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ENVIRONMENT

Linda Hanefeld
Remediation and Redevelopment Team Supervisor
Wisconsin Department of Natural Resources
South Central Region
3911 Fish Hatchery Rd
Fitchburg WI 53711

Subject:
Soil Vapor Extraction (SVE) System Progress Report, July through August 2013, Madison-Kipp Corporation (MKC) Site, 201 Waubesa Street, Madison, Wisconsin.

Date:
September 30, 2013

Contact:
Jennine Trask

Phone:
414.277.6203

Email:
Jennine.Trask@arcadis-us.com

Our ref:
WI001368.0001

Dear Ms. Hanefeld:

On behalf of MKC, this progress report provides a summary of the SVE system monitoring as part of the MKC site located at 201 Waubesa Street in Madison, Wisconsin.

Tasks Completed – July 31, 2013 through August 31, 2013

The following tasks were completed during the period of July 31 through August 31, 2013 and are presented in chronological order. The start date of this reporting period coincides with the most recent SVE system update provided to the Wisconsin Department of Natural Resources (WDNR) in the *Bi-Monthly Progress Report* dated August 1, 2013. As requested by WDNR, SVE system progress reports will be submitted to the WDNR every two months during operation of the system.

During the reporting period, weekly SVE system Operation, Maintenance and Monitoring (OM&M) was performed by ARCADIS and MKC personnel August 6, 12, 19 and 26, 2013. All water generated during SVE maintenance activities was incorporated by Madison Kipp with the facility process water on site. Monthly SVE OM&M was performed by ARCADIS personnel August 13, 2013. Laboratory analytical data collected during the monthly OM&M events is included in Table 1. Data collected during the weekly and monthly OM&M is included in Table 2. The emission tables are also included as Tables 3 through 7. A review of the tables indicates the emissions rates are several orders of magnitude lower than the Wisconsin Administrative Code NR445 Emission Threshold Values.

Tasks In-Progress

The following tasks are scheduled to be completed from September 1 through October 31, 2013.

- Perform weekly and monthly SVE system OM&M activities.

If you have any questions or require any additional information, please contact us at 414.276.7742.

Sincerely,

ARCADIS U.S., Inc.

Christopher D. Kubacki, PE
Senior Engineer

Jennine L. Trask, PE
Project Manager

Attachments:
Table 1 – SVE System Analytical Data
Table 2 – Extraction Well Manifold Monitoring Data
Table 3 – Estimate of Post-Carbon Emissions
Table 4 – Estimate of Post-Carbon Emissions of Tetrachloroethene
Table 5 – Estimate of Post-Carbon Emissions of Trichloroethene
Table 6 – Estimate of Post-Carbon Emissions of Cis-1,2-Dichloroethene
Table 7 – Estimate of Post-Carbon Emissions of Vinyl Chloride

Copies:
David Crass – Michael Best
Mark Meunier – Madison Kipp
Bob Nauta – RJN Environmental Services (electronic)
Steve Tinker – Wisconsin Department of Justice (electronic)
Mike Schmoller – WDNR (electronic)

Table 1. Soil Vapor Extraction System Analytical Data, Madison-Kipp Corporation, Madison, Wisconsin.

Sample Location	Effluent			Influent	Effluent	Influent	Effluent	Influent	Effluent
Sample Date	**3/9/2012**	**3/10/2012**	**3/11/2012**	**3/16/2012**	**3/16/2012**	**3/23/2012**	**3/23/2012**	**3/30/2012**	**3/30/2012**
1,1-Dichloroethene	<0.15	<0.3	<0.3	<2.1	<0.03	<1.5	<0.045	<1.5	<0.12
1,2,4-Trimethylbenzene	<0.26	<0.52	<0.52	<3.6	**0.17 J**	<2.6	**0.079 J**	**5.7 J**	**2.4**
1,2-Dichloroethane	<0.16	<0.31	<0.31	<2.2	<0.031	<1.6	<0.047	<1.6	<0.12
1,3,5-Trimethylbenzene	<0.26	<0.51	<0.51	<3.6	**0.069 J**	<2.6	<0.077	<2.6	**0.69 J**
1,4-Dichlorobenzene	<0.22	<0.44	<0.44	<3.1	**0.049 J**	<2.2	<0.066	<2.2	<0.18
Benzene	<0.09	<0.18	<0.18	<1.3	**0.71**	<0.9	**0.69**	<0.9	**0.57 J**
Chloroethane	<0.08	<0.16	<0.16	<1.1	<0.016	<0.8	<0.024	<0.8	**0.56 J**
Chloroform	<0.16	<0.31	<0.31	<2.2	<0.031	<1.6	<0.047	<1.6	<0.12
Chloromethane	**5.2**	**0.86 J**	<0.13	<0.91	**0.30 J**	<0.65	**0.65 J**	<0.65	**0.87 J**
cis-1,2-Dichloroethene	<0.07	<0.14	<0.14	**78**	**0.5**	**190**	**14**	**150**	**17**
Dichlorodifluoromethane	<0.19	**0.94 J**	**0.56 J**	<2.6	**0.55**	<1.9	**0.44 J**	<1.9	**0.73 J**
Ethylbenzene	<0.11	<0.22	<0.22	<1.5	**0.084 J**	<1.1	<0.033	**2.2 J**	**0.66 J**
Methylene Chloride	<0.065	<0.13	<0.13	<0.91	**0.26 J B**	<0.65	**0.50 J**	<0.65	**0.62 J**
Styrene	<0.15	<0.3	<0.3	<2.1	<0.03	<1.5	<0.045	<1.5	<0.12
Tetrachloroethene	<0.055	<0.11	<0.11	**1,500**	**14**	**1,900**	**38**	**890**	**98**
Toluene	**0.23 J**	**0.32 J**	**0.22 J**	<1.3	**0.33**	**1.0 J**	**0.14 J**	**6.1 J**	**2.7**
Trichloroethene	<0.15	<0.3	<0.3	**76**	**0.2**	**130**	**1.2**	**100**	**4.4**
Trichlorofluoromethane	<0.17	<0.34	<0.34	<2.4	**0.21**	<1.7	**0.18 J**	<1.7	<0.14
Vinyl chloride	<0.15	**10**	**13**	**16**	**18**	**37**	**33**	**34**	**31**
Xylene (total)	<0.11	<0.22	<0.22	<1.5	**0.53**	<1.1	**0.17 J**	**10**	**3.5**
Xylene, o-	<0.11	<0.22	<0.22	<1.5	**0.17 J**	<1.1	**0.052 J**	**3.1 J**	**1.1**

Only detected constituents are noted. Constituent concentrations are reported as ppbv.

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Table 1. Soil Vapor Extraction System Analytical Data, Madison-Kipp Corporation, Madison, Wisconsin.

Sample Location	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
Sample Date	**4/11/2012**	**4/11/2012**	**5/9/2012**	**5/9/2012**	**6/14/2012**	**6/12/2012**	**7/10/2012**	**7/10/2012**
1,1-Dichloroethene	<4	**0.16 J**	<4	<1.2	<5	<1.4	<7.3	<0.4
1,2,4-Trimethylbenzene	<0.98	<0.021	<4	<1.2	<5	<1.4	<7.3	**2**
1,2-Dichloroethane	<0.84	<0.018	<4	<1.2	<5	<1.4	<7.3	**1.2**
1,3,5-Trimethylbenzene	<0.89	<0.019	<4	<1.2	<5	<1.4	<7.3	**0.62**
1,4-Dichlorobenzene	<0.84	<0.018	<4	<1.2	<5	<1.4	<7.3	**1.5**
Benzene	**11**	**0.15 J**	<4	<1.2	<5	<1.4	<7.3	**0.41**
Chloroethane	<1.5	<0.033	<10	<3	<13	<3.5	<18	<1
Chloroform	<1.1	**0.037 J**	<4	<1.2	<5	<1.4	<7.3	**0.67**
Chloromethane	<1.6	**0.6**	<10	<3	<13	<3.5	<18	**1.1**
cis-1,2-Dichloroethene	**240**	**19**	**170**	**230**	**150**	**180**	**190**	**65**
Dichlorodifluoromethane	<0.94	**0.47 J**	<10	<3	<13	<3.5	<18	<1
Ethylbenzene	<0.7	<0.015	<4	<1.2	<5	<1.4	<7.3	**1.1**
Methylene Chloride	**2.5 J B**	**0.16 J B**	<10	<3	<13	<3.5	<18	**1.4**
Styrene	<0.52	<0.011	<4	<1.2	<5	<1.4	<7.3	**0.84**
Tetrachloroethene	**700**	**0.16 J**	**440**	**36**	**580**	<1.4	**650**	<0.4
Toluene	**1.2 J**	<0.014	<4	**2**	<5	**2.2**	<7.3	**12**
Trichloroethene	**110**	**0.061 J**	**80**	**3**	**71**	**8.7**	**96**	**3.4**
Trichlorofluoromethane	<0.98	**0.12 J**	<4	<1.2	<5	<1.4	<7.3	<0.4
Vinyl chloride	**8.7 J**	**7.6**	<4	**3**	<5	<1.4	<7.3	**2.4**
Xylene (total)	<0.75	<0.016	<4	<1.2	<5	**1.4**	<7.3	**4.1**
Xylene, o-	<0.75	<0.016	<4	<1.2	<5	<1.4	<7.3	**1.1**

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Sample Location	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
Sample Date	**8/14/2012**	**8/14/2012**	**9/12/2012**	**9/16/2012**	**10/16/2012**	**10/16/2012**	**11/14/2012**	**11/14/2012**
1,1-Dichloroethene	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2
1,2,4-Trimethylbenzene	<2	**3.4**	<2.4	<0.75	<12	<0.4	<0.8	<1.2
1,2-Dichloroethane	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2
1,3,5-Trimethylbenzene	<2	**1.3**	<2.4	<0.75	<12	<0.4	<0.8	<1.2
1,4-Dichlorobenzene	<2	**2**	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Benzene	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Chloroethane	<5	<2.5	<6	<1.9	<29	<1	<2	<3
Chloroform	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Chloromethane	<5	<2.5	<6	<1.9	<29	<1	<2	<3
cis-1,2-Dichloroethene	**51**	**120**	**84**	**110**	**400**	**42**	**20**	**32**
Dichlorodifluoromethane	<5	<2.5	<6	<1.9	<29	<1	<2	<3
Ethylbenzene	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Methylene Chloride	<5	<2.5	<6	<1.9	<29	<1	<2	<3
Styrene	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Tetrachloroethene	**250**	<1	**290**	**1.9**	**1,500**	**41**	**150**	**170**
Toluene	<2	**1.2**	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Trichloroethene	**27**	**7.6**	**38**	**7.9**	**160**	**5.1**	**13**	**11**
Trichlorofluoromethane	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Vinyl chloride	<2	**1.6**	<2.4	**1.8**	**20**	**0.74**	<0.8	**4.3**
Xylene (total)	<2	**2.5**	<2.4	<0.75	<12	<0.4	<0.8	<1.2
Xylene, o-	<2	<1	<2.4	<0.75	<12	<0.4	<0.8	<1.2

