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THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 974

File:
M.D. 541 460 000.9
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Memorandum

To: Brian Renaghan, CIV AFCEE/EXA
Mike Dobbs, DES-DDC-EE

From: Tom Holmes
Steven Herrera, P.E.

Date: 8 January 2009

Re: **Fluvial Soil Vapor Extraction (SVE) – Operations Summary #8**
Dunn Field Source Areas Remedial Action
Defense Depot Memphis, Tennessee
FA8903-04-D-8722, TO 0031

This memorandum summarizes operations of the Fluvial SVE system from 1 August 2008 through 31 October 2008 (reporting period) and includes operational data and field and laboratory sampling results.

The Fluvial SVE system consists of two 13.1 hp regenerative blowers connected to seven SVE wells. The SVE wells have screen lengths of 25 to 35 feet with the screened interval ranging from 29 to 73 feet below ground surface. Condensate from the SVE wells is removed via a 140-gallon air/water separator and stored in a 535-gallon tank for analysis prior to discharge to the sewer system. If necessary to control VOC emissions, the extracted air flows through two 2,000-pound granular activated carbon (GAC) vessels prior to discharge. No emission controls are currently being used and extracted vapor is being emitted directly to atmosphere. There are 20 vapor monitoring points (VMPs) located 15 to 80 feet from the SVE wells. Fluvial SVE operations began on 25 July 2007. The Fluvial SVE system lay-out is shown on Figure 1.

FLUVIAL SVE OPERATIONS SUMMARY

System uptime was over 94% for the reporting period with both blowers in operation for 88% of the time. System shutdowns were made to collect photoionization detector (PID) measurements and laboratory samples at VMPs, perform general system maintenance, and replace the uninterruptable power supply (UPS). Blower #2 was offline for a six-day period in late August 2008 while the wiring was replaced to address problems with the wiring overheating. The system UPS malfunctioned in September 2008 and the system was unable to be started for a 2-day period; the UPS was replaced under manufacturer warranty. Quarterly laboratory samples were collected from SVE wells and system influent on 17 October 2008. The GAC treatment system remains offline due to low volatile organic compound (VOC) concentrations which are below Memphis Shelby County Health Department (MSCHD) permit limits.

System flow rates and vacuum measurements are shown on Table 1. Flow rates at individual wells are measured by a vane-type meters at the piping manifold. System flow rates are

measured by a mass-flow meter. The system is currently operated with all SVE wells in the 100% open position. Individual well flow rates during the reporting period varied from less than 20 to 180 actual cubic feet per minute (acfm) with both blowers operating and are similar to previous readings. The lower flow rates and higher vacuums at SVE-A and SVE-G are attributed to these wells being screened in tighter formations than other SVE wells. Combined flow from all SVE wells was approximately 750 standard cubic feet per minute (scfm) at 5.8 inches of mercury (in. Hg.) with both blowers operating.

Thermal SVE operations in the overlying loess affected fluvial SVE operations during the reporting period through increased influent air stream temperatures and an increase in condensate generation from approximately 50 gallons per day before TSVE operations to over 500 gallons per day during the reporting period. While most of the extracted water was collected in the system's air/water separator, additional water condensed on the discharge side of the blowers and heat exchangers. An improvised air/water separator was added in September as a temporary measure.

The increase in condensate flow rates resulted in erratic system air flow rates and vacuum as recorded by the system's air/mass meter and pressure transmitter. Measured higher flow rates and vacuums noted on Table 1 are due to slugs of water in the SVE lines being pulled through the system.

Vacuum measurements collected at vapor monitoring points (VMPs) during the reporting period are shown on Table 2. Measurements continue to indicate vacuum influence at distances greater than 80 feet from all SVE wells. Positive pressure was recorded at VMP-2B in September and October, apparently due to steam generation from the thermal SVE system. VMP-2B is a shallow well located in area with increased soil moisture due to standing water on the adjacent railroad property.

PID FIELD MEASUREMENTS

VOC concentrations are estimated through field measurements at individual SVE wells, system influent, and VMPs with a MiniRae 2000 (10.6 eV lamp) PID. PID measurements are made by drawing vapor into a tedlar bag using a sampling pump.

PID measurements from SVE wells and system influent are shown on Table 3. System influent PID measurements ranged from 15.5 to 129 parts per million (ppm) during the reporting period. Increases in PID measurements at several SVE wells (SVE-B, -C, -D, and -G) and the system influent since early June 2008 are attributed to thermal SVE operations; soil heating for the thermal SVE began on 27 May 2008. PID readings showed little variation at SVE-E and -F since the onset of thermal SVE operations. PID measurements at other wells peaked in September and October 2008 and have decreased since. This coincides with the approximate end of thermal SVE operations in selected treatment areas of Dunn Field. The trend in PID measurements at SVE wells are shown on Figure 2.

Quarterly PID measurements at VMPs were collected on 17 October 2008. The SVE system is shutdown for two to four hours prior to the measurements. The VMPs are purged using the sampling pump until three consecutive PID readings are within 10%. The final PID measurements at each VMP are shown on Table 4. PID measurements remain elevated and above pre-thermal SVE operations at several VMPs including VMP-1B, -2A, -3B, -4B, -6B, -7A, -7B, and -8B. At all other VMPs, except VMP-2B and -9B, PID readings are near levels

recorded prior to pre-thermal SVE operations, with most readings below 10 ppm. A PID reading could not be collected from VMP-2B as extracted vapor was too hot and began melting the tedlar bag. PID readings at VMP-9B continue to show a declining trend. Notable PID increases were seen at VMP-1B, -2A, and -8B. PID readings are generally higher at shallow (-B VMPs) wells than at deeper (-A wells) wells. The trend in PID measurements at -A VMPs is shown on Figure 3 and -B VMPs on Figure 4.

LABORATORY ANALYSES

Quarterly SVE Samples

Laboratory samples were collected from all SVE wells and the system influent on 17 October 2008 (4Q08 event). Samples were collected directly into Summa canisters at all sample locations. The field technician noted excess moisture had accumulated in the manifold piping; caused by the thermal SVE system. Attempts were made to remove the excess moisture prior to sampling. However, the laboratory rejected the sample at SVE-A at due to water in the Summa canister. SVE-A was re-sampled on 28 October using a modified collection technique by first drawing the vapor stream into a pipe immersed in an ice bath in an attempt to further condense the excess moisture that had accumulated in the well's manifold piping. The modified sample collection method was also used at SVE-A during the 3Q08 sample event.

Analytical results are shown on Table 5 for the influent system sample and on Table 6 for SVE well samples. Historical sample results for primary chlorinated volatile organic compound (CVOC) constituents at all SVE wells and system influent are on Table 7. Total CVOCs in the 4Q08 treatment system influent were 27,470 parts per billion by volume (ppbv). The primary CVOCs detected in the influent sample are similar to previous samples: trichloroethene (TCE) at 55%; 1,1,2,2-tetachloroethane (TeCA) at 24%; cis-1,2-dichloroethene (cDCE) at 8%, and chloroform at 8%. System influent concentration trends are plotted on Figure 5. The 4Q08 influent sample had higher CVOC concentrations, consistent with the trend in PID measurements.

4Q08 sample results show significant mass being extracted from SVE-C and SVE-D with total CVOC concentrations at these two wells at 60,590 ppbv and 84,280 ppbv, respectively. Each of the other five wells have total CVOC concentrations below 150 ppbv. For the second consecutive quarter, CVOC concentrations remain below 33 ppbv at SVE-A after being consistently above 5,000 ppbv in all events since system start up; this change is attributed to sampling collection methods described above as the majority of the CVOCs are condensing out as water during sample collection.

Additionally, the 4Q08 results showed 1,2,4-trimethylbenzene 1,3,5-trimethylbenzene, and xylene at SVE-C, SVE-D, and system influent at concentrations up to 6,900 ppmv. These compounds had not been detected above laboratory detection limits in previous sampling events. These compounds were detected in smaller concentrations in vapor sample results from the thermal SVE system and may be attributed to migration of these constituents from the loess to the fluvial sands. The primary CVOC in all SVE wells and system influent was TCE.

The trend in total laboratory VOC concentrations at all SVE wells and system influent is shown on Figure 6. Increases in total CVOC concentrations were seen at all sample locations except SVE-G. At SVE-G, total CVOC concentrations decreased to 112.4 ppbv from 3,212 ppbv in 3Q08. The drop in total CVOC concentrations at SVE-G is due to the large decline in chloroform and TCE concentrations.

FLUVIAL SVE MASS ESTIMATES

VOC concentrations in the influent sample (based on TCE, the primary constituent), system operating hours and flow rates were used to calculate the VOC mass removed from the fluvial soils. VOC concentrations used for mass calculations are shown on Table 8. Mass emission calculations are shown on Table 9.

Influent emission rates are estimated at 0.31 pounds per hour (lb/hr) over the reporting period. The MSCHD Operations Permit 01030-01PC for the Fluvial SVE system has a maximum VOC emission limit of 5.71 lb/hr. The Fluvial SVE system removed approximately 646 pounds of VOCs between the 3Q08 and 4Q08 sample events and 3,515 pounds of VOCs since system startup (Table 9).

CONCLUSIONS AND RECOMMENDATIONS

The fluvial SVE system continues to remove VOC mass from the fluvial subsurface. System uptime during the reporting period was above 94%. Approximately 3,515 pounds of VOCs have been removed from the subsurface since startup. The GAC filters remain offline with discharge directly to atmosphere based on continued emission rates well below permit limits.

4Q08 samples collected from SVE wells and system influent show that thermal SVE operations in the overlying loess formation are contributing to increases in CVOC concentrations at several wells and system influent, although more recent PID readings show that concentrations have begun to decline after peaking in September and October. PID readings also remain above pre-thermal SVE operations at several VMPs. Generally, shallower (-B wells) wells have higher PID readings than their deeper VMP counterparts (-A wells).

System influent total CVOC concentrations increased to 27,470 ppbv and are at levels not seen since August 2007. Similar increases were seen at SVE-C and SVE-D. These increases are considered due to elevated soil temperatures from thermal SVE operations mobilizing CVOCs from the loess into the upper fluvial sands. TCE continues to be the primary CVOC detected in the system influent (comprising 55% of the total concentration).

Based on the quarterly sample results and field measurements, VOC mass remains in the fluvial sands and continued SVE operations are warranted at all SVE wells. Weekly PID readings from the system influent and SVE wells will be used to monitor system emissions. The impact of the thermal SVE operations will diminish following shutdown of all heaters in November 2008. PID readings will be collected from VMPs on a quarterly basis. Laboratory samples will be collected from SVE wells and system influent in January 2009 (1Q09 event).

