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N.W. Bernstein & Associates, LLC

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July 10, 2001

Michael McAteer Esq.,
US Environmental Protection Agency
Region 5
77 West Jackson Boulevard, HSR-6J
Chicago, IL 60604

Re: Enviro-Chem Site

Dear Mr. McAteer:

Enclosed please find the Restart Spike Test Report prepared by Versar Inc. dated March, 2001. If you have any questions regarding the enclosed, please feel free to call Roy Ball or me.

Best regards.

Sincerely,

Norman W. Bernstein

NWB/srm
enclosure

c.c. Myron Waters (IDEM) with enclosures
Roy O. Ball (Trustee) with enclosures

SVE RESTART SPIKE TEST REPORT

for

The Enviro-Chem Superfund Site
Indianapolis, Indiana

Prepared by

Versar, Inc
2558 Pearl Buck Road, Suite 1
Bristol, PA

March 2001

Purpose

This report presents the results obtained from four consecutive restart spike tests conducted to determine if the Soil Vapor Extraction (SVE) System at the Enviro-Chem Superfund Site located in Zionsville, Indiana, has met the Soil Vapor Criterion established in Revised Exhibit A

Background

Revised Exhibit A, Section 4.2, Soil Clean-up Verification establishes three criterion for determining when the soil clean-up objectives have been met: 1) Soil Vapor Criterion, 2) On-site Till Water Criterion, and 3) Soil Sampling Criterion. This report presents the results of the testing specified in Section 4.2.1, Soil Vapor Criterion. The procedure for the testing is specified in the 100% Revised Remedial Action Final Design Report (100% RRAFDR). The procedure for evaluating the SVE vapors is a two step process:

Step 1 - Two consecutive rounds of sampling that show all test points (manifolds) having contamination levels below those specified in Revised Exhibit A, Table 4-1, Soil Vapor Concentration in Equilibrium with Acceptable Soil Concentrations.

Step 2 - Four consecutive restart spikes, conducted at two-week intervals, having contamination levels in the common manifold below those specified in Table 4-1

Step 1 was completed in October 2000 and recorded in Versar's October 24, 2000 report On October 31, 2000, Versar submitted a proposed revision to the restart spike vapor sampling procedure specified in the 100% RRAFDR, Volume 2, QAPP/Field Sampling Plan, Section 6.1, Extracted Soil Vapor. The revision was necessary due to operational constraints resulting from the high vacuum pressure (i.e., 9 to 10 inches of Hg) in the SVE manifolds that prevented the use of the specified personal sampling pump On November 21, 2000, the USEPA approved the revised procedure (a copy is attached)

Step 2, the four SVE restart spike tests, was conducted at consecutive two-week intervals, beginning on Thursday, December 7, 2000 and following on December 21, 2000, January 4, 2001, and January 18, 2001 For each event all SVE manifolds were operating at a vacuum of 9 to 10 inches of Hg vacuum for a period of eleven days, followed by a three-day period without vacuum pumping (each manifold valve was closed) Oversight of the testing was performed by CH2M Hill

Restart Spike Testing

On each of the restart spike test days the following procedure was followed:

- Prior to placing the manifolds under vacuum, each manifold was checked for accumulated water and emptied, if water was present

- The train of SVE vapor sampling equipment was assembled in accordance with the approved Spike Testing Procedure Schematic (attached). With the sampling isolation valve closed, the sampling train was operated until the pressures stabilized.

- The two mass-flow meters, one for VOC's and one for phenol, were calibrated. A Gilibrator bubble-type primary calibration unit that had a current factory calibration certification was used for calibration. Each calibration consisted of three tests, averaged

- With the manifold valves still closed, new sorbent tubes were installed in the sampling system and the system was allowed to stabilize at a vacuum pressure that was lower than the SVE system vacuum level would be (8 to 10 inches Hg vacuum for the system versus 11 inches Hg vacuum for the sampling system)

- The SVE restart spike test was started by opening all of the SVE manifold valves to the vacuum pumping system.

- Within 30 minutes of all manifold valves being opened, the sampling system isolation valve was opened, exposing the sorbent tubes to the SVE vapors This event began the five-hour restart spike test vapor sampling.

