Long-Term SSD/SVE System
Operation, Maintenance and Monitoring

December 2017 Data Summary Report

Wendell Avenue Site

Fairbanks, Alaska

December 2017

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SUMMARY OF FINDINGS

RECOMMENDATIONS

ATTACHMENTS

1. Figures

   Figure 1: VI Sample Results
   Figure 2: SSD/SVE Monitoring Location Results
   Figure 3: SSD/SVE System PCE Emission Mass Estimate

2. Tables

   Table 1: OM&M and VI Analytical Results - Oct 2010 to September 2017

3. SVE/SSD System OM&M Data Sheets
   - SVE System OM&M – March 2017
   - SVE System OM&M – May 2017
   - SVE System OM&M – September 2017

4. Photo Log

5. Laboratory Data Review Checklist

6. RadonAway HS5000 Specifications and Instruction Manual

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1. SUMMARY OF FINDINGS

Wendell Avenue SSD/SVE System Remediation: Overall the 314 Wendell Avenue remediation system continues to remove chlorinated ethenes (PCE primarily) from the subsurface soil. The rate of PCE removal by the SVE system has declined from the initial removal rate of over 1 pound per day (lb/day) to the present rate (observed in 2016 and 2017) of approximately 0.1 lb/day or less. The June 2017 Data Summary Report included an estimate of 523 lbs of PCE removed since operations began in 2011.

1. Table 1 presents all the chlorinated ethene concentrations (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, and VC) collected from the ESL building and remediation system. The SVE exhaust stack results (RS-SVE) for PCE were observed to be higher in September 2017 as compared to September 2016, since SVE flow rates were similar this indicates a greater removal rate. Historically removal rates appear to be highest during the fall which may be due to higher soil temperatures or changing groundwater levels.

   Deep soil gas samples were collected at SVE-4 and SVE-5 during September 2017. Both of these locations had PCE concentrations that were above the ADEC target level for commercial deep soil gas locations.

   Figure 1 presents the 2016 and 2017 PCE, TCE, and trans-1,2-DCE concentrations at selected soil gas monitoring locations at Wendell Avenue.

2. Figure 2 presents field screening measurements collected from various sub-slab, soil gas vapor monitoring points, and SVE well locations near the ESL building while the SVE system was operational at Wendell Avenue. The readings included induced vacuum, oxygen (O2) concentration, carbon dioxide (CO2) concentration, and chlorinated ethene concentrations based on Color Tec tube readings. The air flow rate was also recorded for the operating SVE wells. The Color Tec readings show that SVE-4 and SVE-5 have the highest chlorinated ethene concentrations of 6.0 and 7.2 ppm, respectively.

3. Figure 3 presents the PCE mass emission estimate over the course of SSD/SVE system operation at Wendell Avenue. As of 2017 a total PCE removal amount of 523 pounds is estimated as compared to a removal amount of 340 pounds in March 2014. The daily PCE mass removal rate has declined from over 1 lb/day in 2011 to 0.1 lbs/day or less in 2016/2017.

4. The September 27, 2016 daily PCE emission rates were measured at 0.075 lbs/day for the SVE portion of the system and 0.011 lbs/day for the SSD portion of the system.

5. On May 10, 2017 with just the SVE system operating (SSD remained shut down) the SS-4 sub-slab result for PCE was above the Commercial Sub-slab Soil Gas Target Level. Since the building remains unoccupied no indoor air samples have been collected since 2014.

6. Soil gas data and field screening results suggests that the area of greatest remaining source contamination is at the southern end of the ESL building adjacent to Wendell Avenue. A previous investigation identified a 7 foot break in the ESL building sewer line near the front of the building prior to connecting with the main sewer line.

2. RECOMMENDATIONS

SSD/SVE System Conclusions: SVE system-only operation has been shown to be effective at mitigating VI at the ESL Building as previous testing in 2014 has shown that indoor air chlorinated ethene concentrations remain below target levels. Recent 2016-2017 VI sampling demonstrates that sub-slab soil gas and deep vadose zone soil gas levels are also below ADEC commercial levels at all locations sampled with the exception of SS-4, SVE-4, and SVE-5. The sub-slab soil gas PCE concentrations at SS-4 were below the ADEC target level in 2016 but went back above the target level in 2017 (Table 1). The deep vadose zone soil gas PCE concentrations for SVE-4 and SVE-5 were above the ADEC target level during 2016 and 2017. The PCE concentrations for SVE-4 were observed to be higher during periods when the SVE system was operational as compared to samples collected after the SVE system had been shut down for approximately six months. This data suggests that the highest remaining soil gas concentrations are not located in the immediate vicinity of SVE-4.

SSD/SVE System Recommendations: The ESL Building is presently unoccupied however if the building were to be occupied continued mitigation and VI sampling efforts would be necessary to ensure that indoor air concentrations remained below ADEC target levels. The following options could be used to maintain safe commercial indoor air concentrations during building occupation:

What is needed to operate building safely?

- Mitigations efforts are needed until VI sampling demonstrates that they are no longer necessary to ensure concentrations remain below ADEC target levels. The following are a couple of mitigation methods that could be used.
    - Continued SVE or SSD system operation. Both of these mitigation methods have been demonstrated to be effective at controlling VI in the ESL Building. Previous SSD system operational data shows that effective VI control was obtained with DW extraction well vacuums of 10 to 28 inWC and well extraction flow rates of 5 to 20 cfm.
    - Installation of a RadonAway HS5000 blower at a site in Anchorage demonstrated it was capable of generating extraction well vacuums of 17 to 27 inWC and flow rates of 30 to 37 cfm. Note that performance data

will vary by site depending on several factors including soil permeability and sub-slab construction.

- A set of high vacuum radon blowers could be used to extract air and vapors from select SSD wells in the areas where chlorinated ethenes are still present beneath the building floor slab. Initially recommend starting with three radon HS5000 blowers connected to DW-1, DW-2, and DW-3 for VI mitigation. To ensure the system is protective and meets ADEC target levels indoor air and sub-slab sampling should be performed after installation. The system could then be modified accordingly based on the results obtained.
- Specification and installation instructions for the RadonAway HS5000 blower are provided in Attachment 6.

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ATTACHMENT 1

Figures

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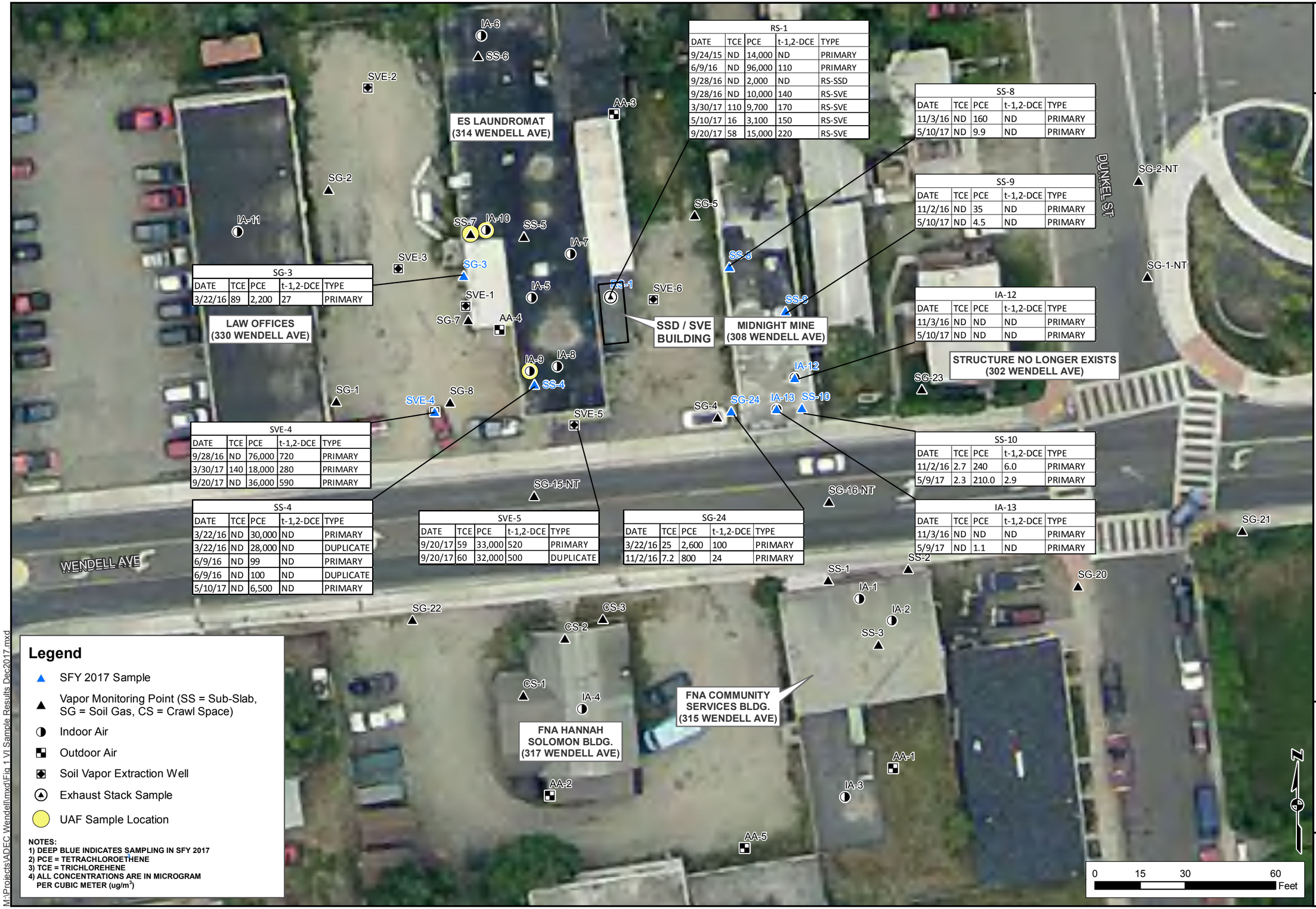
FIGURE 1

DECEMBER 2017 DATA SUMMARY REPORT
SFY 2017 PCE AND TCE SAMPLE RESULTS

WENDELL AVENUE STUDY
Fairbanks, Alaska



RS-1				
DATE	TCE	PCE	t-1,2-DCE	TYPE
9/24/15	ND	14,000	ND	PRIMARY
6/9/16	ND	96,000	110	PRIMARY
9/28/16	ND	2,000	ND	RS-SSD
9/28/16	ND	10,000	140	RS-SVE
3/30/17	110	9,700	170	RS-SVE
5/10/17	16	3,100	150	RS-SVE
9/20/17	58	15,000	220	RS-SVE

