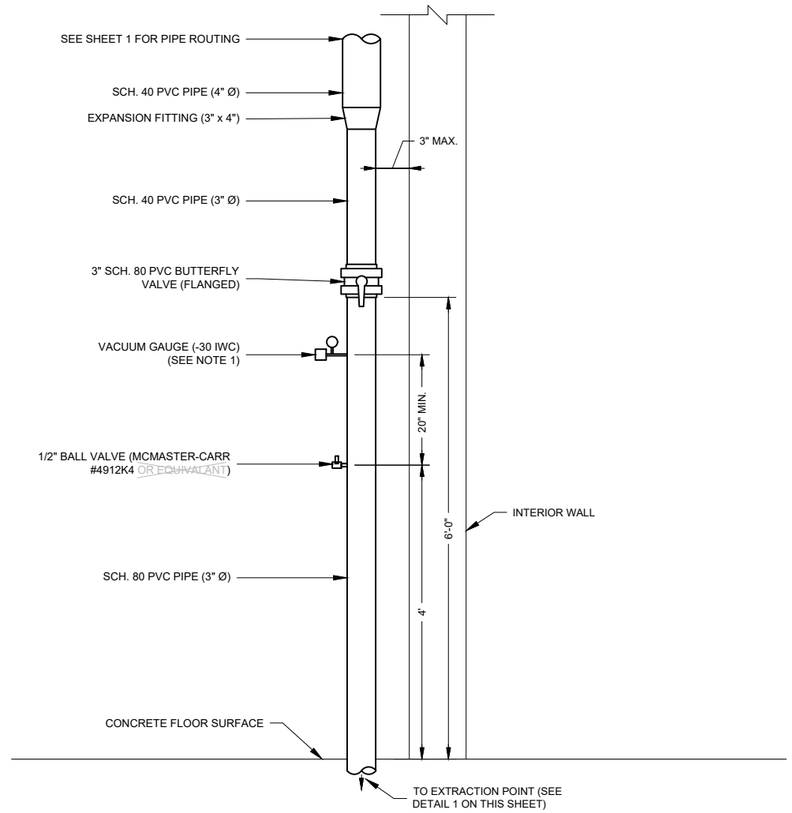
EXTRACTION POINT
NOT TO SCALE
1



NOTES:

1. CONCRETE BONDING AGENT USED BETWEEN NEW AND EXISTING CONCRETE.
2. PIPING SLOPES DOWNWARD TOWARD EXTRACTION POINT (MIN. 1%).

TRENCH SECTION
NOT TO SCALE
2



NOTES:

1. USE MCMASTER-CARR #4106K1 (-30 TO 0 IWC) VACUUM GAUGE.
2. SUPPORT VERTICAL PIPE AT LEAST EVERY 10 FEET.
3. PLACE "SOIL GAS" LABELS EVERY 10 FEET ON ALL INTERIOR CONVEYANCE PIPING INCLUDING EXTRACTION RISERS. USE WHITE FONT (2 INCHES TALL) ON GREEN BACKGROUND.

EXTRACTION RISER
NOT TO SCALE
3

RECORD DRAWINGS
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DATE 02/05/2021 BY

SCALE(S) AS INDICATED

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Professional Engineer's Name: DANIEL J. LOEWENSTEIN
Professional Engineer's No.: 066594

State	Date Signed	Project Mgr.
NY	2/5/21	MF

Designed by	Drawn by	Checked by
CD	RTS	SM

NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

EXTRACTION POINT DETAILS

ARCADIS Project No. 30053689
Date AUGUST 2019

ARCADIS
855 ROUTE 146
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CLIFTON PARK, NEW YORK
TEL. 518.250.7300

SHEET 2

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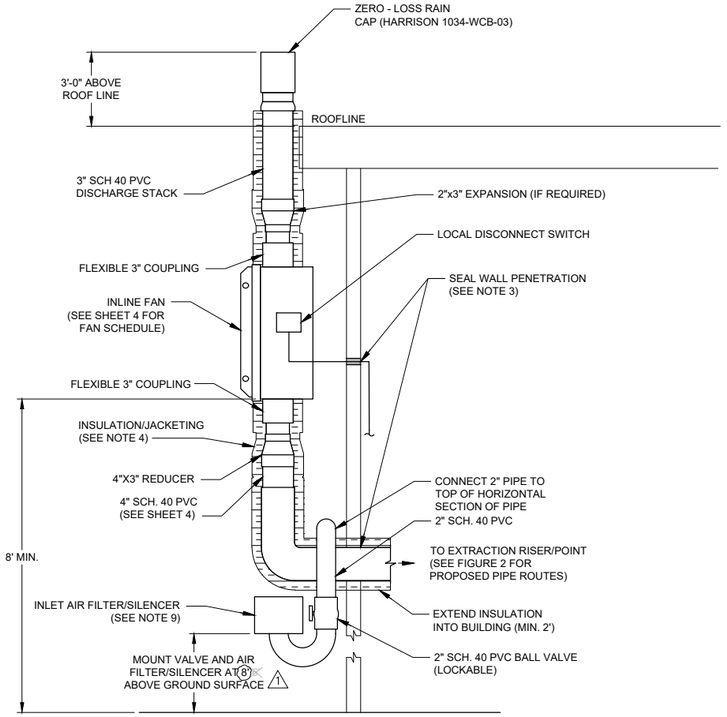
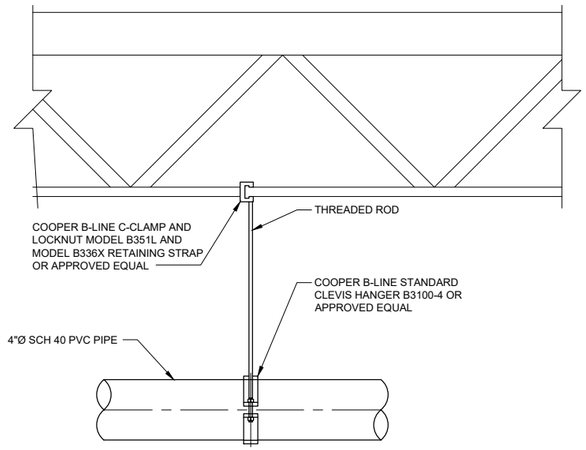


NOTES:

1. PIPE TO BE SUPPORTED IMMEDIATELY INSIDE OF BUILDING BEFORE PENETRATION, PRIOR TO EXTENDING ABOVE ROOF, AND AT ALL CHANGES IN PIPING DIRECTION.
2. MOUNT FAN TO BUILDING PER MANUFACTURER REQUIREMENTS. INSTALL FAN PLUMB AND LEVEL.
3. SEAL WALL PENETRATIONS WITH POLYURETHANE CAULKING (SIKAFLEX 1A OR EQUIVALENT).
4. ALL EXTERIOR PIPING SHALL BE FIT WITH 1 INCH FIBERGLASS INSULATION AND ALUMINUM JACKETING. TERMINATE INSULATION/JACKETING IN A MANNER THAT PREVENTS MOISTURE FROM CONTACTING INSULATION.
5. USE METAL STRUT AND PIPE CLAMPS TO SUPPORT PIPING/FAN. SUPPORT VERTICAL PIPING EVERY 10 FEET AND WITHIN TOP 6 INCH OF BUILDING. USE ANCHORING EPOXY FOR CONCRETE SLEEVE ANCHORS.
6. REFER TO FIGURE 2 FOR PROPOSED INLINE FAN/VERTICAL DISCHARGE LOCATIONS. CONTRACTOR SHALL PROPOSE ACTUAL LOCATIONS. DISCHARGE SHALL BE AT LEAST 15 FEET AWAY FROM ANY AIR INTAKE.
7. ALL PIPING SHALL BE INSTALLED WITH 1% SLOPE BACK TO EXTRACTION POINT.
8. SUPPORT VERTICAL PIPING A MINIMUM OF EVERY 10 FEET AND HORIZONTAL PIPING A MINIMUM OF EVERY 4 FEET
9. USE SOLBERG FS-19P-150. MOUNT CLOSE TO BUILDING (SHOWN EXTENDING OUT FROM BUILDING IN THIS DETAIL FOR CLARITY ONLY).

INLINE FAN / VERTICAL DISCHARGE DETAIL 1

NOT TO SCALE

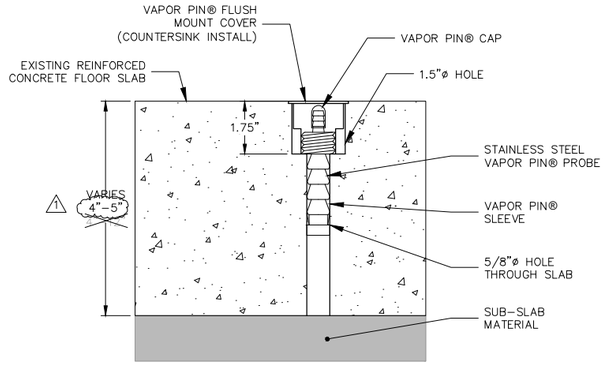


NOTES:

1. HORIZONTAL PIPING SUPPORTED EVERY 4 FEET.
2. HORIZONTAL PIPING PITCHED 1% DOWNWARD TOWARDS THE EXTRACTION POINT.
3. HORIZONTAL PIPE SUPPORT DETAIL SHOWN IS CONCEPTUAL IN NATURE, ACTUAL PIPE SUPPORT METHODS MAY VARY FROM LOCATION TO LOCATION.