- Readings of the two mass-flow meters were recorded at five-minute intervals throughout the five-hour test Periodically, readings of the vacuum pressure in the SVE common manifold and the sampling system were recorded to show a consistent pressure differential.

- At the end of five hours, the sampling system isolation valve was closed and the sorbent tubes were removed and sealed

- A post-test calibration of the mass-flow meters was conducted using the procedure outlined above

- The pre-test and post-test calibrations were averaged and the corrected flow rates sent to a laboratory with the sorbent tubes for analysis

Conclusions:

A summary of the laboratory analyses of the vapor samples obtained during each of the four SVE restart spike tests is attached as Table 1, VOCs and Table 2, SVOCs There were no exceedances of the levels specified in Revised Exhibit A, Table 4-1.

In summary, the two-step process defined in the 100% RRAFDR for the testing of the SVE vapors to meet the Soil Vapor Criterion has been successfully completed

ATTACHMENTS

Table 1, VOC Laboratory Results

Table 2, SVOC Laboratory Results

Spike Test Logs 1 to 4

U.S.EPA Approval of Test Procedure Revision

Revised SVE & Spike Testing Procedures

Table VOC Spike Testing Results for Enviro-Chem Site

Units = ppm

Sample / Manifold #	VC	Acetone	1,1DCE	MC	Trans-1,2DCE	MEK	Cis-1,2-DCE	TCA	TCE	MIBK	1,1,2-TCA	Toluene	PCE	Ebenz	Xylenes	Total VOCs
Spike Test #1 12/7/00																
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spike Test #2 12/22/00																
A	0.00	0.00	0.00	0.00	0.00	0.00	5.74	2.64	1.60	0.00	0.00	0.00	0.36	0.00	0.00	10.35
BLANK A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spike Test #3 1/4/01																
A	2.29	0.00	0.21	0.00	0.00	0.00	10.40	7.64	2.37	0.00	0.00	0.00	0.54	0.00	0.00	23.45
BLANK A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spike Test #4 1/18/01																
A	0.81	0.00	0.00	0.00	0.00	0.00	8.85	4.52	2.37	0.00	0.00	0.00	0.56	0.00	0.00	17.11
BLANK A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Detection Limit	0.81	1.18	0.49	0.81	0.54	0.87	0.54	0.38	0.39	0.54	0.38	0.56	0.35	0.46	0.48	
Vapor Cleanup Standard	338,808	244	461	22	880	13	880	1,442	68	159	1	27,090	16	8,076	130,244	

Manifold #	Phenol (F & B)	1,3-Dichlorobenzene (Front)	1,2-Dichlorobenzene (Back)	Total SVOCs
Spike Test #1 12/7/00				
SS2	0.00	0.00	0.00	0.00
Blank SS2	0.00	0.00	0.00	0.00
Spike Test #2 12/22/00				
B	0.00	0.00	0.00	0.00
Blank B	0.00	0.00	0.00	0.00
Spike Test #3 1/4/01				
B	0.00	0.00	0.00	0.00
Blank B	0.00	0.00	0.00	0.00
Spike Test #4 1/18/01				
B	0.00	0.00	0.00	0.00
Blank B	0.00	0.00	0.00	0.00
Detection Limit	0.76	0.16	0.16	
Vapor Cleanup Standard	1.3	1466	1486	

ENVIRO-CHEM
SPIKE TEST No.1 LOG, 12/7/00

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
0	36	41	8.0	11.0
5	37	40	8.7	10.0
10	39	40	8.7	10.5
15	35	38	8.7	11.0
20	42	38	8.7	10.5
25	36	38	8.6	10.5
30	37	38	8.7	10.0
35	44	37	8.7	11.0
40	42	37	8.7	10.5
45	40	37	8.7	10.0
50	42	37	8.8	10.5
55	43	36	8.8	10.5
60	38	36	8.7	10.5
65	38	36	8.6	10.5
70	38	36	8.7	10.5
75	37	35		
80	42	35		
85	38	37	8.7	10.5
90	38	37		
95	37	37		
100	37	36		
105	37	36		
110	37	36	8.7	10.5
115	37	36		
120	37	36		
125	37	36		
130	37	35	8.7	10.5
135	41	35		
140	37	30	8.7	10.5
145	37	35		
150	37	35		
155	37	35		
160	37	35	8.7	10.5
165	37	35		
170	37	39		
175	37	37	8.7	10.5
180	37	37		
185	37	37		
190	37	37	8.7	10.5
195	37	37		

