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George Jacob, Remedial Project Manager
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U.S. Environmental Protection Agency
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VIA ELECTRONIC AND REGULAR MAIL

Date:
December 17, 2012

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Our ref:
TL003165.0031

Subject:
Remedial Work Element I: Work Plan for Soil-Vapor Extraction System Closure and Soil Excavation, JCI Jones Chemicals Superfund Site, Caledonia, New York

Dear Mr. Jacob:

As requested in your correspondence dated October 16, 2012, ARCADIS U.S., Inc. (ARCADIS), on behalf of JCI Jones Chemicals, Inc. (JCI), is providing you with this work plan describing small-scale excavation and confirmatory sampling required to permanently close the soil-vapor extraction (SVE) system at the JCI Superfund Site in Caledonia, New York ("the Site"). The SVE system was installed as Remedial Work Element I to address affected soil in the source area at the Site.

Background

The remedial design/remedial action at the Site was initiated by JCI as required by the Consent Decree under the Comprehensive Environmental Response, Compensation, and Liability Act established on July 11, 2001, with the U.S. Environmental Protection Agency (USEPA; New York State Department of Environmental Conservation [NYSDEC] Site Code 826003; USEPA Identification NY000813428.) The remedial action includes treatment of affected soil by SVE (Remedial Work Element I) and treatment of affected groundwater by source-area extraction and treatment, in situ chemical oxidation (ISCO) treatment, and monitored natural attenuation (Remedial Work Element II).

A summary of soil- and groundwater-remediation goals is presented in the table below:

Chemical of Concern	Soil (milligrams per kilogram)	Groundwater (micrograms per liter)
Tetrachloroethene	1.4	5
Trichloroethene	0.7	5
Cis-1,2-Dichloroethene	0.3	5
Trans-1,2-Dichloroethene	0.3	5
1,1-Dichloroethene	0.4	5
Vinyl Chloride	0.2	2

Soil-Vapor Extraction System

The SVE system had been in continuous operation (24 hours per day) since startup in April 2004 until May 2006 (with the exception of the period from December 27, 2004, to February 4, 2005, due to SVE blower motor failure). In May 2006, SVE system operations were scaled back to eight hours per day with USEPA approval in order to promote non-steady-state conditions that could possibly improve mass removal. The SVE system was shut down on May 14, 2008, as mass removal was at asymptotic levels and the system was no longer effective.

The SVE system originally consisted of three SVE wells (Attachment A; Figure A-1). The SVE wells were 4 inches in diameter and ranged between 15 and 17 feet below ground surface (bgs; Table A-1). ARCADIS monitored the performance of the SVE system by collecting the following information:

- Vacuum at SVE extraction and observation wells, and total influent vacuum
- Groundwater elevation at observation wells
- Organic vapor analyzer (OVA) readings at each extraction well
- OVA readings of influent and effluent granular-activated carbon (GAC)
- Total airflow and influent and effluent pressure

- Knockout tank water level
- Total hours of operation
- Volatile organic compound (VOC) analyses of influent and effluent air samples

The SVE system was designed to remove VOC vapors from the vadose zone. Four 170-pound GAC vessels were used to treat the SVE effluent. The GAC vessels have been removed and disposed of off site.

Approximately 186 pounds of tetrachloroethene (PCE) equivalents were removed by the SVE system during its operation. The effluent airstream concentration during the previous monitoring events was below the allowable air-emission rate of 0.029 pound per hour. Previous data for the SVE extraction-and-observation wells are summarized in Table A-1; analytical and performance data for the SVE system from April 2004 (startup) to May 2008 (shutdown) are summarized in Table A-2.

