

Sparrows Point, LLC
1430 Sparrows Point Boulevard
Baltimore, Maryland 21219

September 28, 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 August 2012***

Dear Mr. Fan and Ms. Brown:

Enclosed with this correspondence is the ***Coke Oven Area Interim Measures Progress Report August 2012*** completed for the 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 August 31, 2012.

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

Sincerely,



Russell Becker
Sparrows Point, LLC

Enclosure

COKE OVEN AREA INTERIM MEASURES PROGRESS REPORT (AUGUST 2012)

Prepared for

RG Steel Sparrows Point, LLC
Sparrows Point, Maryland



September 28, 2012

URS

URS Corporation
12420 Milestone Center Drive, Suite 150
Germantown, MD 20876
Project no. 15303198

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 August 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 August 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 August 31, 2012, Cells 1, 3, 4 and 6 continue to be operational. Maryland Department of the Environment (MDE) issued discharge permits for Cells 2 and 5 with the effective date of July 26, 2012. Cells 2 and 5 are currently under evaluation and design.

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.

August 2012 Operational Performance

Operational performance of Cell 1 during this reporting period is summarized in **Table 1**. In summary, the CATOX unit operated for 708 hours (95.2 %) 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 0.10 pounds per operating hour (estimated monthly total of 70.82 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 9,367 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 August 23, 2012 was 59.9 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 August 23, 2012 is representative of hydrocarbon concentrations for the entire month of August. This assumption is based on the fact that the same air sparge wells (AS-1 thru AS-8) and extraction wells (V-1 thru V-6) were online when the system was operational.

August 2012 Groundwater Monitoring Results

Groundwater samples were collected on August 15, 2012 from the following wells:

- BP-MW-09 (upgradient of Cell 1),

Coke Oven Area Interim Remedial Measures Progress Report

- 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.

August 2012 Operational Performance

Operational performance of Cell 3 during this reporting period is summarized in **Table 4**. In summary, the CATOX unit operated for 742 hours (99.7 %) during August. 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 0.01 pounds per operating hour (estimated monthly total of 6.01 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 587 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 August 23, 2012 was 5.24 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 August 23, 2012 is representative of hydrocarbon concentrations for the entire month of August. This assumption is based on the fact that the same air sparge wells (AS-2 thru AS-12) and extraction wells (V-2 thru V-4) were online when the system was operational.

August 2012 Cell 3 Groundwater Monitoring

Groundwater samples were collected on August 15, 2012 from the following wells (**Figure 1**):

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

Coke Oven Area Interim Remedial Measures Progress Report

- 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 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.

August 2012 Operations

No activities occurred at Cell 4 during August 2012. As per the approved design concept, groundwater dosing and circulation will not be continuous, but will periodically be repeated to maintain groundwater nutrient levels. The sixth amendment dosing event occurred from July 24 to 26, 2012. The seventh amendment dosing event and associated groundwater monitoring activities are planned for September 2012.

August 2012 Groundwater Monitoring Results

Groundwater samples were collected on August 22 and 23, 2012 to monitor the effects of the sixth amendment dosing event. Groundwater samples were collected from the following wells (**Figure 7**):

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

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-CELL4-1, 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 twice during August 2012 (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.

LNAPL recovery was impacted in August due to a pump failure in recovery well BP-MW-05. The pump has been replaced and LNAPL recovery has been re-established in this well. During August, an estimated 18 gallons (136 pounds) of LNAPL were recovered, bringing the total recovered LNAPL to 7,444 gallons (54,540 pounds) as of August 23, 2012. The LNAPL was recovered from the following wells:

Well	LNAPL Recovery (gal / lbs)		Notes
	During August 2012	Total thru August 23, 2012	
BP-MW-05	0 / 0	6,030 / 44,180	(c)
RW-04	0 / 0	990 / 7,255	(c)
BP-MW-08	3.3 / 24	395 / 2,891	(c)
BP-MW-11	0 / 0	7.8 / 57	(a)
RW-03	15 / 112	19.3 / 141	(d)
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 as well as 5/24/12 to 6/22/12.
- (d) Began pumping RW-03 with a skimmer pump on August 6, 2012.

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

- RW-04 (1.80 to 2.30 ft),
- BP-MW-05 (1.06 to 1.10 ft),
- BP-MW-08 (0.06 to 0.11 ft),
- BP-MW-11 (0.34 to 0.40 ft),
- BP-MW-10 (0.28 to 0.38 ft),

Coke Oven Area Interim Remedial Measures Progress Report

- RW-02 (0.10 to 0.25 ft),
- RW-03 (0.03 to 0.53 ft)
- RW-01 (0.27 to 0.27 ft), and
- BP-MW-07 (0.02 to 0.03 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 August 2012 Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total CATOX Operating Time (August 1 - August 31, 2012)	hours	708
Overall CATOX Operational Time	%	95.2
Estimated Total Hydrocarbons Destroyed	pounds	70.82
Estimated Hydrocarbon Removal Rate	pounds/hour	0.10

Cell 1 Cumulative Summary of Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total ICE/CATOX Operating Time (August 3, 2010 - August 31, 2012)	hours	14,400
Overall ICE/CATOX Operational Time	%	79.1
Estimated Total Hydrocarbons Destroyed	pounds	9,367
Estimated Average Hydrocarbon Removal Rate	pounds/hour	0.65

