RG STEEL
Sparrows Point, LLC

1430 Sparrows Point Boulevard | Sparrows Point, MD 21219

April 27, 2012

Mr. Andrew Fan
US EPA Region III, 3WC23
1650 Arch Street
Philadelphia, PA 19103-2029

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Blvd.
Baltimore, Maryland 21230

Re: Consent Decree, Civil Action Nos. JFM-97-558, JFM-97-559
Coke Oven Area Interim Measures Progress Report March 2012

Dear Mr. Fan and Ms. Brown:

Enclosed with this correspondence is the ***Coke Oven Area Interim Measures Progress Report March 2012*** completed for the RG Steel Sparrows Point Facility in accordance with the requirements outlined in US EPA's September 2, 2010 approval letter for the Coke Oven Area Interim Measures work associated with the referenced Consent Decree. The report summarizes implementation progress for the approved interim measures (IMs) that have been developed to address identified environmental conditions at the Coke Oven Area through March 31, 2012.

Please contact me at (410) 388-6622 should questions arise during your review of the enclosed progress report.

Sincerely,

Russell Becker
Division Manager, Environmental Engineering and Affairs

Enclosure

Russell Becker
Division Manager, Environmental Engineering and Affairs
Russ.becker@rg-steel.com

P: (410) 388 - 6622
F: (410) 388 - 6549
www.rg-steel.com

COKE OVEN AREA INTERIM MEASURES PROGRESS REPORT
(MARCH 2012)

Prepared for

RG Steel Sparrows Point, LLC
Sparrows Point, Maryland

April 27, 2012

URS

URS Corporation
12420 Milestone Center Drive, Suite 150
Germantown, MD 20876
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 March 2012 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 March 2012.

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 March 31, 2012, Cells 1, 3, 4 and 6 continue to be operational. Groundwater samples were collected from Cell 4 on March 7 and 8, 2012 to evaluate the effects of the fourth amendment dosing event, which occurred from February 14 to 16, 2012. 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. **Figure 2** shows the system layout of Cell 1 and locations of the major design components including the air sparging wells and vapor collection trenches.

March 2012 Operational Performance

Operational performance of Cell 1 during this reporting period is summarized in **Table 1**. In summary, the CATOX unit operated for 722 hours (97.0 %) during this reporting period. Operations were in conformance with the manufacturer's specifications at all times that soil gases were collected in accordance with the May 20, 2011 modified permit-to-construct conditions.

The hydrocarbon removal rate was calculated to be approximately 0.04 pounds per operating hour (estimated monthly total of 27.2 pounds). **Table 1** also includes a cumulative summary of operational performance since system startup on August 3, 2010. In total, Cell 1 has destroyed approximately 9,185 pounds of recovered hydrocarbons. **Figure 3** presents a graph of the cumulative estimated monthly hydrocarbon recovery in Cell 1 since the startup of the IM system.

Soil gas samples were collected for laboratory and/or field instrument (e.g., photoionization detector [PID]) analysis to monitor CATOX unit performance. One (1) untreated soil gas sample was collected in a Tedlar® bag and submitted to TestAmerica Laboratories, Inc. in Knoxville, Tennessee (TestAmerica) for analysis by US EPA Method TO-15. The influent soil gas hydrocarbon concentration collected on March 8, 2012 was 22.6 parts per million by volume (ppmv) as summarized in **Table 2**.

Hydrocarbon removal calculations were based entirely on the analytical results and the average daily field-measured influent flow rates. The mass removal calculations assume that the sample collected on March 8, 2012 is representative of hydrocarbon concentrations for the entire month of March. This assumption is based on the fact that the same sparge wells (AS-1 thru AS-8) and extraction wells (V-1 thru V-6) were online when the system was operational.

March 2012 Groundwater Monitoring Results

Groundwater samples were collected on March 8 and 9, 2012 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 4 presents a graph of the total measured VOC concentration in Cell 1 groundwater for each well on a monthly basis since the startup of the IM system. Since system startup in August 2010, a decreasing total VOC concentration trend is documented at well CO18-PZM006 while a generally decreasing trend is observed at wells BP-MW-09 and C002-PZM006. 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

Cell 3 consists of an AS/SVE system coupled with vapor destruction via an electric CATOX unit. **Figure 1** shows the location of the Cell 3 AS/SVE treatment area at the COA. The major design components are described in the Cell 3 final design report (*Coke Oven Area Interim Measures Cell 3 "Cove" Area Air Sparge/Soil Vapor Extraction System Design*), submitted to US EPA on March 1, 2011.

March 2012 Operational Performance

Operational performance of Cell 3 during this reporting period is summarized in **Table 4**. In summary, the CATOX unit operated for 741 hours (99.6 %) during March. Operations were in conformance with the manufacturer's specifications at all times that soil gases were collected in accordance with the May 20, 2011 modified permit-to-construct conditions.

The hydrocarbon removal rate was calculated to be approximately 0.03 pounds per operating hour (estimated monthly total of 22.8 pounds). **Table 4** also includes a cumulative summary of operational performance since system startup on June 24, 2011. In total, Cell 3 has destroyed approximately 512.1 pounds of recovered hydrocarbons. **Figure 3** presents a graph of the cumulative estimated monthly hydrocarbon recovery in Cell 3 since the startup of the IM system.

Soil gas samples were collected for laboratory and/or field instrument (e.g., PID) analysis to monitor CATOX unit performance. One (1) untreated soil gas sample was collected in a Tedlar® bag and submitted to TestAmerica. The influent soil gas hydrocarbon concentration collected on March 8, 2012 was 21.2 ppmv as summarized in **Table 5**.

Hydrocarbon removal calculations were based entirely on the analytical results and the average daily field-measured influent flow rates. The mass removal calculations assume that the sample collected on March 8, 2012 is representative of hydrocarbon concentrations for the entire month of March. This assumption is based on the fact that the same sparge wells (AS-2 thru AS-12) and extraction wells (V-2 thru V-4) were online when the system was operational.

March 2012 Cell 3 Groundwater Monitoring

Groundwater samples were collected on March 9, 2012 from the following wells (**Figure 1**):

- MW-CELL3-1 (downgradient of Cell 3),
- MW-CELL3-2 (upgradient of Cell 3),

- MW-CELL3-3 (upgradient of Cell 3, and
- CO30-PZM015 (downgradient of Cell 3).

The groundwater samples were submitted to Microbac for the analyses shown in **Table 6**. These data indicate that benzene is the most prevalent VOC constituent.

Figure 5 presents a graph of the total measured VOC concentration in Cell 3 groundwater for each well on a monthly basis relative to the baseline concentrations collected in February 2011. Since system startup on June 24, 2011, a generally decreasing VOC concentration trend is documented for each of the sampled wells. The trends for these monitoring wells will continue to be monitored and assessed during system operation in future months.

Cell 4: In-Situ Anaerobic Bio-treatment Area

Cell 4 consists of an in-situ anaerobic bio-treatment system including extraction and mixing of groundwater in an above ground storage tank containing a nutrient amendment solution and reinjection of groundwater. A schematic layout of the Cell 4 system is shown on **Figure 6**. The major design components are described in the Cell 4 final design report (*Coke Oven Area Interim Measures Cell 4 In-Situ Anaerobic Bio-Treatment System Design*), submitted to US EPA on March 31, 2011.

March 2012 Operations

The fourth amendment dosing event occurred from February 14 to 16, 2012 and was summarized in the *February 2012 Coke Oven Area Interim Measures Progress Report*. As per the approved design concept, groundwater in Cell 4 was monitored in March 2012 to document the potential impacts of the February 2012 dosing event.

