STATEMENT OF BASIS

Proposed Soil, Groundwater and Sediment Cleanup

for

Republic Steel
Canton, Ohio

EPA I.D. No. OHR 000 110 197

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STATEMENT OF BASIS

July 2012

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INTRODUCTION

This *Statement of Basis* (SB) is for the Republic Steel facility (Republic) in Canton Township, Ohio. This SB presents the proposed remedies to address contamination at Republic (the Facility) pursuant to the U.S. Environmental Protection Agency's (EPA) August 2, 2004 Administrative Order on Consent (Order). EPA will select a final remedy only after the public comment period has ended and EPA has reviewed and considered the information submitted during this time. EPA is issuing this SB as part of its public participation responsibilities under the Resource Conservation and Recovery Act (RCRA).

This document summarizes information that can be found in greater detail in the *Corrective Measures Proposal* (CMP) and other documents contained in the administrative record for this Facility (Attachment 1: *Index to the Administrative Record*). EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the Facility and activities that have been conducted there under RCRA, 42 U.S.C. §6901 et seq. The administrative record can be found at the local repository located within the Stark County District Main Library and at EPA's Chicago office[1] and at the following website http://www.epa.gov/region5/cleanup/rcra/republicsteel/index.html.

EPA may modify the proposed remedy or select another remedy based on new information or public comments. Therefore, the public is encouraged to review and comment on all corrective measure alternatives. The public can be involved in the remedy selection process by reviewing the documents contained in the administrative record and submitting comments to the EPA during the public comment period.

PROPOSED REMEDIES

EPA is proposing the following remedies to address contamination at several Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), site-wide groundwater, creek overbank soil, and creek sediment at the Facility:

-Soil Excavation and off-site disposal
-Sediment Excavation and off-site disposal

[1] Stark County District Main Library: 715 Market Avenue N, Canton, OH 44702, Phone: 330.452.0665; EPA R5: 77 W Jackson Blvd., Chicago, IL 60604

-Pathway Elimination/Cap
-Long-term Compliance Groundwater Monitoring
-Site wide Institutional Controls (IC)
-Work Place Controls (WPCs)
- Financial Assurance

A full description of those remedies is included in the *Summary of Alternatives* section of this document. A detailed discussion of each SWMU and AOC, including a description and rational for selecting the proposed remedy, can be found in the *Evaluation of Proposed Remedies and Alternatives* section. Table 3, attached, provides further rational for the selection of the proposed remedies through a comparison to EPA threshold and balancing criteria. A budgetary cost is provided for each proposed remedy for evaluation purposes. A more detailed cost estimate of work will be developed as part of the Corrective Measures Implementation Work Plan.

FACILITY BACKGROUND

Location and History

Republic entered into an Order with EPA, effective August 2, 2004, relative to RCRA Corrective Action at the Republic Canton Plant located at 2633 Eighth Street, NE, Canton, Ohio. The Facility includes 44 SWMUs and 22 AOCs (See Table 2 for a complete listing of SWMUs and Figure 1 for a map of the SWMUs). The site covers approximately 380 acres and has been utilized for the production of steel and/or steel products since the early 1900s. The Facility was purchased by the current property owner (Republic Steel) on or about December 19, 2003 and began operations as Republic Engineered Products, Inc. The Company is now called Republic Steel. Current operations at the site include electric arc furnace melting, ladle refining, vacuum degassing, continuous casting, hot rolled bar production, conditioning, non-destructive testing, and shipping. Ancillary and support operations include slag processing, wastewater treatment, air pollution controls, and maintenance activities. Historically, Republic and previous owners have leased a portion of the Facility to Heckett, a slag processor. Currently, slag processing operations are being conducted by Stein, Inc. Additionally, a small portion of the site is leased to Praxair, an industrial gas processor.

The City of Canton provides potable and process water at the Facility and water to the majority of surrounding residences, businesses, and industries. Land use in areas immediately surrounding the site consists of a mixture of industrial, commercial, and residential properties. The residential areas are generally located to the south, while most of the industrial areas are north and east of the Facility and, to a lesser extent, to the west. Commercial properties are located north, west, and south of the Facility. An adjacent State-lead remediation site (Jeffries), owned by Jeffries Brothers Excavating & Paving, Inc. is located north and east of Republic. The Jeffries property boundary shares approximately 2,000 feet of East Branch Nimishillen Creek (EBNC) bank with Republic. For that length, the southern bank of the creek is on Republic's property and the northern bank of the creek is on Jeffries' property. EPA expects current and future operations at the Facility to remain industrial.

Hydro-geologic Setting

The Facility is located in the valley of the westward-flowing East Branch Nimishillen Creek (EBNC). The majority of the Facility buildings are located on the valley floor on fill materials (discussed in more detail on page 7) and alluvial deposits. The thickness of fill material varies throughout the site but, in general, covers the entire Facility. The geologic unit beneath the fill materials consists of sand, gravel and sandy silt alluvial deposits. Thickness of this geologic unit varies across the site, extending as deep as 100 feet below ground surface (bgs) in some areas. The bedrock consists of Pennsylvanian-Age sedimentary rock of the Pottsville Group, which is comprised of shale and sandstone with minor beds of coal, limestone, and clay. At its greatest extent, the formation is estimated to be approximately 400 feet thick. The primary sources of groundwater within the Pottsville Group are the sandstones.

In general, groundwater flow beneath the portion of the Facility south of EBNC trends from the southeast to the northwest towards EBNC through an unconfined aquifer within alluvial deposits. On those portions of the Facility located north of EBNC, however, groundwater flow tends northeast to southwest towards EBNC (Figure 2). The majority of the north bank of the EBNC is not Republic's property but is instead owned by Jeffries Brothers Excavating & Paving, Inc. The Republic Facility and the Jeffries property "share" approximately 2,000 feet of the EBNC starting from the location of the dam and moving upstream.

The EBNC watershed rests entirely in Stark County and originates in the areas around the City of Louisville within several townships. These small headwater streams flow and join in or near the City of Louisville and flow westerly towards the City of Canton.[2] EBNC is 10.4 miles long and flows southwesterly past the Republic property where it joins the Middle Branch of Nimishillen further downstream to form the mainstream of Nimishillen Creek. EBNC has a diverse mix of land use and cover with the primary land use within the City of Canton being industrial (Attachment 2).

Ecological Setting

Although the Facility and its surrounding areas are heavily industrial, EPA identified five general ecological habitat types for the Facility and adjacent properties: 1. upland forest; 2. riparian forest; 3. wetlands; 4. old field/transitional; and, 5. river/open water.

EPA identified potential ecological receptors for both terrestrial and aquatic habitats; however, with the exception of EBNC and its bank, the site itself does not have any ecological habitat. In general, the habitat quality of the EBNC watershed is degraded.

The Ohio EPA is required by the Federal Clean Water Act to develop water quality standards in order to protect, maintain, and improve surface water in the state. As documented in Chapter 3745-1-24 of the Ohio Administrative Code, Nimishillen Creek and its tributaries have the aquatic life habitat designations of warm water habitat (WWH), modified warm water habitat

[2] http://www.uptuscwatershed.org/nimishillen.html

(MWH), and limited resource water (LRW). Ohio EPA did not designate any segment in the Nimishillen Creek Watershed as exceptional warm water habitat (EWH), seasonal salmonid habitat (SSH), or coldwater habitat (CWH).

These aquatic life habitat designations mean that the entire Nimishillen Creek (not just EBNC) has, at most, the designation given to streams and rivers with a typical warm water assemblage of aquatic organisms (WWH). In those portions of the Nimishillen Creek where further degradation has occurred (MWH), the designation is defined as those streams with extensive and irretrievable physical habitat modifications, and where the biological criteria for warm water habitat is not attainable. The activities contributing to the modified warm water habitat designation have been sanctioned and permitted by state or federal law. The representative aquatic assemblages are generally composed of species that are tolerant to low dissolved oxygen, silt, nutrient enrichment and poor habitat quality. The EBNC does not have a MWH designation.

The aquatic life designation for the EBNC, including all segments near Republic, is WWH. The health of biological communities is measured in three ways: the Index of Biotic Integrity (IBI), the modified Index of Well-being (MIwb), and the Invertebrate Community Index (ICI). According to the 2009 Ohio EPA Nimishillen Creek TMDL Report[3], the IBI and MIwb for EBNC slightly improve downstream from Republic as compared to upstream. However, the ICI is in full attainment upstream from Republic and non-attainment downstream for the site. Additional information regarding the overall health of the Nimishillen Creek Watershed can be found in the 2007 State Action Watershed Report, cited at the bottom of the previous page (http://www.uptuscwatershed.org/nimishillen.html).

Several agencies have documented fish impacts within Nimishillen Creek. The Ohio Department of Health, in cooperation with Ohio EPA and the Ohio Department of Natural Resources, issues fish consumption advisories for the State. The Ohio Department of Health advises that everyone limit consumption of sport fish caught from *all* water bodies in Ohio to one meal per week, unless there is a more or less restrictive advisory for a particular water body. The statewide advisory is in effect due to mercury contamination. The Nimishillen Creek, specifically, has a fish consumption advisory of one meal per month of common carp due to PCB contamination.[4] The PCB advisory is in effect for all waters of the Nimishillen Creek, not just the East Branch. PCB concentrations at Republic have been found at levels that pose an unacceptable ecological risk in soils and sediments. Other potential PCB sources to the East Branch likely exist, such as the former PCB transformer refurbishing facility located upstream of Republic in Louisville.

Corrective Action Process

EPA notified Republic of their obligation under RCRA to determine if corrective action was necessary at their facility and entered into an Order in 2004. Pursuant to that order Republic utilized information previously collected and developed by the former site owners as part of the RCRA Facility Investigation (RFI). This information included groundwater monitoring events, Quality Assurance Project Plans (QAPP), studies and reconnaissance reports. In accordance

[3] http://www.epa.ohio.gov/dsw/tmdl/NimishillenCreekTMDL.aspx
[4] http://www.epa.state.oh.us/dsw/fishadvisory/index.aspx

with that Order, Republic performed additional investigative activities and submitted a report that evaluated the potential risks to human health and the environment. Based upon that information, and consistent with the 2004 order, Republic made risk management decisions and performed interim measures at some of the SWMUs and AOCs in order to mitigate imminent threats to human health and the environment and control potential on-going sources of contamination to soil or groundwater

Interim Measures Taken

The interim measures (IMs) described have been conducted at the following locations:

SWMU 47-Old Vertical Caster Treatment Plant: The initial investigation of SWMU 47 consisted of 14 soil borings drilled during the Phase I investigation of the RFI Republic conducted in October and November 2004. Republic analyzed samples from borings 47-B1 through 47-B8 for VOCs, SVOCs, metals, PCBs, cyanide and sulfide. The analytical results showed concentrations exceeding the screening levels in at least one sample for vanadium, PCBs, and some SVOCs in surface samples and for some SVOCs in subsurface samples. Republic analyzed samples from borings 47-B9 through 47-B14 for SVOCs, metals, and PCBs. None of the sample results showed concentrations exceeding the screening levels.

Republic conducted an IM at this SWMU based on the results of a preliminary risk screening for the risk presented by borings 47-B1 through 47-B8. The IM consisted of excavating the top two feet of material from the majority of the construction area and disposal of the soil offsite. Approximately 2,500 cubic yards of soil was excavated and disposed of off-site at the Countywide Recycling and Disposal Facility in East Sparta, OH. Republic did not collect confirmation samples at the completion of the excavation because the limits of excavation extended beyond the defined limit of surface contamination identified during the investigation. The excavation extended to boring locations 47-B9 through 47-B14, where the detected concentrations were all below the screening criteria.

SWMU 53-Old Baghouse #4 Melt Shop: The investigation at this SWMU consisted of five borings and 20 surface soil sample locations. Republic analyzed the samples for metals to delineate the extent of impacts. A number of samples had lead concentrations detected that exceeded a calculated site-specific lead concentration of 1,115 mg/kg for 250 days per year in an industrial exposure scenario. Republic calculated the site-specific concentration using EPA's Technical Review Workgroup's Adult Lead Model (ALM). The highest lead concentration detected at this area of the site was 20,300 mg/kg at 53-SS7.

Republic performed an IM to limit access to the site and in doing so ensure human health risk from this SWMU was under control. The work included installation of approximately 410 linear feet of chain link fence, approximately 110' x 103', on July 12 and 13, 2006. EPA will evaluate and discuss additional corrective measures for this SWMU as part of this SB, below.

SWMU 59- #3 Slab Grinder Baghouse: The investigation at this SWMU consisted of the collection of six surface soil samples from four boring and two surface soil sample locations. Republic analyzed the samples for metals, cyanide, and sulfide. Sample 59-B4-0-1 had a

detected lead concentration (2,160 mg/kg) that exceeded the calculated site-specific lead concentration of 1,115 mg/kg for a 250 days-per-year exposure scenario.

Republic conducted an IM at this location in conjunction with an excavation to repair a water line in the vicinity. The IM consisted of the excavation and offsite disposal of soil that had to be removed to access the pipe. Approximately 120 cubic yards of soil was excavated and disposed of off-site at the Countywide Recycling and Disposal Facility in East Sparta, OH. Republic collected and analyzed confirmation samples at the completion of the excavation. EPA will analyze and discuss additional corrective measures for this SWMU as part of this SB, below.

AOC 94 - Mobile Repair Shop Area: The investigation at this SWMU consisted of the collection of 11 surface soil samples from nine boring and two surface soil sample locations. Republic analyzed the samples for VOCs, SVOCs, metals, PCBs, cyanide, and sulfide. Preliminary risk screening conducted indicated there was an unacceptable carcinogenic risk due primarily to benzo(a)pyrene concentrations detected in surficial materials.

The IM Republic implemented here consisted of excavating the surficially impacted ballast materials (the material surrounding the rail line) and installation of clean ballast material. The excavations specifically targeted sample locations 94-B4 and 94-B7 to remove the detected concentrations of benzo(a)pyrene. The IM included excavation of the ballast material to the top of the railroad ties between the rails in each set of tracks; excavation of the ballast material to the base of the railroad ties between each set of tracks and outside the outer tracks; replacement of clean railroad ballast; and placement of clean fill to return the area to existing grades. Approximately 1,000 tons of material was excavated and disposed of off-site at the Countywide Recycling and Disposal Facility in East Sparta, OH. Republic did not collect confirmation samples at the completion of the excavation because the excavation extended horizontally to boring locations where the detected concentrations were all below the screening criteria and the intention of the IM was to eliminate the potential industrial worker direct contact exposure scenario. Republic used clean ballast/slag materials to backfill the excavation and disposed of the excavated material off-site.