Table 2
Summary of Soil Gas Analytical Results (August 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	8/23/2012
		Time	15:10
		Dilution Factor	3309.26
Analyte	Units		
TO-15 Volatile Organics			
trans-1,3-Dichloropropene	ppb	< 660 U	
Acetone	ppb	< 17,000 U	
Ethylbenzene	ppb	< 660 U	
2-Hexanone	ppb	< 1,700 U	
Methylene Chloride	ppb	< 1,700 U	
Benzene	ppb	44,000	
1,1,2,2-Tetrachloroethane	ppb	< 660 U	
Tetrachloroethene	ppb	< 660 U	
Toluene	ppb	12,000	
1,1,1-Trichloroethane	ppb	< 660 U	
1,1,2-Trichloroethane	ppb	< 660 U	
Trichloroethene	ppb	< 660 U	
Vinyl Chloride	ppb	< 660 U	
o-Xylene	ppb	1,200	
m-Xylene & p-Xylene	ppb	2,700	
2-Butanone (MEK)	ppb	< 3,300 U	
4-Methyl-2-pentanone (MIBK)	ppb	< 1,700 U	
Bromoform	ppb	< 660 U	
Carbon Disulfide	ppb	< 1,700 U	
Carbon tetrachloride	ppb	< 660 U	
Chlorobenzene	ppb	< 660 U	
Chloroethane	ppb	< 660 U	
Chloroform	ppb	< 660 U	
1,1-Dichloroethane	ppb	< 660 U	
1,2-Dichloroethane	ppb	< 660 U	
1,1-Dichloroethene	ppb	< 660 U	
trans-1,2-Dichloroethene	ppb	< 660 U	
1,2-Dichloropropane	ppb	< 660 U	
cis-1,3-Dichloropropene	ppb	< 660 U	
Total Volatile Organics	ppb	59,900	

Notes:

BOLD = Analyte detected

ppb = parts per billion

<U = Analyte not detected above corresponding laboratory reporting limit

Table 3
Summary of Groundwater Analytical Results (August 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	8/15/2012	8/15/2012	8/15/2012	
Time	13:20	14:10	15:05	
Analyte				
Units				
Water Quality Parameters				
Temperature	deg C	22.4	37.7	19.3
pH	std units	10.45	9.37	12.91
ORP	mV	-137	-90	-292
Conductivity	mS/cm	0.433	2.79	0.163
Turbidity	NTU	175	340	--
Dissolved Oxygen	mg/L	3.21	2.96	4.45
Volatile Organics				
Vinyl Chloride	µg/L	< 1,000 U	< 500 U	< 500 U
Chloroethane	µg/L	< 1,000 U	< 500 U	< 500 U
1,1-Dichloroethene	µg/L	< 1,000 U	< 500 U	< 500 U
Acetone	µg/L	< 25,000 U	< 12,000 U	< 12,000 U
Carbon Disulfide	µg/L	< 1,000 U	< 500 U	< 500 U
Methylene Chloride	µg/L	< 5,000 U	< 2,500 U	< 2,500 U
trans-1,2-Dichloroethene	µg/L	< 1,000 U	< 500 U	< 500 U
1,1-Dichloroethane	µg/L	< 1,000 U	< 500 U	< 500 U
2-Butanone (MEK)	µg/L	19,000	< 2,500 U	< 2,500 U
Chloroform	µg/L	< 1,000 U	< 500 U	< 500 U
1,1,1-Trichloroethane	µg/L	< 1,000 U	< 500 U	< 500 U
Carbon Tetrachloride	µg/L	< 1,000 U	< 500 U	< 500 U
Benzene	µg/L	1,600	22,000	96,000
1,2-Dichloroethane	µg/L	< 1,000 U	< 500 U	< 500 U
Trichloroethene	µg/L	< 1,000 U	< 500 U	< 500 U
1,2-Dichloropropane	µg/L	< 1,000 U	< 500 U	< 500 U
Methyl Isobutyl Ketone (MIBK)	µg/L	< 5,000 U	< 2,500 U	< 2,500 U
cis-1,3-Dichloropropene	µg/L	< 1,000 U	< 500 U	< 500 U
Toluene	µg/L	< 1,000 U	1,900	22,000
trans-1,3-Dichloropropene	µg/L	< 1,000 U	< 500 U	< 500 U
1,1,2-Trichloroethane	µg/L	< 1,000 U	< 500 U	< 500 U
2-Hexanone (MBK)	µg/L	< 5,000 U	< 2,500 U	< 2,500 U
Tetrachloroethene	µg/L	< 1,000 U	< 500 U	< 500 U
Chlorobenzene	µg/L	< 1,000 U	< 500 U	< 500 U
1,1,1,2-Tetrachloroethane	µg/L	< 1,000 U	< 500 U	< 500 U
Ethylbenzene	µg/L	< 1,000 U	< 500 U	1,100
Bromoform	µg/L	< 1,000 U	< 500 U	< 500 U
1,1,2,2-Tetrachloroethane	µg/L	< 1,000 U	< 500 U	< 500 U
Total Xylenes	µg/L	< 3,000 U	< 1,500 U	15,000
Total Volatile Organics	µg/L	20,600	23,900	134,100

Notes:

- = Not Measured due to Instrument Malfunction
- Bold** = Analyte Detected
- deg C = degrees Celcius
- mg/L = Milligram per liter
- mS/cm = Microsiemens 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 August 2012 Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total CATOX Operating Time (August 1 - August 31, 2012)	hours	742
Overall CATOX Operational Time	%	99.7
Estimated Total Hydrocarbons Destroyed	pounds	6.01
Estimated Hydrocarbon Removal Rate	pounds/hour	0.01

Cell 3 Cumulative Summary of Estimated Hydrocarbon Recovery

Parameter	Units	Quantity
Total CATOX Operating Time (June 24, 2011 - August 31, 2012)	hours	9,050
Overall CATOX Operational Time	%	82.3
Estimated Total Hydrocarbons Destroyed	pounds	586.7
Estimated Hydrocarbon Removal Rate	pounds/hour	0.06

Table 5
Summary of Soil Gas Analytical Results (August 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	8/23/2012
	Time	15:20
	Dilution Factor	594.72
Analyte	Units	
TO-15 Volatile Organics		
trans-1,3-Dichloropropene	ppb	< 120 U
Acetone	ppb	< 3,000 U
Ethylbenzene	ppb	< 120 U
2-Hexanone	ppb	< 300 U
Methylene Chloride	ppb	< 300 U
Benzene	ppb	4,800
1,1,2,2-Tetrachloroethane	ppb	< 120 U
Tetrachloroethene	ppb	< 120 U
Toluene	ppb	440
1,1,1-Trichloroethane	ppb	< 120 U
1,1,2-Trichloroethane	ppb	< 120 U
Trichloroethene	ppb	< 120 U
Vinyl Chloride	ppb	< 120 U
o-Xylene	ppb	< 120 U
m-Xylene & p-Xylene	ppb	< 120 U
2-Butanone (MEK)	ppb	< 590 U
4-Methyl-2-pentanone (MIBK)	ppb	< 300 U
Bromoform	ppb	< 120 U
Carbon Disulfide	ppb	< 300 U
Carbon tetrachloride	ppb	< 120 U
Chlorobenzene	ppb	< 120 U
Chloroethane	ppb	< 120 U
Chloroform	ppb	< 120 U
1,1-Dichloroethane	ppb	< 120 U
1,2-Dichloroethane	ppb	< 120 U
1,1-Dichloroethene	ppb	< 120 U
trans-1,2-Dichloroethene	ppb	< 120 U
1,2-Dichloropropane	ppb	< 120 U
cis-1,3-Dichloropropene	ppb	< 120 U
Total Volatile Organics	ppb	5,240