March 2012 Groundwater Monitoring Results

To monitor the effects of the fourth dosing event, groundwater samples were collected on March 7 and 8, 2012 (approximately three [3] weeks after the third dosing event) from the following wells (**Figure 7**):

- OBS-6
- OBS-8
- EXT-2
- AS-2
- MW-CELL4-1
- MW-CELL4-3
- MW-CELL4-4
- MW-CELL4-5
- MW-CELL4-6
- MW-CELL4-7

The groundwater samples were submitted to Microbac for the analyses shown in **Table 7**. These data indicate naphthalene is the most prevalent VOC constituent.

Figure 8 presents a graph of the total VOC concentrations in Cell 4 groundwater on a monthly basis, as well as before and after the dosing events. With the exception of MW-CELL4-5, a generally decreasing trend is observed at all monitored Cell 4 wells since system dosing was initiated in July 2011. Trends for these monitoring wells will continue to be monitored and assessed during system operation in future months.

Cell 6: LNAPL Extraction at the Former Benzol Processing Area

The Cell 6 LNAPL monitoring and recovery system was monitored approximately once every two weeks during March (two [2] site visits). **Table 8** summarizes LNAPL occurrence and recovery observed during the reporting period along with the cumulative LNAPL recovery since the beginning of the project. **Figure 9** illustrates the well locations.

During March, approximately 116 gallons (847 pounds) of LNAPL were recovered, bringing the total recovered LNAPL to 6,940 gallons (50,847 pounds) as of March 24, 2012. The LNAPL was recovered from the following wells:

Well	LNAPL Recovery (gal / lbs)		Notes
	During March 2012	Total thru Mar. 24, 2012	
BP-MW-05	88.1 / 646	5,658 / 41,456	(c)
RW-04	14.0 / 103	944 / 6,917	(c)
BP-MW-08	13.4 / 98	324 / 2,372	(c)
BP-MW-11	0 / 0	7.8 / 57	(a)
RW-03	0 / 0	4.0 / 29	(b)
RW-01	0 / 0	1.3 / 10	(b)
RW-02	0 / 0	0.8 / 5.9	(b)

(a) Recovery system moved from BP-MW-11 to BP-MW-08 on September 8, 2010.
(b) Manual bailing.
(c) Cumulative totals included estimated recovery from 12/28/11 to 1/18/12.

The wells are presented in **Table 8** generally in the order of decreasing LNAPL occurrence/recovery. During the reporting period, the range of LNAPL thicknesses varied as summarized below (wells are not listed if LNAPL was not present):

- RW-04 (0.24 to 0.41 ft),
- BP-MW-05 (0.77 to 1.00 ft),
- BP-MW-08 (0.09 to 1.15 ft),
- BP-MW-11 (0.50 to 0.60 ft),
- BP-MW-10 (0.50 to 0.51 ft),
- RW-02 (0.11 to 0.19 ft),
- RW-03 (0.03 to 0.21 ft),

- RW-01 (0.11 to 0.25 ft), and
- BP-MW-07 (0.01 to 0.02 ft).

No LNAPL was observed in wells RW-05, BP-MW-06, BP-MW-09, or CO19-PZM004.

For all wells in which LNAPL accumulated, **Table 9** 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 March 2012 Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total CATOX Operating Time (March 1 - March 31, 2012)	hours	722
Overall CATOX Operational Time	%	97.0
Estimated Total Hydrocarbons Destroyed	pounds	27.22
Estimated Hydrocarbon Removal Rate	pounds/hour	0.04

Cell 1 Cumulative Summary of Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total ICE/CATOX Operating Time (August 3, 2010 - March 31, 2012)	hours	10,813
Overall ICE/CATOX Operational Time	%	74.3
Estimated Total Hydrocarbons Destroyed	pounds	9,185
Estimated Average Hydrocarbon Removal Rate	pounds/hour	0.85

Table 2
Summary of Soil Gas Analytical Results (March 2012)
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
	Date	3/8/2012
	Time	11:00
	Dilution Factor	546.76
Analyte	Units	
TO-15 Volatile Organics		
trans-1,3-Dichloropropene	ppb	< 110 U
Acetone	ppb	< 2,700 U
Ethylbenzene	ppb	< 110 U
2-Hexanone	ppb	< 270 U
Methylene Chloride	ppb	< 270 U
Benzene	ppb	**17,000**
1,1,2,2-Tetrachloroethane	ppb	< 110 U
Tetrachloroethene	ppb	< 110 U
Toluene	ppb	**4,200**
1,1,1-Trichloroethane	ppb	< 110 U
1,1,2-Trichloroethane	ppb	< 110 U
Trichloroethene	ppb	< 110 U
Vinyl Chloride	ppb	< 110 U
o-Xylene	ppb	**450**
m-Xylene & p-Xylene	ppb	**920**
2-Butanone (MEK)	ppb	< 550 U
4-Methyl-2-pentanone (MIBK)	ppb	< 270 U
Bromoform	ppb	< 110 U
Carbon Disulfide	ppb	< 270 U
Carbon tetrachloride	ppb	< 110 U
Chlorobenzene	ppb	< 110 U
Chloroethane	ppb	< 110 U
Chloroform	ppb	< 110 U
1,1-Dichloroethane	ppb	< 110 U
1,2-Dichloroethane	ppb	< 110 U
1,1-Dichloroethene	ppb	< 110 U
trans-1,2-Dichloroethene	ppb	< 110 U
1,2-Dichloropropane	ppb	< 110 U
cis-1,3-Dichloropropene	ppb	< 110 U
Total Volatile Organics	ppb	**22,570**

Notes:

BOLD = Analyte detected

ppb = parts per billion

</U = Analyte not detected above corresponding laboratory reporting limit

Table 3
Summary of Groundwater Analytical Results (March 2012)
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	CO02-PZM006	CO18-PZM006	BP-MW-09
	Date	3/9/2012	3/9/2012	3/8/2012
	Time	9:30	14:10	14:57
Analyte	Units			
Water Quality Parameters				
Temperature	deg C	20.52	26.11	15.30
pH	std units	7.70	6.92	9.25
ORP	mV	-196	-75	-249
Conductivity	mS/cm	1.75	2.41	1.02
Turbidity	NTU	--	--	--
Dissolved Oxygen	mg/L	0.00	0.05	0.00
Volatile Organics				
Vinyl Chloride	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Chloroethane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
1,1-Dichloroethene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Acetone	µg/L	< 120,000 U	< 120,000 U	< 120,000 U
Carbon Disulfide	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Methylene Chloride	µg/L	< 25,000 U	< 25,000 U	< 25,000 U
trans-1,2-Dichloroethene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
1,1-Dichloroethane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
2-Butanone (MEK)	µg/L	< 25,000 U	< 25,000 U	< 25,000 U
Chloroform	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
1,1,1-Trichloroethane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Carbon Tetrachloride	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Benzene	µg/L	**730,000**	**240,000**	**120,000**
1,2-Dichloroethane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Trichloroethene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
1,2-Dichloropropane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Methyl Isobutyl Ketone (MIBK)	µg/L	< 25,000 U	< 25,000 U	< 25,000 U
cis-1,3-Dichloropropene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Toluene	µg/L	**61,000**	**23,000**	**25,000**
trans-1,3-Dichloropropene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
1,1,2-Trichloroethane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
2-Hexanone (MBK)	µg/L	< 25,000 U	< 25,000 U	< 25,000 U
Tetrachloroethene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Chlorobenzene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
1,1,1,2-Tetrachloroethane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Ethylbenzene	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Bromoform	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
1,1,2,2-Tetrachloroethane	µg/L	< 5,000 U	< 5,000 U	< 5,000 U
Total Xylenes	µg/L	< 15,000 U	< 15,000 U	**18,000**
Total Volatile Organics	**µg/L**	**791,000**	**263,000**	**163,000**