Confirmatory Vadose-Zone Soil Sampling

In May 2007, vadose-zone soil within the source area was sampled to verify the effectiveness of the SVE system and to evaluate whether continued SVE operation was necessary. Eight soil borings (P-1 through P-8) were advanced in the source area based on prior soil-sampling results and recommendations from NYSDEC. These locations are shown on Figure A-1. Continuous soil cores were collected at each location from ground surface to approximately 12 feet bgs (approximate depth of groundwater). The soil headspace was screened using an OVA with a photoionization detector (PID). Based on field-screening data, at least one sample per soil boring was collected for analysis.

Results indicated that PCE concentrations were well below remedial action objectives (RAOs; Table A-3). An exception was the soil sample collected from location P-2 between 2 to 3 feet bgs. P-2 was advanced east of ISCO injection well OI-4. PCE in soil was reported at P-2 with a concentration of 31,000 micrograms per kilogram (µg/kg; 31 milligrams per kilogram [mg/kg]), which is consistent with the conceptual site model that identified this area as the principal source area. The reported PCE concentration of 31 mg/kg at P-2 exceeded the soil remediation goal of 1.4 mg/kg; however, the concentration does not indicate a residual dense non-aqueous phase liquid (DNAPL) source. Trichloroethene (TCE) was also detected at P-2 above reporting limits at 44 µg/kg (0.044 mg/kg) but well below RAOs.

System Modification, Evaluation, and Shutdown

A fourth SVE well (SVE-4) was installed on October 29, 2007, approximately equidistant between SVE-1 and SVE-2 (Figure A-1); it was installed to be consistent with the Record of Decision and to address residual vadose-zone PCE-affected soil detected at approximately 2 to 3 feet bgs in soil samples collected in May 2007. SVE-4 is constructed similarly to the other three SVE wells, with the exception of depth; it is 4 inches in diameter, 8 feet deep, and screened between 1 and 8 feet bgs. After SVE-4 was installed, the system was started and inspected for leaks. SVE-3, the westernmost SVE well, was also shut down. SVE-1, SVE-2, and SVE-4 were operated to focus on the area of suspected residual PCE-affected soil.

The SVE system was in operation with this new SVE well for four months between October 2007 and May 2008. On May 7, 2008, a vadose-zone soil sample P-9 (2 to 3 feet bgs; adjacent to previous sampling location of P-2) was collected to evaluate whether operation of the SVE system with the new SVE-4 well had been successful in reducing the residual PCE concentration at the location of sample P-2. Analytical results of confirmatory sample P-9 indicated that the SVE system was not effective in treating this isolated “hot spot.” PCE was detected in P-9 at a concentration of 40 mg/kg, exceeding the soil remediation goal of 1.4 mg/kg (Table A-3).

Confirmatory sampling data indicate that PCE-affected soil at P-2/P-9 is relatively shallow and localized (horizontally). PID readings decreased significantly below 4 feet bgs. Adjacent sample locations did not indicate significant concentrations of PCE or related compounds.

P-2/P-9 is located almost equidistant between SVE-2 and SVE-1, near SVE-4. This may be a stagnant zone where SVE had not been as effective as at other locations, particularly in shallow depths where the PCE was detected. Continued SVE operations did not have any benefits in the area of P-2/P-9. It was recommended in previous semiannual reports that the SVE system be shut down permanently, as a negligible PCE mass remains in the vadose zone of the source area that cannot be effectively treated using SVE.

The SVE system has been shut down since May 2008. As the SVE system remained shut down, no measurements related to vacuum and flow have been collected, and no influent or effluent samples have been collected.

It was recommended that other active remediation methods, such as excavation, be conducted to remove this isolated, stagnant “hot spot.” Given the apparent limited extent of PCE at shallow depths, active remediation by excavation would be effective in reducing PCE in soil to below the remediation goal of 1.4 mg/kg. On June 14, 2011, a proposal was submitted to USEPA and NYSDEC to permanently shut down the SVE system. In October 2012, USEPA indicated that the excavation and confirmatory sampling would be a viable option for the consideration of the permanent closure of the SVE system.

