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

ENVIRONMENT

Subject:

Bi-Monthly Progress Report, Madison-Kipp Corporation (MKC) Site, 201 Waubesa Street, Madison, Wisconsin.

Date:

September 14, 2012

Dear Ms. Hanefeld:

Contact:

Jennine Trask

On behalf of MKC, this Bi-Monthly Progress Report provides a summary of the activities completed from August 29 through September 12, 2012 as part of the MKC site located at 201 Waubesa Street in Madison, Wisconsin (site).

Phone:

414.277.6203

Tasks Completed – August 29 through September 12, 2012

Email:

Jennine.Trask@arcadis-us.com

The following tasks were completed during the period of August 29 through September 12, 2012 and are presented in chronological order.

Our ref:

WI001283.0006

- Participated in a meeting with the Wisconsin Department of Natural Resources (WDNR) on August 29, 2012 to discuss the supplemental investigation activities and provided updated polychlorinated biphenyl (PCB) and polycyclic aromatic hydrocarbon (PAH) soil data summary figures.
- Weekly soil vapor extraction (SVE) system monitoring and blower maintenance was performed by MKC personnel on September 4 and September 10, 2012. Monthly SVE system monitoring and sampling was completed by ARCADIS personnel on September 12, 2012. Data collected during the weekly and monthly Operation, Maintenance and Monitoring (OM&M) is included in Attachment A. The emission tables are also included in Attachment A. A review of the tables indicates the emission rates are several orders of magnitude lower than the NR445 Emission Value Threshold Values and therefore, carbon change-out is not currently

Imagine the result

scheduled. ARCADIS will continue to monitor the need for carbon changeout.

- Submitted the *Results of Soil Sampling* letter to the owners of property located at 102, 106, 110, 114, 118, 126, 128, 130, 134, 138, 142, 210, 214, 218, 222 and 230 South Marquette Street summarizing the soil sampling activities performed on the respective properties. Copies of these letters were also provided to the WDNR and Wisconsin Department of Health Services (WDHS), as well as Norm Berger where appropriate.
- Submitted the *Off-Site Residential Polycyclic Aromatic Hydrocarbon (PAH) Results Summary* letter to the WDNR on September 11, 2012.
- Submitted the *Summary of On-Site Analytical Results* table to WDNR on September 12, 2012.

Tasks In-Progress

The following tasks are scheduled to be completed between September 13 and September 26, 2012.

- Submittal of Site Investigation Work Plan Addenda.
- Submittal of the PCB summary letter providing the results of the PCB investigation and recommendations for remedial actions.
- Investigation activities related to Site Investigation Work Plan Addenda, upon WDNR approval.
- Perform weekly and monthly SVE system OM&M activities.
- Participate in bi-weekly conference calls with the WDNR.
- Preparation of an on-site pilot test work plan.

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
Project Engineer



Jennine L. Trask, PE
Project Manager

Attachments:

A SVE Summary Data Tables

Copies:

David Crass – Michael Best
Bradley Grams & Peter Ramanaukas, EPA Region V (electronic)
Mark Meunier – Madison Kipp
Bob Nauta – RJN Environmental Services (electronic)
Steve Tinker – Wisconsin Department of Justice (electronic)
Mike Schmoller – WDNR (electronic)

Table 1. Phase I SVE System Analytical Data, Madison-Kipp Corporation, Madison, Wisconsin.

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

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

The system operates with the dilution air valve 50 percent open to maintain system operation within maximum range of blower vacuum.

Influent sampling began on 3/16/12 to evaluate the effectiveness of carbon treatment.

System sampling occurred daily for the first three days of startup, weekly for the next three weeks, and monthly thereafter.

< Constituent not detected above noted laboratory detection limit.

-- 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 1. Phase I SVE System Analytical Data, Madison-Kipp Corporation, Madison, Wisconsin.