TABLES

TABLE 1
SYSTEM FLOW RATE AND VACUUM READINGS
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Date/Time of Recording	Number of Blowers in Operation	SVE-A		SVE-B		SVE-C		SVE-D		SVE-E		SVE-F		SVE-G		System	
		Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum (in. Hg.)[2]
7/25/2007 16:00	2	Readings not recorded.															
7/27/2007 07:45	2	60	5.0	150	3.0	160	2.5	145	3.0	145	3.0	145	3.0	50	5.0	785	4.86
7/28/2007 11:30	2	60	5.0	140	3.0	145	2.0	150	3.5	145	3.6	140	3.0	40	5.0	746	4.87
7/29/2007 07:40	2	60	5.5	140	3.0	145	2.0	150	3.5	150	4.0	140	3.0	30	5.0	741	5.03
7/30/2007 12:42	2	60	6.0	145	3.5	145	2.0	150	3.5	150	4.0	140	3.0	30	5.0	740	4.88
7/31/2007 10:59	2	60	5.4	145	3.5	148	2.1	150	3.5	150	3.9	140	3.0	40	5.0	738	4.93
8/1/2007 13:48	2	60	6.0	145	3.5	145	2.3	145	3.5	150	3.9	145	3.0	40	5.0	740	4.87
8/3/2007 12:00	Readings not recorded. [3]																
8/15/2007 13:00	1	20	3.0	100	2.0	115	<1 [4]	110	2.0	110	<1 [4]	110	<1 [4]	20	2.0	602	2.36
8/16/2007 12:30	1	40	3.0	100	2.0	100	<1 [4]	100	2.0	100	2.0	100	2.0	<20	1.5	597	2.74
8/17/2007 12:00	1	20	3.0	100	2.0	100	<1 [4]	100	2.0	100	1.5	100	1.5	<20	2.5	606	2.77
8/20/2007 07:34	1	20	3.2	100	2.0	100	<1 [4]	100	2.0	100	2.0	100	2.0	<20	3.0	609	2.87
8/21/2007 07:30	1	40	3.5	90	2.0	100	<1 [4]	100	2.0	90	<1 [4]	90	<1 [4]	<20	3.0	593	3.13
8/22/2007 07:45	1	50	4.0	100	2.0	100	<1 [4]	100	2.0	100	<1 [4]	100	<1 [4]	20	3.5	571	3.51
8/23/2007 08:30	1	50	4.0	90	2.0	90	<1 [4]	90	2.0	90	<1 [4]	90	<1 [4]	20	3.5	560	3.49
8/27/2007 06:58	1	50	4.0	95	2.0	90	1.0	85	2.0	90	2.0	90	1.0	20	3.5	563	3.59
8/28/2007 09:00	1	30	4.0	90	2.0	90	1.0	95	1.5	95	2.0	90	1.0	20	3.5	550	3.55
8/29/2007 06:55	1	40	4.0	95	1.0	90	<1 [4]	90	2.0	85	2.0	90	1.0	20	3.5	562	3.60
8/31/2007 08:00	2	50	4.5	130	3.5	170	3.0	145	3.5	130	3.5	130	3.5	20	4.0	870	3.93
9/4/2007 08:30	2	50	4.5	130	3.0	170	3.0	150	3.0	150	3.5	140	3.0	20	4.0	870	3.89
9/5/2007 09:20	2	50	5.0	150	4.0	190	3.0	170	4.0	150	4.0	160	3.5	50	4.5	802	4.64
9/7/2007 13:55	2	50	5.0	150	3.0	170	3.5	170	4.0	150	4.0	160	3.5	<20	4.5	800	4.82
9/14/2007 08:10	2	60	5.0	145	4.0	190	3.0	160	4.0	160	3.5	150	3.5	30	4.5	810	4.69
9/17/2007 07:59	2	60	5.0	145	4.0	190	3.0	160	4.0	170	3.0	150	3.5	20	4.5	800	4.71
9/19/2007 14:02	1	20	3.0	110	2.5	150	2.0	20	0.0	120	2.0	110	2.5	<20	3.0	579	2.74
9/21/2007 12:32	2	50	5.0	140	3.8	190	3.0	160	3.9	165	3.2	150	3.6	20	4.5	800	4.49
9/28/2007 08:20	2	50	5.0	145	3.6	200	3.2	160	4.0	170	3.3	150	3.6	20	4.4	806	4.75
10/5/2007 08:45	2	50	5.0	140	3.7	195	3.0	160	4.0	170	3.3	150	3.6	20	4.5	798	4.63
10/11/2007 11:55	2	50	5.0	150	4.0	195	3.5	160	4.0	165	3.5	155	4.0	<20	5.0	831	4.95
10/18/2007 07:50	2	50	5.0	150	4.0	200	3.5	160	4.0	180	3.5	150	4.0	<20	5.0	796	4.82
10/25/2007 12:05	2	60	5.0	150	4.0	200	3.5	170	4.0	180	3.0	160	4.0	20	5.0	805	5.02
11/1/2007 15:20	1	20	2.5	100	2.0	150	1.5	100	2.5	120	2.0	110	2.0	<20	2.0	615	2.38
11/9/2007 12:10	1	30	2.0	110	1.5	150	1.0	100	0.5	110	2.5	110	1.0	<20	1.5	605	2.48
11/15/2007 07:40	1	50	3.0	120	2.5	140	2.5	110	2.5	120	3.0	100	2.5	<20	3.0	600	2.80
11/21/2007 08:40	2	50	5.0	160	5.0	190	4.0	170	3.5	180	4.5	160	4.0	20	5.5	798	5.21
11/29/2007 09:00[5]	2	70	84	160	72	180	4.0	170	62	180	64	150	70	50	86	803	5.38
12/6/2007 07:40	2	70	90	160	80	180	4.0	170	64	180	66	160	70	20	88	794	5.42
12/21/2007 07:50	2	60	88	170	76	180	62	160	64	170	65	150	70	20	88	775	5.36
12/28/2007 14:00	2	60	88	170	78	190	62	160	66	190	66	150	70	30	88	793	5.50
1/4/2008 09:00	2	60	90	180	78	190	62	160	66	180	66	160	70	30	90	799	5.53
1/11/2008 07:00	2	60	88	170	76	180	62	160	64	180	66	150	70	50	88	794	5.37
1/17/2008 09:00	2	70	90	170	78	190	62	170	65	190	66	150	72	20	92	779	5.53
1/24/2008 07:30	2	70	92	180	80	190	64	170	68	190	68	150	74	40	94	800	5.62
2/1/2008 08:45	2	100	95	180	82	190	75	170	70	190	64	160	77	70	91	771	5.50
2/8/2008 08:00	2	90	91	180	79	190	64	170	66	190	66	160	72	70	92	783	5.48
2/15/2008 09:00	1	70	64	130	60	150	50	130	52	130	52	110	58	20	64	542	3.70
2/22/2008 07:15	1	50	66	140	60	150	46	130	52	130	61	110	56	50	64	554	3.48
2/29/2008 08:15	2	70	92	170	80	190	64	160	68	180	66	150	74	40	92	793	5.45
3/6/2008 07:15	2	90	90	180	79	190	64	180	66	190	66	160	74	50	92	773	5.49
3/14/2008 09:00	2	80	98	190	82	200	68	185	70	0[6]	0[6]	180	78	50	98	700	5.96
3/20/08 16:15[7]	2	120	98	0	0	200	70	190	72	0	0	0	0	50	100	700	6.14
3/27/2008 7:15[7]	2	110	98	0	0	200	66	180	68	0	0	0	0	50	100	730	5.96
4/3/2008 7:00[7]	2	90	100	0	0	200	70	190	70	0	0	0	0	30	100	700	6.09
4/10/2008 15:00[7]	2	80	94	0	0	190	65	175	68	0	0	0	0	50	96	644	6.37

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		Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum[2]	Flow rate (scfm)	Vacuum (in. Hg.)[2]
4/17/2008 16.15	2	90	82	150	64	190	58	170	56	190	56	170	60	40	82	821	4.84
4/18/2008 07:15	2	80	88	200	68	190	62	160	62	190	62	160	66	20	90	784	5.16
4/24/2008 11.30	2	70	86	185	67	180	62	160	64	180	62	170	64	20	88	800	5.08
5/2/2008 07:45	2	80	86	185	68	180	62	170	62	175	62	160	64	50	88	760	5.01
5/8/2008 07:45	2	60	84	180	66	180	62	160	62	170	61	160	64	20	88	775	5.00
5/15/2008 12:30	2	70	82	190	66	180	62	170	62	170	62	170	64	50	86	775	5.00
5/22/2008 08:45	2	100	82	190	66	190	62	170	62	180	62	170	64	70	86	778	5.03
5/30/2008 08:45	2	70	82	170	66	N/R[8]	62	165	62	175	60	160	65	20	87	765	4.92
6/5/2008 07:30	2	70	86	190	68	190	62	140	62	170	62	160	66	30	86	755	4.95
6/13/2008 09:26	2	70	86	180	66	200	64	150	64	180	64	150	68	40	88	745	5.01
6/19/2008 08:33	2	60	88	180	70	190	58	150	64	170	64	150	70	20	90	761	5.22
6/26/2008 08.09	2	90	88	190	70	200	60	160	64	180	66	160	72	40	90	744	5.20
7/3/2008 07:30	2	70	90	180	72	190	62	150	66	170	66	150	72	20	92	740	5.26
7/11/2008 07:20	2	80	90	180	74	200	60	150	66	180	66	160	74	50	92	724	5.32
7/16/2008 07:05	2	60	92	180	74	200	62	150	74	180	68	150	76	20	94	731	5.38
7/18/2008 09:10	2	90	92	190	74	200	62	160	66	180	66	140	76	20	92	734	5.30
7/24/2008 13:52	2	60	92	180	76	190	62	150	66	170	66	140	76	20	94	719	5.27
8/1/2008 12:16	2	60	92	180	76	140	60	150	68	170	68	150	76	20	94	705	5.30
8/7/2008 07:45	2	70	94	180	80	140	70	140	68	180	68	150	76	20	96	723	5.37
8/14/2008 09:40	2	50	92	170	80	160	70	150	68	170	70	160	76	30	94	711	5.34
8/20/2008 13.30	1	20	42	135	42	120	32	80	32	100	32	80	38	20	42	560	2.17
8/29/2008 08.42	2	20	66	140	58	120	52	100	48	140	50	140	55	20	62	875[9]	3.64
9/4/2008 10:00	2	20	64	140	60	110	54	100	50	170	50	110	56	20	64	875[9]	3.53
9/12/2008 09:20	2	<20	48	130	60	110	56	100	52	120	52	90	56	<20	64	875[9]	3.66
9/19/2008 10:00	2	100	100	170	90	160	90	160	78	140	86	150	86	50	>100	662	5.97
9/26/2008 07:20	2	50	>100	170	92	120	92	160	76	130	76	150	86	50	>100	846	6.05
10/2/2008 13:45	2	50	>100	170	92	120	94	160	74	120	90	150	87	60	>100	800	5.99
10/10/2008 08:37	2	80	>100	180	94	130	92	170	74	120	90	150	88	50	>100	848	6.00
10/17/2008 05:30	2	70	>100	170	94	120	94	170	76	130	88	150	88	50	>100	1000[10]	6.09
10/23/2008 09:15	2	100	>100	170	92	150	86	160	74	120	86	150	84	50	>100	1049[10]	5.90
10/31/2008 09:30	2	90	>100	170	95	140	93	170	78	120	92	150	88	80	>100	831	6.11