Notes:

-- = Not Measured

Bold = Analyte Detected

deg C = degrees Celcius

mg/L =Milligram per liter

mS/cm = Microsiements per Centimeter

mV = Millivolts

NTU = Nephelometric Turbidity Units

ORP = Oxidation Reduction Potential

std units = standard units

</U = Analyte not detected above corresponding laboratory reporting limit

µg/L = Micrograms per liter

Table 4
Summary of Operating Conditions
Cell 3: AS/SVE System in the "Cove" Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

Cell 3 March 2012 Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total CATOX Operating Time (March 1 - March 31, 2012)	hours	741
Overall CATOX Operational Time	%	99.6
Estimated Total Hydrocarbons Destroyed	pounds	22.79
Estimated Hydrocarbon Removal Rate	pounds/hour	0.03

Cell 3 Cumulative Summary of Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total CATOX Operating Time (June 24, 2011 - March 31, 2012)	hours	5,386
Overall CATOX Operational Time	%	73.6
Estimated Total Hydrocarbons Destroyed	pounds	512.1
Estimated Hydrocarbon Removal Rate	pounds/hour	0.10

Table 5
Summary of Soil Gas Analytical Results (March 2012)
Cell 3: AS/SVE System in the "Cove" Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

	Sample ID	CATOX Influent
	Date	3/8/2012
	Time	11:15
	Dilution Factor	2125.17
Analyte	Units	
TO-15 Volatile Organics		
trans-1,3-Dichloropropene	ppb	< 430 U
Acetone	ppb	< 11,000 U
Ethylbenzene	ppb	< 430 U
2-Hexanone	ppb	< 1,100 U
Methylene Chloride	ppb	< 1,100 U
Benzene	ppb	**20,000**
1,1,2,2-Tetrachloroethane	ppb	< 430 U
Tetrachloroethene	ppb	< 430 U
Toluene	ppb	**1,200**
1,1,1-Trichloroethane	ppb	< 430 U
1,1,2-Trichloroethane	ppb	< 430 U
Trichloroethene	ppb	< 430 U
Vinyl Chloride	ppb	< 430 U
o-Xylene	ppb	< 430 U
m-Xylene & p-Xylene	ppb	< 430 U
2-Butanone (MEK)	ppb	< 2,100 U
4-Methyl-2-pentanone (MIBK)	ppb	< 1,100 U
Bromoform	ppb	< 430 U
Carbon Disulfide	ppb	< 1,100 U
Carbon tetrachloride	ppb	< 430 U
Chlorobenzene	ppb	< 430 U
Chloroethane	ppb	< 430 U
Chloroform	ppb	< 430 U
1,1-Dichloroethane	ppb	< 430 U
1,2-Dichloroethane	ppb	< 430 U
1,1-Dichloroethene	ppb	< 430 U
trans-1,2-Dichloroethene	ppb	< 430 U
1,2-Dichloropropane	ppb	< 430 U
cis-1,3-Dichloropropene	ppb	< 430 U
Total Volatile Organics	ppb	**21,200**

Notes:

BOLD = Analyte detected

ppb = parts per billion

</U = Analyte not detected above corresponding laboratory reporting limit

Table 6
Summary of Groundwater Analytical Results (March 2012)
Cell 3: AS/SVE System in the "Cove" Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

	Sample ID	CO30-PZM015	MW-CELL 3-1	MW-CELL 3-2	MW-CELL 3-3
	Date	3/9/2012	3/9/2012	3/9/2012	3/9/2012
	Time	10:20	11:20	12:12	12:57
Analyte	Units				
Water Quality Parameters					
Temperature	deg C	16.15	16.27	16.49	16.12
pH	std units	12.47	12.43	12.78	12.45
ORP	mV	-289	-269	-270	-125
Conductivity	mS/cm	2.70	2.41	2.15	1.60
Turbidity	NTU	--	--	--	--
Dissolved Oxygen	mg/L	0.05	0.05	0.00	0.90
Volatile Organics					
Vinyl Chloride	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Chloroethane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
1,1-Dichloroethene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Acetone	µg/L	< 25,000 U	< 1,200 U	< 5,000 U	< 12,000 U
Carbon Disulfide	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Methylene Chloride	µg/L	< 5,000 U	< 250 U	< 1,000 U	< 2,500 U
trans-1,2-Dichloroethene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
1,1-Dichloroethane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
2-Butanone (MEK)	µg/L	< 5,000 U	< 250 U	< 1,000 U	< 2,500 U
Chloroform	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
1,1,1-Trichloroethane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Carbon Tetrachloride	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Benzene	µg/L	**42,000**	**4,100**	**9,300**	**2,500**
1,2-Dichloroethane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Trichloroethene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
1,2-Dichloropropane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Methyl Isobutyl Ketone (MIBK)	µg/L	< 5,000 U	< 250 U	< 1,000 U	< 2,500 U
cis-1,3-Dichloropropene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Toluene	µg/L	**3,100**	**320**	**650**	< 500 U
trans-1,3-Dichloropropene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
1,1,2-Trichloroethane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
2-Hexanone (MBK)	µg/L	< 5,000 U	< 250 U	< 1,000 U	< 2,500 U
Tetrachloroethene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Chlorobenzene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
1,1,1,2-Tetrachloroethane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Ethylbenzene	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Bromoform	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
1,1,2,2-Tetrachloroethane	µg/L	< 1,000 U	< 50 U	< 200 U	< 500 U
Xylenes, Total	µg/L	< 3,000 U	**150**	< 600 U	< 1,500 U
Total Volatile Organics	**µg/L**	**45,100**	**4,570**	**9,950**	**2,500**

Notes:

-- = Not Measured
Bold = Analyte Detected
deg C = degrees Celcius
mg/L =Milligram per liter
mS/cm = Microsiements per Centimeter
mV = Millivolts
NTU = Nephelometric Turbidity Units
ORP = Oxidation Reduction Potential
std units = standard units
</U = Analyte not detected above corresponding laboratory reporting limit
µg/L = Micrograms per liter

Table 7
Summary of Groundwater Analytical Results (March 2012)
Cell 4: In-Situ Anaerobic Bio-Treatment Area
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