HANGING PIPE SUPPORT DETAIL 2

NOT TO SCALE



VACUUM MONITORING POINT DETAIL 3

NOT TO SCALE

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DATE 02/05/2021 BY

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SCALE(S) AS INDICATED

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No.	Date	Revisions	By	Ckd
1	1/2021	RECORD DRAWINGS	SM	CMD

Professional Engineer's Name: DANIEL J. LOEWENSTEIN
Professional Engineer's No.: 066594

State	Date Signed	Project Mgr.
NY	2/5/21	MF
Designed by	Drawn by	Checked by
CD	RTS	SM

ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

MISCELLANEOUS DETAILS

ARCADIS Project No. 30053689
Date AUGUST 2019

ARCADIS
855 ROUTE 146
SUITE 210
CLIFTON PARK, NEW YORK
TEL. 518.250.7300

SHEET 3

GENERAL PROCESS DESCRIPTION:

THE SUB-SLAB DEPRESSURIZATION SYSTEM WILL INCLUDE EXTRACTION OF SUB-SLAB SOIL VAPOR FROM SEVEN (7) EXTRACTION POINTS. EACH EXTRACTION POINT INCLUDES SUB-SLAB CONVEYANCE PIPING (IF EXTRACTION POINT IS NEXT TO FOOTER), AN EXTRACTION RISER, AND ABOVE-GRADE CONVEYANCE PIPING LEADING TO THE ASSOCIATED INLINE FAN. EXTRACTION POINTS EP-1A AND EP-1B WILL SHARE ONE (1) INLINE FAN; EXTRACTION POINTS EP-2A AND EP-2B WILL SHARE ONE (1) INLINE FAN; AND EXTRACTION POINTS EP-3A, EP-3B AND EP-3C WILL SHARE ONE (1) INLINE FAN. A VACUUM TRANSMITTER WILL BE INSTALLED FOR EACH INLINE FAN AND CONNECTED TO CONTROL PANEL. INLINE FANS WILL BE MOUNTED ON THE BUILDING EXTERIOR. A DILUTION ASSEMBLY CONSISTING OF A BALL VALVE AND INLET AIR FILTER/SILENCER WILL BE INSTALLED FOR EACH INLINE FAN. THE SYSTEM IS DESIGNED TO OPERATE CONTINUOUSLY.

FAN SCHEDULE:

FAN ID	EXTRACTION POINTS SERVED	FAN MAKE/MODEL	INLET/OUTLET SIZE	DESIGN FLOW/VACUUM
F-100	EP-1A AND EP-1B	RADONAWAY HS-5000E	3" / 2"	30 SCFM AT -20 IWC
F-200	EP-2A AND EP-2B	RADONAWAY HS-5000E	3" / 2"	30 SCFM AT -20 IWC
F-300	EP-3A, EP-3B & EP-3C	OBAR GBR76 SOE	3" / 3"	60 SCFM AT -10 WC

ALARMS:

ALARM ID	INSTRUMENT	ALARM CONDITION	TYPE	AFFECTED DEVICE	ALARM RANGE	RECOGNITION TIME
VAL-101	VT-101	LOW VACUUM	NON-CRITICAL	FAN F-100	TBD	15 SECONDS
VAL-201	VT-201	LOW VACUUM	NON-CRITICAL	FAN F-200	TBD	15 SECONDS
VAL-301	VT-301	LOW VACUUM	NON-CRITICAL	FAN F-300	TBD	15 SECONDS
VAH-101	VT-101	HIGH VACUUM	CRITICAL	FAN F-100	TBD	15 SECONDS
VAH-201	VT-201	HIGH VACUUM	CRITICAL	FAN F-200	TBD	15 SECONDS
VAH-301	VT-301	HIGH VACUUM	CRITICAL	FAN F-300	TBD	15 SECONDS

- NON-CRITICAL ALARMS SHALL TRIGGER ALARM NOTIFICATION PROCEDURE, BUT SHALL NOT AFFECT SYSTEM OPERATION.
- POWER FAILURE SHALL RESULT IN ALARM NOTIFICATION PROCEDURE.

ALARM NOTIFICATION:

OPERATORS WILL BE NOTIFIED REMOTELY VIA EMAIL OR TEXT IN THE EVENT ANY ALARM CONDITION OCCURS, INCLUDING POWER FAILURE. DEPARTMENT TO INDICATE ALARM RECIPIENTS.

CONTROL PANEL:

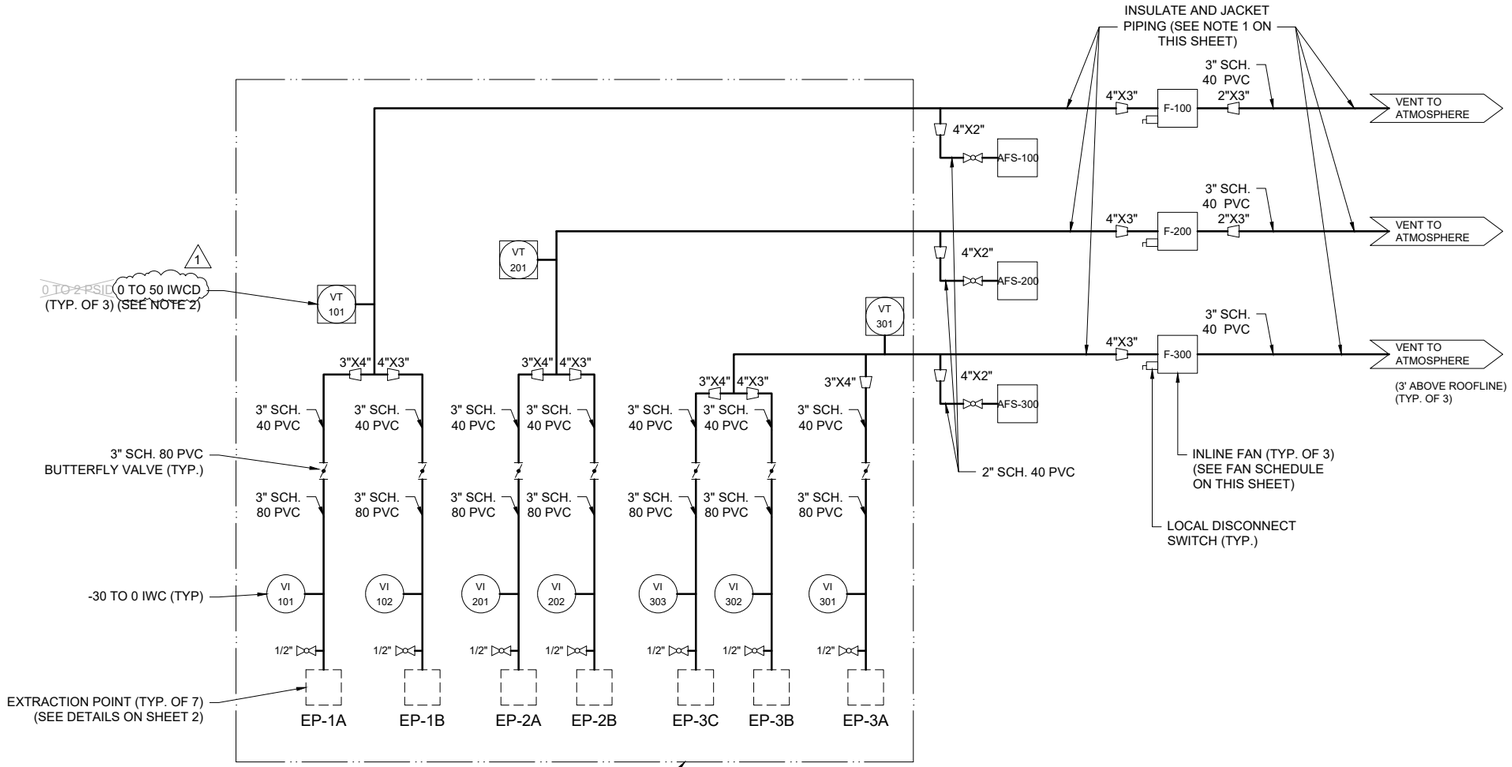
SHALL PROVIDE FOR REMOTE CONTROL OF THE SYSTEM (I.E., ABILITY TO TURN FANS ON AND OFF). SHALL INCLUDE A PROGRAMMABLE LOGIC CONTROLLER, HUMAN MACHINE INTERFACE, UNINTERRUPTIBLE POWER SUPPLY, AND MODEM. SHALL INCLUDE HAND-OFF-AUTO SWITCHES INLINE FAN, A RED ALARM-INDICATED LIGHT, AN ALARM RESET BUTTON, A WHITE POWER INDICATED LIGHT, AND AN EMERGENCY STOP BUTTON. REFER TO ELECTRICAL FIGURES FOR ADDITIONAL CONTROL PANEL DETAILS.

CONTROL LOGIC:

EACH INLINE FAN SHALL RUN WHEN ITS HAND-OFF-AUTO SWITCH IS IN THE HAND POSITION, OR WHEN ITS HAND-OFF-AUTO SWITCH IS IN THE AUTO POSITION AND NO ASSOCIATED CRITICAL ALARMS ARE PRESENT.