Well/Boring	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
Sample Date	3/30/2012	3/30/2012	4/11/2012	4/11/2012	5/9/2012	5/9/2012	6/14/2012	6/12/2012
1,1-Dichloroethene	<1.5	<0.12	<4	0.16 J	<4	<1.2	<5	<1.4
1,2,4-Trimethylbenzene	5.7 J	2.4	<0.98	<0.021	<4	<1.2	<5	<1.4
1,2-Dichloroethane	<1.6	<0.12	<0.84	<0.018	<4	<1.2	<5	<1.4
1,3,5-Trimethylbenzene	<2.6	0.69 J	<0.89	<0.019	<4	<1.2	<5	<1.4
1,4-Dichlorobenzene	<2.2	<0.18	<0.84	<0.018	<4	<1.2	<5	<1.4
Benzene	<0.9	0.57 J	11	0.15 J	<4	<1.2	<5	<1.4
Chloroethane	<0.8	0.56 J	<1.5	<0.033	<10	<3	<13	<3.5
Chloroform	<1.6	<0.12	<1.1	0.037 J	<4	<1.2	<5	<1.4
Chloromethane	<0.65	0.87 J	<1.6	0.6	<10	<3	<13	<3.5
cis-1,2-Dichloroethene	150	17	240	19	170	230	150	180
Dichlorodifluoromethane	<1.9	0.73 J	<0.94	0.47 J	<10	<3	<13	<3.5
Ethylbenzene	2.2 J	0.66 J	<0.7	<0.015	<4	<1.2	<5	<1.4
Methylene Chloride	<0.65	0.62 J	2.5 J B	0.16 J B	<10	<3	<13	<3.5
Styrene	<1.5	<0.12	<0.52	<0.011	<4	<1.2	<5	<1.4
Tetrachloroethene	890	98	700	0.16 J	440	36	580	<1.4
Toluene	6.1 J	2.7	1.2 J	<0.014	<4	2	<5	2.2
Trichloroethene	100	4.4	110	0.061 J	80	3	71	8.7
Trichlorofluoromethane	<1.7	<0.14	<0.98	0.12 J	<4	<1.2	<5	<1.4
Vinyl chloride	34	31	8.7 J	7.6	<4	3	<5	<1.4
Xylene (total)	10	3.5	<0.75	<0.016	<4	<1.2	<5	1.4
Xylene, o-	3.1 J	1.1	<0.75	<0.016	<4	<1.2	<5	<1.4

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

The system operates with the dilution air valve 50 percent open to maintain system operation within maximum range of blower vacuum.

Influent sampling began on 3/16/12 to evaluate the effectiveness of carbon treatment.

System sampling occurred daily for the first three days of startup, weekly for the next three weeks, and monthly thereafter.

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J Constituent concentration is an approximate value.

ppbv Parts per billion by volume.

Table 1. Phase I SVE System Analytical Data, Madison-Kipp Corporation, Madison, Wisconsin.

Well/Boring Sample Date	Influent	Effluent	Influent	Effluent
	7/10/2012	7/10/2012	8/14/2012	8/14/2012
1,1-Dichloroethene	<7.3	<0.4	<2	<1
1,2,4-Trimethylbenzene	<7.3	2	<2	3.4
1,2-Dichloroethane	<7.3	1.2	<2	<1
1,3,5-Trimethylbenzene	<7.3	0.62	<2	1.3
1,4-Dichlorobenzene	<7.3	1.5	<2	2
Benzene	<7.3	0.41	<2	<1
Chloroethane	<18	<1	<5	<2.5
Chloroform	<7.3	0.67	<2	<1
Chloromethane	<18	1.1	<5	<2.5
cis-1,2-Dichloroethene	190	65	51	120
Dichlorodifluoromethane	<18	<1	<5	<2.5
Ethylbenzene	<7.3	1.1	<2	<1
Methylene Chloride	<18	1.4	<5	<2.5
Styrene	<7.3	0.84	<2	<1
Tetrachloroethene	650	<0.4	250	<1
Toluene	<7.3	12	<2	1.2
Trichloroethene	96	3.4	27	7.6
Trichlorofluoromethane	<7.3	<0.4	<2	<1
Vinyl chloride	<7.3	2.4	<2	1.6
Xylene (total)	<7.3	4.1	<2	2.5
Xylene, o-	<7.3	1.1	<2	<1

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

The system operates with the dilution air valve 50 percent open to maintain system operation within maximum range of blower vacuum.

Influent sampling began on 3/16/12 to evaluate the effectiveness of carbon treatment.

System sampling occurred daily for the first three days of startup, weekly for the next three weeks, and monthly thereafter.

< Constituent not detected above noted laboratory detection limit.

-- Not monitored or sampled.

B Compound was found in the blank and sample.

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J Constituent concentration is an approximate value.

ppbv Parts per billion by volume.

