Public Informational Meeting on the Former Sparrows Point Steel Mill Environmental Cleanup

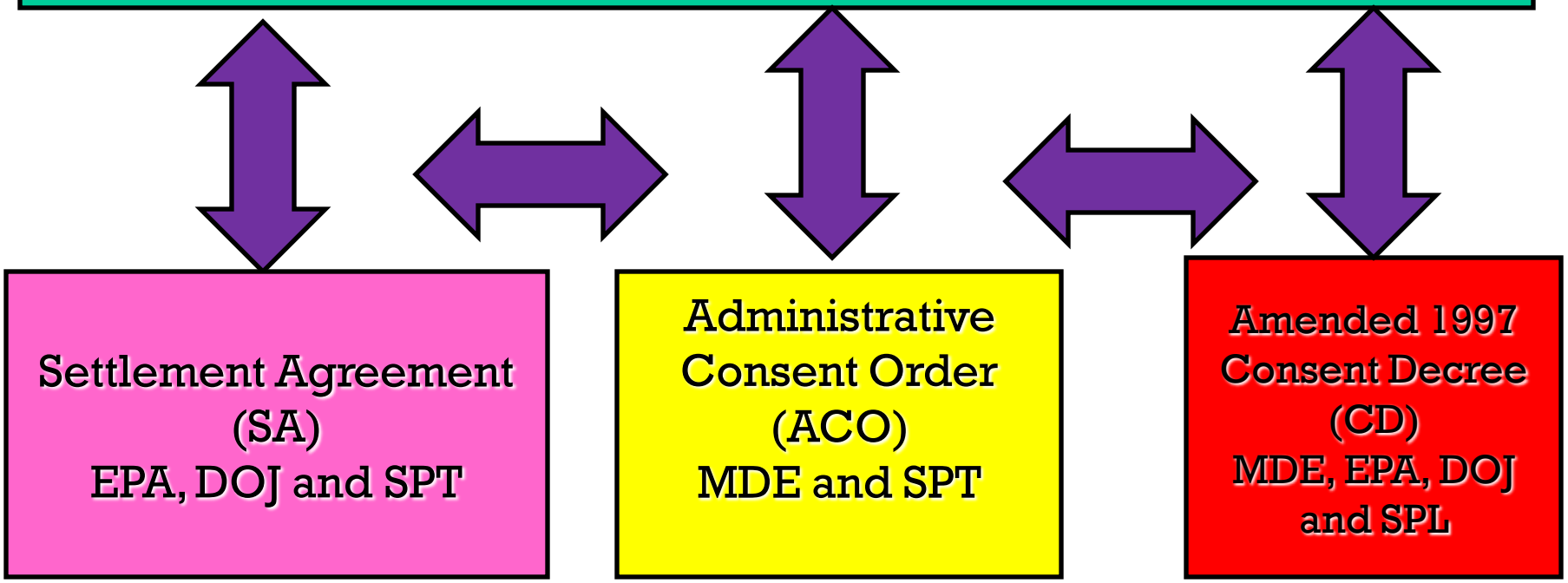
September 30, 2015

Regulatory Framework for Environmental Work Moving Forward

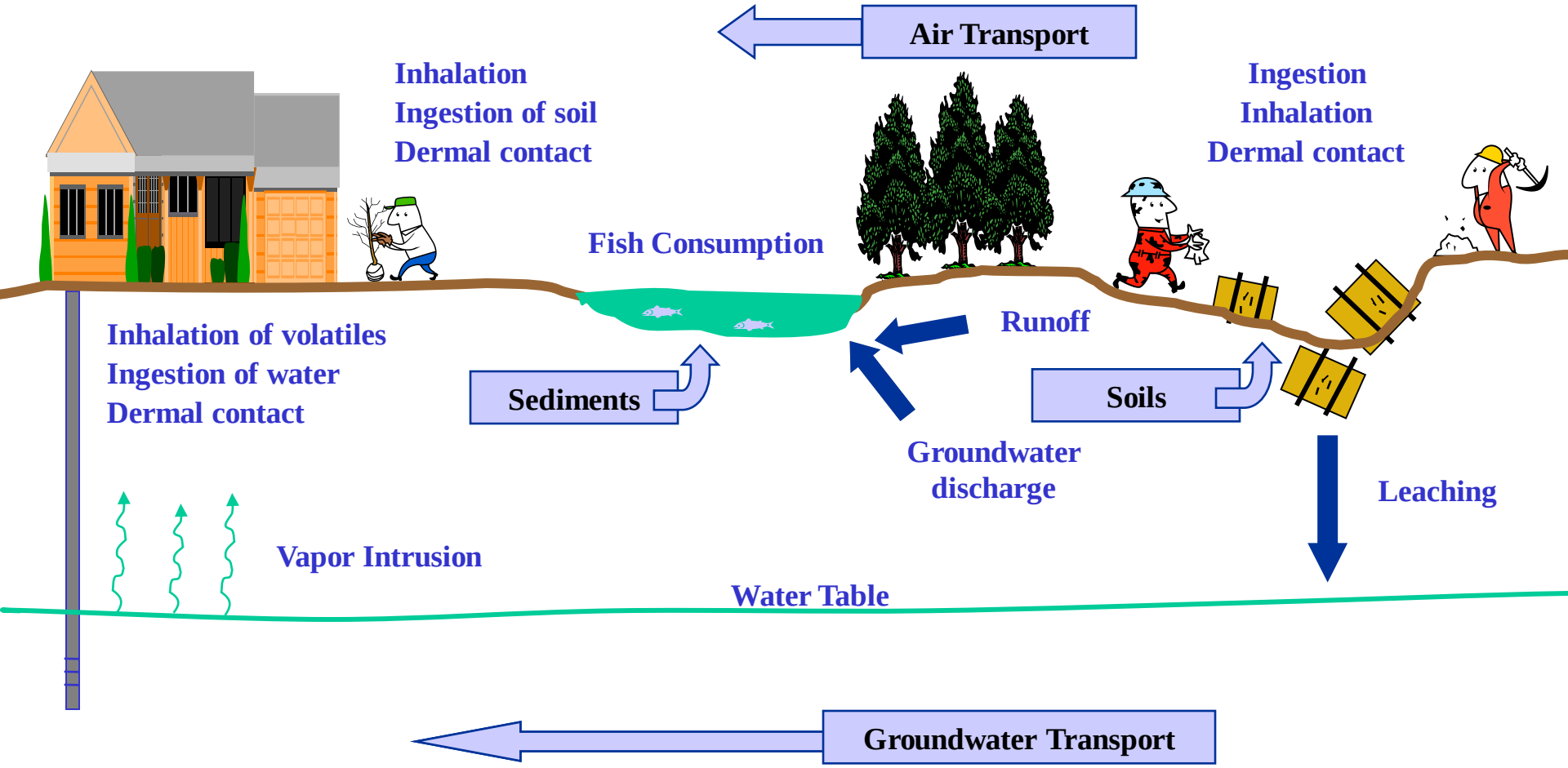
Environmental Work On the Entire Site For MDE and EPA

MDE will assume primary responsibility for overseeing implementation of the onshore work in consultation and cooperation with EPA

EPA will assume primary responsibility for implementation of the offshore work in consultation and cooperation with MDE



Sampling Data for Risk Assessment



Answers are in the QAPP!

What are you going to use the data for?

How many samples do you need for each parcel?

How are you going to collect the samples (soil, ground water, soil gas)?