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Sample Location	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
Sample Date	**12/18/2012**	**12/18/2012**	**1/16/2013**	**1/16/2013**	**2/15/2013**	**2/15/2013**	**3/13/2013**	**3/13/2013**
1,1-Dichloroethene	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
1,2,4-Trimethylbenzene	<9.1	**0.26**	<2.6	<0.3	<6	<0.2	<4	<0.8
1,2-Dichloroethane	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
1,3,5-Trimethylbenzene	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
1,4-Dichlorobenzene	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
Benzene	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
Chloroethane	<23	<0.5	<6.6	<0.75	<15	<0.5	<10	<2
Chloroform	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
Chloromethane	<23	<0.5	<6.6	<0.75	<15	**0.57**	<10	<2
cis-1,2-Dichloroethene	**380**	**33**	**250**	**27**	**95**	**23**	**94**	**25**
Dichlorodifluoromethane	<23	**0.54**	<6.6	<0.75	<15	**0.67**	<10	<2
Ethylbenzene	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
Methylene Chloride	<23	<0.5	<6.6	<0.75	<15	<0.5	<10	<2
Styrene	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
Tetrachloroethene	**1,200**	**36**	**460**	**42**	**260**	**4.5**	**200**	**11**
Toluene	<9.1	**2**	<2.6	**1.8**	<6	**0.38**	<4	**5.4**
Trichloroethene	**140**	**3.9**	**74**	**4.7**	**36**	**0.82**	**29**	**1.3**
Trichlorofluoromethane	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8
Vinyl chloride	**12**	**5.9**	**3.1**	**4.2**	<6	**4.5**	<4	**2.7**
Xylene (total)	<9.1	**0.37**	<2.6	<0.3	**6.9**	<0.2	<4	<0.8
Xylene, o-	<9.1	<0.2	<2.6	<0.3	<6	<0.2	<4	<0.8

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Sample Date	**4/23/2013**	**4/23/2013**	**5/14/2013**	**5/14/2013**	**6/13/2013**	**6/13/2013**	**7/15/2013**	**7/15/2013**
1,1-Dichloroethene	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
1,2,4-Trimethylbenzene	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
1,2-Dichloroethane	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
1,3,5-Trimethylbenzene	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
1,4-Dichlorobenzene	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
Benzene	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
Chloroethane	<2.5	<0.8	<15	<1	<25	<2.5	<15	<0.5
Chloroform	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
Chloromethane	<2.5	<0.8	<15	<1	<25	<2.5	<15	**0.57**
cis-1,2-Dichloroethene	**170**	**61**	**340**	**1.9**	**450**	**6.1**	**240**	<0.2
Dichlorodifluoromethane	<2.5	<0.8	<15	<1	<25	<2.5	<15	<0.5
Ethylbenzene	<1	<0.32	<6	<0.4	<10	<1	<6	**0.31**
Methylene Chloride	<2.5	<0.8	<15	<1	<25	<2.5	<15	**1.4**
Styrene	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
Tetrachloroethene	**190**	**0.61**	**860**	**41**	**1,900**	**140**	**670**	**4.3**
Toluene	<1	<0.32	<6	**2**	<10	**1.8**	<6	**4.1**
Trichloroethene	**48**	**1.3**	**140**	**1.9**	**270**	**7.4**	**150**	<0.2
Trichlorofluoromethane	<1	<0.32	<6	<0.4	<10	<1	<6	<0.2
Vinyl chloride	<1	**0.64**	<6	<0.4	<10	<1	<6	**0.54**
Xylene (total)	<1	<0.32	<6	**1.5**	<10	**1.4**	<6	**0.88**
Xylene, o-	<1	<0.32	<6	**0.44**	<10	<1	<6	**0.24**

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Sample Location	Influent	Effluent
Sample Date	**8/13/2013**	**8/13/2013**
1,1-Dichloroethene	<4	<0.2
1,2,4-Trimethylbenzene	<4	**0.25**
1,2-Dichloroethane	<4	<0.2
1,3,5-Trimethylbenzene	<4	<0.2
1,4-Dichlorobenzene	<4	<0.2
Benzene	<4	<0.2
Chloroethane	<10	<0.5
Chloroform	<4	<0.2
Chloromethane	<10	<0.5
cis-1,2-Dichloroethene	**320**	<0.2
Dichlorodifluoromethane	<10	**0.52**
Ethylbenzene	<4	**0.2**
Methylene Chloride	<10	<0.5
Styrene	<4	<0.2
Tetrachloroethene	**700**	**1.2**
Toluene	<4	**3**
Trichloroethene	**130**	<0.2
Trichlorofluoromethane	<4	<0.2
Vinyl chloride	<4	**0.52**
Xylene (total)	<4	**0.71**
Xylene, o-	<4	**0.2**

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-- Not monitored or sampled.

B Compound was found in the blank and sample.

Bold Constituent detected above laboratory detection limit.

J Constituent concentration is an approximate value.

ppbv Parts per billion by volume.

Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-1	03/09/12	-88.4	20	109.7[1]
SVE-1	03/09/12	-74.8	30	47.4[2]
SVE-1	03/10/12	-81.6	30	27.3
SVE-1	03/11/12	-81.6	30	25.1
SVE-1	03/16/12	-74.8	20	15.9
SVE-1	03/23/12	-81.6	25	--
SVE-1	03/23/12	-81.6	25	13.5
SVE-1 [3]	03/29/12	-40.8	20	--
SVE-1 [4]	03/29/12	-54.4	30	--
SVE-1	03/30/12	-68.0	25	14.8
SVE-1	04/11/12	-68.0	25	14.1
SVE-1	04/16/12	-68.0	25	--
SVE-1	04/23/12	-68.0	100	--
SVE-1	04/30/12	-68.0	30	--
SVE-1	05/07/12	-68.0	10	--
SVE-1	05/09/12	-68.0	30	4.3
SVE-1	05/14/12	-68.0	30	--
SVE-1	05/21/12	-68.0	10	--
SVE-1	05/30/12	-54.4	20	--
SVE-1	06/04/12	-68.0	30	--
SVE-1	06/11/12	-68.0	30	--
SVE-1	06/12/12	-61.2	28	6
SVE-1	06/14/12	-47.6	22	--
SVE-1	06/18/12	-27.2	20	--
SVE-1	06/25/12	-27.2	10	--
SVE-1	07/02/12	-27.2	20	--
SVE-1	07/09/12	-27.2	20	--
SVE-1	07/10/12	-27.2	18	12.6
SVE-1	07/16/12	-27.2	20	--
SVE-1	07/23/12	-27.2	20	--
SVE-1	07/30/12	-27.2	20	--
SVE-1	08/06/12	-27.2	20	--
SVE-1	08/14/12	-27.2	19	34.69
SVE-1	08/20/12	-27.2	20	--
SVE-1	08/27/12	-27.2	20	--
SVE-1	09/04/12	-13.6	20	--
SVE-1	09/10/12	-27.2	20	--
SVE-1	09/12/12	-27.2	12	1.02
SVE-1	09/17/12	-27.2	20	--
SVE-1	09/24/12	-27.2	20	--
SVE-1	10/01/12	-27.2	20	--
SVE-1	10/08/12	-27.2	20	--
SVE-1	10/16/12	-51.0	30	0
SVE-1	10/22/12	-54.4	30	--
SVE-1	10/29/12	-54.4	30	--
SVE-1	11/05/12	-54.4	30	--
SVE-1	11/12/12	-54.4	25	--
SVE-1	11/14/12	-54.4	30	0