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-1	3/9/12	-6.5	-88.4	20	109.7 ¹
SVE-1	3/9/12	-5.5	-74.8	30	47.4 ²
SVE-1	3/10/12	-6	-81.6	30	27.3
SVE-1	3/11/12	-6	-81.6	30	25.1
SVE-1	3/16/12	-5.5	-74.8	20	15.9
SVE-1	3/23/12	-6	-81.6	25	--
SVE-1	3/23/12	-6	-81.6	25	13.5
SVE-1	3/29/12 ³	-3	-40.8	20	--
SVE-1	3/29/12 ⁴	-4	-54.4	30	--
SVE-1	3/30/12	-5	-68.0	25	14.8
SVE-1	4/11/12	-5	-68.0	25	14.1
SVE-1	4/16/12	-5	-68.0	25	--
SVE-1	4/23/12	-5	-68.0	100	--
SVE-1	4/30/12	-5	-68.0	30	--
SVE-1	5/7/12	-5	-68.0	10	--
SVE-1	5/9/12	-5	-68.0	30	4.3
SVE-1	5/14/12	-5	-68.0	30	--
SVE-1	5/21/12	-5	-68.0	10	--
SVE-1	5/30/12	-4	-54.4	20	--
SVE-1	6/4/12	-5	-68.0	30	--
SVE-1	6/11/12	-5	-68.0	30	--
SVE-1	6/12/12	-4.5	-61.2	28	6
SVE-1	6/14/12	-3.5	-47.6	22	--
SVE-1	6/18/12	-2	-27.2	20	--
SVE-1	6/25/12	-2	-27.2	10	--
SVE-1	7/2/12	-2	-27.2	20	--
SVE-1	7/9/12	-2	-27.2	20	--
SVE-1	7/10/12	-2	-27.2	18	12.6
SVE-1	7/16/12	-2	-27.2	20	--
SVE-1	7/23/12	-2	-27.2	20	--
SVE-1	7/30/12	-2	-27.2	20	--
SVE-1	8/6/12	-2	-27.2	20	--
SVE-1	8/14/12	-2	-27.2	19	34.69
SVE-1	8/20/12	-2	-27.2	20	--
SVE-1	8/27/12	-2	-27.2	20	--
SVE-1	9/4/12	-1	-13.6	20	--
SVE-1	9/10/12	-2	-27.2	20	--
SVE-1	9/12/12	-2	-27.2	12	1.02
SVE-2	3/9/12	-3	-40.8	40	105.8 ¹
SVE-2	3/9/12	-4	-54.4	60	11.5 ²
SVE-2	3/10/12	-3.5	-47.6	55	10.3
SVE-2	3/11/12	-3.5	-47.6	50	8.2
SVE-2	3/16/12	-3.5	-47.6	50	5.3
SVE-2	3/23/12	-3.25	-44.2	40	--
SVE-2	3/23/12	-3.25	-44.2	40	6.1
SVE-2	3/29/12 ³	-1.5	-20.4	25	--
SVE-2	3/29/12 ⁴	-2.5	-34.0	37	--
SVE-2	3/30/12	-3	-40.8	40	6.9

Footnotes on Page 8.