HUMAN MACHINE INTERFACE:

SHALL PROVIDE VIRTUAL HAND-OFF-AUTO SWITCHES FOR EACH INLINE FAN, A VIRTUAL ALARM RESET BUTTON, AND A DISPLAY OF VACUUM TRANSMITTER READINGS. HUMAN MACHINE INTERFACE SHALL BE FULLY ACCESSIBLE REMOTELY.



LEGEND:

- VAPOR PROCESS PIPING
- BUILDING LIMITS
- TRANSITION
- F-XXX — INLINE FAN
- BALL VALVE
- REDUCER
- UNION SYMBOL
- INSTRUMENT INTERLOCKED WITH CONTROL PANEL
- INSTRUMENT CONNECTED TO PROCESS LINE
- BUTTERFLY VALVE
- AFS-XXX — AIR FILTER/SILENCER

ABBREVIATIONS:

CS	CARBON STEEL
DI	DUCTILE IRON
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
IWC	INCHES OF WATER COLUMN
IWCD	INCHES OF WATER COLUMN DIFFERENTIAL
PB	PLATED BRASS
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PVC	POLYVINYL CHLORIDE
SCFM	STANDARD CUBIC FEET PER MINUTE
SS	STAINLESS STEEL
VT	VACUUM TRANSMITTER
VAL	VACUUM ALARM LOW
VAH	VACUUM ALARM HIGH

NOTES:

1. CONTRACTOR SHALL INSTALL ADDITIONAL UNIONS OR FLANGES AS APPROPRIATE TO FACILITATE INSTALLATION AND FUTURE MAINTENANCE OF SYSTEM.
2. ALL EXTERIOR PIPING, WITH EXCEPTION OF DILUTION ASSEMBLY PIPING, TO BE FIT WITH 1-INCH FIBERGLASS INSULATION AND ALUMINUM JACKETING. EXTEND INSULATION A MINIMUM OF 1 FOOT INSIDE EXTERIOR WALL PENETRATIONS.
3. USE ASHCROFT IX3 F02 42ST ~~100WL OR APPROVED SUBSTITUTE~~ 50WL. INSTALL TRANSMITTERS APPROXIMATELY 5 FEET DOWNSTREAM FROM TEE. IF ON A HORIZONTAL SECTION OF PIPE, MOUNT ON TOP OF PIPE.
4. USE MCMASTER-CARR VACUUM GAUGE (4106K1).
5. ECCENTRIC REDUCERS SHALL BE USED AT HORIZONTAL PIPE SIZE CHANGES. USE ONLY LONG SWEEP ELBOWS AND SANITARY TEES.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE 02/05/2021 BY

C:\Users\bsmith\BIM 360\Arcadis\ANA - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\Project Files\Northern Circuits RIFS\2021101-DWG\SSDS-DWG 04 P&ID.dwg LAYOUT: 4 SAVED: 2/2/2021 9:30 AM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ----
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SCALE(S) AS INDICATED

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No.	Date	Revisions	By	Ckd
1	1/2021	RECORD DRAWINGS	SM	CMD

Professional Engineer's Name: **DANIEL J. LOEWENSTEIN**
Professional Engineer's No.: 066594

State	Date Signed	Project Mgr.
NY	2/5/21	MF
Designed by: CD	Drawn by: RTS	Checked by: SM

STATE OF NEW YORK — DANIEL JOHN LOEWENSTEIN — 066594 — LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) ● 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

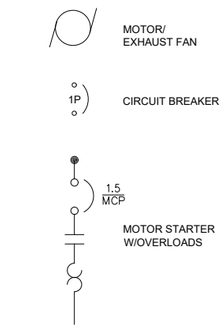
PIPING AND INSTRUMENTATION DIAGRAM

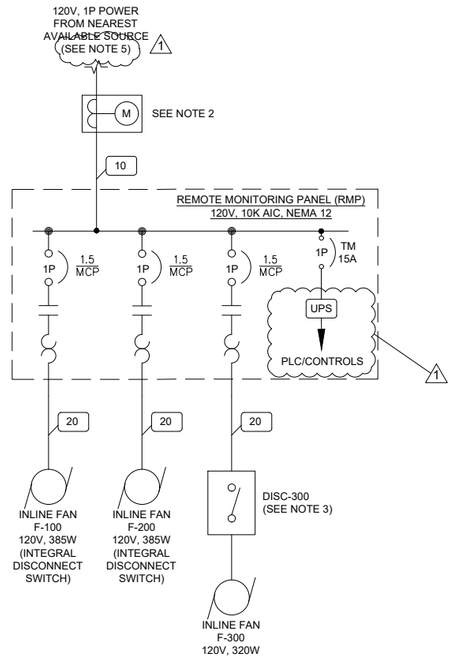
ARCADIS Project No. 30053689
Date AUGUST 2019

ARCADIS
855 ROUTE 146
SUITE 210
CLIFTON PARK, NEW YORK
TEL. 518.250.7300

SHEET 4

ELECTRICAL SYMBOL LEGEND





CONDUIT AND CONDUCTOR SCHEDULE					
CONDUIT #	**SIZE**	**CONDUCTOR SIZE & TYPE**	**PURPOSE**	**ORIGINATION**	**TERMINATION**
10	3/4"	(2) #12 AWG + (1) #12 AWG GND	RMP POWER	SEE NOTE 2	RMP
20	3/4"	(2) #12 AWG + (1) #12 AWG GND	FAN POWER	RMP	INLINE FAN

NOTES:

1. ALL ELECTRICAL SPECIFICATIONS CAN BE FOUND IN SUB-SLAB DEPRESSURIZATION SYSTEM SPECIFICATIONS.
2. ELECTRICAL SUBMETER (E-MON D-MON E10-212050-JKIT) SHALL BE INSTALLED ADJACENT TO THE REMOTE MONITORING PANEL.
3. DISCONNECT SHALL BE NEMA 3R, RATED FOR AT LEAST 30 AMPS, AND LOCKABLE FOR LOCKOUT/TAGOUT PURPOSES(BRYANT 30322D INSTALLED.
4. EMT CONDUIT (ALLIED EMT) USED FOR INTERIOR CONDUIT, INCLUDING FOR VACUUM TRANSMITTERS. FLEXIBLE CONDUIT WITH GALVANIZED STEEL CORE AND PVC COVER (AFC LIQUID-TUFF) USED FOR FINAL AND EXTERIOR CONNECTIONS TO FANS.
5. POWER OBTAINED FROM EXISTING LOW-VOLTAGE DISTRIBUTION PANEL (CIRCUIT BREAKER #19) LOCATED IN NORTHEASTERN CORNER OF BUILDING.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE 02/08/2021 BY David V. Camarda

SCALE(S) AS INDICATED

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Professional Engineer's Name
DAVID V. CAMARDA
Professional Engineer's No.
090411

State	Date Signed	Project Mgr.
NY	2/1/21	MF
Designed by	**Drawn by**	**Checked by**
KE	RTS	CD

STATE OF NEW YORK · DAVID V. CAMARDA · 090411 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

ELECTRICAL SINGLE LINE DIAGRAM

ARCADIS Project No.
30053689
Date
AUGUST 2019

ARCADIS
855 ROUTE 146
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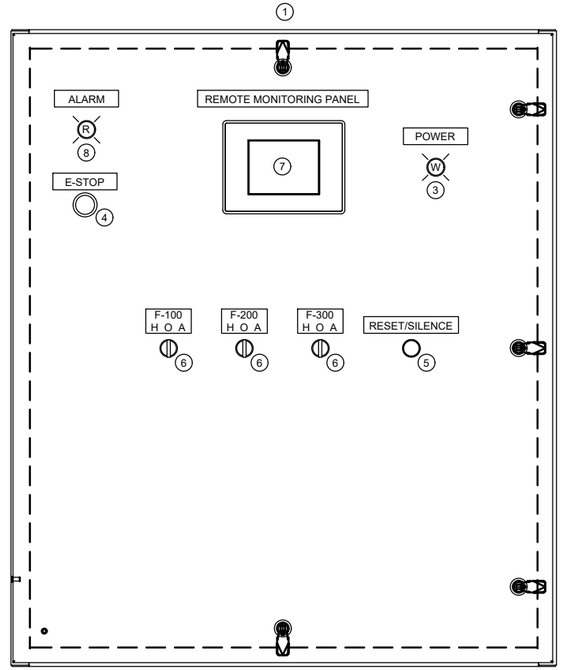
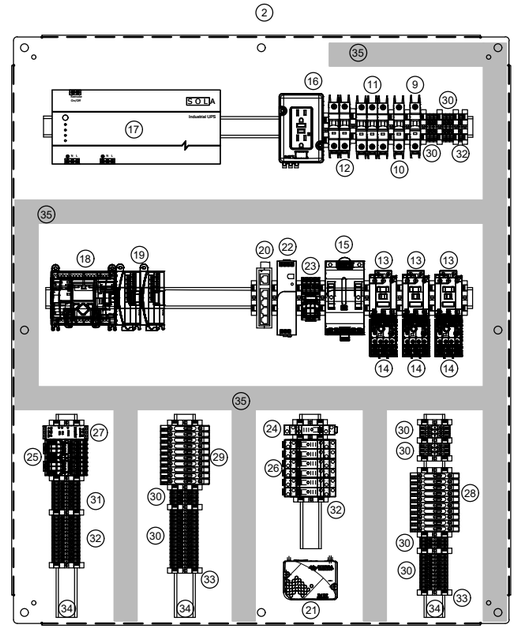
CLIFTON PARK, NEW YORK
TEL. 518.250.7300