How do you document the field work (log books, GPS sample locations, labels)?

How do you ensure the samples are collected property (field blanks and decontamination of equipment)?

What do you do with waste materials generated from the field work (IDW)?

What methods do you use to analyze the samples?

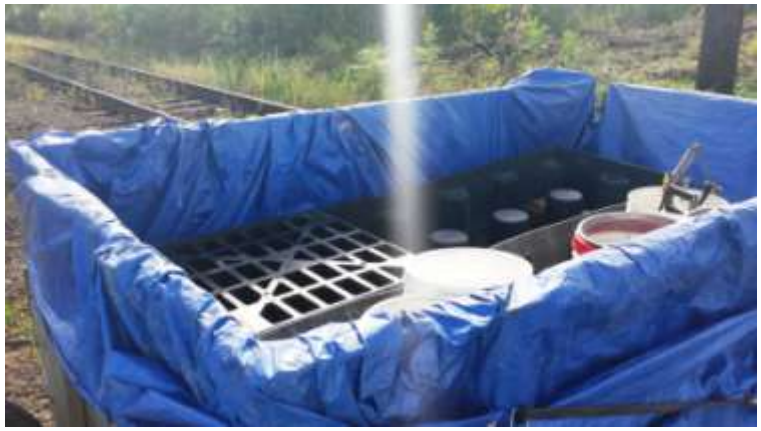
What are the detection limits?

How do you validate that the laboratory analyzed the samples correctly?

What levels do you use to screen the data?

The QAPP outlines specific procedures and requirements for obtaining data during the site characterization process that will be used to determine if the parcel requires remediation.

The Quality Assurance Project Plan (QAPP) In Action!



Equipment Decontamination Trailer

Collecting Field Blanks

Sampling Location Identification

Sparrows Point Terminal
Parcel Investigation Status

Area A2

Approximately 41 Acres-Currently Occupied by Reservoir Warehouse and DACS Building also called the In Process Storage Building.

Final Phase II Work Plan received September 4, 2015
Field Work began September 15,

Information Provided in Phase II Work Plans

Historical information on coastline
Is the site on fill or natural material?

Determining Sample Locations
Area A2 Example

Parcel A2 Historical Site Drawings Details				
Set Name	Typical Features Shown	Drawing Number	Original Date Drawn	Latest Revision Date
Plant Arrangement	Roads, water bodies, building/structure footprints, electric lines, above-ground pipelines (e.g.: steam, nitrogen, etc.)	5057	4/27/1959	3/11/1982
		5062	2/8/1962	3/11/1982
Plant Index	Roads, water bodies, demolished buildings/structures, electric lines, above-ground pipelines	5157	*Unknown*	11/10/2008
		5162	*Unknown*	3/6/2008
Plant Sewer Lines	Same as above plus trenches, sumps, underground piping (includes pipe materials)	5557	*Unknown*	2/2/1976
		5562	3/15/1976	3/15/1976

Historical Plant Drawings with potential sources of contamination (sumps, pits, tanks, etc.) identified

2014 Phase I including other Historical Investigations and Aerial Photos

QAPP-Worksheet 17 Minimum Sampling Density Requirements

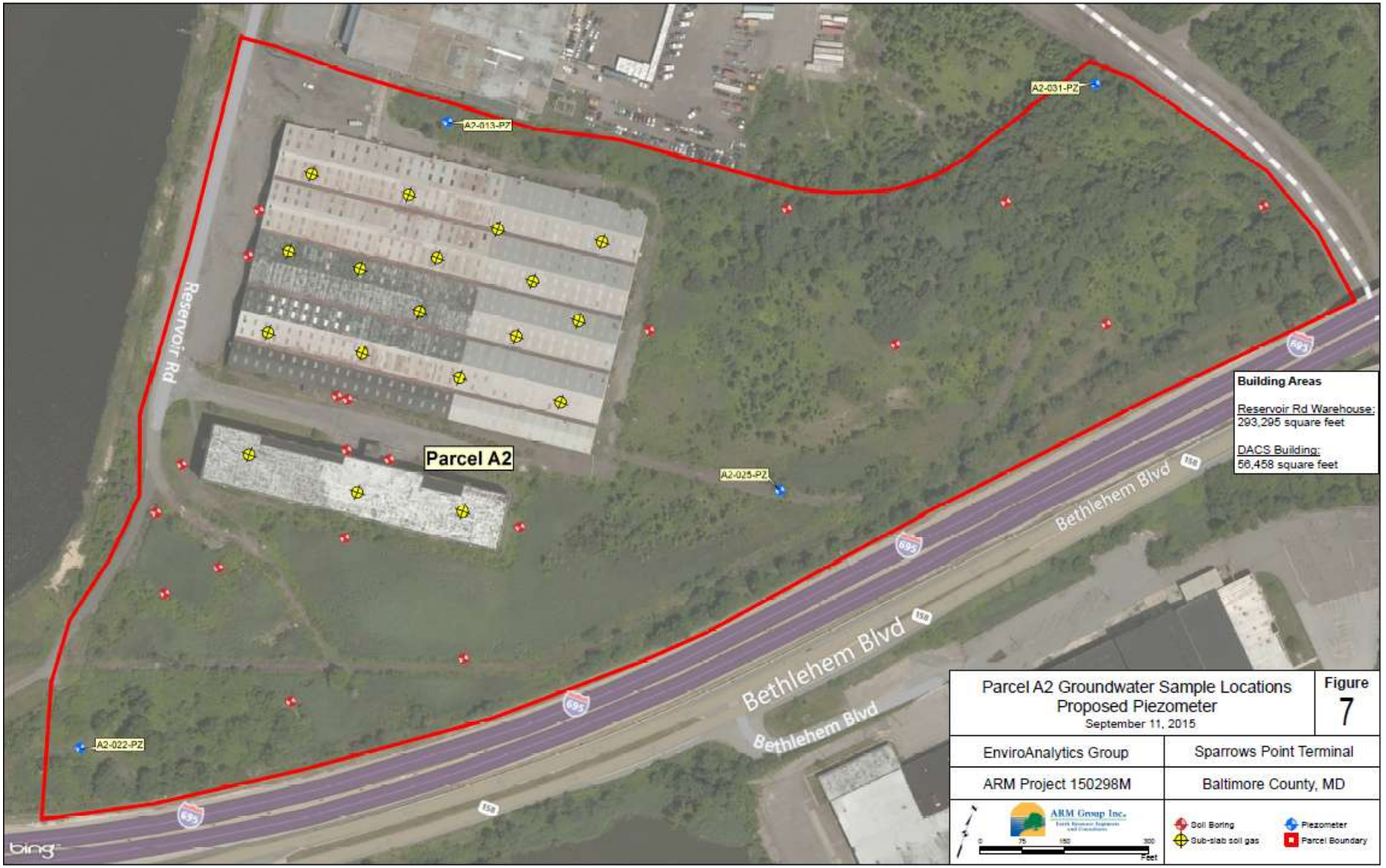
Site Visits to observe current conditions

1952 Aerial Photo

1966 Aerial Photo

1971 Aerial Photo

Area A2 Final Work Plan



Area A2 Sampling Table

Parcel A2 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Table 1 - Soil Gas Samples