SWMU 104 - Old 8-inch Mill Day Tank: The investigation consisted of the collection of two surface soil samples from two locations. Republic analyzed the samples for VOCs, SVOCs, metals, PCBs, cyanide, and sulfide.

The risk screening performed determined the concentration of contamination in this area did not present an unacceptable risk. However, Republic elected to perform an IM that consisted of removing and disposing of visually stained material off-site. Approximately 17 cubic yards of stained soil was excavated and disposed of off-site at the Countywide Recycling and Disposal Facility in East Sparta, OH. Republic did not obtain confirmation samples. Republic replaced the excavated material with slag backfill.

SUMMARY OF FACILITY RISKS

Investigation Results

Republic and prior owners of the site have conducted investigations of site soils and groundwater as well as surface water, fish, and sediments in the EBNC generating data to characterize the nature and extent of contamination at the Facility. Due to the size of the site and similarity of certain areas of concern, EPA grouped the soils at 44 SWMUs and 22 AOCs into 11 separate Target Areas (TAs) based on geographic proximity, similarity of exposure scenarios, and similar constituents of concern. By doing so, EPA expedited the risk assessment process, particularly for Facility soils. Later in this document, EPA presents the evaluation of proposed remedies by Target Area. EPA evaluated each SWMU and/or AOC in its respective TA. In some cases, the overall risk of the TA is disproportionately due to a single SWMU; not every SWMU or AOC requires active remediation through an engineered remedy even if it is part of a TA with unacceptable risk. EPA will address those areas that do not require active remediation to reduce the overall risk of the TA through institutional controls. EPA evaluated groundwater, surface water, and sediments on a site-wide basis rather than by target area.

EPA screened data against appropriate risk-based screening criteria, including: EPA Preliminary Remediation Goals (PRGs), Industrial PRGs for non-carcinogens, Industrial PRGs using a target cancer risk of $1x10^{-5}$ for carcinogens, Maximum Contaminant Levels (MCLs), and Ohio statewide water quality criteria for the protection of aquatic life (OACs).

Due to the fact that the site has been historically graded with non-native fill material known as "mill fill", EPA established concentrations for certain metals common to the fill to determine site-specific background concentrations. A mill fill study was conducted in 2001 and updated in 2007 to establish a background, or "secondary", screening criteria. EPA used the following secondary soil screening criteria to evaluate samples that contained mill fill (MF) to determine constituent concentrations from potential releases versus concentrations attributed to fill:

- Arsenic = 32 mg/kg
- Iron = 171,281 mg/kg
- Manganese = 22,340 mg/kg

EPA identified chromium as a constituent of concern and directed that twelve soil samples be collected and analyzed to determine chromium speciation. The results indicated that between 98.97 and 99.99 percent of the chromium characterized at the site is in the trivalent state (chromium (+3)). Chromium in the trivalent state differs from more toxic forms of chromium, such as hexavalent chromium[5]. Therefore, EPA screened the samples against the appropriate screening criteria, the Industrial PRG for chromium (+3) of 100,000 mg/kg.

EPA identified lead in surface soil, subsurface soil and groundwater as a constituent of potential concern for the site. EPA evaluated direct contact exposure to lead in soil by using the USEPA Adult Lead Model (ALM), which was designed to predict the blood lead concentrations in the

[5] http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=61&tid=17

developing fetus of an adult woman. Additional risk related information regarding lead can be found in the following section.

EPA's groundwater investigation concluded that low levels of metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) are found above screening criteria in some wells throughout the site. Although contaminated groundwater from the site is not migrating off site, EPA requested additional investigation to confirm contaminated groundwater was not, and would not in the future, further contaminate the creek. Republic performed a supplemental investigation to demonstrate that at locations of concern groundwater was not adversely impacting the creek sediment or water. Republic installed an additional 12 piezometers at key locations to fill this data gap. Data was collected and analyzed to conclude that groundwater discharging to the creek will not exceed the ecological screening criteria for sediment and surface water. Based on the additional data, EPA concluded that the proposed groundwater remedy presented later in this SB will not interfere with or adversely impact the creek sediment proposed remedy.

The EBNC sediment investigation concluded that metals, VOCs, SVOCs and PCBs contaminate the creek at concentrations above ecological screening criteria. The complicated history of the site and potential adjacent sources of contamination to the creek, such as the Ohio EPA-lead remediation site north and east of Republic and numerous upstream industrial sources, are compounded by the presence of a dam bisecting the creek. The dam is located upstream of most of Republic's current operational areas. Contaminated sediment accumulated behind the dam, and, although the location of the dam happens to be adjacent to the Republic facility, it serves as a sediment 'trap' for those sediments also emanating from up-gradient sources. In addition to the immediately adjacent OEPA site, there are 62 active and former industrial and municipal wastewater discharges, toxic release facilities, and hazardous waste generators located upstream of the dam at Republic. The current ownership of the dam remains in question; however, it is known that it has been there for approximately 80 years. In that substantial period of time, during which wastewater discharges and disposal of solid wastes were essentially unregulated (before enactment of environmental laws), contamination was accumulating in sediments behind the dam. Republic is one of many active and former industrial properties along the creek but has less than half of its property located upstream of the dam.

Several investigations occurred in order to determine the relative volume of sediment and contamination present. The sediment thickness was measured at almost 400 locations and the data collected indicated that approximately 4,300 cubic yards of sediment is located behind the dam and adjacent to the Facility. Additional investigation sought to define and determine the extent of the contamination in 11 segments adjacent to the Facility, approximately 1,000 feet of streambed. Figure 3, attached, shows the portion of the creek adjacent to Republic that was divided into 11 segments. The figure illustrates that approximately 60% of the sediment, in cubic yards, is located within the first five segments. The presence of the dam has allowed sediment to accumulate. EPA concluded from the data collected that over 90% of the ecological toxicity is located within the first five segments of characterized sediment, or within 500 feet, upstream of the dam. Table 1, attached, presents the data and, for example, shows that 2,216 lbs of lead contamination are located in the characterized sediment within these 5 segments (within 500 feet of the dam). It also demonstrates that 2,749 lbs of chromium are located in these same

segments. EPA used that information to support the proposed remedy for the creek discussed later.

The following tables provide summary information from the investigations at some of the 66 SWMUs or AOCs identified at the site; EPA compared the highest concentrations of constituents to the applicable screening criteria.

SWMU 3 - Heckett Slag & Byproduct Processing Area

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
3-SS3 (MF*)	Iron	264,000 mg/kg**	171,281 mg/kg
64-B2-0-4 (MF)	Manganese	32,100 mg/kg	22,340 mg/kg
64-B4-0-1 (MF)	Benzo[a]pyrene	7,900 ug/kg***	2,100 ug/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soil			
3-B1-4-6 (MF)	Iron	196,000 mg/kg	171,281 mg/kg
3-B2C-12-14 (MF)	Arsenic	43.7 mg/kg	32 mg/kg
64-B1-11-12	Benzo[a]pyrene	7,300 µg/kg	2,100 µg/kg
64-B12-18-18.9 (MF)	Manganese	41,200 mg/kg	22,340 mg/kg

*MF: Mill fill, or non-native fill material that covers the entire site at various depths, see discussion above.
**mg/kg: milligram per kilogram is a measurement equivalent to 1 milligram of the constituent per kilogram of soil.
***ug/kg: microgram per kilogram is a measurement equivalent to 1 microgram of the constituent per kilogram of soil.

SWMU 14 - Ingot Inoculation Dust Collection Bags

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
51-SS1 (MF)	Lead	1,670 mg/kg	1,115 mg/kg
	Manganese	22,400 mg/kg	22,340 mg/kg
52-B6-0-1 (MF)	Iron	331,000 mg/kg	171,281 mg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soil			
14-B1B (8-8.7)	Iron	127,000 mg/kg	100,000 mg/kg

SWMU 30 – Johnson's Pond

Sample	Constituent	Maximum Concentration	Screening Criteria
Sediment			
JPSED-2	Arsenic	18.8 J mg/kg	16 mg/kg

SWMU 38 - 12" Mill Scale Pit

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
40-B1-0-1 (MF)	Arsenic	38.7 mg/kg	32 mg/kg
40-SS1 (MF)	Iron	397,000 mg/kg	171,281 mg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soils			
38-B3-4-6	Arsenic	19.7 mg/kg	16 mg/kg

SWMU 47 - Old Vertical Caster Treatment Plant

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
47-B1-0-2 (MF)	Vanadium	2,440 mg/kg	1,000 mg/kg
	Benzo[b]fluoranthene	29,000 ug/kg	21,000 ug/kg
	Benzo[a]anthracene	70,000 ug/kg	21,000 ug/kg
	Benzo[a]pyrene	17,000 ug/kg	2,100 ug/kg
47-B12-0-2 (MF)	Iron	294,000 mg/kg	171,281 mg/kg

SWMU 48-#3 Melt Shop Baghouse

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
53-B2-0-1 (MF)	Iron	318,000 mg/kg	171,281 mg/kg
	Lead	20,300 mg/kg	1,115 mg/kg
	Manganese	31,200 mg/kg	22,340 mg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soils			
48-B1-1-4 (MF)	Iron	200,000 mg/kg	171,281 mg/kg
48-B3-8-10	Arsenic	17.5 mg/kg	16 mg/kg

SWMU 59 - #4 Steel Conditioning - #3 Slab Grinder Baghouse

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
59-B4-0-1 (MF)	Lead	2,160 mg/kg	1,115 mg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soil			
59-B2-3-5	Arsenic	28.8 mg/kg	16 mg/kg

SWMU 60 - #4 Steel Conditioning - Torch Cut Baghouse

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
75-SS1 (MF)	Manganese	32,200 mg/kg	22,340 mg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soil			
60-B1-3-5	Arsenic	32.8 mg/kg	16 mg/kg
	Iron	133,000 mg/kg	100,000 mg/kg

SWMU 66 - Tub and Associated Trench

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
66-B4-0-1 (MF)	Aroclor-1248	31,000 µg/kg	7,400 µg/kg
46-GPS-0-4 (MF)	Lead	1,750 mg/kg	1,115 mg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soil			
66-B4-4-8 (MF)	Lead	23,000 mg/kg	1,115 mg/kg
	Arsenic	36.5 mg/kg	32 mg/kg
	Benzo(a)pyrene	2,200 µg/kg	2,100 µg/kg

AOC 87c - Leaking Drum/Sample Location BM-GS-5-1UA

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
87C-B1-0-1 (MF)	Iron	245,000 mg/kg	171,281 mg/kg
87C-SS1 (MF)	Benzo(a)pyrene	5,400 µg/kg	2,100 µg/kg

AOC 94 - Mobile Repair Shop Area

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
94-B7-0-1 (MF)	Benzo(a)pyrene	3,400 µg/kg	2,100 µg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
Subsurface Soil			
94-B2-9-10	Arsenic	18.7 mg/kg	16 mg/kg
94-B9-6-8 (MF)	Benzo(a)pyrene	73,000 µg/kg	2,100 µg/kg
	Benzo[b]fluoranthene	72,000 µg/kg	21,000 µg/kg
	Benzo[a]anthracene	88,000 µg/kg	21,000 µg/kg
	Dibenz(a,h)anthracene	9,400 µg/kg	2,100 µg/kg
	Indeno(1,2,3-cd)pyrene	34,000 µg/kg	21,000 µg/kg

Sample	Constituent	Maximum Concentration	Screening Criteria
	Naphthalene	270,000 µg/kg	190,000 µg/kg

AOC 95 - Forge Area Fueling Station

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
95-B4-0-1 (MF)	Manganese	29,200 mg/kg	22,340 mg/kg

SWMU 102 - CBCF Caster Scale Pit Area

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
102-SS1 (MF)	Iron	202,000 mg/kg	171,281 mg/kg

SWMU 104 - Old 8" Mill Day Tank

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
104-SS1	Arsenic	34.1 mg/kg	16 mg/kg
104-SS2	Iron	148,000 mg/kg	100,000 mg/kg

AOC 111 - PCB Soil Impacts - South End of 12" Mill Building Reheat Furnace End

Sample	Constituent	Maximum Concentration	Screening Criteria
111-B1-0-1 (MF)	Aroclor 1242	76,000 µg/kg	7,400 µg/kg

AOC 117 – Former Coke Battery

Sample	Constituent	Maximum Concentration	Screening Criteria
Surface Soil			
117-B1-0-4 Dup (MF)	Arsenic	87.1 mg/kg	32 mg/kg

Site-Wide Groundwater

Well	Constituent	Maximum Concentration	Screening Criteria
Groundwater Sample			
MW-26	N-Nitrosodi-n-butylamine ug/L*	1.3	0.02
	Dissolved Antimony mg/L**	0.0079	0.006
	Total Chromium mg/L	0.89	0.1
	Dissolved Chromium mg/L	0.9	0.1

Well	Constituent	Maximum Concentration	Screening Criteria
MW-29	Benzo(a)anthracene ug/L	2.5	0.92
	Benzo(a)pyrene ug/L	3.9	0.2
	Benzo(b)fluoranthene ug/L	3.9	0.92
	Dibenz(a,h)anthracene ug/L	1.0	0.092
	Indeno(1,2,3-cd)pyrene ug/L	1.8	0.92
MW-29	Naphthalene ug/L	7.8	6.2
	Total Chromium mg/l	0.18	0.1
	Total Lead mg/L	0.27	0.015
MW-32	Trichloroethene ug/L	24	5
	Total Arsenic mg/L	0.058	0.01
MW-32 DUP	Trichloroethene ug/L	11	5
MW-33	Bis(2-ethylhexyl)phthalate ug/L	6.2	6
	N-nitrosodiethylamine ug/L	2.1	0.0045
	Total Chromium mg/L	0.91	0.1
	Dissolved Chromium mg/L	0.35	0.1
MW-40	Total Arsenic mg/L	0.044	0.01
	Dissolved Arsenic mg/L	0.057	0.01
	Aroclor-1016 ug/L	11	0.5
MW-43	Aroclor-1016 ug/L	0.065	0.5
MW-45	Aroclor-1016 ug/L	1.1	0.5
MW-46	Trichloroethene ug/L	6.7	5
	Total Arsenic mg/L	0.02	0.01
	Total Cadmium mg/L	0.011	0.005
	Total Lead mg/L	0.021	0.015
MW-54	Total Arsenic mg/L	0.011	0.01
MW-57	Vinyl Chloride ug/L	8.9	2
MW-58	Naphthalene ug/L	2800	6.2
	Total Arsenic mg/L	0.03	0.01
	Dissolved Arsenic mg/L	0.039	0.01

Well	Constituent	Maximum Concentration	Screening Criteria
	Dissolved Chromium mg/L	0.3	0.1
	Total Vanadium mg/L	0.076	0.036

ug/L: microgram per liter is a measurement equivalent of 1 microgram of constituent per liter of water.
mg/L: milligram per liter is a measurement equivalent of 1 milligram of constituent per liter of water.