Notes:

BOLD = Analyte detected

ppb = parts per billion

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

Table 6
Summary of Groundwater Analytical Results (August 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	8/15/2012	8/15/2012	8/15/2012	8/15/2012	
Time	9:05	10:00	10:50	11:45	
Analyte	Units				
Water Quality Parameters					
Temperature	deg C	19.7	19.8	19.9	20.1
pH	std units	13.16	12.35	12.32	11.55
ORP	mV	-291	-245	-249	-202
Conductivity	mS/cm	0.293	0.289	0.236	0.359
Turbidity	NTU	412	24.1	21.0	40.1
Dissolved Oxygen	mg/L	2.31	2.43	2.23	3.08
Volatile Organics					
Vinyl Chloride	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Chloroethane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
1,1-Dichloroethene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Acetone	µg/L	< 12,000 U	< 12,000 U	< 2,500 U	< 250 U
Carbon Disulfide	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Methylene Chloride	µg/L	< 2,500 U	< 2,500 U	< 500 U	< 50 U
trans-1,2-Dichloroethene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
1,1-Dichloroethane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
2-Butanone (MEK)	µg/L	< 2,500 U	< 2,500 U	< 500 U	< 50 U
Chloroform	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
1,1,1-Trichloroethane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Carbon Tetrachloride	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Benzene	µg/L	61,000	3,500	9,400	470
1,2-Dichloroethane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Trichloroethene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
1,2-Dichloropropane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Methyl Isobutyl Ketone (MIBK)	µg/L	< 2,500 U	< 2,500 U	< 500 U	< 50 U
cis-1,3-Dichloropropene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Toluene	µg/L	4,900	< 500 U	490	44
trans-1,3-Dichloropropene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
1,1,2-Trichloroethane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
2-Hexanone (MBK)	µg/L	< 2,500 U	< 2,500 U	< 500 U	< 50 U
Tetrachloroethene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Chlorobenzene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
1,1,1,2-Tetrachloroethane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Ethylbenzene	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Bromoform	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
1,1,2,2-Tetrachloroethane	µg/L	< 500 U	< 500 U	< 100 U	< 10 U
Xylenes, Total	µg/L	2,000	< 1,500 U	< 300 U	< 30 U
Total Volatile Organics	µg/L	67,900	3,500	9,890	514

Notes:

- = Not Measured
- Bold** = Analyte Detected
- deg C = degrees Celcius
- mg/L = Milligram per liter
- mS/cm = Microsiemens 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 (August 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		08/23/12	08/22/12	08/23/12	08/23/12	08/22/12	08/23/12	08/22/12	08/23/12	08/23/12	08/22/12
Time		9:25	15:05	10:10	11:30	12:30	14:05	13:15	13:10	12:20	14:05
Units											
Water Quality Parameters											
Temperature	deg C	20.47	20.17	21.14	20.10	20.61	21.69	20.33	20.91	20.36	20.69
pH	std units	12.55	12.41	10.01	11.96	8.97	10.08	11.86	12.61	12.83	13.05
ORP	mV	-231	-256	-219	-200	-220	-200	-263	-220	-191	-223
Conductivity	mS/cm	2.11	1.68	1.67	3.16	2.18	2.04	1.47	1.94	2.38	3.75
Turbidity	NTU	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen	mg/L	5.01	0.00	6.21	5.53	0.00	0.00	0.00	0.00	0.00	0.00
Volatile Organics											
Vinyl Chloride	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Chloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
1,1-Dichloroethene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 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	< 2,500 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	< 100 U	< 100 U	< 100 U
Methylene Chloride	µg/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 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	< 100 U	< 100 U	< 100 U
1,1-Dichloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
2-Butanone (MEK)	µg/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U
Chloroform	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 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	< 100 U	< 100 U	< 100 U
Carbon Tetrachloride	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Benzene	µg/L	980	750	370	7,500	750	510	830	1,200	490	980
1,2-Dichloroethane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
1,2-Dichloropropane	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 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	< 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	< 100 U	< 100 U	< 100 U
Toluene	µg/L	630	450	250	5,600	600	310	490	800	290	560
trans-1,3-Dichloropropene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 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	< 100 U	< 100 U	< 100 U
2-Hexanone (MBK)	µg/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U
Tetrachloroethene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Chlorobenzene	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 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	< 100 U	< 100 U	< 100 U
Ethylbenzene	µg/L	< 100 U	< 100 U	< 100 U	100	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Bromoform	µg/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 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	< 100 U	< 100 U	< 100 U
Xylenes, Total	µg/L	720	560	380	2,900	640	420	620	760	420	950
Semi-Volatiles											
Naphthalene	µg/L	10,000	3,900	3,300	13,000	6,100	3,500	4,200	8,000	4,000	19,000
Total Volatile Organics	µg/L	12,330	5,660	4,300	29,100	8,090	4,740	6,140	10,760	5,200	21,490