Sample Location(s)	Source Area/ Description	Number of Borings	REC & Finding/ SWMU/AOC	Boring Depth	Sample Depth	Analytical Parameters	RATIONALE
						Soil Gas Samples	
A2-001, A2-003 through A2-008, A2-035 through A2-041	Reservoir Warehouse	14		6 inches below bottom of concrete slab	6 inches below bottom of concrete slab	VOCs	Investigate potential impacts related to historical activities or materials stored in Reservoir Warehouse.
A2-002	Reservoir Warehouse "Fuel Room"	1		6 inches below bottom of concrete slab	6 inches below bottom of concrete slab	VOCs	Investigate potential impacts from releases from Fuel Room.
A2-009 through A2-011	DACS Building	3		6 inches below bottom of concrete slab	6 inches below bottom of concrete slab	VOCs	Investigate potential impacts related to historical activities or materials stored in DACS Building.
Total:		18					

Soil Gas Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)
Sub-Slab: 1 sample collected per 20,000 ft^2, with a minimum of 3 per building
Reservoir Warehouse (293,295 ft^2) = **15 Samples**
DACS Building (56,458 ft^2) = **3 Samples**

VOCs - Volatile Organic Compounds (Target Compound List)

Table 2 - Soil Borings

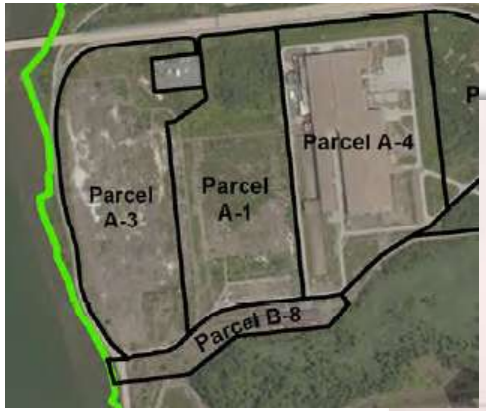
Sample Location(s)	Source Area/ Description	Number of Borings	REC & Finding/ SWMU/AOC	Boring Depth	Sample Depth	Analytical Parameters		RATIONALE
						Soil Samples	Groundwater Samples†	
A2-019 through A2-021	Dredge Disposal Dike	3		Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. Last interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs		Investigate potential impacts related to dredging/dredged material.
A2-012, A2-032 through A2-034	Truck Loading Bay	4		Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. Last interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs		Investigate potential impacts related to loading/unloading of materials in truck bays.
A2-015, A2-042	Electric Substation	2		Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. Last interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs		Investigate potential impacts related to presence of electric substation.
A2-013, A2-014, A2-016 through A2-018, A2-022 through A2-031	Parcel A2 coverage	15		Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. Last interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs	VOC, SVOC, O&G, Dissolved Metals	Investigate potential impacts related to historical activities, and characterize soil and groundwater in areas not previously sampled.
Total:		24						

Soil Borings Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)
No Engineered Barrier (16-40 acres): 1 boring per 1.5 acres with no less than 15 borings
Engineered Barrier (1-15 acres): 1 boring per 2 acres with no less than 2
No Engineered Barrier (29.2 acres) = **20 Samples**
Engineered Barrier - Parking/Buildings (11.4 acres)
Parking (3.4 acres) = **2 Samples**
Building Footprints (8.0 acres) = N/A (Covered by Soil Gas, see Table 1)

VOCs - Volatile Organic Compounds (Target Compound List)
SVOCs - Semivolatile Organic Compounds (Target Compound List)
Metals - (Target Analyte List plus Hexavalent Chromium and Cyanide)
O&G - Oil and Grease
PCBs - Polychlorinated Biphenyls
bgs - Below Ground Surface
†Field measurements include pH, DO, ORP, conductivity, temperature.

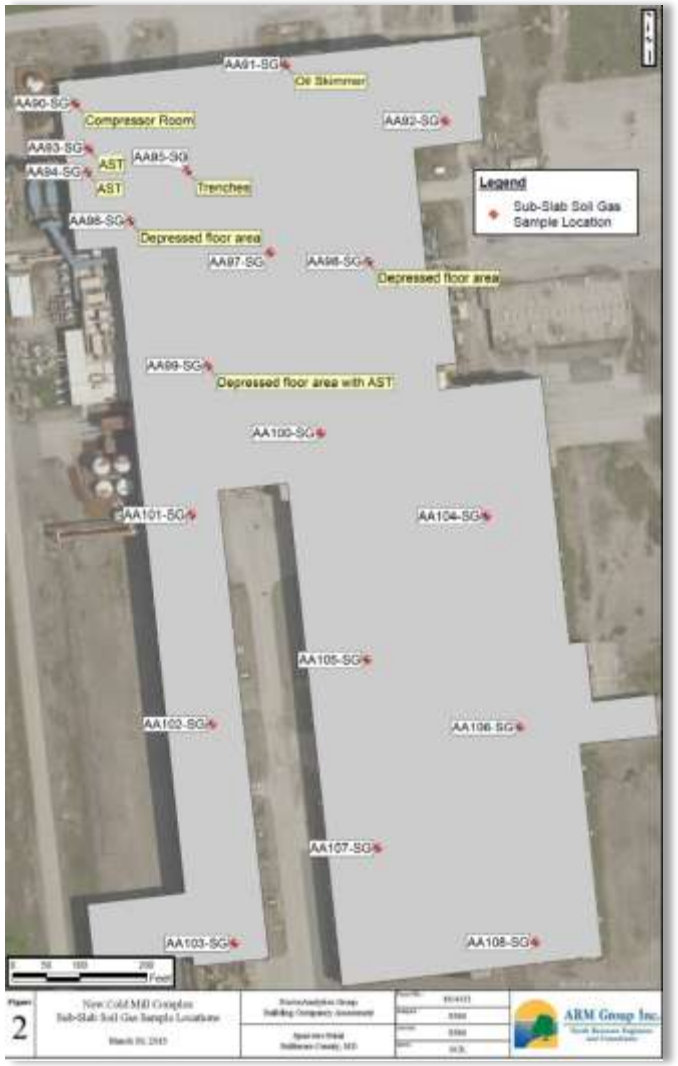
Area A4 New Cold Mill Complex

Built in the late 1990's approximately 800,000 square foot NCMC produced light, flat-rolled sheet steel from hot-rolled steel; which was supplied from Sparrows Point's hot strip mill. The cold-rolled products from Sparrows Point were used in containers, tubing, machinery, storage tanks, automotive parts, metal furniture, electrical lighting equipment and hardware. The NCMC, which replaced the old cold mill, housed an in-line continuous pickler, which cleaned steel prior to rolling. The pickler was linked to a sheet steel cold reduction section that consisted of a five-stand tandem mill. Additionally, the NCMC contained a hydrogen batch annealing facility, a combination skin pass mill and tension leveling line, a coil build-up and inspection line, a packaging line, cranes, storage areas and offices.