(1) - Vacuum measured at blower manifold.
(2) - For all wells, except SVE-C, units are in inches of water (in. H_2O) from 11/29/08 to present. For SVE-C, units are in in. H_2O from 12/21/08 to present. Otherwise, readings are in inches of mercury (in. Hg.)
(3) - To minimize system operation time, the SVE system was online for laboratory sampling only from 11:00 AM to 12:00 PM.
(4) - Readings below 1 in. Hg. are too low to be registered on vacuum gauges which have a span of 0 - 30 in. Hg.
(5) - Vacuum gauges with a smaller span installed on all wells but SVE-C (shipped inoperable) on 28 November 2007. New gauge are in units of inches of water (in. H_2O) and have spans of 0 to -100 in. H_2O (0 to 7.353 in. Hg.) Replacement gauge for SVE-C installed on 21 December 2007.
(6) - SVE-E damaged during other onsite remedial action activities and was offline during 3/14/08 inspection. No reading collected.
(7) -Rebound Event #1 occurred from 3/20/08 to 04/17/08. SVE-B, SVE-E, and SVE-F were offline during this period.
(8) - Gauge could not be read due to debris/grime in site glass.
(9) - Spare manifold legs were opened to lower blower amperage resulting in higher system flow rates, but lower individual well flow rates.
(10) - Higher system flowrates due to water in SVE lines (from thermal SVE system) causing erratic flow rates as slugs of water are pulled through the system.
SVE-D valve left in closed position following system tests on 9/19/07.
acfm: actual cubic feet per minute
N/R: not recorded
scfm standard cubic feet per minute
In. Hg. = inches of mercury
in. H_2O - inches of water
0.07353 x in. H_2O = in. Hg.

TABLE 2
SYSTEM VACUUM READINGS AT VMPs
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

VMP ID[2]	Closest SVE Well	Distance from Closest SVE Well (ft)	Vacuum Reading Recorded (in. H_2O) [1]																				
			8/20/07	8/20/07	8/31/07	9/7/07	9/14/07	9/17/07	11/29/07	12/6/07	1/11/08	1/24/08	2/22/08	3/6/08	3/22/08	4/01/08[3]	4/17/08[3]	5/13/08	6/26/08	7/16/08	8/25/08	9/26/08	10/17/08
VMP-1A	SVE-A	15.06	-5	-6	-8	-7	-8	-7	-9.6	-11.0	-11.0	-11.6	-8.0	-11.4	-13.4	-9.2	-8.8	-11.4	-12.2	-12.0	-11.2	-10.8	-10.8
VMP-1B	SVE-A	21.04	-5	-6	-8	-7	-7	-7	-9.6	-11.0	-11.2	-11.8	-8.0	-11.6	-13.6	-9.8	-8.9	-11.8	-12.2	-12.2	-11.5	-11.0	-10.5
VMP-2A	SVE-B	30.68	-6	-6	-8	-7	-8	-7	-10.0	-11.4	-11.5	-12.0	-7.0	-12.0	-14.2	-7.6	-5.2	-11.8	-13.0	-13.0	-12.5	-13.1	-11.2
VMP-2B	SVE-B	37.47	0[4]	0[4]	-2	-5	-3	-2	-7.6	-11.4	-12.4	-12.2	-7.0	-12.2	-15.0	-7.8	<-15.0[5]	-13.6	-13.4	-13.2	-4.2	0[7]	0[7]
VMP-3A	SVE-C	30.66	-4	-4	-6	-5.75	-6	-5	-9.0	-10.0	-10.4	-10.8	-6.8	-10.8	-12.6	-10.0	-8.2	-10.0	-10.2	-10.4	-10.1	-10.9	-9.6
VMP-3B	SVE-C	25.52	-4	-5	-7	-7	-7	-6	-10.8	-12.0	-12.3	-12.6	-8.0	-12.6	-14.6	-12.0	-9.6	-11.2	-11.2	-11.8	-11.5	-10.2	-9.8
VMP-4A	SVE-C	59.99	0[4]	0[4]	0[4]	1[4]	-5	-5	-8.2	-9.0	-9.8	-10.0	-6.4	-10.0	-12.0	-9.0	-7.4	-8.8	-9.0	-9.2	-10.1	-11.2	-11.5
VMP-4B	SVE-C	59.53	-4	-4	-6	-5	-6	-5	-7.8	-9.0	-9.4	-9.8	-6.0	-9.8	-11.6	-8.8	-7.2	-8.4	-8.8	-9.0	-11.5	-2.8	-5.6
VMP-5A	SVE-D	30.99	-5	-5	-7	-7	-8	-7	-11.2	-12.4	-12.8	-13.2	-8.8	-13.0	-14.8	-8.8	-7.9	-11.4	-11.6	-12.0	-10.7	-10.1	-10.0
VMP-5B	SVE-D	31.05	-5	-5	-7	-8	-8	-8	-11.4	-12.6	-13.0	-13.3	-8.8	-13.0	-14.8	-9.4	-7.8	-11.6	-11.8	-12.2	-10.8	-10.2	-9.6
VMP-6A[6]	SVE-E	45.01	-5	-5	-8	-7	-8	-8	-11.6	-13.0	-13.2	-11.0	-9.0	-13.2	-15.0	-8.8	-7.2	-12.0	-12.2	-12.7	-12.1	-10.2	-9.8
VMP-6B[6]	SVE-E	45.04	-5	-6	-8	-7	-8	-8	-11.5	-12.8	-13.0	-14.8	-9.0	-13.2	-15.0	-8.7	-7.2	-12.0	-12.0	-12.6	-12.2	-11.2	-9.7
VMP-7A	SVE-F	15.30	0[4]	0[4]	0[4]	-1[4]	-10	-9	-13.6	-15.0	-14.4	<-15.0[5]	-8.4	-14.8	-17.2	-5.6	-4.2	-14.0	-9.6	-13.4	-13.1	-12.5	-13.0
VMP-7B	SVE-F	15.23	-8	-8	-10	-10	-10	-10	-14.2	<-15.0[5]	<-15.0[5]	<-15.0[5]	-8.6	-15.0	-17.6	-5.8	-4.2	-14.4	-8.4	-13.6	-12.9	-10.1	-10.0
VMP-8A	SVE-F	80.41	-5	-5	-6	0[4]	-6	-6	-9.6	-11.2	-10.8	-11.4	-6.0	-11.2	-14.2	-5.6	-4.2	-9.6	-13.4	-10.0	-10.4	-9.1	-9.7
VMP-8B	SVE-F	80.17	-4	-2	-4	-4.5	-4	-2	-3.0	-9.0	-9.2	-10.2	-5.0	-9.4	-12.4	-5.4	-4.0	-8.8	-13.6	-8.8	-10.2	-7.7	-7.7
VMP-9A	SVE-G	45.19	-4	-3	-4	-4	-4	-4	-6.2	-7.6	-6.7	-7.3	-2.8	-7.2	-10.2	-5.8	-4.0	-6.0	-6.4	-7.2	-7.1	-6.5	-6.0
VMP-9B	SVE-G	45.18	-4	-3	-4	-4	-4	-4	-6.2	-7.6	-6.6	-7.2	-3.4	-7.0	-10.2	-5.4	-4.4	-6.2	-7.0	-7.6	-7.2	-6.8	-6.2
VMP-10A	SVE-G	60.08	-3	-3	-4	N/R	-4	-4	-6.0	-7.2	-6.3	-7.0	-2.6	-7.0	-10.2	-5.4	-4.2	-6.0	-6.2	-7.0	-6.8	-6.9	-5.8
VMP-10B	SVE-G	60.50	-3	-2	-4	N/R	-4	-4	-5.6	-7.0	-6.2	-7.0	-2.4	-7.0	-10.2	-5.4	-4.2	-6.0	-6.4	-7.0	-6.4	-5.8	-5.8
Number of Blowers Online			1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2

N/R = not recorded

(1) = 0.07353 x in. H_2O = in. Hg.

(2) = All VMP wells contain 5-foot screen lengths VMP "A" wells (e.g., VMP-1A) were constructed with a screen located near the bottom of the screen of the associated SVE well. VMP "B" wells (e.g., VMP-1B) were constructed with a screen located near the top of the screen of the associated SVE well.

(3) = Rebound Event #1 occurred from 3/20/08 to 04/17/08. SVE-B, SVE-E, and SVE-F were offline during this period.

(4) = Vacuum readings affected by debris lodged in tubing. Debris was removed and tube length shortened by 6 inches on 9/14/07.

(5) = Vacuum reading exceeded gauge span of -15 in Hg.

(6) = VMP-6A and VMP-6B are located equidistant from SVE -D and SVE-E.

(7) = A positive pressure was seen at VMP-2B and is believed to be from steam generation from thermal SVE system.

Note: Vacuum gauges with a smaller span used on readings after 11/29/07.

in Hg. = inches of mercury

in. H_2O = inches of water

Shaded Cells indicate SVE well offline.