SS-8				
DATE	TCE	PCE	t-1,2-DCE	TYPE
11/3/16	ND	160	ND	PRIMARY
5/10/17	ND	9.9	ND	PRIMARY

SS-9				
DATE	TCE	PCE	t-1,2-DCE	TYPE
11/2/16	ND	35	ND	PRIMARY
5/10/17	ND	4.5	ND	PRIMARY

SG-3				
DATE	TCE	PCE	t-1,2-DCE	TYPE
3/22/16	89	2,200	27	PRIMARY

IA-12				
DATE	TCE	PCE	t-1,2-DCE	TYPE
11/3/16	ND	ND	ND	PRIMARY
5/10/17	ND	ND	ND	PRIMARY

SVE-4				
DATE	TCE	PCE	t-1,2-DCE	TYPE
9/28/16	ND	76,000	720	PRIMARY
3/30/17	140	18,000	280	PRIMARY
9/20/17	ND	36,000	590	PRIMARY

SS-10				
DATE	TCE	PCE	t-1,2-DCE	TYPE
11/2/16	2.7	240	6.0	PRIMARY
5/9/17	2.3	210.0	2.9	PRIMARY

SS-4				
DATE	TCE	PCE	t-1,2-DCE	TYPE
3/22/16	ND	30,000	ND	PRIMARY
3/22/16	ND	28,000	ND	DUPLICATE
6/9/16	ND	99	ND	PRIMARY
6/9/16	ND	100	ND	DUPLICATE
5/10/17	ND	6,500	ND	PRIMARY

SVE-5				
DATE	TCE	PCE	t-1,2-DCE	TYPE
9/20/17	59	33,000	520	PRIMARY
9/20/17	60	32,000	500	DUPLICATE

SG-24				
DATE	TCE	PCE	t-1,2-DCE	TYPE
3/22/16	25	2,600	100	PRIMARY
11/2/16	7.2	800	24	PRIMARY

IA-13				
DATE	TCE	PCE	t-1,2-DCE	TYPE
11/3/16	ND	ND	ND	PRIMARY
5/9/17	ND	1.1	ND	PRIMARY

Legend

- SFY 2017 Sample
- Vapor Monitoring Point (SS = Sub-Slab, SG = Soil Gas, CS = Crawl Space)
- Indoor Air
- Outdoor Air
- Soil Vapor Extraction Well
- Exhaust Stack Sample
- UAF Sample Location

NOTES:
1) DEEP BLUE INDICATES SAMPLING IN SFY 2017
2) PCE = TETRACHLOROETHENE
3) TCE = TRICHLOREHENE
4) ALL CONCENTRATIONS ARE IN MICROGRAM PER CUBIC METER (ug/m^3)

IMAGERY SOURCE: FBNSB 2012-13 Imagery Web Mapping Service

DATE: DEC. 2017
CHKD: T.M.
DRWN: A.V.K. & J.E.C.
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ERM

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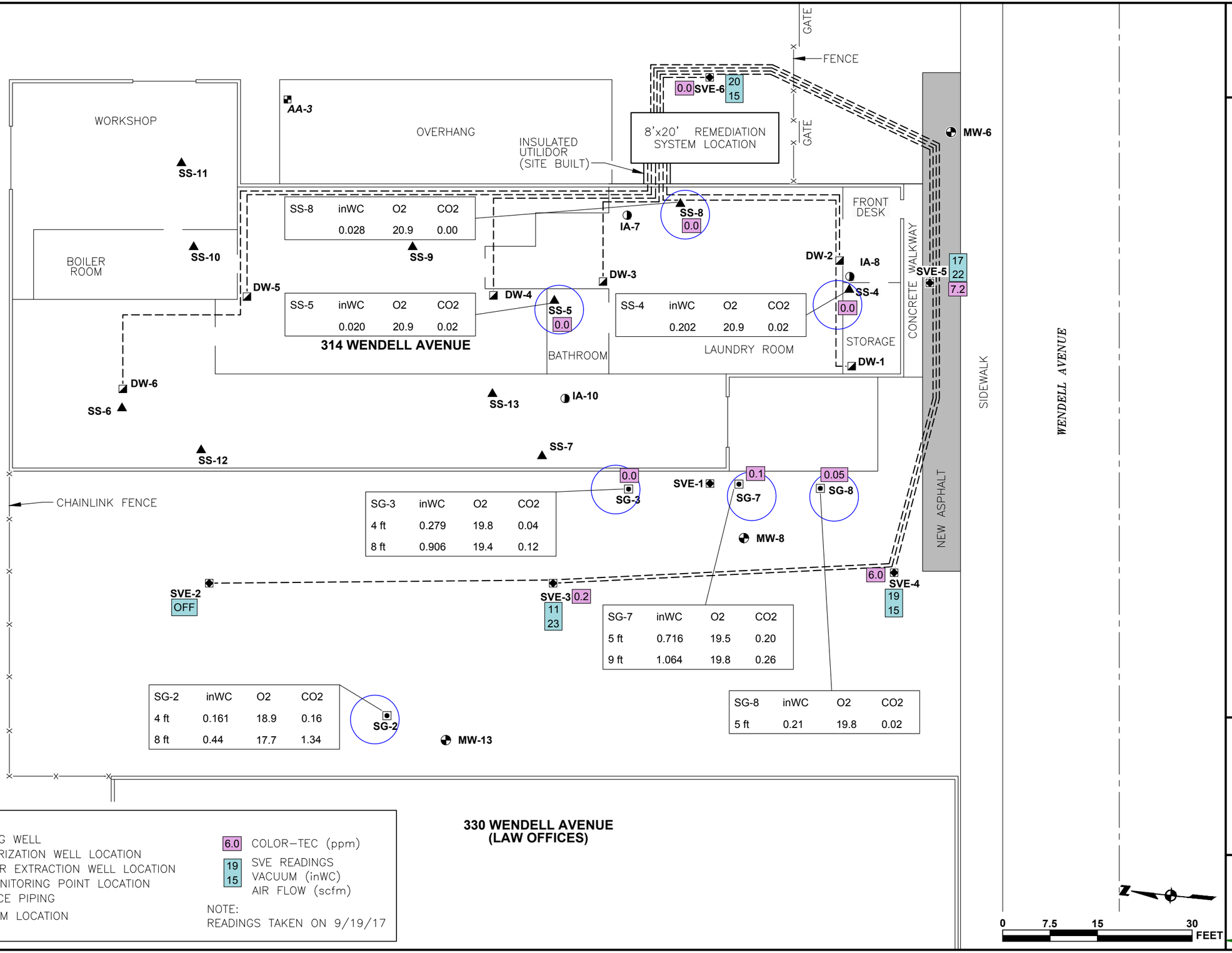

FIGURE 2

DECEMBER 2017 DATA SUMMARY REPORT SSD/SVE SYSTEM MONITORING LOCATIONS AND RESULTS

WENDELL AVENUE SITE
Fairbanks, Alaska

DATE: JULY 2016
CHKD: N.B.B
DRAWN: N.B.B
PROJ. No.: 0227323

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

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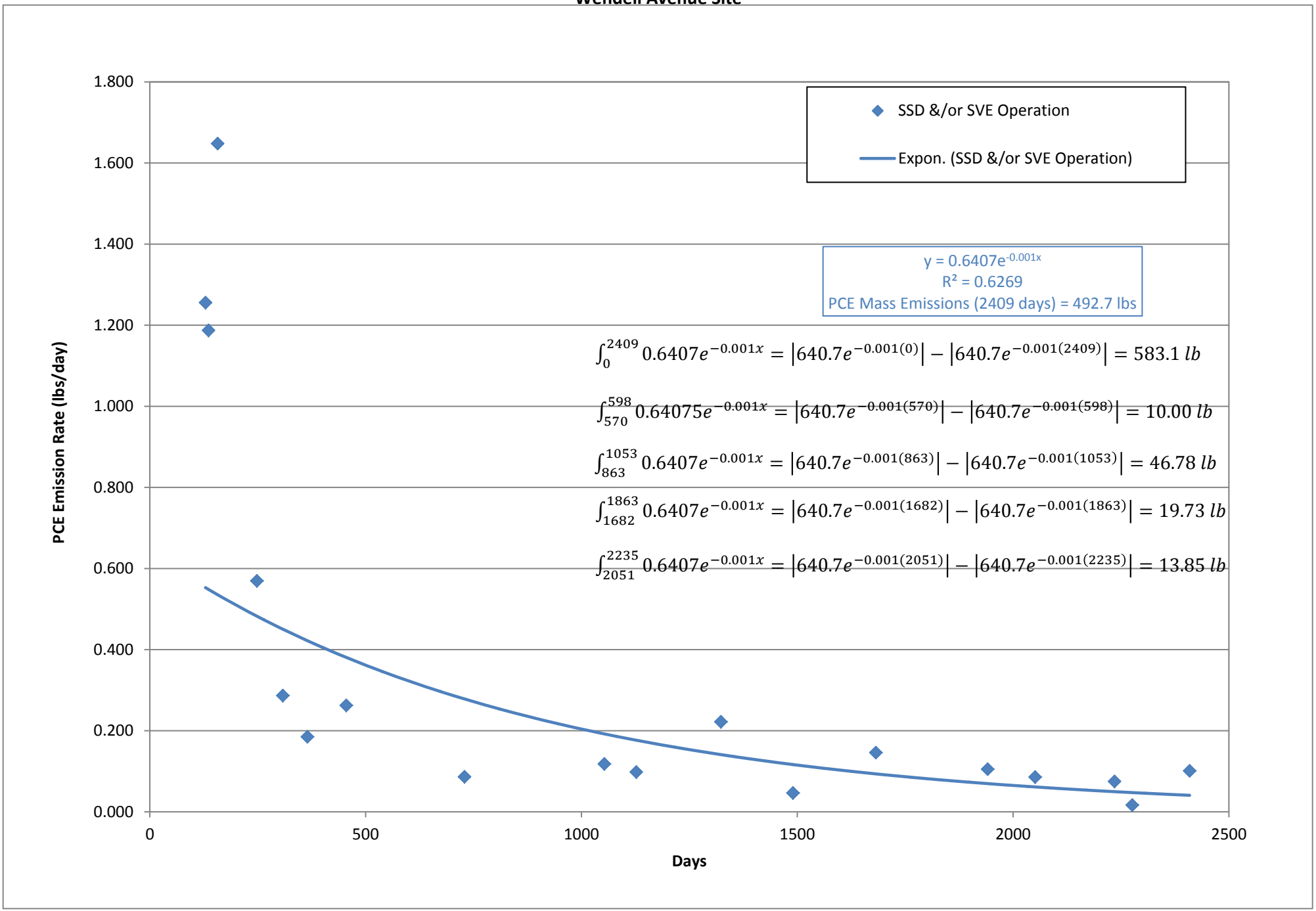
Figure 3: SSD/SVE System PCE Emission Mass Estimate
December 2017 Data Summary Report
Wendell Avenue Site