Table 7
Summary of Groundwater Analytical Results (August 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	08/23/12	08/22/12	08/23/12	08/23/12	08/22/12	08/23/12	08/22/12	08/23/12	08/23/12	08/22/12	
Time	9:25	15:05	10:10	11:30	12:30	14:05	13:15	13:10	12:20	14:05	
Units											
Wet Chemistry											
Ferric Iron	mg/L	0.30	< 0.10 U	0.55	0.41	0.36	0.43	0.26	0.38	0.23	0.14
Ferrous Iron	mg/L	< 0.10 U	0.40	< 0.10 U	0.20	0.21	0.21	0.17	0.10	< 0.10 U	0.15
Nitrite-N	mg/L	0.11	0.070	0.035	0.10	0.022	0.038	0.077	0.10	0.054	0.82
Nitrate-N	mg/L	< 0.050 U	< 0.050 U								
Nitrate/Nitrite-N	mg/L	< 0.050 U	< 0.050 U								
Orthophosphate as P	mg/L	0.018	0.028	0.28	0.033	0.29	0.17	0.036	0.018	0.014	< 0.010 U
Sulfate as SO4	mg/L	250	350	570	1,500	710	750	380	670	330	200
Total Kjeldahl Nitrogen	mg/L	25	25	77	330	120	130	26	57	31	48
Metals											
Iron, Total	mg/L	0.30	0.41	0.55	0.61	0.57	0.64	0.43	0.48	0.23	0.29

Notes:

[1] Temperature meter not functioning properly. Could not Read.

-- = Not Measured

Bold = Analyte Detected

deg C = degrees Celcius

mg/L = Milligram per liter

mS/cm = Microsiemens 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
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 August 2012 (ft)			Total LNAPL Recovery Period		Cumulative Total LNAPL Recovered thru August 23, 2012 (d)		Estimated LNAPL Recovered During August 2012	
				Begin	End	(gal)	(lbs) (a)	(gal)	(lbs) (a)
RW-04	1.80	to	2.30	23-Jul-10	On-going (b)	990	7,255	0.0	0
BP-MW-05	1.06	to	1.10	28-Jan-10	On-going (b)	6,030	44,180	0.0	0
BP-MW-08	0.06	to	0.11	8-Sep-10	On-going (b)	395	2,891	3.3	24
BP-MW-11	0.34	to	0.40	23-Jul-10	8-Sep-10	7.8	57	0	0
RW-02	0.10	to	0.25	1/28/2011	On-going (c)	0.8	5.9	0	0
RW-03	0.03	to	0.53	11/24/2010	On-going (b)	19.3	141	15	112
RW-01	0.27	to	0.27	28-Oct-10	On-going (c)	1.3	10	0	0
BP-MW-10	0.28	to	0.38	na	na	0	0	0	0
BP-MW-07	0.02	to	0.03	na	na	0	0	0	0
BP-MW-06	none			na	na	0	0	0	0
RW-05	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:						7,444	54,540	18	136

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 as well as 5/24/12 to 6/22/12.

Table 9
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
8/6/2012	11.38	11.65	0.27	11.61	11.86	0.25	9.45	9.98	0.53
8/23/2012	11.35	11.62	0.27	11.70	11.80	0.10	9.36	9.39	0.03
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
8/6/2012	9.45	11.75	2.3	11.2	12.26	1.06	11.1	11.13	0.03
8/23/2012	9.4	11.2	1.8	11.08	12.18	1.1	11.01	11.03	0.02
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
8/6/2012	12.3	12.41	0.11	9.4	9.68	0.28	11.55	11.89	0.34
8/23/2012	12.19	12.25	0.06	9.22	9.60	0.38	11.31	11.71	0.40

Figures



- 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



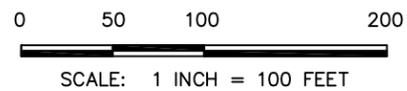
CLIENT: Sparrows Point	LOCATION: Baltimore, MD
DATE: 11/21/2011	FILE: G:\Projects\SparrowsPoint\Projects\2011\CokeOven-and-CokePoint-6Prototype Cells_rev4.mxd
GIS: AER	 12420 Milestone Center Drive Germantown, MD 20876
CHECKED: RL	
SENIOR: BE	

Figure 1
Interim Measures Treatment Areas

Image source: World Imagery, ESRI, GeoEye, 2009.

LEGEND:

- V-1  TRENCH VAPOR EXTRACTION RISER
- EXT-1  SVE PILOT TEST EXTRACTION WELL
- OBS-1  SVE PILOT TEST OBSERVATION WELL
- CO18-PZM006  EXISTING MONITORING WELL
- AS-2  AIR SPARGE WELL
-  VAPOR COLLECTION TRENCHES
-  FORMER STRUCTURES (DEMOLISHED)