ENVIRO-CHEM
SPIKE TEST No.1 LOG, 12/7/00

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
200	37	37		
205	37	37	8.7	10.5
210	37	37		
215	37	36		
220	37	37		
225	36	37		
230	37	36		
235	37	36	8.7	10.5
240	37	36		
245	37	35		
250	35	37		
255	37	35		
260	38	35	8.7	10.5
265	37	35		
270	37	35		
275	37	35		
280	37	35		
285	37	34		
290	37	35		
295	38	34	8.7	10.5
300	38	34		
AVERAGE	37.71	36.21		

FINAL CALIBRATION:

Test #	Flowmeter A	Gilabrator	Flowmeter B	Gilabrator
1	37.00	40.22	31.00	30.66
2	36.00	39.80	29.00	28.76
3	36.00	39.43	27.00	27.63
AVERAGE	36.33	39.82	29.00	29.02
Correction Factor	1.096		1.00069	

Actual Test Average Flow Rate, cc/minute **37.71 x 1.096 = 41.33** **36.21 x 1.00069 = 36.23**

ENVIRO -CHEM
SPIKE TEST No.2 LOG, 12/21/00

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
0	34	39	8.4	11.0
5	33	38	8.4	11.0
10	33	39	8.4	11.0
15	33	39	8.4	11.0
20	33	39	8.4	11.0
25	33	39	8.4	11.0
30	33	38	8.5	11.0
35	33	38	8.5	11.0
40	32	38	8.5	11.0
45	33	38	8.5	11.0
50	32	38		
55	33	38		
60	33	38	8.5	11.0
65	33	38		
70	33	38		
75	32	38	8.5+	11.0
80	33	38		
85	33	38	8.6	11.0
90	33	38		
95	33	38	8.6	11.0
100	33	38		
105	33	38	8.6	11.0
110	33	38		
115	33	38	8.6	11.0
120	33	38		
125	32	38	8.6	11.0
130	33	38		
135	33	38	8.6	11.0
140	33	38		
145	33	38	8.6	11.0
150	33	38		
155	33	38		

ENVIRO -CHEM

SPIKE TEST No.2 LOG, 12/21/00

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
160	33	38	8.6	11.0
165	33	38		
170	33	38	8.6	11.0
175	33	38		
180	33	38	8.6	11.0
185	33	39		
190	33	38/39		
195	33	38	8.6	11.0
200	33	38		
205	33	38/39	8.6	11.0
210	33	39		
215	33	38/38		
220	33	38/39	8.6	11.0
225	33	38/39		
230	33	38/39		
235	33	38/39	8.6	11.0
240	33	38/39		
245	33	38/39		
250	33	39	8.6	11.0
255	33	38		
260	33	39		
265	33	39	8.6	11.0
270	33	39		
275	33	39		
280	33	38/39	8.6	11.0
285	32/33	38/39		
290	32/33	38/39	8.6	11.0
295	32/33	38/39		
300	32/33	38	8.6	11.0
AVERAGE	32.95	38.25		

ENVIRO -CHEM
SPIKE TEST No.2 LOG, 12/21/00

INITIAL CALIBRATION (Pre-Test):

Test #	Flowmeter A	Gilabrator	Flowmeter B	Gilabrator
1	33	39.39	39	40.37
2	33	39.43	39	40.40
3	33	39.49	39	40.42
AVERAGE	33.00	39.44	39.00	40.40
Correction Factor	1.195		1.036	

FINAL CALIBRATION (Post -Test):