ATTACHMENT 2

Tables

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Table 1: OM&M and VI Assessment Analytical Results - October 2010 to September 2017
December 2017 Data Summary Report
314 Wendell Avenue Site

Remediation System Status	Location	Sample ID	Date Measured	Sample Type	Matrix	Tetrachloroethene (µg/m³)			Trichloroethene (µg/m³)			cis-1,2-Dichloroethene (µg/m³)			trans-1,2-Dichloroethene (µg/m³)			Vinyl Chloride (µg/m³)		
						Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag
Pre-Installation	IA-7	10WAS402IA	10/21/2010	Primary	Indoor Air	**320**	0.48		1.2	0.38		0.82	0.28			1.4	ND		0.09	ND
		10WAS403IA	10/21/2010	Duplicate	Indoor Air	**320**	0.5		1.2	0.39		0.81	0.29			1.4	ND		0.093	ND
SSD System Operating		11-WAS-006-IA	2/24/2011	Primary	Indoor Air	**110**	0.22		0.34	0.18		0.24	0.13		7.1	0.65			0.042	ND
		11-WAS-007-IA	2/24/2011	Duplicate	Indoor Air	**110**	0.24		0.32	0.19		0.24	0.14		6.9	0.71			0.046	ND
		11-WAS-047-IA	5/18/2011	Primary	Indoor Air	**160**	0.24		0.4	0.19		0.25	0.14		1.5	0.71			0.046	ND
		11-WAS-048-IA	5/18/2011	Duplicate	Indoor Air	**160**	0.29		0.41	0.23		0.25	0.17		1.5	0.85			0.055	ND
SSD/SVE System Operating		11-WAS-064-IA	10/20/2011	Primary	Indoor Air	27	0.23			0.18	ND		0.14	ND		0.68	ND		0.044	ND
		11-WAS-065-IA	10/20/2011	Duplicate	Indoor Air	27	0.24			0.19	ND		0.14	ND		0.69	ND		0.045	ND
SVE System Operating		13-WAS-007-IA	2/13/2013	Primary	Indoor Air	7.5	0.18			0.15	ND		0.11	ND		0.54	ND		0.035	ND
Post 190-day Shutdown		14-WAS-002-IA	1/2/2014	Primary	Indoor Air	22	0.17	JA		0.13	JA		0.098	JA		0.49	JA		0.032	JA
SVE System Operating		14-WAS-024-IA	3/18/2014	Primary	Indoor Air	4.6	0.19			0.15	ND		0.11	ND		0.56	ND		0.036	ND
Pre-Installation	IA-8	10WAS401IA	10/21/2010	Primary	Indoor Air	**400**	0.68		1.7	0.54		0.96	0.4			2	ND		0.13	ND
SSD System Operating		11-WAS-005-IA	2/24/2011	Primary	Indoor Air	**180**	0.24		0.53	0.19		0.32	0.14		8.1	0.69			0.045	ND
		11-WAS-049-IA	5/18/2011	Primary	Indoor Air	**210**	0.28		0.5	0.22		0.26	0.17		1.5	0.83			0.054	ND
SSD/SVE System Operating		11-WAS-063-IA	10/20/2011	Primary	Indoor Air	**66**	0.25			0.2	ND		0.14	ND		0.73	ND		0.047	ND
		12-WAS-074-IA	2/15/2012	Primary	Indoor Air	3.3	0.23			0.18	ND		0.13	ND		0.67	ND		0.043	ND
		12-WAS-075-IA	2/15/2012	Duplicate	Indoor Air	3.4	0.28			0.22	ND		0.16	ND		0.82	ND		0.053	ND
		12-WAS-129-IA	9/5/2012	Primary	Indoor Air	3.5	0.22			0.18	ND	0.23	0.13			0.65	ND		0.042	ND
Post 28-day Shutdown		12-WAS-133-IA	10/4/2012	Primary	Indoor Air	16	0.18			0.15	ND	0.98	0.11			0.54	ND		0.035	ND
		12-WAS-134-IA	10/4/2012	Duplicate	Indoor Air	16	0.2		0.16	0.15		0.92	0.11			0.57	ND		0.037	ND
SVE System Operating		13-WAS-005-IA	2/13/2013	Primary	Indoor Air	6.9	0.2			0.15	ND		0.11	ND		0.57	ND		0.037	ND
		13-WAS-006-IA	2/13/2013	Duplicate	Indoor Air	7.6	0.2			0.15	ND		0.11	ND		0.57	ND		0.037	ND
Post 190-day Shutdown		14-WAS-003-IA	1/2/2014	Primary	Indoor Air	20	0.16	JA	0.2	0.13	JA		0.097	JA		0.48	JA		0.031	JA
		14-WAS-004-IA	1/2/2014	Duplicate	Indoor Air	23	0.18	JA		0.14	JA		0.1	JA		0.51	JA		0.033	JA
SVE System Operating		14-WAS-022-IA	3/18/2014	Primary	Indoor Air	4.3	0.21			0.17	ND		0.12	ND		0.63	ND		0.04	ND
		14-WAS-023-IA	3/18/2014	Duplicate	Indoor Air	4.4	0.21	JA		0.17	JA		0.12	JA		0.62	JA		0.04	JA
ADEC Target Levels for Commercial Indoor Air						**180 - 41**			**8.4**			**31 - NA**			**260 - NA**			**28**		
Pre-Installation	SS-4	10WAS405SS	10/21/2010	Primary	Sub-Slab Soil Gas	**5,900,000**	**5900**		**10000**	**4600**			**3400**	ND		**3400**	ND		**2200**	ND
SSD System Operating		11-WAS-008-SS	2/24/2011	Primary	Sub-Slab Soil Gas	**12,000**	34			27	ND		20	ND		20	ND		**13**	ND
		11-WAS-052-SS	5/18/2011	Primary	Sub-Slab Soil Gas	**2,000**	6.1			4.8	ND		3.5	ND		3.5	ND		2.3	ND
SSD/SVE System Operating		11-WAS-066-SS	10/21/2011	Primary	Sub-Slab Soil Gas	520	6.0			4.7	ND		3.5	ND		3.5	ND		2.2	ND
		12-WAS-076-SS	2/15/2012	Primary	Sub-Slab Soil Gas	390	5.0			4.0	ND		3.0	ND		3.0	ND		1.9	ND
		12-WAS-077-SS	2/15/2012	Duplicate	Sub-Slab Soil Gas	400	5.4			4.2	ND		3.1	ND		3.1	ND		2	ND
		12-WAS-130-SS	9/5/2012	Primary	Sub-Slab Soil Gas	240	6.6			5.3	ND		3.9	ND		3.9	ND		2.5	ND
Post 28-day Shutdown		12-WAS-135-SS	10/5/2012	Primary	Sub-Slab Soil Gas	**94,000**	390			**310**	ND		230	ND		230	ND		150	ND
SVE System Operating		13-WAS-010-SS	2/14/2013	Primary	Sub-Slab Soil Gas	560	5.7			4.5	ND		3.3	ND		3.3	ND		2.1	ND
		13-WAS-011-SS	2/14/2013	Duplicate	Sub-Slab Soil Gas	560	5.5			4.3	ND		3.2	ND		3.2	ND		2.0	ND
Post 190-day Shutdown		14-WAS-010-SS	1/2/2014	Primary	Sub-Slab Soil Gas	**52,000**	220			**170**	ND		130	ND		130	ND		82	ND
		14-WAS-011-SS	1/2/2014	Duplicate	Sub-Slab Soil Gas	**49,000**	220			**170**	ND		130	ND		130	ND		82	ND
SVE System Operating		14-WAS-026-SS	3/18/2014	Primary	Sub-Slab Soil Gas	**13,000**	49			**39**	ND		29	ND		29	ND		18	ND
		14-WAS-027-SS	3/18/2014	Duplicate	Sub-Slab Soil Gas	**14,000**	59			46	ND		34	ND		34	ND		22	ND
Post 92-day Shutdown		15-WAS-004-SS	1/7/2015	Primary	Sub-Slab Soil Gas	**35,000**	120			**98**	ND		72	ND		72	ND		46	ND
		15-WAS-005-SS	1/7/2015	Duplicate	Sub-Slab Soil Gas	**33,000**	130			**100**	ND		74	ND		74	ND		48	ND
SVE System Operating		15-WAS-006-SS	3/16/2015	Primary	Sub-Slab Soil Gas	**6,900**	26			20	ND		15	ND		15	ND		9.7	ND
		15-WAS-007-SS	3/16/2015	Duplicate	Sub-Slab Soil Gas	**6,900**	26			20	ND		15	ND		15	ND		9.6	ND
Post 180-day Shutdown		16-WAS-018-SS	3/22/2016	Primary	Sub-Slab Soil Gas	**30,000**	55			43	ND		32	ND		32	ND		20	ND
		16-WAS-019-SS	3/22/2016	Duplicate	Sub-Slab Soil Gas	**28,000**	52			41	ND		30	ND		30	ND		19	ND
SVE System Operating		16-WAS-022-SS	6/9/2016	Primary	Sub-Slab Soil Gas	99	1.2			0.91	ND		0.67	ND		0.67	ND		0.43	ND
		16-WAS-023-SS	6/9/2016	Duplicate	Sub-Slab Soil Gas	100	1.2			0.92	ND		0.68	ND		0.68	ND		0.44	ND
		17-WAS-004-SS	5/10/2017	Primary	Sub-Slab Soil Gas	**6,500**	21			17	ND		12	ND		12	ND		8.0	ND
ADEC Target Levels for Commercial Sub-Slab Soil Gas						**1,800**			**88 - 84**			**310 - NA**			**2,600 - NA**			**280**		