Soil Excavation and Confirmatory Sampling

A limited excavation and disposal of PCE-affected soil will be conducted within the source area at the Site. Excavation will occur at the P-2/P-9 sampling location, where previous analytical results exceeded the soil remedial goal (Figure A-1). Excavation will be conducted with a mini-excavator to a depth of up to 4 feet bgs. The area to be excavated is limited (approximately 2 feet by 2 feet by 4 feet deep). The total volume to be excavated is approximately 16 cubic feet, or 0.6 cubic yard (approximately 1 ton). Excavated soil will be characterized for contaminants of interest and will be disposed of off site through a licensed waste contractor. The excavated area will be backfilled with certified clean soil.

Up to five confirmation samples will be collected from each of the side walls and the base of the excavation. Multiple soil samples will be collected for on-site screening of the headspace using a PID. Samples exhibiting the highest readings on the PID will be submitted to Columbia Analytical Laboratories, Inc. (CAS; Rochester, New York) for the analysis of VOCs using USEPA Method 8260B. Additional excavation may be conducted if PID screening indicates potential contamination. Air-quality monitoring, including dust, will be conducted during the excavation at approximately 15-minute intervals and recorded in field notes.

Also as requested in your October 26, 2012 correspondence, two additional soil borings will be advanced in the eastern corners of the source area. These locations are shown on Figure A-1. Continuous soil cores will be collected at each location from ground surface to approximately 12 feet bgs (approximate depth of groundwater). The soil headspace will be screened using a PID. Based on field-screening data, at least one sample per soil boring will be submitted to CAS for VOC analysis.

At least a two-week notice will be provided to the agencies prior the start of the field activities.

Reporting

Upon completion of the excavation, a brief letter report will be prepared and submitted to the agencies. The letter report will summarize excavation activities, confirmatory soil analytical results, air-quality monitoring, and soil disposal. Appropriate conclusions and recommendation will be provided.

Please let me know if you have any questions or would like additional information.

Sincerely,

Shekhar Melkote
Principal Hydrogeologist

Attachments

Copies:
Tom Festa; NYSDEC
Leilani Davis, Esq.; USEPA
Tim Gaffney, Executive Vice-President; JCI
Kevin Warner, P.E.; ARCADIS

Attachment A

SVE System Tables and Figure

Table A-1
SVE Well Data
JCI Jones Chemicals, Inc.
Caledonia, New York

Well ID	Total Depth (feet bgs)	Casing Diameter (inches)	Screened Interval (feet bgs)	Top-of-Casing Elevation (NGVD)	Date	Depth to Water (feet bgs)	Groundwater Elevation (feet NGVD)	Vacuum (inches of water)	OVA (ppm)
SVE -1	15	4	5-15		4/21/04	NA	NA	NM	NM
					5/13/04	NA	NA	-18	NM
					5/26/04	NA	NA	-22	7.1
					7/1/04	NA	NA	-16	5.6
					10/1/04	NA	NA	-0.14	3.4
					2/8/05	NA	NA	-18	1.6
					5/25/05	NA	NA	-17	0.4
					9/27/05	NA	NA	-12.5	1.1
					5/5/06	NA	NA	-19.5	0
					11/16/06	NA	NA	-26	1.2
					5/3/07	NA	NA	-29	0.4
					11/1/07	NA	NA	-27	8.4
					5/6/08	NA	NA	-21	0.3
SVE-2	17	4	2-17		4/21/04	NA	NA	NM	NM
					5/13/04	NA	NA	-17	NM
					5/26/04	NA	NA	-20	5.5
					7/1/04	NA	NA	-16	3.4
					10/1/04	NA	NA	-14	2.5
					2/8/05	NA	NA	-16	0.7
					5/25/05	NA	NA	-17	0.1
					9/27/05	NA	NA	-11	0.5
					5/5/06	NA	NA	-12	0.1
					11/16/06	NA	NA	-27	0.6
					5/3/07	NA	NA	-22	0.2
					11/1/07	NA	NA	-21	2.5
					5/6/08	NA	NA	-18	0.4
SVE-3	17	4	2-17		4/21/04	NA	NA	NM	NM
					5/13/04	NA	NA	-17	NM
					5/26/04	NA	NA	-21	2
					7/1/04	NA	NA	-17	1.2
					10/1/04	NA	NA	-15	1.6
					2/8/05	NA	NA	-17	0.1
					5/25/05	NA	NA	-17.5	0.2
					9/27/05	NA	NA	-10.5	0.7
					5/5/06	NA	NA	-14	0.1
					11/16/06	NA	NA	-19	0.1
					5/3/07	NA	NA	-22	0.4
					11/1/07*	NA	NA	NM	NM
SVE-4	8	4	1-8		11/1/07	NA	NA	-21	35.9
					5/6/08	NA	NA	20	3.5