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

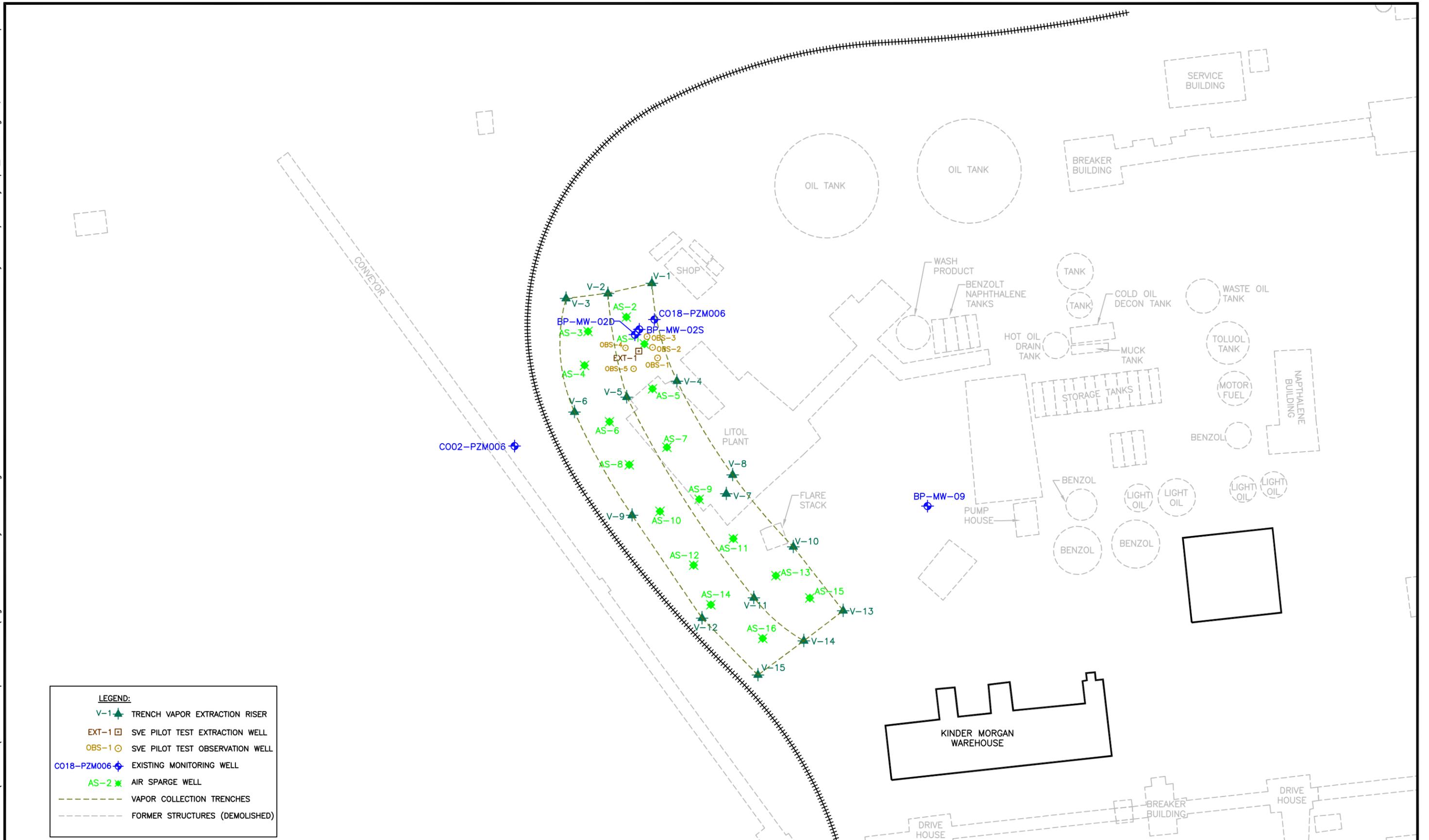


Figure 3
Cumulative Summary of Estimated Hydrocarbon Recovery