Table 1: OM&M and VI Assessment Analytical Results - October 2010 to September 2017
December 2017 Data Summary Report
314 Wendell Avenue Site

Remediation System Status	Location	Sample ID	Date Measured	Sample Type	Matrix	Tetrachloroethene (µg/m³)			Trichloroethene (µg/m³)			cis-1,2-Dichloroethene (µg/m³)			trans-1,2-Dichloroethene (µg/m³)			Vinyl Chloride (µg/m³)		
						Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag
Pre-Installation	SS-5	10WAS404SS	10/21/2010	Primary	Sub-Slab Soil Gas	**310,000**	490		**3900**	**390**			280	ND		280	ND		180	ND
SSD System Operating		11-WAS-011-SS	2/24/2011	Primary	Sub-Slab Soil Gas	200	5.9			4.7	ND		3.5	ND		3.5	ND		2.2	ND
		11-WAS-053-SS	5/18/2011	Primary	Sub-Slab Soil Gas	61	7.4			5.8	ND		4.3	ND		4.3	ND		2.8	ND
SSD/SVE System Operating		11-WAS-067-SS	10/21/2011	Primary	Sub-Slab Soil Gas	19	6.7			5.3	ND		3.9	ND		3.9	ND		2.5	ND
SVE System Operating		13-WAS-012-SS	2/13/2013	Primary	Sub-Slab Soil Gas	8.9	6.5			5.1	ND		3.8	ND		3.8	ND		2.4	ND
SVE System Operating		14-WAS-028-SS	3/18/2014	Primary	Sub-Slab Soil Gas	16	5.2			4.1	ND		3	ND		3	ND		2	ND
Pre-Installation	SS-6	10WAS406SS	10/21/2010	Primary	Sub-Slab Soil Gas	**14,000**	40			31	ND		23	ND		23	ND		15	ND
		10WAS407SS	10/21/2010	Duplicate	Sub-Slab Soil Gas	**15,000**	43			34	ND		25	ND		25	ND		16	ND
SSD System Operating		11-WAS-009-SS	2/24/2011	Primary	Sub-Slab Soil Gas	19	5.2			4.1	ND		3	ND		3	ND		1.9	ND
		11-WAS-010-SS	2/24/2011	Duplicate	Sub-Slab Soil Gas	19	5.7			4.5	ND		3.3	ND		3.3	ND		2.1	ND
		11-WAS-050-SS	5/18/2011	Primary	Sub-Slab Soil Gas	21	5.5			4.3	ND		3.2	ND		3.2	ND		2	ND
		11-WAS-051-SS	5/18/2011	Duplicate	Sub-Slab Soil Gas	22	5.8			4.6	ND		3.4	ND		3.4	ND		2.2	ND
SSD/SVE System Operating		11-WAS-068-SS	10/21/2011	Primary	Sub-Slab Soil Gas		5.5	ND		4.4	ND		3.2	ND		3.2	ND		2.1	ND
		11-WAS-069-SS	10/21/2011	Duplicate	Sub-Slab Soil Gas		5.6	ND		4.4	ND		3.2	ND		3.3	ND		2.1	ND
SVE System Operating		13-WAS-009-SS	2/13/2013	Primary	Sub-Slab Soil Gas	100	5.6			4.4	ND		3.2	ND		3.2	ND		2.1	ND
Post 190-day Shutdown		14-WAS-012-SS	1/2/2014	Primary	Sub-Slab Soil Gas	250	5.2			**4.1**	ND		3	ND		3	ND		1.9	ND
ADEC Target Levels for Commercial Sub-Slab Soil Gas						**1,800**			**88 - 84**			**310 - NA**			**2,600 - NA**			**280**		
Pre-Installation	SG-2 @ 8' bgs	08WAS531SG	10/8/2008	Primary	Deep Soil Gas	8,200	39		790	31		150	23		73	23			15	ND
SSD/SVE System Operating		12-WAS-132-SG	9/5/2012	Primary	Deep Soil Gas	930	6.6		15	**5.3**			3.9	ND		3.9	ND		2.5	ND
Post 28-day Shutdown		12-WAS-137-SG	10/5/2012	Primary	Deep Soil Gas	3,000	11		87	9		10	6.7			6.7	ND		4.3	ND
Post 190-day Shutdown		14-WAS-014-SG	1/2/2014	Primary	Deep Soil Gas	280	7.3			5.8	ND		4.3	ND		4.3	ND		2.8	ND
Post 180-day Shutdown		16-WAS-017-SG	3/22/2016	Primary	Deep Soil Gas	990	5.2		98	4.2		36	3.1		14	3.1			2.0	ND
SSD System Operating	SG-3 @ 8' bgs	11-WAS-003-SG	2/18/2011	Primary	Deep Soil Gas	**560,000**	1500		**4800**	**1200**		1600	860			860	ND		550	ND
		11-WAS-054-SG	5/18/2011	Primary	Deep Soil Gas	**91,000**	370		**970**	290		370	210			210	ND		140	ND
SSD/SVE System Operating		11-WAS-058-SG	6/24/2011	Primary	Deep Soil Gas	**150,000**	440		390	350			260	ND		260	ND		160	ND
		11-WAS-061-SG	7/22/2011	Primary	Deep Soil Gas	**20,000**	91			72	ND		53	ND		53	ND		34	ND
		11-WAS-070-SG	10/21/2011	Primary	Deep Soil Gas	2300	9.7		10	7.7			5.7	ND		5.7	ND		3.6	ND
		12-WAS-078-SS	2/15/2012	Primary	Deep Soil Gas	720	5.5		5.7	4.3			3.2	ND		3.2	ND		2	ND
		12-WAS-131-SG	9/5/2012	Primary	Deep Soil Gas	1200	6.5		10	5.1			3.8	ND		3.8	ND		2.4	ND
Post 28-day Shutdown		12-WAS-136-SG	10/5/2012	Primary	Deep Soil Gas	6500	26		87	21		48	15			15	ND		10	ND
SVE System Operating		13-WAS-008-SG	2/13/2013	Primary	Deep Soil Gas	330	7.6			6.0	ND		4.4	ND		4.4	ND		2.9	ND
Post 190-day Shutdown		14-WAS-013-SG	1/2/2014	Primary	Deep Soil Gas	8800	29		360	23		120	17		58	17			11	ND
SVE System Operating		14-WAS-029-SG	3/18/2014	Primary	Deep Soil Gas	360	7.2			5.7	ND		4.2	ND		4.2	ND		2.7	ND
Post 180-day Shutdown		16-WAS-016-SG	3/22/2016	Primary	Deep Soil Gas	2200	10		89	8.3		73	6.1		27	6.1			4.0	ND
SVE System Operating	SVE-4	16-WAS-001-SG	9/28/2016	Primary	Deep Soil Gas	**76,000**	120			93	ND		68	ND	720	68			44	ND
Post 180-day Shutdown		17-WAS-001-SG	3/30/2017	Primary	Deep Soil Gas	**18,000**	82		140	65		69	48		280	48			31	ND
SVE System Operating		17-WAS-003-SG	9/20/2017	Primary	Deep Soil Gas	**36,000**	54			43	ND		32	ND	590	32			20	ND
SVE System Operating	SVE-5	17-WAS-002-SG	9/20/2017	Primary	Deep Soil Gas	**33,000**	54		59	43			32	ND	520	32			20	ND
SVE System Operating		17-WAS-004-SG	9/20/2017	Duplicate	Deep Soil Gas	**32,000**	53		60	42			31	ND	500	31			20	ND
ADEC Target Levels for Commercial Deep Soil Gas						**18,000**			**880 - 840**			**3,100 - NA**			**26,000 - NA**			**2,800**		

Table 1: OM&M and VI Assessment Analytical Results - October 2010 to September 2017
December 2017 Data Summary Report
314 Wendell Avenue Site