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-1	11/19/12	-54.4	20	--
SVE-1	11/26/12	-54.4	20	--
SVE-1	12/03/12	-54.4	40	--
SVE-1	12/10/12	-54.4	20	--
SVE-1	12/14/12	-47.6	40	--
SVE-1	12/17/12	-47.6	40	--
SVE-1	12/18/12	-47.6	35	0.2
SVE-1	01/02/13	--	60	--
SVE-1	01/07/13	--	--	--
SVE-1	01/16/13	-136.0	0	NM
SVE-1	01/21/13	-88.4	30	--
SVE-1	01/28/13	-74.8	40	--
SVE-1	02/04/13	-34.0	50	--
SVE-1	02/11/13	-40.8	20	--
SVE-1	02/15/13	-68.0	--	9.7
SVE-1	02/18/13	-115.6	20	--
SVE-1	02/22/13	-81.6	20	--
SVE-1	02/24/13	-68.0	20	--
SVE-1	03/04/13	-95.2	15	--
SVE-1	03/13/13	-81.6	<20	12.1
SVE-1	03/18/13	-68.0	20	--
SVE-1	03/25/13	-68.0	20	--
SVE-1	04/01/13	-81.6	20	--
SVE-1	04/02/13	-68.0	10	--
SVE-1	04/04/13	-68.0	10	--
SVE-1	04/09/13	-81.6	16	--
SVE-1	04/15/13	-81.6	10	--
SVE-1	04/16/13	-95.2	10	--
SVE-1	04/18/13	-108.8	10	--
SVE-1	04/19/13	-108.8	7	--
SVE-1	04/21/13	-68.0	8	--
SVE-1	04/22/13	-68.0	8	1.3
SVE-1	05/14/13	-78.0	19	11.4
SVE-1	05/20/13	-90.0	13	--
SVE-1	05/28/13	-98.0	19	--
SVE-1	05/30/13	-100.0	19	--
SVE-1	06/04/13	-90.0	19	--
SVE-1	06/10/13	-80.0	19	--
SVE-1	06/12/13	-80.0	19	1.3
SVE-1	06/17/13	-94.0	23	--
SVE-1	06/18/13	-90.0	23	--
SVE-1	06/24/13	-98.0	23	--
SVE-1	07/01/13	-90.0	23	--
SVE-1	07/11/13	-68.0	19	2.8
SVE-1	07/15/13	-68.0	26	--
SVE-1	07/22/13	-68.0	13	--
SVE-1	07/30/13	-54.4	23	--
SVE-1	08/06/13	-54.4	--	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-1	08/12/13	-54.4	23	--
SVE-1	08/13/13	-54.4	13	0.5
SVE-1	08/19/13	-40.8	19	--
SVE-1	08/22/13	-40.8	13	--
SVE-1	08/26/13	-47.6	26	--
SVE-2	03/09/12	-40.8	40	105.8[1]
SVE-2	03/09/12	-54.4	60	11.5[2]
SVE-2	03/10/12	-47.6	55	10.3
SVE-2	03/11/12	-47.6	50	8.2
SVE-2	03/16/12	-47.6	50	5.3
SVE-2	03/23/12	-44.2	40	--
SVE-2	03/23/12	-44.2	40	6.1
SVE-2 [3]	03/29/12	-20.4	25	--
SVE-2 [4]	03/29/12	-34.0	37	--
SVE-2	03/30/12	-40.8	40	6.9
SVE-2	04/11/12	-34.0	35	6.3
SVE-2	04/16/12	-34.0	40	--
SVE-2	04/23/12	-34.0	120	--
SVE-2	04/30/12	-40.8	40	--
SVE-2	05/07/12	-34.0	30	--
SVE-2	05/09/12	-40.8	35	2.6
SVE-2	05/14/12	-40.8	50	--
SVE-2	05/21/12	-34.0	45	--
SVE-2	05/30/12	-34.0	40	--
SVE-2	06/04/12	-40.8	45	--
SVE-2	06/11/12	-34.0	45	--
SVE-2	06/12/12	-34.0	40	6.6
SVE-2	06/14/12	-47.6	25	--
SVE-2	06/18/12	-13.6	20	--
SVE-2	06/25/12	-13.6	20	--
SVE-2	07/02/12	NM[5]	20	--
SVE-2	07/09/12	-13.6	20	--
SVE-2	07/10/12	-13.6	20	8.8
SVE-2	07/16/12	NM[5]	10	--
SVE-2	07/23/12	NM[5]	20	--
SVE-2	07/30/12	-13.6	10	--
SVE-2	08/06/12	NM[5]	20	--
SVE-2	08/14/12	-8.4	19	32.36
SVE-2	08/20/12	-8.0	20	--
SVE-2	08/27/12	-7.0	20	--
SVE-2	09/04/12	-6.0	20	--
SVE-2	09/10/12	-6.0	20	--
SVE-2	09/12/12	-6.5	20	22.26
SVE-2	09/17/12	-5.5	20	--
SVE-2	09/24/12	-9.0	20	--
SVE-2	10/01/12	-8.0	20	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-2	10/08/12	-9.0	20	--
SVE-2	10/16/12	>-15.0[7]	50	1.6
SVE-2	10/22/12	NM[5]	50	--
SVE-2	10/29/12	NM[5]	50	--
SVE-2	11/05/12	NM[5]	50	--
SVE-2	11/12/12	NM[5]	45	--
SVE-2	11/14/12	NM[5]	55	1.2
SVE-2	11/19/12	NM[5]	60	--
SVE-2	11/26/12	NM[5]	50	--
SVE-2	12/03/12	NM[5]	50	--
SVE-2	12/10/12	NM[5]	60	--
SVE-2	12/14/12	NM[5]	50	--
SVE-2	12/17/12	NM[5]	50	--
SVE-2	12/18/12	NM[5]	50	2.7
SVE-2	01/02/13	--	60	--
SVE-2	01/07/13	NM[5]	55	--
SVE-2	01/16/13	NM[5]	60	0.3
SVE-2	01/21/13	-81.6	20	--
SVE-2	01/28/13	-95.2	20	--
SVE-2	02/04/13	-34.0	50	--
SVE-2	02/11/13	NM[5]	15	--
SVE-2	02/15/13	-27.2	40	12
SVE-2	02/18/13	-27.2	35	--
SVE-2	02/22/13	-54.4	35	--
SVE-2 [8]	02/24/13	-40.8	70	--
SVE-2	03/04/13	-34.0	30	--
SVE-2	03/13/13	-40.8	45	10.6
SVE-2	03/18/13	-40.8	48	--
SVE-2	03/25/13	-40.8	35	--
SVE-2	04/01/13	-40.8	50	--
SVE-2	04/02/13	-40.8	20	--
SVE-2	04/04/13	-27.2	20	--
SVE-2	04/09/13	-54.4	20	--
SVE-2	04/15/13	-40.8	20	--
SVE-2	04/16/13	-40.8	20	--
SVE-2	04/18/13	-68.0	15	--
SVE-2	04/19/13	-68.0	18	--
SVE-2	04/21/13	-40.8	15	--
SVE-2	04/22/13	-40.8	15	2.2
SVE-2	05/14/13	-80.0	46	13.2
SVE-2	05/20/13	-90.0	48	--
SVE-2	05/28/13	-98.0	46	--
SVE-2	05/30/13	-100.0	46	--
SVE-2	06/04/13	-90.0	44	--
SVE-2	06/10/13	-80.0	46	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-2	06/12/13	-84.0	48	1.2
SVE-2	06/17/13	-84.0	30	--
SVE-2	06/18/13	-84.0	32	--
SVE-2	06/24/13	-95.0	26	--
SVE-2	07/01/13	-100.0	23	--
SVE-2	07/11/13	-61.2	37	12.7
SVE-2	07/15/13	-54.4	39	--
SVE-2	07/22/13	-54.4	29	--
SVE-2	07/30/13	-40.8	29	--
SVE-2	08/06/13	-47.6	--	--
SVE-2	08/12/13	-47.6	29	--
SVE-2	08/13/13	-40.8	29	0.5
SVE-2	08/19/13	-34.0	30	--
SVE-2	08/22/13	-34.0	29	--
SVE-2	08/26/13	-40.8	32	--
SVE-3	03/09/12	-30.6	60	85.3[1]
SVE-3	03/09/12	-40.8	85	5.92[2]
SVE-3	03/10/12	-34.0	80	6.1
SVE-3	03/11/12	-34.0	75	4.5
SVE-3	03/16/12	-34.0	60	1.6
SVE-3	03/23/12	-40.8	60	--
SVE-3	03/23/12	-40.8	60	4.4
SVE-3 [3]	03/29/12	-27.2	30	--
SVE-3 [4]	03/29/12	-34.0	50	--
SVE-3	03/30/12	-54.4	50	6.1
SVE-3	04/11/12	-40.8	50	4.9
SVE-3	04/16/12	-34.0	50	--
SVE-3	04/23/12	-34.0	140	--
SVE-3	04/30/12	-35.3	50	--
SVE-3	05/07/12	-40.8	50	--
SVE-3	05/09/12	-40.8	40	5.9
SVE-3	05/14/12	-40.8	50	--
SVE-3	05/21/12	-40.8	50	--
SVE-3	05/30/12	-47.6	50	--
SVE-3	06/04/12	-40.8	50	--
SVE-3	06/11/12	-34.0	50	--
SVE-3	06/12/12	-30.6	50	9.3
SVE-3	06/14/12	-27.2	40	--
SVE-3	06/18/12	-13.6	20	--
SVE-3	06/25/12	-13.6	25	--
SVE-3	07/02/12	-13.6	20	--
SVE-3	07/09/12	-13.6	20	--
SVE-3	07/10/12	-13.6	21	7.6
SVE-3	07/16/12	-13.6	20	--
SVE-3	07/23/12	NM[5]	20	--
SVE-3	07/30/12	-13.6	20	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-3	08/06/12	NM[5]	25	--
SVE-3	08/14/12	-9.8	21	33.73
SVE-3	08/20/12	-10.5	30	--
SVE-3	08/27/12	-9.0	20	--
SVE-3	09/04/12	-8.0	20	--
SVE-3	09/10/12	-9.0	20	--
SVE-3	09/12/12	-7.0	20	0.88
SVE-3	09/17/12	-6.5	20	--
SVE-3	09/24/12	-15.0	20	--
SVE-3	10/01/12	-7.0	20	--
SVE-3	10/08/12	>-15.0[7]	20	--
SVE-3	10/16/12	>-15.0[7]	55	0.2
SVE-3	10/22/12	NM[5]	50	--
SVE-3	10/29/12	NM[5]	55	--
SVE-3	11/05/12	NM[5]	50	--
SVE-3	11/12/12	NM[5]	50	--
SVE-3	11/14/12	NM[5]	50	0.5
SVE-3	11/19/12	NM[5]	50	--
SVE-3	11/26/12	NM[5]	50	--
SVE-3	12/03/12	NM[5]	40	--
SVE-3	12/10/12	NM[5]	50	--
SVE-3	12/14/12	NM[5]	40	--
SVE-3	12/17/12	NM[5]	45	--
SVE-3	12/18/12	NM[5]	40	2.8
SVE-3	01/02/13	--	70	--
SVE-3	01/07/13	NM[5]	60	--
SVE-3	01/16/13	-54.4	40	0
SVE-3	01/21/13	-81.6	30	--
SVE-3	01/28/13	-149.5	10	--
SVE-3	02/04/13	-136.0	10	--
SVE-3	02/11/13	-40.8	20	--
SVE-3	02/15/13	-40.8	30	15.6
SVE-3	02/18/13	-34.0	30	--
SVE-3	02/22/13	-54.4	30	--
SVE-3 [8]	02/24/13	-68.0	50	--
SVE-3	03/04/13	-40.8	35	--
SVE-3	03/13/13	-54.4	40	14.5
SVE-3	03/18/13	-47.6	35	--
SVE-3	03/25/13	-40.8	30	--
SVE-3	04/01/13	-40.8	40	--
SVE-3	04/02/13	-40.8	20	--
SVE-3	04/04/13	-40.8	15	--
SVE-3	04/09/13	-95.2	10	--
SVE-3	04/15/13	-68.0	10	--
SVE-3	04/16/13	-68.0	10	--
SVE-3	04/18/13	-108.8	8	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-3	04/19/13	-68.0	7	--
SVE-3	04/21/13	-54.4	10	--
SVE-3	04/22/13	-54.4	9	1.7
SVE-3	05/14/13	-80.0	23	11.6
SVE-3	05/20/13	-90.0	23	--
SVE-3	05/28/13	-98.0	13	--
SVE-3	05/30/13	-98.0	19	--
SVE-3	06/04/13	-80.0	23	--
SVE-3	06/10/13	-70.0	23	--
SVE-3	06/12/13	-84.0	23	1.9
SVE-3	06/17/13	-98.0	26	--
SVE-3	06/18/13	-90.0	23	--
SVE-3	06/24/13	-98.0	26	--
SVE-3	07/01/13	-98.0	19	--
SVE-3	07/11/13	-68.0	23	21.9
SVE-3	07/15/13	-68.0	26	--
SVE-3	07/22/13	-68.0	37	--
SVE-3	07/30/13	-54.4	39	--
SVE-3	08/06/13	-54.4	--	--
SVE-3	08/12/13	-54.4	45	--
SVE-3	08/13/13	-54.4	44	1.7
SVE-3	08/19/13	-34.0	43	--
SVE-3	08/22/13	-40.8	43	--
SVE-3	08/26/13	-40.8	45	--
SVE-4	03/09/12	-88.4	33	105.1[1]
SVE-4	03/09/12	-88.4	32	5.1[2]
SVE-4	03/10/12	-88.4	30	2.1
SVE-4	03/11/12	-88.4	28	5.2
SVE-4	03/16/12	-95.2	28	3.1
SVE-4	03/23/12	-108.8	27	--
SVE-4	03/23/12	-95.2	27	9.7
SVE-4 [3]	03/29/12	-47.6	25	--
SVE-4 [4]	03/29/12	-61.2	30	--
SVE-4	03/30/12	-95.2	25	10.3
SVE-4	04/11/12	-54.4	20	10
SVE-4	04/16/12	-102.0	17	--
SVE-4	04/23/12	-102.0	20	--
SVE-4	04/30/12	-103.3	27	--
SVE-4	05/07/12	-95.2	18	--
SVE-4	05/09/12	-95.2	18	9.4
SVE-4	05/14/12	-95.2	20	--
SVE-4	05/21/12	-95.2	30	--
SVE-4	05/30/12	-95.2	33	--
SVE-4	06/04/12	-95.2	30	--
SVE-4	06/11/12	-95.2	30	--
SVE-4	06/12/12	-95.2	23	8.3
SVE-4	06/14/12	-78.2	23	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-4	06/18/12	-54.4	17	--
SVE-4	06/25/12	-54.4	18	--
SVE-4	07/02/12	-54.4	18	--
SVE-4	07/09/12	-54.4	20	--
SVE-4	07/10/12	-57.1	22	9.8
SVE-4	07/16/12	-68.0	20	--
SVE-4	07/23/12	-54.4	18	--
SVE-4	07/30/12	-54.4	18	--
SVE-4	08/06/12	-54.4	18	--
SVE-4	08/14/12	-57.1	27	32.28[6]
SVE-4	08/20/12	-54.4	18	--
SVE-4	08/27/12	-54.4	18	--
SVE-4	09/04/12	-54.4	20	--
SVE-4	09/10/12	-54.4	20	--
SVE-4	09/12/12	-54.4	17	1.58
SVE-4	09/17/12	-54.4	20	--
SVE-4	09/24/12	-47.6	15	--
SVE-4	10/01/12	-54.4	15	--
SVE-4	10/08/12	-40.8	20	--
SVE-4	10/16/12	-68.0	27	1.4
SVE-4	10/22/12	-68.0	25	--
SVE-4	10/29/12	-68.0	25	--
SVE-4	11/05/12	-81.6	25	--
SVE-4	11/12/12	-74.8	25	--
SVE-4	11/14/12	-81.6	22	0
SVE-4	11/19/12	-81.6	22	--
SVE-4	11/26/12	-81.6	25	--
SVE-4	12/03/12	-81.6	22	--
SVE-4	12/10/12	-95.2	22	--
SVE-4	12/14/12	-81.6	25	--
SVE-4	12/17/12	-81.6	25	--
SVE-4	12/18/12	-81.6	24	5
SVE-4	01/02/13	--	25	--
SVE-4	01/07/13	-54.4	15	--
SVE-4	01/16/13	-102.0	20	0.3
SVE-4	01/21/13	-81.6	17	--
SVE-4	01/28/13	-149.5	8	--
SVE-4	02/04/13	-136.0	0	--
SVE-4	02/11/13	-95.2	0	--
SVE-4	02/15/13	-68.0	16	11.2
SVE-4	02/18/13	-95.2	15	--
SVE-4	02/22/13	-95.2	15	--
SVE-4	02/24/13	-95.2	0	--
SVE-4	03/04/13	-95.2	20	--
SVE-4	03/13/13	-108.8	20	9.8
SVE-4	03/18/13	-108.8	18	--
SVE-4	03/25/13	-95.2	20	--
SVE-4	04/01/13	-115.6	-8	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-4	04/02/13	-108.8	22	--
SVE-4	04/04/13	-95.2	20	--
SVE-4	04/09/13	-122.4	20	--
SVE-4	04/15/13	-95.2	30	--
SVE-4	04/16/13	-95.2	25	--
SVE-4	04/18/13	-108.8	25	--
SVE-4	04/19/13	-108.8	25	--
SVE-4	04/21/13	-95.2	25	--
SVE-4	04/22/13	-95.2	25	2.6
SVE-4	05/14/13	-80.0	23	12.7
SVE-4	05/20/13	-90.0	30	--
SVE-4	05/28/13	-100.0	27	--
SVE-4	05/30/13	-100.0	26	--
SVE-4	06/04/13	-90.0	26	--
SVE-4	06/10/13	-80.0	26	--
SVE-4	06/12/13	-84.0	26	5
SVE-4	06/17/13	-80.0	26	--
SVE-4	06/18/13	-90.0	26	--
SVE-4	06/24/13	-98.0	26	--
SVE-4	07/01/13	-96.0	26	--
SVE-4	07/11/13	-68.0	23	4.4
SVE-4	07/15/13	-54.4	26	--
SVE-4	07/22/13	-68.0	26	--
SVE-4	07/30/13	-54.4	26	--
SVE-4	08/06/13	-54.4	--	--
SVE-4	08/12/13	-54.4	29	--
SVE-4	08/13/13	-54.4	26	1.1
SVE-4	08/19/13	-40.8	30	--
SVE-4	08/22/13	-40.8	23	--
SVE-4	08/26/13	-47.6	27	--
SVE-5	03/09/12	-88.4	35	47.2[1]
SVE-5	03/09/12	-88.4	34	15.0[2]
SVE-5	03/10/12	-88.4	33	10.8
SVE-5	03/11/12	-88.4	32	3.6
SVE-5	03/16/12	-81.6	34	2.9
SVE-5	03/23/12	-95.2	32	--
SVE-5	03/23/12	-81.6	32	3
SVE-5 [3]	03/29/12	-61.2	30	--
SVE-5 [4]	03/29/12	-74.8	37	--
SVE-5	03/30/12	-95.2	35	2.8
SVE-5	04/11/12	-81.6	27	3.3
SVE-5	04/16/12	-81.6	27	--
SVE-5	04/23/12	-81.6	25	--
SVE-5	04/30/12	-95.2	38	--
SVE-5	05/07/12	-81.6	26	--
SVE-5	05/09/12	-81.6	27	1