Test #	Flowmeter A	Gilibrator	Flowmeter B	Gilibrator
1	33	39.69	39	40.46
2	33	39.58	39	40.39
3	33	39.66	39	40.33
AVERAGE	33	39.64	39	40.39
Correction Factor	1.201		1.036	
Combined Correction	1.198		1.036	

Actual Test Average Flow Rate, cc/minute	**32.95 x 1.198 = 39.47**	**38.25 x 1.036 = 39.63**

ENVIRO-CHEM

SPIKE TEST # 2, 12/21/00

MANIFOLD AIRFLOW RATE, FPM

Manifold Number	8:45 AM	10:45 AM	12:45 PM	Manifold Number	8:45 AM	10:45 AM	12:45 PM	Manifold Number	8:45 AM	10:45 AM	12:45 PM
1	75	50	50	16	25	50	50	31	*	*	*
2	25	50	25	17	25	10	10	32	PLUGGED		
3	25	25	25	18	50	10	0	33	50	*	*
4	75	50	50	19	25	75	0	34	PLUGGED		
5	100	75	225	20	75	50	50	35	25	*	*
6	25	50	75	21	425	10	10	36	SAND		
7	25	50	25	22	100	100	100	37	50	50	25
8	10	10	25	23	50	50	50	38	25	25	25
9	150	75	75	24	25	25	25	39	25	50	75
10	75	10	25	25	125	75	75	40	150	200	200
11	50	10	25	26	50	50	25	41	25	50	50
12	50	50	25	27	250	100	75	42	25	25	50
13	10	10	10	28	25	25	10	Combined Flow, 12" diameter	175	175	225
14	50	25	25	29	75	25	25				
15	25	50	10	30	-	T-2 Well (OFF					

* = Invalid reading (meter "pegged"). Probably due to moisture.

ENVIRO-CHEM
SPIKE TEST No.3 LOG, 1/4/01

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
0	33	39	8.4	11.0
5	32	38	8.4	11.0
10	32	38	8.4	11.0
15	33	40	8.4	11.0
20	33	38	8.4	11.0
25	32	40	8.4	11.0
30	32	40	8.5	11.0
35	33	39	8.5	11.0
40	33	39	8.5	11.0
45	33	39	8.5	11.0
50	33	39		
55	33	39		
60	33	39		
65	33	39	8.5	11.0
70	33	39		
75	32/33	38/39		
80	33	39	8.5+	11.0
85	33	39		
90	33	39	8.6	11.0
95	33	39		
100	33	39	8.6	11.0
105	33	39		
110	33	39	8.6	11.0
115	33	39		
120	33	39	8.6	11.0
125	33	39		
130	33	39/40	8.6	11.0
135	34	40		
140	34	40	8.6	11.0
145	31	37		
150	33	39	8.6	11.0
155	33	39		

ENVIRO-CHEM
SPIKE TEST No.3 LOG, 1/4/01

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
160	33	39	8.6	11.0
165	33	39		
170	33	39	8.6	11.0
175	33	39		
180	33	39	8.6	11.0
185	33	39		
190	33	39	8.6	11.0
195	33	39		
200	33	39	8.6	11.0
205	33	39		
210	33	39	8.6	11.0
215	33	39		
220	33	39	8.6	11.0
225	33	39		
230	33	39	8.6	11.0
235	33	39		
240	33	39	8.6	11.0
245	33	39		
250	33	39	8.6	11.0
255	33	39		
260	33	39	8.6	11.0
265	33	39/40		
270	33/34	39/40	8.6	11.0
275	33/34	39/40		
280	33/34	39	8.6	11.0
285	33	39		
290	33	39	8.6	11.0
295	33	39		
300	33			
AVERAGE	**32.95**	**39.02**		

ENVIRO-CHEM
SPIKE TEST No. 3 LOG, 1/4/01

INITIAL CALIBRATION (Pre-Test):

Test #	Flowmeter A	Gilabrator	Flowmeter B	Gilabrator
1	33	40.00	39	40.96
2	33	39.89	39	40.95
3	33	39.92	39	40.90
AVERAGE	33.00	39.94	39.00	40.94
Correction Factor	1.210		1.050	