Area A4 New Cold Mill Complex
Potential Recognized Environmental Concerns

Area A4 New Cold Mill Complex



April 2015 Occupancy Assessment to evaluation sub-slab soil gas conditions. 19 Sub-slab Soil Gas Sampling Locations. No elevated levels of soil vapor contaminants were detected above MDE Tier 1 Screening Levels

August 2015 Phase II Investigation Work Plan Under Review

Proposed 19 soil borings and 22 ground water samples including three existing wells

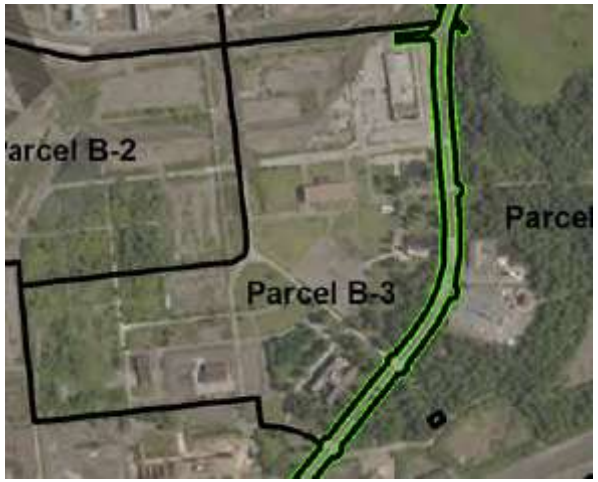
Area A8 Former Air Products

27 acres

Structures have been Demolished

Reviewing July 2015 Work Plan
Proposed 17 Soil borings and 13 Ground water samples

Area B3



Parcel B3 (95 acres) was formerly occupied by the following buildings or facilities: Fire and Police Station, Roll Grinding Facility, Human Resources Building, (Mason's) Garage Building, Residential Town Area and various office/administrative buildings. Several office and other buildings still exist and are currently in use.

Currently Reviewing Phase II Work Plan dated July 2015

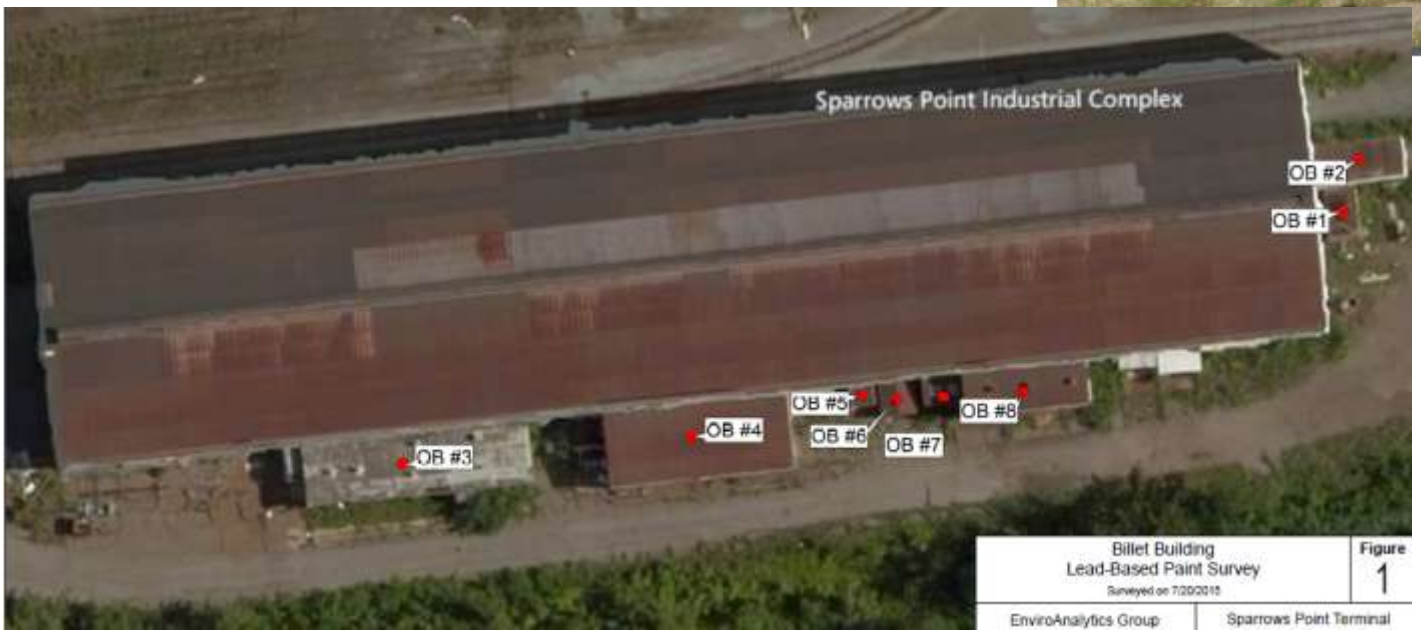
Proposed 27 soil borings

Area B8 Billet Building

Approximately 13. 5 Acres
Historically referred to as the Billet Conditioning Building, Billet Prep Building and the Billet Record Building
Building to remain for reuse
Phase II Work Plan dated September 18, 2015 under review

Area B8 Billet Building

Determining Sample Locations Includes a Site Visit to Observe Conditions



Based on visual observations and the age of building a lead paint survey was completed and the report submitted in August 2015

Area B8 Billet Building Phase II Work Plan

Includes the following proposed samples:
44 borings-building exterior and interior
12 new groundwater samples
2 existing wells sampled
8 soil gas samples within the building

Area A1 Environmental Assessment Work Completed

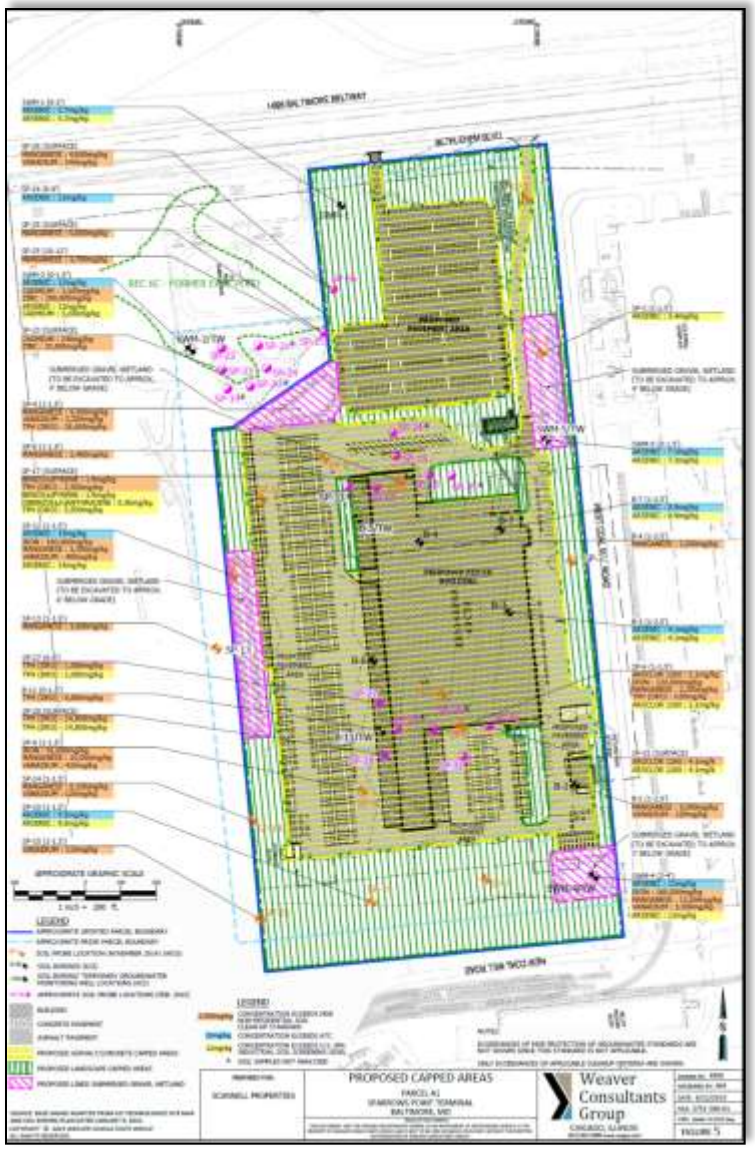
November 2014
26 Soil Borings 5 Groundwater Samples

February 2015
20 Additional Soil Borings

Sampling Identified Metals (Arsenic and Vanadium), PAHs (benzo(a)pyrene), Aroclor 1260 and Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO) in Soil

Dissolved metals and TPH-DRO/GRO in shallow ground water

Area A1 Response Action Plan



April 23, 2015 RAP Submitted

May 11, 2015 Public Informational Meeting

July 6, 2015 Revised RAP Submitted

July 14, 2015 Revised RAP Approved

August 21, 2015 RAP Addendum 1 Submitted

August 24, 2015 RAP Addendum 1 Approved

The entire 48.5 acre site will be capped with either concrete, asphalt paving or clean approved fill material over a geotextile fabric in landscaped areas.