Table A-1
SVE Well Data
JCI Jones Chemicals, Inc.
Caledonia, New York

Well ID	Total Depth (feet bgs)	Casing Diameter (inches)	Screened Interval (feet bgs)	Top-of-Casing Elevation (NGVD)	Date	Depth to Water (feet bgs)	Groundwater Elevation (feet NGVD)	Vacuum (inches of water)	OVA (ppm)
OW-1	~15	1	5-15	648.95	4/21/04	9.72	639.23	-0.29	NA
					5/13/04	NM	NM	NM	NA
					5/26/04	9.46	639.49	-0.36	NA
					7/1/04	10.69	638.26	-0.32	NA
					10/1/04	11.13	637.82	-0.37	NA
					2/8/05	11.10	637.85	-0.35	NA
					5/25/05	10.49	638.46	0.2	NA
					9/27/05	14.35	634.60	0.35	NA
					5/5/06	12.06	636.89	-0.5	NA
					11/16/06	12.99	635.96	0.4	NA
					5/3/07	9.53	639.42	-0.35	NA
					11/1/07	DRY	DRY	-0.6	NA
					5/6/08	10.14	638.81	-0.4	NA
OW-2	~15	1	5-15	649.01	4/21/04	9.83	639.18	-0.34	NA
					5/13/04	NM	NM	NM	NA
					5/26/04	9.59	639.42	-0.48	NA
					7/1/04	10.79	638.22	-0.4	NA
					10/1/04	11.28	637.73	-0.43	NA
					2/8/05	NM	NM	NM	NA
					9/27/05	13.20	635.81	0.45	NA
					5/5/06	12.17	636.84	0.55	NA
					11/16/06	13.08	635.93	-0.6	NA
					5/3/07	9.65	639.36	0.55	NA
					11/1/07	DRY	DRY	-0.85	NA
					5/6/08	10.29	638.72	-0.6	NA
OW-3	~15	1	5-15	653.12	4/21/04	13.75	639.37	-0.7	NA
					5/13/04	NM	NM	NM	NA
					5/26/04	13.48	639.64	-1	NA
					7/1/04	14.71	638.41	-1.25	NA
					10/1/04	15.18	637.94	-2	NA
					2/8/05	15.15	637.97	-1.25	NA
					5/25/05	14.52	638.60	-0.9	NA
					9/27/05	13.48	639.64	-1.15	NA
					5/5/06	16.10	637.02	1.1	NA
					11/16/06	17.03	636.09	1.4	NA
					5/3/07	13.56	639.56	0.7	NA
					11/1/07	19.92	633.20	-1.75	NA
					5/6/08	14.22	638.90	-1.25	NA