EBNC Maximum Sediment Concentration per Segment: Exceedances are in Bold
See Figure 3, attached, for segment locations

Constituent (mg/kg*)	Ecological Screening**	Human Health Screening***	Segment #1	Segment #2	Segment #3	Segment #4	Segment #5
Mercury	0.174	2.3	**0.21**	0.14	0.032	0.091	0.11
Silver	0.5	39	**1.6**	**0.67**	0.13	**2.5**	**0.78**
Arsenic	9.79	3.9	**11.3**	**8.2**	**6**	**6.3**	**7.6**
Barium****	48	540	**57.1**	**54.2**	**48.2**	**65.7**	**110**
Chromium	43.4	300	**317**	**134**	**233**	**263**	**1330**
Lead	35.8	400	**839**	**345**	**59.9**	**203**	**264**
Benzo[a]anthracene	0.108	6.2	**3.6**	**0.18**	0.097	**0.22**	**3.6**
Benzo[a]pyrene	0.15	0.62	**2.6**	0.082	0.056	0.15	**2.8**
PCB Aroclor 1248	0.0598	2.2	**5.4**	**3.3**	**0.55**	**0.68**	**0.93**
PCB Aroclor 1254	0.0598	2.2	0.031	0.022	**0.27**	**0.18**	**0.52**
PCB Aroclor 1260	0.0598	2.2	**0.12**	**0.076**	**0.066**	**0.061**	**0.15**

*mg/kg: milligram per kilogram is a measurement equivalent of 1 milligram of constituent per kilogram of soil
**Ecological sediment screening values are the US EPA Region 5 Ecological Screening Values
***Human health screening values are the US EPA Regional PRGs at a risk level of 10^{-5} and an HI of 1
****Barium Ecological screening value from the National Oceanic Atmospheric Administration

Human Health Risks

EPA developed the media cleanup standards for the Facility using a risk-based approach. The current and anticipated future land use for this site is industrial, and because of that, EPA considers onsite industrial workers and construction workers as the most likely potentially exposed populations. EPA also considers trespassers to be a realistic receptor group under current and anticipated future land use conditions. Offsite residents may have access to surface water, sediment, and fish in the EBNC upstream, adjacent to, and downstream of the Facility through recreational use (i.e., adults and juveniles playing in the EBNC). Therefore, EPA includes adult and adolescent recreational users (i.e., adult and youth recreator) as potentially sensitive receptors for the site.

EPA identified lead as a constituent of concern at the site in surface soil, subsurface soil and groundwater. EPA evaluated direct contact exposure to lead in soil using the USEPA Adult Lead Model (ALM), which was designed to predict the blood lead levels (BLL) in the

developing fetus of an adult woman. EPA considers this a conservative approach that is protective of all receptors at the facility. EPA has adopted a target BLL of 10 micrograms per deciliter (ug/dL) BLL, which has been designated by the U.S. Centers for Disease Control and Agency of Toxic Substances and Disease Registry,[6] as a level to protect sensitive populations (neonates, infants and children). For the Republic facility, the ALM was run to estimate BLLs in the developing fetus of a hypothetical female industrial worker as a result of direct contact exposures to site soil.

The groundwater risk evaluation concluded that if humans used the groundwater as a source of drinking water or wash water, ingestion and dermal contact with groundwater by industrial workers could have cumulative carcinogenic risk in excess of the risk standard. However, there are no current or planned uses for the site groundwater and Republic obtains its water supply from the City of Canton for potable use onsite. As discussed above, EPA concluded that the groundwater discharge to the creek did not pose an unacceptable risk to human health or ecological receptors. Republic will appropriately manage the groundwater risk through the implementation of onsite source control and by establishing and maintaining conservatively layered institutional controls. Off-site drinking water is also supplied by the City of Canton and on-site groundwater contamination does not pose a threat to nearby off-site receptors because it is not migrating off-site. Surrounding off-site properties are served by the City public water system. Some properties east of Trump Road, hydraulically upgradient from Republic, may utilize deep groundwater wells. According to the Ohio Department of Natural Resources well logs for domestic wells in this area, most of the wells are 60-90 feet deep, within the shale and sandstone bedrock. The groundwater on Republic's site does not flow in the direction of Trump Road and does not pose a risk to these wells. Further, the presence of the creek dictates the flow of groundwater towards the creek, which is not towards the east. EPA has informed Ohio EPA of the potential for groundwater wells in this area.

The risk-based approach to address potential risks to human health integrates the results of the Exposure Assessment and Toxicity Assessment to estimate theoretical excess lifetime cancer risks (CRs) and non-carcinogenic health effects associated with exposure to chemicals. This integration provides quantitative estimates of either cancer risk or a non-cancer hazard index (HI), which are compared to standards of acceptable risk or points of departure. EPA used screening values at a risk level of $1x10^{-5}$, but the cumulative standard of risk for this Facility is $1x10^{-4}$ for the carcinogenic risk and 1.0 HI for the non-carcinogenic risk. EPA determined[7] that a carcinogenic risk range of $1x10^{-4} - 1x10^{-6}$ is an acceptable range and the risk at the Republic facility will be managed to remain within that range. EPA used the target BLL of 10 µg/dL for lead exposures.

The following table summarizes the risk assessments for human health risk performed at the facility:

[6] http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=22
[7] National Contingency Plan; 55 Fed Reg. 8665-8865, Section 300.430d1

Summary of Human Health Risks:
Exceedances above EPA's Acceptable Levels are in Bold

SWMU or AOC by Target Area (TA)	Media	Receptor	Carcinogenic Risk	Non-Carcinogenic Risk
TA 1: SWMUs 3, 13, 46, 64, 65, 97	Surface Soil	Industrial Worker	5.7×10^{-6}	0.76
		Construction Worker	8.7×10^{-7}	**3.07**
	Subsurface Soil	Construction Worker	2.13×10^{-6}	**4.5**
TA 2: SWMUs 9 and 66	Surface Soil	Industrial Worker	3.1×10^{-5}	0.0
		Blood Lead		7.7
		Construction Worker	4.7×10^{-6}	0.0
		Blood Lead		**20.1**
	Subsurface Soil	Construction Worker	1.64×10^{-6}	0.25
		Blood Lead		**113**
TA 3: SWMUs 22, 80, 90, 109, 113	Surface Soil	Industrial Worker	0.0	0.87
		Construction Worker	0.0	**3.62**
	Subsurface Soil	Construction Worker	0.0	0.0
TA 4: SWMUs 38, 39, 40	Surface Soil	Industrial Worker	7.71×10^{-6}	0.6
		Construction Worker	1.38×10^{-6}	**2.71**
	Subsurface Soil	Construction Worker	0.0	0.0
TA 5: SWMUs 60, 61, 70, 75	Surface Soil	Industrial Worker	0.0	0.39
		Construction Worker	0.0	**1.53**
	Subsurface Soil	Construction Worker	1.18×10^{-6}	0.19
TA 6: AOCs 87c and 115	Surface Soil	Industrial Worker	7.1×10^{-6}	0.45
		Construction Worker	1.07×10^{-6}	**2.07**
	Subsurface Soil	Construction Worker	0.0	0.0
TA 7: SWMUs 36 and 37	Surface Soil	Industrial Worker	0.0	0.0
		Construction Worker	0.0	0.0

	Subsurface Soil	Construction Worker	0.0	**1.97**
		Blood Lead		**79.3**
TA 8: SWMUs 62 and 105	Surface Soil	Industrial Worker	0.0	0.0
		Construction Worker	0.0	0.0
	Subsurface Soil	Construction Worker	NA*	NA
TA 9: SWMUs 48. 49. 53	Surface Soil	Industrial Worker	0.0	0.75
		Blood Lead		**14.6**
		Construction Worker	0.0	**3.16**
		Blood Lead		**17.2**
	Subsurface Soil	Construction Worker	0.0	0.0
TA 10: SWMUs 14, 51, 52, 101, 76b	Surface Soil	Industrial Worker	0.0	0.58
		Blood Lead		6.2
		Construction Worker	0.0	0.0
		Blood Lead		**13.1**
	Subsurface Soil	Construction Worker	0.0	0.0

*There were no constituents detected above their respective screening criteria in the surface soil; therefore, subsurface samples were not collected as delineation was not necessary.

Ecological Risks

EPA used a risk-based approach to address potential risks to ecological receptors in the EBNC. This risk-based approach involves the use of toxicity-weighted mass factors to help guide remedial efforts. The toxicity-weighted mass factor relates the mass of a chemical to toxicity. The toxicity-weighted mass factor approach consisted of the following steps:

- Calculate the mass of each contaminant in the sediment by stream segment for the targeted area. EPA determined contaminants of concern for ecological risk by comparing sediment data to applicable ecological screening values such as USEPA Region 5 Ecological Screening Values or National Oceanic Atmospheric Administration (NOAA) or USEPA Region 3 BTAG Freshwater sediment screening values. For this evaluation, EPA defined the targeted area as the portion of the EBNC that bisects the facility. The EPA targeted area has been broken into 11 stream segments (Figure 3).
- Determine relative toxicity factors for each contaminant. The factor is relative to the risk-driving chemical (i.e., the chemical with the lowest screening value).

- Calculate a toxicity-weighted mass factor for each stream segment. This factor is representative of the mass of the chemical in a particular stream segment multiplied by the chemical's relative toxicity factor (as calculated in Step 2).

As discussed above, the number of SWMUs and AOCs generated an approach to combine multiple units into Target Areas. EPA evaluated the surface and subsurface soils within these Target Areas, provided the contaminants and exposure assumptions were similar. The highest soil concentrations at individual units can be found in the previous section while the risk summary information can be found in the following table, Summary of Ecological Risk. Where risk exceeded the media cleanup standards, and posed an unacceptable risk, EPA proposed corrective measures; EPA discusses the proposed corrective measures in detail in the following section, Scope of Corrective Action.

The creek sediment risk evaluation concluded that there is no unacceptable risk to human receptors but there is substantial risk to ecological receptors. Following the steps described above to assess the ecological risk from the sediments, EPA concluded that 60% of the total toxicity of all 11 creek segments is located with the first 100 foot segment behind the dam and over 90% of the toxicity is located within 500 feet of the dam. The hazard index, which EPA used to measure ecological risk, demonstrated unacceptable risk to practically every ecological receptor in the creek. An ecological hazard index above 1 indicates that there is potential risk to receptors from contamination. The table below, Summary of Ecological Risk, presents the hazard index for several groups of receptors. The proposed remedy discussed later focuses on removing sediment to dramatically reduce the ecological risk.

In evaluating potential ecological risk within the stream segments, EPA can demonstrate that most contaminants of concern are disproportionately located within the first five stream segments. Again, the reason for this distribution of sediment appears to be the location of the historic dam bisecting the creek near the Republic facility. PCB Aroclor 1248, for example, has an average concentration of 2.17 ppm within the first five segments and a maximum concentration of 5.4 ppm. However, within the last six stream segments, the average concentration is 0.038 ppm and a maximum concentration of 0.12 ppm. Lead has an average concentration of 342 ppm within the first five segments and a maximum concentration of 839 ppm. The last six segments have an average concentration of 25 ppm and a maximum concentration of 66 ppm. This pattern of deposition behind the dam is applicable to most of the contaminants. Consequently, the EPA believes the proposed dredging of the first five stream segments (discussed in more detail later) will remove the following, based upon total mass calculations: 99% of the lead; 100% of the mercury; 93% of the arsenic; and 96% of the zinc, for example. The following table summarizes the risk assessments for ecological risk performed at the facility:

Summary of Ecological Risk

Media Sampled	Receptor	Hazard Index
EBNC Overbank Soils and In-Stream Sediment	Plants	32
	Invertebrates-Earthworms	760
	Avian Invertivore-Robin	17
	Mammalian Invertivore-Short Tail Shrew	16

SCOPE OF CORRECTIVE ACTION

The objective of the proposed corrective measures is to mitigate the potential threat to human health and the environment posed by exposure to contamination through the general elimination of on-going sources to the environment where interim measures have not already done so.

SUMMARY OF ALTERNATIVES

The remediation alternatives that EPA evaluated include no further action, institutional and work place controls, pathway elimination, soil excavation, sediment removal, sediment capping, monitored natural attenuation, and compliance groundwater monitoring. A description of each corrective measure follows.

Soil Remedy Alternatives

Alternative 1: No Further Action: A no further action approach is the baseline by which EPA compares all other remedies. It maintains the SWMU or AOC in its current state without the need to implement methods to control exposures. Republic would use this option for SWMUs or AOCs where EPA establishes that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where Republic controlled or eliminated the source of release, the risk assessment is below the risk-based standards, and/or there were no constituents detected above screening levels. Waste management activities are not applicable to this technology since there would be no waste generated during implementation of this alternative.

Alternative 2: Institutional and Work Place Controls: Institutional controls are non-engineered instruments, such as administrative and legal controls, that help to reduce the potential for human exposure to contamination and/or protect the integrity of the remedy. Institutional controls play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site.

Republic could use an environmental covenant (EC) as a legal control device, and work place controls (WPCs) as administrative controls. Republic would use both control types to control exposure routes to industrial and construction workers as necessary to facilitate reducing the risk each would experience under the assumptions posed under EPA's risk assessment.

Republic would use the EC to document portions of the site that have post-remediation maintenance, monitoring, and institutional and work place control requirements in accordance with the *Final Decision and Response to Comments* document as well as the Post-Remediation Care Plan that Republic will include in the *Final Remedy Construction Completion Report* required by the Order. The EC will restrict the site to industrial land use; owners of the site cannot convert the site to residential land use in the future unless the owners perform further cleanup. Republic would design the land use restrictions, groundwater use restrictions, environmental monitoring requirements, and description of controls included in the EC and deed restriction to prevent unacceptable risks to human health and the environment.

WPCs are administrative programs, policies, practices, procedures, and permits Republic must implement to mitigate the risk to workers by the potential environmental risks. Republic currently has an existing workplace health and safety program, Safety Management System (SMS) documents and site permit requirements. Republic will revise these programs to include information on the areas of the Facility that have greater potential environmental risks (Attachment 3).

Attainment of the cleanup standards by controlling the risk exposure would result in the protection of human health. Waste management activities are not applicable to the use of work place and institutional controls since there will be no waste generated during implementation of these alternatives.

Alternative 3: Pathway Elimination: Republic would achieve pathway elimination through the use of a slag aggregate or asphalt cap. Pathway elimination is a remediation approach known by EPA to be effective in controlling exposure routes and therefore reducing risk exposure. Pathway elimination refers to various types of material placed between the contaminated material and any direct exposure route. Though effective for controlling direct exposure and hydro-geologic processes, it restricts future use of the area and will require maintenance. Pathway elimination can be protective of human health and the environment as long as it remains in place and is properly maintained. Pathway elimination can be alone or in combination with other corrective measure alternatives to meet the risk based cleanup standards. Small amounts of waste may be generated during the installation of a capping system.