Institutional controls will include a groundwater use deed restriction, industrial land use restriction and cap maintenance requirements.

Area B Site Wide Ground Water

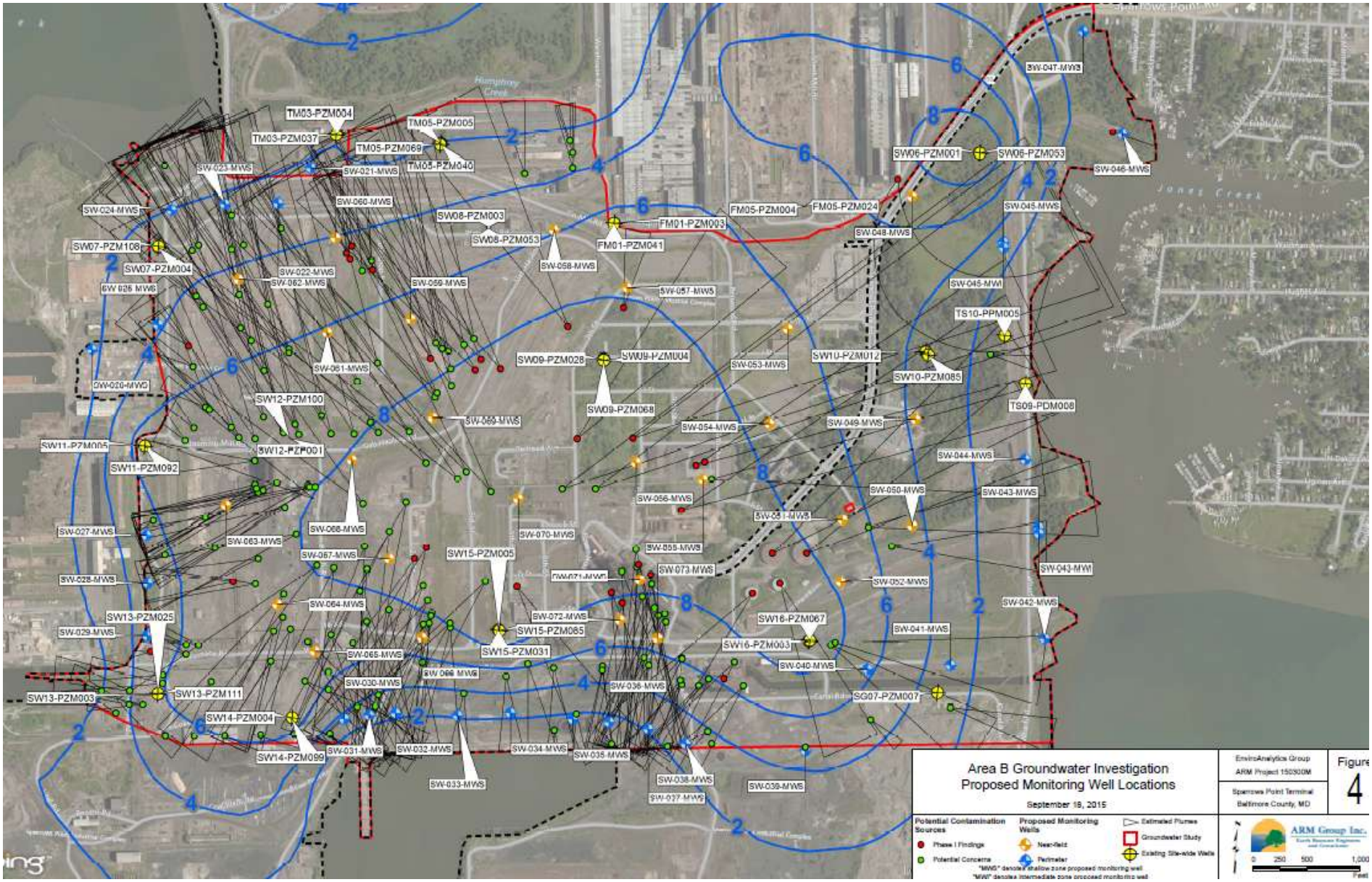
Work Plan Dated September 18, 2015

Objectives:
Determine the presence or absence of impacts to groundwater in the central portion of Area B

Identify potential continuing sources of groundwater contamination, and

Characterize the quality of groundwater at the perimeter of the Site that potentially is discharging to surface water

Area B Site Wide Ground Water Determining Well Locations



Tin Mill Canal

Site Map - Location of Tin Mill Canal
Sparrows Point Terminal, LLC
Sparrows Point, MD

Tin Mill Canal Facts:

Approximately 7,500 feet in length.
30-50 feet wide and 15 feet below grade.

Constructed in 1960's from slag.

Conveyance for stormwater runoff and groundwater baseflow from 800 acres of Sparrows Point site.

Historically received wastewater discharges from numerous manufacturing facilities associated with steelmaking and steel finishing operations.

Average flow during dry weather 3,000 to 4,000 gallons per minute (gpm) but can increase to 50,000 gpm during storm events.

Water collected from Tin Mill Canal routed to Humphrey's Creek Waste Water Treatment Plant for treatment prior to discharge under NPDES permit to outfall 14.