Remediation System Status	Location	Sample ID	Date Measured	Sample Type	Matrix	Tetrachloroethene (µg/m³)			Trichloroethene (µg/m³)			cis-1,2-Dichloroethene (µg/m³)			trans-1,2-Dichloroethene (µg/m³)			Vinyl Chloride (µg/m³)		
						Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag	Result	MRL	Dataflag
Pre-Installation	AA-3	10WAS400AA	10/21/2010	Primary	Outdoor Air	1.6	0.21			0.17	ND		0.12	ND		0.63	ND		0.04	ND
SSD System Operating		11WAS-001-AA	2/17/2011	Primary	Outdoor Air	1.7	0.17			0.13	ND		0.099	ND		0.5	ND		0.032	ND
		11-WAS-004-AA	2/24/2011	Primary	Outdoor Air	3.6	0.19			0.15	ND		0.11	ND		0.55	ND		0.036	ND
		11-WAS-046-AA	5/18/2011	Primary	Outdoor Air	1.5	0.21			0.17	ND		0.12	ND		0.61	ND		0.04	ND
SSD/SVE System Operating		11-WAS-056-AA	6/23/2011	Primary	Outdoor Air	1.2	0.23			0.18	ND		0.13	ND	0.7	0.67			0.043	ND
		11-WAS-062-AA	10/20/2011	Primary	Outdoor Air	0.76	0.2			0.16	ND		0.12	ND		0.59	ND		0.038	ND
		12-WAS-073-AA	2/15/2012	Primary	Outdoor Air	2.3	0.19			0.15	ND		0.11	ND		0.55	ND		0.036	ND
SVE System Operating		13-WAS-004-AA	2/13/2013	Primary	Outdoor Air	6.3	0.26			0.2	ND		0.15	ND		0.76	ND		0.049	ND
Post 190-day Shutdown		14-WAS-001-AA	1/2/2014	Primary	Outdoor Air	1.3	0.16	JA		0.13	JA		0.096	JA		0.48	JA		0.031	JA
SVE System Operating		14-WAS-021-AA	3/18/2014	Primary	Outdoor Air	1.6	0.22			0.17	ND		0.13	ND		0.64	ND		0.041	ND
SSD System Operating	RS-1	11WAS-002-ES	2/17/2011	Primary	RS Exhaust Stack	130,000	570			450	ND		330	ND		330	ND		210	ND
		11-WAS-012-ES	2/25/2011	Primary	RS Exhaust Stack	120,000	360		330	280			210	ND		210	ND		140	ND
		11-WAS-055-ES	5/19/2011	Primary	RS Exhaust Stack	57,000	220			170	ND		120	ND		120	ND		81	ND
SSD/SVE System Operating		11-WAS-057-ES	6/24/2011	Primary	RS Exhaust Stack	97,000	350		450	280		260	200			200	ND		130	ND
		11-WAS-059-ES	7/1/2011	Primary	RS Exhaust Stack	93,000	360			280	ND		210	ND		210	ND		140	ND
		11-WAS-060-ES	7/22/2011	Primary	RS Exhaust Stack	130,000	450			350	ND		260	ND	2700	260			170	ND
		11-WAS-071-ES	10/21/2011	Primary	RS Exhaust Stack	44,000	120			94	ND		69	ND	440	69			44	ND
		11-WAS-072-ES	12/20/2011	Primary	RS Exhaust Stack	22,000	71			56	ND		42	ND	250	42			27	ND
		12-WAS-079-ES	2/15/2012	Primary	RS Exhaust Stack	14,000	85			67	ND		50	ND	140	50			32	ND
SVE System Operating		13-WAS-003-ES	2/13/2013	Primary	RS Exhaust Stack	13,000	41		64	32		60	24		240	24			15	ND
Post 190-day Shutdown		14-WAS-015-ES	1/3/2014	Primary	RS Exhaust Stack	18,000	76		290	60		260	44		690	44			29	ND
SVE System Operating		14-WAS-030-ES	3/18/2014	Primary	RS Exhaust Stack	14,000	83			66	ND		49	ND	180	49			31	ND
		14-WAS-047-ES	10/7/2014	Primary	RS Exhaust Stack	19,000	79			63	ND		46	ND					30	ND
		15-WAS-008-ES	3/16/2015	Primary	RS Exhaust Stack	7,400	34		33	27		24	20		130	20			13	ND
		15-WAS-009-ES	9/24/2015	Primary	RS Exhaust Stack	14,000	54			42	ND		31	ND	170	31			20	ND
		16-WAS-024-ES	6/9/2016	Primary	RS Exhaust Stack	9,600	34			27	ND		20	ND	110	20			13	ND
	RS-SSD	16-WAS-001-ES	9/28/2016	Primary	SSD Exhaust Stack	2,000	6.8	JA		5.4	ND, JA		4.0	ND, JA		4.0	ND, JA		2.6	ND, JA
	RS-SVE	16-WAS-002-ES	9/28/2016	Primary	SVE Exhaust Stack	10,000	41			32	ND		24	ND	140	24			15	ND
Post 180 day Shutdown	RS-SVE	17-WAS-001-ES	3/30/2017	Primary	SVE Exhaust Stack	9,700	42		110	33		140	24		170	24			16	ND
SVE System Operating	RS-SVE	17-WAS-002-ES	5/10/2017	Primary	SVE Exhaust Stack	3,100	12		16	9.7			7.2	ND	150	7.2			4.6	ND
SVE System Operating	RS-SVE	17-WAS-003-ES	9/20/2017	Primary	SVE Exhaust Stack	15,000	54		58	42			31	ND	220	31			20	ND

Notes:

Significant figures may not have been retained from the original laboratory results

Bold values indicate exceedance of ADEC Target Levels

NA = ADEC has not calculated a Target Level for this chemical due to lack of toxicity information for inhalation exposure pathway.

Soil gas samples were taken at an interval of 7.5 - 8.0 feet below ground surface

' bgs = feet below ground surface

µg/m³ = micrograms per cubic meter

MRL = Method Reporting Limit

ND = Not detected above method reporting limit

JA = Analytical result considered estimated because canister received by laboratory at ambient pressure

ATTACHMENT 3

SVE/SSD System OM&M Data Sheets

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Wendell Ave SVE/SSD System OM&M Data Sheet

Wendell Ave - SVE/SSD OM&M Data Sheet

Date: 3/30/17 **Time:** 7:40 **Ambient Temp (^{0}F):** 13 **Technician:** Cox/Surratt **Field Instrument Used/Last Calibrated:** RKI 3/27/17

SSD System

Depressurization Wells

Line	Vacuum (inWC)	Flow (scfm)	Valve % Open	Hex (ppm)	% CO2	%O2
DW-1	*<54*	*~10*				
DW-2	*<54*	*~10*				
DW-3	*<54*	*~10*				
DW-4	*<54*	*~10*				
DW-5	*<54*	*~10*				
DW-6	*<54*	*~10*				
Spare						
Spare						

SSD System Mechanical Parameters

Dilution Valve % open		*Closed*
Knockout drum level		*Empty*
Manifold Vacuum (inWC)		*Max < 54 inWC*
Blower Vacuum (inWC)		*Δ < 10 inWC*
Exhaust Temp Digital (°F)		*< 215 °F*
Exhaust Temp Gauge (°F)		*< 215 °F*
Exhaust Flow (cfm)		*~60*
Filters Checked/Cleaned?		

Indoor Vapor Monitoring Points

Point ID	Vacuum (inWC)	Hex (ppm)	% CO2	% O2
SS-4	*> 0.02*			
SS-5	*> 0.02*			
SS-8	*> 0.02*			

SVE System

Extraction Wells

Line	Vacuum (inWC)		Flow (scfm)		Valve % Open	Hex (ppm)	% CO2	%O2
SVE-1	-	*<81*	-	*~15*	-	-	-	-
SVE-2	9	*<81*	16	*~15*	75	0	0.6	20.3
SVE-3	9	*<81*	19	*~15*	75	0	1.7	17.4
SVE-4	12	*<81*	17	*~15*	75	0	2.3	16.7
SVE-5	15	*<81*	18	*~15*	75	0	2.7	16.4
SVE-6	14	*<81*	16	*~15*	100	5	0.2	20.2
Spare								
TOTAL FLOW			**86**					

SVE System Mechanical Parameters

Dilution Valve % open	0	*Closed*
Knockout drum level	Empty	*Empty*
Manifold Vacuum (inWC)	31	*Max < 81 inWC*
Blower Vacuum (inWC)	34	*Δ < 10 inWC*
Exhaust Temp Digital (°F)	105	*< 275 °F*
Exhaust Temp Gauge (°F)	120	*< 275 °F*
Exhaust Flow (cfm)	105	*~75*
Filters Checked/Cleaned?	no	

Outdoor Vapor Monitoring Points

Point ID	Vacuum (inWC)	Hex (ppm)	%CO2	%O2	
SG-2 @ 4' bgs	*> 0.1*				*At least one reading below 20.9%*
SG-2 @ 8' bgs	*> 0.1*				
SG-3 @ 4' bgs	*> 0.1*				
SG-3 @ 8' bgs	*> 0.1*				
SG-7 @ 5' bgs	*> 0.1*				
SG-7 @ 9' bgs	*> 0.1*				
SG-8 @ 5' bgs	*> 0.1*				
SG-22 @ 8' bgs	*> 0.1*				
SG-24 @ 8' bgs	*> 0.1*				

Field Notes:

Additional Mechanical and Shared Elements

Control Room

Parameter		SSD	SVE System
Motor Speed (Hz)			65
IDEC Hourmeter Reading/Time			26378.98
Hobbs Hourmeter Reading/Time			4295.7
Previous IDEC Hourmeter Reading/Date/Time			26345.03
Previous Hobbs Hourmeter Reading/Date/Time			4257.6
Total Hours Since Last Event IDEC/Hobbs	0		38.1
Percent Operability	33.95		1%

Exhaust Stack/Heat Trace

Exhaust Stack Drained?	Yes
Exhaust Stack (Hex (ppm), %O2, %CO2)	0.0, 18.3%, 1.5%
Exhaust Stack Colortec (ppm)	NA
Heat Trace On?	Yes
LEL Monitor Reading (%LEL)	0
GVEA Meter Reading (kW-hr)	188041

Laboratory Sample

Effluent Sample ID	17-WAS-001-ES	17-WAS-001-SG
Summa Canister ID	3825	1L1623
Time/Date	3/30/2017 13:51	3/30/2017 13:05
Initial Vacuum ("Hg)	30	28
Final Vacuum ("Hg)	5	5
	SVE Exhaust Stack	SVE-4

Field Notes:

SVE System was started at 19:30 on 3/29/2017 after approximately 180 day shutdown period.

SSD System remains shut down.

Itemized values are the operational target for this monitoring parameter. Observed values should be entered and compared to the target values to determine if operational adjustement or maintenance is required

NR = not recorded

##/## = "/" between readings indicates guage reading "before" and "after" adjustment

SG-1 destroyed: SS-6, SS-7, SS-9, SS-10, SS-11, SS-12, SS-13 no longer safely accessible due to building condition

Wendell Ave SVE/SSD System OM&M Data Sheet

Wendell Ave - SVE/SSD OM&M Data Sheet

Date: 5/9/17 **Time:** 9:50 **Ambient Temp (°F):** 40 **Technician:** Cox/Powers **Field Instrument Used/Last Calibrated:** RKI 5/9/17

SSD System

Depressurization Wells

Line	Vacuum (inWC)	Flow (scfm)	Valve % Open	Hex (ppm)	% CO2	%O2
DW-1	*<54*	*~10*				
DW-2	*<54*	*~10*				
DW-3	*<54*	*~10*				
DW-4	*<54*	*~10*				
DW-5	*<54*	*~10*				
DW-6	*<54*	*~10*				
Spare						
Spare						

SSD System Mechanical Parameters

Dilution Valve % open		*Closed*
Knockout drum level		*Empty*
Manifold Vacuum (inWC)		*Max < 54 inWC*
Blower Vacuum (inWC)		*Δ < 10 inWC*
Exhaust Temp Digital (°F)		*< 215 °F*
Exhaust Temp Gauge (°F)		*< 215 °F*
Exhaust Flow (cfm)		*~60*
Filters Checked/Cleaned?		