Table A-1
SVE Well Data
JCI Jones Chemicals, Inc.
Caledonia, New York

Well ID	Total Depth (feet bgs)	Casing Diameter (inches)	Screened Interval (feet bgs)	Top-of-Casing Elevation (NGVD)	Date	Depth to Water (feet bgs)	Groundwater Elevation (feet NGVD)	Vacuum (inches of water)	OVA (ppm)
OP-11	22	2	17-22	653.39	4/21/04	13.32	640.07	-0.04	NA
					5/13/04	NM	NM	NM	NA
					5/26/04	14.67	638.72	0	NA
					7/1/04	14.91	638.48	0	NA
					10/1/04	15.62	637.77	-0.04	NA
					2/8/05	15.67	637.72	0	NA
					5/25/05	14.98	638.41	0	NA
					9/27/05	19.00	634.39	-0.55	NA
					5/5/06	NM	NM	NM	NA
					11/16/06	NM	NM	0.5	NA
					5/3/07	14.01	639.38	0	NA
					11/1/07	20.37	633.02	-0.85	NA
					5/6/08	14.66	638.73	0	NA

Notes:

11/1/07* = SVE-3 off-line
bgs = below ground surface
NA = not applicable
NGVD = National Geodetic Vertical Datum
NM = not measured
OVA = organic vapor analyzer
ppm = parts per million

TABLE A-2: SVE SYSTEM ANALYTICAL AND PERFORMANCE SUMMARY

Facility Name: JCI Jones Chemicals, Inc.
Facility Address: 100 Sunny Sol Boulevard, Caledonia, NY 14423

Sample Location	Date	Hour Meter	Pressure (in of H_20)	Flow (acfm)	Flow (scfm)	OVA (ppm)	PCE (ppmV)	TCE (ppmV)	cis-1,2-DCE (ppmV)	trans-1,2-DCE (ppmV)	1,1-DCE (ppmV)	Vinyl Chloride (ppmV)	Total PCE (mg/m^3)	Total PCE (pounds)	PCE (lb/hr)
Influent	4/20/04	0.00	-23	520	493	NM	29.00	0.620	0.33	<0.25	<0.25	<0.39	221.95	0	0
	4/21/04	42.00	-23.3	520	493	25.0	10.00	<0.38	0.66	<0.50	<0.50	<0.78	79.00	6.113	0.14554554
	4/23/04	75.00	-23	520	493	15.8	6.20	<0.38	0.56	<0.50	<0.50	<0.78	50.10	3.048	0.09236346
	5/13/04	548.00	-23	520	493	NM	2.10	<0.19	<0.25	<0.25	<0.25	<0.39	15.56	13.572	0.02869279
	5/26/04	839.50	-28	510	478	3.9	1.50	<0.19	<0.25	<0.25	<0.25	<0.39	11.116	5.789	0.01986028
	7/1/04	1700.60	-25	540	509	2.8	1.30	<0.25	<0.25	<0.25	<0.25	<0.39	9.634	15.807	0.01835711
	10/5/04	3906.80	-20	545	520	2.0	1.10	<0.19	<0.25	<0.25	<0.25	<0.39	8.152	35.002	0.01586519
	2/8/05	6040.10	-20	580	554	0.6	0.46	<0.19	<0.25	<0.25	<0.25	<0.39	3.409	15.062	0.0070606
	5/25/05	8391.30	-17.5	540	519	3.0	<0.25	<0.19	<0.25	<0.25	<0.25	<0.39	NM	NM	NM
	9/27/05*	11421.80	-15	580	560	0.5	0.07	0.033	0.031	<0.033	<0.033	<0.033	0.971	6.166	0.00203461
	5/5/06	16210.50	-23.8	540	511	0.0	0.16	<0.19	<0.25	<0.25	<0.25	<0.39	1.186	10.850	0.00226585
	11/16/06	17782.40	-27	580	544	0.4	0.30	0.018	<0.01	<0.01	<0.01	<0.01	2.223	7.118	0.00452818
	5/3/07	19104.40	-30	580	541	0.4	0.27	0.014	0.012	<0.0048	<0.0048	<0.0097	2.001	5.349	0.00404583
	10/30/07	20517.00 **	-30 **	580 **	541 **	NM	0.53	0.029	0.019	<0.0073	<0.0073	<0.0073	3.928	11.219	0.00794181
	11/1/07	20565.00	-30 **	580	541	12.8	3.00	0.040	0.052	<0.044	<0.044	<0.044	22.232	2.158	0.04495365
	5/7/08	21439.00	-20 **	570	544	3.5	3.70	0.037	<0.044	<0.044	<0.044	<0.044	27.420	48.780	0.05581264