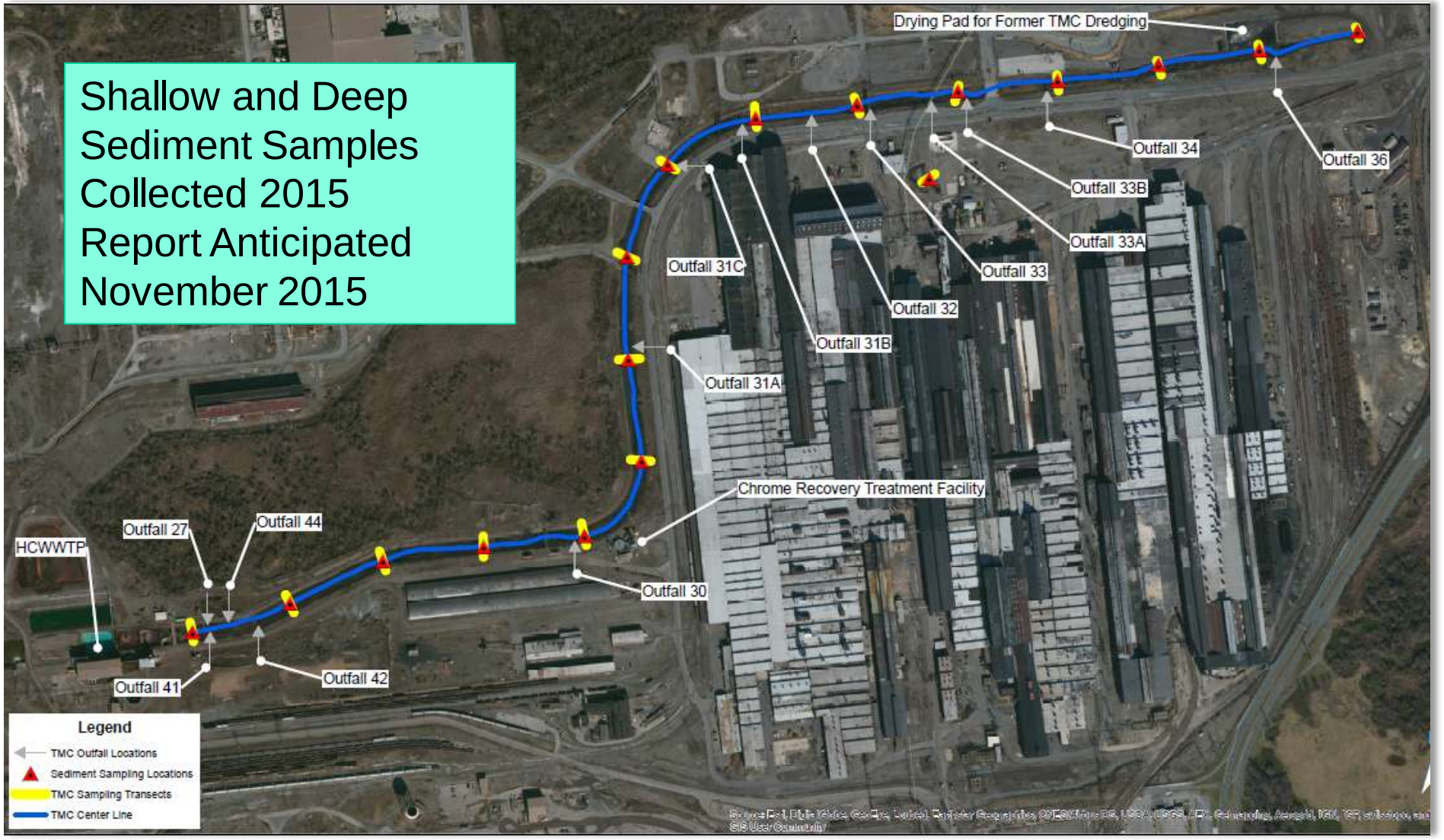
Tin Mill Canal Sediment Cleanout Sampling and Analysis Work Plan

Cleanout goal to remove settled material, provide erosion and sediment control, stabilization of canal floor and sidewalls and subsequently improve quality of water discharge from site.

Work plan to determine volume of sediments to be removed and disposal options

Collect samples of settled material for physical and chemical properties at 17 transect locations

Tin Mill Canal Work Plan Sediment Sampling Locations



Area A3 Rod and Wire Mill

The former mill produced rod and wire products from 1940's to early 1980's

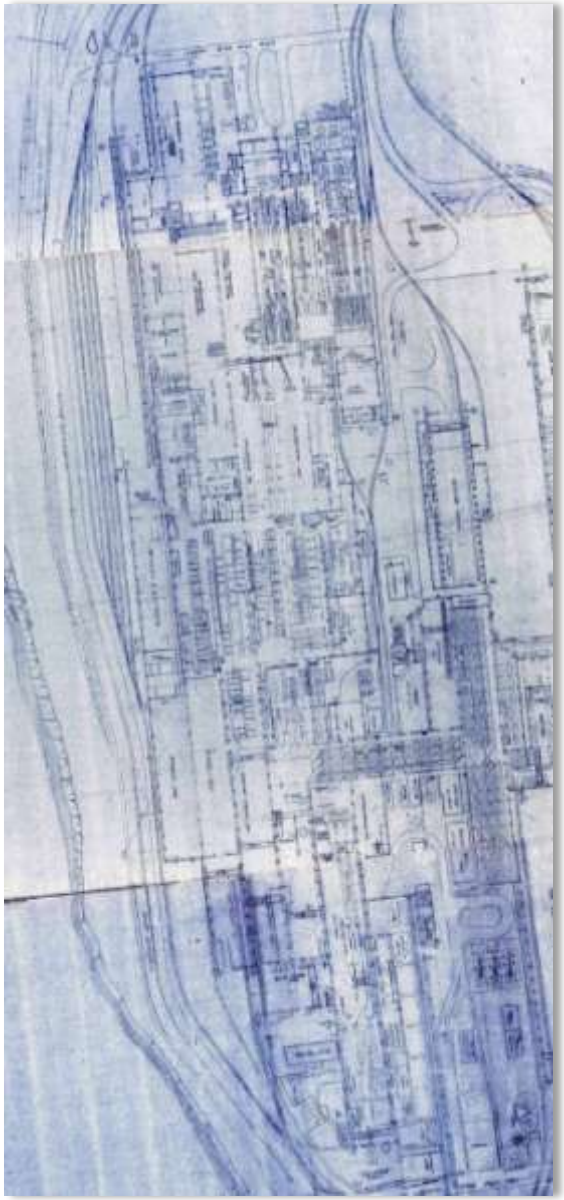
Approximately 60 acres of the former mill have been demolished.

Manufacturing process included leaching of zinc ore and treatment to remove cadmium impurities.

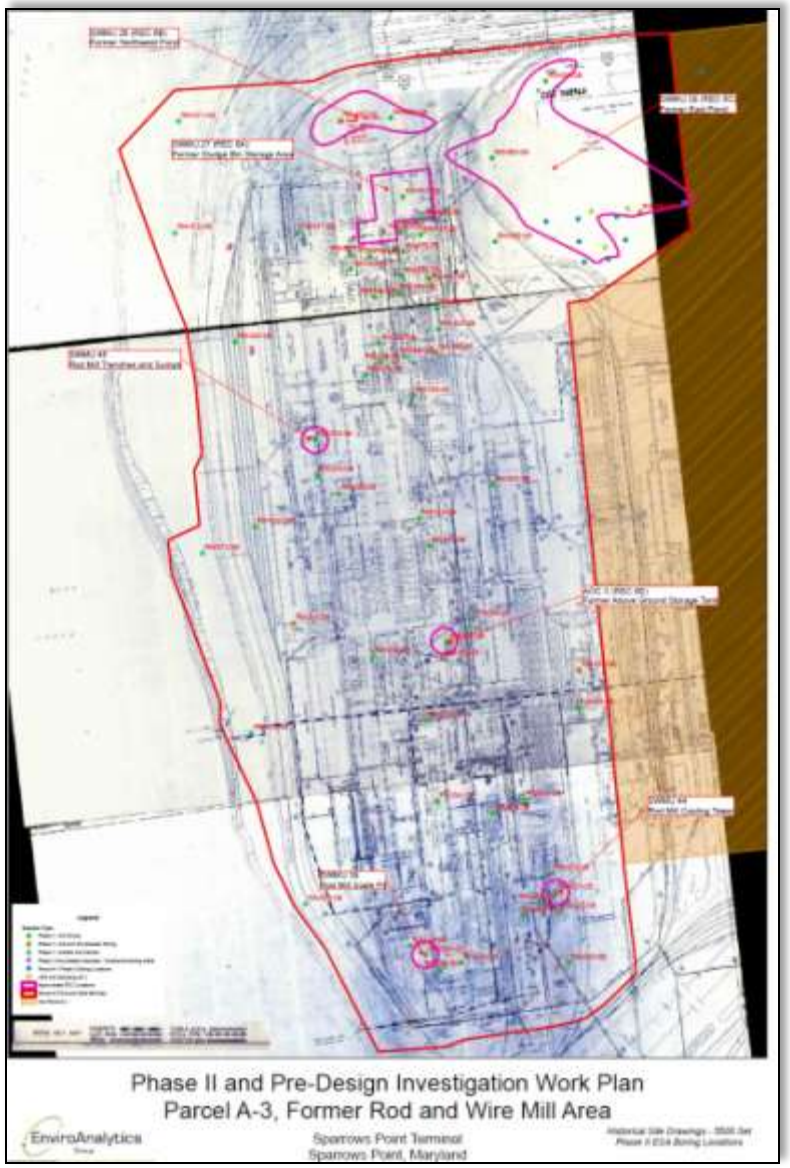
Storage of leach residue, dewatered sludge and excess filtrate resulted in soil and ground water contamination with zinc and cadmium.