SHEET
5

Item	QTY.	Description	Manufacturer	Catalog#
1	1	NEMA 4 ENCLOSURE, 42" X 36" X 12" (CP-1)	SCE	SCE-42EL3612LP
2	1	BACKPANEL FOR CP-1 ENCLOSURE	SCE	SCE-42P36
3	1	22MM, PLASTIC WHITE PILOT LIGHT (120 VAC LED)	SQUARE D	XB5AVG1
4	1	RED MUSHROOM HEAD E-STOP (NC) TWIST RELEASE	SQUARE D	XB5AS644
5	1	22MM, BLACK, MOMENTARY PUSHBUTTON	SQUARE D	XB5AA21
6	3	22MM, BLACK, 3 POSITION SWITCH	SQUARE D	XB5AD33
3	1	22MM, PLASTIC WHITE PILOT LIGHT (120 VAC LED)	ALLEN-BRADLEY	800FP-P7PNSW
4	1	RED MUSHROOM HEAD E-STOP (NC) TWIST RELEASE	ALLEN-BRADLEY	800FP-MT44
5	1	BLACK, 22MM, MOMENTARY PUSH BUTTON (2 NO CONTACTS)	ALLEN-BRADLEY	800FP-F2PX20
6	3	BLACK, 22MM, 3 POSITION SWITCH	ALLEN-BRADLEY	800FP-SM32PX20
7	1	7" C-MORE COLOR TOUCHSCREEN HMI PANEL	C-MORE	EA9-T7CL
8	1	ALARM BEACON (SOUNDER AND LED), 120 VAC, RED LENS, 22.5 MOUNTING HOLE	ALLEN-BRADLEY	855PC-B10LE422
9	1	MINIATURE CIRCUIT BREAKER (1P, 20A)	EATON	FAZ-C20-1-NA-SP
10	1	MINIATURE CIRCUIT BREAKER (1P, 10A)	EATON	FAZ-C10-1-NA-SP
11	3	MINIATURE CIRCUIT BREAKER (1P, 15A)	EATON	FAZ-C15-1-NA-SP
12	2	MINIATURE CIRCUIT BREAKER (1P, 5A)	EATON	FAZ-C5-1-NA-SP
9	1	MINATURE CIRCUIT BREAKER (1 P, 20A)	ALLEN-BRADLEY	1489-M1C200
10	1	MINATURE CIRCUIT BREAKER (1P, 10A)	ALLEN-BRADLEY	1489-M1C100
11	3	MINATURE CIRCUIT BREAKER (1 P, 15A)	ALLEN-BRADLEY	1489-M1C150
12	2	MINATURE CIRCUIT BREAKER (1 P, 5A)	ALLEN-BRADLEY	1489-M1C050
13	3	IEC CONTACTOR, 9A, 120 VAC COIL, 1 N.O. AUX CONTACT	ALLEN-BRADLEY	100-C09D10
14	3	SOLID STATE OVERLOAD RELAY, 1 PHASE, 3.2-16A	ALLEN-BRADLEY	193S-EERB
15	1	SURGE PROTECTION DEVICE (10A)	ALLEN-BRADLEY	4963-DC120-10
16	1	DIN RAIL MOUNTED RECEPTACLE (15A)	ALLEN-BRADLEY	1492-REC15
17	1	520VA AC UNINTERUPTABLE POWER SUPPLY	SOLA	S1K520
	1	MOUNTING BRACKET	SOLA	S1K-PMBRK
18	1	MICROLOGIX 1100 PLC (24 VDC INPUTS)	ALLEN-BRADLEY	1763-L16BWA
19	2	4 CHANNEL ANALOG CURRENT INPUT MODULE	ALLEN-BRADLEY	1762-IF4
20	1	5 PORT UNMANAGED SWITCH	N-TRON	105TX
21	1	CELLULAR MODEM, 4G LTE	SIERRA WIRELESS	RV50X
	1	OMNI DIRECTIONAL ANTENNA, WIDE BAND	WILSON	311203
	2	LIGHTNING ARRESTOR, N-FEMALE TO N-FEMALE	CITEL	LABH2400NN
	2	LMR195 3FT COAXIAL CABLE, SMA MALE TO N MALE		LMR19503NMSM
	2	LMR195 50FT COAXIAL CABLE, N MALE TO N MALE		LMR40050NMNM
21	1	CELLULAR MODEM	SIERRA WIRELESS	RV50
	2	OMNI DIRECTIONAL ANTENNA, WIDE BAND, 50 Ohm	WILSON	311203
	2	COAXIAL RF SURGE PROTECTION DEVICE	POLYPHASER	DXSL-NS
	2	3 Ft. SMA MALE TO N MALE LMR195 COAXIAL CABLE	STANDARD	STANDARD
	2	50 Ft. N MALE TO N MALE LMR195 COAXIAL CABLE	STANDARD	STANDARD
22	1	ESSENTIAL POWER SUPPLY, 24-28V DC, 120 W, 120/240 VAC INPUT VOLTAGE	ALLEN-BRADLEY	1606-XLE120E
23	1	4PDT RELAY (120 VAC COIL)	ALLEN-BRADLEY	700-HC24A1
	1	14 PIN RELAY SOCKET	ALLEN-BRADLEY	700-HN104
24	1	SPDT RELAY (120VAC COIL)	ALLEN-BRADLEY	700-HK36A1
	1	5 PIN RELAY SOCKET	ALLEN-BRADLEY	700-HN221
25	2	4DPT RELAY (24 VDC COIL)	ALLEN-BRADLEY	700-HC24Z24
	2	14 PIN RELAY SOCKET	ALLEN-BRADLEY	700-HN104
26	6	SPDT RELAY (24 VDC COIL)	ALLEN-BRADLEY	700-HK36Z24
	6	5 PIN RELAY SOCKET	ALLEN-BRADLEY	700-HN221
27	1	SAFETY SWITCH, SINGLE CHANNEL, 24 VDC (MSR126T)	ALLEN-BRADLEY	440R-N23117
28	10	FUSED TERMINAL BLOCK W/ AC BLOWN FUSE INDICATOR	DINNECTOR	DN-10L110
29	10	FUSED TERMINAL BLOCK W/ DC BLOWN FUSE INDICATOR	DINNECTOR	DN-10L24
30	TBD	IEC TERMINAL BLOCK GRAY (32A)	PHOENIX CONTACT	3044102
	TBD	IEC TERMINAL BLOCK WHITE (32A)	PHOENIX CONTACT	3045130
	3	IEC TERMINAL BLOCK RED (32A)	PHOENIX CONTACT	3045127
	TBD	IEC TERMINAL BARRIER	PHOENIX CONTACT	3047028
28	10	5X20 MM FUSED TERMINAL BLOCK W/ BLOWN FUSE INDICATION (NEON/AC)	ALLEN-BRADLEY	1492-WFB4250
	10	5X20 MM TIME DELAY FUSE, 2A	BUSSMAN	GDC-2A
29	10	5X20 MM FUSED TERMINAL BLOCK W/ BLOWN FUSE INDICATION (RED/DC)	ALLEN-BRADLEY	1492-WFB424
	5	5X20 MM TIME DELAY FUSE, 5A	BUSSMAN	GDC-5A
	15	5X20 MM TIME DELAY FUSE, 2A	BUSSMAN	GDC-2A
30	TBD	IEC TERMINAL BLOCK (24 A)	ALLEN-BRADLEY	1492-J3
31	8	IEC TERMINAL BLOCK PLUGABLE	ALLEN-BRADLEY	1492-J3P
	8	FUSE PLUG, INDICATING, 24 VDC	ALLEN-BRADLEY	1492-FPK224
	20	5X20 MM TIME DELAY FUSE, 250mA	BUSSMAN	GDC-250mA
32	TBD	IEC GROUNDING TERMINAL BLOCK	PHOENIX CONTACT	3044128
32	TBD	DIN RAIL MOUNTED TERMINAL BLOCK	ALLEN-BRADLEY	1492-J4
33	TBD	IEC TERMINAL END ANCHORS	PHOENIX CONTACT	3022218
33	TBD	END ANCHORS	ALLEN-BRADLEY	1492-EAH35
34	TO FIT	DIN RAIL	STANDARD	STANDARD
35	TO FIT	WIRING DUCT	STANDARD	STANDARD
36	1	ENCLOSURE LIGHT, LED (120VAC)	SCE	SCE-LF18NO
	1	DOOR SWITCH	SCE	SCE-LSA





NOTES:

1. PROGRAMMABLE LOGIC CONTROLLER AND HUMAN MACHINE INTERFACE SHALL BE PROGRAMMED TO PROVIDE THE FUNCTIONALITY DESCRIBED IN THE PROCESS AND INSTRUMENTATION DIAGRAM.
2. ~~INSTALL ANTENNA ON EXTERIOR OF FACILITY ABOVE BUILDING ROOFLINE.~~
1 2. ANTENNA INSTALLED ON INTERIOR OF BUILDING ADJACENT TO REMOTE MONITORING PANEL.
3. INSTALL WIRE (ONE #18 TSP, ONE #12 GND) AND CONDUIT (3/4-INCH) CONNECTING VACUUM TRANSMITTERS TO CONTROL PANEL.

