COKE OVEN AREA INTERIM MEASURES PROGRESS REPORT
(MAY 2011)

Prepared for

RG Steel Sparrows Point, LLC
Sparrows Point, Maryland

June 30, 2011

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Project no. 15302745

Introduction

In accordance with the United States Environmental Protection Agency's (US EPA)'s September 2, 2010 letter, this document is the monthly progress report for May 2011 for the US EPA-approved interim measures (IMs) that have been developed to address identified environmental conditions at the Coke Oven Area (COA) Special Study Area at the RG Steel Sparrows Point Facility (formerly Severstal Sparrows Point Facility) located in Sparrows Point, Maryland. This progress report summarizes IM progress for May 2011.

For mutual ease of understanding, and as agreed during the June 3, 2010 teleconference with US EPA, the following designations are applied in this document to the six (6) IM "Cells" (**Figure 1**) at the COA:

- Cell 1: Prototype Air Sparge/Soil Vapor Extraction (AS/SVE) System in the Former Benzol Processing Area,
- Cell 2: AS/SVE and Dual Phase Groundwater Extraction System in Former Coal Storage Area,
- Cell 3: AS/SVE System in "Cove" Area,
- Cell 4: In-Situ Anaerobic Bio-treatment Area,
- Cell 5: Groundwater Extraction at the Turning Basin Area, and
- Cell 6: Light Non-Aqueous Phase Liquid (LNAPL) Recovery at the Former Benzol Processing Area.

As of May 31, 2011, Cell 1 and Cell 6 are operational. A final design report for the AS/SVE system at Cell 3 was submitted on February 28, 2011. In addition, a final design report for the in-situ anaerobic bio-treatment system at Cell 4 was submitted on March 31, 2011. US EPA has approved the submitted designs for Cells 3 and 4. Construction of the AS/SVE system at Cell 3 began on May 23, 2011 and was substantially completed on June 23, 2011. Startup/shakedown operations were initiated at Cell 3 on June 23, 2011.

Construction of groundwater treatment facilities for the in-situ anaerobic bio-treatment system at Cell 4 were completed in May 2011. Operation of Cell 4 will begin in July 2011. The remaining

Cells (Cells 2 and 5) are in various stages of evaluation, design, and under permitting considerations by Maryland Department of the Environment (MDE).

Cell 1: Prototype AS/SVE System in the Former Benzol Processing Area

Cell 1 consists of a prototype IM, which includes AS/SVE coupled with vapor destruction via an electric catalytic oxidation (CATOX) unit (formerly an ICE unit, the function of which was replaced by a temporary CATOX unit on May 3, 2011). The temporary CATOX unit was installed to improve operational efficiency of the Cell 1 AS/SVE system while new CATOX/AS systems for both Cell 1 and Cell 3 were being fabricated. The new, permanent CATOX system was delivered and installed during the week of June 20, 2011. Startup/shakedown of the new Cell 1 components began on June 23, 2011.

MDE received RG Steel's Air and Radiation Management Administration (ARMA) permit-to-construct application for the new Cell 1 and Cell 3 CATOX units on April 20, 2011 and issued the modified permit-to-construct for the CATOX units (for both Cell 1 and Cell 3) on May 20, 2011. In accordance with the modified permit-to-construct conditions, the CATOX units are operated in accordance with the manufacturer's specifications.

Design of the Cell 1 system includes air sparging groundwater wells and vapor collection trenches as shown schematically on **Figure 2**.

Figure 3 shows the system layout of Cell 1, which consists of the following major components:

- Three (3) generally parallel and interconnected vapor collection trenches approximately 500 feet long and 60 feet apart, fitted with perforated 4-inch SDR-17 high-density polyethylene (HDPE) pipe. 15 vertical extraction risers are connected to a common suction header.
- 16 air sparge wells located between the trenches.
- 4-inch SDR-17 HDPE sparge and suction headers fitted with control valves for 2-inch SDR-17 HDPE sparge and suction laterals.
- One (1) trailer-mounted electric CATOX unit for extraction vacuum and vapor destruction, which is accompanied by a separate air compressor for sparge air.
- Perimeter slag berm for system demarcation and protection from vehicular traffic.

May 2011 Operational Performance

Operational performance of Cell 1 during this reporting period is summarized in **Table 1**. In summary, the CATOX unit operated for 686 hours (92.2 %) during this reporting period. Hydrocarbon removal rates ranged from approximately 0.4 to 1.9 pounds per operating hour (approximately 10 to 46 pounds per operating day for an estimated total of 987 pounds). The average CATOX destruction efficiency exceeded 99 %. **Table 1** also includes a cumulative summary of operational performance since system startup on August 3, 2010. In total, Cell 1 has destroyed approximately 6,977 pounds of recovered hydrocarbons. **Figure 4** presents a graph of the cumulative estimated hydrocarbon recovery in Cell 1 by month since the startup of the IM system.

Soil gas and CATOX exhaust gas samples were collected to confirm system performance within the manufacturer's specifications. Calibrated field instruments (e.g., photoionization detector [PID]) were also used to evaluate system performance. The untreated soil gas samples and CATOX exhaust samples were collected in Tedlar® bags. All gas samples were submitted to TestAmerica Laboratories, Inc. Knoxville, Tennessee laboratory for analysis by US EPA Method TO-15. These data are summarized in **Table 2**.

Hydrocarbon removal calculations were based entirely on the analytical results and the corresponding field-measured influent flow rate at the time of sampling. Calculations were based on the following two (2) assumptions:

- The analytical sample from May 11, 2011 is representative of soil vapor concentrations during the first nine (9) operating days of May because, in general, the same extraction wells (V-1 through V-8) were online and CATOX operational temperatures were generally stable within normal ranges.

- The analytical sample from May 25, 2011 represents soil vapor concentrations during the last 20 operating days of May because, in general, the same extraction wells (V-1 thru V-6) were online and CATOX operational temperatures were generally stable within normal ranges

From **Table 2**, influent soil gas hydrocarbon concentrations, collected on May 11 and 25, 2011, were 275 and 1,167 parts per million by volume (ppmv), respectively. The CATOX exhaust samples, also collected on May 11 and 25, 2011, exhibited hydrocarbon concentrations of 1.8 and 3.3 ppmv, respectively; demonstrating hydrocarbon destruction efficiency greater than 99 %.

In accordance with the May 20, 2011 modified permit-to-construct, the electric catalytic oxidation unit was operational at all times that soil gases were collected.

May 2011 Groundwater Monitoring Results

Groundwater samples were collected on May 5, 2011 from the following wells:

- BP-MW-09 (upgradient of Cell 1),
- CO18-PZM006 (upgradient of Cell 1 at edge of berm), and
- CO02-PZM006 (downgradient of Cell 1).

The groundwater samples were submitted to Microbac Laboratories, Inc. of Baltimore, Maryland (Microbac) for the analyses shown in **Table 3**. These data indicate benzene is the most prevalent volatile organic compound (VOC) constituent.