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC

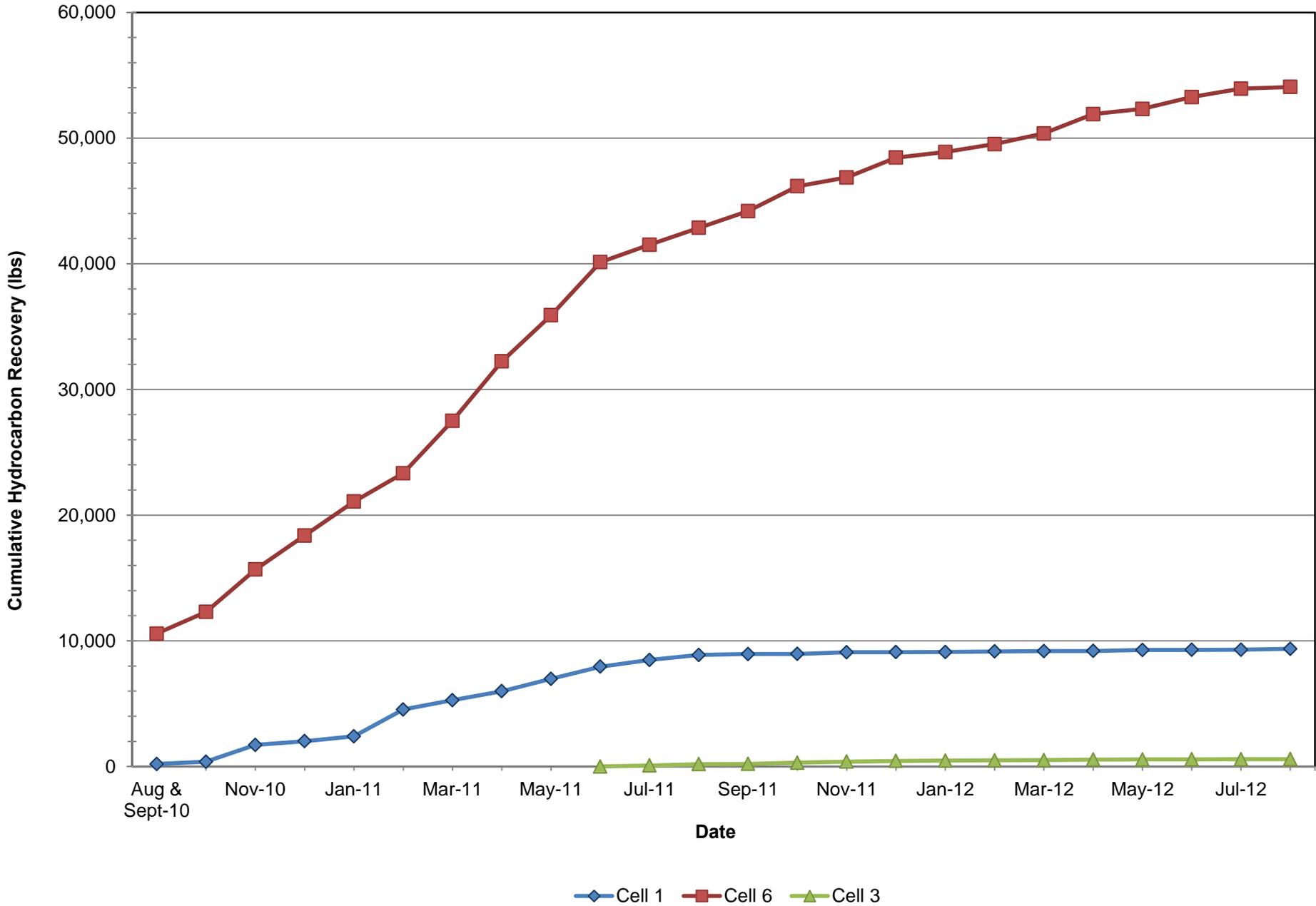
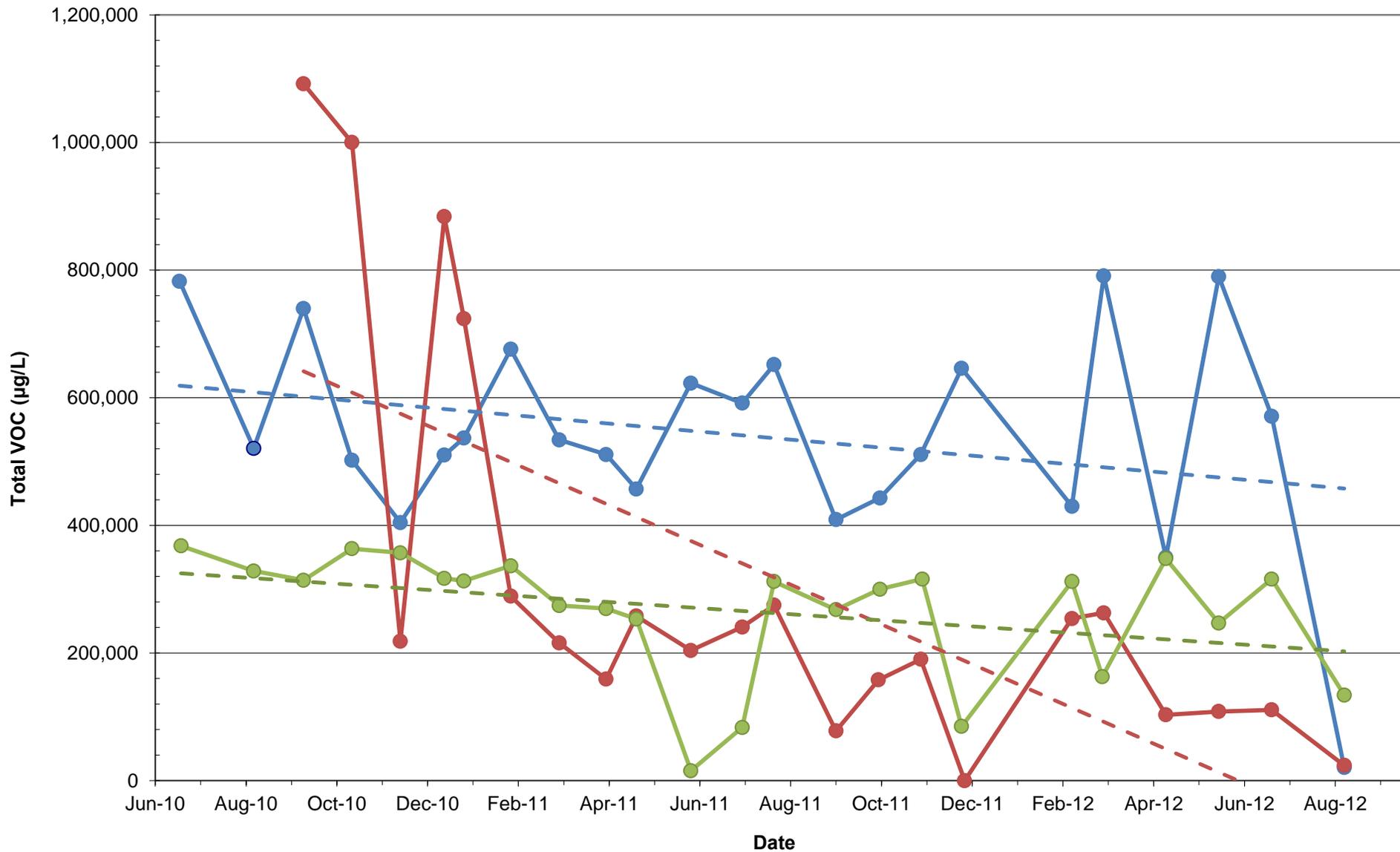