A more detailed explanation of each type of pathway elimination evaluated follows.

Alternative 4: Soil/Slag Cap: The use of a soil/slag cap would consist of Republic grading the impacted area and installing two feet of soil/slag backfill. Dependent upon location and intended use of the area, Republic may cover the cap with six inches of topsoil and provide vegetation.

Several SWMUs/AOCs contain and/or are adjacent to structures, such as railroads or buildings, that may require excavation to an extent that would facilitate placing a cap without compromising the use of the structure and maintaining proper drainage. Operation and maintenance (O&M) of the cap would consist of inspection, mowing, fertilization and reseeding of vegetated covers, and the replacement and re-grading of the soil/slag cover.

Alternative 5: Asphalt Cap: The use of an asphalt cap would consist of Republic grading the site or excavating up to 2 feet of soil to accommodate the cap. Any soil excavation relative to installing the cap would conform to the procedure and standards as laid out in the following section. Following the excavation or grading, Republic would place and compact a slag sub-base. Republic would add an asphalt course consisting of a binder course and a wearing course. Republic would design the thickness of the sub-base, binder course, and wearing course to suit the use of the area. The minimum pavement section would consist of 12 inches of sub-base, 2 inches of binder course, and 0.5 inch wearing course. Maintenance of the asphalt cap, at a minimum, would include inspection, and repair of cracks and damages to the asphalt. Republic may also be required to conduct periodic resealing of the asphalt layer.

Alternative 6: Soil Excavation: Soil excavation is a permanent solution as a corrective measure, where Republic would remove contaminated material and transport the material to EPA or state permitted off-site treatment and/or disposal facilities. Republic can demonstrate long term protection of human health and the environment through the removal of contaminated media until the area meets the risk-based standards. Republic may use partial excavation in conjunction with other corrective measures such as WPCs or capping to demonstrate protection of human health and the environment.

The generation of fugitive emissions may occur during operations and will require engineering and safety controls. The fugitive emission controls will require both source control measures and specific waste management activities. Republic may address source control measures with proper work practices such as the use of PPE and dust suppression. Waste management activities would require specific material handling procedures. Republic must handle excavated material in designated areas only. Republic must segregate potentially impacted material from material that is judged to be un-impacted. Republic must take confirmation samples to verify whether contaminated media above cleanup standards is present or absent. Republic must transport the contaminated media off-site to an EPA or state permitted waste facility.

Republic would determine the extent of excavation using data collected through soil sampling conducted during previous phases of investigation, or through confirmation sampling conducted at the boundaries of excavation. EPA considers surface excavation to be the removal of the top two feet of material. Subsurface excavation would constitute materials below two feet.

EPA would require O&M only if Republic uses excavation in conjunction with another corrective measure. The cost of the excavation alternative is affected by the composition and volume of the media as well as the distance to the nearest disposal facility with the required permits.

Alternative 7: Sediment Removal: Sediment removal is a permanent solution as a corrective measure, where Republic must remove contaminated material and transport the material to EPA or state permitted off-site treatment and/or disposal facilities. Republic may demonstrate long term protection of human health and the environment through the removal of contaminated media until the area meets the risk-based standards. Republic can use partial excavation n conjunction with other corrective measures to demonstrate protection of human health and the environment.

The generation of fugitive emissions may occur during operations and will require engineering and safety controls, although it is unlikely to be necessary given the moisture content of the materials encountered during the investigative phase. The fugitive emission controls will require both source control measures and specific waste management activities. Republic can address source control measures with proper work practices such as the use of PPE and dust suppression. Waste management activities would require specific material handling procedures. Republic must handle the excavated material in designated areas only. Republic must segregate potentially impacted material from material that is judged to be un-impacted. Republic will have to erect

berms around the designated waste handling areas to contain and collect free liquids removed with the sediments.

Alternative 8: Sediment Capping/Cover: Application of clean materials to impacted sediments is an additional alternative for remediation. EPA did not evaluate this alternative beyond an initial review due to the depth of measured sediment accumulation in the EBNC. Existing sediments and water depths (<1 foot), along with the channel section, would likely cause any applied material erode during heavy rainfall and flash flood events.

Groundwater Remedy Alternatives

Alternative 1: No Further Action: A no further action approach is the baseline by which EPA compares all other remedies. It maintains the SWMU or AOC in its current state without the need to implement methods to controls exposures. Republic would use this option for SWMUs or AOCs where EPA establishes that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where Republic controlled or eliminated the source of release, the risk assessment is below the risk-based standards, and/or there were no constituents detected above screening levels. Waste management activities are not applicable to this technology since there would be no waste generated during implementation of this alternative.

Alternative 2: Monitored Natural Attenuation: Monitored Natural Attenuation (MNA) is a technique Republic may use to monitor or test the progress of natural attenuation processes that can degrade contaminants in soil and groundwater. The remedy relies upon naturally occurring weathering and biodegradation processes to reduce or eliminate low concentrations of chemicals. Republic may implement MNA upon completion of source control. MNA would also reaffirm that the soil remedies were successful through an on-going groundwater monitoring program.

Alternative 3: Compliance Groundwater Monitoring: This alternative is appropriate under conditions where groundwater is not migrating offsite at concentrations exceeding Maximum Contaminant Levels (MCLs) and Secondary MCLs (SMCLs); this is the situation at Republic. Additionally, the groundwater migration modeling that EPA performed showed that no groundwater migrating into the EBNC contains constituents at concentrations exceeding the appropriate Ohio EPA water quality standards.

The confirmatory groundwater-monitoring program would reaffirm that the soil and groundwater remedies will continue to be protective of human health and ecological receptors after Republic completes the remedies. Republic must conduct annual monitoring of those perimeter-monitoring wells for constituents that have exceeded the risk based human health and ecological criteria in or up gradient of the perimeter well. Republic will perform annual monitoring for up to five years after Republic implements the EPA proposed corrective measures. Republic must submit annual reports to EPA containing the groundwater sampling results compared to the applicable screening criteria, groundwater figures, and laboratory confirmation. The goal of the program will be to demonstrate that no exceedances of risk based human health and ecological criteria are present.

The proposed confirmatory groundwater-monitoring program would not be applicable to areas where Republic's groundwater contamination data has shown contamination to be migrating onto the Republic site from off-site sources. Specifically, those areas are:

- Chlorinated VOCs exceedances detected at MW-46 and MW-57 located at the western end of the Site, and
- VOC, metals, and cyanide exceedance detected at MW-58, which is located along the property boundary between the boiler house and the dam.

EVALUATION OF PROPOSED REMEDIES AND ALTERNATIVES
[See Table 3, attached]

Clean Units

EPA determined that the following SWMUs and AOCs to not pose an unacceptable risk, provided that the property is restricted to industrial land use and, therefore, EPA does not require selection and implementation of remedial alternatives:

- SWMU 8 - Ingot Inoculation Baghouse Dust Containerized Storage Area
- SWMU 12 - Empty Drum Storage Area #2
- SWMU 30 - Johnson's Pond
- SWMU 32 - Waste Pickle Liquor Sumps
- SWMU 35 - Water Quality Control Center (WQCC)
- SWMU 43 - Mobile Repair Shop Waste Oil Tank
- SWMU 44 - Heat Treatment Waste Oil Decanter Tank & Storage Tank
- SWMU 45 - Machine Shop Waste Oil Storage Tank
- SWMU 47 - Old Vertical Caster Treatment Plant
- SWMU 50 - Interior Solids Drop Station/Melt Shop #4
- SWMU 58 - Pickling Operations Mist Suppression System
- SWMU 62 - Metallurgical Lab Hood Exhaust System
- AOC 81 - Diesel/Fuel Oil UST - Heckett Building
- AOC 83 - Diesel/Fuel Oil UST - Southeast Corner of #4 Melt Shop
- AOC 88 - Heckett Maintenance Garage Area
- AOC 93 - Mobile Repair Shop Salvage Yard
- AOC 94 - Mobile Repair Shop Area
- AOC 99 - Machine Shop Trench
- SWMU 104 - Old 8-inch Mill Day Tank
- SWMU 105 - Met Lab Waste Acid Tank
- AOC 107 - Former UST Locations Adjacent to Former Plant Truck Scales
- AOC 108 - Former 8-inch Mill Etch House HCL Storage Tank
- AOC 110 - Former Surface Impoundment Area
- AOC 110b - #6 Boilerhouse
- AOC 112 - Former Process Impacts at Bar/Coil Pickle Areas
- SWMU 114 - "Old" N&T Repair Shop

- AOC 116 - Sample Location BM-SB-18-1U
- AOC 117 - Former Coke Battery

Units that are Subject to Remedial Alternatives

The table below specifies which remedy or remedies EPA proposes for each of the remaining 37 SWMUs or AOCs, plus the proposed remedy for the site-wide groundwater and creek sediment contamination. Please note "institutional controls" are a component of the proposed remedies at each location because they would be implemented on a site-wide basis. Institutional controls will protect human health and the environment for future land use by ensuring its use is consistent with the risk assessment assumptions. Work place controls (WPCs) are also a component of most remedies as they will establish appropriate protocols for on-site workers designed to reduce exposure risk.

SWMU/AOC Number and Name	**PROPOSED REMEDIES**
3: Heckett Slag & Byproduct Processing Area	WPCs with Institutional Controls
9: Waste Oil Drum Storage Area #1	WPCs with Institutional Controls
13: Heckett Waste Oil Drum Accumulation Area	WPCs with Institutional Controls
14: Ingot Inoculation Dust Collection Baghouse	WPCs and Soil Excavation with off-site disposal with Institutional Controls
22: Mill Scale Staging Area	WPCs with Institutional Controls
36: 8" Mill Scale Pit & Associated Skimmer	WPCs with Institutional Controls
37: Former 8" Mill AST	WPCs and Asphalt Cap with Institutional Controls
38: 12" Mill Scale Pit	No Further Action with Institutional Controls
39: 12" Mill Oil Decanter Tanks	No Further Action with Institutional Controls
40: 12" Mill Oil Storage Tank	Asphalt Cap with Institutional Controls
46: Heckett Waste Oil Storage Tank	WPCs with Institutional Controls
48: #3 Melt Shop Baghouse	WPCs and Soil Excavation with off-site disposal with Institutional Controls
49: #4 Melt Shop Baghouse	WPCs with Institutional Controls
51: Ingot Inoculation Fume Evacuation System	WPCs and Soil Excavation with off-site disposal with Institutional Controls
52: Exterior Solids Drop Station/#4 Melt Shop	WPCs with Institutional Controls
53: Old Baghouse/#4 Melt Shop	Combination Soil and Asphalt Cap and WPCs with Institutional Controls
59: #4 Steel Conditioning/#3 Slab Grinder Baghouse	Soil Excavation and off-site disposal with Institutional Controls
60: #4 Steel Conditioning/Torch Cut Baghouse	WPCs with Institutional Controls
61: #4 Steel Conditioning/#1 Round and #2 Slab Grinder	WPCs with Institutional Controls
64: Heckett Slag Screening Operation	WPCs with Institutional Controls
65: Heckett Refuse Collection Area	WPCs with Institutional Controls
66: Tub and Associated Trench	WPCs and Soil Excavation with off-site disposal

	with Institutional Controls
70: Former Washout Pad	WPCs with Institutional Controls
75: Roll-Off Container	WPCs with Institutional Controls
76b: EAF Dropout Chamber Solids Roll-Off Containers	WPCs with Institutional Controls
80: Locomotive Fueling Station	WPCs with Institutional Controls
87c: Leaking Drum/Sample	WPCs with Institutional Controls
90: Melt Shop Scrap Yard	WPCs with Institutional Controls
95: Forge Area Fueling Station	WPCs with Institutional Controls
97: Solvent Collection Tank Heckett Garage	WPCs with Institutional Controls
101: Canton Bloom Cast Facility LMF Baghouse Area	WPCs with Institutional Controls
102: Bloom Cast Facility Caster Scale Pit Area	WPCs with Institutional Controls
103: Bloom Cast Facility Rolling Mill Scale Pit Area	WPCs with Institutional Controls
109: Former UST Location Melt Shop Scrap Yard	WPCs with Institutional Controls
111: South End of 12" Mill Building Reheat Furnace	Soil Excavation and surface restoration with Institutional Controls
113: Railroad Ties/Railroad Spoil Area	WPCs with Institutional Controls
115: Sample Location BM-GS-6-1UA	WPCs with Institutional Controls
Creek Sediment, Creek Overbank Soil at OB-7 and Outfall 011	Sediment and Soil Excavation with off-site disposal
Groundwater	Long-term Compliance Groundwater Monitoring, WPCs with Institutional Controls

The following section describes the proposed remedies for each SWMU, AOC, groundwater and the EBNC. Additional evaluation information on the proposed remedies can be found in Tables 2 and 3. Table 2 shows the estimated costs of the proposed remedies and Table 3 presents the threshold and balancing criteria EPA used to evaluate each remedy.

Republic must implement site wide institutional controls and appropriate work place controls at the site. Institutional controls are non-engineered instruments used to minimize the potential for human exposure to contamination and/or protect the integrity of an engineered remedy. Specifically, Republic must place a deed restriction on the land to limit future use of the property to industrial use. Republic will use a groundwater restriction to prohibit the use of site groundwater for potable use. The specific mechanism Republic will utilize is an environmental covenant following the format specified by the Ohio Revised Code (ORC) 5301.80 through 5301.92 in order to restrict future use of the property to industrial uses, to document the requirement for work place and institutional controls, and to restrict the use of site groundwater.