Figure 5 presents a graph of the total measured VOC concentration in Cell 1 groundwater for each well by month since the startup of the IM system. A decreasing total VOC concentration trend is documented since system startup in August 2010. The identified trend for these monitoring wells will continue to be monitored and assessed during system operation in future months.

Cell 3: AS/SVE System in the "Cove" Area

Construction of the Cell 3 AS/SVE system began May 23, 2011 and was substantially complete on June 23, 2011. Operation of Cell 3 was initiated on June 23, 2011 when preliminary startup/shakedown of the system was initiated. MDE issued a modified permit-to-construct for the Cell 3 CATOX system on May 20, 2011.

Figure 6 shows the location of the Cell 3 AS/SVE treatment area at the COA. A system schematic of the Cell 3 system layout is shown on **Figure 7**, which consists of the following major components:

- One (1) vapor collection trench (generally parallel to the cove shoreline) approximately 600 feet long and 3 feet wide fitted with a horizontal perforated 4-inch diameter SDR-17 HDPE vapor collection pipe locate on the cove-side of the trench. Five (5) vertical vapor-extraction risers are connected to a common suction header.

- 14 air sparge wells located within the trench, opposite the vapor collection pipe. These 14 air sparge wells, each spaced approximately 40 feet apart, are constructed of 2-inch, schedule 40 PVC with a 2-foot screen of the appropriate slot size and sand pack.

- 4-inch SDR-17 HDPE sparge and suction headers fitted with control valves for 2-inch sparge and suction laterals.

- One (1) electric CATOX unit for extraction vacuum and vapor destruction. The CATOX unit is sized to handle at least the volume of sparge air delivered to the subsurface.

- One (1) electric air compressor for sparge air sized to have the capability to activate all sparge wells.

- Perimeter slag berm for system demarcation and protection from vehicular traffic.

Cell 4: In-Situ Anaerobic Bio-treatment System

Cell 4 IM construction activities were initiated in May 2011, beginning with installation of the seven (7) additional groundwater wells as specified in the design well network (**Figure 8**).

Figure 9 illustrates the extraction and recirculation system that will be used to dose and circulate groundwater to disperse the nutrient amendment. Groundwater dosing and circulation will not be continuous, but will periodically be repeated to maintain groundwater nutrient levels. The first round of groundwater dosing and circulation will be completed in July 2011.

Cell 6: LNAPL Extraction at the Former Benzol Processing Area

The Cell 6 LNAPL monitoring and recovery system was monitored approximately weekly during May 2011 (four [4] site visits). **Table 4** summarizes LNAPL occurrence and recovery observed during the reporting period along with the cumulative LNAPL recovery since the beginning of the project. **Figure 4** presents a graph of the cumulative estimated hydrocarbon recovery in Cell 6 by month since the startup of the IM system. **Figure 10** illustrates the well locations.

During May, approximately 502 gallons (3,674 pounds) of LNAPL was recovered, bringing the total recovered LNAPL to 5,010 gallons (36,708 pounds) as of May 25, 2011. The LNAPL was recovered from the following wells:

Well	LNAPL Recovery (gal / lbs)		Notes
	During May 2011	Total thru May 25, 2011	
BP-MW-05	442 / 3,239	4,400 / 32,239	
RW-04	42 / 305	401 / 2,937	
BP-MW-08	18 / 130	195 / 1,431	
BP-MW-11	0 / 0	8 / 57	(a)
RW-01	0 / 0	1.3 / 10	(b)
RW-02	0 / 0	0.8 / 5	(b)
RW-03	0 / 0	4.0 / 29	(b)

(a) Recovery system moved from BP-MW-11 to BP-MW-08 on September 8, 2010.
(b) Manual bailing.

The wells are presented in **Table 4** generally in the order of decreasing LNAPL occurrence/recovery. During the reporting period, the range of LNAPL thicknesses has varied as summarized below (wells are not listed if LNAPL was not present):

- BP-MW-05 (1.10 to 1.31 feet),
- BP-MW-07 (0.00 to 0.05 feet),
- BP-MW-08 (0.10 to 0.25 feet),
- BP-MW-11 (0.2 to 0.5 feet [estimated]),
- BP-MW-10 (0.05 to 0.20 feet),
- RW-01 (0.10 to 0.15 feet),

- RW-02 (0.12 to 0.23 feet),
- RW-03 (0.13 to 0.18 feet), and
- RW-04 (0.60 to 0.94 feet).

LNAPL was not observed in wells RW-05, BP-MW-06, BP-MW-09, or CO19-PZM004 during this reporting period.

For all wells in which LNAPL accumulated, **Table 5** provides well-specific details concerning the measured depths to LNAPL, the water table, and calculated LNAPL thicknesses.

Tables

Table 1
Summary of Operating Conditions
Cell 1: Prototype AS/SVE System in Former Benzol Processing Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

Cell 1 May 2011 Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total CATOX Operating Time (May 1 - May 31, 2011)	hours	686
Overall CATOX Operational Time	%	92.2
Estimated Total Hydrocarbons Destroyed	pounds	987
Estimated Hydrocarbon Removal Rate	pounds/hour	0.4 - 1.9

Cell 1 Cumulative Summary of Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total ICE/CATOX Operating Time (August 3, 2010 - May 31, 2011)	hours	4,121
Overall ICE/CATOX Operational Time	%	56.9
Estimated Total Hydrocarbons Destroyed	pounds	6,977
Estimated Hydrocarbon Removal Rate	pounds/hour	1.69

Table 2
Summary of Soil Gas Analytical Results
Cell 1: Prototype AS/SVE System in Former Benzol Processing Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

	Sample ID	CATOX Influent	CATOX Exhaust	CATOX Influent	CATOX Exhaust
	Date	5/11/2011	5/11/2011	5/25/2011	5/25/2011
	Time	10:35	10:40	13:40	13:55
	Dilution Factor	6477.19	91.45	92859.70	143.76
Analyte	Units				
TO-15 Volatile Organics					
trans-1,3-Dichloropropene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Acetone	ppb	< 32,000 U	< 460 U	< 460,000 U	< 720 U
Ethylbenzene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
2-Hexanone	ppb	< 3,200 U	< 46 U	< 46,000 U	< 72 U
Methylene Chloride	ppb	< 3,200 U	< 46 U	< 46,000 U	< 72 U
Benzene	ppb	**250,000**	**1,600**	**1,100,000**	**3,200**
1,1,2,2-Tetrachloroethane	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Tetrachloroethene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Toluene	ppb	**21,000**	**140**	**67,000**	**54**
1,1,1-Trichloroethane	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
1,1,2-Trichloroethane	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Trichloroethene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Vinyl Chloride	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
o-Xylene	ppb	< 1,300 U	**25**	< 19,000 U	< 29 U
m-Xylene & p-Xylene	ppb	**3,800**	**59**	< 19,000 U	< 29 U
2-Butanone (MEK)	ppb	< 6,500 U	< 91 U	< 93,000 U	< 140 U
4-Methyl-2-pentanone (MIBK)	ppb	< 3,200 U	< 46 U	< 46,000 U	< 72 U
Bromoform	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Carbon Disulfide	ppb	< 3,200 U	< 46 U	< 46,000 U	< 72 U
Carbon tetrachloride	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Chlorobenzene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Chloroethane	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Chloroform	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
1,1-Dichloroethane	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
1,2-Dichloroethane	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
1,1-Dichloroethene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
trans-1,2-Dichloroethene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
1,2-Dichloropropane	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
cis-1,3-Dichloropropene	ppb	< 1,300 U	< 18 U	< 19,000 U	< 29 U
Total Volatile Organics	ppb	**274,800**	**1,824**	**1,167,000**	**3,254**