FINAL CALIBRATION (Post -Test):

Test #	Flowmeter A	Gilibrator	Flowmeter B	Gilibrator
1	33	39.55	39	41.43
2	33	39.47	39	41.44
3	33	39.49	39	41.46
AVERAGE	33	39.5	39	41.44
Correction Factor	1.197		1.063	
Combined Correction	1.204		1.057	

Actual Test Average Flow Rate, cc/minute	**32.95 x 1.204 = 39.67**	**39.02 x 1.057 = 41.24**

ENVIRO-CHEM

SPIKE TEST # 3, 1/4/01

MANIFOLD AIRFLOW RATE, FPM

Manifold Number	8:30 AM	10:30 AM	12:45 PM	Manifold Number	8:30 AM	10:30 AM	12:45 PM	Manifold Number	8:30 AM	10:30 AM	12:45 PM
1	100	50	50	16	50	25	25	31	25	10	10
2	25	0	0	17	100	175	10	32	PLUGGED		
3	75	0	0	18	10	10	10	33	25	50	75
4	75	50	40	19	125	25	25	34	PLUGGED		
5	125	175	75	20	150	50	50	35	75	50	50
6	200	25	50	21	25	25	10	36	SAND		
7	50	25	75	22	100	100	15	37	75	75	50
8	25	10	0	23	25	0	10	38	25	10	10
9	225	75	75	24	100	50	25	39	0	25	25
10	300	10	0	25	50	50	300	40	50	75	50
11	25	150	10	26	125	50	50	41	25	25	25
12	75	25	25	27	300	100	100	42	25	10	10
13	25	25	0	28	50	25	25				
14	25	25	25	29	100	25	25	Combined flow, 12" diameter	150	225	225
15	75	25	10	30	T-2 Well (OFF)						

* = Invalid reading (meter "pegged") Probably due to moisture

ENVIRO-CHEM
SPIKE TEST No.4 LOG, 1/18/01

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
0	33	39	8.8	11.0
5	35	41	8.8	11.0
10	33	39	8.8	11.0
15	32	38	8.8	11.0
20	32	40	8.8	11.0
25	33	39	8.8	11.0
30	33	38	8.8	11.0
35	33	38	8.8	11.0
40	33	38	8.8	11.0
45	33/34	39/40	8.8	11.0
50	33/34	39/40	8.8	11.0
55	33	39	8.8	11.0
60	33	39	8.8	11.0
65	33	39	8.8	11.0
70	33	39	8.9	11.0
75	33	39	8.9	11.0
80	33	37	8.9	11.0
85	33	38	8.9	11.0
90	33	39	8.9	11.0
95	33	39	8.9	11.0
100	32/33	39	9.0	11.0
105	32/33	39	9.0	11.0
110	32/33	39	9.0	11.0
115	32/33	39	9.0	11.0
120	32/33	39	9.0	11.0
125	32/33	39	9.0	11.0
130	33	39/40	9.0	11.0
135	33	39/40	9.0	11.0
140	33	39/40	9.0	11.0
145	33	39/40	9.0	11.0
150	32/33	39		
155	32/33	39		

ENVIRO-CHEM
SPIKE TEST No.4 LOG, 1/18/01

Minutes Time	VOCs Flowmeter A (cc/min)	Phenol, Flowmeter B (cc/min)	VP-2 Inlet Vacuum (Hg)	Sampling Discharge Vacuum (Hg)
160	32/33	39	9.0	11.0
165	32/33	39		
170	33	39	9.0	11.0
175	33	39		
180	33	39		
185	33	39	9.0	11.0
190	33	39		
195	33	39		
200	33	39	9.0	11.0
205	33	39		
210	33	39		
215	33	39	9.0	11.0
220	33	39		
225	33	39	9.0	11.0
230	33	39		
235	33	39		
240	33	39	9.0	11.0
245	33	39		
250	33	39		
255	33	39	9.0	11.0
260	33	39		
265	34	39		
270	33/34	39	9.0	11.0
275	34	39		
280	33	39	9.0	11.0
285	33	39		
290	33	39		
295	33	39	9.0	11.0
300				
AVERAGE	**32.98**	**39.03**		