Figure 4
Measured Groundwater VOC Concentration by Month
Cell 1: Prototype AS/SVE System in the "Cove" Area
RG Steel Sparrows Point, LLC



CO02-PZM006

CO18-PZM006

BP-MW-09

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

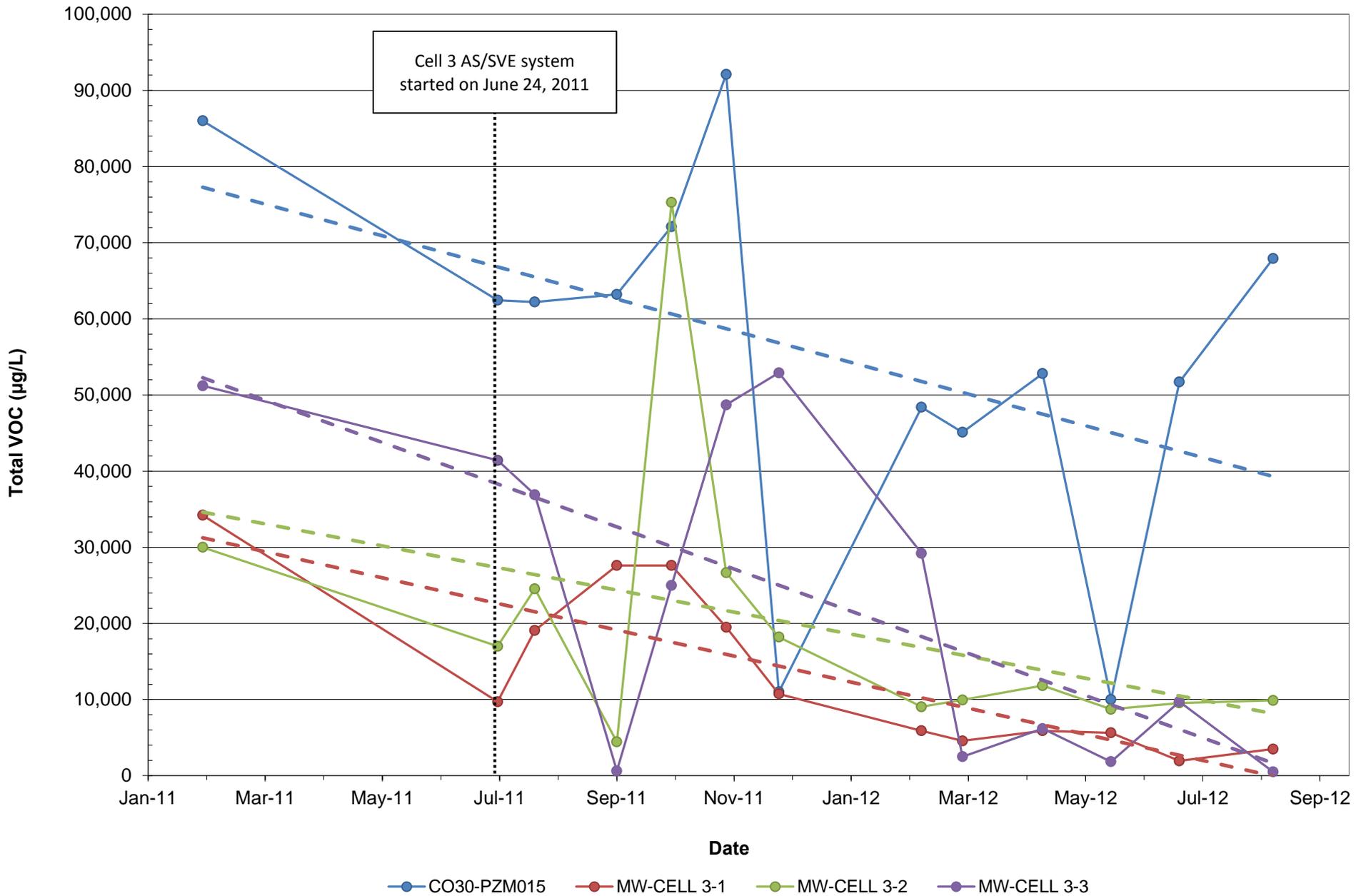
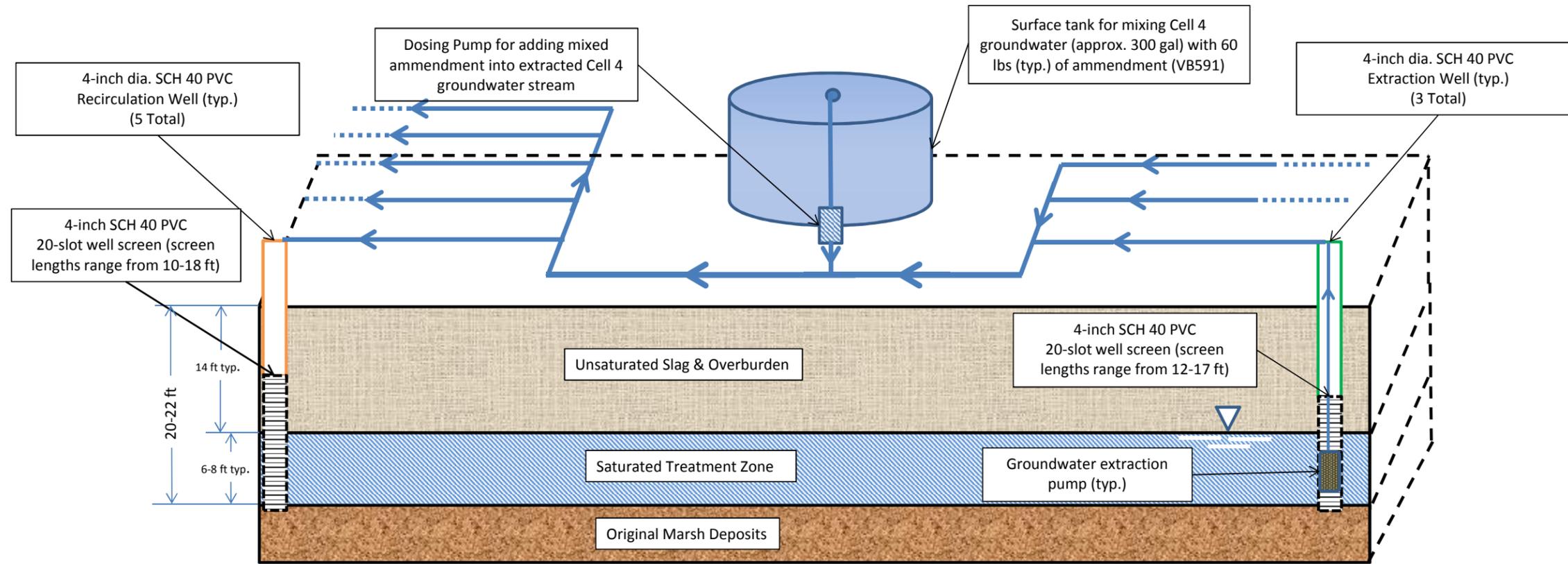
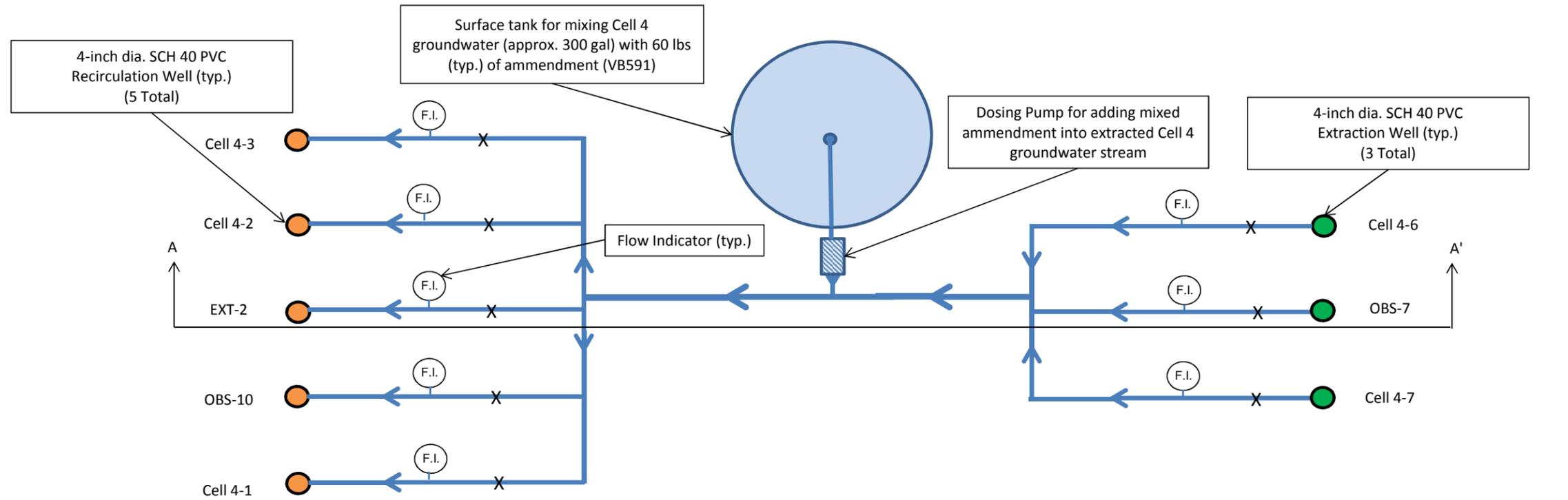