Notes:

<Blank> = Not measured
BOLD = Analyte detected
ppb = parts per billion
</U = Analyte not detected above corresponding Reporting Limit
% = Percent

Table 3
Summary of Groundwater Analytical Results
Cell 1: Prototype AS/SVE System in Former Benzol Processing Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

Analyte	Sample ID / Date / Units	MDE GW Stds	CO02-PZM006 5/5/2011	CO18-PZM006 5/5/2011	BP-MW-09 5/5/2011
Water Quality Parameters					
Temperature	deg C	*NA*	19.90	24.24	16.74
pH	std units	*NA*	7.78	7.21	11.50
ORP	mV	*NA*	-302	84	-390
Conductivity	mS/cm	*NA*	1.700	2.500	1.840
Turbidity	NTU	*NA*	N/A	N/A	N/A
DO	mg/L	*NA*	0.41	4.45	0.64
Volatile Organics					
Acetone	µg/L	*550*	< 120,000 U	< 120,000 U	< 120,000 U
Benzene	µg/L	*5*	**420,000**	**230,000**	**180,000**
Bromoform	µg/L	*80*	< 5,000 U	< 5,000 U	< 5,000 U
2-Butanone (MEK)	µg/L	*700*	< 25,000 U	< 25,000 U	< 25,000 U
Carbon Disulfide	µg/L	*100*	< 5,000 U	< 5,000 U	< 5,000 U
Carbon Tetrachloride	µg/L	*5*	< 5,000 U	< 5,000 U	< 5,000 U
Chlorobenzene	µg/L	*100*	< 5,000 U	< 5,000 U	< 5,000 U
Chloroethane	µg/L	*3.6*	< 5,000 U	< 5,000 U	< 5,000 U
Chloroform	µg/L	*80*	< 5,000 U	< 5,000 U	< 5,000 U
1,1-Dichloroethane	µg/L	*90*	< 5,000 U	< 5,000 U	< 5,000 U
1,2-Dichloroethane	µg/L	*5*	< 5,000 U	< 5,000 U	< 5,000 U
1,1-Dichloroethene	µg/L	*7*	< 5,000 U	< 5,000 U	< 5,000 U
trans-1,2-Dichloroethene	µg/L	*100*	< 5,000 U	< 5,000 U	< 5,000 U
1,2-Dichloropropane	µg/L	*5*	< 5,000 U	< 5,000 U	< 5,000 U
cis-1,3-Dichloropropene	µg/L	*0.44*	< 5,000 U	< 5,000 U	< 5,000 U
trans-1,3-Dichloropropene	µg/L	*0.44*	< 5,000 U	< 5,000 U	< 5,000 U
Ethylbenzene	µg/L	*700*	< 5,000 U	< 5,000 U	< 5,000 U
2-Hexanone (MBK)	µg/L	*NA*	< 25,000 U	< 25,000 U	< 25,000 U
4-Methyl-2-Pentanone (MIBK)	µg/L	*630*	< 25,000 U	< 25,000 U	< 25,000 U
Methylene Chloride	µg/L	*5*	< 25,000 U	< 25,000 U	< 25,000 U
1,1,1,2-Tetrachloroethane	µg/L	*NA*	< 5,000 U	< 5,000 U	< 5,000 U
1,1,2,2-Tetrachloroethane	µg/L	*0.05*	< 5,000 U	< 5,000 U	< 5,000 U
Tetrachloroethene	µg/L	*5*	< 5,000 U	< 5,000 U	< 5,000 U
Toluene	µg/L	*1,000*	**37,000**	**28,000**	**46,000**
Xylenes, Total	µg/L	*10,000*	< 15,000 U	< 15,000 U	**27,400**
1,1,1-Trichloroethane	µg/L	*200*	< 5,000 U	< 5,000 U	< 5,000 U
1,1,2-Trichloroethane	µg/L	*5*	< 5,000 U	< 5,000 U	< 5,000 U
Trichloroethene	µg/L	*5*	< 5,000 U	< 5,000 U	< 5,000 U
Vinyl Chloride	µg/L	*2*	< 5,000 U	< 5,000 U	< 5,000 U
Total Volatile Organics	µg/L	--	**457,000**	**258,000**	**253,400**

Notes:

--	= Not measured
Bold	= Analyte Detected
deg C	= Degree Celcius
mg/L	= milligrams per liter
mS/cm	= Microsiemens per Centimeter
mV	= Millivolts
NA	= Standard not available or not currently established
NTU	= Nephelometric Turbidity Units
ORP	= Oxidation Reduction Potential
std units	= Standard units
</U	= Analyte not detected above corresponding Reporting Limit
µg/L	= micrograms per liter

Table 4
LNAPL Occurrence and Recovery
Cell 6: LNAPL Recovery System in Former Benzol Processing Area
Former Coke Oven Area Interim Remedial Measures
RG Steel-Sparrows Point, LLC

Well	LNAPL Occurrence During May 2011 (ft)			Total LNAPL Recovery Period		Cumulative Total LNAPL Recovered thru May 25, 2011		LNAPL Recovered During May 2011	
				Begin	End	(gal)	(lbs) (a)	(gal)	(lbs) (a)
BP-MW-05	1.10	to	1.31	28-Jan-10	On-going (b)	4,400	32,239	442	3,239
RW-04	0.60	to	0.94	23-Jul-10	On-going (b)	401	2,937	42	305
BP-MW-08	0.10	to	0.25	8-Sep-10	On-going (b)	195	1,431	18	130
BP-MW-11	0.2 (d)	to	0.5 (d)	23-Jul-10	8-Sep-10	8	57	0	0
RW-01	0.10	to	0.15	28-Oct-10	On-going (c)	1.3	10	0.0	0
RW-03	0.13	to	0.18	11/24/2010	On-going (c)	4.0	29	0.0	0
RW-02	0.12	to	0.23	1/28/2011	On-going (c)	0.8	5	0.0	0
BP-MW-10	0.05	to	0.20	na	na	0	0	0	0
BP-MW-07	0.00	to	0.05	na	na	0	0	0	0
RW-05	none			na	na	0	0	0	0
BP-MW-06	none			na	na	0	0	0	0
BP-MW-09	none			na	na	0	0	0	0
CO19-PZM004	none			na	na	0	0	0	0
					Total Recovery:	**5,010**	**36,709**	**501**	**3,673**

Notes:

(a) Weight is calculated based on average BP-MW-05 and BP-MW-08 oil density of 0.878 grams per cubic centimeter, measured by EA (2009) by ASTM method D1481.