ENVIRO-CHEM
SPIKE TEST No. 4 LOG, 1/18/01

INITIAL CALIBRATION (Pre-Test):

Test #	Flowmeter A	Gilabrator	Flowmeter B	Gilabrator
1	33	40.27	39	41.43
2	33	40.40	39	41.62
3	33	40.37	39	41.67
AVERAGE	33.00	40.35	39.00	41.57
Correction Factor	1.223		1.066	

FINAL CALIBRATION (Post-Test):

Test #	Flowmeter A	Gilibrator	Flowmeter B	Gilibrator
1	33	39.22	39	42.81
2	33	39.25	39	42.79
3	33	39.31	39	42.86
AVERAGE	33	39.26	39	42.82
Correction Factor	1.190		1.098	
Combined Correction	1.207		1.082	

Actual Test Average Flow Rate, cc/minute 32.98 x 1.207 = 39.81 39.03 x 1.082 = 42.23

ENVIRO-CHEM

SPIKE TEST # 4, 1/18/01

MANIFOLD AIRFLOW RATE, FPM

Manifold Number	9:00 AM	11:00 AM	1:00 PM	Manifold Number	9:00 AM	11:00 AM	1:00 PM	Manifold Number	9:00 AM	11:00 AM	1:00 PM
1	150	100	75	16	50	50	50	31	*	*	*
2	25	50	25	17	20	25	25	32	PLUGGED		
3	75	50	25	18	25	25	25	33	*	*	*
4	75	75	50	19	125	50	50	34	-		
5	250	225	200	20	100	75	75	35	75	75	*
6	50	50	50	21	225	50	500	36	SAND		
7	50	50	50	22	175	175	200	37	50	50	*
8	25	25	25	23	50	25	25	38	50	75	75
9	100	100	100	24	175	75	50	39	*	50	*
10	25	25	25	25	225	75	50	40	100	75	425
11	75	100	25	26	75	50	50	41	75	75	*
12	50	75	50	27	150	150	175	42	75	75	100
13	25	25	25	28	100	50	50				
14	50	50	25	29	*	*	25	Combined flow, 12" diameter	200	225	225
15	25	25	25	30	T-2 WELL						

* = Invalid reading (meter "pegged"). Probably due to moisture.

From: "Harrison, Tim/DAY" <tharriso@CH2M.com>
To: "Gaffney, Charles/Versar" <gaffncha@versar.com>
Date: 11/21/00 5:09PM
Subject: FW: EnviroChem Site

fyi

-----Original Message-----
From: Mcateer.Michael@epamail.epa.gov
[mailto:Mcateer.Michael@epamail.epa.gov]
Sent: November 21, 2000 4:00 PM
To: Anastgeo.bristol.bristol@versar.com
Cc: rhutchens@environcorp.com; Harrison, Tim/DAY;
Krueger.Thomas@epamail.epa.gov; wwaters@dem.state.in.us
Subject: EnviroChem Site

George:

U.S. EPA and our oversight consultant, CH2M Hill, have reviewed your letter submittal dated October 24, 2000, wherein the results of the October, 2000, Soil Vapor Extraction vapor monitoring sampling now show, for the second consecutive sampling round, that all contaminant levels in the manifolds are below the cleanup criteria listed in Revised Exhibit A, Table 4-1. Therefore, in accordance with Exhibit A to the ECC Consent Decree, restart spike testing may begin.

U.S. EPA and CH2M Hill have also reviewed your letter submittal dated October 31, 2000, wherein Versar proposes a modification to the Restart Spike Sampling method. U.S. EPA agrees with the described modification and therefore this method should be used to conduct the restart spike sampling. Versar has also requested that U.S. EPA approve the modified Soil Vapor Extraction System Sampling Protocol (SVESSP) used for the previous routine collection of vapor extraction samples. After discussing the reasoning for use of this method U.S. EPA agrees that the method was acceptable for its intended purpose.