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-5	05/14/12	-81.6	27	--
SVE-5	05/21/12	-81.6	28	--
SVE-5	05/30/12	-81.6	38	--
SVE-5	06/04/12	-81.6	35	--
SVE-5	06/11/12	-81.6	35	--
SVE-5	06/12/12	-71.4	30	3.6
SVE-5	06/14/12	-68.0	29	--
SVE-5	06/18/12	-54.4	22	--
SVE-5	06/25/12	-54.4	22	--
SVE-5	07/02/12	-54.4	22	--
SVE-5	07/09/12	-54.4	22	--
SVE-5	07/10/12	-43.5	30	5.3
SVE-5	07/16/12	-54.4	25	--
SVE-5	07/23/12	-54.4	20	--
SVE-5	07/30/12	-68.0	15	--
SVE-5	08/06/12	-54.4	20	--
SVE-5	08/14/12	-54.4	29	28.95[6]
SVE-5	08/20/12	-68.0	20	--
SVE-5	08/27/12	-54.4	23	--
SVE-5	09/04/12	-68.0	25	--
SVE-5	09/10/12	-68.0	23	--
SVE-5	09/12/12	-51.0	23	1.33
SVE-5	09/17/12	-40.8	25	--
SVE-5	09/24/12	-40.8	25	--
SVE-5	10/01/12	-40.8	25	--
SVE-5	10/08/12	-27.2	25	--
SVE-5	10/16/12	-74.8	27	0.6
SVE-5	10/22/12	-81.6	25	--
SVE-5	10/29/12	-81.6	25	--
SVE-5	11/05/12	-81.6	25	--
SVE-5	11/12/12	-74.8	22	--
SVE-5	11/14/12	-81.6	20	0.2
SVE-5	11/19/12	-68.0	25	--
SVE-5	11/26/12	-68.0	27	--
SVE-5	12/03/12	-68.0	27	--
SVE-5	12/10/12	-68.0	25	--
SVE-5	12/14/12	-74.8	28	--
SVE-5	12/17/12	-81.6	25	--
SVE-5	12/18/12	-81.6	28	0.8
SVE-5	01/02/13	--	25	--
SVE-5	01/07/13	-81.6	30	--
SVE-5	01/16/13	-68.0	24	0
SVE-5	01/21/13	-68.0	18	--
SVE-5	01/28/13	-149.5	NM	--
SVE-5	02/04/13	-13.6	50	--
SVE-5	02/11/13	-68.0	20	--
SVE-5	02/15/13	-61.2	25	10.1