(b) Skimmer

(c) Bailing

(d) Estimated

Table 5
Depths (feet) to Water and LNAPL
Cell 6: LNAPL Recovery System in Former Benzol Processing Area
Former Coke Oven Area Interim Remedial Measures
RG Steel-Sparrows Point, LLC

Date	RW-01			RW-02			RW-03		
	Depth to LNAPL	Depth to Water	LNAPL Thickness	Depth to LNAPL	Depth to Water	LNAPL Thickness	Depth to LNAPL	Depth to Water	LNAPL Thickness
5/6/2011	11.40	11.50	0.10	11.50	11.63	0.13	9.44	9.58	0.14
5/13/2011	11.20	11.33	0.13	11.30	11.42	0.12	9.26	9.44	0.18
5/19/2011	10.79	10.94	0.15	10.95	11.14	0.19	9.15	9.28	0.13
5/25/2011	10.86	10.98	0.12	10.97	11.20	0.23	8.95	8.95	0.00

Date	RW-04			BP-MW-05			BP-MW-07		
	Depth to LNAPL	Depth to Water	LNAPL Thickness	Depth to LNAPL	Depth to Water	LNAPL Thickness	Depth to LNAPL	Depth to Water	LNAPL Thickness
5/6/2011	9.65	10.25	0.60	11.16	12.33	1.17	10.99	11.04	0.05
5/13/2011	9.41	10.35	0.94	10.92	12.02	1.10	10.84	10.84	0.00
5/19/2011	9.65	10.25	0.60	10.85	11.95	1.10	10.75	10.75	0.00
5/25/2011	9.41	9.90	0.49	10.61	11.92	1.31	10.53	10.53	0.00

Date	BP-MW-08			BP-MW-10			BP-MW-11		
	Depth to LNAPL	Depth to Water	LNAPL Thickness	Depth to LNAPL	Depth to Water	LNAPL Thickness	Depth to LNAPL	Depth to Water	LNAPL Thickness
5/6/2011	11.20	11.38	0.18	9.25	9.32	0.07	11.23	- -	- -
5/13/2011	12.02	12.18	0.16	9.51	9.71	0.20	11.50	- -	- -
5/19/2011	11.20	11.38	0.18	8.88	9.05	0.17	10.84	- -	- -
5/25/2011	11.66	11.74	0.08	8.20	8.25	0.05	10.25	- -	- -

Figures

N
W E
S

Legend

◆ Existing Monitoring Well

INTERIM MEASURES TREATMENT CELLS

"Cell 1": Prototype AS/SVE System in Benzol Area

"Cell 2": AS/SVE and Dual Phase GW Treatment/Injection System in the Former Coal Storage Area

"Cell 3": AS/SVE System in the "Cove" Area

"Cell 4": In-Situ Anaerobic Bio-treatment System in the Coal Tar Area

"Cell 5": Groundwater Extraction/Treatment/ Injection at the Turning Basin Area

"Cell 6": LNAPL Recovery at the Former Benzol Processing Area

200 0 200 400 Feet

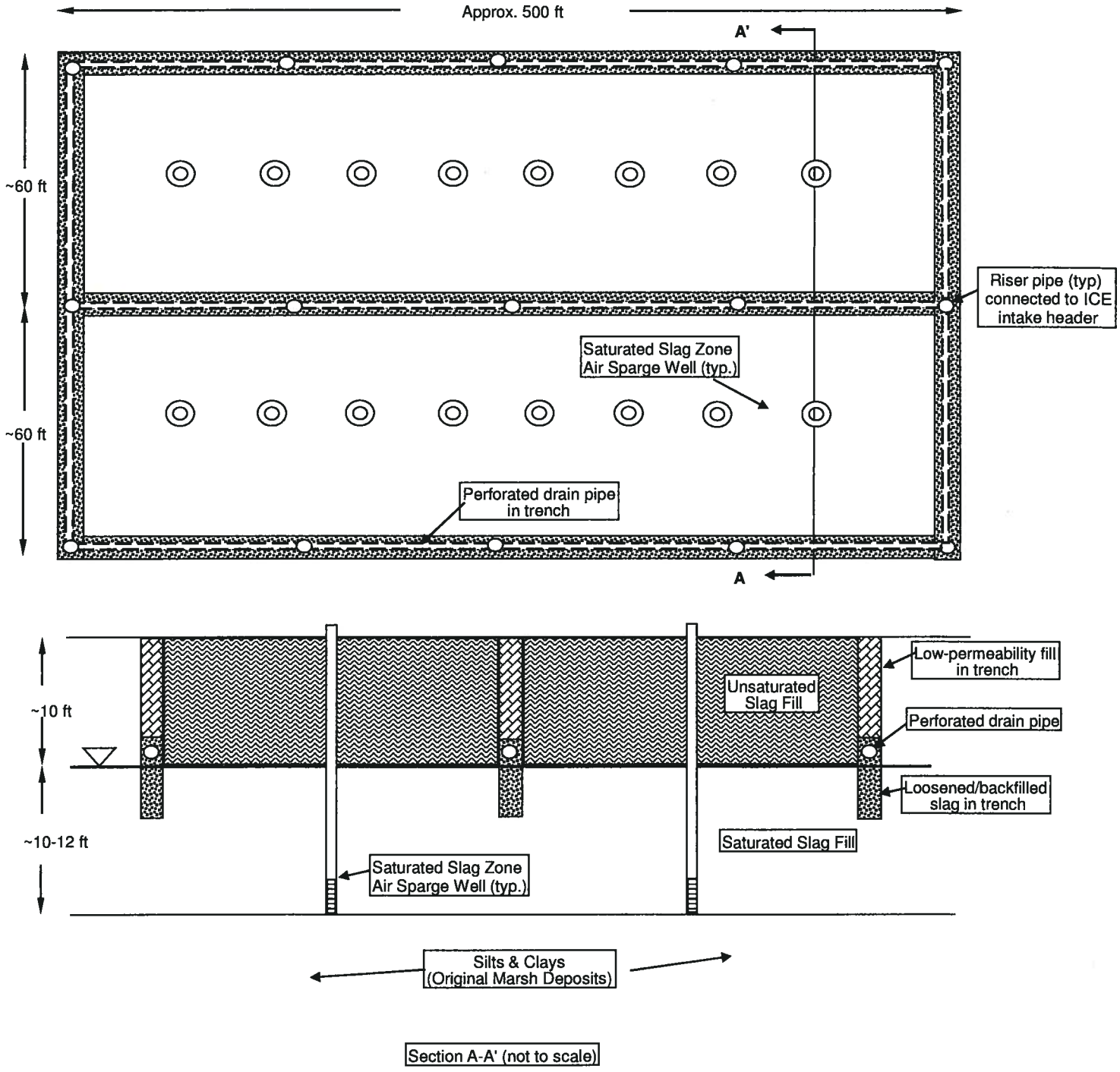
CLIENT: Sparrows Point	LOCATION: Baltimore, MD
DATE: 06/11/10	FILE: G:\Projects\SparrowsPoint\Projects\2010\CokeOven-and-CokePoint-6Prototype Cells_rev1.mxd
GIS: AER	
CHECKED: RL	
SENIOR: BE	