Figure 6
Schematic Layout and Sections
Cell 4 In-Situ Anaerobic Bio-Treatment System
Former Coke Oven Area Interim Remedial Measures
RG Steel Sparrows Point, LLC



Section A-A' (not to scale)

Cell 4

In-Situ Anaerobic Bio-System



Image source: World Imagery, ESRI, GeoEye, 2009.

Legend

- Extraction Well (Existing)
- Extraction Well (New)
- Recirculation Well (Existing)
- Recirculation Well (New)
- ⊕ Monitoring Well (Existing)
- ⊕ Monitoring Well (New)
- ➔ Groundwater Flow Direction

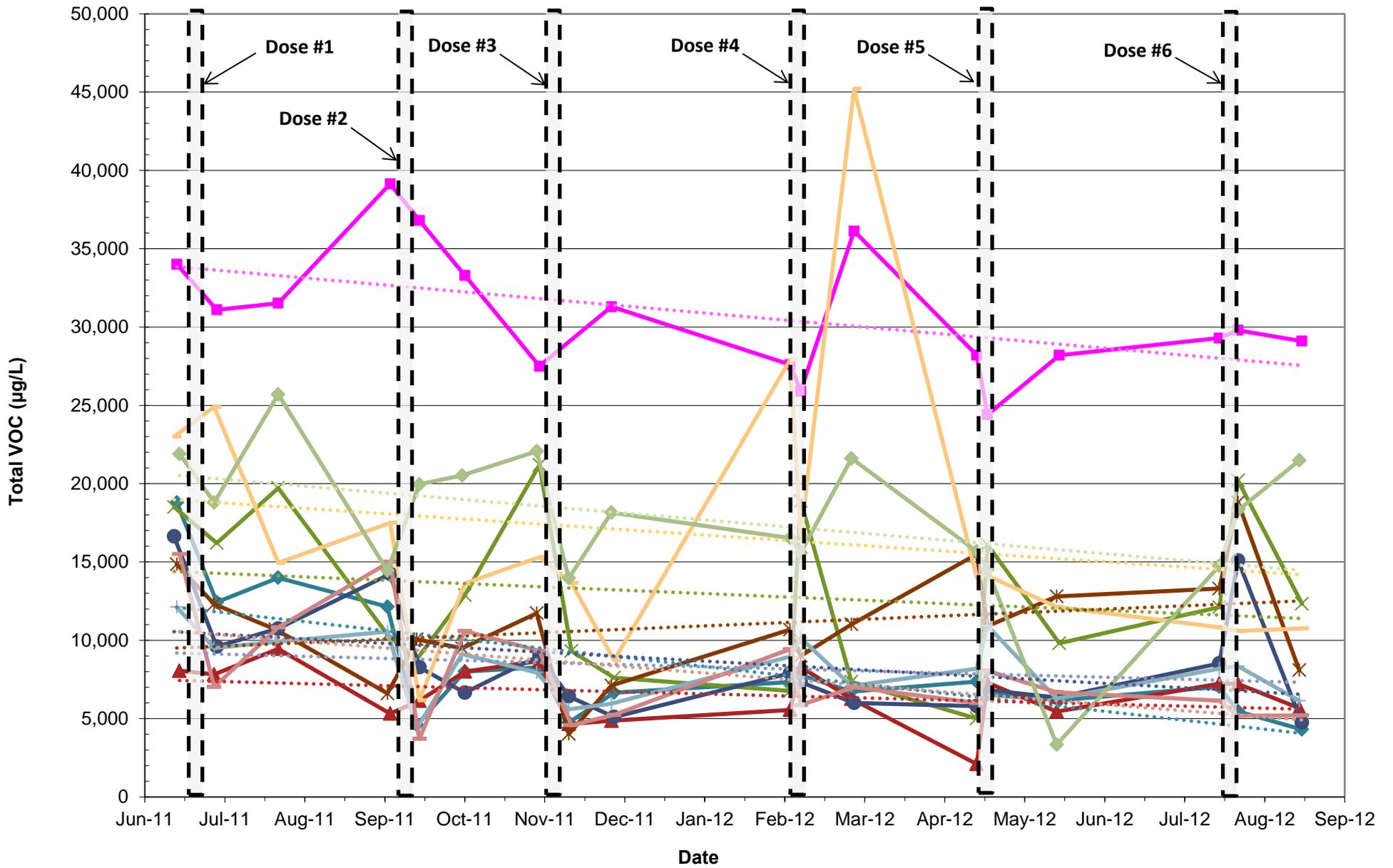
CLIENT	Severstal Sparrows Point, LLC		
LOCATION	Baltimore, MD		
 12420 Milestone Center Drive Germantown, MD 20876	GIS BY	JK/aer	11/18/2011
	CHK BY	BE	11/18/2011
	PM	BE	11/18/2011



Figure 7
Cell 4 Wells

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

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



■ AS-2
 ◆ EXT-2
 ✕ OBS-6
 ▲ OBS-8
 ✱ Cell 4-1
 ● Cell 4-3
 + Cell 4-4
 ■ Cell 4-5
 ■ Cell 4-6
 ◆ Cell 4-7



CLIENT Sparrows Point

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



Figure 9
LNAPL Monitoring and Recovery Wells

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