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-2	4/11/12	-2.5	-34.0	35	6.3
SVE-2	4/16/12	-2.5	-34.0	40	--
SVE-2	4/23/12	-2.5	-34.0	120	--
SVE-2	4/30/12	-3	-40.8	40	--
SVE-2	5/7/12	-2.5	-34.0	30	--
SVE-2	5/9/12	-3	-40.8	35	2.6
SVE-2	5/14/12	-3	-40.8	50	--
SVE-2	5/21/12	-2.5	-34.0	45	--
SVE-2	5/30/12	-2.5	-34.0	40	--
SVE-2	6/4/12	-3	-40.8	45	--
SVE-2	6/11/12	-2.5	-34.0	45	--
SVE-2	6/12/12	-2.5	-34.0	40	6.6
SVE-2	6/14/12	-3.5	-47.6	25	--
SVE-2	6/18/12	-1	-13.6	20	--
SVE-2	6/25/12	-1	-13.6	20	--
SVE-2	7/2/12	<1 ⁵	NM	20	--
SVE-2	7/9/12	-1	-13.6	20	--
SVE-2	7/10/12	-1	-13.6	20	8.8
SVE-2	7/16/12	<1 ⁵	NM	10	--
SVE-2	7/23/12	<1 ⁵	NM	20	--
SVE-2	7/30/12	-1	-13.6	10	--
SVE-2	8/6/12	<1 ⁵	NM	20	--
SVE-2	8/14/12	--	-8.4	19	32.36
SVE-2	8/20/12	--	-8	20	--
SVE-2	8/27/12	--	-7	20	--
SVE-2	9/4/12	--	-6	20	--
SVE-2	9/10/12	--	-6	20	--
SVE-2	9/12/12	--	-6.5	20	22.26
SVE-3	3/9/12	-2.25	-30.6	60	85.3 ¹
SVE-3	3/9/12	-3	-40.8	85	5.92 ²
SVE-3	3/10/12	-2.5	-34.0	80	6.1
SVE-3	3/11/12	-2.5	-34.0	75	4.5
SVE-3	3/16/12	-2.5	-34.0	60	1.6
SVE-3	3/23/12	-3	-40.8	60	--
SVE-3	3/23/12	-3	-40.8	60	4.4
SVE-3	3/29/12 ³	-2	-27.2	30	--
SVE-3	3/29/12 ⁴	-2.5	-34.0	50	--
SVE-3	3/30/12	-4	-54.4	50	6.1
SVE-3	4/11/12	-3	-40.8	50	4.9
SVE-3	4/16/12	-2.5	-34.0	50	--
SVE-3	4/23/12	-2.5	-34.0	140	--
SVE-3	4/30/12	-2.6	-35.3	50	--
SVE-3	5/7/12	-3	-40.8	50	--
SVE-3	5/9/12	-3	-40.8	40	5.9
SVE-3	5/14/12	-3	-40.8	50	--
SVE-3	5/21/12	-3	-40.8	50	--
SVE-3	5/30/12	-3.5	-47.6	50	--
SVE-3	6/4/12	-3	-40.8	50	--

Footnotes on Page 8.

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-3	6/11/12	-2.5	-34.0	50	--
SVE-3	6/12/12	-2.25	-30.6	50	9.3
SVE-3	6/14/12	-2	-27.2	40	--
SVE-3	6/18/12	-1	-13.6	20	--
SVE-3	6/25/12	-1	-13.6	25	--
SVE-3	7/2/12	-1	-13.6	20	--
SVE-3	7/9/12	-1	-13.6	20	--
SVE-3	7/10/12	-1	-13.6	21	7.6
SVE-3	7/16/12	-1	-13.6	20	--
SVE-3	7/23/12	<1 ⁵	NM	20	--
SVE-3	7/30/12	-1	-13.6	20	--
SVE-3	8/6/12	<1 ⁵	NM	25	--
SVE-3	8/14/12	--	-9.8	21	33.73
SVE-3	8/20/12	--	-10.5	30	--
SVE-3	8/27/12	--	-9	20	--
SVE-3	9/4/12	--	-8	20	--
SVE-3	9/10/12	--	-9	20	--
SVE-3	9/12/12	--	-7	20	0.88
SVE-4	3/9/12	-6.5	-88.4	32.5	105.1 ¹
SVE-4	3/9/12	-6.5	-88.4	32	5.1 ²
SVE-4	3/10/12	-6.5	-88.4	30	2.1
SVE-4	3/11/12	-6.5	-88.4	28	5.2
SVE-4	3/16/12	-7	-95.2	28	3.1
SVE-4	3/23/12	-8	-108.8	27	--
SVE-4	3/23/12	-7	-95.2	27	9.7
SVE-4	3/29/12 ³	-3.5	-47.6	25	--
SVE-4	3/29/12 ⁴	-4.5	-61.2	30	--
SVE-4	3/30/12	-7	-95.2	25	10.3
SVE-4	4/11/12	-4	-54.4	20	10
SVE-4	4/16/12	-7.5	-102.0	17	--
SVE-4	4/23/12	-7.5	-102.0	20	--
SVE-4	4/30/12	-7.6	-103.3	27	--
SVE-4	5/7/12	-7	-95.2	18	--
SVE-4	5/9/12	-7	-95.2	18	9.4
SVE-4	5/14/12	-7	-95.2	20	--
SVE-4	5/21/12	-7	-95.2	30	--
SVE-4	5/30/12	-7	-95.2	33	--
SVE-4	6/4/12	-7	-95.2	30	--
SVE-4	6/11/12	-7	-95.2	30	--
SVE-4	6/12/12	-7	-95.2	23	8.3
SVE-4	6/14/12	-5.75	-78.2	23	--
SVE-4	6/18/12	-4	-54.4	17	--
SVE-4	6/25/12	-4	-54.4	18	--
SVE-4	7/2/12	-4	-54.4	18	--
SVE-4	7/9/12	-4	-54.4	20	--
SVE-4	7/10/12	-4.2	-57.1	22	9.8
SVE-4	7/16/12	-5	-68.0	20	--
SVE-4	7/23/12	-4	-54.4	18	--

Footnotes on Page 8.