Sample ID		OBS-6	OBS-8	EXT-2	AS-2	Cell 4-1	Cell 4-3	Cell 4-4	Cell 4-5	Cell 4-6	Cell 4-7
Date		03/07/12	03/07/12	03/07/12	03/08/12	03/07/12	03/08/12	03/07/12	03/08/12	03/08/12	03/07/12
Time		13:30	12:50	14:15	11:10	10:17	13:22	11:10	12:45	12:00	12:00
Units											
Water Quality Parameters											
Temperature	deg C	15.62	16.25	15.45	16.59	16.02	15.84	16.04	16.40	16.61	16.29
pH	std units	12.38	11.99	9.99	11.48	9.80	9.65	11.81	11.69	12.32	12.44
ORP	mV	-190	-260	-211	-153	-165	-156	-261	-199	-176	-124
Conductivity	mS/cm	2.29	1.81	1.65	3.25	1.50	1.70	1.52	2.50	2.51	3.00
Turbidity	NTU	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen	mg/L	0.47	0.30	0.00	0.00	0.10	0.00	0.05	0.00	0.00	0.50
Volatile Organics											
Vinyl Chloride	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Chloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
1,1-Dichloroethene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Acetone	µg/L	< 2,500 U	< 2,500 U	< 2,500 U	< 2,500 U	< 2,500 U	< 2,500 U	< 2,500 U	< 12,000 U	< 2,500 U	< 2,500 U
Carbon Disulfide	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Methylene Chloride	µg/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 2,500 U	< 500 U	< 500 U
trans-1,2-Dichloroethene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
1,1-Dichloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
2-Butanone (MEK)	µg/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 2,500 U	< 500 U	< 500 U
Chloroform	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
1,1,1-Trichloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Carbon Tetrachloride	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Benzene	µg/L	**500**	**730**	**780**	**7,400**	**1,300**	**550**	**740**	**4,800**	**710**	**850**
1,2-Dichloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Trichloroethene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
1,2-Dichloropropane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Methyl Isobutyl Ketone (MIBK)	µg/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 2,500 U	< 500 U	< 500 U
cis-1,3-Dichloropropene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Toluene	µg/L	**340**	**430**	**450**	**5,800**	**920**	**370**	**440**	**4,100**	**480**	**560**
trans-1,3-Dichloropropene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
1,1,2-Trichloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
2-Hexanone (MBK)	µg/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 2,500 U	< 500 U	< 500 U
Tetrachloroethene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Chlorobenzene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
1,1,1,2-Tetrachloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Ethylbenzene	µg/L	< 100 U	< 100 U	< 100 U	**130**	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Bromoform	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
1,1,2,2-Tetrachloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 100 U	< 100 U
Xylenes, Total	µg/L	**510**	**700**	**690**	**3,800**	**1,000**	**580**	**800**	**3,300**	**700**	**1,200**
Semi-Volatiles											
Naphthalene	µg/L	**6,000**	**4,400**	**4,800**	**19,000**	**7,800**	**4,500**	**5,100**	**33,000**	**5,100**	**19,000**
Total Volatile Organics	µg/L	**7,350**	**6,260**	**6,720**	**36,130**	**11,020**	**6,000**	**7,080**	**45,200**	**6,990**	**21,610**
Wet Chemistry											
Ferric Iron	mg/L	**0.14**	**0.28**	**0.36**	**0.27**	**0.54**	**0.37**	**0.25**	**0.41**	**0.22**	**0.20**
Ferrous Iron	mg/L	< 0.10 U	**0.10**	< 0.10 U	**0.18**	**0.12**	**0.28**	**0.13**	**0.54**	< 0.10 U	< 0.10 U
Nitrite-N	mg/L	**0.18**	**0.079**	**0.026**	**0.096**	**0.018**	**0.017**	**0.10**	**0.22**	**0.045**	**0.18**
Nitrate-N	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.096**	< 0.050 U	< 0.050 U
Nitrate/Nitrite-N	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	**0.074**	< 0.050 U	< 0.050 U	< 0.050 U	**0.32**	< 0.050 U	**0.14**
Orthophosphate as P	mg/L	**0.033**	**0.034**	**0.073**	**0.035**	**0.32**	**0.48**	**0.026**	**0.029**	**0.016**	**0.011**
Sulfate as SO4	mg/L	**220**	**380**	**550**	**1,500**	**490**	**570**	**370**	**1,400**	**410**	**500**
Total Kjeldahl Nitrogen	mg/L	**17**	**31**	**53**	**270**	**54**	**46**	**23**	**88**	**52**	**47**
Metals											
Iron, Total	mg/L	**0.14**	**0.38**	**0.36**	**0.45**	**0.66**	**0.65**	**0.38**	**0.95**	**0.22**	**0.20**

Notes:

-- = Not Measured
Bold = Analyte Detected
deg C = degrees Celcius
mg/L =Milligram per liter
mS/cm = Microsiements per Centimeter
mV = Millivolts
NTU = Nephelometric Turbidity Units
ORP = Oxidation Reduction Potential
std units = standard units
</U = Analyte not detected above corresponding laboratory reporting limit
µg/L = Micrograms per liter

Table 8
LNAPL Occurrence and Recovery (March 2012)
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 March 2012 (ft)			Total LNAPL Recovery Period		Cumulative Total LNAPL Recovered thru March 24, 2012 (d)		Estimated LNAPL Recovered During March 2012	
				Begin	End	(gal)	(lbs) (a)	(gal)	(lbs) (a)
RW-04	0.24	to	0.41	23-Jul-10	On-going (b)	944	6,917	14.0	103
BP-MW-05	0.77	to	1.00	28-Jan-10	On-going (b)	5,658	41,456	88.1	646
BP-MW-08	0.09	to	1.15	8-Sep-10	On-going (b)	324	2,372	13.4	98
BP-MW-11	0.50	to	0.60	23-Jul-10	8-Sep-10	7.8	57	0	0
RW-02	0.11	to	0.19	1/28/2011	On-going (c)	0.8	5.9	0	0
RW-03	0.03	to	0.21	11/24/2010	On-going (c)	4.0	29	0	0
RW-01	0.11	to	0.25	28-Oct-10	On-going (c)	1.3	10	0	0
BP-MW-10	0.50	to	0.51	na	na	0	0	0	0
BP-MW-07	0.01	to	0.02	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:	**6,940**	**50,847**	**116**	**847**

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) Cumulative recovery volumes are calculated using an estimated recovery from 12/28/11 to 1/18/12.

Table 9
Depths (feet) to Water and LNAPL (March 2012)
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
3/8/2012	11.30	11.41	0.11	10.96	11.15	0.19	9.32	9.35	0.03
3/24/2012	11.75	12.00	0.25	12.00	12.11	0.11	9.81	10.02	0.21

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
3/8/2012	9.80	10.21	0.41	11.10	12.10	1.00	10.95	10.97	0.02
3/24/2012	10.07	10.31	0.24	11.53	12.30	0.77	11.10	11.11	0.01

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
3/8/2012	12.11	12.20	0.09	8.44	8.95	0.51	10.75	11.25	0.50
3/24/2012	12.45	13.60	1.15	8.25	8.75	0.50	10.60	11.20	0.60

Figures

N
W E
S

Legend

- New Monitoring Well
- Existing Monitoring Well
- AS/SVE Treatment Area
- Special Study Area