TABLE 3
PID MEASUREMENTS AT SVE WELLS
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Sample Location									
	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF	SVE-MID	SVE-EFF
Date	PID Measurement (ppm)[1]									
7/26/2007	3863	>10000 [2]	>10000 [2]	2188	>10000 [2]	2196	>10000 [2]	>10000 [2]	510	5.7
7/27/2007	105	1230	927	1861	1193	11.4	108	1091	3.6	0
7/28/2007	59.1	575	417	835	741	38.1	262	538	598	0.2
7/29/2007	53	432	445	667	550	31.1	205	486	554	0.1
7/30/2007	27.3	229	290	399	356	27.6	168	279	570	2.7
7/31/2007	22.7	186	246	338	285	24.6	131	242	528	72.4
8/1/2007	19.1	157	224	288	256	24.4	127	187	560	299
8/15/2007	7.5	153	210	271	234	22.6	131	152	18.1	9.4
8/16/2007	10.3	74.8	164	231	134	19.7	108	116	0	0
8/17/2007	10.2	94.4	140	208	118	16.9	92.4	120	4.7	2.1
8/20/2007	7.4	58.8	111	128	96.0	12.9	67.6	89.5	34.7	0.7
8/21/2007	8.5	38.5	73.8	95	112	12.7	65.1	68.0	37.9	0.6
8/22/2007	7.8	51.2	94.3	105	114	13.5	65.0	78.0	42.6	0.4
8/23/2007	5.6	37.0	84.0	86.8	99.1	12.9	63.8	74.3	74.1	0.1
8/27/2007	4.5	26.2	60.2	92.5	55.9	8.5	33.4	61.1	46.1	1.4
8/28/2007	4.4	28.3	59.8	87.4	61.3	7.4	27.5	59.1	56.1	0.6
8/29/2007	3.9	26.4	57.9	42.3	38.2	6.9	26.1	53.7	53.8	1.4
8/31/2007	5.0	29.7	55.5	67.0	43.3	0.6	32.0	60.9	62.9	11.1
9/4/2007	4.1	28.1	27.9	68.0	18.9	5.8	24.9	44.8	45.2	19.3
9/5/2007	3.8	24.7	50.3	67.7	38.8	7.9	27.6	39.9	46.6	15.1
9/7/2007	2.4	9.6	16.4	29.1	16.3	3.8	12.7	34.5	45.9	15.3
9/14/2007	3.0	16.6	23.1	44.5	25.6	6.1	18.7	24.4	31.3	16.3
9/19/2007	2.4	20.4	27.1	8.2	28.8	2.9	14.5	21.3	30.7	27.4
9/28/2007	2.3	19.0	13.1	35.1	18.6	3.5	16.4	12.1	23.3	32.2
10/5/2007	2.2	21.2	30.9	32.4	17.0	3.7	13.8	20.8	27.5	29.5
10/11/2007	2.7	23.0	9.9	18.7	13.2	0.5	12.8	22.6	N/C[3]	N/C[3]
10/18/2007	1.3	14.0	20.3	14.8	10.3	1.8	3.5	14.3	N/C	N/C
10/25/2007	1.7	15.2	21.2	19.1	10.7	1.5	12.4	17.4	N/C	N/C
11/1/2007	2.0	14.5	24.0	21.2	1.7	4.2	15.6	17.4	N/C	N/C
11/9/2007	1.2	21.9	22.3	21.3	8.2	1.5	10.7	16	N/C	N/C
11/15/2007	1.8	23.8	21.5	21.1	12.7	1.7	10.0	9.3	N/C	N/C
11/21/2007	2.6	27.6	23.4	22	9.6	2.7	10.2	17.9	N/C	N/C
11/29/2007	2.2	31.1	34.1	18.7	10.9	1.7	16.2	25.7	N/C	N/C
12/6/2007	1.7	24.9	18.5	8.4	6.1	3.5	6.8	20.2	N/C	N/C
12/21/2007	5.4	46.1	31.4	14.5	6.4	0.7	12.3	28.1	N/C	N/C
12/28/2007	1.2	65.9	33.8	9.8	4.3	1.1	15.4	23.4	N/C	N/C
1/4/2008	0.9	41.6	19.1	1.5	3.2	0.3	20	22.5	N/C	N/C
1/11/2008	1.2	61.0	37.5	24.4	5.3	2.3	9.8	20	N/C	N/C
1/17/2008	7.6	27.6	3.7	6.7	1.9	8.0	7.5	18.8	N/C	N/C
1/24/2008	1.8	67.8	10.9	2.2	2.8	0.4	7.6	26.1	N/C	N/C
2/1/2008	0.8	48.9	13.3	4.6	2.1	1.0	8.1	20.9	N/C	N/C
2/8/2008	0.8	31.8	18.4	5.8	1.7	2.4	17.5	6.6	N/C	N/C
2/15/2008	0.9	17.7	5.3	3.9	1.4	0.6	12.4	15.5	N/C	N/C
2/22/2008	0.7	48.6	8.3	4.8	2.3	1.0	13.0	15.8	N/C	N/C
2/29/2008	27.3	39.2	21.5	14.4	5.6	3.1	5.4	17.9	N/C	N/C
3/6/2008	0.3	28.5	13.8	4.2	7.3	0.3	13.2	12.1	N/C	N/C
3/14/2008	13.8	37.3	22.4	16.8	N/C[4]	17.1	17.5	25.8	N/C	N/C
3/20/2008[5]	0.7	N/C	26.1	0.7	N/C	N/C	0.4	10.4	N/C	N/C
3/27/2008[5]	0.0	N/C	21.6	4.0	N/C	N/C	0.0	6.2	N/C	N/C
4/3/2008[5]	9.3	N/C	15.4	5.2	N/C	N/C	8.1	10.6	N/C	N/C
4/10/2008[5]	3.1	N/C	5.7	0.9	N/C	N/C	8.2	6.2	N/C	N/C
4/18/2008	5.1	103	12.7	4.0	0.4	0.5	5.2	34.5	N/C	N/C
4/24/2008	0.4	31.7	7.2	4.8	2.5	0.6	8.7	13.5	N/C	N/C
5/2/2008	0.3	22.0	18.6	2.7	1.6	0.3	8.9	10.3	N/C	N/C
5/8/2008	0.7	27.2	9.5	3.8	1.6	0.6	11.1	9.8	N/C	N/C
5/13/2008	0.6	24.4	14	3.8	7.3	0.6	20.3	16.4	N/C	N/C
5/15/2008	0.5	17.8	5.1	2.4	1.9	0.7	5.4	8.6	N/C	N/C

TABLE 3
PID MEASUREMENTS AT SVE WELLS
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Sample Location									
	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF	SVE-MID	SVE-EFF
Date	PID Measurement (ppm)[1]									
5/22/2008	0.4	7.7	7.3	3.9	1.6	0.5	7.3	8.1	N/C	N/C
5/30/2008	0.3	7.0	7.1	1.5	1.1	0.3	1.2	3.7	N/C	N/C
6/5/2008	1.4	4.7	3.8	2.6	1.4	1.3	1.7	2.9	N/C	N/C
6/13/2008	0.6	5.6	5.6	6.5	2.3	0.7	1.3	3.6	N/C	N/C
6/19/2008	0.5	6.9	0.4	11	0.9	0.4	1.2	5.6	N/C	N/C
6/26/2008[6]	0.0	0.0	0.0	14.1	1.8	0.6	0.9	4.2	N/C	N/C
6/30/2008	0.6	9.2	14.4	22.8	5.4	0.9	1.9	11.4	N/C	N/C
7/3/2008	0.3	8.7	10.7	6.8	1.1	0.3	1.0	10.0	N/C	N/C
7/11/2008	0.3	13.9	16.5	39.9	0.9	0.7	1.8	13.7	N/C	N/C
7/16/2008	0.4	22.7	15.6	54.5	0.9	1.6	2.6	17.6	N/C	N/C
7/18/2008	0.8	25.9	22.3	76.8	2.1	2.9	4.9	23.8	N/C	N/C
7/24/2008	1.5	29.1	15.8	70.3	5.0	1.8	7.5	22.8	N/C	N/C
8/1/2008	0.6	40.4	10.0	48.4	2.5	1.4	8.8	21.8	N/C	N/C
8/7/2008	1.5	34.0	13.4	53.5	1.8	1.3	10.0	23.9	N/C	N/C
8/14/2008	1.0	38.1	15.3	110	1.5	1.8	21.9	29.0	N/C	N/C
8/20/2008[7]	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/C	N/C
8/29/2008	56.5	88.4	16.3	111	2.8	6.7	58.9	20.6	N/C	N/C
9/4/2008	73.7	92.9	24.1	179	0.6	1.4	69.5	34.9	N/C	N/C
9/12/2008	N/R[8]	80.3	33.2	114	3.3	4.6	N/R[8]	23.4	N/C	N/C
9/19/2008	2.4	70.6	31.3	106	5.5	2.6	53.2	52.2	N/C	N/C
9/26/2008	2.3	93.8	26.4	159	3.4	1.9	129	76.7	N/C	N/C
10/2/2008	2.0	27.2	36.1	312	1.8	1.7	74.3	95.3	N/C	N/C
10/10/2008	1.9	21.0	34.7	54.8	3.0	2.1	25.2	33.9	N/C	N/C
10/17/2008	1.3	32.9	60.0	81.5	6.2	4.8	24.2	44.3	N/C	N/C
10/23/2008	2.1	33.7	60.6	56.4	4.7	3.4	12.2	33.6	N/C	N/C
10/31/2008	4.0	18.1	37.5	17.0	1.4	4.0	38.1	15.5	N/C	N/C

(1) = Photo Ionization Detector (PID) manufactured by RAE System (Model: MiniRAE 2000) with a 10.6 eV lamp.
(2) = Influent stream exceeded maximum range of PID meter (10,000 ppm).
(3) = PID reading not collected as treatment system was taken offline following 5 October 2007 readings.
(4) = SVE-E damaged during other onsite remedial action activities and was offline during 3/14/08 inspection. No reading collected.
(5) = Rebound Event #1 occurred from 3/20/08 to 04/17/08. SVE-B, SVE-E, and SVE-F were offline during this period.
(6) = PID readings believed to be in error due to malfunctioning PID. Readings recollected on 6/30/08.
(7) = PID readings not recorded on 08/20/08 due to inoperable meter.
(8) = Field PID reading not able to be recorded due to excess water in manifold piping.
ppm: parts per million

TABLE 4
PID MEASUREMENTS AT VMPs
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