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-4	7/30/12	-4	-54.4	18	--
SVE-4	8/6/12	-4	-54.4	18	--
SVE-4	8/14/2012 ⁶	-4.2	-57.1	27	32.28
SVE-4	8/20/12	-4	-54.4	18	--
SVE-4	8/27/12	-4	-54.4	18	--
SVE-4	9/4/12	-4	-54.4	20	--
SVE-4	9/10/12	-4	-54.4	20	--
SVE-4	9/12/12	-4	-54.4	17	1.58
SVE-5	3/9/12	-6.5	-88.4	35	47.2 ¹
SVE-5	3/9/12	-6.5	-88.4	34	15.0 ²
SVE-5	3/9/12	-0.49	-6.7	0	--
SVE-5	3/10/12	-6.5	-88.4	33	10.8
SVE-5	3/11/12	-6.5	-88.4	32	3.6
SVE-5	3/16/12	-6	-81.6	34	2.9
SVE-5	3/23/12	-7	-95.2	32	--
SVE-5	3/23/12	-6	-81.6	32	3
SVE-5	3/29/12 ³	-4.5	-61.2	30	--
SVE-5	3/29/12 ⁴	-5.5	-74.8	37	--
SVE-5	3/30/12	-7	-95.2	35	2.8
SVE-5	4/11/12	-6	-81.6	27	3.3
SVE-5	4/16/12	-6	-81.6	27	--
SVE-5	4/23/12	-6	-81.6	25	--
SVE-5	4/30/12	-7	-95.2	38	--
SVE-5	5/7/12	-6	-81.6	26	--
SVE-5	5/9/12	-6	-81.6	27	1
SVE-5	5/14/12	-6	-81.6	27	--
SVE-5	5/21/12	-6	-81.6	28	--
SVE-5	5/30/12	-6	-81.6	38	--
SVE-5	6/4/12	-6	-81.6	35	--
SVE-5	6/11/12	-6	-81.6	35	--
SVE-5	6/12/12	-5.25	-71.4	30	3.6
SVE-5	6/14/12	-5	-68.0	29	--
SVE-5	6/18/12	-4	-54.4	22	--
SVE-5	6/25/12	-4	-54.4	22	--
SVE-5	7/2/12	-4	-54.4	22	--
SVE-5	7/9/12	-4	-54.4	22	--
SVE-5	7/10/12	-3.2	-43.5	30	5.3
SVE-5	7/16/12	-4	-54.4	25	--
SVE-5	7/23/12	-4	-54.4	20	--
SVE-5	7/30/12	-5	-68.0	15	--
SVE-5	8/6/12	-4	-54.4	20	--
SVE-5	8/14/2012 ⁶	-4	-54.4	29	28.95
SVE-5	8/20/12	-5	-68.0	20	--
SVE-5	8/27/12	-4	-54.4	23	--
SVE-5	9/4/12	-5	-68.0	25	--
SVE-5	9/10/12	-5	-68.0	23	--
SVE-5	9/12/12	-3.75	-51.0	23	1.33