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

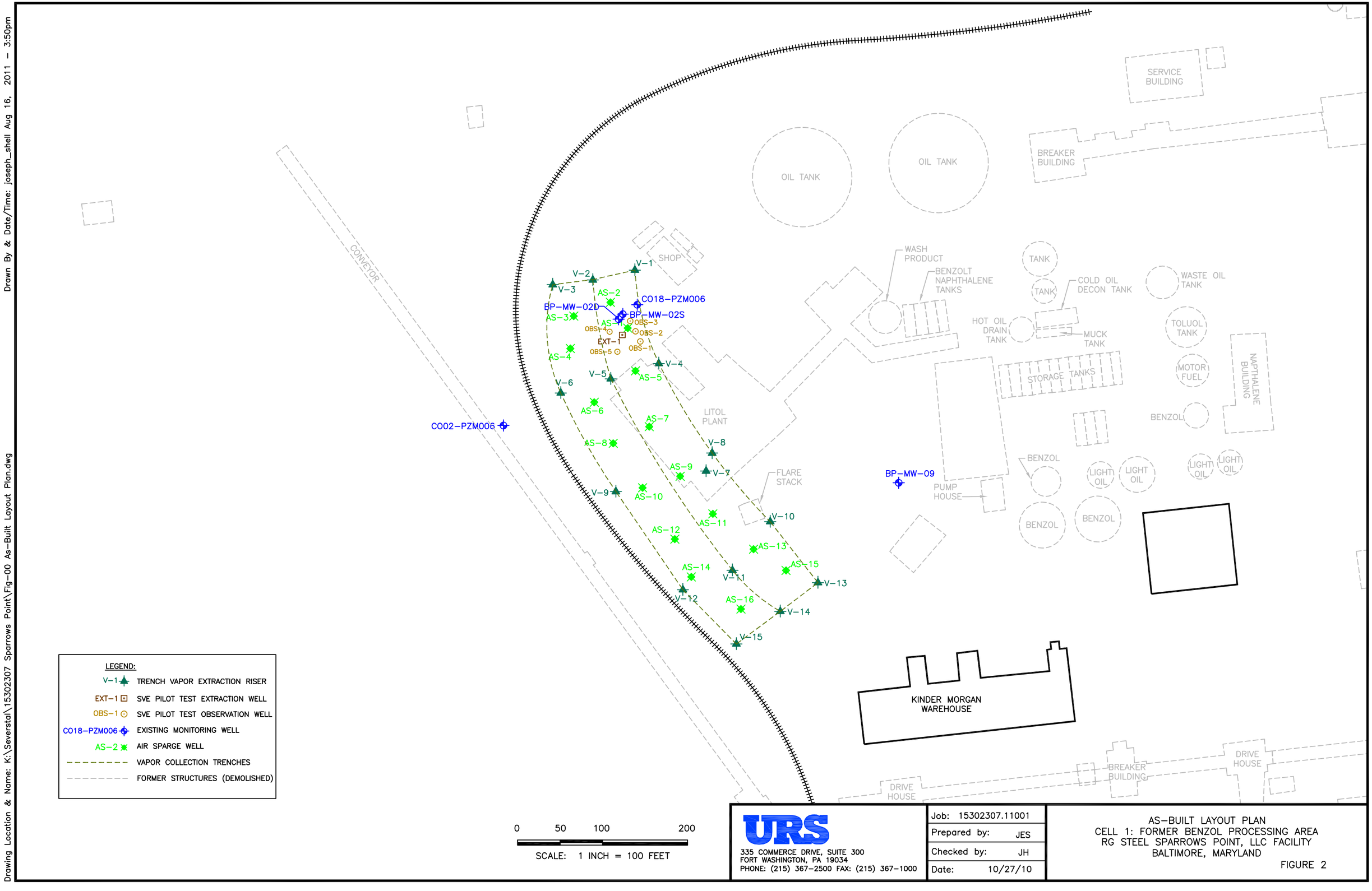
200 0 200 400 Feet

CLIENT: Sparrows Point	LOCATION: Baltimore, MD
DATE: 11/21/2011	FILE: G:\Projects\SparrowsPoint\Projects\2011\CokeOven-and-CokePoint-6Prototype Cells_rev4.mxd
GIS: AER	
CHECKED: RL	
SENIOR: BE	

URS
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1

Interim Measures Treatment Areas



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 2

Figure 3
Cumulative Summary of Estimated Hydrocarbon Recovery
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

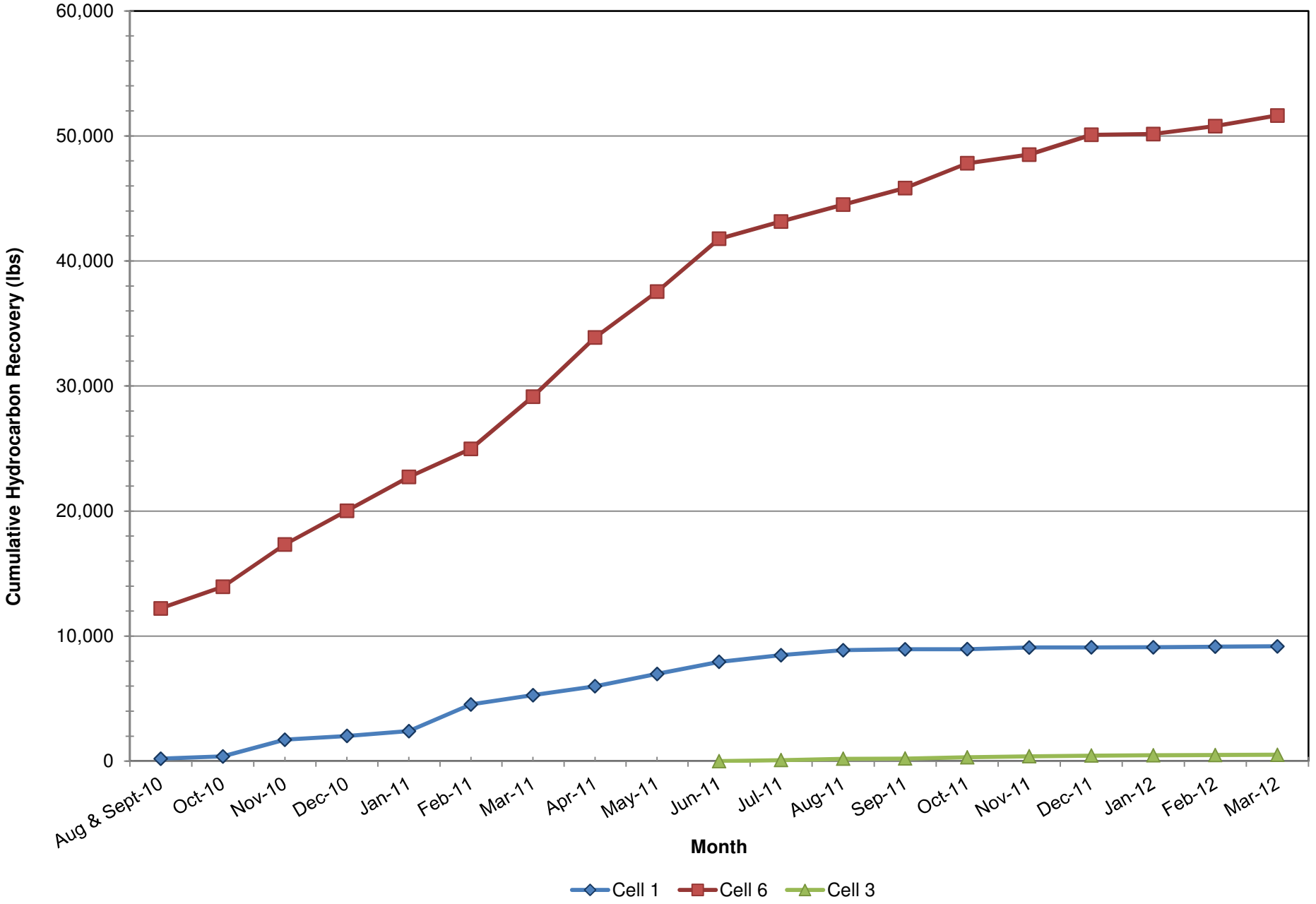


Figure 4
Measured Groundwater VOC Concentration by Month
Cell 1: Prototype AS/SVE System in the "Cove" Area
RG Steel Sparrows Point, LLC