LEGEND

- DENOTES TERMINAL BLOCK CONNECTION
- DASHED LINES DENOTES WIRING TO FIELD DEVICES
- DASHED WITH PATTERN DENOTES DEVICES IN REMOTE LOCATIONS

LINE NUMBER DESCRIPTION

0000
WIRING DIAGRAM SHEET NUMBER (1 OR 2 DIGITS) — LINE NUMBER (ALWAYS 2 DIGITS)

WIRE NUMBER DESCRIPTION

00000
WIRING DIAGRAM SHEET NUMBER (1 OR 2 DIGITS) — WIRE NUMBER (ALWAYS 1 DIGIT); LINE NUMBER (ALWAYS 2 DIGITS)

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE 12/08/2021 BY David V. Camarda

1"=5' 5' 0 5' 10'

THIS BAR REPRESENTS ONE HALF INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	1/2021	RECORD DRAWINGS	SM	CMD

Professional Engineer's Name: DAVID V. CAMARDA
Professional Engineer's No.: 090411

State	Date Signed	Project Mgr.
NY	2/1/21	MF
Designed by: KE	Drawn by: RTS	Checked by: CD

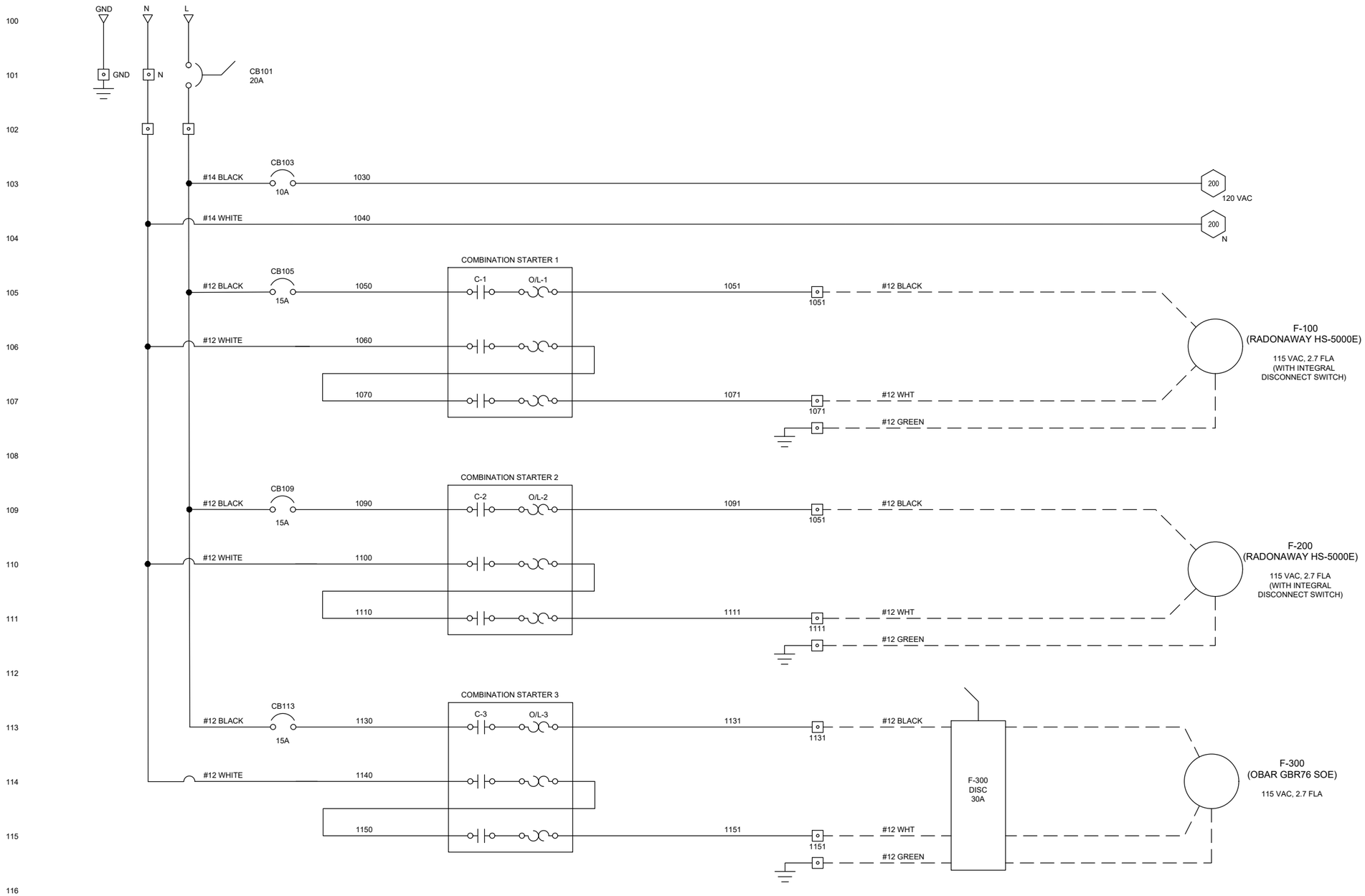
NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

REMOTE MONITORING PANEL PANEL LAYOUT

ARCADIS Project No. 30053689
Date AUGUST 2019

ARCADIS
855 ROUTE 146
SUITE 210
CLIFTON PARK, NEW YORK
TEL. 518.250.7300

SHEET 6



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DATE 02/08/2021 BY David V. Camarda

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Professional Engineer's No.: 090411

State	Date Signed	Project Mgr.
NY	2/1/21	MF
Designed by	**Drawn by**	**Checked by**
KE	RTS	CD

STATE OF NEW YORK · DAVID V. CAMARDA · 090411 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

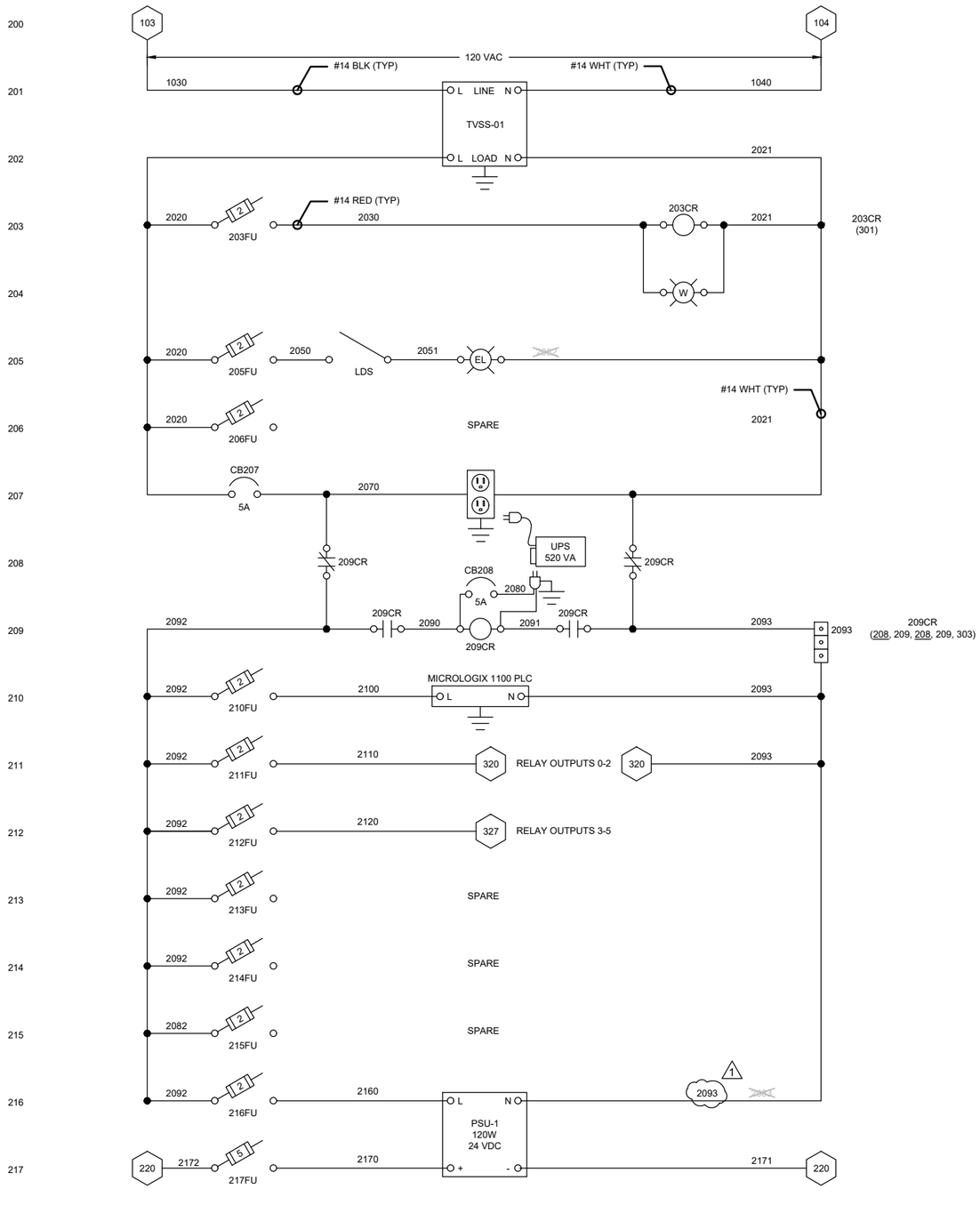
NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