TABLE A-2: SVE SYSTEM ANALYTICAL AND PERFORMANCE SUMMARY

Facility Name: JCI Jones Chemicals, Inc.
Facility Address: 100 Sunny Sol Boulevard, Caledonia, NY 14423

Sample Location	Date	Hour Meter	Pressure (in of H_20)	Flow (acfm)	Flow (scfm)	OVA (ppm)	PCE (ppmV)	TCE (ppmV)	cis-1,2-DCE (ppmV)	trans-1,2-DCE (ppmV)	1,1-DCE (ppmV)	Vinyl Chloride (ppmV)	Total PCE (mg/m^3)	Total PCE (pounds)	PCE (lb/hr)
Effluent	4/20/04	0.00	1.25	491	493	NM	2.70	<0.19	<0.25	<0.25	<0.25	<0.39	20.0	0.0	0.000
	4/21/04	42.00	1.25	491	493	1.2	1.20	<0.19	<0.25	<0.25	<0.25	<0.39	8.9	0.7	0.016
	4/23/04	75.00	1.25	491	493	2.2	0.84	<0.19	<0.25	<0.25	<0.25	<0.39	6.2	0.4	0.011
	5/13/04	548	1.25	491	493	NM	0.70	<0.25	<0.25	<0.25	<0.25	<0.39	5.2	4.5	0.010
	5/26/04	839.5	2	475	478	0.20	0.72	<0.19	<0.25	<0.25	<0.25	<0.39	5.3	2.8	0.010
	7/1/04	1700.6	2	507	509	1.30	0.92	<0.25	<0.25	<0.25	<0.25	<0.39	6.8	11.2	0.013
	10/5/04	3906.8	2.5	517	520	1.20	0.58	<0.19	<0.25	<0.25	<0.25	<0.39	4.3	18.5	0.008
	2/8/05	6040.10	2	551	554	0.90	0.56	<0.19	<0.25	<0.25	<0.25	<0.39	4.2	18.3	0.009
	5/25/05	8391.30	1.5	517	519	0.30	0.63	<0.19	<0.25	<0.25	<0.25	<0.39	4.7	21.3	0.009
	9/27/05*	11421.80	2	558	560	0.00	1.20	0.035	0.024	<0.084	<0.084	<0.084	9.3	59.3	0.020
	5/5/06	16210.50	2	540	542	0.10	1.90	<0.19	<0.25	<0.25	<0.25	<0.39	13.1	127.4	0.027
	11/16/06	17782.40	1.5	580	582	0.30	0.29	0.027	0.028	<0.01	<0.01	<0.01	2.0	6.8	0.004
	5/3/07	19104.40	2	580	583	0.20	0.20	0.014	0.027	<0.0022	<0.0022	<0.0044	1.4	8.7	0.003
	10/30/07	20517.00 **	1.5 **	580**	580 **	NM	0.55	0.038	0.051	<0.0073	<0.0073	<0.0073	3.8	22.5	0.008
	11/1/07	20565.00	1.5	580	582	7.40	2.90	0.036	0.052	<0.044	<0.044	<0.044	20.0	2.1	0.044
	5/7/08	21439.00	1.5	570	572	0.40	1.20	0.023	0.083	<0.015	<0.015	<0.015	8.3	16.3	0.019

Notes:

Analytical results are presented in parts per million, unless otherwise noted.
assumed vacuum = 23 inches of water, and assumed flow = 520 acfm at startup
9/27/05*: Samples were collected in Summa Canisters and analyzed by U.S. EPA Method TO-15
** Estimated values

acfm = actual cubic feet per minute
DCE = dichloroethene
in of H_2O = inches of water
lb/hr = pound per hour
mg/m^3 = milligram per cubic meter
NM = not measured
OVA = organic vapor analyzer
PCE = tetrachloroethene
ppm = parts per million
ppmV = parts per million by volume
scfm = standard cubic feet per minute
TCE = trichloroethene
U.S. EPA = United States Environmental Protection Agency

Table A-3
Vadose Zone Confirmatory Soil Sampling Results
May 2, 2007 and May 7, 2008
JCI Jones Chemicals, Inc.
Caledonia, New York

	Sample Location and Identification, Sample Depth (feet bgs), and Sample Date									
Chemical Analyte	**P-1 9 - 10 5/2/07**	**P-2[1] 2 - 3 5/2/07**	**P-3 9 - 10 5/2/07**	**P-4 8 - 10 5/2/07**	**P-5[1] 9 - 11 5/2/07**	**P-6 9 - 11 5/2/07**	**P-7 8 - 10 5/2/07**	**P-8 8 - 10 5/2/07**	**EB-SI NA 5/2/07**	**P-9 2 - 3 5/7/08**
Benzene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Bromodichloromethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Bromoform	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Bromomethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Carbon Tetrachloride	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Chlorobenzene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Chloroethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Chloroform	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Chloromethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Dibromochloromethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
1, 1-Dichloroethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
1,2-Dichloroethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
1,1-Dichloroethene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Cis-1, 2-Dichloroethene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Trans- 1,2 -Dichloroethene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
1,2 -Dichloropropane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Cis-1, 3-Dichloropropene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Trans-1,3-Dichloropropene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Ethylbenzene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Methylene Chloride	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
1,1,2,2-Tetrachloroethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Tetrachloroethene	**50**	**31,000 D**	**42**	**5.3**	**220 D**	**49**	< 5.2	**56**	< 5.0	**40,000 D**
Toluene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
1,1,1-Trichloroethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
1,1,2-Trichloroethane	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
Trichloroethene	< 5.3	**44**	< 5.4	< 5.1	< 5.3	**13**	< 5.2	< 5.3	< 5.0	< 28
Vinyl Chloride	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
O-Xylene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28
M+P-Xylene	< 5.3	< 28	< 5.4	< 5.1	< 5.3	< 5.4	< 5.2	< 5.3	< 5.0	< 28

Notes:

Concentrations are presented in micrograms per kilogram.

[1] Tetrachloroethene was detected in samples P-2 and P-5 outside the calibration range of the instruments and were flagged as an "E". The samples were reanalyzed at dilution and reflagged with a "D".