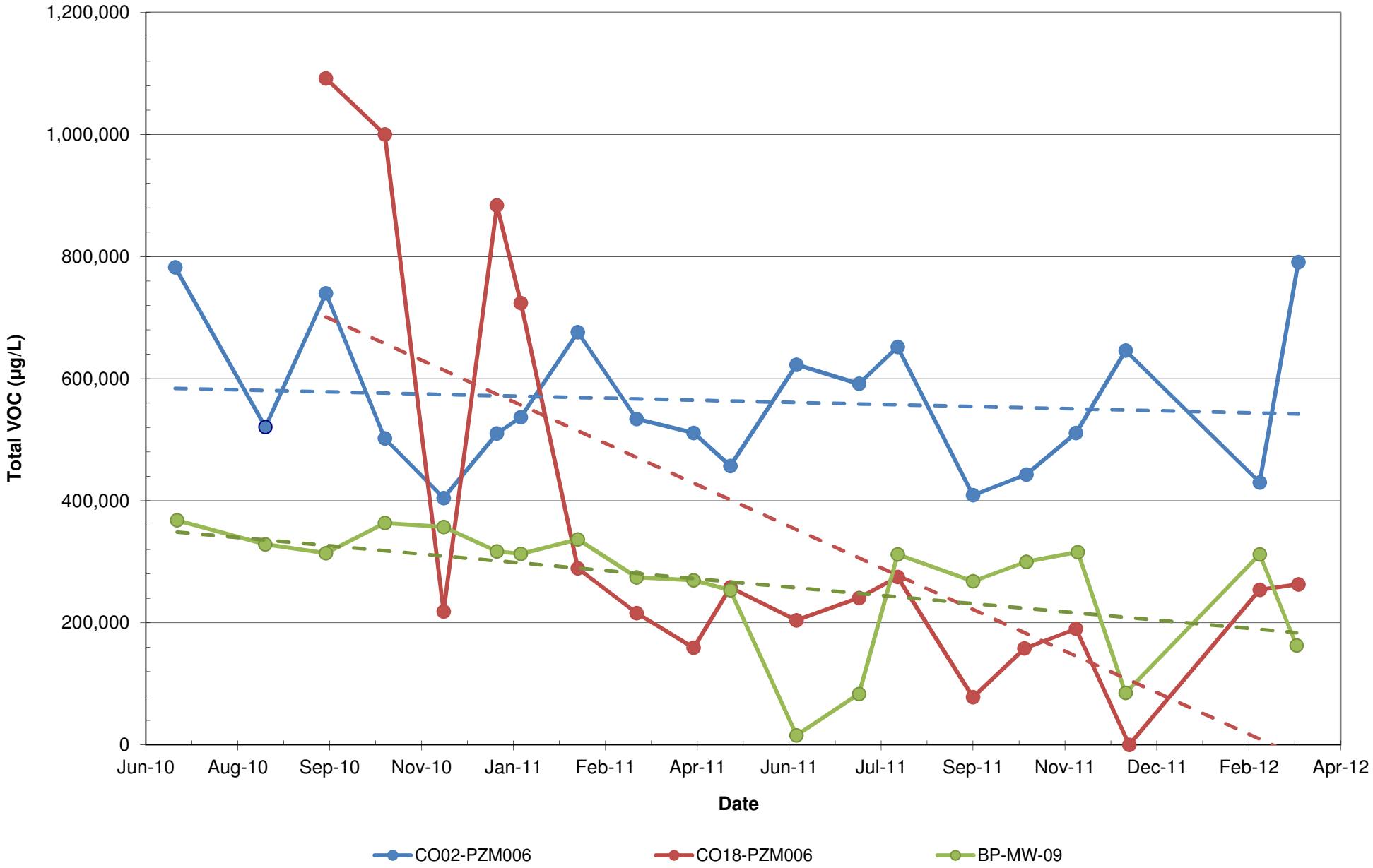


Figure 5
Measured Groundwater VOC Concentration by Month
Cell 3: Prototype AS/SVE System in the "Cove" Area
RG Steel Sparrows Point, LLC