Interim measures pump and treat system In operation since 1987

Aerial View 1982



A3 Rod and Wire Mill Work Plan



Final Work Plan Received September 21, 2015
Field Work Underway

Characterization Sampling Plan:

61 Test borings-sample surface and subsurface soils for VOCs, SVOCs, Metals, Cobalt, Cyanide, Oil and Grease, Hexavalent Chromium and PCBs (surface soil).

10 new locations and 10 existing shallow and intermediate ground water wells sampled for VOCs, SVOCs, Metals, Cobalt, Cyanide, Oil and Grease, and Hexavalent Chromium

Treatment Options Evaluation:

Additional testing-SPLP, TCLP, total and free organic carbon, ph, phosphate, grain size to support modeling and treatment options

Ground water modeling and Aquifer Testing to confirm model

Permeable Reactive Barrier Wall Alignment Testing-4 borings to 50 feet below grade

Bench testing for treatment options with ground water and soil stabilization alternatives

Coke Oven Area Historic Operations

Coke Oven Area Interim Measures

EnviroAnalytics Group
Environmental Engineers

Former Coke Oven Area
Sparrows Point Terminal, LLC

Coke Oven Pre-Design Investigation Work Plan Goals

Conduct feasibility studies of alternatives including enhanced vacuum recovery, passive containment walls, and bioremediation for incorporation into final remedy

Delineate lateral extent of free phase product in Cell 2 and Cell 6 areas and evaluate potential communication.

Delineate lateral and vertical extent of DNAPL in Cell 5 Area.

Evaluate effectiveness of Cell 1 and Cell 3 treatment systems.

Define Area-Wide groundwater elevations, flow directions and gradients.

Define Area-Wide dissolved phase constituent concentrations in the shallow and intermediate groundwater zones.

Coke Oven Pre-Design Investigation
Work Completed

52 delineation borings ranging in depth from 16 to 87 feet below ground surface were completed.

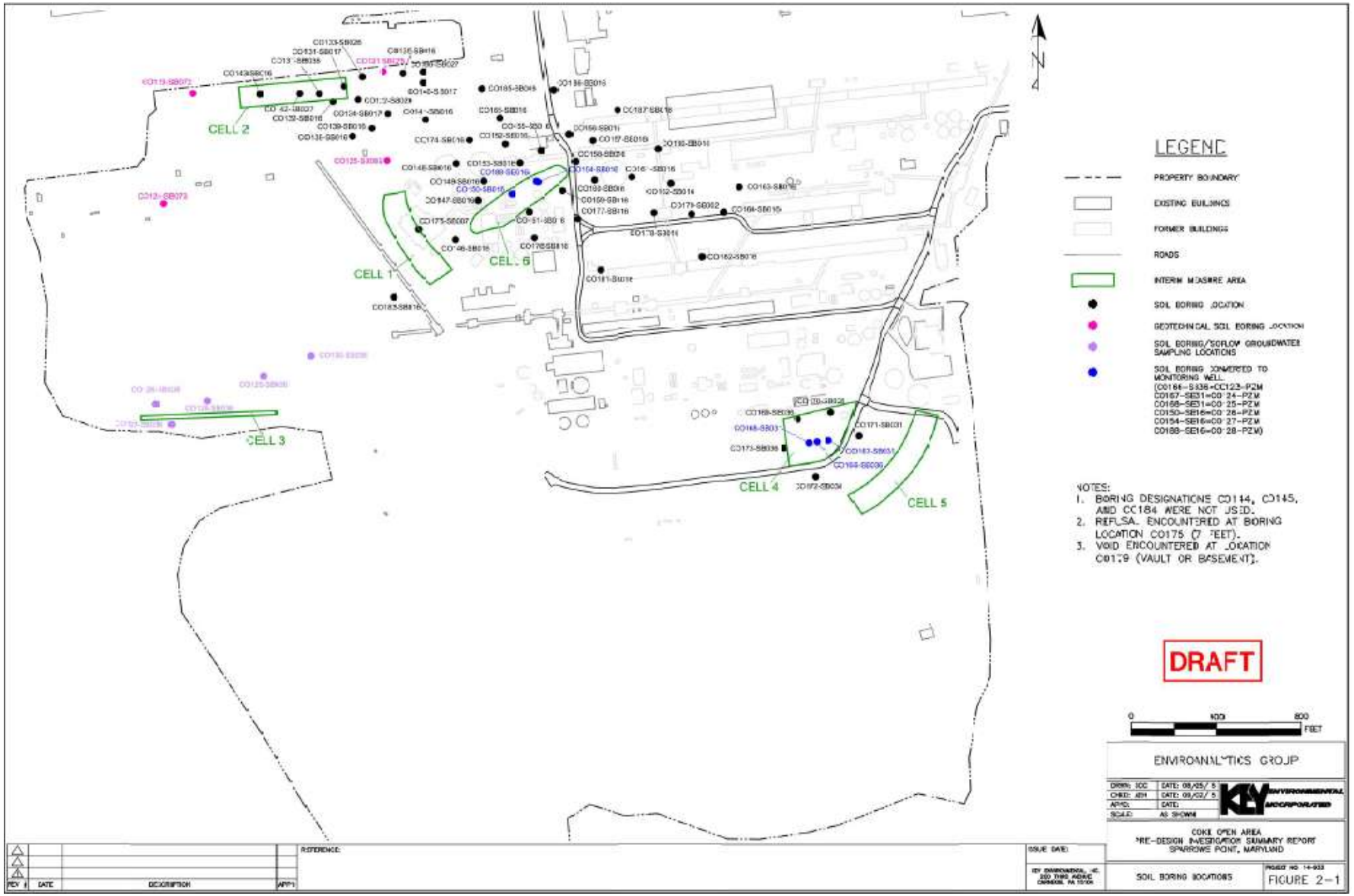
Four of the borings in the Cell 2 area were deep borings.

Installation of 3 new monitoring/recovery wells completed in the Cell 6 area.

Installation of 3 new monitoring/recovery wells in the Cell 5 area.