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-5	02/18/13	-81.6	22	--
SVE-5	02/22/13	-74.8	31	--
SVE-5	02/24/13	-68.0	15	--
SVE-5	03/04/13	-68.0	30	--
SVE-5	03/13/13	-81.6	24	8.9
SVE-5	03/18/13	-81.6	32	--
SVE-5	03/25/13	-68.0	28	--
SVE-5	04/01/13	-108.8	15	--
SVE-5	04/02/13	-108.8	30	--
SVE-5	04/04/13	-81.6	25	--
SVE-5	04/09/13	-108.8	30	--
SVE-5	04/15/13	-81.6	32	--
SVE-5	04/16/13	-81.6	30	--
SVE-5	04/18/13	-95.2	35	--
SVE-5	04/19/13	-81.6	35	--
SVE-5	04/21/13	-81.6	32	--
SVE-5	04/22/13	-81.6	35	1.8
SVE-5	05/14/13	-88.0	30	10.9
SVE-5	05/20/13	-100.0	35	--
SVE-5	05/28/13	-100.0	38	--
SVE-5	05/30/13	-100.0	32	--
SVE-5	06/04/13	-90.0	32	--
SVE-5	06/10/13	-80.0	32	--
SVE-5	06/12/13	-90.0	35	4.5
SVE-5	06/17/13	-88.0	32	--
SVE-5	06/18/13	-88.0	32	--
SVE-5	06/24/13	-98.0	32	--
SVE-5	07/01/13	-90.0	29	--
SVE-5	07/11/13	-74.8	32	2.8
SVE-5	07/15/13	-68.0	32	--
SVE-5	07/22/13	-68.0	32	--
SVE-5	07/30/13	-54.4	29	--
SVE-5	08/06/13	-68.0	--	--
SVE-5	08/12/13	-68.0	32	--
SVE-5	08/13/13	-54.4	35	0.8
SVE-5	08/19/13	-40.8	32	--
SVE-5	08/22/13	-54.4	35	--
SVE-5	08/26/13	-54.4	32	--
SVE-6	03/09/12	-115.6	19	37.5[1]
SVE-6	03/09/12	-108.8	19	3.7[2]
SVE-6	03/10/12	-108.8	20	1.3
SVE-6	03/11/12	-108.8	20	2.8
SVE-6	03/16/12	-102.0	16	1.9
SVE-6	03/23/12	-122.4	--	--
SVE-6	03/23/12	-122.4	17	2.2
SVE-6 [3]	03/29/12	-81.6	23	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-6 [4]	03/29/12	-95.2	24	--
SVE-6	03/30/12	-122.4	17	2
SVE-6	04/11/12	-95.2	17	2.3
SVE-6	04/16/12	-108.8	5	--
SVE-6	04/23/12	-102.0	19	--
SVE-6	04/30/12	-122.4	25	--
SVE-6	05/07/12	-81.6	18	--
SVE-6	05/09/12	-81.6	13	0.5
SVE-6	05/14/12	-95.2	15	--
SVE-6	05/21/12	-95.2	25	--
SVE-6	05/30/12	-95.2	24	--
SVE-6	06/04/12	-95.2	20	--
SVE-6	06/11/12	-95.2	20	--
SVE-6	06/17/12	-68.0	15	--
SVE-6	06/23/12	-81.6	15	--
SVE-6	06/12/12	-91.8	16	3.1
SVE-6	06/12/12	-81.6	15	
SVE-6	06/12/12	-81.6	16	
SVE-6	06/14/12	-81.6	19	--
SVE-6	06/18/12	-68.0	15	--
SVE-6	06/25/12	-68.0	15	--
SVE-6	07/02/12	-68.0	15	--
SVE-6	07/09/12	-68.0	15	--
SVE-6	07/10/12	-62.6	21	3.9
SVE-6	07/16/12	-68.0	15	--
SVE-6	07/23/12	-68.0	15	--
SVE-6	07/30/12	-68.0	13	--
SVE-6	08/06/12	-68.0	12	--
SVE-6	08/14/12	-68.0	18	24.71 [6]
SVE-6	08/20/12	-68.0	12	--
SVE-6	08/27/12	-68.0	8	--
SVE-6	09/04/12	-54.4	12	--
SVE-6	09/12/12	-64.6	10	0.79
SVE-6	09/17/12	-54.4	12	--
SVE-6	09/24/12	-54.4	22	--
SVE-6	10/01/12	-54.4	25	--
SVE-6	10/08/12	-40.8	20	--
SVE-6	10/16/12	-81.6	20	0
SVE-6	10/22/12	-81.6	20	--
SVE-6	10/29/12	-81.6	20	--
SVE-6	11/05/12	-81.6	20	--
SVE-6	11/12/12	-81.6	20	--
SVE-6	11/14/12	-81.6	18	0
SVE-6	11/19/12	-81.6	17	--
SVE-6	11/26/12	-81.6	25	--
SVE-6	12/03/12	-68.0	25	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-6	12/10/12	-81.6	17	--
SVE-6	12/14/12	-95.2	22	--
SVE-6	12/17/12	-95.2	20	--
SVE-6	12/18/12	-95.2	19	0.3
SVE-6	01/02/13	--	20	--
SVE-6	01/07/13	-68.0	23	--
SVE-6	01/16/13	-88.4	25	0
SVE-6	01/21/13	-136.0	10	--
SVE-6	01/28/13	-81.6	30	--
SVE-6	02/04/13	-54.4	0	--
SVE-6	02/11/13	-81.6	15	--
SVE-6	02/15/13	-102.0	23	8.7
SVE-6	02/18/13	-81.6	15	--
SVE-6	02/22/13	-95.2	26	--
SVE-6	02/24/13	-108.8	10	--
SVE-6	03/04/13	-68.0	18	--
SVE-6	03/13/13	-108.8	25	7.7
SVE-6	03/18/13	-81.6	25	--
SVE-6	03/25/13	-81.6	25	--
SVE-6	04/01/13	-108.8	15	--
SVE-6	04/02/13	-108.8	30	--
SVE-6	04/04/13	-68.0	25	--
SVE-6	04/09/13	-95.2	25	--
SVE-6	04/15/13	-81.6	28	--
SVE-6	04/16/13	-68.0	30	--
SVE-6	04/18/13	-81.6	32	--
SVE-6	04/19/13	-81.6	28	--
SVE-6	04/21/13	-68.0	30	--
SVE-6	04/22/13	-68.0	30	1.3
SVE-6	05/14/13	-80.0	23	11.3
SVE-6	05/20/13	-90.0	26	--
SVE-6	05/28/13	-98.0	23	--
SVE-6	05/30/13	-100.0	26	--
SVE-6	06/04/13	-92.0	26	--
SVE-6	06/10/13	-80.0	30	--
SVE-6	06/12/13	-82.0	26	2.8
SVE-6	06/17/13	-80.0	26	--
SVE-6	06/18/13	-84.0	26	--
SVE-6	06/24/13	-98.0	26	--
SVE-6	07/01/13	-94.0	26	--
SVE-6	07/11/13	-68.0	29	2
SVE-6	07/15/13	-68.0	29	--
SVE-6	07/22/13	-68.0	18	--
SVE-6	07/30/13	-54.4	26	--
SVE-6	08/06/13	-54.4	--	--
SVE-6	08/12/13	-54.4	32	--
SVE-6	08/13/13	-54.4	32	0.5