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-6	3/9/12	-8.5	-115.6	19	37.5 ¹
SVE-6	3/9/12	-8	-108.8	19	3.7 ²
SVE-6	3/10/12	-8	-108.8	20	1.3
SVE-6	3/11/12	-8	-108.8	20	2.8
SVE-6	3/16/12	-7.5	-102.0	16	1.9
SVE-6	3/23/12	-9	-122.4	--	--
SVE-6	3/23/12	-9	-122.4	17	2.2
SVE-6	3/29/12 ³	-6	-81.6	23	--
SVE-6	3/29/12 ⁴	-7	-95.2	24	--
SVE-6	3/30/12	-9	-122.4	17	2
SVE-6	4/11/12	-7	-95.2	17	2.3
SVE-6	4/16/12	-8	-108.8	5	--
SVE-6	4/23/12	-7.5	-102.0	19	--
SVE-6	4/30/12	-9	-122.4	25	--
SVE-6	5/7/12	-6	-81.6	18	--
SVE-6	5/9/12	-6	-81.6	13	0.5
SVE-6	5/14/12	-7	-95.2	15	--
SVE-6	5/21/12	-7	-95.2	25	--
SVE-6	5/30/12	-7	-95.2	24	--
SVE-6	6/4/12	-7	-95.2	20	--
SVE-6	6/11/12	-7	-95.2	20	--
SVE-6	6/17/12	-5	-68.0	15	--
SVE-6	6/23/12	-6	-81.6	15	--
SVE-6	6/12/12	-6.75	-91.8	16	3.1
SVE-6	6/12/12	-6	-81.6	15	--
SVE-6	6/12/12	-6	-81.6	16	--
SVE-6	6/14/12	-6	-81.6	19	--
SVE-6	6/18/12	-5	-68.0	15	--
SVE-6	6/25/12	-5	-68.0	15	--
SVE-6	7/2/12	-5	-68.0	15	--
SVE-6	7/9/12	-5	-68.0	15	--
SVE-6	7/10/12	-4.6	-62.6	21	3.9
SVE-6	7/16/12	-5	-68.0	15	--
SVE-6	7/23/12	-5	-68.0	15	--
SVE-6	7/30/12	-5	-68.0	13	--
SVE-6	8/6/12	-5	-68.0	12	--
SVE-6	8/14/2012 ⁶	-5	-68.0	18	24.71
SVE-6	8/20/12	-5	-68.0	12	--
SVE-6	8/27/12	-5	-68.0	8	--
SVE-6	9/4/12	-4	-54.4	12	--
SVE-6	9/10/12	-4	-54.4	12	--
SVE-6	9/12/12	-4.75	-64.6	10	0.79
SVE-7	3/9/12	-6	-81.6	40	96.2 ¹
SVE-7	3/9/12	-5.5	-74.8	30	11.8 ²
SVE-7	3/10/12	-5.5	-74.8	30	10.5
SVE-7	3/11/12	-5.25	-71.4	30	7.3

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-7	3/16/12	-5.5	-74.8	30	3.6
SVE-7	3/23/12	-6	-81.6	35	--
SVE-7	3/23/12	-6	-81.6	35	3.4
SVE-7	3/29/12 ³	-3.5	-47.6	20	--
SVE-7	3/29/12 ⁴	-4	-54.4	30	--
SVE-7	3/30/12	-5	-68.0	30	3
SVE-7	4/11/12	-4	-54.4	25	7
SVE-7	4/16/12	-5	-68.0	25	--
SVE-7	4/23/12	-5	-68.0	120	--
SVE-7	4/30/12	-5	-68.0	30	--
SVE-7	5/7/12	-5	-68.0	25	--
SVE-7	5/9/12	-5	-68.0	30	0.6
SVE-7	5/14/12	-5	-68.0	30	--
SVE-7	5/21/12	-5	-68.0	40	--
SVE-7	5/30/12	-4	-54.4	30	--
SVE-7	6/4/12	-5	-68.0	40	--
SVE-7	6/11/12	-4	-54.4	40	--
SVE-7	6/12/12	-4.5	-61.2	35	4
SVE-7	6/14/12	-3.5	-47.6	25	--
SVE-7	6/18/12	-2.5	-34.0	20	--
SVE-7	6/25/12	-2	-27.2	15	--
SVE-7	7/2/12	-2	-27.2	20	--
SVE-7	7/9/12	-1	-27.2	20	--
SVE-7	7/10/12	-2.4	-32.4	16	4.9
SVE-7	7/16/12	-1	-13.6	10	--
SVE-7	7/23/12	-1	-13.6	20	--
SVE-7	7/30/12	-1	-13.6	20	--
SVE-7	8/6/12	-2	-27.2	20	--
SVE-7	8/14/2012 ⁶	-2.3	-31.3	20	25.27
SVE-7	8/20/12	-2	-27.2	20	--
SVE-7	8/27/12	-1	-13.6	20	--
SVE-7	9/4/12	-1	-13.6	20	--
SVE-7	9/10/12	-1	-13.6	20	--
SVE-7	9/12/12	-2	-27.2	12	1.12
SVE-8	3/9/12	-7	-95.2	30	34.2 ¹
SVE-8	3/9/12	-7	-95.2	30	7.2 ²
SVE-8	3/10/12	-7	-95.2	31	4.3
SVE-8	3/11/12	-6.5	-88.4	33	6.7
SVE-8	3/16/12	-6.5	-88.4	32	2.4
SVE-8	3/23/12	-7	-95.2	35	--
SVE-8	3/23/12	-7	-95.2	35	2.5
SVE-8	3/29/12 ³	-5	-68.0	29	--
SVE-8	3/29/12 ⁴	-5.5	-74.8	35	--
SVE-8	3/30/12	-6	-81.6	37	2.9
SVE-8	4/11/12	-6	-81.6	27	2
SVE-8	4/16/12	-6	-81.6	25	--