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

Figure 1

Interim Measures Treatment Areas

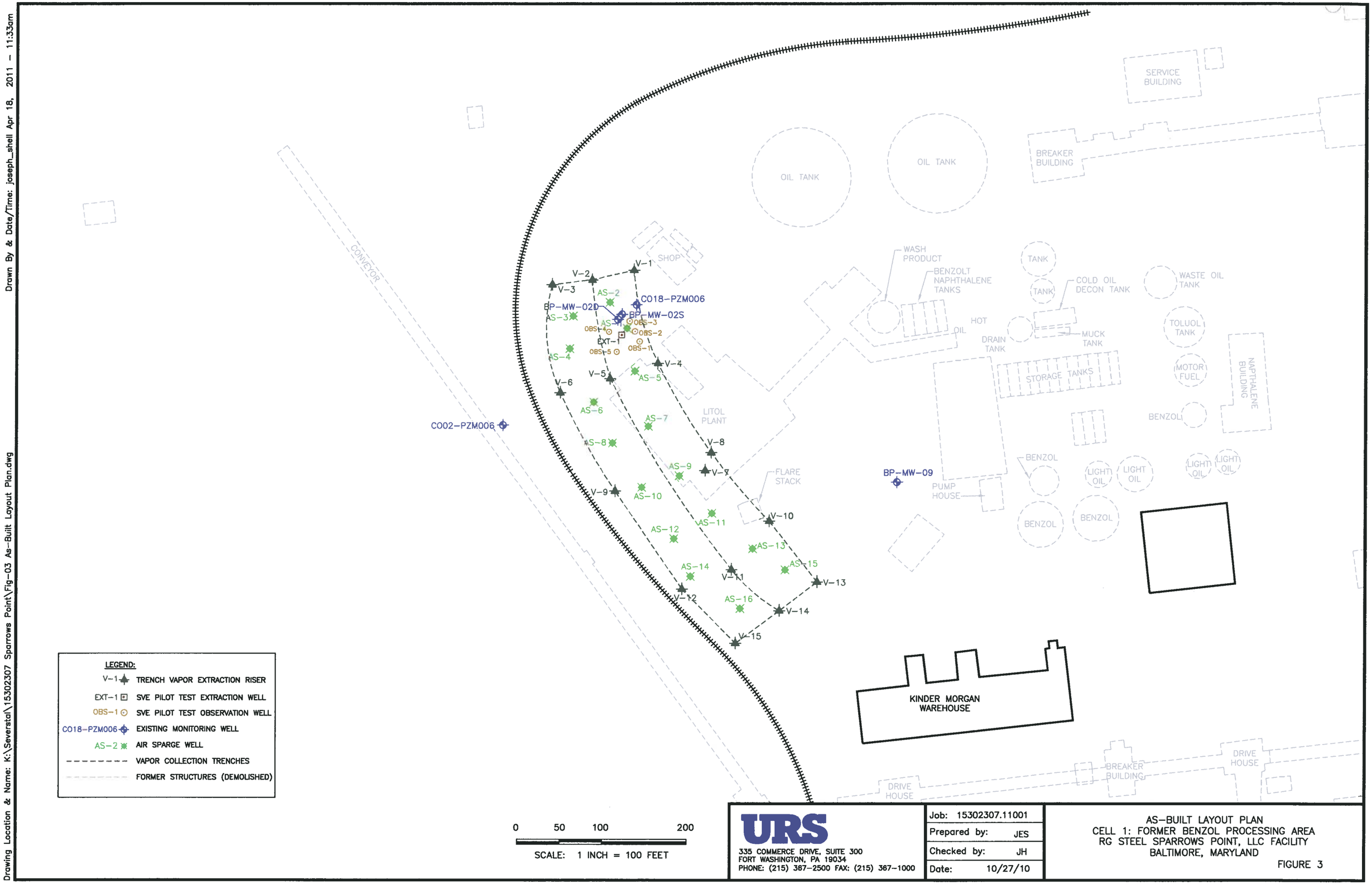
Figure 2
Schematic Diagram
Cell 1: Prototype AS/SVE System in Former Benzol Processing Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC



Section A-A' (not to scale)

Drawn By & Date/Time: joseph_shell Apr 18, 2011 - 11:33am

Drawing Location & Name: K:\Severstal\15302307 Sparrows Point\Fig-03 As-Built Layout Plan.dwg



LEGEND:

- V-1 — TRENCH VAPOR EXTRACTION RISER
- EXT-1 — SVE PILOT TEST EXTRACTION WELL
- OBS-1 — SVE PILOT TEST OBSERVATION WELL
- C018-PZM006 — EXISTING MONITORING WELL
- AS-2 — AIR SPARGE WELL
- VAPOR COLLECTION TRENCHES
- FORMER STRUCTURES (DEMOLISHED)

0 50 100 200

SCALE: 1 INCH = 100 FEET

URS
335 COMMERCE DRIVE, SUITE 300
FORT WASHINGTON, PA 19034
PHONE: (215) 367-2500 FAX: (215) 367-1000

Job:	15302307.11001
Prepared by:	JES
Checked by:	JH
Date:	10/27/10

AS-BUILT LAYOUT PLAN
CELL 1: FORMER BENZOL PROCESSING AREA
RG STEEL SPARROWS POINT, LLC FACILITY
BALTIMORE, MARYLAND

FIGURE 3

Figure 4
Cumulative Summary of Estimated Hydrocarbon Recovery
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