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-6	08/19/13	-40.8	32	--
SVE-6	08/22/13	-40.8	32	--
SVE-6	08/26/13	-40.8	26	--
SVE-7	03/09/12	-81.6	40	96.2[1]
SVE-7	03/09/12	-74.8	30	11.8[2]
SVE-7	03/10/12	-74.8	30	10.5
SVE-7	03/11/12	-71.4	30	7.3
SVE-7	03/16/12	-74.8	30	3.6
SVE-7	03/23/12	-81.6	35	--
SVE-7	03/23/12	-81.6	35	3.4
SVE-7 [3]	03/29/12	-47.6	20	--
SVE-7 [4]	03/29/12	-54.4	30	--
SVE-7	03/30/12	-68.0	30	3
SVE-7	04/11/12	-54.4	25	7
SVE-7	04/16/12	-68.0	25	--
SVE-7	04/23/12	-68.0	120	--
SVE-7	04/30/12	-68.0	30	--
SVE-7	05/07/12	-68.0	25	--
SVE-7	05/09/12	-68.0	30	0.6
SVE-7	05/14/12	-68.0	30	--
SVE-7	05/21/12	-68.0	40	--
SVE-7	05/30/12	-54.4	30	--
SVE-7	06/04/12	-68.0	40	--
SVE-7	06/11/12	-54.4	40	--
SVE-7	06/12/12	-61.2	35	4
SVE-7	06/14/12	-47.6	25	--
SVE-7	06/18/12	-34.0	20	--
SVE-7	06/25/12	-27.2	15	--
SVE-7	07/02/12	-27.2	20	--
SVE-7	07/09/12	-13.6	20	--
SVE-7	07/10/12	-32.4	16	4.9
SVE-7	07/16/12	-13.6	10	--
SVE-7	07/23/12	-13.6	20	--
SVE-7	07/30/12	-13.6	20	--
SVE-7	08/06/12	-27.2	20	--
SVE-7	08/14/12	-31.3	20	25.27[6]
SVE-7	08/20/12	-27.2	20	--
SVE-7	08/27/12	-13.6	20	--
SVE-7	09/04/12	-13.6	20	--
SVE-7	09/10/12	-13.6	20	--
SVE-7	09/12/12	-27.2	12	1.12
SVE-7	09/17/12	-13.6	20	--
SVE-7	09/24/12	-27.2	20	--
SVE-7	10/01/12	-27.2	20	--
SVE-7	10/08/12	-27.2	20	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-7	10/16/12	-47.6	40	0.7
SVE-7	10/22/12	-47.6	30	--
SVE-7	10/29/12	-27.2	45	--
SVE-7	11/05/12	-40.8	40	--
SVE-7	11/12/12	-40.8	40	--
SVE-7	11/14/12	-47.6	30	0.3
SVE-7	11/19/12	-54.4	30	--
SVE-7	11/26/12	-54.4	35	--
SVE-7	12/03/12	-54.4	30	--
SVE-7	12/10/12	-54.4	30	--
SVE-7	12/14/12	-54.4	30	--
SVE-7	12/17/12	-54.4	30	--
SVE-7	12/18/12	-54.4	30	0.5
SVE-7	01/02/13	--	50	--
SVE-7	01/07/13	-40.8	40	--
SVE-7	01/16/13	-61.2	30	0
SVE-7	01/21/13	-95.2	15	--
SVE-7	01/28/13	-163.1	10	--
SVE-7	02/04/13	-68.0	30	--
SVE-7	02/11/13	-54.4	10	--
SVE-7	02/15/13	-68.0	NM	9.7
SVE-7	02/18/13	-68.0	20	--
SVE-7	02/22/13	-61.2	20	--
SVE-7 [8]	02/24/13	-68.0	60	--
SVE-7	03/04/13	-47.6	20	--
SVE-7	03/13/13	-81.6	25	9.2
SVE-7	03/18/13	-68.0	20	--
SVE-7	03/25/13	-68.0	30	--
SVE-7	04/01/13	-81.6	20	--
SVE-7	04/02/13	-68.0	10	--
SVE-7	04/04/13	-68.0	10	--
SVE-7	04/09/13	-68.0	10	--
SVE-7	04/15/13	-81.6	10	--
SVE-7	04/16/13	-81.6	10	--
SVE-7	04/18/13	-136.0	8	--
SVE-7	04/19/13	-122.4	10	--
SVE-7	04/21/13	-68.0	8	--
SVE-7	04/22/13	-68.0	10	1.9
SVE-7	05/14/13	-80.0	19	10.6
SVE-7	05/20/13	-95.0	23	--
SVE-7	05/28/13	-100.0	19	--
SVE-7	05/30/13	-100.0	13	--
SVE-7	06/04/13	-90.0	23	--
SVE-7	06/10/13	-80.0	23	--
SVE-7	06/12/13	-84.0	23	2.0
SVE-7	06/17/13	-90.0	23	--
SVE-7	06/18/13	-90.0	19	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-7	06/24/13	-100.0	23	--
SVE-7	07/01/13	-90.0	26	--
SVE-7	07/11/13	-68.0	23	1.1
SVE-7	07/15/13	-54.4	26	--
SVE-7	07/22/13	-68.0	18	--
SVE-7	07/30/13	-54.4	26	--
SVE-7	08/06/13	-68.0	--	--
SVE-7	08/12/13	-54.4	26	--
SVE-7	08/13/13	-54.4	19	0.3
SVE-7	08/19/13	-40.8	26	--
SVE-7	08/22/13	-47.6	19	--
SVE-7	08/26/13	-47.6	26	--
SVE-8	03/09/12	-95.2	30	34.2[1]
SVE-8	03/09/12	-95.2	30	7.2[2]
SVE-8	03/10/12	-95.2	31	4.3
SVE-8	03/11/12	-88.4	33	6.7
SVE-8	03/16/12	-88.4	32	2.4
SVE-8	03/23/12	-95.2	35	--
SVE-8	03/23/12	-95.2	35	2.5
SVE-8 [3]	03/29/12	-68.0	29	--
SVE-8 [4]	03/29/12	-74.8	35	--
SVE-8	03/30/12	-81.6	37	2.9
SVE-8	04/11/12	-81.6	27	2
SVE-8	04/16/12	-81.6	25	--
SVE-8	04/23/12	-81.6	25	--
SVE-8	04/30/12	-81.6	40	--
SVE-8	05/07/12	-81.6	25	--
SVE-8	05/09/12	-81.6	27	0.5
SVE-8	05/14/12	-81.6	27	--
SVE-8	05/21/12	-81.6	38	--
SVE-8	05/30/12	-81.6	38	--
SVE-8	06/04/12	-95.2	35	--
SVE-8	06/11/12	-81.6	35	--
SVE-8	06/12/12	-74.8	28	3.4
SVE-8	06/14/12	-68.0	27	--
SVE-8	06/18/12	-40.8	18	--
SVE-8	06/25/12	-54.4	20	--
SVE-8	07/02/12	-54.4	18	--
SVE-8	07/09/12	-54.4	20	--
SVE-8	07/10/12	-53.0	24	4.3
SVE-8	07/16/12	-54.4	22	--
SVE-8	07/23/12	-54.4	20	--
SVE-8	07/30/12	-54.4	20	--
SVE-8	08/06/12	-54.4	18	--
SVE-8	08/14/12	-54.4	27	23.24[6]

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-8	08/20/12	-54.4	25	--
SVE-8	08/27/12	-54.4	22	--
SVE-8	09/04/12	-54.4	22	--
SVE-8	09/10/12	-54.4	25	--
SVE-8	09/12/12	-54.4	21	1.95
SVE-8	09/17/12	-54.4	22	--
SVE-8	09/24/12	-40.8	22	--
SVE-8	10/01/12	-40.8	25	--
SVE-8	10/08/12	-40.8	22	--
SVE-8	10/16/12	-68.0	40	0
SVE-8	10/22/12	-68.0	30	--
SVE-8	10/29/12	-68.0	32	--
SVE-8	11/05/12	-68.0	30	--
SVE-8	11/12/12	-68.0	30	--
SVE-8	11/14/12	-68.0	30	0
SVE-8	11/19/12	-68.0	30	--
SVE-8	11/26/12	-68.0	32	--
SVE-8	12/03/12	-68.0	30	--
SVE-8	12/10/12	-68.0	30	--
SVE-8	12/14/12	-74.8	30	--
SVE-8	12/17/12	-74.8	30	--
SVE-8	01/02/13	--	22	--
SVE-8	01/07/13	-122.4	~8	--
SVE-8	01/16/13	-40.8	18	0
SVE-8	01/21/13	-129.2	18	--
SVE-8	01/28/13	-136.0	10	--
SVE-8	02/04/13	-136.0	0	--
SVE-8	02/11/13	-81.6	0	--
SVE-8	02/15/13	-108.8	10	6.8
SVE-8	02/18/13	-95.2	10	--
SVE-8	02/22/13	-20.4	17	--
SVE-8	02/24/13	-122.4	0	--
SVE-8	03/04/13	-95.2	15	--
SVE-8	03/13/13	-108.8	18	6.2
SVE-8	03/18/13	-108.8	NM	--
SVE-8	03/25/13	-95.2	NM	--
SVE-8	04/01/13	-102.0	20	--
SVE-8	04/02/13	-95.2	35	--
SVE-8	04/04/13	-81.6	35	--
SVE-8	04/09/13	-122.4	11	--
SVE-8	04/15/13	-95.2	15	--
SVE-8	04/16/13	-81.6	25	--
SVE-8	04/18/13	-108.8	8	--
SVE-8	04/19/13	-108.8	20	--
SVE-8	04/21/13	-81.6	25	--
SVE-8	04/22/13	-81.6	25	1.3
SVE-8	05/14/13	-76.0	23	9.7
SVE-8	05/20/13	-90.0	0	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-8	05/28/13	-92.0	13	--
SVE-8	05/30/13	-100.0	13	--
SVE-8	06/04/13	-94.0	23	--
SVE-8	06/10/13	-88.0	13	--
SVE-8	06/12/13	-88.0	23	1.7
SVE-8	06/17/13	-90.0	26	--
SVE-8	06/18/13	-88.0	23	--
SVE-8	06/24/13	-100.0	26	--
SVE-8	07/01/13	-88.0	26	--
SVE-8	07/11/13	-68.0	26	1.1
SVE-8	07/15/13	-68.0	29	--
SVE-8	07/22/13	-68.0	13	--
SVE-8	07/30/13	-54.4	23	--
SVE-8	08/06/13	-54.4	--	--
SVE-8	08/12/13	-54.4	0	--
SVE-8	08/13/13	-54.4	9	0.3
SVE-8	08/19/13	-40.8	0	--
SVE-8	08/22/13	-47.6	13	--
SVE-8	08/26/13	-47.6	18	--
SVE-9	03/09/12	-129.2	13	196.1[1]
SVE-9	03/09/12	-122.4	15	172.1[2]
SVE-9	03/10/12	-122.4	15	144.5
SVE-9	03/11/12	-122.4	15	131.2
SVE-9	03/16/12	-122.4	15	26.3
SVE-9	03/23/12	-129.2	17	--
SVE-9	03/23/12	-136.0	17	29.7
SVE-9 [3]	03/29/12	-95.2	13	--
SVE-9 [4]	03/29/12	-115.6	17	--
SVE-9	03/30/12	-122.4	17	30.6
SVE-9	04/11/12	-115.6	13	5
SVE-9	04/16/12	-122.4	7	--
SVE-9	04/23/12	-122.4	4	--
SVE-9	04/30/12	-122.4	22	--
SVE-9	05/07/12	-122.4	8	--
SVE-9	05/09/12	-108.8	13	4.3
SVE-9	05/14/12	-108.8	10	--
SVE-9	05/21/12	-108.8	25	--
SVE-9	05/30/12	-108.8	25	--
SVE-9	06/04/12	-108.8	22	--
SVE-9	06/11/12	-108.8	22	--
SVE-9	06/12/12	-108.8	18	6.9
SVE-9	06/14/12	-98.6	17	--
SVE-9	06/18/12	-81.6	12	--
SVE-9	06/25/12	-81.6	14	--
SVE-9	07/02/12	-81.6	12	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-9	07/09/12	-81.6	15	--
SVE-9	07/10/12	-74.8	17	12
SVE-9	07/16/12	-81.6	15	--
SVE-9	07/23/12	-81.6	15	--
SVE-9	07/30/12	-81.6	13	--
SVE-9	08/06/12	-81.6	12	--
SVE-9	08/14/12	-77.5	20	28.9[6]
SVE-9	08/20/12	-81.6	15	--
SVE-9	08/27/12	-68.0	15	--
SVE-9	09/04/12	-68.0	15	--
SVE-9	09/10/12	-68.0	15	--
SVE-9	09/12/12	-74.8	14	1.76
SVE-9	09/17/12	-68.0	12	--
SVE-9	09/24/12	-68.0	12	--
SVE-9	10/01/12	-68.0	12	--
SVE-9	10/08/12	-68.0	12	--
SVE-9	10/16/12	-95.2	20	0.2
SVE-9	10/22/12	-95.2	15	--
SVE-9	10/29/12	-95.2	20	--
SVE-9	11/05/12	-95.2	20	--
SVE-9	11/12/12	-95.2	20	--
SVE-9	11/14/12	-95.2	17	0.6
SVE-9	11/19/12	-95.2	17	--
SVE-9	11/26/12	-95.2	17	--
SVE-9	12/03/12	-95.2	15	--
SVE-9	12/10/12	-95.2	17	--
SVE-9	12/14/12	-108.8	18	--
SVE-9	12/17/12	-95.2	20	--
SVE-9	12/18/12	-108.8	17	2.7
SVE-9	01/02/13	--	10	--
SVE-9	01/07/13	-149.5	0	--
SVE-9	01/16/13	-136.0	8	0
SVE-9	01/21/13	-142.7	NM	--
SVE-9	01/28/13	-68.0	NM	--
SVE-9	02/04/13	-163.1	0	--
SVE-9	02/11/13	-95.2	0	--
SVE-9	02/15/13	-95.2	17	11.7
SVE-9	02/18/13	-81.6	NM	--
SVE-9	02/22/13	-115.6	9	--
SVE-9	02/24/13	-136.0	10	--
SVE-9	03/04/13	-108.8	10	--
SVE-9	03/13/13	-95.2	18	8.6
SVE-9	03/18/13	-108.8	24	--
SVE-9	03/25/13	-95.2	25	--
SVE-9	04/01/13	-122.4	18	--
SVE-9	04/02/13	-122.4	25	--
SVE-9	04/04/13	-108.8	23	--
SVE-9	04/09/13	-136.0	23	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