VMP ID[2]	Closest SVE Well	Distance from Closest SVE Well (ft)	PID[1] Measurement (ppm)											
			8/20/2007[3]	11/29/2007[4]	12/6/2007[4]	01/11/08[4]	01/24/08[4]	02/22/08[4]	03/20/08[4][5]	04/03/08[4]	04/10/08[4]	04/17/08[4]	07/16/08[4]	10/17/2008[4]
VMP-1A	SVE-A	15.08	4,783	0.1	1.7	0.0	0.0	0.0	0.0	N/C	N/C	1.3	1.3	0.0
VMP-1B	SVE-A	21.04	3,194	4.3	0.3	0.9	1.3	0.2	0.0	N/C	N/C	16.0	2.0	1123
VMP-2A	SVE-B	30.68	1,078	1.2	0.8	0.2	0.6	0.0	0.0	0.0	0.5	0.5	0.6	227
VMP-2B	SVE-B	37.47	>10,000[6]	34.5	22.7	316	143	0.0	42.2	217	135	316	713	--[7]
VMP-3A	SVE-C	30.68	103	1.2	1.8	0.5	0.7	0.4	0.0	N/C	N/C	0.8	1.8	6.5
VMP-3B	SVE-C	25.52	4,509	847	619	398	645	50.0	1.47	N/C	N/C	43.4	>10,000[6]	793
VMP-4A	SVE-C	59.99	98.2	1.7	1.4	0.2	0.6	0.7	0.0	N/C	N/C	1.4	2.3	0.5
VMP-4B	SVE-C	59.53	386	68.6	62.2	23.1	23.2	37.7	0.0	N/C	N/C	9.9	6.0	73.9
VMP-5A	SVE-D	30.99	1,464	4.4	3.5	1.7	2	2.63	0.5	N/C	N/C	9.9	5.0	1.1
VMP-5B	SVE-D	31.05	82.3	94.1	79.2	54.2	56.3	28.9	12.6	N/C	N/C	7.0	606	58.6
VMP-6A	SVE-E	45.01	989	15.4	11.5	4.17	3.6	7.4	0.0	0.0	0.0	0.2	2.3	4.1
VMP-6B	SVE-E	45.04	3,320	482	459	666	470	1,277	406	302	85.5	112	2,990	1,429
VMP-7A	SVE-F	15.30	14.6	2.2	1.8	0.1	0.2	1.7	0.0	0.0	0.3	3.6	3.7	55.3
VMP-7B	SVE-F	15.23	11.7	3.9	3.1	3.0	2.1	3.9	1.1	0.0	0.0	3.9	55.6	15.5
VMP-8A	SVE-F	80.41	450	0.3	0.4	0.0	0.2	1.6	0.0	0.0	0.0	0.7	4.6	3.7
VMP-8B	SVE-F	80.17	80.6	28.6	33.3	7.2	5.0	5.1	0.5	19.7	1.2	4.4	16.8	80.5
VMP-9A	SVE-G	45.19	2.3	1.2	1.2	1.3	0.7	1.9	0.0	N/C	N/C	2.7	4.1	6.1
VMP-9B	SVE-G	45.18	84.3	119	126	54.3	49.4	51.3	11.3	N/C	N/C	23.1	2.6	5.8
VMP-10A	SVE-G	60.08	2.1	0.4	0.3	0.1	0.1	0.7	0.0	N/C	N/C	0.7	3.2	2.6
VMP-10B	SVE-G	60.50	27.2	2.8	3.8	11.1	18.8	27.4	3.73	N/C	N/C	2.2	2.3	2.7

(1) Photo Ionization Detector (PID) manufactured by RAE Systems (Model: MiniRAE 2000) with a 10.6 eV lamp.
(2) All VMP wells contain 5-foot screen lengths. VMP "A" wells (e.g., VMP-1A) were constructed with a screen located near the bottom of the screen of the assocated SVE well. VMP "B" wells (e.g., VMP-1B) were constructed with a screen located near the top of the screen of the assocated SVE well.
(3) Measurements collected prior to system startup.
(4) Measurements collected while system offline. System offine for two hours prior to collection of PID readings.
(5) Measurements collected prior to shut down of SVE wells as part of rebound study.
(6) Influent stream exceeded maxium range of PID meter (10,000 ppm).
(7) PID readings unable to be collected as extract vapor was too hot and began melting the tedlar bag.
N/C - Rebound Event #1 occurred from 3/20/08 to 04/17/08. PID readings only collected on VMPs assolcated with those offline weel.s No PID readings collected from VMP-1A/B, VMP-3A/B, VMP-4A/B, VMP-5A/B, VMP-9A/B, and VMP-10A/B.
ppm: parts per million

974 11

TABLE 5
ANALYTICAL RESULTS SUMMARY - SYSTEM INFLUENT (4Q08 EVENT)
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Location	SYSTEM-SVE-INF
Sample ID	FSVE-SVEINF-4Q08
Date	10/17/2008
Event	4Q08
Analyte	ppb(v/v)
1,1,2,2-Tetrachloroethane	**6500**
1,1,2-Trichloroethane	66 F
1,1-Dichloroethene	63 F
1,2,4-Trimethylbenzene	**540**
1,3,5-Trimethylbenzene	**220**
Benzene	100 F
Carbon tetrachloride	24 F
Chloroform	**2000**
Chloromethane	100 F
cis-1,2-Dichloroethene	**2200**
Ethylbenzene	**140**
Methylene chloride	320 F B
m-Xylene & p-Xylene	**520**
o-Xylene	**150**
Tetrachloroethene	**200**
Toluene	57 F
Trichloroethene	**15000**
Trichlorofluoromethane	14 F
Total VOCs	27470

Notes:
Bold: Detected above RL
B: Method Blank Contamination
F: Estimate -result >MDL and <RL
<: Result is less than laboratory detection limit.
* Sum of detected analytes above reporting limit.
Units: ppb v/v: parts per billion volume per volume

TABLE 6
ANALYTICAL RESULTS SUMMARY - SVE WELLS (4Q08 EVENT)
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Location	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G
Date	10/28/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008
Event	4Q08	4Q08	4Q08	4Q08	4Q08	4Q08	4Q08
Units	ppb(v/v)	ppb(v/v)	ppb(v/v)	ppb(v/v)	ppb(v/v)	ppb(v/v)	ppb(v/v)
Analyte							
1,1,2,2-Tetrachloroethane	**5.2**	**2.8**	**9400**	**29000**	**20**	**38**	**25**
1,1,2-Trichloroethane	<1.8	<2	140 F	76 F	<2	<2	<2
1,1-Dichloroethene	<1.8	<2	120 F	<250	<2	<2	0.77 F
1,2,4-Trimethylbenzene	<1.8	<2	**1900**	**4500**	<2	<2	<2
1,3,5-Trimethylbenzene	<1.8	<2	**760**	**1700**	<2	<2	<2
Benzene	0.77 F	0.72 F	<260	110 F	0.67 F	1.1 F	0.69 F
Chloroform	**5**	**5.9**	160 F	70 F	**6.7**	**8.7**	**9.8**
Chloromethane	<4.6	<5	<650	<640	3.8 F	<5	<5
cis-1,2-Dichloroethene	**6.8**	**7.1**	**3500**	320 F	**7.8**	**11**	**8.6**
Dichlorodifluoromethane	<1.8	<2	140 F	<250	<2	0.7 F	<2
Ethylbenzene	<1.8	<2	**1200**	**1800**	<2	<2	<2
Methylene chloride	1.8 F B	2.5 F B	670 F B	**900 B**	**18 B**	**8.2 B**	**6 B**
m-Xylene & p-Xylene	<1.8	<2	**4300**	**6900**	<2	<2	<2
o-Xylene	<1.8	<2	**1200**	**1800**	<2	<2	<2
Tetrachloroethene	**3.8**	<2	**330**	**680**	0.88 F	1.1 F	0.91 F
Toluene	0.81 F	0.65 F	79 F	100 F	0.67 F	1.1 F	0.79 F
Trichloroethene	**12**	**45**	**38000**	**37000**	**55**	**70**	**63**
Trichlorofluoromethane	0.24 F	<2	<260	<250	<2	0.27 F	<2
Total VOCs*	32.8	60.8	60590	84280	108	136	112

Notes:

Bold: Detected above RL

B: Method Blank Contamination

F: Estimate -result >MDL and <RL

<: Result is less than laboratory detection limit.

* Sum of detected analytes above reporting limit.

Units: ppb v/v: parts per billion volume per volume

TABLE 7
HISTORICAL RESULTS FOR PRIMARY CVOCs
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Sample Date	Analyte	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF
		ppb(v/v)							
7/25/2007	1,1,2,2-Tetrachloroethane	410	230	110000	140000	<3800	150	2600F	290000
Base 1	Chloroform	850	52	4400F	530F	<3800	32	610000	53000
	cis-1,2-Dichloroethene	10000	210	450000	10000	5500F	130	5500	220000
	Tetrachloroethene	590	16	10000	18000	5700	10	13000	19000
	Trichloroethene	38000	960B	1300000B	740000B	320000	670	260000	670000B D
	Total VOCs*	50570	1503	1876600	908000	330300	1003	925500	1261100
8/23/2007	1,1,2,2-Tetrachloroethane	13	14	23000	26000	35	12	13000	8500
Base 4	Chloroform	1600D	4.7	330F	110F	6.8F	4.2	94000	4000
	cis-1,2-Dichloroethene	210	4.1	17000	1600	28	3.8	1400	3500
	Tetrachloroethene	120	0.72	1000	1500	4.8F	0.62	2800	530
	Trichloroethene	700	17	37000	37000	540	15	27000	14000
	Total VOCs*	3400	48	80020	66920	628	41	149440	31560
9/19/2007	1,1,2,2-Tetrachloroethane	4.4F	2	1900	81	740	0.95	4000	70F
Base 5	Chloroform	7200	3.8	76F	6.3	30	4.6	22000	3100
	cis-1,2-Dichloroethene	240	4.7	2700	26	340	5.8	260	3200
	Tetrachloroethene	420	0.21	190	9.7	63	0.2	1300	<170
	Trichloroethene	1600	15	7300	370	5200	19	5900	12000
	Total VOCs*	11130	28	12340	493	6406	33	37860	19090
10/18/2007	1,1,2,2-Tetrachloroethane	14	3.3	3200	3700	3.1	2.8	1100	3100
4Q07	Chloroform	4200D	1.6	110F	35F	1.4	1.5	6200	2000
	cis-1,2-Dichloroethene	120	1.2	3300	210	1.1	1	73	1600
	Tetrachloroethene	260	0.78	340	450	0.73	0.86	390	470
	Trichloroethene	1100D	6	16000	4600	5.5	5.3	1500	8100
	Total VOCs*	6507	18	22840	8960	17	17	10663	15930
1/17/2008	1,1,2,2-Tetrachloroethane	730	10	410	4500	14	9.9	450	1000
1Q08	Chloroform	5300	16	60	38F	17	21	32000	3100
	cis-1,2-Dichloroethene	140	17	2100	140	18	22	210F	3500
	Tetrachloroethene	190	2.5	170	300	3.5	860	1100	330
	Trichloroethene	720	51	13000	3100	68	68	5500	11000
	Total VOCs*	7985	101	15680	8040	127	981	40550	19830
4/24/2008	1,1,2,2-Tetrachloroethane	76	1.5	500	4300	2.7	<0.2	9.5	1800
2Q08	Chloroform	4800	0.48	170	7 F	5.1	0.47	6.3	2200
	cis-1,2-Dichloroethene	21	1.3	2500	110	11	0.64	0.72	3100
	Tetrachloroethene	22	0.062F	180	190	2	<0.2	0.29	170
	Trichloroethene	94	2	13000	2600	120	1.1	3.5	7400
	Total VOCs*	5095.3	9.99	16350	7200	147.16	5.15	25.38	15204
7/16/2008	1,1,2,2-Tetrachloroethane	4.4	9.8	20000	14000	7.2	9.4	420	2700
3Q08	Chloroform	6.7	1.9 F	160	<240	1.6 F	1.6 F	2000	420
	cis-1,2-Dichloroethene	1.2 F	6	4000	880	5.2	5.7	47	1400
	Tetrachloroethene	1.9 F	0.55 F	59	670	0.49 F	0.46 F	27	140
	Trichloroethene	13	24	13000	28000	24	24	600	6800
	Total VOCs*	24.1	39.8	37429	43550	36.4	39.1	3212.3	11557
10/17/2008	1,1,2,2-Tetrachloroethane	5.2	2.8	9400	29000	20	38	25	6500
4Q08	Chloroform	5	5.9	160 F	70 F	6.7	8.7	9.8	2000
	cis-1,2-Dichloroethene	6.8	7.1	3500	320 F	7.8	11	8.6	2200
	Tetrachloroethene	3.8	<2	330	680	0.88 F	1.1 F	0.91 F	200
	Trichloroethene	12	45	38000	37000	55	70	63	15000
	Total VOCs*	32.8	60.8	60590	84280	107.5	135.9	112.4	27470