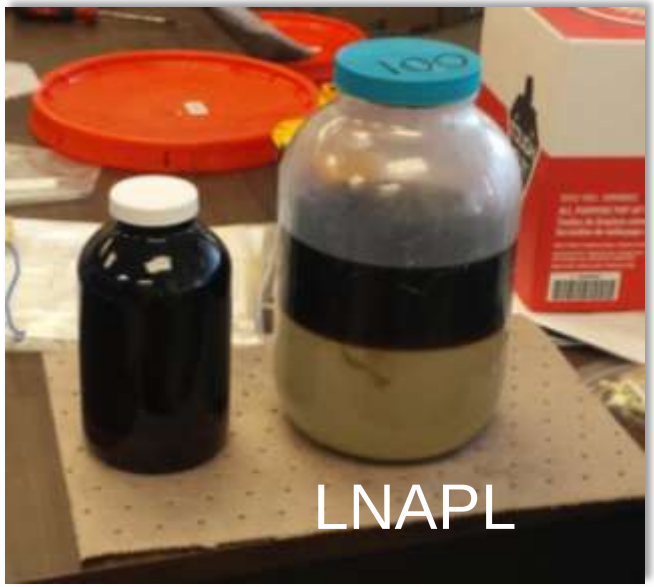
Collection of 15 groundwater samples from three discrete depths (15, 25, and 45 feet below ground surface) at Cell 3.

Coke Oven Pre-Design Investigation
Work Completed



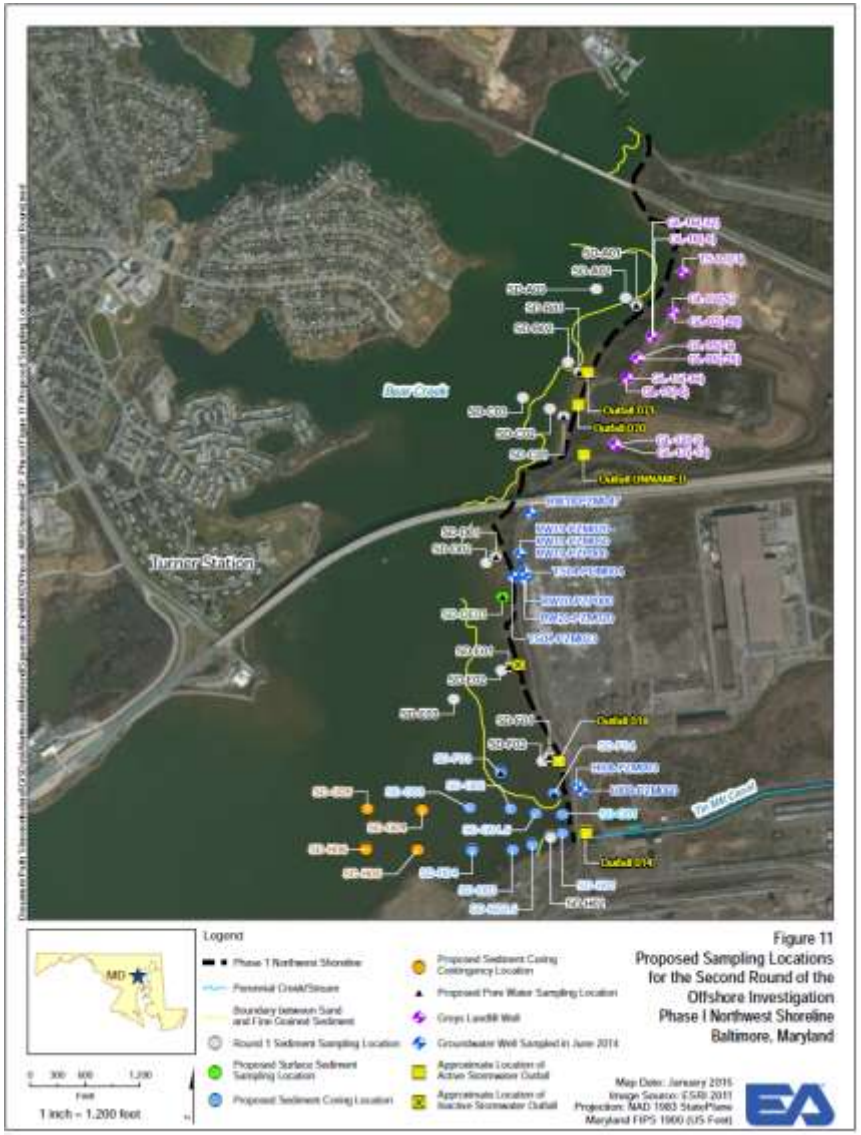
Coke Oven Pre-Design Investigation Work Plan
Work Completed

- Completed further delineation of light (LNAPL) and dense (DNAPL) hydrocarbon product in Cells 2,4 and 6
- Measured depth to clay layer in Cell 2 area for barrier wall feasibility evaluation
- Completed high vacuum product recovery tests in Cells 2 and 6
- Completed DNAPL recoverability test in Cell 4
- Completed testing to rebalance air sparge/Vapor extraction in Cell 3



Scope of Offshore Investigation

Phase 1 Off-Shore Sampling



First round sampling included collection of surface sediment from 20 locations, along eight transects and sediment core samples from 12 locations

Surface sediments (6 inch) show elevated metals.

Sediment core samples (5-6 feet) near Tin Mill Canal show high concentrations of oil and grease, sheen and petroleum odor

Second round sampling work plan approved by Agencies on January 14, 2015

Second round sampling plan includes pore water samples and additional surface sediment samples at co-locations.

Second Round of Sampling has been completed. Risk Assessment and Final Report currently being prepared for submittal to Agencies

Phase 2 Off-Shore Sampling

A contractor has been selected and preliminary planning underway

Includes a review of existing information regarding current and historic site activities and stormwater discharge locations

Will require review of results from ground water wells to be installed along shoreline prior to determining off-shore sampling scope

Coke Point Land Fill Proposed Monitoring Wells

Additional Wells Approved February 12, 2015

Wells installed Spring 2015

Coke Point Land Fill Monitoring Well Installation

Greys Landfill

After an MDE Inspection in December 2014 the following work is being performed as required at Greys Landfill :

- Placement of intermediate cover on side slopes of the landfill above elevation 85’ to 110’.
- Repair of erosion on slopes from 60’ to 100’ elevation of the landfill.
- Repair of the 85’ bench elevation of the landfill and placement of storm water control systems on the 85’ to 110’ elevation side slopes.

Grading and stabilization construction work for the side slopes was initiated on January 20, 2015 and was completed Summer 2015

Demolition Progress

Site Restoration Process

Materials Management Plan submitted and approved for reuse of concrete and brick. The plan requires sampling of each pile after crushing prior to reuse as backfill.

Plans submitted for cleanout and engineered backfill for each pit. Some pits are up to 60 feet below grade.

Recycling

Recycled Materials:

Steel, Copper, Aggregate: 1,275,500 tons
Oils: 245,000 gallons
Batteries: 157,000 lbs
Light Tubes & Ballasts: 78,300 lbs
Electronic Waste: 273,000 lbs
Paper: 23,000 lbs

For Additional Information From EPA:

Andrew Fan

U.S. Environmental Protection Agency Region 3
Mail Stop: 3LC20
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3426
fan.andrew@epa.gov

For Additional Information From MDE

Barbara Brown
Land Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230
(410) 537-3493
Barbara.brown1@maryland.gov

Visit the MDE Website!

http://www.mde.maryland.gov

Questions?

Dredging near the Ore Pier