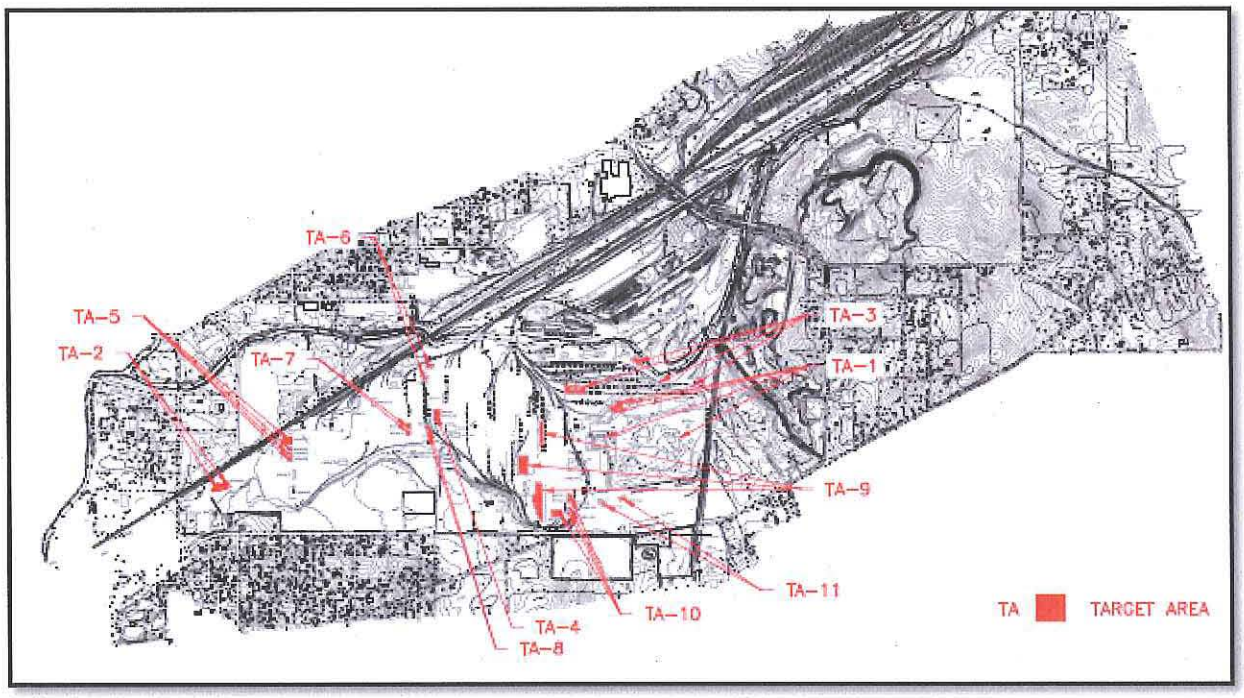
EPA will require Republic to submit a *Corrective Measures Implementation (CMI) Workplan* to EPA for approval shortly after EPA issues its *Final Decision and Response to Comments*. This workplan must provide a detailed description and schedule of all construction and/or demolition needed to implement the selected remedy. In addition it must cover operation, maintenance and monitoring of the remedy, including a scheduled date for submitting a detailed groundwater-

monitoring plan. Republic must provide a detailed cost at the time of submittal of the corrective measures implementation workplan. In addition, Republic must provide financial assurance within 60 days after EPA approves the cost estimate.

EPA grouped the 66 individual areas of investigation into Target Areas (TAs) based on geographic proximity, similarity of exposure scenarios, and similar constituents of concern. EPA presents the following proposed remedies by TA. Each TA consists of multiple SWMUs and/or AOCs. Under certain exposure and risk scenarios, Republic will manage certain SWMUs or AOCs through institutional controls. Some areas will only require ICs, whereas others will require engineered controls (such as excavation or capping) and ICs. EPA may address the TA as a whole using a combination of remedies.

The following figure illustrates the locations of the target areas. Figure 1, attached, shows the locations of individual SWMUs and AOCs.

Target Areas



TARGET AREA 1

The following SWMUs and AOCs have been grouped together as TA 1 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The remedies proposed for TA 1 are WPCs and ICs. The implementation of these practices alone will be sufficient to reduce the risk from constituents present due to site-wide fill.

SWMU 3 – Heckett Slag & Byproduct Processing Area: SWMU 3 is an active area where sorting, sizing and staging of the steel-making slag occurs pending sale as a construction

aggregate. This area was previously leased by a third-party contractor, Harsco Metals Group, Ltd. (formerly Heckett). The State of Ohio broadly excludes "slag and other substances that are not harmful or… inimical to public health" from the definition of solid waste (Ohio Administrative Code §3745-27-01(S)(24)). Ohio EPA also requires that the processing, stockpiling, and storage of steel/blast furnace slag meet applicable environmental regulations pertaining to dust control and storm water runoff.

The risk-based factors for TA 1, which includes SWMU 3, are the hazard indices (HI) for the ingestion of iron and manganese by the construction worker for both surface and subsurface soils. At SWMU 3, iron was detected as high as 264,000 mg/kg and manganese at 22,340 mg/kg. The corrective measures EPA evaluated for SWMU 3 are no further action, WPCs (surface and subsurface), excavation, or the addition of a soil/slag cap.

No further action would not be protective of human health and the environment.

EPA dismissed excavation because the material is considered to be a valuable commodity and product by Republic, not a waste.

Work place controls will be adequately protective of human health (worker exposure) and the environment. Establishing exposure controls in the form of standard operating procedures for on-site workers accessing the area would be protective of those EPA determined to be at risk.

EPA determined that the placement of a cap is not feasible due to the nature of the ongoing activity in the area, which would continuously damage the soil cap by heavy equipment traffic and by Republic's excavations to extract the product. The cap alternative as an independent corrective measure would not be protective of human health for the construction worker in subsurface soils.

The EPA recommended corrective measure for SWMU 3 is the institution of WPCs and ICs. The scope of the WPCs program at the Republic site is included as Attachment 3.

SWMU 13 – Heckett Waste Oil Drum Accumulation Area: SWMU 13 is currently an active area of the facility associated with the slag operations at SWMU 3. There are no drains to the outside area or obvious damage to the concrete. The contaminant and media of concern in this area are iron and manganese in surface and subsurface soil, at 320,000 mg/kg and 28,100 mg/kg, respectively. EPA attributes the iron and manganese at many SWMUs and AOCs to the fill upon which the facility was built.

The corrective measures EPA evaluated for SWMU 13 are no further action, WPCs (surface and subsurface), excavation and disposal, and the addition of a soil/slag cap.

No further action is not protective of human health and the environment.

EPA dismissed excavation and disposal because EPA acknowledges the company's claim that the slag is a commodity, not a waste.

Work place controls will be protective of human health and the environment in this area of the site. The primary risk drivers in this area are iron and manganese via the ingestion pathway. Control measures include: Employees that work in this area are inside heavy equipment with enclosed cabs or other vehicles with enclosed cabs. Management of slag in Ohio requires compliance with dust suppression and storm water control regulations. Existing work practices and compliance with applicable environmental regulations reduce human exposures to below the assumptions in the risk calculations. Employee training, including personal hygiene, washing of hands prior to eating, drinking, or smoking will serve to greatly reduce, if not eliminate, the risk posed by iron and manganese to construction workers. Republic will provide outside contractors it retains to perform work in this area with a summary of the analytical data and will require outside contractors to prepare a health and safety plan to mitigate risks to their employees.

The placement of a soil/slag cap might be protective of exposures to contaminated surface soil but is not feasible as a long-term remedy due to the nature of the ongoing activity in the area. It is reasonable to anticipate that there would be damage to the soil cap by heavy equipment traffic and by Republic's excavations to extract the product. The soil cap alternative also would not be protective of human health for the construction worker in subsurface soils.

The recommended corrective measure for SWMU 13 will control potential risks associated with the presence of fill-related constituents, such as iron and manganese, through the use of institutional controls and work place controls.

SWMU 46 – Heckett Waste Oil Storage Tank: SWMU 46 is comprised of the Heckett Waste Oil Storage Tank, an AST, and the surrounding area, located on the north side of the Heckett Maintenance Garage. Heckett uses it for the temporary storage of waste oils generated by operations within the Heckett Maintenance Building. Heckett pumps waste oils from the tank on an as-needed basis and sends the waste oils off-site for processing.

Soil samples assigned to this SWMU did not exceed secondary screening levels, the site-specific background concentrations in the fill. However, SWMU 46 is associated with TA 1, which requires further evaluation as a whole. EPA's contaminants of concern are iron and manganese in surface soil and arsenic, iron, and manganese in subsurface soil.

Although samples EPA assigned to this SWMU did not exceed secondary screening levels, the EPA recommended corrective measure for TA 1, including SWMU 46, is the institution of WPCs and ICs for surface and subsurface soils.

SWMU 64 – Heckett Slag Screening Operation: SWMU 64 is located in the southwestern portion of SWMU 3. The SWMU encompasses approximately 1.5 acres of the site and consists of a slag screening and processing operation. Historic operations at SWMU 64 consisted primarily of the segregation of slag. However, other mill waste known, or suspected, to have been managed at SWMU 64 includes refractory brick. Currently, slag-processing operations at this SWMU include slag quenching, air-cooling, crushing, metal recovery, and slag aggregate screening, sizing, and storage for later sale. The risk based driving factors for TA 1, which includes SWMU 64, are the HIs for the ingestion of iron and manganese in surface soil and arsenic, iron, and manganese in subsurface soils by the construction worker.

The corrective measures EPA evaluated for SWMU 64 are no further action, WPCs (surface and subsurface), a soil/slag cap, and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls and ICs would be protective of human health and the environment by reducing the on-site worker's and construction worker's potential exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap. Additionally, ongoing activities in the area would result in damage to the cap.

Surface soil excavation and disposal would be protective of human health and the environment by removing the source, but is not reasonable given the function of this area is a slag screening and processing area. Further, excavation of the soil itself would not be economically feasible given the large surface area. It would cost an estimated $500,000 to remove soil primarily contaminated with constituents associated with the slag product.

The EPA recommended corrective measure for TA 1, including SWMU 64, is the institution of WPCs and ICs.

SWMU 65 – Heckett Refuse Collection Area: SWMU 65 consists of the refuse collection operations conducted by Heckett. Roll-off containers are in place for collection of trash and maintenance waste from the area. EPA's contaminants of concern are iron and manganese in surface soil, and arsenic, iron, and manganese in subsurface soil.

The corrective measures EPA evaluated for SWMU 65 as part of TA 1 are no further action and WPCs (surface and subsurface).

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment to reduce the HI for the TA below target levels.

EPA's recommended corrective measure for TA 1, including SWMU 65, is the institution of WPCs and ICs for surface and subsurface soils.

AOC 97 – Solvent Collection Tank Heckett Garage: AOC 97, a Solvent Collection Tank, is located at the Heckett Garage Area. AOC 97 is comprised of a 3-foot by 5-foot by 4-foot open-top tank Heckett utilized as a parts washer. The parts washer is fully enclosed and the interior of the building has a concrete slab floor.

Soil samples EPA assigned to this AOC did not exceed secondary screening levels, site-specific background levels. However, this area is considered part of TA 1 and as such the contaminants

of concern are arsenic, iron and manganese for surface and subsurface soils and will be managed in a manner consistent with the rest of TA1.

Although samples EPA assigned to this AOC did not exceed secondary screening levels the EPA recommended corrective measure for TA 1, including AOC 97, is the institution of WPCs and ICs for surface and subsurface soils as a matter of consistency for the TA.

TARGET AREA 2

The following SWMUs and AOCs have been grouped together as TA 2 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 2 are soil excavation and disposal, WPCs, and ICs.

SWMU 9 – Waste Oil Drum Storage Area #1: SWMU 9 is currently active for accumulation of drums for disposal (non-hazardous and hazardous waste). This area has a concrete containment area in-place with no visible cracks of the floor or curbing. The samples EPA assigned to this SWMU did not exceed secondary screening levels, site-specific background levels. As an area within TA 2, this SWMU will be managed in a manner that further reduces the overall risk within the TA.

Although samples EPA assigned to this SWMU did not exceed secondary screening levels, the EPA recommended corrective measure for TA 2, including SWMU 9, is the institution of WPCs and ICs for surface and subsurface soils.

SWMU 66 – Tub and Associated Trench (Includes Boring Location 46-GPS): SWMU 66 consists of a heating tub and the associated trench formerly used for the inspection of stainless cast slabs. This is an inactive area in which owners or operators have demolished buildings. EPA's contaminants of concern in this TA are lead and PCBs in surface and subsurface soil. One surface soil sample at this SWMU had PCBs detected at 31 ppm, above the applicable TSCA concentration of 25 ppm for "bulk material", or soil, for low occupancy exposure. Another sample had lead-impacted surface soil above the screening criteria at a concentration of 1,750 mg/kg.

During the field reconnaissance to evaluate EPA's request to consider excavation of the PCB impacted soil, Republic made the case that placement of a cap around boring GP-46 to reduce exposure to lead in surface soil would be difficult to achieve while maintaining access to nearby building entrances. The XRF was used to further delineate the lead levels in this area.

The corrective measures EPA evaluated for SWMU 66 are no further action, WPCs (surface and subsurface), a soil/slag cap, and soil excavation and off-site disposal.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

Work place controls and ICs would be protective of human health by reducing the on-site and construction worker's exposures, but would leave lead impacted surface soils exposed to the environment.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap. Additionally, ongoing activities in the area would result in damage to the cap. WPCs in the form of a modified Health and Safety Plan used in conjunction with the slag cap would be protective of human health. The cap would serve to reduce surface exposure to potential receptors while WPCs would reduce the construction worker's exposure to surface soils during earth disturbance activities.

Soil excavation and disposal would be protective of human health and the environment by removing the surface source. Excavation in combination with WPCs and the site-wide institutional controls would be protective.

The EPA recommended corrective measure for SWMU 66, as part of TA 2, is the combination of a surface soil excavation with WPCs. Institutional controls are site-wide and will therefore also be a component of this remedy. The proposed surface excavation will consist of two EPA targeted hot spot removals to a depth of one foot. The excavations measure approximately 30 feet by 30 feet at boring 66-B4 to address PCB-impacted surface soil and 10 feet by 10 feet at boring location GP-46 to address lead-impacted surface soil. Once the soil excavation is complete, there will be no risk in excess of 10^{-4}. EPA also requires WPCs to reduce the potential exposures to on-site and construction workers for the SMWU. The cost of excavating the material ($20,000 to $48,000) is dependent on whether Republic disposes of the material as non-hazardous or hazardous, respectively.

TARGET AREA 3

The following SWMUs and AOCs have been grouped together as TA 3 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 3 are the removal of railroad materials from the bank of the EBNC and execution of best management practices, WPCs, and ICs.

SWMU 22 – Mill Scale Staging Area: Historical operations at SWMU 22 consisted primarily of mill scale management activities. Currently, mill scale is staged in this area until sufficient quantities are available for sale. The quantity of mill scale staged at any given time varies. Current best management practices consist of draining the mill scale generated at containment areas adjacent to the two scale pits to remove free liquids (water and oil). Once the mill scale has been properly drained, and characterized for the absence of contaminants (grease, dirt, and TCLP metals (Pb, Cr, and Cd), the scale is loaded into trucks and transported to SWMU 22. The marketable mill scale fines are stockpiled until a suitable buyer purchases them from a Commodity Agent in Purchasing. If contamination is detected in the mill scale, the material is isolated at the scale pit containment area until removal from the site as waste via a covered roll off box. EPA's contaminants of concern are iron and manganese, associated with the mill scale, in surface soil at 224,000 mg/kg and 41,000 mg/kg, respectively. The constituents are likely the result of pieces of mill scale being present in the samples.