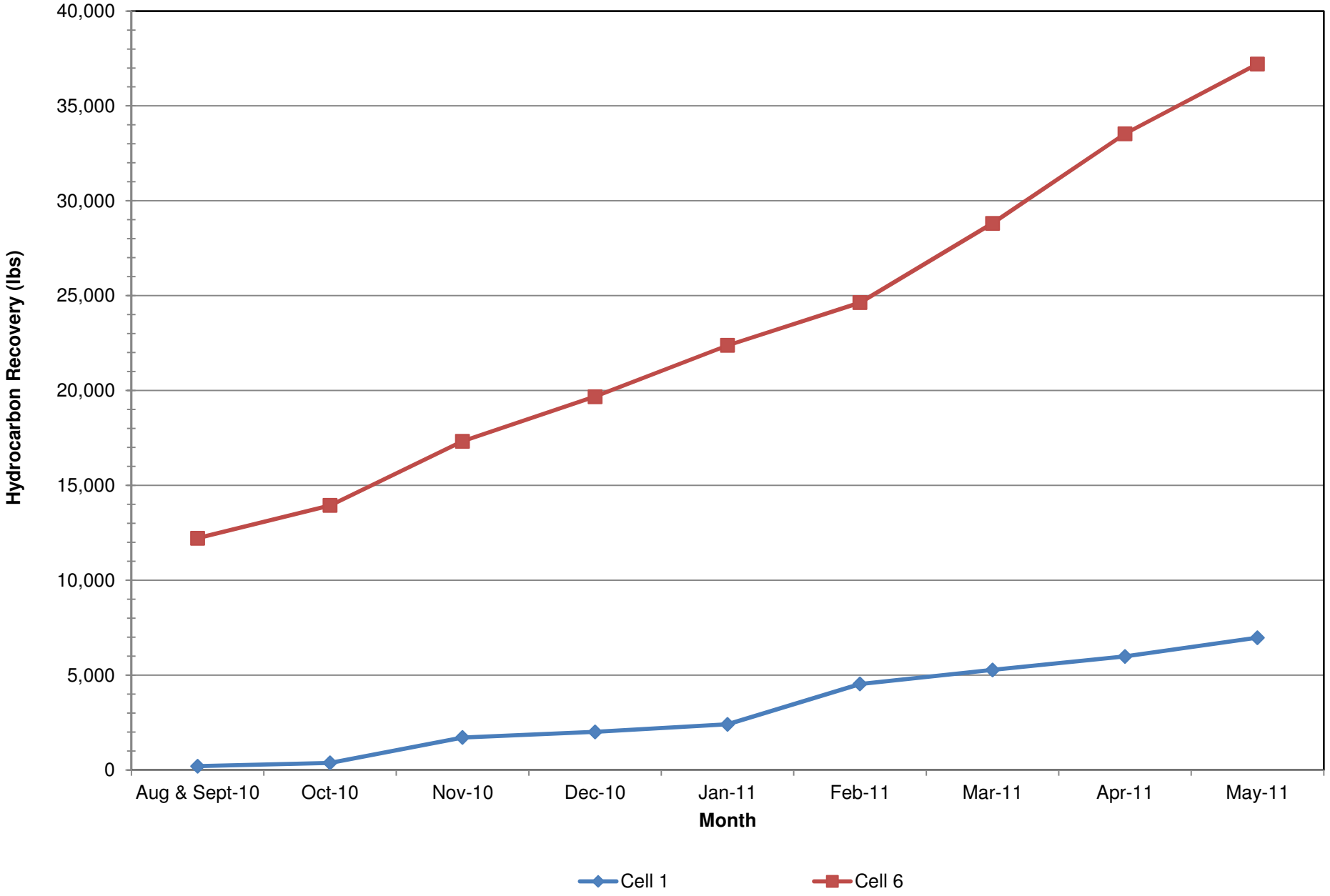


Figure 5
Measured Groundwater VOC Concentration per Month
Cell 1: Prototype AS/SVE System in Former Benzol Processing Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