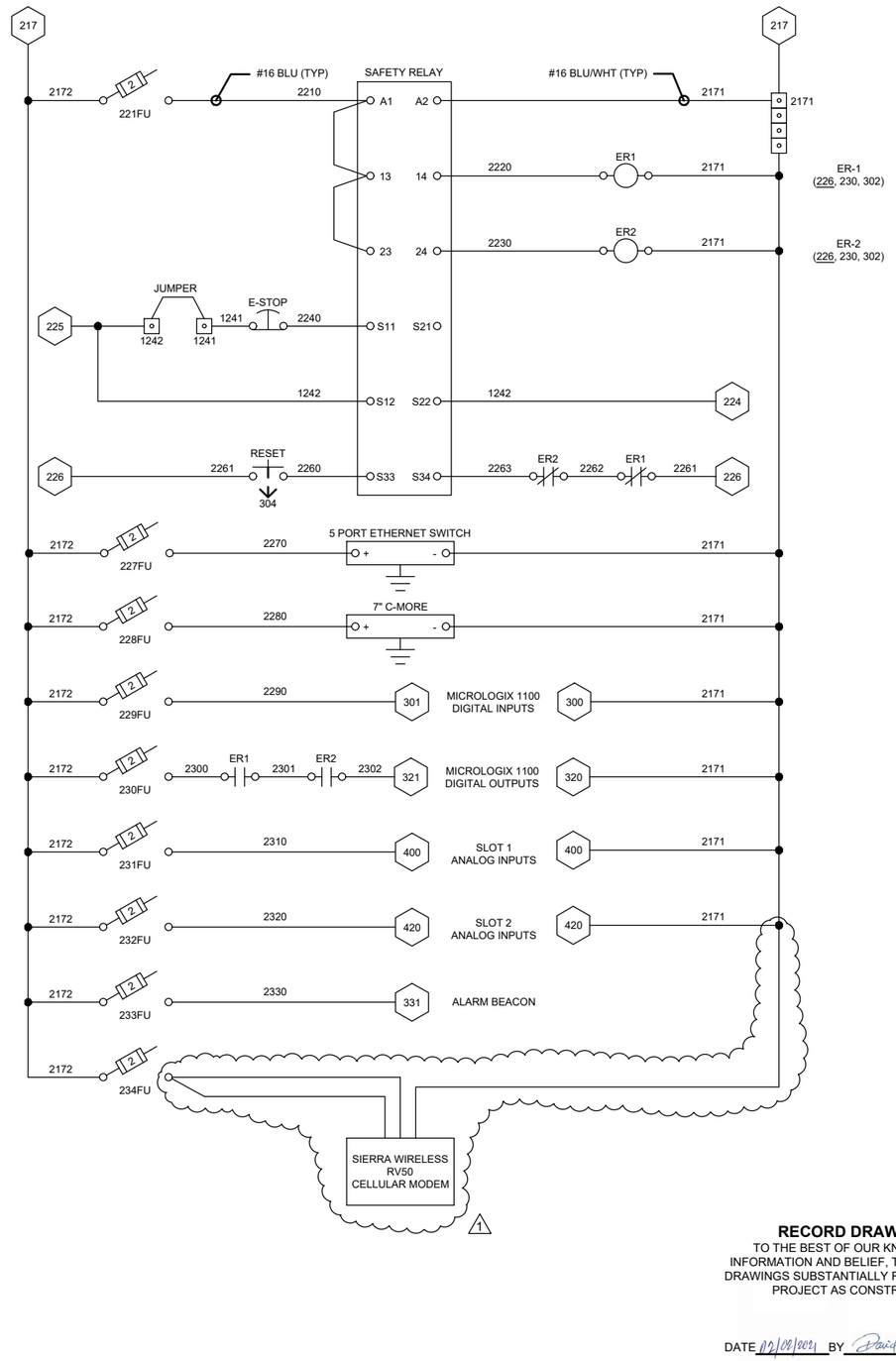
REMOTE MONITORING PANEL MOTOR POWER DISTRIBUTION

ARCADIS Project No. 30053689
Date AUGUST 2019

ARCADIS
855 ROUTE 146
SUITE 210
CLIFTON PARK, NEW YORK
TEL. 518.250.7300

SHEET 7





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DATE 12/08/2021 BY David V. Camarda

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Professional Engineer's No.: 090411

State	Date Signed	Project Mgr.
NY	2/1/21	MF
Designed by	Drawn by	Checked by
KE	RTS	CD

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RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

REMOTE MONITORING PANEL CONTROL POWER DISTRIBUTION

ARCADIS Project No. 30053689
Date AUGUST 2019

ARCADIS
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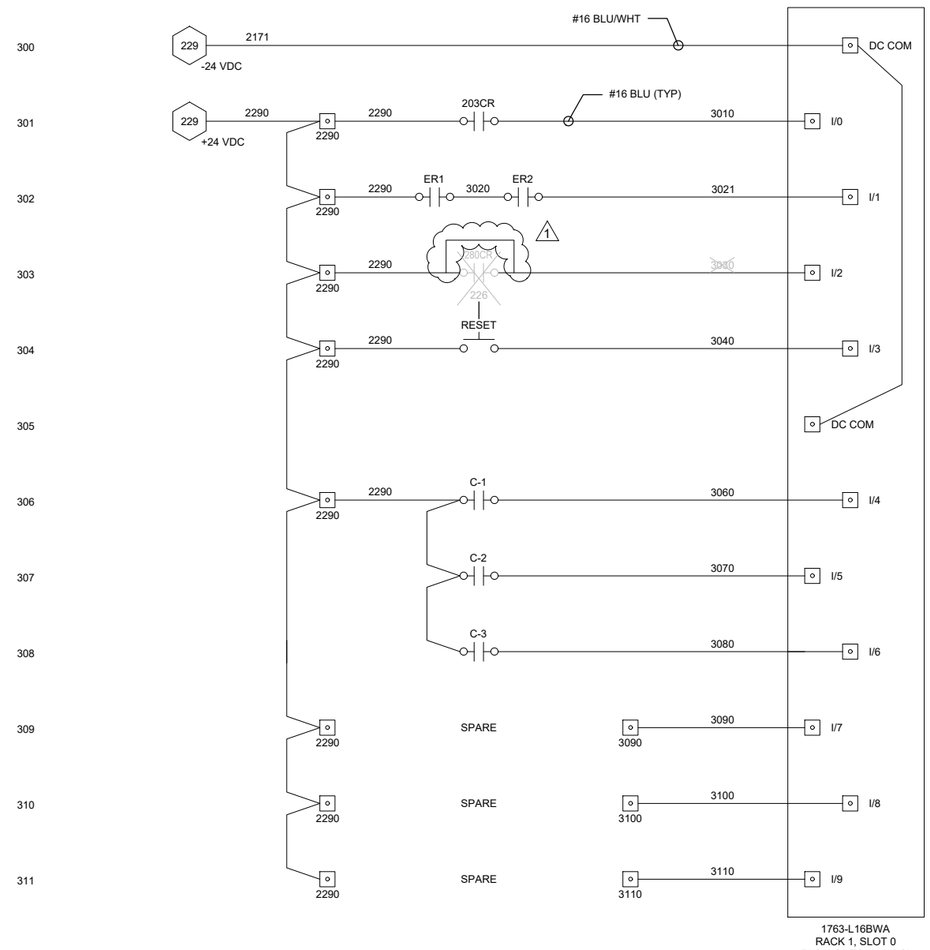