		System Manifold		
Well ID	Date	Vacuum (in H_20)	Flow Rate (cfm)	VOCs (ppm)
SVE-9	04/15/13	-122.4	18	--
SVE-9	04/16/13	-108.8	25	--
SVE-9	04/18/13	-122.4	22	--
SVE-9	04/19/13	-122.4	20	--
SVE-9	04/21/13	-108.8	20	--
SVE-9	04/22/13	-108.8	20	2.7
SVE-9	05/14/13	-82.0	23	10.2
SVE-9	05/20/13	--	23	--
SVE-9	05/28/13	--	27	--
SVE-9	05/30/13	--	26	--
SVE-9	06/04/13	--	23	--
SVE-9	06/10/13	--	23	--
SVE-9	06/12/13	--	23	1.2
SVE-9	06/17/13	--	26	--
SVE-9	06/18/13	--	26	--
SVE-9	06/24/13	--	23	--
SVE-9	07/01/13	--	23	--
SVE-9	07/11/13	-74.8	23	2
SVE-9	07/15/13	-81.6	26	--
SVE-9	07/22/13	-81.6	23	--
SVE-9	07/30/13	-27.2	26	--
SVE-9	08/06/13	-40.8	--	--
SVE-9	08/12/13	-40.8	26	--
SVE-9	08/13/13	-40.8	23	0.6
SVE-9	08/19/13	-34.0	0	--
SVE-9	08/22/13	-40.8	19	--
SVE-9	08/26/13	-27.2	26	--

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Table 2. Extraction Well Manifold Monitoring Data, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

Start system at 1:15 pm on March 9, 2012.
Vacuum measured with inline vacuum gauge in units of in Hg. Vacuum converted to in H_2O for comparison.
Extraction well flow rate measured with inline air flow meter.
VOCs measured with a PID (calibrated to 100 ppm isobutylene).
System flow and vacuum variable due to freezing conditions at the influent lines starting 1/7/2013. System flow balanced by opening make-up air valve.
Interim system was shut down 4/29/2013. The permanent SVE system was started 5/13/2013.
Initial permanent system readings recorded 5/14/2013 after optimization. No makeup air is required for system operation.

[1]	Vacuum measured at well head at 12:55 pm.
[2]	Vacuum measured at well head at 5:30 pm.
[3]	System restarted with make-up air value open 100 percent to reduce backpressure on blower.
[4]	Make-up air valve closed to 50 percent open to continue operation of system consistent with previous settings.
[5]	Vacuum measured at well head indicates influence is still being achieved at this well.
[6]	PID results were analyzed from tedlar bag approximately four hours after collection due to instrument malfunction.
[7]	Gauge reading above calibrated range.
[8]	Influent flow inconsistent with previous readings.
--	Not monitored.
cfm	Cubic feet per minute.
in Hg	Inches of mercury.
in H_2O	Inches of water column.
NM	Not measurable.
PID	Photoionization detector.
ppm	Parts per million.
VOCs	Volatile organic compounds reported as isobutylene.

Table 3. Estimate of Post-Carbon Emissions, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

Date	Total VOC Concentration [1]	System Flow Rate	Emission Rate [2]
	µg/m^3	cfm	lb/hr
3/9/2012 [3]	16.03	450	--
3/10/2012	43.89	450	7.39E-05
3/11/2012	47.07	450	7.93E-05
3/16/2012	154.42	450	2.60E-04
3/23/2012	418.29	450	7.05E-04
3/30/2012 [4]	887.68	450	1.50E-03
4/11/2012	101.77	450	1.71E-04
5/9/2012	1,250.95	450	2.11E-03
6/12/2012	775.20	450	1.31E-03
7/10/2012	400.50	450	6.75E-04
8/14/2012	598.85	450	1.01E-03
9/16/2012	516.30	450	8.70E-04
10/16/2012 [5, 7]	496.55	450	8.36E-04
11/14/2012 [6, 7]	1,455.85	275	1.50E-03
12/18/2012 [7]	425.55	275	4.38E-04
1/16/2013	445.88	275	4.59E-04
2/15/2013	149.37	275	1.54E-04
3/13/2013	242.85	275	2.50E-04
4/23/2013	267.45	275	2.75E-04
5/14/2013	330.00	223	2.75E-04
6/13/2013	1,039.55	223	8.68E-04
7/15/2013	65.41	223	5.46E-05
8/13/2013	36.17	222	3.01E-05
		Average Emission Rate =	**6.31E-04** lb/hr
		NR 445 Emission Threshold =	**5.7** lb/hr

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Table 3. Estimate of Post-Carbon Emissions, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

[1] Total VOC concentration was based on the sum of all detected analyte concentrations in post-carbon effluent samples for dates shown. When compounds are not detected above the laboratory reporting limit, emissions are calculated using 1/2 the reporting limit.

[2] Emission rates were determined using the following equation:

$$\text{Emission Rate} = \text{Conc.} * \text{Flow Rate} * 60\ \text{min/hr} * (1\ m^3/35.31\ ft^3) * (1\ \text{lb}/4.54 \times 10^8\ \mu g)$$

[3] SVE system began operation on 3/9/2012.

[4] System was shut down between 3/24/2012 and 3/29/2012.

[5] System was shut down between 10/13/2012 and 10/16/2012.

[6] System was shut down between 11/13/2012 and 11/14/2012.

[7] System flow rate optimized 10/16/2012 by closing make-up air valve.

System flow variable due to freezing conditions at the influent lines starting 1/7/2013. System flow balanced by opening make-up air valve.

Interim system was shut down 4/29/2013. The permanent system was started 5/13/2013.

The initial permanent system sample was collected 5/14/2013 after system optimization.

No makeup air is required for permanent system operation.

cfm	Cubic feet per minute.
lb/hr	Pounds per hour.
$\mu g/m^3$	Micrograms per cubic meter.
VOC	Volatile organic compound.

Table 4. Estimate of Post-Carbon Emissions of Tetrachloroethene, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

Date	Total PCE Concentration [1]	System Flow Rate	Emission Rate [2]	Percent of NR 445 Emission Threshold [5]
	µg/m^3	cfm	lb/hr	%
3/9/2012 [3]	0.19	450	--	--
3/10/2012	0.38	450	6.32E-07	1.78E-06
3/11/2012	0.38	450	6.32E-07	1.78E-06
3/16/2012	93	450	1.57E-04	4.42E-04
3/23/2012	260	450	4.38E-04	1.24E-03
3/30/2012 [4]	660	450	1.11E-03	3.14E-03
4/11/2012	1.1	450	1.85E-06	5.23E-06
5/9/2012	240	450	4.04E-04	1.14E-03
6/12/2012	9.4	450	1.58E-05	4.47E-05
7/10/2012	2.7	450	4.55E-06	1.28E-05
8/14/2012	6.8	450	1.15E-05	3.24E-05
9/16/2012	13	450	2.19E-05	6.19E-05
10/16/2012 [6,8]	280	450	4.72E-04	1.33E-03
11/14/2012 [7,8]	1200	275	1.24E-03	3.49E-03
12/18/2012 [8]	240	275	2.47E-04	6.98E-04
1/16/2013	280	275	2.88E-04	8.14E-04
2/15/2013	30	275	3.09E-05	8.72E-05
3/13/2013	74	275	7.62E-05	2.15E-04
4/23/2013	4	275	4.32E-06	1.22E-05
5/14/2013	280	222	2.33E-04	6.58E-04
6/13/2013	920	223	7.68E-04	2.17E-03
7/15/2013	29	223	2.42E-05	6.84E-05
8/13/2013	8.1	222	6.73E-06	1.90E-05
		Average Emission Rate =	**2.52E-04**	**lb/hr**
		NR 445 Emission Threshold =	**35.4**	**lb/hr**

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Table 4. Estimate of Post-Carbon Emissions of Tetrachloroethene, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

[1] VOC concentration was based on the detected analyte concentration in post-carbon effluent samples for dates shown. When compound was not detected above the laboratory reporting limit, emissions were calculated using 1/2 the reporting limit.

[2] Emission rates were determined using the following equation:

$$\text{Emission Rate} = \text{Conc.} * \text{Flow Rate} * 60 \text{ min/hr} * (1 \text{ m}^3/35.31 \text{ ft}^3) * (1 \text{ lb}/4.54\text{x}10^8 \text{ µg})$$

[3] SVE system began operation on 3/9/2012.

[4] System was shut down between 3/24/2012 and 3/29/2012.

[5] Post-carbon emissions presented as a percentage of the threshold level using the following equation:

$$\text{Percent of Threshold} = (\text{Emission rate} / \text{NR 445 Emission Threshold}) * 100$$

[6] System was shut down between 10/13/2012 and 10/16/2012.

[7] System was shut down between 11/13/2012 and 11/14/2012.

[8] System flow rate optimized 10/16/2012 by closing make-up air valve.

System flow variable due to freezing conditions at the influent lines starting 1/7/2013. System flow balanced by opening make-up air valve.

Interim system was shut down 4/29/2013. The permanent system was started 5/13/2013.

The initial permanent system sample was collected 5/14/2013 after system optimization.