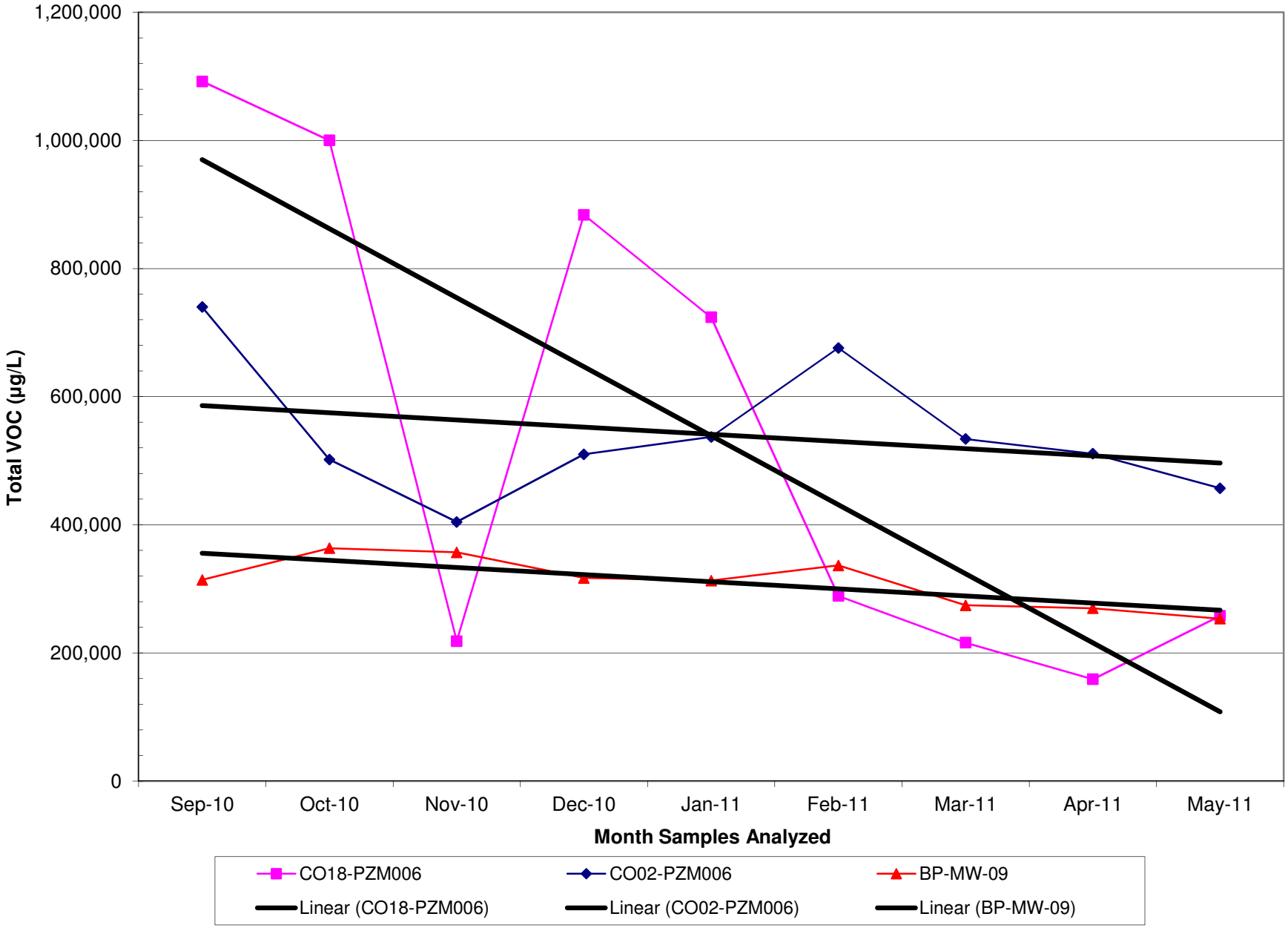


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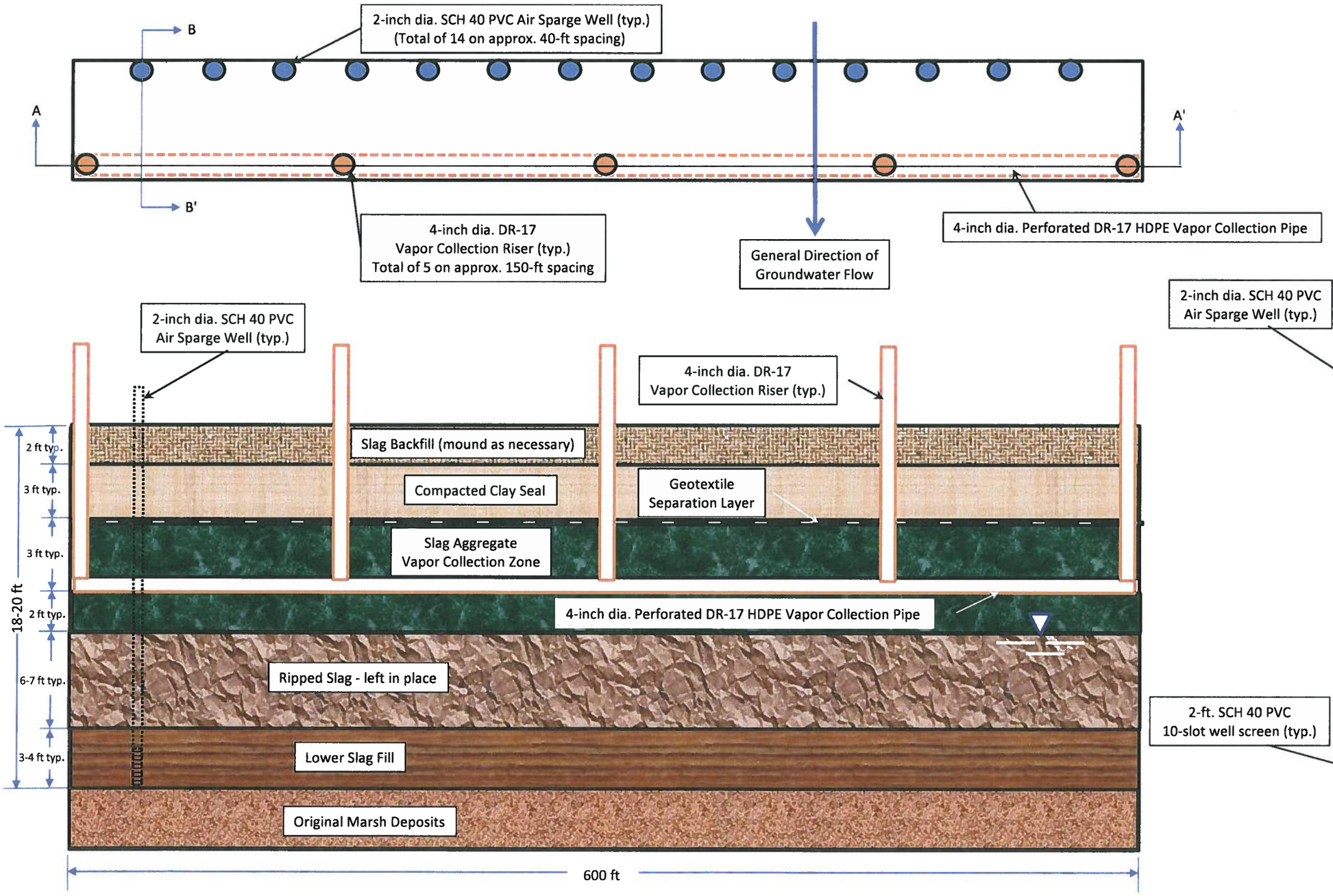
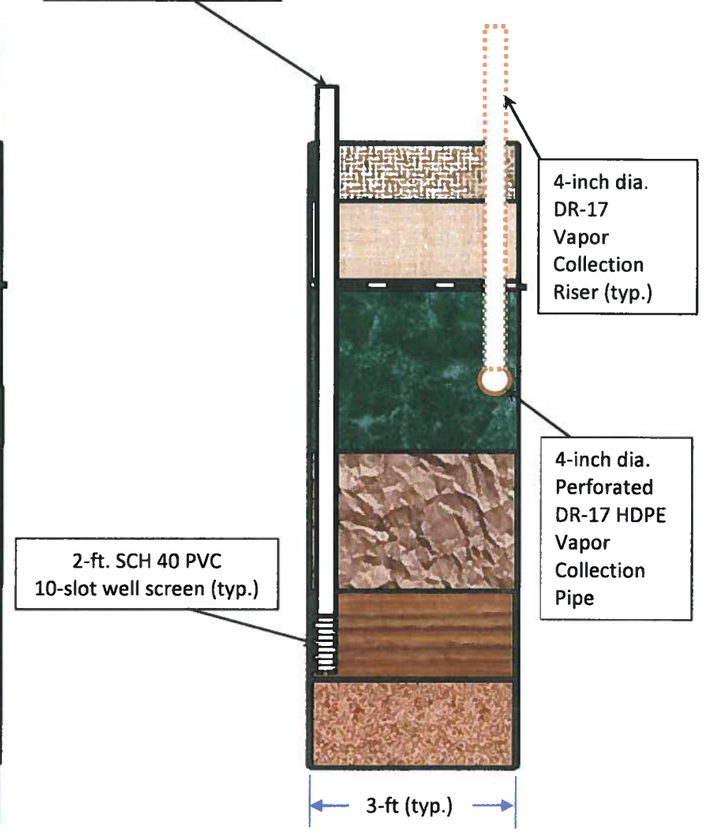
Figure 6

Cell 3 AS/SVE Treatment Area

Figure 7
Schematic Layout and Sections
Cell 3 AS/SVE System in "Cove" Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC



Section A-A' (not to scale)



Section B-B'
(not to scale)