Please note however, on page 3 of your letter dated October 31, that U.S. EPA does not believe it is appropriate to describe either U.S. EPA's or CH2M Hill's supposed beliefs regarding the use of vapor sampling or restart spikes. It would be preferable if this statement were retracted from your letter.

If you have any questions regarding this message, please feel free to contact me at 312/886-4663.

Mike McAteer
Remedial Project Manager

The phenol vapor samples will be collected as follows:

- A high vacuum sampling pump will be attached to the sampling tap installed in the SVE system. A 12-liter Tedlar bag will be connected to the discharge side of the sampling pump.
- The sample tap valve will be opened until the Tedlar bag is filled with vapor.
- The sampling tap valve will be closed at the end of the sampling interval.
- A calibrated personal sampling pump will be used to transfer vapor from the Tedlar bag through the XAD-7 sorbent NIOSH tube.
- The volume of vapor required (10 liters) to achieve the method detection limit will be pumped at a flow rate of 0.1 liters per minute for a total of 100 minutes.
- The activated XAD-7 tube will be removed, capped, placed in sealable plastic "whirl pak" bag (as supplied by the selected analytical laboratory), and labeled.
- The tubes will be carefully packed into new, clean paint cans with loose charcoal in the bottom, which will then be stored in a cooled container, separate from other types of environmental samples.

The soil vapor sampling procedures for VOCs and phenol analyses will be modified during the restart spike events by using a flow rate of 0.04 liters per minute for a total of 5 hours, starting 30 minutes after restarting the SVE system, as specified in Section 4.2.1 of Exhibit A. The procedures for collecting samples will be as follows (see attached Figure):

- The sampling port for collecting SVE vapors will be located in the vacuum piping downstream of the air/water separator, upstream of the vacuum pump, prior to the bleed air inlet point, and sufficiently distant from piping elbows.
- The sampling system will be connected to an isolation valve at the sampling port and will split the flow into two trains, one for the carbon sorbent (for VOCs) and one for the XAD-7 sorbent (for phenols). Each train will contain, in series, an isolation valve, sorbent tube(s), electronic mass flow meter, and a precision needle valve for calibrating flow.
- The two sampling trains will be connected to a pulsation-dampening chamber that will be evacuated by a diaphragm-type high vacuum sampling pump capable of producing vacuum pressure below 10 inches Hg vacuum.

- Prior to and again after each sampling event, the flow meter will be calibrated using a "Gilibrator" primary flow calibration device. The flow meter in each train will be calibrated at 0.04 liters per minute with a duplicate sorbent tube located between the calibrator and the flow meter. The flow rate will be set by adjusting the needle valve located between the flow meter and the vacuum source.

- The restart spike method requires that combined vapor samples be collected after each of four consecutive restart spikes, once every two weeks. Each restart spike requires shutting down the SVE system for three days. Then, beginning 30-minutes after restarting the SVE system, samples are collected using a flow rate of 0.04 liters per minute for five hours (total of 12 liters).