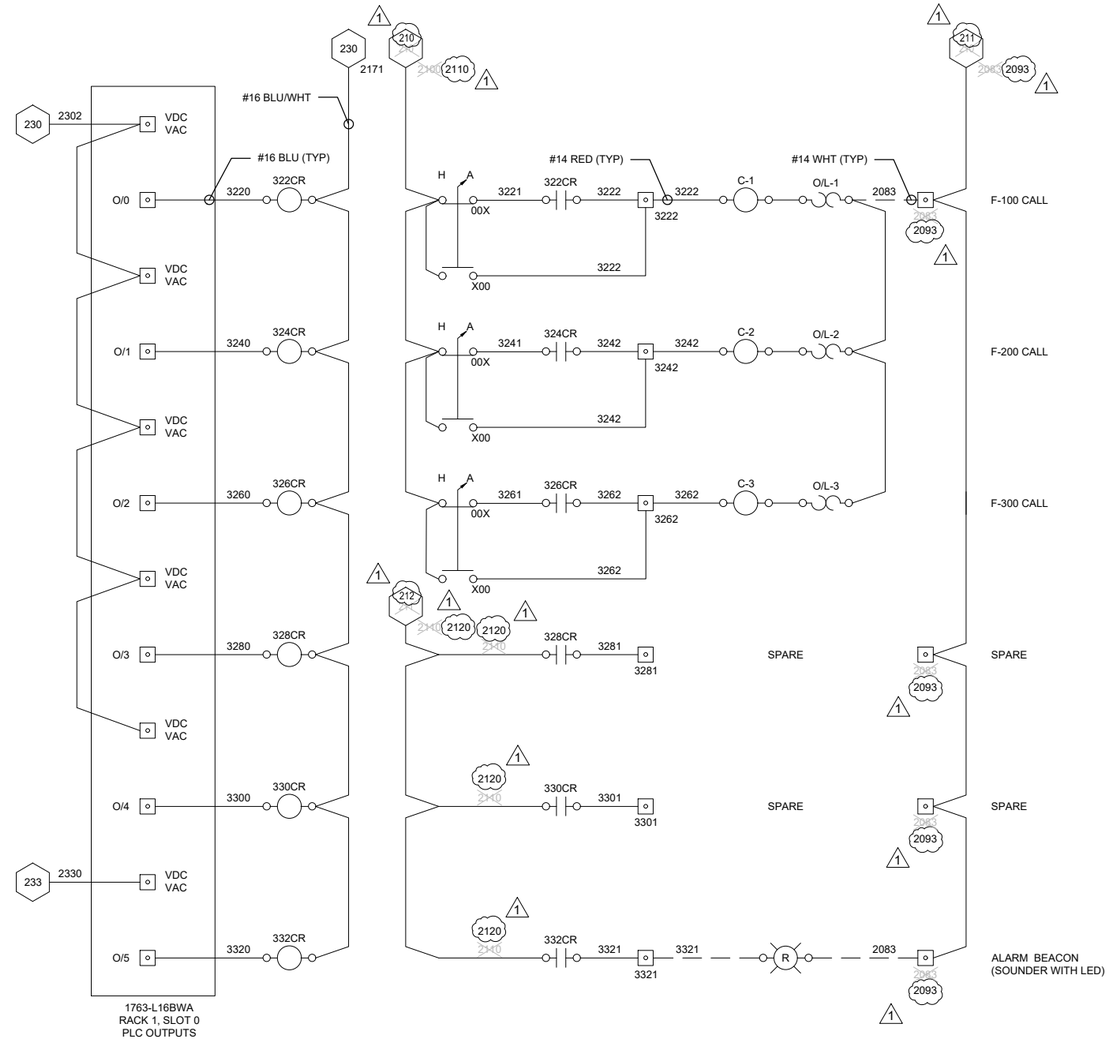

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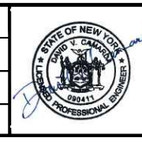
1	1/2021	RECORD DRAWINGS	SM	CMD

Professional Engineer's Name: **DAVID V. CAMARDA**
Professional Engineer's No.: 090411

State	Date Signed	Project Mgr.
NY	2/1/21	MF
Designed by	Drawn by	Checked by
KE	RTS	CD



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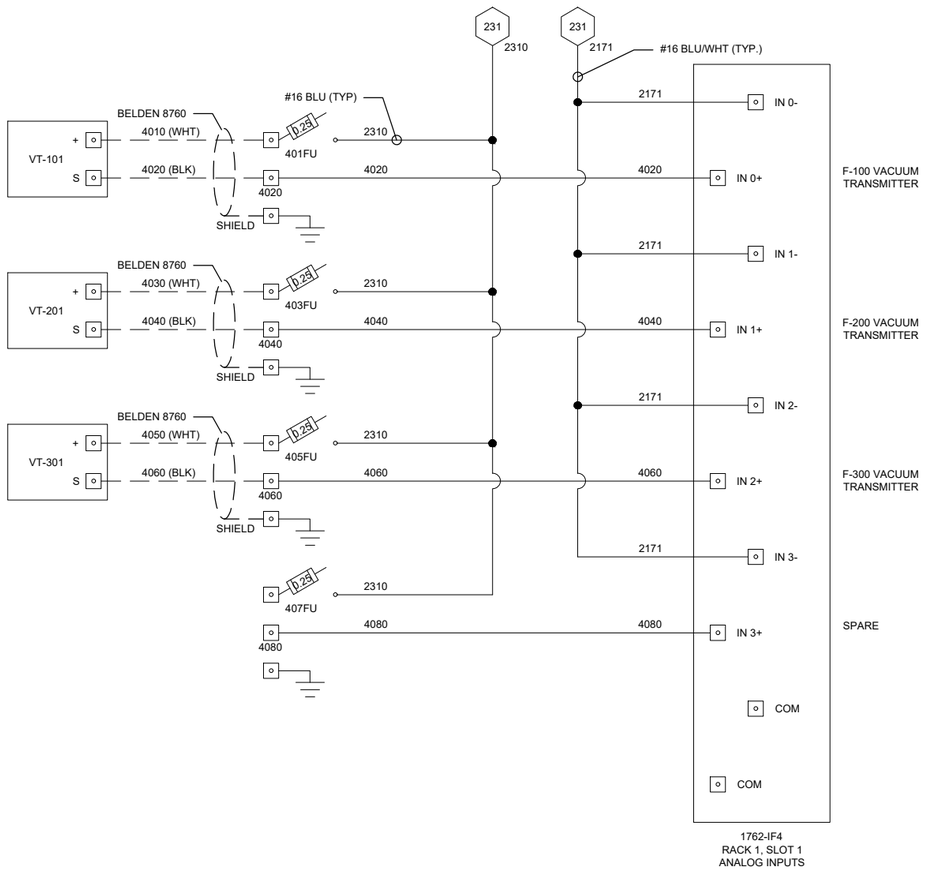
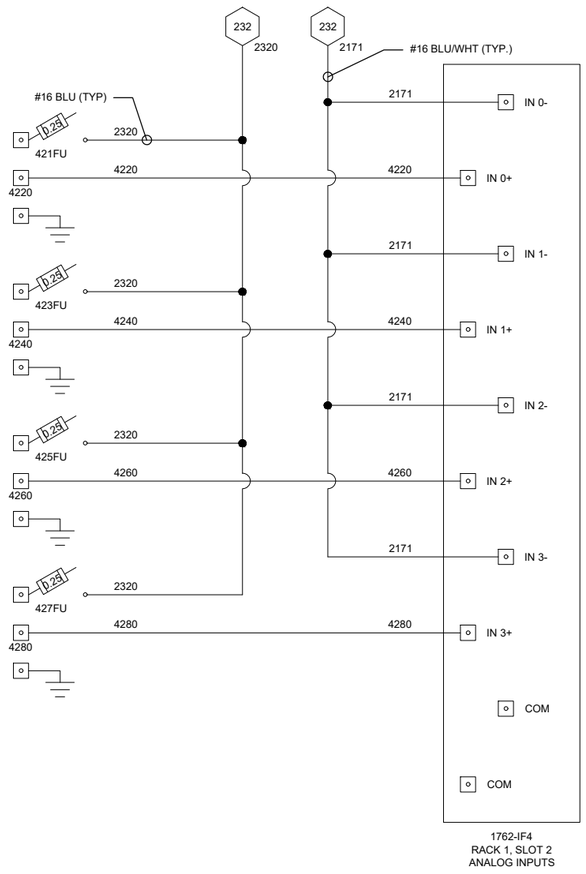
NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

REMOTE MONITORING PANEL EMBEDDED I/O

ARCADIS Project No. 30053689
Date AUGUST 2019
ARCADIS
855 ROUTE 146
SUITE 210
CLIFTON PARK, NEW YORK
TEL. 518.250.7300

SHEET 9





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1	1/2021	RECORD DRAWINGS	SM	CMD

Professional Engineer's Name: **DAVID V. CAMARDA**
Professional Engineer's No.: 090411

State	Date Signed	Project Mgr.
NY	2/1/21	MF
Designed by: KE	Drawn by: RTS	Checked by: CD

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NYSDEC NORTHERN CIRCUITS (SITE NO. 734124) • 6 ADLER DRIVE, DEWITT, NEW YORK
RECORD DRAWINGS - OFF-SITE SUB-SLAB DEPRESSURIZATION SYSTEM (8 ADLER DRIVE)

REMOTE MONITORING PANEL SLOT 1 AND 2 ANALOG INPUTS

ARCADIS Project No. 30053689
Date AUGUST 2019

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TEL. 518.250.7300

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APPENDIX C

Photographic Log

PHOTOGRAPHIC LOG

Off-Site Sub-Slab Depressurization System (8 Adler Drive)
Northern Circuits (Site No. 734124)
6 Adler Drive, Dewitt, New York

Photograph: 1

Description:
Extraction point EP-2A installation

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/10/2020

Photograph: 2

Description:
Extraction riser installation for EP-2B

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/10/2020

Photograph: 3

Description:
Wall penetration for conveyance piping

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/23/2020

Photograph: 4

Description:
Conveyance pipe installation above drop ceiling

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/21/2020

Photograph: 5

Description:
Extraction riser and conveyance piping for EP-3B

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/21/2020

Photograph: 6

Description:
Typical vacuum monitoring point installation

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/13/2020

Photograph: 7

Description:
Vacuum monitoring point installation with flush-mounted cover

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/13/2020

Photograph: 8

Description:
Typical vacuum transmitter installation

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/29/2020

Photograph: 9

Description:
Extraction riser EP-1A

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/29/2020

Photograph: 10

Description:
Extraction riser EP-1B

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/31/2020

Photograph: 11

Description:
Extraction riser EP-2A

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/31/2020

Photograph: 12

Description:
Extraction riser EP-2B

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/29/2020

Photograph: 13

Description:
Extraction riser EP-3A

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/29/2020

Photograph: 14

Description:
Extraction riser EP-3B

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/29/2020

Photograph: 15

Description:
Extraction riser EP-3C (mid-buildout)