CLIENT	Severstal Sparrows Point, LLC
LOCATION	Baltimore, MD

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

GIS BY	JK	05/31/2011
CHK BY	BE	05/31/2011
PM	BE	05/31/2011

N

Figure 8

Cell 4 Wells

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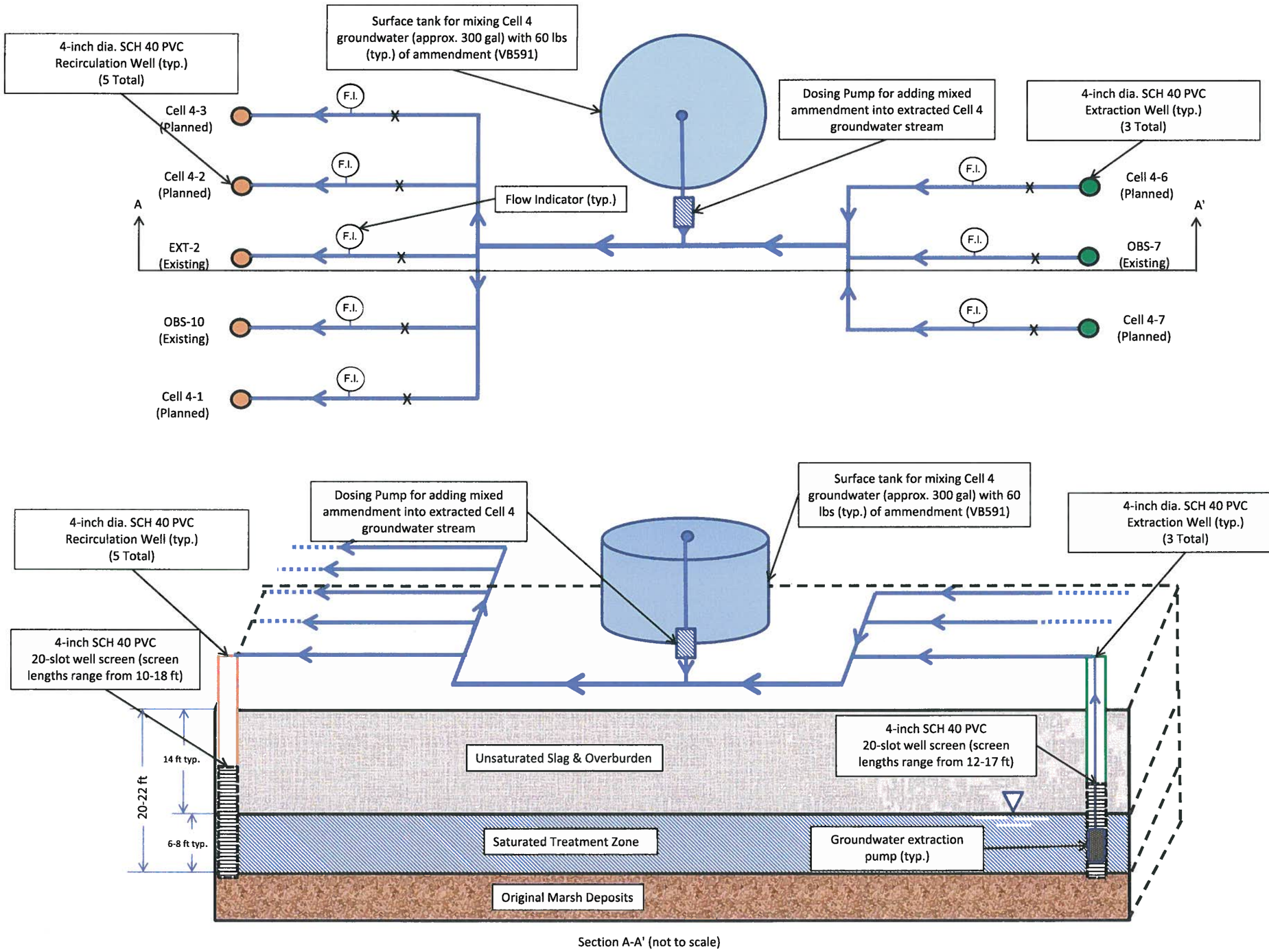
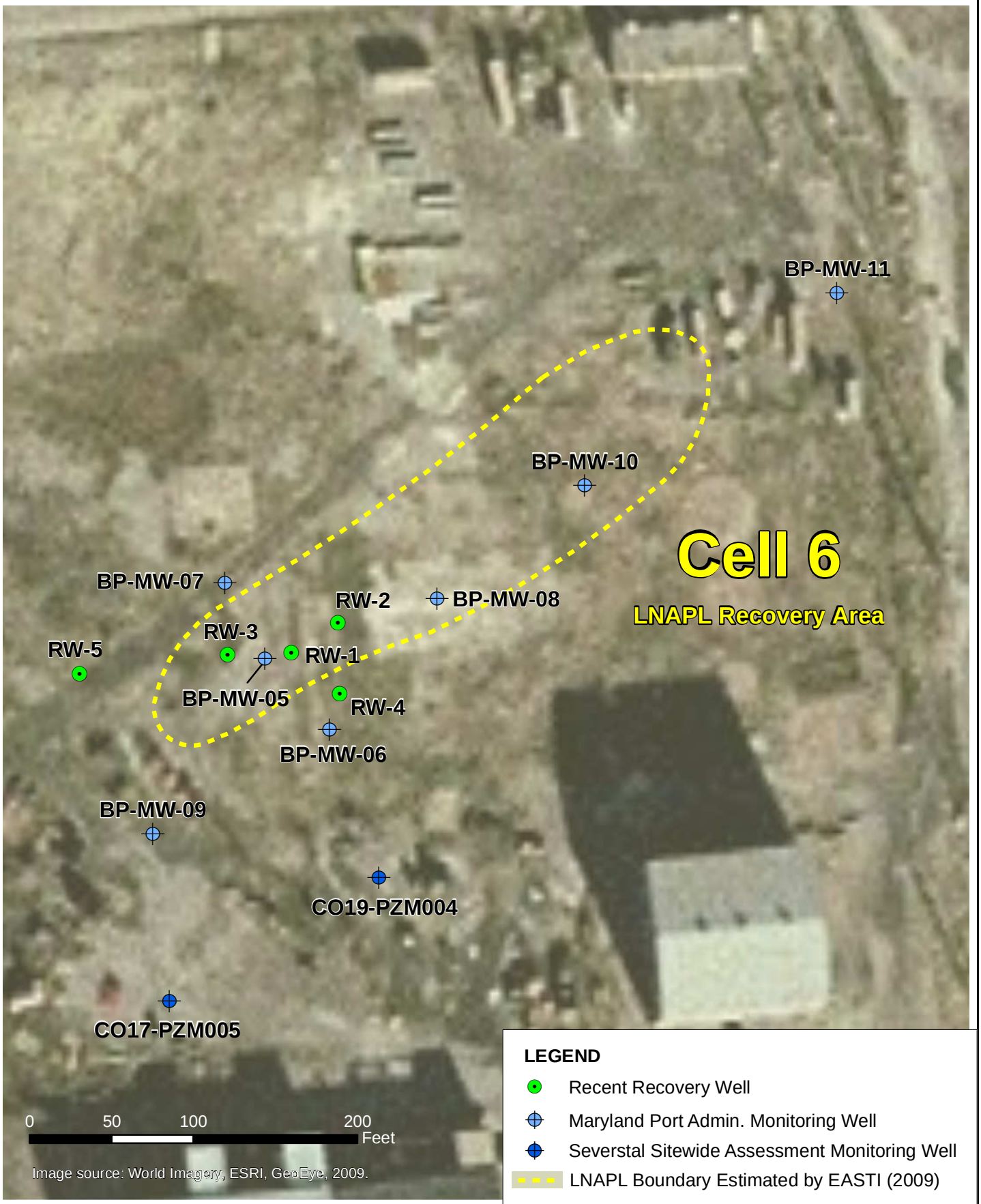
Figure 9
Schematic Layout and Sections
Cell 4 In-Situ Anaerobic Bio-Treatment System
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC



Section A-A' (not to scale)



CLIENT	Sparrows Point
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200 Orchard Ridge Drive
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GIS BY	JK	10/13/10
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PM	BE	10/14/10

N

Figure 10

LNAPL Monitoring and Recovery Wells

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