The corrective measures EPA evaluated for SWMU 22 are No Further Action, WPC (for surface soil), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls for surface soil exposures would be protective of human health and the environment by reducing the exposure of construction workers to surface soils.

A soil/slag cap would not be protective of human health since the receptor of concern is the construction worker, whose activities could include excavation through the cap. Additionally, installation and maintenance of a cap over the area would be economically infeasible with the large area involved and the fact that active operations in the area would damage a soil cap. A cap would cost an estimated $117,000.

Surface soil excavation and off-site disposal would be protective of human health and the environment by eliminating the source. However, soil excavation is not economically feasible with the large area involved. The approximate area involved is 60,000 square feet by 2 feet deep. Republic's estimated cost of excavation is $3,946,000.

EPA's recommended corrective measure for SWMU 22 is the institution of WPCs based on SWMU 22 being an active mill scale and slag staging area where the constituents responsible for exceeding the risk based standards are the metals found among the staged material itself. While excavation would remove the material, rendering the exposure pathway incomplete, WPC will be effective in reducing the exposure to industrial workers to acceptable levels and institutional controls will protect future land use.

AOC 80 – Locomotive Fueling Station: AOC 80 is the former Locomotive Fueling Station. This AOC was formerly used for the fueling of locomotives with diesel fuel. When in operation, the area consisted of an AST situated on a pedestal support that elevated the tank and dispenser to a height facilitating re-fueling operations. Fueling operations were discontinued in 1996 and the tank was removed.

Soil samples EPA assigned to this AOC did not exceed secondary screening levels, the site-specific background levels. As an area within TA 3, this area will be managed in a manner that further reduces the overall risk from the TA.

Although samples EPA assigned to this AOC did not exceed secondary screening levels the EPA recommended corrective measure for AOC 80 is the institution of surface WPCs and ICs as a matter of consistency for the TA.

AOC 90 – Melt Shop Scrap Yard: AOC 90 is comprised of approximately 13 acres of property where scrap management operations are conducted. Historic and current operations at AOC 90 consist primarily of staging scrap metal in support of facility operations. No mill wastes are known to or suspected to have been managed at AOC 90. This area is an active area for staging scrap metal used in steel production. The relevant EPA contaminants of concern are iron and manganese in surface soil.

The corrective measures EPA evaluated for AOC 90 are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment. .

WPCs would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap. Additionally, the ongoing activities in the area would damage the cap, which makes it an unrealistic long-term remedy.

Surface soil excavation with disposal would be protective of human health and the environment by removing the surface source, but the high capital cost renders this option infeasible, particularly to address constituents associated with the site-wide fill material. Republic estimated the excavation cost to be $3,080,000.

The EPA recommended corrective measure for AOC 90 is the institution of WPCs and ICs as part of the overall strategy to reduce risk throughout TA 3.

AOC 109 – Former UST Location: AOC 109, a former UST location, is located west of AOC 80 in the Melt Shop Scrap Yard. The leaded gasoline storage and fueling operations in AOC 109 were discontinued in 1980. The tank was removed prior to 1988. No visible indications of the location of this tank exist. EPA's contaminants of concern associated with TA 3 are iron and manganese in surface soil by the construction worker.

The corrective measures EPA evaluated for AOC 109 as part of TA 3 are no further action and surface WPCs and ICs.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment to reduce the HI for the TA below target levels.

The EPA recommended corrective measure for AOC 109 is the institution of surface WPCs and ICs.

AOC 113 – Railroad Ties / Railroad Spoil Area: AOC 113, the Railroad Ties/Railroad Spoil Area, is located along the northern limits of the Facility just south of EBNC. This area has been utilized to accumulate used railroad ties and ballasts from maintenance activities on the in-plant rail lines. Railroad ties and railroad ballast are accumulating and encroaching on the bank of EBNC. The contaminants of concern are iron and manganese in surface soils.

The corrective measures EPA evaluated for AOC 113 are no further action, WPCs (surface), soil/slag cap, general housekeeping/best management practices through the removal of the debris, and surface soil excavation with off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

The best management practices to be utilized after completion of the corrective measure will be to prohibit the stockpiling of materials in this area, including the installation of a vehicle barrier.

Surface soil excavation and off-site disposal would be protective of human health and the environment by removing the source. However, the constituents of concern are associated with the site-wide fill material and excavation would cost $300,000.

EPA's recommended corrective measure for AOC 113 is the institution of surface WPCs and execution of general housekeeping/best management practices by removing the accumulated debris. The best management practice to be utilized after completion of the corrective measure will be to prohibit the stockpiling of materials in this area. The existing debris will be sorted to separate materials that can be reused or recycled from materials that cannot be. Materials that cannot or will not be reused will be tested as necessary to profile the material into an off-site non-hazardous (or hazardous, if appropriate) disposal facility. Institutional controls will also be a component of the remedy. The cost of this remedy is estimated to be $150,000.

TARGET AREA 4

EPA evaluated SWMU 38 with SWMUs 39 and 40 as TA 4. EPA more accurately describes these three SWMUs as three pieces of equipment associated with a single SWMU (the scale pit) and associated ASTs used to temporarily store oil and oily water recovered from the scale pit. The proposed remedies for TA 4 include an asphalt cap, establishing an improved process for managing materials, WPCs, and ICs.

SWMU 38 – 12-Inch Mill Scale Pit: SWMU 38 is currently used as a waste/byproduct management area for draining/decanting wet byproducts and wastes (e.g. wet scale, grease and dirt). The free liquids drain into the scale pit and the "dry" material can be loaded out for proper disposal. SWMU 38 was previously used as the Scale Pit for the former 12-inch Rolling Mill. Re-circulated water, waste oil, and scale were the primary wastes generated when the former 12-Inch Rolling Mill was operating. The surface soil samples EPA assigned to this SWMU did not exceed secondary screening levels; however, this SWMU will be managed in a manner consistent with TA 4 in order to further reduce the overall risk of the TA. The contaminants of concern are arsenic and iron in surface soils.

The corrective measures EPA evaluated for SWMU 38 as part of TA 4 are no further action and surface WPCs.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment portion of the RFI to aid in reducing the HI for the TA below target levels.

The EPA recommended corrective measure for SWMU 38 is WPCs in addition to the implementation of the recommended corrective measures at SWMU 40 as discussed below and site-wide ICs.

SWMU 39 – 12-Inch Mill Oil Decanter Tank: SWMU 39 is the 12-Inch Rolling Mill Oil Decanter Tank. EPA evaluated SWMU 39 with SWMUs 38 and 40 as TA 4. EPA's contaminants of concern in TA 4 are arsenic and iron in surface soils. This SWMU will be managed in a manner that is consistent with reducing the overall risk at TA 4.

The corrective measures EPA evaluated for SWMU 39 as part of TA 4 are no further action and surface WPCs.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment portion of the RFI to aid in reducing the HI for the TA below target levels.

The EPA recommended corrective measure for SWMU 39 is WPCs and ICs in addition to the implementation of the recommended corrective measures at SWMU 40 as discussed below.

SWMU 40 – 12-Inch Mill Oil Storage Tank: SWMU 40 consists of an aboveground storage tank (AST) inside of a secondary containment. Operations began in this area in 1978. Waste oil is the primary waste in SWMU 40. EPA evaluated SWMU 40 with SWMUs 38 and 39 as TA 4. The constituent concentrations investigators detected in the samples EPA assigned to SWMU 40 require further evaluation of TA 4 due to the exceedance of the target HI for the construction worker's potential exposure to arsenic and iron in surface soils.

The location of the proposed asphalt cap more closely located at SWMU 38 because it is adjacent to the scale pit, not the 12-Inch Mill Oil Storage Tank. Soil samples within TA 4 exceeded screening criteria and the HI for worker's exposure to arsenic and iron. Due to the proximity of all three SWMU's in this TA, the specific remedy proposed to address the TA as a whole overlaps SWMU's.

The corrective measures EPA evaluated for SWMU 40 are no further action, WPCs, an asphalt cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls would be protective of human health and the environment. Republic would have to design the WPCs it institutes to reduce the potential for future contamination.

An asphalt cap would be protective of human health and the environment by eliminating the potential exposure pathway. Republic would have to design the asphalt cap to reduce the potential for future contamination.

Surface excavation would be protective of human health and the environment by eliminating the source.

The EPA recommended corrective measure for SWMU 40, and TA 4 as a whole, is the installation of an asphalt cap at $50,000. It is our understanding that Republic intends to establish an improved material processing area at SWMU 40 in order to benefit all three SWMUs within TA 4, SWMUs 38, 39 and 40. Republic will include an asphalt cap in that design to reduce potential exposure risk and future contamination.

TARGET AREA 5

The following SWMUs and AOCs have been grouped together as TA 5 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 5 are WPCs and ICs. The implementation of these practices alone will be sufficient to reduce the risk from constituents present due to site-wide fill.

SWMU 60 – Torch Cut Baghouse at #4 Steel Conditioning: SWMU 60 consists of the baghouse used to control emissions from the torch cut operations in #4 Steel Conditioning. These baghouse operations began in 1979 and ceased in 2002 when #4 Steel Conditioning was shut down. EPA's contaminant of concern at this location is manganese in surface soil, at 32,200 mg/kg, for on-site worker potential exposure.

The corrective measures EPA evaluated for SWMU 60 are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

Work place controls would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

Surface soil excavation and disposal would be protective of human health and the environment by removing the source but is not economically justifiable provided the constituent of concern is associated with the site-wide fill material. Excavation would cost an estimated $50,000.

The EPA recommended corrective measure for SWMU 60 is the institution of WPCs and ICs.

SWMU 61 - #1 Round Grinder and #2 Slab Grinder at #4 Steel Conditioning:
SWMU 61 consists of the two baghouses used to control emissions from the #1 Round Grinder and the #2 Slab Grinder operations in #4 Steel Conditioning. These baghouses ceased operating

in 2002 with the shutdown of #4 Steel Conditioning. Soil samples EPA assigned to this SWMU did not exceed secondary screening levels. However, the individual SWMUs/AOCs associated with TA 5 require further evaluation due to the exceedance of the target HI for the construction worker's exposure to surface soil. EPA's contaminant of concern is manganese for surface soil.

The corrective measures EPA evaluated for SWMU 61 as part of TA 5 are no further action and surface WPCs.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment to reduce the HI for the TA below target levels.

Although samples assigned to this SWMU did not exceed secondary screening levels, EPA's recommended corrective measure for SWMU 61 is the institution of surface WPCs and ICs as a matter of consistency for the TA.

SWMU 70 – Former Washout Pad: This former concrete washout pad was used for steam cleaning of equipment and machinery. This is an inactive area due to the shutdown of #4 Steel Conditioning in 2002. Only a concrete pad remains in the area around the soil. Soil samples EPA assigned to this SWMU did not exceed secondary screening levels. However, the individual SWMUs/AOCs associated with TA 5 require further evaluation due to EPA's contaminant of concern, manganese, in surface soil.

The corrective measures EPA evaluated for SWMU 70 as part of TA 5 are no further action and surface WPCs.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment to reduce the HI for the TA below target levels.

Although samples EPA assigned to this SWMU did not exceed secondary screening levels, EPA's recommended corrective measure for SWMU 70 is the institution of surface WPCs and ICs as a matter of consistency for the TA.

SWMU 75 – Roll-Off Container Staging Area West of #4 Steel Conditioning: SWMU 75 was a roll-off container previously used to store the used baghouse bags and grinder dust generated by the #1 Round Grinder and the #2 Slab Grinder baghouses (SWMU 61). This is an inactive area due to the shutdown of #4 Steel Conditioning in 2002. Only a concrete pad and a small pile of debris remain in the area. EPA's contaminant of concern is manganese for surface soil.

The corrective measures EPA evaluated for SWMU 75 are no further action, WPCs (surface), a soil/slag cap, and surface soil excavation and off-site disposal.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

Work place controls would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

Surface excavation would be protective of human health and the environment by removing the surface source, but EPA could not justify the capital cost because the constituent is manganese, which is a constituent associated with the background concentration in fill.

EPA's recommended corrective measure for SWMU 75, as part of the overall TA 5 remedy, is the institution of WPCs and ICs.

TARGET AREA 6

The following SWMUs and AOCs have been grouped together as TA 6 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 6 are WPCs and ICs. The implementation of these practices alone will be sufficient to reduce the risk from constituents present due to site-wide fill.

AOC 115 – Sample Location BM-GS-6-1UA: Investigators collected this sample west of the Non-Destructive Testing portion of the 12-inch Bar Mill. Soil samples EPA assigned to this AOC did not exceed secondary screening levels. However, the individual SWMUs/AOCs EPA associated with TA 6 require further evaluation due to the exceedance of the target HI for the construction worker's potential exposure to iron in surface soils.

The corrective measures EPA evaluated for AOC 115 as part of TA 6 are no further action and surface WPCs.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment to reduce the HI for the TA below target levels.

Although samples EPA assigned to this AOC did not exceed secondary screening levels, EPA's recommended corrective measure for AOC 115 is the institution of surface WPCs and ICs as a matter of consistency for the TA.

AOC 87c – Leaking Drum/Sample Location BM-GS-5-1UA: During the RCRA Facility Assessment, this area contained two empty drums lying on their sides. Republic removed the drums. EPA's contaminant of concern is iron in surface soil at 245,000 mg/kg and potential on-site and construction worker exposure.

The corrective measures EPA evaluated for AOC 87c are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

Work place controls would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

Surface soil excavation with disposal would be protective of human health and the environment by removing the surface source, but EPA could not justify the capital cost because the constituent is iron, which is a constituent associated with the background concentration in fill.

EPA's recommended corrective measure for AOC 87c is the institution of WPCs and ICs. As part of the overall TA 6 remedy, these controls will further reduce the current and future overall risk associated with the elevated metals that are constituents in the fill.

TARGET AREA 7

The following SWMUs and AOCs have been grouped together as TA 7 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 7 include an asphalt cap, WPCs, and ICs.

SWMU 36 – 8-inch Mill Scale Pit & Associated Skimmer: SWMU 36 is the former scale pit and associated skimmer for the 8-Inch Mill. In 1996, under the Canton Plant Improvement Program (CPIP), the scale pit was taken out of service. The scale was removed, the pit was cleaned, and the concrete structure was broken up and left in the pit. The area was then top-graded with clean slag or asphalt pavement and is currently used as a truck access roadway and parking area.

The EPA samples assigned to this SWMU did not exceed secondary screening levels. However, it is part of TA 7 where unacceptable risk was found and will therefore be managed in a manner that will further reduce the overall risk of the TA. EPA's contaminants of concern are iron and lead found in subsurface soil and potential exposure to on-site and construction workers.