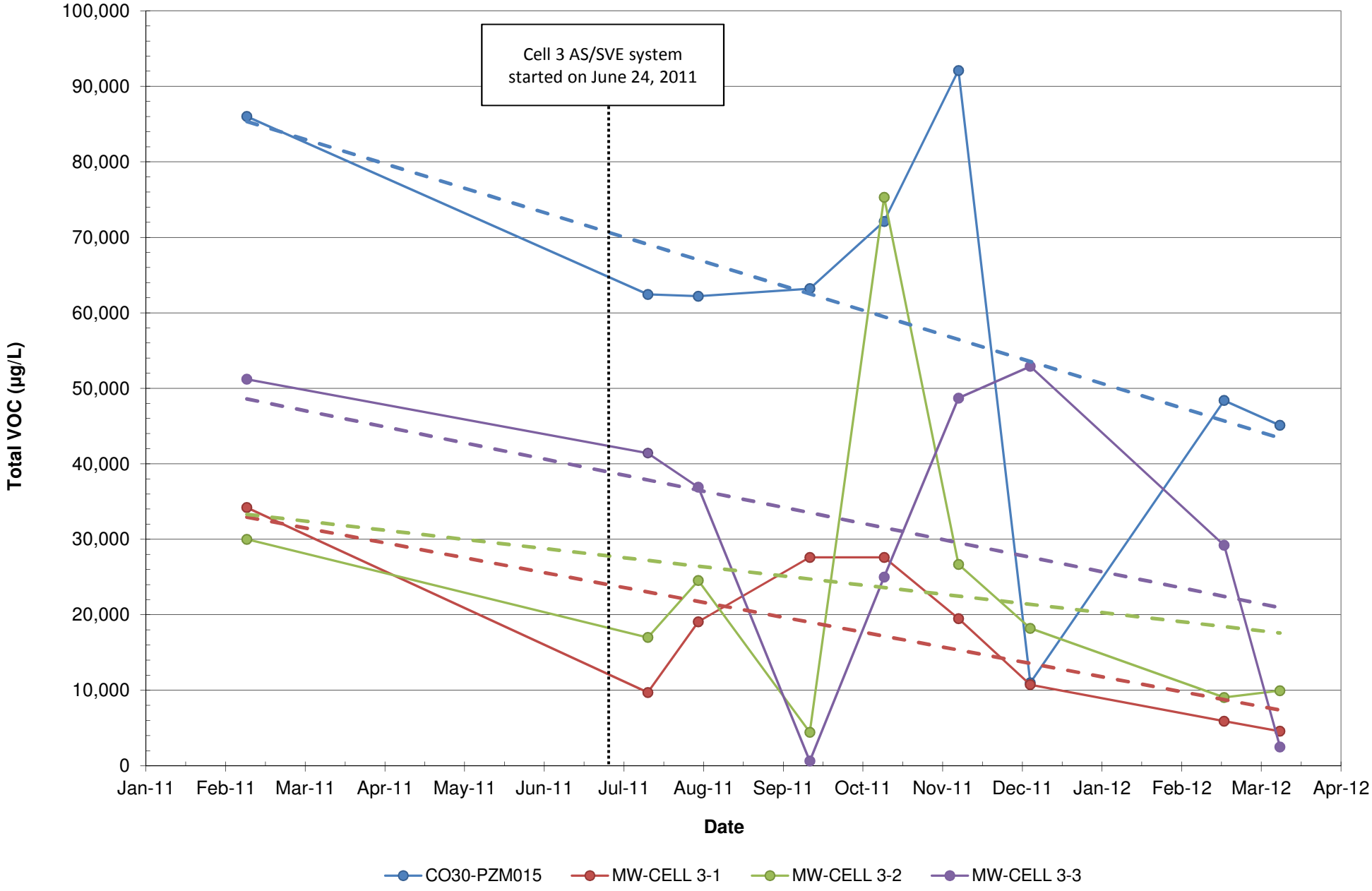
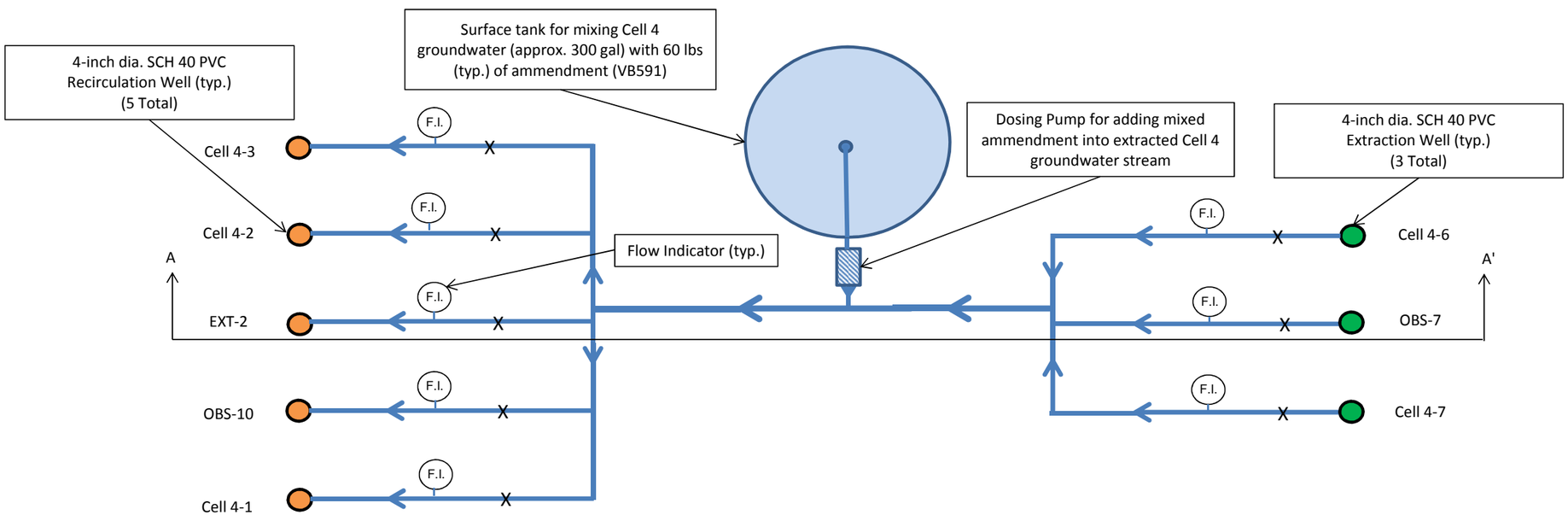
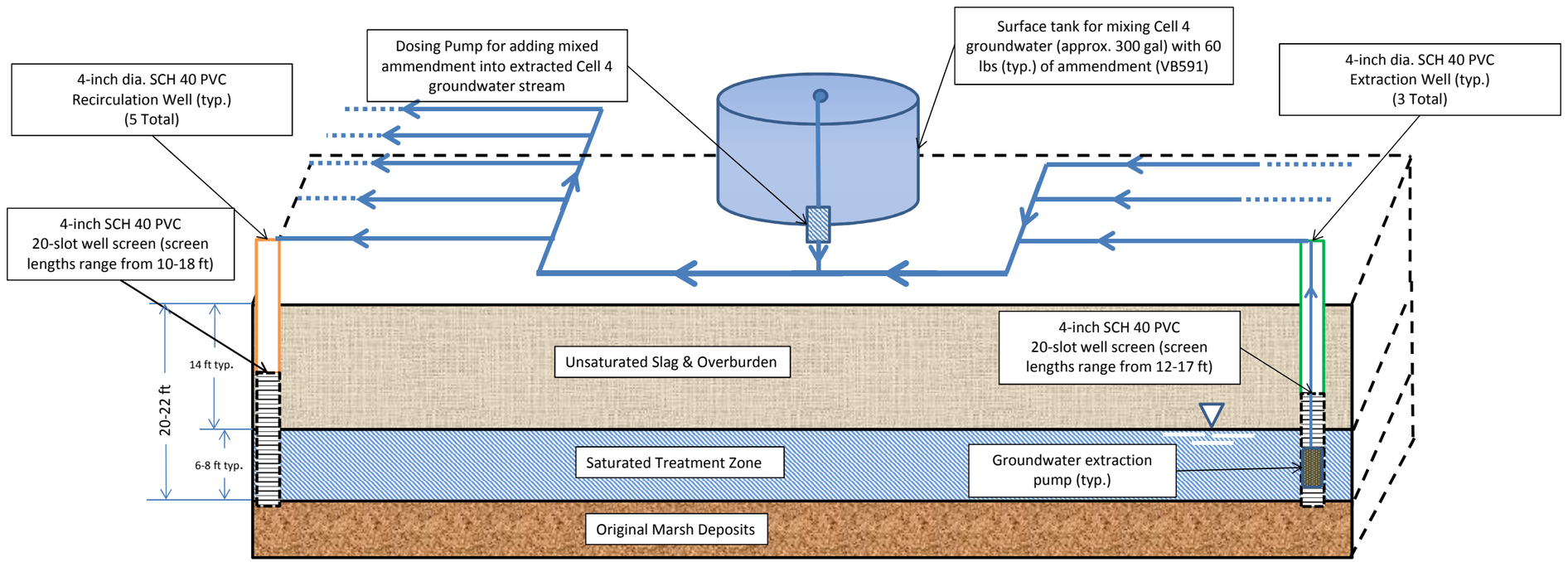


Figure 6
Schematic Layout and Sections
Cell 4 In-Situ Anaerobic Bio-Treatment System
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC





Section A-A' (not to scale)

CLIENT	RG Steel Sparrows Point, LLC		
LOCATION	Baltimore, MD		
URS 12420 Milestone Center Drive Germantown, MD 20876	GIS BY	JK/aer	11/18/2011
	CHK BY	BE	11/18/2011
	PM	BE	11/18/2011