Indoor Vapor Monitoring Points

Point ID	Vacuum (inWC)		Hex (ppm)	% CO2	% O2
SS-4	0.024	*> 0.02*	0	0.02	20.9
SS-5	0.003	*> 0.02*	0	0.0	20.9
SS-8	NR	*> 0.02*	NR	NR	NR
SS-9	0.000	*> 0.02*	0	0.0	20.9
SS-13	0.000	*> 0.02*	0	0.0	20.9

SVE System

Extraction Wells

Line	Vacuum (inWC)		Flow (scfm)		Valve % Open	Hex (ppm)	% CO2	%O2
SVE-1	-	*<81*	-	*~15*	-	-	-	-
SVE-2	10	*<81*	16	*~15*	75	20	0.42	20.9
SVE-3	10	*<81*	20	*~15*	75	0	0.40	20.9
SVE-4	16	*<81*	13	*~15*	75	5	0.76	20.9
SVE-5	17	*<81*	18	*~15*	75	0	0.92	20.7
SVE-6	16	*<81*	14	*~15*	100	35	0.0	20.9
Spare								
TOTAL FLOW			**81**					

Field Notes:

SVE System Mechanical Parameters

Dilution Valve % open	0	*Closed*
Knockout drum level	Empty	*Empty*
Manifold Vacuum (inWC)	32	*Max < 81 inWC*
Blower Vacuum (inWC)	36	*Δ < 10 inWC*
Exhaust Temp Digital (°F)	110.6	*< 275 °F*
Exhaust Temp Gauge (°F)	126	*< 275 °F*
Exhaust Flow (cfm)	100	*~75*
Filters Checked/Cleaned?	no	

Outdoor Vapor Monitoring Points

Point ID	Vacuum (inWC)		Hex (ppm)	%CO2	%O2
SG-2 @ 4' bgs	0.577	*> 0.1*	0	0.06	20.0
SG-2 @ 8' bgs	0.770	*> 0.1*	0	0.38	18.7
SG-3 @ 4' bgs	1.62	*> 0.1*	0	0.00	20.6
SG-3 @ 8' bgs	1.69	*> 0.1*	0	1.38	18.9
SG-7 @ 5' bgs	NR	*> 0.1*	NR	NR	NR
SG-7 @ 9' bgs	NR	*> 0.1*	NR	NR	NR
SG-8 @ 5' bgs	2.73	*> 0.1*	0	0.42	20.3
SG-22 @ 8' bgs	NR	*> 0.1*	NR	NR	NR
SG-24 @ 8' bgs	0.797	*> 0.1*	10	0.02	20.9

At least one reading below 20.9%

Additional Mechanical and Shared Elements

Control Room

Parameter		SSD	SVE System
Motor Speed (Hz)			65
IDEC Hourmeter Reading/Time			No Reading
Hobbs Hourmeter Reading/Time			5258.5
Previous IDEC Hourmeter Reading/Date/Time			26378.98
Previous Hobbs Hourmeter Reading/Date/Time			4295.7
Total Hours Since Last Event IDEC/Hobbs	0		962.8
Percent Operability	#VALUE!		100%

Exhaust Stack/Heat Trace

Exhaust Stack Drained?	Yes
Exhaust Stack (Hex (ppm), %O2, %CO2)	20, 20.9%, 0.48%
Exhaust Stack Colortec (ppm)	NA
Heat Trace On?	Yes
LEL Monitor Reading (%LEL)	0
GVEA Meter Reading (kW-hr)	192938

Laboratory Sample

Effluent Sample ID		
Summa Canister ID		
Time/Date		
Initial Vacuum ("Hg)		
Final Vacuum ("Hg)		

Field Notes:

SSD System remains shut down.

Itemized values are the operational target for this monitoring parameter. Observed values should be entered and compared to the target values to determine if operational adjustement or maintenance is required

NR = not recorded

##/## = "/" between readings indicates guage reading "before" and "after" adjustment

SG-1 destroyed: SS-6, SS-7, SS-9, SS-10, SS-11, SS-12, SS-13 no longer safely accessible due to building condition

Wendell Ave SVE/SSD System OM&M Data Sheet

Wendell Ave - SVE/SSD OM&M Data Sheet

Date: 5/10/17 **Time:** 11:35 **Ambient Temp (^{0}F):** 55 **Technician:** Cox/Powers **Field Instrument Used/Last Calibrated:** RKI 5/9/17

SSD System

Depressurization Wells

Line	Vacuum (inWC)	Flow (scfm)	Valve % Open	Hex (ppm)	% CO2	%O2
DW-1	*<54*	*~10*				
DW-2	*<54*	*~10*				
DW-3	*<54*	*~10*				
DW-4	*<54*	*~10*				
DW-5	*<54*	*~10*				
DW-6	*<54*	*~10*				
Spare						
Spare						

SSD System Mechanical Parameters

Dilution Valve % open		*Closed*
Knockout drum level		*Empty*
Manifold Vacuum (inWC)		*Max < 54 inWC*
Blower Vacuum (inWC)		*Δ < 10 inWC*
Exhaust Temp Digital (°F)		*< 215 °F*
Exhaust Temp Gauge (°F)		*< 215 °F*
Exhaust Flow (cfm)		*~60*
Filters Checked/Cleaned?		

Indoor Vapor Monitoring Points

Point ID	Vacuum (inWC)		Hex (ppm)	% CO2	% O2
SS-4	0.036	*> 0.02*	0	0.04	20.9
SS-5	0.003	*> 0.02*	0	0.02	20.9
SS-8	NR	*> 0.02*	NR	NR	NR
SS-9	0.003	*> 0.02*	0	0.04	20.9
SS-13	0.000	*> 0.02*	0	0.02	20.9

SVE System

Extraction Wells

Line	Vacuum (inWC)		Flow (scfm)		Valve % Open	Hex (ppm)	% CO2	%O2
SVE-1	-	*<81*	-	*~15*	-	-	-	-
SVE-2	-	*<81*	0	*~15*	0	-	-	-
SVE-3	23	*<81*	12	*~15*	75	0	0.38	20.9
SVE-4	19	*<81*	15	*~15*	75	0	0.78	20.7
SVE-5	21	*<81*	18	*~15*	75	0	0.98	20.5
SVE-6	18	*<81*	15	*~15*	100	20	0.20	20.9
Spare								
TOTAL FLOW			**60**					

SVE System Mechanical Parameters

Dilution Valve % open	0	*Closed*
Knockout drum level	Empty	*Empty*
Manifold Vacuum (inWC)	35	*Max < 81 inWC*
Blower Vacuum (inWC)	39	*Δ < 10 inWC*
Exhaust Temp Digital (°F)	108.6	*< 275 °F*
Exhaust Temp Gauge (°F)	124	*< 275 °F*
Exhaust Flow (cfm)	60	*~75*
Filters Checked/Cleaned?	no	

Outdoor Vapor Monitoring Points

Point ID	Vacuum (inWC)		Hex (ppm)	%CO2	%O2	
SG-2 @ 4' bgs	0.574	*> 0.1*	0	0.06	20.5	*At least one reading below 20.9%*
SG-2 @ 8' bgs	0.756	*> 0.1*	0	0.40	20.5	
SG-3 @ 4' bgs	1.85	*> 0.1*	0	0.12	20.9	
SG-3 @ 8' bgs	1.93	*> 0.1*	0	1.26	19.7	
SG-7 @ 5' bgs	NR	*> 0.1*	NR	NR	NR	
SG-7 @ 9' bgs	NR	*> 0.1*	NR	NR	NR	
SG-8 @ 5' bgs	3.20	*> 0.1*	30	0.46	20.7	
SG-22 @ 8' bgs	NR	*> 0.1*	NR	NR	NR	
SG-24 @ 8' bgs	0.929	*> 0.1*	0	0.02	20.9	

Field Notes:

Additional Mechanical and Shared Elements

Control Room

Parameter		SSD	SVE System
Motor Speed (Hz)			65
IDEC Hourmeter Reading/Time			No Reading
Hobbs Hourmeter Reading/Time			5283.2
Previous IDEC Hourmeter Reading/Date/Time			No Reading
Previous Hobbs Hourmeter Reading/Date/Time			5258.5
Total Hours Since Last Event IDEC/Hobbs	0		24.7
Percent Operability	#VALUE!		96%

Exhaust Stack/Heat Trace

Exhaust Stack Drained?	Yes
Exhaust Stack (Hex (ppm), %O2, %CO2)	0, 20.9%, 0.34%
Exhaust Stack Colortec (ppm)	NA
Heat Trace On?	No
LEL Monitor Reading (%LEL)	0
GVEA Meter Reading (kW-hr)	193063

Laboratory Sample

Effluent Sample ID	17-WAS-002-ES	17-WAS-004-SS
Summa Canister ID	6L0450	000001877
Time/Date	5/10/2017 9:06	5/10/2017 10:30
Initial Vacuum ("Hg)	29	30
Final Vacuum ("Hg)	9	12.5
	SVE Exhaust Stack	SS-4

Field Notes:

SSD System remains shut down.

Shut off flow to SVE-2 to concentrate flow on primary source of contamination.

192938

125

Itemized values are the operational target for this monitoring parameter. Observed values should be entered and compared to the target values to determine if operational adjustement or maintenance is required

NR = not recorded

##/## = "/" between readings indicates guage reading "before" and "after" adjustment

SG-1 destroyed: SS-6, SS-7, SS-9, SS-10, SS-11, SS-12, SS-13 no longer safely accessible due to building condition

Wendell Ave SVE/SSD System OM&M Data Sheet

Wendell Ave - SVE/SSD OM&M Data Sheet

Date: 9/19/17 **Time:** 13:38 **Ambient Temp (°F):** 46 **Technician:** Cox/Powers **Field Instrument Used/Last Calibrated:** RKI 9/19/17 BumpCheck

SSD System

Depressurization Wells

Line	Vacuum (inWC)	Flow (scfm)	Valve % Open	Hex (ppm)	% CO2	%O2
DW-1	*<54*	*~10*				
DW-2	*<54*	*~10*				
DW-3	*<54*	*~10*				
DW-4	*<54*	*~10*				
DW-5	*<54*	*~10*				
DW-6	*<54*	*~10*				
Spare						
Spare						

SSD System Mechanical Parameters

Dilution Valve % open		*Closed*
Knockout drum level		*Empty*
Manifold Vacuum (inWC)		*Max < 54 inWC*
Blower Vacuum (inWC)		*Δ < 10 inWC*
Exhaust Temp Digital (°F)		*< 215 °F*
Exhaust Temp Gauge (°F)		*< 215 °F*
Exhaust Flow (cfm)		*~60*
Filters Checked/Cleaned?		