Notes
B: Method Blank Contamination
D: Result obtained form analysis of dilution
F: Estimate -result >MDL and <RL
N/C: Sample not collected.
<: Result is less than laboratory detection limit.
* Sum of detected analytes above reporting limit.
ppb v/v: parts per billion volume per volume
VOC: volatile organic compound

TABLE 8
AVERAGE VOC CONCENTRATIONS USED FOR MASS CALCULATIONS
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	System Influent			System Effluent		
Sample Date	PID Reading (ppm)	Laboratory Total VOC Influent Concentration (ppbv)	VOC Concentration Used for Mass Emission Calculations [1] (ppbv)	PID Reading (ppm)	Laboratory Total VOC Effluent Concentration (ppbv)	VOC Concentration Used for Mass Emission Calculations [1] (ppbv)
7/25/2007	NR	1,261,000	1,261,000	NR	5.82	5.82
7/26/2007	>10,000	NS	903,250 [2]	5.7	NS	2.91 [2]
7/27/2007	1091	NS	545,500	0	NS	0
7/28/2007	538	NS	269,000	0.2	NS	100
7/29/2007	486	NS	243,000	0.1	NS	50
7/30/2007	279	NS	139,500	2.7	NS	1,350
8/3/2007	NR[3]	119,700	119,700	NR[3]	207,000	207,000
8/13/2007	NR	NS	109,745[4]	NR	NS	0[5]
8/16/2007	116	99,790	99,790	0	30.59	30.59
8/23/2007	74.3	31,560	31,560	0.1	42.31	42.31
9/19/2007	21.3	14,800	14,800	27.4	19,090	19,090
10/18/2007	17.5	15,930	15,930	N/C	N/C	15,930[6]
1/17/2008	18.8	NS	19,830	N/C	N/C	19,830[6]
3/20/2008	10.4	NS	19,076[7]	N/C	N/C	19,076[6]
4/17/2005	34.5	NS	34,500[8]	N/C	N/C	34,500[6]
4/24/2008	13.5	15,204	15,204	N/C	N/C	15,204[6]
7/16/2008	17.6	11,557	11,557	N/C	N/C	11,557[6]
10/17/2008	44.3	27,470	27,470	N/C	N/C	27,470[6]
10/31/2008	15.2	NS	27,470[9]	N/C	N/C	27,470[6]

Notes:

(1) Laboratory sample total VOC concentration used for calculation. If not sample was collected or results are not available, then concentration is half of the PID reading unless otherwise noted. PID readings more accurately reflect declining concentrations trends.

(2) Concentration is average of concentrations from 07/25/07 and 07/27/07.

(3) To minimize system operation time, the SVE system was online for laboratory sampling only.

(4) Concentration is average of concentrations from 08/03/07 and 08/16/07.

(5) Concentration estimated to be 0 ppb following carbon change out.

(6) Treatment system offline. VOC influent concentration used for mass emission calculation.

(7) Start of Rebound Event #1. No sample collected. Concentration is 96.2% of concentration from 1/17/08 and is based on mass rates from four online SVE wells prior to shutdown.

(8) End of Rebound Event #1. No sample collected. Concentration from PID readings.

(9) No laboratory sample collected. Used laboratory VOC concentration from 10/17/08.

NR: PID reading not collected

NS: Sample not collected.

N/C: Not sample collected. Treatment system offline.

N/A Not applicable.

TABLE 9
MASS EMISSIONS CALCULATIONS
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM - OPERATIONS SUMMARY #8
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

SVE System Data				Influent				Effluent		Treatment System	
Start Date	End Date	Hours Operating Between Dates	Average Flow rate (scfm)	Average Influent VOC Concentration (ppbv)	Influent Emission Rate [1] (lb/hr)	Estimated VOC Mass Removal During Period (lbs)	Cumulative Mass Removed From Fluvial Subsurface (lbs)	Average Effluent VOC Concentration (ppbv)	Effluent Emission Rate[2] (lb/hr)	VOC Mass Captured by Treatment System (lbs)	Cumulative VOC Mass Captured by Treatment System (lbs)
7/25/2007	7/25/2007	4	755	1,082,125	16.995	68.0	68.0	4.4	0.000	68.0	68.0
7/26/2007	7/26/2007	4	755	724,375	11.377	45.5	113.5	1.5	0.000	45.5	113.5
7/27/2007	7/27/2007	24	785	407,250	6.650	159.6	273.1	50	0.001	159.6	273.1
7/28/2007	7/28/2007	24	746	256,000	3.973	95.3	368.4	75	0.001	95.3	368.4
7/29/2007	7/29/2007	24	741	191,250	2.948	70.8	439.2	700	0.009	70.5	438.9
7/30/2007	8/2/2007	66	739	129,600	1.992	131.5	570.7	104,175	1.294	46.1	485.0
8/3/2007	8/12/2007	20	740	114,723	1.766	35.3	606.0	207,000	2.351	(11.7)	473.3[3]
8/13/2007	8/15/2007	39	602	104,768	1.312	51.2	657.2	15.3	0.000	51.2	51.2
8/16/2007	8/22/2007	167	596	65,675	0.814	136.0	793.1	36.5	0.000	135.9	187.1
8/23/2007	9/19/2007	640	758	23,180	0.366	233.9	1,027.1	9,566	0.111	162.7	349.8
9/19/2007	10/18/2007	699	795	15,365	0.254	177.6	1,204.7	17,510	0.290	59.5	409.3[4]
10/18/2007	1/17/2008	2,077	748	17,880	0.278	577.6	1,782.3	N/C	0.278	N/A	N/A
1/17/2008	3/20/2008	1413	738	17,517	0.269	380.0	2,162.3	N/C	0.269	N/A	N/A
3/20/2008	4/17/2008	626	385[5]	19,076	0.153	95.6	2,257.9	N/C	0.153	N/A	N/A
4/17/2008	4/24/2008	145	784	24,852	0.405	58.8	2,316.7	N/C	0.405	N/A	N/A
4/24/2008	7/16/2008	1981	741	13,381	0.206	408.8	2,725.5	N/C	0.206	N/A	N/A
7/16/2008	10/17/2008	2118	752	19,514	0.305	646.2	3,371.7	N/C	0.305	N/A	N/A
10/17/2008	10/31/2008	327	766	27,470	0.438	143.1	3,514.9	N/C	0.438	N/A	N/A

Notes:

(1) Calculation based on TCE which is the primary constituent.

(2) Calculation based on xylene (primary constituent from sample collected 07/25), cis-1,2-DCE (primary constituent from sample collected on 8/03/07), vinyl chloride (primary constituent from samples collected on 8/16 and 8/23), or TCE (primary constituent from sample collected on 9/19/07 and 10/18/07).

(3) GAC replaced on 13 August 2007.

(4) GAC replaced on 26 December 2007.

(5) Rebound Event #1 occurred between 03/20/08 and 04/17/08. SVE-B, SVE-E, and SVE-F were offline.

N/A: Not applicable. Treatment sytem taken offline on 10/05/07.

N/C: No sample collected. Treatment system offline. Influent emissions rates used for effluent emission rates.