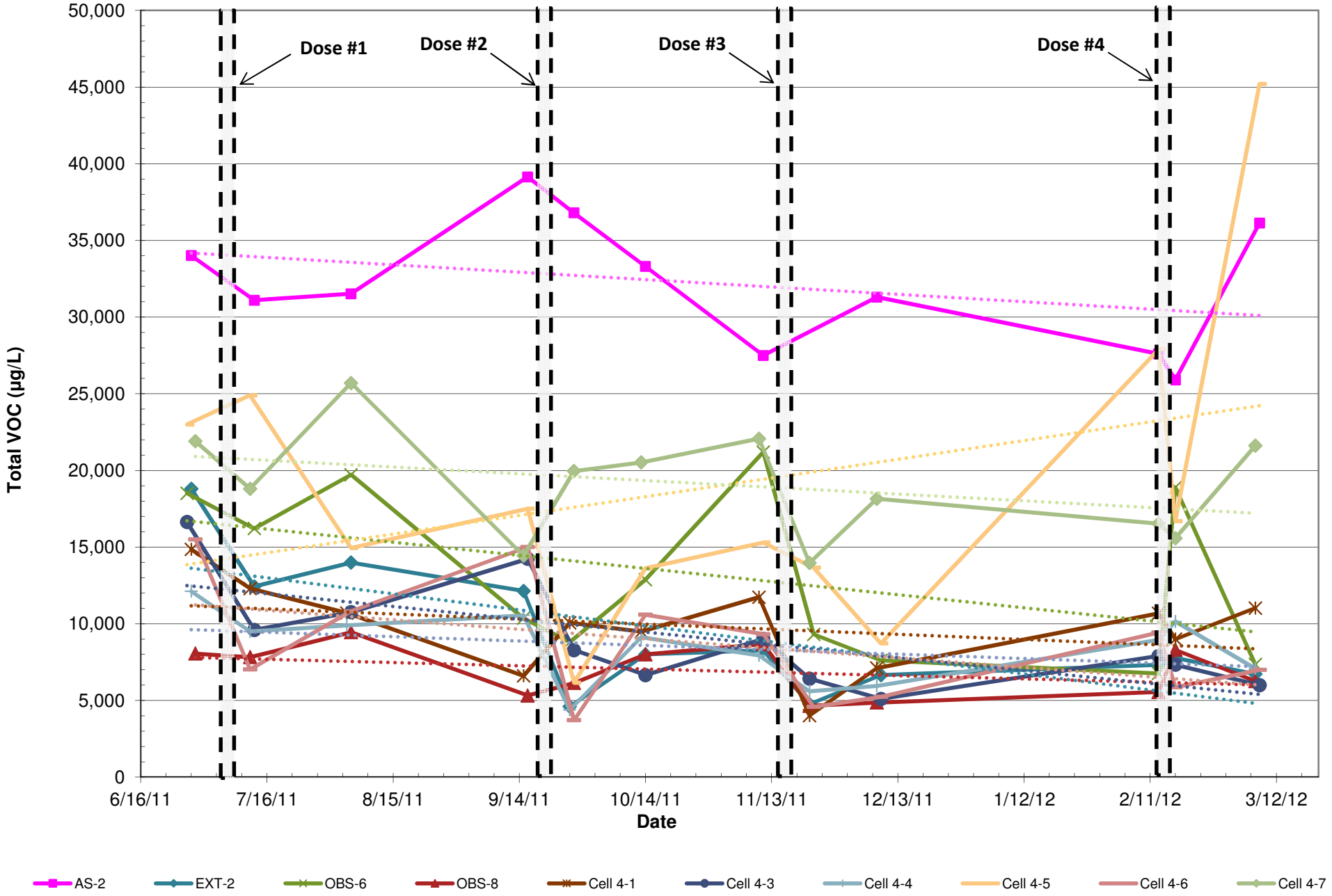
N

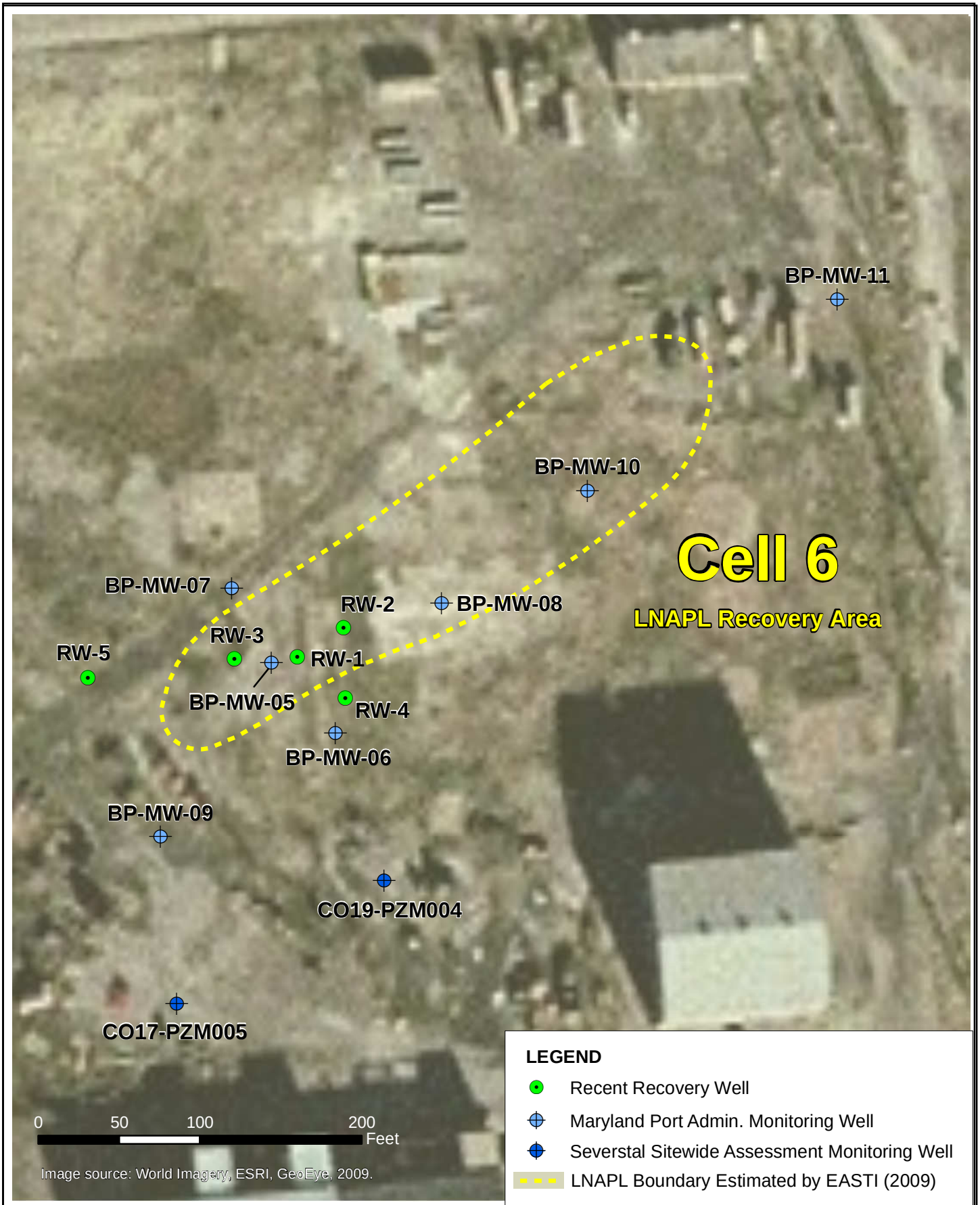
Figure 7

Cell 4 Wells

G:\Projects\SparrowsPoint\Projects\2011\CokeOven-and-CokePoint-Cell4closeup_Surveyed_Wells.mxd

Figure 8
Measured Groundwater VOC Concentration per Month
Cell 4: In-Situ Anaerobic Bio-Treatment Area
RG Steel Sparrows Point, LLC





CLIENT	RG Steel Sparrows Point, LLC		
LOCATION	Baltimore, MD		
URS 200 Orchard Ridge Drive Gaithersburg, MD 20878	GIS BY	JK	10/13/10
	CHK BY	BE	10/14/10
	PM	BE	10/14/10

N

Figure 9

LNAPL Monitoring and Recovery Wells

G:\Projects\SparrowsPoint\Projects\2010\CokeOven-and-CokePoint-Cell6closeup_rev.mxd