bgs = below ground surface

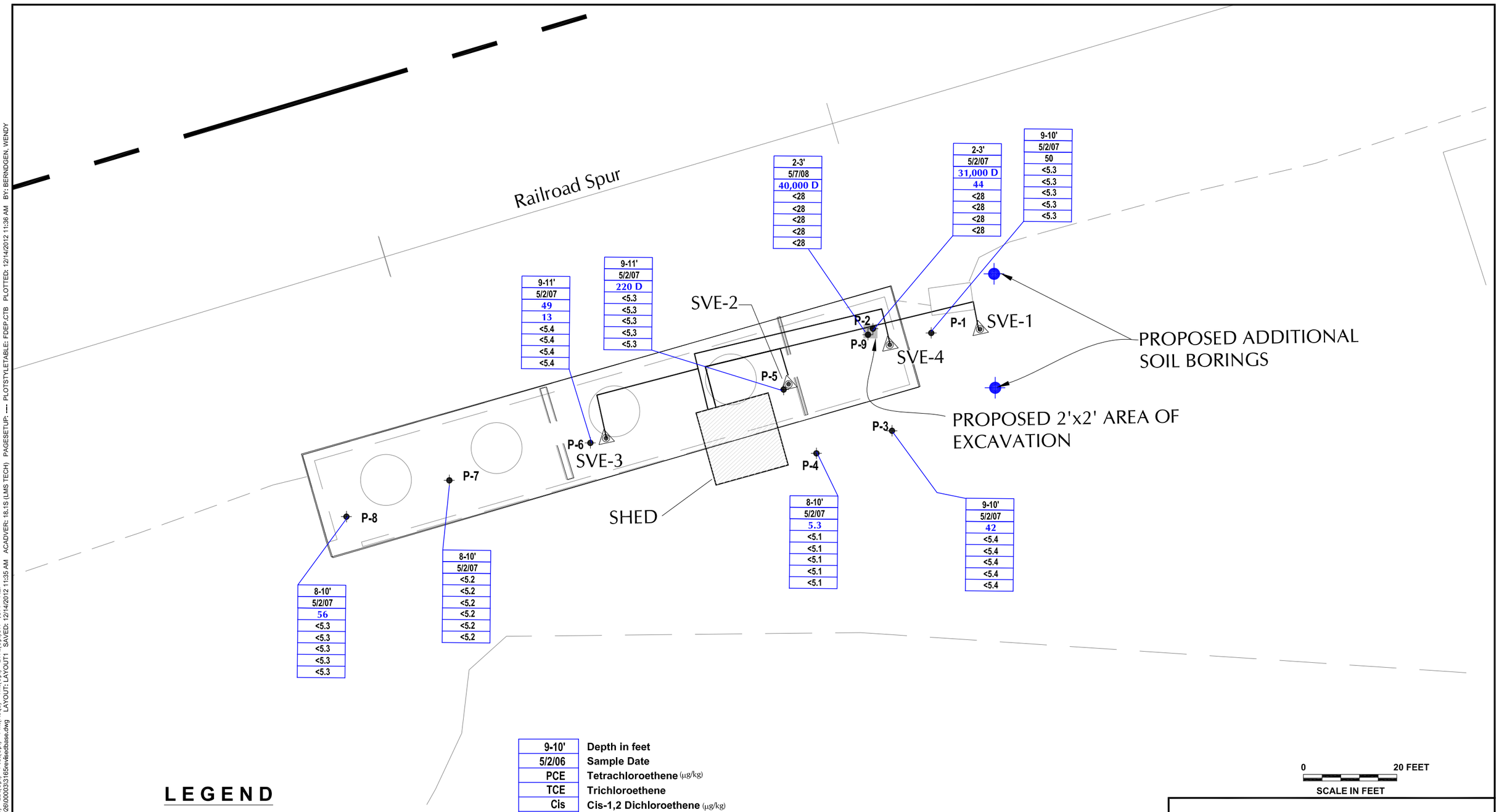
Bold = positive detection

D - indicates that results were based on a reanalysis at dilution

E - indicates the results were rejected due to exceeding calibration range of the instrument

EB - equipment blank

NA - not applicable



LEGEND

- Site boundary JCI Jones Chemicals, Inc..
- P-1 Soil Boring
- SVE well

9-10'	Depth in feet
5/2/06	Sample Date
PCE	Tetrachloroethene (µg/kg)
TCE	Trichloroethene
Cis	Cis-1,2 Dichloroethene (µg/kg)
Trans	Trans-1,2 Dichloroethene (µg/kg)
1,1-DCE	1,1 Dichloroethene (µg/kg)
VC	Vinyl Chloride (µg/kg)
<5.2	Chemical not detected; value shown is Practical Quantitation Limit
D	Results based on a reanalysis at dilution
µg/kg	Micrograms per kilogram

NOTE: BOLD FONT = POSITIVE DETECTION
P9 is the new sample location sampled May 7, 2008

0 20 FEET
SCALE IN FEET

JCI JONES CHEMICALS, INC. - SUPERFUND SITE
CALEDONIA, NEW YORK

PROPOSED AREA OF EXCAVATION AND ADDITIONAL SOIL BORINGS

ARCADIS

FIGURE
A-1