FIGURES

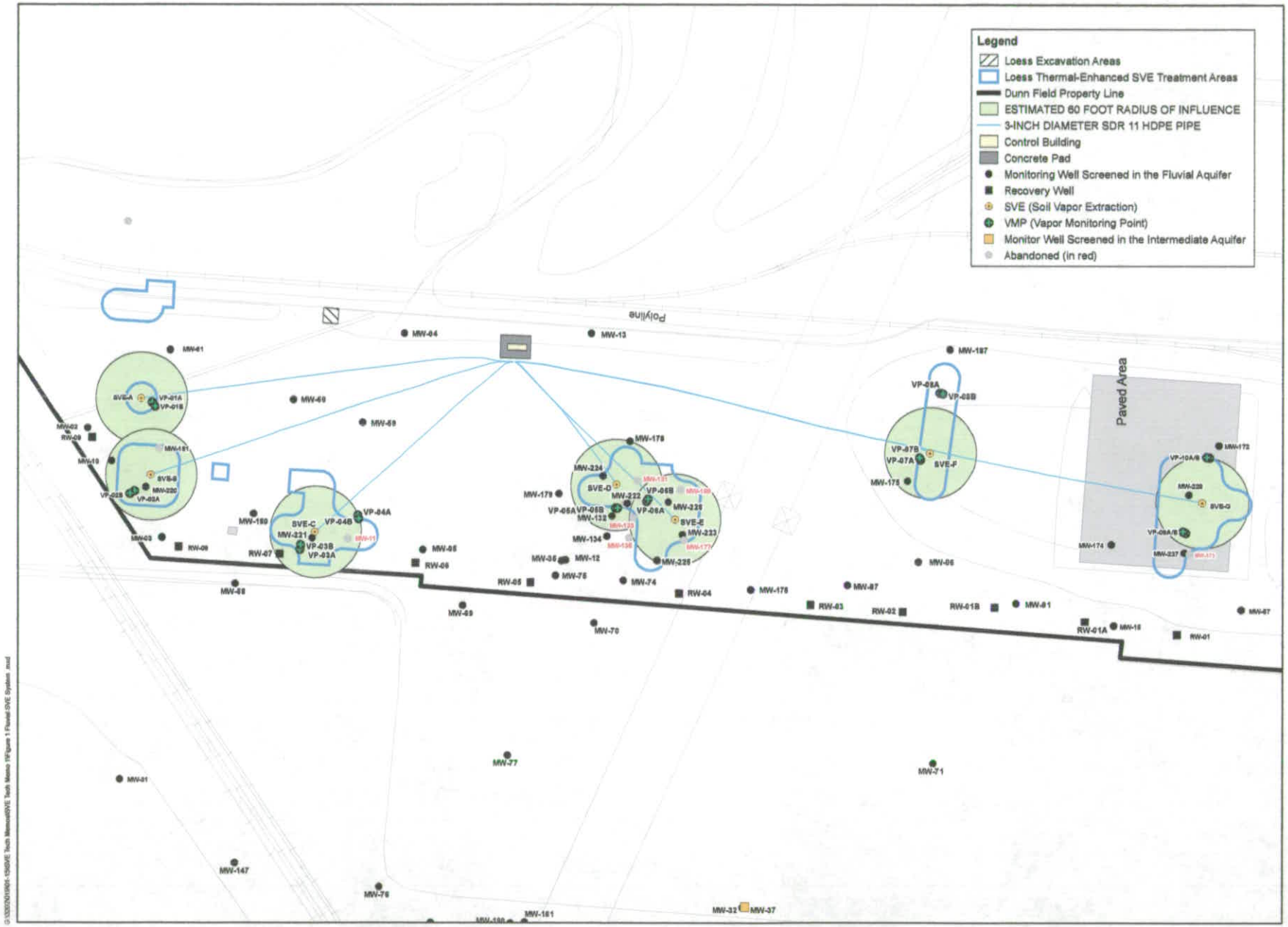

Figure 1

FLUVIAL SVE SYSTEM

OPERATION SUMMARY

DUNN FIELD SOURCE AREAS
REMEDIAL ACTION

DEFENSE DEPOT
MEMPHIS, TENNESSEE

974 18

Projection: NAD 1927 StatePlane Tennessee
Datum : WGS 84
Units: Feet

0 50 100 150 200 Feet

Installation Location
Memphis, Tennessee

Date: September 2007
Edition: Draft

G:\330\30190\1-1SVE Tech Memo\SVE Tech Memo 19\Figure 1 Fluvial SVE System .mxd

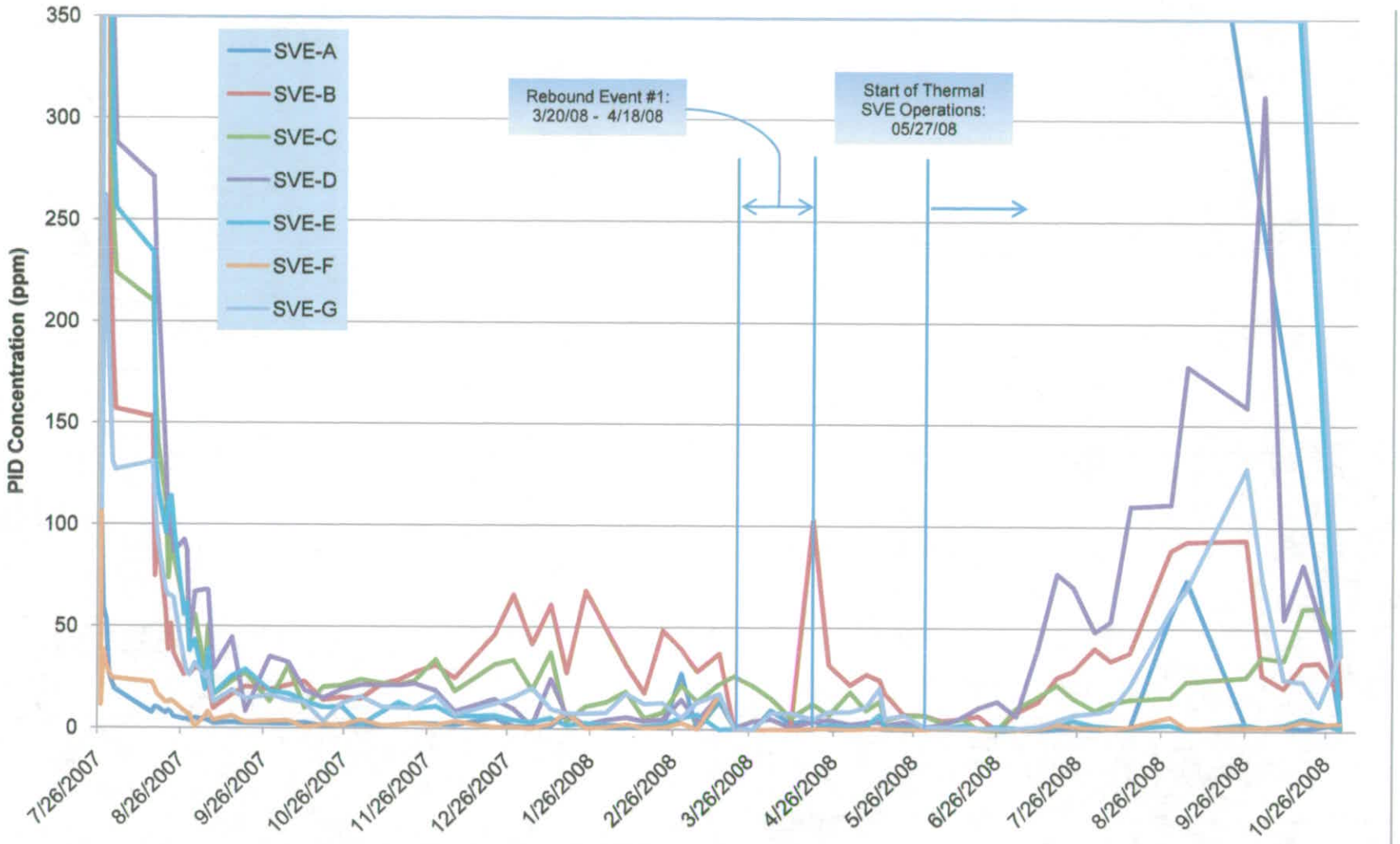

Figure 2.
TREND OF PID MEASUREMENTS AT SVE WELLS
OPERATIONS SUMMARY #8
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

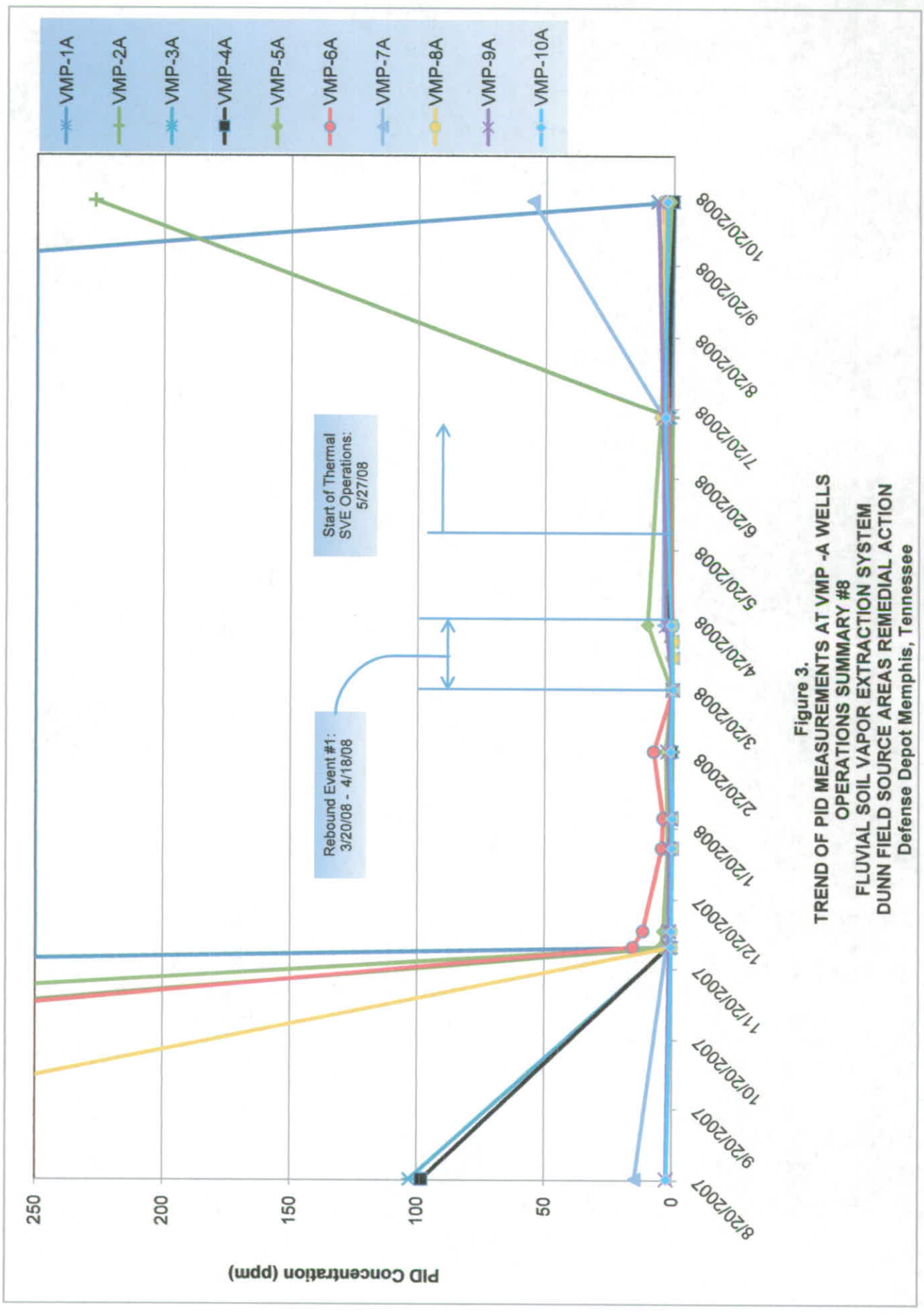

Figure 3.
TREND OF PID MEASUREMENTS AT VMP -A WELLS
OPERATIONS SUMMARY #8
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