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-8	4/23/12	-6	-81.6	25	--
SVE-8	4/30/12	-6	-81.6	40	--
SVE-8	5/7/12	-6	-81.6	25	--
SVE-8	5/9/12	-6	-81.6	27	0.5
SVE-8	5/14/12	-6	-81.6	27	--
SVE-8	5/21/12	-6	-81.6	38	--
SVE-8	5/30/12	-6	-81.6	38	--
SVE-8	6/4/12	-7	-95.2	35	--
SVE-8	6/11/12	-6	-81.6	35	--
SVE-8	6/12/12	-5.5	-74.8	28	3.4
SVE-8	6/14/12	-5	-68.0	27	--
SVE-8	6/18/12	-3	-40.8	18	--
SVE-8	6/25/12	-4	-54.4	20	--
SVE-8	7/2/12	-4	-54.4	18	--
SVE-8	7/9/12	-4	-54.4	20	--
SVE-8	7/10/12	-3.9	-53.0	24	4.3
SVE-8	7/16/12	-4	-54.4	22	--
SVE-8	7/23/12	-4	-54.4	20	--
SVE-8	7/30/12	-4	-54.4	20	--
SVE-8	8/6/12	-4	-54.4	18	--
SVE-8	8/14/2012 ⁶	-4	-54.4	27	23.24
SVE-8	8/20/12	-4	-54.4	25	--
SVE-8	8/27/12	-4	-54.4	22	--
SVE-8	9/4/12	-4	-54.4	22	--
SVE-8	9/10/12	-4	-54.4	25	--
SVE-8	9/12/12	-4	-54.4	21	1.95
SVE-9	3/9/12	-9.5	-129.2	13	196.1 ¹
SVE-9	3/9/12	-9	-122.4	15	172.1 ²
SVE-9	3/10/12	-9	-122.4	15	144.5
SVE-9	3/11/12	-9	-122.4	15	131.2
SVE-9	3/16/12	-9	-122.4	15	26.3
SVE-9	3/23/12	-9.5	-129.2	17	--
SVE-9	3/23/12	-10	-136.0	17	29.7
SVE-9	3/29/12 ³	-7	-95.2	13	--
SVE-9	3/29/12 ⁴	-8.5	-115.6	17	--
SVE-9	3/30/12	-9	-122.4	17	30.6
SVE-9	4/11/12	-8.5	-115.6	13	5
SVE-9	4/16/12	-9	-122.4	7	--
SVE-9	4/23/12	-9	-122.4	4	--
SVE-9	4/30/12	-9	-122.4	22	--
SVE-9	5/7/12	-9	-122.4	8	--
SVE-9	5/9/12	-8	-108.8	13	4.3
SVE-9	5/14/12	-8	-108.8	10	--
SVE-9	5/21/12	-8	-108.8	25	--
SVE-9	5/30/12	-8	-108.8	25	--
SVE-9	6/4/12	-8	-108.8	22	--

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

Well ID	Date	System Manifold			
		Vacuum (in Hg)	Vacuum (in H ₂ O)	Flow Rate (cfm)	VOCs (ppm)
SVE-9	6/11/12	-8	-108.8	22	--
SVE-9	6/12/12	-8	-108.8	18	6.9
SVE-9	6/14/12	-7.25	-98.6	17	--
SVE-9	6/18/12	-6	-81.6	12	--
SVE-9	6/25/12	-6	-81.6	14	--
SVE-9	7/2/12	-6	-81.6	12	--
SVE-9	7/9/12	-6	-81.6	15	--
SVE-9	7/10/12	-5.5	-74.8	17	12
SVE-9	7/16/12	-6	-81.6	15	--
SVE-9	7/23/12	-6	-81.6	15	--
SVE-9	7/30/12	-6	-81.6	13	--
SVE-9	8/6/12	-6	-81.6	12	--
SVE-9	8/14/2012 ⁶	-5.7	-77.5	20	28.9
SVE-9	8/20/12	-6	-81.6	15	--
SVE-9	8/27/12	-5	-68.0	15	--
SVE-9	9/4/12	-5	-68.0	15	--
SVE-9	9/10/12	-5	-68.0	15	--
SVE-9	9/12/12	-5.5	-74.8	14	1.76

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 H₂O for comparison.