The corrective measures EPA evaluated for SWMU 36 as part of TA 7 are no further action and subsurface WPCs.

No further action would not aid in reducing the TA calculated risk below acceptable levels.

The institution of WPCs will alter the assumptions EPA utilized in the risk assessment portion of the RFI to aid in reducing the HI and BLL for the TA below target levels.

Although samples EPA assigned to this SWMU did not exceed secondary screening levels, EPA's recommended corrective measure for SWMU 36 is the institution of WPCs and ICs for subsurface soils as a matter of consistency for the TA.

SWMU 37 – 8-Inch Mill Oil Storage Tank: SWMU 37 is the former aboveground storage tank used for the storage of waste oil for the 8-Inch Mill. In 1996, the 8-Inch Mill Oil Storage Tank was taken out of service. The oil from the tank was transferred and processed with the other waste oils from the plant. The piping and tank were cleaned, dismantled and cut into scrap. A contractor purchased the scrap and transported the scrap off-site. EPA's contaminants of concern are iron and lead in subsurface soils at SWMU 37, where levels of contaminants found were 238,000 mg/kg and 9,130 mg/kg, respectively. These levels would pose an unacceptable risk to on-site workers and construction workers.

The corrective measures EPA evaluated for SWMU 37 are no further action, WPC for subsurface soil and an asphalt cap to abut next to the existing adjacent asphalt roads and parking lots.

No further action would not be protective of human health and the environment.

Work place controls for subsurface soil exposures would be protective of human health and the environment by reducing the exposure of construction workers to subsurface soils.

An asphalt cap would eliminate the potentially complete exposure pathways under normal operating conditions. However, the use of an asphalt cap as a stand alone remedy would not reduce the EPA calculated potential non-carcinogenic risk and blood lead level concentrations for a construction worker, whose assumed activities would require penetrating the cap. Under normal operating conditions, an asphalt cap would eliminate potential exposure pathways to industrial workers and reduce the potential for leaching and migration of metals in the slag aggregate. The addition of WPCs and institutional controls will protect current and future receptors.

EPA's recommended corrective measure for SWMU 37 is an asphalt cap and the institution of subsurface WPCs and ICs. The estimated cost of this remedy is $50,000.

TARGET AREA 8

EPA assigned SWMUs 62 and 105 to Target Area 8. As presented in the *Scope of Corrective Action* section, these two units did not pose unacceptable risk. Therefore, EPA selected no further action for TA 8.

TARGET AREA 9

The following SWMUs and AOCs have been grouped together as TA 9 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 9 include soil excavation and disposal, a soil/slag cap, an asphalt cap, implementation of best management practices for waste management, WPCs, and ICs.

SWMU 48 - #3 Melt Shop Baghouse: SWMU 48 consists of the baghouse used to control emissions from electric arc furnaces and an Argon Oxygen Decarburization (AOD) vessel in the #3 Melt Shop. It encompasses approximately 11,550 square feet of area (33 ft. by 350 ft.)

located west of the #3 Melt Shop. The #3 Melt Shop Baghouse operations began in 1976 and ceased operation in 2001. Primary wastes in this SWMU are electric arc furnace (EAF) dust and baghouse bags.

EPA's contaminants of concern are iron, manganese and lead in surface soil. The lead impacted soil appears to be limited to the area around the fan bases. In September 2008, Republic conducted additional delineation of lead in surface soil at this SWMU using handheld X-ray fluorescence (XRF) spectrometry technology to better define the limits of lead impacted soil and to refine estimated costs. The additional delineation of lead in surface soil at this SWMU resulted in reducing the area of lead impacted soils exceeding the calculated site-specific lead concentration of 1,115 mg/kg to approximately 50 feet by 320 feet in plan dimension and approximately 1 foot in depth. The lead concentrations in this area is 20,300 mg/kg. The iron and manganese are 318,000 mg/kg and 31,200 mg/kg, respectively.

The corrective measures EPA evaluated for SWMU 48 are WPC (for surface soil), soil/slag cap, an asphalt cap and surface soil excavation and off-site disposal.

The institution of WPCs for exposure to surface soils will alter the assumptions EPA utilized in the risk assessment to reduce the HI and BLL for the TA below target levels and therefore would be protective of human health. However, WPCs for surface soils would result in leaving the lead-impacted surface soil in place and exposed.

Installation of a soil or asphalt cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap. WPCs in the form of a modified Health and Safety Plan that Republic can use in conjunction with the slag cap would be protective of human health. The cap would serve to reduce surface exposure to potential receptors while WPCs would reduce the construction worker's exposure to contaminants during soil disturbance activities.

Surface soil excavation and off-site disposal would be protective of human health and the environment. It is also less cost prohibitive than a cap and is therefore the EPA recommended remedy. The estimated cost of excavation is $107,000, whereas the cost of a cap would be $130,000.

The EPA recommended corrective measure for SWMU 48 is a combination of the excavation of lead-impacted surface soil and WPCs to reduce potential exposures to iron and manganese in remaining surface soils. Institutional controls would also be a component of the remedy.

SWMU 49 - #4 Melt Shop Baghouse: The #4 Melt Shop Baghouse, located west of the #4 Melt Shop, encompasses approximately 25,350 square feet (97.5 ft. by 260 ft.). The area under and surrounding the baghouse is paved with concrete and/or asphalt, which serves as an existing cap for this area. A building that accommodates rail or truck service encloses the current dust load-out area. The risk-based driving factor for TA 9, which includes SWMU 49, is the HI for the ingestion of iron and manganese in surface soil by the construction worker.

The corrective measures EPA evaluated for SWMU 49 are WPCs (surface), soil/slag cap, an asphalt cap, and surface soil excavation and off-site disposal.

Work place controls would be protective of human health and the environment but would not reduce the potential for contamination caused by ongoing activities in the area.

Installation of a soil or asphalt cap would not be necessary because this SWMU is covered entirely with existing concrete.

Surface excavation would not be appropriate due to the presence of existing concrete.

The EPA recommended corrective measure for TA 9 is the institution of WPCs and ICs for surface soils. Additionally, Republic must employ proper work practices to prevent future contamination of the area. The work practices will include operating and maintaining the baghouse and waste loading areas in a manner that will reduce the potential for accidental releases, specifically within those areas in this TA not covered by concrete.

SWMU 53 – Old Baghouse #4 Melt Shop: SWMU 53, the former #4 Melt Shop Baghouse, was used to control emissions from the EAFs in the #4 Melt Shop between 1968 and 1982. EAF dust was the primary waste in this area. The baghouse structure was removed over the last ten years. EPA's contaminants of concern are iron, manganese and lead in surface soil. Lead was detected up to 20,300 mg/kg.

The corrective measures EPA evaluated for SWMU 53 are no further action, WPCs (surface), soil/slag cap, an asphalt cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls for exposure to surface soils will alter the assumptions EPA utilized in the risk assessment to reduce the HI and BLL for the TA below target levels and therefore would be protective of human health. However, WPCs controls for surface soils would result in leaving the lead impacted surface soil in place and exposed.

Installation of a soil or asphalt cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap. Additionally, there is current activity in the area that would result in damage to a soil/slag cap. However, EPA would consider a combination cap consisting of soil/slag and asphalt that Republic would place in the appropriate locations protective.

Surface excavation would be protective of human health and the environment by removing the source. However, the capital costs to excavate the entire area would be very high. EPA considered potential hot spot removal for lead at this SWMU. The highest concentration of lead encountered was in sample 53-SS7 (20,300 mg/kg). This sample was obtained from the floor of a depression around a ventilation shaft and access manhole to the high voltage (32,000 volt) electrical supply tunnel to the melt shop. Excavation in this area could result in damage to the utilities, leading EPA to reject the potential removal option.

The EPA recommended corrective measure for SWMU 53 is a combination of the installation of a soil/slag cap with an asphalt cap for the portion of the area that receives vehicle traffic and WPCs to reduce the exposures to construction workers. The minimum pavement section Republic would install for its required access routes would conceptually consist of 6 inches of sub-base, 4 inches of binder course, and 2 inch wearing course. The EPA recommended corrective measure is expected to cover approximately 41,000 sq. ft and cost an estimated $83,000. Institutional controls will also be a component of the remedy.

TARGET AREA 10

The following SWMUs and AOCs have been grouped together as TA 10 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 10 include soil excavation and disposal, WPCs, and ICs.

SWMU 14 – Ingot Inoculation Dust Collection Baghouse: SWMU 14 was previously inactive, but has been in use as the FlexCast Baghouse since about mid-2006. The baghouse controls emissions from material handling activities at the FlexCast refining operation and emissions from the caster when casting leaded steel. Investigators did not observe any visible damage to the concrete or visible staining of soils in the surrounding area. EPA's contaminants and media of concern are iron, manganese and lead in the surface soil at 331,000 mg/kg, 22,400 mg/kg, and 1,670 mg/kg, respectively.

The corrective measures EPA evaluated for SWMU 14 are no further action, WPC for surface soil, soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls for surface soils would be protective of human health and the environment by limiting worker exposure: Republic would mitigate the iron contaminated soil but the lead soil would continue to pose a potential threat in the subsurface.

The addition of a soil/slag cap would be protective of human health and the environment, but would also result in leaving the lead-impacted surface soil in place and would require ongoing O&M.

Soil excavation and off-site disposal would provide a permanent solution by removing lead impacted soils from the Site. Given the relatively small size of the impacted area, soil excavation is feasible. The estimated cost of excavation is $38,000.

The EPA recommended corrective measure for SWMU 14 is excavation of the lead- impacted surface soils and WPCs for surface soil containing iron. Surface excavation of lead-impacted soils would require the removal of a 120 square foot (6 ft. by 20 ft.) area with confirmatory samples collected from the north and south walls of the excavation. The western limit of the excavation will extend to the #4 Melt Shop and the eastern limit of the excavation will extend to the concrete pad below the baghouse. EPA may require Republic to conduct hand excavation due to the limited accessibility to the area. Republic will provide contractors it retains to perform

work in this area a summary of the analytical data, and require those contractors to prepare a health and safety plan to mitigate risks to their employees.

SWMU 51 – Ingot Inoculation Fume Evacuation System: SWMU 51, now in use as the FlexCast Fume Evacuation System, is part of the emissions control system that includes SWMU 14. The emissions control system has been used to evacuate emissions from material handling at the FlexCast refining operation and emissions from the caster when casting leaded steels since about mid-2006. Previously, SWMU 51 and SWMU 14 were part of the Ingot Inoculation Fume Evacuation System that was used for the capture and control of particulate emissions from the addition of lead to molten steel prior to casting. This area includes the induced draft fan and metal building enclosure that surround the fan. The fan and the fume evacuation system were removed from service in 1999 and placed back into service in about mid-2006. EAF dust is the primary waste in this area on exposed soil. EPA's contaminants of concern are iron, manganese and lead in surface soils at concentrations of 182,000 mg/kg, 22,400 mg/kg, and 1,670 mg/kg, respectively.

The corrective measures EPA evaluated for SWMU 51 are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls for exposure to surface soils will alter the assumptions EPA utilized in the risk assessment to reduce the HI and BLL for the TA below target levels and therefore would be protective of human health. However, WPCs controls for surface soils would result in leaving the lead-impacted surface soil in place and exposed.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap. Additionally, there is current activity in the area that could result in damage to a soil/slag cap.

Surface excavation would be protective of human health and the environment by removing the source. The cost of a cap compared to excavation is comparable, with excavation estimated to cost $38,000. The permanent removal of lead contamination is preferable.

The EPA recommended corrective measure for SWMU 51 is a combination of the excavation of lead-impacted surface soil with off-site disposal and WPCs to reduce potential exposures to iron in surface soils. Republic's surface excavation of lead impacted soils would require the removal of a 500 square foot (20 ft. by 25 ft.) area with confirmatory samples.

SWMU 52 – Exterior Solids Drop Station / #4 Melt Shop: SWMU 52 is the former #4 Melt Shop Exterior Solids Drop Station that consisted of a 5 cubic yard roll-off and the concrete beneath and around it. It was used to collect solid materials too heavy for the transfer velocity within the duct of the #4 Melt Shop Baghouse. The duct work and drop station were removed in 1999. The area is currently used for staging materials and for maintenance activities. EPA's contaminants of concern are iron, manganese and lead in surface soil.

The corrective measures EPA evaluated for SWMU 52 are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls for exposure to surface soils in this TA will alter the assumptions EPA utilized in the risk assessment to reduce the HI and BLL for the TA below target levels and therefore would be protective of human health.

Installation of a cap at this SWMU is not necessary because the area is already covered by concrete.

Surface soil excavation and disposal would not be possible at this location due to the concrete cover.

The EPA recommended corrective measure for SWMU 52 is the institution of WPCs and ICs. In combination with the excavation proposed for SWMU 51, this proposed remedy is protective for the TA.

SWMU 101 – Canton Bloom Cast Facility LMF Baghouse Area: SWMU 101 consists of the baghouse used to control emissions from the ladle metallurgy facility (LMF) operations in the Canton Bloom Cast Facility and the two roll-off containers used to collect the baghouse dust. Soil samples assigned to this SWMU did not exceed secondary screening levels. However, SWMU 101 is part of TA 10, where EPA's contaminant of concern is lead in surface soil. This area will be managed in a manner that further reduces the overall risk of this TA.

The corrective measures EPA evaluated for SWMU 101 as part of TA 10 are no further action and surface WPCs.

No further action would not aid in reducing the TA calculated risk below acceptable levels

The institution of WPCs, in general, will alter the assumptions EPA utilized in the risk assessment to reduce the HI and BLL for the TA below target levels.

Although samples assigned to this SWMU did not exceed secondary screening levels, EPA's recommended corrective measure for SWMU 101 is the institution of surface WPCs and ICs as a matter of consistency for the TA.

SWMU 76b – EAF Dropout Chamber Solids Roll-Off Containers: SWMU 76b is an area where roll-off containers were used to temporarily store the dropout chamber solids material generated by the #9 EAF operations (SWMU 49). The container management operations began in 1998 and ceased in 1999 with the removal of the exterior solids drop station. The container and the exterior solids drop station are no longer in-place. The area is comprised of mill, soil, and an associated concrete pad that extends from the baghouse to the south wall of the area. EPA's contaminants of concern are iron and manganese in surface soils.

The corrective measures EPA evaluated for SWMU 76b are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not aid in reducing the TA calculated risk below acceptable levels

Work place controls would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap. Also, a portion of this area is already covered by concrete.

Surface excavation would be protective of human health and the environment by removing the surface source, but EPA could not justify the capital cost because the constituents are iron and manganese, which are constituents associated with the background concentrations in fill.