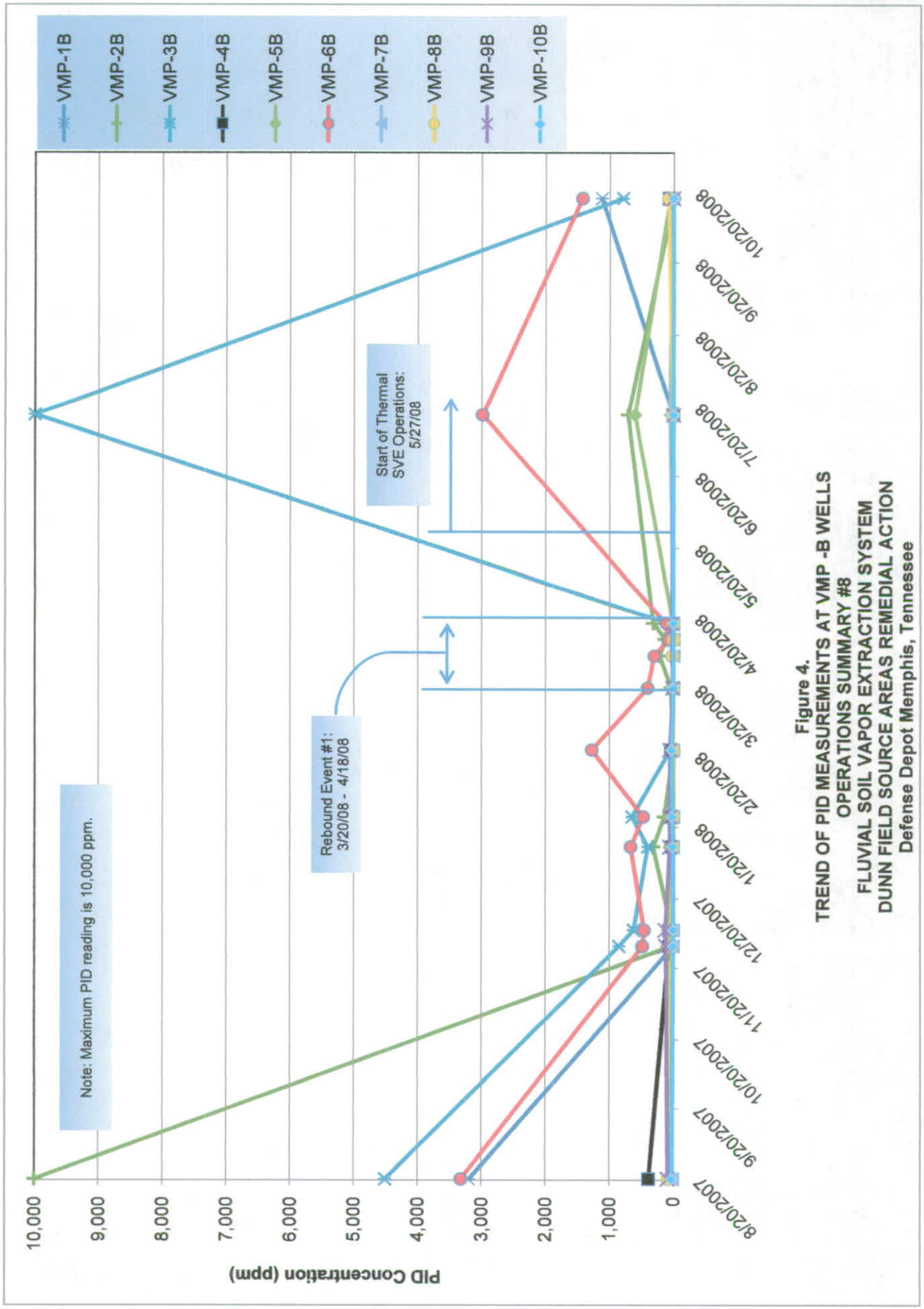

Figure 4.
TREND OF PID MEASUREMENTS AT VMP -B WELLS
OPERATIONS SUMMARY #8
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

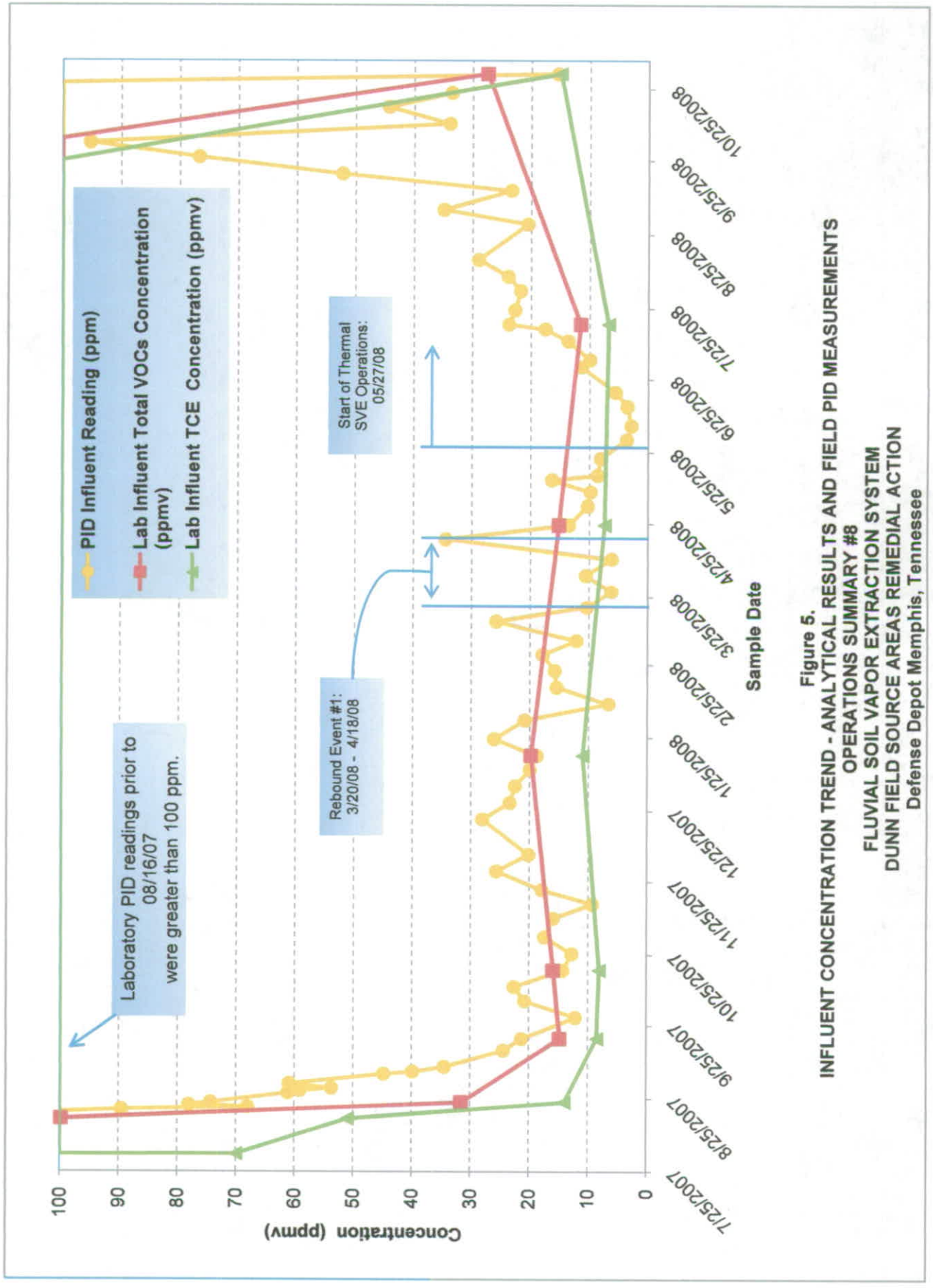

Figure 5.
INFLUENT CONCENTRATION TREND - ANALYTICAL RESULTS AND FIELD PID MEASUREMENTS
OPERATIONS SUMMARY #8
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

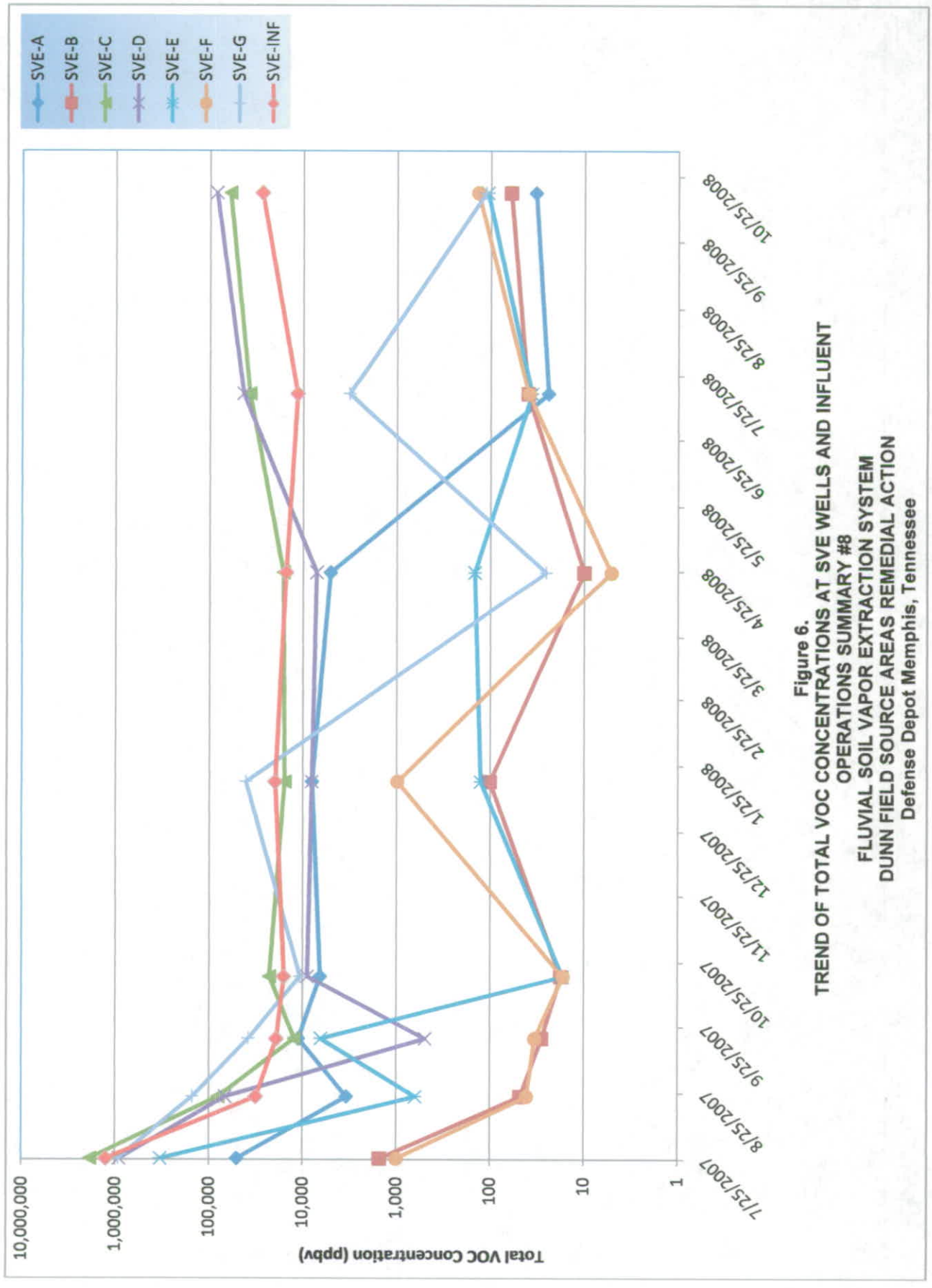

Figure 6.
TREND OF TOTAL VOC CONCENTRATIONS AT SVE WELLS AND INFLUENT
OPERATIONS SUMMARY #8
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM
DUNN FIELD SOURCE AREAS REMEDIAL ACTION
Defense Depot Memphis, Tennessee

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ADMINISTRATIVE RECORD

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