Extraction well flow rate measured with inline air flow meter.

VOCs measured with a PID (calibrated to 100 ppm isobutylene).

- 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 valve 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.
- <1 Vacuum reading below minimum gauge reading of 1 inch of mercury. Vacuum gauge replaced on 8/1/12.
- Not monitored.
- cfm Cubic feet per minute.
- in Hg Inches of mercury.
- in H₂O 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, Phase I 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	633.45	450	1.07E-03

Average Emission Rate = 7.94E-04 lb/hr

NR 445 Emission Threshold = 5.7 lb/hr

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:

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

³ Phase I SVE system began operation on 3/9/12.

⁴ System was shut down between 3/24/12 and 3/29/12.

cfm Cubic feet per minute.
 lb/hr Pounds per hour.
 µg/m³ Micrograms per cubic meter.
 VOC Volatile organic compound.



Table 4. Estimate of Post-Carbon Emissions of cis-1,2-Dichloroethene, Phase I 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

Average Emission Rate = 4.33E-04 lb/hr

NR 445 Emission Threshold = 166 lb/hr

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:

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

³ Phase I SVE system began operation on 3/9/12.

⁴ System was shut down between 3/24/12 and 3/29/12.

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

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

cfm Cubic feet per minute.
 lb/hr Pounds per hour.
 µg/m³ Micrograms per cubic meter.
 cis-1,2-DCE cis-1,2-Dichloroethene



Table 5. Estimate of Post-Carbon Emissions of Tetrachloroethene, Phase I 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

Average Emission Rate = 2.15E-04 lb/hr

NR 445 Emission Threshold = 35.4 lb/hr

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:

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

³ Phase I SVE system began operation on 3/9/12.

⁴ System was shut down between 3/24/12 and 3/29/12.

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

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

cfm Cubic feet per minute.
 lb/hr Pounds per hour.
 µg/m³ Micrograms per cubic meter.
 PCE Tetrachloroethene.



Table 6. Estimate of Post-Carbon Emissions of Trichloroethene, Phase I SVE System, Madison-Kipp Corporation, Madison, Wisconsin.

Date	Total TCE 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	0.41	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

Average Emission Rate = 2.64E-05 lb/hr

NR 445 Emission Threshold = 56.1 lb/hr

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:

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

³ Phase I SVE system began operation on 3/9/12.

⁴ System was shut down between 3/24/12 and 3/29/12.

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

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

cfm Cubic feet per minute.
 lb/hr Pounds per hour.
 µg/m³ Micrograms per cubic meter.
 TCE Trichloroethene.



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

Date	Total VC Concentration ¹	System Flow Rate	Emission Rate ²	Percent of NR 445 Emission Threshold ⁵
	µg/m ³	cfm	lb/yr	%
3/9/2012 ³	0.19	450	--	--
3/10/2012	27	450	0.398	0.05
3/11/2012	34	450	0.502	0.06
3/16/2012	45	450	0.664	0.08
3/23/2012	84	450	1.239	0.15
3/30/2012 ⁴	79	450	1.166	0.14
4/11/2012	19	450	0.280	0.03
5/9/2012	7.7	450	0.114	0.01
6/12/2012	3.5	450	0.052	0.01
7/10/2012	6.0	450	0.089	0.01
8/14/2012	4.0	450	0.059	0.01

Average Emission Rate = 0.456 lb/yr

NR 445 Emission Threshold = 830 lb/yr

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:

$$\text{Emission Rate} = \text{Conc.} * \text{Flow Rate} * 60 \text{ min/hr} * (1 \text{ m}^3/35.31 \text{ ft}^3) * (1 \text{ lb}/4.54 \times 10^8 \text{ } \mu\text{g}) * 24 \text{ hr/day} * 365 \text{ days/yr}$$

³ Phase I SVE system began operation on 3/9/12.

⁴ System was shut down between 3/24/12 and 3/29/12.

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

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

cfm Cubic feet per minute.
 lb/yr Pounds per year.
 lb/hr Pounds per hour.
 µg/m³ Micrograms per cubic meter.
 VC Vinyl Chloride.