Indoor Vapor Monitoring Points

Point ID	Vacuum (inWC)		Hex (ppm)	% CO2	% O2
SS-4	0.202	*> 0.02*	20	0.02	20.9
SS-5	0.020	*> 0.02*	75	0.02	20.9
SS-8	0.028	*> 0.02*	35	0.00	20.9
SS-9	NR	*> 0.02*	NR	NR	NR
SS-13	NR	*> 0.02*	NR	NR	NR
SS-7	NR	*> 0.02*	NR	NR	NR

SVE System

Extraction Wells

Line	Vacuum (inWC)		Flow (scfm)		Valve % Open	Hex (ppm)	% CO2	%O2
SVE-1	-	*<81*	-	*~15*	-	-	-	-
SVE-2	-	*<81*	0	*~15*	0	-	-	-
SVE-3	11	*<81*	23	*~15*	75	0	0.50	19.4
SVE-4	19	*<81*	15	*~15*	75	0	1.1	18.5
SVE-5	17	*<81*	22	*~15*	75	0	0.76	18.8
SVE-6	20	*<81*	15	*~15*	100	0	0.24	19.2
Spare								
TOTAL FLOW			**75**					

Field Notes:

SVE System Mechanical Parameters

Dilution Valve % open	0	*Closed*
Knockout drum level	Empty	*Empty*
Manifold Vacuum (inWC)	36	*Max < 81 inWC*
Blower Vacuum (inWC)	39	*Δ < 10 inWC*
Exhaust Temp Digital (°F)	101.4	*< 275 °F*
Exhaust Temp Gauge (°F)	109	*< 275 °F*
Exhaust Flow (cfm)	* / 75	*~75*
Filters Checked/Cleaned?	no	

Outdoor Vapor Monitoring Points

Point ID	Vacuum (inWC)		Hex (ppm)	%CO2	%O2	
SG-2 @ 4' bgs	0.161	*> 0.1*	0	0.16	18.9	*At least one reading below 20.9%*
SG-2 @ 8' bgs	0.440	*> 0.1*	0	1.34	17.7	
SG-3 @ 4' bgs	0.279	*> 0.1*	0	0.04	19.8	
SG-3 @ 8' bgs	0.906	*> 0.1*	0	0.12	19.4	
SG-7 @ 5' bgs	0.716	*> 0.1*	0	0.20	19.5	
SG-7 @ 9' bgs	1.064	*> 0.1*	0	0.26	19.8	
SG-8 @ 5' bgs	0.21	*> 0.1*	0	0.02	19.8	
SG-22 @ 8' bgs	NR	*> 0.1*	NR	NR	NR	
SG-24 @ 8' bgs	NR	*> 0.1*	NR	NR	NR	

Additional Mechanical and Shared Elements

Control Room

Parameter	Time	SSD	SVE System
Motor Speed (Hz)			65
IDEC Hourmeter Reading/Time	14:11		30534.0
Hobbs Hourmeter Reading/Time	14:02		8451.1
Previous IDEC Hourmeter Reading/Date/Time			No Reading
Previous Hobbs Hourmeter Reading/Date/Time			5283.2
Total Hours Since Last Event IDEC/Hobbs	0		3167.9
Percent Operability	#VALUE!		100%

Exhaust Stack/Heat Trace

Exhaust Stack Drained?	Yes
Exhaust Stack (Hex (ppm), %O2, %CO2)	0, 18.7%, 0.64%
Exhaust Stack Colortec (ppm)	NA
Heat Trace On?	Yes
LEL Monitor Reading (%LEL)	0
GVEA Meter Reading (kW-hr)	199956

Laboratory Sample

Effluent Sample ID	17-WAS-003-ES	17-WAS-003-SG
Summa Canister ID	35636	N2776
Time/Date	9/20/2017 8:10	9/20/2017 8:16
Initial Vacuum ("Hg)	30	30
Final Vacuum ("Hg)	5	5
	SVE Exhaust Stack	SVE-4

Field Notes:

SSD System remains shut down.

Flow to SVE-2 is off to concentrate flow on primary source of contamination.

SG-7 has a broken well monument.

* - The SVE Exhaust flow gauge was not functioning properly, therefore sum of well flows used to obtain total flow.

193063

6893

Itemized values are the operational target for this monitoring parameter. Observed values should be entered and compared to the target values to determine if operational adjustement or maintenance is required

NR = not recorded

##/## = "/" between readings indicates guage reading "before" and "after" adjustment

SG-1 destroyed: SS-6, SS-7, SS-9, SS-10, SS-11, SS-12, SS-13 no longer safely accessible due to building condition

ATTACHMENT 4

Photo Log

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PHOTOGRAPH 1: SOIL GAS SAMPLE LOCATION SG-7 OUTSIDE ESL BUILDING.

PHOTOGRAPH 2: COLLECTING READINGS AT SG-8 OUTSIDE ESL BUILDING.

PHOTOGRAPH 3: SUB-SLAB SAMPLE LOCATION SS-4 IN ESL BUILDING.

PHOTOGRAPH 4: SUB-SLAB SAMPLE LOCATION SS-5 IN ESL BUILDING.

PHOTOGRAPH 5: SVE SAMPLE LOCATION SVE-4 AT WENDELL AVENUE SITE.

PHOTOGRAPH 6: COLLECTING COLOR TEC READING AT SVE-4.

ATTACHMENT 5

Laboratory Data Review Checklists

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Laboratory Data Review Checklist for Air Samples

Completed by:	Tim McDougall		
Title:	Project Manager	Date:	Oct 4, 2017
CS Report Name:	Wendell Ave December 2017 Data Summary Report	Report Date:	Oct 4, 2017
Consultant Firm:	ERM Alaska, Inc.		
Laboratory Name:	Eurofins Air Toxics, Inc.	Laboratory Report Number:	1709443A,B
ADEC File Number:		ADEC Haz ID:	

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (●) NA (Please explain.) Comments:

NA. Samples were not transferred or subcontracted to another laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

NA. There were no receiving discrepancies.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

Data quality and usability is not affected with respect to the reported laboratory sample receipt documentation.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ○ No ◉ NA (Please explain) Comments:

NA. There were no discrepancies, errors or QC failures.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

NA. There were no corrective actions.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability is not affected with respect to the case narrative report.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

Dilution was performed on samples 17-WAS-002-SG, 17-WAS-003-SG, 17-WAS-004-SG, and 17-WAS-003-ES due to the presence of high level target species.

d. Data quality or usability affected?

Comments:

Data quality and usability is not affected with respect to the reported sample results.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

NA. All method blank results were below PQL.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

NA. All method blank results were below PQL.

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability is not affected with respect to the reported method blank results.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

All %R and RPD within acceptable limits.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

All %R and RPD within acceptable limits.

vi. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability is not affected with respect to the reported LCS/LCSD results.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

NA. All surrogates recoveries were within limits.

iv. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability is not affected with respect to the reported surrogate results.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

○ Yes ◉ No ○ NA (Please explain) Comments:

Primary 17-WAS-002-SG with duplicate 17-WAS-004-SG

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iv. Data quality or usability affected? (Please explain.) Comments:

Data quality and usability is not affected with respect to the duplicate results.

e. Field Blank (If not used explain why).

( ) Yes ( ) No (•) NA (Please explain) Comments:

NA. Field blank was not required.

i. All results less than PQL?

( ) Yes ( ) No (•) NA (Please explain) Comments:

NA. Field blank was not required.

ii. If above PQL, what samples are affected? Comments:

NA. Field blank was not required.

iii. Data quality or usability affected? (Please explain.) Comments:

NA. Field blank was not required.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Defined within the laboratory case narrative.

Reset Form

ATTACHMENT 6

RadonAway HS5000 Specifications and Instruction Manual

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Products for a Healthier Indoor Environment

RadonAway® High Suction Series Fans

Fan Summary

RadonAway® High Suction series radon mitigation fans are intended for use as a component of an active soil depressurization (ASD) system for reducing radon, other soil gases and moisture. HS fans offer a proven solution for tough mitigation jobs, providing up to 25 times the suction of inline tube fans to deal with sand, tight soil or clay sub-slab material.

				Typical CFM vs. Static Pressure WC					
Model	**P/N**	**Watts**	**Recomm Max Op Pressure "WC**	**0"**	**10"**	**15"**	**20"**	**25"**	**35"**
HS2000 w/cord	23004-1	159-318	14	63	37	12	-	-	-
HS2000 w/switch box	23004-4	159-318	14	63	37	12	-	-	-
HS3000 w/cord	23004-2	120-250	21	39	30	25	19	-	-
HS3000 w/switch box	23004-5	120-250	21	39	30	25	19	-	-
HS5000 w/cord	23004-3	202-350	35	44	37	33	29	25	16
HS5000 w/switch box	23004-6	202-350	35	44	37	33	29	25	16

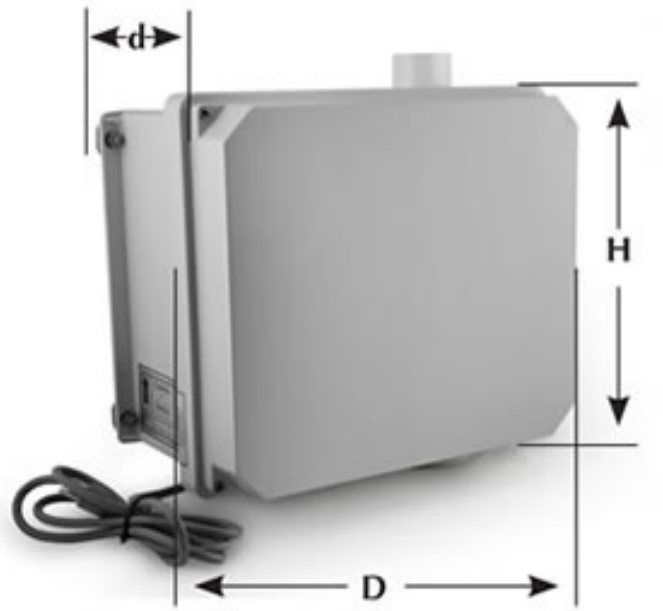
Features

- Internal condensate bypass
- Brackets for vertical mounting indoors and outdoors
- Inlet: 3.0" PVC / Outlet: 2.0" PVC
- Weight: 18 lbs.