EPA's recommended corrective measure for SWMU 76b is the institution of WPCs and ICs.

TARGET AREA 11

The following SWMUs and AOCs have been grouped together as TA 11 and the proposed remedies will be applied at these areas such that the entire TA will be addressed in a consistent fashion. The proposed remedies for TA 11 are WPCs and ICs. The implementation of these practices alone will be sufficient to reduce the risk from constituents present due to site-wide fill.

SWMU 102 – Canton Bloom Cast Facility Caster Scale Pit Area: SWMU 102 is the concrete-lined scale pit for the caster and rolling mill located in the Bloom Cast Facility. This is an active operation area that receives re-circulated water, waste oil and scale. The scale is removed from a pit and staged on a concrete pad. EPA's contaminant of concern is iron in surface soil to on-site and construction workers at 202,000 mg/kg.

The corrective measures EPA evaluated for SWMU 102 are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

Surface soil excavation with disposal would be protective of human health and the environment by removing the surface source, but EPA could not justify the capital cost since the constituent is iron, which is a constituent associated with the background concentration in fill.

The EPA recommended corrective measure for SWMU 102 is the institution of WPCs and ICs.

SWMU 103 – Canton Bloom Cast Facility Rolling Mill Scale Pit Area: SWMU 103 is the concrete-lined scale pit for the caster and rolling mill located in the Bloom Cast Facility. This is an active operation area that receives re-circulated water, waste oil and scale. The scale is removed from a pit and staged on a concrete pad. EPA's contaminant of concern is iron in surface soil.

The corrective measures EPA evaluated for SWMU 103 are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

Work place controls would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

Surface soil excavation with disposal would be protective of human health and the environment by removing the surface source, but EPA could not justify the capital cost since the constituent is iron, which is a constituent associated with the background concentration in fill.

The EPA recommended corrective measure for SWMU 103 is the institution of WPCs. Site-wide institutional controls will also further reduce potential risk from fill-related constituents for future use.

SWMU 59, AOC 95, & AOC 111
EPA did not assign these three areas to a Target Area; EPA evaluated each individually. Site-wide institutional controls will apply to these areas.

SWMU 59 - #3 Slab Grinder Baghouse at #4 Steel Conditioning: SWMU 59 consisted of a grinding dust collection system and associated roll-off boxes that collected grinding dust generated from the slab grinding operations in the #4 Steel Conditioning Building. The grinding dust collection operations began in 1979 and were shut down in 2002. The area surrounding the baghouse consists of asphalt and concrete pavement. Investigators visually observed small piles of dust in the area below the baghouse. EPA's contaminant of concern is lead in surface soil at 2,160 mg/kg for the potential exposure to on-site and construction workers.

The corrective measures EPA evaluated for SWMU 59 are no further action, WPCs (surface), soil/slag cap, and surface soil excavation and off-site disposal.

No further action would not aid in reducing the TA's calculated risk to below acceptable levels.

Work place controls for exposure to surface soils will alter the assumptions EPA utilized in the risk assessment portion of the RFI to reduce the BLL for the TA below target levels and therefore would be protective of human health. However, WPCs controls for surface soils would result in leaving the lead-impacted surface soil in place and exposed.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

Surface excavation would be protective of human health and the environment by removing the source. Republic estimated the cost of excavation at $22,000.

The EPA recommended corrective measure for SWMU 59 is excavation and disposal of lead-impacted surface soil. Republic has partially completed this excavation as an IM as previously discussed. The confirmation samples Republic took at the extent of the IM excavation exceeded 1,100 mg/kg lead on the north wall. Republic would remove an additional 10 feet of soil along the north wall and perform confirmation sampling. Republic will continue excavation as necessary until confirmation sample results provide an acceptable calculated BLL.

AOC 95 – Forge Area Fueling Station: AOC 95 consists of a former diesel fuel AST, a secondary containment, and a dispenser. The AOC area serves as a fueling station for facility equipment. The tank, formerly situated within a concrete secondary containment structure, was taken out of service in November 2003. It was cleaned and rendered unusable in April 2004. The tank was subsequently used as scrap. A concrete pad abuts the containment area adjacent to the former dispenser. EPA's contaminant of concern is manganese in surface soil at 29,200 mg/kg for on-site and construction workers.

The corrective measures EPA evaluated for AOC 95 are no further action, WPCs (surface), soil/slag cap and surface soil excavation and off-site disposal.

No further action would not be protective of human health and the environment.

WPCs would be protective of human health and the environment by reducing the construction worker's exposures.

Installation of a soil cap alone would not be protective of human health and the environment because the receptor of interest is a construction worker, whose assumed activities would include penetrating the cap.

Surface excavation would be protective of human health and the environment by removing the surface source, but EPA could not justify the capital cost since the constituent is manganese, which is a constituent associated with the background concentration in fill.

The EPA recommended corrective measure for AOC 95 is the institution of WPCs and ICs.

AOC 111 - PCB Soil Impacts at South End of 12-Inch Mill Building Reheat Furnace: AOC 111 is the aboveground hydraulic oil tank associated with the hydraulic systems for the former 12" Bar Mill. Hydraulic oils were stored in the tanks and used for the makeup to the hydraulic system reservoirs. AOC 111 had two surface soil samples that exceeded the TSCA bulk material standard for low-occupancy areas, 25 ppm. The concentrations of PCBs at the two locations were 28 ppm and 76 ppm.

Soil excavation and disposal is a permanent solution to the impacts and is protective of human health and the environment. Republic estimated the cost of the proposed remedy at $62,000.

The EPA recommended corrective measure for AOC 111 is the excavation of surface soils and replacement of the existing asphalt cover. The proposed excavation measures approximately 50 feet by 50 feet. The proposed remedy will consist of removing the existing asphalt pavement, excavating soil to a depth of 2 feet, backfilling the excavation with compacted slag, and replacement of the asphalt pavement. Republic will dispose of the excavated soil off-site in an appropriate landfill.

East Branch Nimishillen Creek (EBNC): The EBNC originates in the areas around the City of Louisville and flows southwesterly past the Republic site for a total of 10.4 miles before joining the Middle Branch of Nimishillan Creek downstream. Information about the contamination in the creek can be found in the *Investigations* section and *Summary of Facility Risks* section, above. Contaminants of concern in the sediment include mostly metals and SVOCs, such as arsenic, lead, chromium, benzo(a)anthracene, benzo(a)pyrene, and floranthene, for example.

EPA's proposed remedy for the EBNC is excavation and off-site disposal of 500 linear feet of contaminated creek sediment. Contaminants that Republic will remove include metals, semi-volatile organic compounds, and volatile organic compounds. The proposed area of excavation starts behind the dam and extends 500 feet upstream. Republic will remove all sediment down to the natural streambed. During the investigation, Republic divided the creek into 100-foot sections, starting at the dam, with the proposed area of excavation targeting sections 1-5 (Figure 3). The excavation will require the de-watering of the sediment, sampling of the water and sediment, and proper disposal of both. Republic will perform stream restoration afterwards to ensure the re-establishment of stream bank stability. Figure 3 shows the thickness of sediment present that Republic will remove in the area of the proposed corrective measure. Republic's estimated cost for the proposed 500 feet of sediment removal is approximately $365,000. A more detailed cost estimate will be developed as part of the CMI.

As discussed in the *Summary of Alternatives* section, EPA considered an alternative to sediment removal, "sediment capping/cover". EPA did not further consider this alternative after the initial evaluation due to the depth of sediment that is located behind the dam. The average thickness of sediment within the first 500 feet behind the dam is 2 feet. The maximum thickness of sediment over a large area immediately behind the dam, however, is 8 feet.

Based on the available data, the constituents from Republic's site operations are only a portion of the total chemical load found in the EBNC sediment. Upstream sources contributed to the contamination present within the creek sediment and were therefore considered in the delineation

of the proposed remedial footprint. Of the eleven creek segments investigated adjacent to the Republic site, a disproportionate amount of total contamination is located within the first 500 feet behind the dam (Figure 3). Normal, or expected, creek sediment fate and transport mechanisms have been altered by the presence of the dam. The dam serves as a single location for the deposition of decades' worth of sediment and contamination to accumulate. Furthermore, its intended function of 'holding back' water in a 'pool' alters the stream bank morphology. Sediment from upstream does not deposit on the banks as a result of the steep grade associated with this change in morphology. Therefore, over half of all the sediment present behind the dam and adjacent to the site is located within 500 feet of the dam.

The aquatic life ecological risk screening concluded that there is risk from the sediments to ecological receptors upstream, adjacent to, and downstream of the Republic site. Based on stream and organism sampling of EBNC by OEPA since 1999, the creek is impaired throughout its entire length. However, the some biotic measurements of the creek happen to improve slightly downstream of the Republic Facility as compared to upstream. Through the derivation of a cumulative toxicity weighted mass factor calculated for each stream segment adjacent to the Republic Facility, it was determined that 91% of the total mass loading and 93% of the toxicity from the contamination is within the first 500 feet behind the dam. Ecological risk exists from creek sediment beyond the 500 feet; however, as previously stated, based upon Republic's equitable share of contaminant contribution and cost, the proposed remedy is limited to 500 feet.

In addition to the in-stream sediment removal activities, EPA proposes a targeted hot spot excavation around stream bank sample location OB-7. The proposed surface excavation is estimated to measure approximately 10 feet by 10 feet by 1 foot deep to address PAH-impacted overbank sediment deposits. The excavation will continue until Republic removes obviously impacted soil, as identified in the field through visual observation or aided by field-testing procedures. Republic will collect one confirmation sample from each excavation wall and the excavation floor and submit the samples to the laboratory for PAH analyses. Based on the results of the initial confirmation samples, Republic will expand the excavation until the concentrations of PAHs detected in the confirmation samples do not result in an unacceptable risk. Once the calculated potential risk meets the project goals, Republic will backfill the excavation. The estimated cost of this corrective measure is $5,000.

Investigators visually identified an area of orange staining near Outfall 011 for sampling. Sampling showed contamination above the ecological screening criteria for arsenic, chromium, and nickel. EPA did not identify this area as a particular ecological risk; however, due to the visual staining and screening level exceedances, Republic will also excavate this sediment. Republic will base the excavation footprint upon the sampling and, the area exceeding screening criteria, and will extend 3 feet beyond the horizontal extent and 6 inches beyond the vertical extent to ensure the characterized contamination is removed. Republic's estimated cost of this corrective measure is $2,000.

Site-wide Groundwater: The corrective measures EPA evaluated for site-wide groundwater are no further action, monitored natural attenuation, source control with compliance monitoring, and workplace and institutional controls.

No further action would not aid in reducing the site-wide groundwater calculated risk below acceptable levels.

Monitored Natural attenuation (MNA) would aid in reducing the site-wide groundwater calculated risk below acceptable levels over time as natural attenuation factors reduce chemical concentrations in the groundwater. MNA will also ensure that groundwater with a calculated risk above acceptable levels is not migrating offsite. However, MNA alone would not reduce the site-wide groundwater calculated risk for construction workers below acceptable levels in the short term. Further, based upon an incomplete exposure pathway, a demonstration that the groundwater will not impact the creek, and the long-term cost of MNA compared to source control with monitoring, EPA did not select MNA as a corrective measure.

Source control, in the form of the soil excavation remedies and areas of pathway elimination presented for the SWMUs and AOCs above, with compliance monitoring addresses groundwater contamination while confirming the assumptions discussed above remain unchanged. The proposal is to perform annual monitoring of perimeter monitoring wells for constituents that have exceeded the risk based criteria in that well or an up-gradient well. EPA expects the monitoring to occur for five years after Republic implements the proposed source control remedies. The goal of the monitoring will be for Republic to demonstrate that no exceedances of risk-based criteria are present at the compliance points. Monitoring may continue for up to five years unless sampling demonstrates unacceptable levels of constituents migrating off site. EPA may determine that additional measures are required to protect human health and the environment at any time.

Institutional controls would aid in reducing site-wide groundwater calculated risk below acceptable levels by eliminating potential exposure pathways. Republic will initiate a deed restriction to limit future use of the property to industrial use thereby eliminating non-industrial exposure scenarios, prohibit the use of site groundwater thereby eliminating potential ingestion and direct contact exposure pathways to industrial workers, and require on-site companies to implement WPCs to protect construction workers who may be exposed to groundwater in the future thereby eliminating the ingestion and direct contact pathways to construction workers. Republic would use an environmental covenant to require that companies continue to institute and document all institutional and work place controls.

The EPA recommended corrective measure for site wide groundwater is a combination of workplace and institutional controls as well as source control with confirmatory groundwater sampling.

Financial Assurance

EPA is proposing financial assurance as a component of the final remedy. Republic must demonstrate that adequate funds will be available to complete the construction as well as the operation and maintenance of all selected remedies. Republic will develop a detailed, updated cost estimated as part of the CMI, incorporating contractor bids of the EPA approved scope of work contained in the work plan for all selected remedies. Republic must provide this financial assurance within 90 days after EPA issues the Final Decision and Response to Comments document. Republic may use any of the following financial mechanisms to make this

demonstration: financial trust, surety bonds, letters of credit, insurance, or qualification as a self insurer by means of a financial test. After successfully completing the construction, Republic may request that EPA reduce the amount of the financial assurance to the amount necessary to cover the remaining costs. Republic may make similar requests from time to time as the operation and maintenance phase of the remedies proceeds.

Respondent must submit all original executed and/or otherwise finalized instruments to EPA's Regional Comptroller (MF-10J), 77 W. Jackson Blvd., Chicago, IL 60604-3590, within 30 days after date of execution or finalization as required to make the documents legally binding. A transmittal letter stating the name and RCRA ID number of the facility, Respondent's name and address, and the EPA docket number of the Order must accompany the instruments. Respondent must also provide copies to the EPA Project Manager.

PUBLIC PARTICIPATION

EPA solicits input from the community on the cleanup methods proposed under each of the previous alternatives. EPA has set a public comment period from August 20 – September 19, 2012, to encourage public participation in the selection process. We encourage community members to submit any comments regarding these proposed remedies in writing by September 19, 2012. If requested, EPA will also host a public meeting in Canton to hear public comments. To request a public meeting, contact Michelle Kaysen, below.

The administrative record is available at the following locations (please call for hours):

EPA, Region 5
7th Floor Record Center
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 886-4253

Stark County District Main Library
715 Market Avenue N,
Canton, OH 44702
(330) 452-0665

EPA will summarize comments and provide responses in the Response to Comments. EPA will draft the Response to Comments at the conclusion of the public comment period and incorporate the Response to Comments into the administrative record. To send written comments or obtain further information, contact:

Michelle Kaysen (LU-9J)
77 W. Jackson Blvd
Chicago, IL 60604
(312) 886-4253
kaysen.michelle@epa.gov