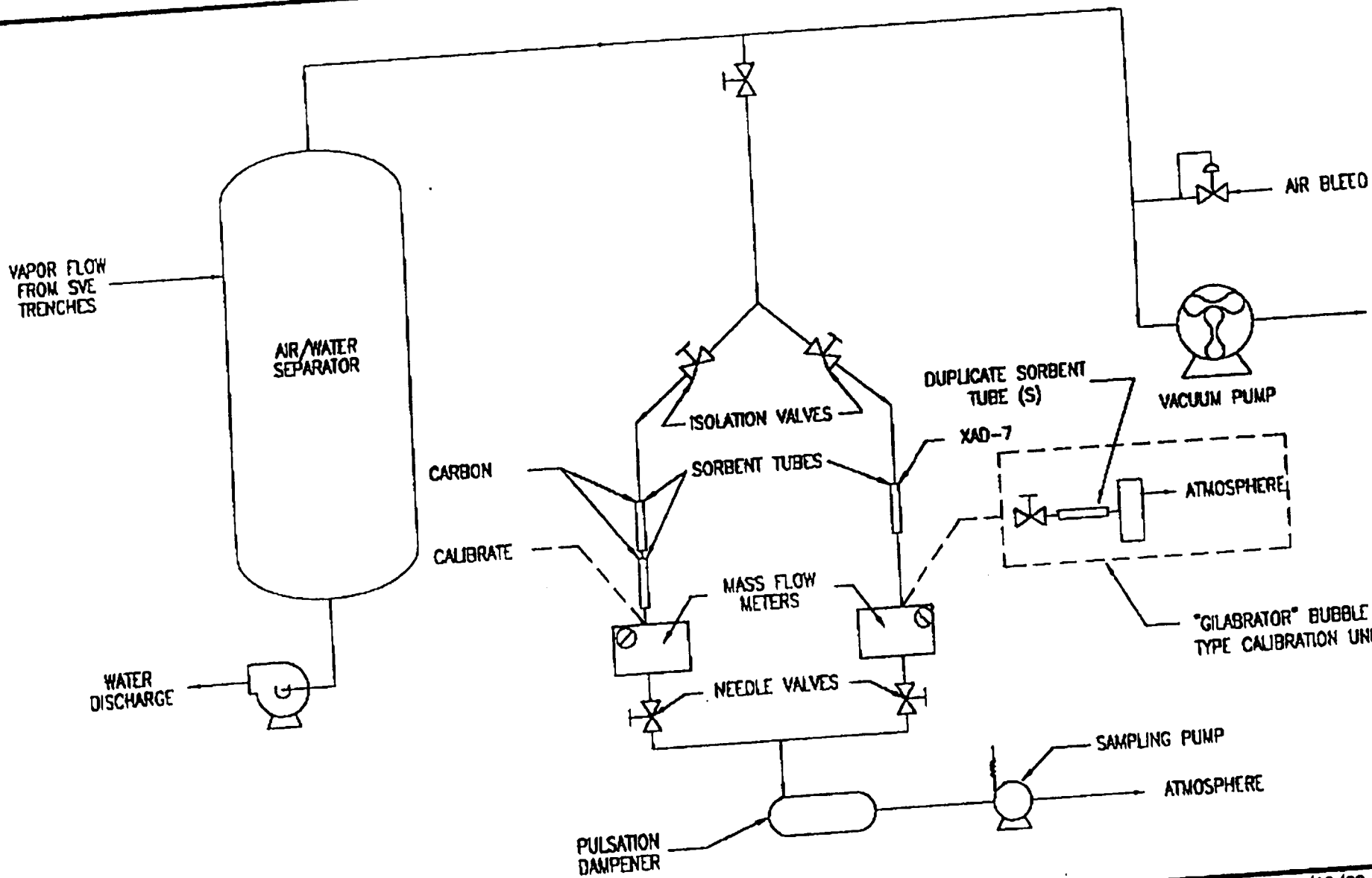
- To initiate a five hour sampling event, the sampling pump is started with the isolation valve closed and the pressure allowed to stabilize at a level that is lower than the SVE manifold pressure. The timing begins when the isolation valve is opened, drawing vapors through the sorbent tubes at the set flow rate.

- At five-minute intervals, the flow rate, sampling pump pressure, and SVE manifold pressure will be recorded. Adjustments to the needle valve will be made, if needed, to maintain the correct flow rate.

- The activated sorbent tubes will be removed after five hours, capped, placed in sealable plastic "whirl pak" bag (as supplied by the selected analytical laboratory), and labeled.

- The tubes will be carefully packed into new, clean paint cans with loose charcoal in the bottom, which will then be stored in a cooled container, separate from other types of environmental samples.

Decontamination of the vapor sampling equipment will be conducted prior to any sampling and between sampling events by purging the sampling train (except sorbent tubes) with nitrogen to remove any residual extracted soil vapor. Interconnecting tubing will be disposed of after each sampling event.



ENVIRO CHEM
SPIKE TESTING SCHEMATIC
ZIONSVILLE, IN

DATE:	10/18/00
DESIGNED BY:	CG
SCALE:	NTS
JOB NO.:	4037.253
DWG. NO.:	SAMPLE DIAGRAM

Versar INC.
1900 FROST ROAD, SUITE 110
BRISTOL, PA 19007