- Size: 15.5" W x 13.3" H x 8.2" D
- Warranty: 1 year (3-year option available

Why choose this fan?

HS fans offer a proven solution for tough radon mitigation jobs, providing up to 25 times the suction of inline tube fans to deal with sand, tight soil or clay sub-slab material.



Model	H	D	d
HS2000	13.3"	15.5"	8.2"
HS3000	13.3"	15.5"	8.2"
HS5000	13.3"	15.5"	8.2"
HS2000E	13.3"	15.5"	8.2"
HS3000E	13.3"	15.5"	8.2"
HS5000E	13.3"	15.5"	8.2"

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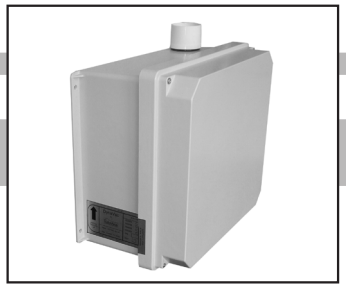
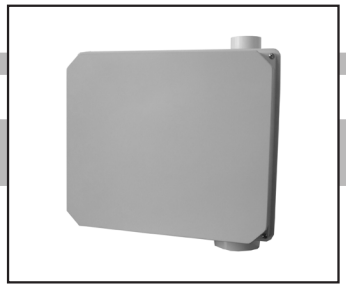
RadonAway™

The World's Leading
Radon Fan Manufaturer

HS Series

Installation & Operating Instructions

RadonAway
3 Saber Way | Ward Hill, MA 01835
www.radonaway.com

P/N IN007-REV J 9/13

RadonAway Ward Hill, MA.

HS Series Fan Installation & Operating Instructions

Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
   See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
   Do NOT attempt to open. Return unit to the factory for service.
6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.
7. **WARNING!** In the event that the fan is immersed in water, return unit to factory for service before operating.
8. **WARNING!** Do not twist or torque fan inlet or outlet piping as Leakage may result.
9. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
10. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

    a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

    b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The HS Series Fan is intended for use by trained, certified/licensed, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of the HS Series Fan. This instruction should be considered as a supplement to EPA/Radon Industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The HS Series Fan is designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the HS Series Fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F. The HS Series Fan is thermally protected such that it will shut off when the internal temperature is above 104 degrees F. Thus if the HS Series Fan is idle in an area where the ambient temperature exceeds this shut off, it will not restart until the internal temperature falls below 104 degrees F.

1.3 ACOUSTICS

The HS Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. There are, however, some considerations to be taken into account in the system design and installation. When installing the HS Series Fan above sleeping areas, select a location for mounting which is as far away as possible from those areas. Avoid mounting near doors, fold-down stairs or other uninsulated structures which may transmit sound. Insure a solid mounting for the HS Series Fan to avoid structure-borne vibration or noise.

The velocity of the outgoing air must also be considered in the overall system design. With small diameter piping, the "rushing" sound of the outlet air can be disturbing. The system design should incorporate a means to slow and quiet the outlet air. The use of the RadonAway Exhaust Muffler, p/n 24002, is strongly recommended.

1.4 GROUND WATER

Under no circumstances should water be allowed to be drawn into the inlet of the HS Series Fan as this may result in damage to the unit. The HS Series Fan should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the HS Series Fan with water in installations with occasional high water tables.

In the event that a temporary high water table results in water at or above slab level, water will be drawn into the riser pipes thus blocking air flow to the HS Series Fan. The lack of cooling air will result in the HS Series Fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the HS Series Fan be disconnected until the water recedes allowing for return to normal operation.

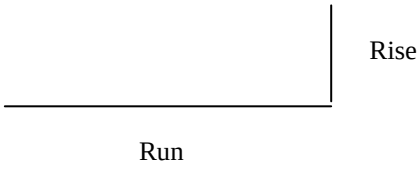
1.5 CONDENSATION & DRAINAGE

(WARNING!: Failure to provide adequate drainage for condensation can result in system failure and damage the HS Series Fan).

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation.

The use of small diameter piping in a system increases the speed at which the air moves. The speed of the air can pull water uphill and at sufficient velocity it can actually move water vertically up the side walls of the pipe. This has the potential of creating a problem in the negative pressure (inlet) side piping. For HS Series Fan inlet piping, the following table provides the minimum recommended pipe diameters as well as minimum pitch under several system conditions. Use this chart to size piping for a system.

Pipe Diam.	Minimum Rise per Foot of Run*		
	@ 25 CFM	@ 50 CFM	@ 100 CFM
4"	1/32 "	3/32 "	3/8 "
3"	1/8 "	3/8 "	1 1/2 "



*Typical operational flow rates:

HS3000, or HS5000	20 - 40 CFM
HS2000	50 - 90 CFM

All exhaust piping should be 2" PVC.

1.6 SYSTEM MONITOR AND LABEL

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A Magnehelic pressure gauge is recommended for this purpose. The indicator should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the gauge with water in installations with occasional high water tables. A System Label (P/N 15022) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.

1.7 SLAB COVERAGE

The HS Series Fan can provide coverage of well over 1000 sq. ft. per slab penetration. This will, of course, depend on the sub-slab aggregate in any particular installation and the diagnostic results. In general, sand and gravel are much looser aggregates than dirt and clay. Additional suction points can be added as required. It is recommended that a small pit (2 to 10 gallons in size) be created below the slab at each suction hole.

1.8 ELECTRICAL WIRING

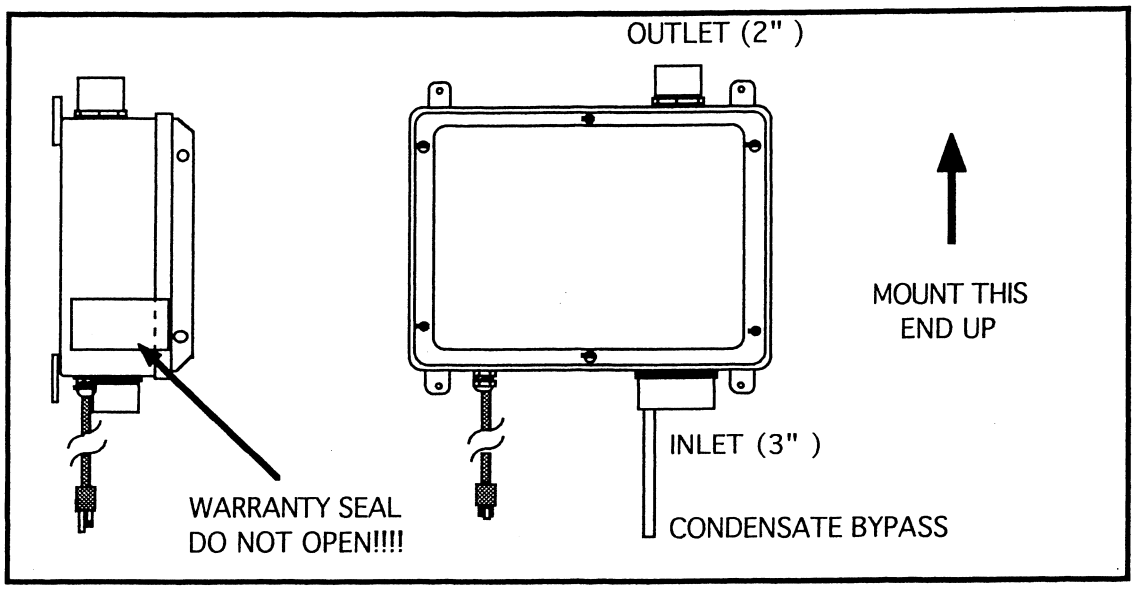
The HS Series Fan plugs into a standard 120V outlet. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.8a ELECTRICAL BOX (optional)

The optional Electrical Box (p/n 20003) provides a weather tight box with switch for outdoor hardwire connection. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

Electronic speed controls can **NOT** be used on HS Series units.



2.0 INSTALLATION

2.1 MOUNTING

Mount the HS Series Fan to the wall studs, or similar structure, in the selected location with (4) 1/4" x 1 1/2" lag screws (not provided). Insure the HS Series Fan is both plumb and level.

2.2 DUCTING CONNECTIONS

Make final ducting connection to HS Series Fan with flexible couplings. Insure all connections are tight. Do not twist or torque inlet and outlet piping on HS Series Fan or leaks may result.

2.3 VENT MUFFLER INSTALLATION

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed above the roofline at the end of the vent pipe.

2.5 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

____ Make final operation checks by verifying all connections are tight and leak-free.

____ Insure the HS Series Fan and all ducting is secure and vibration-free.

____ Verify system vacuum pressure with Magnehelic. Insure vacuum pressure is within normal operating range and less than the maximum recommended as shown below:

HS2000	14" WC
HS3000	21" WC
HS5000	40" WC

(Above are based on sea-level operation, at higher altitudes reduce above by about 4% per 1000 Feet.) If these are exceeded, increase number of suction points.

____ Verify Radon levels by testing to EPA protocol.

PRODUCT SPECIFICATIONS

Model	Maximum Static Suction	Typical CFM vs Static Suction WC (Recommended Operating Range)						Power* Watts @ 115 VAC
		0"	10"	15"	20"	25"	35"	
HS2000	18"	110	72	40	-	-	-	150-270
HS3000	27"	40	33	30	23	18	-	105-195
HS5000	50"	53	47	42	38	34	24	180-320

*Power consumption varies with actual load conditions

Inlet: 3.0" PVC

Outlet: 2.0" PVC

Mounting: Brackets for vertical mount

Weight: Approximately 18 lbs.

Size: Approximately 15"W x 13"H x 8"D

Minimum recommended inlet ducting (greater diameter may always be used):

HS3000, HS5000 --- 2.0" PVC Pipe

HS2000 --- Main feeder line of 3.0" or greater PVC Pipe

Branch lines (if 3 or more) may be 2.0" PVC Pipe

Outlet ducting: 2.0" PVC

Storage temperature range: 32 - 100 degrees F.

Thermally protected

Locked rotor protection

Internal Condensate Bypass

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the HS Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the HS Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the HS Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of one (1) year from the date of manufacture (the "Warranty Term"). Outside the Continental United States and Canada the Warranty Term is one (1) year from the date of manufacture.

RadonAway will repair any fan which fails due to defects in materials or workmanship. The Fan must be returned (at owner's cost) to the RadonAway factory. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE HS SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No._____

Purchase Date_____