No makeup air is required for permanent system operation.

lb/hr	Pounds per hour.
µg/m^3	Micrograms per cubic meter.
PCE	Tetrachloroethene.

Table 5. Estimate of Post-Carbon Emissions of Trichloroethene, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

Date	Total TCE Concentration [1]	System Flow Rate [8]	Emission Rate [2]	Percent of NR 445 Emission Threshold [5]
	µg/m^3	cfm	lb/hr	%
3/9/2012 [3]	0.41	450	--	--
3/10/2012	0.80	450	1.35E-06	2.40E-06
3/11/2012	0.80	450	1.35E-06	2.40E-06
3/16/2012	1.1	450	1.85E-06	3.30E-06
3/23/2012	6.5	450	1.09E-05	1.95E-05
3/30/2012 [4]	24	450	4.04E-05	7.21E-05
4/11/2012	0.3	450	5.56E-07	9.91E-07
5/9/2012	16	450	2.69E-05	4.80E-05
6/12/2012	47	450	7.92E-05	1.41E-04
7/10/2012	19	450	3.20E-05	5.70E-05
8/14/2012	41	450	6.91E-05	1.23E-04
9/16/2012	43	450	7.24E-05	1.29E-04
10/16/2012 [6,8]	27	450	4.55E-04	8.11E-04
11/14/2012 [7,8]	59	275	6.07E-04	1.08E-03
12/18/2012 [8]	21	275	2.16E-04	3.85E-04
1/16/2013	25	275	2.57E-04	4.59E-04
2/15/2013	4	275	4.53E-05	8.07E-05
3/13/2013	7	275	7.20E-05	1.28E-04
4/23/2013	7	275	7.10E-05	1.27E-04
5/14/2013	10	222	8.32E-05	1.48E-04
6/13/2013	40	223	3.34E-04	5.95E-04
7/15/2013	1	223	9.18E-06	1.64E-05
8/13/2013	1	222	9.14E-06	1.63E-05
		Average Emission Rate =	**1.13E-04**	**lb/hr**
		NR 445 Emission Threshold =	**56.1**	**lb/hr**

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Table 5. Estimate of Post-Carbon Emissions of Trichloroethene, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

[1] VOC concentration was based on the detected analyte concentration in post-carbon effluent samples for dates shown. When compound was not detected above the laboratory reporting limit, emissions were calculated using 1/2 the reporting limit.

[2] Emission rates were determined using the following equation:

Emission Rate = Conc. * Flow Rate * 60 min/hr * (1 m^3/35.31 ft^3) * (1 lb/4.54x10^8 μg)

[3] SVE system began operation on 3/9/2012.

[4] System was shut down between 3/24/2012 and 3/29/2012.

[5] Post-carbon emissions presented as a percentage of the threshold level using the following equation:

Percent of Threshold = (Emission rate / NR 445 Emission Threshold) * 100

[6] System was shut down between 10/13/2012 and 10/16/2012.

[7] System was shut down between 11/13/2012 and 11/14/2012.

[8] System flow rate optimized 10/16/12 by closing make-up air valve.

System flow variable due to freezing conditions at the influent lines starting 1/7/2013. System flow balanced by opening make-up air valve.

Interim system was shut down 4/29/2013. The permanent system was started 5/13/2013.

The initial permanent system sample was collected 5/14/2013 after system optimization.

No makeup air is required for permanent system operation.

lb/hr	Pounds per hour.
μg/m^3	Micrograms per cubic meter.
TCE	Trichloroethene.

Table 6. Estimate of Post-Carbon Emissions of Cis-1,2-Dichloroethene, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

Date	Total cis-1,2-DCE Concentration [1]	System Flow Rate	Emission Rate [2]	Percent of NR 445 Emission Threshold [5]
	µg/m^3	cfm	lb/hr	%
3/9/2012 [3]	0.14	450	--	--
3/10/2012	0.28	450	4.72E-07	2.84E-07
3/11/2012	0.28	450	4.72E-07	2.84E-07
3/16/2012	2.0	450	3.37E-06	2.03E-06
3/23/2012	57	450	9.60E-05	5.78E-05
3/30/2012 [4]	69	450	1.16E-04	7.00E-05
4/11/2012	75	450	1.26E-04	7.61E-05
5/9/2012	930	450	1.57E-03	9.44E-04
6/12/2012	720	450	1.21E-03	7.31E-04
7/10/2012	260	450	4.38E-04	2.64E-04
8/14/2012	460	450	7.75E-04	4.67E-04
9/16/2012	420	450	7.07E-04	4.26E-04
10/16/2012 [6,8]	170	450	2.86E-04	1.72E-04
11/14/2012 [7,8]	130	275	1.34E-04	8.06E-05
12/18/2012 [8]	130	275	1.34E-04	8.06E-05
1/16/2013	110	275	1.13E-04	6.82E-05
2/15/2013	90	275	9.26E-05	5.58E-05
3/13/2013	100	275	1.03E-04	6.20E-05
4/23/2013	240	275	2.47E-04	1.49E-04
5/14/2013	8	222	6.32E-06	3.81E-06
6/13/2013	24	223	2.00E-05	1.21E-05
7/15/2013	1	223	6.59E-07	3.97E-07
8/13/2013	1	222	6.56E-07	3.95E-07
		Average Emission Rate =	**2.81E-04**	**lb/hr**
		NR 445 Emission Threshold =	**166**	**lb/hr**

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Table 6. Estimate of Post-Carbon Emissions of Cis-1,2-Dichloroethene, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

[1] VOC concentration was based on the detected analyte concentration in post-carbon effluent samples for dates shown. When compound was not detected above the laboratory reporting limit, emissions were calculated using 1/2 the reporting limit.

[2] Emission rates were determined using the following equation:

$$\text{Emission Rate} = \text{Conc.} * \text{Flow Rate} * 60\ \text{min/hr} * (1\ m^3/35.31\ ft^3) * (1\ lb/4.54 \times 10^8\ \mu g)$$

[3] SVE system began operation on 3/9/2012.

[4] System was shut down between 3/24/2012 and 3/29/2012.

[5] Post-carbon emissions presented as a percentage of the threshold level using the following equation:

$$\text{Percent of Threshold} = (\text{Emission rate} / \text{NR 445 Emission Threshold}) * 100$$

[6] System was shut down between 10/13/2012 and 10/16/2012.

[7] System was shut down between 11/13/2012 and 11/14/2012.

[8] System flow rate optimized 10/16/2012 by closing make-up air valve.

System flow variable due to freezing conditions at the influent lines starting 1/7/2013. System flow balanced by opening make-up air valve.

Interim system was shut down 4/29/2013. The permanent system was started 5/13/2013.
The initial permanent system sample was collected 5/14/2013 after system optimization.
No makeup air is required for permanent system operation.

lb/hr	Pounds per hour.
µg/m^3	Micrograms per cubic meter.
cis-1,2-DCE	cis-1,2-Dichloroethene

Table 7. Estimate of Post-Carbon Emissions of Vinyl Chloride, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

Date	Total VC Concentration [1]	System Flow Rate [8]	Emission Rate [2]	Emission Rate [2]	Percent of NR 445 Emission Threshold [5]
	µg/m^3	cfm	lb/hr	lb/yr	%
3/9/2012 [3]	0.19	450	--	--	--
3/10/2012	27	450	4.55E-05	0.398	0.05
3/11/2012	34	450	5.73E-05	0.502	0.06
3/16/2012	45	450	7.58E-05	0.664	0.08
3/23/2012	84	450	1.41E-04	1.239	0.15
3/30/2012 [4]	79	450	1.33E-04	1.166	0.14
4/11/2012	19	450	3.20E-05	0.280	0.03
5/9/2012	7.7	450	1.30E-05	0.114	0.01
6/12/2012	3.5	450	5.89E-06	0.052	0.01
7/10/2012	6	450	1.01E-05	0.089	0.01
8/14/2012	4	450	6.74E-06	0.059	0.01
9/16/2012	5	450	7.58E-06	0.066	0.01
10/16/2012 [6,8]	2	450	3.20E-06	0.028	0.00
11/14/2012 [7,8]	11	275	1.13E-05	0.099	0.01
12/18/2012 [8]	15	275	1.54E-05	0.135	0.02
1/16/2013	11	275	1.13E-05	0.099	0.01
2/15/2013	12	275	1.24E-05	0.108	0.01
3/13/2013	7	275	7.00E-06	0.061	0.01
4/23/2013	2	275	1.65E-06	0.014	0.00
5/14/2013	2	229	1.89E-06	0.017	0.00
6/13/2013	3	222	2.16E-06	0.019	0.00
7/15/2013	1	223	1.17E-06	0.010	0.00
8/13/2013	1	222	1.08E-06	0.009	0.00
	Average Emission Rate =		--	**0.260**	**lb/yr**
	NR 445 Emission Threshold =		--	**830**	**lb/yr**

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Table 7. Estimate of Post-Carbon Emissions of Vinyl Chloride, SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

[1] VOC concentration was based on the detected analyte concentration in post-carbon effluent samples for dates shown. When compound was not detected above the laboratory reporting limit, emissions were calculated using 1/2 the reporting limit.

[2] Emission rates were determined using the following equation:

Emission Rate = Conc. * Flow Rate * 60 min/hr * (1 m^3/35.31 ft^3) * (1 lb/4.54x10^8 μg) * 24 hr/day * 365 days/yr

[3] SVE system began operation on 3/9/2012.

[4] System was shut down between 3/24/2012 and 3/29/2012.

[5] Post-carbon emissions presented as a percentage of the threshold level using the following equation:

Percent of Threshold = (Emission rate / NR 445 Emission Threshold) * 100

[6] System was shut down between 10/13/2012 and 10/16/2012.

[7] System was shut down between 11/13/2012 and 11/14/2012.

[8] System flow rate optimized 10/16/2012 by closing make-up air valve.

System flow variable due to freezing conditions at the influent lines starting 1/7/2013. System flow balanced by opening make-up air valve.

Interim system was shut down 4/29/2013. The permanent system was started 5/13/2013.

The initial permanent system sample was collected 5/14/2013 after system optimization.

No makeup air is required for permanent system operation.

lb/yr	Pounds per year.
lb/hr	Pounds per hour.
μg/m^3	Micrograms per cubic meter.
VC	Vinyl Chloride.