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/22/2020

Photograph: 16

Description:
Extraction riser EP-3C (buildout with access panels)

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
C. Hill

Date: 7/28/2020

Photograph: 17

Description:
Extraction riser EP-3C (buildout with access panels)

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/28/2020

Photograph: 18

Description:
Extraction riser EP-3C (owner to complete finish work)

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/28/2020

Photograph: 19

Description:
Typical butterfly valve and vacuum gauge at extraction riser

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 9/11/2020

Photograph: 20

Description:
Vertical discharge (fan F-100) for extraction points EP-1A and EP-1B

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/29/2020

Photograph: 21

Description:
Vertical discharge (fan F-200) for extraction points EP-2A and EP-2B

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/31/2020

Photograph: 22

Description:
Vertical discharge (fan F-300) for extraction points EP-3A, EP-3B, and EP-3C

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/31/2020

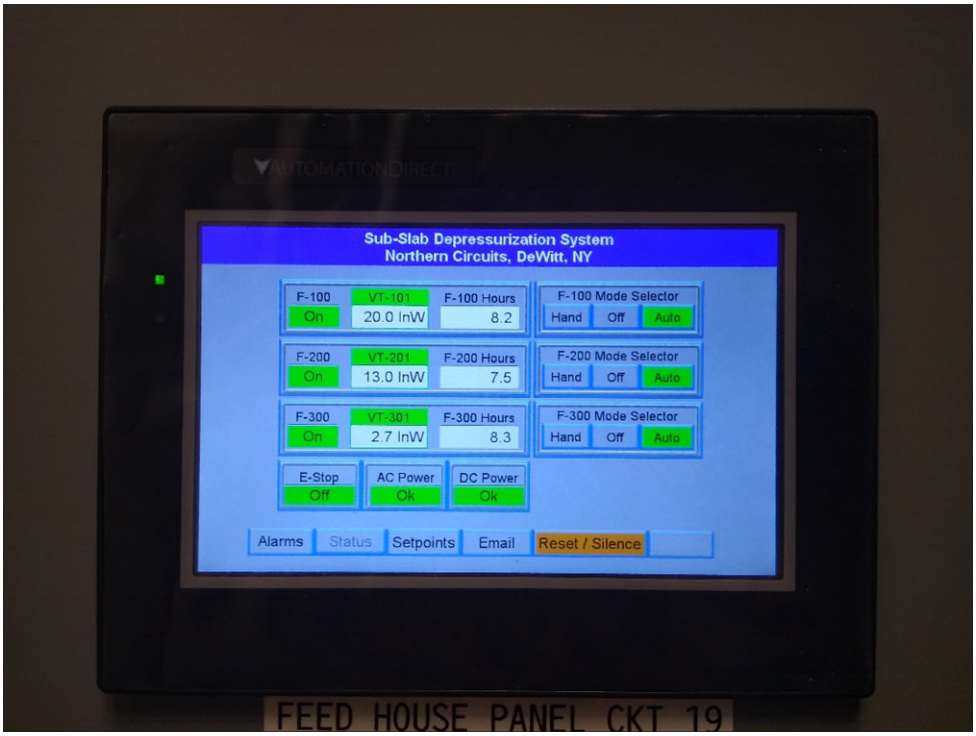
Photograph: 23

Description:
Control panel

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 7/31/2020



Photograph: 24

Description:
Human machine interface (HMI) screen on outside of control panel

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
C. Hill

Date: 7/31/2020

Photograph: 25

Description:
Existing damage to block wall foundation on exterior of building near extraction point EP-1A

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
S. McGowan

Date: 8/20/2020

Photograph: 26

Description:
Sealed cracks in the northwesternmost room near vacuum monitoring point VMP-1

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
Q. Carnahan

Date: 7/31/2020

Photograph: 27

Description:
Floor crack sealing in Suite 3 garage

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
Q. Carnahan

Date: 7/31/2020

Photograph: 28

Description:
Floor crack sealing in Suite 3 garage; EP-3A to right

Location:
8 Adler Drive, Dewitt, New York

Photograph taken by:
Q. Carnahan

Date: 7/31/2020

APPENDIX D

Supplemental Performance Monitoring Data

Table D-1
Supplemental Performance Data
Off-Site Sub-Slab Depressurization System (8 Adler Drive)
Northern Circuits (Site No. 734124)
6 Adler Drive, Dewitt, New York

Locations		Parameter	7/31/2020[a]						8/13/2020				
			Step #1	Step #1	Step #2	Step #2	Step #3	Step #3	Step #1	Step #2	Step #3	Step #4	Step #4
Extraction Points	EP-1A	Applied Vacuum (iwc)	34	34	20.5	20.5	15	16	9.5	Not measured (no adjustments made)			
		Flow Rate (scfm)	5	5	2	7	4	4	5				
	EP-1B	Applied Vacuum (iwc)	35	36	21	20.5	15.5	15	9.5				
		Flow Rate (scfm)	18	20	12	6	11	12	6				
	EP-2A	Applied Vacuum (iwc)	18	18.5	12	12.5	6.5	6	4				
		Flow Rate (scfm)	See Note (b)		7	9	10	10	5				
	EP-2B	Applied Vacuum (iwc)	19	19	12.5	12.5	6.5	7	4				
		Flow Rate (scfm)	14	15	15	6	11	10	7				
	EP-3A	Applied Vacuum (iwc)	6	6	4	-	2.5	3	12.5	9.4	9.5	5	4.9
		Flow Rate (scfm)	1	3	1	-	1	1	6	4	5	2	2
	EP-3B	Applied Vacuum (iwc)	6	5.5	4	-	2.5	3	12.5	9.3	9.4	4.9	4.8
		Flow Rate (scfm)	4	3	1	-	1	1	7	5	5	3	3
	EP-3C	Applied Vacuum (iwc)	5.5	5.5	3	-	2.5	3	11.5	8.8	8.8	4.5	4.5
		Flow Rate (scfm)	3	3	1	-	1	1	8	6	5	3	3
Vacuum Monitoring Points	VMP-1	Differential Pressure (iwc)	0.000	0.000	0.000	-0.001	0.000	0.000	-	-	-	-	-
	VMP-2		-0.061	-0.060	-0.039	-0.038	-0.029	-0.030	-	-	-	-	-
	VMP-3		-0.716	-0.725	-0.520	-0.525	-0.326	-0.325	-	-	-	-	-
	VMP-4		-0.643	-0.628	-0.323	-0.295	-0.159	-0.162	-	-	-	-	-
	VMP-5		-0.012	-0.015	-0.010	-	-0.010	-0.009	-0.006	-0.005	-0.005	-0.003	-0.003
	VMP-6		-0.005	-0.005	-0.003	-	-0.003	-0.002	-0.010	-0.009	-0.010	-0.004	-0.004
	VMP-7		-0.034	-0.032	-0.027	-	-0.016	-0.013	-0.062	-0.051	-0.049	-0.025	-0.025
	VMP-8		-0.006	-0.005	-0.006	-	-0.003	-0.004	-0.012	-0.010	-0.010	-0.005	-0.006
Temporary Vacuum Monitoring Points[c]	VMP-7-1		-	-	-	-	-	-	-0.151	-0.010	-	-	
	VMP-7-2		-	-	-	-	-	-	0.000	0.000	-	-	
	VMP-7-3		-	-	-	-	-	-	-0.143	-0.073	-	-	
	VMP-7-4		-	-	-	-	-	-	-0.039	-0.026	-	-	
	VMP-7-6		-	-	-	-	-	-	-0.491	-0.318	-	-	
	VMP-8-1		-	-	-	-	-	-	-0.003	-0.001	-	-	

Notes:

a) For startup performance monitoring conducted on July 31, 2020, inline fan F-300 (for EP-3A, EP-3B, and EP-3C) was inadvertently tuned down. Additional startup data collected on August 13, 2020 with F-300 tuned to higher speed.

b) No air flow was measured at EP-2A due to presence of water in extraction sump.

c) Temporary monitoring points installed, and subsequently abandoned, on August 13, 2020 at locations utilized during SSD pilot testing conducted in January 2019.

- Applied vacuum values shown are based on extraction point vacuum gauge readings. Flow rates shown are based on anemometer measurements taken at extraction points and converted from acfm to scfm.
- Groundwater level measurements:

	DTW (feet below ground surface)	
	7/31/2020	8/13/2020
MW-7S	3.44	2.47
MW-8S	2.39	2.76
MW-9S	2.64	2.57

- Abbreviations

"-" = not measured
acfm = actual cubic feet per minute
DTW = depth to water
iwc = inches of water column
scfm = standard cubic feet per minute
SSD = sub-slab depressurization

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